Attachment VIII.C.17.a-2

EPT Concord Resort

SULLIVAN COUNTY, NEW YORK

Stormwater Pollution Prevention Plan

Prepared in compliance with

New York State Department of Environmental Conservation

Stormwater Pollutant Discharge Elimination System (SPDES)

General Permit for Stormwater Discharges from Construction Activities
Permit No. GP-0-10-001 (SPDES GP-0-10-001)

AKRF Project Number: 80286

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1.0 OBJECTIVE

AKRF Engineering, P.C. (AKRF) prepared this Stormwater Pollution Prevention Plan (SWPPP) in accordance with the following applicable rules, regulations and guidance documents:

- New York State Department of Environmental Conservation (NYSDEC) Stormwater Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activities Permit No. GP-0-10-001 (SPDES GP-0-10-001), see Appendix A;
- New York State Stormwater Management Design Manual, dated August 2010 produced by the NYSDEC;
- New York State Standards and Specifications for Erosion and Sediment Control, dated August 2005 produced by NYSDEC;
- Delaware River Basin Commission (DRBC) Special Protection Water (SPW) regulations.

The objectives of this SWPPP are to:

1. Demonstrate compliance with Town of Thompson Town Code.
2. Outline Contractor responsibilities to maintain compliance with SPDES GP-0-10-001, including required inspections, maintenance, forms, and certifications.
3. Outline measures to install, inspect, and maintain erosion and sediment control measures for the proposed project. The objective of these measures is to eliminate or significantly minimize pollutant discharges to the adjacent surface water bodies during construction activities.
4. Demonstrate that the post-construction water quality treatment practices as proposed are designed to capture and treat the stormwater runoff from the proposed project.
5. Specify post-construction stormwater management structures on-site such that the proposed peak flows do not exceed the pre–development peak flows, thus providing channel protection, overbank flood control, and control of the peak discharge control from the extreme storm event.
6. Incorporate green infrastructure techniques in order to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow and discharge volume.
7. Provide a long term inspection and maintenance plan that would ensure the long term operation of the proposed practices.
8. Describe the measures that will be taken to comply with the requirements of the DRBC to maintain the high water quality of the Special Protection Waters of the Delaware River Basin.

2.0 OWNER/APPLICANT'S RESPONSIBILITIES

EPT Concord II, LLC, the "Owner/Applicant", is responsible to ensure that the Contractor installs and maintains the erosion and sediment control measures in accordance with this SWPPP. The Owner/Applicant is also responsible to ensure that the appropriate forms and certifications contained herein are completed prior to and throughout the duration of demolition and construction activities. The Owner/Applicant shall keep a copy of this document, associated attachments, and any inspection reports generated on-site for the duration of the project and for a minimum of 5 years from the date that the site achieves final stabilization. During this time period it is the Owner/Applicant's responsibility to conform to any changes or updates to the current regulations as they apply to the project.

The Owner/Applicant should ensure that the provisions of the SWPPP are implemented from the commencement of construction activity until all areas of disturbance have achieved final stabilization and the Notice of Termination (NOT) has been submitted to the appropriate NYSDEC office.

The Owner/Applicant should maintain a copy of the General Permit (SPDES GP-0-10-001), Notice of Intent (NOI), NOI acknowledgement letter (see Appendix B), SWPPP, and Inspection Reports at the construction site until all disturbed areas have achieved final stabilization and the Notice of Termination has been submitted to the NYSDEC. The documents must be maintained in a secure location, such as a project trailer, on-site construction office, or mailbox with lock; that is accessible during normal working hours to an individual performing a compliance inspection.

3.0 CONTRACTOR'S RESPONSIBILITIES

The Contractor is responsible for implementing this SWPPP and related project specifications and reviewing all forms, certifications, and contract drawings to become familiar with all aspects related to the SPDES GP-0-10-001. The Contractor shall retain a signed copy of this SWPPP and all associated attachments on-site from the initiation of demolition and proposed construction activities to the date of final stabilization. The Contractor is responsible for completing the certification prior to the commencement of demolition and proposed construction activities. Each of the Subcontractors involved in the implementation of erosion and sediment control measures must also complete a certification. The Contractor is responsible for each of the Subcontractors employed by the Contractor that are involved in the implementation of erosion and sediment controls or earthwork.

It is the duty of the Contractor to properly install and maintain all erosion and sediment control measures on the site as per this SWPPP. The Contractor shall also be responsible for the inspection of all erosion and sediment control measures for the proposed project by a "Trained Contractor" as per this SWPPP. Should the Owner, an owner's representative, or any local authority having jurisdiction deem that the SWPPP or the Contractor's implementation of the SWPPP proves to be ineffective in eliminating or significantly minimizing the pollutants or achieving the goals of the SPDES GP-0-10-001, the Contractor shall take any necessary action to conform to the objectives of the permit at no additional cost to the Owner.

It is the duty of the Contractor to properly inspect and maintain all erosion and sediment control measures installed on the site as per this SWPPP. Any revision to the SWPPP in design, demolition and construction activities, inspection, or maintenance shall be reflected by the Contractor in the on-site copy of the SWPPP in a timely manner. At the beginning of this work, the Contractor must designate a qualified inspector. The Contractor and its subconsultants are required to review the SWPPP and complete the certification forms in Appendix C. The Contractor shall coordinate with the Construction Manager to ensure that all of the inspection requirements are in conformance with this SWPPP and the requirements of the SPDES GP-0-10-001. Any revisions to the Contract Drawings found in Appendix F should be included in the same appendix as addendum. On a weekly basis, copies of all inspection forms and maintenance records shall be organized and filed accordingly by the Contractor.

4.0 PROJECT DESCRIPTION

The project purpose is to redevelop and revitalize the site of the former Concord Resort in the Town of Thompson, Sullivan County, as envisioned and authorized by State, regional, and local economic development plans, into a thriving destination resort that serves to revitalize the economy and culture of the region, see Figure 1.

The project sponsor, EPT Concord II, LLC (referred to as "EPT" or the "Applicant") proposes to develop a master planned destination resort community (referred to as "EPT Concord Resort" on approximately

1,583 acres of land located on the site of the former Concord Resort in the Town of Thompson, Sullivan County, New York, see Figure 2.

When complete, the EPT Concord Resort will include an 18-hole golf course, Casino Resort, harness horse racetrack, grandstand/showroom, simulcast facility, hotels, water park, an RV park, and an entertainment village with cinemas and supporting retail (the "Casino Resort"). In addition, there will be a residential village with a mix of unit types including condos, apartments, townhouses and detached single family homes, a civic center, and an active adult residential community. This mix of uses will be connected via a multi-use trail system with abundant open space. In total, the Resort is planned to have 897 housing units, 1,800 hotel rooms, a 405,000 sq ft Casino, 903,000 sq ft of commercial space, and a 35,000 sq ft Civic Center.

The EPT Concord Resort components will be phased over an approximately 10-year horizon beginning with certain components of the Resort Core (the "Resort Core"), from which all additional components will flow. The development program of the EPT Concord Resort including the MRMI parcel will require infrastructure improvements including electric, telecommunications, water supply, stormwater, sanitary services, and site access. Although these improvements will specifically support the proposed development on the MRMI Site, they will also be designed to support future development phases of the EPT Concord Resort.

This comprehensive SWPPP covers the following Roadway and Infrastructure Improvements phase of development, which together is referred to as the "Project Site":

- Roadway - The Applicant has elected to develop a proposed gateway to the EPT Concord Resort Access through the development of the "Resort Entry Road" which will be constructed west of Joyland Road (see Figure 2 for the Resort Entry Road or Infrastructure Right of Way layout). The Resort Entry Road will connect to the Exit 106 off-ramp at its intersection with Towner and CR173/Cimarron Road. From here, the road will convey traffic north before turning east to meet with a newly improved Joyland CR 173/Cimarron Road intersection. At this point, the Resort Entry Road will travel west for a short distance before curving to the north, passing to the west of the lake and then turning to the northeast after which it enters the MRMI Site before rejoining Joyland Road. In order to facilitate the construction of the Resort Entry Road, the Applicant has acquired several parcels to the west of Joyland Road and to the south of the MRMI Site.
- Infrastructure - Water service will be constructed under Route 17 west of the Exit 106 interchange overpass and will follow the alignment of the Resort Entry Road. Water service will connect to existing Village of Monticello infrastructure located within East Broadway. Sanitary sewer service will be provide within Thompsonville Road and will connect to the Town of Thompson Sewage Treatment Plant (STP) via an existing maintenance path and under Kiamesha Creek directly into the STP. Electrical conduits and utility poles will also be constructed along the roadway to provide power and telecommunications to the MRMI facility.

5.0 PRE-DEVELOPMENT CONDITIONS

The Project Site is located in central Sullivan County, New York within the Town of Thompson. Towns and Villages surrounding Thompson include: Liberty, Fallsburg, Mamakating, Forestburgh, Lumberland and Bethel. The Project Site lies to the south and east of Kiamesha Lake in the northeast portion of the Town of Thompson. The EPT Concord Resort Site is generally bordered on the south by New York State Route 17 (NY Route 17), on the west by New York State Route 42 (NY Route 42), on the north by County Route 109 (CR 109 - Kiamesha Lake Road), and on the east by County Route 161 (CR-161 Heiden Road). Figure 1 presents the Proposed Project Location.

5.1 Existing Geology & Soil Conditions

Geologic maps indicate that the Project Site is underlain by bedrock of the Upper and Lower Walton formations of the West Fall Group. This group characterizes the geology of the entire Neversink watershed, and largely consists of sedimentary rocks, including shale, sandstones, and conglomerate covered by glacial till.

The majority of surface material covering bedrock in the Catskills is soil and glacial deposits. Glacial advancement during the Pleistocene Epoch eroded and reduced rock to various forms and sizes, subsequently depositing glacial till as the ice sheets melted and retreated. Maps of unconsolidated deposits show that surficial geology within the Project Site consists of till and kame. The kame occurs in a narrow north-south band that underlies the Kiamesha Creek valley east of Kiamesha Creek, and the till underlies the site's higher elevation areas to the west. Characteristics of till include varying texture of clay, silt-clay, or boulder-clay, high impermeability, tendency to be sandy in areas underlain by gneiss or sandstone, varying depths, and potential instability on steep slopes. Kame deposits are formed by glacial melt water flowing between a glacier and adjacent valley. Kame is usually found along opposite sides of a glacial valley, as illustrated within the Project Site where kame deposits border the eastern portion of the site, east of Kiamesha Creek. Kame is a coarse to fine gravel or sand that occurs in thicknesses of 10 to 30 meters.

The following soils are found on the Project Site based on the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) Soil Survey of Sullivan County, New York and the geotechnical investigations completed by Melick-Tully and Associates, P.C. (MTA).

- Subsurface Investigation - Proposed Concord Resort Development, dated May 1, 2012.
- Subsurface Investigation - Proposed Resort Entry Road, dated March 5, 2013.

5.1.1 USDA Soil Description

The NRCS identifies major classifications of soils that have similar characteristics (such as texture and drainage) into a series. Within each series, soils differ in slope and other characteristics that affect their use. On the basis of these differences, soil series are further divided into phases (soil map units). Different soil phases exhibit variable water storage, erosion potential, and other characteristics that are important from a development perspective.

The upper part of the Project Site consists mainly of Wellsboro and Wurtsboro Series soils which are gravelly loams with a perched water table of approximately 1.5 to 3 feet below the surface. The lower portion of the site consists of Scriba loams, Neversink and Alden soils, Wayland silt loam and Wurtsboro loam. These soils generally have a perched water table of approximately 0.5 to 6 feet.

Table 5-1 contains a complete list of the soil mapping units located within the study area and lists their primary characteristics. The soil boundaries, as mapped by the NRCS Soils Survey of Sullivan County, are shown in Figures D-1 through D-6. The majority of the soils are categorized as Hydrologic Group C or D soils which are typically indicative of comparatively slower soil permeability as compared to Hydrologic Group A or B soils. The HSG for each soil type found within the pre- or post-development drainage areas is listed on Table 5-2.

Table 5-1
NRCS Soil Classification

Symbol	Soil Series Name	Depth to Bedrock	Drainage Characteristics
AoC	Arnot-Oquage complex, 0-15% slopes, very rocky	10-20 inches	Drainage class: shallow and somewhat excessively drained to moderately well drained. Depth to water table: greater than 6 feet. Soil erodibility "K" factor: 0.17-0.24 Permeability: 0.6-2.0 in/hr Hydrologic group: C/D
AoE	Arnot-Oquage complex, 15-35% slopes, very rocky	10-20 inches	Drainage class: shallow and somewhat excessively drained to moderately well drained. Depth to water table: greater than 6 feet. Soil erodibility "K" factor: 0.17-0.24 Permeability: 0.6-2.0 in/hr Hydrologic group: C/D
Fu	Fluvaquents-Udifluvents complex, frequently flooded	Not listed	Drainage class: excessively drained to very poorly drained. Depth to water table: Not listed. Soil erodibility "K" factor: not listed. Permeability not listed. Subject to frequent flooding and stream scour, streambank erosion, and shifting of soil deposits. Hydrologic group not listed; capability subclass Vw.
MrA	Morris loam, 0-3% slopes	More than 60 inches	Drainage class: Somewhat poorly drained soil on till plains or broad, flat hilltop on uplands. Depth to water table: 0.5-1.5 feet Soil erodibility "K" factor: 0.24-0.32 Permeability: <0.2-2.0 in/hr Hydrologic group: C
MrB	Morris loam, 3-8% slopes	More than 60 inches	Drainage class: Somewhat poorly drained soil on the lower parts of concave hillsides on uplands. Depth to water table: 0.5-1.5 feet Soil erodibility "K" factor: 0.24-0.32 Permeability: <0.2-2.0 in/hr Hydrologic group: C
MrC	Morris loam, 8-15% slopes	More than 60 inches	Drainage class: Somewhat poorly drained soil on the lower parts of hillsides on uplands. Depth to water table: 0.5-1.5 feet Soil erodibility "K" factor: 0.24-0.32 Permeability: <0.2-2.0 in/hr Hydrologic group: C
Ne	Neversink loam	More than 60 inches	Drainage class: poorly drained to very poorly drained. Depth to water table: 0 to 6 inches, Dec-Apr. Permeability is moderate in surface and subsurface layers and slow in subsoil and substratum. Surface runoff is slow or very slow. Erosion is a slight hazard. Soil erodibility "K" factor: 0.20-0.28. Hydrologic group D and capability subclass IVw.
Nf	Neversink and Alden soils, very stony	More than 60 inches	Drainage class: poorly drained to very poorly drained. Depth to water table: 0 to 6 inches, Dec-Apr. Permeability not listed. Surface runoff is very slow or intermittently ponded. Erosion hazard not listed. Soil erodibility "K" factor: 0.20-0.24. Hydrologic group D and capability subclass VIIs.
OeB	Oquaga very channery silt loam, 3-8% slopes	20-40 inches	Drainage class: Well drained to excessively well drained soil on hilltops on bedrock-controlled uplands. Depth to water table: greater than 6 feet. Soil erodibility "K" factor: 0.20 Permeability: 0.6-2.0 in/hr Hydrologic group: C

Table 5-1
NRCS Soil Classification

Symbol	Soil Series Name	Depth to Bedrock	Drainage Characteristics
OgC	Oquaga Oquaga-Arnot complex, 8-15% slopes	20-40 inches	Drainage class: Moderately deep and well drained to excessively drained. Depth to water table: greater than 6 feet. Soil erodibility "K" factor: 0.20 Permeability: 0.6-2.0 in/hr Hydrologic group: C
Ra	Raynham silt loam	More than 60 inches	Drainage class: Somewhat poorly drained soil that formed in water-laid deposits of coarse silt and sands. Depth to water table: 0.5-1.5 feet Soil erodibility "K" factor: 0.49-0.64 Permeability: 0.06-2.0 in/hr Hydrologic group: C
ScB	Scriba loam, 3-8% slopes, stony	More than 60 inches	Drainage class: somewhat poorly drained. Depth to water table: 6 to 18 inches, Feb-Mar. Permeability is moderate or slow above the fragipan and slow in the fragipan. Surface runoff is slow. Erosion hazard is not listed. Soil erodibility "K" factor: 0.20-0.28. Hydrologic group C and capability subclass IIIw.
SeB	Scriba and Morris loams, gently sloping, extremely stony	More than 60 inches	Drainage class: somewhat poorly drained. Depth to water table: 6 to 18 inches, Feb-Apr. Permeability is slow to moderate above the fragipan and very slow to slow in the fragipan. Surface runoff is slow or medium. Erosion hazard is not listed. Soil erodibility "K" factor: 0.20. Hydrologic group C and capability subclass VIIs.
SrC	Raynham silt loam, 8-15% slopes, stony	More than 60 inches	Drainage class: Very deep, strongly sloping, well-drained soil on the sides and tops of hills. Depth to water table: 2.5-6.0 Soil erodibility "K" factor: 0.20 Permeability: 0.06-2.0 in/hr Hydrologic group: C
Wd	Wayland silt loam	More than 60 inches	Drainage class: poorly drained to very poorly drained. Depth to water table: 0 to 6 inches, Nov-Jun. Permeability is moderate in the surface layer and slow in the subsoil and substratum. Surface runoff is slow. Erosion hazard is not listed. Soil erodibility "K" factor: 0.43. Hydrologic group C/D and capability subclass Vw.
WeA	Wellsboro gravelly loam, 0-3% slopes	More than 60 inches	Drainage class: Very deep, nearly level, moderately well drained soil on till plains. Depth to water table: 1.5-3.0 feet Soil erodibility "K" factor: 0.28 Permeability: 0.06-2.0 in/hr Hydrologic group: C
WeB	Wellsboro gravelly loam, 3-8% slopes	More than 60 inches	Drainage class: moderately well-drained Depth to water table: 18 to 36 inches, Nov-Mar. Permeability is moderate above the fragipan and slow in the fragipan. Surface runoff is slow to rapid. Erosion is a hazard on long slopes. Soil erodibility "K" factor: 0.28. Hydrologic group C and capability subclasses IIw (0-3% and 3-8% slopes) and IIIe (8-15% slopes).
WeC	Wellsboro gravelly loam, 8-15% slopes	More than 60 inches	Drainage class: Very deep, sloping, moderately well drained soil on hillsides. Depth to water table: 1.5-3.0 feet Soil erodibility "K" factor: 0.28 Permeability: 0.06-2.0 in/hr Hydrologic group: C

Table 5-1
NRCS Soil Classification

Symbol	Soil Series Name	Depth to Bedrock	Drainage Characteristics
WlC	Wellsboro and Wurtsboro soils, strongly sloping, extremely stony	More than 60 inches	Drainage class: moderately well-drained. Depth to water table: 18-36 inches, Nov-Mar. Permeability is moderate above the fragipan and slow in the fragipan. Surface runoff is medium or rapid. Erosion hazard is not listed. Soil erodibility "K" factor: 0.24-0.28. Hydrologic group C and capability subclass VIIs.
WuA	Wurtsboro loam, 0-3% slopes, stony	More than 60 inches	Drainage class: Very deep, gently sloping, moderately well drained soil on hillsides and hilltops. Depth to water table: 1.0-3.0 feet Soil erodibility "K" factor: 0.28 Permeability: 0.06-2.0 in/hr Hydrologic group: C
WuB	Wurtsboro loam, 3-8% slopes	More than 60 inches	Drainage class: moderately well-drained. Depth to water table: 1 to 3 feet, Nov-Mar. Permeability is moderate to a depth of 26 inches and slow beyond. Surface runoff is medium (3-8% slopes). Erosion is a hazard at 3-8% slopes. Soil erodibility "K" factor: 0.28. Hydrologic group C and capability subclasses IIw (3-5% slopes).
WuC	Wurtsboro loam, 8-15% slopes, stony	More than 60 inches	Drainage class: moderately well-drained. Depth to water table: 1 to 3 feet, Nov-Mar. Permeability is moderate to a depth of 26 inches and slow beyond. Surface runoff is medium to rapid. Soil erodibility "K" factor: 0.28. Hydrologic group C and capability subclass IIIe

Table 5-2
NRCS Soil Classification and Hydrologic Soil Group

Symbol	Soil Series Name	Hydrologic Soil Group
AoC	Arnot-Oquage complex	C/D
AoE	Arnot-Oquage complex	C/D
MrA	Morris loam	C
MrB	Morris loam	C
MrC	Morris loam	C
Ne	Neversink loam	D
Nf	Neversink and Alden soils	D
OeB	Oquaga very channery silt loam	C
OgC	Oquaga Oquaga-Arnot complex	C
Ra	Raynham silt loam	C
ScB	Scriba loam	C
SeB	Scriba and Morris loam	C
SrC	Swartswood gravelly loam	C
Wd	Wayland silt loam	C/D
WeA	Wellsboro gravelly loam	C
WeB	Wellsboro gravelly loam	C
WeC	Wellsboro gravelly loam	C
WIC	Wellsboro and Wurtsboro soils	C

Table 5-2
NRCS Soil Classification and Hydrologic Soil Group

Symbol	Soil Series Name	Hydrologic Soil Group
WuA	Wurtsboro loam	C
WuB	Wurtsboro loam	C
WuC	Wurtsboro loam	C

Please note that while Arnot-Oquage complex, AoE, soils are found within our project limits, there is no soil disturbance proposed within this soil series.

5.1.2 Geotechnical Results

MTA's initial subsurface investigation included 48 test borings and 41 test pit explorations at the site, see Appendix D. Sixteen (16) borings were completed along the proposed sanitary sewer route. The remaining 9 test pits were completed in the future phase entertainment village area. Tube permeameter tests were performed at 20 locations and the results are presented in Table 5-3. The laboratory results show that the permeability rate of the soils range from 0.02 inches/hour to 1.9 inches/hour. However, several of the locations demonstrated that with rates greater than 0.5 inches per hour certain green infrastructure practices may be feasible.

The general strata consisted of the following

- Topsoil – A layer of at least 4- to 12-inch thick topsoil was encountered in the majority of the test pits and borings.
- Pavement/Fill – up to 2 feet of fill may be encountered in previously disturbed areas, such as the abandoned camps. Existing pavement in Thompsonville Road are chip seal type construction.
- Silty Sand – Beneath topsoil and fill layers (where present), the natural soils consist of sands and silty sands containing gravel, cobbles and boulders. The top two feet of this sandy soil layer was observed to be loose, most likely due to freeze-thaw cycles. However the deeper sandy soils are very dense to the completion depths of most of the borings. Due to the high silt content and loose nature of the upper 2 feet of this layer as well as the presence of a perched water table, this soil will be highly susceptible to softening and disturbance once subjected to construction equipment traffic.
- Silty/Gravelly Strata – Based on the laboratory grain size testing, several of the soil samples can be classified as silt and/or gravel.
- Sandstone/Siltstone/Claystone Bedrock – relatively sound bedrock was encountered at 20 to 46 feet below grade in the vicinity of the proposed casino structure.

Based on MTA's Subsurface Investigation Report – Proposed Concord Resort Development, the majority of soils had a relatively low permeability rate observed in the tube permeameter test performed on the natural glacial soils. Pavements and slabs may derive their support from the undisturbed natural soils, fracture or sound sedimentary bedrock or controlled compacted fill place to reach the desired levels. On the basis of their moisture levels, the glacial soils on site could be used as controlled

compacted fill, but their high silt content renders the soils susceptible to disturbance from slight changes in moisture. Over-excavation of foundations and a layer of fill materials such as crushed stone or gravel may be beneficial due to the high percentages of fines in the soils and the variation in groundwater levels throughout the site. Variable groundwater levels may necessitate control of groundwater through drains and diversion trenches, in addition to standard dewatering during and after construction. It is anticipated that below-grade walls for lower building levels would require a vertical drainage system to prevent buildup of hydrostatic pressure behind the walls.

Table 5-3
Summary of Tube Permeameter Results

Exploration No.	Approximate Surface Elevation (ft)	Approximate Test Depth (ft)	Approximate Permeability (in/hr)
TP-P-l	1,385	2.0	1.3
TP-P-l	1,385	6.0	0.7
TP-P-2	1,414	2.0	0.06
TP-P-3	1,442	2.0	0.6
TP-P-4	1,448	2.0	0.5
TP-P-4	1,448	6.0	0.7
TP-P-5	1,440	1.5	1.9
TP-P-6	1,448	1.5	0.2
TP-P-7	1,446	1.5	0.4
TP-P-8	1,450	1.5	0.4
TP-P-9	1,448	2.0	0.05
TP-P-11	1,368	2.5	0.02
TP-P-12	1,365	2.0	0.1
TP-P-13	1,375	3.5	0.04
TP-P-14	1,388	2.0	0.04
TP-P-15	1,380	2.0	0.06
TP-P-18	1,434	2.0	0.02
TP-P-20	1,454	2.0	0.09

A summary of the depth to season high groundwater, or mottling in the various test pit locations show that the water table varies throughout the site, varying from 0.5 feet below grade to greater than 7 feet. Rock or graded cobbles and boulders were found in several of the deep test pits, where rock refusal occurred as shallow as 4 feet in one or two areas. The confining layers in each test pit are summarized in Table 5-4 and locations can be found on maps included in Appendix D. Additional soil testing is in the process of being completed throughout the project limits to confirm pond depths and infiltration rates for proposed green infrastructure practices.

Table 5-4
Summary of Soil Sample Results

Exploration No.	Depth to seasonal high groundwater table (FT)	Depth to rock (FT)	Total depth (FT)
T-1	3	9	11
T-2	-	7	7
T-3	-	4	4
T-4	-	8	8
T-5	3.5	7.5	7.5
T-6	1.5	7.5	7.5
T-7	-	8	8
P-1	-	7.5	7.5
P-2	-	10	10
P-3	-	-	12
P-4	4.5	11	11
P-5	-	-	12
P-6	-	-	12
P-7	2	5	5
P-8	4.5	-	12
P-9	2	13	13
P-10	7.5	9	9
P-11	-	6	8
P-12	3	6	7.5
P-13	-	8.5	8.5
P-14	-	10	10
P-15	-	-	8
P-16	1.5	-	12
P-17	0.5	-	11
P-18	-	10	10
P-19	1	-	12
P-20	1.5	-	13
P-21	3	-	10
P-22	4	-	12
P-23	1.5	-	11
P-24	1.5	-	11
P-25	2	-	12
R-1	2	-	10
R-2	-	10.5	10.5
R-3	-	11	11
R-4	2	-	12
R-5	1.5	-	12
R-6	4	-	12
R-7	-	-	10
R-8	-	10	10
R-9	6	9	9

Roadway and Infrastructure Improvements

MTA's subsurface investigation described above included 16 borings that were completed along the proposed sanitary sewer route on the MRMI site and along Thompsonville Road. A geotechnical investigation is currently underway along the Cimarron Road and the Route 17 Interchange to determine subsurface conditions along the alignment of the roadway and in areas of proposed stormwater treatment practices. Additional testing along south and east of Cimarron Road in addition to the testing for retaining walls and roadway design, is also being conducted to determine suitability for bioretention practices as well as other stormwater treatment practices. Geotechnical testing at the location of proposed improvements at NYS Route 17 Interchange 106 will commence following the conclusion of the Resort Entry Road testing program.

A second geotechnical investigation report was prepared in support of the proposed Resort Entry Road which was completed March 5, 2013. The following is a summary of the types of soils that were encountered in the explorations and are listed in order of increasing depth.

Topsoil: A surficial layer of topsoil was encountered in 94 of the 99 test pits and 6 of the 14 borings performed along the Joyland Rd. and Thompsonville Rd. alignments. In general the topsoil was found to be approximately 4 to 8 inches thick in the majority of the explorations, but up to 14 inches deep in some instances.

Silt: Silt and clayey silt was observed in two of the borings and in twelve of the test pit explorations.

Silty Sand: the natural soils typically consisted of sands and silty sands containing varying amount of gravel, cobble, and boulders. He sandy soils are believed to be glacial in nature and extended to the completion depths in the majority of the explorations performed.

Silt stone/Sandstone Bedrock: In 4 of the 14 borings and 16 of the 99 test pipes, siltstone/sandstone bedrock was encountered at depths varying from approximately 3 to 20 feet below grade.

Groundwater Seepage: Groundwater seepage was encountered in 10 of the 14 borings and 65 of the 99 test pits.

Table 5-5
Summary of Soil Sample Results

Exploration No.	Depth to seasonal high groundwater table (FT)	Depth to rock (FT)	Total depth (FT)	Infiltration Rate (in/hr)
1	2.5' mottling, groundwater not encountered	-	10	2.25
2	4.5' mottling, groundwater not encountered	-	9	14
3	3' mottling, groundwater not encountered	-	8	2.25
4	1' mottling	-	10	
5	1' mottling	-	8	
6	1' mottling	-	9	
7	2' seepage	-	9	
8	2' groundwater seepage	-	9.5	
9	2' groundwater seepage	-	9	

Table 5-5
Summary of Soil Sample Results

Exploration No.	Depth to seasonal high groundwater table (FT)	Depth to rock (FT)	Total depth (FT)	Infiltration Rate (in/hr)
10	4’ mottling, groundwater not encountered	-	8.5	2.5
11	4’ mottling observed, groundwater not encountered	-	8.5	14
12	2.5’ mottling, perched groundwater seepage at 3’	-	9	
13	3.5’ mottling, groundwater seepage at 6.6’	-	7	4.25
14	3’ mottling, groundwater not encountered	-	6.5	12
15	-	-	9	17.5/28
16	-	-	9	
17	4’ mottling, groundwater not encountered	-	9	10.5
18	Seepage at 2’	-	9	
19	Seepage at 2’	-	10	
20	Not completed due to high groundwater			
21	1.5’ mottling, seepage at 2’	-	9	
22	2.5’ seepage	-	9	
23	2.5’ seepage	-	9	
24	2’ mottling, seepage at 4’	-	9	
25	1.5’ mottling, seepage at 3’	-	9	
26	1.5’ mottling, seepage at 5’	-	9	
27	3’ mottling, seepage at 5.5’	-	10	
28	seepage at 1.5’	-	10	
29	seepage at 2’	-	10	
30	1.5’ mottling, seepage at 2.5’	-	10	
31	1.5’ mottling, seepage at 7’	-	10	
32	1.67’ mottling, seepage at 5.5’	-	10	
33	1.5’ mottling, seepage at 5.5’	-	10	
34	seepage at 3.5’	-	10	
35	3.5’ mottling, groundwater not encountered	-	10	8/14
36	2.5’ mottling, seepage at 8’	-	9.5	
37	Moderate seepage at 2’	-	10	
38	1.5’ mottling, seepage at 6’	-	10	
39	1.5’ seepage	-	10	
40	2.5’ mottling, groundwater not observed	-	10	
41	2.5’ mottling, seepage at 5’	-	10	
42	1’ mottling, seepage at 5’	-	10	
43	2’ mottling, seepage at 7’	-	9	
44	2.25’ seepage	-	10	
45	2’ seepage	-	10	
46	1.5’ mottling, seepage at 3.5’	-	10	
47	1.5’ mottling, seepage at 8’	-	10.5	
48	3.5’ mottling, seepage at 5.5’	-	9	
49	-	-	7	10
50	2’ mottling, groundwater not encountered	-	6.6	10
51	-	-	11	23
52	3.75’ mottling, seepage at 4.5’	-	9	

Table 5-5
Summary of Soil Sample Results

Exploration No.	Depth to seasonal high groundwater table (FT)	Depth to rock (FT)	Total depth (FT)	Infiltration Rate (in/hr)
53	2.5' mottling, seepage at 4.25'	-	8	
54	-	-	10.5	23
55	-	12.5	12.5	11
56	-	7	7	
57	-	5.5	5.5	
58	seepage at 8'	-	8	
59	seepage at 1.5'	-	9.5	
60	2.5' mottling, groundwater not encountered	-	13	8
61	-	-	14	6
62	-	-	8.5	
63	Seepage at 4'	-	6	
64	1.5' mottling, seepage at 1.5'	-	10	
65	1.5' mottling, seepage at 1.5'	-	10	
66	2.5' mottling, seepage at 3'	-	10	
67	1.5' mottling and seepage	-	10	
68	1.5' mottling and seepage		10	
69	-	-	7	6.5
70	-	-	11	50
71	2.5' mottling, seepage at 5'	-	10	
72	3' mottling, seepage at 5'	-	8.5	
73	2.5' mottling, seepage at 4.5'	-	10	5.75
74	2.5' mottling, seepage at 5'	-	10.5	
75	2.5' mottling, seepage at 3'	-	10	
76	3' mottling, seepage at 5'	-	11	
77	3' mottling, seepage at 1'	-	10.5	
78	2.5' mottling, groundwater not encountered	-	10	
79	2' mottling and seepage	-	10	
80	2' mottling and seepage	-	10	
81	2' mottling and seepage	-	10	
82	10' mottling, groundwater not encounterd	-	11	9/9
83	-	8	8	45
84	2.5' mottling, seepage at 4'	-	10	
85	-	-	10	
86	3' mottling	-	10	
87	4.5' mottling, groundwater not encountered	-	10	
88	-	-	10.5	
89	1.5' mottling, seepage at 5'	-	10.5	
90	Seepage at 5'	-	10.5	
91	1' mottling and seepage	-	10.5	
92	1.5' mottling and seepage	-	11	
93	5.5' mottling, seepage at 8.5'	-	11	
94	5' mottling, seepage at 6'	-	10.5	
95	1' mottling, seepage at 4'	-	11	
96	Seepage at 1'	-	10.5	
97	1.5' mottling, seepage at 3'	-	10	
98	1' mottling and seepage	-	10.5	
99	0.5' mottling, groundwater not encountered	-	11	

5.2 Existing Natural Resources

Several vegetated wetlands and surface drainage channels that connect these wetlands to Kiamesha Creek can be found throughout the Project Site. However, there aren't any perennial streams or rivers within the project boundary. Kiamesha Creek is the closest perennial watercourse and is located immediately west of the MRMI Site.

There are approximately 10 wetlands located within or adjacent to the proposed roadway and infrastructure improvements, see Figure 3. Three of the wetlands located within the roadway and infrastructure improvements are regulated by NYSDEC and are assigned a 100-foot buffer around the perimeter of the wetland. The other seven wetlands are under the jurisdiction of USACE. The selected alternative Resort Entry Road eliminates the habitat disturbance required for the widening of Joyland Road, which formerly consisted of approximately 13.25 acres of habitat disturbance to maple-beech forest, hemlock and red maple forested wetlands, and previously developed/disturbed land. The Roadway and Infrastructure Improvements places the Resort Entry Road south of the Resort Core resulting in the disturbance to approximately 42.6 acres of habitat, principally hemlock and maple-beech forest cover types, but also smaller amounts of hemlock forested wetland and previously developed/disturbed lands.

5.3 Existing Utilities

The Project Site contains very little existing infrastructure. Private wells are located north of Thompsonville Road serving the Golf Club facilities. There are no existing public water service mains located within or adjacent to the site. Further, there are no active fire hydrants or storage facilities supporting fire protection for these facilities.

Likewise, sanitary sewers do not exist adjacent to the project site. On-site sanitary sewerage systems serve the existing golf course facilities or adjacent residential parcels.

An existing Wastewater Treatment Plant, located north of Thompsonville Road and west of Kiamesha Creek is owned and operated by the Town of Thompson. The project site is located within the Town of Thompson designated sanitary sewer district.

While there are no natural gas lines in the vicinity of the Project Site, New York State Electric and Gas Corporation (NYSEG) currently provides electric service to the Site via overhead wires and poles located along the public roads and within easements on the Site.

Telephone, high speed internet and cable television service is currently provided by Time Warner Cable (TWC) in the area of the Project Site via overhead wires in the public right-of-way along the major roadways. Verizon provides telephone and high-speed internet service in the area of the Project Site but does not provide cable television or FIOS services.

5.4 Cultural Resources

Phase 1 (of which the project site is part of) for the purpose of the following discussion regarding cultural resources refers to the roadway and infrastructure improvements as well as the MRMI site. The following is based on the summary from the Final Environmental Impact Statement. Correspondence from the respective agencies will be included in Appendix E.

5.4.1 Archaeological Resources

An archaeological survey of Phase 1, the area northeast of Phase 1 bound to the north and east by Thompsonville Road and Joyland Road, and a small area on the east side of Joyland Road was conducted involving the hand excavation of approximately 2,000

shovel test pits and analysis of recovered artifacts in accordance with State standards. Three archaeological resources were identified: (1) a historic site on the south side of Thompsonville Road consisting of foundation remains, a stone-lined well, and associated artifact deposits (U. Clark Foundation Historic Site), (2) a second historic foundation on the west side of Joyland Road (N. Rumsey Foundation Historic Site), and (3) a historic bottle dump (Krum Bottle Dump Site).

The additional testing of sites 1 and 3 involved the excavation of tighter interval shovel tests and larger units and was completed in June 2012. Analysis is complete, and it appears that the two sites would not be considered S/NR eligible. However, if these resources are determined to be S/NR eligible by SHPO and impacts to them cannot be avoided, the development of Phase 1 will likely have an adverse effect on archaeological resources as they are located near the current ground surface and project actions call for construction of a parking facility and infrastructure improvements in these areas.

The Phase 1 Site is not expected to be sensitive for archaeological resources. Therefore, no mitigation is proposed for Phase 1 with respect to archaeological resources. Should SHPO determine that there are eligible archeological resources on the Phase 1 Site; the Applicant will work with SHPO to develop the appropriate mitigation measures to offset these impacts.

5.4.2 Historic Resources

Based on review of the materials submitted to the State in support of the project, the OPRHP has determined that there are two historic resources that are State/National Registry (S/NR) eligible in the Area of Potential Effect for Phase 1 and its related infrastructure improvements: Breezy Corners Bungalow Colony and the Osterhoudt-Towner Farm.

The selected alternative Resort Entry Road will have no adverse effect on the Osterhoudt-Towner Farm. The farmhouse is located approximately 300 feet from the roadway improvements with the barn and outbuilding located at a greater distance. Based on vibration induced risk criteria for construction activities these structures are located beyond the range for architectural or structural damage from construction activities anticipated to modify and construct roadways for the Resort Entry Road, including pavement breaking, excavating and bulldozing, heavy truck traffic, and use of jackhammers. In addition, the Resort Entry Road will have no indirect effects on this historic resource. The Osterhoudt –Towner Farm is separated from the proposed new roadway that will be constructed west of Towner Road by a number of intervening properties. Therefore, there will be no adverse visual effects or detrimental effects to the setting of the historic property.

Improvements to Joyland Road will require the demolition of at least one of the contributing buildings of the Breezy Corners Bungalow Colony. Appropriate mitigation measures will be developed in consultation with SHPO and will be set forth in either a Letter of Resolution or a Memorandum of Agreement, describing the measures by which adverse effects on the Breezy Corners Bungalow Colony will be mitigated, and will indicate the responsible parties for the implementation of such measures.

5.5 Existing Stormwater

Substantive stormwater infrastructure does not exist within the Project Site except for the area of NYS Route 17 Interchange 106. The reconstruction of the recently completed Interchange 106 Bridge resulted in stormwater management facilities constructed on the north side of the interchange south of Cimarron Road. These facilities will continue to be utilized as a part of the stormwater management system.

The existing MRMI Site is predominantly undeveloped, consisting mainly of wooded and grassy vegetative cover. The Site of the Resort Entry Road is entirely undeveloped, consisting entirely of wooded area. The Project Site presently contains minimal impervious cover from the existing roadways bordering the site and the various buildings and residences which remain on the site from previous uses. Drainage generally flows from the high area located along the western side of Joyland Road to the low lying wetlands and lakes. The elevations of the Resort Entry Road site range from a high on the south side of the MRMI Site of 1,440 feet to a low of approximately 1,380 feet in the area adjacent to Route 17 where the Resort Entry Road transitions from running north-south to east-west. Another high point of the Resort Entry Road is the intersection of Resort Entry Road and Joyland Road at an approximate elevation of 1415.5 feet.

Since there is minimal stormwater infrastructure located within the roadway network, the majority of the site runoff travels to the existing wetlands and water bodies via overland flow, natural channels, and through tributary streams and brooks. In some areas, such as along the southern side of Thompsonville Road, man-made swales parallel to the roadway collect and convey the stormwater through culvert crossings. These small (in the range of 8-inch to 24-inch) culverts channel stormwater flows under roadways and driveway crossings. They also serve, in some instances, to maintain the hydrologic connections between wetlands.

5.5.1 Design Points

The existing stormwater runoff corresponding to Project Site presently discharges to twelve design points. While some of these design points are pinpointed to a structural element such as a culvert, the majority of the points are defined as the locations at which overland flow enters a wetland or waterbody. See Figures D-1 and D-2 for the design point location and contributing drainage areas.

A summary table of the areas used for the determination of the weighted curve numbers for both pre- and post-development drainage areas can be found in the HydroCAD analysis in Appendices H and I of this report. Figures D-1 and D-2 show the general impervious coverage and existing land use. Pre-development hydrologic calculations can be found in Appendix H of this report.

6.0 PROPOSED PROJECT DESCRIPTION

The initial phase of construction of the EPT Concord Resort Project will consist of the construction of a new Casino Resort and 248-room Hotel with a harness race track and grandstand near the intersection of Thompsonville and Joyland Roads. The proposed project will also include the construction of a paddock and maintenance building in support of the racing facilities. Utility infrastructure, stormwater management, lighting and landscaping will be designed and constructed as part of the project.

6.1 Anticipated Permits

The following is a list of anticipated permits for the construction activities associated with the proposed project.

6.1.1 United States Army Corps of Engineers and New York State Department of Environmental Conservation

EPT is submitting a Joint Application to the New York State Department of Environmental Conservation ("DEC") for authorization under the New York Freshwater Wetlands Act and the United States Army Corps of Engineers ("USACE") for authorization under Section 404 of the Clean Water Act.

6.1.2 New York State Department of Environmental Conservation

The Project work would disturb more than one (1) acre of land, and NYSDEC has determined that a SPDES permit is required for stormwater discharges based on the Project's potential for contribution to a violation of the water quality standards or for significant contribution of pollutants to surface waters of the state. This requires coverage under the SPDES General Permit for New Construction GP-0-10-001. This SWPPP is being prepared in compliance with the requirements of the New York State Stormwater Management Design Manual.

6.1.3 Town of Thompson

The Applicant must obtain Site Plan Approval from the Town of Thompson Planning Board for the initial phase development of the Proposed Project that will include a casino, hotel, harness race track and related facilities.

6.1.4 Delaware River Basin Commission (DRBC)

The Delaware River Basin Commission (DRBC) requires applicants located in the drainage area of a Special Protection Water (SPW) to develop a site-specific Non-Point Source Pollution Control Plan (NPSPCP). The objective of the NPSPCP is to describe the Stormwater Management Practices (SMP's) that will be utilized at the MRMI Site to control any increase in non-point source pollutant loadings. A SWPPP prepared in compliance with the NYSDEC SPDES General Permit 0-10-001 would serve as fulfillment of the DRBC NPSPCP requirement.

Table 6-1
Required Permits, Approvals and Involved Agencies

Approval/Permit/Review	Involved/Interested Agency
New York State Department of Environmental Conservation (NYSDEC)	
Article 15 Protection of Waters	NYSDEC
Article 24 Freshwater Wetland	NYSDEC
Water Quality Certification (Section 401)	NYSDEC
Threatened and Endangered Species (TES)	NYSDEC
CAFOS	NYSDEC
Sewer Extension Approval	NYSDEC

Table 6-1
Required Permits, Approvals and Involved Agencies

Approval/Permit/Review	Involved/Interested Agency
SPDEC General Permit (GP-0-10-001) - SWPPP	NYSDEC
Sullivan County Planning and Environmental Management (SCPEM)	
Project Review (GML 239)	SCPEM
Swimming Pool Approval	SCPEM
Roadway Improvement Plans and Traffic Signal	DPW
Town of Thompson	
Approval of Planned Resort Development (PRD) and Comprehensive Development Plan (CDP)	Town Board - COMPLETED
Site Plan Approval	Planning Board
Stripping of Land Approval	Planning Board
Subdivision Approval (as needed)	Planning Board
Water Service Connection	Department of Public Works (DPW)
Roadway Improvement Plant	Highway Superintendent
Delaware River Basin Commission (DRBC)	
Discharge of Pollutants	DRBC
New York State Department of Health (NYSDOH)	
Public Water Supply	NYSDOH
Sewer System Extension	NYSDOH
New York State Department of Transportation (NYSDOT)	
State Road Improvement	NYSDOT
Traffic Signal at Route 17 Exit 106 Interchange	NYSDOT
United States Army Corps of Engineers (USACE)	
Wetlands Permit	United States Army Corps of Engineers (USACE)
New York State Historic Preservation Office (SHPO)	
Section 106 and Section 14.09 Cultural Resources Coordination	SHPO
New York State Racing and Wagering Board	
Section 322 Approval	New York State Racing and Wagering Board
New York State Lottery	
Section 1617A Approval	New York State Lottery

7.0 POST-CONSTRUCTION STORMWATER PRACTICES

Post-construction stormwater practices that provide water quality and quantity control are required to meet pollutant removal goals, reduce runoff volume, reduce channel erosion, prevent overbank flooding, and control extreme floods. These controls help mitigate the effects of development by controlling suspended solids content and peak flows of runoff from developed sites. The NYSDEC has developed

unified sizing criteria to size stormwater management measures. The requirement for treatment volume, also referred to as water quality volume (WQv), is to capture and treat the stormwater runoff generated from a 90% rainfall event. The NYSDEC requires stormwater attenuation to meet the channel protection volume, overbank flood and extreme storm, the 1, 10 and 100 year, 24-hour storm events respectively.

7.1 NYSDEC Sizing Criteria

The following table is representative of the storm design criteria required by the NYSDEC as outlined in the New York State Stormwater Management Design Manual (NYSSMDM).

Table 7-1
NYSDEC Uniform Sizing Criteria

Water Quality Volume (WQv)	WQv = Capture and treat runoff from the 90% rainfall event
Runoff Reduction Volume (RRv)	RRv = Reduction of the total WQv by application of green infrastructure techniques and SMPs to replicate pre-development hydrology.
Channel Protection (Cpv)	Cpv = 24 hour extended detention of post-developed 1-year, 24-hour storm event.
Overbank Flood (Qp)	Control the peak discharge from the 10-year storm to 10-year predevelopment rates.
Extreme Storm (Qf)	Control the peak discharge from the 100-year storm to 100-year predevelopment rates. Safely pass the 100-year storm event.

7.2 Design Approach and Site Planning

Construction of the roadway and infrastructure of the EPT Concord Resort Project will result in an increase in the total impervious coverage of the site as compared to the existing condition, and thereby produce greater stormwater volumes and introduce additional pollutants into the runoff. To mitigate the effects of the project, the stormwater management system has been designed in accordance with NYSDEC guidelines to comply with runoff reduction requirements, and provide minimum pollutant removal rates by using Stormwater Management Practices (SMP's) acceptable for water quality and runoff reduction.

The alignment and grading of the Resort Entry Road has been designed to include a system of green infrastructure practices as well as stormwater ponds that will capture, convey, and manage stormwater runoff. The proposed roadway is designed with the minimum lane width, thereby reducing the potential impervious surface coverage. The median will be vegetated and landscaped with trees, where sight distance allows, providing additional green infrastructure practices along the entire roadway. The roadway will consist of super elevated asphalt pavement sloped to convey stormwater runoff to a vegetated open channel that will convey runoff to bioretention basins where feasible. Stormwater management ponds are proposed at various sections of the roadway to provide additional treatment and provide detention during larger storm events. The system is designed to meet the requirements of the NYSDEC Stormwater Management Design Manual.

Table 7-2
Green Infrastructure Planning General Categories and Specific Practices

Table 7-2
Green Infrastructure Planning General Categories and Specific Practices

Group	Practice	Description
Preservation of Natural Resources	Preservation of Undisturbed Areas	In the creation of the Resort Entry Road the applicant has carefully created a roadway corridor that would weave through the wooded areas preserving as many of its natural features as feasible.
	Preservation of Buffers	Where possible, the project has been designed to not impact steep slopes or wetland buffers.
	Reduction of Clearing and Grading	The roadway has been designed to match the existing site topography thus minimize areas of clearing and grading to the greatest extent possible.
	Locating Development in Less Sensitive Areas	The proposed resort and related amenities have been sited to avoid sensitive resource areas such as flood plains, wetlands and their buffers,
	Open Space Design	The primary goal in developing the proposed roadway was trying to maintain a natural corridor and preserving the existing trees and other natural features as much as possible.
	Soil Restoration	Prior to final site stabilization the on-site soils would be modified or restored in order to reintroduce oxygen into compacted soils and improve the water storage within the soil which would subsequently help reduce runoff through infiltration and evapotranspiration.

Table 7-2
Green Infrastructure Planning General Categories and Specific Practices

Reduction of Impervious Cover	Roadway Reduction	The proposed roads will be constructed based on the required safe travel lane width of 12 feet. In some areas the roadway width has been reduced to 11 feet with a 2' gravel shoulder.
	Sidewalk Reduction	The sidewalk and pathway are to be constructed on one side of the roadway.
	Driveway Reduction	Not applicable, there aren't any driveways proposed as part of this project.
	Cul-de-sac Reduction	Not applicable, there aren't any cul-de-sacs proposed as part of this project.
	Building Footprint Reduction	Not applicable, there isn't any building proposed as part of this project.
	Parking Reduction	Not applicable. There isn't any on-street parking proposed.

The contractor will be required to complete soil restoration in the areas of the proposed pervious surfaces once final grade has been achieved in these areas. The type of soil restoration will depend on the type of soil disturbance and the type of hydrologic soil group. The contractor will be required to complete soil restoration in conformation with the various methods outline in the following table.

Table 7-3
Soil Restoration

Type of Soil Disturbance	Soil Restoration Requirement		Comments/Examples
No soil disturbance	Restoration not permitted		Preservation of Natural Features
Minimal soil disturbance	Restoration not permitted		Clearing and grubbing
Areas where topsoil is stripped only - no change in grade	HSG A &B	HSG C&D	Protect area from any ongoing construction activities.
	apply 6 inches of topsoil	Aerate* and apply 6 inches of topsoil	
Areas of cut or fill	HSG A &B	HSG C & D	
	Aerate and apply 6 inches of topsoil	Apply full Soil Restoration **	
Heavy traffic areas on site (especially in a zone 5-25 feet around buildings but not within a 5 foot perimeter around foundation walls)	Apply full Soil Restoration (de-compaction and compost enhancement)		
Areas where Runoff Reduction and/or Infiltration practices are applied	Restoration not required, but may be applied to enhance the reduction specified for appropriate practices.		Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area

7.3 Water Quality Volume

The Water Quality Volume (WQv), based on the 90% of the average annual stormwater runoff volume, was calculated for each proposed drainage area. The calculation is based on the 90% rainfall event.

7.4 Green Infrastructure Techniques and Standard SMPs with RRv Capacity

Along with treating the water quality and quantity for the major storm events on the proposed project, the NYSSMDM requires the project to achieve a runoff reduction volume. This volume is achieved through infiltration, groundwater recharge, reuse, recycle, evaporation/evapotranspiration of 100 percent of the post-development water quality volumes to replicate pre-development hydrology by maintaining pre-construction infiltration, peak runoff flow, discharge volume, as well as minimizing concentrated flow. This requirement can be accomplished by application of on-site green infrastructure techniques, standard stormwater management practices with runoff reduction capacity, and good operation and maintenance. The following Green Infrastructure techniques are proposed for the project and their locations are shown on Figures 4a and 4b.

Green Infrastructure Technique 7: Bioretention Basins

Bioretention basins have been designated on the project site in areas downstream of paved roadway surfaces, where there is sufficient space to provide the necessary treatment area. Each area is designed to capture and treat this surface runoff before discharging into an adjacent proposed stormwater conveyance system. These areas are designed to achieve pollutant treatment, groundwater recharge, and micro-scale habitat. All of the project site is situated in HSG C and D soils with poor infiltrative capacity and high groundwater table and therefore a geomembrane liner system is proposed to provide proper separation to the groundwater table. The specification for the proposed soil media can be found in Appendix R.

Infrastructure Technique 11: Porous Pavement

In addition to the proposed multi-use trails that will be constructed with porous pavement a section of the roadway will be construction with porous pavements. The use of porous pavement will decrease stormwater runoff and promote on-site infiltration. These areas would help to reduce stormwater runoff and improve water quality and quantity downstream. The specification for porous pavement construction can be found in Appendix Q.

Vegetated Swale

The Resort Entry Road is designed to convey stormwater runoff to the outside edge of the road to a grassed buffer. Instead of the typical crown and curb and gutter system, stormwater runoff will be conveyed via overland flow to the grassed filter strip towards the vegetated swale. An integrated system of vegetated swales, conforming to the design requirements of the manual are proposed to help promote infiltration where feasible.

Tree Plantings

Through the implementation of a tree protection program and a wider median, existing trees with larger canopies will be maintained through the construction and implementation of the proposed Resort Entry Road.

7.4.1 Runoff Reduction Volume Comparison

In order to achieve the requirements for the Runoff Reduction Volume (RRv), the proposed Project Site must use green infrastructure techniques and practices to meet the required water quality volume (WQv) as determined in the NYSSMDM. However due to limiting site conditions the WQv could not be achieved using the green infrastructure practices. The major limiting conditions are that all of the soils on the project site are HSG C and D. Soil testing throughout the project site revealed that the depth to the seasonal water table was generally shallow and poor infiltrative capacity of the sub-soils.

In this case, the NYSSMDM states that if a project is not able to achieve runoff reduction to the pre-construction condition, it must at a minimum; reduce a percentage of the runoff from impervious areas to be constructed on-site. The percent reduction is based on the Hydrologic Soil Group(s) (HSG) of the site.

The Project Site is located in HSG C and D soils, and therefore the percent reduction factor is 0.30 and 0.20, respectively. The reduction factor for this site decreases the required RRv water quality volume for each drainage area.

By providing rain gardens/bioretention basins and porous pavement, the project would likely meet the requirements of the RRv based on the Specific Reduction Factor as outlined in Section 4 of the NYSSMDM.

Resort Entry Road
The majority of the proposed roadway infrastructure is considered redevelopment; however, the proposed Resort Entry Road is a new impervious surface. Based on the standard methodology, the required RRv is 32,819 cubic feet. However, as described above the soil reduction factor was used to calculate the minimum RRv required. Therefore the minimum RRv required is 9,460 cubic feet. With the implementation of the green infrastructure practices as well as the standard water quality treatment practices, the proposed Water Quality Volume is 10,075 cubic feet. All back-up calculations and design assumptions can be found in Appendix G.

Thompsonville Road and Joyland Road Improvements
The proposed improvements on Thompsonville Road include the redevelopment of the existing asphalt pavement to develop two uniform 11 ft. travel lanes and 2 ft. gravel shoulder. The existing impervious area is approximately 74,555.62 square feet and will increase to 83,005.20 square feet in the final condition. Due to the minimal area available for green infrastructure within the right-of-way, the applicant is proposing an increase width to accommodate a vegetated swale for conveyance of the 100-year storm event. These vegetated swales don't meet the specific design criteria due to the steeper sideslopes as a result of the limited right-of-way width. Three bioretention basins are proposed on the north side of roadway as a way of incorporating green infrastructure practices in connection with the vegetated swales. However, due to the shallow water table, existing wetland, limited right-of-way and proposed roadway elevations, bioretention basins could not be incorporated because there wasn't enough head to be able to daylight the bioretention systems in a reasonable distance. Therefore, stormwater created wetlands (W-4) are also proposed along Thompsonville Road providing treatment from 100% of the redeveloped and new impervious surfaces.

Similar to Thompsonville Road, Joyland Road will be widened to accommodate the anticipated traffic demand. The proposed road will need to increase to a two lane boulevard with the associated turn lanes based on the traffic analysis. The proposed roadway will be a crowned road with a curb and gutter system conveying stormwater runoff to catch basins and pipe network. The existing impervious surface is 54,972.62 sq. ft. and the proposed impervious area is approximately 81,706.81 sq. ft. Three created wetlands are proposed instead of green infrastructure practices due to the shallow depth to the water table and the ability to outlet from a pond.

7.5 Stormwater Management System

In order to evaluate the pre- and post-development drainage conditions, twelve Design Points were chosen based on the pre-development hydrology. The pre- and post-development contributing drainage areas, USDA soil boundaries, and Tc flow paths are shown on Pre- and Post-Development Stormwater Maps, Figure Nos. D-1 through D-6.

To analyze the peak flow in pre- and post-development conditions HydroCAD®, a computer aided design tool is used to evaluate and analyze the stormwater runoff from the site. The program also

models the surface flow through the proposed stormwater practices determining the plug-flow and center-of-mass detention time within the ponds. A simultaneous routing process is used to evaluate the impacts associated with stormwater practices in series. The program is based on United State Department of Agriculture, Natural Resources Conservation Service (NRCS) Technical Releases TR20 and TR55. TR55 and TR20 are tools that were developed to calculate the volume and peak discharge rates of stormwater runoff generated in different rainfall events over a 24-hour period. Runoff volumes and rates are calculated by determining the curve numbers (CN) and calculating the time of concentration (Tc) for each subcatchment area depending on the given rainfall value. The CN values are based on the TR55 table and the hydrologic soil group, cover type, hydrologic condition and antecedent runoff condition. The Tc represents the time it takes for surface water to travel the hydraulically most distant point within the subcatchment area. The post-development hydrologic analysis can be found in Appendix I.

The following rainfall values for Sullivan County, shown in Table 6-6, were used in the analysis. For the purposes of the hydrologic analysis the runoff was based on Type III rainfall distribution for the northeast region. The following rainfall values are based on the 24-hour storm event. These values represent the rainfall distribution for various 24-hour storm frequencies.

Table 7-5
Rainfall Values

Rainfall Value (inches)	24-hour Storm Event (Year)
2.6	1
6.0	10
8.0	100
Source: Northeast Regional Climate Center	

Different types of ponds are proposed throughout the site to capture and treat the stormwater runoff. In addition to stormwater treatment the proposed ponds will also attenuate the larger storm events thereby reducing the total runoff flow to the predevelopment conditions. See Appendix J for a description of the ponds and the various design elements.

Table 7-6
Summary of Pond Types

Pond No.	Location	Pond Type	In-line or off-line system	Drainage Area (acres)
C	Thompsonville Road	W-4 (Pocket Wetland)	Off-line	0.959
E	Thompsonville Road	W-4	In-Line Treatment	1.422
G	Thompsonville Road	W-4	In-Line Treatment	0.677
30	Joyland Road (between Thompsonville Rd. and Resort Entry Road)	W-4	In-Line Treatment	1.148
29A	Joyland Road (between Thompsonville Rd. and Resort Entry Road)	W-4	Off-Line Treatment	0.448

Table 7-6
Summary of Pond Types

Pond No.	Location	Pond Type	In-line or off-line system	Drainage Area (acres)
29B	Joyland Road (between Thompsonville Rd. and Resort Entry Road)	W-4	In-Line Treatment	1.788
28	Resort Entry Road	Pocket Pond (P-5)	In-Line Treatment	3.802
26	Resort Entry Road	P-5	In-Line Treatment	5.277
24	Resort Entry Road	Micropool Extended Detention Pond (P-1)	In-Line Treatment	12.441
23	Resort Entry Road	Pocket Pond (P-5)	In-Line Treatment	7.321
21B	Resort Entry Road	P-5	In-Line Treatment	3.185
21A	Resort Entry Road	P-5	In-Line Treatment	3.680

7.5.1 Design Analysis Points

The HydroCAD analysis was performed with the assumption of a permanent pool as the starting water surface elevation. Pursuant to the design requirements of the stormwater ponds a permanent pool is required and the overall function of the water quality treatment is improved when the water table is intercepted. Appendices H and I include the Pre and Post-development hydrologic analysis for each of the design analysis points. Table 7-7 is a summary of the peak flow analysis.

The stormwater ponds are conservatively designed to capture and treat the stormwater runoff from the 90% rainfall event in accordance with NYSDEC requirements for treatment of phosphorous pollutants. These stormwater ponds also provide attenuation of peak flows from the larger storm events. The following table demonstrates that the post-development flows are less that the pre-development flows for the 1, 10, and 100-year, 24-hour storm events.

Table 7-7
Peak Flow Summary Table

Design Point	Pre-Development Flow (cfs)			Post-Development Flow (cfs)		
	1-Year	10-Year	100-Year	1-Year	10-Year	100-Year
1	3.06	20.87	33.48	1.20	14.80	25.37
9	0.96	5.15	7.98	0.64	3.85	5.88
10	3.74	20.20	31.23	3.48	19.03	28.63
11	1.03	4.16	6.11	0.15	2.78	3.84

Table 7-7
Peak Flow Summary Table

Design Point	Pre-Development Flow (cfs)			Post-Development Flow (cfs)		
	1-Year	10-Year	100-Year	1-Year	10-Year	100-Year
21	22.18	126.56	197.89	18.59	108.76	176.45
23	3.34	22.88	36.71	1.89	20.89	34.71
24	6.42	34.33	53.10	3.15	34.16	48.33
25	4.40	28.10	44.61	2.88	26.92	41.82
26	2.05	11.66	18.25	1.53	10.91	17.08
CFS – cubic feet per second						

7.5.2 Non-structural Stormwater Best Management Practices

Below is a list of nonstructural stormwater management practices that would be implemented throughout the Project Site:

- Long term soil stabilization through landscaping and maintenance in the developed areas. Prevention of soil loss, through establishment of vegetation and a landscape plan that would increase the amount of tree canopy and healthy ground cover. The landscape plan would also maximize the travel time of stormwater runoff and minimize concentrated flows.
- The grounds maintenance program limits the potential for excessive nutrient loading, specifically controlling the application of phosphate-based fertilizers.
- A high level of maintenance and good housekeeping practices would be implemented for both the driving and parking surfaces located throughout the MRMI Site.
- Catch basins would contain deep sumps and a hood would be installed at the downstream end of all proposed catch basins. This would trap floatables and debris within the catch basin. The deep sumps would trap the petroleum and antifreeze attached to sediment particles. The accumulated material would be cleaned out of the catch basins in accordance with the long term inspection and maintenance plan.
- The area along the southwest property line would be designed to convey overland stormwater through a grassed swale before being collected into downstream yard drains. This would allow for sediment deposition and promote infiltration.

7.6 Hydraulic Analysis

A hydraulic analysis of the proposed piped network was performed to demonstrated safe conveyance of the 25-year storm event as required by the Town of Thompson.

7.6.1 Piped Conveyance

In order to model the proposed stormwater management piping network for the proposed project, Bentley® StormCAD® V8i (SELECT series 2) was used. This product provides comprehensive modeling of stormwater piping network systems by calculating catchment runoff to inlets and pipe networks based on information from the specific design/layout land use types, rainfall intensity curves and tailwater condition provided. The resulting calculations provide information on hydraulic and energy grade lines which are helpful for determining pipe size and to confirm the functionality of the stormwater piping network.

Table 7-8
Rainfall Intensity Table

	Storm Duration (minutes)											
Return Period (years)	**5**	**10**	**15**	**20**	**25**	**30**	**35**	**40**	**45**	**50**	**55**	**60**
2	4.9	3.7	3	2.6	2.3	2	1.8	1.6	1.5	1.4	1.3	1.2
5	5.8	4.6	3.7	3.2	2.8	2.5	2.3	2.1	1.9	1.8	1.7	1.6
10	6.5	5.2	4.3	3.7	3.3	3	2.6	2.4	2.2	2.1	1.9	1.8
25	7.5	6	5.1	4.4	3.9	3.5	3.1	2.9	2.7	2.5	2.4	2.2
50	8.3	6.8	5.8	5	4.4	3.9	3.6	3.3	3	2.8	2.7	2.5
100	9.1	7.5	6.3	5.5	4.9	4.3	4	3.6	3.3	3.1	2.9	2.7

Source: NYSDOT 1991

The StormCAD model was completed using the catchment drainage areas, cover types and time of concentration flow paths as shown on Figures D-7a through D-7d Hydraulic Analysis Subcatchment Areas. The tailwater elevation was set at the permanent pool elevation of the receiving pond. By modeling the stormwater piping network this way will help to ensure future functionality and confirm adequate pipe sizing throughout the system.

The resulting analysis confirms that the stormwater management piping network is designed accurately and will perform properly for the 25-year design storm. The corresponding stormwater report is provided in Appendix K.

7.6.2 Culverts

Two elliptical culvert pipes are proposed along Resort Entry Road. These culvert pipes are proposed to maintain connectivity of the existing natural wetland and stream channels. The preliminary design analysis can be found within Appendix L.

7.7 Summary

The peak flows have been reduced through the implementation of green infrastructure practices and stormwater detention ponds. The post-development peak flows are less than the pre-development conditions. Therefore it has been demonstrated that the proposed stormwater management system mitigates the impacts associated with the proposed projects. By decreasing the peak flow to values less than predevelopment conditions, the potential impacts to the downstream wetland has been mitigated.

8.0 TEMPORARY EROSION AND SEDIMENT CONTROLS

The proposed project would require excavation of soil and the grading, which would result in the exposure of soil to natural forces. Several soil types located on the Project Site have moderate to severe erosion potential, including shallow depth to the seasonal groundwater table. If not properly managed, the temporary exposure of bare soil accelerates the potential for erosion. This acceleration in soil erosion could potentially lead to siltation of off-site wetlands, ponds, and off-site watercourses. This has the potential to cause a reduction in surface water quality. Measures to avoid impacts from the proposed project are discussed below.

A 5-acre waiver request will be necessary for this project due to the proposed cut and fill balances and overall construction timeline. As the design of the proposed project has progressed, the cut/fill calculations have determined that excess earth material to be excavated from the construction site would require deposition elsewhere off-site. Section 9 of this SWPPP discusses the phasing and staging.

8.1 Erosion and Sediment Control Practices

The following are specific erosion control measures as identified in the large scale drawings prepared for this project. Please refer to the large scale Erosion and Sediment Control drawing in Appendix F.

8.1.1 Stabilized Construction Entrance / Exit (SCE)

The construction entrance/exit shall have a stabilized aggregate pad underlain with filter cloth to prevent construction vehicles from tracking sediment off-site. Stabilized construction entrances are located at specific transition areas between concrete/asphalt to exposed earth.

8.1.2 Vehicle Wash Area

Vehicle wash areas shall be located as identified on the plans to minimize dust and tracking onto roadways.

8.1.3 Construction Road Stabilization

Construction road stabilization shall be used to control erosion on temporary construction routes and parking areas. The construction road shall be located in any areas to reduce erosion potential, minimize impact on existing site resources, and maintain operations in a safe manner.

8.1.4 Silt Fence

Silt fence shall be installed on the down gradient edge of disturbed areas parallel to existing or proposed contours or along the property line as perimeter control. Silt fence are to be used where stakes can be properly driven into the ground as per the Silt Fence detail in the New York State Standards and Specifications for Erosion and Sediment Control and as shown on the drawings (See large scale drawings Appendix F).

Silt fence controls sediment runoff where the soil has been disturbed by slowing the flow of water and encouraging the deposition of sediment before the water passes through the silt fence. Built-up sediment shall be removed from silt fences when it has reached one-third the height of the fence and properly disposed.

8.1.5 Storm Drain Inlet Protection

Inlet protection shall be installed at all inlets where the surrounding area has been disturbed. The inlet protection shall be constructed in accordance with NYSDEC Standards and Specifications for Erosion and Sediment Control. Typically they should be constructed to pass stormwater through, but prevent silt and sediment from entering the drainage system.

8.1.6 Soil Stockpile Detail

Stockpiled soil is to be protected, stabilized, and sited in accordance with the Soil Stockpile Detail, as shown on the detail sheets. Soil stockpiles and exposed soil shall be stabilized by seed, mulch, or other appropriate measures, when activities temporarily cease during construction for 7 days or more in accordance with NYSDEC requirements.

8.1.7 Fiber Roll

Fiber rolls shall be installed to dissipate energy and reduce sheet flow on slopes. Fiber rolls shall be installed along a contour at intervals as indicated on the plans.

8.1.8 Water Bar

A water bar is installed to limit the accumulation of erosive velocity of water by diverting surface runoff at pre-designed intervals.

8.1.9 Dust Control

During the demolition and construction process, debris and any disturbed earth shall be wet down with water, if necessary to control dust. After demolition and construction activities, all disturbed areas shall be covered and/or vegetated to provide for dust control on the site.

8.1.10 Temporary Seeding and Stabilization

In areas where demolition and construction activities, clearing, and grubbing have ceased, temporary seeding or permanent landscaping shall be performed to control sediment laden runoff and provide stabilization to control erosion during storm events. Other methods of soil stabilization methods besides temporary seeding include rolled erosion control product, hydro-seeding or hydro-mulching. This temporary seeding/stabilization or permanent landscaping shall be in place no later than 7 days after demolition and construction activity has ceased.

8.1.11 Sump Pit

A temporary pit is constructed to trap and filter water for pumping to a suitable discharge area. The purpose is to remove excessive water from excavations. Sump pits are constructed when water collects during the excavation phase of construction.

8.1.12 Dewatering

Due to the depth of excavation for the building foundation and proximity to on-site watercourses and wetland areas, there may be areas of construction where the groundwater table would be intercepted and dewatering activities would take place. Site-specific practices and appropriate filtering devices should be employed by the Contractor so as to avoid discharging turbid water to the surface waters of the State of New York.

A portable sediment tank may be used in conjunction with other practices that would settle and filter the sediment from the stormwater runoff. The sediment tank is a compartmented tank container to which sediment laden water is pumped to trap and retain the sediment. The purpose of the tank is to trap and retain sediment prior to pumping the water to drainage ways, adjoining properties, and right-of-ways. In conjunction with the portable sediment tank, the mechanical filtering devices may be necessary to filter out the finer particulates. A permit may be required for such activities; therefore the Contractor must coordinate with the Construction Manager.

8.1.13 Perimeter Dike/Swale

The purpose of a perimeter dike/swale is to prevent off-site storm runoff from entering a disturbed area and to prevent sediment laden storm runoff from leaving the construction site or disturbed area. It can be used to convey stormwater runoff from the work area to a proposed sediment basin.

8.1.14 Temporary Swale

The purposed of a temporary swale is to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet or to intercept sediment laden water and divert it to a sediment trapping device.

8.1.15 Stone Check Dam

The purpose of a check dam is to slow the rate of channelized flow in order to reduce erosion and allow for sediment deposition. A check dam is typically constructed out of stone and filter fabric and is positioned perpendicular to the flow of stormwater. This is typically a temporary measure before permanent stormwater controls are installed.

8.1.16 Temporary Sediment Basin

The purpose of a sediment basin is to intercept sediment-laden runoff and filter the sediment laden stormwater runoff leaving the disturbed area in order to protect drainage ways, properties, and rights-of-way below the sediment basin. The basin would be installed down gradient of construction operations which expose critical areas to soil erosion. A low flow dewatering device may be used to restrict the outflow rate from the temporary sediment basin. The basin shall be maintained until the final stabilization is achieved. The supporting sizing calculations are shown in Appendix M.

8.1.17 Rock Outlet Sediment Trap

The rock outlet sediment trap is intended to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way below the sediment trap from sedimentation.

8.1.18 Level Spreader

A level spread would be installed to convert concentrated flow to sheet flow and release it uniformly over a stabilized area.

8.1.19 Rip Rap Outlet Protection

Rip rap outlet protection would be installed at the outlet of all on-site stormwater piping. The purpose of the rip rap is to reduce flow rates, prevent scouring, and allow

for sediment deposition. Outlet protection is important to the longevity of the development by helping to prevent future erosion and stabilize the discharge point.

8.1.20 Materials Handling

The Contractor must store construction and waste materials as far as practical from any environmentally sensitive areas. Where possible, materials shall be stored in a covered area to minimize any potential runoff. The Contractor shall incorporate storage practices to minimize exposure of the materials to stormwater, and spill prevention and response where practicable. Prior to commencing any construction activities the Contractor shall obtain all necessary permits or verify that all permits have been obtained.

8.2 Five (5) acre Waiver

It has also been determined that a portion of the construction period will require the disturbance of greater than 5-acres of land for a period of time. A waiver of the 5-acre disturbance will officially be requested of NYSDEC as part of this SWPPP.

Construction will be completed in a phased approach in an attempt at limiting the total disturbance at any given point in time. All efforts will be made to limit the disturbance to 5-acres. However it is expected that disturbance will be greater than 5 acres for some portions of the construction. Note that secondary erosion and sediment control measures will be employed at the Site during the period of time that the disturbance will be larger than 5 acres.

Colloidal Solids

Due to clay and fine silts which are present on the Project Site, the Contractor will be required to design, permit, install, operate and maintain a Chemical Treatment System (CTS) to prevent sediment-laden stormwater runoff from leaving the works areas. The primary mechanism is to introduce chemical flocculants into the runoff to bind clays and silts together and enhance settlement or all filtration prior to discharge from the work area/site. Contractor shall note:

1. The use of chemical treatment must have the advanced, written approval of the NYSDEC. The Water Treatment Chemical Form shall be completed and submitted to NYSDEC for approval. The flocculant manufacturer, toxicity results and standard information shall be identified.
2. Prior to authorization for field use, jar tests shall be conducted in order to demonstrate that turbidity reduction necessary to meet the receiving water quality criteria can be achieved.
3. A pH-adjusting chemical may be needed in the CTS to bring the pH into the chemical flocculant manufacturer's recommended operating range. The pH adjusting chemical or gas must be mixed thoroughly into the stormwater to insure proper dispersion and contact. This can be achieved in various ways after the chemical is introduced to the flow of the turbid water, including metering the chemical into the pump intake or routing the treated flow through corrugated pipe, static mixers, and/or tanks with baffles.
4. Chemically treated stormwater should not be directly discharged from the construction site to a receiving waterbody. Settling basins designed to allow sufficient settling time must be used, preferably with surface discharge and porous baffles. Where space is limited, mechanical sand filters can remove the flocullant and pump the sediment backwash sludge to isolated contained storage areas for decanting and final stabilization or disposal. The treated stormwater can be pumped into geotextile sediment bags. Contractor will be responsible to maintain the system throughout the duration of the project.

8.3 Inspections and Record Keeping During Construction

Once the contract has been let, the name, address, and phone number of responsible parties for maintenance would be provided to the NYSDEC. The following is a description of the maintenance and inspection practices that would be implemented as part of the project. Maintenance and inspection is important to ensure that the stabilization and structural practices that are part of the SWPPP continue to be effective in preventing sediment and other pollutants from entering the stormwater system. It is the responsibility of the owner or operator to ensure that inspections are completed in accordance with NYSDEC regulations.

8.3.1 Erosion and Sediment Control Inspection Report

Inspection and maintenance is important to ensure that the erosion and sediment control practices that are part of the SWPPP continue to be effective in preventing sediment and other pollutants from entering the stormwater system. It is the responsibility of the owner to ensure that inspections are completed in accordance with SPDES GP-0-10-001.

As a part of the SWPPP inspection and maintenance activities during construction, the Erosion and Sediment Control Inspection Report shall be updated and kept on-site. A sample Erosion and Sediment Control Inspection Report is provided in Appendix N of this report.

Inspections would be conducted by the qualified inspector periodically according to the schedule required by the SPDES GP 0-10-001. During each inspection, the qualified inspector would record the areas of disturbance, deficiencies in erosion and sediment control practices, required maintenance, and areas of temporary or permanent stabilization. The need for modifications to the Erosion and Sediment Control Plan would be identified and implemented immediately.

The Erosion and Sediment Control Inspection Report would be completed by a qualified inspector to fully document each inspection. A qualified inspector is a person knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), licensed Landscape Architect, or other NYSDEC endorsed individual(s). It also means someone working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect, provided the person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that an individual performing the site inspection has received four hours of training, which has been endorsed by the NYSDEC, from a Soil and Water Conservation District, CPESC, Inc., or other NYSDEC endorsed entity, in proper erosion and sediment control principles no later than two years from the date SPDES GP-0-10-001 is issued. After receiving the initial training, an individual working under the direct supervision of the licensed Professional Engineer or licensed Landscape Architect shall receive four hours of training every three years.

8.3.2 Inspections

Inspections shall be conducted by the qualified inspector periodically according to the following schedule:

1. When construction activities are ongoing, the qualified inspector shall conduct a site inspection at least once every seven (7) calendar days.

2. When construction activities are ongoing and the owner or operator has received authorization in accordance with Part II.C.3 of GP-0-10-001 to disturb greater than five acres of soil at any one time, the qualified inspector shall conduct at least two site inspections every seven calendar days. When performing two inspections every seven calendar days, the inspections shall be separated by a minimum of two full calendar days.
3. If soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the qualified inspector shall conduct a site inspection at least once every thirty (30) calendar days. The owner or operator shall notify the Regional Office stormwater contact person in writing prior to reducing the frequency of inspections.
4. If soil disturbance activities have been shut down with partial project completion, the qualified inspector can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved final stabilization and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The owner or operator shall notify the Regional Office stormwater contact person in writing prior to the shutdown. If soil disturbance activities have not resumed within 2 years from the date of shutdown, the owner or operator shall have the qualified inspector(s) perform a final inspection and certify that all disturbed areas have achieved final stabilization, and all temporary, structural erosion and sediment control measures have been removed, and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the Notice of Termination (NOT). The owner or operator shall then submit the completed NOT form in accordance with NYSDEC regulations.

During each inspection, the qualified inspector should fill out the Erosion and Sediment Control Inspection Report as directed below:

On the Erosion and Sediment Control Inspection Report site map show the following:

- Disturbed site areas and drainage pathways.
- Site areas that are expected to undergo initial disturbance or significant site work within the next 14-day period.
- Site areas that have undergone temporary or permanent stabilization.
- In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.
- Photographs, including date stamp, of any deficiencies and recommendations.
- As deficiencies are fixed by the Contractor, a photograph, include date stamp, should be included in the report.

- Photograph of each outfall during a rain event.

Record the following information on the Erosion and Sediment Control Inspection Report:

- For each structural measure, circle YES, NO, or N/A (not applicable) to indicate if the pollutant control measure is in conformance with specifications.
- For each structural measure, circle YES, NO, or N/A to indicate whether the structural measure is performing effectively in minimizing stormwater pollution.
- Inspect all sediment control practices and record the approximate degree of sediment accumulation as a percentage of the sediment storage volume in the allocated location on the Inspection Form Chart (i.e., 10 percent, 20 percent, and 50 percent).
- A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any discharges of sediment from the construction site. Include discharges from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;
- A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any discharges of sediment to the surface waterbody;

The qualified inspector would give a brief explanation for all locations where he/she has noted that the structural practice was either not in conformance with specifications or in need of repair. This should be noted in the Erosion and Sediment Control Inspection Report. The qualified inspector would then give a brief recommendation for soil erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced.

8.4 Erosion and Sediment Control Maintenance Measures

All maintenance described below shall be completed in accordance with the New York State Standards and Specifications for Erosion and Sediment Control. Any material removed from erosion and sediment control measure shall be properly disposed.

All measures would be maintained in good working order; if repairs are found to be necessary, the qualified inspector shall notify the owner or operator and appropriate contractor (and subcontractor) of any corrective actions needed within one business day. The contractor (or subcontractor) shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

A maintenance inspection report, titled "Erosion and Sediment Control Inspection Report," would be made after each inspection conducted by a qualified inspector.

Disturbed areas and materials storage areas would be inspected for evidence of potential pollutants entering stormwater systems. Within one business day of the completion of the inspection, the qualified inspector shall notify the owner or operator and the appropriate contractor (or subcontractor) of any corrective actions that need to be taken. The contractor (or subcontractor) shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

The following are the maintenance requirements for each practice that would be implemented at the site.

8.4.1 Stabilized Construction Entrance/Exit

The stabilized construction entrance/exit shall be maintained in a condition that would prevent the tracking or flow of sediment onto public rights-of-way. All sediment spilled, dropped, washed or tracked onto public rights-of-way must be removed immediately; streets shall be swept as needed. The gravel pad shall be replaced as necessary. Sediment tracked onto public streets should be removed or cleaned on a daily basis.

8.4.2 Vehicle Wash Area

Vehicle wash areas shall be located as identified on the plans to minimize dust and tracking onto roadways. The contractor must maintain these measures and replace the necessary components as necessary.

8.4.3 Construction Road Stabilization

Construction road stabilization shall be used to control erosion on temporary construction routes and parking areas. The construction road shall be located in any areas to reduce erosion potential, minimize impact on existing site resources, and maintain operations in a safe manner. The contractor is required to check sideslopes and roadway for erosion. The contractor will be required to topdress with new gravel as needed.

8.4.4 Silt Fence

Maintenance of all silt fence shall be performed as needed. If a silt fence is knocked down, it shall be replaced immediately. When a silt fence appears deteriorated or ineffective and/or built up sediment reaches one-third the height of the bale or fence, the silt fence shall be replaced and/or cleaned accordingly. When “bulges” of material develop on the fence, they shall be removed.

Silt fence controls sediment runoff where the soil has been disturbed by slowing the flow of water and encouraging the deposition of sediment before the water passes through the silt fence. Built-up sediment shall be removed from silt fences when it has reached one-third the height of the fence and properly disposed.

8.4.5 Sump Pit

The sump pit would be inspected for proper control of runoff and sediment materials. Clean water should be pumped to a grassy area. If the Contractor notices any visible contrast in the water, proper filtration shall be provided to release off site.

8.4.6 Soil Stockpile Detail

The silt fencing should be inspected for bulges and proper installation. The soil stockpile should be stabilized with grass or rolled erosion control blanket.

8.4.7 Storm Drain Inlet Protection

Maintenance and inspection of the filter fabric cloth beneath inlet grates in paved areas or the filter fabric drop inlet protection around the drop inlet shall be conducted. The filter fabric cloth shall be cleaned to allow water to pass and prevent clogging the drainage structure. The drainage inlet protection should be inspected for integrity and

visible sediment buildup. Collected sediment should be removed from the drainage inlet protection and shall be disposed of properly in accordance with all applicable local, state, and federal requirements.

8.4.8 Dust Control

Maintain all dust control measures through dry weather periods until all disturbed areas are stabilized.

8.4.9 Soil Stabilization

To ensure that the site is properly seeded and stabilized, the Contractor must initiate stabilization measures as soon as practicable in areas of the site where construction activities have permanently ceased and in no case more than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. The Contractor would be responsible for the maintenance of the vegetated cover for the duration of construction activities. The areas shall be monitored to ensure that vegetation achieves good coverage over the entire disturbed section. Additional seeding shall be completed as needed. Watering shall be provided as needed.

In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

8.4.10 Perimeter Dike/Swale

The dike/swale should be properly stabilized with rolled erosion control blanket or other stabilization measures. Any rilling or areas of cutting should be immediately stabilized. Further investigation as to the cause should also be performed to determine if other upstream erosion and sediment control measures are needed. When accumulated sediment reached a depth of 1/3 of the total depth of the swale, this material shall be removed and properly disposed.

8.4.11 Temporary Swale

The purposed of a temporary swale is to prevent runoff from entering disturbed areas by intercepting and diverting it to a stabilized outlet or to intercept sediment laden water and divert it to a sediment trapping device.

8.4.12 Check Dam

Check dams should be field verified on a regular basis to ensure their functionality. It is important to remove excessive sediment and debris from the stone as well as inspect the edges of the dam where erosion is possible during large storm events. Stone or rock should be installed where necessary in order to maintain height, drainage width, and flow through operation.

8.4.13 Temporary Sediment Basin

Any rilling and erosion of the basin sideslopes should be evaluated and adequate stabilization should be provided. Rolled erosion control blankets or other stabilization practices should be installed on the sideslopes. The outlet structure should be inspected for damages, accumulation of sediment, trash and debris, and overall

performance. If sediment-laden stormwater is leaving the basin then additional erosion and sediment control practices may be required.

8.4.14 Rock Outlet Sediment Trap

The rock outlet sediment trap is intended to intercept sediment-laden runoff and trap the sediment in order to protect drainage ways, properties, and rights-of-way below the sediment trap from sedimentation. The contractor will take care to remove sediment accumulation and replace rock to maintain the level outlet structure.

8.4.15 Level Spreader

A level spread would be installed to convert concentrated flow to sheet flow and release it uniformly over a stabilized area.

9.0 SEQUENCE OF CONSTRUCTION

The phasing of the project is important for the construction of the proposed development. The protection of the natural resources, specifically the watercourse and wetland areas, have also been carefully factored into the development of the sequence of construction.

A pre-construction meeting shall be held with representatives of the Town, the Construction Manager, and the Contractor prior to any site disturbance. Any potential changes to the Erosion and Sediment Control Plan should be discussed at this time. See Figures CP-1 and C-2 for the associated phasing and stages.

The sequence of construction activities is based on several different criteria including drainage boundaries, cut and fill balance, the requirements of the 5-acre waiver and the wetland permitting. The contractor shall ensure that each of its subcontractors is aware of the permit conditions and limits of disturbance. Tree-protection shall be completed in conformance with the Landscape Plans. Phases 1 through 3 and 5 are to be completed under a separate contract.

Phase 4	
Stages 1 to 8 - Resort Entry Road and Thompsonville Road Area of Disturbance: Stage 1 – 4.2 acres Stage 2 – 3.0 acres Stage 3 – 4.0 acres Stage 4 – 6.0 acres Stage 5 – 7.7 acres Stage 6 – 7.5 acres Stage 7 – 10.4 acres Stage 8 – 6.6 acres Stage 9 – 11.7 acres	The following is a sequence for each stage of construction. The stages were developed based on drainage boundaries. The contractor shall not proceed to the next stage until Item 7 is completed and the majority of the area has been stabilized with RECP or soil stabilizer. The contractor should make preparations for multiple applications of RECP and/or soil stabilizer.
	1. Install orange construction fence at limits of grading. Install tree protection fencing in conformance with the Landscape Plans. 2. Contractor is to install and implement all erosion and sediment control practices in or around the wetland and its adjacent area in conformance with the applicable Army Corps of Engineers and NYSDEC permit. 3. Install silt fence prior to clearing the limits of the roadway up until limit of drainage area. The contractor is to only complete grubbing within the areas of the proposed temporary sediment basin or temporary sediment traps. 4. Construct temporary sediment basin and/or temporary sediment traps. Install 6" of topsoil, seed, and stabilize with rolled erosion control product (RECP) or soil stabilizer. Install temporary outlet control structure. 5. Contactor to complete grubbing in the balance of the limit of disturbance for the specific stage. 6. Rough grade roadway and swales. 7. Stabilize all disturbed areas with standard practices such as rolled erosion control blankets, hydroseeding and mulching, and/or soil stabilizers. 8. Install utility trenching, including water, sanitary, electric and telecommunications as shown on the contract drawings. 9. Install inlet protection on all new stormwater inlets. 10. Complete sub base of proposed roadway asphalt section. 11. The contractor is to complete roadway appurtenances including timber guiderail, light poles and finalize swale grading. 12. Final grading - The contractor to complete soil restoration in conformance with the specifications. Once soil restoration is complete landscape planting shall be completed in conformance with the Landscape Plans. 13. Once each stage within Phase 4 is completed the contractor will complete 14. Once final grading and landscape planting is completed, the contractor shall convert the temporary sediment basins/traps to permanent stormwater management pond following completion of construction activities. 15. Prior to final stabilization the Contractor and Resident Engineer shall complete the construction Inspection Checklist in Appendix O for each of the stormwater green infrastructure practices and stormwater ponds or wetlands. 16. Once the site is completely stabilized the contractor shall remove all erosion and sediment controls.

10.0 POST-CONSTRUCTION OPERATION AND MAINTENANCE

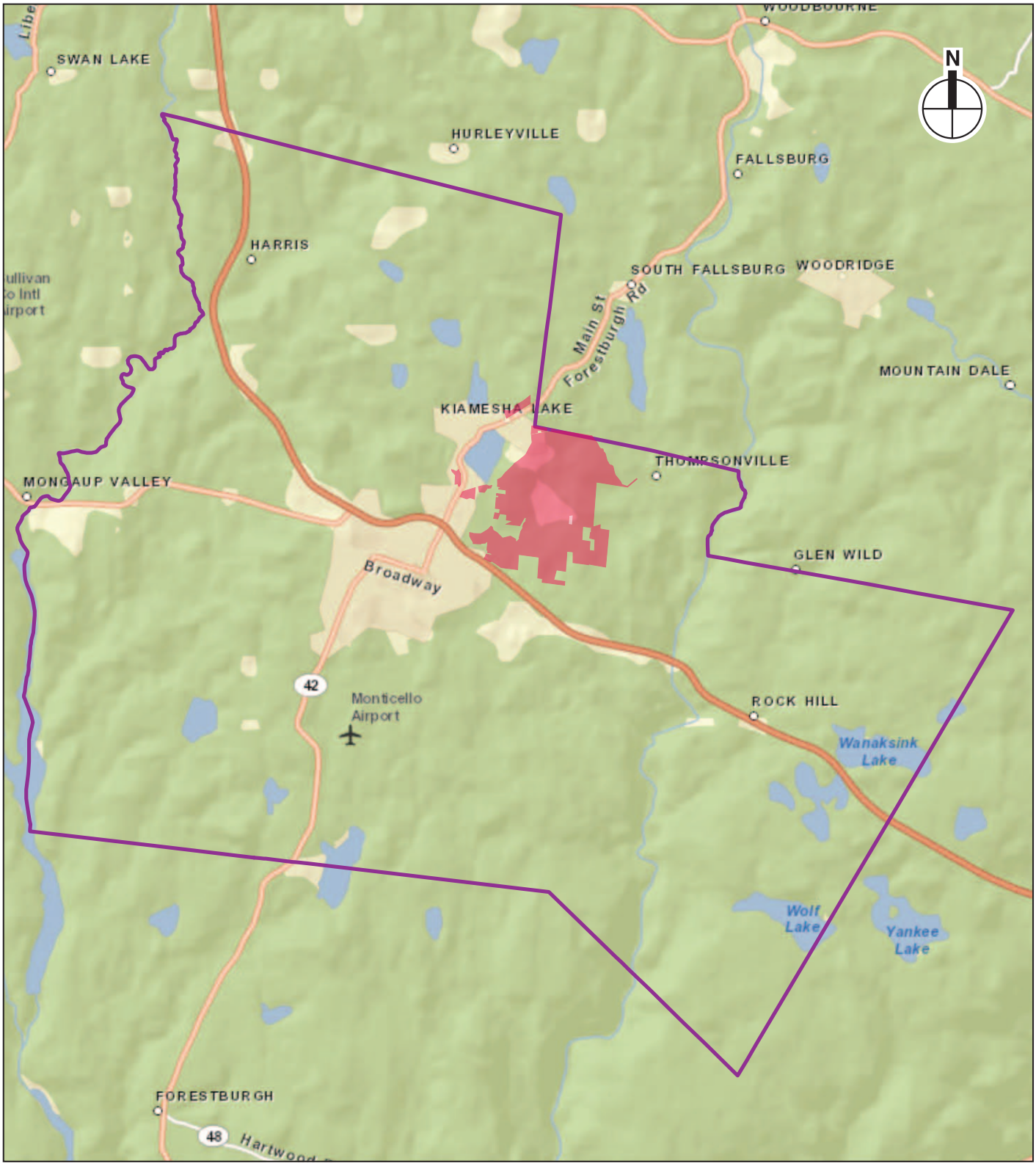
Following completion of construction, a long term operations and maintenance program would be implemented to ensure the proper function of the stormwater management system. The program would be carried out by the facilities manager. A detailed checklist of pond inspection and maintenance is included in the Appendix P. The maintenance program would generally include the following:

1. The side slopes of the pond would be mowed at a minimum twice a year. If necessary, invasive woody vegetation around and in the pond would be removed to prevent it from becoming established within the pond.
2. Litter and debris would be removed from catch basins, vegetated swales, ponds, and the outlet control structures.
3. The stormwater management system should be inspected after each major storm event (greater than 2-year, 24-hour storm) to ensure the small orifices and inlets remain open.
4. Silt would be cleaned from catch basins and other drainage structures when the depth exceeds half of the depth of the sump.
5. Sediment would be removed from stormwater ponds as needed, but at a minimum of every five years. A backhoe or excavator would be used to remove sediment accumulation from the bottom of the detention pond. However, vehicles shall be prevented from traversing the sideslopes to the extent possible to avoid damaging established vegetation. Repairs to the embankment should be done with hand tools to the extent practical.
6. Use of road salt for maintenance of driveway areas would be minimized.
7. Eroded areas and gullies would be restored and re-seeded as soon as possible.

In addition to inspection and maintenance of the stormwater management system, inspection of the overall site for areas of potential contamination would also be noted. Maintenance of existing landscaped areas is performed consistently throughout the year. Pest control would follow an Integrated Pest Management program in conjunction with guidance from the Cornell Cooperative Extension Agency, applicable regulations, and best practices. All potential pollutants, such as petroleum products, chemicals, etc, would be properly stored in designated areas that would minimize contact with precipitation.

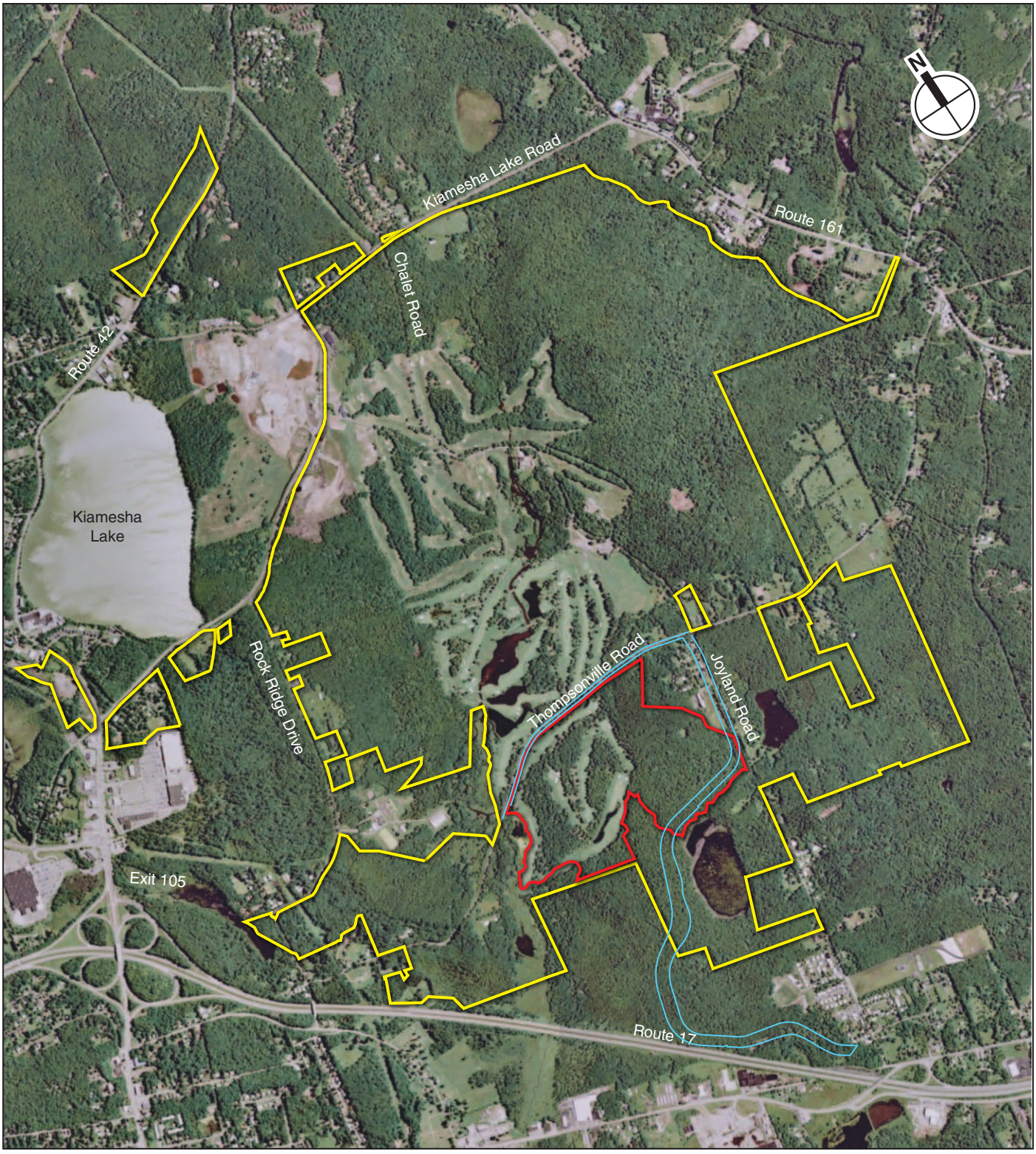
WEST NILE VIRUS

Recent field observations conclude that constructed wetlands and stormwater management ponds actually pose a low risk in spreading the West Nile Virus since the mosquito species that are found in wetlands and stormwater management ponds tend not to be the variety that are known to carry the West Nile Virus. Within a healthy aquatic ecosystem, other aquatic invertebrates (dragonfly larvae and other species) prey on mosquito larvae thereby reducing mosquito populations. The SWPPP submitted to the NYSDEC would include a regular maintenance schedule to be implemented at the completion of construction. This may include the stocking of the ponds with species to feed on potential mosquito larvae, and possible aeration systems to be exercised during periods of minimal flow through the ponds.



Regional Site Loction

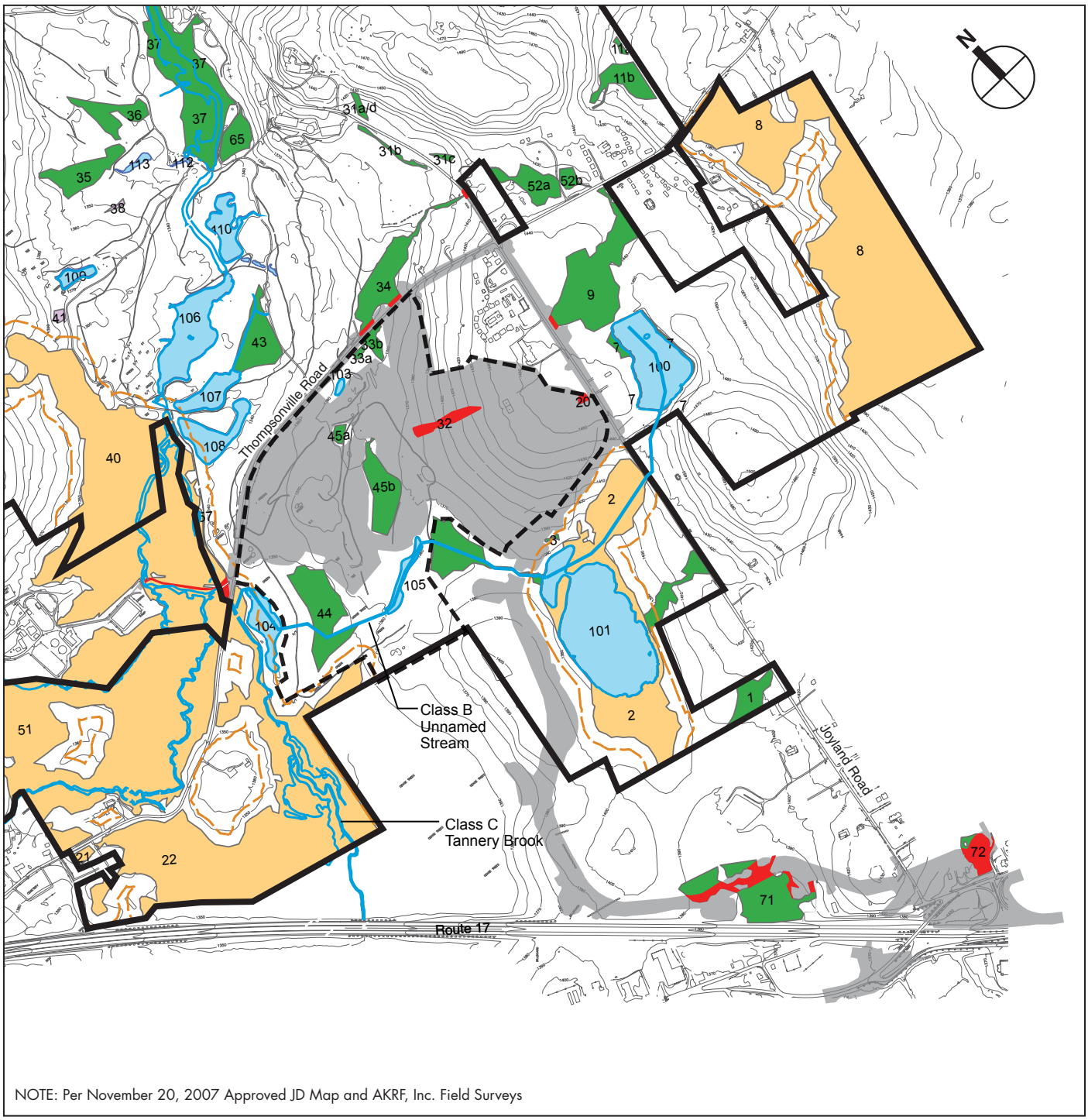
Figure 1



EPT Concord Resort boundary
Monticello Raceway Management, Inc. (MRMI) Parcel Boundary
Infrastructure Right-of-Way

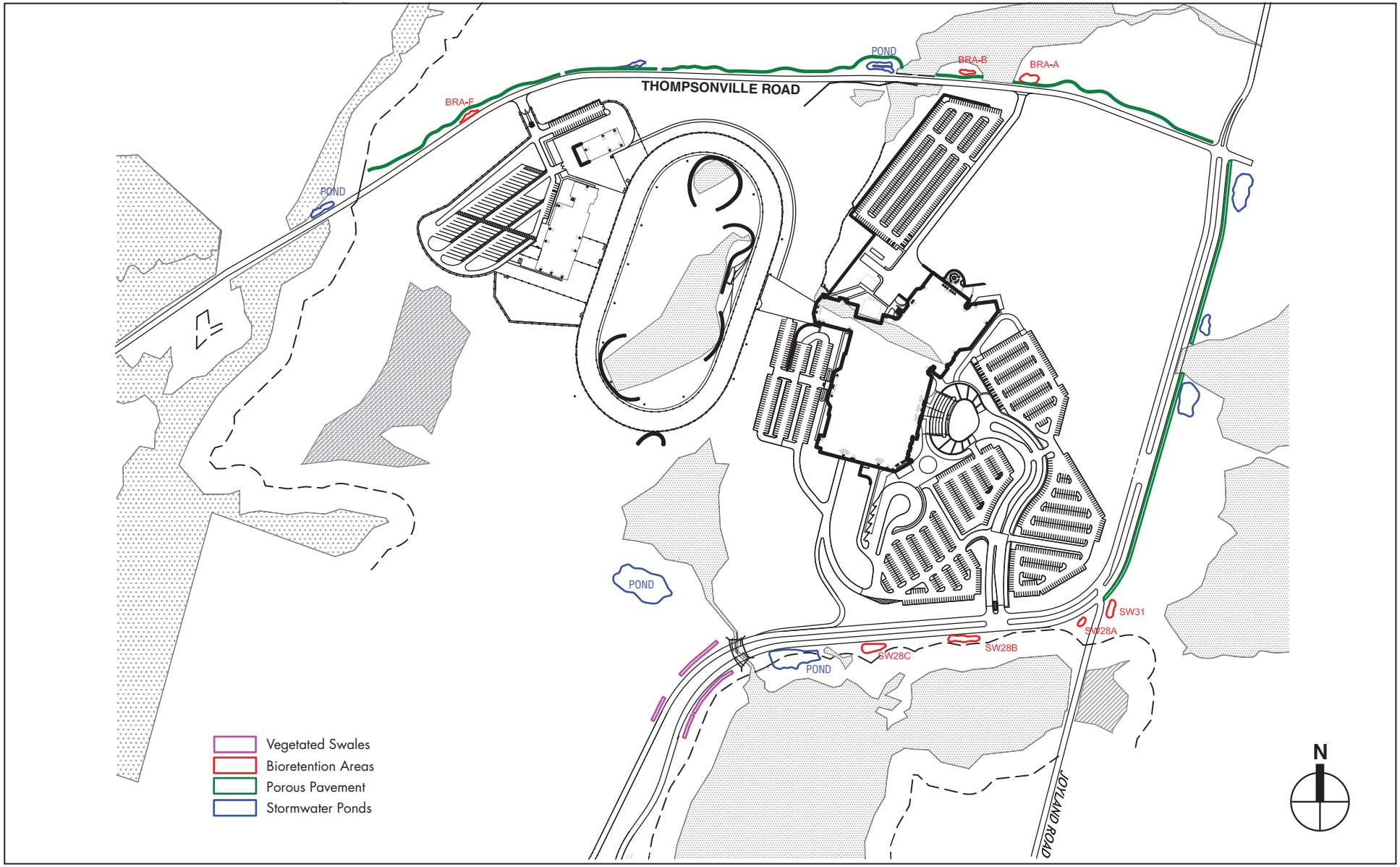
0 1000 2000 FEET
SCALE

Aerial Site Location
Figure 2



MRMI Site, Roadway and Infrastructure Improvements Wetland Disturbance

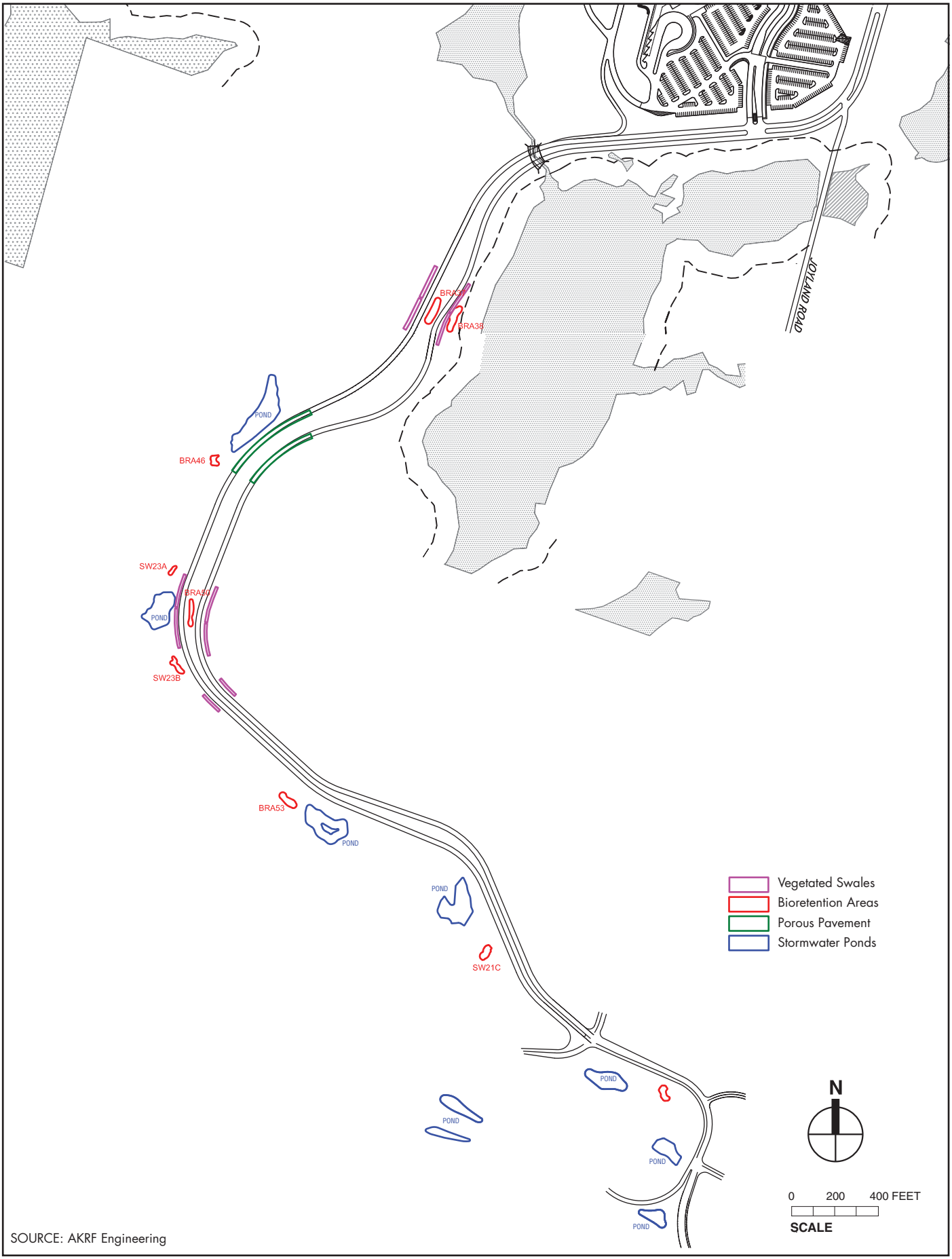
Figure 3



SOURCE: AKRF Engineering

0 200 400 FEET
SCALE

Resort Entry Road Green Infrastructure
Figure 4a



SOURCE: AKRF Engineering

Resort Entry Road Green Infrastructure

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NEW YORK

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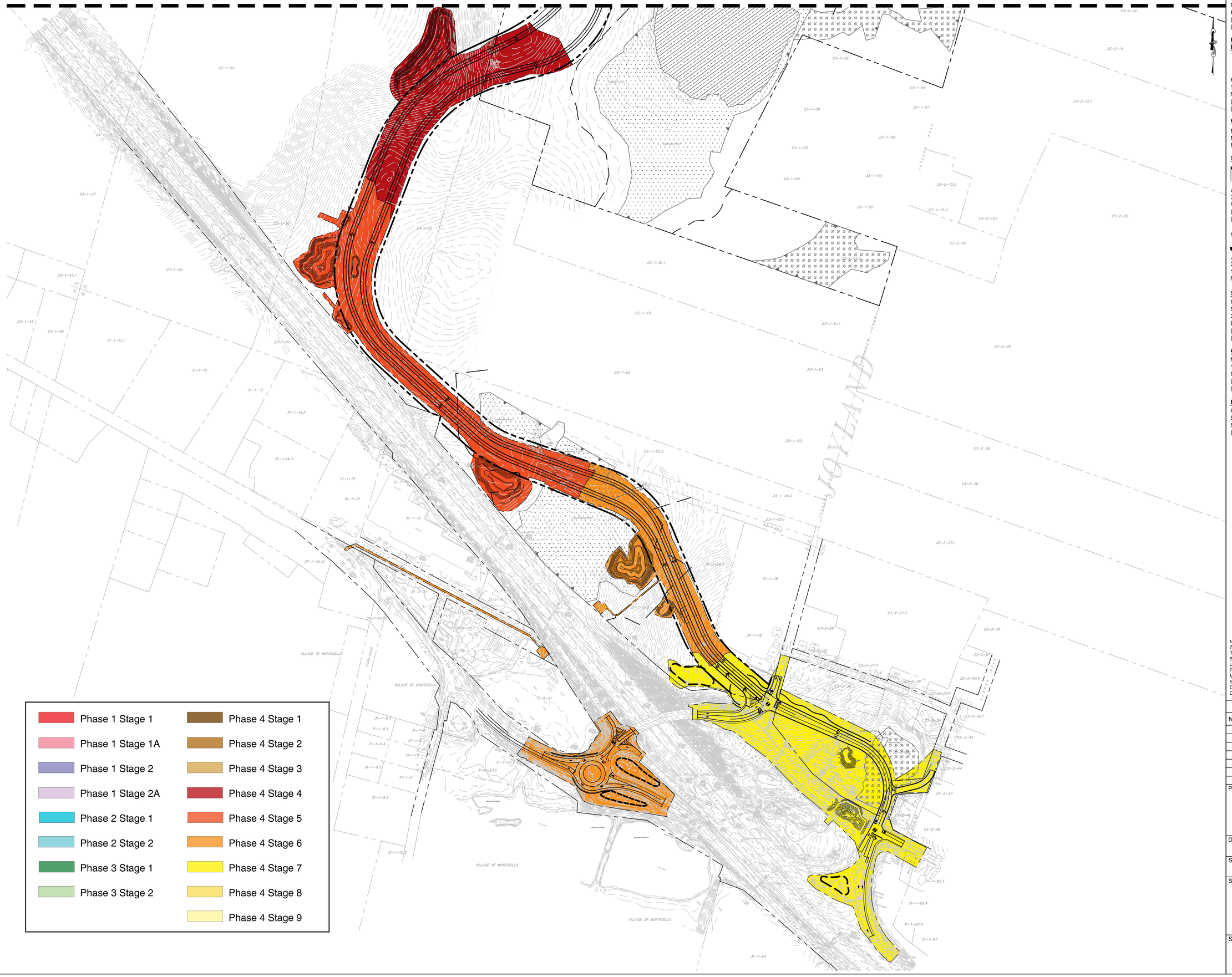
SHEET TITLE

CONSTRUCTION PHASING PLAN 1

SHEET NO.

CP-1

MATCHLINE - SEE CONSTRUCTION PHASING PLAN 1



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TOWN OF THOMPSON NEW YORK

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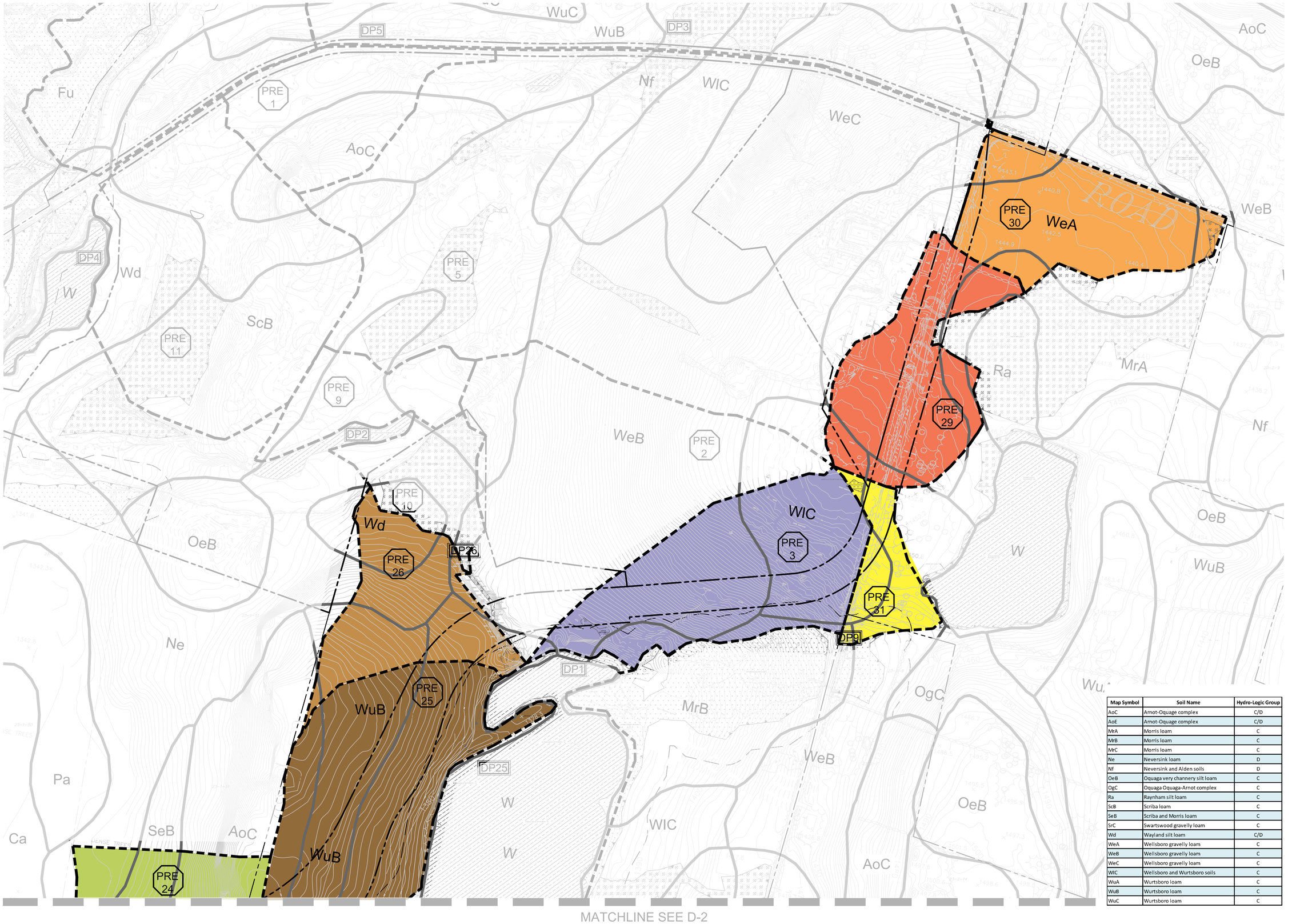
SHEET TITLE

CONSTRUCTION PHASING PLAN 2

SHEET NO.

CP-2



Map Symbol	Soil Name	Hydro-Logic Group
AoC	Arnot-Oquage complex	C/D
AoE	Arnot-Oquage complex	C/D
MrA	Morris loam	C
MrB	Morris loam	C
MrC	Morris loam	C
Ne	Neversink loam	D
Nf	Neversink and Alden soils	D
OeB	Oquaga very channery silt loam	C
OgC	Oquaga Oquaga-Arnot complex	C
Ra	Raynham silt loam	C
ScB	Scriba loam	C
SeB	Scriba and Morris loam	C
SrC	Swartswood gravelly loam	C
Wd	Wayland silt loam	C/D
WeA	Wellsboro gravelly loam	C
WeB	Wellsboro gravelly loam	C
WeC	Wellsboro gravelly loam	C
WIC	Wellsboro and Wurtsboro soils	C
WuA	Wurtsboro loam	C
WuB	Wurtsboro loam	C
WuC	Wurtsboro loam	C

Pre 3
Pre 24
Pre 25
Pre 26
Pre 29
Pre 30
Pre 31

LEGEND

- EXISTING CONTOUR
- EXISTING TREE LINE
- USDA SOIL BOUNDARY
- FEMA 100 YEAR FLOOD PLAIN
- DP4 — DESIGN POINT
- PRE 4B — PRE DEVELOPMENT SUB-CATCHMENT AREA
- DRAINAGE BOUNDARY
- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY

CLIENT/OWNER

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TOWN OF THOMPSON
NEW YORK

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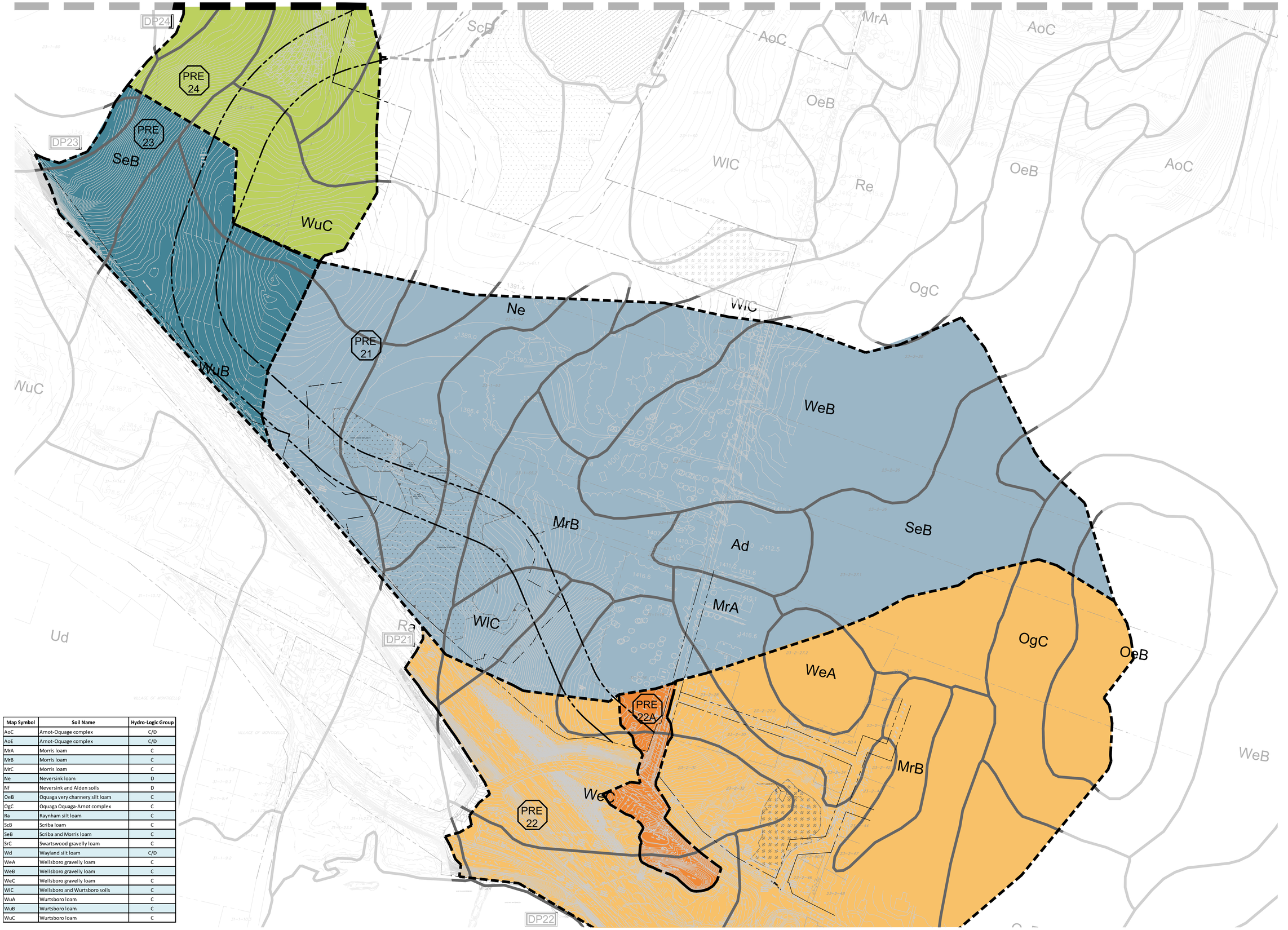
SHEET TITLE

PRE-DEVELOPMENT STORMWATER MAP

SHEET NO.

FIGURE D-1

MATCHLINE SEE D-1



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ScB	Scriba loam	C
SeB	Scriba and Morris loam	C
SrC	Swartswood gravelly loam	C
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WeA	Wellsboro gravelly loam	C
WeB	Wellsboro gravelly loam	C
WeC	Wellsboro gravelly loam	C
WlC	Wellsboro and Wurtsboro soils	C
WuA	Wurtsboro loam	C
WuB	Wurtsboro loam	C
WuC	Wurtsboro loam	C

Pre 21
Pre 22
Pre 22A
Pre 23
Pre 24

LEGEND

EXISTING CONTOUR
EXISTING TREE LINE
USDA SOIL BOUNDARY
FEMA 100 YEAR FLOOD PLAIN

DP4 DESIGN POINT
PRE 4B PRE DEVELOPMENT SUB-CATCHMENT AREA
DRAINAGE BOUNDARY
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NEW YORK

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SHEET TITLE

PRE-DEVELOPMENT STORMWATER MAP

SHEET NO.

FIGURE D-2

Map Symbol	Soil Name	Hydro-Logic Group
AoC	Arnot-Oquage complex	C/D
AoE	Arnot-Oquage complex	C/D
MrA	Morris loam	C
MrB	Morris loam	C
MrC	Morris loam	C
Ne	Neversink loam	D
Nf	Neversink and Alden soils	D
OeB	Oquaga very channery silt loam	C
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SeB	Scriba and Morris loam	C
SrC	Swartswood gravelly loam	C
Wd	Wayland silt loam	C/D
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WeC	Wellsboro gravelly loam	C
WlC	Wellsboro and Wurtsboro soils	C
WuA	Wurtsboro loam	C
WuB	Wurtsboro loam	C
WuC	Wurtsboro loam	C

Post A1
Post A2
Post A3
Post B1
Post B2
Post B3
Post C1
Post C2
Post C3
Post D1
Post D2
Post D3
Post 29
Post 29A
Post 29B
Post 29C
Post 29D
Post SW29A
Post SW29B
Post 30
Post 30A
Post SW30

LEGEND

EXISTING CONTOUR
EXISTING TREE LINE
USDA SOIL BOUNDARY
FEMA 100 YEAR FLOOD PLAIN

DP4 — DESIGN POINT
POST 4B — POST DEVELOPMENT SUB-CATCHMENT AREA
DRAINAGE BOUNDARY
EPT CONCORD II, LLC PROPERTY BOUNDARY
MRMI PARCEL BOUNDARY

CLIENT/OWNER

ENTERTAINMENT PROPERTIES TRUST
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KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

HART HOWERTON
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NEW YORK, NY 10016
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(212) 481-3768 (FAX)

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT

EPT CONCORD RESORT
TOWN OF THOMPSON
NEW YORK

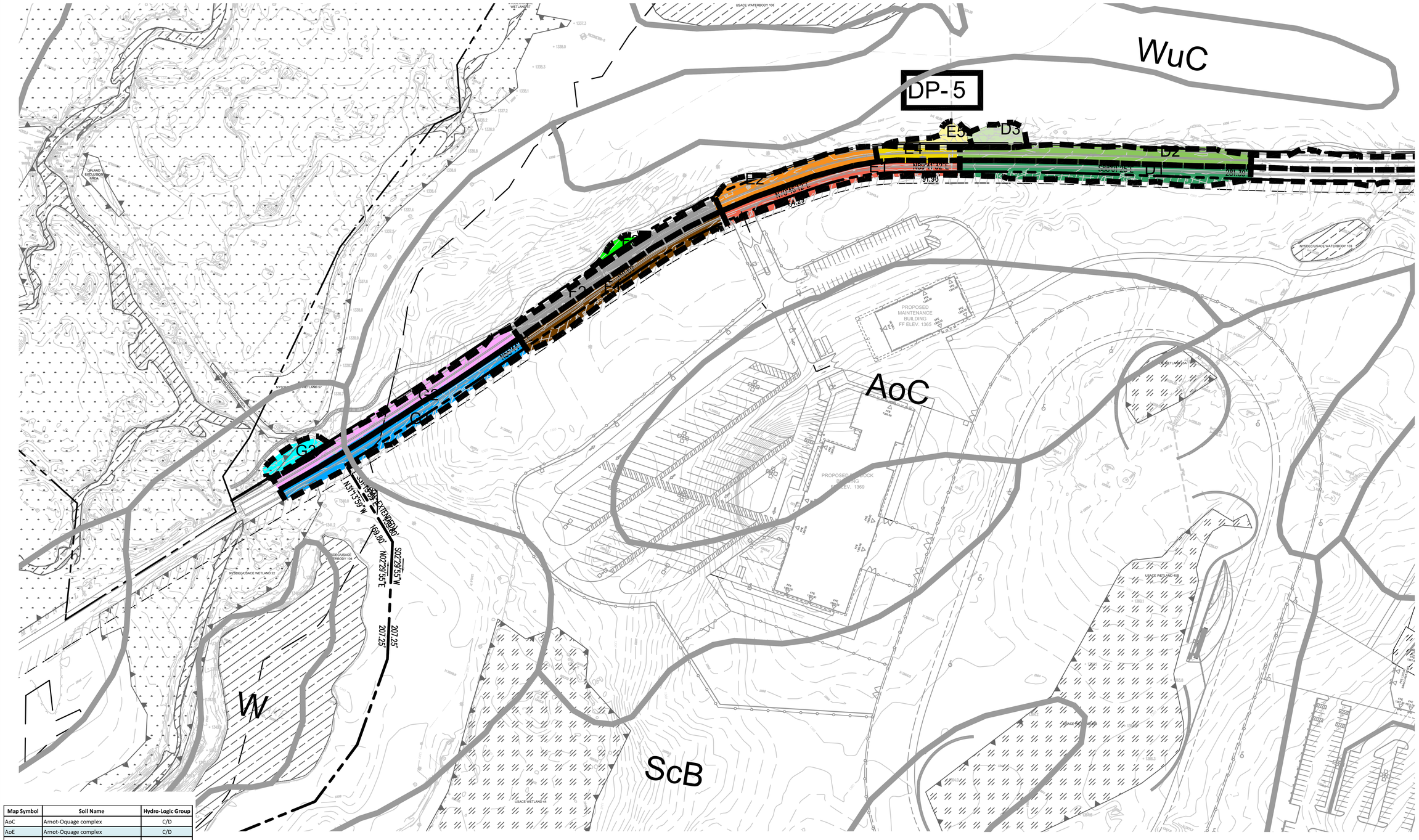
DRAWN BY	CHECKED BY
JH	AM
SCALE	DATE
1" = 60'	03/13/13

SHEET TITLE

POST-DEVELOPMENT STORMWATER MAP DESIGN POINTS 3, 5, 10 &11

SHEET NO.

FIGURE D-3



Map Symbol	Soil Name	Hydro-Logic Group
AoC	Arnot-Oquage complex	C/D
AoE	Arnot-Oquage complex	C/D
MrA	Morris loam	C
MrB	Morris loam	C
MrC	Morris loam	C
Ne	Neversink loam	D
Nf	Neversink and Alden soils	D
OeB	Oquaga very channery silt loam	C
OgC	Oquaga Oquaga-Arnot complex	C
Ra	Raynham silt loam	C
ScB	Scriba loam	C
SeB	Scriba and Morris loam	C
SrC	Swartswood gravelly loam	C
Wd	Wayland silt loam	C/D
WeA	Wellsboro gravelly loam	C
WeB	Wellsboro gravelly loam	C
WeC	Wellsboro gravelly loam	C
WlC	Wellsboro and Wurtsboro soils	C
WuA	Wurtsboro loam	C
WuB	Wurtsboro loam	C
WuC	Wurtsboro loam	C

Post D1 | Post D2 | Post D3 | Post E1 | Post E2 | Post E4 | Post E5 | Post F1 | Post F2 | Post F3 | Post G1 | Post G2 | Post G3

LEGEND

- EXISTING CONTOUR
- EXISTING TREE LINE
- USDA SOIL BOUNDARY
- FEMA 100 YEAR FLOOD PLAIN
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- POST 4B — POST DEVELOPMENT SUB-CATCHMENT AREA
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TOWN OF THOMPSON
NEW YORK

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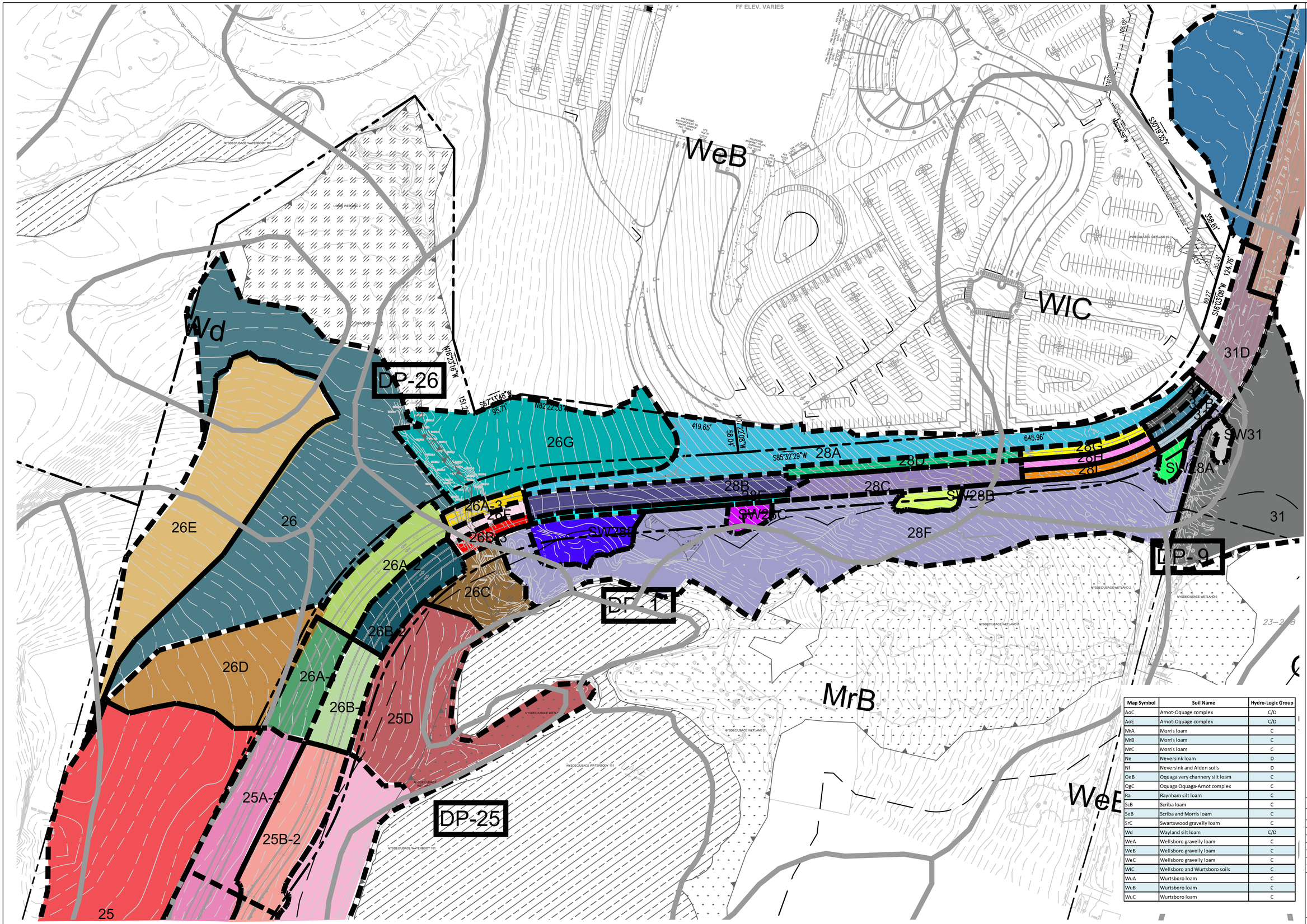
JH	AM
SCALE	DATE
1" = 60'	03/13/13

SHEET TITLE

POST-DEVELOPMENT STORMWATER MAP DESIGN POINT 5

SHEET NO.

FIGURE D-4



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Nf	Neversink and Alden soils	D
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OgC	Oquaga Oquaga-Arnot complex	C
Ra	Raynham silt loam	C
ScB	Scriba loam	C
SeB	Scriba and Morris loam	C
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Wd	Wayland silt loam	C/D
WeA	Wellsboro gravelly loam	C
WeB	Wellsboro gravelly loam	C
WeC	Wellsboro gravelly loam	C
WIC	Wellsboro and Wurtsboro soils	C
WuA	Wurtsboro loam	C
WuB	Wurtsboro loam	C
WuC	Wurtsboro loam	C

Post 25 | Post 25A | Post 25B | Post 25C | Post 26A-1 | Post 26A-2 | Post 26A-3
Post 25D | Post 26 | Post 26C | Post 26D | Post 26B-1 | Post 26B-2 | Post 26B-3
Post 26E | Post 26F | Post 26G | Post 28A | Post SW28A | Post SW28B | Post SW28C
Post 28B | Post 28C | Post 28D | Post 28E | SW28D | SW31
Post 28F | Post 28G | Post 28H | Post 28I
Post 29 | Post 29A | Post 31 | Post 31A | Post 31B | Post 31C | Post 31D

LEGEND

- EXISTING CONTOUR
- EXISTING TREE LINE
- USDA SOIL BOUNDARY
- FEMA 100 YEAR FLOOD PLAIN
- DP4 — DESIGN POINT
- POST 4B — POST DEVELOPMENT SUB-CATCHMENT AREA
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- MRMI PARCEL BOUNDARY

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TOWN OF THOMPSON
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SCALE	DATE
1" = 60'	03/13/13

SHEET TITLE
POST-DEVELOPMENT STORMWATER MAP DESIGN POINTS 1, 9, 25 & 26

SHEET NO.
FIGURE D-5

MATCH LINE

Post 21	Post 21E-1	Post SW21A	Post 22E	Post 23B-1	Post 24A-1
Post 21A-1	Post 21E-2	Post SW21B	Post 22G	Post 23B-2	Post 24A-2
Post 21A-2	Post 21E-3	Post SW21C	Post 22H	Post 23C	Post 24A-3
Post 21B-1	Post 21F-1	Post 22	Post 23	Post 23F	Post 24A-4
Post 21B-2	Post 21F-2	Post 22A	Post 23A-1	Post 23G	Post 24B-1
Post 21C	Post 21F-3	Post 22B	Post 23A-2	Post 23H	Post 24B-2
Post 21D	Post 21G	Post 22C	Post SW23A	Post 23P	Post 24B-3
	Post 21H	Post 22D	Post SW23B	Post 24P	Post 24B-4
				Post 24	Post 24C

Map Symbol	Soil Name	Hydro-Logic Group
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EPT CONCORD RESORT
TOWN OF THOMPSON
NEW YORK

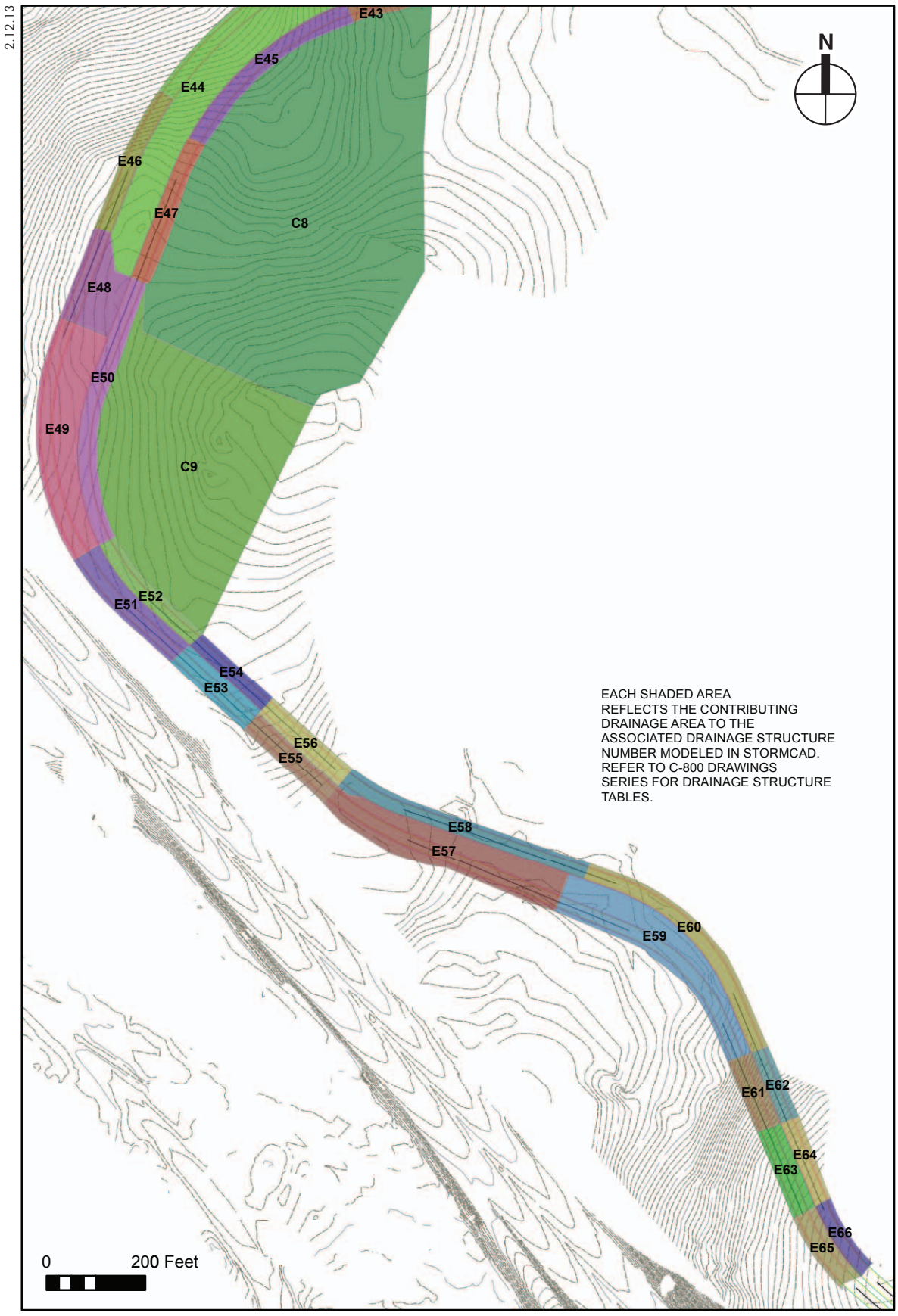
DRAWN BY	CHECKED BY
JH	AM
SCALE: 1" = 60'	DATE: 03/13/13

SHEET TITLE

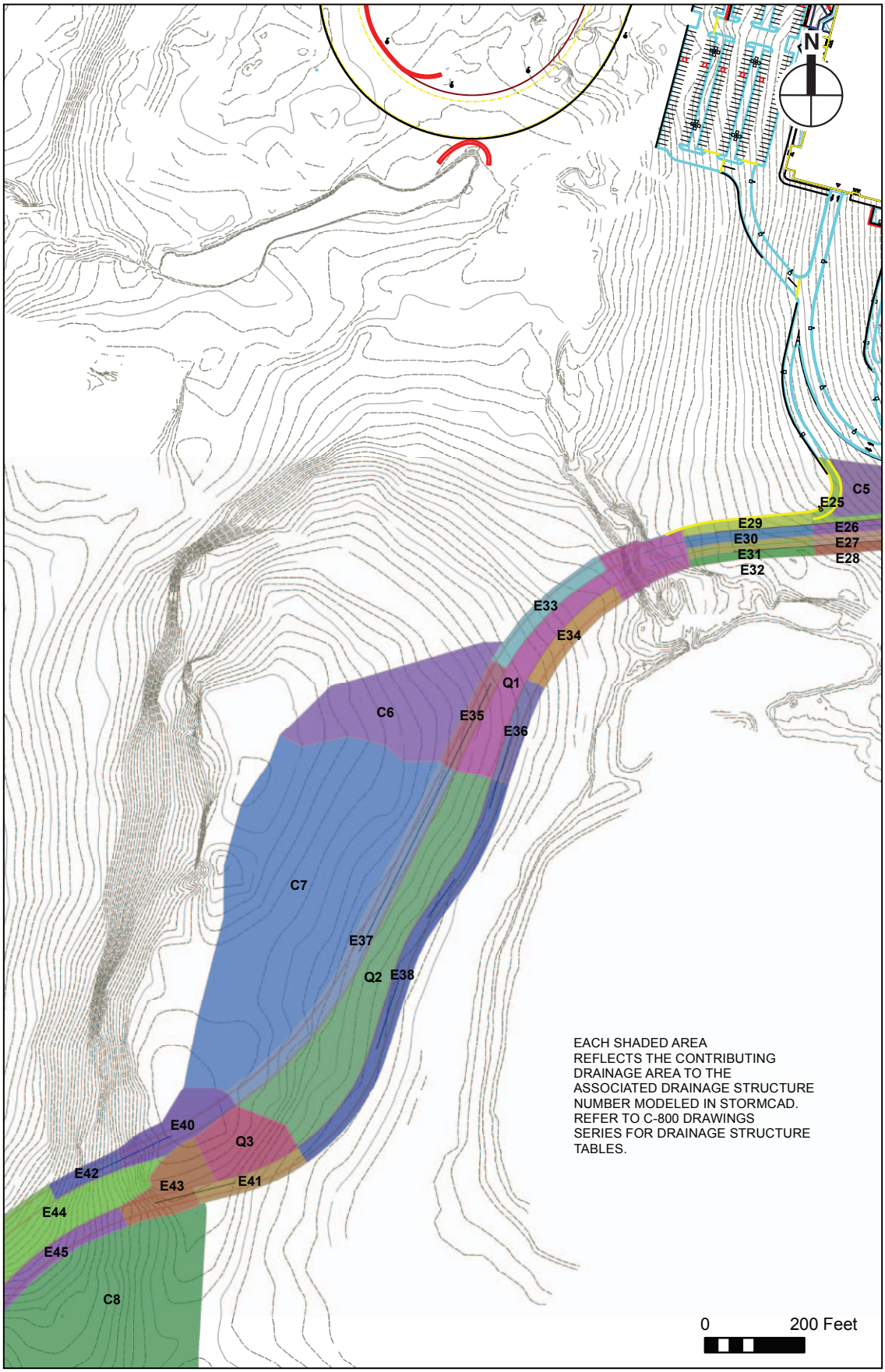
POST-DEVELOPMENT STORMWATER MAP
RESORT ENTRY ROAD
DESIGN POINTS 21, 23 &24

SHEET NO.

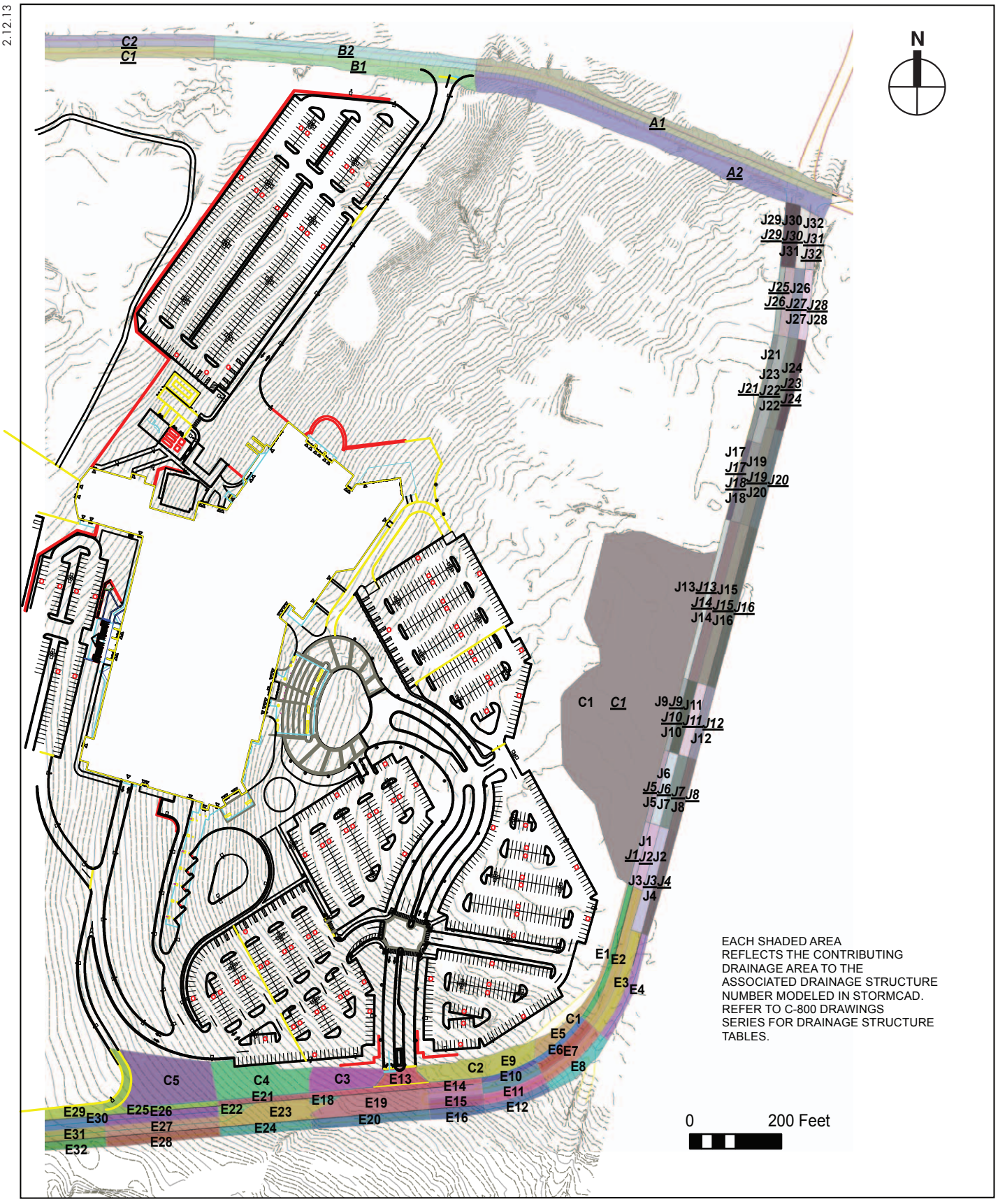
FIGURE D-6



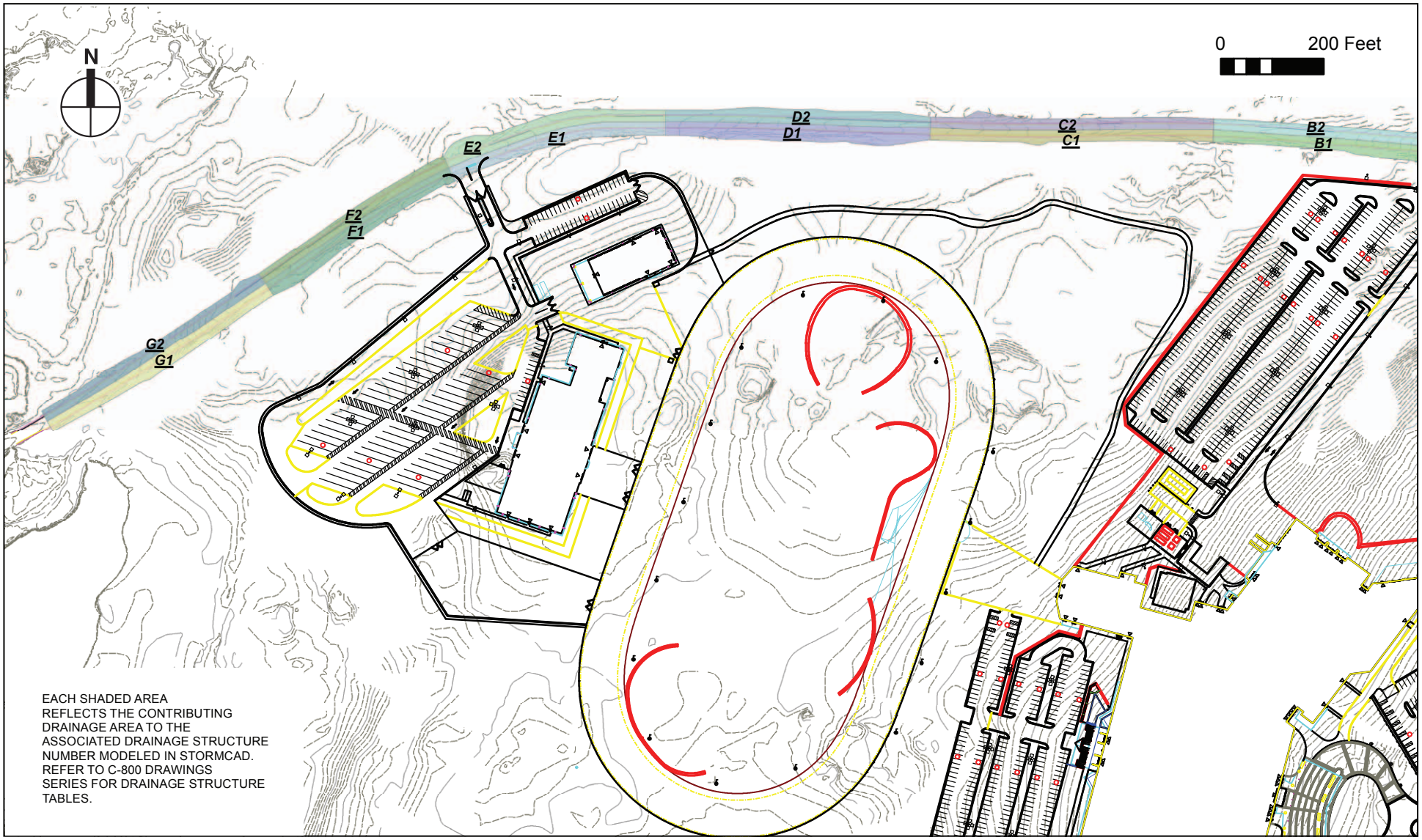
Hydraulic Analysis Subcatchment Areas:
Resort Entry Road



Hydraulic Analysis Subcatchment Areas:
Resort Entry Road



Hydraulic Analysis Subcatchment Areas:
Resort Entry Road and Thompsonville Road



Hydraulic Analysis Subcatchment Areas:
Thompsonville Road
Figure D-7D

SWPPP

APPENDIX A

SPDES GP 0-10-001

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SPDES GENERAL PERMIT
FOR STORMWATER DISCHARGES

from

CONSTRUCTION ACTIVITY

Permit No. GP-0-10-001

Issued Pursuant to Article 17, Titles 7, 8 and Article 70
of the Environmental Conservation Law

Effective Date: January 29, 2010 Expiration Date: January 28, 2015

William R. Adriance
Chief Permit Administrator

William R. Adriance — January 28, 2010
Authorized Signature — Date

Address: NYS DEC
Div. Environmental Permits
625 Broadway, 4th Floor
Albany, N.Y. 12233-1750

PREFACE

Pursuant to Section 402 of the Clean Water Act ("CWA"), stormwater *discharges* from certain *construction activities* are unlawful unless they are authorized by a *National Pollutant Discharge Elimination System ("NPDES")* permit or by a state permit program. New York's *State Pollutant Discharge Elimination System ("SPDES")* is a NPDES-approved program with permits issued in accordance with the *Environmental Conservation Law ("ECL").*

This general permit ("permit") is issued pursuant to Article 17, Titles 7, 8 and Article 70 of the ECL. An *owner or operator* may obtain coverage under this permit by submitting a Notice of Intent ("NOI") to the Department. Copies of this permit and the NOI for New York are available by calling (518) 402-8109 or at any New York State Department of Environmental Conservation ("the Department") regional office (see Appendix G).They are also available on the Department's website at:

http://www.dec.ny.gov/

An *owner or operator* of a *construction activity* that is eligible for coverage under this permit must obtain coverage prior to the *commencement of construction activity*. Activities that fit the definition of "*construction activity*", as defined under 40 CFR 122.26(b)(14)(x), (15)(i), and (15)(ii), constitute construction of a point source and therefore, pursuant to Article 17-0505 of the ECL, the *owner or operator* must have coverage under a SPDES permit prior to *commencing construction activity*. They cannot wait until there is an actual *discharge* from the construction site to obtain permit coverage.

***Note: The italicized words/phrases within this permit are defined in Appendix A.**

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
SPDES GENERAL PERMIT FOR STORMWATER DISCHARGES

FROM CONSTRUCTION ACTIVITIES

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Part I. PERMIT COVERAGE AND LIMITATIONS

A. Permit Application - This permit authorizes stormwater *discharges* to *surface waters of the State* from the following *construction activities* identified within 40 CFR Parts 122.26(b)(14)(x), 122.26(b)(15)(i) and 122.26(b)(15)(ii), provided all of the eligibility provisions of this permit are met:

1. *Construction activities* involving soil disturbances of one (1) or more acres; including disturbances of less than one acre that are part of a *larger common plan of development or sale* that will ultimately disturb one or more acres of land; excluding *routine maintenance activity* that is performed to maintain the original line and grade, hydraulic capacity or original purpose of a facility;

2. *Construction activities* involving soil disturbances of less than one (1) acre where the Department has determined that a *SPDES* permit is required for stormwater *discharges* based on the potential for contribution to a violation of a *water quality standard* or for significant contribution of *pollutants* to *surface waters of the State.*

3. *Construction activities* located in the watershed(s) identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

B. Maintaining Water Quality - It shall be a violation of this permit and the *ECL* for any *discharge* to either cause or contribute to a violation of *water quality standards* as contained in Parts 700 through 705 of Title 6 of the Official Compilation of Codes, Rules and Regulations of the State of New York, such as:

1. There shall be no increase in turbidity that will cause a substantial visible contrast to natural conditions;

2. There shall be no increase in suspended, colloidal or settleable solids that will cause deposition or impair the waters for their best usages; and

3. There shall be no residue from oil and floating substances, nor visible oil film, nor globules of grease.

C. Eligibility Under This General Permit

1. This permit may authorize all *discharges* of stormwater from *construction activity* to *surface waters of the State* and *groundwaters* except for ineligible *discharges* identified under subparagraph D. of this Part.

2. Except for non-stormwater *discharges* explicitly listed in the next paragraph, this permit only authorizes stormwater discharges from *construction activities*.

(Part I. C)

3. Notwithstanding paragraphs C.1 and C.2 above, the following non-stormwater *discharges* may be authorized by this permit: discharges from fire fighting activities; fire hydrant flushings; waters to which cleansers or other components have not been added that are used to wash vehicles or control dust in accordance with the SWPPP, routine external building washdown which does not use detergents; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled material has been removed) and where detergents are not used; air conditioning condensate; uncontaminated groundwater or spring water; uncontaminated discharges from construction site de-watering operations; and foundation or footing drains where flows are not contaminated with process materials such as solvents. For those entities required to obtain coverage under this permit, and who discharge as noted in this paragraph, and with the exception of flows from fire fighting activities, these discharges must be identified in the SWPPP. Under all circumstances, the *owner or operator* must still comply with water quality standards in Part I.B.

D. <u>Activities Which Are Ineligible for Coverage Under This General Permit</u> - All of the following are **<u>not</u>** authorized by this permit:

1. *Discharges* after *construction activities* have been completed and the site has undergone *final stabilization*;

2. *Discharges* that are mixed with sources of non-stormwater other than those expressly authorized under subsection C.3. of this Part and identified in the SWPPP required by this permit;

3. *Discharges* that are required to obtain an individual SPDES permit or another SPDES general permit pursuant to Part VII, subparagraph K of this permit;

4. *Discharges* from *construction activities* that adversely affect a listed, or proposed to be listed, endangered or threatened species, or its critical habitat;

5. *Discharges* which either cause or contribute to a violation of *water quality standards* adopted pursuant to the *ECL* and its accompanying regulations;

6. *Construction activities* for residential, commercial and institutional projects that:

    a. are tributary to waters of the state classified as AA or AA-s; and

(Part I. D. 6)

b. disturb one or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

7. *Construction activities* for linear transportation projects and linear utility projects that:
   a. are tributary to waters of the state classified as AA or AA-s; and

   b. disturb two or more acres of land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey for the County in which the disturbance will occur.

8. *Construction activities* that adversely affect a property that is listed or is eligible for listing on the State or National Register of Historic Places (Note: includes Archeological sites), unless there are written agreements in place with the NYS Office of Parks, Recreation and Historic Preservation (OPRHP) or other governmental agencies to mitigate the effects, or there are local land use approvals evidencing the same.

Part II. OBTAINING PERMIT COVERAGE

A. Notice of Intent (NOI) Submittal

1. An *owner or operator* of a *construction activity* that is not subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then submit a completed NOI form to the address below in order to be authorized to *discharge* under this permit. The NOI form shall be one which is associated with this permit, signed in accordance with Part VII.H. of this permit.

   NOTICE OF INTENT
   NYS DEC, Bureau of Water Permits
   625 Broadway, 4th Floor
   Albany, New York 12233-3505

2. An *owner or operator* of a *construction activity* that is subject to the requirements of a *regulated, traditional land use control MS4* must first develop a SWPPP in accordance with all applicable requirements of this permit and then have its SWPPP reviewed and accepted by the *MS4* prior to submitting the NOI to the Department. The *owner or operator* shall have the "MS4 SWPPP Acceptance" form signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4*, or by a duly authorized representative of that person, and then submit that form along with the NOI to the address referenced under "Notice of Intent (NOI) Submittal".

(Part II. A.2)

This requirement does not apply to an *owner or operator* that is obtaining permit coverage in accordance with the requirements in Part II.E. (Change of Owner or Operator).

3. The *owner or operator* shall have the SWPPP preparer sign the "SWPPP Preparer Certification" statement on the NOI prior to submitting the form to the Department.

4. As of the date the NOI is submitted to the Department, the *owner or operator* shall make the NOI and SWPPP available for review and copying in accordance with the requirements in Part VII.F. of this permit.

B. <u>Permit Authorization</u>

1. An *owner or operator* shall not *commence construction activity* until their authorization to *discharge* under this permit goes into effect.

2. Authorization to *discharge* under this permit will be effective when the *owner or operator* has satisfied <u>all</u> of the following criteria:

    a. project review pursuant to the State Environmental Quality Review Act (SEQRA) have been satisfied, when SEQRA is applicable,

    b. where required, all necessary Department permits subject to the *Uniform Procedures Act (UPA)* (see 6 NYCRR Part 621) have been obtained, unless otherwise notified by the Department pursuant to 6 NYCRR 621.3(a)(4). *Owners or operators* of *construction activities* that are required to obtain *UPA* permits must submit a preliminary SWPPP to the appropriate DEC Regional Office in Appendix F at the time all other necessary *UPA* permit applications are submitted. The preliminary SWPPP must include sufficient information to demonstrate that the *construction activity* qualifies for authorization under this permit,

    c. the final SWPPP has been prepared, and

    d. an NOI has been submitted to the Department in accordance with the requirements of this permit.

3. An *owner or operator* that has satisfied the requirements of Part II.B.2 above will be authorized to *discharge* stormwater from their *construction activity* in accordance with the following schedule:

(Part II. B. 3)

a. For *construction activities* that are <u>not</u> subject to the requirements of a *regulated, traditional land use control MS4*:

i. Five (5) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 and/or 3, or

ii. Sixty (60) business days from the date the Department receives a complete NOI for *construction activities* with a SWPPP that has <u>not</u> been prepared in conformance with the technical standards referenced in Parts III.B.1, 2 or 3.

b. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4*:

i. Five (5) business days from the date the Department receives a complete NOI and signed "MS4 SWPPP Acceptance" form,

4. The Department may suspend or deny an *owner's or operator's* coverage under this permit if the Department determines that the SWPPP does not meet the permit requirements.

5. Coverage under this permit authorizes stormwater *discharges* from only those areas of disturbance that are identified in the NOI. If an *owner or operator* wishes to have stormwater *discharges* from future or additional areas of disturbance authorized, they must submit a new NOI that addresses that phase of the development, unless otherwise notified by the Department.

C. <u>General Requirements For Owners or Operators With Permit Coverage</u>

1. The *owner or operator* shall ensure that the provisions of the SWPPP are implemented from the *commencement of construction activity* until all areas of disturbance have achieved *final stabilization* and the Notice of Termination (NOT) has been submitted to the Department in accordance with Part V. of this permit. This includes any changes made to the SWPPP pursuant to Part III.A.4.

2. The *owner or operator* shall maintain a copy of the General Permit (GP-0-10-001), NOI, *NOI Acknowledgment Letter*, SWPPP, MS4 SWPPP Acceptance form and inspection reports at the construction site until all disturbed areas have achieved *final stabilization* and the NOT has been submitted to the Department.

(Part II. C. 2)

The documents must be maintained in a secure location, such as a job trailer, on-site construction office, or mailbox with lock. The secure location must be accessible during normal business hours to an individual performing a compliance inspection.

3. The *owner or operator* of a *construction activity* shall not disturb greater than five (5) acres of soil at any one time without prior written authorization from the Department or, in areas under the jurisdiction of a *regulated, traditional land use control MS4*, the MS4 (provided the MS4 is not the *owner or operator* of the construction activity). At a minimum, the *owner or operator* must comply with the following requirements in order to be authorized to disturb greater than five (5) acres of soil at any one time:

    a. The *owner or operator* shall have a *qualified inspector* conduct **at least** two (2) site inspections in accordance with Part IV.C. every seven (7) calendar days, for as long as greater than five (5) acres of soil remain disturbed. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

    b. In areas where soil disturbance activity has been temporarily or permanently ceased, temporary and/or permanent soil stabilization measures shall be installed and/or implemented within seven (7) days from the date the soil disturbance activity ceased. The soil stabilization measures selected shall be in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control.

    c. The *owner or operator* shall prepare a phasing plan that defines maximum disturbed area per phase and shows required cuts and fills.

    d. The *owner or operator* shall install any additional site specific practices needed to protect water quality.

    e. The *owner or operator* shall include the requirements above in their SWPPP.

4. The Department may suspend or revoke an *owner's or operator's* coverage under this permit at any time if the Department determines that the SWPPP does not meet the permit requirements.

(Part II. C)

5. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4,* the *owner or operator* shall notify the *MS4* in writing of any planned amendments or modifications to the post-construction stormwater management practice component of the SWPPP required by Part III.A. 4. and 5. of this permit. Unless otherwise notified by the *MS4*, the *owner or operator* shall have the SWPPP amendments or modifications reviewed and accepted by the *MS4* prior to commencing construction of the post-construction stormwater management practice.

D. Permit Coverage for Discharges Authorized Under GP-0-08-001

1. Upon renewal of SPDES General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-0-08-001), a*n owner or operator* of *construction activity* with coverage under GP-0-08-001, as of the effective date of GP-0-10-001, shall be authorized to *discharge* in accordance with GP-0-10-001 unless otherwise notified by the Department.

E. Change of Owner or Operator

1. When property ownership changes or when there is a change in operational control over the construction plans and specifications, the original *owner or operator* must notify the new *owner or operator*, in writing, of the requirement to obtain permit coverage by submitting a NOI with the Department. Once the new *owner or operator* obtains permit coverage, the original *owner or operator* shall then submit a completed NOT with the name and permit identification number of the new *owner or operator* to the Department at the address in Part II.A.1.. If the original *owner or operator* maintains ownership of a portion of the *construction activity* and will disturb soil, they must maintain their coverage under the permit.

   Permit coverage for the new *owner or operator* will be effective as of the date the Department receives a complete NOI, provided the original *owner or operator* was not subject to a sixty (60) business day authorization period that has not expired as of the date the Department receives the NOI from the new *owner or operator*.

Part III. STORMWATER POLLUTION PREVENTION PLAN (SWPPP)

A. General SWPPP Requirements

1. The SWPPP shall be prepared prior to the submittal of the NOI. The NOI shall be submitted to the Department prior to the *commencement of construction activity*.

(Part III. A)

2. The SWPPP shall describe the erosion and sediment control practices and where required, post-construction stormwater management practices that will be used and/or constructed to reduce the pollutants in stormwater discharges and to assure compliance with the terms and conditions of this permit. In addition, the SWPPP shall identify potential sources of pollution which may reasonably be expected to affect the quality of stormwater *discharges*.

3. All SWPPPs that require the post-construction stormwater management practice component shall be prepared by a *qualified professional* that is knowledgeable in the principles and practices of stormwater management and treatment.

4. The *owner or operator* must keep the SWPPP current so that it at all times accurately documents the erosion and sediment controls practices that are being used or will be used during construction, and all post-construction stormwater management practices that will be constructed on the site. At a minimum, the *owner or operator* shall amend the SWPPP:

    a. whenever the current provisions prove to be ineffective in minimizing pollutants in stormwater *discharges* from the site;

    b. whenever there is a change in design, construction, or operation at the construction site that has or could have an effect on the discharge of pollutants; and

    c. to address issues or deficiencies identified during an inspection by the *qualified inspector*, the Department or other regulatory authority.

5. The Department may notify the *owner or operator* at any time that the SWPPP does not meet one or more of the minimum requirements of this permit. The notification shall be in writing and identify the provisions of the SWPPP that require modification. Within fourteen (14) calendar days of such notification, or as otherwise indicated by the Department, the *owner or operator* shall make the required changes to the SWPPP and submit written notification to the Department that the changes have been made. If the *owner or operator* does not respond to the Department's comments in the specified time frame, the Department may suspend the *owner's or operator's* coverage under this permit.

6. Prior to the *commencement of construction activity*, the *owner or operator* must identify the contractor(s) and subcontractor(s) that will be responsible for installing, constructing, repairing, replacing, inspecting and maintaining the erosion and sediment control practices included in the SWPPP; and the contractor(s) and subcontractor(s) that will be responsible for constructing the post-construction stormwater management practices included in the SWPPP.

(Part III. A. 6)

The *owner or operator* shall have each of the contractors and subcontractors identify at least one person from their company that will be responsible for implementation of the SWPPP. This person shall be known as the *trained contractor.* The *owner or operator* shall ensure that at least one *trained contractor* is on site on a daily basis when soil disturbance activities are being performed.

The *owner or operator* shall have each of the contractors and subcontractors identified above sign a copy of the following certification statement below before they commence any *construction activity*:

> "I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the *qualified inspector* during a site inspection. I also understand that the *owner or operator* must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings. "

In addition to providing the certification statement above, the certification page must also identify the specific elements of the SWPPP that each contractor and subcontractor will be responsible for and include the name and title of the person providing the signature; the name and title of the *trained contractor* responsible for SWPPP implementation; the name, address and telephone number of the contracting firm; the address (or other identifying description) of the site; and the date the certification statement is signed. The *owner or operator* shall attach the certification statement(s) to the copy of the SWPPP that is maintained at the construction site. If new or additional contractors are hired to implement measures identified in the SWPPP after construction has commenced, they must also sign the certification statement and provide the information listed above.

7. For projects where the Department requests a copy of the SWPPP or inspection reports, the *owner or operator* shall submit the documents in both electronic (PDF only) and paper format within five (5) business days, unless otherwise notified by the Department.

8. The SWPPP must include documentation supporting the determination of permit eligibility with regard to Part I.D.8. (Historic Places or Archeological Resource). At a minimum, the supporting documentation shall include the following:

(Part III. A. 8)

a. Information on whether the stormwater discharge or *construction activities* would have an effect on a property (historic or archeological resource) that is listed or eligible for listing on the State or National Register of Historic Places;

b. Results of historic resources screening determinations conducted. Information regarding the location of historic places listed, or eligible for listing, on the State or National Registers of Historic Places and areas of archeological sensitivity that may indicate the need for a survey can be obtained online by viewing the New York State Office of Parks, Recreation and Historic Places (OPRHP) online resources located on their web site at: http://nysparks.state.ny.us/shpo/online-tools/ (using The Geographic Information System for Archeology and National Register). OPRHP can also be contacted at: NYS OPRHP, State Historic Preservation Office, Peebles Island Resources Center, P.O. Box 189, Waterford, NY 12188-0189, phone: 518-237-8643;

c. A description of measures necessary to avoid or minimize adverse impacts on places listed, or eligible for listing, on the State or National Register of Historic Places. If the *owner or operator* fails to describe and implement such measures, the stormwater *discharge* is ineligible for coverage under this permit; and

d. Where adverse effects may occur, any written agreements in place with OPRHP or other governmental agency to mitigate those effects, or local land use approvals evidencing the same.

B. Required SWPPP Contents

1. Erosion and sediment control component - All SWPPPs prepared pursuant to this permit shall include erosion and sediment control practices designed in conformance with the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Where erosion and sediment control practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard. At a minimum, the erosion and sediment control component of the SWPPP shall include the following:

    a. Background information about the scope of the project, including the location, type and size of project;

(Part III. B. 1)

b. A site map/construction drawing(s) for the project, including a general location map. At a minimum, the site map shall show the total site area; all improvements; areas of disturbance; areas that will not be disturbed; existing vegetation; on-site and adjacent off-site surface water(s), wetlands and drainage patterns that could be affected by the construction activity; existing and final slopes; locations of different soil types with boundaries; material, waste, borrow or equipment storage areas located on adjacent properties; and location(s) of the stormwater discharge(s);

c. A description of the soil(s) present at the site, including an identification of the Hydrologic Soil Group (HSG);

d. A construction phasing plan and sequence of operations describing the intended order of construction activities, including clearing and grubbing, excavation and grading, utility and infrastructure installation and any other activity at the site that results in soil disturbance;

e. A description of the minimum erosion and sediment control practices to be installed or implemented for each construction activity that will result in soil disturbance. Include a schedule that identifies the timing of initial placement or implementation of each erosion and sediment control practice and the minimum time frames that each practice should remain in place or be implemented;

f. A temporary and permanent soil stabilization plan that meets the requirements of the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, for each stage of the project, including initial land clearing and grubbing to project completion and achievement of final stabilization;

g. A site map/construction drawing(s) showing the specific location(s), size(s), and length(s) of each erosion and sediment control practice;

h. The dimensions, material specifications, installation details, and operation and maintenance requirements for all erosion and sediment control practices. Include the location and sizing of any temporary sediment basins and structural practices that will be used to divert flows from exposed soils;

(Part III. B. 1)

i. A maintenance inspection schedule for the contractor(s) identified in Part III.A.6., to ensure continuous and effective operation of the erosion and sediment control practices. The maintenance inspection schedule shall be in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control;

j. A description of the pollution prevention measures that will be used to control litter, construction chemicals and construction debris from becoming a pollutant source in the stormwater *discharges*;

k. A description and location of any stormwater *discharges* associated with industrial activity other than construction at the site, including, but not limited to, stormwater *discharges* from asphalt plants and concrete plants located on the construction site; and

l. Identification of any elements of the design that are not in conformance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards.

2. Post-construction stormwater management practice component - All construction projects identified in Table 2 of Appendix B as needing post-construction stormwater management practices shall prepare a SWPPP that includes practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual"). If the Design Manual is revised during the term of this permit, an *owner or operator* must begin using the revised version of the Design Manual to prepare their SWPPP six (6) months from the final revision date of the Design Manual.

   Where post-construction stormwater management practices are not designed in conformance with this technical standard, the *owner or operator* must demonstrate equivalence to the technical standard.

   At a minimum, the post-construction stormwater management practice component of the SWPPP shall include the following:

   a. Identification of all post-construction stormwater management practices to be constructed as part of the project;

(Part III. B. 2)

b. A site map/construction drawing(s) showing the specific location and size of each post-construction stormwater management practice;

c. The dimensions, material specifications and installation details for each post-construction stormwater management practice;

d. Identification of any elements of the design that are not in conformance with the Design Manual. Include the reason for the deviation or alternative design and provide information which demonstrates that the deviation or alternative design is equivalent to the technical standards;

e. A hydrologic and hydraulic analysis for all structural components of the stormwater management control system;

f. A detailed summary (including calculations) of the sizing criteria that was used to design all post-construction stormwater management practices. At a minimum, the summary shall address the required design criteria from the applicable chapter of the Design Manual; including the identification of and justification for any deviations from the Design Manual, and identification of any design criteria that are not required based on the design criteria or waiver criteria included in the Design Manual; and

g. An operations and maintenance plan that includes inspection and maintenance schedules and actions to ensure continuous and effective operation of each post-construction stormwater management practice. The plan shall identify the entity that will be responsible for the long term operation and maintenance of each practice.

3. Enhanced Phosphorus Removal Standards - All construction projects identified in Table 2 of Appendix B that are located in the watersheds identified in Appendix C shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the Design Manual. At a minimum, the post-construction stormwater management practice component of the SWPPP shall include items 2.a - 2.g. above.

(Part III. C)

C. Required SWPPP Components by Project Type - Unless otherwise notified by the Department, *owners or operators* of *construction activities* identified in Table 1 of Appendix B are required to prepare a SWPPP that only includes erosion and sediment control practices designed in conformance with Part III.B.1. *Owners or operators* of the *construction activities* identified in Table 2 of Appendix B shall prepare a SWPPP that also includes post-construction stormwater management practices designed in conformance with Part III.B.2 or 3.

Part IV. INSPECTION AND MAINTENANCE REQUIREMENTS

A. General Construction Site Inspection and Maintenance Requirements

1. The *owner or operator* must ensure that all erosion and sediment control practices and all post-construction stormwater management practices identified in the SWPPP are maintained in effective operating condition at all times.

2. The terms of this permit shall not be construed to prohibit the State of New York from exercising any authority pursuant to the ECL, common law or federal law, or prohibit New York State from taking any measures, whether civil or criminal, to prevent violations of the laws of the State of New York, or protect the public health and safety and/or the environment.

B. Owner or Operator Maintenance Inspection Requirements

1. The *owner or operator* shall inspect, in accordance with the requirements in the most current version of the technical standard, New York State Standards and Specifications for Erosion and Sediment Control, the erosion and sediment controls identified in the SWPPP to ensure that they are being maintained in effective operating condition at all times.

2. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *owner or operator* can stop conducting the maintenance inspections. The *owner or operator* shall begin conducting the maintenance inspections in accordance with Part IV.B.1. as soon as soil disturbance activities resume.

3. For construction sites where soil disturbance activities have been shut down with partial project completion, the *owner or operator* can stop conducting the maintenance inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational.

(Part IV. C)

C. <u>Qualified Inspector Inspection Requirements</u> - The *owner or operator* shall have a *qualified inspector* conduct site inspections in conformance with the following requirements:

[Note: The *trained contractor* identified in Part III.A.6. **cannot** conduct the *qualified inspector* site inspections unless they meet the *qualified inspector* qualifications included in Appendix A. In order to perform these inspections, the *trained contractor* would have to be a:

- Licensed Professional Engineer,
- Certified Professional in Erosion and Sediment Control (CPESC),
- Registered Landscape Architect, or
- Someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity].

1. A *qualified inspector* shall conduct site inspections for all *construction activities* identified in Tables 1 and 2 of Appendix B, <u>with the exception of</u>:

    a. the construction of a single family residential subdivision with 25% or less impervious cover at total site build-out that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

    b. the construction of a single family home that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres and is <u>not</u> located in one of the watersheds listed in Appendix C and <u>not</u> directly discharging to one of the 303(d) segments listed in Appendix E;

    c. construction on agricultural property that involves a soil disturbance of one (1) or more acres of land but less than five (5) acres; and

    d. construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

2. Unless otherwise notified by the Department, the *qualified inspector* shall conduct site inspections in accordance with the following timetable:

    a. For construction sites where soil disturbance activities are on-going, the *qualified inspector* shall conduct a site inspection at least once every seven (7) calendar days.

(Part IV. C. 2)

b. For construction sites where soil disturbance activities are on-going and the *owner or operator* has received authorization in accordance with Part II.C.3 to disturb greater than five (5) acres of soil at any one time, the *qualified inspector* shall conduct at least two (2) site inspections every seven (7) calendar days. The two (2) inspections shall be separated by a minimum of two (2) full calendar days.

c. For construction sites where soil disturbance activities have been temporarily suspended (e.g. winter shutdown) and temporary stabilization measures have been applied to all disturbed areas, the *qualified inspector* shall conduct a site inspection at least once every thirty (30) calendar days. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity) in writing prior to reducing the frequency of inspections.

d. For construction sites where soil disturbance activities have been shut down with partial project completion, the *qualified inspector* can stop conducting inspections if all areas disturbed as of the project shutdown date have achieved *final stabilization* and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational. The *owner or operator* shall notify the Regional Office stormwater contact person (see contact information in Appendix F) or, in areas under the jurisdiction of a *regulated, traditional land use control MS4,* the MS4 (provided the MS4 is not the *owner or operator* of the construction activity). in writing prior to the shutdown. If soil disturbance activities are not resumed within 2 years from the date of shutdown, the *owner or operator* shall have the *qualified inspector* perform a final inspection and certify that all disturbed areas have achieved *final stabilization*, and all temporary, structural erosion and sediment control measures have been removed*;* and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the NOT. The *owner or operator* shall then submit the completed NOT form to the address in Part II.A.1..

(Part IV. C. 3)

3. At a minimum, the *qualified inspector* shall inspect all erosion and sediment control practices to ensure integrity and effectiveness, all post-construction stormwater management practices under construction to ensure that they are constructed in conformance with the SWPPP, all areas of disturbance that have not achieved *final stabilization*, all points of discharge to natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site, and all points of discharge from the construction site.

4. The *qualified inspector* shall prepare an inspection report subsequent to each and every inspection. At a minimum, the inspection report shall include and/or address the following:

    a. Date and time of inspection;

    b. Name and title of person(s) performing inspection;

    c. A description of the weather and soil conditions (e.g. dry, wet, saturated) at the time of the inspection;

    d. A description of the condition of the runoff at all points of discharge from the construction site. This shall include identification of any *discharges* of sediment from the construction site. Include *discharges* from conveyance systems (i.e. pipes, culverts, ditches, etc.) and overland flow;

    e. A description of the condition of all natural surface waterbodies located within, or immediately adjacent to, the property boundaries of the construction site which receive runoff from disturbed areas. This shall include identification of any *discharges* of sediment to the surface waterbody;

    f. Identification of all erosion and sediment control practices that need repair or maintenance;

    g. Identification of all erosion and sediment control practices that were not installed properly or are not functioning as designed and need to be reinstalled or replaced;

    h. Description and sketch of areas that are disturbed at the time of the inspection and areas that have been stabilized (temporary and/or final) since the last inspection;

i. Current phase of construction of all post-construction stormwater management practices and identification of all construction that is not in conformance with the SWPPP and technical standards;

j. Corrective action(s) that must be taken to install, repair, replace or maintain erosion and sediment control practices; and to correct deficiencies identified with the construction of the post-construction stormwater management practice(s); and

k. Digital photographs, with date stamp, that clearly show the condition of all practices that have been identified as needing corrective actions. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report being maintained onsite within seven (7) calendar days of the date of the inspection. The *qualified inspector* shall also take digital photographs, with date stamp, that clearly show the condition of the practice(s) after the corrective action has been completed. The *qualified inspector* shall attach paper color copies of the digital photographs to the inspection report that documents the completion of the corrective action work within seven (7) calendar days of that inspection.

5. Within one business day of the completion of an inspection, the *qualified inspector* shall notify the *owner or operator* and appropriate contractor or subcontractor identified in Part III.A.6. of any corrective actions that need to be taken. The contractor or subcontractor shall begin implementing the corrective actions within one business day of this notification and shall complete the corrective actions in a reasonable time frame.

6. All inspection reports shall be signed by the *qualified inspector.* Pursuant to Part II.C.2., the inspection reports shall be maintained on site with the SWPPP.

Part V. TERMINATION OF PERMIT COVERAGE

A. Termination of Permit Coverage

1. An *owner or operator* that is eligible to terminate coverage under this permit must submit a completed NOT form to the address in Part II.A.1. The NOT form shall be one which is associated with this general permit, signed in accordance with Part VII.H.

2. An *owner or operator* may terminate coverage when one or more the following conditions have been met:

(Part V. A. 2)

a. Total project completion - All construction activity identified in the SWPPP has been completed; and all areas of disturbance have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices have been constructed in conformance with the SWPPP and are operational;

b. Planned shutdown with partial project completion - All soil disturbance activities have ceased; and all areas disturbed as of the project shutdown date have achieved *final stabilization*; and all temporary, structural erosion and sediment control measures have been removed; and all post-construction stormwater management practices required for the completed portion of the project have been constructed in conformance with the SWPPP and are operational;

c. A new *owner or operator* has obtained coverage under this permit in accordance with Part II.E.

3. For *construction activities* meeting subdivision 2a. or 2b. of this Part, the *owner or operator* shall have the *qualified inspector* perform a final site inspection prior to submitting the NOT. The *qualified inspector* shall, by signing the "Final Stabilization" and "Post-Construction Stormwater Management Practice" certification statements on the NOT, certify that all disturbed areas have achieved *final stabilization;* and all temporary, structural erosion and sediment control measures have been removed; and that all post-construction stormwater management practices have been constructed in conformance with the SWPPP.

4. For *construction activities* that are subject to the requirements of a *regulated, traditional land use control MS4* and meet subdivision 2a. or 2b. of this Part, the *owner or operator* shall also have the MS4 sign the "MS4 Acceptance" statement on the NOT. The *owner or operator* shall have the principal executive officer, ranking elected official, or duly authorized representative from the *regulated, traditional land use control MS4*, sign the "MS4 Acceptance" statement. The MS4 official, by signing this statement, has determined that it is acceptable for the *owner or operator* to submit the NOT in accordance with the requirements of this Part. The MS4 can make this determination by performing a final site inspection themselves or by accepting the *qualified inspector's* final site inspection certification(s) required in Part V.3.

5. For *construction activities* that require post-construction stormwater management practices and meet subdivision 2a. of this Part, the *owner or operator* must, prior to submitting the NOT, ensure one of the following:

(Part V. A. 5)

a. the post-construction stormwater management practice(s) and any right-of-way(s) needed to maintain such practice(s) have been deeded to the municipality in which the practice(s) is located,

b. an executed maintenance agreement is in place with the municipality that will maintain the post-construction stormwater management practice(s),

c. for post-construction stormwater management practices that are privately owned, the *owner or operator* has modified their deed of record to include a deed covenant that requires operation and maintenance of the practice(s) in accordance with the operation and maintenance plan,

d. for post-construction stormwater management practices that are owned by a public or private institution (e.g. school, college, university), or government agency or authority, the *owner or operator* has policy and procedures in place that ensures operation and maintenance of the practices in accordance with the operation and maintenance plan.

Part VI. REPORTING AND RETENTION OF RECORDS

A. Record Retention - The *owner or operator* shall retain a copy of the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form and any inspection reports that were prepared in conjunction with this permit for a period of at least five (5) years from the date that the site achieves *final stabilization*. This period may be extended by the Department, in its sole discretion, at any time upon written notification.

B. Addresses - With the exception of the NOI, NOT, and MS4 SWPPP Acceptance form (which must be submitted to the address referenced in Part II.A.1), all written correspondence requested by the Department, including individual permit applications, shall be sent to the address of the appropriate Department Regional Office listed in Appendix F.

Part VII. STANDARD PERMIT CONDITIONS

A. Duty to Comply - The *owner or operator* must comply with all conditions of this permit. All contractors and subcontractors associated with the project must comply with the terms of the SWPPP. Any non-compliance with this permit constitutes a violation of the Clean Water Act (CWA) and the ECL and is grounds for an enforcement action against the *owner or operator* and/or the contractor/subcontractor; permit revocation, suspension or modification; or denial of a permit renewal application. Upon a finding of significant non-compliance with this permit or the applicable SWPPP, the Department may order an immediate stop to all *construction activity* at the site until the non-compliance is remedied.

(Part VII. A)

The stop work order shall be in writing, shall describe the non-compliance in detail, and shall be sent to the *owner or operator*.

B. <u>Continuation of the Expired General Permit</u> - This permit expires five (5) years from the effective date. However, coverage may be obtained under the expired general permit, which will continue in force and effect, until a new general permit is issued. Unless otherwise notified by the Department in writing, an *owner or operator* seeking authorization under the new general permit must submit a new NOI in accordance with the terms of such new general permit.

C. <u>Enforcement</u> - Failure of the *owner or operator,* its contractors, subcontractors, agents and/or assigns to strictly adhere to any of the permit requirements contained herein shall constitute a violation of this permit. There are substantial criminal, civil, and administrative penalties associated with violating the provisions of this permit. Fines of up to $37,500 per day for each violation and imprisonment for up to fifteen (15) years may be assessed depending upon the nature and degree of the offense.

D. <u>Need to Halt or Reduce Activity Not a Defense</u> - It shall not be a defense for an *owner or operator* in an enforcement action that it would have been necessary to halt or reduce the *construction activity* in order to maintain compliance with the conditions of this permit.

E. <u>Duty to Mitigate</u> - The *owner or operator* and its contractors and subcontractors shall take all reasonable steps to minimize or prevent any *discharge* in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

F. <u>Duty to Provide Information</u> - The *owner or operator* shall make available to the Department for review and copying or furnish to the Department within five (5) business days of receipt of a Department request for such information, any information requested for the purpose of determining compliance with this permit. This can include, but is not limited to, the NOI, NOI Acknowledgment Letter, SWPPP, MS4 SWPPP Acceptance form, executed maintenance agreement, and inspection reports. Failure to provide information requested by the Department within the request timeframe shall be a violation of this permit.

The NOI, SWPPP and inspection reports required by this permit are public documents that the *owner or operator* must make available for review and copying by any person within five (5) business days of the *owner or operator* receiving a written request by any such person to review the NOI, SWPPP or inspection reports. Copying of documents will be done at the requester's expense.

G. <u>Other Information</u> - When the *owner or operator* becomes aware that they failed to submit any relevant facts, or submitted incorrect information in the NOI or in any other report, or have made substantive revisions to the SWPPP (e.g. the scope of the project changes significantly, the type of post-construction stormwater management practice(s)

changes, there is a reduction in the sizing of the post-construction stormwater management practice, or there is an increase in the disturbance area or impervious area), which were not reflected in the original NOI submitted to the Department, they shall promptly submit such facts or information to the Department. Failure of the *owner or operator* to correct or supplement any relevant facts within five (5) business days of becoming aware of the deficiency shall constitute a violation of this permit.

H. <u>Signatory Requirements</u>

1. All NOIs and NOTs shall be signed as follows:

    a. For a corporation these forms shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means:

        i. a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation; or

        ii. the manager of one or more manufacturing, production or operating facilities, provided the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

    b. For a partnership or sole proprietorship these forms shall be signed by a general partner or the proprietor, respectively; or

    c. For a municipality, State, Federal, or other public agency these forms shall be signed by either a principal executive officer or ranking elected official. For purposes of this section, a principal executive officer of a Federal agency includes:

        i. the chief executive officer of the agency, or

(Part VII. H. 1. c)

ii. a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of EPA).

2. The SWPPP and other information requested by the Department shall be signed by a person described in Part VII.H.1. or by a duly authorized representative of that person. A person is a duly authorized representative only if:

    a. The authorization is made in writing by a person described in Part VII.H.1.;

    b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position) and,

    c. The written authorization shall include the name, title and signature of the authorized representative and be attached to the SWPPP.

3. All inspection reports shall be signed by the *qualified inspector* that performs the inspection.

4. The MS4 SWPPP Acceptance form shall be signed by the principal executive officer or ranking elected official from the *regulated, traditional land use control MS4,* or by a duly authorized representative of that person.

    It shall constitute a permit violation if an incorrect and/or improper signatory authorizes any required forms, SWPPP and/or inspection reports.

I. <u>Property Rights</u> - The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State or local laws or regulations. *Owners or operators* must obtain any applicable conveyances, easements, licenses and/or access to real property prior to *commencing construction activity.*

J. <u>Severability</u> - The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit shall not be affected thereby.

(Part VII. K)
K. <u>Denial of Coverage Under This Permit</u>

1. At its sole discretion, the Department may require any *owner or operator* authorized by this permit to apply for and/or obtain either an individual SPDES permit or another SPDES general permit. When the Department requires any discharger authorized by a general permit to apply for an individual SPDES permit, it shall notify the discharger in writing that a permit application is required. This notice shall include a brief statement of the reasons for this decision, an application form, a statement setting a time frame for the *owner or operator* to file the application for an individual SPDES permit, and a deadline, not sooner than 180 days from *owner or operator* receipt of the notification letter, whereby the authorization to discharge under this general permit shall be terminated. Applications must be submitted to the appropriate Regional Office. The Department may grant additional time upon demonstration, to the satisfaction of the Regional Water Engineer, that additional time to apply for an alternative authorization is necessary or where the Department has not provided a permit determination in accordance with Part 621 of this Title.

2. Any *owner or operator* authorized by this permit may request to be excluded from the coverage under this permit by applying for an individual permit or another general permit. In such cases, the *owner or operator* shall submit an individual application or an alternative general permit application in accordance with the requirements of this general permit, 40 CFR 122.26(c)(1)(ii) and 6 NYCRR Part 621, with reasons supporting the request, to the Department at the address for the appropriate Department Office (see addresses in Appendix F).The request may be granted by issuance of an individual permit or another general permit at the discretion of the Department.

3. When an individual SPDES permit is issued to a discharger authorized to discharge under a general SPDES permit for the same discharge(s), the general permit authorization for outfalls authorized under the individual SPDES permit is automatically terminated on the effective date of the individual permit unless termination is earlier in accordance with 6 NYCRR Part 750.

L. <u>Proper Operation and Maintenance</u> - The *owner or operator* shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the *owner or operator* to achieve compliance with the conditions of this permit and with the requirements of the SWPPP.

M. <u>Inspection and Entry</u> - The *owner or operator* shall allow the Department or an authorized representative of EPA, the State, or, in the case of a construction site which discharges through an *MS4*, an authorized representative of the *MS4* receiving the discharge, upon the presentation of credentials and other documents as may be required by law, to:

(Part VII. M)

1. Enter upon the *owner's or operator's* premises where a regulated facility or activity is located or conducted or where records must be kept under the conditions of this permit;

2. Have access to and copy at reasonable times, any records that must be kept under the conditions of this permit; and

3. Inspect at reasonable times any facilities or equipment (including monitoring and control equipment).

N. Permit Actions - At the Department's sole discretion, this permit may, at any time, be modified, suspended, revoked, or renewed. The filing of a request by the *owner or operator* for a permit modification, revocation and reissuance, termination, a notification of planned changes or anticipated noncompliance does not limit, diminish and/or stay compliance with any terms of this permit.

O. Definitions - Definitions of key terms are included in Appendix A of this permit.

P. Re-Opener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any stormwater discharge associated with *construction activity* covered by this permit, the *owner or operator* of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part VII.K. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Permit modification, suspension or revocation will be conducted in accordance with 6 NYCRR Part 621, 6 NYCRR 750-1.18, and 6 NYCRR 750-1.20.

Q. Penalties for Falsification of Forms and Reports – Article 17 of the ECL provides for a civil penalty of $37,500 per day per violation of this permit. Articles 175 and 210 of the New York State Penal Law provide for a criminal penalty of a fine and/or imprisonment for falsifying forms and reports required by this permit.

R. Other Permits – Nothing in this permit relieves the *owner or operator* from a requirement to obtain any other permits required by law.

APPENDIX A

Definitions

Alter Hydrology from Pre to Post-Development Conditions - means the post-development peak flow rate(s) has increased by more than 5% of the pre-developed condition for the design storm of interest (e.g. 10 yr and 100 yr).

Combined Sewer - means a sewer that is designed to collect and convey both "sewage" and "stormwater".

Commence (Commencement of) Construction Activities - means the initial disturbance of soils associated with clearing, grading or excavation activities; or other construction related activities that disturb or expose soils such as demolition, stockpiling of fill material, and the initial installation of erosion and sediment control practices required in the SWPPP. See definition for "Construction Activity(ies)" also.

Construction Activity(ies) - means any clearing, grading, excavation, filling, demolition or stockpiling activities that result in soil disturbance. Clearing activities can include, but are not limited to, logging equipment operation, the cutting and skidding of trees, stump removal and/or brush root removal. Construction activity does not include routine maintenance that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility.

Direct Discharge (to a specific surface waterbody) - means that runoff flows from a construction site by overland flow and the first point of discharge is the specific surface waterbody, or runoff flows from a construction site to a separate storm sewer system and the first point of discharge from the separate storm sewer system is the specific surface waterbody.

Discharge(s) - means any addition of any pollutant to waters of the State through an outlet or point source.

Environmental Conservation Law (ECL) - means chapter 43-B of the Consolidated Laws of the State of New York, entitled the Environmental Conservation Law.

Final Stabilization - means that all soil disturbance activities have ceased and a uniform, perennial vegetative cover with a density of eighty (80) percent over the entire pervious surface has been established; or other equivalent stabilization measures, such as permanent landscape mulches, rock rip-rap or washed/crushed stone have been applied on all disturbed areas that are not covered by permanent structures, concrete or pavement.

General SPDES permit - means a SPDES permit issued pursuant to 6 NYCRR Part 750-1.21 authorizing a category of discharges.

Groundwater - means waters in the saturated zone. The saturated zone is a subsurface zone in

which all the interstices are filled with water under pressure greater than that of the atmosphere. Although the zone may contain gas-filled interstices or interstices filled with fluids other than water, it is still considered saturated.

Impervious Area (Cover) - means all impermeable surfaces that cannot effectively infiltrate rainfall. This includes paved, concrete and gravel surfaces (i.e. parking lots, driveways, roads, runways and sidewalks); building rooftops and miscellaneous impermeable structures such as patios, pools, and sheds.

Larger Common Plan of Development or Sale - means a contiguous area where multiple separate and distinct construction activities are occurring, or will occur, under one plan. The term "plan" in "larger common plan of development or sale" is broadly defined as any announcement or piece of documentation (including a sign, public notice or hearing, marketing plan, advertisement, drawing, permit application, State Environmental Quality Review Act (SEQRA) application, zoning request, computer design, etc.) or physical demarcation (including boundary signs, lot stakes, surveyor markings, etc.) indicating that construction activities may occur on a specific plot.

For discrete construction projects that are located within a larger common plan of development or sale that are at least 1/4 mile apart, each project can be treated as a separate plan of development or sale provided any interconnecting road, pipeline or utility project that is part of the same "common plan" is not concurrently being disturbed.

Municipal Separate Storm Sewer (MS4) - a conveyance or system of conveyances (including roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made channels, or storm drains):

i. Owned or operated by a State, city, town, borough, county, parish, district, association, or other public body (created by or pursuant to State law) having jurisdiction over disposal of sewage, industrial wastes, stormwater, or other wastes, including special districts under State law such as a sewer district, flood control district or drainage district, or similar entity, or an Indian tribe or an authorized Indian tribal organization, or a designated and approved management agency under section 208 of the CWA that discharges to surface waters of the State*;*
ii. Designed or used for collecting or conveying stormwater;
iii. Which is not a *combined sewer*; and
iv. Which is not part of a Publicly Owned Treatment Works (POTW) as defined at 40 CFR 122.2.

National Pollutant Discharge Elimination System (NPDES) - means the national system for the issuance of wastewater and stormwater permits under the Federal Water Pollution Control Act (Clean Water Act).

NOI Acknowledgment Letter - means the letter that the Department sends to an owner or operator to acknowledge the Department's receipt and acceptance of a complete Notice of Intent. This letter documents the owner's or operator's authorization to discharge in accordance with the general permit for stormwater discharges from construction activity.

Owner or Operator - means the person, persons or legal entity which owns or leases the property on which the construction activity is occurring; and/or an entity that has operational control over the construction plans and specifications, including the ability to make modifications to the plans and specifications.

Pollutant - means dredged spoil, filter backwash, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand and industrial, municipal, agricultural waste and ballast discharged into water; which may cause or might reasonably be expected to cause pollution of the waters of the state in contravention of the standards or guidance values adopted as provided in Parts 700 et seq of this Title.

Qualified Inspector - means a person that is knowledgeable in the principles and practices of erosion and sediment control, such as a licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or other Department endorsed individual(s).

It can also mean someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided that person has training in the principles and practices of erosion and sediment control. Training in the principles and practices of erosion and sediment control means that the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the individual working under the direct supervision of the licensed Professional Engineer or Registered Landscape Architect shall receive four (4) hours of training every three (3) years.

It can also mean a person that meets the *Qualified Professional* qualifications in addition to the *Qualified Inspector* qualifications.

Note: Inspections of any post-construction stormwater management practices that include structural components, such as a dam for an impoundment, shall be performed by a licensed Professional Engineer.

Qualified Professional - means a person that is knowledgeable in the principles and practices of stormwater management and treatment, such as a licensed Professional Engineer, Registered Landscape Architect or other Department endorsed individual(s). Individuals preparing SWPPPs that require the post-construction stormwater management practice component must have an understanding of the principles of hydrology, water quality management practice design, water quantity control design, and, in many cases, the principles of hydraulics in order to prepare a SWPPP that conforms to the Department's technical standard. All components of the SWPPP that involve the practice of engineering, as defined by the NYS Education Law (see Article 145), shall be prepared by, or under the direct supervision of, a professional engineer licensed to practice in the State of New York.

Regulated, Traditional Land Use Control MS4 - means a city, town or village with land use control authority that is required to gain coverage under New York State DEC's SPDES General Permit For Stormwater Discharges from Municipal Separate Stormwater Sewer Systems (MS4s).

Routine Maintenance Activity - means construction activity that is performed to maintain the original line and grade, hydraulic capacity, or original purpose of a facility, including, but not limited to:

- Re-grading of gravel roads or parking lots,
- Stream bank restoration projects (does not include the placement of spoil material),
- Cleaning and shaping of existing roadside ditches and culverts that maintains the approximate original line and grade, and hydraulic capacity of the ditch,
- Cleaning and shaping of existing roadside ditches that does not maintain the approximate original grade, hydraulic capacity and purpose of the ditch if the changes to the line and grade, hydraulic capacity or purpose of the ditch are installed to improve water quality and quantity controls (e.g. installing grass lined ditch),
- Placement of aggregate shoulder backing that makes the transition between the road shoulder and the ditch or embankment,
- Full depth milling and filling of existing asphalt pavements, replacement of concrete pavement slabs, and similar work that does not expose soil or disturb the bottom six (6) inches of subbase material,
- Long-term use of equipment storage areas at or near highway maintenance facilities,
- Removal of sediment from the edge of the highway to restore a previously existing sheet-flow drainage connection from the highway surface to the highway ditch or embankment,
- Existing use of Canal Corp owned upland disposal sites for the canal, and
- Replacement of curbs, gutters, sidewalks and guide rail posts.

State Pollutant Discharge Elimination System (SPDES) - means the system established pursuant to Article 17 of the ECL and 6 NYCRR Part 750 for issuance of permits authorizing discharges to the waters of the state.

Surface Waters of the State - shall be construed to include lakes, bays, sounds, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Atlantic ocean within the territorial seas of the state of New York and all other bodies of surface water, natural or artificial, inland or coastal, fresh or salt, public or private (except those private waters that do not combine or effect a junction with natural surface or underground waters), which are wholly or partially within or bordering the state or within its jurisdiction. Waters of the state are further defined in 6 NYCRR Parts 800 to 941.

Temporary Stabilization - means that exposed soil has been covered with material(s) as set forth in the technical standard, New York Standards and Specifications for Erosion and Sediment Control, to prevent the exposed soil from eroding. The materials can include, but are not limited to, mulch, seed and mulch, and erosion control mats (e.g. jute twisted yarn, excelsior wood fiber mats).

Total Maximum Daily Loads (TMDLs) - A TMDL is the sum of the allowable loads of a single pollutant from all contributing point and nonpoint sources. It is a calculation of the maximum amount of a pollutant that a waterbody can receive on a daily basis and still meet water quality standards, and an allocation of that amount to the pollutant's sources. A TMDL stipulates wasteload allocations (WLAs) for point source discharges, load allocations (LAs) for nonpoint sources, and a margin of safety (MOS).

Trained Contractor - means an employee from the contracting (construction) company, identified in Part III.A.6., that has received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity. After receiving the initial training, the *trained contractor* shall receive four (4) hours of training every three (3) years.

It can also mean an employee from the contracting (construction) company, identified in Part III.A.6., that meets the *qualified inspector* qualifications (e.g. licensed Professional Engineer, Certified Professional in Erosion and Sediment Control (CPESC), Registered Landscape Architect, or someone working under the direct supervision of, and at the same company as, the licensed Professional Engineer or Registered Landscape Architect, provided they have received four (4) hours of Department endorsed training in proper erosion and sediment control principles from a Soil and Water Conservation District, or other Department endorsed entity).

The *trained contractor* will be responsible for the day to day implementation of the SWPPP.

Uniform Procedures Act (UPA) Permit - means a permit required under 6 NYCRR Part 621 of the Environmental Conservation Law (ECL), Article 70.

Water Quality Standard - means such measures of purity or quality for any waters in relation to their reasonable and necessary use as promulgated in 6 NYCRR Part 700 et seq.

APPENDIX B

Required SWPPP Components by Project Type

Table 1
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT ONLY INCLUDES EROSION AND SEDIMENT CONTROLS

The following construction activities that involve soil disturbances of one (1) or more acres of land, but less than five (5) acres:

- Single family home not located in one of the watersheds listed in Appendix C and not *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions with 25% or less impervious cover at total site build-out and not located in one of the watersheds listed in Appendix C and not directly discharging to one of the 303(d) segments listed in Appendix E
- Construction of a barn or other agricultural building, silo, stock yard or pen.

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Installation of underground, linear utilities; such as gas lines, fiber-optic cable, cable TV, electric, telephone, sewer mains, and water mains
- Environmental enhancement projects, such as wetland mitigation projects, stormwater retrofits and stream restoration projects
- Bike paths and trails
- Sidewalk construction projects that are not part of a road/ highway construction or reconstruction project
- Slope stabilization projects
- Slope flattening that changes the grade of the site, but does not significantly change the runoff characteristics
- Spoil areas that will be covered with vegetation
- Land clearing and grading for the purposes of creating vegetated open space (i.e. recreational parks, lawns, meadows, fields), excluding projects that *alter hydrology from pre to post development* conditions
- Athletic fields (natural grass) that do not include the construction or reconstruction of *impervious area* and do not *alter hydrology from pre to post development* conditions
- Demolition project where vegetation will be established and no redevelopment is planned
- Overhead electric transmission line project that does not include the construction of permanent access roads or parking areas surfaced with *impervious cover*
- Structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State", excluding projects that involve soil disturbances of less than five acres and construction activities that include the construction or reconstruction of impervious area

The following construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land:

- All construction activities located in the watersheds identified in Appendix D that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land.

Table 2
CONSTRUCTION ACTIVITIES THAT REQUIRE THE PREPARATION OF A SWPPP THAT INCLUDES POST-CONSTRUCTION STORMWATER MANAGEMENT PRACTICES

The following construction activities that involve soil disturbances of one (1) or more acres of land:

- Single family home located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions located in one of the watersheds listed in Appendix C or *directly discharging* to one of the 303(d) segments listed in Appendix E
- Single family residential subdivisions that involve soil disturbances of between one (1) and five (5) acres of land with greater than 25% impervious cover at total site build-out
- Single family residential subdivisions that involve soil disturbances of five (5) or more acres of land, and single family residential subdivisions that involve soil disturbances of less than five (5) acres that are part of a larger common plan of development or sale that will ultimately disturb five or more acres of land
- Multi-family residential developments; includes townhomes, condominiums, senior housing complexes, apartment complexes, and mobile home parks
- Airports
- Amusement parks
- Campgrounds
- Cemeteries that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Commercial developments
- Churches and other places of worship
- Construction of a barn or other agricultural building(e.g. silo) and structural practices as identified in Table II in the "Agricultural Management Practices Catalog for Nonpoint Source Pollution in New York State" that include the construction or reconstruction of *impervious area*, excluding projects that involve soil disturbances of less than five acres.
- Golf courses
- Institutional, includes hospitals, prisons, schools and colleges
- Industrial facilities, includes industrial parks
- Landfills
- Municipal facilities; includes highway garages, transfer stations, office buildings, POTW's and water treatment plants
- Office complexes
- Sports complexes
- Racetracks, includes racetracks with earthen (dirt) surface
- Road construction or reconstruction
- Parking lot construction or reconstruction
- Athletic fields (natural grass) that include the construction or reconstruction of impervious area (>5% of disturbed area) or *alter the hydrology from pre to post development* conditions
- Athletic fields with artificial turf
- Permanent access roads, parking areas, substations, compressor stations and well drilling pads, surfaced with *impervious cover*, and constructed as part of an over-head electric transmission line project , wind-power project, cell tower project, oil or gas well drilling project or other linear utility project
- All other construction activities that include the construction or reconstruction of *impervious area* and *alter the hydrology from pre to post development* conditions, and are not listed in Table 1

APPENDIX C

Watersheds Where Enhanced Phosphorus Removal Standards Are Required

Watersheds where *owners or operators* of construction activities identified in Table 2 of Appendix B must prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the Enhanced Phosphorus Removal Standards included in the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

- Entire New York City Watershed located east of the Hudson River - Figure 1
- Onondaga Lake Watershed - Figure 2
- Greenwood Lake Watershed -Figure 3
- Oscawana Lake Watershed – Figure 4

Figure 1 - New York City Watershed East of the Hudson

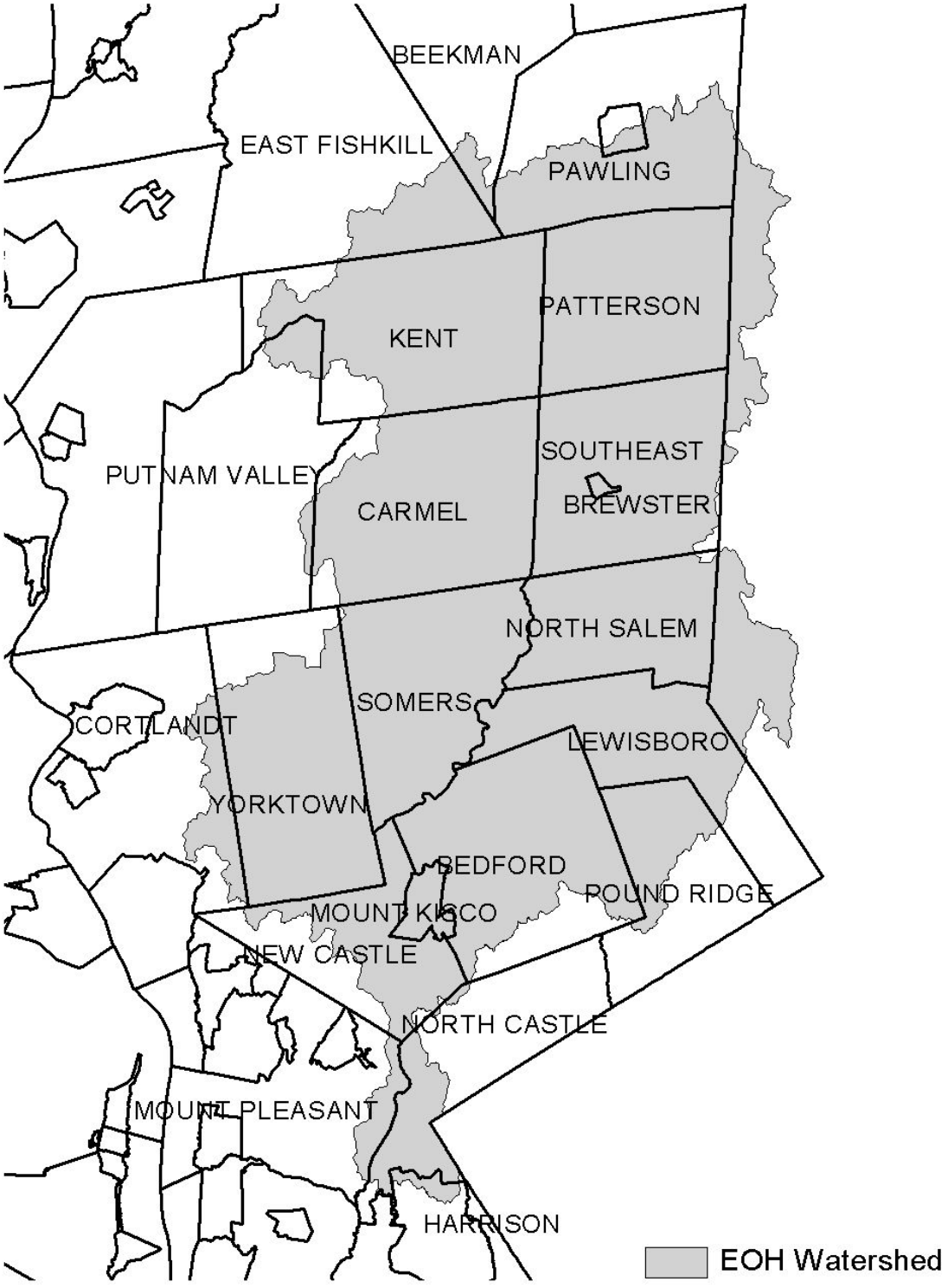
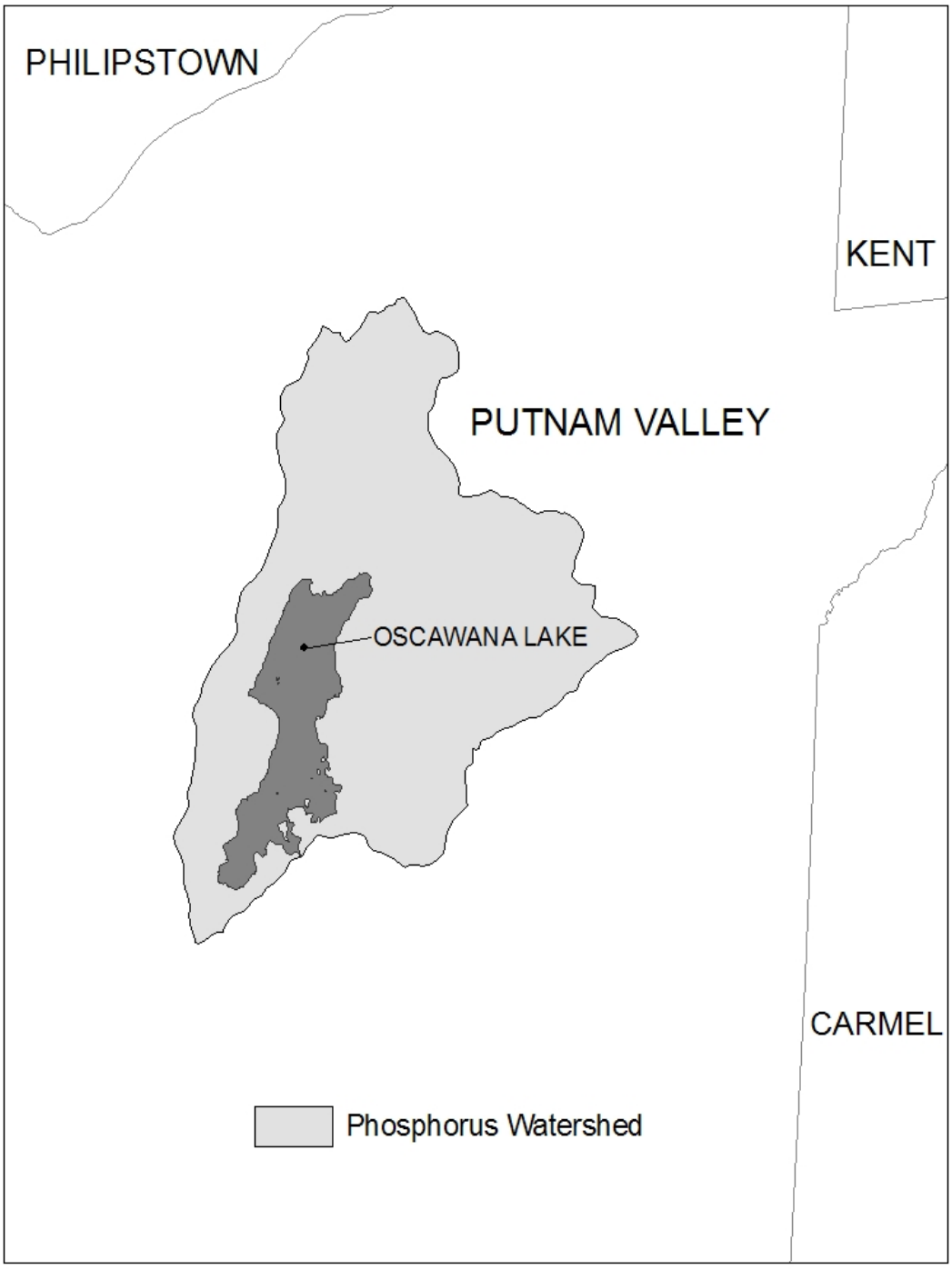


Figure 2 - Onondaga Lake Watershed

Figure 3 - Greenwood Lake Watershed

Figure 4 - Oscawana Lake Watershed



APPENDIX D

Watersheds where *owners or operators* of construction activities that involve soil disturbances between five thousand (5000) square feet and one (1) acre of land must obtain coverage under this permit.

Entire New York City Watershed that is located east of the Hudson River - See Figure 1 in Appendix C

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity (e.g. silt, sediment or nutrients). *Owners or operators* of single family home and single family residential subdivision construction activities that involve soil disturbances of one or more acres of land, but less than 5 acres, and *directly discharge* to one of the listed segments below shall prepare a SWPPP that includes post-construction stormwater management practices designed in conformance with the most current version of the technical standard, New York State Stormwater Management Design Manual ("Design Manual").

COUNTY	WATERBODY
Albany	Ann Lee (Shakers) Pond, Stump Pond
Albany	Basic Creek Reservoir
Bronx	Van Cortlandt Lake
Broome	Whitney Point Lake/Reservoir
Broome	Beaver Lake
Broome	White Birch Lake
Chautauqua	Chautauqua Lake, North
Chautauqua	Chautauqua Lake, South
Chautauqua	Bear Lake
Chautauqua	Chadakoin River and tribs
Chautauqua	Lower Cassadaga Lake
Chautauqua	Middle Cassadaga Lake
Chautauqua	Findley Lake
Clinton	Great Chazy River, Lower, Main Stem
Columbia	Kinderhook Lake
Columbia	Robinson Pond
Dutchess	Hillside Lake
Dutchess	Wappinger Lakes
Dutchess	Fall Kill and tribs
Dutchess	Rudd Pond
Erie	Rush Creek and tribs
Erie	Ellicott Creek, Lower, and tribs
Erie	Beeman Creek and tribs
Erie	Murder Creek, Lower, and tribs
Erie	South Branch Smoke Cr, Lower, and tribs
Erie	Little Sister Creek, Lower, and tribs
Essex	Lake George (primary county listed as Warren)
Genesee	Black Creek, Upper, and minor tribs
Genesee	Tonawanda Creek, Middle, Main Stem
Genesee	Tonawanda Creek, Upper, and minor tribs
Genesee	Little Tonawanda Creek, Lower, and tribs
Genesee	Oak Orchard Creek, Upper, and tribs
Genesee	Bowen Brook and tribs
Genesee	Bigelow Creek and tribs
Greene	Schoharie Reservoir
Greene	Sleepy Hollow Lake
Herkimer	Steele Creek tribs
Kings	Hendrix Creek
Lewis	Mill Creek/South Branch and tribs
Livingston	Conesus Lake
Livingston	Jaycox Creek and tribs
Livingston	Mill Creek and minor tribs
Monroe	Genesee River, Lower, Main Stem
Monroe	Genesee River, Middle, Main Stem
Monroe	Black Creek, Lower, and minor tribs
Monroe	Buck Pond
Monroe	Long Pond
Monroe	Cranberry Pond
Monroe	Mill Creek and tribs
Monroe	Shipbuilders Creek and tribs
Monroe	Minor tribs to Irondequoit Bay
Monroe	Thomas Creek/White Brook and tribs
Nassau	Glen Cove Creek, Lower, and tribs
Nassau	LI Tribs (fresh) to East Bay
Nassau	East Meadow Brook, Upper, and tribs
Nassau	Hempstead Bay
Nassau	Hempstead Lake
Nassau	Grant Park Pond
Niagara	Bergholtz Creek and tribs
Oneida	Ballou, Nail Creeks
Onondaga	Ley Creek and tribs
Onondaga	Onondaga Creek, Lower and tribs
Onondaga	Onondaga creek, Middle and tribs
Onondaga	Onondaga Creek, Upper, and minor tribs
Onondaga	Harbor Brook, Lower, and tribs
Onondaga	Ninemile Creek, Lower, and tribs
Onondaga	Minor tribs to Onondaga Lake
Ontario	Honeoye Lake
Ontario	Hemlock Lake Outlet and minor tribs
Ontario	Great Brook and minor tribs
Oswego	Lake Neatahwanta
Putnam	Oscawana Lake
Putnam	Lake Carmel
Queens	Jamaica Bay, Eastern, and tribs (Queens)
Queens	Bergen Basin
Queens	Shellbank Basin
Rensselaer	Snyders Lake
Richmond	Grasmere, Arbutus and Wolfes Lakes
Saratoga	Dwaas Kill and tribs
Saratoga	Tribs to Lake Lonely
Saratoga	Lake Lonely
Saratoga	Schuyler Creek and tribs
Schenectady	Collins Lake

APPENDIX E

List of 303(d) segments impaired by pollutants related to construction activity, cont'd.

COUNTY	WATERBODY	COUNTY	WATERBODY
Schoharie	Engleville Pond		
Schoharie	Summit Lake		
St. Lawrence	Black Lake Outlet/Black Lake		
Steuben	Lake Salubria		
Steuben	Smith Pond		
Suffolk	Millers Pond		
Suffolk	Mattituck (Marratooka) Pond		
Suffolk	Tidal tribs to West Moriches Bay		
Suffolk	Canaan Lake		
Suffolk	Lake Ronkonkoma		
Tompkins	Cayuga Lake, Southern End		
Tompkins	Owasco Inlet, Upper, and tribs		
Ulster	Ashokan Reservoir		
Ulster	Esopus Creek, Upper, and minor tribs		
Warren	Lake George		
Warren	Tribs to L.George, Village of L George		
Warren	Huddle/Finkle Brooks and tribs		
Warren	Indian Brook and tribs		
Warren	Hague Brook and tribs		
Washington	Tribs to L.George, East Shore of Lake George		
Washington	Cossayuna Lake		
Wayne	Port Bay		
Wayne	Marbletown Creek and tribs		
Westchester	Peach Lake		
Westchester	Mamaroneck River, Lower		
Westchester	Mamaroneck River, Upper, and minor tribs		
Westchester	Sheldrake River and tribs		
Westchester	Blind Brook, Lower		
Westchester	Blind Brook, Upper, and tribs		
Westchester	Lake Lincolndale		
Westchester	Lake Meahaugh		
Wyoming	Java Lake		
Wyoming	Silver Lake		

Note: The list above identifies those waters from the final New York State "2008 Section 303(d) List of Impaired Waters Requiring a TMDL/Other Strategy", dated May 26, 2008, that are impaired by silt, sediment or nutrients.

APPENDIX F

LIST OF NYS DEC REGIONAL OFFICES

Region	COVERING THE FOLLOWING COUNTIES:	DIVISION OF ENVIRONMENTAL PERMITS (DEP) PERMIT ADMINISTRATORS	DIVISION OF WATER (DOW) WATER (SPDES) PROGRAM
1	NASSAU AND SUFFOLK	50 CIRCLE ROAD STONY BROOK, NY 11790 TEL. (631) 444-0365	50 CIRCLE ROAD STONY BROOK, NY 11790-3409 TEL. (631) 444-0405
2	BRONX, KINGS, NEW YORK, QUEENS AND RICHMOND	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4997	1 HUNTERS POINT PLAZA, 47-40 21ST ST. LONG ISLAND CITY, NY 11101-5407 TEL. (718) 482-4933
3	DUTCHESS, ORANGE, PUTNAM, ROCKLAND, SULLIVAN, ULSTER AND WESTCHESTER	21 SOUTH PUTT CORNERS ROAD NEW PALTZ, NY 12561-1696 TEL. (845) 256-3059	100 HILLSIDE AVENUE, SUITE 1W WHITE PLAINS, NY 10603 TEL. (914) 428 - 2505
4	ALBANY, COLUMBIA, DELAWARE, GREENE, MONTGOMERY, OTSEGO, RENSSELAER, SCHENECTADY AND SCHOHARIE	1150 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2069	1130 NORTH WESTCOTT ROAD SCHENECTADY, NY 12306-2014 TEL. (518) 357-2045
5	CLINTON, ESSEX, FRANKLIN, FULTON, HAMILTON, SARATOGA, WARREN AND WASHINGTON	1115 STATE ROUTE 86, PO BOX 296 RAY BROOK, NY 12977-0296 TEL. (518) 897-1234	232 GOLF COURSE ROAD, PO BOX 220 WARRENSBURG, NY 12885-0220 TEL. (518) 623-1200
6	HERKIMER, JEFFERSON, LEWIS, ONEIDA AND ST. LAWRENCE	STATE OFFICE BUILDING 317 WASHINGTON STREET WATERTOWN, NY 13601-3787 TEL. (315) 785-2245	STATE OFFICE BUILDING 207 GENESEE STREET UTICA, NY 13501-2885 TEL. (315) 793-2554
7	BROOME, CAYUGA, CHENANGO, CORTLAND, MADISON, ONONDAGA, OSWEGO, TIOGA AND TOMPKINS	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7438	615 ERIE BLVD. WEST SYRACUSE, NY 13204-2400 TEL. (315) 426-7500
8	CHEMUNG, GENESEE, LIVINGSTON, MONROE, ONTARIO, ORLEANS, SCHUYLER, SENECA, STEUBEN, WAYNE AND YATES	6274 EAST AVON-LIMA ROAD AVON, NY 14414-9519 TEL. (585) 226-2466	6274 EAST AVON-LIMA RD. AVON, NY 14414-9519 TEL. (585) 226-2466
9	ALLEGANY, CATTARAUGUS, CHAUTAUQUA, ERIE, NIAGARA AND WYOMING	270 MICHIGAN AVENUE BUFFALO, NY 14203-2999 TEL. (716) 851-7165	270 MICHIGAN AVE. BUFFALO, NY 14203-2999 TEL. (716) 851-7070

SWPPP

APPENDIX B

NOTICE OF INTENT,

LETTER OF ACKNOWLEDGEMENT,

& NYSDEC CORRESPONDENCE

SWPPP

APPENDIX B

NOTICE OF INTENT,

LETTER OF ACKNOWLEDGEMENT,

& NYSDEC CORRESPONDENCE

1358331598

NOTICE OF INTENT

New York State Department of Environmental Conservation
Division of Water
625 Broadway, 4th Floor
Albany, New York 12233-3505

NYR _____ (for DEC use only)

Stormwater Discharges Associated with Construction Activity Under State Pollutant Discharge Elimination System (SPDES) General Permit # GP-0-10-001

All sections must be completed unless otherwise noted. Failure to complete all items may result in this form being returned to you, thereby delaying your coverage under this General Permit. Applicants must read and understand the conditions of the permit and prepare a Stormwater Pollution Prevention Plan prior to submitting this NOI. Applicants are responsible for identifying and obtaining other DEC permits that may be required.

-IMPORTANT-
RETURN THIS FORM TO THE ADDRESS ABOVE
OWNER/OPERATOR MUST SIGN FORM

Owner/Operator Information

Owner/Operator (Company Name/Private Owner Name/Municipality Name)
EPT CONCORD II, LLC

Owner/Operator Contact Person Last Name (NOT CONSULTANT)
TIM LIES

Owner/Operator Contact Person First Name
ENTERTAINMENT PROPERTIES TRUST

Owner/Operator Mailing Address
909 WALNUT, SUITE 200

City
KANSAS CITY

State
MO

Zip
64106 -

Phone (Owner/Operator)
816 - 472 - 1700

Fax (Owner/Operator)
___ - ___ - ____

Email (Owner/Operator)
TIML@EPRKC.COM

FED TAX ID
43 - 1790877 (not required for individuals)

Project Site Information

Project/Site Name

EPT CONCORD RESORT

Street Address (NOT P.O. BOX)

Thompsonville Road

Side of Street

● **North** ◉ **South** ○ **East** ○ **West**

City/Town/Village (THAT ISSUES BUILDING PERMIT)

THOMPSON

State: NY

Zip: 10013 -

County: SULLIVAN

DEC Region: 3

Name of Nearest Cross Street

Joyland Road

Distance to Nearest Cross Street (Feet)

5

Project In Relation to Cross Street

○ **North** ○ **South** ● **East** ○ **West**

Tax Map Numbers
Section-Block-Parcel

Tax Map Numbers

SEE ATTACHED TABLE 1

1. Provide the Geographic Coordinates for the project site in NYTM Units. To do this you **must** go to the NYSDEC Stormwater Interactive Map on the DEC website at:

www.dec.ny.gov/imsmaps/stormwater/viewer.htm

Zoom into your Project Location such that you can accurately click on the centroid of your site. Once you have located your project site, go to the tool boxes on the top and choose "i"(identify). Then click on the center of your site and a new window containing the X, Y coordinates in UTM will pop up. Transcribe these coordinates into the boxes below. For problems with the interactive map use the help function.

X Coordinates (Easting): 529575

Y Coordinates (Northing): 4612320

2. What is the nature of this construction project?

○ **New Construction**

● **Redevelopment with increase in imperviousness**

○ **Redevelopment with no increase in imperviousness**

3. Select the predominant land use for both pre and post development conditions.
SELECT ONLY ONE CHOICE FOR EACH

Pre-Development Existing Land Use

- ○ FOREST
- ○ PASTURE/OPEN LAND
- ○ CULTIVATED LAND
- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ● ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY
- ○ PARKING LOT
- ○ OTHER

Post-Development Future Land Use

- ○ SINGLE FAMILY HOME
- ○ SINGLE FAMILY SUBDIVISION — Number of Lots
- ○ TOWN HOME RESIDENTIAL
- ○ MULTIFAMILY RESIDENTIAL
- ○ INSTITUTIONAL/SCHOOL
- ○ INDUSTRIAL
- ○ COMMERCIAL
- ○ MUNICIPAL
- ● ROAD/HIGHWAY
- ○ RECREATIONAL/SPORTS FIELD
- ○ BIKE PATH/TRAIL
- ○ LINEAR UTILITY (water, sewer, gas, etc.)
- ○ PARKING LOT
- ○ CLEARING/GRADING ONLY
- ○ DEMOLITION, NO REDEVELOPMENT
- ○ WELL DRILLING ACTIVITY *(Oil, Gas, etc.)
- ○ OTHER

***note: for gas well drilling, non-high volume hydraulic fractured wells only**

4. Will future use of this site be an agricultural property as defined by the NYS Agriculture and Markets Law ? ○ **Yes** ● **No**

5. Is this a project which does not require coverage under the General Permit (e.g. Project done under an Individual SPDES Permit, or department approved remediation)? ○ **Yes** ● **No**

6. Is this property owned by a state authority, state agency, federal government or local government? *Portions of Project Fall within NYSDOT & County Property* ● **Yes** ○ **No**

7. In accordance with the larger common plan of development or sale, enter the total project site acreage, the acreage to be disturbed and the future impervious area (acreage)within the disturbed area. Round to the nearest tenth of an acre.

Total Site Acreage	**Acreage To Be Disturbed**	**Existing Impervious Area Within Disturbed**	**Future Impervious Area Within Disturbed**
1583.□	68.2	8.5	18.2

8. Do you plan to disturb more than 5 acres of soil at any one time? ● **Yes** ○ **No**

9. Indicate the percentage of each Hydrologic Soil Group(HSG) at the site.

A	**B**	**C**	**D**
0%	0%	86%	14%

10. Is this a phased project? ● Yes ○ No

11. Enter the planned start and end dates of the disturbance

Start Date	End Date
08/01/2013	- 02/01/2015

12. Identify the nearest, natural, surface waterbody(ies) to which construction site runoff will discharge.

Name

TANNERY BROOK, KIAMESHA CREEK

SEVERAL NYSDEC AND USACE WETLANDS

12a. Type of waterbody identified in Question 12?

- ● Wetland / State Jurisdiction On Site (Answer 12b)
- ● Wetland / State Jurisdiction Off Site
- ● Wetland / Federal Jurisdiction On Site (Answer 12b)
- ● Wetland / Federal Jurisdiction Off Site
- ● Stream / Creek On Site
- ● Stream / Creek Off Site
- ○ River On Site
- ○ River Off Site
- ● Lake On Site
- ● Lake Off Site
- ○ Other Type On Site
- ○ Other Type Off Site

12b. How was the wetland identified?

- ○ Regulatory Map
- ● Delineated by Consultant
- ○ Delineated by Army Corps of Engineers
- ○ Other (identify)

13. Has the surface waterbody(ies) in question 12 been identified as a 303(d) segment in Appendix E of GP-0-10-001? ○ Yes ● No

14. Is this project located in one of the Watersheds identified in Appendix C of GP-0-10-001? ○ Yes ● No

15. Is the project located in one of the watershed areas associated with AA and AA-S classified waters? **If no, skip question 16.** ○ Yes ● No

16. Does this construction activity disturb land with no existing impervious cover and where the Soil Slope Phase is identified as an E or F on the USDA Soil Survey? **If Yes, what is the acreage to be disturbed?**

[ ][ ][ ][ ].[ ]

○ **Yes** ○ **No**

17. Will the project disturb soils within a State regulated wetland or the protected 100 foot adjacent area?

● **Yes** ○ **No**

18. Does the site runoff enter a separate storm sewer system (including roadside drains, swales, ditches, culverts, etc)?

● **Yes** ○ **No** ○ **Unknown**

19. What is the name of the municipality/entity that owns the separate storm sewer system?

TOWN OF THOMPSON, SULLIVAN COUNTY DPW,

NYSDOT

20. Does any runoff from the site enter a sewer classified as a Combined Sewer?

○ **Yes** ● **No** ○ **Unknown**

21. Has the required Erosion and Sediment Control component of the SWPPP been developed in conformance with the current NYS Standards and Specifications for Erosion and Sediment Control (aka Blue Book) ?

● **Yes** ○ **No**

22. Does this construction activity require the development of a SWPPP that includes Water Quality and Quantity Control components (Post-Construction Stormwater Management Practices) **(If No, skip questions 23 and 27-35)**

● **Yes** ○ **No**

23. Have the Water Quality and Quantity Control components of the SWPPP been developed in comformance with the current NYS Stormwater Management Design Manual ?

○ **Yes** ● **No**

4262331595

24. The Stormwater Pollution Prevention Plan (SWPPP) was prepared by:

- ● **Professional Engineer (P.E.)**
- ○ **Soil and Water Conservation District (SWCD)**
- ○ **Registered Landscape Architect (R.L.A)**
- ○ **Certified Professional in Erosion and Sediment Control (CPESC)**
- ○ **Owner/Operator**
- ○ **Other**

SWPPP Preparer
AKRF ENGINEERING, P.C.

Contact Name (Last, Space, First)
MALEK, ANDREW

Mailing Address
440 PARK AVENUE, SOUTH

City
NEW YORK

State
NY

Zip
10016-

Phone
646-388-1746

Fax
212-726-0942

Email
AMALEK@AKRF.COM

SWPPP Preparer Certification

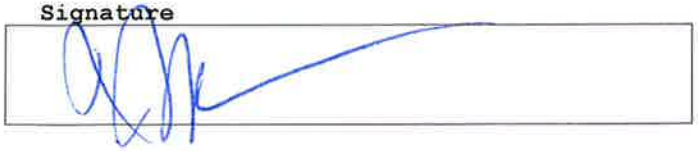
I hereby certify that the Stormwater Pollution Prevention Plan (SWPPP) for this project has been prepared in accordance with the terms and conditions of the GP-0-10-001. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of this permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings.

First Name
ANDREW

MI

Last Name
MALEK

Signature



Date
05/09/2013

25. Has a construction sequence schedule for the planned management practices been prepared? ● Yes ○ No

26. Select **all** of the erosion and sediment control practices that will be employed on the project site:

Temporary Structural

- ● Check Dams
- ● Construction Road Stabilization
- ● Dust Control
- ○ Earth Dike
- ● Level Spreader
- ● Perimeter Dike/Swale
- ○ Pipe Slope Drain
- ● Portable Sediment Tank
- ○ Rock Dam
- ● Sediment Basin
- ● Sediment Traps
- ● Silt Fence
- ● Stabilized Construction Entrance
- ● Storm Drain Inlet Protection
- ● Straw/Hay Bale Dike
- ○ Temporary Access Waterway Crossing
- ○ Temporary Stormdrain Diversion
- ● Temporary Swale
- ○ Turbidity Curtain
- ● Water bars

Biotechnical

- ○ Brush Matting
- ○ Wattling

Vegetative Measures

- ○ Brush Matting
- ○ Dune Stabilization
- ○ Grassed Waterway
- ● Mulching
- ● Protecting Vegetation
- ○ Recreation Area Improvement
- ● Seeding
- ● Sodding
- ● Straw/Hay Bale Dike
- ● Streambank Protection
- ● Temporary Swale
- ● Topsoiling
- ○ Vegetating Waterways

Permanent Structural

- ○ Debris Basin
- ○ Diversion
- ○ Grade Stabilization Structure
- ● Land Grading
- ○ Lined Waterway (Rock)
- ○ Paved Channel (Concrete)
- ○ Paved Flume
- ● Retaining Wall
- ● Riprap Slope Protection
- ● Rock Outlet Protection
- ○ Streambank Protection

Other

Fiber Roll, RECP/Soil Stabilization,

Chemical Flocculant

Water Quality and Quantity Control

Important: **Completion of Questions 27-35 is not required if response to Question 22 is No.**

Post-Construction Stormwater Management Practices

27. Indicate **all** Stormwater Management Practice(s) that will be installed/constructed on this site:

Ponds
- ● **Micropool Extended Detention (P-1)**
- ○ **Wet Pond (P-2)**
- ○ **Wet Extended Detention (P-3)**
- ○ **Multiple Pond System (P-4)**
- ● **Pocket Pond (P-5)**

Filtering
- ○ **Surface Sand Filter (F-1)**
- ○ **Underground Sand Filter (F-2)**
- ○ **Perimeter Sand Filter (F-3)**
- ○ **Organic Filter (F-4)**
- ● **Bioretention (F-5)**
- ○ **Other**

Alternative Practice
- ○ **Rain Garden**
- ○ **Cistern**
- ○ **Green Roof**
- ○ **Stormwater Planters**
- ● **Permeable Paving (Modular Block)**

Wetlands
- ○ **Shallow Wetland (W-1)**
- ○ **Extended Detention Wetland (W-2)**
- ○ **Pond/Wetland System (W-3)**
- ● **Pocket Wetland (W-4)**

Infiltration
- ○ **Infiltration Trench (I-1)**
- ○ **Infiltration Basin (I-2)**
- ○ **Dry Well (I-3)**
- ○ **Underground Infiltration System**

Open Channels
- ● **Dry Swale (O-1)**
- ○ **Wet Swale (O-2)**

Verified Proprietary Practice
- ○ **Hydrodynamic**
- ○ **Wet Vault**
- ○ **Media Filter**

28. Describe other stormwater management practices not listed above or explain any deviations from the technical standards.

TREE PRESERVATION, VEGETATED SWALES AND POROUS PAVEMENT SYSTEMS IN ACCORDANCE WITH NYSDEC STORMWATER DESIGN MANUAL. DEVIATIONS FROM TECNICAL STANDARDS ARE RELATED TO PERMANENT POOL DEPTHS IN CERTAIN PONDS AND WETLANDS.

29. Has a long term Operation and Maintenance Plan for the post-construction stormwater management practice(s) been developed? ● **Yes** ○ **No**

If Yes, Identify the entity responsible for the long term Operation and Maintenance

TOWN OF THOMPSON AND

EPT CONCORD MASTER ASSOC.

30. Provide the total water quality volume required and the total provided for the site.

WQv Required 1.190 **acre-feet**

WQv Provided 1.70 **acre-feet**

31. Provide the following Unified Stormwater Sizing Criteria for the site.

Total Channel Protection Storage Volume (CPv) - Extended detention of post-developed 1 year, 24 hour storm event

CPv Required 3.01 **acre-feet**

CPv Provided 3.01 **acre-feet**

31a. The need to provide for channel protection has been waived because:

○ **Site discharges directly to fourth order stream or larger**

Total Overbank Flood Control Criteria (Qp) - Peak discharge rate for the 10 year storm

Pre-Development 406.32 **CFS**

Post-development 362.16 **CFS**

Total Extreme Flood Control Criteria (Qf) - Peak discharge rate for the 100 year storm

Pre-Development 633.36 **CFS**

Post-development 569.88 **CFS**

31b. The need to provide for flood control has been waived because:

○ **Site discharges directly to fourth order stream or larger**

○ **Downstream analysis reveals that flood control is not required**

IMPORTANT: For questions 31 and 32, impervious area should be calculated considering the project site and all offsite areas that drain to the post-construction stormwater management practice(s). (Total Drainage Area = Project Site + Offsite areas)

32. Pre-Construction Impervious Area - As a percent of the Total Drainage Area enter the percentage of the existing impervious areas before construction begins. 2 %

33. Post-Construction Impervious Area - As a percent of the Total Drainage Area, enter the percentage of the future impervious areas that will be created/remain on the site after completion of construction. 19 %

34. Indicate the total number of post-construction stormwater management practices to be installed/constructed. 42

35. Provide the total number of stormwater discharge points from the site. (include discharges to either surface waters or to separate storm sewer systems) 11

36. Identify other DEC permits that are required for this project.

DEC Permits

○ Air Pollution Control	● Navigable Waters Protection / Article 15
○ Coastal Erosion	● Water Quality Certificate
○ Hazardous Waste	○ Dam Safety
○ Long Island Wells	○ Water Supply
○ Mined Land Reclamation	● Freshwater Wetlands/Article 24
● Other SPDES	○ Tidal Wetlands
○ Solid Waste	○ Wild, Scenic and Recreational Rivers
○ None	○ Stream Bed or Bank Protection / Article 15

○ Other

37. Does this project require a US Army Corps of Engineers Wetland Permit? ● Yes ○ No
If Yes, Indicate Size of Impact. 7.9

38. Is this project subject to the requirements of a regulated, traditional land use control MS4? ○ Yes ● No
(If No, skip question 39)

39. Has the "MS4 SWPPP Acceptance" form been signed by the principal executive officer or ranking elected official and submitted along with this NOI? ○ Yes ○ No

40. If this NOI is being submitted for the purpose of continuing coverage under a general permit for stormwater runoff from construction activities, please indicate the former SPDES number assigned. NYR

Owner/Operator Certification

I have read or been advised of the permit conditions and believe that I understand them. I also understand that, under the terms of the permit, there may be reporting requirements. I hereby certify that this document and the corresponding documents were prepared under my direction or supervision. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I further understand that coverage under the general permit will be identified in the acknowledgment that I will receive as a result of submitting this NOI and can be as long as sixty (60) business days as provided for in the general permit. I also understand that, by submitting this NOI, I am acknowledging that the SWPPP has been developed and will be implemented as the first element of construction, and agreeing to comply with all the terms and conditions of the general permit for which this NOI is being submitted.

Print First Name TIMOTHY **MI** C

Print Last Name LILES

Owner/Operator Signature

Date 05/14/2013

EPT CONCORD RESORT NOI
ATTACHMENT A

Table 1 - Tax Map Numbers

Section	Block	Lot
31	1	62.3
31	1	91
23	2	33
23	2	32
23	2	31
31	1	19.2
31	1	18
23	1	65.3
23	1	65.1
31	1	17.1
23	1	65.2
23	1	63
23	1	51
23	1	54.4
23	1	52
23	1	55
23	2	8
23	2	4
23	1	54.1
23	2	6
23	2	3
23	2	2
23	2	1
15	1	19
15	1	16
15	1	18
15	1	17
23	1	53
23	1	54.3
23	1	52
23	1	48
13	3	24
15	1	13
15	1	50
15	1	14.1
15	1	14.2
13	3	19.1
13	3	18
NYS Route 17		
County Road 182		
NYS Route 42		

New York State Department of Environmental Conservation
Division of Water
Bureau of Water Permits, 4th Floor
625 Broadway, Albany, New York 12233-3505
Phone: (518) 402-8111 ▪ **Fax:** (518) 402-9029
Website: www.dec.ny.gov

Joe Martens
Commissioner

5/29/2013

EPT CONCORD II, LLC
ENTERTATNMENT PROPERTIES TRUST TIM LIES
909 WALNUT, SUITE 200
KANSAS CITY MO 64106-

Re: ACKNOWLEDGMENT of NOTICE of INTENT for Coverage Under SPDES General Permit for Storm Water Discharges from CONSTRUCTION ACTIVITY General Permit No. GP-0-10-001

Dear Prospective Permittee:

This is to acknowledge that the New York State Department of Environmental Conservation (Department) has received a complete Notice of Intent (NOI) for coverage under General Permit No. GP-0-10-001 for the construction activities located at:

EPT CONCORD RESORT
THOMPSONVI11E ROAD
THOMPSON NY 10013- **County: SULLIVAN**

Pursuant to Environmental Conservation Law (ECL) Article 17, Titles 7 and 8, ECL Article 70, discharges in accordance with GP-0-10-001 from the above construction site will be authorized **5** business days from **5/21/2013** which is the date we received your final NOI, unless notified differently by the Department.

The permit identification number for this site is: NYR **10W763**. Be sure to include this permit identification number on any forms or correspondence you send us. When coverage under the permit is no longer needed, you must submit a Notice of Termination to the Department.

This authorization is conditioned upon the following:

1. The information submitted in the NOI received by the Department on **5/21/2013** is accurate and complete.

2. You have developed a Stormwater Pollution Prevention Plan (SWPPP) that complies with GP-0-10-001 which must be implemented as the first element of construction at the above-noted construction site.

3. Activities related to the above construction site comply with all other requirements of GP-0-10-001.

4. Payment of the annual $100 regulatory fee, which is billed separately by the Department in the late fall. The regulatory fee covers a period of one calendar year. In addition, since September 1, 2004, construction stormwater permittees have been assessed an initial authorization fee which is now $100 per acre of land disturbed and $600 per acre of future impervious area. The initial authorization fee covers the duration of the authorized disturbance.

5. When applicable, project review pursuant to the State Environmental Quality Review Act (SEQRA) has been satisfied.

6. You have obtained all necessary Department permits subject to the Uniform Procedures Act (UPA). You should check with your Regional Permit Administrator for further information.

***Note: Construction activities cannot commence until project review pursuant to SEQRA has been satisfied, when SEQRA is applicable; and, where required, all necessary Department permits subject to the UPA have been obtained.**

7. Before disturbing greater than 5 acres of soil at any one time, you have obtained approval from our regional office. You should contact the regional office listed below to have your construction sequencing plan reviewed.

Patrick Ferracane
NYS Department of Environmental Conservation - Region 3
100 Hillside Avenue, Suite 1W
White Plains, NY 10603-2860

Please be advised that the Department may request a copy of your SWPPP for review.

Should you have any questions regarding any aspect of the requirements specified in GP-0-10-001, please contact Dave Gasper at (518) 402-8114 or the undersigned at (518) 402-8109.

Sincerely,

Toni Cioffi

Toni Cioffi
Environmental Program Specialist 1

cc: RWE - 3
SWPPP Preparer

AKRF ENGINEERING, PC
MALEK, ANDREW
440 PARK AVENUE, SOUTH
NEW YORK NY 10016-

New York State Department of Environmental Conservation
Division of Water, Region 3
100 Hillside Avenue, Suite 1W, White Plains, NY 10603-2860
Phone: (914) 428-2505 ext 359• **FAX:** (914) 428-0323
Website: www.dec.ny.gov

Joe Martens
Commissioner

September 23, 2013

Mr. Justin P. Baker, P.E.
Technical Director
AKRF Engineering
440 Park Ave. South
7th Floor
NY, NY, 10016

Re: **Water Treatment Chemical Usage/ Five Acre Waiver**
EPT Concord II/ Phase I Roadway and Utilities
SW SPDES ID# NYR10W763
(T) Thompson, Sullivan County

Dear Mr. Baker:

The Department has evaluated the Water Treatment Chemical Usage forms and the application process, (submittal cover letter dated July 26, 2013) for the proposed use of StormKlear: LBP-2101 and HaloKlear LiquiFloc 1% at the EPT Concord II/ Phase I Roadway and Utilities project in the Town of Thompson, Sullivan County. The receiving waters for the project have been identified as Tannery Brook and Kiamesha Creek.

The use of StormKlear: LBP 2101 and HaloKlear LiquiFloc 1% are acceptable for use at the referenced project. The products must be used in accordance with the dosage rates and application methods (proposed & alternative) described in the July 26, 2013 submittal. The Department must be notified, and a new application submitted, if there is a deviation from the proposed chemical use, dosage rate, application process, or receiving water. Additionally, the project permittee will be liable for any environmental damages resulting from the use of the water treatment chemical at this site.

The Department has also evaluated the Five Acre Waiver request, which was included in the July 26, 2013 submittal for the referenced project. Your request to disturb more than five acres at one time, at the referenced site, is granted.

Please contact me at the above number if you have questions.

Sincerely,

Patrick Ferracane
Division of Water

cc: Shohreh Karimipour, P.E., Regional Water Engineer, NYSDEC, White Plains

AKRF

AKRF Engineering, P.C.

440 Park Avenue South
7th Floor
New York, NY 10016
tel: 212 696-0670
fax: 212 213-3191
www.akrf.com

August 12, 2013

NYS DEC Division of Water (Region 3)
100 Hillside Ave. Suite 1W
White Plains, NY 10603-2860

Attention: Patrick Ferracane

Reference: Water Treatment Chemical Usage Noticification/ 5 Acre Waiver Request
Monticello Raceway Management, Inc. (MRMI)/EPT Concord Resort
Permit ID#: NYR 10W713

Dear Mr. Ferracane:

In response to your request dated May 24, 2013, we are submitting a formal request for a waiver from the five acre threshold and authorization to use water treatment chemicals (WTC) during construction to treat stormwater. A Project Overview, basis for Five (5) Acre Waiver Request, and information relating to the proposed WTC use is summarized below.

PROJECT OVERVIEW

The request is specific to the development of the Sullivan County Casino Project by Monticello Raceway Management, Inc. (MRMI) under the Stormwater General Permit 0-10-001 and site specific Stormwater Pollution Prevention Program (SWPPP) prepared for this project.

FIVE (5) ACRE WAIVER REQUEST

Due to the cut & fill analysis and contractor phasing for the MRMI project, it is necessary to disturb more than 5 acres at a time. The project SWPPP and construction documents include a detailed construction sequence and phasing plan which will allow soil disturbance and stabilization to proceed in a controlled manner. The SWPPP provides for construction of the project in three phases with multiple stages which will reduce the disturbance area into areas which may be effectively managed by the Contractor. The phasing is summarized below:

PHASE	STAGE	DESCRIPTION	AREA (Acres)
1	1	Constr. Access Roads / Constr. Entrance / Temp. Sed. Basins	11.5
1	1A	CAFOs Area/South Temp. Sed. Basin	4.8
1	2	Emp. Parking Lot/Casino Excav.	15.7
1	2A	Parking Lot betw. Casino and track	2.8
2	1	South Access Road/West Main Parking Lot	10.2
2	2	East Main Parking Lot	10.9
3	1	Paddock Area	12.3
3	2	Track	17.5

The stage-specific sequence of work is provided within the SWPPP and construction documents. See Attachment C for the reduced-size phasing plan.

The amount of earthwork anticipated within each phase is summarized below:

Phase	Cut (Cubic Yards)	Fill (Cubic Yards)	Net (Cut or Fill)
1	132,577	121,296	11,280 (Cut)
2	178,412	109,114	69,298 (Cut)
3	52,073	163,208	111,135 (Fill)

As required within the SWPPP and Part II.C.2. of the General Permit, the frequency of inspections by the Qualified Inspector will be twice per seven calendar day period and separated by two full calendar days for as long as more 5 acres are disturbed. Where soil disturbance has temporarily or permanently ceased, temporary and/or permanent soil stabilization measures will be installed and/or implemented within seven (7) calendar days from the date the soil disturbance activity has ceased. As erosion and sediment control is a dynamic process, the owner or operator may modify site specific practices as needed to protect water quality as specified in the technical standards outlined in New York State (NYS) Standards and Specifications for Erosion and Sediment Control as well as the use of water treatment chemicals as summarized below.

WATER TREATMENT CHEMICAL USE

Overview

Chemical treatment of stormwater runoff and groundwater from dewatering operations may be required based on the varying clay and silt content of soils as characterized by the project Geotechnical Investigation and as summarized in the SWPPP. The water treatment chemicals

proposed for use is the HaloKlear Dual Polymer System (DPS) which consists of the LBP-2101 charging agent and LiquiFloc 1% Chitosan flocculent.

Based on information provided by HaloSource Inc., "*the LBP-2101 active ingredient is natural and used in food preparation, thus biodegradable and not toxic. The flocculent in LiquiFloc uses Chitosan, which is a naturally occurring polysaccharide and is naturally derived from Chitin, which is a natural biopolymer and the major component of shells of crustaceans such as shrimp and crabs, insects, and cell walls of fungi. Chitosan-based water treatment agents have been used for decades in a variety of commercial and municipal applications including water treatment and pond, lake, swimming pool and aquarium clarification. It provides the necessary positive charge that destabilizes the negative surface charge of sediment particles and binds with them to form particles large enough to settle and/or be filtered. The product is completely biodegradable, non-toxic to mammals, and can be used in both fresh and salt water applications.*" See Attachment A for HaloKlear DPS Literature; MSDS documents; Toxicity Test Report; and the NYS DEC Water Treatment Chemical Forms prepared for this project.

Treatment Approach

The HaloKlear DPS will be used in an active treatment approach based on the need to treat large volumes of water from temporary sediment basins. The condition water treatment may be required occurs when run-off collected in the temporary sediment basins fails to clarify by virtue of natural settling and where suspended solids may potentially pass through the temporary sediment basin outlet structure at time of discharge. If this condition develops, the temporary outlet control system will be temporarily abandoned in place and active treatment will be implemented. Once initiated, the active treatment systems will continue to be required until such time that the temporary sediment basins are substantially stabilized and collected stormwater may be treated passively using the temporary outlet control systems.

The Contractor will implement active treatment of the water in the sediment basin using pumps to withdraw and circulate the water from one side of the sediment basin to the opposing side. Chemical feed pumps will be used to introduce a metered dose of chemicals into the hose before the pump. The Contractor is to provide sufficient length of hose to withdraw and discharge water from opposing ends of the sediment basin. The discharge of treated water to the opposite end of the sediment basin will result in treatment of the desired volume of water stored. The portable pump system will use six inch suction pumps capable of pumping water at 400 to 500 gallons per minute (GPM). Based on discussions with the manufacturer, the required dosage is anticipated to be approximately 300 gallons of DPS or 150 gallons of each LBP-2101 and LiquiFloc 1% for 1,000,000 gallons of water. The Contractor will be able to calibrate the dosage required based on the amount of accumulated water to be treated in the sediment basin. It is anticipated that the treatment will typically occur when depth of water ranges between two and four feet deep in the basins. Following treatment and circulation and visual confirmation of clarity at the surface, the water will be drawn off the surface with settlement of flocculated solids collected in the bottom of the basin. The Contractor will pump the water from the surface of the basin through a sand filter to provide additional water treatment prior to discharge.

As a treatment alternate, the Contractor may conduct active treatment in space restricted areas using a large settling tank instead of constructed sediment basins. For this scenario, the water is pumped with the liquid flocculent introduced prior to the settling tanks. Water may be processed at lower flow rates using two to three inch size pumps with the necessary chemical

feed pumps for metered dosing of the water. Based on discussions with contractors, we understand that the typical settling tank size of 18,000 gallons would be appropriate for a water treatment rate of up to 250 GPM, however, the equipment size varies with the amount of treatment required. The settling tank discharge will be pumped through a sand filter prior to discharge. This treatment approach may be used for an abbreviated period depending on project requirements. The location and number of treatment systems will vary based on the project phasing. It is anticipated that a minimum of four treatment systems will be required initially; one at each of three temporary sediment basins and one portable settling tank system. See Attachment B for typical processing schematics.

Performance Monitoring During Operation

The performance of the treatment system will be the responsibility of the Contractor. The goal as observed at the outfall will be qualitative and seek to significantly reduce turbidity levels so that there is no contravention of water quality standards. As part of performance monitoring, the Contractor will maintain on-going records of water treatment including the following information:

- Pump type, hours of use, and volume (gallons) treated;
- Amount of WTC used (GPM);
- Depth of sediment accumulation in sediment basin and/or settling tanks

Operation and Maintenance

Regular maintenance will be required by the Contractor to ensure reliable system performance. Based on treatment needs and weather conditions, the Contractor will also need to employ measures to ensure functionality of equipment during freezing conditions. This may necessitate measures such as draining of system piping at the end of each work day and temporary heating enclosures for equipment. During periods of sustained sub-freezing conditions, it is anticipated that the need for active treatment will not be necessary. The following maintenance schedule is suggested to the Contractor however it is subject to change based on frequency of use of the treatment systems and field conditions.

Component	Description	Frequency
System Pumps	Check Hoses, Fuel, Oil, Air Filters	Daily
Sediment Basins/ Settling Tanks	Check Sediment Accumulation	Weekly
	Remove Sediment	Monthly
Sand Filter	Monitor Pressure Drop	Daily
	Backwash	Weekly

WTC Project References

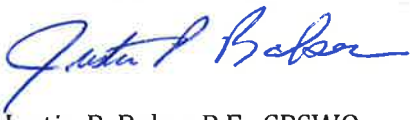
HaloSource, Inc. has teamed with Rain for Rent and other equipment contractors in deploying storm water treatment systems for numerous construction projects in the United States. Several recent large projects where storm water was treated using the HaloKlear DPS system include:

- Florida DOT I-10 and I-110 interchange expansion project where over 180 million gallons of storm water. FDOT has created a standard specification for use of HaloKlear DPS system;
- Super Wal-Mart (Maryland) where Maryland Department of Environment approved use with discharge to sensitive Chesapeake Bay Watershed (see May 2013 Erosion Control Magazine)
- Maryland DOT Inter County Connector Project (see September 2009 Stormwater Magazine)
- SeaTac International Airport Project where over 1.1 billion gallons of storm water was treated in an environmentally sensitive area.

We also understand that on a more local basis, the NYC DEP has approved use of HaloKlear system for numerous systems treating groundwater and stormwater including the NYS DEC Region 3 approved used of the treatment system approach for the Belleayre Resort at Catskill Park(August 24, 2007).

Please contact our office at 646-388-9541 should you have any questions or require more information relating to the information provided within this request.

Sincerely,
AKRF Engineering, P.C.



Justin P. Baker P.E., CPSWQ
Technical Director

Cc: J. McColgan P.E.

Attachment A

HaloKlear™

A HaloSource Brand

HaloKlear™ Dual Polymer System (DPS)

The best water treatment system for your business and the environment

The Science of Cleaner Water

ECO-FRIENDLY PRODUCTS HALOKLEAR.

haloklear.com

HaloKlear™
A HaloSource Brand

Key HaloKlear Product Benefits

- TSS Reduction
- Has a proven track record in protecting the environment and exceeding rigorous state and national discharge requirements
- Works effectively in active, semi-passive, and passive treatment models
- Is cost-effective for treating large and small sites
- 100% biodegradable through enzymatic activity
- Produces no bioaccumulation
- Uses the HaloKlear DPS Jar Test Kit for quickly determining correct dosages **in the field**
- 100% PAM-free
- Works on **ALL** soils
- Works on a wide range of pH and in fresh and salt water
- Traps or flocculates some hydrocarbons, metals, and nutrients
- Residual testing can be done on-site with available residual test kits

HaloKlear products are used to treat storm, industrial and municipal water, including pollutants in construction site runoff, by reversing the process of water contamination through a combination of advanced, environmentally friendly, natural biopolymer technologies.

When it comes to handling dirty water, HaloKlear has built its reputation on creating reliable, effective and safe solutions that can solve all kinds of sediment control problems. HaloKlear's Dual Polymer System (DPS) uses natural biopolymers that completely biodegrade through simple enzymatic activity, resulting in no bioaccumulation. The primary active ingredients are commonly used in the dietary supplement and food industries.

The HaloKlear Biopolymer Residual Test Kit is used to ensure excess biopolymers are not leaving the site. This knowledge is comforting for regulators,contractors and the general public, who can rest assured that the products are not going to cause harm to the environment.

Most importantly, HaloKlear's DPS has a best-in-class performance, and has proven itself under vastly varied conditions around the world. It is used in systems ranging from active treatment for mobile water treatment, semi-passive pumped water incorporating coarse filtration and geotextile bags, and completely passive models, such as bio-filtration and check dams. HaloKlear DPS is designed to give contractors and industries in need of water treatment solutions the essential tool they need to meet state and national discharge regulations, and as well as the new proposed EPA Effluent Limitation Guidelines (ELGs).

HaloKlear Products Deliver Performance and Clean Water Solutions

In the field, we all face the same problem – we must return water to the environment that meets discharge guidelines. HaloKlear products are a complete line of cost-effective, innovative products that will meet your needs today. These products are not only safe for the environment, they have helped our customers solve their discharge problems, while enhancing project economics in industries like:

- Construction
- Oil & Gas
- Mining
- Dredging
- Industrial Process Water
- Raw Wastewater Treatment
- Environmental Remediation

The bottle on the far left shows untreated water while the bottle on the right shows water treated with HaloKlear's new Dual Biopolymer System. The picture at right shows the "flocked" dirt.

ECO-FRIENDLY PRODUCTS HALOKLEAR

HaloKlear™
A HaloSource Brand

HaloKlear products achieve significant water quality results in active, semi-passive and passive treatment systems.

HaloKlear DPS "Passive" Treatment Models Feature

- Acrylamide-free treatment system
- Lowest maintenance requirement
- No mechanized equipment requirement
- Can reduce footprint by up to 50%
- Minimizes or eliminates need for water storage
- Actual flow range dependent on Best Management Practice (BMP) design and frequency/severity of storm events
- Uses natural filtration and settling to reduce costs
- A cost-effective model for meeting EPA & ELG requirements
- Easily applied to new and existing BMPs
- Lowest cost treatment system

Typical Results:
50-250 NTU

HaloKlear DPS "Semi-Passive" Treatment Model

Typical Results: 20-50 NTU

- Delivers consistent results
- Acrylamide-free treatment system
- Low maintenance requirement
- Low mechanized equipment requirement
- **Significantly reduces footprint** compared to traditional active treatment systems
- Does not require backwashing
- Requires HaloKlear SockMaster™ Manifold kit & pump; rated 100-500 GPM
- Low cost compared to traditional active treatment systems
- May **use coarse filtration,** settling, or both to improve cost effectiveness
- Plug-in-**play a variety of configurations** including: BMPs, dewatering bags, and recirculation systems.
- May be used in conjunction with passive treatment models
- May involve contaminant and nutrient removal

HaloKlear DPS "Active" Treatment Model

Typical Results: 10-35 NTU

- Delivers consistent results
- Acrylamide-free treatment system
- Identical footprint to traditional active treatment systems
- Reduced frequency of backwashing compared to traditional active treatment systems
- **Actual flow range dependent on mechanized equipment** and pumping capabilities
- Can reduce operational costs compared to traditional active treatment systems.
- The use of HaloKlear biopolymers enhances the efficiency of most filtration equipment used in active treatment systems, by aiding the capture of finer solids, reducing the frequency of back-wash, allowing faster settling of particles in settling tanks, and providing solids/contaminants that have a lower percentage of water, which reduces hauling and disposal costs.

HaloKlear™
A HaloSource Brand

HaloKlear Dry and Liquid Formula Flocculants

The HaloKlear product line offers a diverse selection of flocculants made up of natural bioplymers, ranging from stand-alone media to component solutions. The 100% biodegradable treatments deliver superior, consistent performance with a minimal environmental impact. HaloKlear has proven to be effective with all construction soil types and in a wide range of climates.

The treatments can be used separately or as part of the HaloKlear Dual Polymer System (DPS) to remove contaminants - such as sediments, oils, heavy metals, and nutrients - from storm and effluent water. The concentrated dry formula is more economical to ship. Consult a qualified HaloKlear technical representative or your local HaloKlear distributor for application methods and dosing information.

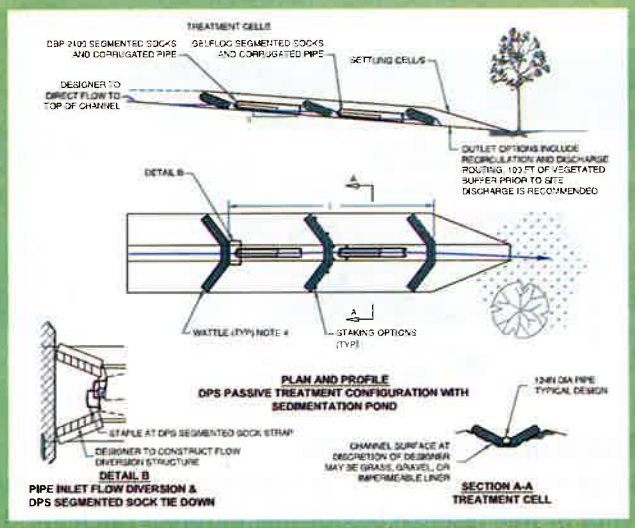
HaloKlear LiquiFloc™ and HaloKlear LBP-2101™ Liquid Formula Products

HaloKlear LiquiFloc and LBP-2101 are both available in 5-gallon buckets, 55-gallon drums, 275-gallon totes and bulk liquid. The HaloKlear LiquiFloc product is available in 1%, 2%, and 3% active concentrations, as well as in custom formulations for specific applications.

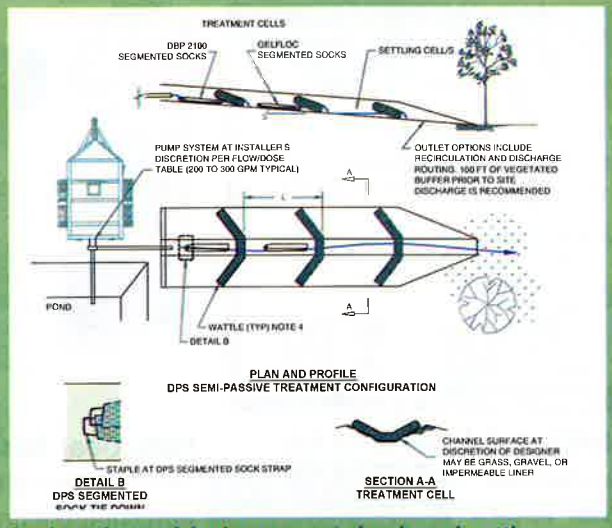
HaloKlear GelFloc™ and HaloKlear DBP-2100™ Dry Formula Products

Pictures on the left show the HaloKlear MB kit, the color-coded HaloKlear GelFloc (yellow) and the HaloKlear DBP-2100 (green) segmented socks. Each bucket has 4 individually packed socks. Dosage and metering rates can be determined using the HaloKlear DPS Jar Test Kit and by consulting a HaloKlear agent or qualified representative.

Patents:
US 6,749,748
US 6,821,427



Passive model using DPS segmented socks in corrugated pipe



Semi-passive model using segmented socks and wattles

HaloKlear DPS vs. PAMs (Polyacrylamides)

VARIABLES	HALOKLEAR DPS	PAMs (POLYACRYLAMIDES) GRANULAR, POWDER & BLOCKS
Soil Types	The HaloKlear Formula works on *all* construction soil types	Highly soil-specific (100s of different formulations)
Soil Samples	There is no need to send soil samples. The HaloKlear DPS system works on all construction soil types	The majority of soil samples must be collected and shipped to manufacturer's lab for specific polyacrylamide selection, adding time and cost
Dose Rate Calculation	Dose rates can be rapidly determined in the field with the HaloKlear DPS Jar Test Kit	Dose rate calculation must be made by manufacturer after soil sample is received at factory and analyzed, adding time and cost
Organic & Biodegradable	Yes—manufactured from natural occurring biopolymers, which degrade through enzymatic activity	Yes—derived from petroleum-based products
Residual Testing	HaloKlear offers an affordable biopolymer residual test kit, which can be used in the field for immediate results	Laboratory analysis is needed, which can take several days, adding time and cost
Application Range	HaloKlear DPS can be applied on passive, semi-passive, and active treatment systems (Sand-Media, Bags, Cartridges, Screens, etc.). Active treatment systems will benefit due to the type of flock generated (stable and high sheer strength), its ability to retain finer solids, retain a lower percentage of water (i.e. drier solids), and easily be backwashed from the filter	Polyacrylamides can only be used with passive and semi-passive systems and not with active treatment systems, because they will usually produce a gelatinous flock which contains a high percentage of water and will stick/bind to the filtration media (i.e. Sand, Screens, etc.) making it difficult to backwash and clean

ACCESSORIES

HaloKlear DPS Dose Calculator

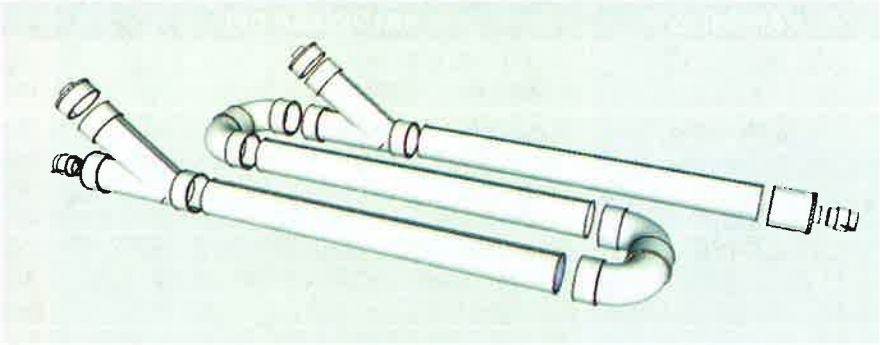
HaloKlear DPS Jar Test Kit

Order the HaloKlear DPS Jar Test Kit free www.haloklear.com

The HaloKlear DPS Jar Test Kit can be used with the HaloKlear DPS Dose Calculator to determine the proper bio-polymer dose for your water clarification needs. The HaloKlear DPS Dose Calculator, available for download at www.haloklear.com/calculator, will provide the total quantity of products required in 275-gal totes, 55-gal drums, biopolymer socks and dry powder/flake. Please contact a HaloKlear representative or local distributor for pricing.

HaloKlear Residual Biopolymer Test Kit

The HaloKlear Residual Biopolymer Test Kit uses proven test methods for detecting the presence of free residual biopolymer before it can leave the job site. Compared to other test kits, this kit improves accuracy by up to 25%. You can achieve results without the hassle of using outside labs, while ensuring you are compliant with local and federal discharge regulations.



HaloKlear SockMaster Manifold Kit

The HaloKlear SockMaster Manifold Kit, combined with three 10-ft sections of 6-in PVC schedule-40 pipe obtained locally (not included), provides all of the parts required to quickly and easily assemble a complete HaloKlear SockMaster Manifold. The assembled manifold houses the HaloKlear Dual Polymer System (DPS) sock sets during semi-passive stormwater and wastewater treatment applications. The HaloKlear SockMaster Manifold Kit comes complete with easy to follow assembly instructions and diagram. Please contact a HaloKlear representative or your local HaloKlear distributor for further details and/or product pricing.

HaloKlear™
A HaloSource Brand

Neither HaloSource, Inc. nor the seller of this product can accept any responsibility where the product is not used according to directions, guides and for the manner in which it was intended. HaloKlear, GelFloc, LiquiFloc, DBP-2100, LBP-2101, SockMaster, and HaloSource are trademarks of HaloSource, Inc.
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1-888-282-6766

HALOSOURCE
Clean Water & Antimicrobial Solutions

DISTRIBUTED BY

Form WTCFX (2/02)

NYSDEC - Division of Water

Water Treatment Chemical (WTC) Usage Notification Requirements for SPDES Permittees

Instructions Page

Note: All requested information must be supplied. Incomplete submissions will not be reviewed.

Applicability

New or increased use of a WTC requires prior DEC review and authorization. At a minimum, the permittee must notify the DEC in writing of its intent to change WTC use. The DEC will review that submittal and determine if a formal SPDES permit modification is necessary or whether WTC review and authorization may proceed outside of the formal permit administrative process. **The majority of WTC authorizations do not require formal SPDES permit modification.** Notification requirements are summarized below. WTCs which are used in closed systems and cannot be discharged or those which are discharged to municipal STP do not require DEC review. Examples of WTCs include, biocides, coagulants, conditioners, corrosion inhibitors, defoamers, flocculants, scale inhibitors, sequestrants, and settling aids. DEC staff may also direct you to use this form for review and authorization of substances, other than WTCs, which could be present in wastewater, e.g. process chemicals.

Notification Requirements and Instructions

For **each** new or increased use of a WTC, please **complete items 1a, and 2 - 14 on the attached 3 page form, entitled WTC Usage Notification Requirements for SPDES Permittees.** *Alternatively*, the permittee may, at a minimum, complete items 1a, 2 - 9 and 14 then forward the form to the WTC manufacturer who must then complete the remaining items (10 - 13) and items 1b and 15. The manufacturer must then send the completed form directly to the permit writer. This alternative method may be necessary because the WTC manufacturer may be reluctant to reveal trade secret product formulations to the permittee.[1] **Fax or Mail the completed form to:**

Permit writer:	Telephone:	Fax:
Address:		

Outfall WTC Concentration - *In general,* when completing item 7b, the average mg/l should be determined by dividing the average dosage in 6a by the average flow in 7a and then dividing by 8.34; the maximum mg/l should be determined by dividing the maximum dosage in 6a by the average flow in 7a and then dividing by 8.34. *However*, for blowdowns which are highly intermittent or are not tributary to a treatment system or some form of equalization, it may be appropriate to factor in the information in item 8 when completing item 7b.

Toxicity Information - When completing item 13, please ensure that the tests were conducted in accordance with the EPA Toxicity Manual and that the results are for the appropriate receiving water (i.e. fresh water or salt water).[2] In general, submissions which do not include any toxicity information will not be authorized. Submissions containing incomplete toxicity information will be reviewed using conservative safety factors which may prevent authorization or result in the permit being modified to include routine whole effluent toxicity testing or other monitoring.

Phosphorus - The permittee must demonstrate that the use and discharge of any WTCs containing phosphorus, tributary to the Great Lakes Basin or other ponded waters, is necessary and that no acceptable alternatives exist. Please note that in some cases your permit may require modification to regulate phosphorus.

After reviewing the submission, **the permit writer will complete items 16 and 17** and fax or mail a copy of the completed form to the person identified in item 2.c and, if appropriate, to the facility inspector.

Common Reasons Which Prevent Letter Authorization of a WTC

- Submission of incomplete or inaccurate information.
- High WTC toxicity compared to available receiving stream dilution or other predicted water quality contravention.
- Department review indicates that a SPDES permit modification is necessary.

Footnotes:

(1) If requested, the Department will restrict access to trade secret information to the extent authorized by law.

(2) **Submission of both acute (48 or 96 hour LC50 or EC50) and chronic (NOEC) test results for at least one vertebrate and one invertebrate species are required.** Refer to the following three manuals: EPA/600/4-90/027F (1993); EPA/600/4-91/002 (1994); EPA/600/4-91/003 (1994); or their replacements.

Form WTCFX (2/02)

NYSDEC - Division of Water

Water Treatment Chemical (WTC) Usage Notification Requirements for SPDES Permittees

Note: All requested information must be supplied. Incomplete submissions will not be reviewed.

Permittee completes items 1a and 2 - 14. Alternatively, the permittee may complete items 1a, 2 - 9 and 14 if the WTC manufacturer completes items 1b, 10 - 13 and 15. See instructions page.

1.a. Date Signed by Permittee - 7/31/13	1.b. Date Signed by WTC Manufacturer - 7/11/2013
2.a. Permittee Name - Empire Resorts	2.b. SPDES No. - NYR 10W713
2.c. Contact Name - Joseph D'Amato	
3.a. WTC Name - HaloKlear LiquiFloc 1%	
3.b. WTC Manufacturer - HaloSource, Inc.	
4. WTC Function - Flocculates soil contamination in water	
5. Affected Outfall(s) - Sediment basin outfalls (typical one outfall)	
6.a. WTC Daily Dosage: average lbs/day = 50	, maximum lbs/day = 100
6.b. Dosage Frequency: minutes/day = 480	, days/week = <6
7.a. Outfall Flow Rate: average MGD = 0.24	, maximum MGD = 0.36
7.b. Outfall WTC Concentration: average mg/l = <0.1	, maximum mg/l = 0.1
8.a. System Blowdown Flow Rate: average gpm = N/A	, maximum gpm = N/A
8.b. System Blowdown Frequency: minutes/day = N/A	, days/week = N/A

9. List measures in place to ensure that excessive levels of WTC are not used and subsequently discharged -

1. Sediment Basin/Weir Tank and Sand Filter will be used to remove flocculated solids and WTC before discharging to existing Water Treatment System.
2. Discharge will be field tested for WTC residual.
3. Doses used are 0.5ppm/1.0ppm (@500GPM) and are to be field tested.

10.a. WTC Composition - Ingredients/Impurities (note: ingredients/impurities must total to 100%)	10.b. %	10.c. CAS#	10.d. Outfall Concentration
Acetic Acid	1.0%	64-19-7	<0.1 mg/l
All other components are non-hazardous	99.0%		mg/l
			mg/l
			mg/l
			mg/l
			mg/l
			mg/l

10.e. Intermediate/Final Degradation Products - $CO_2 + N_2 + H_2O$ (see Gooday GW (1990))

Form WTCFX (2/02)

NYSDEC - Division of Water

WTC Usage Notification Requirements for SPDES Permittees

1.a. Date Signed by Permittee -	1.b. Date Signed by WTC Manufacturer - 7/11/2013
2.b. SPDES No. - NYR 10W713	3.a. WTC Name - HaloKlear LiquiFloc 1%
11. WTC BOD and COD (lb/lb) - 0	
12.a. Is WTC a NYS registered biocide? No	12.b. Registration Number - N/A

13. WTC Toxicity Info (most sensitive species) - Attach description of endpoint for each EC50 and LOEC.

13.a. Vertebrate Species	LC50	EC50	NOEC	LOEC	Other -
Rainbow Trout Acute	173 mg/l	mg/l	125 mg/l	mg/l	
13.b. Vertebrate Species	LC50	EC50	NOEC	LOEC	Other -
Fathead minnow acute	642 mg/l	mg/l	500 mg/l	mg/l	
13.c. Invertebrate Species	LC50	EC50	NOEC	LOEC	Other -
C. Daphnia	1369 mg/l	mg/l	1000 mg/l	mg/l	
13.d. Invertebrate Species	LC50	EC50	NOEC	LOEC	Other -
	mg/l	mg/l	mg/l	mg/l	
13.e. Species	LC50	EC50	NOEC	LOEC	Other -
	mg/l	mg/l	mg/l	mg/l	

14. Permittee Certification - I certify under penalty of law that this notification and all attachments are, to the best of my knowledge and belief, true, accurate and complete. The generic WTC usage requirements noted below will be adhered to.

PRINT NAME - Joseph A. D'Amato	SIGNATURE - Joseph A. D'Amato
TITLE/COMPANY - CEO / Empire Resorts, Inc	
TELEPHONE - 845-807-0001	FAX - 845-807-0006

15. WTC Manufacturer Certification - I certify under penalty of law that this notification and all attachments are, to the best of my knowledge and belief, true, accurate and complete.

PRINT NAME - Frank Kneib	SIGNATURE -
TITLE/COMPANY - Technical Director	
TELEPHONE - 425-974-1970	FAX - 425-556-4120

Form WTCFX (2/02)

NYSDEC - Division of Water

WTC Usage Notification Requirements for SPDES Permittees

1.a. Date Signed by Permittee -	1.b. Date Signed by WTC Manufacturer - 7/11/2013
2.b. SPDES No. - NYR 10W713	2.c. Contact Name - Joseph D'Amato
3.a.. WTC Name - HaloKlear LiquiFloc 1%	6.a. Avg/Max Daily Dosage = 50 / 100 lbs/day

Generic WTC Usage Requirements

A. WTC use shall not exceed the rate reported by the permittee or authorized below, whichever is less.
B. The discharge shall not cause or contribute to a violation of water quality or an exceedance of AWQC.
C. **The permittee must maintain a logbook** of all WTC use, noting for each WTC the date, time, exact location,and amount of each dosage, and, the name of the individual applying or measuring the chemical. The logbook must also document that adequate process controls are in place to ensure that excessive levels of WTCs are not used and subsequently discharged through outfalls. The permittee shall retain the logbook data for a period of at least 3 years. This period may be extended by request of the DEC.
D. **The permittee shall provide an annual report,** attached to the December DMR, containing the following information for each outfall: the current list of WTCs authorized for use and discharge by the DEC, for each WTC the amount in pounds used during the year, identification of authorized WTCs the permittee no longer uses, and any other pertinent information.

Items 16 - 17 must be completed by NYSDEC permit writer.

16. Review Decision (check the appropriate box). *Fax or mail a copy of the completed form to the person identified in item 2.c and, if appropriate, to the facility inspector.*

☐ The proposed WTC usage may proceed as proposed without permit modification subject to the conditions noted above.

☐ The proposed WTC usage may not proceed for one of the following three reasons:

- ☐ As noted below, the information provided is insufficient to complete our review.
- ☐ As noted below, the SPDES permit must first be modified to add new requirements.
- ☐ As noted below, the proposed use is prohibited.

17. Permit Writer Information:

PRINT NAME -	SIGNATURE -
TITLE -	DATE -
ADDRESS -	
TELEPHONE -	FAX -

Form WTCFX (2/02)

NYSDEC - Division of Water

Water Treatment Chemical (WTC) Usage Notification Requirements for SPDES Permittees

Instructions Page

Note: All requested information must be supplied. Incomplete submissions will not be reviewed.

Applicability

New or increased use of a WTC requires prior DEC review and authorization. At a minimum, the permittee must notify the DEC in writing of its intent to change WTC use. The DEC will review that submittal and determine if a formal SPDES permit modification is necessary or whether WTC review and authorization may proceed outside of the formal permit administrative process. **The majority of WTC authorizations do not require formal SPDES permit modification.** Notification requirements are summarized below. WTCs which are used in closed systems and cannot be discharged or those which are discharged to municipal STP do not require DEC review. Examples of WTCs include, biocides, coagulants, conditioners, corrosion inhibitors, defoamers, flocculants, scale inhibitors, sequestrants, and settling aids. DEC staff may also direct you to use this form for review and authorization of substances, other than WTCs, which could be present in wastewater, e.g. process chemicals.

Notification Requirements and Instructions

For **each** new or increased use of a WTC, please **complete items 1a, and 2 - 14 on the attached 3 page form, entitled WTC Usage Notification Requirements for SPDES Permittees.** *Alternatively*, the permittee may, at a minimum, complete items 1a, 2 - 9 and 14 then forward the form to the WTC manufacturer who must then complete the remaining items (10 - 13) and items 1b and 15. The manufacturer must then send the completed form directly to the permit writer. This alternative method may be necessary because the WTC manufacturer may be reluctant to reveal trade secret product formulations to the permittee.[1] **Fax or Mail the completed form to:**

Permit writer:	Telephone:	Fax:
Address:		

Outfall WTC Concentration - *In general,* when completing item 7b, the average mg/l should be determined by dividing the average dosage in 6a by the average flow in 7a and then dividing by 8.34; the maximum mg/l should be determined by dividing the maximum dosage in 6a by the average flow in 7a and then dividing by 8.34. *However*, for blowdowns which are highly intermittent or are not tributary to a treatment system or some form of equalization, it may be appropriate to factor in the information in item 8 when completing item 7b.

Toxicity Information - When completing item 13, please ensure that the tests were conducted in accordance with the EPA Toxicity Manual and that the results are for the appropriate receiving water (i.e. fresh water or salt water).[2] In general, submissions which do not include any toxicity information will not be authorized. Submissions containing incomplete toxicity information will be reviewed using conservative safety factors which may prevent authorization or result in the permit being modified to include routine whole effluent toxicity testing or other monitoring.

Phosphorus - The permittee must demonstrate that the use and discharge of any WTCs containing phosphorus, tributary to the Great Lakes Basin or other ponded waters, is necessary and that no acceptable alternatives exist. Please note that in some cases your permit may require modification to regulate phosphorus.

After reviewing the submission, **the permit writer will complete items 16 and 17** and fax or mail a copy of the completed form to the person identified in item 2.c and, if appropriate, to the facility inspector.

Common Reasons Which Prevent Letter Authorization of a WTC

- Submission of incomplete or inaccurate information.
- High WTC toxicity compared to available receiving stream dilution or other predicted water quality contravention.
- Department review indicates that a SPDES permit modification is necessary.

Footnotes:

(1) If requested, the Department will restrict access to trade secret information to the extent authorized by law.

(2) **Submission of both acute (48 or 96 hour LC50 or EC50) and chronic (NOEC) test results for at least one vertebrate and one invertebrate species are required.** Refer to the following three manuals: EPA/600/4-90/027F (1993); EPA/600/4-91/002 (1994); EPA/600/4-91/003 (1994); or their replacements.

Form WTCFX (2/02)

NYSDEC - Division of Water

Water Treatment Chemical (WTC) Usage Notification Requirements for SPDES Permittees

Note: All requested information must be supplied. Incomplete submissions will not be reviewed.

Permittee completes items 1a and 2 - 14. Alternatively, the permittee may complete items 1a, 2 - 9 and 14 if the WTC manufacturer completes items 1b, 10 - 13 and 15. See instructions page.

1.a. Date Signed by Permittee -	1.b. Date Signed by WTC Manufacturer - 7/11/2013
2.a. Permittee Name - Empire Resorts	2.b. SPDES No. - NYR 10W713
2.c. Contact Name - Joseph D'Amato	
3.a. WTC Name - StormKlear: LBP-2101	
3.b. WTC Manufacturer - HaloSource, Inc.	
4. WTC Function - This charging agent is used with flocculent to enhance settling and water clarification	
5. Affected Outfall(s) - Sediment basin outfall (typical one outfall)	
6.a. WTC Daily Dosage: average lbs/day = 50	, maximum lbs/day = 100
6.b. Dosage Frequency: minutes/day = 480	, days/week = <6
7.a. Outfall Flow Rate: average MGD = 0.24	, maximum MGD = 0.36
7.b. Outfall WTC Concentration: average mg/l = <0.1	, maximum mg/l = 0.1
8.a. System Blowdown Flow Rate: average gpm = N/A	, maximum gpm = N/A
8.b. System Blowdown Frequency: minutes/day = N/A	, days/week = N/A

9. List measures in place to ensure that excessive levels of WTC are not used and subsequently discharged -

1. Sediment Basin/Weir Tank and Sand Filter will be used to remove flocculated solids and WTC before discharging to existing Water Treatment System.
2. Discharge will be field tested for WTC residual.
3. Doses used are 0.5 ppm/1.0ppm (@500GPM) and are to be field tested.

10.a. WTC Composition - Ingredients/Impurities (note: ingredients/impurities must total to 100%)	10.b. %	10.c. CAS#	10.d. Outfall Concentration
Natural biopolymer composed of the following natural carbohydrate derivatives:	1.0		<0.1 mg/l
D-Glucose, D-Mannose		50-99-7, 3458-28-4	mg/l
D-Glucopyranuronic acid		6556-12-3	mg/l
6-O-acetyl-D-mannose		146611-48-5	mg/l
pyruvate acetal of D-Mannose		not registered	mg/l
Acetic Acid, water	1.0, 97.9	64-19-7, N/A	<0.1, N/A mg/l
Sodium benzoate	0.1	532-32-1	<0.1 mg/l

10.e. Intermediate/Final Degradation Products - D-Glucose, D-Mannose, D-Glucopyranuronic acid, 6-O-acetyl-D-Mannose, pyruvate acetal of D-Mannose, catechol, acetate, CO2, H2O

Form WTCFX (2/02)

NYSDEC - Division of Water

WTC Usage Notification Requirements for SPDES Permittees

1.a. Date Signed by Permittee - **8/8/2013**	1.b. Date Signed by WTC Manufacturer - 7/11/2013
2.b. SPDES No. - NYR 10W713	3.a. WTC Name - StormKlear: LBP-2101
11. WTC BOD and COD (lb/lb) - 0	
12.a. Is WTC a NYS registered biocide? No	12.b. Registration Number - N/A

13. WTC Toxicity Info (most sensitive species) - Attach description of endpoint for each EC50 and LOEC.

13.a. Vertebrate Species	LC50	EC50	NOEC	LOEC	Other -
Rainbow Trout Acute	>4000 mg/l	mg/l	4000 mg/l	mg/l	
13.b. Vertebrate Species	LC50	EC50	NOEC	LOEC	Other -
Fathead minnow acute	>4000 mg/l	mg/l	4000 mg/l	mg/l	
13.c. Invertebrate Species	LC50	EC50	NOEC	LOEC	Other -
C. Dubia chronic survival	>4000 mg/l	mg/l	4000 mg/l	mg/l	
13.d. Invertebrate Species	LC50	EC50	NOEC	LOEC	Other -
	mg/l	mg/l	mg/l	mg/l	
13.e. Species	LC50	EC50	NOEC	LOEC	Other -
	mg/l	mg/l	mg/l	mg/l	

14. Permittee Certification - I certify under penalty of law that this notification and all attachments are, to the best of my knowledge and belief, true, accurate and complete. The generic WTC usage requirements noted below will be adhered to.

PRINT NAME - Joseph A. D'Amato	SIGNATURE - Joseph A D'Amato
TITLE/COMPANY - CEO / Empire Resorts, Inc	
TELEPHONE - 845-807-0001	FAX - 845-807-0000

15. WTC Manufacturer Certification - I certify under penalty of law that this notification and all attachments are, to the best of my knowledge and belief, true, accurate and complete.

PRINT NAME - Frank Kneib	SIGNATURE - Frank Kneib
TITLE/COMPANY - Technical Director	
TELEPHONE - 425-974-1970	FAX - 425-556-4120

NYSDEC - Division of Water

WTC Usage Notification Requirements for SPDES Permittees

1.a. Date Signed by Permittee - **8/8/2013**	1.b. Date Signed by WTC Manufacturer - 7/11/2013
2.b. SPDES No. - NYR 10W713	2.c. Contact Name - Joseph D'Amato
3.a.. WTC Name - StormKlear: LBP-2101	6.a. Avg/Max Daily Dosage = 50 / 100 lbs/day

Generic WTC Usage Requirements

A. WTC use shall not exceed the rate reported by the permittee or authorized below, whichever is less.
B. The discharge shall not cause or contribute to a violation of water quality or an exceedance of AWQC.
C. **The permittee must maintain a logbook** of all WTC use, noting for each WTC the date, time, exact location,and amount of each dosage, and, the name of the individual applying or measuring the chemical. The logbook must also document that adequate process controls are in place to ensure that excessive levels of WTCs are not used and subsequently discharged through outfalls. The permittee shall retain the logbook data for a period of at least 3 years. This period may be extended by request of the DEC.
D. **The permittee shall provide an annual report**, attached to the December DMR, containing the following information for each outfall: the current list of WTCs authorized for use and discharge by the DEC, for each WTC the amount in pounds used during the year, identification of authorized WTCs the permittee no longer uses, and any other pertinent information.

Items 16 - 17 must be completed by NYSDEC permit writer.

16. Review Decision (check the appropriate box). *Fax or mail a copy of the completed form to the person identified in item 2.c and, if appropriate, to the facility inspector.*

☐ The proposed WTC usage may proceed as proposed without permit modification subject to the conditions noted above.

☐ The proposed WTC usage may not proceed for one of the following three reasons:

- ☐ As noted below, the information provided is insufficient to complete our review.
- ☐ As noted below, the SPDES permit must first be modified to add new requirements.
- ☐ As noted below, the proposed use is prohibited.

_____

_____

_____

17. Permit Writer Information:

PRINT NAME -	SIGNATURE -
TITLE -	DATE -
ADDRESS -	
TELEPHONE -	FAX -

HALOSOURCE

Date: 9/27/2011
Revision: 00

Material Safety Data Sheet
HaloKlear: LBP-2101

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Manufacturer's Name:	HaloSource, Inc.
Corporate Address:	1631 220th St. SE, Suite 100, Bothell, WA 98021
Manufacturer's Telephone:	(425) 881-6464 (Monday-Friday, 8AM-5PM PDT)
Emergency Telephone (24 Hours):	800-424-9300 CHEMTREC (Domestic, North America) 703-527-3887 CHEMTREC (International, collect calls accepted)
Material/Trade/Product Name:	**HaloKlear: LBP-2101**
Synonyms:	LBP-X1, Polymer X Liquid
Chemical Name:	Proprietary
Chemical Formula:	Proprietary
CAS No.:	Not applicable.
EPA Registration #:	Not applicable
Product Use:	Environmental water treatment, flocculation and clarification

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

CAS NO.	COMPONENT	%	OSHA HAZARDOUS?
Trade Secret	*Trade Secret*	*Trade Secret*	NO
	Other hazardous components below de minimus quantities		YES
	All other components are non-hazardous		YES

NOTE: See Section 8 for permissible exposure limits.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Milky white to clear liquid.

May be mildly irritating to eyes. Not likely to be hazardous to skin, respiratory tract, or by ingestion.

POTENTIAL HEALTH EFFECTS

EYE: May be mildly irritating to eyes.

SKIN: Not likely to be hazardous to skin.

INHALATION: Not likely to be hazardous by inhalation.

INGESTION: Not likely to be hazardous by ingestion.

CHRONIC EXPOSURE/CARCINOGENICITY: None of the components present in this material at concentrations of equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

AGGRAVATION OF PRE-EXISTING CONDITIONS: None known.

POTENTIAL ENVIRONMENTAL EFFECTS: None known.

SECTION 4: FIRST AID MEASURES

FIRST AID PROCEDURES

EYE CONTACT: Remove contact lenses (if applicable), flush with water for 15 minutes. Call a physician.

SKIN CONTACT: Cleansing the skin after exposure is advisable.

INHALATION: If large amounts of fumes are inhaled, remove to fresh air and consult a physician.

INGESTION: Consult a physician if necessary.

NOTE TO PHYSICIANS: None.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: Not available
UPPER FLAMMABLE LIMIT: Not available
FLAMMABLITY CLASS (OSHA): Not applicable
AUTOIGNITION TEMPERATURE: Not available
LOWER FLAMMABLE LIMIT: Not available
FLAME PROPAGATION/BURNING RATE: Not available

UNIQUE FIRE PROPERTIES: None known.

HAZARDOUS COMBUSTION PRODUCTS: None.

EXTINGUISHING MEDIA: Does not burn. Use water, dry chemicals, carbon dioxide, sand or foam. Use extinguishing media appropriate for surrounding fire.

PROTECTION OF FIREFIGHTERS: Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coat, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Water may be used to keep fire-exposed containers cool until fire is out.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: See Section 8 (Personal Protective Equipment).

ENVIRONMENTAL PRECAUTIONS: None known.

METHODS FOR CLEANING UP: Contain large spills and pump to recover. Small spills can be mopped up and recovered.

SECTION 7: HANDLING AND STORAGE

SAFE *HANDLING* RECOMMENDATIONS

VENTILATION: General ventilation should be sufficient under normal conditions.

FIRE PREVENTION: Non-flammable, no special fire protection required.

SPECIAL HANDLING REQUIREMENTS: Avoid eye contact.

SAFE *STORAGE* RECOMMENDATIONS

CONTAINMENT: The container should be kept covered to prevent contamination.

STORAGE ROOM RECOMMENDATIONS: Store in a cool, dry, well-ventilated area away from direct heat.

INCOMPATIBLE MATERIALS: None known.

STORAGE CONDITIONS: Store in cool, dry place. Keep container closed when not in use; keep out of the reach of children.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General ventilation

PERSONAL PROTECTIVE EQUIPMENT (PPE)

EYE/FACE PROTECTION: Safety glasses are recommended under normal conditions.

SKIN PROTECTION: Avoid contact with skin.

HAND PROTECTION: Chemical resistant gloves are recommended to minimize potential irritation from handling.

RESPIRATORY PROTECTION: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. Respirator use is not required for this product.

GOOD HYGEIENE/WORK PRACTICES: Always follow good hygiene/work practices by avoiding vapors or mists and contact with eyes and skin. Thoroughly wash hands after handling and before eating or drinking. Always wear the appropriate PPE when repairing or performing maintenance on contaminated equipment.

EXPOSURE GUIDELINES

PERMISSIBLE EXPOSURE LIMITS						
INGREDIENT CAS NO.	OSHA		WISHA		ACGIH (TLV)	
	TWA	STEL	TWA	STEL	TWA	STEL
Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Milky white to clear
PHYSICAL FORM: Liquid
pH: 3.4 – 3.8
VAPOR DENSITY: Not known
MELTING POINT: Not known
SOLUBILITY IN WATER: Fully soluble
SHAPE: Liquid
ODOR: Faint vinegar odor
VAPOR PRESSURE: Not known
BOILING POINT: Not known
FREEZING POINT: Not known
SPECIFIC GRAVITY OR DENSITY: 0.95-0.99 g/cc

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Values should not be construed as a guaranteed analysis of any specific lot or as specifications.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable

CONDITIONS TO AVOID: None known

MATERIALS TO AVOID (INCOMPATIBILITY): None known

HAZARDOUS DECOMPOSITION PRODUCTS: None known

HAZARDOUS POLYMERIZATION: Will not occur

SECTION 11: TOXICOLOGICAL INFORMATION

ORAL LD_{50} (rat): Not available

DERMAL LD_{50} (rabbit): Not available

DERMAL LD_{50} (rat): Not available

SKIN IRRITATION: Not available

EYE IRRITATION: Not available

SKIN SENSITIZATION: Not available

ADDITIONAL INFORMATION: Not available

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY:

- Acute LC_{50}/LC_{25} Rainbow Trout = >4000 mg/L/96 hr
- NOEC Acute Rainbow Trout = 4000 mg/L/96 hr
- Acute LC_{50}/LC_{25} Fathead Minnow = >4000 mg/L/96 hr
- NOEC Acute Fathead Minnow = 4000 mg/L/96 hr
- Chronic Survival LC_{50}/LC_{25} C. Dubia = >4000 mg/L/7 day
- NOEC Chronic Survival C. Dubia = 4000 mg/L/7 day

- Chronic Reproduction LC_{25} C. Dubia = 694 mg/L/7 day
- NOEC Chronic Reproduction C. Dubia = 500 mg/L/7 day

MOBILITY: Not available

PERSISTENCE AND DEGRADABILITY: Not available

BIOACCUMULATIVE POTENTIAL: Not available

ADDITIONAL INFORMATION: Not available

SECTION 13: DISPOSAL CONSIDERATIONS

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

NOTE: Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT):

Proper Shipping Name:	Not Regulated
Hazard Class:	Not Regulated
Identification Number (UN Number):	Not Regulated
Packing Group (PG):	Not Regulated

SECTION 15: REGULATORY INFORMATION

TSCA STATUS: Components are listed

CERCLA REPORTABLE QUANTITY (RQ):

CHEMICAL NAME	RQ
Not applicable	Not applicable

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (EHS):

CHEMICAL NAME	TPQ	RQ
Not applicable	Not applicable	Not applicable

SARA TITLE III SECTION 311/312 HAZARD CATEGORIES: Does this product/material meet the definition of the following hazard classes according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of SARA Title III?

ACUTE HEALTH HAZARD	CHRONIC HEALTH HAZARD	FIRE HAZARD	REACTIVE HAZARD	SUDDEN RELEASE OF PRESSURE
NO	NO	NO	NO	NO

SARA TITLE III SECTION 313 TOXIC CHEMICALS INFORMATION:

CHEMICAL NAME	CAS NO.	CONCENTRATION (%)
Not applicable	Not applicable	Not applicable

CALIFORNIA PROPOSITION 65: The following chemical(s) is/are known to the state of California to cause cancer or reproductive toxicity:

CHEMICAL NAME	CAS NO.	CONCENTRATION (%)
Not applicable	Not applicable	Not applicable

SECTION 16: OTHER INFORMATION

REVISION INFORMATION:
MSDS sections(s) changed since last revision of document:

- None, this is a new MSDS.

DISCLAIMER:
****
The above information is based upon information HaloSource, Inc. believes to be reliable and is supplied for informational purposes only. HaloSource, Inc. disclaims any liability for damage which results from the use of the above information and nothing contained therein shall constitute a guarantee, warranty (including fitness for a particular purpose) or representation with respect to the accuracy or completeness of the data, the product described or their use for any specific purpose even if that purpose is known to HaloSource, Inc. The final determination of the suitability of the information, the manner of use of the information or product and potential infringement is the sole responsibility of the user.
****

MSDS PREPARED BY: Jeremy Heath, EH&S Manager

HALOSOURCE

Date: 9/27/2011
Revision: 00

Material Safety Data Sheet
HaloKlear® LiquiFloc™ 1%

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Manufacturer's Name:	HaloSource, Inc.
Corporate Address:	1631 220th St. SE, Suite 100, Bothell, WA 98021
Manufacturer's Telephone:	(425) 881-6464 (Monday-Friday, 8AM-5PM PDT)
Emergency Telephone (24 Hours):	**800-424-9300 CHEMTREC (Domestic, North America)** **703-527-3887 CHEMTREC (International, collect calls accepted)**
Material/Trade/Product Name:	**HaloKlear® LiquiFloc™ 1%**
Synonyms:	None
Chemical Name:	Chitosan Acetate Solution
Chemical Formula:	Not available
CAS No.:	Not applicable
EPA Registration #:	Not applicable
Product Use:	Flocculates soil contamination in stormwater.

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

CAS NO.	COMPONENT	%	OSHA HAZARDOUS?
Trade Secret	Trade Secret	2	NO
	All other components are non-hazardous.	98	NO

NOTE: See Section 8 for permissible exposure limits.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Clear to pale yellow viscous liquid with a pungent vinegar odor.

May be mildly irritating to eyes. Not likely to be hazardous to skin, respiratory tract, or by ingestion.

POTENTIAL HEALTH EFFECTS

EYE: May be mildly irritating to eyes.

SKIN: Not hazardous to skin.

INHALATION: Not likely to be hazardous by inhalation.

INGESTION: Not likely to be hazardous by ingestion.

CHRONIC EXPOSURE/CARCINOGENICITY: None of the components present in this material at concentrations of equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

SIGNS AND SYMPTOMS OF OVEREXPOSURE: Eye irritation.

AGGRAVATION OF PRE-EXISTING CONDITIONS: None known.

POTENTIAL ENVIRONMENTAL EFFECTS: Material is 100% biodegradable and nontoxic.

SECTION 4: FIRST AID MEASURES

FIRST AID PROCEDURES

EYE CONTACT: Remove contact lenses (if applicable), flush with water for 15 minutes. Call a physician.

SKIN CONTACT: Cleansing the skin after exposure is advisable.

INHALATION: If large amounts of fumes are inhaled, remove to fresh air and consult a physician.

INGESTION: Consult a physician if necessary.

NOTE TO PHYSICIANS: None.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: Not available
UPPER FLAMMABLE LIMIT: Not available
FLAMMABLITY CLASS (OSHA): Not applicable

AUTOIGNITION TEMPERATURE: Not available
LOWER FLAMMABLE LIMIT: Not available
FLAME PROPAGATION/BURNING RATE: Not available

UNIQUE FIRE PROPERTIES: None known.

HAZARDOUS COMBUSTION PRODUCTS: None.

EXTINGUISHING MEDIA: Does not burn. Use water, dry chemicals, carbon dioxide, sand or foam. Use extinguishing media appropriate for surrounding fire.

PROTECTION OF FIREFIGHTERS: Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coat, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Water may be used to keep fire-exposed containers cool until fire is out.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: See Section 8 (Personal Protective Equipment).

ENVIRONMENTAL PRECAUTIONS: Material is 100% biodegradable and nontoxic.

METHODS FOR CLEANING UP: Dilute with water and hose down.

SECTION 7: HANDLING AND STORAGE

SAFE *HANDLING* RECOMMENDATIONS

VENTILATION: General ventilation should be sufficient under normal conditions.

FIRE PREVENTION: Non-flammable, no special fire protection required.

SPECIAL HANDLING REQUIREMENTS: Avoid eye contact.

SAFE *STORAGE* RECOMMENDATIONS

CONTAINMENT: The container should be kept covered to prevent contamination.

STORAGE ROOM RECOMMENDATIONS: Store in a cool, dry, well-ventilated area away from direct heat.

INCOMPATIBLE MATERIALS: Strong oxidizing material and strong bases.

STORAGE CONDITIONS: 10-50°C recommended (will freeze @ ~3°C). Shelf life is indefinite but viscosity will decrease over time.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General ventilation should be sufficient under normal conditions.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

EYE/FACE PROTECTION: Safety glasses recommended.

SKIN PROTECTION: For operations where skin contact can occur, wear impervious clothing such as apron, boots, or whole bodysuit.

HAND PROTECTION: For operations where hand contact can occur, rubber gloves recommended.

RESPIRATORY PROTECTION: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. Respirator use is not required for this product.

GOOD HYGEIENE/WORK PRACTICES: Always follow good hygiene/work practices by avoiding vapors or mists and contact with eyes and skin. Thoroughly wash hands after handling and before eating or drinking. Always wear the appropriate PPE when repairing or performing maintenance on contaminated equipment.

EXPOSURE GUIDELINES

PERMISSIBLE EXPOSURE LIMITS						
INGREDIENT CAS NO.	OSHA		WISHA		ACGIH (TLV)	
	TWA	STEL	TWA	STEL	TWA	STEL
Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Clear to pale yellow
PHYSICAL FORM: Viscous liquid
pH: 3.0-4.5
VAPOR DENSITY: Not available
MELTING POINT: Not available
SOLUBILITY IN WATER: Soluble
SHAPE: Viscous liquid
ODOR: Pungent vinegar odor
VAPOR PRESSURE: Not available
BOILING POINT: 211°F
FREEZING POINT: Not available
SPECIFIC GRAVITY OR DENSITY: 1.0-1.1 g/mL

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Values should not be construed as a guaranteed analysis of any specific lot or as specifications.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable.

CONDITIONS TO AVOID: Freezing temperatures or excess heat (for quality purposes).

MATERIALS TO AVOID (INCOMPATIBILITY): Strong oxidizing material and strong bases.

HAZARDOUS DECOMPOSITION PRODUCTS: Decomposition will not occur.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

ORAL LD_{50} (rat): Not available.

DERMAL LD_{50} (rabbit): Not available.

SKIN IRRITATION: Not available.

EYE IRRITATION: Not available.

SKIN SENSITIZATION: Not available.

ADDITIONAL INFORMATION:

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY (in water):

- Acute:
  - Daphnia LC 50 – 1369 mg/ L
  - Daphnia NOEC – 1000 mg/L
  - Fathead minnows LC 50 – 642 mg/L
  - Fathead minnows NOEC – 500 mg/L
  - Rainbow Trout LC 50 – 173mg/L
  - Rainbow Trout NOEC – 125 mg/L
- Chronic:
  - Rainbow Trout LC 50 – 154 mg /L

- Rainbow Trout LC 25 – 121 mg/L
- Fathead Minnow LC 50 - > 1000 mg/L
- Fathead Minnow LC25 – 932 mg/L

MOBILITY: Not available.

PERSISTENCE AND DEGRADABILITY: Not available.

BIOACCUMULATIVE POTENTIAL: Not available.

ADDITIONAL INFORMATION: Not available.

SECTION 13: DISPOSAL CONSIDERATIONS

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

NOTE: Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT):

Proper Shipping Name:	Not Regulated
Hazard Class:	Not Regulated
Identification Number (UN Number):	Not Regulated
Packing Group (PG):	Not Regulated

SECTION 15: REGULATORY INFORMATION

TSCA STATUS: The substances in this preparation are included on or exempted from the TSCA 8(b) inventory (40 CFR 710).

CERCLA REPORTABLE QUANTITY (RQ):

CHEMICAL NAME	RQ
Not applicable	Not applicable

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (EHS):

CHEMICAL NAME	TPQ	RQ
Not applicable	Not applicable	Not applicable

SARA TITLE III SECTION 311/312 HAZARD CATEGORIES: Does this product/material meet the definition of the following hazard classes according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of SARA Title III?

ACUTE HEALTH HAZARD	CHRONIC HEALTH HAZARD	FIRE HAZARD	REACTIVE HAZARD	SUDDEN RELEASE OF PRESSURE
NO	NO	NO	NO	NO

SARA TITLE III SECTION 313 TOXIC CHEMICALS INFORMATION:

CHEMICAL NAME	CAS NO.	CONCENTRATION (%)
Not applicable	Not applicable	Not applicable

CALIFORNIA PROPOSITION 65: The following chemical(s) is/are known to the state of California to cause cancer or reproductive toxicity:

CHEMICAL NAME	CAS NO.	CONCENTRATION (%)
Not applicable	Not applicable	Not applicable

SECTION 16: OTHER INFORMATION

REVISION INFORMATION:
MSDS sections(s) changed since last revision of document:

- None, this is a new MSDS.

DISCLAIMER:
****
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MSDS PREPARED BY: Jeremy Heath, EH&S Manager

HALOSOURCE

Date: 9/27/2011
Revision: 00

Material Safety Data Sheet
HaloKlear: LBP-2101

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

Manufacturer's Name:	HaloSource, Inc.
Corporate Address:	1631 220th St. SE, Suite 100, Bothell, WA 98021
Manufacturer's Telephone:	(425) 881-6464 (Monday-Friday, 8AM-5PM PDT)
Emergency Telephone (24 Hours):	800-424-9300 CHEMTREC (Domestic, North America) 703-527-3887 CHEMTREC (International, collect calls accepted)
Material/Trade/Product Name:	**HaloKlear: LBP-2101**
Synonyms:	LBP-X1, Polymer X Liquid
Chemical Name:	Proprietary
Chemical Formula:	Proprietary
CAS No.:	Not applicable.
EPA Registration #:	Not applicable
Product Use:	Environmental water treatment, flocculation and clarification

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

CAS NO.	COMPONENT	%	OSHA HAZARDOUS?
Trade Secret	*Trade Secret*	*Trade Secret*	NO
	Other hazardous components below de minimus quantities		YES
	All other components are non-hazardous		YES

NOTE: See Section 8 for permissible exposure limits.

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

Milky white to clear liquid.

May be mildly irritating to eyes. Not likely to be hazardous to skin, respiratory tract, or by ingestion.

POTENTIAL HEALTH EFFECTS

EYE: May be mildly irritating to eyes.

SKIN: Not likely to be hazardous to skin.

INHALATION: Not likely to be hazardous by inhalation.

INGESTION: Not likely to be hazardous by ingestion.

CHRONIC EXPOSURE/CARCINOGENICITY: None of the components present in this material at concentrations of equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

AGGRAVATION OF PRE-EXISTING CONDITIONS: None known.

POTENTIAL ENVIRONMENTAL EFFECTS: None known.

SECTION 4: FIRST AID MEASURES

FIRST AID PROCEDURES

EYE CONTACT: Remove contact lenses (if applicable), flush with water for 15 minutes. Call a physician.

SKIN CONTACT: Cleansing the skin after exposure is advisable.

INHALATION: If large amounts of fumes are inhaled, remove to fresh air and consult a physician.

INGESTION: Consult a physician if necessary.

NOTE TO PHYSICIANS: None.

SECTION 5: FIRE FIGHTING MEASURES

FLASH POINT: Not available
UPPER FLAMMABLE LIMIT: Not available
FLAMMABLITY CLASS (OSHA): Not applicable
AUTOIGNITION TEMPERATURE: Not available
LOWER FLAMMABLE LIMIT: Not available
FLAME PROPAGATION/BURNING RATE: Not available

UNIQUE FIRE PROPERTIES: None known.

HAZARDOUS COMBUSTION PRODUCTS: None.

EXTINGUISHING MEDIA: Does not burn. Use water, dry chemicals, carbon dioxide, sand or foam. Use extinguishing media appropriate for surrounding fire.

PROTECTION OF FIREFIGHTERS: Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coat, gloves and rubber boots), including a positive pressure NIOSH approved self-contained breathing apparatus. Water may be used to keep fire-exposed containers cool until fire is out.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PROTECTIVE EQUIPMENT: See Section 8 (Personal Protective Equipment).

ENVIRONMENTAL PRECAUTIONS: None known.

METHODS FOR CLEANING UP: Contain large spills and pump to recover. Small spills can be mopped up and recovered.

SECTION 7: HANDLING AND STORAGE

SAFE *HANDLING* RECOMMENDATIONS

VENTILATION: General ventilation should be sufficient under normal conditions.

FIRE PREVENTION: Non-flammable, no special fire protection required.

SPECIAL HANDLING REQUIREMENTS: Avoid eye contact.

SAFE *STORAGE* RECOMMENDATIONS

CONTAINMENT: The container should be kept covered to prevent contamination.

STORAGE ROOM RECOMMENDATIONS: Store in a cool, dry, well-ventilated area away from direct heat.

INCOMPATIBLE MATERIALS: None known.

STORAGE CONDITIONS: Store in cool, dry place. Keep container closed when not in use; keep out of the reach of children.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: General ventilation

PERSONAL PROTECTIVE EQUIPMENT (PPE)

EYE/FACE PROTECTION: Safety glasses are recommended under normal conditions.

SKIN PROTECTION: Avoid contact with skin.

HAND PROTECTION: Chemical resistant gloves are recommended to minimize potential irritation from handling.

RESPIRATORY PROTECTION: A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use. Respirator use is not required for this product.

GOOD HYGEIENE/WORK PRACTICES: Always follow good hygiene/work practices by avoiding vapors or mists and contact with eyes and skin. Thoroughly wash hands after handling and before eating or drinking. Always wear the appropriate PPE when repairing or performing maintenance on contaminated equipment.

EXPOSURE GUIDELINES

PERMISSIBLE EXPOSURE LIMITS						
INGREDIENT CAS NO.	OSHA		WISHA		ACGIH (TLV)	
	TWA	STEL	TWA	STEL	TWA	STEL
Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Milky white to clear
PHYSICAL FORM: Liquid
pH: 3.4 – 3.8
VAPOR DENSITY: Not known
MELTING POINT: Not known
SOLUBILITY IN WATER: Fully soluble
SHAPE: Liquid
ODOR: Faint vinegar odor
VAPOR PRESSURE: Not known
BOILING POINT: Not known
FREEZING POINT: Not known
SPECIFIC GRAVITY OR DENSITY: 0.95-0.99 g/cc

NOTE: These physical data are typical values based on material tested but may vary from sample to sample. Values should not be construed as a guaranteed analysis of any specific lot or as specifications.

SECTION 10: STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable

CONDITIONS TO AVOID: None known

MATERIALS TO AVOID (INCOMPATIBILITY): None known

HAZARDOUS DECOMPOSITION PRODUCTS: None known

HAZARDOUS POLYMERIZATION: Will not occur

SECTION 11: TOXICOLOGICAL INFORMATION

ORAL LD_{50} (rat): Not available

DERMAL LD_{50} (rabbit): Not available

DERMAL LD_{50} (rat): Not available

SKIN IRRITATION: Not available

EYE IRRITATION: Not available

SKIN SENSITIZATION: Not available

ADDITIONAL INFORMATION: Not available

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY:

- Acute LC_{50}/LC_{25} Rainbow Trout = >4000 mg/L/96 hr
- NOEC Acute Rainbow Trout = 4000 mg/L/96 hr
- Acute LC_{50}/LC_{25} Fathead Minnow = >4000 mg/L/96 hr
- NOEC Acute Fathead Minnow = 4000 mg/L/96 hr
- Chronic Survival LC_{50}/LC_{25} C. Dubia = >4000 mg/L/7 day
- NOEC Chronic Survival C. Dubia = 4000 mg/L/7 day

- Chronic Reproduction LC_{25} C. Dubia = 694 mg/L/7 day
- NOEC Chronic Reproduction C. Dubia = 500 mg/L/7 day

MOBILITY: Not available

PERSISTENCE AND DEGRADABILITY: Not available

BIOACCUMULATIVE POTENTIAL: Not available

ADDITIONAL INFORMATION: Not available

SECTION 13: DISPOSAL CONSIDERATIONS

If this product as supplied becomes a waste, it does not meet the criteria of a hazardous waste as defined under the Resource Conservation and Recovery Act (RCRA) 40 CFR 261. Please be advised that state and local requirements for waste disposal may be more restrictive or otherwise different from federal regulations. Consult state and local regulations regarding the proper disposal of this material.

NOTE: Chemical additions, processing or otherwise altering this material may make the waste management information presented in this MSDS incomplete, inaccurate or otherwise inappropriate.

SECTION 14: TRANSPORT INFORMATION

U.S. DEPARTMENT OF TRANSPORTATION (DOT):

Proper Shipping Name:	Not Regulated
Hazard Class:	Not Regulated
Identification Number (UN Number):	Not Regulated
Packing Group (PG):	Not Regulated

SECTION 15: REGULATORY INFORMATION

TSCA STATUS: Components are listed

CERCLA REPORTABLE QUANTITY (RQ):

CHEMICAL NAME	RQ
Not applicable	Not applicable

SARA TITLE III SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES (EHS):

CHEMICAL NAME	TPQ	RQ
Not applicable	Not applicable	Not applicable

SARA TITLE III SECTION 311/312 HAZARD CATEGORIES: Does this product/material meet the definition of the following hazard classes according to the EPA 'Hazard Categories' promulgated under Sections 311 and 312 of SARA Title III?

ACUTE HEALTH HAZARD	CHRONIC HEALTH HAZARD	FIRE HAZARD	REACTIVE HAZARD	SUDDEN RELEASE OF PRESSURE
NO	NO	NO	NO	NO

SARA TITLE III SECTION 313 TOXIC CHEMICALS INFORMATION:

CHEMICAL NAME	CAS NO.	CONCENTRATION (%)
Not applicable	Not applicable	Not applicable

CALIFORNIA PROPOSITION 65: The following chemical(s) is/are known to the state of California to cause cancer or reproductive toxicity:

CHEMICAL NAME	CAS NO.	CONCENTRATION (%)
Not applicable	Not applicable	Not applicable

SECTION 16: OTHER INFORMATION

REVISION INFORMATION:
MSDS sections(s) changed since last revision of document:

- None, this is a new MSDS.

DISCLAIMER:
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****

MSDS PREPARED BY: Jeremy Heath, EH&S Manager

HaloKlear®

Jar Test Instructions for HaloKlear Biopolymers

Reliable and effective TSS and turbidity control.

- **BMPs for Sediment Control**
- **Dewatering**
- **General Water Treatment**

Purposes of the Jar Test:

1. To determine the proper dose for HaloKlear biopolymers
2. To determine which products and in what combination will provide best results
3. To determine the proper injection rate when using liquid biopolymers

HaloKlear Biopolymer Field Test Instructions

Jar Test Materials:

HaloKlear LiquiFloc 1% and LBP-2101 (supplied)
Several 1 liter clear jars for testing
2 to 3 liters of representative turbid water sample to be treated

Jar Test Method for Single Biopolymer Test Instructions:

1. Obtain 1 liter source sample water for testing
2. Add 1 drop of HaloKlear LiquiFloc 1%
3. Shake sample, then let stand for several minutes
4. Repeat steps 2 through 4 as needed until flocculation occurs and desired result reached. Count the number of drops used.

Jar Test Method for Dual Biopolymer Test Instructions:

Step 1:

1. Obtain 1 Liter of source sample water for testing
2. Add 1 drop of HaloKlear LBP-2101
3. Shake sample
4. Add 1 drop of HaloKlear LiquiFloc 1%
5. Shake sample, then let stand for several minutes
6. Repeat steps 2 through 6 as needed until flocculation occurs and desired results reached. Count the number of drops used and continue on to Step 2.

Step 2:

1. Obtain 1 liter of source sample water for testing
2. Once Step 1 above has been concluded, add the total number of drops of LBP-2101 all at once and shake well.
3. Add 1 drop of HaloKlear LiquiFloc 1%
4. Shake sample and let stand for several minutes
5. Repeat steps 3-4 as needed until flocculation occurs and desired results reached. Count the number

Note: In a liter, each drop of HaloKlear LBP-2101 is equal to 0.5ppm active (50 ppm of product). Each drop of HaloKlear LiquiFloc 1% is equal to 0.5ppm active.

For laboratory method using a dilution series for obtaining results, please contact HaloKlear at info@haloklear.com. If you have any questions, please contact HaloKlear at 1-888-282-6766.

Injection Rate Table Directions:

1. Determine the target flow rate (left hand column).
2. Locate the dose (top row) that was determined from the jar test method for single biopolymer and the jar test method for dual biopolymer test above.
3. The Injection Rate Table is designed for HaloKlear LBP-2101 and HaloKlear Liquifloc 1%. Determine the rate in milliliters per min (mL/min) or gallons per hour (gph).
4. If using HaloKlear LiquiFloc 2% instead of LiquiFloc 1%, divide the value from step C by 2. If using HaloKlear LiquiFloc 3% divide the value from step C by 3.

*For accurate dosing, refer to the HaloKlear Dose Calculator.

Biopolymer Injection Rate Table

Flow Rate	Active Biopolymer Dose			
	0.25 mg/L (0.25 ppm)	**0.5 mg/L (0.5 ppm)**	**0.75 mg/L (0.75 ppm)**	**1.0 mg/L (1.0 ppm)**
100 gpm	9.4 mL/min. or 0.15 gph	19 mL/min. or 0.30 gph	28 mL/min. or 0.45 gph	38 mL/min. or 0.60 gph
200 gpm	19 mL/min. or 0.30 gph	38 mL/min. or 0.60 gph	57 mL/min. or 0.90 gph	75 mL/min. or 1.2 gph
300 gpm	28 mL/min. or 0.45 gph	57 mL/min. or 0.90 gph	85 mL/min. or 1.3 gph	110 mL/min. or 1.8 gph
400 gpm	38 mL/min. or 0.60 gph	75 mL/min. or 1.2 gph	110 mL/min. or 1.8 gph	150 mL/min. or 2.4 gph
500 gpm	47 mL/min. or 0.75 gph	94 mL/min. or 1.5 gph	140 mL/min. or 2.2 gph	190 mL/min. or 3.0 gph
600 gpm	57 mL/min. or 0.90 gph	110 mL/min. or 1.8 gph	170 mL/min. or 2.7 gph	230 mL/min. or 3.6 gph
700 gpm	66 mL/min. or 1.0 gph	130 mL/min. or 2.1 gph	200 mL/min. or 3.1 gph	260 mL/min. or 4.2 gph
800 gpm	75 mL/min. or 1.2 gph	150 mL/min. or 2.4 gph	230 mL/min. or 3.6 gph	300 mL/min. or 4.8 gph
900 gpm	85 mL/min. or 1.3 gph	170 mL/min. or 2.7 gph	250 mL/min. or 4.0 gph	340 mL/min. or 5.4 gph
1000 gpm	94 mL/min. or 1.5 gph	190 mL/min. or 3.0 gph	280 mL/min. or 4.5 gph	380 mL/min. or 6.0 gph

Calculated HaloKlear GelFloc or DBP-2100 Dose:

Each HaloKlear GelFloc or DBP-2100 sock will normally treat 100,000 to 125,000 gallons of turbid water. Some applications may allow the sock to treat more water.

One HaloKlear GelFloc FS or DBP-2100 FS sock in 100,000 gallons of water will have an average dose of 2.64 mg/L or 2.11 mg/L if 125,000 gallons are treated.

The HaloKlear Residual Biopolymer Test Kit can detect the presence of biopolymer at less than 0.1 mg/L, below toxicity concerns.

HaloKlear water treatment products are natural, proven, and cost-effective flocculants for sediment control.

HaloKlear LiquiFloc 1%
Classic Strength

- **Proven track record of treating billions of** gallons of stormwater
- **Meets even the most stringent regulatory** requirements
- **Easily used, even in cold climate applications**

HaloKlear LBP-2101
Natural Biopolymer Charging Agent

- **100% biodegradable using natural** ingredients
- **Used in conjunction with HaloKlear flocculants**
- **Liquid form for highly accurate dosing** requirements

HaloKlear GelFloc
Flocculant/Clarifier

- **Provides consistent performance**
- **Segmented to prevent bunching for maximum** effectiveness
- **Can be used in settling, enhanced filtration,** and pretreatment
- **Contains a substantially higher percentage of** chitosan than liquid forms

HaloKlear DBP-2100
Natural Biopolymer Charging Agent

- **100% biodegradable using natural ingredients**
- **Used in conjunction with HaloKlear flocculants**
- **Dry concentrate for cost effective applications** and easy handling

HaloSource, Inc.

HaloKlear is a division of HaloSource, Inc. HaloSource is a recognized worldwide leader in clean water and antimicrobial technology and a creator of cutting-edge solutions that benefit people and the planet.

Founded in 2002 in Seattle, Washington, HaloSource has grown to become an influential global innovator with offices and processing plants all over the world, including Bangalore, India and China.

We are partnering with top companies and thought leaders across the globe to make water better.

HaloKlear®

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1725 220th St SE, Ste 103
Bothell, WA 98021
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www.halosource.com

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Rainier ENVIRONMENTAL

Toxicity Testing of DPS

December 2012

Report date: January 14, 2012

Submitted to:

HaloSource
1725 220th Street SE Suite 102
Bothell, WA 98021

5013 Pacific Hwy East
Suite 20
Tacoma, WA 98424

1.0 INTRODUCTION

Toxicity testing was conducted using DPS, a combination of LPB-2101 and LiquiFloc 1% as manufactured and distributed by HaloSource. The sample was received from Nautilus Environmental and stored at 4°C in the dark until used for testing. Testing was conducted using the test organism *Pimephales promelas* (fathead minnow). Testing was performed at Rainier Environmental Laboratory located in Tacoma, Washington.

2.0 METHODS

A chronic test was conducted using fathead minnows. This test involved a 7-day exposure and was evaluated for survival and growth. Methods for this test are summarized in Table 1.

The concentration is based on the highest concentration expected during standard use. For this test, 672 mg of the sample LBP-2101 was weighed and added to 2 liters of dilution water. Then 336 mg of LiquiFloc 1% was added to the same 2 liters of water to achieve the highest test concentration (100%). The test solution was thoroughly mixed prior to dilutions. Dilutions were then made from this stock solution. Test dilutions were allowed to acclimate for one hour prior to use. This procedure was repeated daily for all renewal solutions.

Control water for both of the tests, was moderately hard synthetic water, prepared by addition of reagent grade salts into deionized water to achieve a hardness of 80 to 100 mg/L.

Table 1. Summary of conditions for the fathead minnow 7-day survival and growth test.

Test initiation date and time	12/14/2012; 1615h
Test termination date and time	12/21/2012; 1530h
Test organism	*Pimephales promelas*
Test organism source	Aquatic BioSystems; Fort Collins, CO
Test organism age	< 24 hours
Feeding	*Artemia* nauplii, twice daily
Test chamber	500 mL plastic cup
Test solution volume	250 mL
Test temperature	25 ± 1°C
Dilution water	Moderately hard synthetic water
Test concentrations (% sample)	100, 50, 25, 12.5, 6.25, control
Number of organisms/chamber	10
Number of replicates	4
Photoperiod	16 hours light/8 hours dark
Aeration	None
Test protocol	EPA-821-R-02-013
Test acceptability criteria for controls	≥ 80% survival; average dry weight ≥ 0.25 mg
Reference toxicant	Sodium chloride

3.0 RESULTS

Results of the test evaluating survival and growth of fathead minnows are provided in Table 2.

The median lethal concentration (LC50) in the chronic fathead minnow test was >100% DPS. The median effect concentration (EC50) was also >100% DPS. There was no toxicity observed in the test.

Table 2. Results for 7-day survival and growth tests using fathead minnows.

	Fathead minnow	
DPS %	Survival (% ± S.D.)	Biomass (mg ± S.D.)
Control	97.5 ± 5.0	0.526 ± 0.017
6.25	97.5 ± 5.0	0.583 ± 0.083
12.5	95.0 ± 5.8	0.565 ± 0.073
25	95.0 ± 5.8	0.542 ± 0.018
50	97.5 ± 5.0	0.523 ± 0.032
100	95.0 ± 5.8	0.488 ± 0.049
Endpoints (% DPS)		
NOEC	100	100
LOEC	>100	>100
LC50	>100	
LC25	>100	
EC50[1]		>100
EC25[2]		>100

[1] Predicted to cause 50% reduction in growth in test organisms, [2] Predicted to cause 25% reduction in growth in test organisms

4.0 QA/QC

The toxicity test met all acceptability criteria for performance of control organisms. There were no deviations from the protocols and all water quality parameters remained within the ranges specified in the corresponding test method throughout the test.

Results for the reference toxicant test used to monitor laboratory performance and test organism sensitivity are summarized in Table 3. The results for the reference toxicant test fell within the acceptable range of mean ± two standard deviations of historical test results. The coefficients of variation (CVs) for the endpoints are also shown in the table. Based on the reference toxicant results, test organisms appeared to be of an appropriate degree of sensitivity.

Individual statistical summaries for all tests, copies of the laboratory bench sheets, control QC plots and chains of custody are provided in Appendices A through C.

Table 3. Reference toxicant test results.

Species	Endpoint	Date initiated	LC_{50}/EC_{50}	Acceptable Range	CV (%)
Fathead Minnow	7d survival	12/14/2012	4.32 g/L NaCl	3.02 - 5.45 g/L	15.9
	7d growth	12/14/2012	4.50 g/L NaCl	2.12 - 5.77 g/L	28.5

REFERENCES

Tidepool Scientific Software. 2001-2011. CETIS Comprehensive Environmental Toxicity Information System Software, Version 1.8.4.6.

USEPA. 2002a. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition. EPA-821-R-02-012. Pp.51-52, 55-56.

USEPA. 2002b. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition. EPA-821-R-02-013. Pp. 141-196, 53-111.

Appendix A
Fathead Minnow Survival and Growth Chronic Test
Statistical Summaries and Raw Bench Sheets

CETIS Summary Report

Fathead Minnow 7-d Larval Survival and Growth Test — **Rainier Environmental Laboratory**

Batch ID:	11-0507-6106	**Test Type:**	Growth-Survival (7d)	**Analyst:**	Eric Tollefson
Start Date:	14 Dec-12 16:15	**Protocol:**	EPA/821/R-02-013 (2002)	**Diluent:**	Mod-Hard Synthetic Water
Ending Date:	21 Dec-12 15:30	**Species:**	Pimephales promelas	**Brine:**	
Duration:	6d 23h	**Source:**	Aquatic Biosystems, CO	**Age:**	<24h
Sample ID:	17-9745-6194	**Code:**	12-057	**Client:**	Halo Source
Sample Date:	05 Dec-12 12:30	**Material:**	Chemical Product	**Project:**	
Receive Date:	12 Dec-12 14:30	**Source:**	Halo Source		
Sample Age:	9d 4h	**Station:**	DPS		

Comparison Summary

Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
15-2344-2472	7d Survival Rate	100	>100	NA	9.45%	1	Steel Many-One Rank Sum Test
01-1400-2092	Mean Dry Biomass-mg	100	>100	NA	16.8%	1	Dunnett Multiple Comparison Test

Point Estimate Summary

Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method
05-2446-8878	7d Survival Rate	LC5	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)
		LC10	>100	N/A	N/A	<1	
		LC15	>100	N/A	N/A	<1	
		LC20	>100	N/A	N/A	<1	
		LC25	>100	N/A	N/A	<1	
		LC40	>100	N/A	N/A	<1	
		LC50	>100	N/A	N/A	<1	
00-2582-0883	Mean Dry Biomass-mg	IC5	38.97	N/A	107.4	2.566	Linear Interpolation (ICPIN)
		IC10	76.15	6.006	N/A	1.313	
		IC15	>100	N/A	N/A	<1	
		IC20	>100	N/A	N/A	<1	
		IC25	>100	N/A	N/A	<1	
		IC40	>100	N/A	N/A	<1	
		IC50	>100	N/A	N/A	<1	

Test Acceptability

Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision
05-2446-8878	7d Survival Rate	Control Resp	0.975	0.8 - NL	Yes	Passes Acceptability Criteria
15-2344-2472	7d Survival Rate	Control Resp	0.975	0.8 - NL	Yes	Passes Acceptability Criteria
00-2582-0883	Mean Dry Biomass-mg	Control Resp	0.5255	0.25 - NL	Yes	Passes Acceptability Criteria
01-1400-2092	Mean Dry Biomass-mg	Control Resp	0.5255	0.25 - NL	Yes	Passes Acceptability Criteria
01-1400-2092	Mean Dry Biomass-mg	PMSD	0.1681	0.12 - 0.3	Yes	Passes Acceptability Criteria

7d Survival Rate Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	0.975	0.9563	0.9937	0.9	1	0.025	0.05	5.13%	0.0%
6.25		4	0.975	0.9563	0.9937	0.9	1	0.025	0.05	5.13%	0.0%
12.5		4	0.95	0.9284	0.9716	0.9	1	0.02887	0.05774	6.08%	2.56%
25		4	0.95	0.9284	0.9716	0.9	1	0.02887	0.05774	6.08%	2.56%
50		4	0.975	0.9563	0.9937	0.9	1	0.025	0.05	5.13%	0.0%
100		4	0.95	0.9284	0.9716	0.9	1	0.02887	0.05774	6.08%	2.56%

Mean Dry Biomass-mg Summary

C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	0.5255	0.5191	0.5319	0.514	0.551	0.008627	0.01725	3.28%	0.0%
6.25		4	0.5833	0.5523	0.6142	0.478	0.674	0.04145	0.0829	14.21%	-10.99%
12.5		4	0.5647	0.5377	0.5918	0.465	0.637	0.03625	0.0725	12.84%	-7.47%
25		4	0.5418	0.5351	0.5484	0.521	0.558	0.008882	0.01776	3.28%	-3.09%
50		4	0.5232	0.5112	0.5353	0.488	0.559	0.01607	0.03214	6.14%	0.43%
100		4	0.4882	0.47	0.5065	0.431	0.55	0.02441	0.04882	10.0%	7.09%

Fathead Minnow 7-d Larval Survival and Growth Test

Rainier Environmental Laboratory

7d Survival Rate Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	1	0.9	1	1
6.25		1	1	1	0.9
12.5		1	0.9	0.9	1
25		0.9	0.9	1	1
50		0.9	1	1	1
100		0.9	0.9	1	1

Mean Dry Biomass-mg Detail

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	0.516	0.521	0.551	0.514
6.25		0.674	0.615	0.566	0.478
12.5		0.637	0.568	0.465	0.589
25		0.558	0.555	0.533	0.521
50		0.488	0.559	0.54	0.506
100		0.491	0.431	0.481	0.55

7d Survival Rate Binomials

C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	10/10	9/10	10/10	10/10
6.25		10/10	10/10	10/10	9/10
12.5		10/10	9/10	9/10	10/10
25		9/10	9/10	10/10	10/10
50		9/10	10/10	10/10	10/10
100		9/10	9/10	10/10	10/10

Rainier Environmental
Washington Laboratory
Client: Hale Source
Sample ID. DPS
Test No: 1212-018
Log-In#: 12-057 12-057

Initial and Final Chemistries
Seven Day Chronic Freshwater Bioassay
Start Date & Time: 12/14/12 16:15
Stop Date & Time: 12/21/12 1530
Test Species: Pimephales promelas
12-057

Conc. or %: CON

	Days 0 init.	0 final	1 init.	1 final	2 init.	2 final	3 init.	3 final	4 init.	4 final	5 init.	5 final	6 init.	6 final
pH	7.76	7.91	7.85	7.93	7.87	8.01	7.75	7.92	7.83	7.87	7.92	7.95	7.87	7.92
DO (mg/l)	7.6	6.6	7.7	5.8	7.8	5.7	8.0	5.3	8.1	5.4	8.0	5.8	7.7	7.2
Cond. (µmhos-cm)	284	291	289	295	282	291	291	297	285	292	290	295	287	292
Temperature (°C)	25.0	25.2	24.8	25.4	24.5	25.2	24.4	25.4	24.3	25.3	24.4	25.4	24.2	25.4

Conc. or %: 6.25

	Days 0 init.	0 final	1 init.	1 final	2 init.	2 final	3 init.	3 final	4 init.	4 final	5 init.	5 final	6 init.	6 final
pH	7.72	7.93	7.81	7.93	7.89	8.00	7.77	7.99	7.85	7.85	7.91	7.93	7.89	7.89
DO (mg/l)	7.8	6.5	7.8	6.2	8.0	5.6	7.8	5.7	8.0	5.2	8.1	5.7	7.8	7.0
Cond. (µmhos-cm)	285	287	290	294	285	291	295	298	287	295	287	297	290	295
Temperature (°C)	24.9	25.3	24.7	25.5	24.6	25.2	24.6	25.6	24.2	25.4	24.3	25.5	24.4	25.3

Conc. or %: 12.5

	Days 0 init.	0 final	1 init.	1 final	2 init.	2 final	3 init.	3 final	4 init.	4 final	5 init.	5 final	6 init.	6 final
pH	7.72	7.90	7.81	7.93	7.89	7.95	7.75	7.93	7.85	7.84	7.93	7.93	7.89	7.91
DO (mg/l)	7.8	6.2	7.8	6.2	8.1	5.4	7.8	5.2	8.0	5.1	8.1	5.7	7.8	6.9
Cond. (µmhos-cm)	285	286	290	294	284	292	295	303	287	291	292	298	291	295
Temperature (°C)	24.9	25.3	24.5	25.7	24.6	25.2	24.3	25.6	24.2	25.4	24.3	25.7	24.5	25.3

Conc. or %: 25

	Days 0 init.	0 final	1 init.	1 final	2 init.	2 final	3 init.	3 final	4 init.	4 final	5 init.	5 final	6 init.	6 final
pH	7.78	7.91	7.83	7.91	7.91	8.01	7.76	7.95	7.87	7.87	7.91	7.97	7.91	7.90
DO (mg/l)	7.7	5.9	8.0	5.8	8.0	5.3	8.1	5.2	8.1	5.4	7.8	5.3	7.8	7.2
Cond. (µmhos-cm)	286	289	290	294	285	289	297	301	287	298	293	302	293	289
Temperature (°C)	24.9	25.5	24.8	25.5	~~25.9~~ 24.5	25.2	24.3	25.7	24.1	25.5	24.3	25.6	24.4	25.1

Conc. or %: 50

	Days 0 init.	0 final	1 init.	1 final	2 init.	2 final	3 init.	3 final	4 init.	4 final	5 init.	5 final	6 init.	6 final
pH	7.81	7.95	7.82	7.92	7.93	7.99	7.76	7.95	7.89	7.88	7.91	7.96	7.90	7.93
DO (mg/l)	7.5	6.0	7.6	5.7	7.6	5.2	8.1	4.9	7.8	5.2	7.7	5.2	7.7	7.1
Cond. (µmhos-cm)	285	292	288	296	285	293	296	308	289	296	294	305	293	293
Temperature (°C)	25.0	25.3	24.9	25.5	24.7	25.2	24.3	25.5	24.1	25.5	24.3	25.6	24.4	25.3

Conc. or %: 100

	Days 0 init.	0 final	1 init.	1 final	2 init.	2 final	3 init.	3 final	4 init.	4 final	5 init.	5 final	6 init.	6 final
pH	7.85	7.96	7.84	7.92	7.95	7.93	7.81	7.94	7.86	7.91	7.90	7.97	7.92	7.96
DO (mg/l)	7.4	5.7	7.3	5.4	7.4	4.9	8.1	5.3	7.7	5.0	7.6	4.8	7.7	7.1
Cond. (µmhos-cm)	286	291	290	295	287	295	295	303	289	293	294	304	293	295
Temperature (°C)	25.0	25.3	24.8	25.5	24.5	25.2	24.3	25.5	24.1	25.5	24.3	25.5	24.4	25.3
Tech. Initials	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL	CL

Dilution Water Batch #: MHSW 028
Test Chamber: VWR

QA Check: CL

Sample Description: 672 mg of LBP-2101 and 336 mg 1% Liquidox in 2L MHSW
Animal Source: ABS
Date Received: 12/14/12 Date of Hatch: 12/13/12
Comments:

Rainier Environmental
Washington Laboratory
5013 Pacific Hwy. E., Suite 20
Tacoma, WA 98424

Raw Data Sheet
Fathead Minnow
(Pimephales promelas)
Larval Survival

Client Name: Hla. Beach **Test No.:** 1212-018

Sample ID: DPS

Rep.	Conc. or %	Cont.	Days 0	1	2	3	4	5	6	7	Mean % Survival
1	CON	3	10	10	10	10	10	10	10	10	
2		7	10	10	10	9	9	9	9	9	
3		20	10	10	10	10	10	10	10	10	
4		19	10	10	10	10	10	10	10	10	
1	6.25	23	10	10	10	10	10	10	10	10	
2		4	10	10	10	10	10	10	10	10	
3		15	10	10	10	10	10	10	10	10	
4		8	10	10	10	10	10	10	10	9	
1	12.5	21	10	10	10	10	10	10	10	10	
2		6	10	10	10	9	9	9	9	9	
3		13	10	10	10	10	9	9	9	9	
4		2	10	10	10	10	10	10	10	10	
1	25	5	10	10	10	9	9	9	9	9	
2		12	10	10	10	10	9	9	9	9	
3		24	10	10	10	10	10	10	10	10	
4		14	10	10	10	10	10	10	10	10	
1	50	9	10	10	10	10	9	9	9	9	
2		10	10	10	10	10	10	10	10	10	
3		1	10	10	10	10	10	10	10	10	
4		16	10	10	10	10	10	10	10	10	
1	100	11	10	10	10	10	9	9	9	9	
2		18	10	9→10	10	10	10	10	10	9	
3		22	10	10	10	10	10	10	10	10	
4		17	10	10	10	10	10	10	10	10	
1											
2											
3											
4											
1											
2											
3											
4											
Tech Initials			CL	CL	CL	CL	CL	CL	CL	CL	

Feeding Times: 0 1 815 2 815 3 830 4 800 5 815 6 815
1630 1530 1500 1600 1600 1545 1600

Comments:

QA Check: CL

Rainier Environmental
Washington Laboratory
5013 Pacific Hwy. E., Suite 20
Tacoma, WA 98424

Raw Data Sheet
Fish Weights
Seven Day Chronic Bioassay

Client: Hale Source

Test No: 1212-018

Sample ID: DPS

Species: *Pimephales promelas*

rep #	Conc. or %	cont #	pan wt. (gm)	pan + fish (gm)	fish wt. (mg)	# fish	avg. per fish (mg)	avg. per conc. (mg)
1	CON	3	0.03743	0.04259		10		
2		7	0.03559	0.04080		9		
3		20	0.03755	0.04306		10		
4		19	0.03534	0.04048		10		
1	6.25	23	0.03528	0.04202		10		
2		4	0.03785	0.04400		10		
3		15	0.03959	0.04525		10		
4		8	0.03480	0.03958		9		
1	12.5	21	0.03553	0.04190		10		
2		6	0.03493	0.04061		9		
3		13	0.03597	0.04062		9		
4		2	0.03933	0.04522		10		
1	25	5	0.03764	0.04322		9		
2		12	0.03417	0.03972		9		
3		24	0.04117	0.04650		10		
4		14	0.03386	0.03907		10		
1	50	9	0.03440	0.03928		9		
2		10	0.03385	0.03944		10		
3		1	0.03977	0.04517		10		
4		16	0.03686	0.04192		10		
1	100	11	0.03238	0.03729		9		
2		18	0.03611	0.04042		9		
3		22	0.03792	0.04273		10		
4		17	0.03596	0.04146		10		
1								
2								
3								
4								
	Technician Initials:		RT	RT				

Date/Time in: 12/21/12 1530 **Oven temp. (°C):** 64.0

Date/Time out: 12/23/12 1045 **Oven temp. (°C):** 61.0

QA Check: RT

Appendix B
Control QC Plots

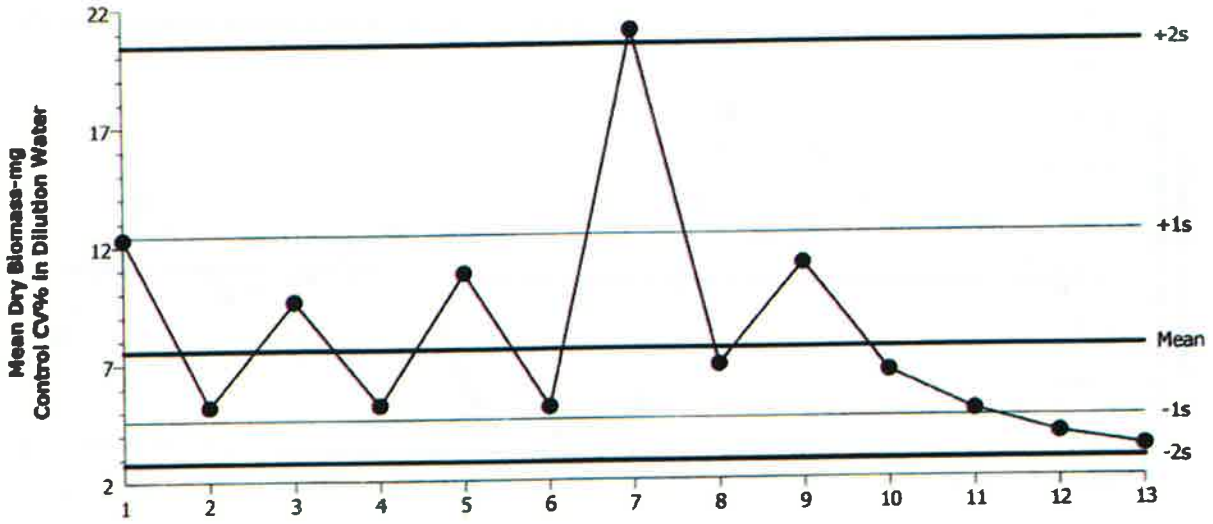
CETIS QC Plot

Report Date: 10 Jan-13 11:03 (1 of 1)

Fathead Minnow 7-d Larval Survival and Growth Test — Rainier Environmental Laboratory

Test Type:	Growth-Survival (7d)	**Organism:**	Pimephales promelas (Fathead Minn	**Material:**	All Materials
Protocol:	EPA/821/R-02-013 (2002)	**Endpoint:**	Mean Dry Biomass-mg	**Source:**	All SampleID Sources

Fathead Minnow 7-d Larval Survival and Growth Test



Mean:	7.553	**Count:**	12	**-1s Warning Limit:**	4.593	**-2s Action Limit:**	2.793
Sigma:	NA	**CV:**	64.50%	**+1s Warning Limit:**	12.42	**+2s Action Limit:**	20.43

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Nov	2	12.31	4.757	0.9817			18-5217-8274	
2			2	5.183	-2.37	-0.757			10-3397-0952	
3			10	9.615	2.062	0.4851			15-8584-2443	
4			30	5.211	-2.342	-0.7462			18-8884-5002	
5			30	10.77	3.217	0.7131			00-9439-4647	
6	2012	Jul	24	5.122	-2.431	-0.7808			17-0222-9006	
7			24	20.99	13.44	2.054	(+)	(+)	17-3839-8833	
8		Nov	6	6.846	-0.7074	-0.1977			14-4967-7084	
9			6	11.1	3.547	0.7738			00-3655-4796	
10		Dec	14	6.536	-1.017	-0.2908			01-6201-5768	
11			14	4.856	-2.697	-0.888			00-1471-6011	
12			14	3.861	-3.692	-1.349	(-)		02-6033-9694	
13			14	3.283	-4.27	-1.675	(-)		03-1191-6885	

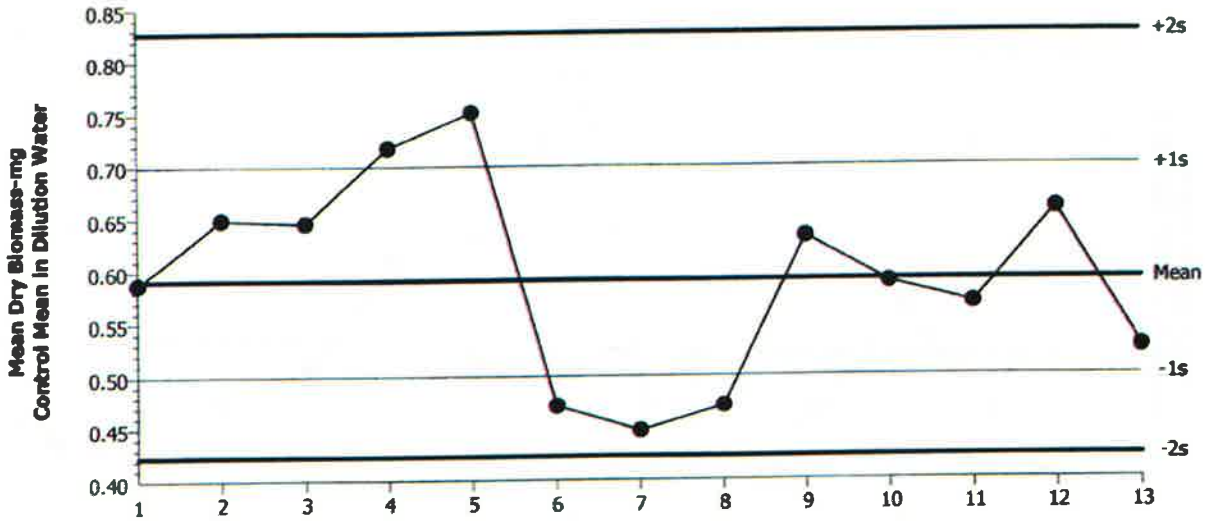
CETIS QC Plot

Report Date: 10 Jan-13 11:03 (1 of 1)

Fathead Minnow 7-d Larval Survival and Growth Test — Rainier Environmental Laboratory

Test Type:	Growth-Survival (7d)	**Organism:**	Pimephales promelas (Fathead Minn	**Material:**	All Materials
Protocol:	EPA/821/R-02-013 (2002)	**Endpoint:**	Mean Dry Biomass-mg	**Source:**	All SampleID Sources

Fathead Minnow 7-d Larval Survival and Growth Test



Mean:	0.5913	**Count:**	12	**-1s Warning Limit:**	0.5	**-2s Action Limit:**	0.4228
Sigma:	NA	**CV:**	18.30%	**+1s Warning Limit:**	0.6992	**+2s Action Limit:**	0.8269

Quality Control Data

Point	Year	Month	Day	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2011	Nov	2	0.5878	-0.00346	-0.03499			18-5217-8274	
2			2	0.6485	0.05724	0.551			10-3397-0952	
3			10	0.645	0.05374	0.5188			15-8584-2443	
4			30	0.7172	0.1259	1.151	(+)		18-8884-5002	
5			30	0.7512	0.1599	1.428	(+)		00-9439-4647	
6	2012	Jul	24	0.471	-0.1203	-1.356	(-)		17-0222-9006	
7			24	0.4472	-0.1441	-1.665	(-)		17-3839-8833	
8		Nov	6	0.4712	-0.1201	-1.353	(-)		14-4967-7084	
9			6	0.6317	0.04044	0.3945			00-3655-4796	
10		Dec	14	0.5883	-0.00296	-0.02992			01-6201-5768	
11			14	0.568	-0.02326	-0.2393			00-1471-6011	
12			14	0.6577	0.06644	0.635			02-6033-9694	
13			14	0.5255	-0.06576	-0.7031			03-1191-6885	

Appendix C
Chain-of-Custody Forms

TESTING LOCATION (Please Circle)

Nautilus Environmental

Chain of Custody

British Columbia
8664 Commerce Court
Burnaby, British Columbia, Canada V5A 4N3
Phone 604.420.8773

Date_____Page___of___

Sample Collection By:

Report to:		Invoice To:	
Company	HaloSource, Inc.	Company	HaloSource, Inc.
Address	1725 220th Street SE, STE 103	Address	1725 220th Street SE, STE 103
City/State/Zip	Bothell, WA 98021	City/State/Zip	Bothell, WA 98021
Contact	Carolyn Ramsden	Contact	Carolyn Ramsden
Phone	425-974-1924	Phone	425-974-1924
Email	cramsden@halosource.com	Email	cramsden@halosource.com

	SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS	ANALYSES REQUIRED: Fathead acute Test	Fathead chronic Test	Receipt Temperature (°C)
1	LBP-2101	11-29-12			bottle	1	12-RLBP-0326		X	
2	Liqui Floc 1%	11.29.12			bottle	1	12-RBTO-0318		X	
3	DPS-DC2	11.29.12			bag	1	12-RDCT-0319	X	X	
4										
5										
6										
7										
8										
9										
10										

PROJECT INFORMATION		SAMPLE RECEIPT	
Client:	HaloSource, Inc.	Total No. of Containers	3
PO No.:	9915923	Received Good Condition?	Y
Shipped Via:	FedEX	Matches Test Schedule?	Y

RELINQUISHED BY (CLIENT)	RELINQUISHED BY (COURIER)
(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)

RECEIVED BY (COURIER)	RECEIVED BY (LABORATORY)
(Signature) (Time)	(Signature) (Time)
(Printed Name) (Date)	(Printed Name) (Date)
(Company)	(Company)

Additional costs may be required for sample disposal or storage. Payment net 30 unless otherwise contracted.

APPROVAL OF DUAL POLYMER SYSTEM USING LIQUI-FLOC 1% AND LBP-2101
JUNE 25, 2013

Chitosan-enhanced sand filtration (CESF) using Storm Klear Liqui-Floc™ containing 1% chitosan acetate was approved for use in Washington State in 2004. The approval was based upon an Intended Use Plan dated November 18, 2004 which described how the treatment chemical concentration will be kept below its toxic threshold to the most sensitive species. The maximum concentration of LiquiFloc in the intended use plan and approved for use is below the toxic threshold to the most sensitive species and will be reduced further by binding to suspended solids in the stormwater and then being trapped in the sand filter. The safety margin for the final discharge is substantial.

HaloSource requested permission to begin adding a second polymer, HaloKlear LBP-2101, to CESF treatment systems using LiquiFloc 1% (Dual Polymer System). LBP-2101 is similar to chitosan in being a polysaccharide. Unlike chitosan, LBP-2101 is an anionic biopolymer. The use of LBP-2101 with LiquiFloc allows Dual Polymer System treatment to be effective with a wider range of soil types than LiquiFloc alone. Approval for the Dual Polymer System was granted February 11, 2013. HaloSource has now completed toxicity testing of these two polymers in order to get permission for discharge from the Dual Polymer System into marine waters and lakes.

The toxicity testing in 2004 using LiquiFloc 1% by itself found rainbow trout to be the most sensitive species. Toxicity testing in 2010 using LBP-2101 by itself showed fathead minnow to be the most sensitive species. LBP-2101 did not have toxicity to fathead minnow (or any other test species) up to a test concentration of 2000 mg/L. The high end of the dose range given by HaloSource for treating typical stormwater is 300 mg/L of LBP-2101.

The fathead minnow 7-day survival and growth test was used to confirm that a mixture of LiquiFloc 1% and LBP-2101 did not have toxicity in excess of the toxicity of each material tested by itself. The highest concentration tested was 168 mg/L of LiquiFloc combined with 336 mg/L of LBP-2101 (2:1 ratio of LBP-2101 to LiquiFloc). This highest concentration was not toxic to fathead minnows confirming an absence of synergistic toxicity from the two chemicals tested together at concentrations a little above typical treatment concentrations. The testing was repeated in May 2013 using the topsmelt and Atlantic mysid 7-day survival and growth tests. The lack of combined toxicity was confirmed for these organisms as well.

2010 Toxicity Tests and Results

Toxicity Testing of Key Species to Determine the Most Sensitive Response to LBP-2101

Test	**Endpoint**	**EC_{50} (mg/L)**	**EC_{25} (mg/L)**
rainbow trout 96-hr acute	survival	> 4000	> 4000
fathead minnow 96-hr acute	survival	> 4000	> 4000
rainbow trout 7-day survival & growth	survival	> 4000	NC
	biomass	3830	2770
fathead minnow 7-day survival & growth	survival	3790	2740
	biomass	3750	2710
Ceriodaphnia 7-day survival & reproduction	survival	> 4000	> 4000
	reproduction	NC	NC

NC = not calculable

LBP-2101 Concentration in CESF Treatment

An August 22, 2012 e-mail from HaloSource (Frank Kneib) stated that the typical LBP-2101 concentration range for treatment of construction stormwater in Washington State would be 100 mg/L to 300 mg/L of product. Toxicity testing of the combination of LiquiFloc and LBP-2101 showed no toxicity up to 336 mg/L of LBP-2101 along with 168 mg/L of LiquiFloc. Allowing up to 336 mg/L of LBP-2101 would be safe and give a little extra room for effectively treating difficult suspended solids in construction stormwater.

Toxic thresholds for LBP-2101 are over 8 times higher than the maximum dose of 336 mg/L to be used in treatment so the safety margin is large. Reaction with suspended solids and entrainment in the sand filter will further reduce the concentration of LBP-2101. No confidence building period of flow-through or *in-situ* toxicity testing is needed.

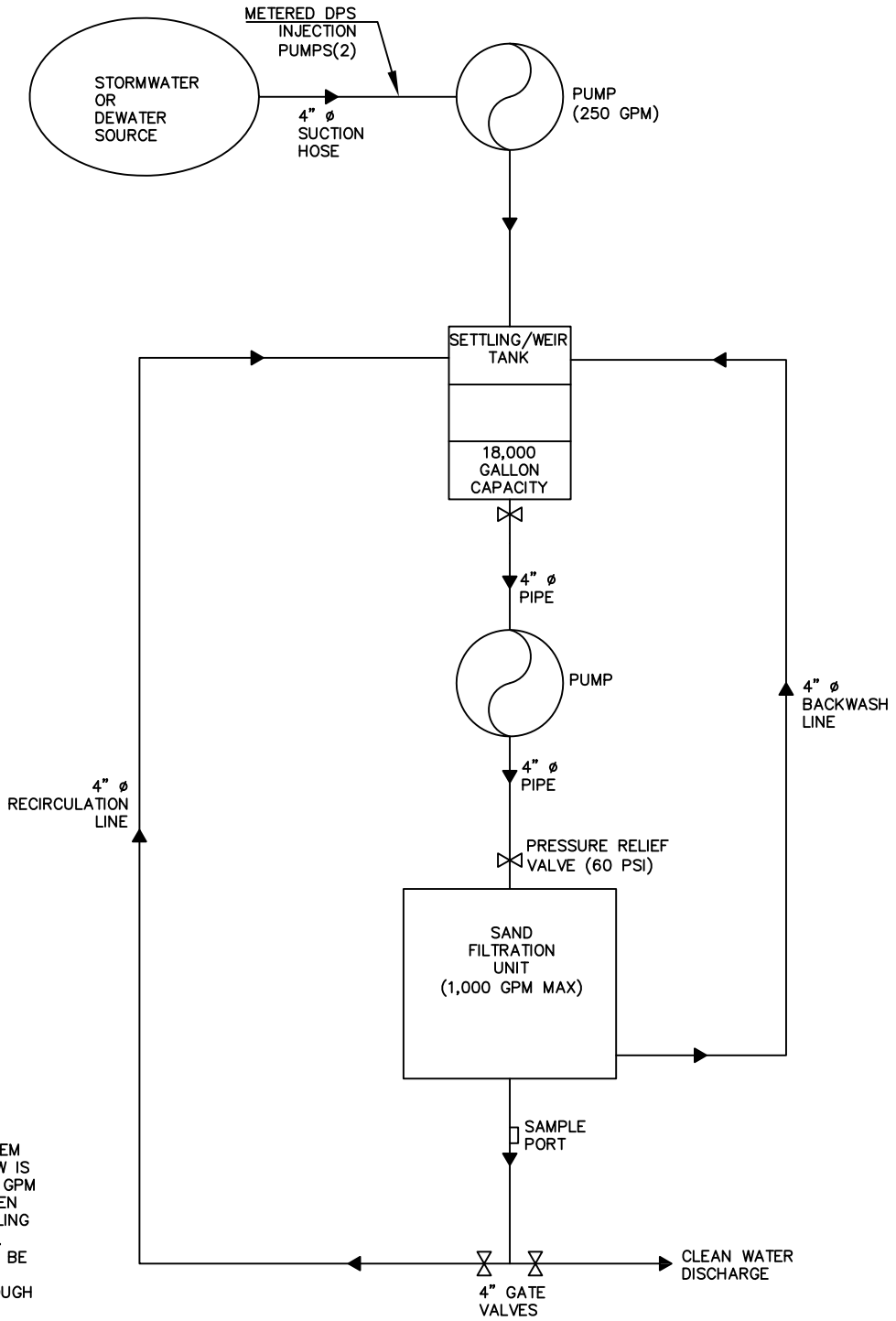
Treating Exceptionally High Suspended Solids

HaloSource reports that 500 mg/L of LBP-2101 might be needed when suspended solids are exceptionally high. Properly managed construction stormwater is unlikely to require such a high dose of LBP-2101, but it could happen. Toxicity testing results would support giving permission for up to 500 mg/L on a case-by-case basis. The toxicity testing of the mixture of LiquiFloc and LBP-2101 did not go higher than 336 mg/L of LBP-2101 but no sign of synergistic toxicity was seen. Toxic thresholds for LBP-2101 by itself are more than 5 times higher than 500 mg/L.

Conditions for Maintaining a Safety Margin

- All requirements in the December 2004 approval for Storm Klear Liqui-Floc containing 1% chitosan acetate shall also apply to Dual Polymer System treatment.
- Only HaloKlear LBP-2101 may be used in the Dual Polymer System treatment covered by this approval.
- No more than 336 mg/L of HaloKlear LBP-2101 may be dosed to any construction stormwater wastestream.
- Treatment using between 336 mg/L and 500 mg/L of HaloKlear LBP-2101 may be approved on a case-by-case basis.
- No more LBP-2101 or LiquiFloc may be added than is needed to provide adequate treatment.
- The ratio of LBP-2101 to LiquiFloc should be around 2:1.
- Discharges shall be monitored regularly with the iodine field test. Dosing of treatment chemicals must be reduced if the iodine field test has a positive reaction. The iodine field test reacts to both LiquiFloc and LBP-2101.
- Dual Polymer System treatment using LBP-2101 and meeting these conditions is approved for discharge to freshwater streams, lakes, and any marine water not designated as a sanctuary, park, refuge, or reserve.

Attachment B



NOTES:

1. FLOW THROUGH SYSTEM AND DISCHARGE FLOW IS APPROXIMATELY 250 GPM
2. HOSE LENGTH BETWEEN WTC FEED AND SETTLING TANK TO BE 50' MIN. ADDITIONAL HOSE TO BE PROVIDED IF NEEDED.
3. MIN. PRESSURE THROUGH SAND FILTER 30 PSI.
4. SCHEMATIC PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY. CONTRACTOR TO PROVIDE SUBMITTAL TO ENGINEER FOR APPROVAL.

APPLICANT : MRMI, INC.

PERMIT ID. #: NYR10W713

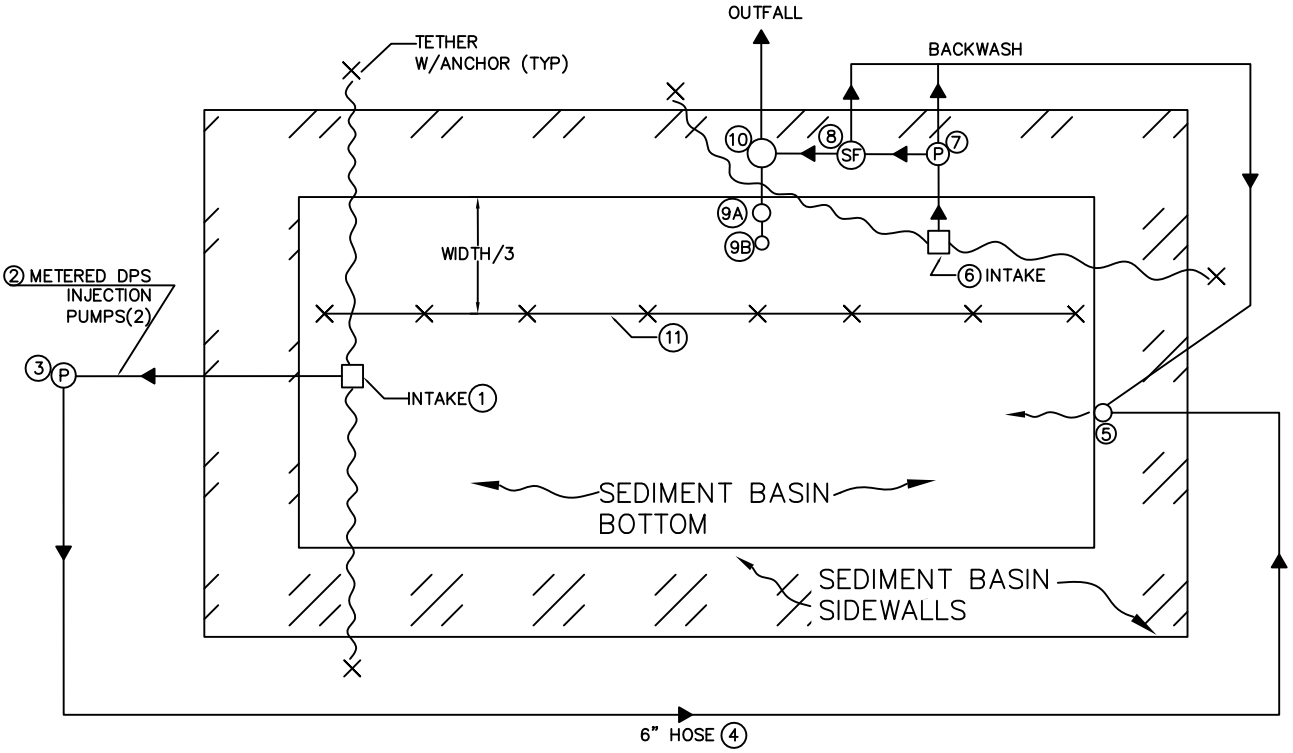
ENVIRONMENTAL CONSULTANT/ENGINEER

AKRF

AKRF INC./AKRF ENGINEERING, P.C.
440 PARK AVENUE SOUTH
NEW YORK, NY 10016
(212) 696-0670 (PHONE)
(212) 726-0942 (FAX)

PROJECT	SHEET TITLE
EPT CONCORD RESORT	SCHEMATIC LAYOUT ACTIVE TREATMENT W/SETTLING TANK
DRAWN BY / CHECKED BY	SHEET NO.
SCALE: NOT TO SCALE / DATE: 07/08/2013	FIGURE 1
	SHEET 1 OF 2

NOTE: SCHEMATIC PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY.
CONTRACTOR TO PROVIDE SUBMITTAL TO ENGINEER FOR APPROVAL.



KEY:

1	INTAKE: HOSE ON FLOAT TO DRAW WATER 24" FROM SURFACE
2	DPS BULK STORAGE AND HIGH VISCOSITY METER PUMPS (ELECTRIC) IN SHED
3	INFLUENT PUMP: 500 GPM, CENTRIFUGAL, DIESEL PUMP
4	CONVEYANCE LINES: LENGTH TO CIRCULATE WATER TO OPPOSITE END OF BASIN. FLEX OR SCHED. 40 PVC, 4" TO 6" AS REQUIRED FOR FLOW RATE
5	STILLING BASIN: 4' DIA. MH BASE SECTION W/12" OPENING
6	INTAKE: HOSE ON FLOAT TO DRAW WATER FROM SURFACE
7	INFLUENT PUMP: 250 – 500 GPM/30 PSI MIN
8	SAND FILTRATION UNIT: 3 VESSEL W/CRUSHED STONE AND SILICA SAND MEDIA TO INCLUDE BACKWASH AND RECIRCULATION CAPABILITY
9A, 9B	TEMP. BASIN OUTLET: USED TO MONITOR SEDIMENT DEPTH
10	EMERGENCY SPILLWAY: USED TO DISCHARGE TREATED, CLEAN WATER FROM SAND FILTER
11	REINFORCED SILT FENCE BARRIER

APPLICANT : MRMI, INC.

PERMIT ID. #: NYR10W713

ENVIRONMENTAL CONSULTANT/ENGINEER

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NEW YORK, NY 10016
(212) 696-0670 (PHONE)
(212) 726-0942 (FAX)

PROJECT: EPT CONCORD RESORT		SHEET TITLE: SCHEMATIC LAYOUT ACTIVE TREATMENT W/SEDIMENT BASIN
DRAWN BY	CHECKED BY	SHEET NO.
SCALE: NOT TO SCALE	DATE: 07/08/2013	FIGURE 2
		SHEET 2 OF 2

Attachment C

MATCHLINE - SEE CONSTRUCTION PHASING PLAN 2

APPLICANT

EPT CONCORD II, LLC
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KANSAS CITY, MO 64106
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(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

HART HOWERTON

HART HOWERTON
10 EAST 40TH STREET
NEW YORK, NY 10016
(212) 683-5631 (PHONE)
(212) 481-3788 (FAX)

CASINO RESORT DEVELOPER

MONTICELLO RACEWAY
MANAGEMENT, INC.
MONTICELLO, NEW YORK

SITE/CIVIL ENGINEER

AKRF

AKRF ENGINEERING, P.C.
34 SOUTH BROADWAY, SUITE 401
WHITE PLAINS, NY 10601
(914) 949-7336 (PHONE)
(914) 949-7559 (FAX)

ARCHITECT - CASINO RESORT

JCJ ARCHITECTURE

JCJ ARCHITECTURE
2 GRAND CENTRAL TOWER
140 EAST 45TH STREET
NEW YORK, NY 10017

SURVEYOR

CONTRACTORS' LINE & GRADE SOUTH, LLC
23 NEPPERHAN AVENUE
ELMSFORD, NY 10523
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(914) 347-3120 (FAX)

GEOTECHNICAL CONSULTANT

MELICK-TULLY AND ASSOCIATES, P.C.
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(732) 356-9054 (FAX)

LANDSCAPE ARCHITECT

CR3
571 HOPMEADOW STREET
SIMSBURY, CT 06070
(860) 658-1988 (PHONE)

SITE PLAN SUBMISSION
NOT FOR CONSTRUCTION

NEW YORK STATE EDUCATION LAW 145, SECTION 7209, PROHIBITS ANY INDIVIDUAL FROM ALTERING THESE DRAWINGS AND/OR ACCOMPANYING SPECIFICATIONS IN ANY WAY, UNLESS IT IS UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. IF ALTERATIONS ARE MADE, THE ALTERING ENGINEER MUST SIGN, SEAL, DATE, AND DESCRIBE THE FULL DESCRIPTION OF THE ALTERATION ON THE DRAWING AND/OR SPECIFICATIONS.

REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JH, MH	AM
SCALE	DATE
1"=400'	02/11/13

SHEET TITLE

CONSTRUCTION PHASING PLAN 1

SHEET NO.

CP-1

SWPPP

APPENDIX C

CERTIFICATIONS

CONTRACTOR'S CERTIFICATION

"I hereby certify that I understand and agree to comply with the terms and conditions of the SWPPP and agree to implement any corrective actions identified by the qualified inspector during a site inspection. I also understand that the owner or operator must comply with the terms and conditions of the most current version of the New York State Pollutant Discharge Elimination System ("SPDES") general permit for stormwater discharges from construction activities and that it is unlawful for any person to cause or contribute to a violation of water quality standards. Furthermore, I understand that certifying false, incorrect or inaccurate information is a violation of the referenced permit and the laws of the State of New York and could subject me to criminal, civil and/or administrative proceedings. "

SIGNED: _____ DATE: _____

NAME: _____

FIRM: _____

ADDRESS: _____

_____

PHONE: _____

SITE: _____

SWPPP
IMPLEMENTER'S NAME: _____

SWPPP
IMPLEMETER'S TITLE: _____

CONTRACTOR'S SCOPE: _____

TRAINED
CONTRACTOR'S NAME: _____

TRAINED
CONTRACTOR'S TITLE: _____

*The SWPPP Implementer must be a trained contractor responsible for SWPPP implementation, an employee of the firm who has received training in accordance with SPDES GP-0-10-001.

SWPPP

APPENDIX D

GEOTECHNICAL REPORTS

- PROPOSED CONCORD RESORT DEVELOPMENT, MAY 2012
- PROPOSED RESORT ENTRY ROAD, MARCH 2013

REPORT
SUBSURFACE INVESTIGATION

PROPOSED CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, SULLIVAN COUNTY, NEW JERSEY
CONCORD RESORT DEVELOPMENT

May 1, 2012

Prepared By:
Melick-Tully and Associates, P.C.
117 Canal Road
South Bound Brook, NJ 08880
Tel: 732-356-3400 Fax: 732-356-9054

MTA Project No.: 8979-001*1D

MELICK-TULLY AND ASSOCIATES, P.C.
GEOTECHNICAL ENGINEERS AND ENVIRONMENTAL CONSULTANTS

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ROBERT E. SCHWANKERT, P.E.
TODD E. HOROWITZ, P.E.
MARK R. DENNO, P.E.

Senior Associates:
RICHARD D. LEV, CPG
JAMES H. BEATTIE, P.E.

Associates:
CHRISTOPHER P. TANSEY, P.E.

May 1, 2012

Concord Resort Development
c/o AKRF, Inc.
440 Park Avenue South, 7th Floor
New York, New York 10016

Attention: Ms. Karen E. Franz, P.E., LEED, AP
Vice President

Report
Subsurface Investigation
Proposed Concord Resort Development
Town of Thompson, Sullivan County, New York
Concord Resort Development

Introduction

This report presents the results of a subsurface investigation performed by Melick-Tully and Associates, P.C. (MTA) for the proposed Concord Resort development to be constructed in the Town of Thompson, Sullivan County, New York. The portion of the resort currently slated for the first phase of development is primarily located south of and adjacent to Thompsonville Road, to the west of its intersection with Joyland Road, as shown on the Site Location Map, Plate 1. This report was prepared in general accordance with our proposal dated February 7, 2012.

Proposed Construction

We understand that the on-site Phase I portion of the proposed development would include the construction of approximately 4,500 linear feet of sanitary sewer line, a harness track, and paddock/maintenance buildings which will be located to the west of the harness track. The

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☑ NY OFFICE: 324 Route 208, Monroe, NY 10950 / Phone: (845) 783-9190 Fax: (845) 783-5060

development would also include a nine-story hotel constructed as a part of a casino building with a total footprint of over 300,000 square feet in plan area, with up to three levels of below-grade parking and service facilities. A number of retail and commercial structures are proposed to be located north and east of the proposed casino structure. Automobile parking lots and access roadways would be situated to the north and east of the casino.

Structural loading information provided to us for the main casino structure indicates maximum interior column loads of up to 1,800 kips would be imposed where the parking levels will extend up to three levels below the main entry level, and column loads for the hotel tower would reportedly be up to approximately 1,200 kips. The entry level along the east side of the structure would be established at approximately Elevation +1,435 feet, requiring fills of up to 13 feet along the eastern edge of the structure to match the proposed exterior and slab-on-grade portion of the structure. Access to the lowest level parking area along the western side of the casino would be established at Elevation +1,399 feet, requiring fills of approximately 5 to 13 feet to reach the proposed lowest garage floor slab level. In addition, cuts of up to approximately 15 feet will be required to reach portions of the lowest floor slab levels. Although not provided to us at this time, we anticipate that the proposed paddock, maintenance building and retail structures would impose light to moderate column loads and light to moderate at-grade floor slab loads. At this time, grading plans for the surrounding parking, track and paddock areas were not provided to us.

Purpose and Scope of Work

The purpose of our services was to:

1) explore the subsurface soil, rock and groundwater conditions along the proposed alignment of the new sanitary sewer and within the proposed track, building and parking areas at accessible locations;

2) estimate the relevant geotechnical engineering properties of the encountered materials;

3) evaluate the site foundation requirements considering the anticipated structural loads and encountered subsurface conditions;

4) recommend an appropriate type of foundation for support of the proposed structures, and provide geotechnical-related foundation design and installation criteria, including an estimate of the Site Class as defined by the Building Code of New York State, 2010 Edition, for seismic design purposes;

5) provide recommendations for the support and the need for subdrainage of the lowest level floor slabs;

6) estimate the post-construction settlements of the recommended floor and foundation systems;

7) provide estimated lateral earth pressure and drainage criteria for use in the design of below-grade building walls;

8) provide geotechnical-related parameters for use in pavement design;

9) collect tube samples from test pits performed in the areas proposed for automobile parking where the stormwater management system may be constructed and subject the samples to laboratory permeability testing; and

10) discuss appropriate earthwork considerations consistent with the proposed construction and encountered subsurface conditions.

To accomplish these purposes, a subsurface exploration program consisting of 48 test borings and 41 test pit explorations was performed at the site. Thirty-two borings were performed in the casino/hotel area and 16 borings along the route of the proposed new sanitary sewer line. Seven test pit explorations were performed in the vicinity of the proposed track and paddock areas, 25 test pits in the proposed parking areas, and 9 test pits in the portion of the development where the retail structures are proposed. The borings were advanced utilizing all-terrain vehicle and truck-mounted drilling equipment and extended to depths varying from approximately 8-1/2 to 51 feet below the existing surface grades. Piezometers were installed in Borings C-1, C-7 and C-12 to depths of 34 to

50 feet to allow periodic measurement of the water levels. The test pits were advanced using a track-mounted excavator (Caterpillar Model 315) and extended to depths ranging from approximately 4 to 13 feet below the existing surface grades. The approximate locations of the explorations are shown on the Plot Plan, Plate 2.

All work was performed under the direct technical observation of engineers and geologists from MTA. Our representatives located the explorations in the field utilizing limited survey control provided by others and the topographic information and existing site features shown on plans provided to us. Our representatives maintained continuous logs of the explorations as the work proceeded, supervised the soil sampling operations during the drilling operations, and obtained bulk samples of the encountered materials from the test pits. Numerous closely spaced soil samples were obtained from the borings using the general procedures of the Standard Penetration Test. Rock core samples were obtained from the borings using an NQ size core barrel. Several bulk samples and numerous tube samples were collected from the test pits for laboratory Proctor and permeability testing.

All soil and rock samples obtained from the explorations were brought to our office where they were further examined in our soil mechanics laboratory. Detailed descriptions of the materials encountered in the borings are shown on the individual boring logs, Plates 3-C-1 through 3-C-32 (casino borings) and 3-S-1 through 3-S-16 (sanitary line borings). The results of the test pit explorations are shown on Plates 4-T-1 through 4-T-7 (track/paddock test pits), 4-P-1 through 4-P-25 (parking area test pits) and 4-R-1 through 4-R-9 (retail area test pits). The soils were visually classified in general accordance with the Unified Soil Classification System presented on Plate 5 and the Engineering Rock Classification and Core Description Chart, Plate 6.

Numerous soil samples were subjected to laboratory testing consisting of grain-size analyses, modified Proctor compaction testing, and moisture content determinations to aid in their engineering classification and evaluation. The results of the grain-size tests are presented on Plates 7A through 7K, Gradation Curves, and the results of the modified Proctor tests on Plates 7L through 7Q, Gradation Curves and Compaction Test Reports. The results of the moisture content tests are presented on the Gradation Curves and on the appropriate exploration logs. In addition, 18 tube samples collected from the test pits performed in the automobile parking areas where below-grade stormwater management facilities may be situated were subjected to falling head tube permeameter permeability tests. A summary of the results of the tube permeameter tests are presented on Plate 8. The construction details for the piezometers installed at Borings 3-C-1, 3-C-7 and 3-C-12 are shown on Plates 9A through 9C, Piezometer Construction Details.

The results of our subsurface exploration program, our visual examination of the soil and rock samples, and our review of the laboratory test results have provided the basis for our engineering analyses and design recommendations. The following discussions of our findings are subject to the limitations attached as an Appendix to this report.

Site Conditions

Published Geology: The proposed Concord Resort complex is located within the southern New York section of the Appalachian Plateau's Geomorphic Province. This province is characterized by a deeply dissected plateau underlain by Paleozoic Age clastic sedimentary rock.

According to the Geologic Map of New York, Map and Chart Series No. 15, published by the New York State Education Department, 1970, the site is underlain by rock of the Upper Walton Formation. This rock formation is Devonian in age and consists of greenish to reddish conglomerates, sandstones and shales.

The Soil Survey of Sullivan County, New York, USDA, 1989, maps the upper part of the site as containing Willsboro and Wurtsboro soils. The Willsboro and Wurtsboro Series are similar in nature, being gravelly loams to gravelly fine sand loams with a perched water table of approximately one and one-half to three feet. Bedrock is reported as being deeper than six feet. These soils consist of dense glacial till.

The lower portion of the site in the area of the track is mapped as containing Scriba loams, Navasink and Alden soils, Arnot-Oquaga Complex, Wayland silt loam and Wurtsboro loam. These materials are generally loamy soils and sandy loams formed from residual sandstone, shale or dense glacial till, with the exception of the Wayland soils which are silty loams formed from alluvial materials. These soils are mapped as having a perched water table of approximately 0.5 to 6 feet and bedrock deeper than 6 feet below grade.

Surface Features: The majority of the proposed casino/hotel and southern parking areas are currently moderately to heavily wooded with several areas identified as wetlands. The northeast portion of the property just west of Joyland Road is occupied by an abandoned summer camp with numerous one-story cottage structures and gravel access drives. The majority of the proposed track and paddock areas are currently occupied by portions of the Concord Golf Course with numerous fairways, water features, areas mapped as wetlands, and wooded areas scattered throughout.

Topographic information shown on plans provided to us indicates that the site generally slopes moderately to steeply downward from east to west from a high of approximately Elevation +1,456 feet in the eastern portion of the property adjacent to Joyland Road to a low of approximately Elevation +1,360 feet in the north central portion of the proposed track oval. Thompsonville Road slopes moderately to gently downward from its intersection with Joyland Road to the west from a high of approximately Elevation +1,434 feet at the intersection of Thompsville Road and Joyland

Road to a low of approximately Elevation +1,344 feet in the area of Boring S-16 where our study for the sanitary line terminated.

Subsurface Conditions: The following generalized strata were encountered in the explorations and are listed in order of increasing depth:

1) Topsoil: A surficial layer of topsoil was encountered in 84 of the 89 explorations performed for this study. In general, the topsoil was found to be approximately 4 to 12 inches thick in the majority of the explorations, but ranged up to approximately 18 to 24 inches in thickness in 16 of the test pits.

2) Pavement/Fill: A two-inch thick layer of asphalt pavement was encountered in Test Pit P-8 and gravel pavement and fill materials were encountered in nine of the explorations, primarily in the area of the abandoned camp and adjacent to Thompsonville Road. The borings performed for Thompsonville Road were advanced adjacent to the existing pavement surface in order to minimize disturbance to the existing roadway. However, our visual observations indicate that Thompsville Road and Joyland Roads are likely constructed by "chip seal" methods and do not consist of a true asphaltic concrete section. Although only shallow fill materials on the order of two feet or less were encountered in only about ten percent of the explorations, it should be anticipated that fill materials may be encountered once construction begins in previously developed areas such as the abandoned camp, along Thompsonville Road and in sections of the existing golf course.

3) Silty Sand: Below the surficial topsoil and fill materials, the natural soils typically consisted of sands and silty sands containing varying amounts of gravel, cobbles and boulders which were encountered in all of the explorations performed for this study. The sandy soils are believed to be glacial in nature and extended to the completion depths in the majority of the explorations performed. The upper one to two feet of the glacial sandy soils were found to be somewhat loose in relative density, probably the result of freeze-thaw cycles. Below the upper two feet, the glacial materials were observed to be dense to very dense in relative density for their full depth.

4) Silty/Gravelly Strata: The glacial sandy soils contained varying amounts of silts and gravels; however, in several samples subjected to laboratory grain-size testing, the silt and gravel percentages were high enough to classify the materials as silt and/or gravel, as indicated on the appropriate exploration logs.

5) Sandstone/Siltstone/Claystone Bedrock: In 11 of the 32 borings performed in the casino area, 4 of the 16 borings performed along the route of the proposed

> sanitary sewerline on Thompsonville Road, and in 13 of the 41 test pit explorations, sandstone /siltstone/claystone bedrock was encountered at depths varying from approximately 4 to 45 feet below grade. For discussion purposes, the sandstone/siltstone/claystone will be referred to as sedimentary rock for the remainder of this report. In several of the explorations, it could not be determined if refusal to further drilling or excavation was encountered atop sedimentary bedrock or relatively large boulders. In general, the sedimentary rock was found to grade sounder with depth, where encountered.

It should be noted that the soil classification from the borings are based on the materials recovered in a standard SPT sample spoon which is approximately two inches in outside diameter. Our logs note the presence of gravel, cobbles and boulders, but these larger particles are not reflected on the grain-size curves.

Groundwater seepage was encountered in 15 of the 41 test pits and 36 of the 48 test borings performed for this study upon their completion. Three piezometers were installed in Borings No. C-1, C-7 and C-12. The stabilized groundwater levels in the piezometers installed in the deeper borings were at levels of approximately 24 to 30 feet below grade. The groundwater levels observed in the remainder of the explorations were shallow, typically on the order of 1 to 21 feet at most locations and could represent true groundwater levels in the lower elevated portions of the site or perched groundwater levels atop less pervious zones of the in-place materials in the higher portions of the site. In addition, mottling which is indicative of seasonal groundwater conditions or seasonally saturated soils, was observed in a number of the test pit explorations. “True” groundwater levels could be present at depths of 24 feet or greater below grade; however, it is apparent due to the numerous ponds, lakes and wetlands present at varying elevations throughout the area, as well as the seepage observed at varying levels in the explorations, that groundwater seepage could be encountered at variable elevations and intensities throughout the site, at least on a seasonal basis.

Cross-sections showing the generalized subsurface conditions are presented on Plates 10A through 10E.

Findings and Recommendations

General: Based on the results of our study, it is our opinion that:

1) The proposed casino, paddock buildings and retail structures may derive their support from conventional shallow foundations established on the undisturbed natural soils, fractured or sound sedimentary bedrock, or controlled compacted fill placed to reach the desired levels. Pavements and floor slabs may also derive their support from these materials.

2) Relatively sound sedimentary bedrock was encountered at depths of approximately 20 to 46 feet below the existing surface grades in the casino, generally anticipated to be below the levels required to construct the planned lowest level of the casino structure. However, relatively large boulders were encountered in a number of the explorations and refusal to further excavation with the excavator atop sedimentary bedrock and/or large boulders was encountered at shallower levels throughout the site. Consequently, the use of relatively large excavation equipment and/or localized jackhammering with hydraulic hammers attached to large excavation equipment could be required for site excavations. Excavations which extend more than several feet below the surface of the refusal levels observed could require blasting.

3) The moisture levels observed in the majority of the materials subjected to laboratory testing indicate that the natural glacial soils appear to be at or close to moisture levels which would allow recompaction to 95 percent of their maximum dry density. Several samples contained high moisture contents. Due to the relatively high silt content of the materials, the soils are highly susceptible to disturbance due to slight changes in moisture content. Consequently, some aeration and drying of the shallower surficial materials and portions of the material which are wet or which are allowed to become wet should be anticipated to be required.

4) The relatively low permeability rates observed in the tube permeameter tests performed on the natural glacial soils, as well as the observation of perched groundwater at variable levels indicates that the existing site soils would provide very limited infiltration characteristics for stormwater recharge.

5) Stabilized groundwater levels in the three deep piezometers installed were observed at depths of approximately 24 to 30 feet below grade; however, slight to moderate groundwater seepage was encountered in a number of the explorations at variable levels across the site. Consequently, dewatering

during construction should be anticipated to be required, and drainage systems should be provided for below-grade portions of the structures.

Further discussion of these items and others considered relevant to the proposed development are presented in subsequent sections of this report.

Site Preparation and Earthwork: The development areas should be cleared and grubbed of all vegetation and any existing structures and existing subsurface elements such as foundations or utilities should be demolished and the resulting demolition rubble legally disposed of off-site. Any excavations resulting from demolition and utility removal should be backfilled with controlled compacted fill as described in subsequent sections of this report. After clearing, grubbing and demolition, the topsoil should be stripped for its full depth from within and at least 20 feet beyond the proposed casino building and track area. The topsoil should be stripped from within and up to ten feet beyond the limits of areas where minor cuts and fills may be required such as the limits of the proposed parking areas, paddock building and retail structures. We recommend that the site grades be identified and finalized prior to determining the limits of topsoil removal. The topsoil would not be suitable for reuse as controlled compacted fill or backfill in building or paved areas.

After clearing and stripping, any isolated pockets of fill and/or soft, wet soils should be located and removed. We believe that potentially compressible deposits could be encountered in wetland areas present where the new racetrack will be developed. However, due to the preliminary planning stages of the project, wetlands disturbance permits were not obtained at the time of our study and no explorations were completed in the wetlands. Consequently, pockets of soft, compressible organic soils and/or pockets of fill materials installed during the construction of the existing golf course would need to be located and removed prior to constructing the proposed track. Additional test pits should be performed when the site plans in this area are finalized.

After clearing and stripping and removal of any soft organic and/or uncontrolled fill materials, and prior to placement of controlled compacted fill in areas to be raised, the exposed subgrade materials should be proofrolled and compacted to a dense and unyielding consistency with several passes of a heavy, self-propelled, vibrating drum compactor with a minimum static drum weight of ten tons under the observation of a qualified geotechnical engineer. Any subgrade materials which appear to be soft or unstable should be further excavated to the surface of competent soils and backfilled with controlled compacted fill. We believe that the majority of the soils exposed after stripping of the topsoil will consist of glacial silty sand materials. For the most part, these materials are anticipated to be relatively dense; however, due to their high silt content and the relatively loose nature of the upper two feet of the materials encountered in the explorations and the presence of shallow perched groundwater, we anticipate that the surficial materials will be highly susceptible to softening and disturbance once subjected to construction equipment traffic.

In the lower elevated or poorly drained areas where the proposed racetrack will be constructed, it may be prudent to proofroll the exposed subgrade soils with the compactor in a "static" mode to help limit disturbance. This determination should be made at the time of construction by a qualified geotechnical engineer. Installation of an initial two foot thick lift of gravel, shot rock and/or similar free-draining material to bridge soft areas may help stabilize the subgrades prior to additional fill placement for the track.

The majority of the on-site soils in the cut areas of the casino building were observed to consist of silty sands with varying amounts of cobbles and boulders. Three bulk samples of the on-site soils which appear to be representative of materials anticipated to be generated from cut areas were subjected to laboratory modified Proctor (ASTM D-1557) compaction testing to estimate the moisture/density relationship of the soils. The moisture content tests performed on additional

samples obtained in the explorations indicated that the majority of the site materials were at moisture contents that would permit compaction to the required degree. However, several samples possibly impacted by freezing/thawing and inundation of surface water, were observed to be well above the levels required for compaction. Consequently, some aeration and drying should be anticipated. We recommend that the project be sequenced so that the majority of the earthwork operations are performed during periods of warm, dry weather in order to facilitate reuse of the on-site soils as structural fill. If the earthwork operations are performed during or following periods of wet or freezing weather, compaction of the on-site soils to the required degree may be difficult. We recommend that the earthwork contractor work in conjunction with a qualified geotechnical engineer familiar with the site conditions to selectively utilize the driest available materials from cut areas as fill in the building footprint and/or track area or other areas critical for completion of the project's construction schedule, and to utilize wetter soils over as large an area as possible in the parking areas where they could be allowed to dry prior to compaction, minimizing construction delays.

We recommend to the extent possible, that cobbles and boulders be utilized in areas requiring deeper fills where they would not interfere with future excavation for foundation and utility installation. Portions of the cobbles and boulders could be broken into smaller fragments where they may be reused to stabilize wetter areas prior to installation of granular controlled compacted fill. Care should be taken to provide sufficient soil to infill any voids between the cobbles and boulders to minimize the potential for migration of the upper fill soils into voids between the cobbles and boulders.

Any imported fill required to complete the site grading within the building and paved areas should consist of uncontaminated, relatively well-graded, granular soils containing less than 15 percent by weight of material passing a U.S. Standard No. 200 sieve and a maximum particle size of

six inches. The fill supplier should provide documentation of the environmental quality of all imported fill.

All materials placed in building or paved areas should be spread in layers on the order of twelve inches or less in loose thickness and uniformly compacted to at least 95 percent of its maximum dry density as determined by the ASTM D-1557 test procedure. Backfill placed in confined areas, such as foundation or utility trench excavations, should be spread in thinner layers and uniformly compacted to similar densities using manually operated compaction equipment.

All construction excavations should be performed in accordance with the most recent OSHA Excavation Guidelines and any state and local governing safety codes. Based on the results of our explorations, we believe that the existing site soils will be considered a Type "C" soil as defined by the latest OSHA Excavation Regulations. Excavation side slopes should be flattened as necessary to maintain safe excavations, or should be adequately braced.

Due to the high percentage of cobbles and boulders encountered in the glacial matrix soils, installation of driven sheeting for excavations which need sidewall support would be difficult or impossible. Consequently, excavation side slope support consisting of soldier piles and lagging could be required.

Bedrock consisting of fractured sedimentary bedrock was encountered in several of the borings at depths of approximately 19 to 45 feet below grade in the casino area, 15 to 20 feet in three of the borings performed along the route of the proposed sanitary line, and in a number of the test pits at depths as shallow as four feet below the existing surface grades. Rock cores utilizing an NQ size core barrel which extracts a rock core approximately two inches in diameter were advanced in nine of the casino borings and two of the borings performed along the route of the proposed sanitary line in Thompsonville Road. Approximately five to ten feet of rock was cored at each boring and

was observed to grade sounder with depth. We believe that excavations could extend a few feet below the surface of the highly weathered portions of the bedrock using rippers, or large excavators fitted with rock teeth. The transition between the highly weathered, fractured sedimentary rock and sounder, less jointed bedrock will vary across the site. Excavations below sounder portions of the bedrock could likely extend only a nominal depth below the sound rock using heavy construction equipment. In addition, large boulders could be encountered.

In confined areas such as foundation or utility trench excavations, it should be anticipated that some blasting or extensive hammering may be required to achieve the proposed construction subgrade levels. All we can really say is based on grades provided, we do not think rock will be encountered in the casino/hotel. No grades were provided in other areas.

Groundwater was encountered in the majority of the borings at depths of approximately 6 to 21 feet below grade upon their completion, and shallower perched water from runoff and snow melt was encountered in a number of the test pits at the time of our study. Groundwater levels were measured four to six times in Borings No. C-1, C-7 and C-12 where piezometers were installed to depths of 34 to 50 feet, and the stabilized groundwater levels were encountered at depths of approximately 24 to 30 feet below grade corresponding to elevations of +1,387 feet to 1,400 feet. The variable nature of the groundwater levels observed while the explorations were being performed indicates that groundwater seepage could be encountered in excavations at various levels due to seepage through more pervious zones of materials, and from surface water which percolates through the surficial soils. Surficial runoff through the topsoil into the test pit excavations was noted extensively at the time of our study, even when the lower strata in the test pits exhibited no infiltration. Consequently, controlling groundwater through drains and diversion trenches upgrade from the earthwork construction activities should be anticipated during construction. We believe

that perched water seepage will be variable in intensity, but that the majority of the site groundwater can be controlled by pumping from sumps and/or diversion and cutoff trenches. The contract documents should require the contractor to provide the equipment, labor and whatever means necessary to maintain relatively dry excavations at all times.

Groundwater seepage above the levels encountered in the explorations should be anticipated, at least on a seasonal basis. We recommend that the site stormwater utilities be installed as early as possible and be bedded in clean, three-quarter crushed stone in order to help intercept and divert groundwater seepage to the extent possible.

Foundation Design Criteria: Following the previously described site preparation procedures, the proposed casino, paddock area and retail structures could be supported by conventional shallow foundations which derive their support from the undisturbed, natural glacial soils, sedimentary bedrock, or controlled compacted fill installed to achieve the proposed floor slab subgrade levels. If the foundation excavations are allowed to remain open, it may be prudent to overexcavate the footings and place a four to six-inch thick layer of clean, three-quarter inch crushed stone, washed gravel, or flowable fill in the excavations to protect the exposed subgrade soils from the affects of moisture and/or foot traffic prior to the installation of concrete. We believe that foundations established a minimum of four feet below the existing surface grades on the dense glacial soils could be designed to impose allowable net bearing pressures of up to four tons per square foot. Foundations established on controlled compacted fill required to achieve the proposed lowest floor slab levels, which from our preliminary review of the existing topography appear to be required at the eastern upper entry level and along the west side of the casino structure for the proposed Level 3 entry to the below grade parking, could be designed to impose maximum allowable net bearing pressures of up to two tons per square foot. Bearing capacities of six tons per square foot or more

could be obtained from the fractured sedimentary bedrock. However, for ease of construction, it may be prudent to design all foundations for dense till or controlled compacted fill.

If higher bearing capacities are desired in the fill areas of the parking structure due to the relatively heavy column loads, the foundations could be constructed at deeper levels on the dense natural glacial till soils and the area backfilled to reach the proposed floor slab levels. Drilled piers or forms of ground improvement such as geopiers could also be considered to achieve higher bearing capacities. Further evaluation of these alternatives could be provided as the design progresses, if desired.

Although no structural loading or grading information was provided to us for the paddock area buildings or retail structures, we anticipate that relatively light to moderate foundation loads would be imposed. Consequently, for ease of construction, it may be prudent to design the paddock and retail buildings for maximum allowable bearing capacities of 4,000 pounds per square foot, which could be attained from the recompacted, in-place natural soils and/or controlled compacted fill required to achieve the proposed site grading.

Exterior foundations should be established at least four feet below the lowest adjacent exterior grades, or deeper if required by local building codes, to provide protection from frost penetration. Interior foundations located in permanently heated portions of the proposed buildings could be constructed at convenient depths below the ground floor slab, provided they reach the intended bearing stratum. Any foundations below unheated space should extend to four feet.

Foundation Settlement: Because of the wide variation in column loads and the footing sizes, as well as depths below existing grade, foundation settlements will be variable and additional analyses will be required when more detailed foundation plans and loading are available.

For preliminary purposes, we looked at a column load of 1,800 kips for a footing four feet below grade at a four ton per square foot bearing capacity which results in a footing size of 15 feet by 15 feet and total settlements estimated to be up to approximately one and one-half inches. Settlements will occur rapidly as the load is applied and post-construction settlements will be smaller.

Settlements for smaller size footings will be proportionally less, on the order of one-half of one inch, or less.

Seismic Design Criteria: Based on the subsurface conditions encountered in the explorations performed for this study, we estimate that the site would be a Site Class "C" as defined by the Building Code of the State of New York, 2010 Edition, for seismic design purposes. This estimate is based on the average Standard Penetration Test N-values obtained in the borings and the formula prescribed in the building code. To more accurately define the Site Class, shear wave velocity measurements could be made using geophysical methods.

Floor Slab Design Criteria: Following the previously described site preparation procedures, the ground floor slabs of the proposed structures may be supported at the indicated levels on the natural subgrade materials or properly placed controlled compacted fill. We recommend that the lowest level floor in the below-grade parking slab subgrades be underlain by a layer of coarse, free-draining material consisting of at least twelve inches of clean, three-quarter inch crushed stone or washed gravel. We recommend that subslab drains consisting of minimum four-inch diameter, perforated PVC pipes spaced 20 feet on center be installed below the proposed third level below grade parking area which would reportedly be established at Elevation +1,399 feet. The pipes should be surrounded by a minimum of four inches of clean, three-quarter inch crushed stone or

washed gravel and be connected to a manifold or header pipe where any water which accumulates in the stone may drain by gravity to daylight beyond the building limits or to the storm sewer system.

We recommend that floor slabs for the proposed paddock area and retail structures be underlain by a minimum of six inches of clean, three-quarter inch crushed stone or washed gravel to provide a capillary break between the floor slab and underlying subgrade soils. Depending upon the final elevations determined for the various retail and/or paddock area buildings, and especially if floor slabs are designed to step down to below grade levels, such as for a cinema, the final floor slab levels should be reviewed and recommendations be made to provide adequate drainage.

Immediately prior to at-grade slab construction, the exposed subgrade materials should be compacted to an unyielding condition under the observation of a qualified geotechnical engineer. Any subgrade materials which cannot be compacted as required should be excavated to the surface of suitable materials and replaced with controlled compacted fill or clean, three-quarter inch crushed stone.

We estimate that post-construction settlements of floor slabs supported by materials which are prepared in accordance with our recommendations would be less than one-quarter of one inch.

Below-Grade Walls: Significant retaining walls will be required to accommodate the difference in floor slab levels between the entrance level supported at-grade stepping down to the Parking Level 2 supported at-grade approximately 25 feet lower, and for the second step between the Lower Level 2 parking area and Lower Level 3 parking, an 11 foot change in elevation. Consequently, to accommodate the difference in floor slab levels, two retaining walls approximately 11 feet and 25 feet in height will be required along the entire length of the east-central portion of the structure where parking will be located. In addition, a single wall approximately 36 feet high will be required between the entry level in the area of the hotel and the office/training/service rooms west of

the hotel and north of the below-grade parking. We recommend that the below-grade walls be provided with a vertical drainage system to prevent the buildup of hydrostatic pressure behind the walls. The vertical drain should consist of a synthetic drainage material (Enkadrain, or equivalent) or a column of crushed stone which extends from the top of the wall foundation for the full height of the interior retaining walls. The vertical drainage layer should be connected to a foundation drain consisting of a minimum eight-inch diameter porous concrete or perforated ADS pipe surrounded on all sides by a minimum of six inches of free-draining crushed stone wrapped in filter fabric. The foundation drain should be sloped to drain by gravity to the storm sewer system or to daylight downslope.

All below-grade walls should be designed to resist lateral earth pressures imposed by the adjacent soils, as well as surcharge loads due to adjacent footings and surface improvements, as well as temporary construction traffic, material stockpiles, sloping backfills, etc. Walls which are free to rotate slightly during backfilling may be designed to resist lateral earth pressures assuming an active earth pressure condition. If the retaining walls are restrained, they should be designed assuming an at-rest earth pressure condition. If sandier portions of the on-site soils are used as backfill, a total unit weight of 145 to 150 pounds per cubic foot should be used, based on the Proctors obtained from the on-site soils compacted to 95 percent of their maximum dry density, and an approximate moisture content of 5 percent. A friction angle of 34 degrees may be used. We estimate that a friction factor between mass concrete and the on-site soils would be 0.40. If the footings are underlain by at least eight inches of crushed stone, the friction factor could be increased to 0.55.

Based on our previous experience with below-grade walls which accommodate interior steps between floor slabs greater than ten feet in height, such as those planned for the proposed casino, it is common practice for the structural engineer to require the framing of the upper level and upper floor

slab(s) to be in-place to brace the interior building wall before allowing backfilling. Significant construction delays could be encountered if backfilling of the proposed wall is delayed until the frame of the structure is complete and this would then dictate use of at-rest pressures for design of the walls.

Our conversations with the structural engineer indicated that due to the current plans requiring the decking for the proposed parking areas to be precast prior to installation, the below-grade walls would need to be tied back through the use of soil anchors. Based on our review of the Post Tensioning Institute (PTI) publication, "Recommendations for Pre-Stressed Rock and Soil Anchors" 2004 Edition, typical ultimate bond stresses between the soil and grouted portion of pressure grouted anchors for dense glacial till range from 43 to 75 psi. We suggest assuming 50 psi for preliminary design. However, since the actual anchor capacities will be dependent on the installation methods, we recommend a performance specification where an anchor capacity is specified and an experienced specialty contractor provides a design to achieve that capacity. All tie backs should be performance and proof tested in accordance with the PTI recommendations. In areas where fills are required for the walls, the use of tiebacks attached to deadmen installed before backfilling should be considered.

Pavement Design Criteria: We recommend that paved areas be prepared in general accordance with our prior discussions, including stripping of topsoil, proofrolling of subgrades, and placement and compaction of controlled compacted fill. Immediately prior to pavement construction, the exposed subgrade soils should be recompacted to a firm and unyielding consistency, and the upper two feet of the subgrade soils compacted to at least 95 percent of their maximum dry density as determined by the ASTM D-1557 test procedure. If the pavements are established on the natural soils consisting of silty sands, subgrade support conditions should be

considered “fair” with an estimated California Bearing Ratio (CBR) value of approximately five percent.

During the current study, detailed evaluation of the current condition of Joyland Road and Thompsonville Road which may need to be improved to access the proposed casino development was not performed. Our visual observations of the existing roadway surface indicate that the existing roads were constructed using a “chip-seal” method utilizing gravel and an asphalt emulsion which is reapplied and regraded every few years to restore the surface. Consequently, the existing pavement may not serve to be incorporated into a final pavement section.

We believe that the fill materials required to reach the proposed subgrade levels for the proposed track surface should be installed as described in previous sections of this report. The final site grades and the surface section required to accommodate horse racing has not been provided to us at this time. We recommend that the proposed section, once available, be provided for review to determine if materials generated on-site could provide the required support conditions if used within the racing surface section of the track.

Proposed Stormwater Management: Based on our ongoing discussions, you have indicated that it is currently desired to construct subsurface stormwater management systems below landscaped and/or parking areas as part of the overall site development. As part of our preliminary assessment of the permeability of the natural subgrade soils, tubes were driven into the test pit excavation sidewalls and the tube samples brought to our laboratory where they were saturated and subjected to falling head permeability tests. These results were transmitted to you in our correspondence of April 23, 2012. In general, the measured permeabilities were relatively low, likely due to the compactness and silty nature of the natural soils at the site. A summary of the tube permeameter results are included as Plate 8 to this report. As planning for the proposed stormwater

management systems on the site progress, we would be pleased to perform additional in-place permeability tests in accordance with NYDEC Appendix "D" in order to satisfy New York State requirements, or to discuss alternate groundwater management practices.

Proposed Sanitary Sewer Lines: Borings No. S-1 through S-16 were performed along a portion of the proposed new sanitary line route in the area of the proposed retail development between Joyland Road and Thompsville Road, and to the west along Thompsville Road for a total length of approximately 4,500 feet. Based on preliminary information provided to us, the borings performed along the proposed sanitary pipeline route were advanced to depths of between 15 and 20 feet below the existing surface grades. However, a boulder encountered in Boring S-8 terminated that exploration at a depth of eight and one-half feet below grade. In addition, bedrock was encountered at depths of approximately 15 to 20 feet below grade in Borings No. S-14 and S-16 located towards the eastern end of the proposed pipeline route included as part of this phase of the project. It should be anticipated that large boulders could be encountered in the excavations to install the proposed sanitary line which could require jackhammering and/or blasting for removal. Wider than anticipated excavations could be necessary in order to remove large boulders. In addition, any areas where the proposed sanitary line is anticipated to extend to depths of below 15 to 20 feet below grade could encounter sedimentary bedrock which would likely require blasting for removal.

Future Work

Proposed floor slab levels were provided to us for the casino/hotel/garage structure for preparation of this report. However, grading plans and proposed floor levels were not provided for the remainder of the site. Consequently, the findings and recommendations presented in this report

may need to be revised based on the final design levels. We recommend that as plans are developed, they be provided to us for review to confirm that the items discussed in this report remain valid.

Please feel free to contact us if you have any questions regarding this report.

The following Plates are attached and complete this report:

Plate 1 – Site Location Map
Plate 2 – Plot Plan
Plates 3-C-1 through 3-C-32 – Logs of Borings (Casino)
Plates 3-S-1 through 3-S-16 – Logs of Borings (Sanitary Line)
Plates 4-T-1 through 4-T-7 – Logs of Test Pits (Track/Paddock Area)
Plates 4-P-1 through 4-P-25 – Logs of Test Pits (Parking Area)
Plates 4-R-1 through 4-R-9 – Logs of Test Pits (Retail Area)
Plate 5 – Unified Soil Classification System
Plate 6 – Engineering Rock Classification and Core Description Chart
Plates 7A through 7K – Gradation Curves
Plates 7L through 7Q – Gradation Curves/Compaction Test Reports
Plate 8 – Summary of Tube Permeameter Test Results
Plates 9A through 9C – Monitoring Well Details
Plates 10A through 10E – Subsurface Profiles
Appendix – Limitations

Respectfully submitted,

MELICK-TULLY and ASSOCIATES, P.C.

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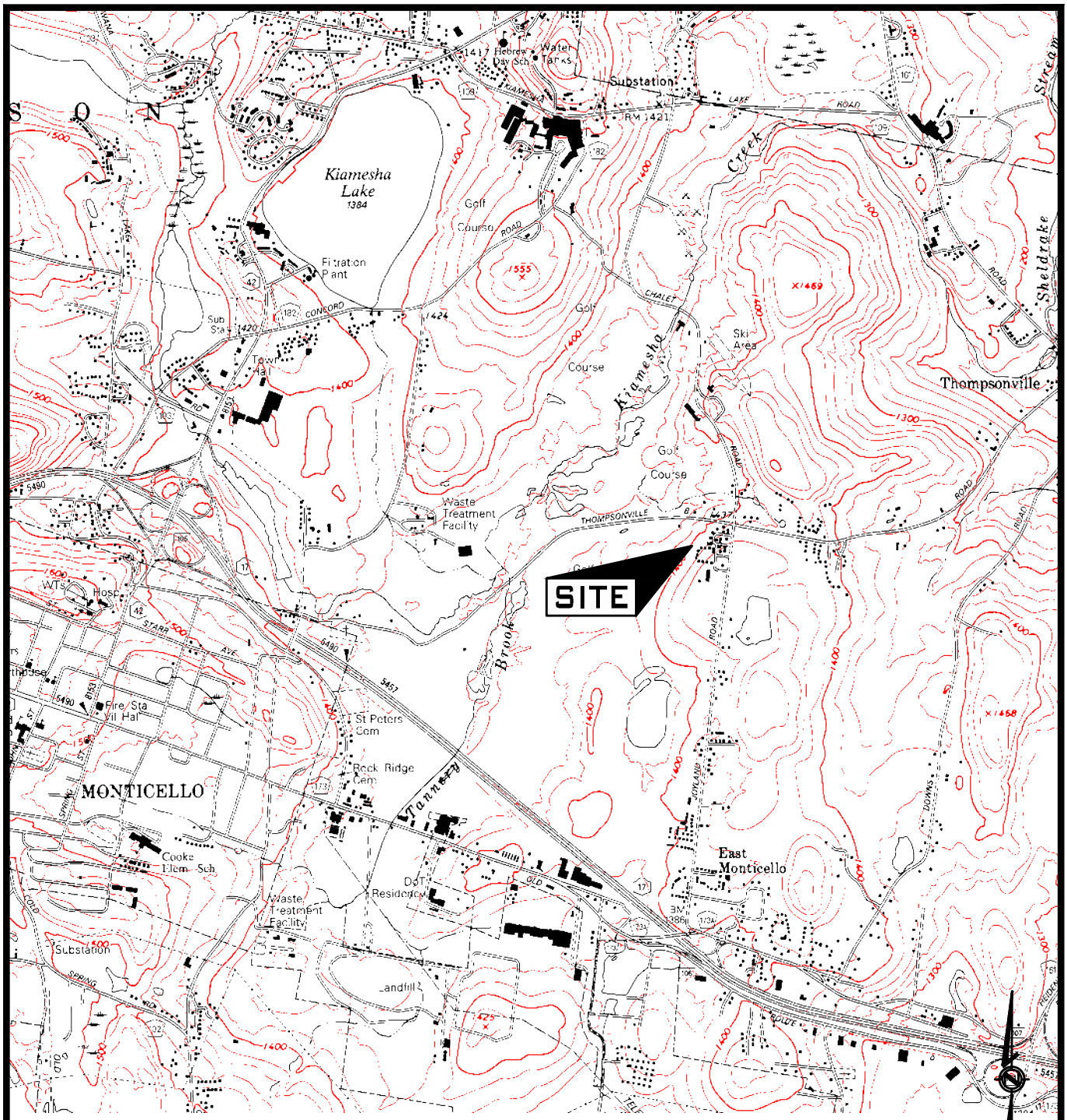
JHB:TEH/mh
8979-001*1D
(3 copies submitted)



FROM: "Digital Raster Quadrangles" at 1:24,000 scale provided by New York State GIS Clearinghouse website (http://www.nysgis.state.ny.us/gisdata/quads/).

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SITE LOCATION MAP

CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
8979–001*1D	25299	VJD	JHB	4–23–12	1"=2,000'	1

GRAPHIC SCALE

100 0 50 100 200

(IN FEET)

1 inch =100 ft.

KEY:

B-C-1 NUMBER AND APPROXIMATE LOCATION OF BORINGS PERFORMED FOR THIS STUDY

TP-1 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

B-1 SURVEY CONTROL POINTS PROVIDED BY OTHERS

A A' INDICATES NAME, APPROXIMATE LOCATION AND DIRECTION OF SUBSURFACE PROFILE

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-001*1D and should be read together with the report for complete evaluation.
2. General layout was obtained from an unlabeled drawing provided by the client.

PLOT PLAN

CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

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JOB NO.	FILE NO.			
8979-001*1D	25299			
DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	3-29-12	1"=100'	2

LOG OF BORING

BORING NO. C-1

COMPLETION DATE: 3/02/12 | SURFACE ELEVATION: +1,421 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/02/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	6				Red-brown fine to coarse sand, some silt, little fine gravel (moist)(loose to very dense)	
	S2	55	7.0		SM		
5						- driller notes boulder @ 4'	5
	S3	50	9.3			Red-brown fine to coarse sand, and silt, little fine gravel (moist)(dense to very dense) - driller notes boulder @ 8'	
10	S4	46	8.3				10
15					SM	- grading with cobbles and boulders	15
	S5	50/5"					
20	S6	94					20
25	S7	68					25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-1

COMPLETION DATE: 3/02/12 | SURFACE ELEVATION: +1,421 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/02/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	62			SM	Red-brown fine to coarse sand, some silt, little fine gravel (moist)(dense to very dense)	
35	S9	39					35
40	S10	54					40
45	S11	40					45
50	S12	50/5"				- piezometer installed to 50'	50
						Boring completed @ 50'-11"	
55						Date / Water Level: 3/09/12 19'-0"; 3/23/12 24'-0"; 4/04/12 28'-7"; 4/13/12 24'-4"	55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-2

COMPLETION DATE: 3/01/12 | SURFACE ELEVATION: +1,425 ft (±) | WATER LEVEL: 9'

JOB NUMBER: 8979-001*1D | READING DATE: 3/01/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						12" Topsoil	
	S1	4				Red-brown fine to coarse sand, and silt, trace fine gravel (wet)(loose to dense)	
	S2	32	9.2				
5					SM	- grading to little fine gravel	5
	S3	39	8.9				
						- driller notes boulder @ 9'	
10					SM	Light gray fine to coarse sand, little silt, some fine gravel (moist)(very dense)	10
	S4	52	3.1				
						Red-brown fine to coarse sand, and silt, some fine to coarse gravel (wet)(very dense)	
15	S5	81					15
					SM		
20	S6	64/9"					20
						- driller notes boulder @ 23'	
						Gray fine to medium sand, little silt, some fine to coarse gravel (moist)(very dense)	
25	S7	94/8"					25
					SM	- grading with frequent cobbles and boulders	
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-2

COMPLETION DATE: 3/01/12 | SURFACE ELEVATION: +1,425 ft (±) | WATER LEVEL: 9'

JOB NUMBER: 8979-001*1D | READING DATE: 3/01/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	67				Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(very dense)	
35	S9	42			SM	- grading (wet)(dense)	35
40	S10	90/11"				- grading (very dense) with frequent cobbles and boulders	40
						- auger refusal @ 43' on boulder	
	CORE RUN NO. 1			3 3 3 4 4 3 3	SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel, frequent cobbles and boulders (wet)(very dense) CORE RUN NO. 1: 43' to 48'	
45							45
	NO. 2					CORE RUN NO. 2: 48' TO 50'	
50							50
55						Boring completed @ 50' Groundwater encountered @ 9'	55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-3

COMPLETION DATE: 2/29/12 | SURFACE ELEVATION: +1,424 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-001*1D | READING DATE: 2/29/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						6" Topsoil	
	S1	6	3.0		SM	Red-brown fine to coarse sand, and silt, trace fine gravel (moist)(loose to dense)	
	S2	43					
5						Gray fine to medium sand, little silt, little fine gravel, occasional cobbles and boulders (moist)(very dense)	5
	S3	92/9"			SM		
10						Red-brown fine to coarse sand, some silt, and fine to coarse gravel (wet)(dense)	10
	S4	35			SM		
15						Red-brown fine to coarse sand, and silt, some fine to coarse gravel (wet)(very dense)	15
	S5	76/11"					
20	S6	50/5"			SM	- grading with frequent cobbles and boulders	20
25	S7	50/3"					25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-3

COMPLETION DATE: 2/29/12 | SURFACE ELEVATION: +1,424 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-001*1D | READING DATE: 2/29/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	70			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (wet)(very dense)	
35	S9	50/3"					35
40	S10	52					40
45	S11	50/3"					45
	CORE RUN NO. 1			3 4 4 5 5		Green-gray medium grained, poor quality, closely jointed sandstone bedrock ROCK CORE RUN NO. 1: 46' to 51' REC = 97% RQD = 28%	
50							50
55						Boring completed @ 51' Groundwater encountered @ 2'	55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 2 of 2 PLATE: 3-C-3

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-4

COMPLETION DATE: 2/27/12 | SURFACE ELEVATION: +1,424 ft (±) | WATER LEVEL: 10'

JOB NUMBER: 8979-001*1D | READING DATE: 2/27/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						6" Topsoil	
	S1	4			SM	Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(loose)	
	S2	55	8.8			Red-brown fine to coarse sand, some to and silt, little fine gravel (moist)(very dense)	
5	S3	87	6.2		SM		5
10	CORE RUN 1	68		5 5 6 6 10 10	SM	Red-brown fine to medium sand, some silt, little fine gravel (wet)(very dense) NQ CORE RUN NO. 1: 10' to 12' NQ CORE RUN NO. 2: 12' to 15' - driller coring from 10' to 42' anticipating rock - no rock, glacial till with frequent cobbles and boulders	10
15	CORE RUN 2 CORE RUN NO. 3			4 4 5 5 5		NQ CORE RUN NO. 3: 15' to 20'	15
20	CORE RUN NO. 4			5 3 3 4 5		NQ CORE RUN NO. 4: 20' TO 25'	20
25	S5 CORE RUN NO. 5	82		5 3 4 4 4	SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(very dense) NQ CORE RUN NO. 5: 25' to 30'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-4

COMPLETION DATE: 2/27/12 | SURFACE ELEVATION: +1,424 ft (±) | WATER LEVEL: 10'

JOB NUMBER: 8979-001*1D | READING DATE: 2/27/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S6 CORE RUN NO. 6	39		5 5 6 6 5	SM	NQ CORE RUN NO. 6: 30' to 35'	
35	S7 CORE RUN NO. 7	82		6 4 4 5 5		NQ CORE RUN NO. 7: 35' to 40'	35
40	S8 CORE RUN NO. 8	53		6 4 4 5 6 6 5 6 7 6 6		NQ CORE RUN NO. 8: 40' to 45' - rock encountered @ 42' REC = 100% RQD = 63% Red-brown, fair quality, medium grained, closely jointed sandstone bedrock NQ RUN NO. 9: 45 to 50' REC = 100% RQD = 90% - grading to green-gray sandstone rock, excellent quality	40
45	CORE RUN NO. 9						45
50							50
55						Boring completed @ 50' Groundwater encountered @ 10'	55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-5

COMPLETION DATE: 3/12/12 | SURFACE ELEVATION: +1,426 ft (±) | WATER LEVEL: 15'

JOB NUMBER: 8979-001*1D | READING DATE: 3/09/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						12" Topsoil	
	S1	5			SM	Red-brown fine to coarse sand, and silt, little fine gravel (moist)(loose to dense)	
	S2	42	8.0				
5	S3	41	9.4				5
10	S4	73				Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(very dense to dense)	10
15	S5	50/1"			SM		15
20	S6	38					20
25	S7	63				- grading (very dense)	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-5

COMPLETION DATE: 3/12/12 | SURFACE ELEVATION: +1,426 ft (±) | WATER LEVEL: 15'

JOB NUMBER: 8979-001*1D | READING DATE: 3/09/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	68			SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(very dense)	
35	S9	92					35
40	S10	50/4"					40
45	CORE RUN NO. 1			2 2 3 3 4		- auger refusal @ 45' atop sandstone bedrock Red-brown fair quality, fine grained, closely jointed sandstone bedrock NQ ROCK CORE RUN NO. 1: 45' to 50' REC = 70% RQD = 60%	45
50							50
55						Boring completed @ 50' Groundwater encountered @ 15'	55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-6

COMPLETION DATE: 3/02/12 | SURFACE ELEVATION: +1,428 ft (±) | WATER LEVEL: 18'

JOB NUMBER: 8979-001*1D | READING DATE: 3/02/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	8				Red-brown fine to coarse sand, and silt, little fine gravel (moist)(loose to very dense)	
	S2	68/11"					
5					SM		5
	S3	64		7.4			
10						Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(dense to very dense)	10
	S4	44		7.2			
15							15
	S5	50					
20					SM	- grading with frequent cobbles and boulders	20
	S6	86					
25							25
	S7	50/4"					
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 2 PLATE: 3-C-6

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-6

COMPLETION DATE: 3/02/12 | SURFACE ELEVATION: +1,428 ft (±) | WATER LEVEL: 18'

JOB NUMBER: 8979-001*1D | READING DATE: 3/02/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	100/6"			SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(very dense)	
35	S9	50/4"					35
40						Green to red-brown medium to fine grained, good quality, closely jointed sandstone bedrock NQ ROCK CORE NO. 1: 39' to 44' REC = 97% RQD = 80%	40
45							45
50							50
						Boring completed @ 44' Groundwater encountered @ 18'	
55							55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-7

COMPLETION DATE: 3/14/12 | SURFACE ELEVATION: +1,430 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/14/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	8				12" Topsoil	
	S2	44				Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel (moist)(loose to very dense)	
5	S3	74					5
10	S4	88					10
					SM		
15	S5	42				- grading (dense)	15
20	S6	50/1"				- grading (very dense)	20
25	S7	54					25
						Red-brown decomposed sandstone bedrock	
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-7

COMPLETION DATE: 3/14/12 | SURFACE ELEVATION: +1,430 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/14/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	50/1"				Red-brown decomposed sandstone bedrock	
35							35
	S9 CORE RUN NO. 1	50/1"		3 4 4 5 5		Green-gray, good quality, medium grained, medium jointed, sandstone bedrock NQ CORE RUN NO. 1: 35' to 40' REC = 90% RQD = 75%	
40	CORE RUN NO. 2			4 5 7 5 5		NQ CORE RUN NO. 2: 40' to 45' REC = 92% RQD = 73% - grading to red-brown claystone bedrock from 44'-10" to 45' - piezometer installed to 40'	40
45							45
50						Boring completed @ 44'	50
55						Date / Water Level 3/14/12 — 18'-0" 3/15/12 — 26'-2" 3/19/12 — 27'-6" 3/23/12 — 30'-0" 4/04/12 — 29'-7" 4/13/12 — 29-9"	55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-8

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,410 ft (±) | WATER LEVEL: 7'-6"

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	32				Red-brown fine to coarse sand, some silt, little fine to coarse gravel (moist)(dense to very dense)	
	S2	45					
5					SM	- grading with occasional cobbles and boulders @ 5'	5
	S3	50/5"					
10							10
	S4	37				Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(dense)	
15							15
	S5	48					
					SM		
20						- grading to trace fine gravel (medium dense)	20
	S6	24					
25						- grading (very dense)	25
	S7	50/5"				- driller notes boulder from 26' to 27'-6"	
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-8

COMPLETION DATE: 3/05/12 SURFACE ELEVATION: +1,410 ft (±) WATER LEVEL: 7'-6"

JOB NUMBER: 8979-001*1D READING DATE: 3/05/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	37			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(dense to very dense)	
35	S9	50/1"					35
40							40
45						Boring completed @ 37' Groundwater encountered @ 7'-6"	45
50							50
55							55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-9

COMPLETION DATE: 3/01/12 | SURFACE ELEVATION: +1,414 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/01/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	5			SM	Red-brown fine to medium sand, some silt, little fine gravel (moist)(loose to dense)	
	S2	41					
5							5
	S3	47	7.8		SM	Red-brown fine to coarse sand, and silt, little fine gravel, occasional cobbles and boulders (moist)(dense)	
10	S4	50/4"			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	10
15	S5	50					15
20	S6	71					20
25	S7	38	8.3		SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel (wet)(dense)	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-9

COMPLETION DATE: 3/01/12 | SURFACE ELEVATION: +1,414 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/01/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	41			SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel (wet)(dense)	
35	S9	40					35
40							40
45							45
50						Boring completed @ 37' * Perched groundwater seepage encountered @ 2'-6"	50
55							55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-10

COMPLETION DATE: 3/07/12 | SURFACE ELEVATION: +1,414 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/07/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						12" Topsoil	
	S1	25				Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(medium dense to very dense)	
	S2	80			SM		
5							5
	S3	36				Red-brown fine to coarse sand, and silt, little fine to coase gravel, occasional cobbles and boulders (moist)(dense to very dense)	
10	S4	40					10
15					SM		15
	S5	48					
20	S6	95					20
25							25
	S7	50/1"				- driller notes boulder from 26' to 30'	
30	S8	43					30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-10

COMPLETION DATE: 3/07/12 | SURFACE ELEVATION: +1,414 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/07/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
					SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel, occasional cobbles and boulders (moist)(dense to very dense)	
35	CORE NO. 1			2 3		NQ ROCK CORE RUN NO. 1: 33' to 35' REC = 92% RQD = 42% - green poor quality, medium grained, closely jointed, sandstone bedrock	35
40							40
45							45
50						Boring completed @ 35' *Groundwater not encountered	50
55							55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-11

COMPLETION DATE: 3/08/12 | SURFACE ELEVATION: +1,410 ft (±) | WATER LEVEL: 21'

JOB NUMBER: 8979-001*1D | READING DATE: 3/08/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						12" Topsoil	
	S1	17			SM	Red-brown fine to coarse sand, some silt, and fine gravel (moist)(medium dense to very dense)	
	S2	47	5.4				
5	S3	89					5
10	S4	31	9.7		SM	Red-brown fine to coarse sand, and silt, little fine gravel (moist)(dense to very dense)	10
15	S5	70					15
20	S6	31				- grading with cobbles and boulders @ 20'	20
25	S7	70					25
30	S8	50/5"				Boring completed @ 30'-5" Groundwater encountered @ 21'	30
35							35

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-11

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-12

COMPLETION DATE: 3/12/12 | SURFACE ELEVATION: +1,416 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/12/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						12" Topsoil	
	S1	4			SM	Red-brown fine to medium sand, little fine to coarse gravel (moist)(loose to dense)	
	S2	26					
5	S3	49					5
10	S4	62			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(very dense)	10
15	S5	63					15
20	S6	45			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(dense)	20
25	S7	23				- grading (medium dense)	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-12

COMPLETION DATE: 3/12/12 | SURFACE ELEVATION: +1,416 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/12/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	81			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(dense)	
						Decomposed sandstone bedrock - auger and sampler refusal encountered @ 35' - piezometer installed to 34'	
35	S9	50/0"					35
40							40
45						Boring completed @ 35'	45
50						Date / Water Level 3/12/12 — 15'-0" 3/13/12 — 15'-0" 3/19/12 — 27'-0" 3/23/12 — 28'-8" 4/04/12 — 29'-2" 4/13/12 — 29'-2"	50
55							55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-13

COMPLETION DATE: 3/13/12 | SURFACE ELEVATION: +1,416 ft (±) | WATER LEVEL: 16'

JOB NUMBER: 8979-001*1D | READING DATE: 3/13/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	18				12" Topsoil	
					SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel (moist)(medium dense)	
	S2	65				Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(very dense)	
5	S3	57			SM		5
10	S4	52	7.7			Red-brown fine to coarse sand, some silt, little fine gravel, occasional cobbles and boulders (moist)(very dense)	10
15	S5	50			SM		15
20	S6	50/4"				Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(very dense to dense)	20
25	S7	38			SM		25
						Highly fractured sandstone bedrock	
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-13

COMPLETION DATE: 3/13/12 | SURFACE ELEVATION: +1,416 ft (±) | WATER LEVEL: 16'

JOB NUMBER: 8979-001*1D | READING DATE: 3/13/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
35	CORE RUN NO. 1			4 4 5 6 7		Red-brown, good quality, closely jointed, siltstone bedrock NQ CORE RUN NO. 1: 30' to 35' REC = 100% RQD = 75%	35
40							40
45							45
50						Boring completed @ 35' Groundwater encountered @ 16'	50
55							55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. 14

COMPLETION DATE: 3/14/12 | SURFACE ELEVATION: +1,416 ft (±) | WATER LEVEL: 18'

JOB NUMBER: 8979-001*1D | READING DATE: 3/14/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	3				8" Topsoil	
	S2	48			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(loose to very dense)	
5	S3	71					5
10	S4	68					10
15	S5	74					15
20	S6	50/1"				- driller notes boulder from 22' to 24'	20
25	S7						25
	CORE RUN NO. 1			3 2 3 4 4		NQ CORE RUN NO. 1: 27' to 32' Bedrock encountered @ 28': Red-brown poor quality, closely jointed claystone REC = 88% RQD = 35%	
30	S8						30
						Boring completed @ 32' Groundwater encountered @ 18'	
35							35

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C14

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-15

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,399 ft (±) | WATER LEVEL: 15'

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	3			SM	Red-brown fine to coarse sand, and silt, little fine gravel (moist)(loose to very dense)	
	S2	58					
5	S3	38				Red-brown fine to medium sand, and silt, little fine gravel (moist)(dense)	5
10	S4	44			SM	- grading to little fine to coarse gravel	10
15	S5	50/5"	5.4			- grading (very dense) with cobbles and boulders	15
20	S6	50/5"				- driller notes boulder from 20'-6" to 22'	20
25	S7	27				- grading (medium dense)	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-15

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,399 ft (±) | WATER LEVEL: 15'

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S8	75			SM	Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(very dense)	
35							35
40							40
45						Boring completed @ 31'-11" *Groundwater encountered @ 15'	45
50							50
55							55
60							60

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 2 of 2 PLATE: 3-C-15

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-16

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,404 ft (±) | WATER LEVEL: 8'

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	13				8" Topsoil	
	S2	50/5"			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense to very dense)	
5	S3	35				- grading (dense)	5
10	S4	62				- grading (very dense) with occasional cobbles and boulders @ 10'	10
15	S5	58			SM	Red-brown fine sand, and silt, some fine to coarse gravel (moist to wet)(very dense)	15
20	S6	85/8"					20
25	S7	50/3"				- grading to little fine to coarse gravel @ 25' - driller notes frequent cobbles and boulders @ 27'	25
30	S8	50/3"					30
35						Boring completed @ 30'-3" Groundwater encountered @ 8'	35

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-16

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-17

COMPLETION DATE: 3/07/12 | SURFACE ELEVATION: +1,404 ft (±) | WATER LEVEL: 17'

JOB NUMBER: 8979-001*1D | READING DATE: 3/07/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	11				12" Topsoil	
	S2	60			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense to very dense)	
5	S3	29				- grading (medium dense)	5
10	S4	46				Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(dense to very dense)	10
15	S5	65					15
					SM		
20	S6	26				- grading (medium dense)	20
25	S7	50/4"				- grading (very dense) with frequent cobbles and boulders	25
30	S8	50/3"					30
						Boring completed @ 30'-3" Groundwater encountered @ 17'	
35							35

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-17

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-18

COMPLETION DATE: 3/08/12 | SURFACE ELEVATION: +1,401 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/08/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	6				12" Topsoil	
	S2	31				Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(loose to medium dense)	
5	S3	37					5
10	S4	61			SM	- grading (very dense) with frequent cobbles and boulders	10
15	S5	46				- grading (dense)	15
20	S6	25			SM	Red-brown fine to coarse sand, and clayey silt, little fine to coarse gravel (moist)(medium dense)	20
25	S7	83			SM	Brown fine to medium sand, and silt, little fine to coarse gravel (decomposed sandstone)(moist)(very dense)	25
30	S8	75/3"				Boring completed @ 30'-3" *Groundwater not encountered	30
35							35

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-18

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. C-19

COMPLETION DATE: 3/16/12 | SURFACE ELEVATION: +1,409 ft (±) | WATER LEVEL: 17'

JOB NUMBER: 8979-001*1D | READING DATE: 3/16/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
0	S1	7				12" Topsoil	0
	S2	44			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(loose to very dense)	
5	S3	70					5
10	S4	79			SM	Red-brown fine to coarse sand, and silt, little fine gravel (moist)(very dense)	10
15	S5	56	8.1				15
20	S6	50/1"			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(very dense)	20
25	S7	50/1"				- grading with increased sandstone fragments @ 25'	25
30	S8	50/1"				Boring completed @ 30' Groundwater encountered @ 17'	30
35							35

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-19

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. C-20

COMPLETION DATE: 3/13/12 | SURFACE ELEVATION: +1,409 ft (±) | WATER LEVEL: 17'

JOB NUMBER: 8979-001*1D | READING DATE: 3/13/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
0	S1	3				8" Topsoil	0
	S2	27			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(loose to dense)	
5	S3	41					5
10	S4	34					10
15	S5	68			SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel (moist)(very dense)	15
20	S6	50/1"					20
	CORE RUN 1			3 2		Red-brown, good quality, medium jointed claystone - grading to siltstone NQ ROCK CORE RUN NO. 1: 22' to 25' REC = 89% RQD = 78%	
25	CORE RUN NO. 2			3 4 4 5 4		Red-brown, good quality, medium jointed siltstone - grading to sandstone NQ ROCK CORE RUN NO. 2: 25' to 30' REC = 97% RQD = 80%	25
30						Boring completed @ 30' Groundwater encountered @ 17'	30
35							35

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-20

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-21

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,388 ft (±) | WATER LEVEL: 11'

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	6			SM	Red-brown fine to medium sand, some silt, little fine to coarse gravel (very moist)(loose to dense)	
	S2	49					
5							5
	S3	29				Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(medium dense)	
10							10
	S4	30			SM		
15						- grading (dense) with occasional cobbles and boulders	15
	S5	32					
						- driller notes boulder @ 18' to 19'	
20							20
	S6	44					
25						Boring completed @ 22' Groundwater encountered @ 11'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-21

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. C-22

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,394 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	2				Red-brown fine to coarse sand, some clayey silt, little fine to coarse gravel (moist)(loose to very dense)	
	S2	50					
5	S3	36			SM	- grading (dense)	5
10	S4	67				Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(very dense)	10
15	S5	50/2"			SM	- driller notes boulder from 14' to 15'	15
20	S6	74					20
25						Boring completed @ 22' *Groundwater not encountered	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-22

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-23

COMPLETION DATE: 3/07/12 | SURFACE ELEVATION: +1,393 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/07/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						12" Topsoil	
	S1	2				Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel (moist)(loose to dense)	
	S2	50					
5	S3	36					5
10	S4	67			SM	- grading (very dense) with frequent cobbles and boulders @ 10'	10
15	S5	50/2"				- driller notes boulder from 15' to 19'	15
20	S6	74				Highly decomposed sandstone bedrock	20
25						Boring completed @ 20'-3" *Groundwater not encountered	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-23

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. C-24

COMPLETION DATE: 3/08/12 | SURFACE ELEVATION: +1,386 ft (±) | WATER LEVEL: 12'

JOB NUMBER: 8979-001*1D | READING DATE: 3/08/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						12" Topsoil	
	S1	5				Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(loose to dense)	
	S2	26					
5	S3	40			SM		5
10	S4	49					10
15	S5	53				Red-brown fine to coarse sand, and silt, little fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	15
					SM		
20	S6	50/1"					20
25						Boring completed @ 20'-7" Groundwater encountered @ 12'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-24

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. C-25

COMPLETION DATE: 3/16/12 | SURFACE ELEVATION: +1,397 ft (±) | WATER LEVEL: 17'

JOB NUMBER: 8979-001*1D | READING DATE: 3/16/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	8				Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel (moist)(loose to very dense)	
	S2	75					
5	S3	88					5
10	S4	47			SM	- grading (dense)	10
						- driller notes boulder @ 13'	
15	S5	58				- grading (very dense)	15
						- driller notes boulder @ 19'	
20	S6	50/0"					20
25						Boring completed @ 20' Groundwater encountered @ 17'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-25

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-26

COMPLETION DATE: 3/14/12 | SURFACE ELEVATION: +1,398 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/14/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	15			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense to dense)	
	S2	45					
5	S3	44					5
10	S4	36			SM	Red-brown fine to coarse sand, and silt, little fine gravel (moist)(dense)	10
15	S5	63			SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(very dense)	15
20	S6	52					20
25						Boring completed @ 22' *Groundwater not encountered	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-26

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-27

COMPLETION DATE: 3/14/12 | SURFACE ELEVATION: +1,380 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/14/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	4			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(loose to very dense)	
	S2	57					
5	S3	52				Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(very dense)	5
10	S4	50/5"			SM	- driller notes boulder @ 10'	10
15	S5	28				- grading (medium dense)	15
20	S6	22					20
25						Boring completed @ 22' *Groundwater not encountered	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-27

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-28

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,381 ft (±) | WATER LEVEL: 9'

JOB NUMBER: 8979-001*1D | READING DATE: 3/09/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						12" Topsoil	
	S1	4			SM	Red-brown fine to coarse sand, some silt, little fine gravel (moist)(loose to medium dense)	
	S2	22					
5	S3	50				Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(very dense)	5
10	S4	50/5"			SM	- grading with cobbles and boulders	10
15	S5	22			SM	Red-brown fine to coarse sand, and silt, little fine gravel (moist)(medium dense)	15
						Decomposed sandstone bedrock	
20	S6	50/1"					20
25						Boring completed @ 20'-1" Groundwater encountered @ 9'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-28

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-29

COMPLETION DATE: 3/16/12 | SURFACE ELEVATION: +1,381 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/16/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	5				8" Topsoil Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(loose to very dense)	
	S2	60					
5	S3	38				- grading (dense)	5
10	S4	50/3"				- grading (very dense) with frequent cobbles and boulders	10
15	S5	50/3"					15
20	S6	50/0"					20
25						Boring completed @ 20' *Groundwater not encountered	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-29

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-30

COMPLETION DATE: 3/19/12 | SURFACE ELEVATION: +1,376 ft (±) | WATER LEVEL: 13'

JOB NUMBER: 8979-001*1D | READING DATE: 3/19/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	9				Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(loose to very dense)	
	S2	57					
5						- grading (dense)	5
	S3	47					
10					SM		10
	S4	38					
15						- grading (very dense) with frequent cobbles and boulders	15
	S5	50					
20	S6	50/3"					20
25						Boring completed @ 20'-3" Groundwater encountered @ 13'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-30

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-31

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,374 ft (±) | WATER LEVEL: 7'

JOB NUMBER: 8979-001*1D | READING DATE: 3/09/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	15			SM	Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(medium dense to dense)	
	S2	49					
5	S3	50					5
						Red-brown fine to medium sand, some clayey silt, little fine to coarse gravel, occasional cobbles and boulders (wet)(very dense to dense)	
10	S4	52			SM		10
15	S5	34					15
20	S6	50/1"				Decomposed sandstone bedrock	20
						Boring completed @ 20'-1"	
25						Groundwater encountered @ 9'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-31

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. C-32

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,371 ft (±) | WATER LEVEL: 7'

JOB NUMBER: 8979-001*1D | READING DATE: 3/09/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						12" Topsoil	
	S1	5			SM	Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(loose to medium dense)	
	S2	35					
5	S3	56				Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(very dense)	5
10	S4	45			SM	- grading (dense)	10
15	S5	37					15
20	S6	65				- grading (very dense)	20
25						Boring completed @ 22' Groundwater encountered @ 7'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-C-32

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-1

COMPLETION DATE: 2/27/12 | SURFACE ELEVATION: +1,455 ft (±) | WATER LEVEL: 10'

JOB NUMBER: 8979-001*1D | READING DATE: 2/27/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	6				8" Topsoil	
					SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(loose)	
	S2	60	5.3			Red-brown fine to coarse sand, some to and silt, little to some fine gravel (moist)(very dense to dense)	
5	S3	46	5.9				5
	S4	85/11"					
					SM		
10	S5	43					10
15	S6	68					15
20						Boring completed @ 17' Groundwater encountered @ 10'	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-1

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-2

COMPLETION DATE: 2/19/12 | SURFACE ELEVATION: +1,455 ft (±) | WATER LEVEL: 15'

JOB NUMBER: 8979-001*1D | READING DATE: 2/19/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	9			SM	Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(loose)	
5	S2	62			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(very dense)	5
10	S3	50/0"			SM	- driller notes boulder @ 10'	10
15	S4	50/5"					15
20						Boring completed @ 15'-11" Groundwater encountered @ 15'	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-2

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-3

COMPLETION DATE: 2/27/12 | SURFACE ELEVATION: +1,452 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 2/27/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	5			ML	Red-brown silt, and fine to coarse sand, trace fine gravel (moist)(medium to hard)	
	S2	32	8.7				
5	S3	52			SM	Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel (moist)(very dense) - driller notes boulder @ 7'-6"	5
10	S4	52					10
15	S5	98/10"					15
20						Boring completed @ 16'-4" *Groundwater not encountered	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-3

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-4

COMPLETION DATE: 3/19/12 | SURFACE ELEVATION: +1,445 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/19/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
0	S1	18	32.2		SM	Red-brown fine to coarse sand, some silt, little to some fine gravel, occasional cobbles and boulders (moist)(medium dense)	0
5	S2	24	8.8				5
10	S3	64	7.6		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(very dense)	10
15	S4	75					15
20						Boring completed @ 16'-10" *Groundwater not encountered	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-4

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-5

COMPLETION DATE: 2/27/12 | SURFACE ELEVATION: +1,435 ft (±) | WATER LEVEL: 10'

JOB NUMBER: 8979-001*1D | READING DATE: 2/27/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						6" Topsoil	
	S1	8	24.4		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(loose to dense)	
	S2	36	7.9			Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(dense to very dense)	
5	S3	60	8.4				5
10	S4	35			SM		10
15	S5	66					15
20	S6	50/2"					20
25						Boring completed @ 20'-8" Perched groundwater encountered @ 10'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-5

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-6

COMPLETION DATE: 3/19/12 | SURFACE ELEVATION: +1,412 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/19/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	5				8" Topsoil	
					SM	Red-brown fine to coarse sand, and silt, little to some fine to coarse gravel, occasional cobbles and boulders (moist)(loose to very dense)	
5	S2	42					5
10	S3	65					10
15	S4	50/1"				- driller notes numerous cobbles and boulders @ 15'	15
20	S5	50/1"					20
25						Boring completed @ 20'-1" *Groundwater not encountered	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-6

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-7

COMPLETION DATE: 2/27/12 | SURFACE ELEVATION: +1,383 ft (±) | WATER LEVEL: 10'

JOB NUMBER: 8979-001*1D | READING DATE: 2/27/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	4	22.8			6" Topsoil	
					SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (loose to very dense)	
	S2	17	12.6				
5	S3	43	7.3				5
10	S4	87/10"	4.8				10
						- driller notes boulder @ 14'	
15	S5	75/10"				- driller notes boulder @ 16'	15
20	S6	50/1"				Highly fractured sandstone bedrock	20
25						Boring completed @ 20'-7" Perched groundwater encountered at 10'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-7

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-8

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,354 ft (±) | WATER LEVEL: 3'

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	12				4" Topsoil	
						FILL - Fine to coarse sand, little silt, little fine to coarse gravel	
	S2	36				Red-brown fine to coarse sand, and silt, little fine to coarse gravel (wet)(dense)	
5	S3	45			SM	- grading with cobbles and boulders @ 6'	5
	S4	50/0"					
	S5	50/0"				- auger refusal atop boulder @ 8'-6"	
10							10
15							15
						Boring completed @ 8'-6"	
20						Perched groundwater encountered @ 3'	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-8

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-9

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,350 ft (±) | WATER LEVEL: 6'

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	24				FILL - Red-brown fine to coarse sand, and silt, some fine to coarse gravel	
	S2	46			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense to dense)	
5	S3	28					5
	S4	50/1"					
	S5	61			SM	Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel, occasional cobbles and boulders (wet)(dense to very dense)	
10	S6	47					10
	S7	86					
	S8	50/2"					
15							15
20						Boring completed @ 14'-8" *Groundwater encountered @ 6'	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-9

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-10

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,357 ft (±) | WATER LEVEL: 5'-6"

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	9				4" Topsoil	
						FILL - Brown fine to coarse sand, some silt, little fine gravel	
	S2	41				Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(dense to very dense)	
5	S3	86					5
	S4	59			SM		
	S5	81					
10	S6	86					10
	S7	122					
15	S8	80					15
						Boring completed @ 15'-10" Groundwater encountered @ 5'-6"	
20							20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-10

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-11

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,360 ft (±) | WATER LEVEL: 6'

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						6" Topsoil	
	S1	10			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist to wet)(medium dense to very dense)	
	S2	26					
5	S3	47					5
	S4	35			SM	Red-brown fine to coarse sand, little silt, little fine to coarse gravel (wet)(dense)	
	S5	90			SM	Red-brown fine to coarse sand, little to some silt, little fine to coarse gravel, occasional cobbles and boulders (wet)(very dense)	
10	S6	130					10
	S7	96					
15	S8	100/5"					15
20	S9	100/4"				- driller noted cobbles @ 21'-6"	20
25						Boring completed @ 22' Groundwater encountered @ 6'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-11

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-12

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,352 ft (±) | WATER LEVEL: 6'

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						2" Topsoil and pine needles	
	S1	4			SM	Brown to dark brown fine to coarse sand, little silt, trace fine to coarse gravel (moist)(loose to very dense)	
	S2	50/4"				- driller notes cobbles @ 3'	
5	S3	56	39.0		SM	Red-brown fine to coarse sand, and silt, trace fine gravel (wet)(very dense)	5
	S4	66					
	S5	158/10"			SM	Gray and red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional to frequent cobbles and boulders (moist)(very dense)	
10	S6	100/4"					10
	S7	100/4"					
15							15
20	S8	100/1"					20
25						Boring completed @ 20'-1" Groundwater encountered @ 6'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-13

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,352 ft (±) | WATER LEVEL: 12'

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	4			SM	4" Topsoil Red-brown fine to coarse sand, some silt, trace fine gravel (moist)(loose)	
	S2	70			ML	Red-brown clayey silt, and fine to medium sand, trace fine to coarse gravel (wet)(hard)	
5	S3	55				Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel (moist to wet)(very dense)	5
	S4	56					
	S5	69					
10	S6	75			SM		10
	S7	104				- grading with frequent cobbles and boulders	
15	S8	100/3"					15
20							20
25						Boring completed @ 20' Groundwater encountered @ 12'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-13

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-14

COMPLETION DATE: 3/16/12 | SURFACE ELEVATION: +1,352 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/16/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						3" Topsoil	
	S1	28				FILL - Fine to coarse gravel, and fine to coarse sand, trace silt	
	S2	66				Red-brown fine to coarse sand, some silt, little fine gravel (moist)(very dense)	
5	S3	59	25.7				5
	S4	159/11"			SM		
	S5	81					
10	S6	112					10
	S7	100/4"					
15	S8	50/0"		6		NQ ROCK CORE RUN NO. 1: 15' to 20'	15
	CORE RUN NO. 1			2 3 3 3		REC = 97% RQD = 77% Red-brown good quality, closely jointed siltstone, grading to sandstone @ 16'	
20							20
25						Boring completed @ 20' *Groundwater not encountered	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-14

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-15

COMPLETION DATE: 3/16/12 | SURFACE ELEVATION: +1,355 ft (±) | WATER LEVEL:

JOB NUMBER: 8979-001*1D | READING DATE: 3/16/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						3" Topsoil	
	S1	11				FILL - Brown-dark gray fine to coarse sand, some silt, little fine gravel	
	S2	59				Gray to red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(very dense)	
5	S3	83					5
	S4	100/5"			SM		
	S5	100/5"					
10	S6	75/2"				- driller notes cobbles @ 10'-6"	10
	S7	100/5"				- possible bedrock @ 14'-5"	
15							15
20						Boring completed @ 14'-5"	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-15

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-16

COMPLETION DATE: 3/16/12 | SURFACE ELEVATION: +1,344 ft (±) | WATER LEVEL: 7'-6"

JOB NUMBER: 8979-001*1D | READING DATE: 3/16/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						3" Gravel pavement	
	S1	41				Red-brown fine to coarse sand, little to some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(medium dense to very dense)	
	S2	78					
5	S3	37					5
	S4	32	10				
	S5	40					
10					SM		10
	S6	192/11"					
	S7	28					
15	S8	66					15
20	—			6		NQ ROCK CORE RUN NO. 1: 20' to 25'	20
	CORE RUN NO. 1			3 3 4 4		REC = 90% RQD = 83% Light green-gray good quality, medium jointed, coarse grained sandstone, and conglomerate	
25	—						25
						Boring completed @ 25' Groundwater encountered @ 7'-6"	
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 3-S-16

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: T-1

COMPLETION DATE: 2/28/12 | SURFACE ELEVATION: +1,373 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 2/28/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1	9.9	SM	Red-brown fine to coarse sand, some silt, little fine gravel (wet)(dense)	
5	S2		SM	Red-brown fine to coarse sand, little silt, little fine to coarse gravel (moist)(medium dense)	5
	S3	8.7	SM	Red-brown fine to medium sand, and silt, some fine to coarse gravel (moist)(very dense)	
				- grading with cobbles/boulders @ 9'	
10				- refusal @ 11' on dark green sandstone boulder, or bedrock	10
				Test pit completed @ 11' *Groundwater not encountered Mottling observed @ 3'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-T-1

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: T-2

COMPLETION DATE: 2/28/12 | SURFACE ELEVATION: +1,366 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 2/28/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1		SM	Red-brown fine to coarse sand, little silt, some fine to coarse gravel (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense) - refusal @ 7' on sandstone bedrock	5
10				Test pit completed @ 7' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-T-2

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: T-3

COMPLETION DATE: 2/29/12 | SURFACE ELEVATION: +1,367 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 2/29/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1			FILL - Orange-brown fine to medium sand, some silt, trace fine gravel	
	S2		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles and boulders (moist)(dense) - refusal @ 4' on dark gray/green sandstone bedrock	
5					5
10				Test pit completed @ 4' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-T-3

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: T-4

COMPLETION DATE: 2/28/12 | SURFACE ELEVATION: +1,368 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 2/29/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Red-brown fine to coarse sand, little silt, some fine to coarse gravel (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(dense to very dense) - refusal @ 8' on green/gray sandstone bedrock	5
10				Test pit completed @ 8' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-T-4

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: T-5

COMPLETION DATE: 2/29/12 | SURFACE ELEVATION: +1,356 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 2/29/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				24" Topsoil	
	S1	11.5	SM	Light brown fine to coarse sand, and silt, little fine gravel (moist)(dense)	
5	S2	7.4	SM	Red-brown fine to coarse sand, and silt, little fine gravel, frequent cobbles (moist)(very dense) - refusal @ 7'-6" on green/gray sandstone bedrock	5
10				Test pit completed @ 7'-6" *Groundwater not encountered Mottling observed @ 3.5'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-T-5

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: T-6

COMPLETION DATE: 2/29/12
JOB NUMBER: 8979-001*1D

SURFACE ELEVATION: +1,361 ft (±)

WATER LEVEL: *
READING DATE: 2/29/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt (moist)(medium dense)	
	S2	16.6	ML	Red-brown silt, trace fine sand (moist)(hard)	
5				- refusal @ 7'-6" on sandstone bedrock	5
				Test pit completed @ 7'-6" *Groundwater not encountered Mottling observed @ 1'-6"	
10					10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-T-6

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: T-7

COMPLETION DATE: 2/29/12 | SURFACE ELEVATION: +1,367 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 2/29/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (very moist)(medium dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(dense to very dense) - refusal @ 8' on gray/green sandstone bedrock	5
10				Test pit completed @ 8' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-T-7

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-1

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,385 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
				Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
	S1	11.3	SM		
5	S2			- grading with and fine to coarse gravel	5
				- backhoe refusal encountered @ 7'-6" on nested boulders	
10				Test pit completed @ 7'-6" *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-1

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-2

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,414 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel (moist)(dense)	
5	S2 S3		SM	Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(very dense)	5
			ML	Red-brown clayey silt, and fine to coarse sand, little fine to coarse gravel (moist)(hard) - backhoe refusal encountered at 10' on sandstone bedrock	
10				Test pit completed @ 10' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-2

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-3

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,442 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1	21.5	SM	Red-brown fine to coarse sand, and silt, some fine gravel (moist)(medium dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(dense)	5
				- grading (very dense) with cobbles and boulders	
10	S3				10
				Test pit completed @ 12'	
				*Groundwater not encountered	
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-3

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-4

COMPLETION DATE: 3/02/12 | SURFACE ELEVATION: +1,448 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/02/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, trace fine to coarse gravel (moist)(medium dense)	
5	S2			- grading to some fine to coarse sand, some fine to coarse gravel (very dense)	5
				Red-brown highly fractured, weathered sandstone	
10	S3			- backhoe refusal encountered @ 11' atop sandstone bedrock	10
				Test pit completed @ 11' *Groundwater not encountered Mottling observed @ 4'-6"	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-4

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-5

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,440 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1	12.5	SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(dense)	5
	S3				
10	S4				10
				Test pit completed @ 12' *Groundwater not encountered	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-5

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-6

COMPLETION DATE: 3/02/12 SURFACE ELEVATION: +1,448 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-001*1D READING DATE: 3/02/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1			Red-brown fine to coarse sand, and silt, little to some fine to coarse gravel, occasional to frequent cobbles and boulders (moist)(dense to very dense)	
5	S2		SM		5
	S3				
10					10
				Test pit completed @ 12' *Groundwater not encountered	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-6

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-7

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,446 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1	15.4	SM	Red-brown fine to coarse sand, some silt, some fine gravel (wet)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(dense to very dense) - refusal @ 5' on red sandstone bedrock	
5					5
10				Test pit completed @ 5' *Groundwater not encountered Mottling observed @ 2'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-7

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-8

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,450 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				2" Asphalt over 8" of sandy fill	
	S1			Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional to frequent cobbles and boulders (moist)(dense)	
5	S2		SM		5
	S3				
10					10
				Test pit completed @ 12' *Perched groundwater seepage encountered @ 10" Mottling observed from 4' to 6'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-8

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-9

COMPLETION DATE: 3/02/12
JOB NUMBER: 8979-001*1D

SURFACE ELEVATION: +1,448 ft (±)

WATER LEVEL: 12'
READING DATE: 3/02/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1			Red-brown fine to coarse sand,some silt, little fine to coarse gravel (moist)(medium dense)	
5	S2			- grading with some fine to coarse gravel, frequent cobbles and boulders (very dense)	5
			SM		
10	S3				10
	S4			- backhoe refusal encountered @ 13' on sandstone bedrock	
				Test pit completed @ 13' Groundwater encountered @ 12' Mottling observed from 2' to 3'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-9

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-10

COMPLETION DATE: 3/05/12
JOB NUMBER: 8979-001*1D

SURFACE ELEVATION: +1,450 ft (±)

WATER LEVEL: 7.5'
READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles (moist)(dense to very dense)	
5				- bulk sample taken from 5' to 6'	5
	S2			- backhoe refusal encountered @ 9' on sandstone bedrock	
10				Test pit completed @ 9' Perched water encountered @ 7'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-10

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-11

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,368 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				24" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(dense)	
5	S2			- grading with cobbles/boulders @ 6'	5
10				Test pit completed @ 8' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-11

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-12

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,365 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(dense)	
5	S2			- grading with frequent cobbles and boulders @ 6'	5
10				Test pit completed @ 7'-6" *Groundwater not encountered Mottling observed @ 3'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-13

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,375 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				24" Topsoil	
	S1	10.0	SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	
5	S2	10.5	SM	Red-brown fine to coarse sand, and silt, some fine gravel, frequent cobbles and boulders (moist)(very dense) - backhoe refusal encountered @ 8'-6" on nested boulders	5
10				Test pit completed @ 8'-6" *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-13

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-14

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,388 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Brown fine to coarse sand, some silt, little fine to coarse gravel (moist)(dense)	
5	S2	7.8	GM	Red-brown fine to coarse gravel, and fine to coarse sand, some silt (moist)(very dense) - bulk sample taken from 5'-6" to 6'-6"	5
				Green gray highly fractured weathered sandstone - backhoe refusal encountered @ 10' on sandstone bedrock	
10				Test pit completed @ 10' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-14

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-15

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,380 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, frequent cobbles (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	5
10				Test pit completed @ 8' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-15

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-16

COMPLETION DATE: 3/08/12 | SURFACE ELEVATION: +1,448 ft (±) | WATER LEVEL: 1'-6"

JOB NUMBER: 8979-001*1D | READING DATE: 3/08/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1	8.4	SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional to frequent cobbles and boulders (moist)(dense to very dense) - mottling observed from 3' to 5'	
5	S2				5
10	S3				10
15				Test pit completed @ 12' Slight perched groundwater seepage encountered @ 1'-6" Mottling observed from 3' to 5'	15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-16

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-17

COMPLETION DATE: 3/08/12 | SURFACE ELEVATION: +1,455 ft (±) | WATER LEVEL: 6"

JOB NUMBER: 8979-001*1D | READING DATE: 3/08/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1		SM	Red-brown fine to coarse sand, and clayey silt, little fine to coarse gravel, occasional cobbles and boulders (moist)(dense to very dense)	
5	S2	4.0	GM	Red-brown fine to coarse gravel, some fine to coarse sand, some silt (moist)(very dense)	5
10	S3				10
				Test pit completed @ 11' Slight perched groundwater seepage encountered from 6" to 12" Mottling observed from 3' to 4'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-17

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-18

COMPLETION DATE: 3/07/12 | SURFACE ELEVATION: +1,434 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/07/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles and boulders (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	5
	S3			- backhoe refusal encountered @ 10' atop nested boulders	
10				Test pit completed @ 10' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-18

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-19

COMPLETION DATE: 3/08/12 | SURFACE ELEVATION: +1,447 ft (±) | WATER LEVEL: 1'

JOB NUMBER: 8979-001*1D | READING DATE: 3/08/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(dense)	
	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	
5	S3				5
10	S4				10
				Test pit completed @ 12' Slight perched groundwater seepage encountered @ 1'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-19

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-20

COMPLETION DATE: 3/08/12 | SURFACE ELEVATION: +1,454 ft (±) | WATER LEVEL: 1'-6"

JOB NUMBER: 8979-001*1D | READING DATE: 3/08/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	5
10	S3				10
15				Test pit completed @ 13' Slight perched groundwater seepage encountered @ 1'-6" Mottling observed from 4' to 8'	15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-20

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-21

COMPLETION DATE: 3/08/12 | SURFACE ELEVATION: +1,417 ft (±) | WATER LEVEL: 3'

JOB NUMBER: 8979-001*1D | READING DATE: 3/08/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1	8.8	SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(very dense)	
5					5
	S2		SM	Red-brown and gray fine to coarse sand, and silt, some fine to coarse gravel, few cobbles (moist)(very dense)	
	S3	8.3			
10					10
				Test pit completed @ 10' Slight perched groundwater seepage encountered @ 3' to 4'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-21

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-22

COMPLETION DATE: 3/07/12 | SURFACE ELEVATION: +1,428 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/07/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	5
10	S3				10
15				Test pit completed @ 12' *Groundwater not encountered Mottling observed from 4' to 6'	15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-22

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-23

COMPLETION DATE: 3/07/12
JOB NUMBER: 8979-001*1D

SURFACE ELEVATION: +1,433 ft (±)

WATER LEVEL: 1'-6"
READING DATE: 3/07/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, little fine gravel (moist)(dense)	
5	S2 S3		SM	Brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	5
	S4				
10					10
				Test pit completed @ 11' Slight perched groundwater seepage encountered @ 1'-6" Mottling observed from 8' to 9'-6"	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-23

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-24

COMPLETION DATE: 3/07/12 | SURFACE ELEVATION: +1,442 ft (±) | WATER LEVEL: 1'-6"

JOB NUMBER: 8979-001*1D | READING DATE: 3/07/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	5
10	S3			Test pit completed @ 11' Slight perched groundwater seepage encountered @ 1'-6" Mottling observed from 5'-6" to 8'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-24

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: P-25

COMPLETION DATE: 3/07/12 | SURFACE ELEVATION: +1,410 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-001*1D | READING DATE: 3/07/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1			Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles (moist)(very dense)	
5	S2		SM	- grading with frequent cobbles and boulders	5
	S3				
10	S4				10
				Test pit completed @ 12'	
				Slight perched groundwater seepage encountered @ 2'	
15				Mottling observed from 8' to 10'	15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-P-25

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: R-1

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,427 ft (±) | WATER LEVEL: 2'-3'

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1	9.4	SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
				- grading (wet)	
5	S2	4.7	GM	Red-brown fine to coarse gravel, and fine to coarse sand, some silt, frequent cobbles and boulders (moist)(very dense)	5
10				Test pit completed @ 10'	10
				Perched groundwater seepage encountered from 2' to 3'	
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-R-1

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: R-2

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,410 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles and boulders (moist)(dense)	
5					5
	S2		SM	Red-brown fine to coarse sand, and silt, trace fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	
10	S3			- backhoe refusal encountered @ 10'-6" on sandstone bedrock	10
				Test pit completed @ 10'-6" *Groundwater not encountered	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-R-2

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: R-3

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,439 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
				FILL - Light brown silt, little fine to coarse sand, trace fine gravel	
	S1		SM	Red-brown fine to coarse sand, some silt, little fine gravel (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	5
10				- backhoe refusal encountered @ 11' on nested boulders	10
15				Test pit completed @ 11' *Groundwater not encountered	15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-R-3

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: R-4

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,432 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				24" Topsoil	
	S1	7.8	SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel, occasional cobbles (moist)(dense)	
5					5
	S2	8.3	SM	Red-brown fine to coarse sand, and silt, little fine gravel, frequent cobbles and boulders (moist)(very dense)	
10	S3				10
				Test pit completed @ 12' Perched groundwater seepage encountered @ 2'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-R-4

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: R-5

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,442 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	5
10	S3				10
15				Test pit completed @ 12' Slight perched groundwater seepage encountered @ 18" Mottling observed @ 3'	15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-R-5

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: R-6

COMPLETION DATE: 3/06/12 | SURFACE ELEVATION: +1,432 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/06/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				18" Topsoil	
	S1			Red-brown fine to coarse sand, some to and silt, little fine to coarse gravel, occasional cobbles (moist)(very dense)	
5	S2		SM		5
				- grading with frequent cobbles and boulders @ 7'	
	S3				
10					10
				Test pit completed @ 12'	
				*Groundwater not encountered	
				Mottling observed from 4' to 6'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-R-6

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: R-7

COMPLETION DATE: 3/05/12
JOB NUMBER: 8979-001*1D

SURFACE ELEVATION: +1,448 ft (±)

WATER LEVEL: *
READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1	8.9	ML	Red-brown silt, some fine to coarse sand (moist)(medium)	
	S2	6.8	SM	Red-brown fine to coarse sand, and silt, some fine gravel, frequent cobbles and boulders (moist)(very dense)	
5					5
	S3				
10				Test pit completed @ 10' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-R-7

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: R-8

COMPLETION DATE: 3/05/12 | SURFACE ELEVATION: +1,453 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
	S2				
5			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense)	5
				- backhoe refusal encountered @ 10' on nested boulders	
10	S3				10
				Test pit completed @ 10'	
				*Groundwater not encountered	
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-R-8

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: R-9

COMPLETION DATE: 3/05/12
JOB NUMBER: 8979-001*1D

SURFACE ELEVATION: +1,453 ft (±)

WATER LEVEL: 7'-8'
READING DATE: 3/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasionial cobbles and boulders (moist)(very dense)	
5					5
	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, frequent cobbles and boulders (moist)(very dense) - backhoe refusal encountered @ 9' on nested boulders	
10				Test pit completed @ 9' Slight perched groundwater seepage encountered from 7' to 8' Mottling observed @ 6'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-R-9

MELICK-TULLY AND ASSOCIATES, P.C.
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MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS More than 50% of material is LARGER than No. 200 Sieve	GRAVEL & GRAVELLY SOILS More than 50% of coarse fraction RETAINED on No. 4 Sieve	CLEAN GRAVELS (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS More than 50% of coarse fraction PASSING a No. 4 Sieve	CLEAN SAND (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.
			SP	Poorly-graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS More than 50% of material is SMALLER than No. 200 Sieve.	SILTS AND CLAYS	Liquid limit LESS than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS	Liquid limit GREATER than 50	MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			PT	Peat, humus, swamp soils with high organic contents

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

GRADATION*		COMPACTNESS* sand and/or gravel		CONSISTENCY* clay and/or silt	
% Finer by Weight		Relative Density		Range of Shearing Strength in Pounds per Square Foot	
Trace	0% to 10%	Loose	0% to 40%	Very Soft	less than 250
Little	10% to 20%	Medium Dense	40% to 70%	Soft	250 to 500
Some	20% to 35%	Dense	70% to 90%	Medium	500 to 1000
And	35% to 50%	Very Dense	90% to 100%	Stiff	1000 to 2000
				Very Stiff	2000 to 4000
				Hard	Greater than 4000

**Values are from laboratory or field test data, where applicable. When no testing was performed, values are estimated.*

UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL CLASSIFICATION CHART

ENGINEERING ROCK CLASSIFICATION AND CORE DESCRIPTION CHART (1)

DESCRIPTIVE TERMINOLOGY FOR JOINT SPACING

Description Term	Spacing of Joints
Very Close	Less than 2 inches
Close	2 inches to 1 foot
Moderately Close	1 foot to 3 feet
Wide	3 feet to 10 feet
Very Wide	Greater than 10 feet

RELATIONSHIP OF RQD AND ROCK QUALITY

Rock Quality Designation (RQD) (2)	Description of Rock Quality
0 - 25%	Very Poor
25 - 50%	Poor
50 - 75%	Fair
75 - 90%	Good
90 - 100%	Excellent

(1) Core description system is based on a suggested system proposed in the ASCE Rock Mechanics Seminar in April and May of 1968 entitled "Geologic Considerations of Rock Mechanics" as presented by Don V. Deere.

(2) "Rock Quality Designation" is defined as a modified core recovery ratio which considers only pieces of core that are at least 4 inches long. Obvious fractures induced by drilling are ignored in this system.

Gradation Curve(s)

	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	18.0	14.7	16.3	22.8	28.2
□	0.0	0.0	10.8	13.6	13.1	21.7	40.8
△	0.0	0.0	12.1	13.6	13.7	20.7	39.9
◇	0.0	0.0	5.3	10.5	14.3	23.2	46.7
▽	0.0	0.0	11.6	17.7	11.0	19.5	40.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	C-1	S-2	2-4	Fine to coarse Sand, some Silt, little fine Gravel. (MC=7.0%)	SM
□	C-1	S-4	10-12	Fine to coarse Sand, and Silt, little fine Gravel. (MC=9.3%)	SM
△	C-1	S-7	25-27	Fine to coarse Sand, and Silt, little fine Gravel. (MC=8.3%)	SM
◇	C-2	S-2	2-4	Fine to coarse Sand, and Silt, trace fine Gravel. (MC=9.2%)	SM
▽	C-2	S-3	5-7	Fine to coarse Sand, and Silt, little fine Gravel. (MC=8.9%)	SM

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

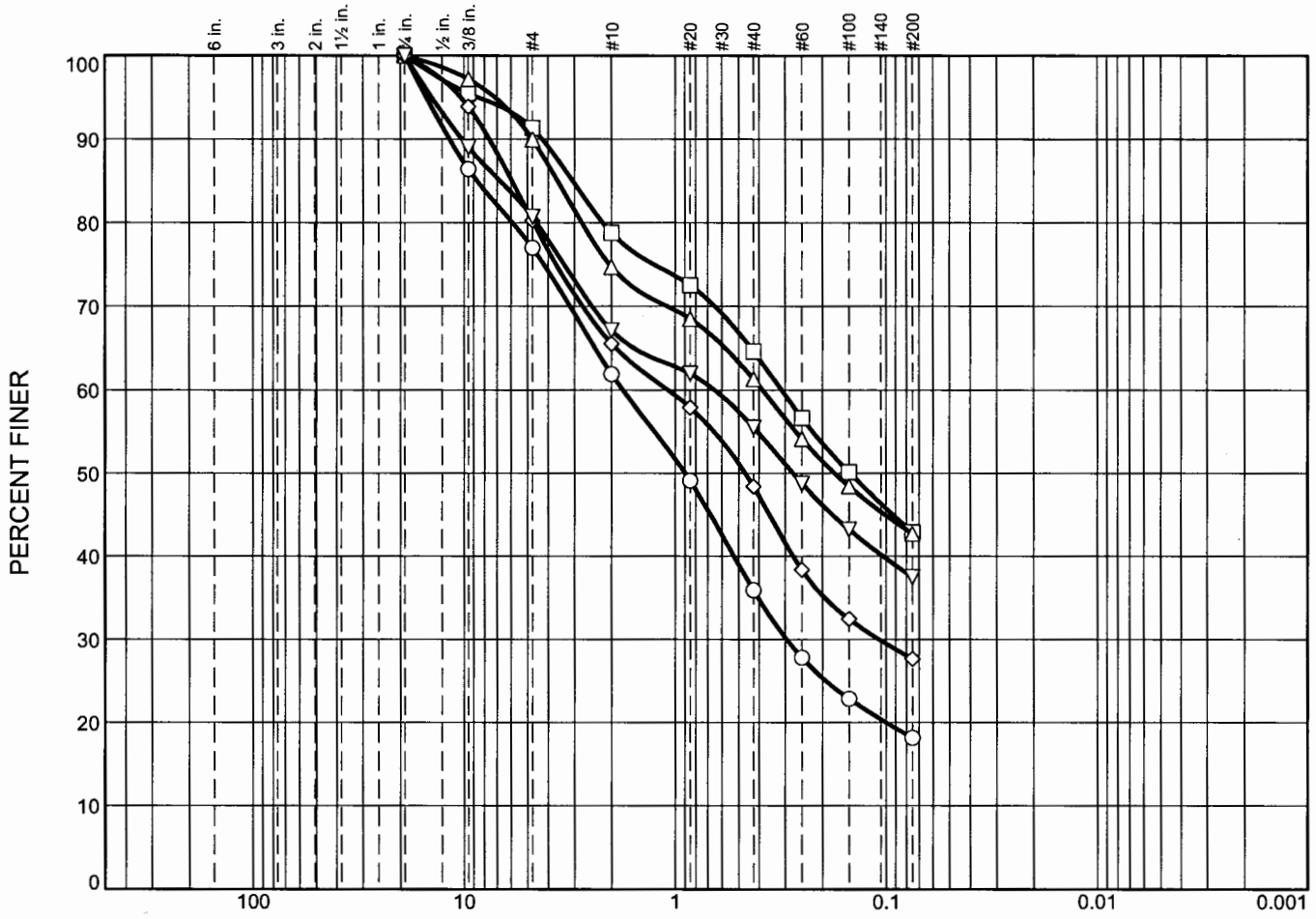
Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001

Plate 7A

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	23.0	15.1	26.0	17.8	18.1
□	0.0	0.0	8.7	12.5	14.2	21.7	42.9
△	0.0	0.0	10.0	15.3	13.4	18.6	42.7
◇	0.0	0.0	19.7	14.7	17.2	20.8	27.6
▽	0.0	0.0	19.3	13.5	11.7	18.0	37.5

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	C-2	S-4	10-12	F-c Sand, some fine Gravel, little Silt. (MC=3.1%)	SM
□	C-3	S-1	0-2	Fine to coarse Sand, and Silt, trace fine Gravel. (MC=3.0%)	SM
△	C-4	S-2	2-4	Fine to coarse Sand, and Silt, little fine Gravel. (MC=8.8%)	SM
◇	C-4	S-3	5-7	Fine to coarse Sand, some Silt, little fine Gravel. (MC=6.2%)	SM
▽	C-5	S-2	2-4	Fine to coarse Sand, and Silt, little fine Gravel. (MC=8.0%)	SM

Melick-Tully & Associates, P.C.

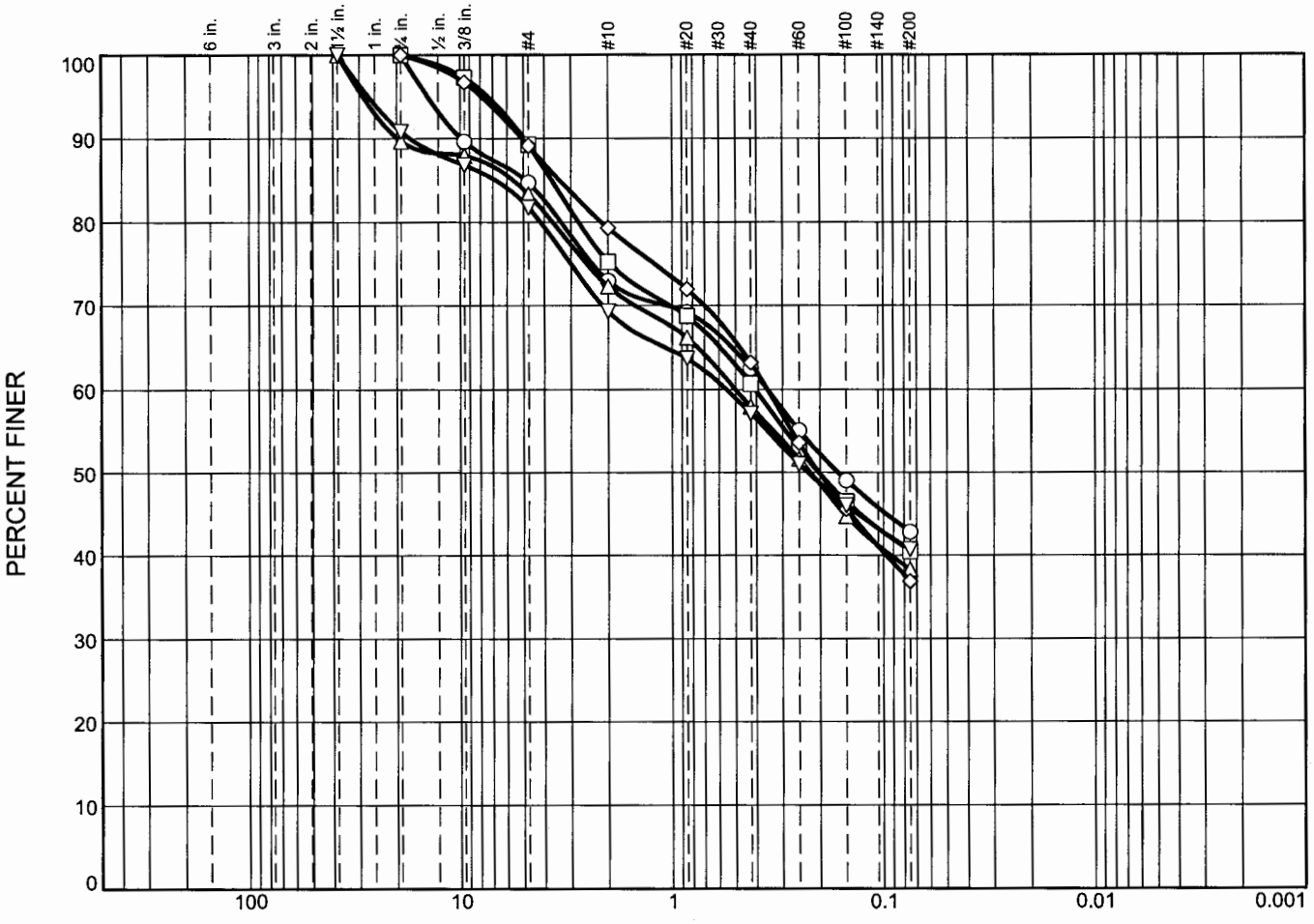
South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001 **Plate** 7B

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	15.3	11.7	10.5	19.7	42.8
□	0.0	0.0	10.7	14.0	14.6	20.2	40.5
△	0.0	10.3	6.4	11.0	14.4	19.6	38.3
◇	0.0	0.0	10.9	9.8	16.1	26.3	36.9
▽	0.0	9.2	9.0	12.5	12.2	16.4	40.7

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	C-5	S-3	5-7	Fine to coarse Sand, and Silt, little fine Gravel. (MC=9.4%)	SM
□	C-6	S-3	5-7	Fine to coarse Sand, and Silt, little fine Gravel. (MC=7.4%)	SM
△	C-6	S-4	10-12	Fine to coarse Sand, and Silt, little f-c Gravel. (MC=7.2%)	SM
◇	C-9	S-3	5-7	Fine to coarse Sand, and Silt, little fine Gravel. (MC=7.8%)	SM
▽	C-9	S-7	25-27	Fine to coarse Sand, and Silt, little f-c Gravel. (MC=8.3%)	SM

Melick-Tully & Associates, P.C.

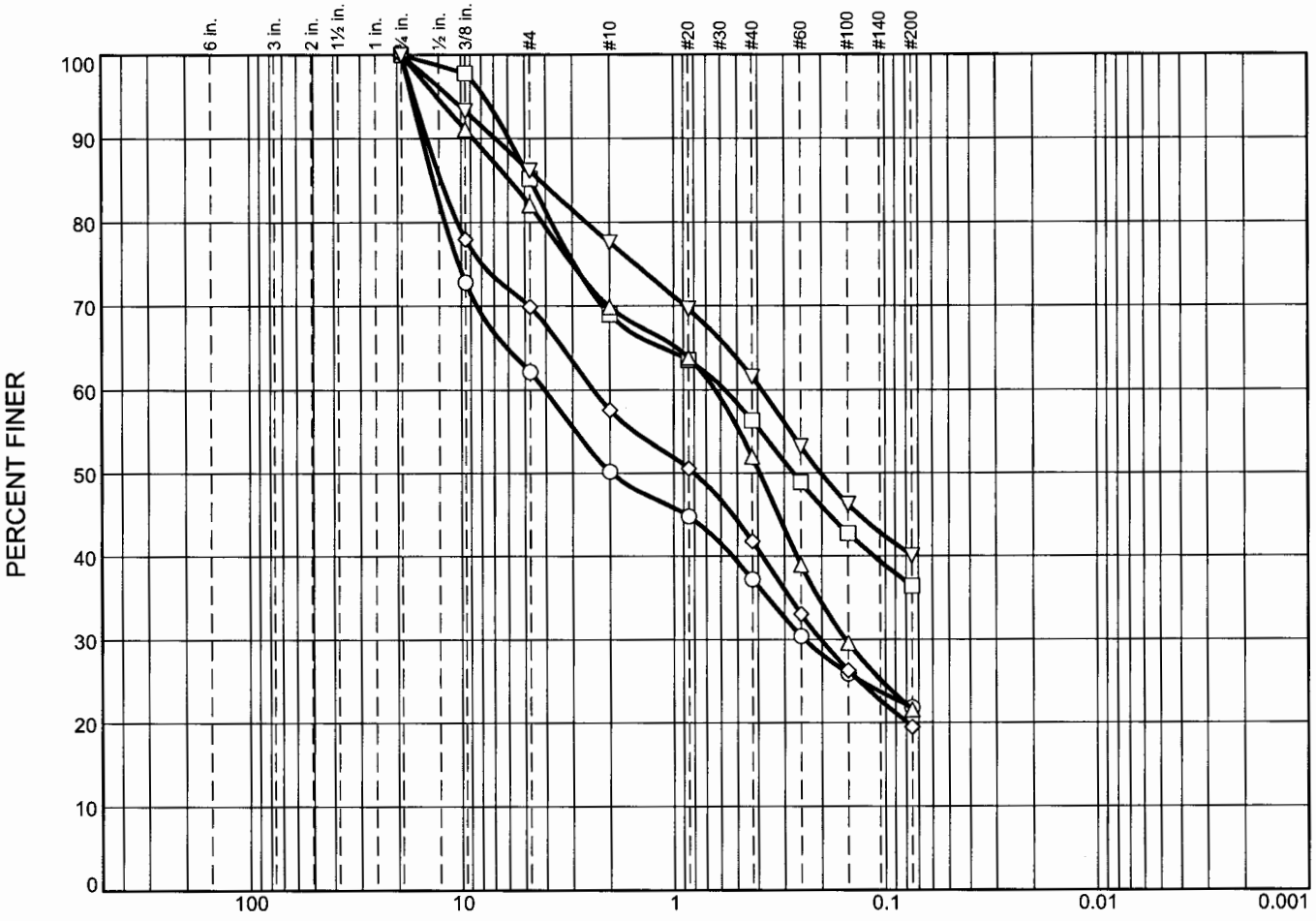
South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001 **Plate** 7C

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	37.9	11.9	13.0	15.4	21.8
□	0.0	0.0	14.8	16.2	12.7	19.9	36.4
△	0.0	0.0	17.9	12.2	17.9	30.4	21.6
◇	0.0	0.0	30.1	12.3	15.8	22.3	19.5
▽	0.0	0.0	13.8	8.6	16.1	21.4	40.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	C-11	S-2	2-4	Fine to coarse Sand, and fine Gravel, some Silt. (MC=5.4%)	SM
□	C-11	S-4	10-12	Fine to coarse Sand, and Silt, little fine Gravel. (MC=9.7%)	SM
△	C-13	S-4	10-12	Fine to coarse Sand, some Silt, little fine Gravel. (MC=7.7%)	SM
◇	C-15	S-5	15-17	Fine to coarse Sand, some fine Gravel, little Silt. (MC=5.4%)	SM
▽	C-19	S-5	15-17	Fine to coarse Sand, and Silt, little fine Gravel. (MC=8.1%)	SM

Melick-Tully & Associates, P.C.

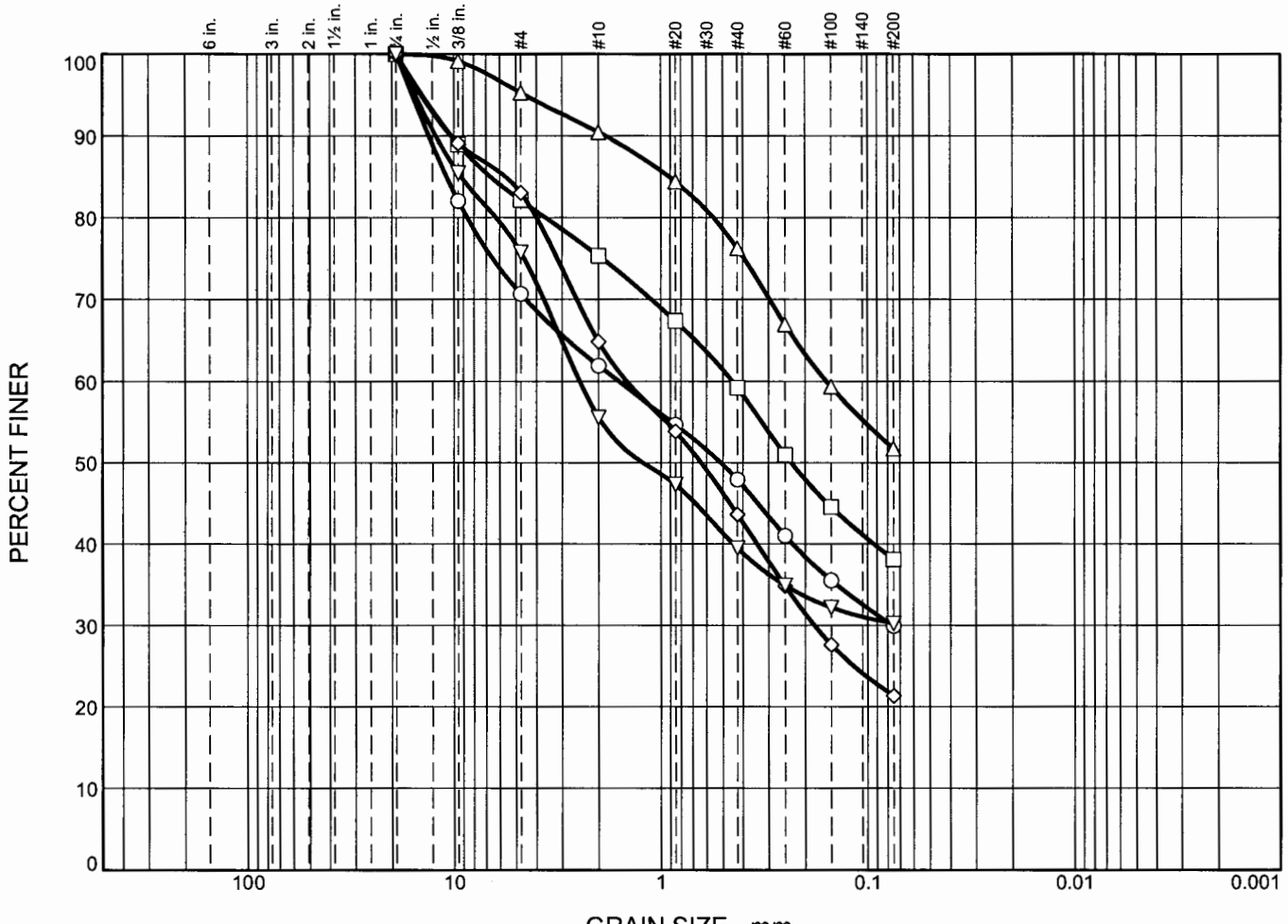
South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001 **Plate** 7D

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	29.3	8.8	14.0	18.0	29.9
□	0.0	0.0	17.9	6.7	16.2	21.1	38.1
△	0.0	0.0	4.7	4.9	14.1	24.6	51.7
◇	0.0	0.0	16.9	18.2	21.3	22.3	21.3
▽	0.0	0.0	24.2	20.2	16.1	9.3	30.2

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	S-1	S-2	2-4	Fine to coarse Sand, some Silt, some fine Gravel. (MC=5.3%)	SM
□	S-1	S-3	4-6	Fine to coarse Sand, and Silt, little fine Gravel. (MC=5.9%)	SM
△	S-3	S-2	2-4	Silt, and fine to coarse Sand, trace fine Gravel. (MC=8.7%)	ML
◇	S-4	S-1	0-2	Fine to coarse Sand, some Silt, little fine Gravel. (MC=32.2%)	SM
▽	S-4	S-2	5-7	Fine to coarse Sand, some Silt, some fine Gravel. (MC=8.8%)	SM

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

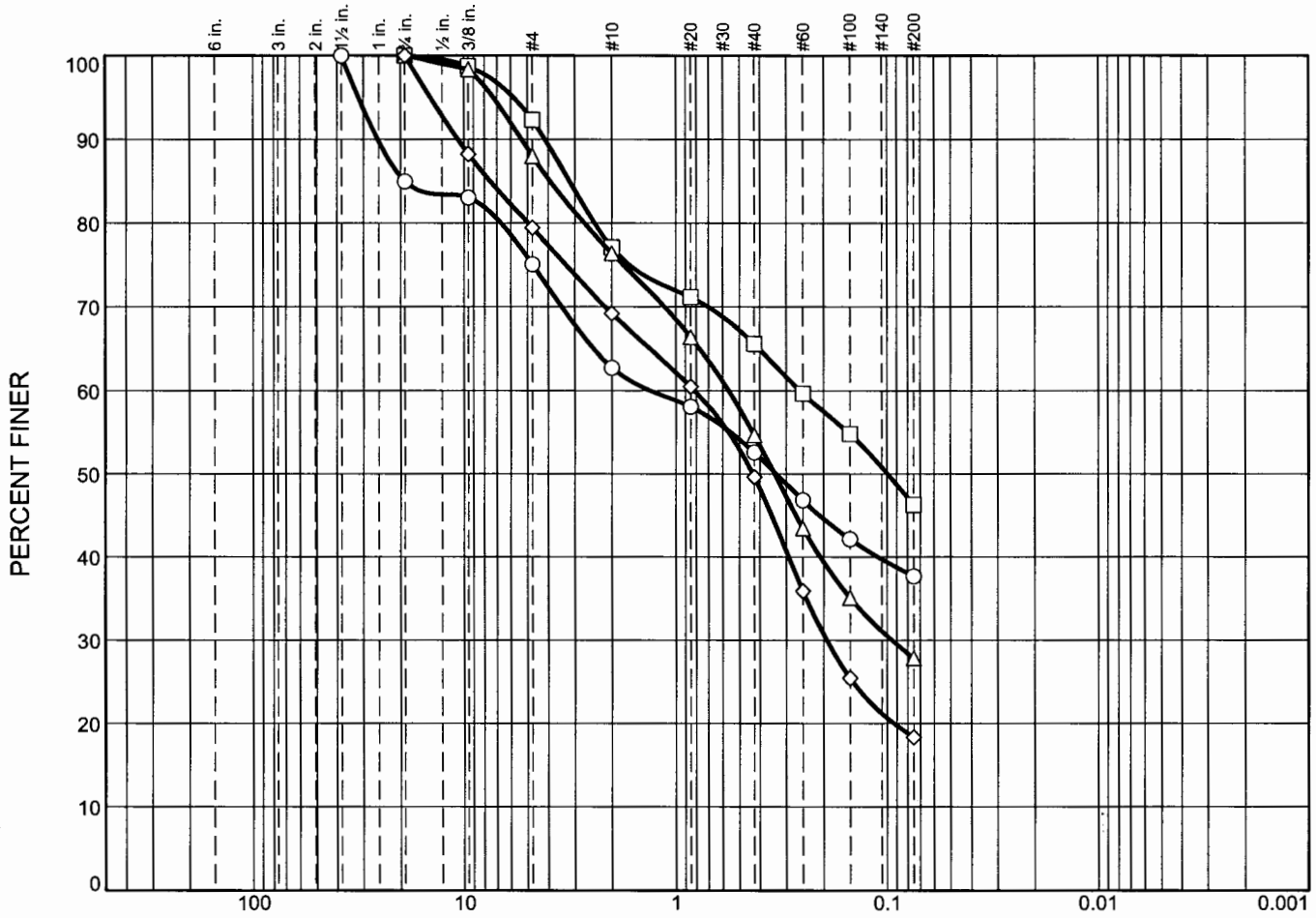
Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001

Plate 7E

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	15.0	9.9	12.4	10.1	14.9	37.7
□	0.0	0.0	7.7	15.2	11.5	19.3	46.3
△	0.0	0.0	12.0	11.6	21.7	26.9	27.8
◇	0.0	0.0	20.5	10.3	19.6	31.3	18.3

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	S-4	S-3	10-12	Fine to coarse Sand, and Silt, some f-c Gravel. (MC=7.6%)	SM
□	S-12	S-3	4-6	Fine to coarse Sand, and Silt, trace fine Gravel. (MC=39.0%)	SM
△	S-14	S-3	4-6	Fine to coarse Sand, some Silt, little fine Gravel. (MC=25.7%)	SM
◇	S-16	S-4	6-8	Fine to coarse Sand, some fine Gravel, little Silt. (MC=10.0%)	SM

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001 **Plate** 7F

Gradation Curve(s)

	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	19.6	15.7	16.7	19.2	28.8
□	0.0	7.8	13.2	1.4	12.7	18.8	46.1
△	0.0	0.0	15.3	8.5	10.5	22.3	43.4
◇	0.0	0.0	14.8	7.9	16.0	24.6	36.7
▽	0.0	0.0	0.0	0.0	0.1	3.0	96.9

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-T-1	S-1	3	Fine to coarse Sand, some Silt, little fine Gravel. (MC=9.9%)	SM
□	TP-T-1	S-3	6.5	Fine to medium Sand, and Silt, some f-c Gravel. (MC=8.7%)	SM
△	TP-T-5	S-1	3	Fine to coarse Sand, and Silt, little fine Gravel. (MC=11.5%)	SM
◇	TP-T-5	S-2	6	Fine to coarse Sand, and Silt, little fine Gravel. (MC=7.4%)	SM
▽	TP-T-6	S-2	4.5	Silt, trace fine Sand. (MC=16.6%)	ML

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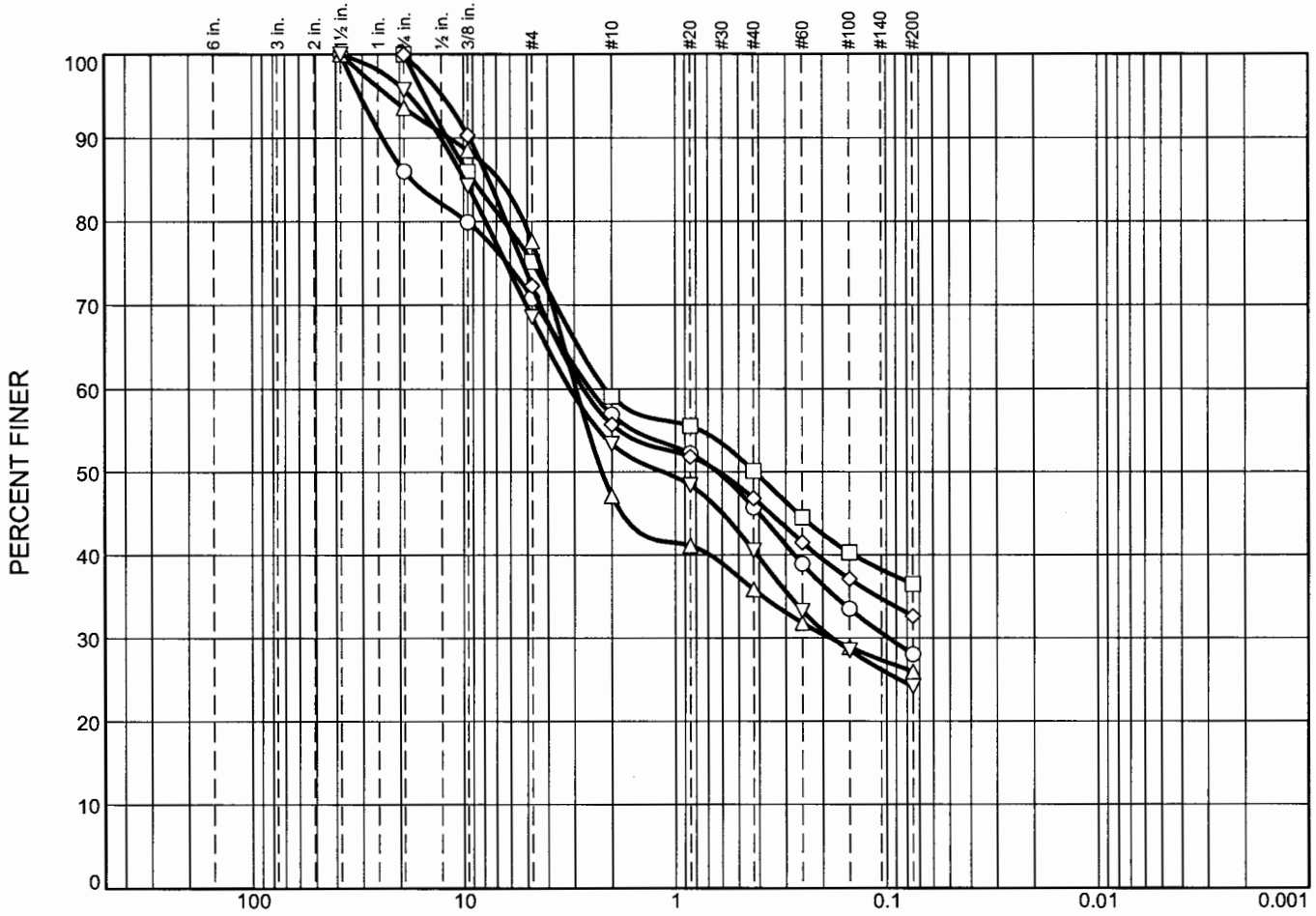
South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001 **Plate** 7G

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	14.0	15.2	13.9	11.2	17.7	28.0
□	0.0	0.0	24.8	16.1	9.0	13.6	36.5
△	0.0	6.4	15.9	30.6	11.3	9.8	26.0
◇	0.0	0.0	27.7	16.6	8.9	14.2	32.6
▽	0.0	4.2	27.2	15.2	12.9	16.4	24.1

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-P-1	S-1	3.5	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=11.3%)	SM
□	TP-P-3	S-1	2	Fine to coarse Sand, and Silt, some fine Gravel. (MC=21.5%)	SM
△	TP-P-5	S-1	2	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=12.5%)	SM
◇	TP-P-7	S-1	1.5	Fine to coarse Sand, some Silt, some fine Gravel. (MC=15.4%)	SM
▽	TP-P-13	S-1	3.5	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=10.0%)	SM

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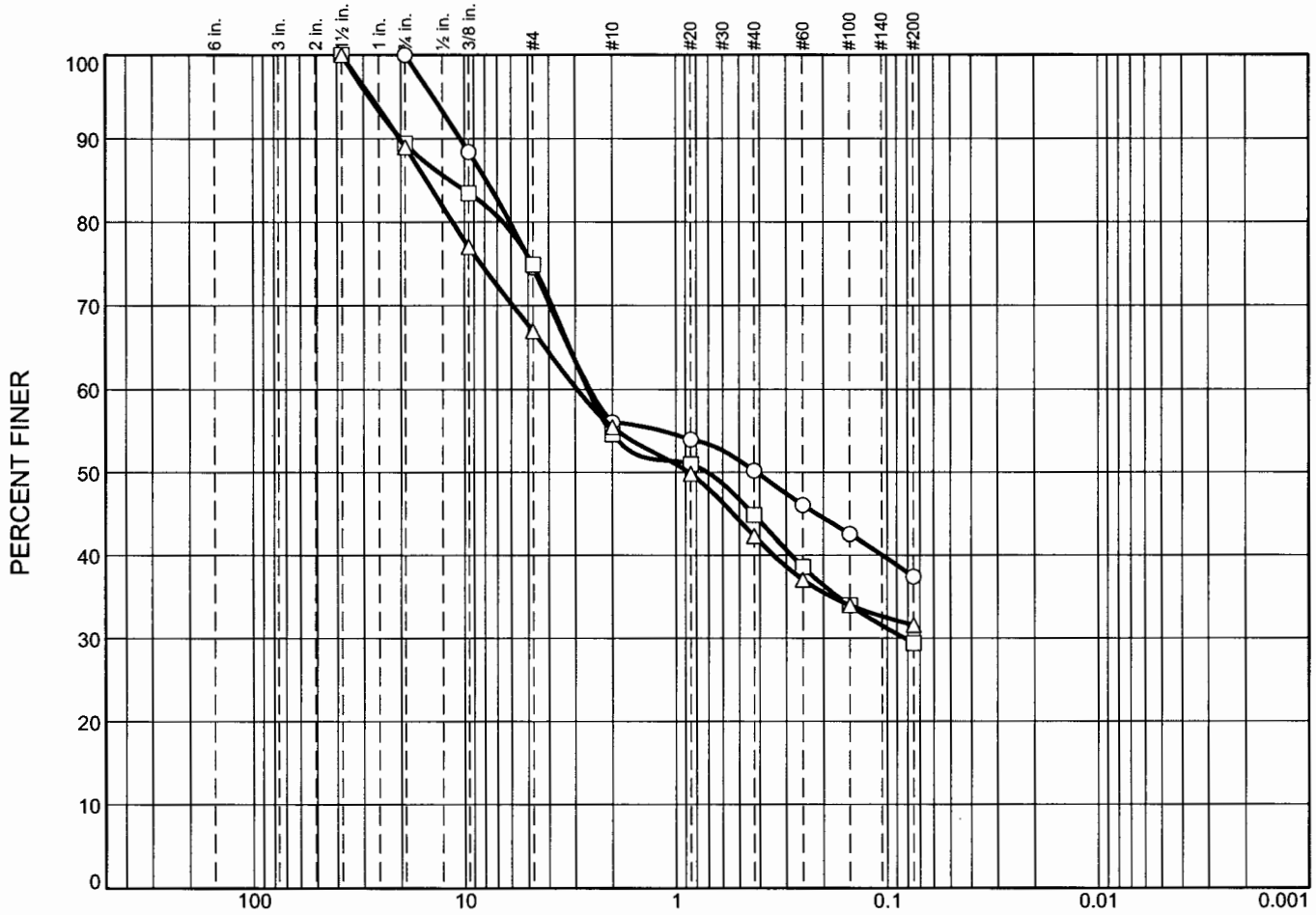
South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001 **Plate** 7H

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	25.4	18.6	5.8	12.8	37.4
□	0.0	10.6	14.5	20.3	9.8	15.4	29.4
△	0.0	11.0	22.1	11.4	13.2	10.7	31.6

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-P-13	S-2	5	Fine to coarse Sand, and Silt, some fine Gravel. (MC=10.5%)	SM
□	TP-P-16	S-1	2	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=8.4%)	SM
△	TP-P-21	S-1	3	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=8.8%)	SM

Melick-Tully & Associates, P.C.

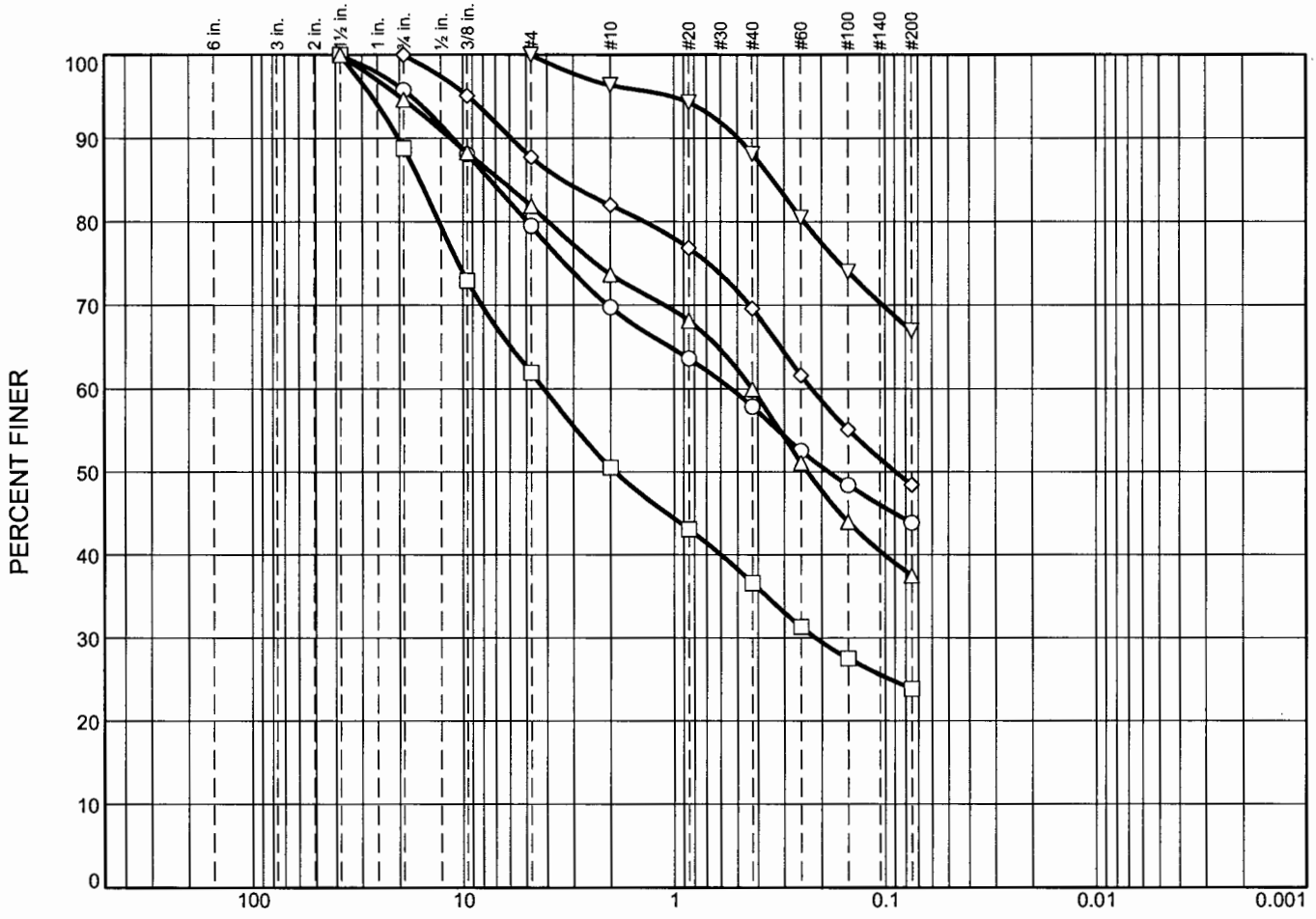
South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001 **Plate** 7I

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	4.2	16.3	9.8	11.8	14.0	43.9
□	0.0	11.2	26.9	11.4	13.9	12.7	23.9
△	0.0	5.4	12.7	8.2	13.7	22.5	37.5
◇	0.0	0.0	12.2	5.8	12.4	21.2	48.4
▽	0.0	0.0	0.0	3.6	8.3	21.1	67.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-R-1	S-1	1.5	Fine to coarse Sand, and Silt, some f-c Gravel. (MC=9.4%)	SM
□	TP-R-1	S-2	5.0	Fine to coarse Gravel, and f-c Sand, some Silt. (MC=4.7%)	GM
△	TP-R-4	S-1	3.0	Fine to coarse Sand, and Silt, little f-c Gravel. (MC=7.8%)	SM
◇	TP-R-4	S-2	8.0	Fine to coarse Sand, and Silt, little fine Gravel. (MC=8.3%)	SM
▽	TP-R-7	S-1	2.0	Silt, some fine to coarse Sand. (MC=8.9%)	ML

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

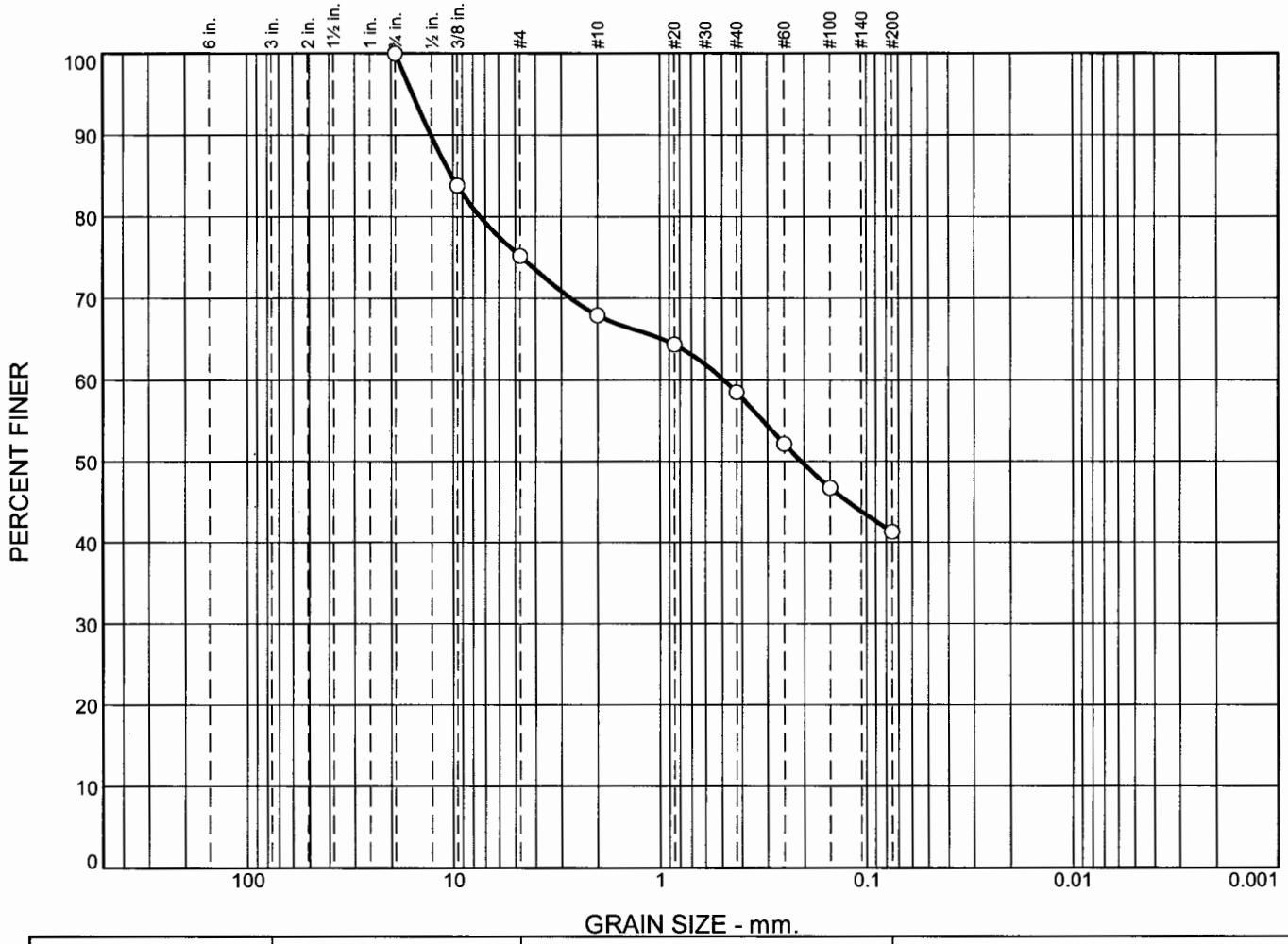
Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001

Plate 7J

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	24.8	7.3	9.4	17.2	41.3

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-R-7	S-2	4.0	Fine to coarse Sand, and Silt, some fine Gravel. (MC=6.8%)	SM

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001

Plate 7K

Gradation Curve(s)

	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	19.0	22.9	6.0	12.3	17.9	21.9

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-P-14		5.0-6.5	Fine to coarse Gravel, and f-c Sand, some Silt. (MC=7.8%)	GM

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

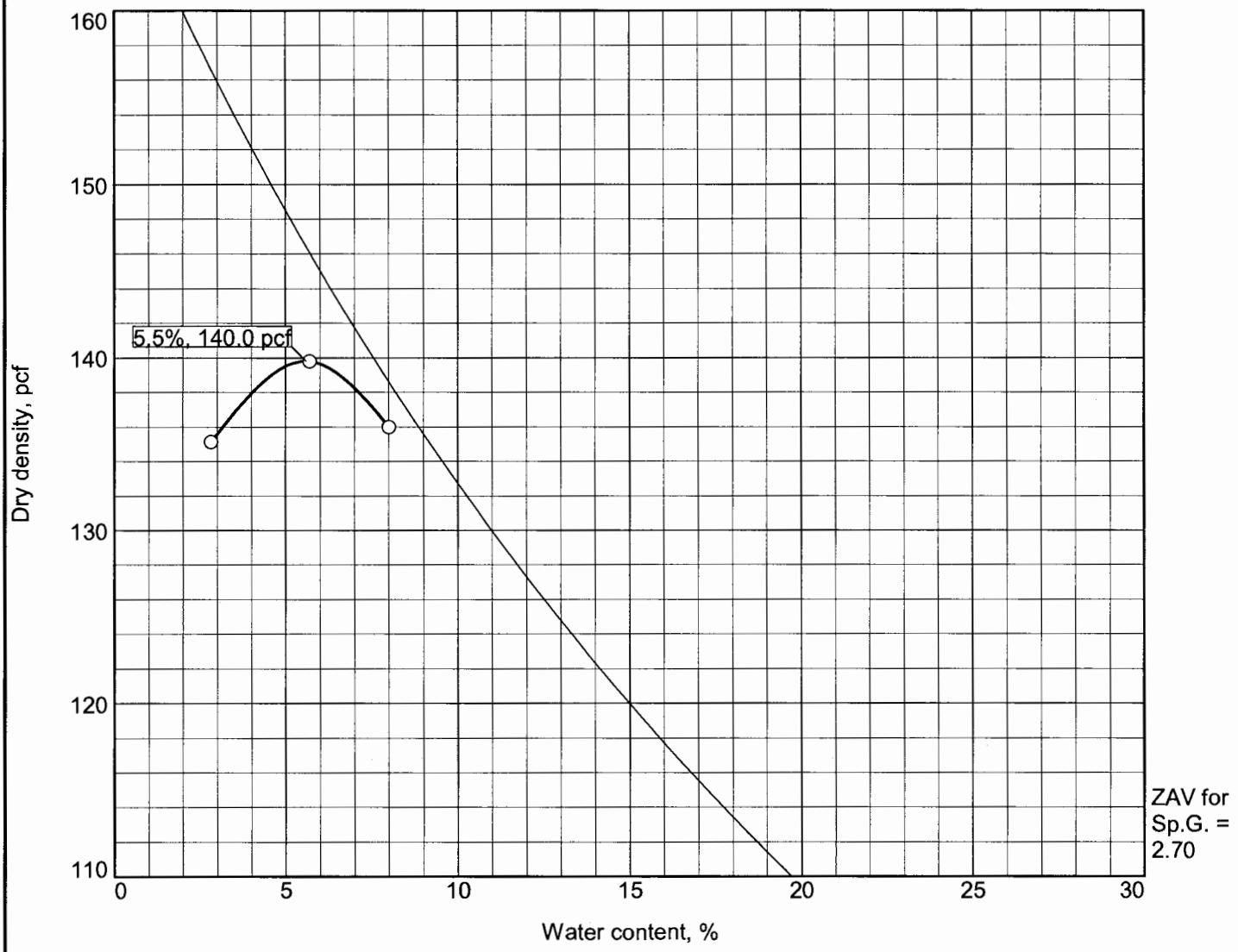
Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001

Plate 7L

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method C Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/4 in.	% < No.200
	USCS	AASHTO						
5.0-6.5	GM		7.8				19.0	21.9

ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 140.0 pcf Optimum moisture = 5.5 %	Fine to coarse Gravel, and f-c Sand, some Silt. (MC=7.8%)

Project No. 8979-001 **Client:** Concord Resort Development
Project: Concord Resort Development, Thompson, NY

○ **Source of Sample:** TP-P-14

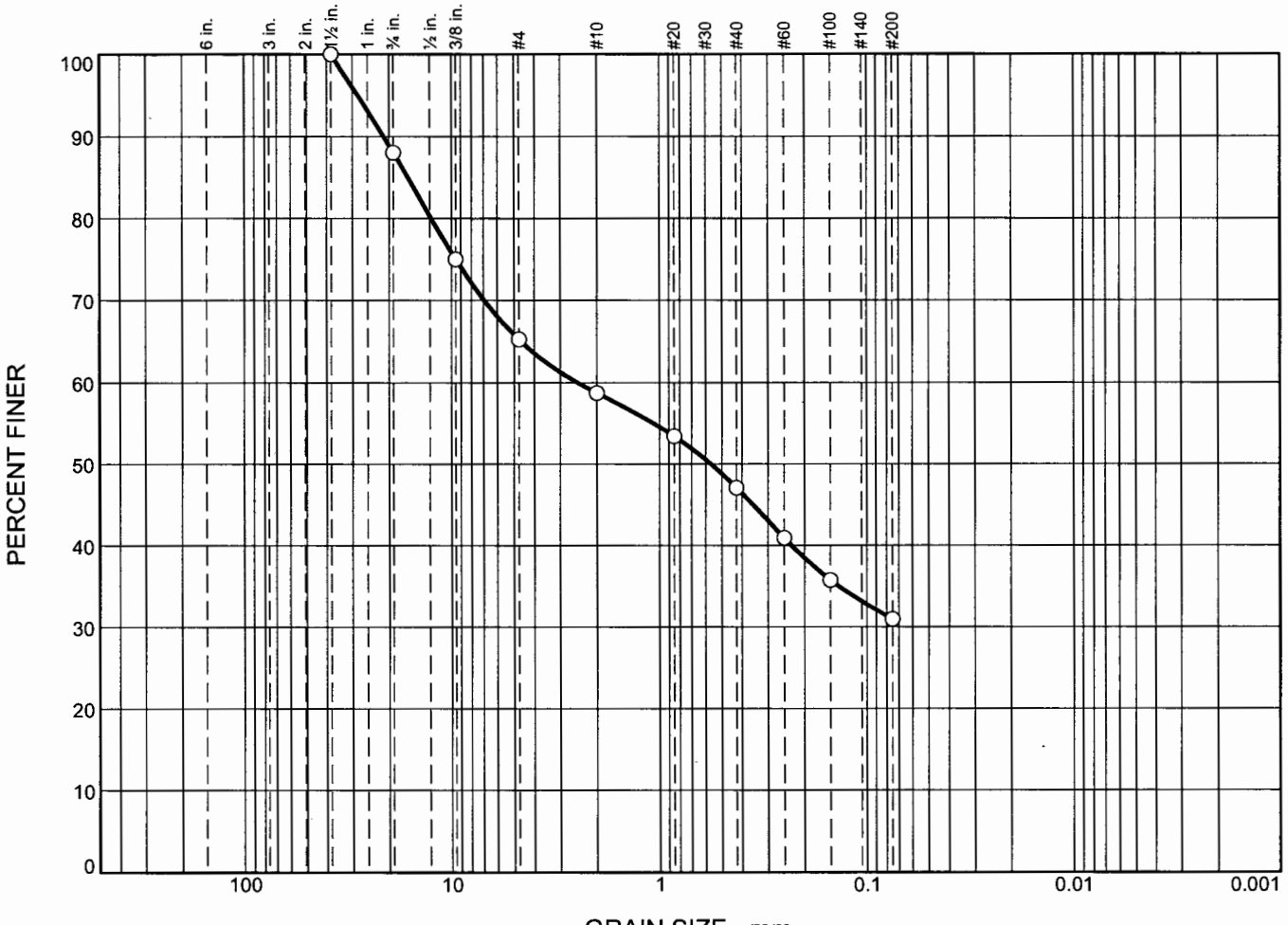
Remarks:

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

Plate 7M

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	12.0	22.7	6.6	11.6	16.1	31.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-P-17		6.5-7.5	Fine to coarse Gravel, some f-c Sand, some Silt. (MC=4.0%)	GM

Melick-Tully & Associates, P.C.

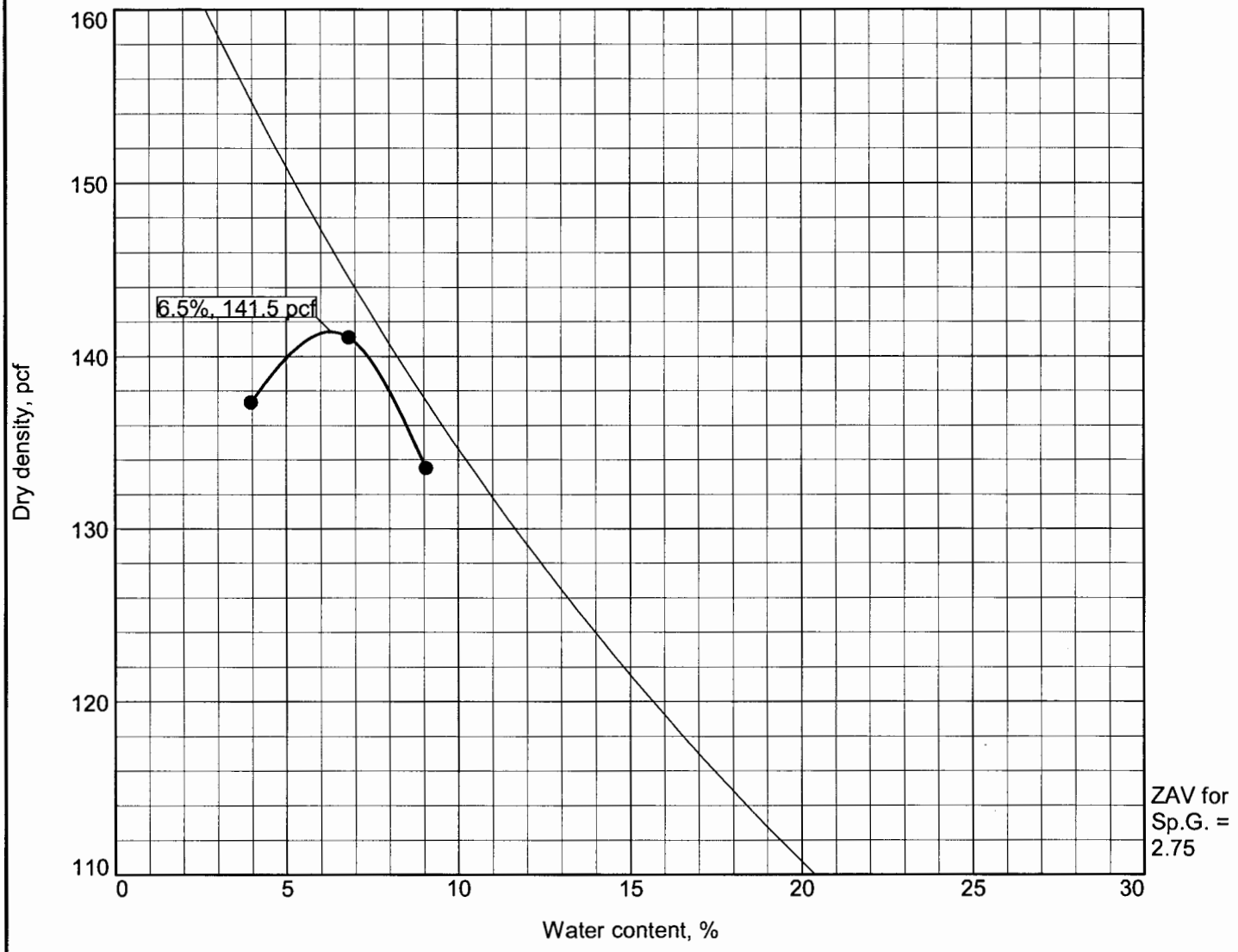
South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001 **Plate** 7N

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method B Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
6.5-7.5	GM		4.0				25.0	31.0

ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 141.5 pcf Optimum moisture = 6.5 %	Fine to coarse Gravel, some f-c Sand, some Silt. (MC=4.0%)

Project No. 8979-001 **Client:** Concord Resort Development
Project: Concord Resort Development, Thompson, NY

○ **Source of Sample:** TP-P-17

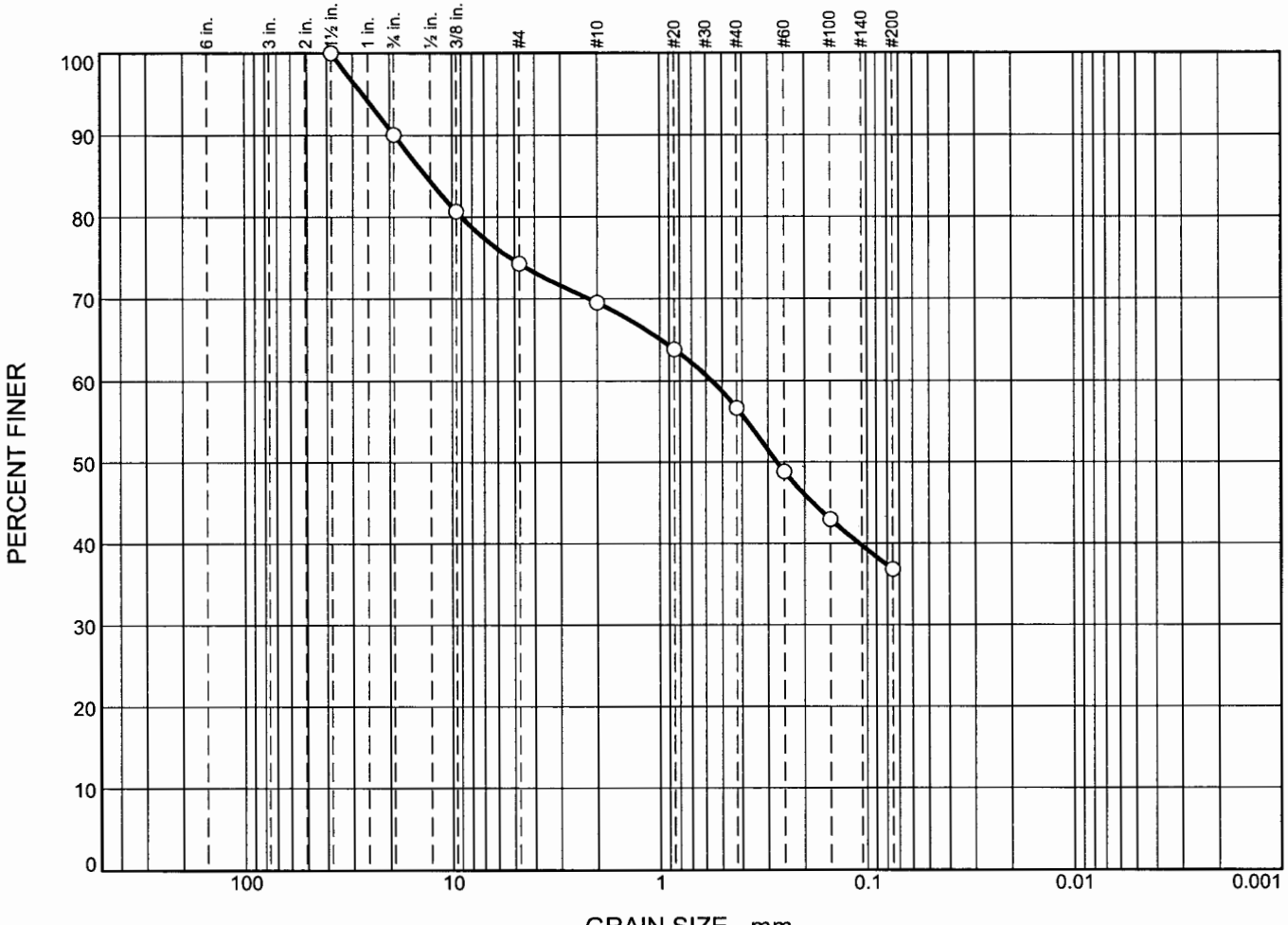
Remarks:

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

Plate 7O

Gradation Curve(s)



	% +3"	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	9.9	15.8	4.8	12.9	19.8	36.8

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-P-21		8.0	Fine to coarse Sand, and Silt, some f-c Gravel. (MC=8.3%)	SM

Melick-Tully & Associates, P.C.

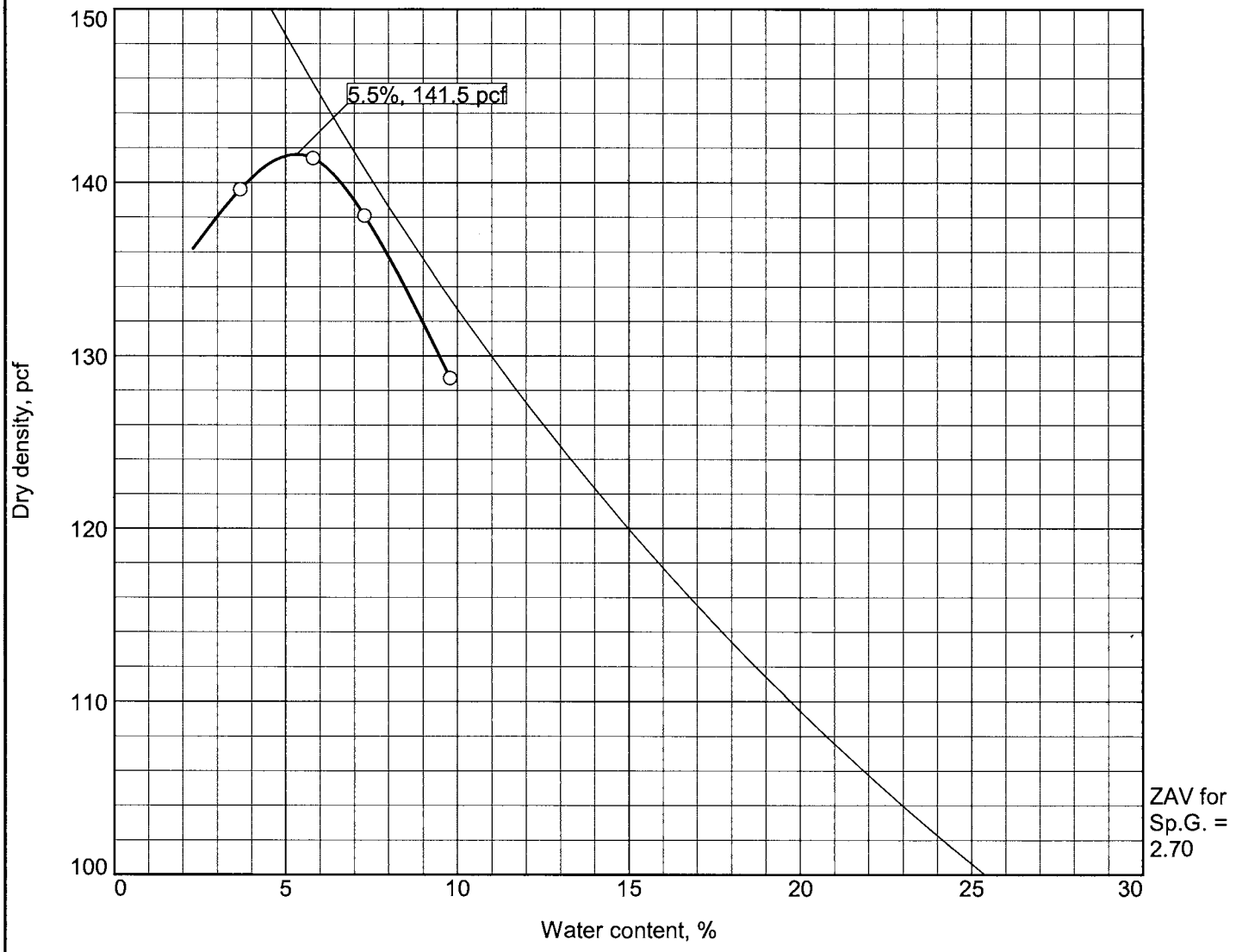
South Bound Brook, NJ

Client: Concord Resort Development

Project: Concord Resort Development, Thompson, NY

Project No.: 8979-001 **Plate** 7P

COMPACTION TEST REPORT



Test specification: ASTM D 1557-07 Method B Modified
ASTM D 4718-87 Oversize Corr. Applied to Each Test Point

Elev/ Depth	Classification		Nat. Moist.	Sp.G.	LL	PI	% > 3/8 in.	% < No.200
	USCS	AASHTO						
8.0	SM		8.3				19.3	36.8

ROCK CORRECTED TEST RESULTS	MATERIAL DESCRIPTION
Maximum dry density = 141.5 pcf Optimum moisture = 5.5 %	Fine to coarse Sand, and Silt, some f-c Gravel. (MC=8.3%)

Project No. 8979-001 **Client:** Concord Resort Development
Project: Concord Resort Development, Thompson, NY

○ **Source of Sample:** TP-P-21

Remarks:

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

Plate 7Q

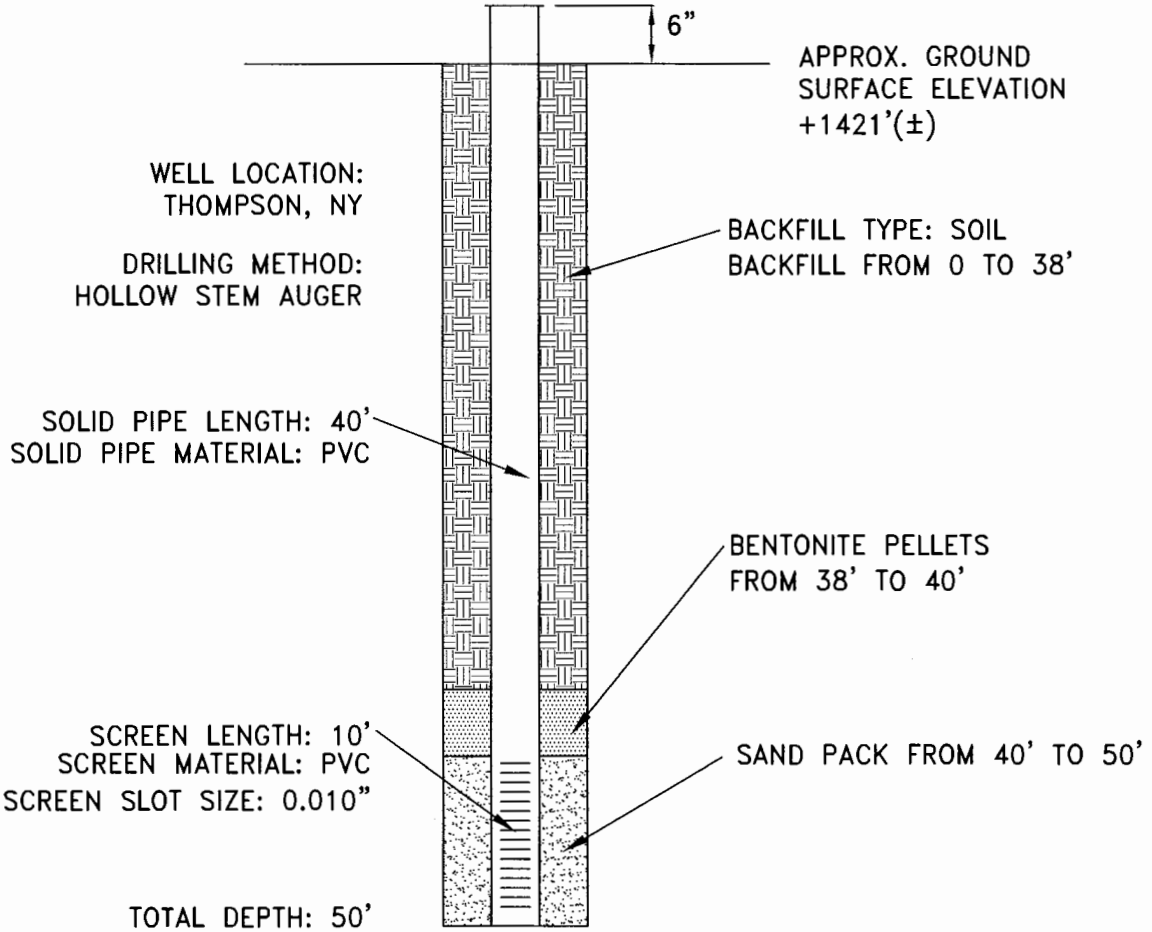
SUMMARY OF TUBE PERMEAMETER RESULTS
Thompson, New York
Concord Development

Exploration No.	Approximate Surface Elevation (ft)	Approximate Test Depth (ft)	Approximate Permeability (in/hr)
TP-P-1	1,385	2.0	1.3
TP-P-1	1,385	6.0	0.7
TP-P-2	1,414	2.0	0.06
TP-P-3	1,442	2.0	0.6
TP-P-4	1,448	2.0	0.5
TP-P-4	1,448	6.0	0.7
TP-P-5	1,440	1.5	1.9
TP-P-6	1,448	1.5	0.2
TP-P-7	1,446	1.5	0.4
TP-P-8	1,450	1.5	0.4
TP-P-9	1,448	2.0	0.05
TP-P-11	1,368	2.5	0.02
TP-P-12	1,365	2.0	0.1
TP-P-13	1,375	3.5	0.04
TP-P-14	1,388	2.0	0.04
TP-P-15	1,380	2.0	0.06
TP-P-18	1,434	2.0	0.02
TP-P-20	1,454	2.0	0.09

PIEZOMETER CONSTRUCTION DETAIL

PIEZOMETER C-1

DATE OF CONSTRUCTION 3/2/12



DATE	3/9/12	3/23/12	4/4/12	4/13/12
WATER LEVEL	19'0"	24'0"	28'7"	24'4"

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

TEMPORARY PIEZOMETER DETAIL

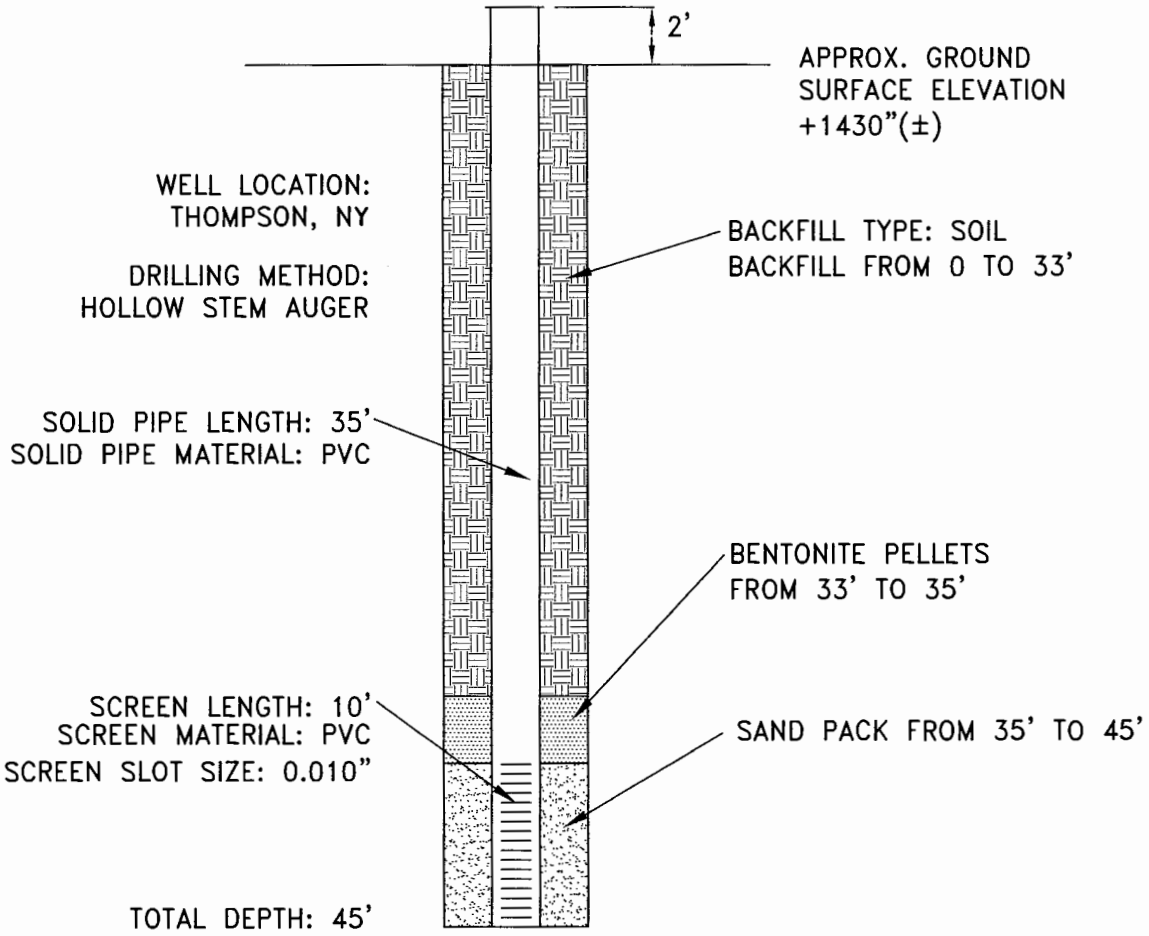
CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
8979-001*1D	25299	JCB	JHB	4-6-12	NTS	9A

PIEZOMETER CONSTRUCTION DETAIL

PIEZOMETER C-7

DATE OF CONSTRUCTION 3/1/12



DATE	3/14/12	3/15/12	3/19/12	3/23/12	4/4/12	4/13/12
WATER LEVEL	18'0"	26'2"	27'6"	30'0"	29'7"	29'9"

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

TEMPORARY PIEZOMETER DETAIL

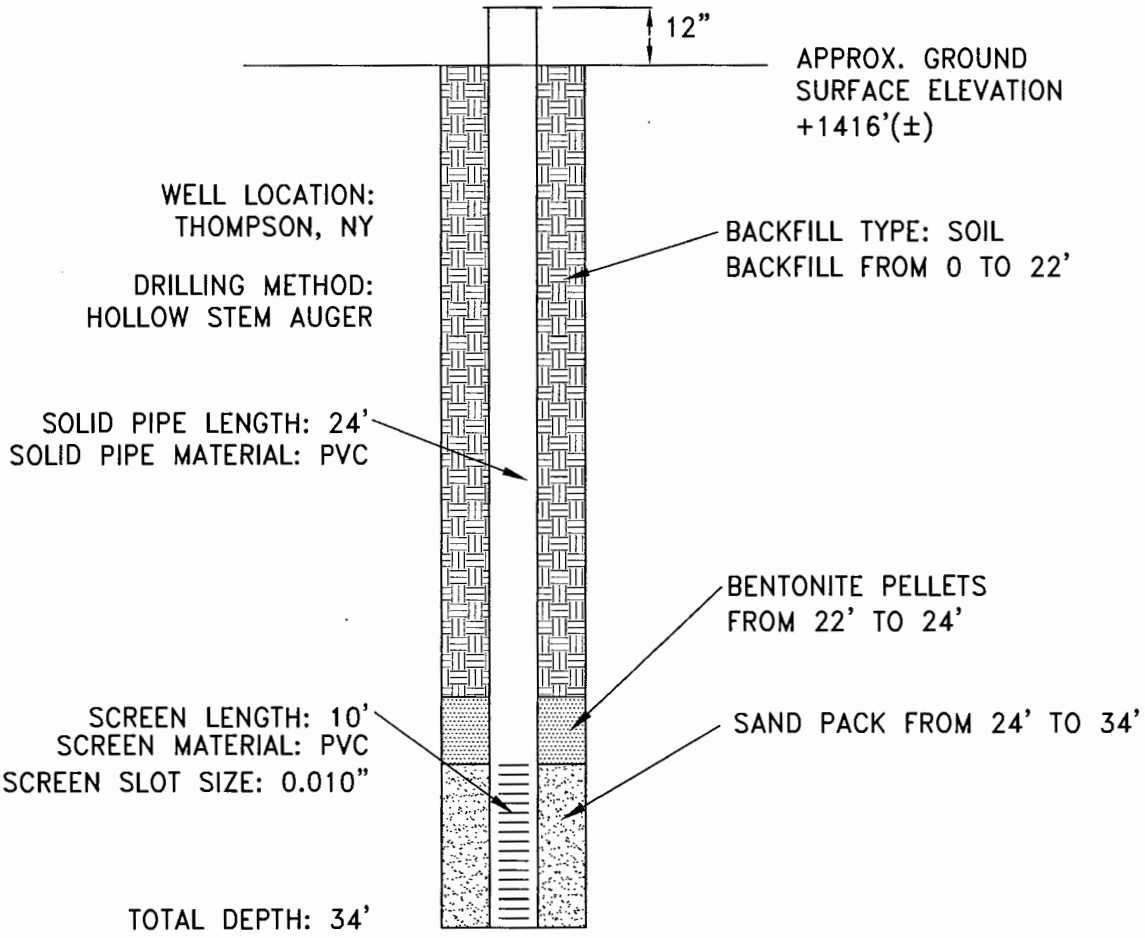
CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
8979-001*1D	25299	VJD	JHB	4-6-12	NTS	9B

PIEZOMETER CONSTRUCTION DETAIL

PIEZOMETER C-12

DATE OF CONSTRUCTION 3/12/12



DATE	3/12/12	3/13/12	3/19/12	3/23/12	4/4/12	4/13/12
WATER LEVEL	15'0"	15'0"	27'0"	28'8"	29'2"	29'2"

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

TEMPORARY PIEZOMETER DETAIL

CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
8979-001*1D	25299	VJD	JHB	4-6-12	NTS	9C

KEY:

C-1 — BORING NUMBER AND LOCATION

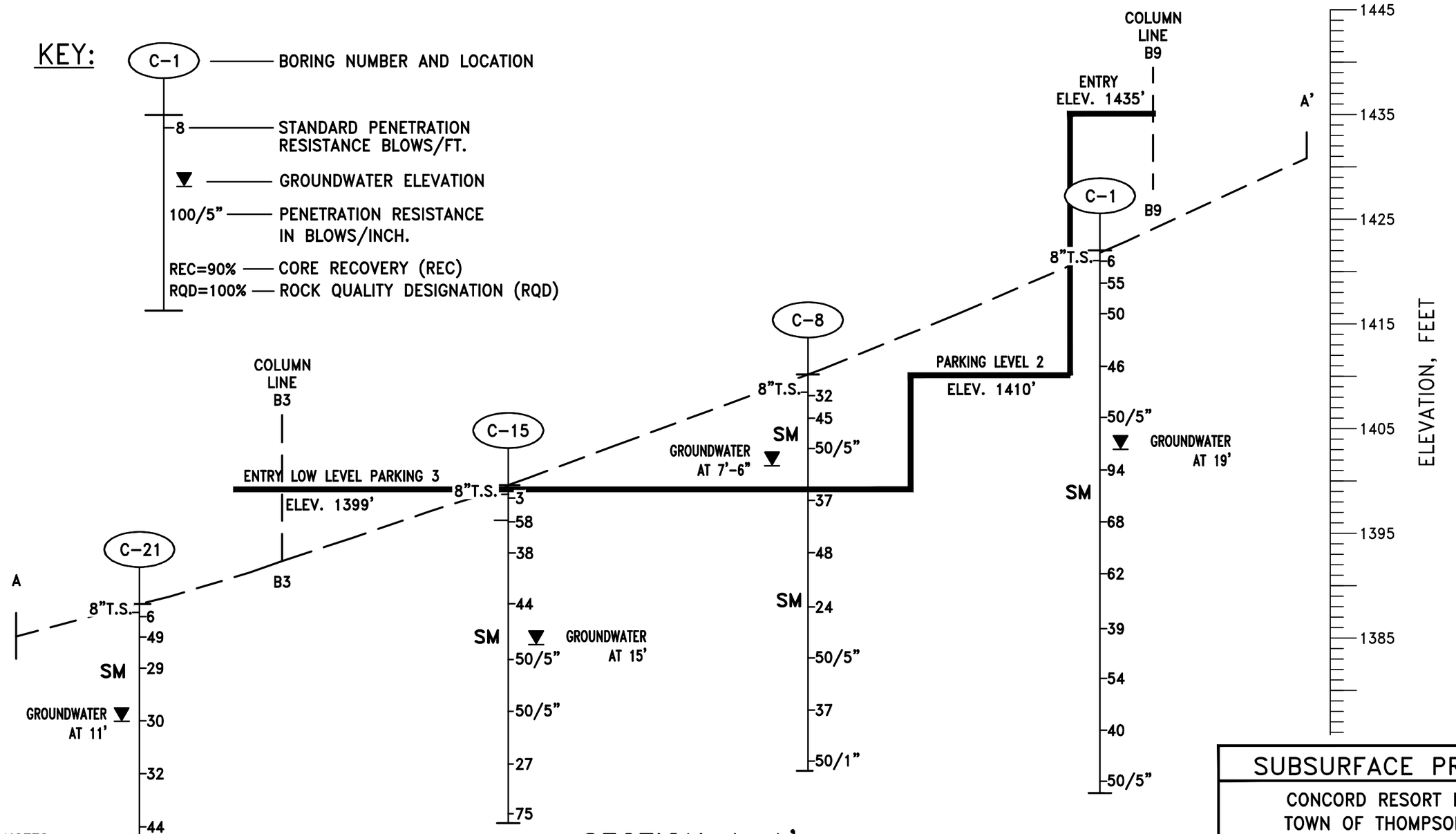
8 — STANDARD PENETRATION RESISTANCE BLOWS/FT.

▼ — GROUNDWATER ELEVATION

100/5" — PENETRATION RESISTANCE IN BLOWS/INCH.

REC=90% — CORE RECOVERY (REC)

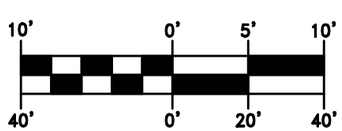
RQD=100% — ROCK QUALITY DESIGNATION (RQD)



SECTION A-A'

NOTES:

1. This drawing is part of Melick-Tully and Associates, Inc. Report No. 8979-001*1D and should be read together with the report for complete evaluation.
2. The stratification lines are based upon interpolations between widely spaced test borings and thus represent the approximate boundaries between soil types. Actual transitions may vary from those shown.
3. Stratum designations are generalized. See report for descriptions of each stratum and the test boring logs for detailed descriptions at specific locations.



SUBSURFACE PROFILE A-A'

CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

JOB NO.	FILE NO.
8979-001*1D	25299

DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	4-6-12	AS NOTED	10A

KEY:

C-1 — BORING NUMBER AND LOCATION

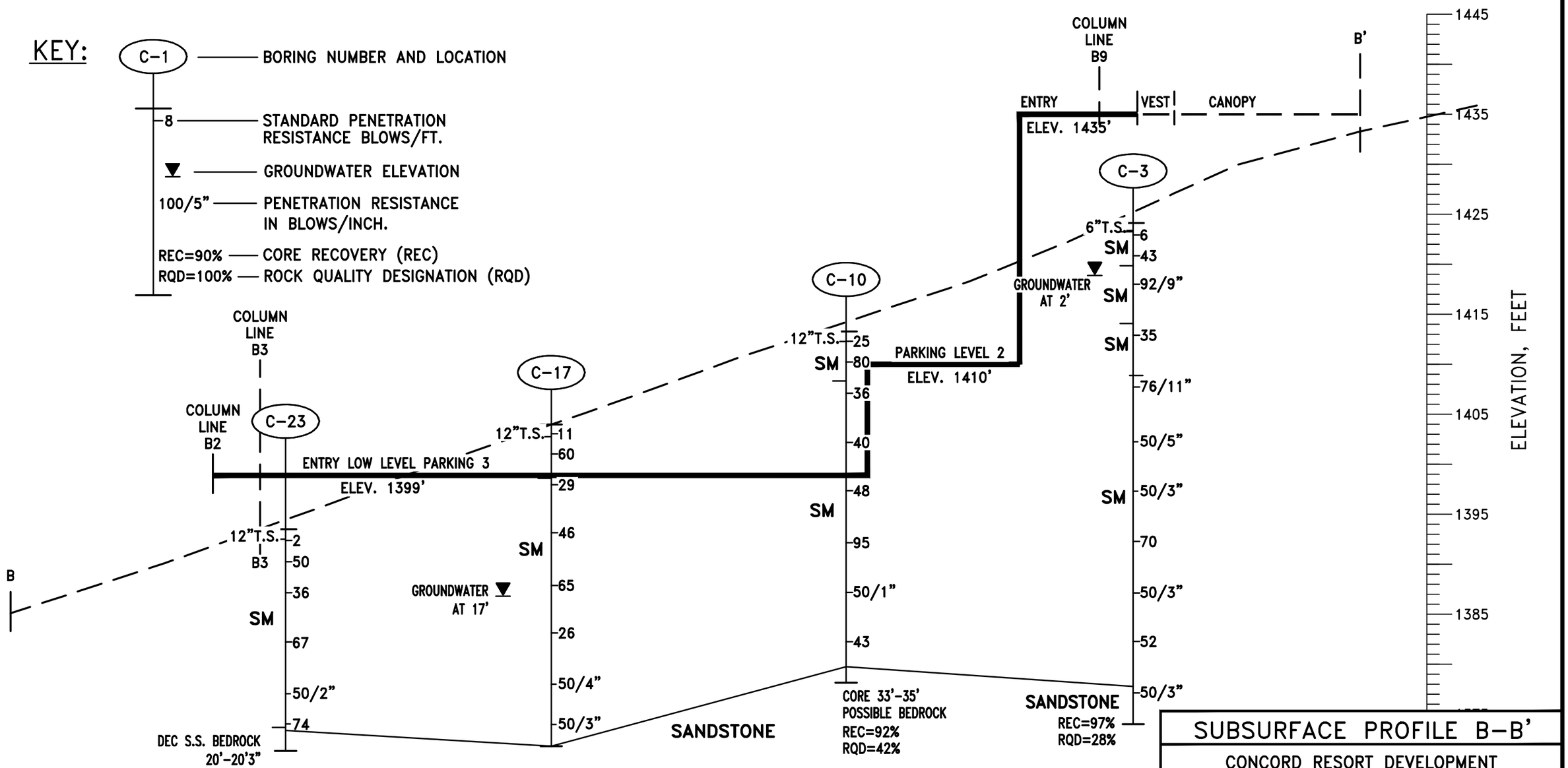
8 — STANDARD PENETRATION RESISTANCE BLOWS/FT.

▼ — GROUNDWATER ELEVATION

100/5" — PENETRATION RESISTANCE IN BLOWS/INCH.

REC=90% — CORE RECOVERY (REC)

RQD=100% — ROCK QUALITY DESIGNATION (RQD)



SECTION B-B'

NOTES:

1. This drawing is part of Melick-Tully and Associates, Inc. Report No. 8979-001*1D and should be read together with the report for complete evaluation.
2. The stratification lines are based upon interpolations between widely spaced test borings and thus represent the approximate boundaries between soil types. Actual transitions may vary from those shown.
3. Stratum designations are generalized. See report for descriptions of each stratum and the test boring logs for detailed descriptions at specific locations.

-VERTICAL-

10' 0' 5' 10'

40' 0' 20' 40'

-HORIZONTAL-

SUBSURFACE PROFILE B-B'

CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

JOB NO.	FILE NO.
8979-001*1D	25299

DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	4-6-12	AS NOTED	10B

KEY:

C-1 — BORING NUMBER AND LOCATION

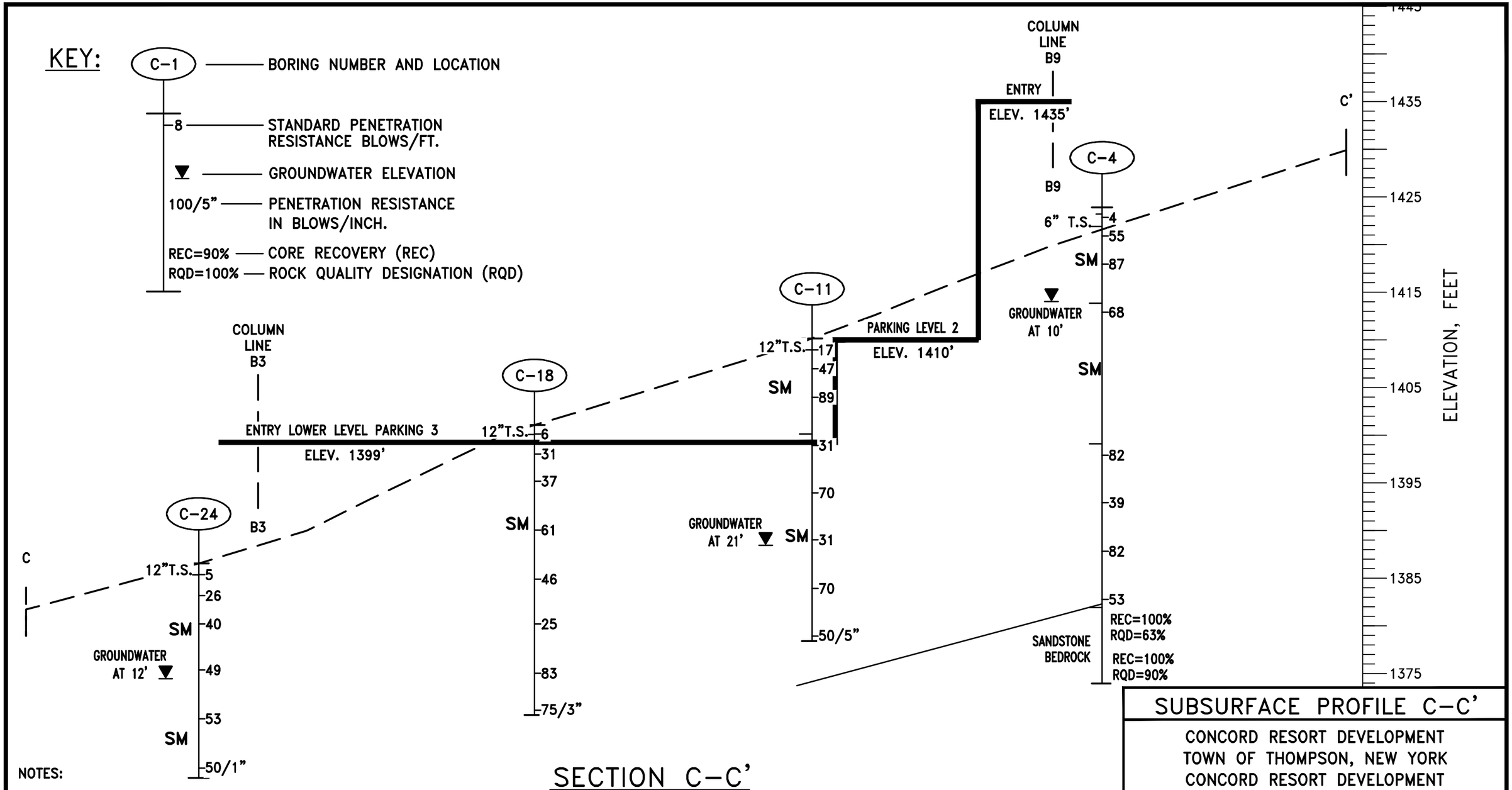
8 — STANDARD PENETRATION RESISTANCE BLOWS/FT.

▼ — GROUNDWATER ELEVATION

100/5" — PENETRATION RESISTANCE IN BLOWS/INCH.

REC=90% — CORE RECOVERY (REC)

RQD=100% — ROCK QUALITY DESIGNATION (RQD)



SECTION C-C'

NOTES:

1. This drawing is part of Melick-Tully and Associates, Inc. Report No. 8979-001*1D and should be read together with the report for complete evaluation.
2. The stratification lines are based upon interpolations between widely spaced test borings and thus represent the approximate boundaries between soil types. Actual transitions may vary from those shown.
3. Stratum designations are generalized. See report for descriptions of each stratum and the test boring logs for detailed descriptions at specific locations.

-VERTICAL-

10' 0' 5' 10'

40' 0' 20' 40'

-HORIZONTAL-

SUBSURFACE PROFILE C-C'

CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

JOB NO.	FILE NO.
8979-001*1D	25299

DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	4-6-12	AS NOTED	10C

KEY:

C-1 — BORING NUMBER AND LOCATION

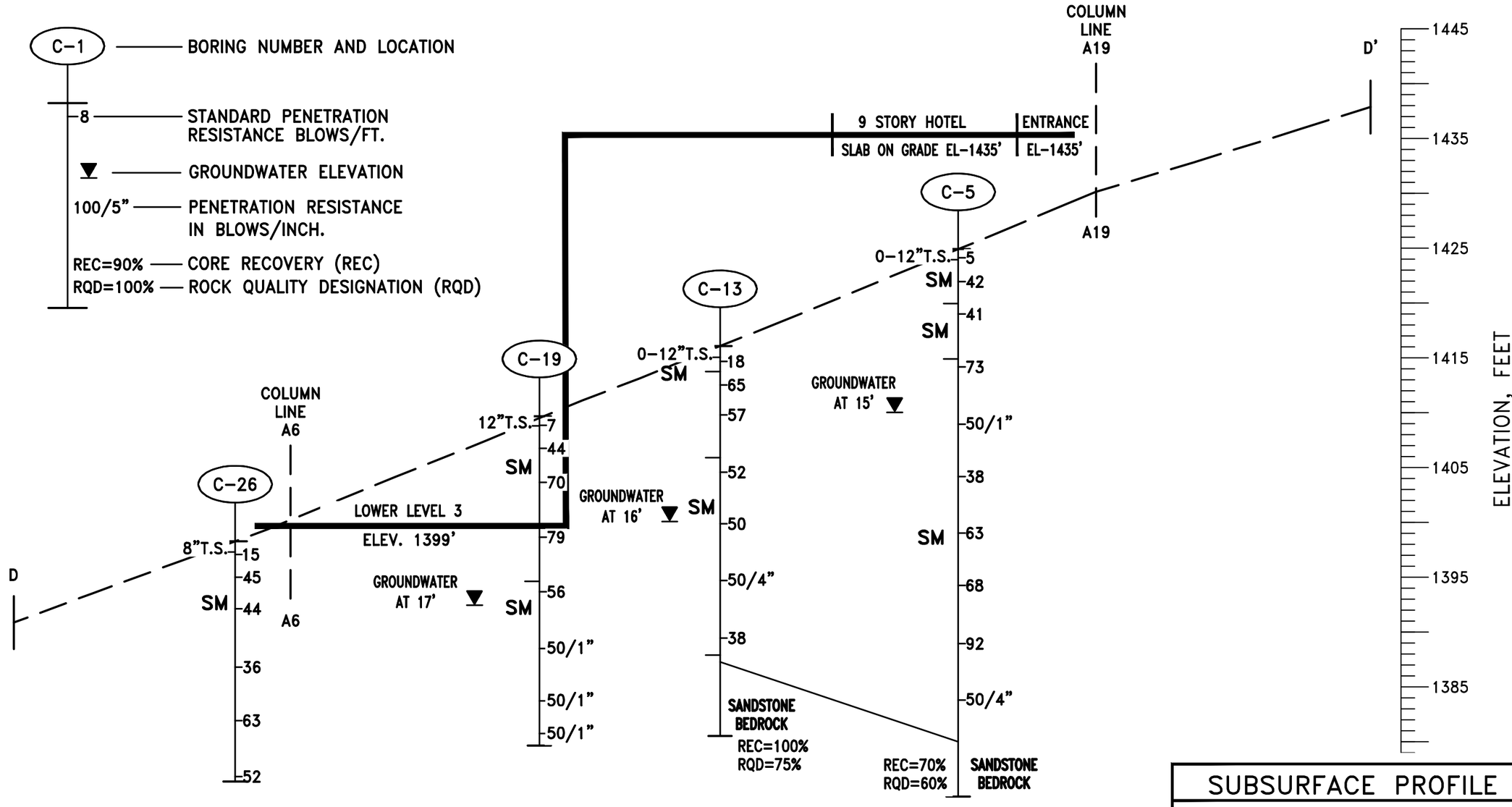
8 — STANDARD PENETRATION RESISTANCE BLOWS/FT.

▼ — GROUNDWATER ELEVATION

100/5" — PENETRATION RESISTANCE IN BLOWS/INCH.

REC=90% — CORE RECOVERY (REC)

RQD=100% — ROCK QUALITY DESIGNATION (RQD)



SECTION D-D'

NOTES:

1. This drawing is part of Melick-Tully and Associates, Inc. Report No. 8979-001*1D and should be read together with the report for complete evaluation.
2. The stratification lines are based upon interpolations between widely spaced test borings and thus represent the approximate boundaries between soil types. Actual transitions may vary from those shown.
3. Stratum designations are generalized. See report for descriptions of each stratum and the test boring logs for detailed descriptions at specific locations.

-VERTICAL-

10' 0' 5' 10'

40' 0' 20' 40'

-HORIZONTAL-

SUBSURFACE PROFILE D-D'

CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

JOB NO.	FILE NO.
8979-001*1D	25299

DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	4-6-12	AS NOTED	10D

KEY:

C-1 — BORING NUMBER AND LOCATION

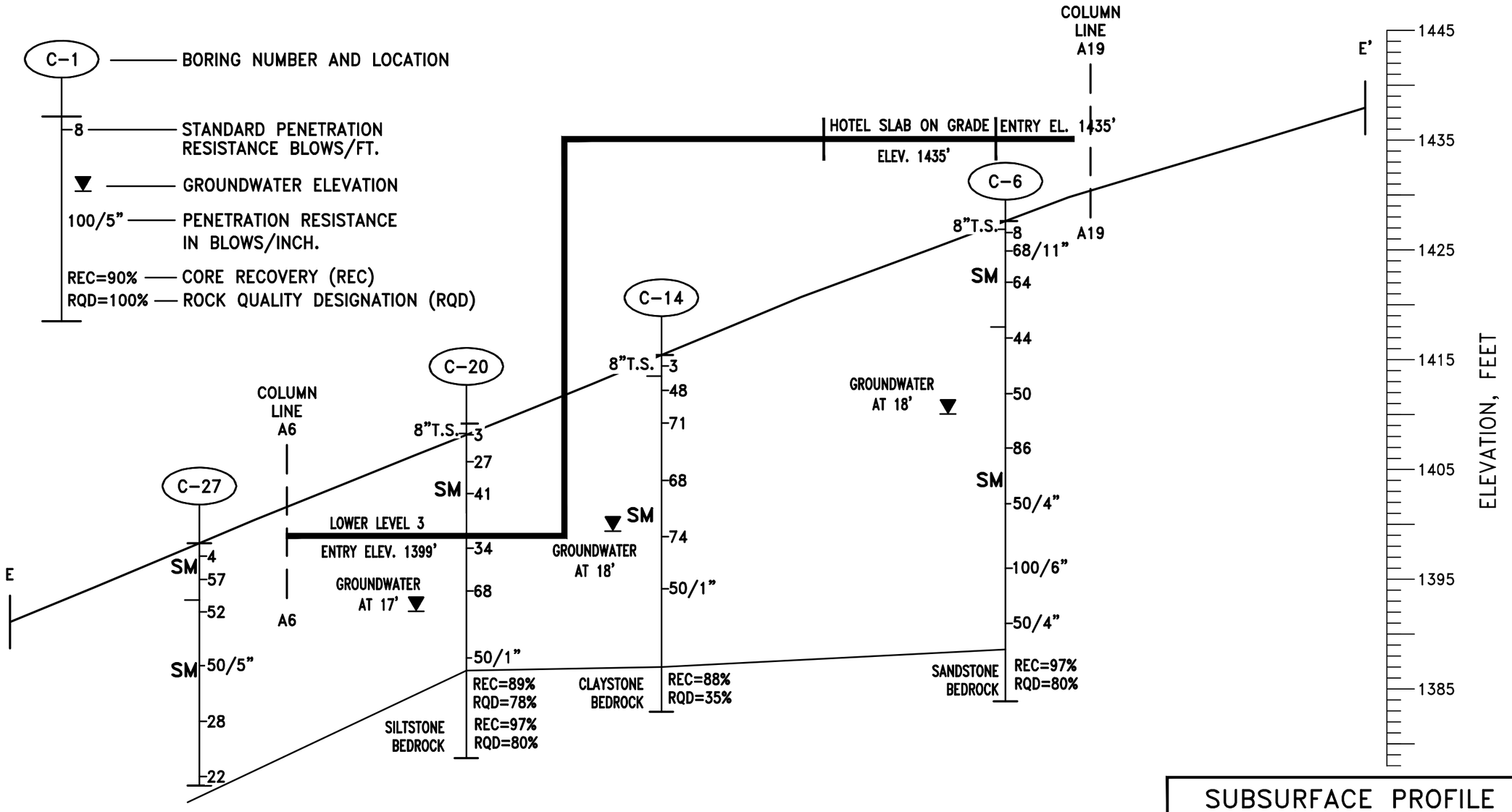
8 — STANDARD PENETRATION RESISTANCE BLOWS/FT.

▼ — GROUNDWATER ELEVATION

100/5" — PENETRATION RESISTANCE IN BLOWS/INCH.

REC=90% — CORE RECOVERY (REC)

RQD=100% — ROCK QUALITY DESIGNATION (RQD)



SECTION E-E'

NOTES:

1. This drawing is part of Melick-Tully and Associates, Inc. Report No. 8979-001*1D and should be read together with the report for complete evaluation.
2. The stratification lines are based upon interpolations between widely spaced test borings and thus represent the approximate boundaries between soil types. Actual transitions may vary from those shown.
3. Stratum designations are generalized. See report for descriptions of each stratum and the test boring logs for detailed descriptions at specific locations.

-VERTICAL-

10' 0' 5' 10'

40' 0' 20' 40'

-HORIZONTAL-

SUBSURFACE PROFILE E-E'

CONCORD RESORT DEVELOPMENT
TOWN OF THOMPSON, NEW YORK
CONCORD RESORT DEVELOPMENT

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

JOB NO.	FILE NO.
8979-001*1D	25299

DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	4-6-12	AS NOTED	10E

APPENDIX

APPENDIX

Limitations

A. Subsurface Information

Locations: The locations of the explorations were approximately determined by tape measurement from existing site features shown on an unlabeled plan provided to us by AKRF Engineers and survey control points provided by others in the area of the proposed casino. Elevations of the explorations were approximately determined by interpolation between contours shown on topographic plans provided to us by the site engineer. The locations and elevations of the explorations should be considered accurate only to the degree implied by the method used.

Interface of Strata: The stratification lines shown on the individual logs of the subsurface explorations represent the approximate boundaries between soil types, and the transitions may be gradual.

Field Logs/Final Logs: A field log was prepared for each exploration by a member of our staff. The field log contains factual information and interpretation of the soil conditions between samples. Our recommendations are based on the final logs as shown in this report and the information contained therein, and not on the field logs. The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and/or tests of the field samples.

Water Levels: Water level readings have been made in the explorations at times and under conditions stated on the individual logs. These data have been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater will occur due to variations in rainfall, temperature, and other factors.

Pollution/Contamination: Unless specifically indicated to the contrary in this report, the scope of our services was limited only to investigation and evaluation of the geotechnical engineering aspects of the site conditions, and did not include any consideration of potential site pollution or contamination resulting from the presence of chemicals, metals, radioactive elements, etc. This report offers no facts or opinions related to potential pollution/contamination of the site.

Environmental Considerations: Unless specifically indicated to the contrary in this report, this report does not address environmental considerations which may affect the site development, e.g., wetlands determinations, flora and fauna, wildlife, etc. The conclusions and recommendations of this report are not intended to supersede any environmental conditions which should be reflected in the site planning.

B. Applicability of Report

This report has been prepared in accordance with generally accepted soils and foundation engineering practices for the exclusive use of AKRF for specific application to the design of the proposed Concord Resort Development. No other warranty, expressed or implied, is made.

This report may be referred to in the project specifications for general information purposes only, but should not be used as the technical specifications for the work, as it was prepared for design purposes exclusively.

C. Reinterpretation of Recommendations

Change in Location or Nature of Facilities: In the event that any changes in the nature, design or location of the facilities are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

Changed Conditions During Construction: The analyses and recommendations submitted in this report are based in part upon the data obtained from 48 widely-spaced test borings and 41 test pit excavations performed for this study. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

Changes in State-of-the-Art: The conclusions and recommendations contained in this report are based upon the applicable standards of our profession at the time this report was prepared.

D. Use of Report by Prospective Bidders

This soil and foundation engineering report was prepared for the project by Melick-Tully and Associates, P.C. for design purposes and may not be sufficient to prepare an accurate bid. Contractors utilizing the information in the report should do so with the express understanding that its scope was developed to address design considerations. Prospective bidders should obtain the owner's permission to perform whatever additional explorations or data gathering they deem necessary to prepare their bid accurately.

E. Construction Observation

We recommend that Melick-Tully and Associates, P.C. be retained to provide on-site soils engineering services during the earthwork construction and foundation phases of the work. This is to observe compliance with the design concepts and to allow changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

REPORT
SUBSURFACE INVESTIGATION

PROPOSED RESORT ENTRY ROAD
TOWN OF THOMPSON, SULLIVAN COUNTY, NEW YORK
EPT CONCORD RESORT

March 5, 2013

Prepared By:
Melick-Tully and Associates, P.C.
117 Canal Road
South Bound Brook, NJ 08880
Tel: 732-356-3400 Fax: 732-356-9054

MTA Project No.: 8979-004*1D

MELICK-TULLY
AND ASSOCIATES, P.C.
GEOTECHNICAL ENGINEERS AND
ENVIRONMENTAL CONSULTANTS

Principals:
RAYMOND J. TULLY, P.E.
EUGENE M. GALLAGHER JR., P.E.
ROBERT E. SCHWANKERT, P.E.
TODD E. HOROWITZ, P.E.
MARK R. DENNO, P.E.

Senior Associates:
RICHARD D. LEV, CPG
JAMES H. BEATTIE, P.E.
CHRISTOPHER P. TANSEY, P.E.

March 5, 2013

AKRF, Inc.
440 Park Avenue South, 7th Floor
New York, New York 10016

Attention: Ms. Jennilee Harrison
Project Engineer

Report
Subsurface Investigation
Proposed Resort Entry Road
Town of Thompson, Sullivan County, New York
EPT Concord Resort

Introduction

This report presents the results of a subsurface investigation performed by Melick-Tully and Associates, P.C. (MTA) for the proposed new Resort Entry Road and stormwater management basins to be constructed to service the proposed EPT Concord Resort development in the Town of Thompson, Sullivan County, New York.

Background Data

MTA previously performed a subsurface investigation for the resort, as well as a subsequent study for wetland mitigation sites. The results of those studies were presented in our reports dated May 1 and September 28, 2012. Borings were performed along the western section of Thompsonville Road as part of our May 1, 2012 report.

Proposed Construction

Based on information AKRF, Inc. provided to us, we understand the improvements would include approximately 8,400 linear feet of new roadway from the area near the intersection

of Joyland Road and Route 17 to the north and east where Resort Entry Road reconnects to Joyland Road. The improvements to Thompsonville Road and Joyland Road will consist of widening the north end of Joyland Road and re-grading and re-paving Thompsonville Road. A stream crossing along Resort Entry Road is planned to consist of either a pre-engineered "Contech" type bridge or bottomless culvert. Cuts and fills of approximately five feet or less would typically be required along the roadways. A sanitary sewer will be installed below portions of Joyland and Thompsonville Roads, reportedly at depths of less than 15 feet below the existing surface grades.

We further understand that bio-retention basins would be constructed along Resort Entry Road in currently heavily wooded portions of the site, and along Joyland Road and Thompsonville Road. The basins would be established at depths varying from three to five feet below the current grades.

This study presents the results of our testing along the new Resort Entry Road alignment in the undeveloped areas west of Joyland Road, the northern portion of Joyland Road south of its intersection with Thompsonville Road, and Thompsonville Road to the west of its intersection with Joyland Road, as shown on the "Site Location Map", Plate 1 and the "Key Plan", Plate 2-0.

Purpose and Scope of Work

The purpose of our services was to:

1) explore the subsurface soil, rock and groundwater conditions within the proposed roadway alignments, at the stream crossing, and at numerous locations which may be developed as stormwater management basins;

2) estimate the relevant geotechnical engineering properties of the encountered materials;

3) initiate field permeability tests at or near locations and depths identified by AKRF;

4) recommend an appropriate type of foundation for support of the proposed stream crossing structure, and provide geotechnical-related foundation design and installation criteria, including an estimate of the Site Class as defined by the Building Code of the State of New York, 2010 Edition for seismic design purposes;

5) recommend an appropriate pavement section based on the encountered subsurface conditions and estimated traffic data provided to us by AKRF; and

6) discuss appropriate earthwork considerations consistent with the proposed construction and encountered subsurface conditions.

To accomplish these purposes, a subsurface exploration program consisting of both test borings and test pit explorations was performed. A total of five borings were advanced along the northern portion of Joyland Road and the eastern portion of Thompsonville Road, west of its intersection with Joyland Road, to supplement the nine borings performed in our previous study. The borings were drilled using truck-mounted, hollow-stem auger drilling equipment and extended to depths of approximately 14 to 16 feet below the existing surface grades. A total of 99 test pit explorations were advanced utilizing both a rubber-tire backhoe and track-mounted excavator and extended to depths ranging from approximately 5-1/2 to 14 feet below the existing surface grades. The approximate locations of the explorations performed for this study are shown on the Plot Plans, Plates 2-1 through 2-11.

All work was performed under the direct technical observation of engineers and geologists from MTA. Our representatives located the explorations in the field utilizing the existing site features and survey points provided by others, maintained continuous logs of the explorations as the work proceeded, supervised the soil sampling procedures during the drilling

operations, and obtained bulk samples of the materials encountered in the test pits. Numerous closely spaced soil samples were obtained from the borings using the general procedures of the Standard Penetration Test. During advancement of the test pits, our representative obtained numerous bulk samples of the encountered materials.

All soil samples obtained from the explorations were brought to our office where they were further examined in our soil mechanics laboratory. Detailed descriptions of the materials encountered in the test pits are shown on the individual Logs of Test Pits, Plates 3-1 through 3-99. The results of the borings are shown on Plates 4-101 through 4-114. The soils were visually classified in general accordance with the Unified Soil Classification System presented on Plate 5.

Numerous soil samples were subjected to laboratory testing consisting of grain-size analyses (ASTM D-422) and moisture content determinations (ASTM D-2216), and two samples were subjected to California Bearing Ratio (CBR) testing (ASTM D-1883-07) to aid in their engineering classification and evaluation. The results of the grain-size tests are presented on Plates 6A through 6D, Gradation Curves. The results of the moisture content determinations are presented on Plates 6A through 6D and on the appropriate exploration logs.

The results of our subsurface exploration program, visual examination of the soil samples, and a review of the laboratory test results have provided the basis for our engineering analysis and findings. The following discussions of our findings are subject to the limitations attached as an Appendix to this report.

Site Conditions

Surface Features: Thompsonville Road and Joyland Road are currently two-lane paved roadways. The roadways will need to be widened and re-graded in order to accommodate the

increased volume of traffic. The majority of the remainder of the Resort Entry Road, from its intersection with Joyland Road to the west and south where it will connect with the new Route 17 intersection, is moderately to heavily wooded with several areas identified as wetlands and a stream crossing.

Topographic information shown on plans provided to us indicates that surface elevations slope moderately downward from east to west along Thompsonville Road from its intersection with Joyland Road from approximately Elevation +1,436 feet to a low of approximately Elevation +1,344 feet to the west where the explorations terminate in the area of B-S-16. The northern portion of Joyland Road slopes gently upward from its intersection with Thompsonville Road to the south from a low of approximately Elevation +1,436 feet to approximately Elevation +1,447 feet, where the new Resort Entry Road turns west. The remainder of the new Resort Entry Road alignment from its intersection with Joyland Road, west and south varies from Elevation +1,431 feet to Elevation +1,364 feet.

Subsurface Conditions: The following generalized strata were encountered in the explorations and are listed in order of increasing depth:

1) Topsoil: A surficial layer of topsoil was encountered in 94 of the 99 test pits and 6 of the 14 borings (current and previous) performed along the Joyland Road and Thompsonville Road alignments. In general, the topsoil was found to be approximately 4 to 8 inches thick in the majority of the explorations, but ranged up to approximately 14 inches in thickness in some of the test pits.

2) Pavement/Fill: A three to six inch thick layer of asphalt pavement was encountered in Borings 101 through 105 and in Boring S-8. The previous borings performed for Thompsonville Road were advanced adjacent to the existing pavement in order to minimize disturbance to the existing roadway surface. Our visual observations indicate that both Thompsonville Road and Joyland Road are likely constructed by "chip

seal" methods and do not consist of a true asphaltic concrete section. Shallow fill materials ranging from approximately one to two feet in thickness were encountered in 10 of the 14 borings and in only 7 of the 99 test pits, generally reflecting the grading required during construction of Joyland and Thompsonville Roads.

3) Silt: Below the surficial topsoil, asphalt and fill materials, silt and clayey silt was observed in two of the borings and twelve of the test pit explorations. The siltier materials were similar in nature to the glacial silty sands encountered throughout the area; however, their silt content was high enough to require classification as silt. In general, the silty soils were found to be stiff in consistency.

4) Silty Sand: Below the surficial topsoil, fill and silt, the natural soils typically consisted of sands and silty sands containing varying amounts of gravel, cobbles and boulders. The sandy soils are believed to be glacial in nature and extended to the completion depths in the majority of the explorations performed. The upper one to two feet of the sandy soils in several of the explorations were found to be somewhat loose in relative density, probably the result of freeze-thaw cycles. The deeper glacial materials were observed to be dense to very dense in relative density.

5) Siltstone/Sandstone Bedrock: In 4 of the 14 borings and 16 of the 99 test pits, siltstone/sandstone bedrock was encountered at depths varying from approximately 3 to 20 feet below grade. In several of the explorations, it could not be determined if refusal was encountered atop sedimentary bedrock or relatively large boulders. In general, the sedimentary rock was found to grade sounder with depth, where encountered.

Groundwater seepage was encountered in 10 of the 14 borings and 65 of the 99 test pits performed for this study upon their completion. The observed groundwater levels varied from approximately 1 to 14-1/2 feet below grade. In addition, mottling which is indicative of seasonal groundwater conditions or seasonally saturated soils, was observed in the majority of the test pit explorations at shallower levels.

Findings and Recommendations

General: Based on the results of our study, it is our opinion that:

1) The soils encountered in Test Pits No. 33 and 40 advanced closest to the stream consisted of medium dense to dense silty sands which in our opinion will provide suitable support for the bridge or culvert on spread footings.

2) Following the site preparation and earthwork procedures, the undisturbed glacial soils will provide adequate support for the roadways.

3) The moisture levels observed in the majority of the materials subjected to laboratory testing indicate that the natural glacial soils appear to be at or somewhat above moisture levels which would allow recompaction to 95 percent of their maximum dry density. Consequently, it should be assumed some moisture conditioning of the materials used as controlled compacted fill would be required.

4) The permeability rates observed in the explorations were variable along the route of the proposed Resort Entry Road. Details of that testing are summarized on the individual logs of test pits, and are summarized on Plate 7.

Further discussions of these items and others considered relevant to the proposed development are presented in subsequent sections of this report.

Site Preparation and Earthwork: The areas of the new Resort Entry Road should be cleared and grubbed of all vegetation. After clearing and grubbing, the topsoil should be stripped for its full depth from within and at least five feet beyond the proposed roadway limits. The topsoil would not be suitable for reuse as controlled compacted fill or backfill in paved areas.

After clearing and stripping, the exposed subgrade materials should be proofrolled and compacted to a dense and unyielding consistency with several passes of a heavy, self-propelled, vibrating drum compactor with a minimum static drum weight of ten tons under the observation of a qualified geotechnical engineer. Any subgrade materials which appear to be soft or unstable should be further excavated to the surface of competent soils and backfilled with controlled compacted fill. Although not encountered in our test pits outside the wetlands, potentially

compressible deposits could be encountered in wetland areas. Consequently, areas of soft compressible organic soils may be encountered that require removal prior to placing fill. In addition, areas of fill could be present along the sides of the existing roadways that require removal or recompaction.

We believe that the majority of the soils exposed after stripping of the topsoil will consist of glacial silty sand materials. For the most part, these materials are anticipated to be relatively dense; however, due to their high silt content and the moist nature of the upper portions of the materials encountered in the explorations and the presence of shallow perched groundwater, we anticipate that the surficial materials will be highly susceptible to softening and disturbance once subjected to construction equipment traffic. Therefore, it should be anticipated that some aeration and drying, or overexcavation and replacement of the surficial soils, may be necessary.

The current pavement section along Joyland and Thompsonville Roads appears to consist of a "chip seal" surface over several feet of fill materials placed during road construction. We do not believe it is feasible to incorporate the existing pavement into the new pavement section. We recommend that the existing asphaltic pavement be broken up and removed, or milled for possible reuse as general fill in areas below proposed paved parking or roadway areas.

The latest plans provided to us indicate that the new Resort Entry Road alignment will generally require cuts and fills on the order five feet or less throughout most of its planned route. The majority of the on-site soils in the cut areas were observed to consist of silty sands with varying amounts of cobbles and boulders. The moisture contents performed on selected samples obtained in the explorations indicated that the materials were at or above moisture contents that will permit compaction to the required degree in their existing condition. Consequently, some

aeration and drying should be anticipated. If the earthwork operations are performed during or following periods of wet or freezing weather, compaction of the on-site soils to the required degree may be difficult.

We recommend to the extent possible, that cobbles and boulders be utilized in areas requiring deeper fills where they would not interfere with future excavation for utility installation. Portions of the cobbles and boulders could be broken into smaller fragments where they may be reused to stabilize wetter areas prior to installation of granular controlled compacted fill. Care should be taken to provide sufficient soil to infill any voids between the cobbles and boulders to minimize the potential for migration of the upper fill soils into voids between the cobbles and boulders.

Any imported fill required to complete the site grading along the proposed roadway should consist of uncontaminated, relatively well graded granular soils containing less than 15 percent by weight of material passing a U.S. Standard No. 200 sieve and a maximum particle size of six inches. The fill supplier should provide documentation of the environmental quality of all imported fill.

All fill materials placed in the roadways should be spread in layers on the order of twelve inches or less in loose thickness and uniformly compacted to at least 95 percent of its maximum dry density as determined by the ASTM D-1557 test procedure. Backfill placed in confined areas such as utility trench excavations should be spread in thin layers and uniformly compacted to similar densities using manually operated compaction equipment.

Bedrock consisting of fractured sedimentary siltstone and sandstone was encountered in 16 of the test pits and 4 of the borings at depths varying from approximately 3 to 20 feet below

the existing surface grades. Based on information AKRF, Inc. provided to us, we understand that the deeper rock levels encountered in the borings are anticipated to be below the utility invert levels along Joyland and Thompsonville Road. The surface of fractured rock in the test pits was as shallow as three feet, but excavations into the rock extended to total depths of up to five and one-half feet below grade. Cut areas extending several feet into the fractured rock should not be a major construction-related concern. Excavations which extend below the refusal levels encountered in the explorations could require jack-hammering and/or blasting.

Groundwater was encountered in the majority of the explorations at depths varying from approximately 1 to 14-1/2 feet below grade, and shallower perched water from runoff and snow melt should be anticipated. The variable nature of the groundwater infiltration levels observed while the explorations were being performed indicates that groundwater could be encountered at various levels due to seepage through more pervious materials and from surface water runoff. Controlling groundwater through drains and diversion trenches upgrade from the roadway alignment should be anticipated during construction.

Bridge Foundation Design Criteria: Test pits were advanced in the area of the proposed stream crossing as close as possible without infringing upon the existing wetlands. At the time of our study, it was not determined whether the proposed new stream crossing would consist of a "Contech" type bridge or an open box culvert installed in the stream.

We believe that foundations established a minimum of four feet below the existing grades on the dense glacial soils could be designed to impose maximum allowable net bearing pressures of up to two tons per square foot. Depending upon the location of the bridge foundations in relation to the existing stream, dewatering of the excavations could be required. We recommend

that a qualified geotechnical engineer familiar with the site conditions observe the excavations at the time of construction and determine that adequate bearing soils are reached.

Wing walls should be designed to resist lateral earth pressures imposed by the adjacent soils, as well as surcharge loads due to adjacent footings and surface improvements, as well as temporary construction traffic, material stockpiles, sloping backfills, etc. Walls which are free to rotate slightly during backfilling may be designed to resist lateral earth pressures assuming an active earth pressure condition. If the walls are restrained, they should be designed assuming an at-rest earth pressure condition. If sandier portions of the on-site soils are used as backfill, a total unit weight of 145 to 150 pounds per cubic foot should be used, based on the Proctors previously obtained from the on-site soils compacted to 95 percent of their maximum dry density, and an approximate moisture content of five percent. A friction angle of 34 degrees may be used. We estimate that a friction factor between mass concrete and the on-site soils would be 0.40. If the footings are underlain by at least eight inches of crushed stone, the friction factor could be increased to 0.55.

Once a bridge design and more detailed plans are developed, we would review the proposed bridge to evaluate if the design assumptions are consistent with our recommendations.

Seismic Design Criteria: Based on the subsurface conditions encountered in the explorations performed for this and our previous studies, we estimate that the site would be a Site Class "C" as defined by the Building Code of the State of New York, 2010 Edition, for seismic design purposes.

Pavement Design Criteria: We recommend that roadway areas be prepared in accordance with our recommendations outlined in previous sections of this report. Immediately prior to

pavement construction, the exposed subgrade soils should be recompacted to a firm and unyielding consistency, and the upper two feet of the subgrade soils compacted to at least 95 percent of their maximum dry density as determined by the ASTM D-1557 test procedure.

Based on the traffic information provided to us for the various sections of the development by AKRF, the results of our CBR testing of bulk samples obtained in the test pit explorations as part of this study, and utilizing the design procedures outlines in the "AASHTO Guide for Design of Pavement Structures, 1993", we believe the that the following pavement sections would be appropriate:

Roadway Section	**AADT**	**CBR %**	**Design EAL**	**Asphalt Surface Course**	**Asphaltic Binder Course**	**Aggregate Subbase**
Entry Roadway between Interchange and Joyland Road	45,000	6	6.6×10^6	2"	5"	12"
Joyland Road between Entry Road and Thompsonville Road	20,000	6	2.9×10^6	2"	4"	12"
Thompsonville East and West of Joyland Road	5,000	6	7.3×10^5	2"	2"	12"

Proposed Stormwater Management: Based on our investigation and the locations provided to us which were adjusted during the course of our study, infiltration rates are provided on the individual exploration logs and are summarized on Plate 7. In general, all infiltration tests were performed in accordance with NYSDEC Appendix "D" in order to satisfy New York State requirements. In some areas, as discussed with AKRF, Inc. at the time of our study, percolation tests were performed as an alternate.

Please feel free to contact us if you have any questions regarding this report.

The following Plates and Appendix are attached and complete this report:

Plate 1 – Site Location Map
Plate 2-0 – Key Plan
Plates 2-1 through 2-11 – Plot Plans
Plates 3-1 through 3-99 – Logs of Test Pits
Plates 4-101 through 4-114 – Logs of Borings
Plate 5 – Unified Soil Classification System
Plates 6A through 6D – Gradation Curves
Plate 7 – Data Summary Sheet
Appendix – Limitations

Respectfully submitted,

MELICK-TULLY and ASSOCIATES, P.C.

James H. Beattie, P.E.
Senior Associate

Todd E. Horowitz, P.E.
Vice President

JHB:TEH/mh
8979-004*1D
(3 copies submitted)

FROM: "Digital Raster Quadrangles" at 1:24,000 scale provided by New York State GIS Clearinghouse website (http://www.nysgis.state.ny.us/gisdata/quads/).

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SITE LOCATION MAP

PROPOSED RESORT ENTRY ROAD
TOWN OF THOMPSON, NEW YORK
EPT CONCORD RESORT

JOB NO.	FILE NO.	DR. BY	CHK. BY	DATE	SCALE	PLATE
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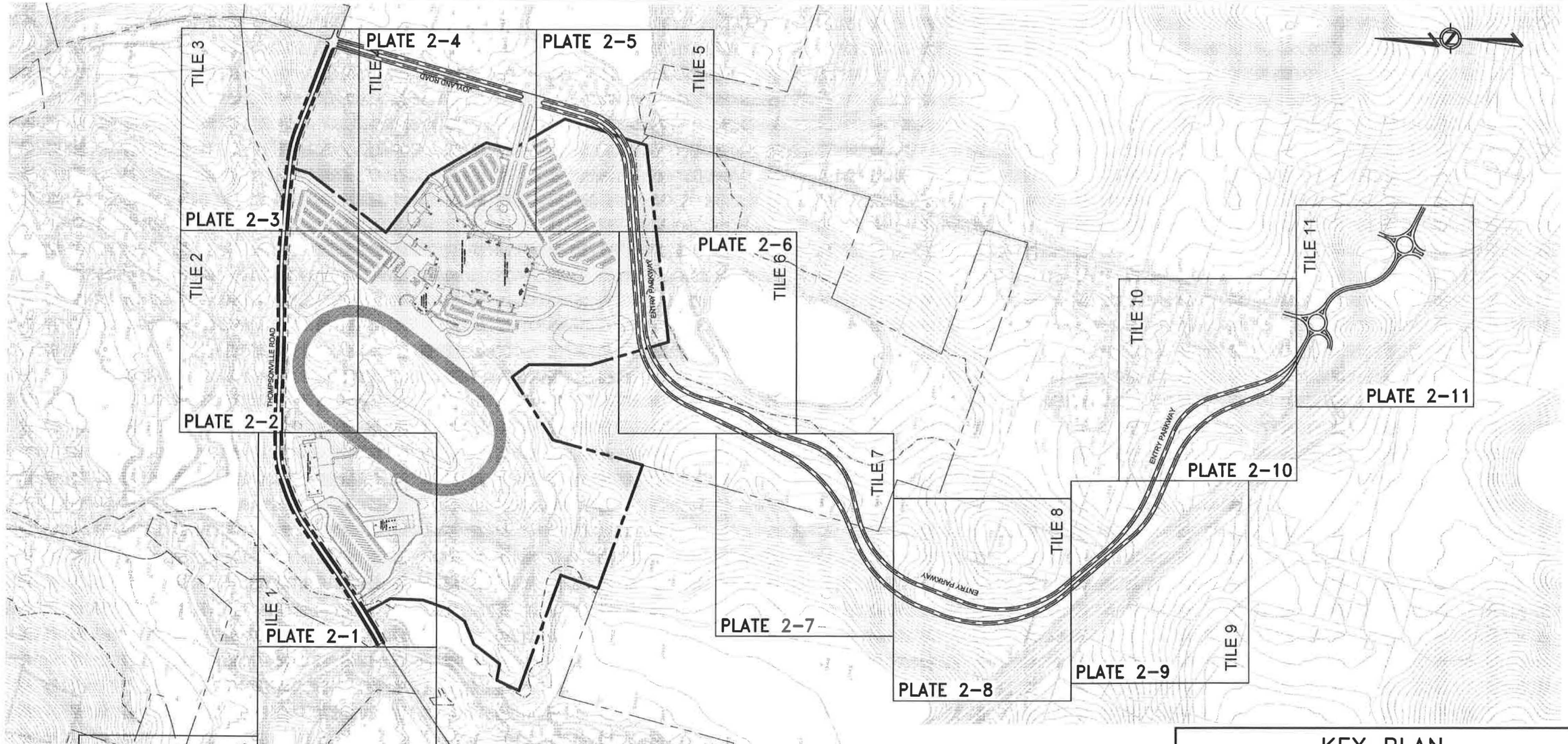

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.
2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Overall Site Plan" dated 6-15-12, scale 1"=350'.

KEY PLAN

PROPOSED ROADWAY
THOMPSON, NEW YORK
CONCORD RESORTS DEVELOPMENT

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JOB NO.	FILE NO.
8979-004*1D	25558

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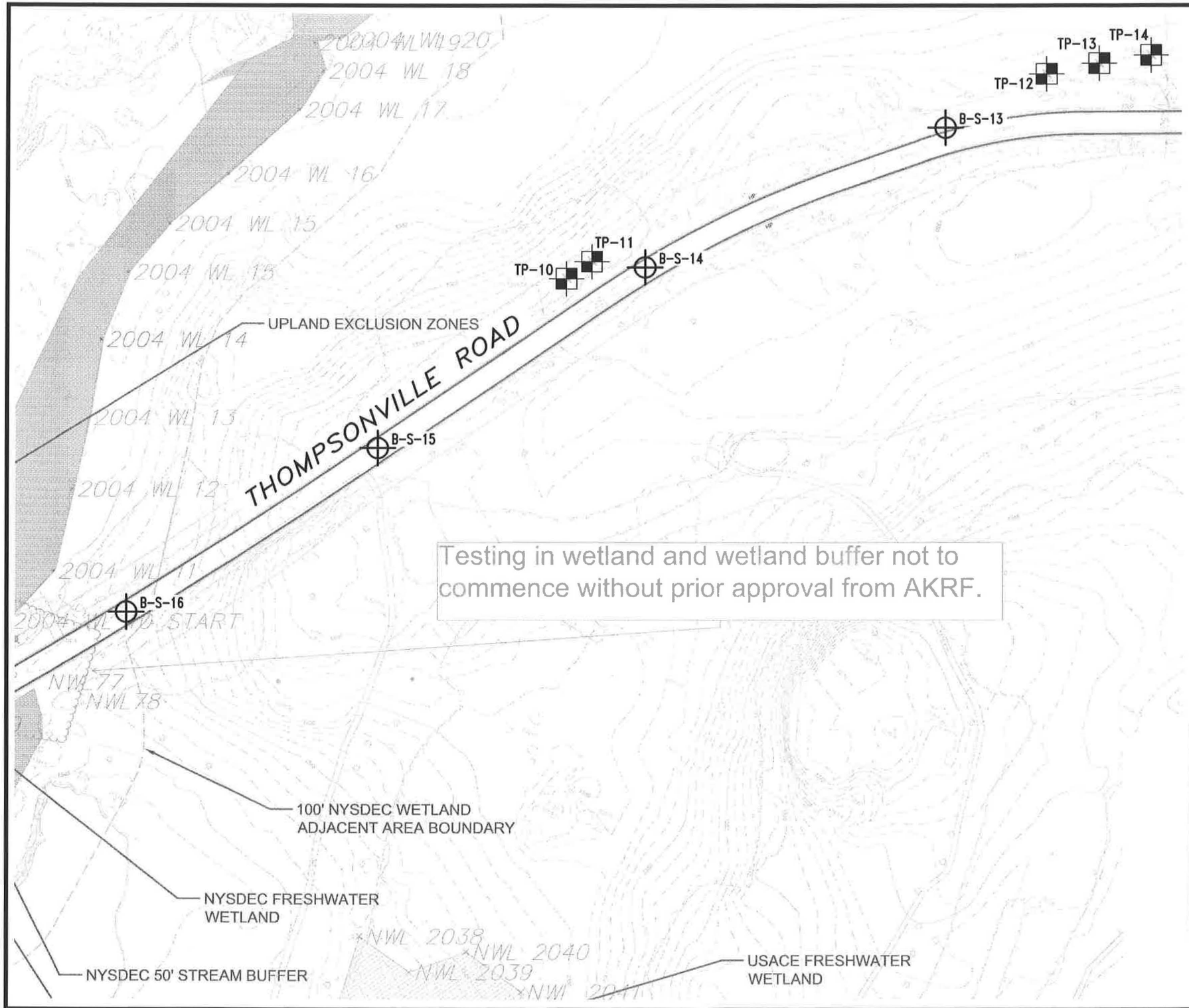

Testing in wetland and wetland buffer not to commence without prior approval from AKRF.

KEY:

TP-1 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

B-S-13 NUMBER AND APPROXIMATE LOCATION OF BORINGS PREVIOUSLY PERFORMED BY MTA

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.
2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 1" dated 10-8-12, scale 1"=40'.

PLOT PLAN

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JOB NO.	FILE NO.			
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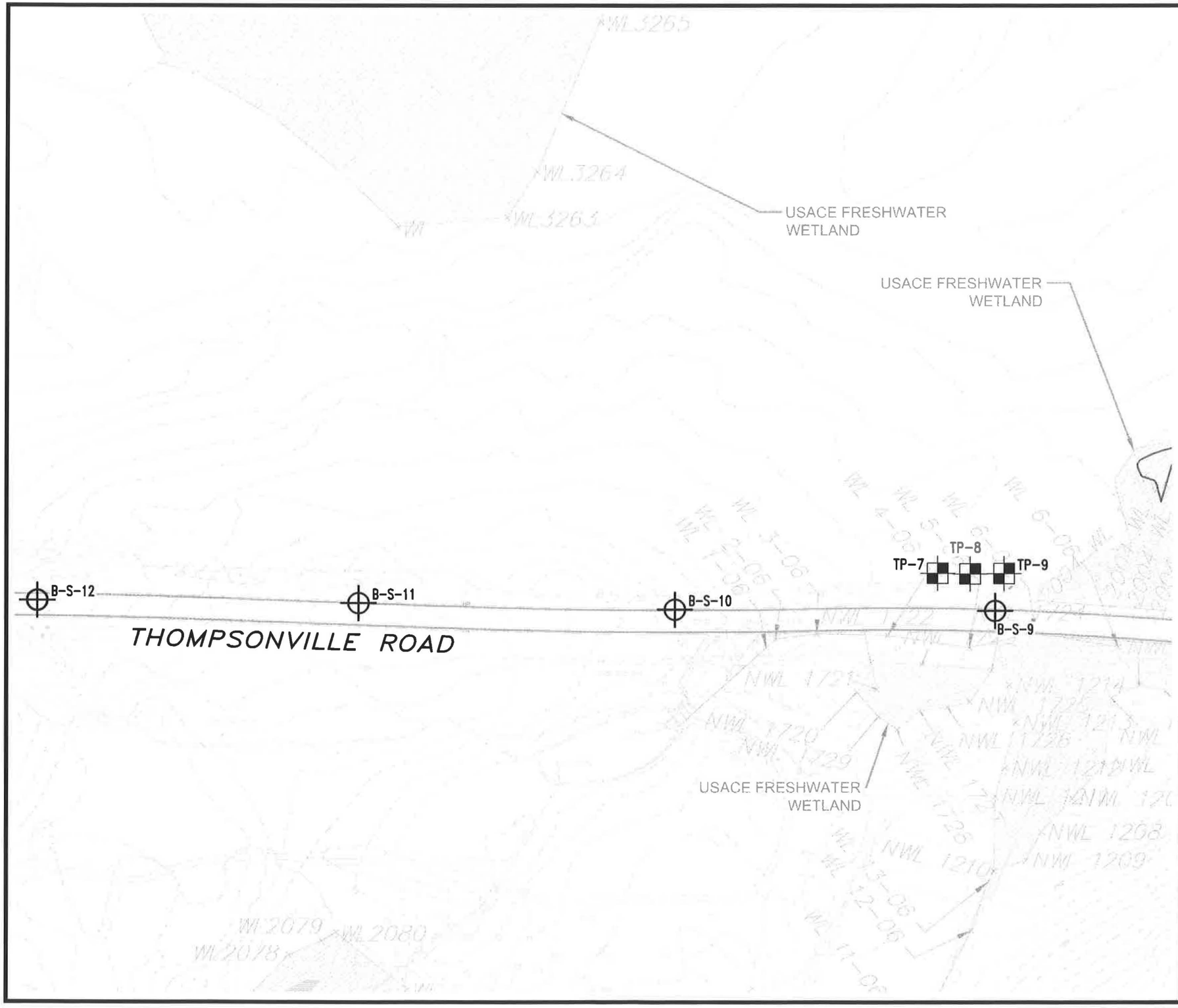

KEY:

TP-1 — NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

B-S-9 — NUMBER AND APPROXIMATE LOCATION OF BORINGS PREVIOUSLY PERFORMED BY MTA

NOTES:

1. This drawing is part of Melick–Tully and Associates, P.C. Report No. 8979–004*1D and should be read together with the report for complete evaluation.
2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan–Map 2" dated 10–8–12, scale 1"=40'.

PLOT PLAN

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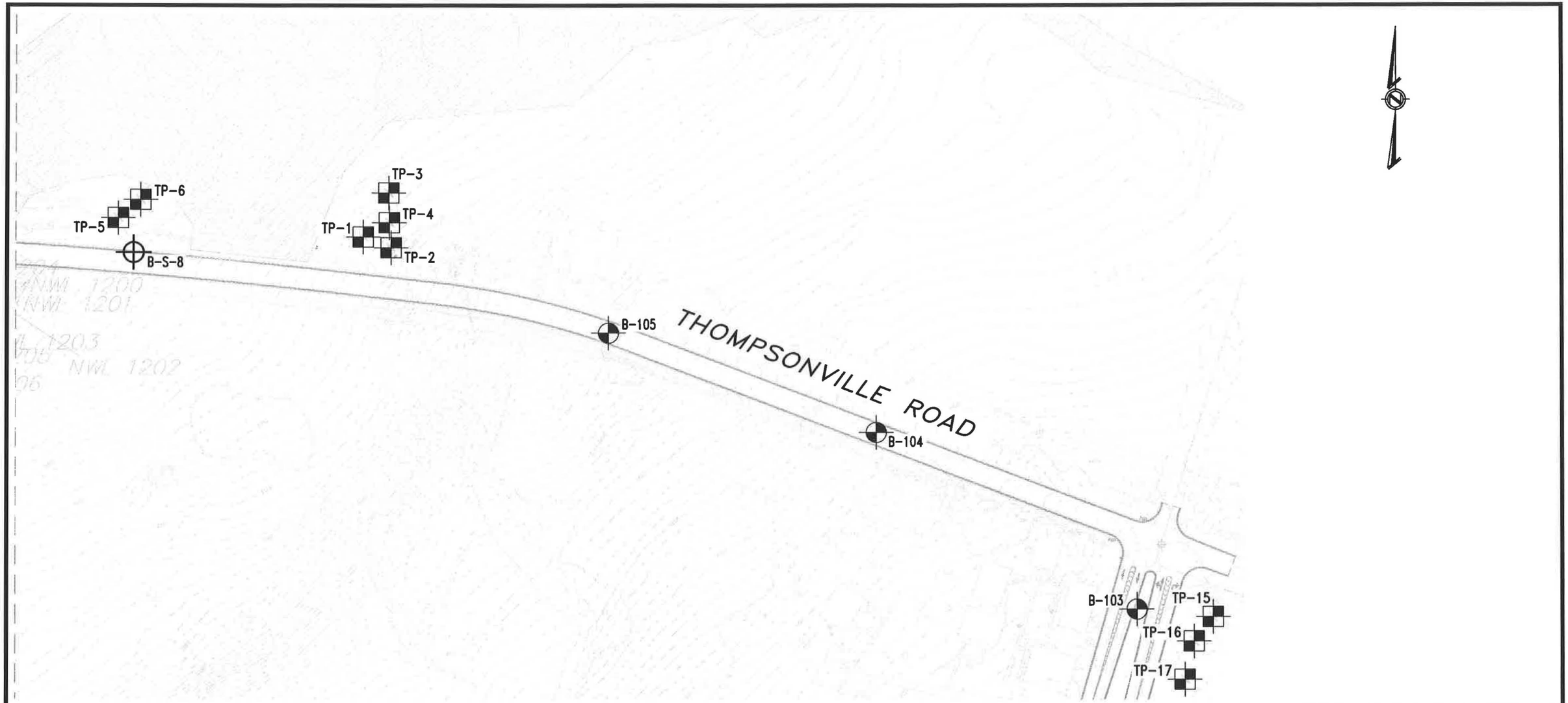

KEY:

TP-1 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

B-103 NUMBER AND APPROXIMATE LOCATION OF BORINGS PERFORMED FOR THIS STUDY

B-S-8 NUMBER AND APPROXIMATE LOCATION OF BORINGS PREVIOUSLY PERFORMED BY MTA

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.
2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 3" dated 10-8-12, scale 1"=40'.

PLOT PLAN

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8979-004*1D	25558			
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KEY:

TP-18 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

B-102 NUMBER AND APPROXIMATE LOCATION OF BORING PERFORMED FOR THIS STUDY

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.

2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 4" dated 10-8-12, scale 1"=40'.

PLOT PLAN

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JOB NO.	FILE NO.			
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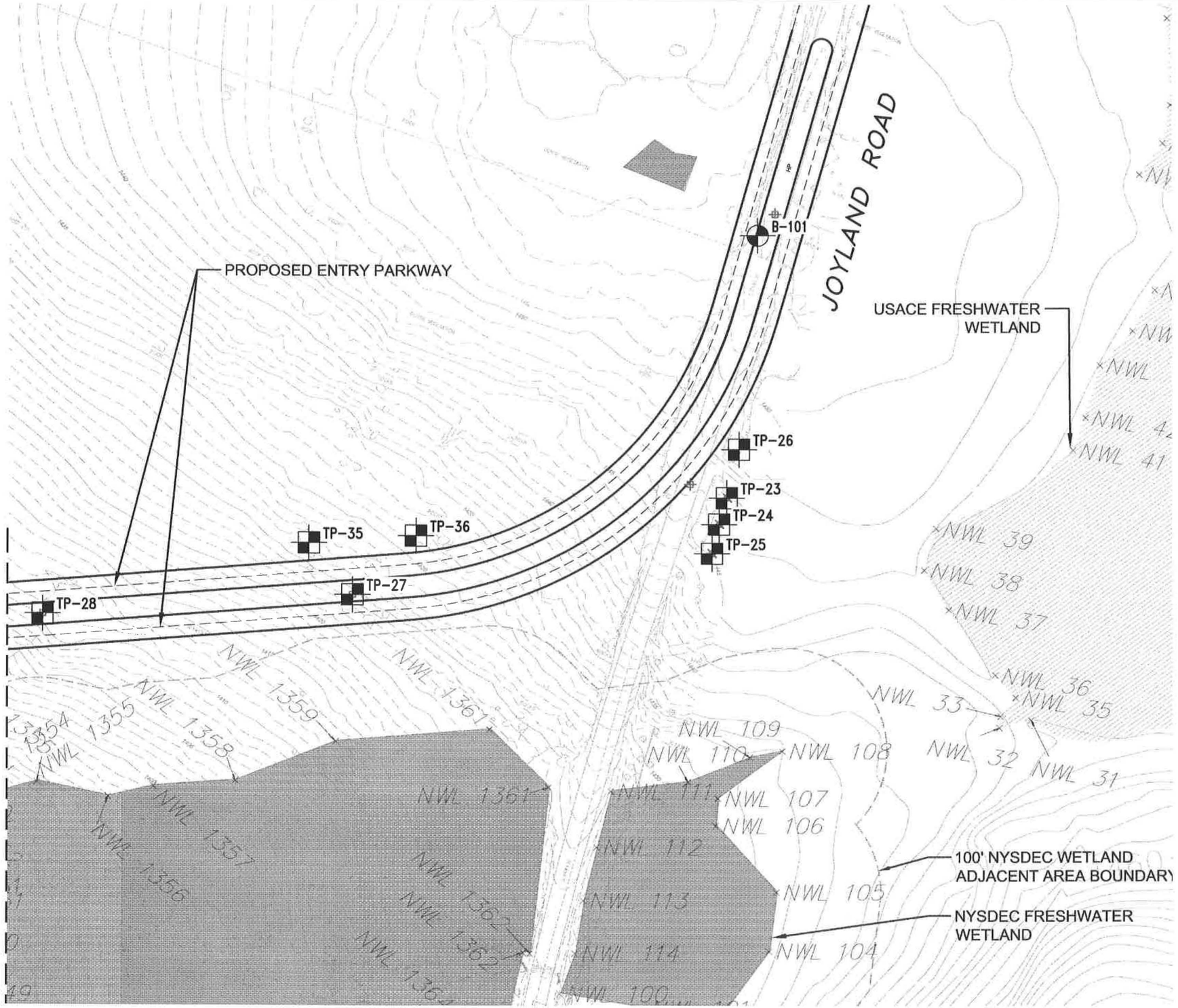

KEY:

TP-23 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.
2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 5" dated 10-8-12, scale 1"=40'.

PLOT PLAN

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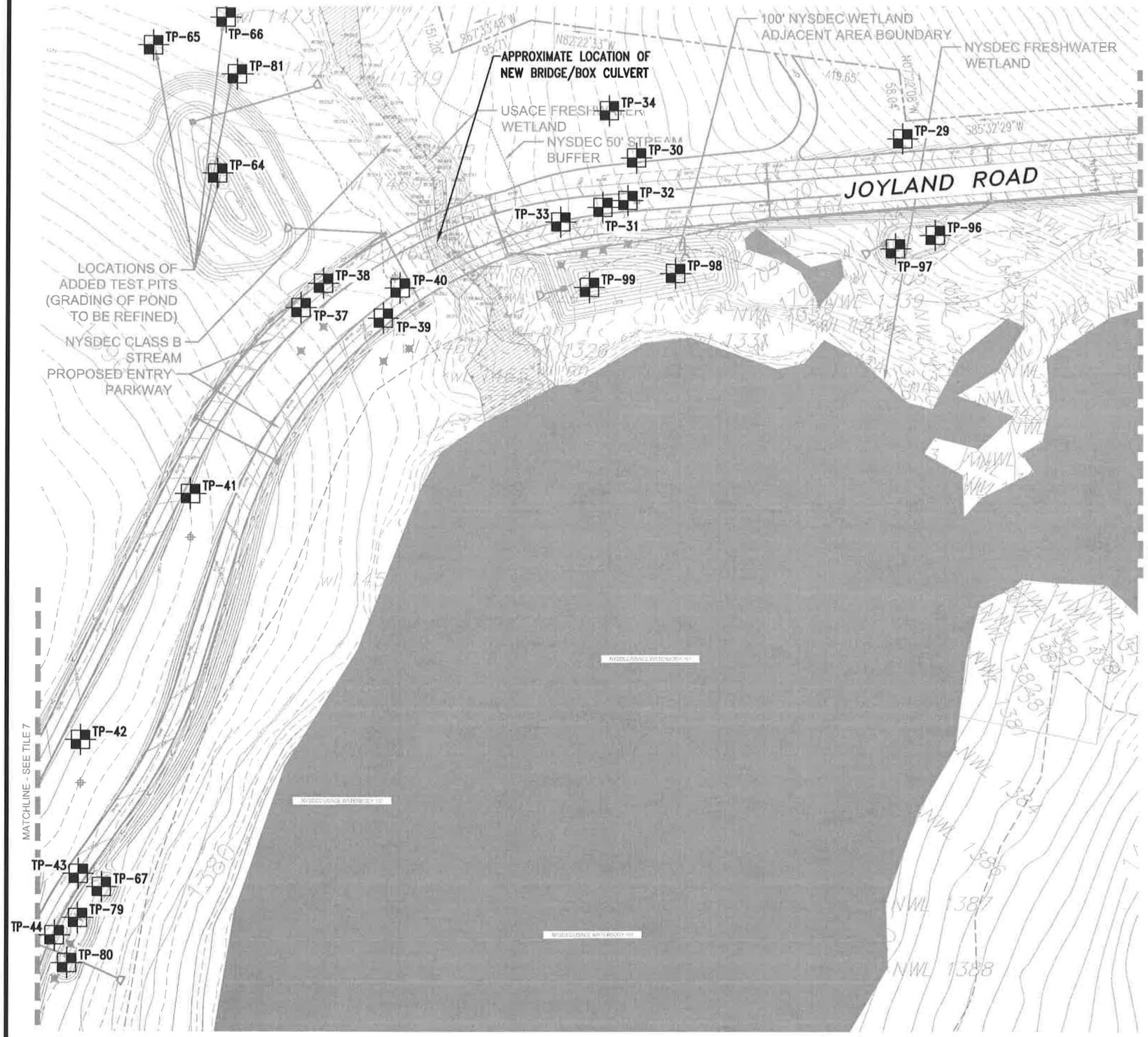

KEY:

TP-29 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.

2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 6" dated 10-8-12 (revised 12-19-12), scale 1"=40'.

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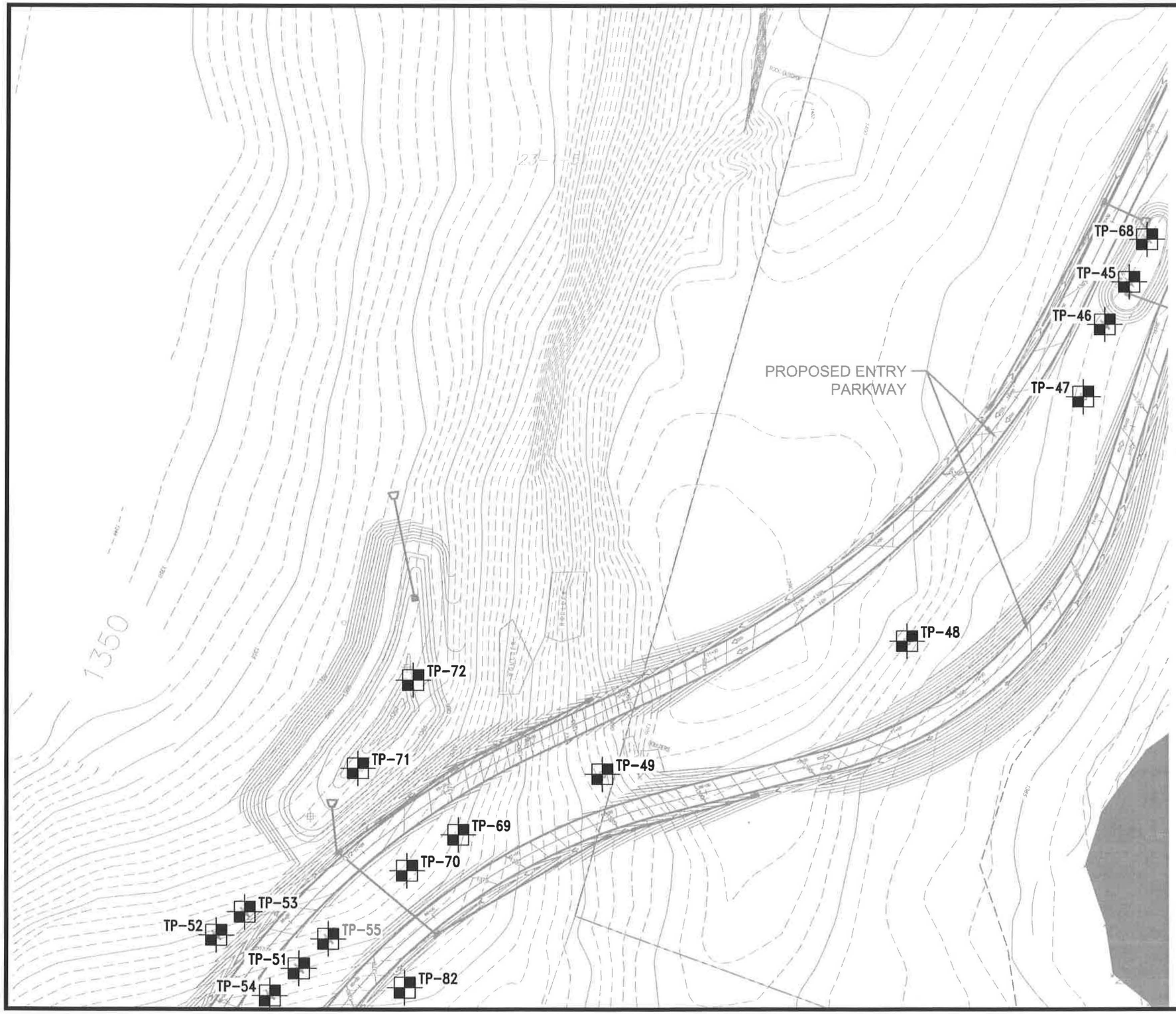

KEY:

TP-45 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.
2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 7" dated 10-8-12 (revised 12-19-12), scale 1"=40'.

PLOT PLAN

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South Bound Brook, New Jersey 08880
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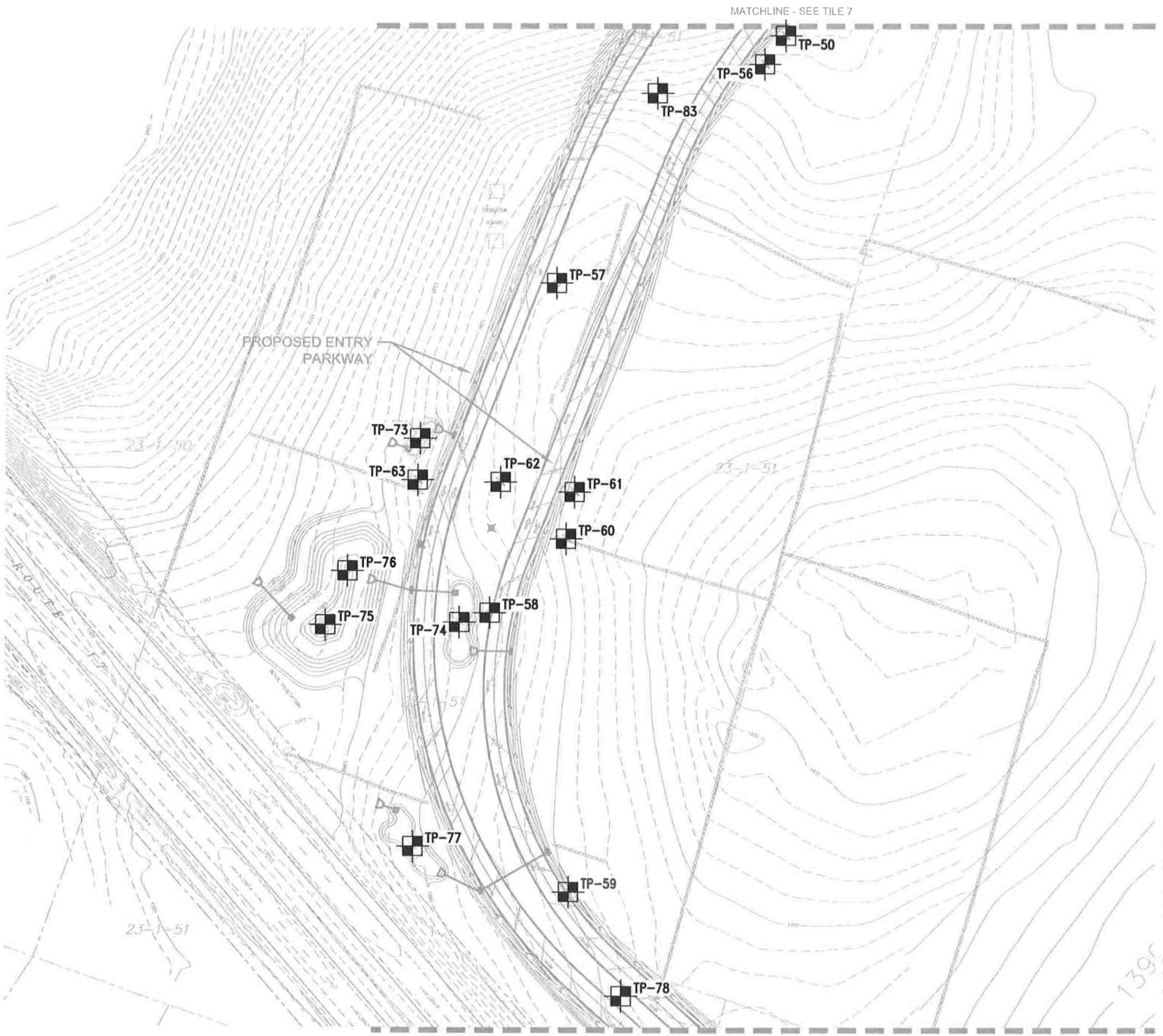
JOB NO.	FILE NO.			
8979-004*1D	25558			
DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	12-18-12	1"=100'	2-7



KEY:

TP-50 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.

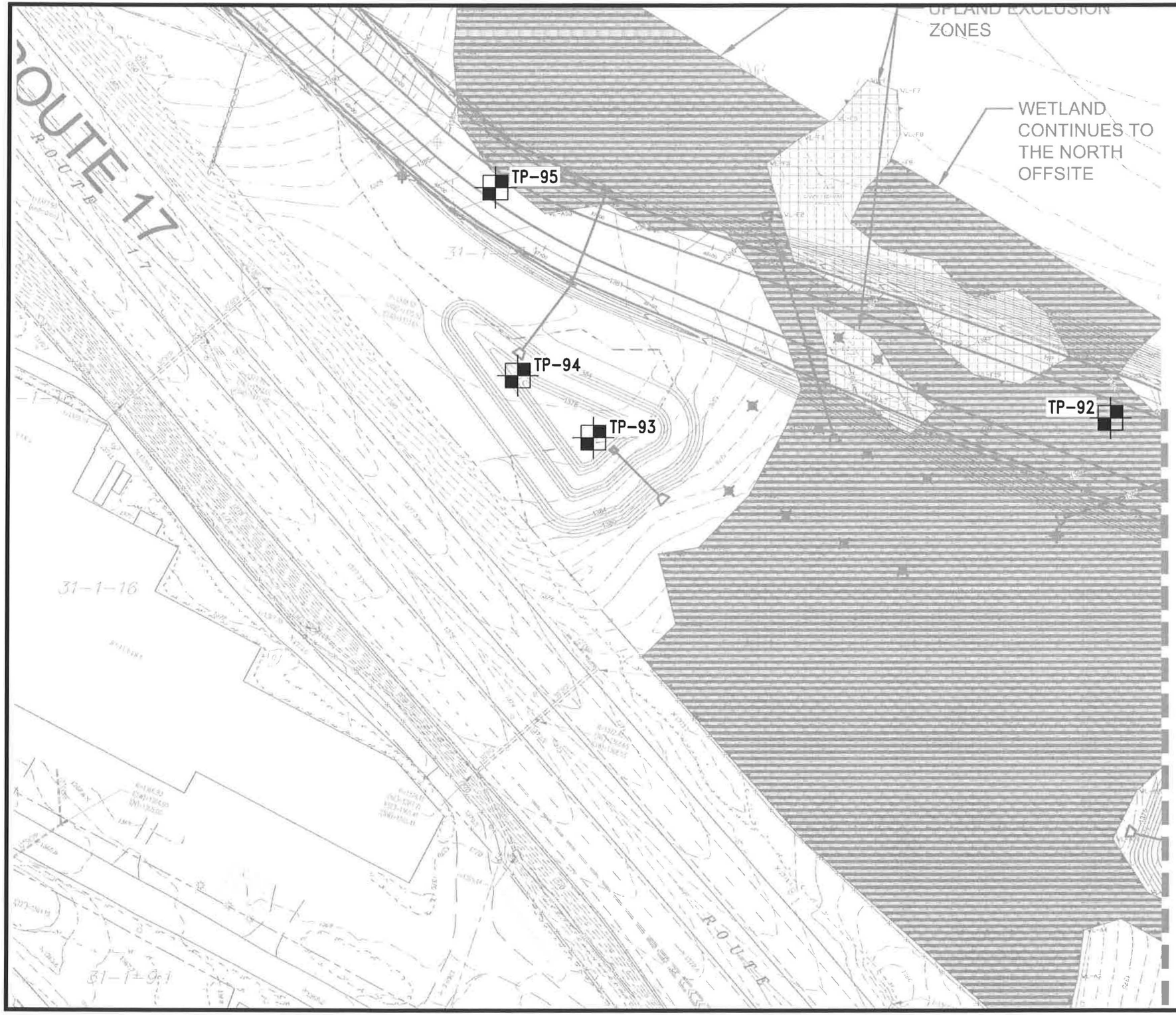
2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 8" dated 10-8-12, scale 1"=40'.

PLOT PLAN

PROPOSED ROADWAY
THOMPSON, NEW YORK
CONCORD RESORTS DEVELOPMENT

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

JOB NO.	FILE NO.			
8979-004*1D	25558			
DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	12-18-12	1"=120'	2-8



KEY:

TP-92 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.
2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 8" dated 10-8-12 (revised 12-19-12), scale 1"=40'.

PLOT PLAN

PROPOSED ROADWAY
THOMPSON, NEW YORK
CONCORD RESORTS DEVELOPMENT

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

JOB NO.	FILE NO.			
8979-004*1D	25558			
DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	2-25-13	1"=100'	2-9

MATCHLINE - SEE TILE 9

100' NYSDEC WETLAND
ADJACENT AREA BOUNDARY

PROPOSED ENTRY
PARKWAY

TP-85
TP-86
TP-87
TP-88
TP-89
TP-90
TP-91

23-1-65.3
23-1-65.2
23-1-65.1
23-1-65.A10
23-1-59
31-1-19.2
31-1-18
31-1-20
23-2-28
23-2

JOYLAND ROAD
LORRAINE

MATCHLINE - SEE TILE 11

KEY:

TP-85 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.

2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 10" dated 10-8-12 (revised 12-19-12), scale 1"=40'.

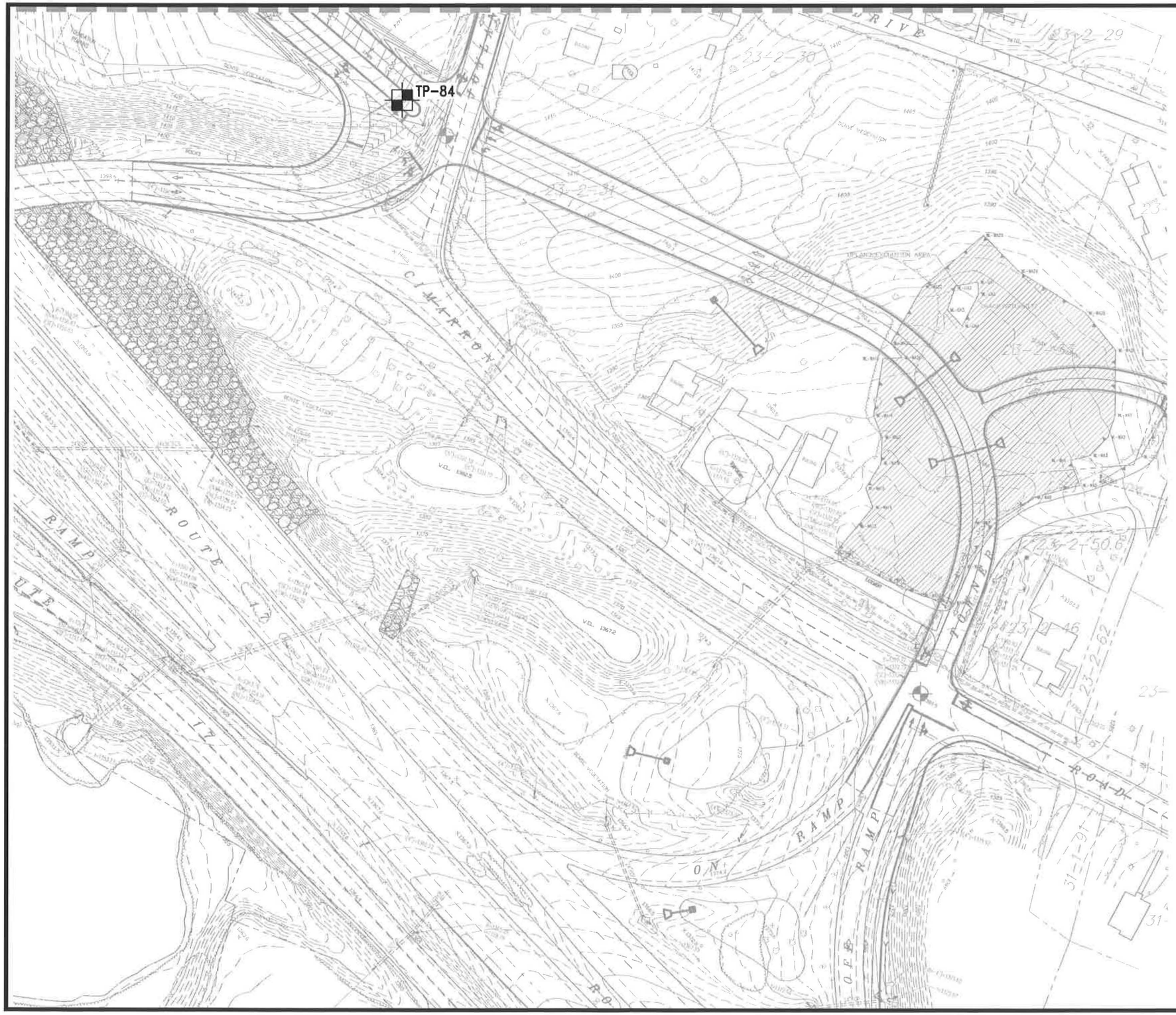
PLOT PLAN

PROPOSED ROADWAY
THOMPSON, NEW YORK
CONCORD RESORTS DEVELOPMENT

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

JOB NO.	FILE NO.
8979-004*1D	25558

DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	2-25-13	1"=100'	2-10



KEY:

TP-84 NUMBER AND APPROXIMATE LOCATION OF TEST PITS PERFORMED FOR THIS STUDY

NOTES:

1. This drawing is part of Melick-Tully and Associates, P.C. Report No. 8979-004*1D and should be read together with the report for complete evaluation.

2. General layout was obtained from a drawing prepared by AKRF Eng., entitled "Geotechnical Soil Investigation Plan-Map 11" dated 10-8-12 (revised 12-19-12), scale 1"=40'.

PLOT PLAN

PROPOSED ROADWAY
THOMPSON, NEW YORK
CONCORD RESORTS DEVELOPMENT

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers
& Environmental Consultants
117 Canal Road
South Bound Brook, New Jersey 08880
(732) 356-3400

JOB NO.	FILE NO.			
8979-004*1D	25558			
DR. BY	CHK. BY	DATE	SCALE	PLATE
VJD	JHB	2-25-13	1"=100'	2-11

LOG OF TEST PIT

TEST PIT NO: 1

COMPLETION DATE: 10/10/12 | SURFACE ELEVATION: +1,366 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 10/10/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1	21.4	ML	Red-brown silt, some fine to coarse sand, trace fine gravel (moist)(stiff)	
	S2				
5					5
	S3		SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(dense)	
10					10
				Test pit completed @ 10' Mottling observed @ 2'-6" *Groundwater not encountered Infiltration test performed @ 2' Measured Infiltration Rate = 2-1/4 in/h	
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-1

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 2

COMPLETION DATE: 10/10/12 SURFACE ELEVATION: +1,368 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/10/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to coarse sand, and silt, little fine gravel (moist)(medium dense to dense)	
5	S2	18.9			5
	S3		SM	Red-brown fine to coarse sand, little silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
10				Test pit completed @ 9' Mottling observed @ 4'-6" *Groundwater not encountered Infiltration test performed @ 4' Measured Infiltration Rate = 14 in/hr	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-2

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 3

COMPLETION DATE: 10/10/12 SURFACE ELEVATION: +1,364 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/10/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1	25.3	SM	Red-brown fine to coarse sand, and silt, little fine gravel (moist)(medium dense)	
5	S2		SM	Brown fine to coarse sand, some silt, little to some fine to coarse gravel, occasional cobbles (moist)(dense to very dense)	5
10				Test pit completed @ 8' Mottling observed @ 3' *Groundwater not encountered Infiltration test performed @ 1' Measured Infiltration Rate = 2-1/4 in/h	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-3

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 4

COMPLETION DATE: 10/10/12 SURFACE ELEVATION: +1,366 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/10/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1	19.2	SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	5
10				Test pit completed @ 10' Mottling observed @ 1' *Groundwater not encountered Infiltration test initiated @ 2'-6" Presoak did not drain	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-4

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 5

COMPLETION DATE: 10/10/12 SURFACE ELEVATION: +1,350 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/10/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1	19.1	ML	Gray silt, and fine to medium sand (moist)(stiff)	
	S2		SM	Red-brown fine to coarse sand, and clayey silt, some fine to coarse gravel (moist)(medium dense to dense)	
5					5
	S3			- backhoe refusal encountered @ 8' atop boulder	
10				Test pit completed @ 8' Mottling observed @ 1' *Moderate to heavy groundwater seepage from 6'-6" to 8' Infiltration test initiated @ 2' Presoak did not drain	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-5

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 6

COMPLETION DATE: 10/10/12 SURFACE ELEVATION: +1,350 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/10/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Red-brown fine to coarse sand, and silt, little fine to coarse gravel (moist)(dense)	
5	S2		SM	Red-brown fine to medium sand, and clayey silt, occasional cobbles (moist to wet)(dense) - backhoe refusal encountered @ 9' atop boulder	5
10				Test pit completed @ 9' Mottling observed @ 1' *Groundwater seepage encountered from 1' to 4' Infiltration test initiated @ 2' Presoak did not drain	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-6

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 7

COMPLETION DATE: 10/11/12 SURFACE ELEVATION: +1,350 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/11/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				2" Topsoil	
	S1			FILL - Brown fine to coarse sand, intermixed with roots and topsoil	
				Red-brown fine to coarse sand, some silt, and fine to coarse gravel, occasional cobbles (moist)(medium dense to dense)	
	S2	7.7			
5			SM		5
10				Test pit completed @ 9'	10
				*Rapid groundwater seepage @ 2'	
				Infiltration test not attempted due to shallow groundwater seepage	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-7

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 8

COMPLETION DATE: 10/11/12 SURFACE ELEVATION: +1,349 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/11/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				2" Topsoil	
	S1			FILL - Gray-brown fine to medium sand, trace silt	
				FILL - Brown silty sand, with roots (original topsoil)	
				Red-brown fine to coarse sand, some to and silt, little fine gravel, occasional cobbles (moist)(dense to very dense)	
5	S2	9.2	SM		5
10				Test pit completed @ 9'-6" *Rapid groundwater seepage encountered @ 2' Infiltration test not attempted due to shallow groundwater seepage	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-8

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 9

COMPLETION DATE: 10/11/12 SURFACE ELEVATION: +1,348 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/11/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				2" Topsoil	
	S1			FILL - Light brown fine to medium sand, trace silt	
				FILL - Brown silty sand, with roots (original topsoil)	
				Red-brown fine to coarse sand, and silt, little fine gravel, occasional cobbles (moist)(very dense)	
5			SM		5
	S2	8.7			
10				Test pit completed @ 9' *Rapid groundwater seepage encountered @ 2' atop original topsoil layer Infiltration test not attempted due to shallow groundwater seepage	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-9

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 10

COMPLETION DATE: 10/11/12 SURFACE ELEVATION: +1,350 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/11/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				14" Topsoil	
	S1	5.3	SM	Gray fine to coarse sand, some silt, some fine to coarse gravel (moist)(very dense)	
5				Fractured sandstone bedrock	5
				- backhoe refusal encountered @ 8'-6" atop sandstone bedrock	
10				Test pit completed @ 8'-6" Mottling observed @ 4' *Groundwater not encountered Infiltration test performed @ 3'-6" Measured Infiltration Rate = 2-1/2 in/h	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-10

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 11

COMPLETION DATE: 10/14/12 SURFACE ELEVATION: +1,350 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/15/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(dense to very dense)	
	S2				
5					5
10				Test pit completed @ 8'-6" Mottling observed @ 4' *Groundwater not encountered Infiltration test performed @ 3'-3" Measured Infiltration Rate = 14 in/hr	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-11

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 12

COMPLETION DATE: 10/11/12 SURFACE ELEVATION: +1,348.5 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/11/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				2" Topsoil	
	S1		SM	Red-brown fine to medium sand, little silt, trace fine gravel (moist)(medium dense)	
				Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobles (moist)(dense to very dense)	
	S2				
5			SM		5
	S3				
10				Test pit completed @ 9'	10
				Mottling observed @ 2'-6"	
				*Slight perched groundwater seepage encountered @ 3'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-12

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 13

COMPLETION DATE: 10/11/12 SURFACE ELEVATION: +1,348.5 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/11/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				2" Topsoil	
	S1		SM	Brown fine to medium sand, little silt, trace fine gravel (moist)(medium dense)	
			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(dense)	
5					5
	S2			- backhoe refusal encountered @ 7' atop sandstone bedrock	
				Test pit completed @ 7'	
10				Mottling observed @ 3'-6"	10
				*Slight groundwater seepage encountered @ 6'-6"	
				Infiltration test performed @ 3'	
				Measured Infiltration Rate = 4-1/4 in/h	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-13

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 14

COMPLETION DATE: 10/11/12 SURFACE ELEVATION: +1,348 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/11/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				2" Topsoil	
	S1		SM	Red-brown fine to medium sand, little silt, trace fine gravel (moist)(medium dense)	
			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(dense)	
5				- backhoe refusal encountered @ 6'-6" atop sandstone bedrock	5
				Test pit completed @ 6'-6"	
10				Mottling observed @ 3'	10
				*Groundwater not encountered	
				Infiltration test performed @ 2'	
				Measured Infiltration Rate = 12 in/hr	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-14

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 15

COMPLETION DATE: 10/12/12 | SURFACE ELEVATION: +1,441 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 10/12/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		ML	Red-brown silt, some fine to coarse sand, trace fine gravel (moist)(stiff)	
			SM	Red-brown fine to coarse sand, little silt, some fine to coarse gravel (moist)(medium dense)	
				Fractured sandstone bedrock	
5					5
	S2			- backhoe refusal encountered @ 9' atop sandstone bedrock	
10				Test pit completed @ 9' *Groundwater not encountered Infiltration test performed @ 2'-6" Observed Infiltration Rate = 17.5 in/hr **Percolation test performed @ 5'-6" Percolation Rate = 28 min/inch **Percolation test run as approved by AKRF because infiltration sleeve could not be seated in fractured rock	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-15

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 16

COMPLETION DATE: 10/12/12 SURFACE ELEVATION: +1,441.5 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/12/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, trace fine to coarse gravel (moist)(medium dense)	
				Red-brown fine to coarse sand, little silt, some to and fine to coarse gravel (moist)(very dense)	
	S2		SM		
5					5
				- backhoe refusal encountered @ 9' atop sandstone bedrock	
10				Test pit completed @ 9'	10
				*Groundwater not encountered	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-16

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 17

COMPLETION DATE: 10/12/12 SURFACE ELEVATION: +1,443 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/12/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				3" Topsoil	
	S1	7.7	SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(dense to very dense)	
5	S2				5
10				Test pit completed @ 9' Mottling observed @ 4' *Groundwater not encountered Infiltration test performed @ 2' Measured infiltration rate = 10-1/2 in/hr Infiltration test initiated @ 5'-6" Presoak did not drain	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-17

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 18

COMPLETION DATE: 10/12/12 | SURFACE ELEVATION: +1,445 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-004*1D | READING DATE: 10/12/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		ML	Red-brown clayey silt, and fine to coarse sand, little fine gravel (moist)(stiff)	
				Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(very dense)	
	S2				
5			SM		5
				- grading with cobbles @ 7'-6"	
10				Test pit completed @ 9'	10
				Slight groundwater seepage encountered @ 2'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-18

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 19

COMPLETION DATE: 10/12/12 | SURFACE ELEVATION: +1,444 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-004*1D | READING DATE: 10/12/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		ML	Red-brown clayey silt, little fine to coarse sand, trace fine to coarse gravel (moist)(stiff)	
	S2		SM	Red-brown fine to coarse sand, some fine to coarse gravel (moist)(very dense)	
5					5
	S3				
10				Test pit completed @ 10' Moderate groundwater seepage encountered @ 2'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-19

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 20

COMPLETION DATE:
JOB NUMBER: 8979-004*1D

SURFACE ELEVATION: +1,443.5 ft (±)

WATER LEVEL:
READING DATE:

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
5				Test pit eliminated by AKRF due to standing water	5
10					10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-20

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 21

COMPLETION DATE: 10/14/12 SURFACE ELEVATION: +1,444 ft (±) WATER LEVEL: 2'

JOB NUMBER: 8979-004*1D READING DATE: 10/14/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				3" Topsoil	
	S1		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(dense)	
5	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles (wet)(very dense)	5
	S3				
10				Test pit completed @ 9' Mottling observed @ 1'-6" Moderate groundwater seepage encountered @ 2'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-21

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 22

COMPLETION DATE: 10/14/12 SURFACE ELEVATION: +1,445 ft (±) WATER LEVEL: 2.5'

JOB NUMBER: 8979-004*1D READING DATE: 10/14/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				3" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles (wet)(dense)	
5					5
	S3		SM	Red-brown fine to medium sand, some clayey silt, some fine to coarse gravel (wet)(medium dense)	
10				Test pit completed @ 9' Slight groundwaer seepage encountered @ 2'-6" Rapid groundwater seepage encountered @ 8'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-22

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 23

COMPLETION DATE: 10/14/12 | SURFACE ELEVATION: +1,447 ft (±) | WATER LEVEL: 2.5'

JOB NUMBER: 8979-004*1D | READING DATE: 10/14/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				FILL - Red-brown fine to medium sand, and silt	
	S1		SM	Red-brown fine to medium sand, some silt, little fine to coarse gravel (moist)(medium dense)	
5			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(dense)	5
10				Test pit completed @ 9' Moderate groundwaer seepage encountered @ 2'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-23

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 24

COMPLETION DATE: 10/14/12 | SURFACE ELEVATION: +1,446 ft (±) | WATER LEVEL: 2.5'

JOB NUMBER: 8979-004*1D | READING DATE: 10/14/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				3" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, some fine to coarse gravel (moist)(medium dense)	
5			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(dense)	5
10				Test pit completed @ 9' Mottling observed @ 2' Moderate groundwater seepage encountered @ 4'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-24

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 25

COMPLETION DATE: 10/14/12 SURFACE ELEVATION: +1,445 ft (±) WATER LEVEL: 3'

JOB NUMBER: 8979-004*1D READING DATE: 10/14/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				9" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(medium dense)	
5	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	5
10				Test pit completed @ 9' Mottling observed @ 1'-6" Slight groundwater seepage encountered @ 3'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-25

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 26

COMPLETION DATE: 10/15/12 | SURFACE ELEVATION: +1,447 ft (±) | WATER LEVEL: 5'

JOB NUMBER: 8979-004*1D | READING DATE: 10/15/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
	S1			10" Topsoil	
	S2		SM	Red-brown fine to coarse sand, some to and silt, little fine to coarse gravel, occasional cobbles and boulders (moist)(medium dense)	
	S3				
5					5
			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, numerous cobbles (moist)(very dense)	
	S4				
10				Test pit completed @ 9' Mottling observed @ 1'-6" Slight groundwater seepage encountered @ 5'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-26

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 27

COMPLETION DATE: 10/16/12 | SURFACE ELEVATION: +1,425 ft (±) | WATER LEVEL: 5'-6"

JOB NUMBER: 8979-004*1D | READING DATE: 10/16/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense to dense)	
5	S3				5
			SM	Red-brown fine to coarse sand, some silt, and fine to coarse gravel, frequent cobbles and boulders (moist to wet)(very dense)	
10				Test pit completed @ 10' Mottling observed @ 3' Slight groundwater seepage encountered @ 5'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-27

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 28

COMPLETION DATE: 10/16/12 SURFACE ELEVATION: +1,410 ft (±) WATER LEVEL: 1'-6"

JOB NUMBER: 8979-004*1D READING DATE: 10/16/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt, some fine to coarse gravel (moist to wet)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, frequent cobbles (moist)(dense)	
5					5
10				Test pit completed @ 10' Slight groundwater seepage encountered @ 1'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 29

COMPLETION DATE: 10/16/12 | SURFACE ELEVATION: +1,392.5 ft (±) | WATER LEVEL: 2'-0"

JOB NUMBER: 8979-004*1D | READING DATE: 10/16/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
	S1			3" Topsoil	
	S2		SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense)	
5	S3				5
	S4		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist to wet)(dense)	
	S5		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (wet)(dense)	
10				Test pit completed @ 10' Slight groundwater seepage encountered @ 2'-0"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-29

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 30

COMPLETION DATE: 10/16/12 SURFACE ELEVATION: +1,382 ft (±) WATER LEVEL: 2'-0"

JOB NUMBER: 8979-004*1D READING DATE: 10/16/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, some to and silt, trace fine to coarse gravel, occasional cobbles and boulders (moist)(medium dense)	
5					5
			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (wet)(dense)	
10				Test pit completed @ 10' Mottling observed @ 1'-6" Slight groundwater seepage encountered @ 2'-6'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-30

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 31

COMPLETION DATE: 10/17/12 | SURFACE ELEVATION: +1,380.5 ft (±) | WATER LEVEL: 7'-0"

JOB NUMBER: 8979-004*1D | READING DATE: 10/17/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
	S1			FILL - Intermixed silty sand, and topsoil	
	S2				
				Red-brown fine to medium sand, little to some silt, little fine gravel (moist)(medium dense)	
	S3				
	S4				
5			SM		5
				- grading with occasional cobbles @ 6'-6"	
	S5				
10					10
				Test pit completed @ 10'	
				Mottling observed @ 1'-6"	
				Rapid groundwater seepage encountered @ 7'-0'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-31

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 32

COMPLETION DATE: 10/17/12 SURFACE ELEVATION: +1,381 ft (±) WATER LEVEL: 5'-6"

JOB NUMBER: 8979-004*1D READING DATE: 10/17/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1			Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(medium dense to dense)	
5			SM		5
	S2				
10				Test pit completed @ 10' Mottling observed @ 1'-8" Moderate groundwater seepage encountered @ 5'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-32

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 33

COMPLETION DATE: 10/17/12 SURFACE ELEVATION: +1,380 ft (±) WATER LEVEL: 5'-6"

JOB NUMBER: 8979-004*1D READING DATE: 10/17/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1			Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (wet)(dense)	
	S2				
5			SM		5
10				Test pit completed @ 10' Mottling observed @ 1'-6" Slight groundwater seepage encountered @ 5'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-33

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 34

COMPLETION DATE: 10/17/12 SURFACE ELEVATION: +1,382 ft (±) WATER LEVEL: 3'-6"

JOB NUMBER: 8979-004*1D READING DATE: 10/17/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		ML	Red-brown clayey silt, some fine to medium sand (moist)(stiff)	
				Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(medium dense to dense)	
	S2				
5	S3		SM		5
10				Test pit completed @ 10' Slight groundwater seepage encountered @ 3'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-34

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 35

COMPLETION DATE: 10/17/12 SURFACE ELEVATION: +1,426 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/17/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				3" Topsoil	
	S1		SM	Red-brown fine to medium sand, some to and silt, little fine to coarse gravel (moist)(medium dense)	
	S2	11.0	SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles and boulders (moist)(medium dense)	
5					5
10				Test pit completed @ 10' Mottling encountered @ 3'-6" *Groundwater not encountered Two infiltration tests performed @ 2'-6" Measured infiltration rates = 8 in/hr and 14 in/hr	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-35

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 36

COMPLETION DATE: 10/17/12 SURFACE ELEVATION: +1,431 ft (±) WATER LEVEL: 8'

JOB NUMBER: 8979-004*1D READING DATE: 10/17/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
	S1		SM	Red-brown fine to medium sand, some silt, trace fine gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, little to some silt, little fine to coarse gravel (moist)(medium dense)	
5	S3				5
10				Test pit completed @ 9'-6" Mottling encountered @ 2'-6" Moderate groundwater seepage encountered @ 8'-0" Infiltration test initiated @ 5' Presoak did not drain	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-36

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 37

COMPLETION DATE: 10/17/12 SURFACE ELEVATION: +1,382 ft (±) WATER LEVEL: 2'

JOB NUMBER: 8979-004*1D READING DATE: 10/17/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(medium dense)	
5	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(dense)	5
	S3				
10				Test pit completed @ 10' Moderate groundwater seepage encountered @ 2' Infiltration test initiated @ 6' Presoak did not drain	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-37

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 38

COMPLETION DATE: 10/18/12 SURFACE ELEVATION: +1,380 ft (±) WATER LEVEL: 6'-0"

JOB NUMBER: 8979-004*1D READING DATE: 10/18/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				11" Topsoil	
	S1			Red-brown fine to medium sand, some silt, some fine to coarse gravel (moist)(medium dense)	
	S2		SM		
5					5
			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
10				Test pit completed @ 10' Mottling observed @ 1'-6" Slight groundwater seepage encountered @ 6'-0"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-38

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 39

COMPLETION DATE: 10/18/12 SURFACE ELEVATION: +1,379 ft (±) WATER LEVEL: 1'-6"

JOB NUMBER: 8979-004*1D READING DATE: 10/18/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
	S1			8" Topsoil	
				Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense to dense)	
	S2				
5			SM		5
10				Test pit completed @ 10' Slight groundwater seepage encountered @ 1'-6"	10
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-39

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 40

COMPLETION DATE: 10/18/12 SURFACE ELEVATION: 1,377 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 10/18/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				3" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt, trace fine gravel (moist)(medium dense)	
	S2			Gray-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense to dense)	
5			SM		5
	S3				
10					10
				Test pit completed @ 10'	
				Mottling observed @ 2'-6"	
				*Groundwater not encountered	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 41

COMPLETION DATE: 10/18/12 SURFACE ELEVATION: +1,389 ft (±) WATER LEVEL: 5'

JOB NUMBER: 8979-004*1D READING DATE: 10/18/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		ML	Red-brown silt, and fine to coarse sand, trace fine to coarse gravel (moist)(stiff)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
5					5
10				Test pit completed @ 10' Mottling observed @ 2'-6" Moderate groundwater seepage encountered @ 5'-0"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-41

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 42

COMPLETION DATE: 10/22/12 | SURFACE ELEVATION: +1,389 ft (±) | WATER LEVEL: 5'

JOB NUMBER: 8979-004*1D | READING DATE: 10/22/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (wet)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles (moist)(medium dense to dense)	
5	S3				5
10				Test pit completed @ 10' Mottling observed @ 1'-0" Groundwater seepage encountered @ 5'-0"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-42

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 43

COMPLETION DATE: 10/22/12 | SURFACE ELEVATION: +1,386 ft (±) | WATER LEVEL: 7'

JOB NUMBER: 8979-004*1D | READING DATE: 10/22/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (wet)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
5					5
10				Test pit completed @ 9' Mottling observed @ 2' Groundwater seepage encountered @ 7'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-43

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 44

COMPLETION DATE: 10/22/12 | SURFACE ELEVATION: +1,386 ft (±) | WATER LEVEL: 2'-3"

JOB NUMBER: 8979-004*1D | READING DATE: 10/22/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
			SM	Red-brown fine to medium sand, and silt, trace fine gravel (moist)(medium dense)	
	S1		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(dense)	
5					5
	S2				
10				Test pit completed @ 10' Moderate groundwater seepage encountered @ 2'-3"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-44

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 45

COMPLETION DATE: 10/22/12 | SURFACE ELEVATION: +1,389 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-004*1D | READING DATE: 10/22/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(dense)	
5					5
10				Test pit completed @ 10' Moderate groundwater seepage encountered @ 2'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 46

COMPLETION DATE: 10/22/12 | SURFACE ELEVATION: +1,389 ft (±) | WATER LEVEL: 3'-6"

JOB NUMBER: 8979-004*1D | READING DATE: 10/22/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				3" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(dense)	
5					5
10	S3			Test pit completed @ 10' Mottling observed @ 1'-6" Moderate groundwater seepage encountered @ 3'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-46

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 47

COMPLETION DATE: 10/22/12 SURFACE ELEVATION: +1,389 ft (±) WATER LEVEL: 8'

JOB NUMBER: 8979-004*1D READING DATE: 10/22/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (wet)(medium dense)	
5			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(dense)	5
10				Test pit completed @ 10'-6" Mottling observed @ 1'-6" Rapid groundwater seepage encountered @ 8'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 48

COMPLETION DATE: 10/22/12 | SURFACE ELEVATION: +1,393 ft (±) | WATER LEVEL: 5'-6"

JOB NUMBER: 8979-004*1D | READING DATE: 10/22/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				3" Topsoil	
			ML	Red-brown silt, and fine to medium sand, trace fine gravel (moist)(stiff)	
			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
5				Fractured sandstone bedrock	5
				- refusal @ 9' atop relatively sound sandstone bedrock	
10				Test pit completed @ 9' Mottling observed @ 3'-6" Rapid groundwater seepage encountered @ 5'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 49

COMPLETION DATE: 11/01/12 SURFACE ELEVATION: +1,387.5 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 11/01/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, little fine gravel (moist)(dense)	
	S3	11.5			
5				Fractured sandstone bedrock	5
				- backhoe refusal encountered @ 7' atop sandstone bedrock	
10				Test pit completed @ 7'	10
				*Groundwater not encountered	
				Infiltration test performed @ 3'	
				Measured infiltration rate = 10 in/hr	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 50

COMPLETION DATE: 11/01/12 SURFACE ELEVATION: +1,374 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 11/01/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
			SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
	S1				
	S2	11.9		Gray fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense)	
			SM		
5					5
				Fractured sandstone bedrock - backhoe refusal @ 6'-6" atop sandstone bedrock	
10				Test pit completed @ 6'-6"	10
				Mottling observed @ 2'	
				*Groundwater not encountered	
				Infiltration test performed @ 4'	
				Measured infiltrate rate = 10 in/hr	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 51

COMPLETION DATE: 11/01/12 SURFACE ELEVATION: +1,376 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 11/01/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Yellow-brown fine to medium sand, some silt (moist)(medium dense)	
5			SM	Red-brown fine to coarse sand, some silt, some fine to coarse grave, occasional cobbles (moist)(dense)	5
10				Fractured sandstone bedrock	10
15				Test pit completed @ 11' *Groundwater not encountered Infiltration test performed @ 8'-6" Measured infiltration rate = 23 in/hr	15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 52

COMPLETION DATE: 11/01/12 SURFACE ELEVATION: +1,371 ft (±) WATER LEVEL: 4'-6"

JOB NUMBER: 8979-004*1D READING DATE: 11/01/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				2" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(dense)	
5					5
10				Test pit completed @ 9' Mottling observed @ 3'-9" Moderate groundwater seepage encountered @ 4'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 53

COMPLETION DATE: 11/01/12 | SURFACE ELEVATION: +1,369 ft (±) | WATER LEVEL: 4'-3"

JOB NUMBER: 8979-004*1D | READING DATE: 11/01/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
			SM	Red-brown fine to medium sand, and silt (moist)(medium dense)	
5			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(dense)	5
10				Test pit completed @ 8' Mottling observed @ 2'-6" Moderate groundwater seepage encountered @ 4'-3"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 54

COMPLETION DATE: 11/01/12 SURFACE ELEVATION: +1,378 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 11/01/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Yellow-brown fine to medium sand, some silt (moist)(medium dense)	
	S2	12.7	SM	Red-brown fine to coarse sand, and silt, little fine gravel, occasional cobbles and boulders	
5					5
10	S3			Fractured sandstone bedrock	10
				Test pit completed @ 10'-6" *Groundwater not encountered Infiltration test performed @ 2'-6" Measured infiltration rate = 23 in/hr	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 55

COMPLETION DATE: 11/05/12 SURFACE ELEVATION: +1,381 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 11/02/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Yellow-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(very dense)	
5					5
	S3			Fractured sandstone bedrock	
10				- backhoe refusal encountered @ 12'-6" atop sandstone bedrock	10
				Test pit completed @ 12'-6" *Groundwater not encountered Percolation test performed in fractured rock @ 10' Measured percolation rate = 11 min/in	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 56

COMPLETION DATE: 11/02/12 SURFACE ELEVATION: +1,383 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 11/02/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Yellow-brown fine to medium sand, some silt, little fine gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(dense)	
5				Fractured sandstone bedrock - backhoe refusal encountered @ 7' atop sandstone bedrock	5
				Test pit completed @ 7' *Groundwater not encountered	
10					10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-56

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 57

COMPLETION DATE: 11/02/12 SURFACE ELEVATION: +1,393 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 11/02/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
5				Fractured sandstone bedrock - backhoe refusal encountered @ 5'-6" atop sandstone bedrock	5
				Test pit completed @ 5'-6" *Groundwater not encountered	
10					10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

Sheet: 1 of 1 PLATE: 3-57

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 58

COMPLETION DATE: 11/02/12 | SURFACE ELEVATION: +1,390.5 ft (±) | WATER LEVEL: 3'

JOB NUMBER: 8979-004*1D | READING DATE: 11/02/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
5			SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles (moist to wet)(medium dense to dense)	5
10				Test pit completed @ 8' Moderate groundwater seepage encountered @ 3'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 59

COMPLETION DATE: 11/02/12 SURFACE ELEVATION: +1,394 ft (±) WATER LEVEL: 1'-6"

JOB NUMBER: 8979-004*1D READING DATE: 11/02/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt (moist)(medium dense)	
			SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles (moist)(medium dense to dense)	
5					5
				Fractured sandstone bedrock	
10				Test pit completed @ 9'-6" Moderate groundwater seepage encountered @ 1'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 60

COMPLETION DATE: 11/06/12 SURFACE ELEVATION: +1,395.5 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 11/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Yellow-brown fine to medium sand, and silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense to very dense)	
5					5
	S3	7.0			
10					10
15				Test pit completed @ 13' Mottling observed @ 2'-6" *Groundwater not encountered Infiltration test performed @ 10'-6" **Measured infiltration rate = 8 in/hr**	15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 61

COMPLETION DATE: 11/06/12 SURFACE ELEVATION: +1,395.5 ft (±) WATER LEVEL: *

JOB NUMBER: 8979-004*1D READING DATE: 11/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Yellow-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(very dense)	
5					5
10	S3	7.4			10
15				Test pit completed @ 14' *Groundwater not encountered Infiltration test performed @ 13'-0", Measured infiltation rate = 6 in/hr	15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 62

COMPLETION DATE: 11/05/12 | SURFACE ELEVATION: +1,392.5 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 11/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Red-brown fine to medium sand, some to and silt (moist)(medium dense)	
	S2		SM	Gray-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(medium dense to dense)	
5					5
10				Test pit completed @ 8'-6" *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 63

COMPLETION DATE: 11/05/12 SURFACE ELEVATION: +1,388 ft (±) WATER LEVEL: 4'

JOB NUMBER: 8979-004*1D READING DATE: 11/05/12

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
			SM	Red-brown fine to medium sand, and silt (moist)(medium dense)	
			SM	Gray fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(dense)	
5					5
				Fractured sandstone bedrock	
10				Test pit completed @ 6' Slight groundwater seepage encountered @ 4'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 11/12

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 64

COMPLETION DATE: 1/21/13 | SURFACE ELEVATION: +1,377.5 ft (±) | WATER LEVEL: 1.5'

JOB NUMBER: 8979-004*1D | READING DATE: 1/21/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
				Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(dense)	
	S2				
5			SM		5
	S3				
10				Test pit completed @ 10'	10
				Mottling observed form 1'-6" to 10'	
				Slight groundwater seepage encountered from 1'-6" to 3'	
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-64

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 65

COMPLETION DATE: 1/21/13 | SURFACE ELEVATION: +1,373 ft (±) | WATER LEVEL: 1.5'

JOB NUMBER: 8979-004*1D | READING DATE: 1/21/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
			SM	Red-brown fine to medium sand, and silt (moist)(medium dense)	
				Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(dense)	
	S1				
5			SM		5
	S2				
10				Test pit completed @ 10'	10
				Mottling observed form 1'-6" to 10'	
				Slight groundwater seepage encountered from 1'-6" to 3'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-65

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 66

COMPLETION DATE: 1/21/13 | SURFACE ELEVATION: +1,370 ft (±) | WATER LEVEL: 3'

JOB NUMBER: 8979-004*1D | READING DATE: 1/21/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(medium dense to dense)	
5					5
10				Test pit completed @ 10' Mottling observed form 2'-6" to 7' Slight groundwater seepage encountered @ 3'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-66

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 67

COMPLETION DATE: 1/21/13 | SURFACE ELEVATION: +1,386 ft (±) | WATER LEVEL: 1'-6"

JOB NUMBER: 8979-004*1D | READING DATE: 1/21/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt, little fine to coarse gravel (moist)(medium dense)	
				Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense)	
5			SM		5
10				Test pit completed @ 10' Mottling observed form 1'-6" to 10' Slight groundwater seepage encountered @ 1'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-67

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 68

COMPLETION DATE: 1/21/13
JOB NUMBER: 8979-004*1D

SURFACE ELEVATION: +1,389 ft (±)

WATER LEVEL: 1'-6"
READING DATE: 1/21/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Brown fine to medium sand, and silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist to wet)(medium dense)	
5					5
10				Test pit completed @ 10' Mottling observed form 1'-6" to 10' Slight groundwater seepage encountered @ 1'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-68

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 69

COMPLETION DATE: 1/21/13 | SURFACE ELEVATION: +1,374 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/21/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				9" Topsoil	
	S1		SM	Brown fine to medium sand, and silt, trace fine gravel (moist)(medium dense)	
5	S2		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles and boulders (moist)(medium dense) - backhoe refusal encountered on boulders @ 7'	5
10				Test pit completed @ 7' *Groundwater not encountered Infiltration test performed @ 4'-6" Measured Infiltration Rate = 6-1/2 in/hr	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

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MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 70

COMPLETION DATE: 1/21/13 | SURFACE ELEVATION: +1,372.5 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/21/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
			SM	Red-brown fine to medium sand, and silt, little fine to coarse gravel (moist)(medium dense)	
5			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(dense)	5
10				Highly fractured shale bedrock	10
15				Test pit completed @ 11' *Groundwater not encountered Percolation test performed @ 9' Measured Percolation Rate = 50 min/inch	15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-70

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 71

COMPLETION DATE: 1/22/13 | SURFACE ELEVATION: +1,364 ft (±) | WATER LEVEL: 5'

JOB NUMBER: 8979-004*1D | READING DATE: 1/22/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
	S1			2" Topsoil	
			SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
	S2			Red-brown fine to coarse sand, some silt, little fine to coarse gravel (moist)(medium dense)	
			SM		
5					5
	S3				
				Highly fractured shale bedrock	
10					10
				Test pit completed @ 10' Mottling observed from 2'-6" to 4' Moderate groundwater seepage encountered @ 5'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-71

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 72

COMPLETION DATE: 1/22/13 | SURFACE ELEVATION: +1,363.5 ft (±) | WATER LEVEL: 5'

JOB NUMBER: 8979-004*1D | READING DATE: 1/22/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, little silt, some fine to coarse gravel, occasional cobbles (moist to wet)(dense)	
5				- backhoe refusal atop shale bedrock @ 8'-6"	5
10				Test pit completed @ 8'-6" Mottling observed @ 3' Moderate groundwater seepage encountered @ 5'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 73

COMPLETION DATE: 1/22/13 | SURFACE ELEVATION: +1,386 ft (±) | WATER LEVEL: 4'-6"

JOB NUMBER: 8979-004*1D | READING DATE: 1/22/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1			Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(medium dense to dense)	
	S2				
5			SM		5
				- backhoe refusal encountered @ 10' atop shale bedrock	
10				Test pit completed @ 10'	10
				Mottling observed from 2'-6" to 10'	
				Moderate groundwater seepage encountered @ 4'-6"	
				Infiltration test performed @ 3' Measured Infiltration Rate = 5-3/4 in/hr	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 74

COMPLETION DATE: 1/22/13 | SURFACE ELEVATION: +1,389.5 ft (±) | WATER LEVEL: 5'

JOB NUMBER: 8979-004*1D | READING DATE: 1/22/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(medium dense to dense)	
5					5
10				Test pit completed @ 10'-6" Mottling observed @ 2'-6" Moderate groundwater seepage encountered @ 5' Infiltraton test performed @ 3'-6" Presoak did not drain	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

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MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 75

COMPLETION DATE: 1/22/13 | SURFACE ELEVATION: +1,384 ft (±) | WATER LEVEL: 3'

JOB NUMBER: 8979-004*1D | READING DATE: 1/22/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist to wet)(medium dense to dense)	
5					5
				Highly fractured shale bedrock	
10				Test pit completed @ 10' Mottling observed @ 2'-6" Moderate groundwater seepage encountered @ 3'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-75

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 76

COMPLETION DATE: 1/23/13 | SURFACE ELEVATION: +1,383.5 ft (±) | WATER LEVEL: 5'

JOB NUMBER: 8979-004*1D | READING DATE: 1/23/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(medium dense to dense)	
5					5
10	S3				10
				Test pit completed @ 11'	
				Mottling observed @ 3'	
				Moderate groundwater seepage encountered @ 5'	
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-76

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 77

COMPLETION DATE: 1/23/13 | SURFACE ELEVATION: +1,389.5 ft (±) | WATER LEVEL: 1'

JOB NUMBER: 8979-004*1D | READING DATE: 1/23/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to coarse sand, and silt (moist)(medium dense)	
	S2		SM	Gray fine to coarse sand, some silt, trace fine to coarse gravel, occasional cobbles (moist to wet)(medium dense to dense)	
5					5
10				Test pit completed @ 10'-6" Mottling observed @ 3' Moderate groundwater seepage encountered @ 1'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 78

COMPLETION DATE: 1/24/13 | SURFACE ELEVATION: +1,396 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/24/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		ML	Brown clayey silt, some fine to coarse sand, little fine gravel (moist)(stiff)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense to dense)	
5					5
10				Test pit completed @ 10' Mottling observed @ 2'-6" *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-78

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 79

COMPLETION DATE: 1/24/13 | SURFACE ELEVATION: +1,386 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-004*1D | READING DATE: 1/24/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				9" Topsoil	
			ML	Brown clayey silt, some fine to coarse sand, little fine to coarse gravel (moist)(stiff)	
5			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(medium dense)	5
10				Test pit completed @ 10' Mottling observed from 2' to 10' Slight groundwater seepage encountered @ 2'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-79

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 80

COMPLETION DATE: 1/24/13 | SURFACE ELEVATION: +1,386 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-004*1D | READING DATE: 1/24/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
			ML	Brown clayey silt, little fine to coarse sand, little fine to coarse gravel (moist)(stiff)	
5			SM	Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel, occasional cobbles (moist to wet)(medium dense)	5
10				Test pit completed @ 10' Mottling observed from 2' to 10' Slight groundwater seepage encountered @ 2'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-80

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 81

COMPLETION DATE: 1/24/13 | SURFACE ELEVATION: +1,372.5 ft (±) | WATER LEVEL: 2'

JOB NUMBER: 8979-004*1D | READING DATE: 1/24/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				2" Topsoil	
	S1		ML	Brown clayey silt, and fine to medium sand, little fine to coarse gravel (moist)(stiff)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(medium dense to dense)	
5					5
	S3				
10				Test pit completed @ 10' Mottling observed from 2' to 10' Slight groundwater seepage encountered @ 2'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-81

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 82

COMPLETION DATE: 1/24/13 | SURFACE ELEVATION: +1,379 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/24/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
			SM	Brown fine to medium sand, some silt, little fine to coarse gravel (moist)(medium dense)	
	S1				
5			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense to dense)	5
10	S2				10
				Test pit completed @ 11' Mottling observed @ 10' *Groundwater not encountered Infiltration test performed @ 4'-6" Measured Infiltration Rate = 9 in/hr Infiltration test performed @ 10' Measured infiltration rate = 9 in/hr	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-82

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 83

COMPLETION DATE: 1/25/13 | SURFACE ELEVATION: +1,385 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/25/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Brown fine to medium sand, some silt, little fine to coarse gravel (moist)(medium dense)	
5	S2		SM	Brown fine to coarse sand, little silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(dense) - backhoe refusal atop nested boulders @ 8'	5
10				Test pit completed @ 8' *Groundwater not encountered Percolation test performed @ 5'-6" Measured Percolation Rate = 45 min/in	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 84

COMPLETION DATE: 1/29/13 | SURFACE ELEVATION: +1,420.5 ft (±) | WATER LEVEL: 4'

JOB NUMBER: 8979-004*1D | READING DATE: 1/29/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
	S1			FILL - Brown fine to medium sand, some silt, trace fine gravel, with roots and wood fragments	
	S2			Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(medium dense)	
	S3				
5			SM		5
10				Test pit completed @ 10'	10
				Mottling observed from 2'-6" to 5'	
				Perched groundwater seepage encountered @ 4'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 85

COMPLETION DATE: 1/28/13 | SURFACE ELEVATION: +1,429 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/28/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1			Red-brown fine to medium sand, some silt, little fine to coarse gravel (moist)(medium dense)	
	S2		SM		
5					5
	S3		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense)	
10					10
				Test pit completed @ 10'	
				*Groundwater not encountered	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

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MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 86

COMPLETION DATE: 1/29/13 | SURFACE ELEVATION: +1,416 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/29/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
5	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense to very dense)	5
10				Test pit completed @ 10' Mottling observed @ 3' *Groundwater not encountered	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

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LOG OF TEST PIT

TEST PIT NO: 87

COMPLETION DATE: 1/28/13 | SURFACE ELEVATION: +1,407.5 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/28/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(dense)	
5					5
				Highly fractured sandstone bedrock	
10					10
				Test pit completed @ 10' Mottling observed @ 4'-6" *Groundwater not encountered Permeability test initiated @ 3' Presoak did not drain	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-87

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 88

COMPLETION DATE: 1/28/13 | SURFACE ELEVATION: +1,403 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/28/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
	S1		SM	Red-brown fine to medium sand, some silt, little fine to coarse gravel (moist)(medium dense)(possible fill)	
5	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense)	5
10				Test pit completed @ 10'-6" *Groundwater not encountered Permeability test initiated @ 2' Presoak did not drain	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-88

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 89

COMPLETION DATE: 1/29/13
JOB NUMBER: 8979-004*1D

SURFACE ELEVATION: +1,390.5 ft (±)

WATER LEVEL: 5'
READING DATE: 1/29/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, some fine gravel (moist)(medium dense)	
	S2			Brown fine to coarse sand, some silt, trace fine to coarse gravel, occasional cobbles (moist)(medium dense to dense)	
5			SM		5
	S3				
10					10
				Test pit completed @ 10'-6"	
				Mottling observed @ 1'-6"	
				Moderate groundwater seepage encountered @ 5'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-89

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 90

COMPLETION DATE: 1/29/13 | SURFACE ELEVATION: +1,383 ft (±) | WATER LEVEL: 1'

JOB NUMBER: 8979-004*1D | READING DATE: 1/29/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt, trace fine gravel (moist)(loose)	
	S2			Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles (moist to wet)(medium dense to dense)	
5	S3		SM		5
10				Test pit completed @ 10'-6" Moderate groundwater seepage encountered @ 5'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-90

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 91

COMPLETION DATE: 1/29/13
JOB NUMBER: 8979-004*1D

SURFACE ELEVATION: +1,378 ft (±)

WATER LEVEL: 1'
READING DATE: 1/29/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				12" Topsoil	
	S1			Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist to wet)(medium dense)	
	S2				
5			SM		5
	S3				
10					10
				Test pit completed @ 10'-6"	
				Mottling observed from 1' to 10'-6"	
				Moderate groundwater seepage encountered @ 1'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-91

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 92

COMPLETION DATE: 1/29/13 | SURFACE ELEVATION: N/A | WATER LEVEL: 1'-6"

JOB NUMBER: 8979-004*1D | READING DATE: 1/29/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				7" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (wet)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles (wet)(dense)	
5	S3				5
10				Test pit completed @ 11' Mottling observed from 1'-6" to 11' Moderate groundwater seepage encountered @ 1'-6"	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-92

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 93

COMPLETION DATE: 1/30/13 | SURFACE ELEVATION: 1,382.5 ft (±) | WATER LEVEL: 8'-6"

JOB NUMBER: 8979-004*1D | READING DATE: 1/30/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense)	
5	S3				5
			SP/SM	Red-brown fine to coarse sand, little silt, some fine to coarse gravel, occasional cobbles (moist to wet)(medium dense)	
10	S4				10
				Test pit completed @ 11' Mottling observed from 5'-6" to 11' Moderate groundwater seepage encountered @ 8'-6"	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-93

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 94

COMPLETION DATE: 1/30/13 | SURFACE ELEVATION: 1,383.5 ft (±) | WATER LEVEL: 6'

JOB NUMBER: 8979-004*1D | READING DATE: 1/30/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
	S2			Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles (moist)(medium dense)	
5	S3		SM		5
				- grading with numerous cobbles @ 8'	
10				Test pit completed @ 10'-6"	10
				Mottling observed @ 5'	
				Rapid groundwater seepage encountered @ 6'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-94

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 95

COMPLETION DATE: 1/30/13 | SURFACE ELEVATION: 1,383.5 ft (±) | WATER LEVEL: 4'

JOB NUMBER: 8979-004*1D | READING DATE: 1/30/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				8" Topsoil	
	S1		SM	Gray-brown fine to medium sand, some silt (moist)(medium dense)	
5			SM	Gray-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(medium dense to dense)	5
10	S2				10
				Test pit completed @ 11' Mottling observed @ 1' Moderate groundwater seepage encountered @ 4'	
15					15

NOTES FOR COLUMNS:

1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:

TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-95

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 96

COMPLETION DATE: 1/30/13 | SURFACE ELEVATION: 1,390.5 ft (±) | WATER LEVEL: 1'

JOB NUMBER: 8979-004*1D | READING DATE: 1/30/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt (moist)(medium dense)	
	S2			Red-brown fine to coarse sand, some silt, little fine to coarse gravel, occasional cobbles (moist to wet)(medium dense to dense)	
5	S3		SM		5
10				Test pit completed @ 10'-6"	10
				Groundwater seepage encountered @ 1'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-96

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 97

COMPLETION DATE: 1/30/13 | SURFACE ELEVATION: 1,388 ft (±) | WATER LEVEL: 3'

JOB NUMBER: 8979-004*1D | READING DATE: 1/30/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1		SM	Red-brown fine to medium sand, and silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(medium dense to dense)	
5					5
10				Test pit completed @ 10' Mottling observed from 1'-6" to 10' Moderate groundwater seepage encountered @ 3'	10
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-97

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF TEST PIT

TEST PIT NO: 98

COMPLETION DATE: 1/30/13 | SURFACE ELEVATION: 1,380 ft (±) | WATER LEVEL: 1'

JOB NUMBER: 8979-004*1D | READING DATE: 1/30/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				6" Topsoil	
	S1		SM	Red-brown fine to medium sand, some silt (moist)(medium dense)	
	S2		SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(medium dense to dense)	
5					5
10					10
				Test pit completed @ 10'-6" Mottling observed from 1' Rapid groundwater seepage encountered @ 1'	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-98

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF TEST PIT

TEST PIT NO: 99

COMPLETION DATE: 1/30/13 | SURFACE ELEVATION: 1,376 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 1/30/13

DEPTH	SAMPLES (1)	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH
				4" Topsoil	
	S1			Red-brown fine to coarse gravel, little to some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(medium dense to dense)	
5			SM		5
10	S2				10
				Test pit completed @ 11'	
				Mottling observed from 6" to 11'	
				*Groundwater not encountered	
15					15

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 3-99

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. 101

COMPLETION DATE: 10/31/12 | SURFACE ELEVATION: +1,454 ft (±) | WATER LEVEL: 6'-2"

JOB NUMBER: 8979-004*1D | READING DATE: 10/31/12

DEPTH (ft.)	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH (ft.)
					6" Asphalt	
					FILL - Red-brown fine to medium sand, some silt, some fine to coarse gravel	
	S1	10		ML	Red-brown clayey silt, little fine to medium sand (moist)(stiff)	
	S2	50/3"			Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel (moist to wet)(dense to very dense)	
5	S3	49				5
				SM		
10	S4	106				10
15	S5	51				15
					Boring completed @ 16'	
					Groundwater encountered @ 6'-2"	
20						20

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 4-101

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. 102

COMPLETION DATE: 10/31/12 | SURFACE ELEVATION: +1,452 ft (±) | WATER LEVEL: 14'-6"

JOB NUMBER: 8979-004*1D | READING DATE: 10/31/12

DEPTH (ft.)	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH (ft.)
					3" Asphalt over mixed stone and asphalt (chip seal)	
					FILL - Red-brown fine to coarse sand, some silt, some fine to coarse gravel	
	S1	27			Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(medium dense to very dense)	
	S2	40				
5						5
	S3	84				
				SM		
10	S4	98				10
15	S5	39				15
					Boring completed @ 16'	
					Groundwater encountered @ 14'-6"	
20						20

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 4-102

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. 103

COMPLETION DATE: 10/31/12 | SURFACE ELEVATION: +1,438 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-004*1D | READING DATE: 10/31/12

DEPTH (ft.)	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH (ft.)
					5" Asphalt	
	S1	21			Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist)(medium dense to very dense)	
	S2	60/6"				
5	S3	108				5
				SM		
10	S4	67				10
	S5	50/4"				
15					Boring completed @ 14'-10"	15
					*Groundwater not encountered	
20						20

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 4-103

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. 104

COMPLETION DATE: 10/31/12 | SURFACE ELEVATION: +1,418 ft (±) | WATER LEVEL: 4'

JOB NUMBER: 8979-004*1D | READING DATE: 10/31/12

DEPTH (ft.)	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH (ft.)
					3" Asphalt	
					FILL - Red-brown fine to coarse sand, little silt, some fine to coarse gravel	
	S1	29			Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist to wet)(medium dense to very dense)	
	S2	57				
5						5
	S3	91				
				SM		
10	S4	50				10
	S5	50/1"			- sampler refusal @ 14'-1" atop possible sandstone bedrock	
15						15
					Boring completed @ 14'-1"	
					Groundwater encountered @ 4'	
20						20

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 4-104

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. 105

COMPLETION DATE: 10/31/12 | SURFACE ELEVATION: +1,498 ft (±) | WATER LEVEL: 8'-3"

JOB NUMBER: 8979-004*1D | READING DATE: 10/31/12

DEPTH (ft.)	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	SYMBOL	DESCRIPTION	DEPTH (ft.)
					3" Asphalt	
					FILL - Dark brown fine to medium sand, some silt, some fine to coarse gravel	
	S1	42			Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist to wet)(dense to very dense)	
	S2	70				
5	S3	94				5
				SM		
10	S4	66			- driller notes boulder from 10'-6" to 13'	10
15	S5	59				15
					Boring completed @ 16'	
					Groundwater encountered @ 8'-3"	
20						20

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: jhb/mh 2/13

Sheet: 1 of 1 PLATE: 4-105

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. S-3

COMPLETION DATE: 2/27/12 | SURFACE ELEVATION: +1,452 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 2/27/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						8" Topsoil	
	S1	5			ML	Red-brown silt, and fine to coarse sand, trace fine gravel (moist)(medium to hard)	
	S2	32	8.7				
5	S3	52			SM	Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel (moist)(very dense) - driller notes boulder @ 7'-6"	5
10	S4	52					10
15	S5	98/10"					15
20						Boring completed @ 16'-4" *Groundwater not encountered	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-106

MELICK-TULLY AND ASSOCIATES, P.C.
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LOG OF BORING

BORING NO. S-9

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,350 ft (±) | WATER LEVEL: 6'

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	24				FILL - Red-brown fine to coarse sand, and silt, some fine to coarse gravel	
	S2	46			SM	Red-brown fine to coarse sand, some silt, some fine to coarse gravel (moist)(medium dense to dense)	
5	S3	28					5
	S4	50/1"					
	S5	61			SM	Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel, occasional cobbles and boulders (wet)(dense to very dense)	
10	S6	47					10
	S7	86					
	S8	50/2"					
15							15
20						Boring completed @ 14'-8" *Groundwater encountered @ 6'	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-107

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-10

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,357 ft (±) | WATER LEVEL: 5'-6"

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	9				4" Topsoil	
						FILL - Brown fine to coarse sand, some silt, little fine gravel	
	S2	41				Red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(dense to very dense)	
5	S3	86					5
	S4	59			SM		
	S5	81					
10	S6	86					10
	S7	122					
15	S8	80					15
						Boring completed @ 15'-10" Groundwater encountered @ 5'-6"	
20							20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-108

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-11

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,363 ft (±) | WATER LEVEL: 6'

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						6" Topsoil and pine needles	
	S1	10			SM	Red-brown fine to coarse sand, and silt, some fine to coarse gravel (moist to wet)(medium dense to very dense)	
	S2	26					
5	S3	47	39.0				5
	S4	35			SM	Red-brown fine to coarse sand, little silt, trace fine gravel (wet)(dense)	
	S5	90			SM	Red-brown fine to coarse sand, little to some silt, little fine to coarse gravel, occasional cobbles and boulders (wet)(very dense)	
10	S6	130					10
	S7	96					
15	S8	100/5"					15
20	S9	100/4"				- driller noted cobbles @ 21'-6"	20
25						Boring completed @ 22' Groundwater encountered @ 6'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-109

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-12

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,352 ft (±) | WATER LEVEL: 6'

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	4				2" Topsoil and pine needles	
					SM	Brown to dark brown fine to coarse sand, little silt, trace fine to coarse gravel (moist)(loose to very dense)	
	S2	50/4"				- driller notes cobbles @ 3'	
5	S3	56	39.0		SM	Red-brown fine to coarse sand, and silt, trace fine gravel (wet)(very dense)	5
	S4	66					
	S5	158/10"			SM	Gray and red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional to frequent cobbles and boulders (moist)(very dense)	
10	S6	100/4"					10
	S7	100/4"					
15							15
20	S8	100/1"					20
25						Boring completed @ 20'-1" Groundwater encountered @ 6'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-110

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-13

COMPLETION DATE: 3/15/12 | SURFACE ELEVATION: +1,352 ft (±) | WATER LEVEL: 12'

JOB NUMBER: 8979-001*1D | READING DATE: 3/15/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	4			SM	4" Topsoil Red-brown fine to coarse sand, some silt, trace fine gravel (moist)(loose)	
	S2	70			ML	Red-brown clayey silt, and fine to medium sand, trace fine to coarse gravel (wet)(hard)	
5	S3	55				Red-brown fine to coarse sand, some to and silt, some fine to coarse gravel (moist to wet)(very dense)	5
	S4	56					
	S5	69					
10	S6	75			SM		10
	S7	104				- grading with frequent cobbles and boulders	
15	S8	100/3"					15
20							20
25						Boring completed @ 20' Groundwater encountered @ 12'	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-111

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-14

COMPLETION DATE: 3/16/12 | SURFACE ELEVATION: +1,352 ft (±) | WATER LEVEL: *

JOB NUMBER: 8979-001*1D | READING DATE: 3/16/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
						3" Topsoil	
	S1	28				FILL - Fine to coarse gravel, and fine to coarse sand, trace silt	
	S2	66				Red-brown fine to coarse sand, some silt, little fine gravel (moist)(very dense)	
5	S3	59	25.7				5
	S4	159/11"			SM		
	S5	81					
10	S6	112					10
	S7	100/4"					
15	S8	50/0"		6		NQ ROCK CORE RUN NO. 1: 15' to 20'	15
	CORE RUN NO. 1			2		REC = 97%	
				3		RQD = 77%	
				3		Red-brown good quality, closely jointed siltstone, grading to sandstone @ 16'	
20				3			20
25						Boring completed @ 20'	25
						*Groundwater not encountered	
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-112

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-15

COMPLETION DATE: 3/16/12 | SURFACE ELEVATION: +1,355 ft (±) | WATER LEVEL:

JOB NUMBER: 8979-001*1D | READING DATE: 3/16/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	11				3" Topsoil	
						FILL - Brown-dark gray fine to coarse sand, some silt, little fine gravel	
	S2	59				Gray to red-brown fine to coarse sand, some silt, some fine to coarse gravel, occasional cobbles and boulders (moist)(very dense)	
5	S3	83					5
	S4	100/5"			SM		
	S5	100/5"					
10	S6	75/2"				- driller notes cobbles @ 10'-6"	10
	S7	100/5"				- possible bedrock @ 14'-5"	
15							15
20						Boring completed @ 14'-5"	20
25							25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-113

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

LOG OF BORING

BORING NO. S-16

COMPLETION DATE: 3/16/12 | SURFACE ELEVATION: +1,344 ft (±) | WATER LEVEL: 7'-6"

JOB NUMBER: 8979-001*1D | READING DATE: 3/16/12

DEPTH	SAMPLES	N-VALUE	MOISTURE CONTENT (%)	CORING TIMES (MIN./FT.)	SYMBOL	DESCRIPTION	DEPTH
	S1	41				3" Gravel pavement	
	S2	78				Red-brown fine to coarse sand, little to some silt, some fine to coarse gravel, occasional cobbles and boulders (moist to wet)(medium dense to very dense)	
5	S3	37					5
	S4	32	10				
	S5	40					
10	S6	192/11"			SM		10
	S7	28					
15	S8	66					15
20	CORE RUN NO. 1			6 3 3 4 4		NQ ROCK CORE RUN NO. 1: 20' to 25' REC = 90% RQD = 83% Light green-gray good quality, medium jointed, coarse grained sandstone, and conglomerate	20
25						Boring completed @ 25' Groundwater encountered @ 7'-6"	25
30							30

NOTES FOR COLUMNS:
1. SAMPLE AT AVERAGE SAMPLING DEPTH
2. INDICATES THE NUMBER OF BLOWS TO ADVANCE A 2" OD SAMPLER A DISTANCE OF 12 INCHES USING A 140 POUND WEIGHT FALLING 30 INCHES

SOIL DESCRIPTION MODIFIERS:
TRACE 0 - 10%
LITTLE 10 - 20%
SOME 20 - 35%
AND OVER 35%

Typist/Date: kt/mh 3/12

Sheet: 1 of 1 PLATE: 4-114

MELICK-TULLY AND ASSOCIATES, P.C.
Geotechnical Engineers and Environmental Consultants

MAJOR DIVISIONS			LETTER SYMBOL	TYPICAL DESCRIPTIONS
COARSE GRAINED SOILS More than 50% of material is LARGER than No. 200 Sieve	GRAVEL & GRAVELLY SOILS More than 50% of coarse fraction RETAINED on No. 4 Sieve	CLEAN GRAVELS (Little or no fines)	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.
			GP	Poorly-graded gravels, gravel-sand mixtures, little or no fines
		GRAVELS WITH FINES (Appreciable amount of fines)	GM	Silty gravels, gravel-sand-silt mixtures.
			GC	Clayey gravels, gravel-sand-clay mixtures.
	SAND AND SANDY SOILS More than 50% of coarse fraction PASSING a No. 4 Sieve	CLEAN SAND (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.
			SP	Poorly-graded sands, gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures
			SC	Clayey sands, sand-clay mixtures.
FINE GRAINED SOILS More than 50% of material is SMALLER than No. 200 Sieve.	SILTS AND CLAYS	Liquid limit LESS than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.
			OL	Organic silts and organic silty clays of low plasticity.
	SILTS AND CLAYS	Liquid limit GREATER than 50	MH	Inorganic silts, micaceous or diatomaceous fine sand or silty soils.
			CH	Inorganic clays of high plasticity, fat clays.
			OH	Organic clays of medium to high plasticity, organic silts.
HIGHLY ORGANIC SOILS			PT	Peat, humus, swamp soils with high organic contents

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS.

GRADATION*	COMPACTNESS* sand and/or gravel	CONSISTENCY* clay and/or silt
% Finer by Weight	Relative Density	Range of Shearing Strength in Pounds per Square Foot

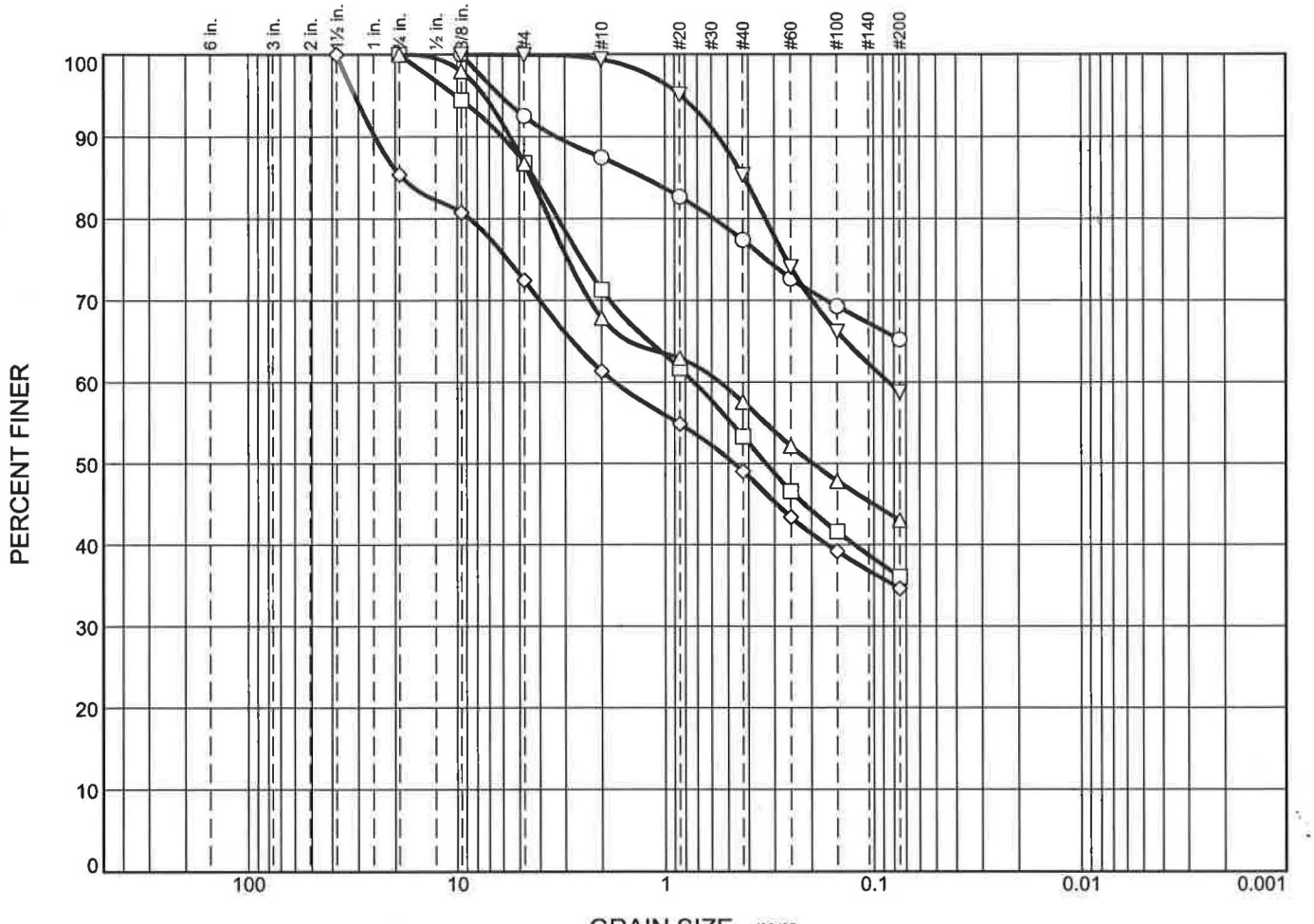
Trace	0% to 10%	Loose	0% to 40%	Very Soft	less than 250
Little	10% to 20%	Medium Dense	40% to 70%	Soft	250 to 500
Some	20% to 35%	Dense	70% to 90%	Medium	500 to 1000
And	35% to 50%	Very Dense	90% to 100%	Stiff	1000 to 2000
				Very Stiff	2000 to 4000
				Hard	Greater than 4000

**Values are from laboratory or field test data, where applicable. When no testing was performed, values are estimated.*

UNIFIED SOIL CLASSIFICATION SYSTEM

SOIL CLASSIFICATION CHART

Gradation Curve(s)



	% Cobbles	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	7.5	5.0	10.1	12.2	65.2
□	0.0	0.0	13.2	15.5	18.0	17.3	36.0
△	0.0	0.0	13.3	18.8	10.3	14.6	43.0
◇	0.0	14.6	12.9	11.2	12.3	14.4	34.6
▽	0.0	0.0	0.1	0.5	14.1	26.5	58.8

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-1	S-1	2	Silt, some fine to coarse Sand, trace fine Gravel. (MC=21.4%)	ML
□	TP-2	S-2	4	Fine to coarse Sand, and Silt, little fine Gravel. (MC=18.9%)	SM
△	TP-3	S-1	2	Fine to coarse Sand, and Silt, little fine Gravel. (MC=25.3%)	SM
◇	TP-4	S-1	2	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=19.2%)	SM
▽	TP-5	S-1	1	Silt, and fine to medium Sand. (MC=19.1%)	ML

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

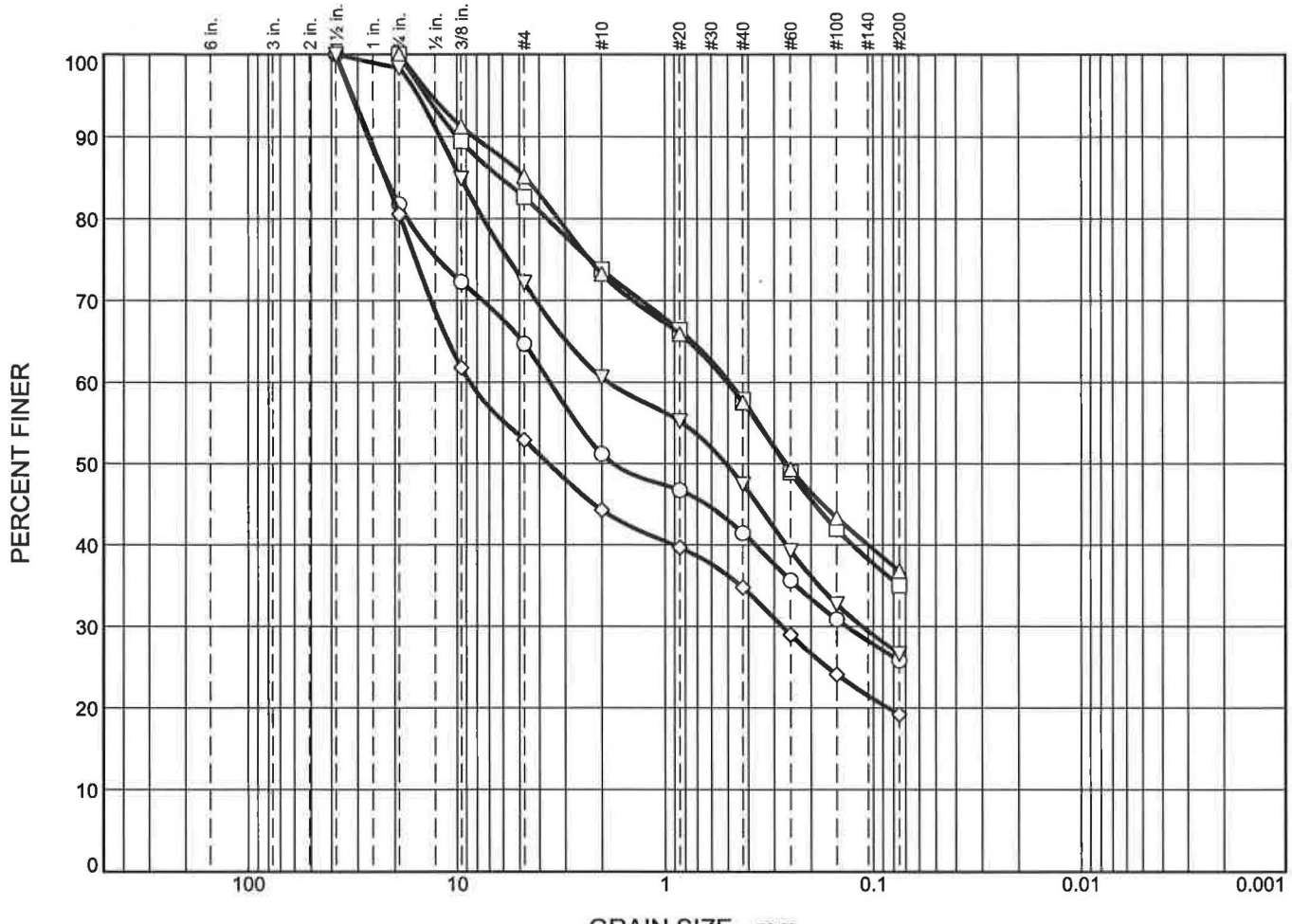
Client: Concord Resort Development

Project: Proposed Roadway, Thompson, NY

Project No.: 8979-004

Plate 6A

Gradation Curve(s)



	% Cobbles	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	18.2	17.1	13.5	9.7	15.7	25.8
□	0.0	0.0	17.4	8.8	15.9	22.9	35.0
△	0.0	0.0	14.8	11.9	15.7	20.8	36.8
◇	0.0	19.4	27.7	8.6	9.5	15.6	19.2
▽	0.0	1.7	26.1	11.6	13.1	20.9	26.6

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-7	S-2	4	Fine to coarse Sand, and f-c Gravel, some Silt. (MC=7.7%)	SM
□	TP-8	S-2	6	Fine to coarse Sand, and Silt, little fine Gravel. (MC=9.2%)	SM
△	TP-9	S-2	8	Fine to coarse Sand, and Silt, little fine Gravel. (MC=8.7%)	SM
◇	TP-10	S-1	2.5	Fine to coarse Gravel, some f-c Sand, little Silt. (MC=5.3%)	GM
▽	TP-17	S-1	2	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=7.7%)	SM

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

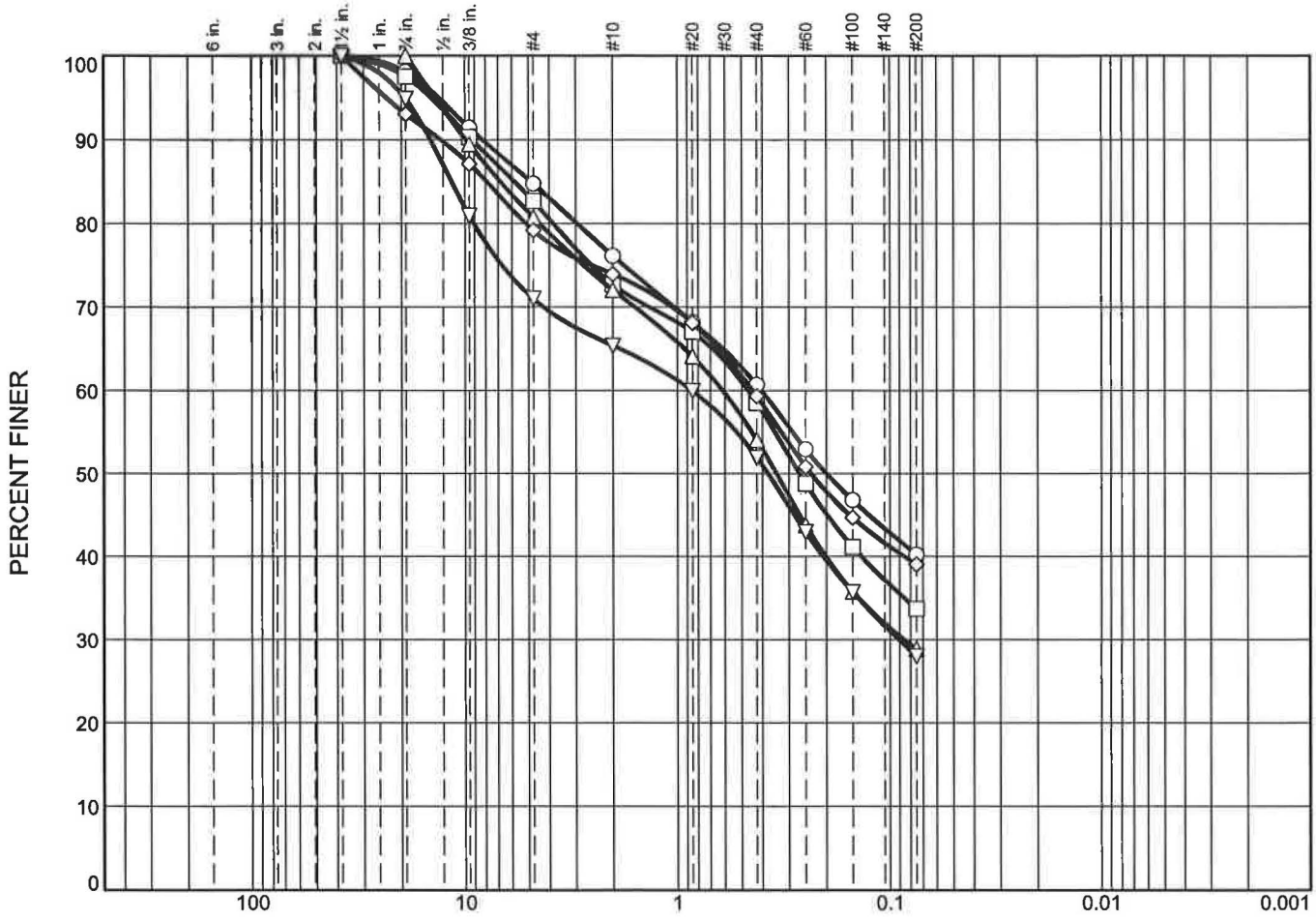
Client: Concord Resort Development

Project: Proposed Roadway, Thompson, NY

Project No.: 8979-004

Plate 6B

Gradation Curve(s)



	% Cobbles	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	1.9	13.3	8.7	15.4	20.5	40.2
□	0.0	2.5	14.8	10.0	14.2	24.8	33.7
△	0.0	0.0	19.3	8.6	18.0	25.2	28.9
◇	0.0	6.9	13.9	5.2	14.7	20.3	39.0
▽	0.0	5.1	23.9	5.6	13.5	23.9	28.0

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-30	Bulk	2.5	Fine to coarse Sand, and Silt, little f-c Gravel.	SM
□	TP-35	S-2	3	Fine to coarse Sand, some Silt, little f-c Gravel. (MC=11.0%)	SM
△	TP-49	S-3	3.5	Fine to coarse Sand, some Silt, little fine Gravel. (MC=11.5%)	SM
◇	TP-49	Bulk	3.5	Fine to coarse Sand, and Silt, some f-c Gravel.	SM
▽	TP-50	S-2	2.5	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=11.9%)	SM

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

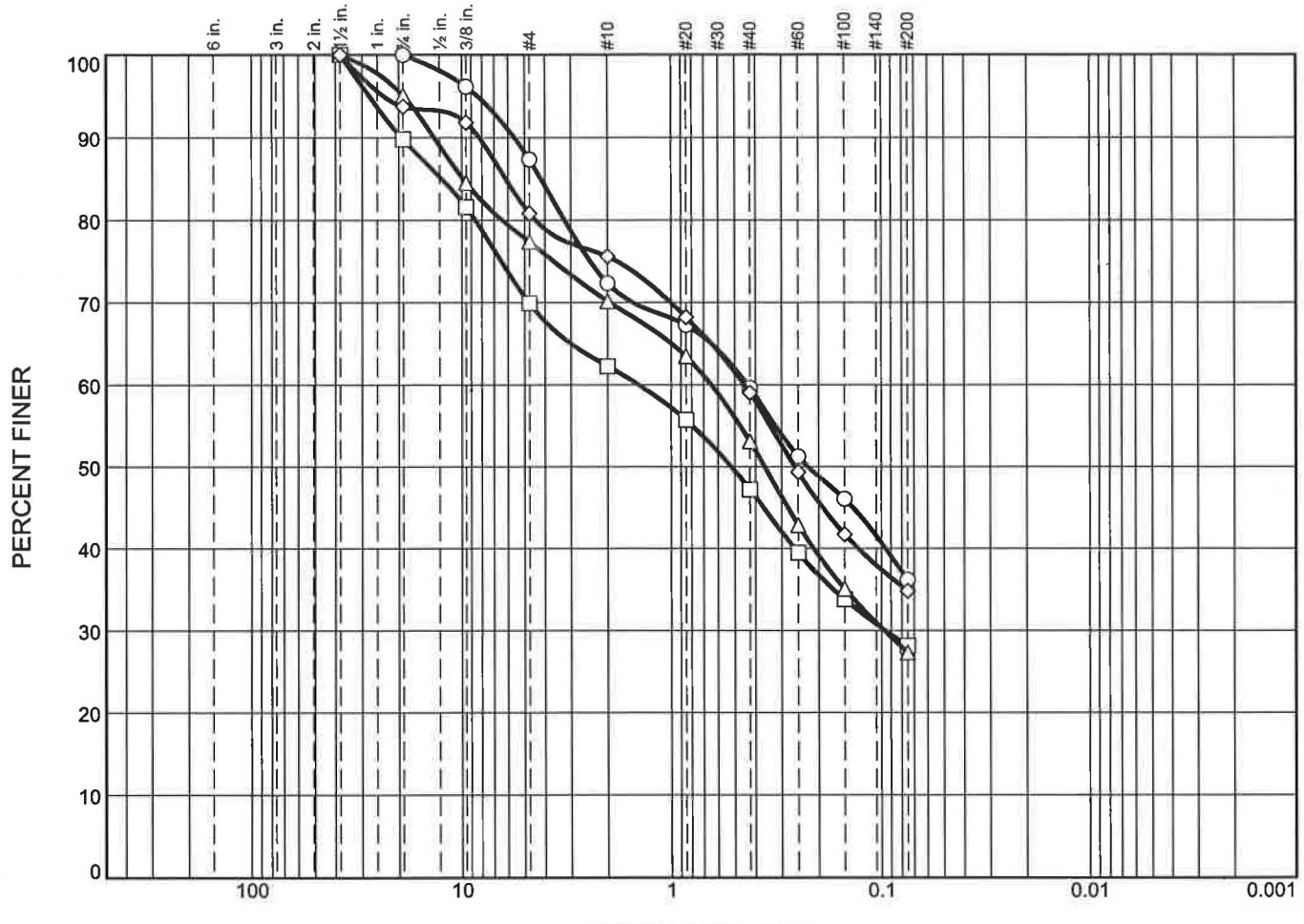
Client: Concord Resort Development

Project: Proposed Roadway, Thompson, NY

Project No.: 8979-004

Plate 6C

Gradation Curve(s)



	% Cobbles	% Gravel		% Sand			% Fines
		Coarse	Fine	Coarse	Medium	Fine	
○	0.0	0.0	12.7	15.0	12.7	23.4	36.2
□	0.0	10.2	19.9	7.6	15.1	19.1	28.1
△	0.0	4.9	17.7	7.2	17.1	25.8	27.3
◇	0.0	6.3	12.9	5.2	16.6	24.2	34.8

SOIL DATA

SYMBOL	SOURCE	SAMPLE NO.	DEPTH (ft.)	Material Description	USCS
○	TP-54	S-2	4	Fine to coarse Sand, and Silt, little fine Gravel. (MC=12.7%)	SM
□	TP-60	S-3	8	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=7.0%)	SM
△	TP-61	S-3	10.5	Fine to coarse Sand, some Silt, some f-c Gravel. (MC=7.4%)	SM
◇	TP-86	S-2	2.0	Fine to coarse Sand, and Silt, little f-c Gravel.	SM

Melick-Tully & Associates, P.C.

South Bound Brook, NJ

Client: Concord Resort Development

Project: Proposed Roadway, Thompson, NY

Project No.: 8979-004

Plate 6D

SUMMARY OF INFILTRATION TEST RESULTS
Thompson, New York
EPT Concord Resort Development

Test Pit	Approximate Surface Elevation (ft)	Approximate Test Depth (ft)	Observed Infiltration Rate (in/hr)
1	1,366	2	2.25
2	1,368	4	14
3	1,364	1	2.25
4	1,366	2.5	*(1)*
5	1,350	2	*(1)*
6	1,350	2	*(1)*
10	1,350	3.5	2.5
11	1,350	3.25	14
13	1,348.5	3	4.25
14	1,348	2	12
15	1,441	2.5	17.5
15	1,441	5.5	28 *(2)*
17	1,443	2	10.5
17	1,443	5.5	*(1)*
35	1,426	2.5	8
35	1,426	2.5	14
36	1,431	5	*(1)*
37	1,382	6	*(1)*
49	1,387.5	3	10
50	1,374	4	10
51	1,376	8.5	23
54	1,378	2.5	23
55	1,381	10	11 *(2)*
60	1,395.5	10.5	8
61	1,395.5	13	6
69	1,374	4.5	6.5
70	1,372.5	9	50 *(2)*
73	1,386	3	5.75
74	1,389.5	3.5	*(1)*
82	1,379	4.5	9
82	1,379	10	9
83	1,385	5.5	45 *(2)*
87	1,407.5	3	*(1)*
88	1,403	2	*(1)*

Notes:

(1) Presoak did not drain after 24 hours

(2) Percolation test run as approved by AKRF, results are minutes/inches

APPENDIX

APPENDIX

Limitations

A. Subsurface Information

Locations: The locations of the explorations were approximately determined by tape measurement from plans prepared by AKRF Engineering entitled "Geotechnical Soil Evaluation" dated October 8, 2012 and/or revised December 19, 2012. Elevations of the explorations were approximately determined by interpolation between contours shown on topographic plans provided to us by the site engineer. The locations and elevations of the explorations should be considered accurate only to the degree implied by the method used.

Interface of Strata: The stratification lines shown on the individual logs of the subsurface explorations represent the approximate boundaries between soil types, and the transitions may be gradual.

Field Logs/Final Logs: A field log was prepared for each exploration by a member of our staff. The field log contains factual information and interpretation of the soil conditions between samples. Our recommendations are based on the final logs as shown in this report and the information contained therein, and not on the field logs. The final logs represent our interpretation of the contents of the field logs, and the results of the laboratory observations and/or tests of the field samples.

Water Levels: Water level readings have been made in the explorations at times and under conditions stated on the individual logs. These data have been reviewed and interpretations made in the text of this report. However, it must be noted that fluctuations in the level of the groundwater will occur due to variations in rainfall, temperature, and other factors.

Pollution/Contamination: Unless specifically indicated to the contrary in this report, the scope of our services was limited only to investigation and evaluation of the geotechnical engineering aspects of the site conditions, and did not include any consideration of potential site pollution or contamination resulting from the presence of chemicals, metals, radioactive elements, etc. This report offers no facts or opinions related to potential pollution/contamination of the site.

Environmental Considerations: Unless specifically indicated to the contrary in this report, this report does not address environmental considerations which may affect the site development, e.g., wetlands determinations, flora and fauna, wildlife, etc. The conclusions and recommendations of this report are not intended to supersede any environmental conditions which should be reflected in the site planning.

B. Applicability of Report

This report has been prepared in accordance with generally accepted soils and foundation engineering practices for the exclusive use of AKRF for specific application to the design of the proposed project. No other warranty, expressed or implied, is made.

This report may be referred to in the project specifications for general information purposes only, but should not be used as the technical specifications for the work, as it was prepared for design purposes exclusively.

C. Reinterpretation of Recommendations

Change in Location or Nature of Facilities: In the event that any changes in the nature, design or location of the facilities are planned, the conclusions and recommendations contained in this report shall not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing.

Changed Conditions During Construction: The analyses and recommendations submitted in this report are based in part upon the data obtained from 14 widely-spaced test borings and 99 test pit excavations performed for this study. The nature and extent of variations between the explorations may not become evident until construction. If variations then appear evident, it will be necessary to reevaluate the recommendations of this report.

Changes in State-of-the-Art: The conclusions and recommendations contained in this report are based upon the applicable standards of our profession at the time this report was prepared.

D. Use of Report by Prospective Bidders

This soil and foundation engineering report was prepared for the project by Melick-Tully and Associates, P.C. for design purposes and may not be sufficient to prepare an accurate bid. Contractors utilizing the information in the report should do so with the express understanding that its scope was developed to address design considerations. Prospective bidders should obtain the owner's permission to perform whatever additional explorations or data gathering they deem necessary to prepare their bid accurately.

E. Construction Observation

We recommend that Melick-Tully and Associates, P.C. be retained to provide on-site soils engineering services during the earthwork construction and foundation phases of the work. This is to observe compliance with the design concepts and to allow changes in the event that subsurface conditions differ from those anticipated prior to the start of construction.

SWPPP

APPENDIX E

CULTURAL RESOURCES

ADDITIONAL INFORMATION

TO FOLLOW AT A

LATER DATE

0 300 600

SCALE: 1" = 300'

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

HART HOWERTON

HART HOWERTON
10 EAST 40TH STREET
NEW YORK, NY 10016
(212) 683-5631 (PHONE)
(212) 481-3768 (FAX)

SITE/CIVIL ENGINEER

AKRF

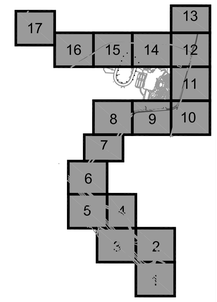
AKRF ENGINEERING, P.C.
34 SOUTH BROADWAY, SUITE 401
WHITE PLAINS, NY 10601
(914) 949-7336 (PHONE)
(914) 949-7559 (FAX)

SURVEYOR

CONTRACTORS' LINE & GRADE SOUTH, LLC
23 NEPPERHAN AVENUE
ELMSFORD, NY 10523
(914) 347-3141 (PHONE)
(914) 347-3120 (FAX)

GEOTECHNICAL CONSULTANT

MELICK-TULLY AND ASSOCIATES, P.C.
117 CANAL ROAD
SOUTH BOUND BROOK, NJ 08880
(732) 356-3400 (PHONE)
(732) 356-9054 (FAX)



KEY PLAN

NYSDEC SWPPP SUBMISSION
NOT FOR CONSTRUCTION

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT

EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=300'	01/30/13

SHEET TITLE

OVERALL SITE PLAN

SHEET NO.

C-100

MATCHLINE - SEE TILE 2

ROUTE 17 EXIT 106 ON-RAMP

ROUTE 17 WESTBOUND

ROUTE 17 EASTBOUND

ROUTE 17 EXIT 106 OFF-RAMP

31-1-62.3

31-1-62.4

31-1-62.4

31-1-67

31-1-63

31-1-60

31-1-61

31-1-59

31-1-62.1

31-1-58

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80

SCALE: 1" = 40'

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

HART | HOWERTON

HART HOWERTON
10 EAST 40TH STREET
NEW YORK, NY 10016
(212) 683-5631 (PHONE)
(212) 481-3768 (FAX)

SITE/CIVIL ENGINEER

AKRF

AKRF ENGINEERING, P.C.
34 SOUTH BROADWAY, SUITE 401
WHITE PLAINS, NY 10601
(914) 949-7336 (PHONE)
(914) 949-7559 (FAX)

SURVEYOR

CONTRACTORS' LINE & GRADE SOUTH, LLC
23 NEPPERHAN AVENUE
ELMSFORD, NY 10523
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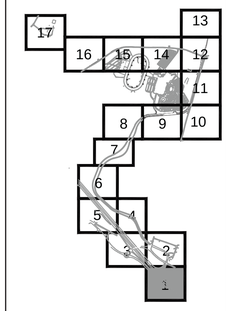

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REVISIONS

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EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EXISTING CONDITIONS PLAN

TILE 1

SHEET NO.

C-201

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

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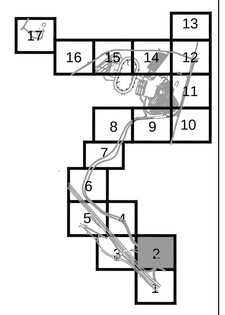

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PROJECT
EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

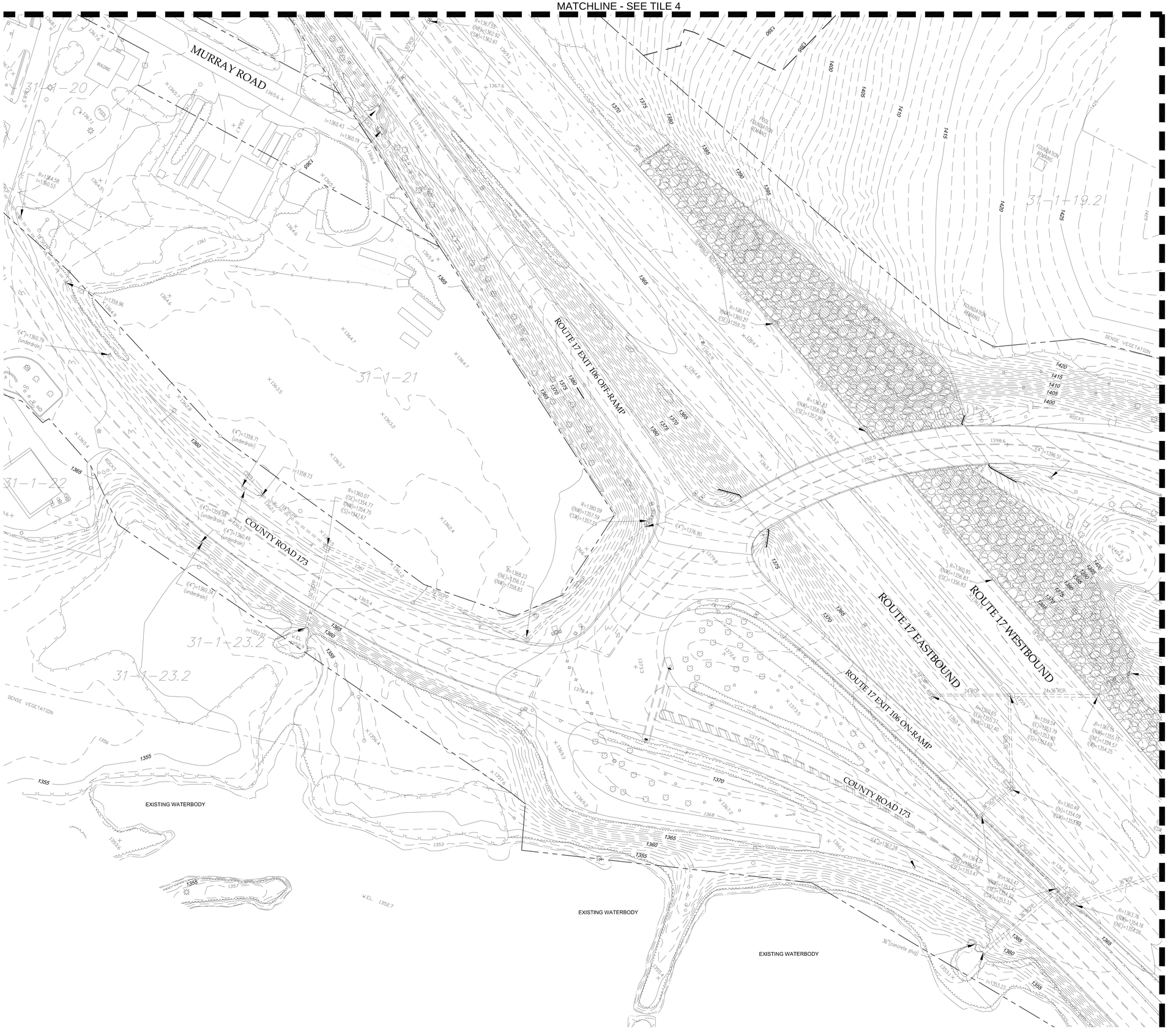
SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 2

SHEET NO.
C-202

MATCHLINE - SEE TILE 4

MATCHLINE - SEE TILE 2



LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
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- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

APPLICANT

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KANSAS CITY, MO 64106
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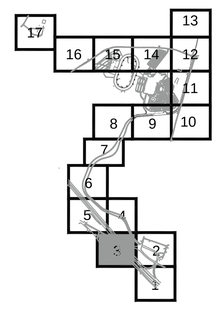

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TOWN OF THOMPSON
NEW YORK

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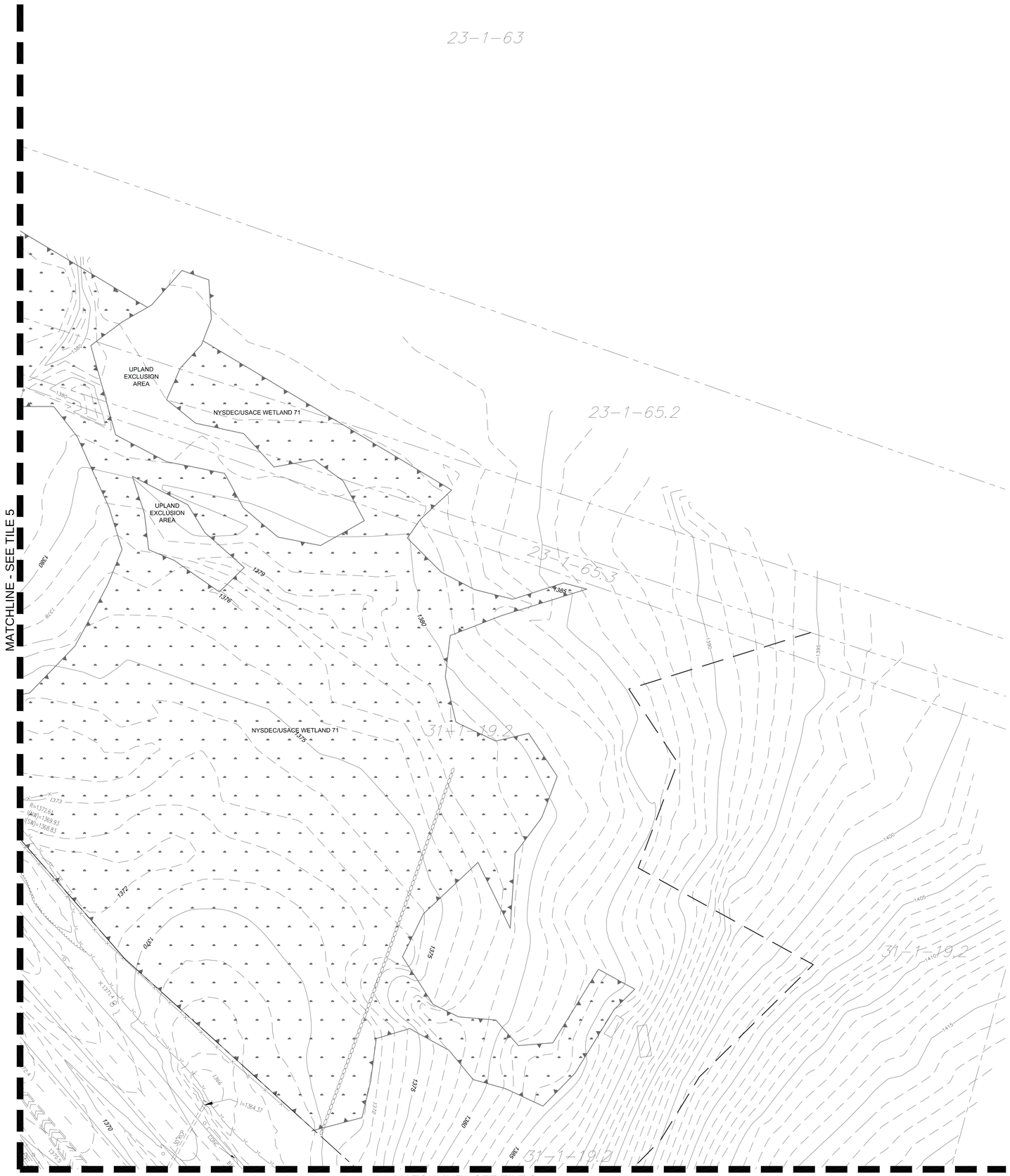
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 3

SHEET NO.
C-203



LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
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- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

HART | HOWERTON

HART HOWERTON
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NEW YORK, NY 10016
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SURVEYOR

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SOUTH BOUND BROOK, NJ 08880
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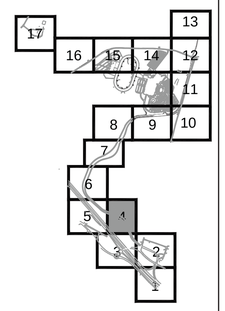

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PROJECT
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TOWN OF THOMPSON
NEW YORK

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EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 4

SHEET NO.
C-204

MATCHLINE - SEE TILE 6

MATCHLINE - SEE TILE 4

MATCHLINE - SEE TILE 3

NYSDEC/USACE WETLAND 71

ROUTE 17 WESTBOUND

ROUTE 17 EASTBOUND

COUNTY ROAD 173

MURRAY ROAD

31-1-14.2

31-1-15

31-1-16

31-1-17.1

31-1-10.12

31-1-9.1

31-1-19.1

BUILDING

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
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- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80

SCALE: 1" = 40'

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
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MASTER PLANNER / LANDSCAPE ARCHITECT

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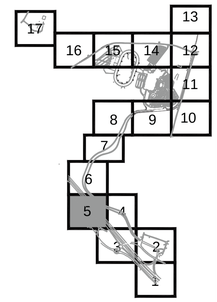

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PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

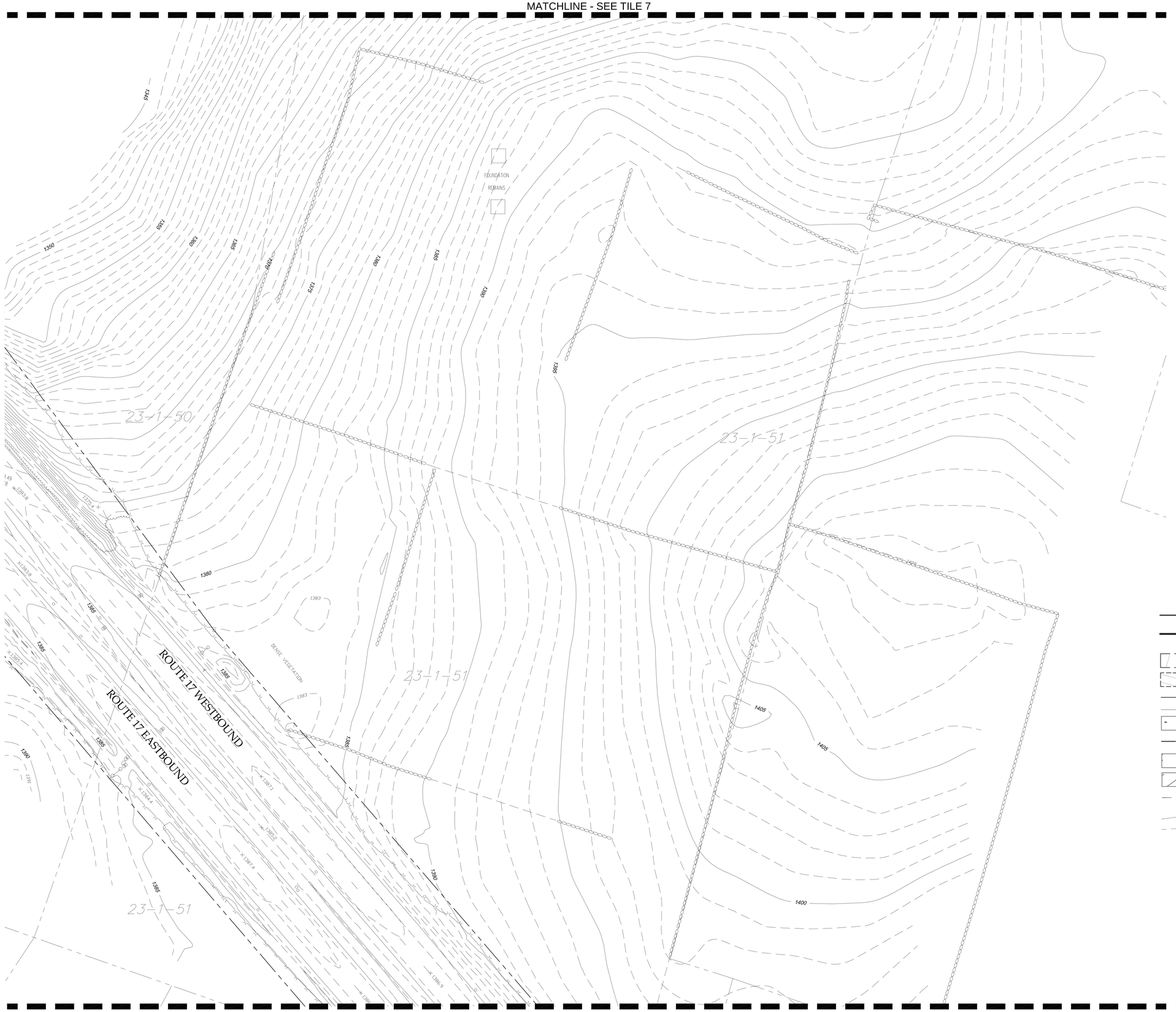
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 5

SHEET NO.
C-205

MATCHLINE - SEE TILE 7



MATCHLINE - SEE TILE 5

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
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- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

APPLICANT

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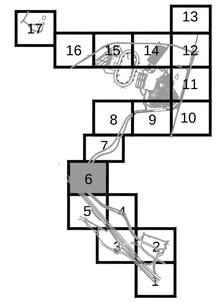

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT

EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

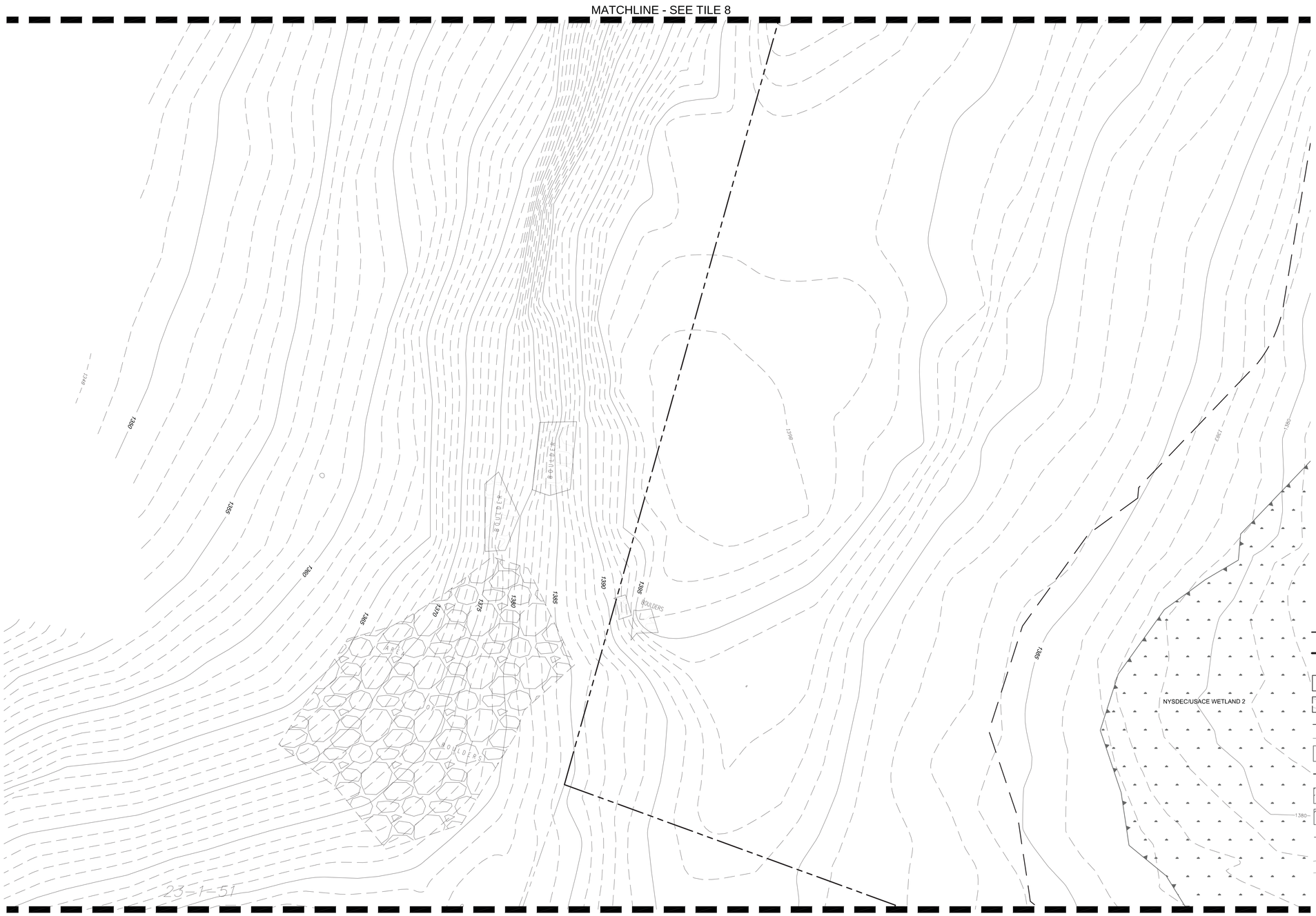
EXISTING CONDITIONS PLAN

TILE 6

SHEET NO.

C-206

MATCHLINE - SEE TILE 8



MATCHLINE - SEE TILE 6

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
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- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

APPLICANT

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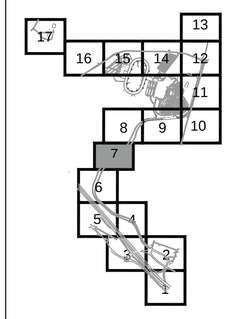

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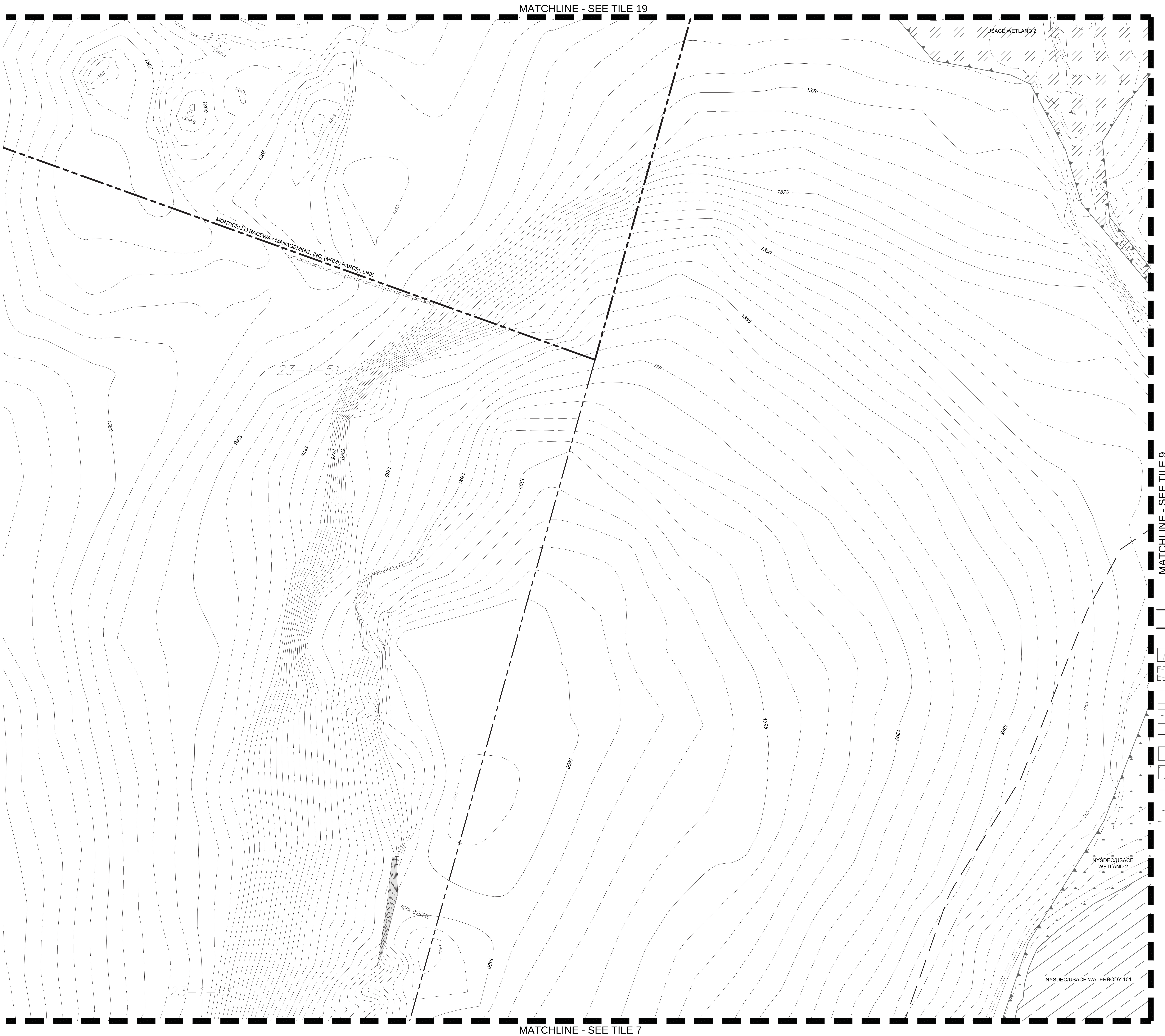
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 7

SHEET NO.
C-207



LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

HART HOWERTON

HART HOWERTON
10 EAST 40TH STREET
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SITE/CIVIL ENGINEER

AKRF

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WHITE PLAINS, NY 10601
(914) 949-7336 (PHONE)
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SURVEYOR

CONTRACTORS' LINE & GRADE SOUTH, LLC
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GEOTECHNICAL CONSULTANT

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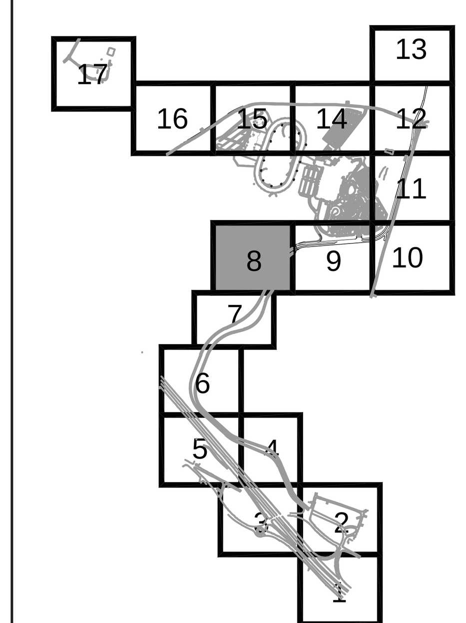

KEY PLAN

NYSDEC SWPPP SUBMISSION
NOT FOR CONSTRUCTION

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE TOWN OF THOMPSON NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 8

SHEET NO.
C-208

MATCHLINE - SEE TILE 18

MATCHLINE - SEE TILE 8

MATCHLINE - SEE TILE 10

MONTICELLO RACEWAY MANAGEMENT, INC. (MRMI) PARCEL LINE

USACE WETLAND 3

NYSDEC/USACE WETLAND 2

NYSDEC/USACE WETLAND 2

NYSDEC/USACE WETLAND 2

NYSDEC/USACE WATERBODY 101

LAKE

DENSE EVERGREEN COVERAGE

ROCKS

ROCK

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80

SCALE: 1" = 40'

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TOWN OF THOMPSON
NEW YORK

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EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EXISTING CONDITIONS PLAN

TILE 9

SHEET NO.

C-209

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
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SCALE: 1" = 40'

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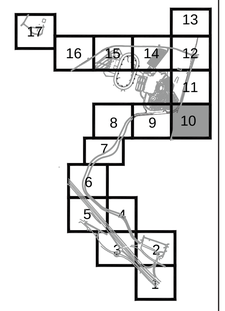

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SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 10

SHEET NO.
C-210

MATCHLINE - SEE TILE 12

MATCHLINE - SEE TILE 18

MATCHLINE - SEE TILE 10

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
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- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

APPLICANT

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KANSAS CITY, MO 64106
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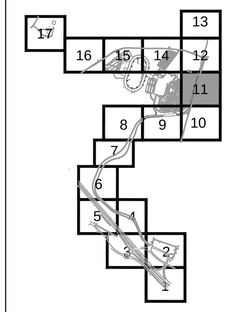

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1"=40'	01/30/13

SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 11

SHEET NO.
C-211

MATCHLINE - SEE TILE 13

MATCHLINE - SEE TILE 14

MATCHLINE - SEE TILE 11

USACE WETLAND 34

USACE WETLAND 52

USACE WETLAND 52

15-1-20

15-1-20

THOMPSONVILLE ROAD

CHALET ROAD

JOYLAND ROAD

POLE

BUNGALOW

POOL

CLUBHOUSE

DENSE VEGETATION

ROCKS

ROCK

SHED

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
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- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80

SCALE: 1" = 40'

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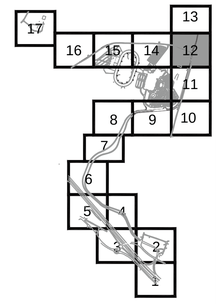

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1"=40'	01/30/13

SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 12

SHEET NO.
C-212

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
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- EXISTING PARCEL BOUNDARY
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- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

APPLICANT

EPT CONCORD II, LLC
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KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
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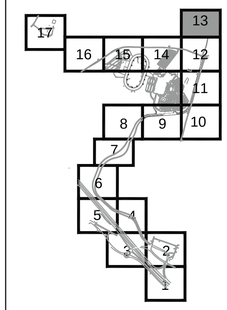

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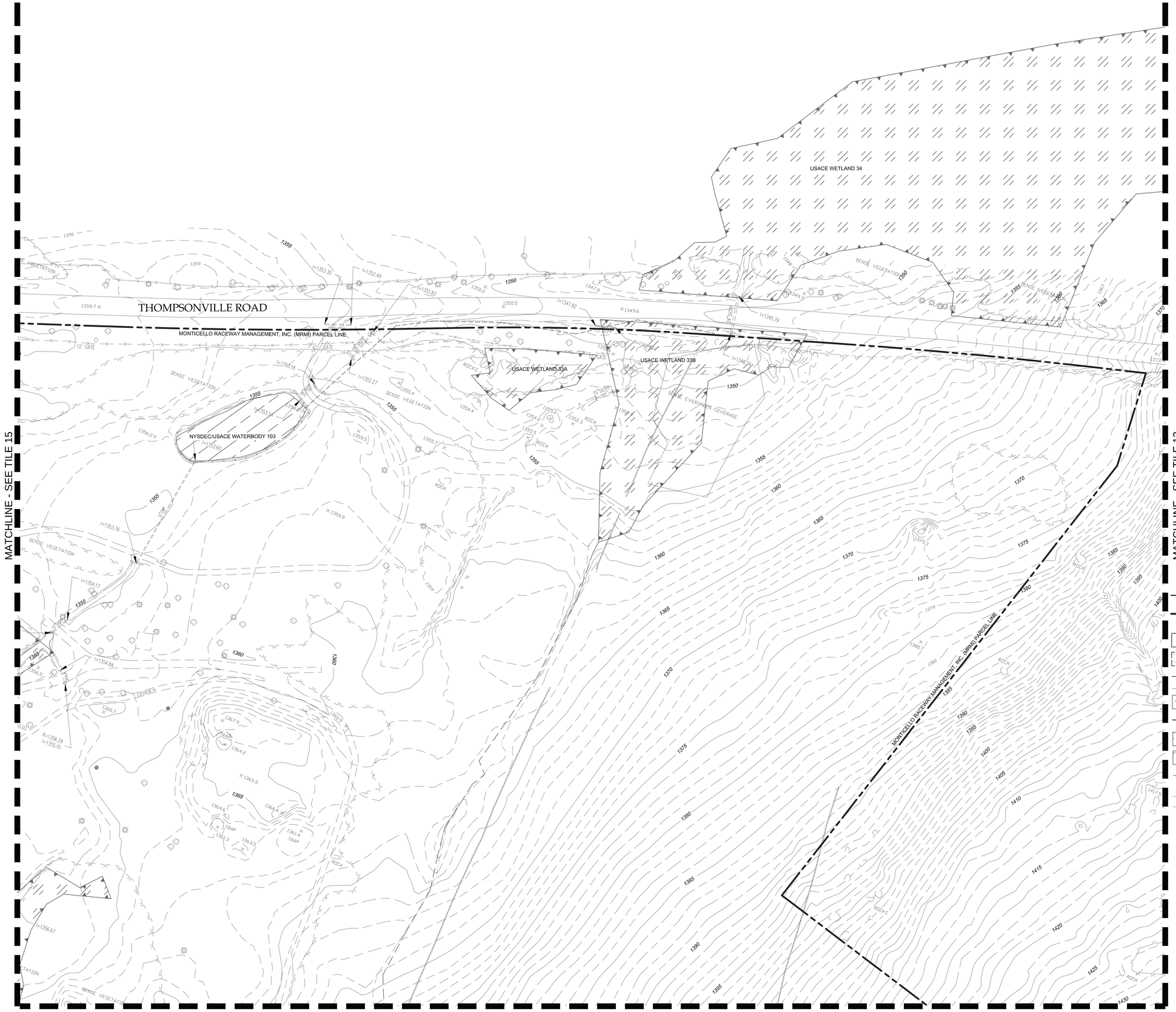
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 13

SHEET NO.
C-213



LEGEND

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- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

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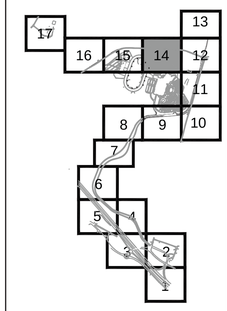

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SCALE	DATE
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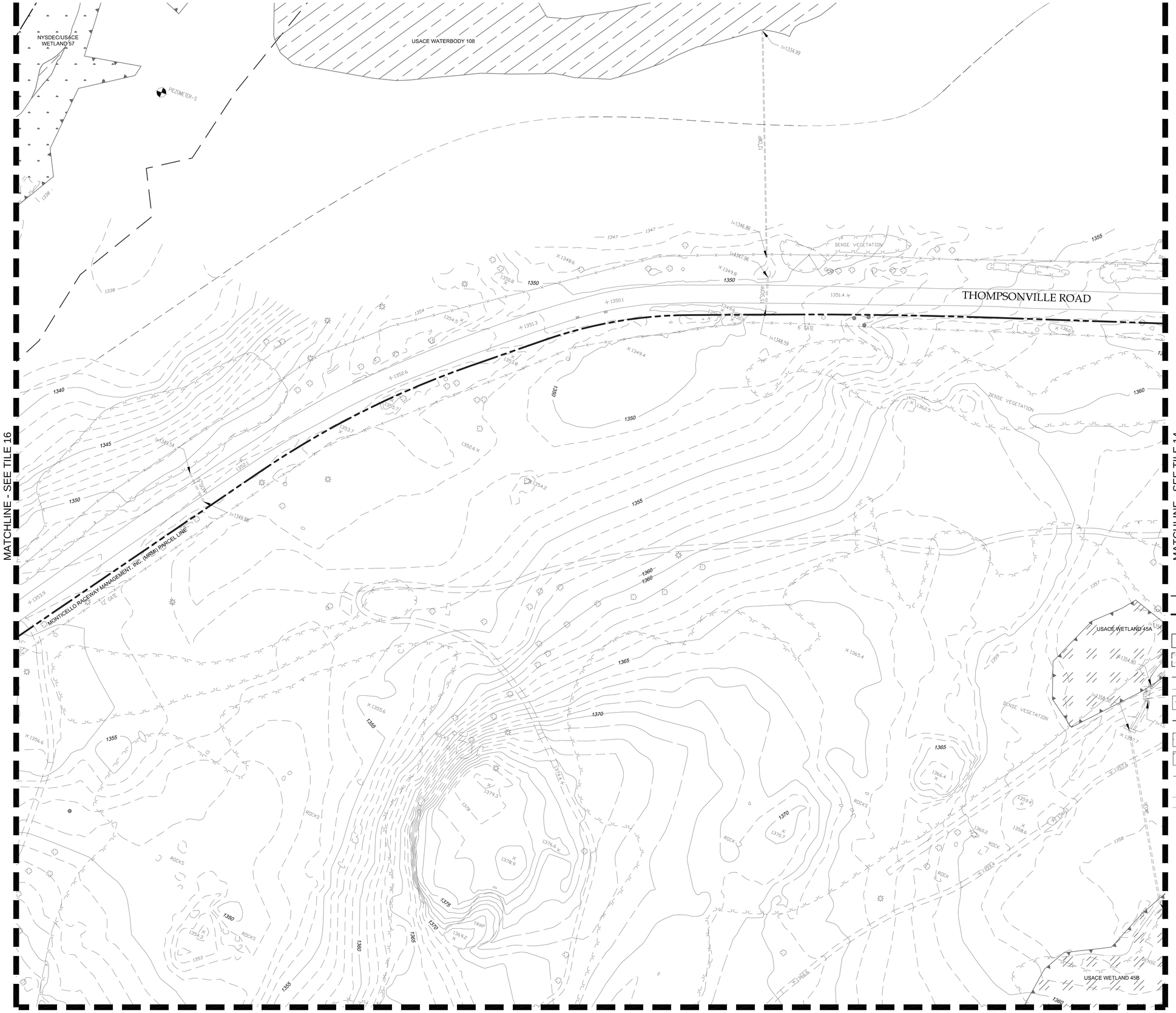
SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 14

SHEET NO.
C-214



LEGEND

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- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

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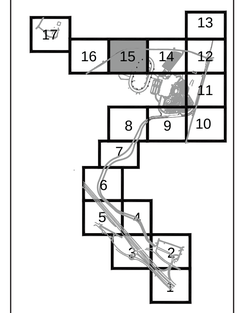

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SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 15

SHEET NO.
C-215

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

0 20 40 80
SCALE: 1" = 40'

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

HART | HOWERTON

HART HOWERTON
10 EAST 40TH STREET
NEW YORK, NY 10016
(212) 683-5631 (PHONE)
(212) 481-3768 (FAX)

SITE/CIVIL ENGINEER

AKRF

AKRF ENGINEERING, P.C.
34 SOUTH BROADWAY, SUITE 401
WHITE PLAINS, NY 10601
(914) 949-7336 (PHONE)
(914) 949-7559 (FAX)

SURVEYOR

CONTRACTORS' LINE & GRADE SOUTH, LLC
23 NEPPERHAN AVENUE
ELMSFORD, NY 10523
(914) 347-3141 (PHONE)
(914) 347-3120 (FAX)

GEOTECHNICAL CONSULTANT

MELICK-TULLY AND ASSOCIATES, P.C.
117 CANAL ROAD
SOUTH BOUND BROOK, NJ 08880
(732) 356-3400 (PHONE)
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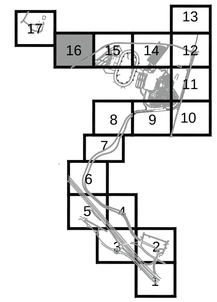

KEY PLAN

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
EXISTING CONDITIONS PLAN

TILE 16

SHEET NO.
C-216

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR

APPLICANT

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KANSAS CITY, MO 64106
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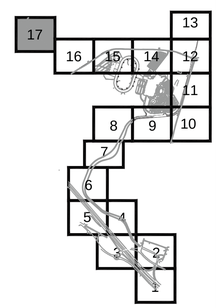

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT

EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

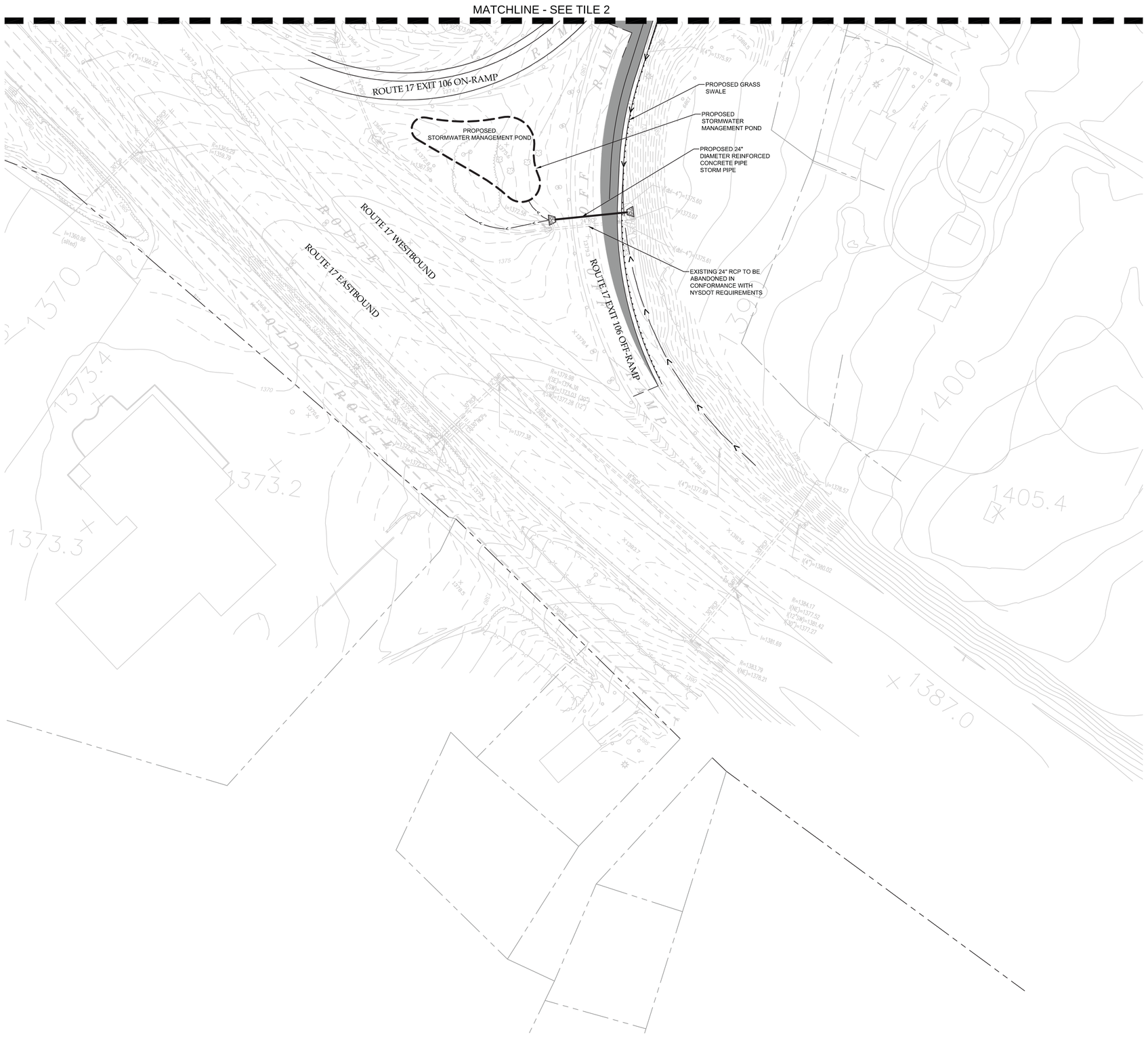
SHEET TITLE

EXISTING CONDITIONS PLAN

TILE 17

SHEET NO.

C-217



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- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
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- 1390 EXISTING MAJOR CONTOUR
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- 1375 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- SW PROPOSED STORMWATER PIPE
- PROPOSED GRASSED SWALE
- PROPOSED MANHOLE
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED CATCH BASIN/YARD DRAIN
- PROPOSED TRENCH DRAIN
- PROPOSED OUTFALL/CULVERT
- PROPOSED LEVEL SPREADER
- UD PROPOSED UNDERDRAIN
- PUD PROPOSED CUTOFF TRENCH AND UNDERDRAIN
- UNDERGROUND SAND FILTER
- PROPOSED FLOW DIVERSION STRUCTURE
- PROPOSED STORMWATER MANAGEMENT POND FOOTPRINT
- PROPOSED BIORETENTION AREA FOOTPRINT
- TIMBER GUIDERAIL
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT (NYSDOT)
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED STANDARD DUTY ASPHALT PAVEMENT
- PROPOSED CONCRETE SURFACE
- PROPOSED GRASS PAVERS
- PROPOSED POROUS PAVEMENT WITH 6" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 12" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 24" RESERVOIR COURSE
- PROPOSED IMPRINTED CONCRETE SURFACE (SEE LANDSCAPE DRAWINGS)
- PROPOSED BIORETENTION AREA
- SIGNALIZED INTERSECTION
- TRAFFIC ARROW (PAVEMENT MARK)
- TRAFFIC FLOW
- PROPOSED LIGHTING FIXTURE (MRMI)
- PROPOSED STREET LIGHTS (ENTRY ROAD)
- (2) DENOTES STORM STRUCTURE NUMBER
- P - 2 DENOTES STORM PIPE NUMBER
- PROPOSED SCREEN/RETAINING WALL
- PROPOSED CONC. CURB AND GUTTER (ADJ. TO ASP. PVMT)
- PROPOSED CONC. CURB AND GUTTER (ADJ. TO CONC. PVMT.)
- PROPOSED CURB (NYSDOT)
- PROPOSED 6" CURB WITH 10" GUTTER
- PROPOSED 6" CURB

0 20 40 80
SCALE: 1" = 40'

APPLICANT

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KANSAS CITY, MO 64106
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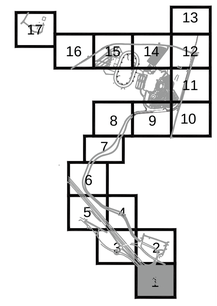

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TOWN OF THOMPSON
NEW YORK

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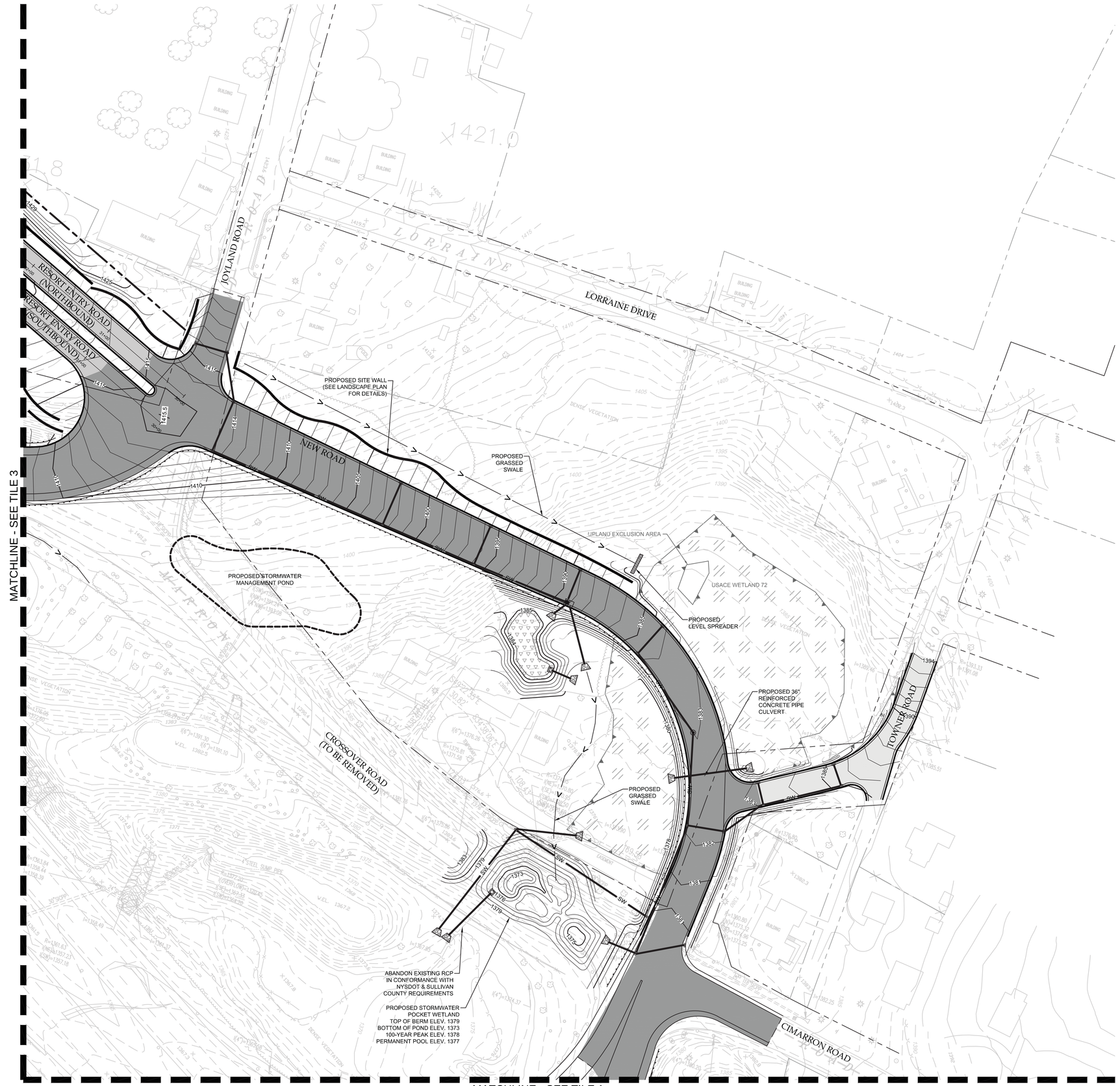
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 1

SHEET NO.
C-501



LEGEND

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- PROPOSED LANDSCAPE BUFFER
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- UD PROPOSED UNDERDRAIN
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- PROPOSED 6" CURB

0 20 40 80
SCALE: 1" = 40'

APPLICANT

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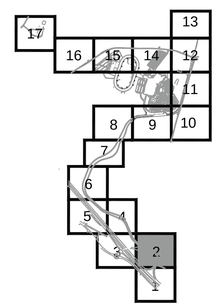

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REVISIONS

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EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 2

SHEET NO.
C-502

MATCHLINE - SEE TILE 5

MATCHLINE - SEE TILE 4

MATCHLINE - SEE TILE 2

MURRAY ROAD

COUNTY ROAD 173

ROUTE 17 WESTBOUND

ROUTE 17 EASTBOUND

ROUTE 17 EXIT 106 OFF-RAMP

ROUTE 17 EXIT 106 ON-RAMP

RESORT ENTRY ROAD (NORTHBOUND)

RESORT ENTRY ROAD (SOUTHBOUND)

PROPOSED 2' WIDE GRAVEL SHOULDER

PROPOSED GRASS SWALE

PROPOSED RETAINING WALL

PROPOSED BIORETENTION BASIN

EXISTING WATERBODY

DENSE VEGETATION

FOUNDATION REMAINS

SCALE: 1" = 40'

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
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- PROPOSED 6" CURB

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SCALE: 1" = 40'

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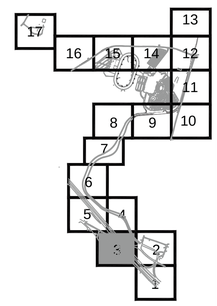

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No.	DATE	DESCRIPTION

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EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
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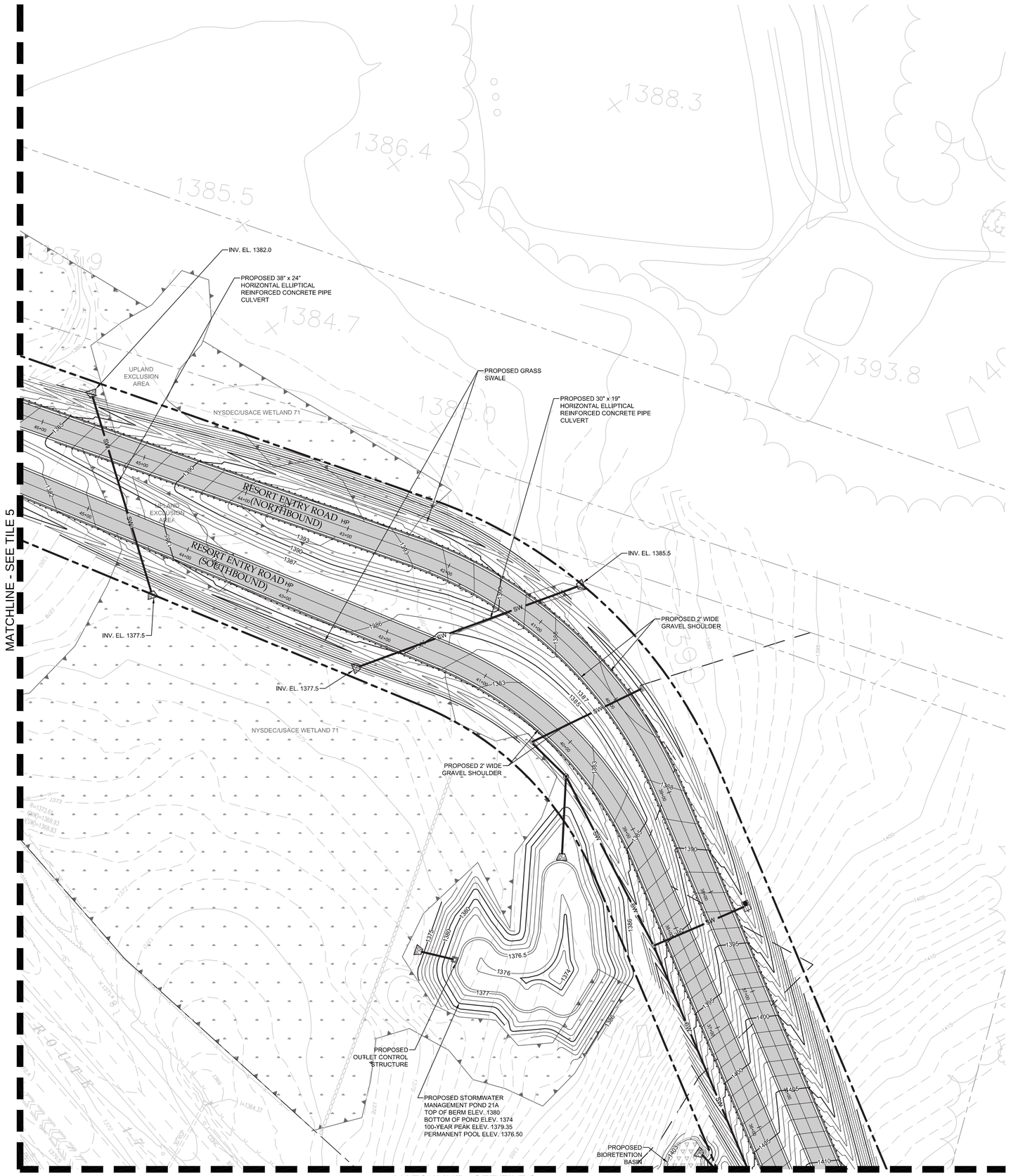
SHEET TITLE

GRADING, PAVING AND DRAINAGE PLAN

TILE 3

SHEET NO.

C-503



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SCALE: 1" = 40'

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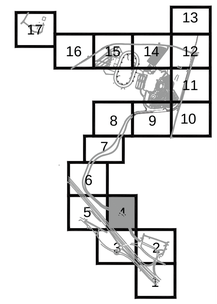

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REVISIONS

No.	DATE	DESCRIPTION

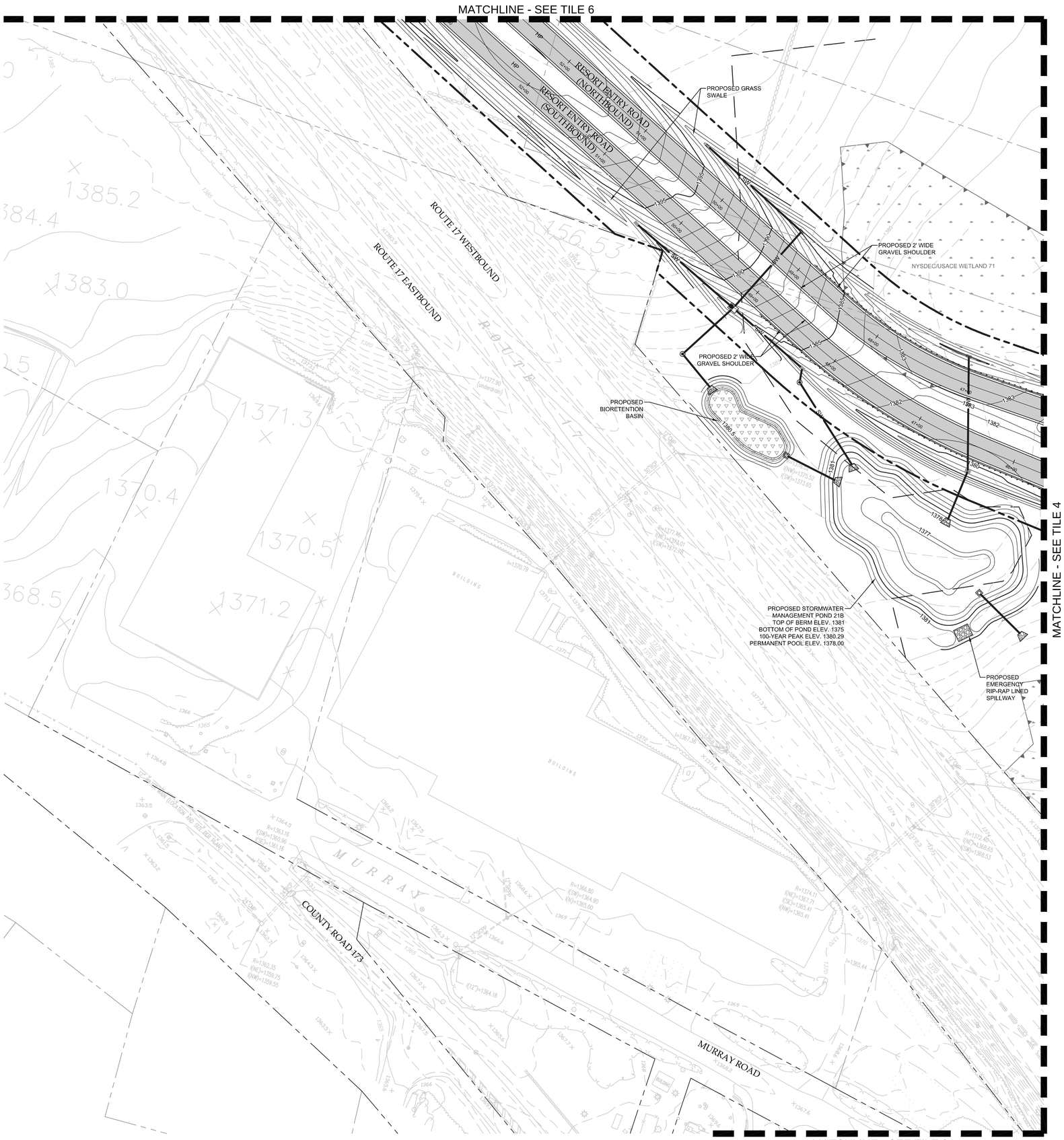
PROJECT
EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 4

SHEET NO.
C-504



LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
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- NYSDEC 100' WETLAND BUFFER
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- PROPOSED POROUS PAVEMENT WITH 12" RESERVOIR COURSE
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- SIGNALIZED INTERSECTION
- TRAFFIC ARROW (PAVEMENT MARK)
- TRAFFIC FLOW
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- DENOTES STORM STRUCTURE NUMBER
- P - 2 DENOTES STORM PIPE NUMBER
- PROPOSED SCREEN/RETAINING WALL
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- PROPOSED CONC. CURB AND GUTTER (ADJ. TO CONC. PVMT.)
- PROPOSED CURB (NYSDOT)
- PROPOSED 6" CURB WITH 10" GUTTER
- PROPOSED 6" CURB

0 20 40 80
SCALE: 1" = 40'

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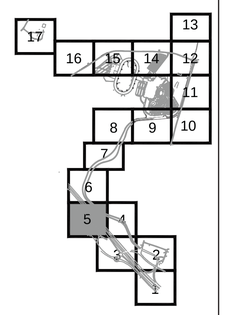

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SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 5

SHEET NO.
C-505

MATCHLINE - SEE TILE 7

MATCHLINE - SEE TILE 5

PROPOSED GRASS SWALE

EXISTING STONE WALL TO REMAIN

FOUNDATION TO REMAIN

RESORT ENTRY ROAD (SOUTHBOUND)

RESORT ENTRY ROAD (NORTHBOUND)

PROPOSED BIORETENTION BASIN

1384
1383.5
1383.0

PROPOSED RIP-RAP LINED EMERGENCY SPILLWAY

PROPOSED STORMWATER MANAGEMENT POND 23
TOP OF BERM ELEV. 1386
BOTTOM OF POND ELEV. 1377
100-YEAR PEAK ELEV. 1384.54
PERMANENT POOL ELEV.1381.00

PROPOSED VEGETATED SWALE
150' @ 1.0%
(SEE DETAIL)

PROPOSED VEGETATED SWALE
170' @ 1.2%
(SEE DETAIL)

PROPOSED BIORETENTION BASIN

EL. 1388.50

PROPOSED VEGETATED SWALE
180' @ 1.1%
(SEE DETAIL)

PROPOSED VEGETATED SWALE
150' @ 0.7%
(SEE DETAIL)

PROPOSED 2' WIDE GRAVEL SHOULDER

PROPOSED BIORETENTION BASIN

PROPOSED VEGETATED SWALE
100' @ 2.5%
(SEE DETAIL)

PROPOSED 2' WIDE GRAVEL SHOULDER

PROPOSED VEGETATED SWALE
100' @ 2.2%
(SEE DETAIL)

ROUTE 17 WESTBOUND

ROUTE 17 EASTBOUND

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- PROPOSED 6" CURB

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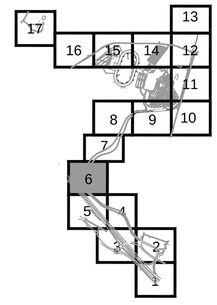

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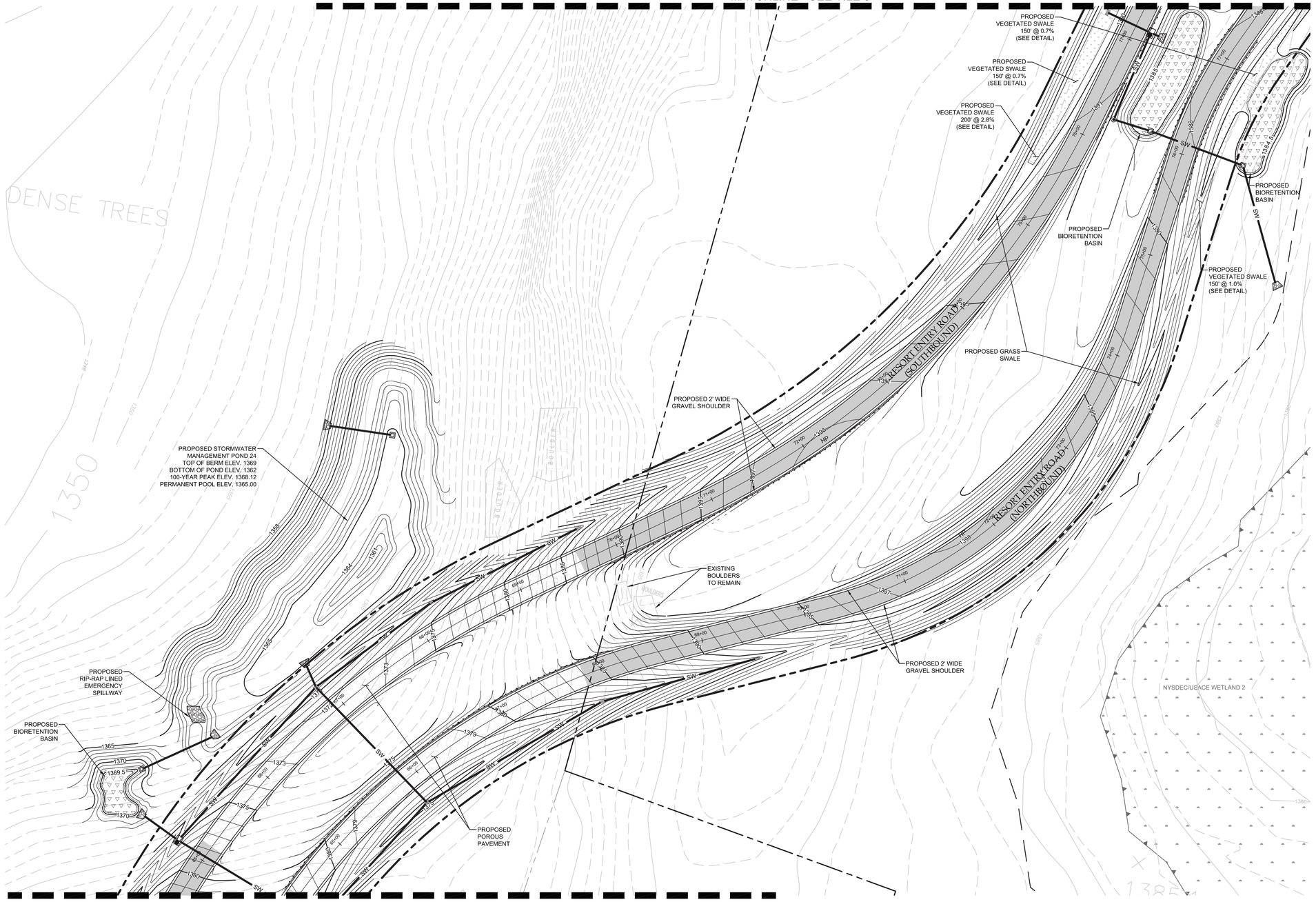
SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 6

SHEET NO.
C-506



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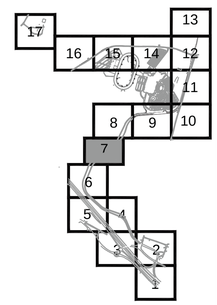

KEY PLAN

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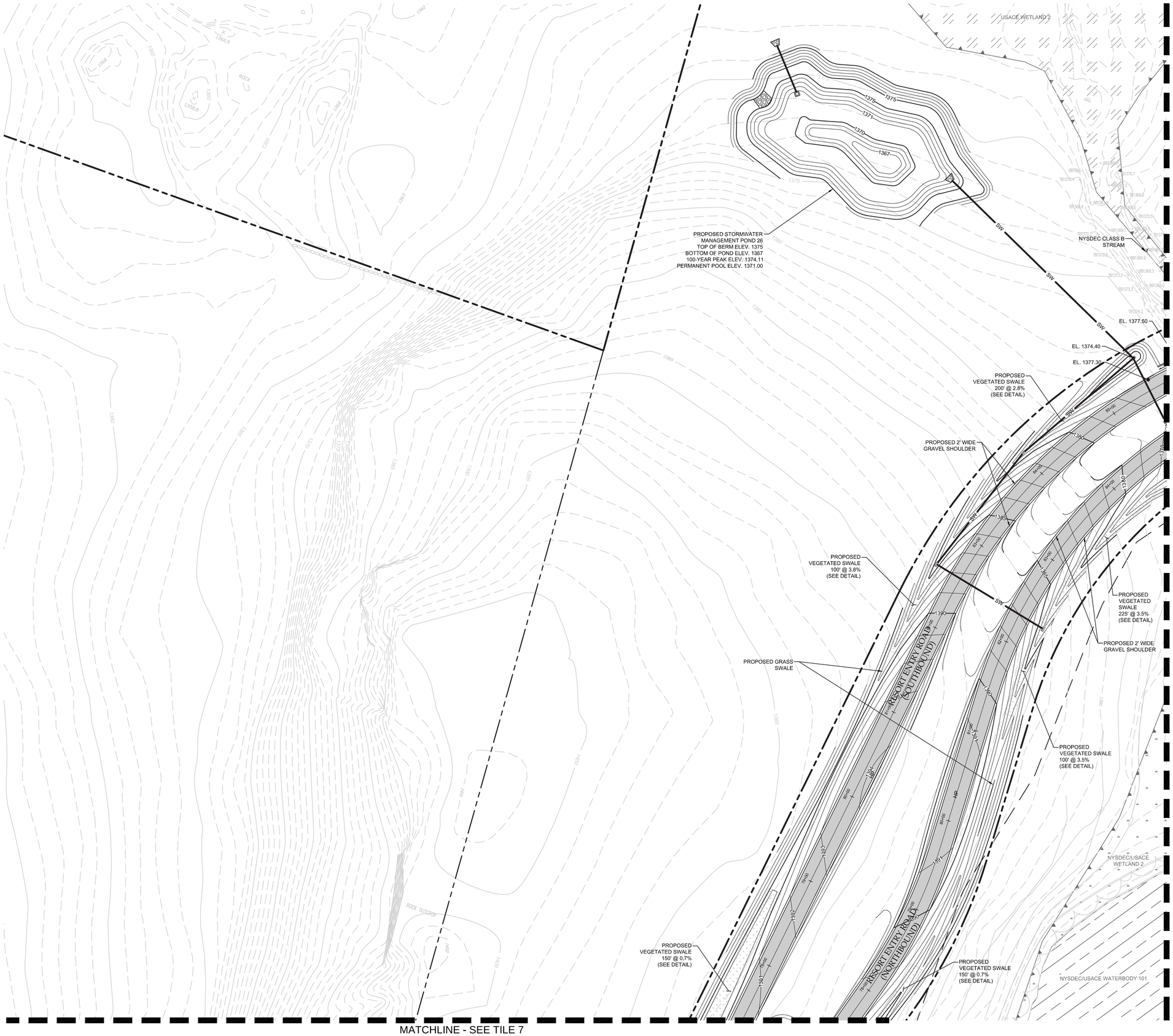
SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 7

SHEET NO.
C-507



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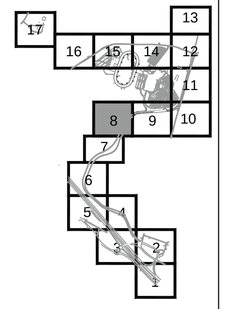

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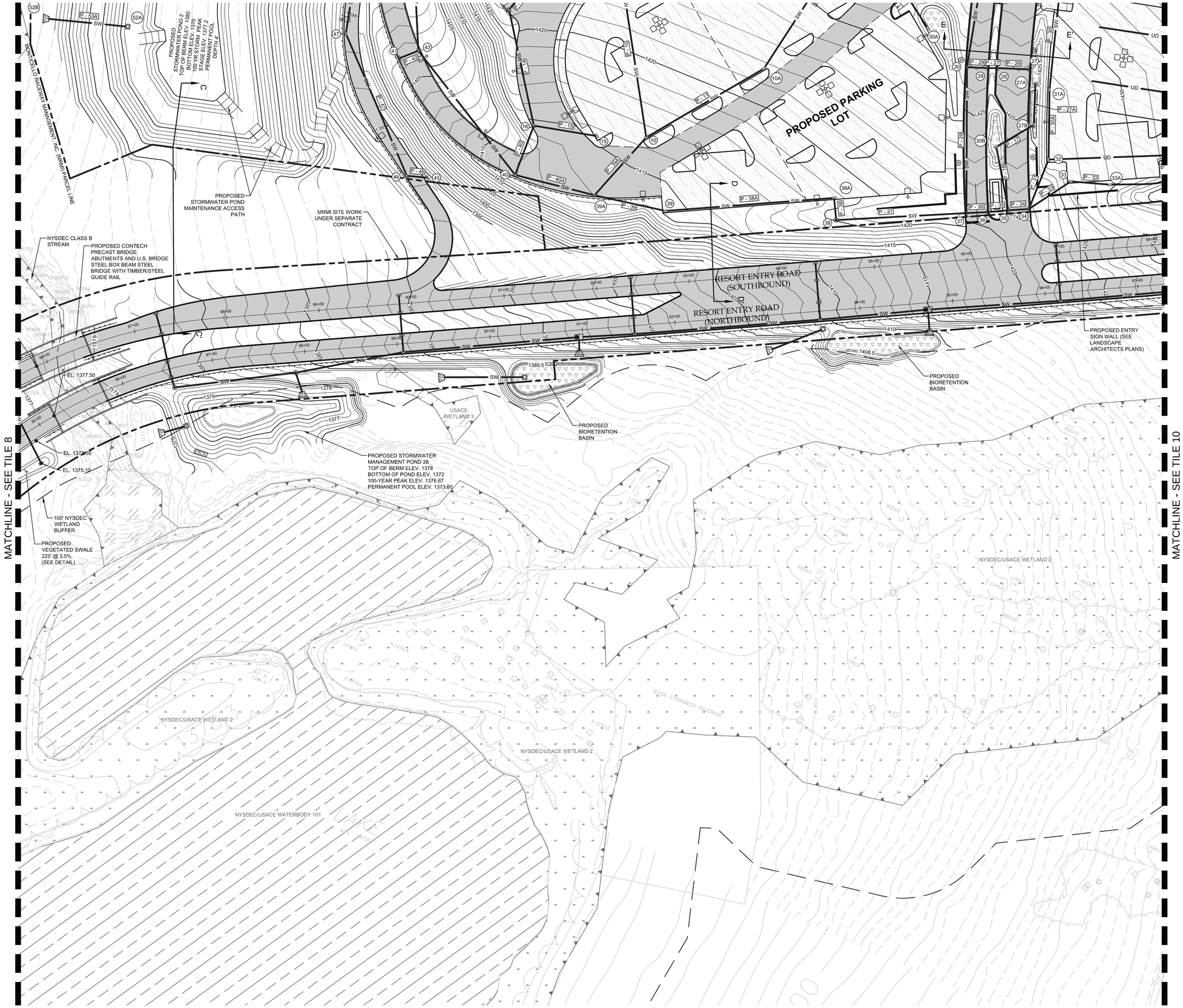
SHEET TITLE

GRADING, PAVING AND DRAINAGE PLAN

TILE 8

SHEET NO.

C-508



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- PROPOSED OUTFALL/CULVERT
- PROPOSED LEVEL SPREADER
- PROPOSED UNDERDRAIN
- PROPOSED CUTOFF TRENCH AND UNDERDRAIN
- UNDERGROUND SAND FILTER
- PROPOSED FLOW DIVERSION STRUCTURE
- PROPOSED STORMWATER MANAGEMENT POND FOOTPRINT
- PROPOSED BIORETENTION AREA FOOTPRINT
- TIMBER GUIDERAIL
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT (NYSDOT)
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
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- PROPOSED GRASS PAVERS
- PROPOSED POROUS PAVEMENT WITH 6" RESERVOIR COURSE
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- PROPOSED 6" CURB WITH 10" GUTTER
- PROPOSED 6" CURB

0 20 40 80
SCALE: 1" = 40'

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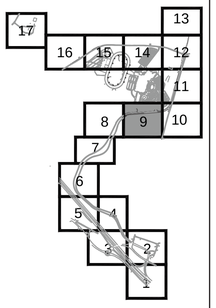

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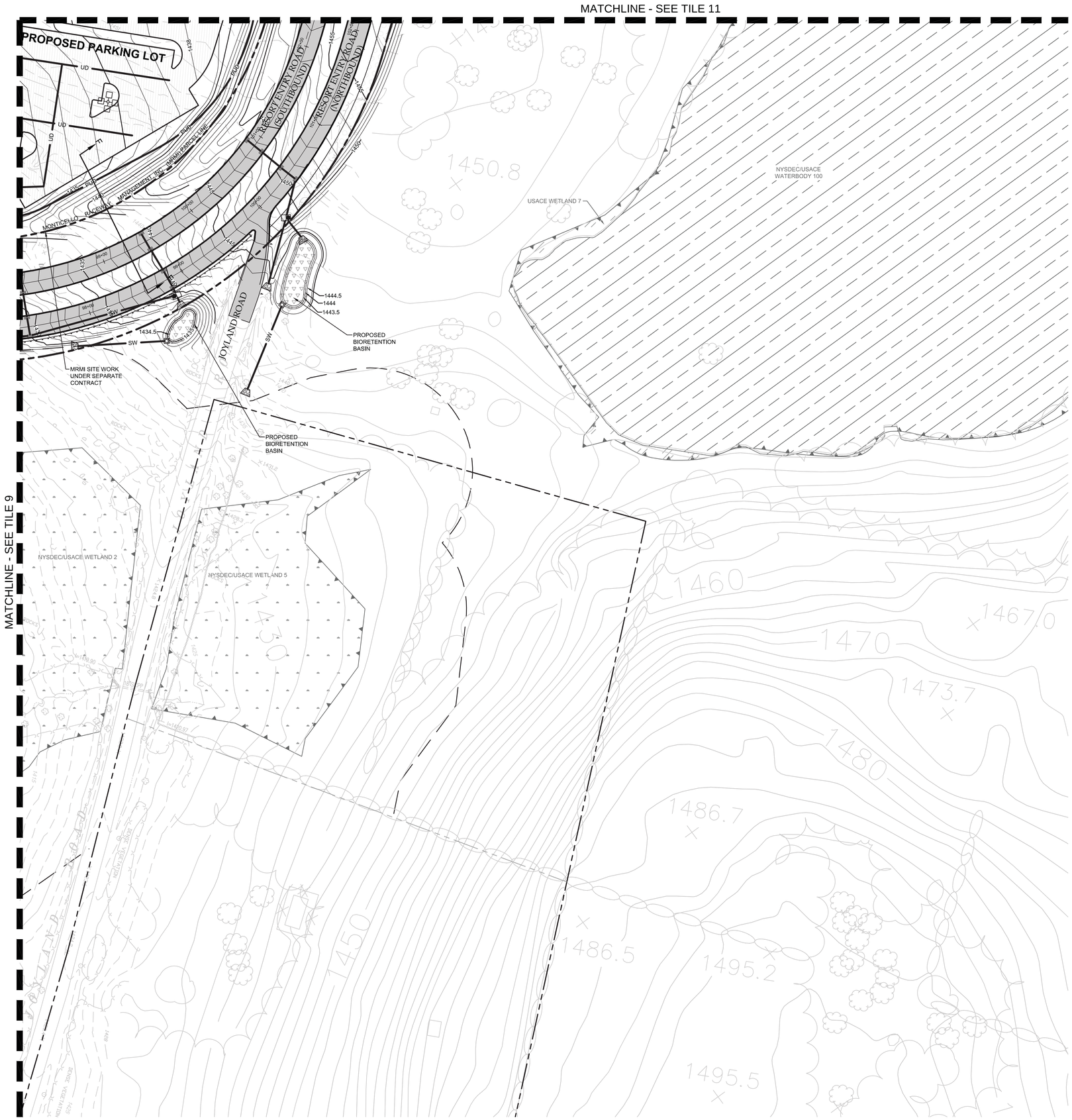
EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 9

SHEET NO.
C-509



LEGEND

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- PROPOSED LANDSCAPE BUFFER
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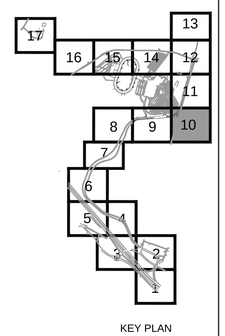

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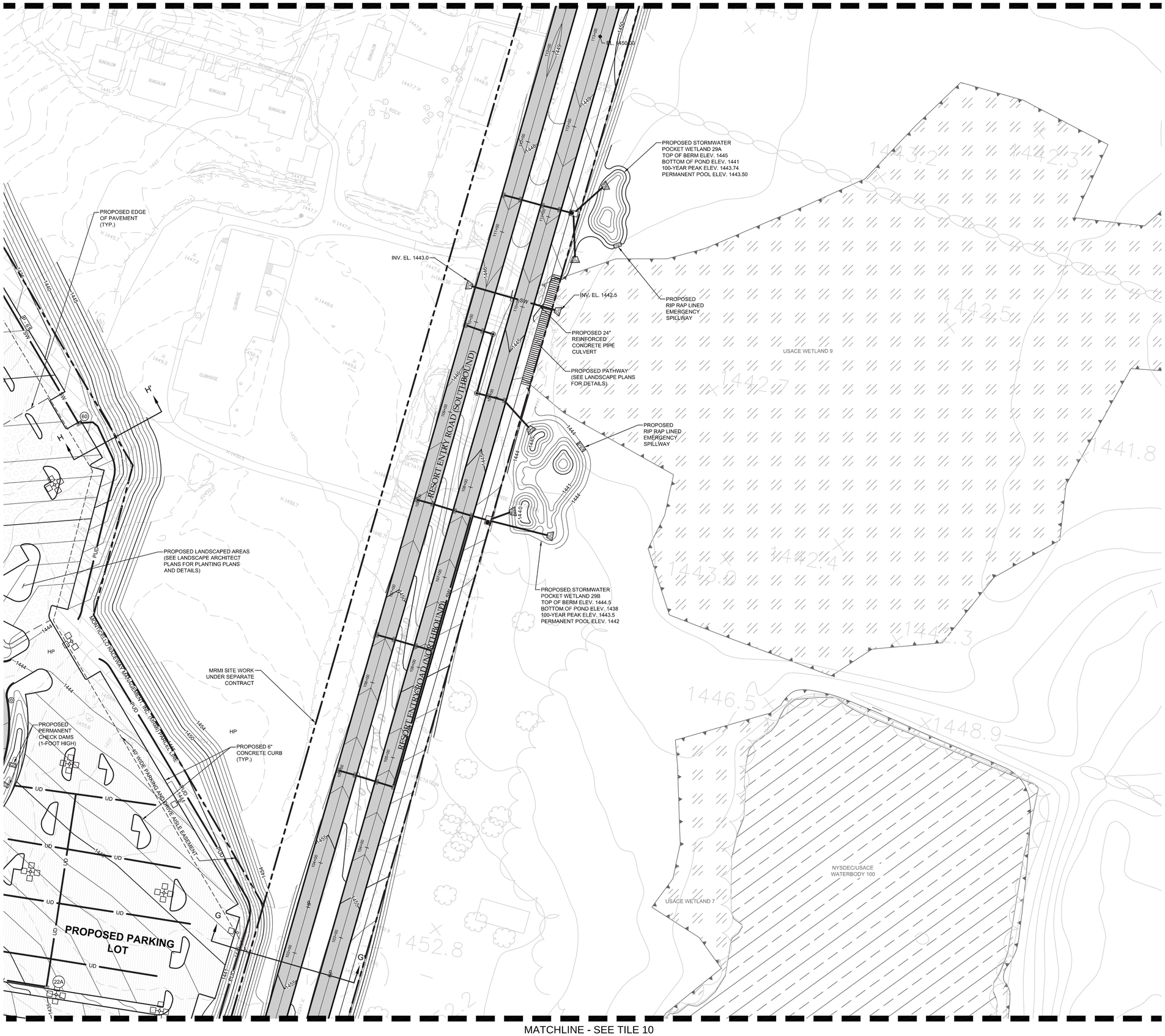
SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 10

SHEET NO.
C-510

MATCHLINE - SEE TILE 12



MATCHLINE - SEE TILE 10

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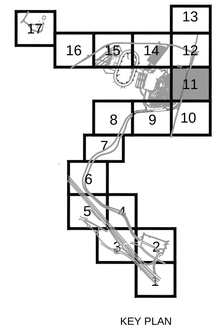

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TOWN OF THOMPSON
NEW YORK

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EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 11

SHEET NO.
C-511

MATCHLINE - SEE TILE 13

MATCHLINE - SEE TILE 14

MATCHLINE - SEE TILE 11

USACE WETLAND 34

PROPOSED BIORETENTION BASIN

PROPOSED GRASS SWALE

PROPOSED POROUS PAVEMENT (REFER TO LANDSCAPE ARCHITECTURE DRAWINGS)

THOMPSONVILLE ROAD

MRMI SITE WORK UNDER SEPARATE CONTRACT

PROPOSED 2' WIDE GRAVEL SHOULDER

CHALET ROAD

RESORT ENTRY ROAD (SOUTHBOUND)

RESORT ENTRY ROAD (NORTHBOUND)

PROPOSED RIP RAP LINED EMERGENCY SPILLWAY

PROPOSED STORMWATER POCKET WETLAND 30
TOP OF BERM ELEV. 1440
BOTTOM OF POND ELEV. 1434
100-YEAR PEAK ELEV. 1439
PERMANENT POOL ELEV. 1437

PROPOSED 10' WIDE POROUS PAVEMENT (REFER TO LANDSCAPE ARCHITECTURE DRAWINGS)

USACE WETLAND 52

USACE WETLAND 52

THOMPSONVILLE

LEGEND

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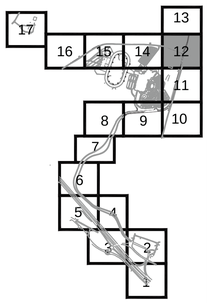

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SHEET TITLE

GRADING, PAVING AND DRAINAGE PLAN

TILE 12

SHEET NO.

C-512

LEGEND

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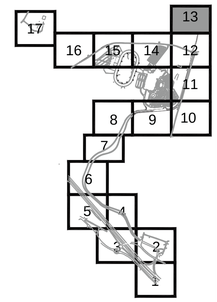

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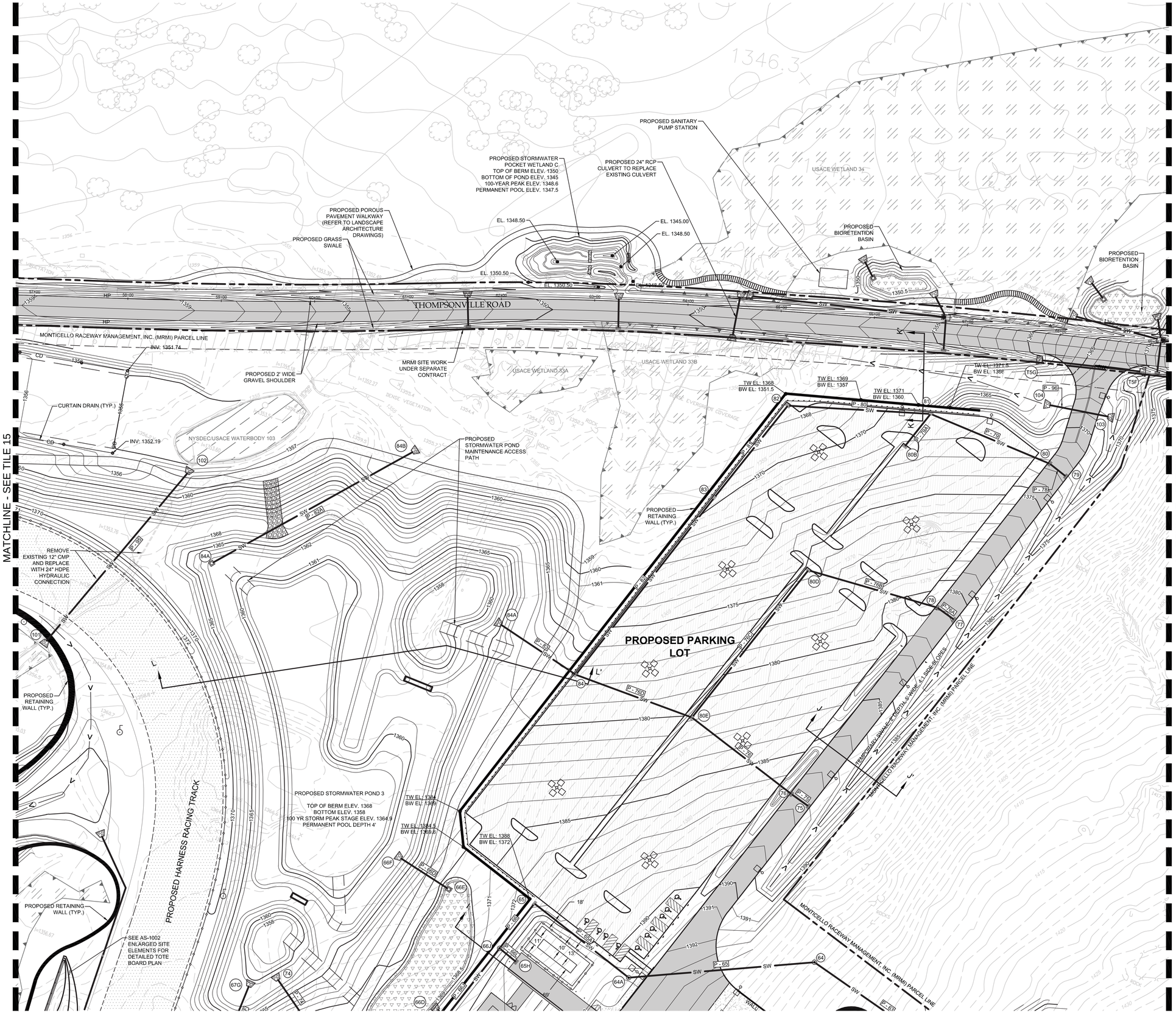
SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 13

SHEET NO.
C-513



LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORMWATER PIPE
- PROPOSED GRASSED SWALE
- PROPOSED MANHOLE
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED CATCH BASIN/YARD DRAIN
- PROPOSED TRENCH DRAIN
- PROPOSED OUTFALL/CULVERT
- PROPOSED LEVEL SPREADER
- UD PROPOSED UNDERDRAIN
- PUD PROPOSED CUTOFF TRENCH AND UNDERDRAIN
- UNDERGROUND SAND FILTER
- PROPOSED FLOW DIVERSION STRUCTURE
- PROPOSED STORMWATER MANAGEMENT POND FOOTPRINT
- PROPOSED BIORETENTION AREA FOOTPRINT
- TIMBER GUIDERAIL
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT (NYSDOT)
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED STANDARD DUTY ASPHALT PAVEMENT
- PROPOSED CONCRETE SURFACE
- PROPOSED GRASS PAVERS
- PROPOSED POROUS PAVEMENT WITH 6" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 12" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 24" RESERVOIR COURSE
- PROPOSED IMPRINTED CONCRETE SURFACE (SEE LANDSCAPE DRAWINGS)
- PROPOSED BIORETENTION AREA
- SIGNALIZED INTERSECTION
- TRAFFIC ARROW (PAVEMENT MARK)
- TRAFFIC FLOW
- PROPOSED LIGHTING FIXTURE (MRMI)
- PROPOSED STREET LIGHTS (ENTRY ROAD)
- DENOTES STORM STRUCTURE NUMBER
- P - 2 DENOTES STORM PIPE NUMBER
- PROPOSED SCREEN/RETAINING WALL
- PROPOSED CONC. CURB AND GUTTER (ADJ. TO ASP. PVMT)
- PROPOSED CONC. CURB AND GUTTER (ADJ. TO CONC. PVMT.)
- PROPOSED CURB (NYSDOT)
- PROPOSED 6" CURB WITH 10" GUTTER
- PROPOSED 6" CURB

0 20 40 80
SCALE: 1" = 40'

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

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HART HOWERTON
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SURVEYOR

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GEOTECHNICAL CONSULTANT

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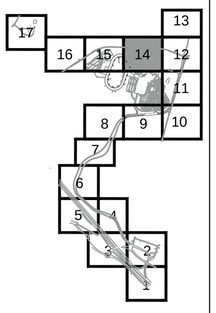

KEY PLAN

NYSDEC SWPPP SUBMISSION
NOT FOR CONSTRUCTION

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REVISIONS

No.	DATE	DESCRIPTION

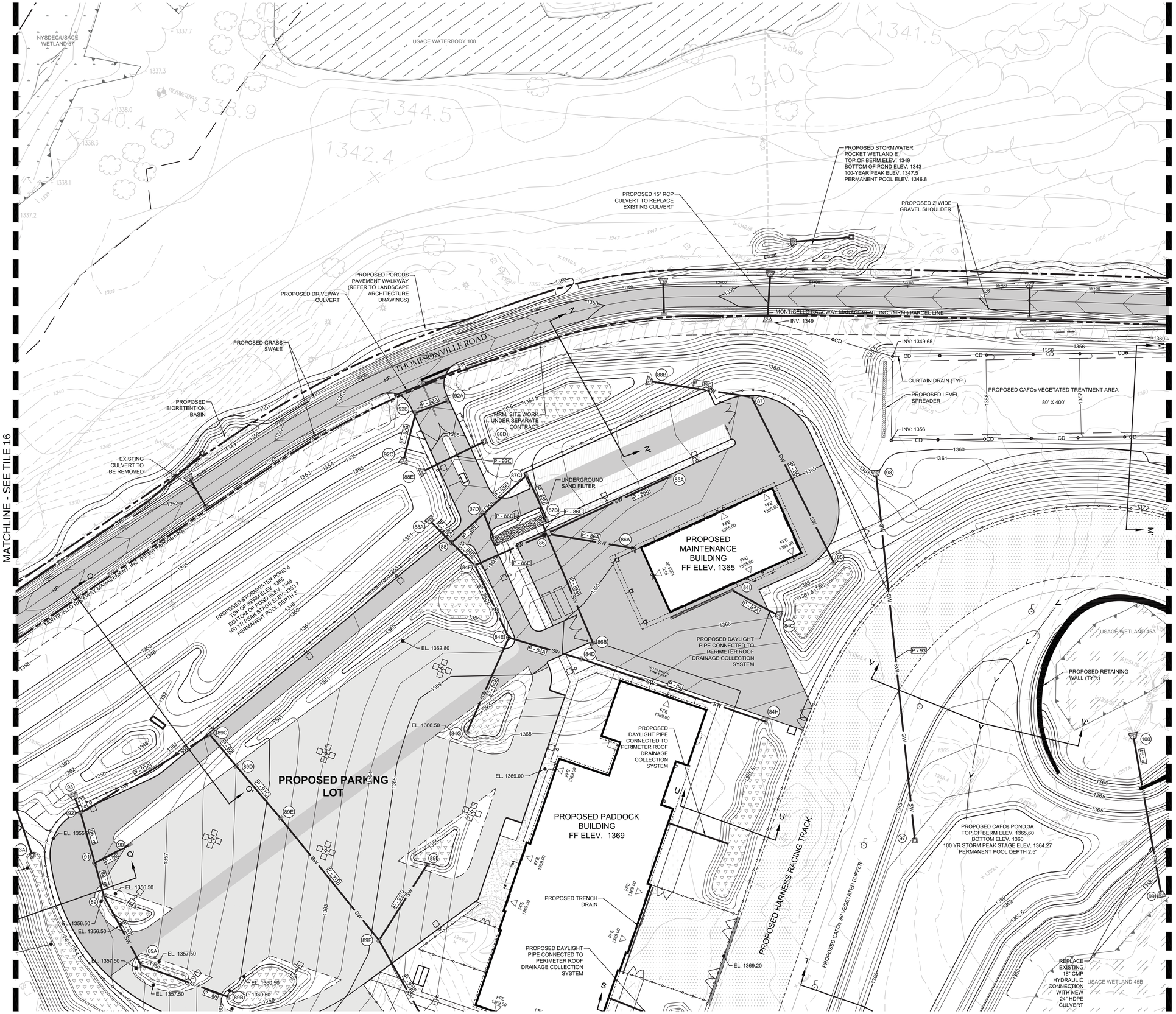
PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 14

SHEET NO.
C-514



LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
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- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
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- EXISTING MINOR CONTOUR
- 1375 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- SW PROPOSED STORMWATER PIPE
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- PROPOSED MANHOLE
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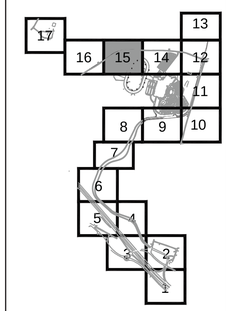
SCALE: 1" = 40'



KEY PLAN

APPLICANT

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TOWN OF THOMPSON
NEW YORK

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EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 15

SHEET NO.
C-515

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
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- PROPOSED 6" CURB WITH 10" GUTTER
- PROPOSED 6" CURB

0 20 40 80
SCALE: 1" = 40'

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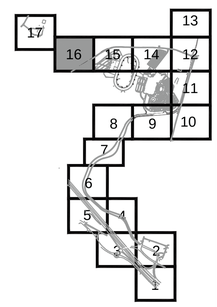

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TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 16

SHEET NO.
C-516

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
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- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
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- PROPOSED MANHOLE
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- PROPOSED CATCH BASIN/YARD DRAIN
- PROPOSED TRENCH DRAIN
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- PROPOSED 6" CURB

0 20 40 80
SCALE: 1" = 40'

APPLICANT

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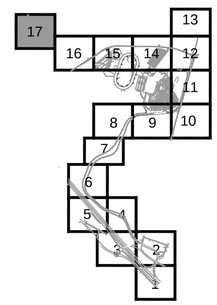

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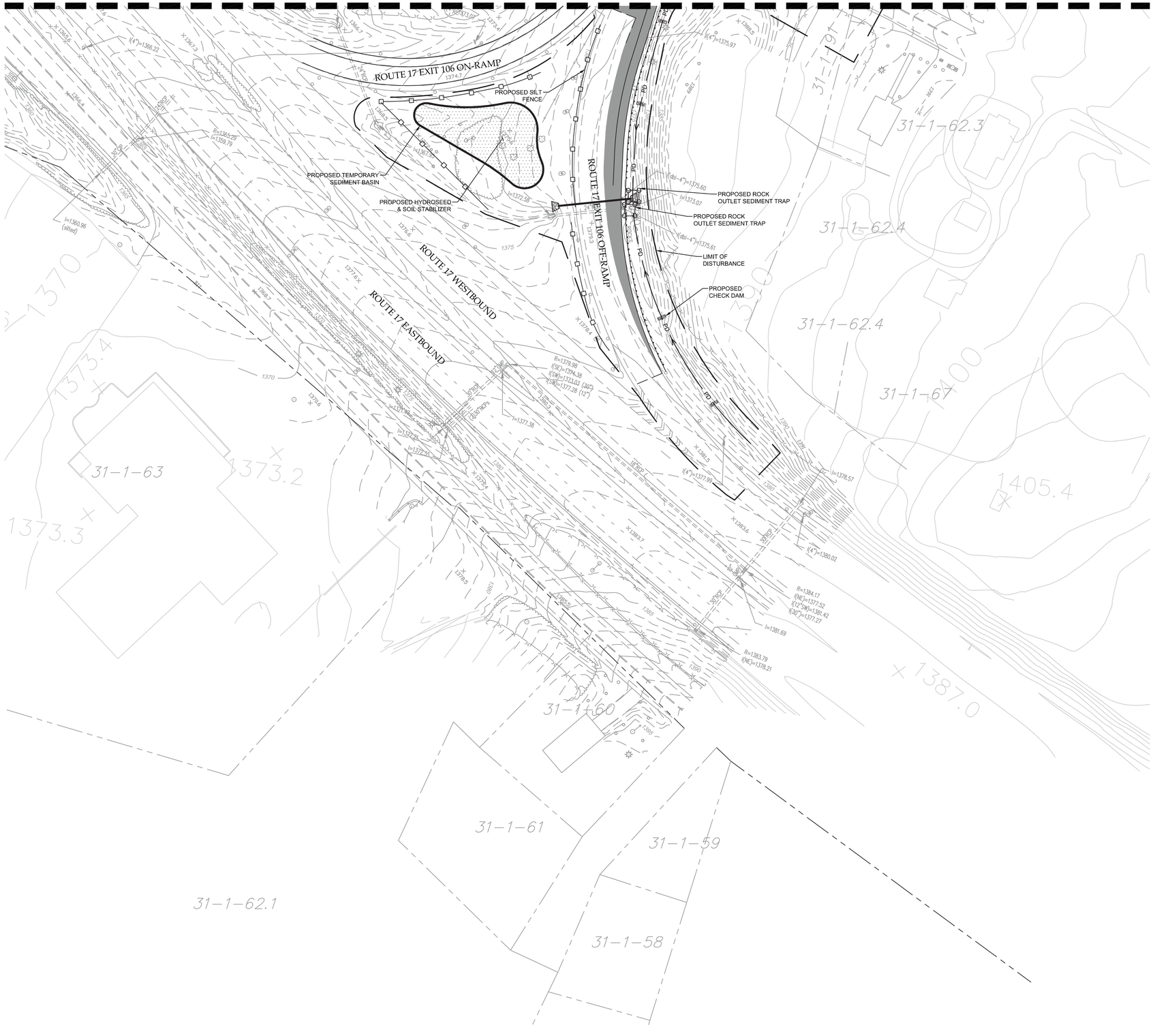
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
GRADING, PAVING AND DRAINAGE PLAN

TILE 17

SHEET NO.
C-517

MATCHLINE - SEE TILE 2



0 20 40 80

SCALE: 1" = 40'

LEGEND

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- PROPOSED MINOR CONTOUR
- SW PROPOSED STORMWATER PIPE
- W PROPOSED WATER MAIN
- S PROPOSED SANITARY SEWER MAIN
- FM PROPOSED SANITARY FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED FLOW DIVERSION STRUCTURE
- PROPOSED CATCH BASIN/YARD DRAIN
- PROPOSED TRENCH DRAIN
- PROPOSED OUTFALL/CULVERT
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- PROPOSED IMPRINTED CONCRETE SURFACE (SEE LANDSCAPE DRAWINGS)
- PROPOSED BIORETENTION AREA
- LIMIT OF DISTURBANCE
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE/EXIT
- PROPOSED CONSTRUCTION ROAD STABILIZATION
- PROPOSED HYDROSEED & SOIL STABILIZER
- PROPOSED SILT FENCE
- WB PROPOSED WATER BAR
- FR PROPOSED FIBER ROLL
- PROPOSED ORANGE CONSTRUCTION FENCE
- PD PROPOSED PERIMETER DIKE/SWALE
- PROPOSED TEMPORARY SWALE
- PROPOSED CATCH BASIN SEDIMENT TRAP
- PROPOSED TEMPORARY OUTLET STRUCTURE
- PROPOSED LEVEL SPREADER
- PROPOSED ROCK OUTLET SEDIMENT TRAP
- PROPOSED CHECK DAM

NOTE:
ALL SITE IMPROVEMENTS WITHIN THE MONTICELLO RACEWAY MANAGEMENT, INC. (MRMI) PARCEL LINE WILL BE CONSTRUCTED UNDER A SEPARATE CONTRACT.

APPLICANT

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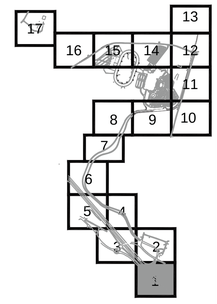

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

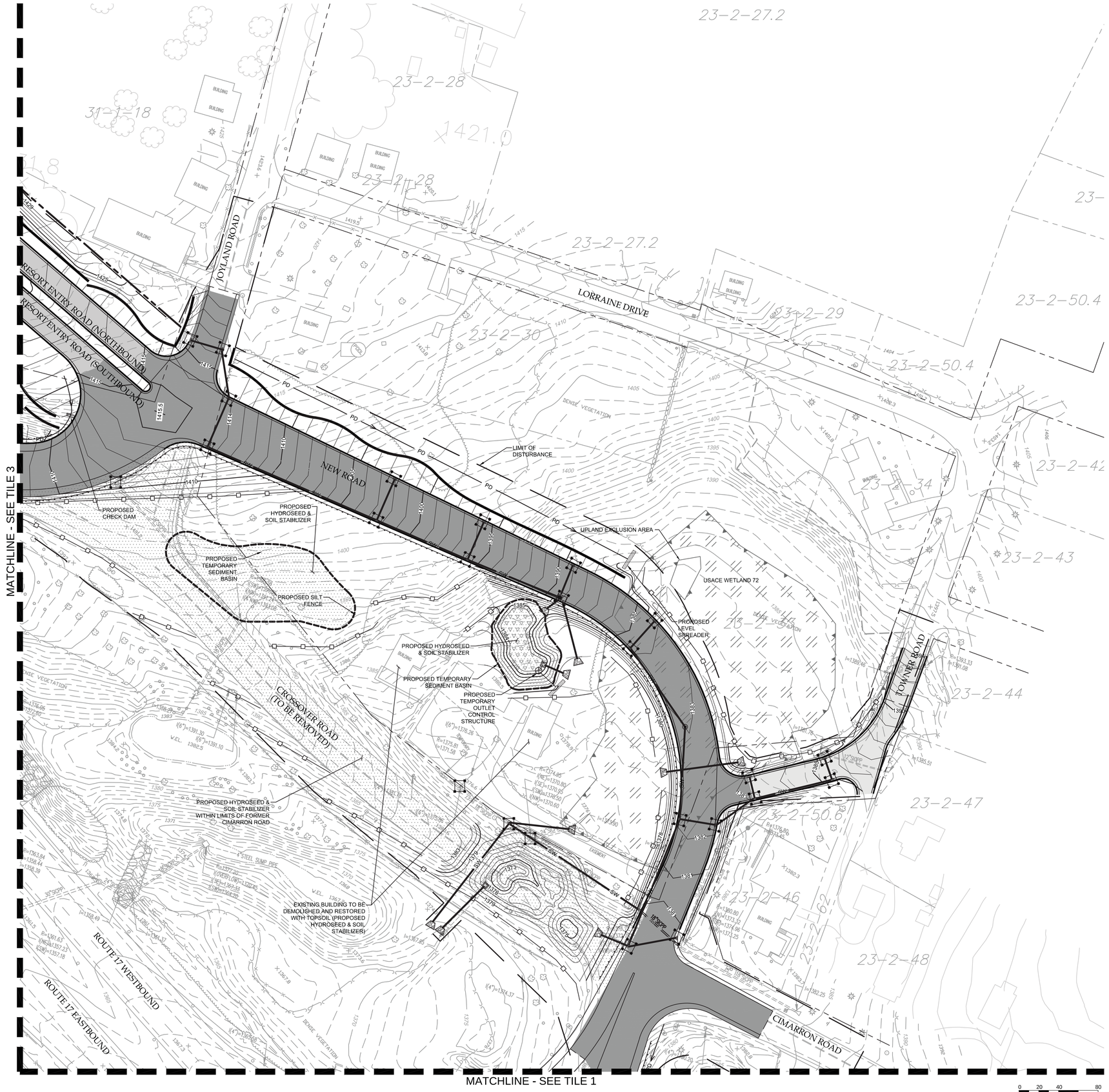
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 1

SHEET NO.

C-701



LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 1375 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
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- W PROPOSED WATER MAIN
- S PROPOSED SANITARY SEWER MAIN
- FM PROPOSED SANITARY FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED FLOW DIVERSION STRUCTURE
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- UD PROPOSED UNDERDRAIN
- PUD PROPOSED CUTOFF TRENCH AND UNDERDRAIN
- PROPOSED CONCRETE CURB
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT (NYSDOT)
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED STANDARD DUTY ASPHALT PAVEMENT
- PROPOSED CONCRETE SURFACE
- PROPOSED GRASS PAVERS
- PROPOSED POROUS PAVEMENT WITH 6" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 12" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 24" RESERVOIR COURSE
- PROPOSED IMPRINTED CONCRETE SURFACE (SEE LANDSCAPE DRAWINGS)
- PROPOSED BIORETENTION AREA
- LIMIT OF DISTURBANCE
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE/EXIT
- PROPOSED CONSTRUCTION ROAD STABILIZATION
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- PROPOSED TEMPORARY OUTLET STRUCTURE
- PROPOSED LEVEL SPREADER
- PROPOSED ROCK OUTLET SEDIMENT TRAP
- PROPOSED CHECK DAM

NOTE:
ALL SITE IMPROVEMENTS WITHIN THE MONTICELLO RACEWAY MANAGEMENT, INC. (MRMI) PARCEL LINE WILL BE CONSTRUCTED UNDER A SEPARATE CONTRACT.

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

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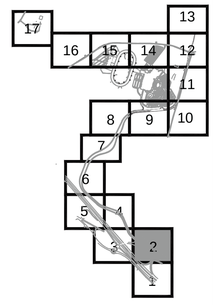

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SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 2

SHEET NO.

C-702

MATCHLINE - SEE TILE 5

MATCHLINE - SEE TILE 4

MATCHLINE - SEE TILE 2

MURRAY ROAD

COUNTY ROAD 173

ROUTE 17 EXIT 106 OFF-RAMP

ROUTE 17 EASTBOUND

ROUTE 17 WESTBOUND

ROUTE 17 EXIT 106 ON-RAMP

RESORT ENTRY ROAD (NORTHBOUND)

RESORT ENTRY ROAD (SOUTHBOUND)

100' NYSDEC WETLAND BUFFER

RIGHT-OF-WAY

LIMIT OF DISTURBANCE

PROPOSED HYDROSEED & SOIL STABILIZER

PROPOSED TEMPORARY SEDIMENT BASIN

PROPOSED CHECK DAM

PROPOSED SILT FENCE

PROPOSED RETAINING WALL

EXISTING WATERBODY

DENSE VEGETATION

31-1-20

31-1-21

31-1-22

31-1-23.2

SCALE: 1" = 40'

0 20 40 80

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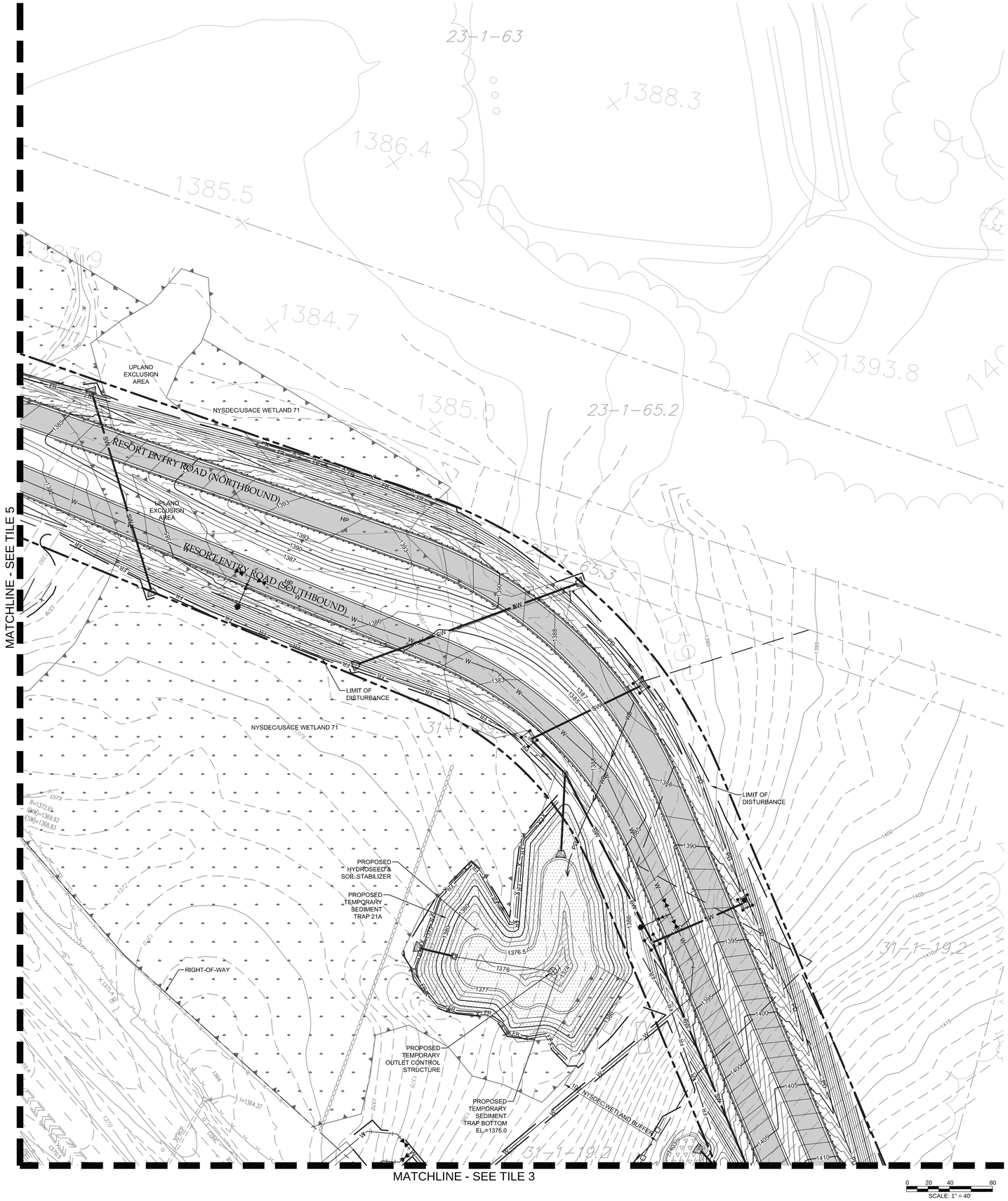
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 3

SHEET NO.

C-703



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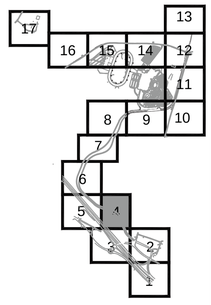

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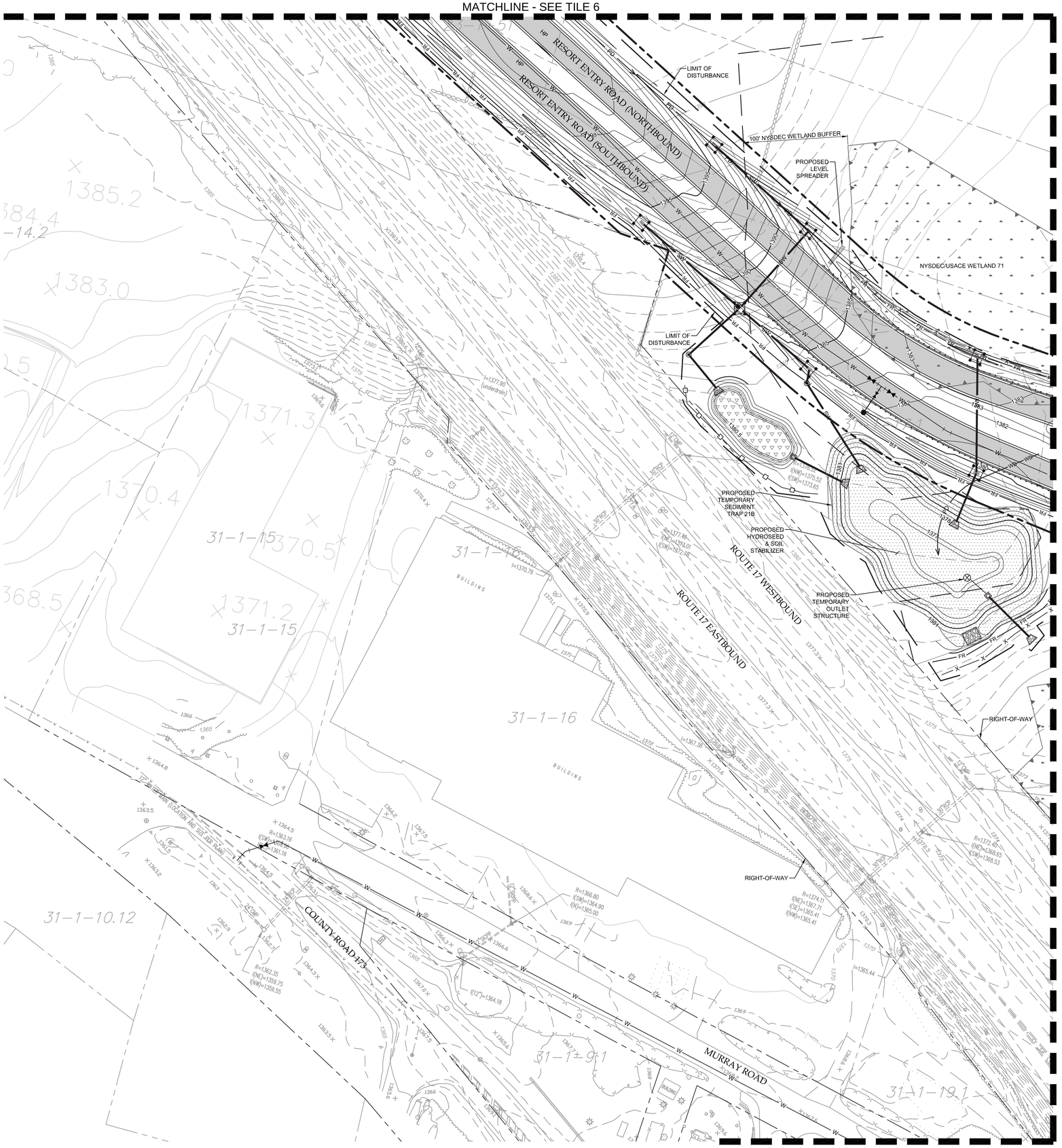
SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 4

SHEET NO.

C-704



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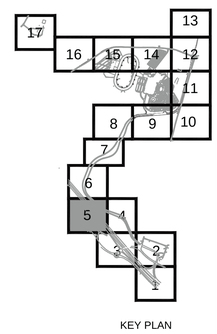

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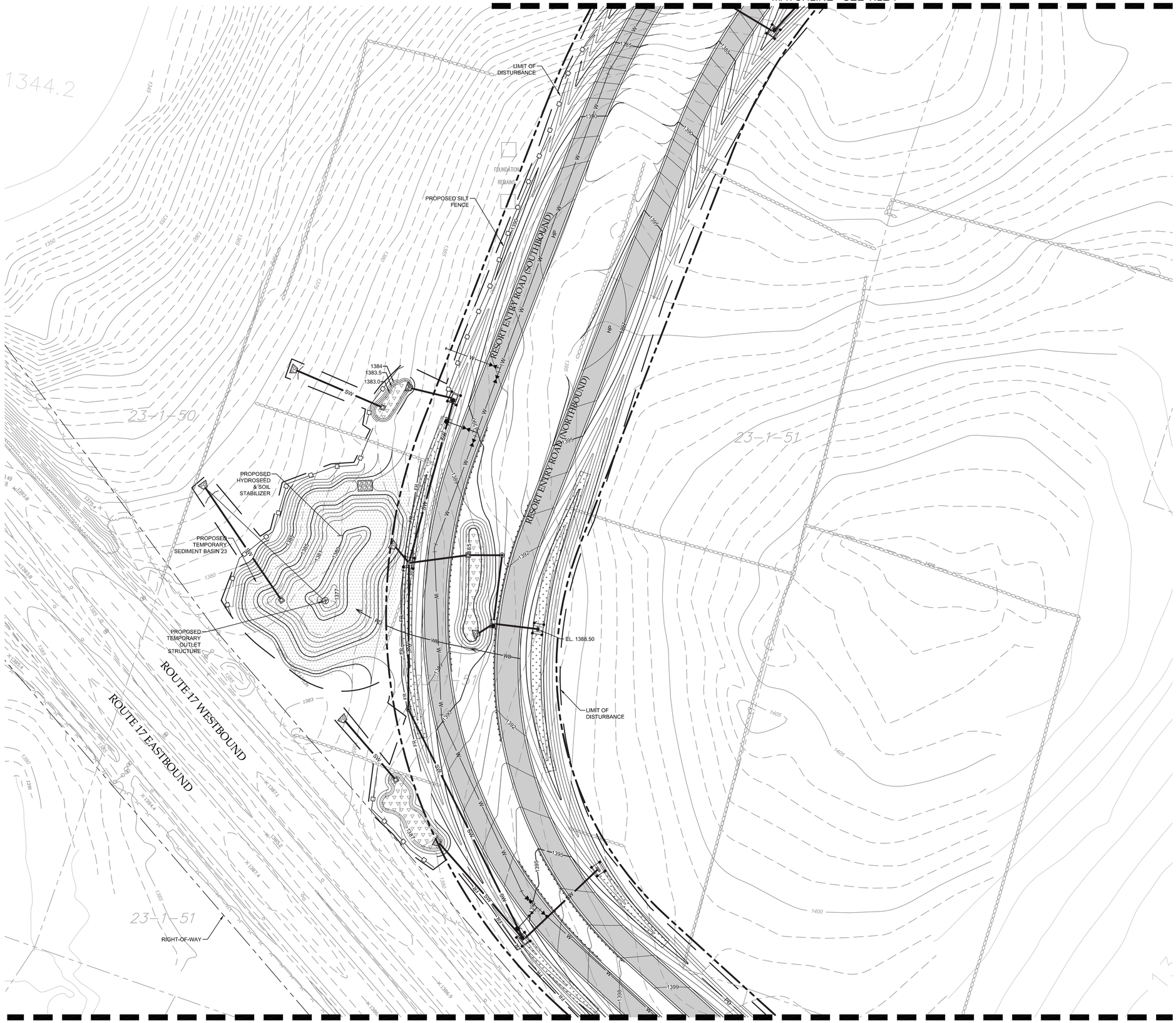
SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 5

SHEET NO.

C-705

MATCHLINE - SEE TILE 7



MATCHLINE - SEE TILE 5

SCALE: 1" = 40'

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(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

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SITE/CIVIL ENGINEER

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GEOTECHNICAL CONSULTANT

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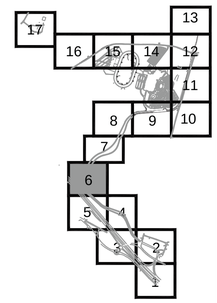

KEY PLAN

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

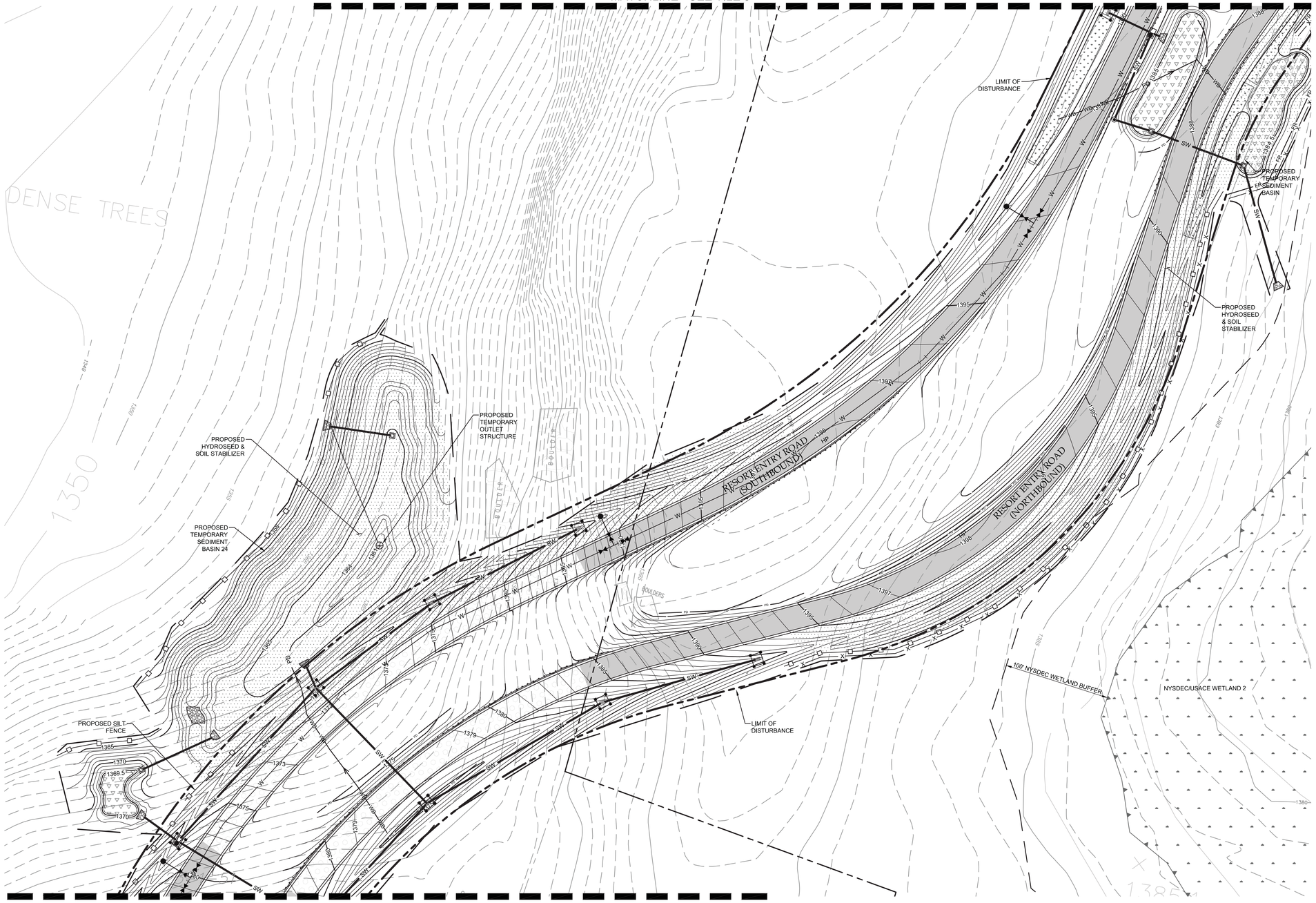
SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 6

SHEET NO.

C-706

MATCHLINE - SEE TILE 8



MATCHLINE - SEE TILE 6

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 1375 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- SW PROPOSED STORMWATER PIPE
- W PROPOSED WATER MAIN
- S PROPOSED SANITARY SEWER MAIN
- FM PROPOSED SANITARY FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED FLOW DIVERSION STRUCTURE
- PROPOSED CATCH BASIN/YARD DRAIN
- PROPOSED TRENCH DRAIN
- PROPOSED OUTFALL/CULVERT
- UD PROPOSED UNDERDRAIN
- PUD PROPOSED CUTOFF TRENCH AND UNDERDRAIN
- PROPOSED CONCRETE CURB
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT (NYSDOT)
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED STANDARD DUTY ASPHALT PAVEMENT
- PROPOSED CONCRETE SURFACE
- PROPOSED GRASS PAVERS
- PROPOSED POROUS PAVEMENT WITH 6" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 12" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 24" RESERVOIR COURSE
- PROPOSED IMPRINTED CONCRETE SURFACE (SEE LANDSCAPE DRAWINGS)
- PROPOSED BIORETENTION AREA
- LIMIT OF DISTURBANCE
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE/EXIT
- PROPOSED CONSTRUCTION ROAD STABILIZATION
- PROPOSED HYDROSEED & SOIL STABILIZER
- PROPOSED SILT FENCE
- WB PROPOSED WATER BAR
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- X X PROPOSED ORANGE CONSTRUCTION FENCE
- PD PROPOSED PERIMETER DIKE/SWALE
- PROPOSED TEMPORARY SWALE
- PROPOSED CATCH BASIN SEDIMENT TRAP
- PROPOSED TEMPORARY OUTLET STRUCTURE
- PROPOSED LEVEL SPREADER
- PROPOSED ROCK OUTLET SEDIMENT TRAP
- PROPOSED CHECK DAM

NOTE:
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0 20 40 80
SCALE: 1" = 40'

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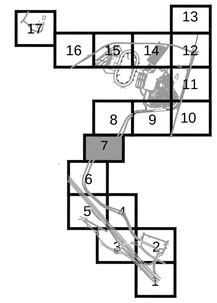

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SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 7

SHEET NO.

C-707

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
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- PROPOSED BIORETENTION AREA
- LIMIT OF DISTURBANCE
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- PROPOSED CONSTRUCTION ROAD STABILIZATION
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NOTE:
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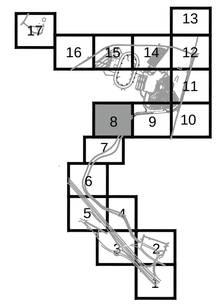

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TOWN OF THOMPSON
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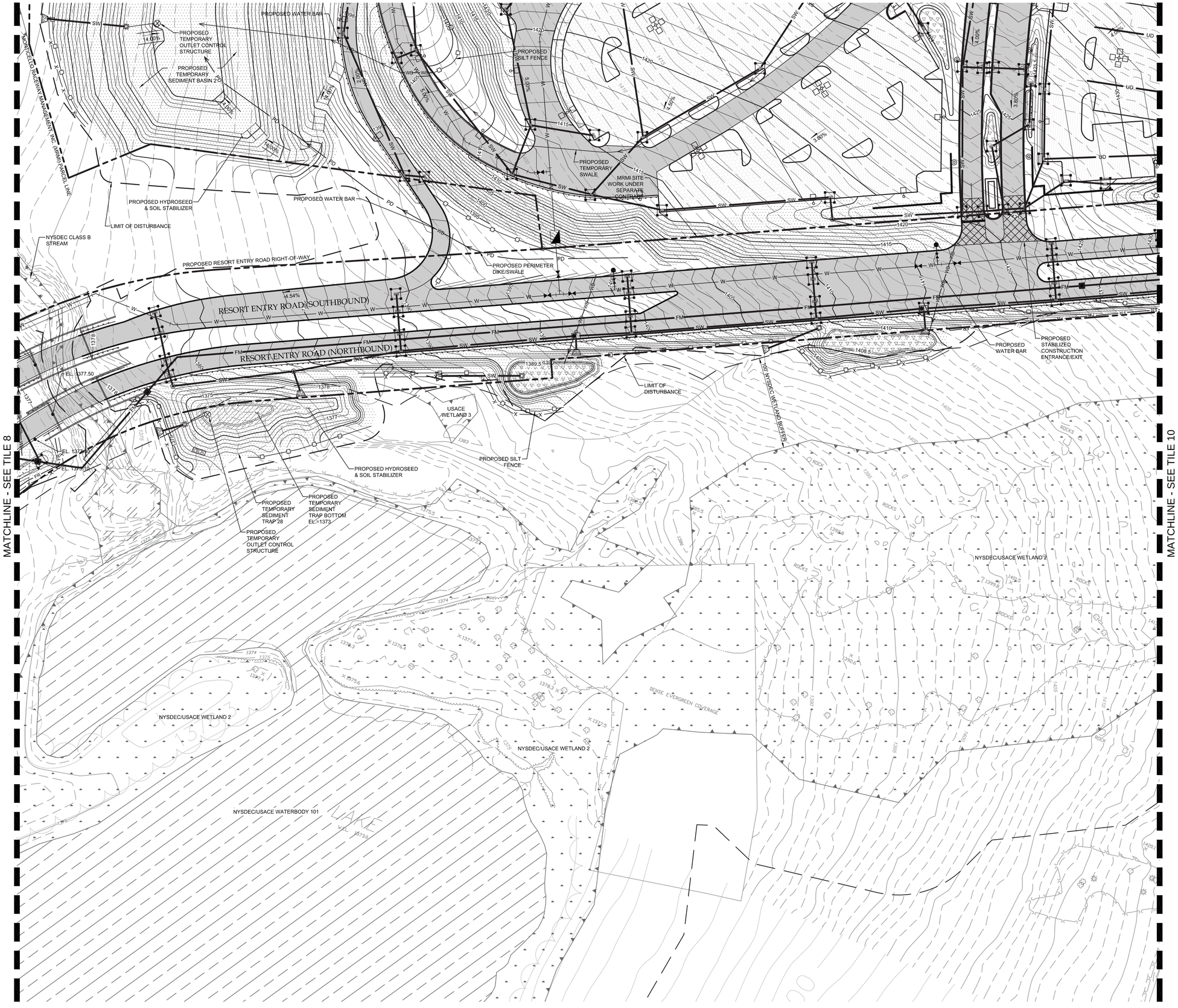
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 8

SHEET NO.

C-708



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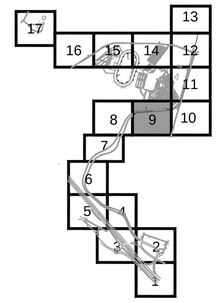

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TOWN OF THOMPSON NEW YORK

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EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

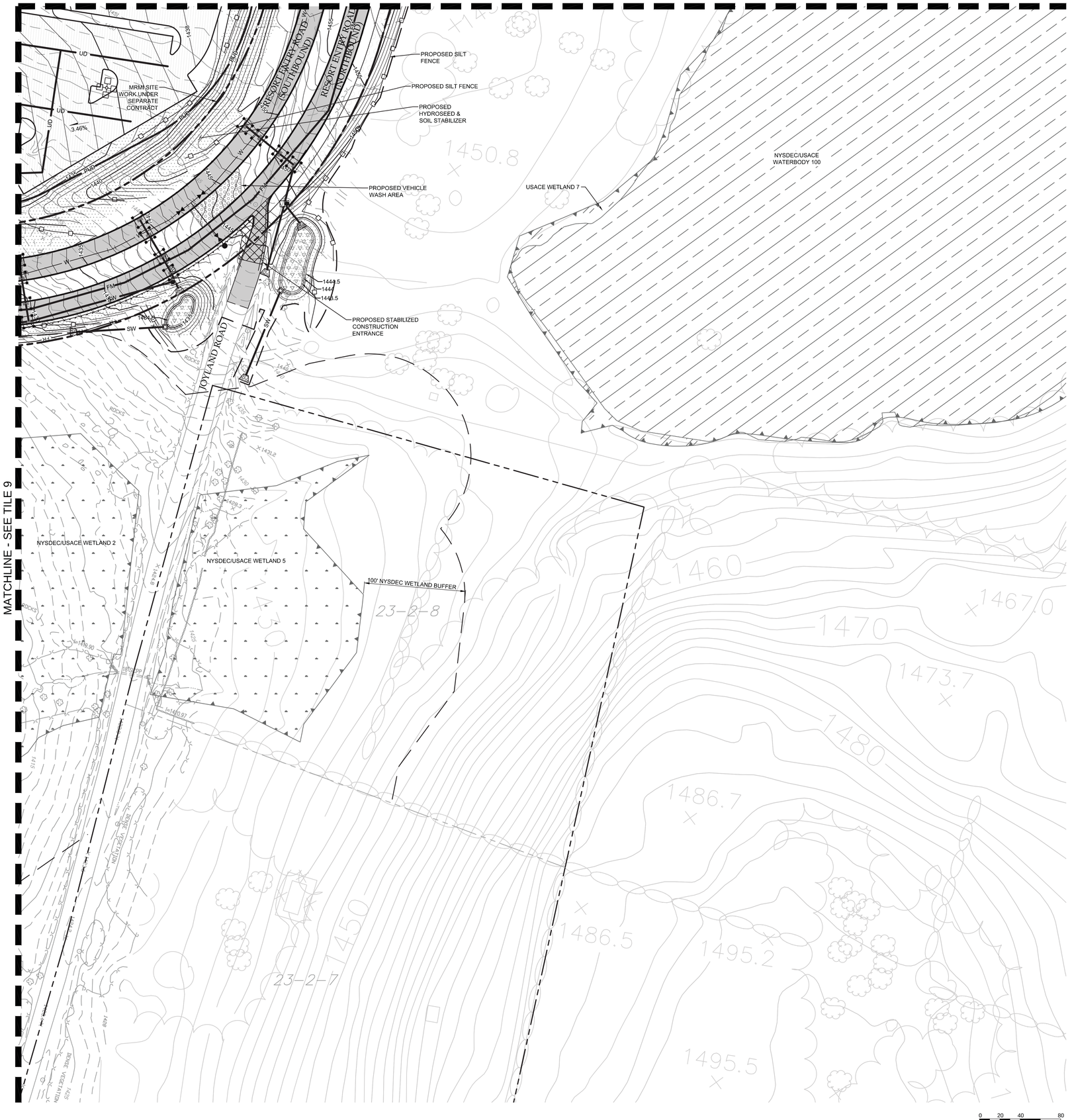
EROSION AND SEDIMENT CONTROL PLAN
TILE 9

SHEET NO.

C-709

MATCHLINE - SEE TILE 11

MATCHLINE - SEE TILE 9



0 20 40 80
SCALE: 1" = 40'

LEGEND

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- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
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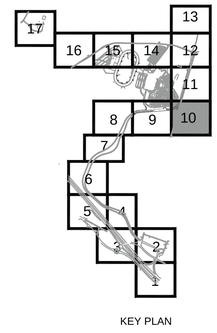

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SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 10

SHEET NO.

C-710

MATCHLINE - SEE TILE 12

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
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- PROPOSED STABILIZED CONSTRUCTION ENTRANCE/EXIT
- PROPOSED CONSTRUCTION ROAD STABILIZATION
- PROPOSED HYDROSEED & SOIL STABILIZER
- PROPOSED SILT FENCE
- WB PROPOSED WATER BAR
- FR PROPOSED FIBER ROLL
- X X PROPOSED ORANGE CONSTRUCTION FENCE
- PD PROPOSED PERIMETER DIKE/SWALE
- PROPOSED TEMPORARY SWALE
- PROPOSED CATCH BASIN SEDIMENT TRAP
- PROPOSED TEMPORARY OUTLET STRUCTURE
- PROPOSED LEVEL SPREADER
- PROPOSED ROCK OUTLET SEDIMENT TRAP
- PROPOSED CHECK DAM

NOTE:
ALL SITE IMPROVEMENTS WITHIN THE MONTICELLO RACEWAY MANAGEMENT, INC. (MRMI) PARCEL LINE WILL BE CONSTRUCTED UNDER A SEPARATE CONTRACT.

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

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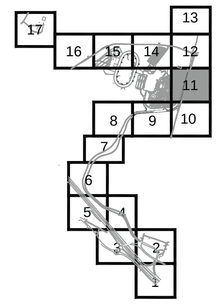

KEY PLAN

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 11

SHEET NO.

C-711

MATCHLINE - SEE TILE 13

MATCHLINE - SEE TILE 14

MATCHLINE - SEE TILE 11

USACE WETLAND 34

USACE WETLAND 52

PROPOSED HYDROSEED & SOIL STABILIZER

LIMIT OF DISTURBANCE

TEMPORARY

MRMI SITE WORK UNDER SEPARATE CONTRACT

THOMPSONVILLE ROAD

CHALET ROAD

RESORT ENTRY ROAD (SOUTHBOUND)

RESORT ENTRY ROAD (NORTHBOUND)

CLUBHOUSE

PROPOSED RESORT ENTRY ROAD RIGHT-OF-WAY

PROPOSED TEMPORARY SEDIMENT BASIN

PROPOSED HYDROSEED & SOIL STABILIZER

PROPOSED SILT FENCE

LIMIT OF DISTURBANCE

DENSE VEGETATION

ROCKS

BUNGALOW

POOL

POLE

15-1-20

SCALE: 1" = 40'

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- PROPOSED STORMWATER PIPE
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER MAIN
- PROPOSED SANITARY FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED FLOW DIVERSION STRUCTURE
- PROPOSED CATCH BASIN/YARD DRAIN
- PROPOSED TRENCH DRAIN
- PROPOSED OUTFALL/CULVERT
- PROPOSED UNDERDRAIN
- PROPOSED CUTOFF TRENCH AND UNDERDRAIN
- PROPOSED CONCRETE CURB
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT (NYSDOT)
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED STANDARD DUTY ASPHALT PAVEMENT
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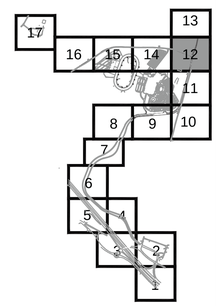

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TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 12

SHEET NO.

C-712

MATCHLINE - SEE TILE 12

SCALE: 1" = 40'

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
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- EXISTING MINOR CONTOUR
- 1375 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- SW PROPOSED STORMWATER PIPE
- W PROPOSED WATER MAIN
- S PROPOSED SANITARY SEWER MAIN
- FM PROPOSED SANITARY FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED FLOW DIVERSION STRUCTURE
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NOTE:
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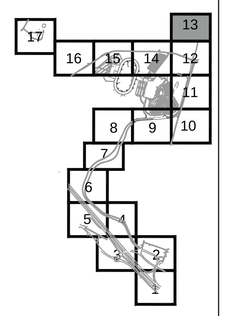

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REVISIONS

No.	DATE	DESCRIPTION

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EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

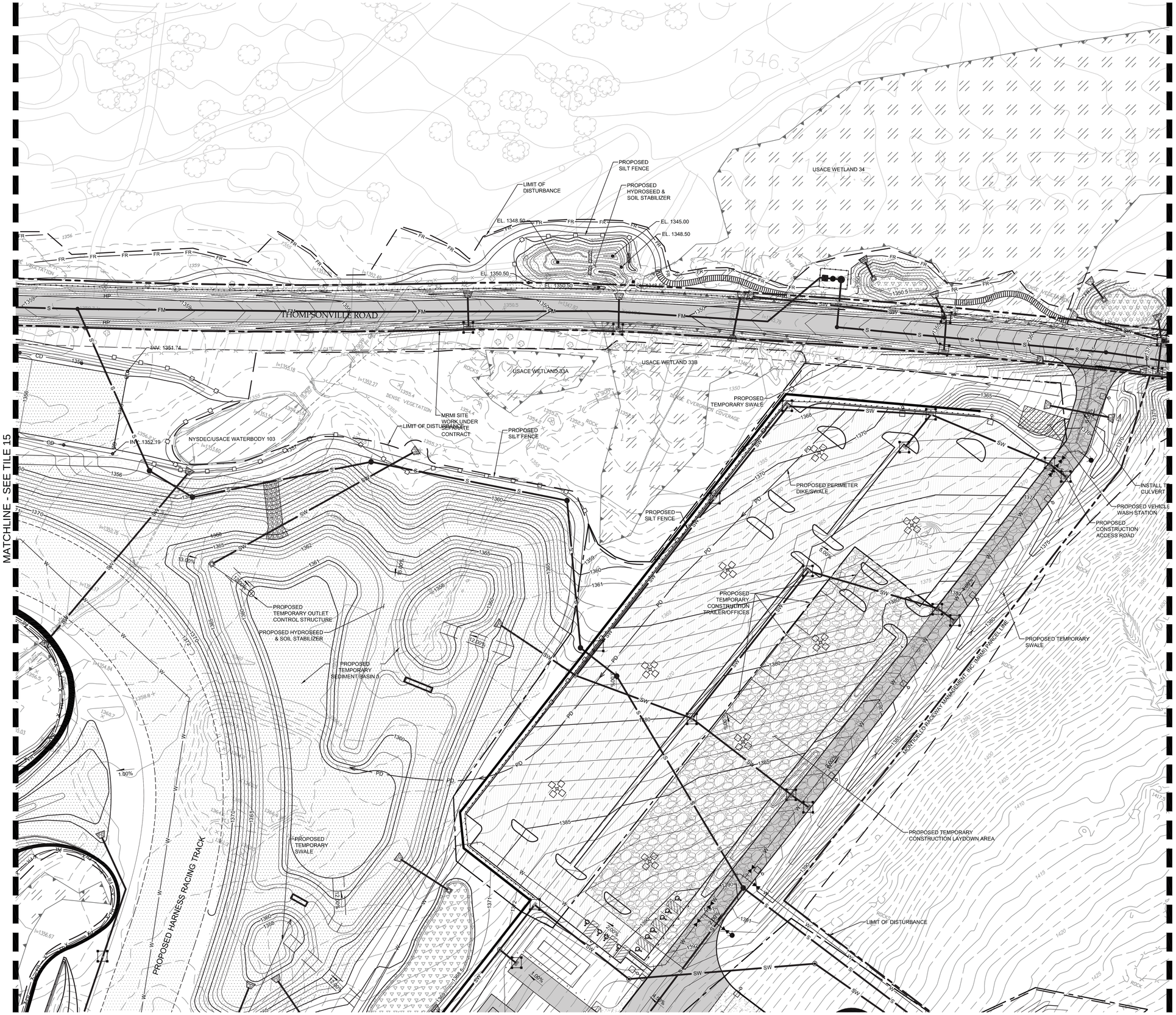
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 13

SHEET NO.

C-713



LEGEND

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- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
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NOTE:
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0 20 40 80
SCALE: 1" = 40'

APPLICANT

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KANSAS CITY, MO 64106
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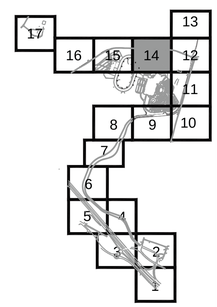

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EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON NEW YORK

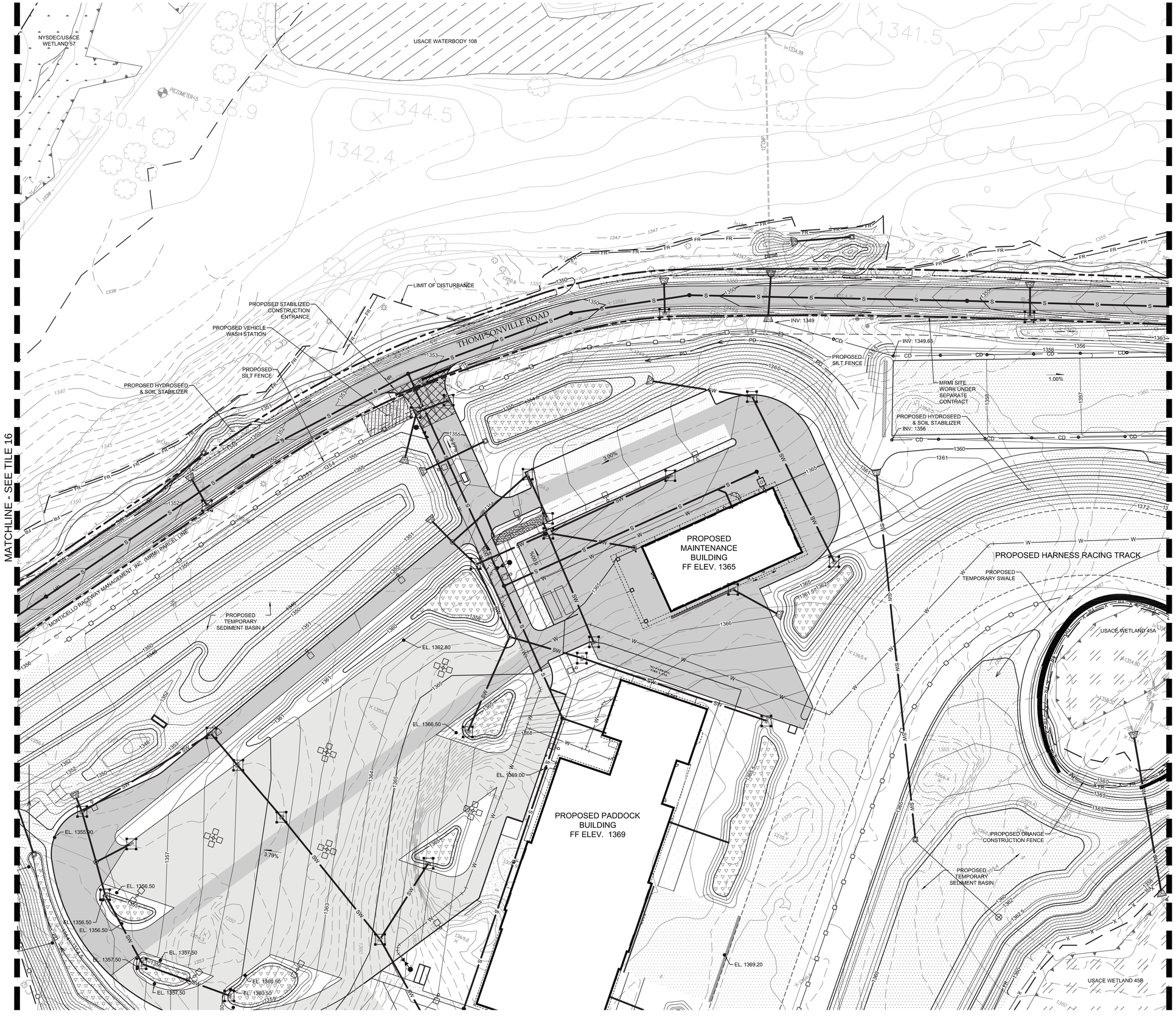
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 14

SHEET NO.

C-714



SCALE: 1" = 40'

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
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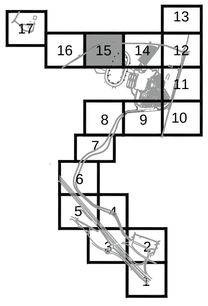

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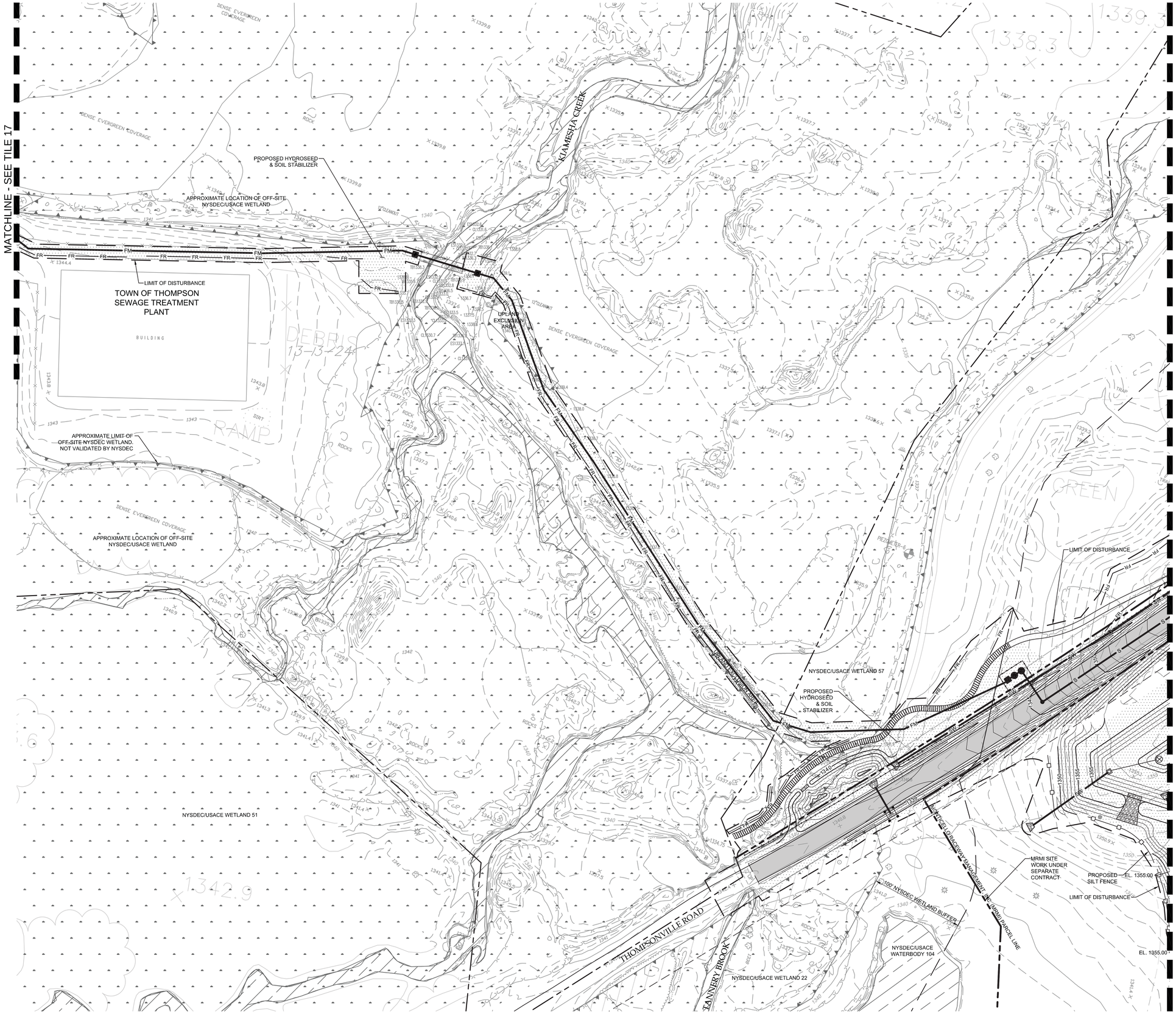
SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN TILE 15

SHEET NO.

C-715



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- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
- FEMA 100 YEAR FLOODPLAIN LINE
- 1390 EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- 1375 PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- SW PROPOSED STORMWATER PIPE
- W PROPOSED WATER MAIN
- S PROPOSED SANITARY SEWER MAIN
- FM PROPOSED SANITARY FORCE MAIN
- PROPOSED MANHOLE
- PROPOSED OUTLET CONTROL STRUCTURE
- PROPOSED FLOW DIVERSION STRUCTURE
- PROPOSED CATCH BASIN/YARD DRAIN
- PROPOSED TRENCH DRAIN
- PROPOSED OUTFALL/CULVERT
- UD PROPOSED UNDERDRAIN
- PUD PROPOSED CUTOFF TRENCH AND UNDERDRAIN
- PROPOSED CONCRETE CURB
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT (NYSDOT)
- PROPOSED HEAVY DUTY ASPHALT PAVEMENT
- PROPOSED STANDARD DUTY ASPHALT PAVEMENT
- PROPOSED CONCRETE SURFACE
- PROPOSED GRASS PAVERS
- PROPOSED POROUS PAVEMENT WITH 6" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 12" RESERVOIR COURSE
- PROPOSED POROUS PAVEMENT WITH 24" RESERVOIR COURSE
- PROPOSED IMPRINTED CONCRETE SURFACE (SEE LANDSCAPE DRAWINGS)
- PROPOSED BIORETENTION AREA
- LIMIT OF DISTURBANCE
- PROPOSED STABILIZED CONSTRUCTION ENTRANCE/EXIT
- PROPOSED CONSTRUCTION ROAD STABILIZATION
- PROPOSED HYDROSEED & SOIL STABILIZER
- PROPOSED SILT FENCE
- WB PROPOSED WATER BAR
- FR PROPOSED FIBER ROLL
- PROPOSED ORANGE CONSTRUCTION FENCE
- PD PROPOSED PERIMETER DIKE/SWALE
- PROPOSED TEMPORARY SWALE
- PROPOSED CATCH BASIN SEDIMENT TRAP
- PROPOSED TEMPORARY OUTLET STRUCTURE
- PROPOSED LEVEL SPREADER
- PROPOSED ROCK OUTLET SEDIMENT TRAP
- PROPOSED CHECK DAM

NOTE:
ALL SITE IMPROVEMENTS WITHIN THE MONTICELLO RACEWAY MANAGEMENT, INC. (MRMI) PARCEL LINE WILL BE CONSTRUCTED UNDER A SEPARATE CONTRACT.

APPLICANT

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SURVEYOR

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(914) 347-3120 (FAX)

GEOTECHNICAL CONSULTANT

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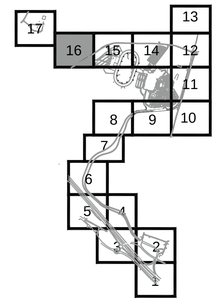
(732) 356-9054 (FAX)



KEY PLAN

NYSDEC SWPPP SUBMISSION
NOT FOR CONSTRUCTION

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN TILE 16

SHEET NO.

C-716

LEGEND

- EPT CONCORD II, LLC PROPERTY BOUNDARY
- MRMI PARCEL BOUNDARY AND/OR PROPOSED RIGHT OF WAY LINE
- PROPOSED LANDSCAPE BUFFER
- PROPOSED EASEMENT AREA
- EXISTING RIGHT OF WAY LINE
- EXISTING PARCEL BOUNDARY
- NYSDEC/USACE WETLAND
- NYSDEC 100' WETLAND BUFFER
- USACE WETLAND
- USACE WATERBODY
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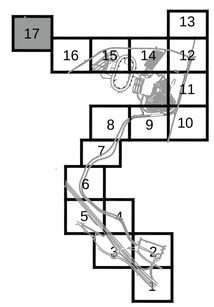

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE

EROSION AND SEDIMENT CONTROL PLAN
TILE 17

SHEET NO.

C-717

STORM DRAINAGE STRUCTURE SCHEDULE

STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
E1	CB	RIM = 1448.98'± SE INV. OUT = 1446.00' 15" DIA. PIPE	11751.46	5.4173
E2	CB	RIM = 1448.99'± NW INV. IN = 1445.80' 15" DIA. PIPE SE INV. OUT = 1445.80' 15" DIA. PIPE	11765.41	-5.9735
E3	CB	RIM = 1450.63'± NW INV. IN = 1445.50' 15" DIA. PIPE SE INV. OUT = 1445.50' 15" DIA. PIPE	11784.83	-21.9196
E4	CB	RIM = 1450.60'± NW INV. IN = 1445.30' 15" DIA. PIPE S INV. OUT = 1445.30' 18" DIA. PIPE	11798.99	-33.0854
E4A	FS	RIM = 1449.05'± N INV. IN = 1444.60' 18" DIA. PIPE SE INV. OUT = 1444.60' 18" DIA. PIPE S INV. OUT = 1444.60' 18" DIA. PIPE	11789.66	-71.1058
E4B	OUTFALL	RIM = 1444.50'± NW INV. IN = 1444.00' 18" DIA. PIPE	11804.28	-89.6573
E4C	OUTFALL	RIM = 1443.42'± N INV. IN = 1443.00' 18" DIA. PIPE	11772.56	-135.6942
E4D	OS	RIM = 1444.29'± S INV. OUT = 1438.50' 15" DIA. PIPE	11785.85	-156.6208
E4E	OUTFALL	RIM = 1437.95'± N INV. IN = 1437.50' 15" DIA. PIPE	11751.77	-239.6077
E5	CB	RIM = 1439.77'± SE INV. OUT = 1436.60' 15" DIA. PIPE	11647.12	-86.7506
E6	CB	RIM = 1439.84'± NW INV. IN = 1436.40' 15" DIA. PIPE SE INV. OUT = 1436.40' 15" DIA. PIPE	11656.03	-102.0420
E7	CB	RIM = 1439.99'± NW INV. IN = 1436.10' 15" DIA. PIPE SE INV. OUT = 1436.10' 15" DIA. PIPE	11669.09	-123.5053
E8	CB	RIM = 1439.98'± NW INV. IN = 1435.80' 15" DIA. PIPE SE INV. OUT = 1435.80' 15" DIA. PIPE	11677.98	-139.0774
E8A	FS	RIM = 1439.60'± NW INV. IN = 1435.64' 15" DIA. PIPE SE INV. OUT = 1435.64' 15" DIA. PIPE W INV. OUT = 1435.64' 15" DIA. PIPE	11681.73	-147.2914
E8B	OUTFALL	RIM = 1437.37'± NW INV. IN = 1435.50' 15" DIA. PIPE	11684.76	-153.9242
E8C	OS	RIM = 1435.33'± W INV. OUT = 1429.50' 15" DIA. PIPE	11672.17	-192.4065
E8D	OUTLET	RIM = 1429.11'± E INV. IN = 1428.50' 15" DIA. PIPE	11584.97	-197.4399
E9	CB	RIM = 1430.98'± S INV. OUT = 1428.00' 15" DIA. PIPE	11528.24	-126.9653
E10	CB	RIM = 1430.99'± N INV. IN = 1427.80' 15" DIA. PIPE S INV. OUT = 1427.80' 15" DIA. PIPE	11530.68	-144.7536
E11	CB	RIM = 1429.79'± N INV. IN = 1427.50' 15" DIA. PIPE S INV. OUT = 1427.50' 15" DIA. PIPE	11534.63	-169.3974
E12	CB	RIM = 1429.82'± E INV. IN = 1427.30' 15" DIA. PIPE N INV. IN = 1427.30' 15" DIA. PIPE W INV. OUT = 1427.30' 18" DIA. PIPE	11537.64	-187.2590
E13	CB	RIM = 1422.95'± S INV. OUT = 1420.20' 15" DIA. PIPE	11410.28	-136.8440
E14	CB	RIM = 1422.99'± N INV. IN = 1420.00' 15" DIA. PIPE S INV. OUT = 1420.00' 15" DIA. PIPE	11411.90	-154.8964
E15	CB	RIM = 1422.35'± N INV. IN = 1419.40' 15" DIA. PIPE S INV. OUT = 1419.40' 15" DIA. PIPE	11413.83	-179.7238
E16	CB	RIM = 1422.35'± N INV. IN = 1419.20' 15" DIA. PIPE E INV. IN = 1419.20' 18" DIA. PIPE W INV. OUT = 1419.20' 18" DIA. PIPE	11415.23	-197.7002
E16A	FS	RIM = 1414.98'± E INV. IN = 1412.00' 18" DIA. PIPE S INV. OUT = 1412.00' 18" DIA. PIPE W INV. OUT = 1412.00' 18" DIA. PIPE	11272.34	-207.1555
E16B	OUTFALL	RIM = 1410.63'± N INV. IN = 1410.50' 18" DIA. PIPE	11273.97	-228.4407
E17	CB	RIM = 1409.99'± S INV. OUT = 1407.00' 15" DIA. PIPE	11151.21	-157.0258
E18	CB	RIM = 1409.73'± N INV. IN = 1406.80' 15" DIA. PIPE S INV. OUT = 1406.80' 15" DIA. PIPE	11152.63	-175.4742
E19	CB	RIM = 1408.87'± N INV. IN = 1406.50' 15" DIA. PIPE S INV. OUT = 1406.50' 15" DIA. PIPE	11154.60	-199.3117

STORM DRAINAGE STRUCTURE SCHEDULE

STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
E20	CB	RIM = 1408.99'± E INV. IN = 1406.00' 18" DIA. PIPE N INV. IN = 1406.30' 15" DIA. PIPE W INV. OUT = 1406.00' 18" DIA. PIPE	11156.24	-217.9298
E20A	OS	RIM = 1408.48'± W INV. OUT = 1403.50' 15" DIA. PIPE	11159.38	-228.1590
E20B	OUTFALL	RIM = 1400.67'± E INV. IN = 1401.00' 15" DIA. PIPE	11104.93	-249.7388
E21	CB	RIM = 1400.99'± S INV. OUT = 1397.90' 15" DIA. PIPE	10951.85	-172.5387
E22	CB	RIM = 1401.00'± N INV. IN = 1397.60' 15" DIA. PIPE S INV. OUT = 1397.60' 15" DIA. PIPE	10953.30	-190.6052
E23	CB	RIM = 1399.38'± N INV. IN = 1396.30' 15" DIA. PIPE S INV. OUT = 1396.30' 15" DIA. PIPE	10955.17	-215.4222
E24	CB	RIM = 1399.17'± N INV. IN = 1396.00' 15" DIA. PIPE E INV. IN = 1396.00' 18" DIA. PIPE W INV. OUT = 1396.00' 18" DIA. PIPE	10956.58	-233.4870
E24A	FS	RIM = 1396.80'± E INV. IN = 1392.50' 18" DIA. PIPE S INV. OUT = 1392.50' 18" DIA. PIPE W INV. OUT = 1392.50' 18" DIA. PIPE	10896.49	-236.7713
E24B	OUTFALL	RIM = 1395.32'± N INV. IN = 1392.00' 18" DIA. PIPE	10896.82	-251.1403
E24C	OS	RIM = 1389.50'± W INV. OUT = 1384.50' 15" DIA. PIPE	10837.99	-279.8810
E24D	OUTFALL	RIM = 1383.77'± E INV. IN = 1383.50' 15" DIA. PIPE	10751.80	-280.0168
E25	CB	RIM = 1389.40'± S INV. OUT = 1386.70' 15" DIA. PIPE	10702.41	-191.5148
E26	CB	RIM = 1389.92'± N INV. IN = 1386.40' 15" DIA. PIPE S INV. OUT = 1386.40' 15" DIA. PIPE	10703.90	-210.0128
E27	CB	RIM = 1389.00'± N INV. IN = 1385.90' 15" DIA. PIPE S INV. OUT = 1385.90' 15" DIA. PIPE	10705.82	-234.8480
E28	CB	RIM = 1388.99'± E INV. IN = 1385.70' 18" DIA. PIPE N INV. IN = 1385.70' 15" DIA. PIPE W INV. OUT = 1385.00' 24" DIA. PIPE	10707.41	-252.9543
E29	CB	RIM = 1378.63'± S INV. OUT = 1375.95' 18" DIA. PIPE	10441.03	-211.5749
E30	CB	RIM = 1378.87'± N INV. IN = 1375.70' 18" DIA. PIPE S INV. OUT = 1375.70' 18" DIA. PIPE	10446.93	-233.3232
E31	CB	RIM = 1379.00'± N INV. IN = 1375.30' 18" DIA. PIPE S INV. OUT = 1375.30' 18" DIA. PIPE	10453.08	-262.3599
E32	CB	RIM = 1379.00'± N INV. IN = 1375.10' 18" DIA. PIPE S INV. OUT = 1375.10' 18" DIA. PIPE	10457.40	-279.9291
E32A	MH	RIM = 1378.63'± N INV. IN = 1374.95' 18" DIA. PIPE E INV. OUT = 1374.95' 18" DIA. PIPE	10460.97	-291.0079
E32B	MH	RIM = 1382.72'± E INV. IN = 1379.00' 24" DIA. PIPE W INV. IN = 1374.00' 18" DIA. PIPE S INV. OUT = 1374.00' 24" DIA. PIPE	10591.32	-275.0572
E32C	OUTFALL	RIM = 1377.27'± N INV. IN = 1373.60' 24" DIA. PIPE	10598.08	-295.5060
E33	CB	RIM = 1374.40'± SW INV. IN = 1372.40' 18" DIA. PIPE SE INV. IN = 1372.40' 15" DIA. PIPE NW INV. OUT = 1372.40' 18" DIA. PIPE	10256.86	-253.4303
E33A	OUTFALL	RIM = 1373.11'± SE INV. IN = 1371.00' 18" DIA. PIPE	10064.86	-65.0329
E34	CB	RIM = 1375.10'± NW INV. OUT = 1373.10' 15" DIA. PIPE	10317.21	-372.7952
E35	CB	RIM = 1384.82'± SE INV. IN = 1378.45' 15" DIA. PIPE NE INV. OUT = 1378.45' 18" DIA. PIPE	10047.95	-472.1016
E35A	CB	RIM = 1378.76'± SW INV. IN = 1374.80' 18" DIA. PIPE NE INV. OUT = 1374.80' 18" DIA. PIPE	10140.11	-353.6802
E36	CB	RIM = 1383.50'± NW INV. OUT = 1379.80' 15" DIA. PIPE	10160.96	-540.7905
E37	CB	RIM = 1389.00'± SE INV. OUT = 1386.00' 18" DIA. PIPE	9805.64	-962.7115
E37A	FS	RIM = 1390.04'± NW INV. IN = 1385.60' 18" DIA. PIPE SE INV. OUT = 1385.60' 18" DIA. PIPE SW INV. OUT = 1385.60' 18" DIA. PIPE	9846.45	-981.9309

STORM DRAINAGE STRUCTURE SCHEDULE

STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
E37B	OUTFALL	RIM = 1388.69'± NW INV. IN = 1385.50' 18" DIA. PIPE	9853.75	-985.0384
E37C	MH	RIM = 1389.57'± NE INV. IN = 1383.00' 18" DIA. PIPE E INV. OUT = 1383.00' 18" DIA. PIPE	9811.30	-1063.7991
E37D	OS	RIM = 1385.00'± W INV. IN = 1382.00' 18" DIA. PIPE E INV. OUT = 1382.00' 18" DIA. PIPE	9845.95	-1074.6942
E38	OS	RIM = 1384.50'± W INV. IN = 1381.50' 18" DIA. PIPE S INV. OUT = 1381.50' 18" DIA. PIPE	9933.46	-1107.3561
E38A	OUTFALL	RIM = 1381.62'± N INV. IN = 1380.90' 18" DIA. PIPE	9963.98	-1217.6327
E40	CB	RIM = 1383.67'± SW INV. OUT = 1380.25' 15" DIA. PIPE	9304.90	-1450.1956
E41	CB	RIM = 1388.97'± W INV. OUT = 1385.45' 15" DIA. PIPE	9473.95	-1573.4947
E42	CB	RIM = 1371.99'± NE INV. IN = 1368.55' 15" DIA. PIPE SW INV. OUT = 1368.30' 18" DIA. PIPE	9166.04	-1520.5019
E43	CB	RIM = 1380.96'± E INV. IN = 1377.25' 15" DIA. PIPE SW INV. OUT = 1377.00' 18" DIA. PIPE	9327.55	-1614.2202
E44	CB	RIM = 1369.00'± SE INV. IN = 1365.15' 24" DIA. PIPE NE INV. IN = 1365.15' 18" DIA. PIPE SW INV. IN = 1365.15' 15" DIA. PIPE NW INV. OUT = 1365.15' 30" DIA. PIPE	9056.54	-1600.5108
E44A	OUTFALL	RIM = 1365.99'± SE INV. IN = 1365.00' 30" DIA. PIPE	9048.13	-1581.3276
E45	CB	RIM = 1375.00'± NE INV. IN = 1370.80' 18" DIA. PIPE SW INV. IN = 1371.05' 15" DIA. PIPE NW INV. OUT = 1370.30' 24" DIA. PIPE	9161.74	-1709.6918
E46	FS	RIM = 1374.95'± SE INV. IN = 1371.45' 15" DIA. PIPE NE INV. OUT = 1371.45' 15" DIA. PIPE NW INV. OUT = 1371.45' 15" DIA. PIPE	8926.35	-1745.5148
E46A	OUTFALL	RIM = 1371.56'± SE INV. IN = 1371.00' 15" DIA. PIPE	8895.02	-1723.0271
E46B	OS	RIM = 1367.34'± NE INV. OUT = 1366.00' 15" DIA. PIPE	8891.83	-1678.1065
E46C	OUTFALL	RIM = 1367.11'± SW INV. IN = 1365.20' 15" DIA. PIPE	8958.13	-1647.9562
E47	FS	RIM = 1378.98'± NE INV. OUT = 1376.00' 15" DIA. PIPE NW INV. OUT = 1376.00' 15" DIA. PIPE	9057.45	-1824.6727
E48	FS	RIM = 1386.91'± W INV. OUT = 1383.75' 15" DIA. PIPE S INV. OUT = 1383.75' 15" DIA. PIPE	8724.67	-2206.7524
E48A	OUTFALL	RIM = 1383.74'± E INV. IN = 1383.50' 15" DIA. PIPE	8681.02	-2196.2561
E48B	OS	RIM = 1383.00'± NW INV. OUT = 1378.00' 15" DIA. PIPE	8650.38	-2216.0351
E48C	OUTFALL	RIM = 1376.94'± SE INV. IN = 1376.50' 15" DIA. PIPE	8561.17	-2177.6577
E49	CB	RIM = 1385.00'± E INV. IN = 1381.30' 18" DIA. PIPE S INV. IN = 1381.30' 15" DIA. PIPE N INV. IN = 1381.30' 15" DIA. PIPE NW INV. OUT = 1381.30' 24" DIA. PIPE	8677.70	-2378.0488
E49A	OUTFALL	RIM = 1384.34'± SE INV. IN = 1381.00' 24" DIA. PIPE	8664.24	-2361.7680
E49B	MH	RIM = 1386.96'± SE INV. IN = 1384.00' 15" DIA. PIPE N INV. OUT = 1384.00' 15" DIA. PIPE	8677.13	-2530.4580
E50	CB	RIM = 1388.51'± W INV. OUT = 1386.50' 18" DIA. PIPE	8812.27	-2446.9473
E50A	FS	RIM = 1390.57'± E INV. IN = 1386.10' 18" DIA. PIPE SW INV. OUT = 1386.10' 18" DIA. PIPE N INV. OUT = 1385.60' 18" DIA. PIPE	8765.80	-2441.2935
E50B	OUTFALL	RIM = 1385.86'± NE INV. IN = 1386.00' 18" DIA. PIPE	8751.08	-2450.7501
E50C	MH	RIM = 1391.54'± S INV. IN = 1383.20' 18" DIA. PIPE W INV. OUT = 1383.20' 16" DIA. PIPE	8774.82	-2369.9192
E50D	OS	RIM = 1385.24'± E INV. IN = 1382.00' 18" DIA. PIPE W INV. OUT = 1382.00' 16" DIA. PIPE	8739.41	-2369.8248
E51	FS	RIM = 1391.95'± NE INV. IN = 1388.50' 15" DIA. PIPE NW INV. OUT = 1388.50' 18" DIA. PIPE NW INV. OUT = 1388.50' 15" DIA. PIPE	8797.43	-2770.1876

STORM DRAINAGE STRUCTURE SCHEDULE

STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
E51A	OUTFALL	RIM = 1387.00'± SE INV. IN = 1387.50' 18" DIA. PIPE	8709.97	-2670.5366
E51B	OS	RIM = 1387.00'± NW INV. OUT = 1384.00' 18" DIA. PIPE	8664.00	-2603.9311
E51C	OUTFALL	RIM = 1384.00'± SE INV. IN = 1383.00' 18" DIA. PIPE	8611.47	-2542.8978
E52	CB	RIM = 1392.00'± SW INV. OUT = 1389.60' 15" DIA. PIPE	8874.90	-2696.9163
E53	CB	RIM = 1391.46'± SE INV. OUT = 1387.85' 15" DIA. PIPE	9096.84	-3049.7299
E53A	FS	RIM = 1385.95'± NW INV. IN = 1383.56' 15" DIA. PIPE NE INV. IN = 1381.75' 15" DIA. PIPE SE INV. OUT = 1381.50' 15" DIA. PIPE SW INV. OUT = 1381.75' 15" DIA. PIPE	9190.34	-3131.3440
E53B	MH	RIM = 1386.64'± NE INV. IN = 1381.25' 15" DIA. PIPE SE INV. OUT = 1381.25' 15" DIA. PIPE	9141.37	-3175.8502
E53C	OUTFALL	RIM = 1384.50'± NW INV. IN = 1381.00' 15" DIA. PIPE	9167.47	-3207.5498
E53D	OS	RIM = 1383.63'± SE INV. OUT = 1378.50' 15" DIA. PIPE	9241.81	-3274.2266
E53E	OUTFALL	RIM = 1379.71'± NW INV. IN = 1378.00' 15" DIA. PIPE	9288.43	-3297.9877
E54	CB	RIM = 1391.99'± SE INV. OUT = 1388.55' 15" DIA. PIPE	9165.88	-2974.5842
E55	CB	RIM = 1382.39'± NW INV. IN = 1380.50' 15" DIA. PIPE S INV. OUT = 1379.30' 18" DIA. PIPE	9257.14	-3189.6550
E55A	MH	RIM = 1384.02'± N INV. IN = 1379.10' 18" DIA. PIPE SE INV. OUT = 1379.10' 18" DIA. PIPE	9254.75	-3203.3438
E55B	OUTFALL	RIM = 1378.14'± NW INV. IN = 1378.00' 18" DIA. PIPE	9305.13	-3282.6248
E56	CB	RIM = 1385.04'± NW INV. IN = 1382.75' 15" DIA. PIPE SW INV. OUT = 1382.75' 15" DIA. PIPE	9256.55	-3057.2852
E57	CB	RIM = 1379.00'± N INV. IN = 1378.50' 15" DIA. PIPE S INV. OUT = 1378.50' 15" DIA. PIPE	9417.60	-3289.3376
E57A	OUTFALL	RIM = 1378.87'± N INV. IN = 1378.00' 15" DIA. PIPE	9398.61	-3335.6976
E58	CB	RIM = 1380.00'± S INV. OUT = 1379.75' 15" DIA. PIPE	9418.65	-3178.1517
E59	CB	RIM = 1381.00'± NE INV. IN = 1377.70' 18" DIA. PIPE SE INV. OUT = 1377.70' 24" DIA. PIPE	9965.82	-3535.4039
E59A	MH	RIM = 1381.00'± NW INV. IN = 1377.20' 24" DIA. PIPE SE INV. IN = 1377.20' 18" DIA. PIPE S INV. OUT = 1377.20' 24" DIA. PIPE	9997.93	-3567.1295
E59B	OUTFALL	RIM = 1377.28'± N INV. IN = 1376.50' 24" DIA. PIPE	9994.31	-3638.4852
E60	CB	RIM = 1385.00'± SW INV. OUT = 1380.50' 18" DIA. PIPE	10068.13	-3485.6542
E61	CB	RIM = 1387.93'± NE INV. IN = 1380.00' 15" DIA. PIPE SE INV. IN = 1377.20' 15" DIA. PIPE NW INV. OUT = 1384.00' 18" DIA. PIPE	10079.13	-3724.0287
E62	CB	RIM = 1390.98'± SW INV. OUT = 1387.00' 15" DIA. PIPE	10165.16	-3686.9964
E63	FS	RIM = 1408.81'± NE INV. IN = 1404.50' 15" DIA. PIPE NW INV. OUT = 1404.50' 18" DIA. PIPE NW INV. OUT = 1404.50' 15" DIA. PIPE	10192.98	-3993.9987
E63A	OUTFALL	RIM = 1403.00'± SE INV. IN = 1403.50' 18" DIA. PIPE	10124.53	-3918.1800
E63B	OS	RIM = 1403.00'± W INV. OUT = 1398.00' 18" DIA. PIPE	10080.99	-3949.1674
E63C	OUTFALL	RIM = 1398.00'± E INV. IN = 1397.50' 18" DIA. PIPE	10046.20	-3963.1275
E64	CB	RIM = 1410.18'± SW INV. OUT = 1406.75' 15" DIA. PIPE	10275.70	-3950.7537

ABBREVIATIONS:

CB - CATCH BASIN
MH - MANHOLE
OS - OUTLET CONTROL STRUCTURE
YD - YARD DRAIN
FS - FLOW SPLITTER
N - NORTH
S - SOUTH
E - EAST
W - WEST
NE - NORTH EAST
NW - NORTH WEST
SE - SOUTH EAST
SW - SOUTH WEST

NOTES:
1. ALL STORMWATER PIPING SHALL BE REINFORCED CONCRETE PIPE OR ENGINEER APPROVED EQUAL, UNLESS OTHERWISE NOTED.
2. DRAINAGE STRUCTURES AND PIPES EAST OF RESORT ENTRY ROAD STATION 33+00 ARE NOT INCLUDED IN THIS SCHEDULE. CONTRACTOR SHALL ASSUME 24" DIA. REINFORCED CONCRETE PIPES AND STANDARD MANHOLES AND CATCH BASINS AS SPECIFIED ON THE C-900 SERIES DRAWINGS FOR COST ESTIMATE PURPOSES.
3. PROPOSED ROADWAY CULVERTS ARE NOT INCLUDED IN THIS SCHEDULE. REFER TO C-500 SERIES DRAWINGS.

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NYSDEC SWPPP SUBMISSION
NOT FOR CONSTRUCTION

NEW YORK STATE EDUCATION LAW 145, SECTION 7209, PROHIBITS ANY INDIVIDUAL FROM ALTERING THESE DRAWINGS AND/OR ACCOMPANYING SPECIFICATIONS IN ANY WAY, UNLESS IT IS UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. IF ALTERATIONS ARE MADE, THE ALTERING ENGINEER MUST SIGN, SEAL, DATE, AND DESCRIBE THE FULL DESCRIPTION OF THE ALTERATION ON THE DRAWING AND/OR SPECIFICATIONS.

REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
SCHEDULES, SECTIONS AND PROFILES
STORM DRAINAGE SCHEDULE I

SHEET NO.
C-801

STORM DRAINAGE STRUCTURE SCHEDULE				
STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
J1	CB	RIM = 1453.98'± E INV. OUT = 1450.80' 15" DIA. PIPE	11884.35	388.1654
J2	CB	RIM = 1453.98'± W INV. IN = 1450.50' 15" DIA. PIPE E INV. OUT = 1450.50' 15" DIA. PIPE	11901.72	383.2374
J3	CB	RIM = 1452.29'± W INV. IN = 1449.38' 15" DIA. PIPE E INV. OUT = 1449.38' 15" DIA. PIPE	11925.61	375.7909
J4	CB	RIM = 1452.25'± W INV. IN = 1449.00' 15" DIA. PIPE N INV. OUT = 1449.00' 18" DIA. PIPE	11942.72	370.3912
J5	CB	RIM = 1450.99'± E INV. OUT = 1447.10' 15" DIA. PIPE	11925.94	532.5784
J6	CB	RIM = 1450.99'± W INV. IN = 1446.80' 15" DIA. PIPE E INV. OUT = 1446.80' 15" DIA. PIPE	11943.29	527.7383
J7	CB	RIM = 1449.23'± W INV. IN = 1445.10' 15" DIA. PIPE E INV. OUT = 1445.10' 15" DIA. PIPE	11967.17	520.8273
J8	CB	RIM = 1449.00'± W INV. IN = 1444.70' 15" DIA. PIPE S INV. IN = 1444.70' 18" DIA. PIPE N INV. OUT = 1444.70' 24" DIA. PIPE	11984.46	515.7726
J9	CB	RIM = 1448.01'± E INV. OUT = 1445.25' 15" DIA. PIPE	11967.52	677.0367
J10	CB	RIM = 1448.00'± W INV. IN = 1445.00' 15" DIA. PIPE E INV. OUT = 1445.00' 15" DIA. PIPE	11984.74	672.2712
J11	CB	RIM = 1446.45'± W INV. IN = 1443.00' 15" DIA. PIPE E INV. OUT = 1443.00' 15" DIA. PIPE	12008.76	664.8468
J12	CB	RIM = 1445.99'± W INV. IN = 1442.75' 15" DIA. PIPE S INV. IN = 1442.25' 24" DIA. PIPE E INV. OUT = 1442.25' 24" DIA. PIPE	12025.94	659.8234
J12A	FS	RIM = 1446.07'± W INV. IN = 1442.00' 24" DIA. PIPE E INV. OUT = 1442.00' 24" DIA. PIPE E INV. OUT = 1442.00' 24" DIA. PIPE	12044.10	654.8163
J12B	OUTFALL	RIM = 1443.87'± W INV. IN = 1441.60' 24" DIA. PIPE	12067.00	663.1956
J12C	OUTFALL	RIM = 1442.66'± W INV. IN = 1441.30' 24" DIA. PIPE	12106.89	638.9407
J13	CB	RIM = 1446.00'± E INV. OUT = 1442.90' 15" DIA. PIPE	12021.00	862.6710
J14	CB	RIM = 1446.00'± W INV. IN = 1442.70' 15" DIA. PIPE E INV. OUT = 1442.70' 15" DIA. PIPE	12037.91	856.7093
J14A	MH	RIM = 1445.96'± W INV. IN = 1442.55' 15" DIA. PIPE S INV. OUT = 1442.55' 15" DIA. PIPE	12049.38	853.2743
J14B	MH	RIM = 1446.03'± N INV. IN = 1441.90' 15" DIA. PIPE E INV. OUT = 1441.90' 15" DIA. PIPE	12032.04	790.3185
J15	CB	RIM = 1445.00'± W INV. IN = 1441.80' 15" DIA. PIPE E INV. OUT = 1441.80' 15" DIA. PIPE	12044.10	787.3703
J16	CB	RIM = 1445.00'± W INV. IN = 1441.60' 15" DIA. PIPE SE INV. OUT = 1441.60' 15" DIA. PIPE	12061.12	782.6440
J16A	OUTFALL	RIM = 1443.21'± NW INV. IN = 1441.20' 15" DIA. PIPE	12087.13	754.1683
J17	CB	RIM = 1447.01'± E INV. OUT = 1444.25' 15" DIA. PIPE	12060.86	1001.5422
J18	CB	RIM = 1447.01'± W INV. IN = 1444.00' 15" DIA. PIPE E INV. OUT = 1444.00' 15" DIA. PIPE	12078.22	996.9687
J19	CB	RIM = 1447.16'± W INV. IN = 1443.70' 15" DIA. PIPE E INV. OUT = 1443.70' 15" DIA. PIPE	12102.41	990.2734

STORM DRAINAGE STRUCTURE SCHEDULE				
STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
J20	CB	RIM = 1447.16'± W INV. IN = 1443.50' 15" DIA. PIPE E INV. OUT = 1443.50' 15" DIA. PIPE	12119.81	985.9966
J20A	FS	RIM = 1447.70'± W INV. IN = 1443.30' 15" DIA. PIPE NE INV. OUT = 1443.30' 15" DIA. PIPE S INV. OUT = 1443.30' 15" DIA. PIPE	12135.07	982.0413
J20B	OUTFALL	RIM = 1444.37'± SW INV. IN = 1443.00' 15" DIA. PIPE	12165.78	1009.4499
J20C	OUTFALL	RIM = 1445.00'± N INV. IN = 1443.00' 15" DIA. PIPE	12136.79	936.0643
J21	CB	RIM = 1445.01'± E INV. OUT = 1442.28' 15" DIA. PIPE	12164.17	1370.0746
J22	CB	RIM = 1445.01'± W INV. IN = 1442.10' 15" DIA. PIPE E INV. OUT = 1442.10' 15" DIA. PIPE	12181.80	1366.9318
J23	CB	RIM = 1446.97'± W INV. IN = 1441.80' 15" DIA. PIPE E INV. OUT = 1441.80' 15" DIA. PIPE	12206.69	1363.0649
J24	CB	RIM = 1446.97'± W INV. IN = 1441.60' 15" DIA. PIPE N INV. OUT = 1441.60' 15" DIA. PIPE	12224.34	1360.4781
J25	CB	RIM = 1441.82'± E INV. OUT = 1438.50' 15" DIA. PIPE	12179.64	1507.9146
J26	CB	RIM = 1441.45'± W INV. IN = 1438.30' 15" DIA. PIPE E INV. OUT = 1438.30' 15" DIA. PIPE	12197.59	1505.6325
J27	CB	RIM = 1441.98'± W INV. IN = 1438.00' 15" DIA. PIPE E INV. OUT = 1438.00' 15" DIA. PIPE	12222.29	1503.7210
J28	CB	RIM = 1441.98'± S INV. IN = 1437.80' 15" DIA. PIPE W INV. IN = 1437.80' 15" DIA. PIPE N INV. OUT = 1437.80' 18" DIA. PIPE	12240.36	1501.6061
J29	CB	RIM = 1438.10'± E INV. OUT = 1435.30' 15" DIA. PIPE	12191.06	1621.3448
J30	CB	RIM = 1438.15'± W INV. IN = 1435.10' 15" DIA. PIPE E INV. OUT = 1435.10' 15" DIA. PIPE	12208.87	1619.3195
J31	CB	RIM = 1438.00'± W INV. IN = 1434.80' 15" DIA. PIPE E INV. OUT = 1434.80' 15" DIA. PIPE	12233.58	1617.0422
J32	CB	RIM = 1438.00'± W INV. IN = 1434.60' 15" DIA. PIPE S INV. IN = 1434.60' 18" DIA. PIPE E INV. OUT = 1434.60' 18" DIA. PIPE	12251.76	1615.2771
J32A	MH	RIM = 1438.11'± W INV. IN = 1434.55' 18" DIA. PIPE SE INV. OUT = 1434.55' 18" DIA. PIPE	12270.04	1613.8222
J32B	OUTFALL	RIM = 1438.83'± NW INV. IN = 1434.20' 18" DIA. PIPE	12304.76	1568.6423
J32C	OS	RIM = 1438.90'± SE INV. OUT = 1434.00' 15" DIA. PIPE	12323.19	1454.4384
J32D	OUTFALL	RIM = ???'± NW INV. IN = 1432.00' 15" DIA. PIPE	12335.55	1438.7199

STORM DRAINAGE STRUCTURE SCHEDULE				
STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
T1	CB	RIM = 1405.58'± N INV. OUT = 1405.50' 12" DIA. PIPE	11869.39	1786.4351
T2	CB	RIM = 1405.51'± S INV. IN = 1405.00' 12" DIA. PIPE W INV. OUT = 1404.48' 15" DIA. PIPE	11881.52	1819.1264
T3	CB	RIM = 1387.00'± N INV. OUT = 1387.00' 12" DIA. PIPE	11676.36	1857.3894
T4	CB	RIM = 1387.36'± E INV. IN = 1386.31' 15" DIA. PIPE S INV. IN = 1386.64' 12" DIA. PIPE W INV. OUT = 1386.31' 15" DIA. PIPE	11688.59	1890.3056
T5	CB	RIM = 1368.70'± N INV. OUT = 1368.27' 12" DIA. PIPE	11514.73	1887.2496
T5A	FS	RIM = 1368.71'± S INV. IN = 1367.76' 12" DIA. PIPE E INV. IN = 1367.76' 15" DIA. PIPE N INV. OUT = 1367.76' 15" DIA. PIPE W INV. OUT = 1367.76' 15" DIA. PIPE	11518.83	1922.1099
T5B	OUTFALL	RIM = 1364.00'± E INV. IN = 1363.38' 15" DIA. PIPE	11428.63	1947.0374
T5C	OUTFALL	RIM = 1367.00'± S INV. IN = 1366.50' 15" DIA. PIPE	11515.59	1943.7145
T5D	OS	RIM = 1365.50'± NW INV. OUT = 1360.50' 12" DIA. PIPE	11457.32	1965.7198
T5E	OUTFALL	RIM = 1361.73'± SE INV. IN = 1360.00' 12" DIA. PIPE	11445.06	1982.6833

STORM DRAINAGE STRUCTURE SCHEDULE				
STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
T6	CB	RIM = 1352.97'± N INV. OUT = 1351.50' 12" DIA. PIPE	11285.96	1911.4030
T7A	FS	RIM = 1352.96'± S INV. IN = 1351.10' 12" DIA. PIPE NW INV. OUT = 1351.10' 12" DIA. PIPE W INV. OUT = 1351.10' 15" DIA. PIPE	11288.45	1946.3768
T7B	OUTFALL	RIM = 1352.89'± SE INV. IN = 1351.00' 12" DIA. PIPE	11277.58	1968.0666
T7C	OUTFALL	RIM = 1349.51'± E INV. IN = 1348.00' 15" DIA. PIPE	11081.92	1968.9408
T7D	OS	RIM = 1350.50'± NW INV. OUT = 1348.10' 12" DIA. PIPE	11210.60	1988.4824
T7E	OUTFALL	RIM = 1348.69'± SE INV. IN = 1348.00' 12" DIA. PIPE	11202.15	2005.3255

STORM DRAINAGE STRUCTURE SCHEDULE				
STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
T5F	OUTFALL	RIM = 1368.00'± W INV. OUT = 1367.00' 12" DIA. PIPE	11495.83	1888.4374
T5G	OUTFALL	RIM = 1360.03'± E INV. IN = 1360.00' 12" DIA. PIPE	11392.06	1900.2293

STORM DRAINAGE STRUCTURE SCHEDULE				
STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
T8	CB	RIM = 1347.00'± N INV. OUT = 1347.50' 12" DIA. PIPE	10937.68	1935.2029
T9	OUTFALL	RIM = 1349.00'± S INV. IN = 1347.20' 12" DIA. PIPE	10938.16	1965.7724
T10	CB	RIM = 1348.99'± N INV. OUT = 1348.45' 12" DIA. PIPE	10777.06	1937.0791
T11	OUTFALL	RIM = 1351.01'± S INV. IN = 1348.09' 12" DIA. PIPE	10776.28	1967.6939

STORM DRAINAGE STRUCTURE SCHEDULE				
STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
T12	CB	RIM = 1353.95'± N INV. OUT = 1353.50' 12" DIA. PIPE	10143.11	1947.1492
T13	OUTFALL	RIM = 1355.07'± S INV. IN = 1353.25' 12" DIA. PIPE	10143.11	1977.6552
T14	OS	RIM = 1347.46'± W INV. OUT = 1346.20' 12" DIA. PIPE	9952.29	2032.3205
T15	OUTFALL	RIM = 1349.00'± E INV. IN = 1346.00' 12" DIA. PIPE	9893.69	2027.8541

STORM DRAINAGE STRUCTURE SCHEDULE				
STRUCTURE NO.	STRUCTURE TYPE	ELEVATION	X (FEET)	Y (FEET)
T16	CB	RIM = 1348.00'± N INV. OUT = 1347.50' 12" DIA. PIPE	9751.71	1950.5312
T17	OUTFALL	RIM = 1348.58'± S INV. IN = 1347.10' 12" DIA. PIPE	9750.86	1981.8804
T18	OS	RIM = 1349.42'± SW INV. OUT = 1345.00' 15" DIA. PIPE	9257.41	1800.9538
T18A	CB	RIM = 1349.96'± NW INV. OUT = 1349.25' 15" DIA. PIPE	9261.19	1743.9949
T18B	OUTFALL	RIM = 1350.54'± SE INV. IN = 1349.00' 15" DIA. PIPE	9245.11	1771.6221
T19	MH	RIM = 1351.39'± NE INV. IN = 1344.20' 15" DIA. PIPE SW INV. OUT = 1344.20' 15" DIA. PIPE	9198.95	1749.2799
T20	MH	RIM = 1351.27'± NE INV. IN = 1341.50' 15" DIA. PIPE SW INV. OUT = 1341.50' 15" DIA. PIPE	8993.62	1609.2244
T21	OUTFALL	RIM = 1340.07'± NE INV. IN = 1339.50' 15" DIA. PIPE	8766.80	1469.2598
T22	CB	RIM = 1339.00'± NW INV. OUT = 1338.50' 12" DIA. PIPE	8758.85	1414.6017
T23	OUTFALL	RIM = 1339.39'± SE INV. IN = 1338.20' 12" DIA. PIPE	8742.57	1443.0338

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FS - FLOW SPLITTER
N - NORTH
S - SOUTH
E - EAST
W - WEST
NE - NORTH EAST
NW - NORTH WEST
SE - SOUTH EAST
SW - SOUTH WEST

NOTES:
1. ALL STORMWATER PIPING SHALL BE REINFORCED CONCRETE PIPE OR ENGINEER APPROVED EQUAL, UNLESS OTHERWISE NOTED.
2. DRAINAGE STRUCTURES AND PIPES EAST OF RESORT ENTRY ROAD STATION 33+00 ARE NOT INCLUDED IN THIS SCHEDULE. CONTRACTOR SHALL ASSUME 24" DIA. REINFORCED CONCRETE PIPES AND STANDARD MANHOLES AND CATCH BASINS AS SPECIFIED ON THE C-900 SERIES DRAWINGS FOR COST ESTIMATE PURPOSES.
3. PROPOSED ROADWAY CULVERTS ARE NOT INCLUDED IN THIS SCHEDULE. REFER TO C-500 SERIES DRAWINGS.

APPLICANT

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NYSDEC SWPPP SUBMISSION
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REVISIONS		
No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
SCHEDULES, SECTIONS AND PROFILES
STORM DRAINAGE SCHEDULE II

SHEET NO.
C-802

STORM DRAINAGE PIPE SCHEDULE							
PIPE NO.	DIAMETER (IN.)	LENGTH (FT.)	SLOPE (%)	FROM	TO	START INVERT	END INVERT
E-1	15	18	1.11%	E1	E2	1446.00	1445.80
E-2	15	25	1.19%	E2	E3	1445.80	1445.50
E-3	15	18	1.11%	E3	E4	1445.50	1445.30
E-4	18	39	1.79%	E4	E4A	1445.30	1444.60
E-4A	18	24	2.54%	E4A	E4B	1444.60	1444.00
E-4B	18	67	2.39%	E4A	E4C	1444.60	1443.00
E-4C	15	90	1.11%	E4D	E4E	1438.50	1437.50
E-5	15	18	1.13%	E5	E6	1436.60	1436.40
E-6	15	25	1.19%	E6	E7	1436.40	1436.10
E-7	15	18	1.67%	E7	E8	1436.10	1435.80
E-8	15	9	1.77%	E8	E8A	1435.80	1435.64
E-8A	15	7	1.92%	E8A	E8B	1435.64	1435.50
E-8B	15	150	5.58%	E8A	E12	1435.64	1427.30
E-8C	15	87	1.14%	E8C	E8D	1429.50	1428.50
E-9	15	18	1.11%	E9	E10	1428.00	1427.80
E-10	15	25	1.20%	E10	E11	1427.80	1427.50
E-11	15	18	1.10%	E11	E12	1427.50	1427.30
E-12	18	123	6.59%	E12	E16	1427.30	1419.20
E-13	15	18	1.10%	E13	E14	1420.20	1420.00
E-14	15	25	2.41%	E14	E15	1420.00	1419.40
E-15	15	18	1.11%	E15	E16	1419.40	1419.20
E-16	18	143	5.03%	E16	E16A	1419.20	1412.00
E-16A	18	21	7.03%	E16A	E16B	1412.00	1410.50
E-16B	18	117	5.15%	E16A	E20	1412.00	1406.00
E-17	15	19	1.08%	E17	E18	1407.00	1406.80
E-18	15	24	1.25%	E18	E19	1406.80	1406.50
E-19	15	19	1.07%	E19	E20	1406.50	1406.30
E-20	18	200	4.99%	E20	E24	1406.00	1396.00
E-20A	15	59	4.27%	E20A	E20B	1403.50	1401.00
E-21	15	18	1.66%	E21	E22	1397.90	1397.60
E-22	15	25	5.22%	E22	E23	1397.60	1396.30
E-23	15	18	1.66%	E23	E24	1396.30	1396.00
E-24	18	60	5.82%	E24	E24A	1396.00	1392.50
E-24A	18	14	3.48%	E24A	E24B	1392.50	1392.00
E-24B	18	190	3.58%	E24A	E28	1392.50	1385.70
E-24C	15	86	1.16%	E24C	E24D	1384.50	1383.50
E-25	15	19	1.62%	E25	E26	1386.70	1386.40
E-26	15	25	2.01%	E26	E27	1386.40	1385.90
E-27	15	18	1.10%	E27	E28	1385.90	1385.70
E-28	24	118	5.08%	E28	E32B	1385.00	1379.00
E-29	18	23	1.11%	E29	E30	1375.95	1375.70
E-30	18	30	1.35%	E30	E31	1375.70	1375.30
E-31	18	18	1.11%	E31	E32	1375.30	1375.10
E-32	18	12	1.29%	E32	E32A	1375.10	1374.95
E-32A	18	131	0.72%	E32A	E32B	1374.95	1374.00
E-32B	24	22	1.86%	E32B	E32C	1374.00	1373.60
E-33	18	269	0.52%	E33	E33A	1372.40	1371.00
E-34	15	134	0.52%	E34	E33	1373.10	1372.40
E-35	18	150	2.43%	E35	E35A	1378.45	1374.80
E-35A	18	154	1.56%	E35A	E33	1374.80	1372.40

STORM DRAINAGE PIPE SCHEDULE							
PIPE NO.	DIAMETER (IN.)	LENGTH (FT.)	SLOPE (%)	FROM	TO	START INVERT	END INVERT
E-36	15	132	1.02%	E36	E35	1379.80	1378.45
E-37	18	45	0.89%	E37	E37A	1386.00	1385.60
E-37A	18	8	1.26%	E37A	E37B	1385.60	1385.50
E-37B	18	89	2.92%	E37A	E37C	1385.60	1383.00
E-37C	18	36	2.75%	E37C	E37D	1383.00	1382.00
E-37D	18	93	0.54%	E37D	E38	1382.00	1381.50
E-37E	18	114	0.52%	E38	E38A	1381.50	1380.90
E-40	15	156	7.52%	E40	E42	1380.25	1368.55
E-41	15	152	5.40%	E41	E43	1385.45	1377.25
E-42	18	136	2.32%	E42	E44	1368.30	1365.15
E-43	18	191	3.24%	E43	E45	1377.00	1370.80
E-44	24	152	3.40%	E45	E44	1370.30	1365.15
E-44A	30	21	0.72%	E44	E44A	1365.15	1365.00
E-46	15	195	3.23%	E46	E44	1371.45	1365.15
E-47	15	155	3.19%	E47	E45	1376.00	1371.05
E-48	15	178	1.38%	E48	E49	1383.75	1381.30
E-48A	15	45	0.56%	E48	E48A	1383.75	1383.50
E-48B	15	97	1.54%	E48B	E48C	1378.00	1376.50
E-49	15	152	1.77%	E49B	E49	1384.00	1381.30
E-49A	24	21	1.42%	E49	E49A	1381.30	1381.00
E-50	18	47	0.85%	E50	E50A	1386.50	1386.10
E-50A	18	72	3.34%	E50A	E50C	1385.60	1383.20
E-50B	18	35	3.39%	E50C	E50D	1383.20	1382.00
E-50C	18	62	1.12%	E50D	E49	1382.00	1381.30
E-50D	18	17	0.57%	E50A	E50B	1386.10	1386.00
E-51	15	268	1.68%	E51	E49B	1388.50	1384.00
E-51A	18	133	0.75%	E51	E51A	1388.50	1387.50
E-51B	18	81	1.24%	E51B	E51C	1384.00	1383.00
E-52	15	107	1.03%	E52	E51	1389.60	1388.50
E-53	15	124	3.45%	E53	E53A	1387.85	1383.56
E-53 (1)	15	89	1.13%	E53A	E55	1381.50	1380.50
E-53A	15	66	0.76%	E53A	E53B	1381.75	1381.25
E-53B	15	41	0.61%	E53B	E53C	1381.25	1381.00
E-53C	15	52	0.96%	E53D	E53E	1378.50	1378.00
E-54	15	123	4.73%	E54	E56	1388.55	1382.75
E-55	18	14	1.44%	E55	E55A	1379.30	1379.10
E-55A	18	94	1.17%	E55A	E55B	1379.10	1378.00
E-57	15	50	1.00%	E57	E57A	1378.50	1378.00
E-58	15	111	1.12%	E58	E57	1379.75	1378.50
E-59	24	45	1.11%	E59	E59A	1377.70	1377.20
E-59A	24	71	0.98%	E59A	E59B	1377.20	1376.50
E-60	18	114	2.46%	E60	E59	1380.50	1377.70
E-61	18	177	3.85%	E61	E59A	1384.00	1377.20
E-62	15	94	7.47%	E62	E61	1387.00	1380.00
E-63	15	293	9.32%	E63	E61	1404.50	1377.20
E-63A	18	102	0.98%	E63	E63A	1404.50	1403.50
E-63B	18	37	1.33%	E63B	E63C	1398.00	1397.50
E-64	15	93	2.41%	E64	E63	1406.75	1404.50
E - 46A	15	39	1.17%	E46	E46A	1371.45	1371.00
E - 46B	15	73	1.10%	E46B	E46C	1366.00	1365.20

STORM DRAINAGE PIPE SCHEDULE							
PIPE NO.	DIAMETER (IN.)	LENGTH (FT.)	SLOPE (%)	FROM	TO	START INVERT	END INVERT
J-1	15	18	1.66%	J1	J2	1450.80	1450.50
J-2	15	25	4.48%	J2	J3	1450.50	1449.38
J-3	15	18	2.12%	J3	J4	1449.38	1449.00
J-4	18	151	2.84%	J4	J8	1449.00	1444.70
J-5	15	18	1.67%	J5	J6	1447.10	1446.80
J-6	15	25	6.84%	J6	J7	1446.80	1445.10
J-7	15	18	2.22%	J7	J8	1445.10	1444.70
J-8	24	150	1.63%	J8	J12	1444.70	1442.25
J-9	15	18	1.40%	J9	J10	1445.25	1445.00
J-10	15	25	7.95%	J10	J11	1445.00	1443.00
J-11	15	18	1.40%	J11	J12	1443.00	1442.75
J-12	24	19	1.33%	J12	J12A	1442.25	1442.00
J-12A	24	24	1.64%	J12A	J12B	1442.00	1441.60
J-12B	24	65	1.08%	J12A	J12C	1442.00	1441.30
J-13	15	18	1.12%	J13	J14	1442.90	1442.70
J-14	15	12	1.25%	J14	J14A	1442.70	1442.55
J-14A	15	65	1.00%	J14A	J14B	1442.55	1441.90
J-14B	15	12	0.81%	J14B	J15	1441.90	1441.80
J-15	15	18	1.13%	J15	J16	1441.80	1441.60
J-16	15	39	1.04%	J16	J16A	1441.60	1441.20
J-17	15	18	1.39%	J17	J18	1444.25	1444.00
J-18	15	25	1.20%	J18	J19	1444.00	1443.70
J-19	15	18	1.12%	J19	J20	1443.70	1443.50
J-20	15	16	1.27%	J20	J20A	1443.50	1443.30
J-20A	15	46	0.65%	J20A	J20C	1443.30	1443.00
J-20B	15	41	0.73%	J20A	J20B	1443.30	1443.00
J-21	15	18	1.01%	J21	J22	1442.28	1442.10
J-22	15	25	1.19%	J22	J23	1442.10	1441.80
J-23	15	18	1.12%	J23	J24	1441.80	1441.60
J-24	15	142	2.68%	J24	J28	1441.60	1437.80
J-25	15	18	1.11%	J25	J26	1438.50	1438.30
J-26	15	25	1.21%	J26	J27	1438.30	1438.00
J-27	15	18	1.10%	J27	J28	1438.00	1437.80
J-28	18	114	2.80%	J28	J32	1437.80	1434.60
J-29	15	18	1.12%	J29	J30	1435.30	1435.10
J-30	15	25	1.21%	J30	J31	1435.10	1434.80
J-31	15	18	1.10%	J31	J32	1434.80	1434.60
J-32	18	18	0.27%	J32	J32A	1434.60	1434.55
J-32A	18	57	0.61%	J32A	J32B	1434.55	1434.20
J32C	15	20	10.00%	J32C	J32D	1434.00	1432.00

STORM DRAINAGE PIPE SCHEDULE							
PIPE NO.	DIAMETER (IN.)	LENGTH (FT.)	SLOPE (%)	FROM	TO	START INVERT	END INVERT
T-1	12	34	1.47%	T1	T2	1405.50	1405.00
T-2	15	205	8.87%	T2	T4	1404.48	1386.31
T-3	12	35	1.03%	T3	T4	1387.00	1386.64
T-5	15	173	10.74%	T4	T5A	1386.31	1367.76
T-5A	15	22	5.77%	T5A	T5C	1367.76	1366.50
T-5B	15	94	4.69%	T5A	T5B	1367.76	1363.38
T-5C	12	21	2.39%	T5D	T5E	1360.50	1360.00
T-6	12	35	1.45%	T5	T5A	1368.27	1367.76

STORM DRAINAGE PIPE SCHEDULE							
PIPE NO.	DIAMETER (IN.)	LENGTH (FT.)	SLOPE (%)	FROM	TO	START INVERT	END INVERT
T-5D	12	104	6.70%	T5F	T5G	1367.00	1360.00

STORM DRAINAGE PIPE SCHEDULE							
PIPE NO.	DIAMETER (IN.)	LENGTH (FT.)	SLOPE (%)	FROM	TO	START INVERT	END INVERT
T-6	12	35	1.14%	T6	T7A	1351.50	1351.10
T-7A	12	24	0.41%	T7A	T7B	1351.10	1351.00
T-7C	15	208	1.49%	T7A	T7C	1351.10	1348.00
T-7D	12	19	0.53%	T7D	T7E	1348.10	1348.00

STORM DRAINAGE PIPE SCHEDULE							
PIPE NO.	DIAMETER (IN.)	LENGTH (FT.)	SLOPE (%)	FROM	TO	START INVERT	END INVERT
T-8	12	31	0.98%	T8	T9	1347.50	1347.20
T-9	12	31	1.18%	T10	T11	1348.45	1348.09

STORM DRAINAGE PIPE SCHEDULE							
PIPE NO.	DIAMETER (IN.)	LENGTH (FT.)	SLOPE (%)	FROM	TO	START INVERT	END INVERT
T-10	12	31	0.82%	T12	T13	1353.50	1353.25
T-11	12	59	0.34%	T14	T15	1346.20	1346.00

STORM DRAINAGE PIPE SCHEDULE							
PIPE NO.	DIAMETER (IN.)	LENGTH (FT.)	SLOPE (%)	FROM	TO	START INVERT	END INVERT
T-12	12	31	1.28%	T16	T17	1347.50	1347.10
T-13	15	78	1.03%	T18	T19	1345.00	1344.20
T-13A	15	32	0.78%	T18A	T18B	1349.25	1349.00
T-14	15	249	1.09%	T19	T20	1344.20	1341.50
T-15	15	267	0.75%	T20	T21	1341.50	1339.50
T-16	12	33	0.92%	T22	T23	1338.50	1338.20

ABBREVIATIONS:

CB - CATCH BASIN
MH - MANHOLE
OS - OUTLET CONTROL STRUCTURE
YD - YARD DRAIN
FS - FLOW SPLITTER
N - NORTH
S - SOUTH
E - EAST
W - WEST
NE - NORTH EAST
NW - NORTH WEST
SE - SOUTH EAST
SW - SOUTH WEST

NOTES:
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3. PROPOSED ROADWAY CULVERTS ARE NOT INCLUDED IN THIS SCHEDULE. REFER TO C-500 SERIES DRAWINGS.

APPLICANT

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REVISIONS

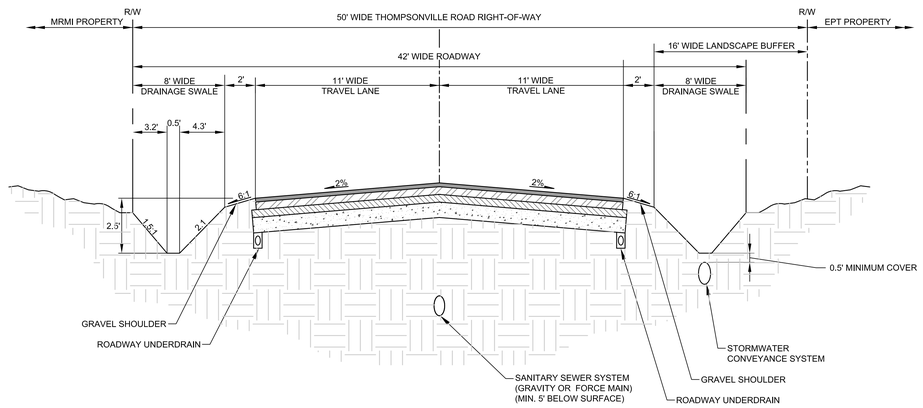
No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

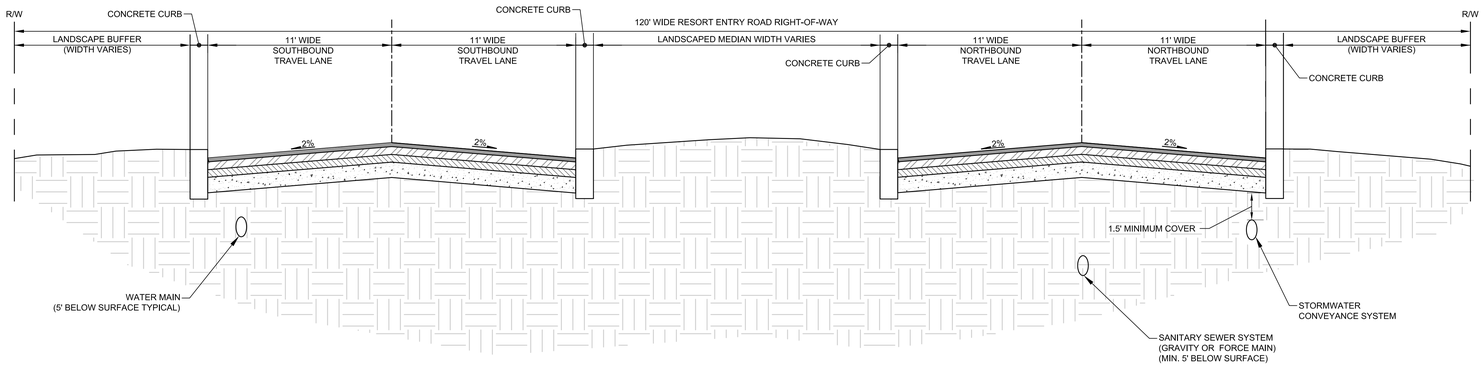
SHEET TITLE
SCHEDULES, SECTIONS AND PROFILES
STORM DRAINAGE SCHEDULE III

SHEET NO.
C-803



TYPICAL ROADWAY SECTION - THOMPSONVILLE ROAD

NOT TO SCALE



TYPICAL ROADWAY SECTION - RESORT ENTRY ROAD (CURBED)
(EAST OF MRMI DRIVEWAY TO THOMPSONVILLE ROAD)

NOT TO SCALE

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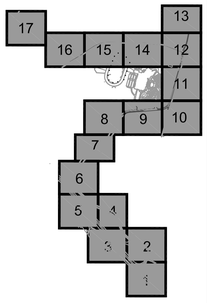


KEY PLAN

NYSDEC SWPPP SUBMISSION
NOT FOR CONSTRUCTION

NEW YORK STATE EDUCATION LAW 145, SECTION 7209, PROHIBITS ANY INDIVIDUAL FROM ALTERING THESE DRAWINGS AND/OR ACCOMPANYING SPECIFICATIONS IN ANY WAY, UNLESS IT IS UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. IF ALTERATIONS ARE MADE, THE ALTERING ENGINEER MUST SIGN, SEAL, DATE, AND DESCRIBE THE FULL DESCRIPTION OF THE ALTERATION ON THE DRAWING AND/OR SPECIFICATIONS.

REVISIONS

No.	DATE	DESCRIPTION

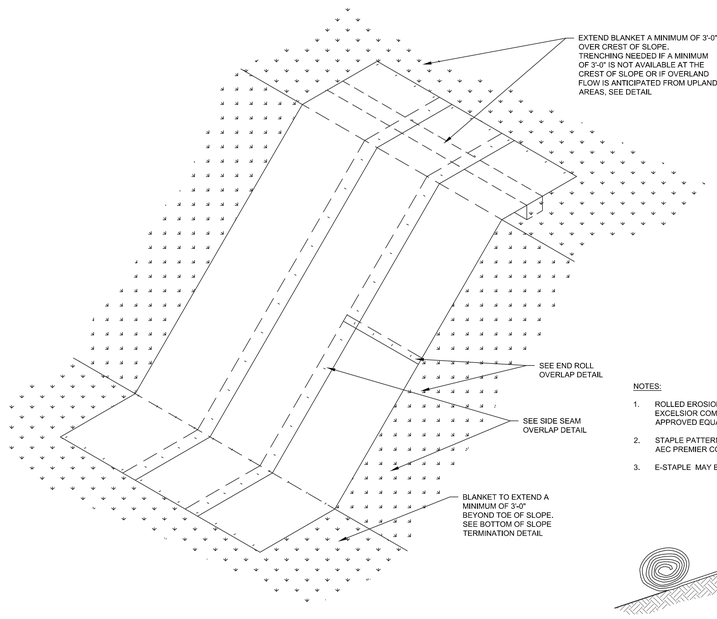
PROJECT
EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
1"=40'	01/30/13

SHEET TITLE
SCHEDULES, SECTIONS AND PROFILES

TYPICAL SECTIONS

SHEET NO.
C-804



ROLLED EROSION CONTROL PRODUCT
N.T.S.

SEEDING:

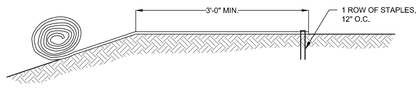
TIME	TYPE 1	QUANTITY
SPRING/SUMMER/ EARLY FALL	STEEP SLOPE SEED MIX	100 LBS. PER ACRE
	TYPE 2	
SPRING/SUMMER/ EARLY FALL	65% KENTUCKY BLUEGRASS BLEND	85-114 LBS. PER ACRE
SPRING/SUMMER/ EARLY FALL	20% PERENNIAL RYEGRASS	26-35 LBS. PER ACRE
SPRING/SUMMER/ EARLY FALL	15% FINE FESCUE	19-26 LBS. PER ACRE
	TYPE 3	
SPRING/SUMMER/ EARLY FALL	100% TALL FESCUE, TURF-TYPE, FINE LEAF	150-200 LBS. PER ACRE
	TYPE 4	
SPRING/SUMMER/ EARLY FALL	RYEGRASS (ANNUAL OR PERENNIAL)	30 LBS. PER ACRE (1 LB./1000 SF)
	TYPE 5	
LATE FALL/ EARLY WINTER	CERTIFIED 'AROOSTOOK' WINTER RYE (CEREAL RYE)	100 LBS. PER ACRE (2.5 LBS. /1000 S.F.)

MULCHING:

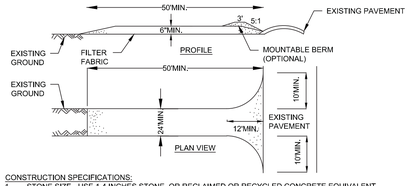
TYPE	QUANTITY	DEPTH OF APPLICATION
NYSDOT APPROVED SOIL STABILIZER OR RECP	PER MANUFACTURER'S RECOMMENDATION	-
WOOD FIBER CELLULOSE (PARTLY DIGESTED WOOD FIBERS)	2,000 LBS. PER ACRE	-
HAY OR STRAW	2 TONS PER ACRE (100-120 BALES)	COVER ABOUT 90% SURFACE
COMPOST	134-402 CUBIC YARDS PER ACRE	1-3 INCHES

NOTES:

1. ROLLED EROSION CONTROL BLANKET (RECB) TO BE AMERICAN EXCELSIOR COMPANY (AEC) PREMIER COCONUT ECD, OR APPROVED EQUAL.
2. STAPLE PATTERNS ARE DEPENDENT ON SITE CONDITIONS. SEE AEC PREMIER COCONUT STAPLE PATTERN GUIDE FOR DETAILS.
3. E-STAPLE MAY BE USED IN PLACE OF WIRE STAPLES.



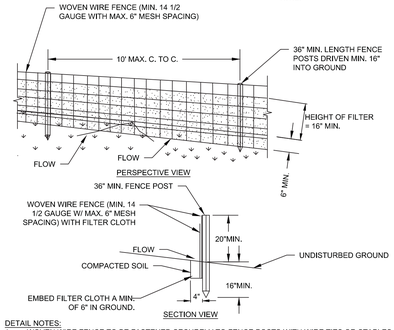
SLOPE TRENCH METHOD "A" (NO TRENCH)
N.T.S.



CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE - USE 1-4 INCHES STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH - NOT LESS THAN 50 FEET
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWELVE (12) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. TWENTY-FOUR (24) FOOT IF SINGLE ENTRANCE TO SITE.
5. FILTER FABRIC - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE, IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACTED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
8. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED EVERY 7 CALENDAR DAYS AND AFTER EACH RAINFALL EVENT.

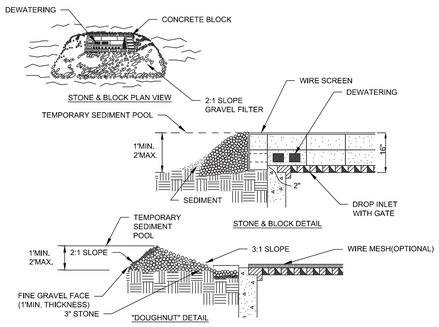
STABILIZED CONSTRUCTION ENTRANCE/EXIT
N.T.S.



DETAIL NOTES:

1. WOVEN WIRE FENCE TO BE FASTENED SECURELY TO FENCE POSTS WITH WIRE TIES OR STAPLES. POSTS SHALL BE STEEL EITHER "T" OR "U" TYPE OR HARDWOOD.
2. FILTER CLOTH TO BE TO BE FASTENED SECURELY TO WOVEN WIRE FENCE WITH TIES SPACED EVERY 24" AT TOP AND MID SECTION. FENCE SHALL BE WOVEN WIRE, 6" MAXIMUM MESH OPENING.
3. WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER THEY SHALL BE OVER-LAPPED BY SIX INCHES AND FOLDED. FILTER CLOTH SHALL BE EITHER FILTER X, MIRAFI 100X, STABILINKA T140N, OR APPROVED EQUIVALENT.
4. PREFABRICATED UNITS SHALL BE GEOFAB, ENVIROFENCE, OR APPROVED EQUIVALENT.
5. MAINTENANCE SHALL BE PERFORMED AS NEEDED AND MATERIAL REMOVED WHEN "BULGES" DEVELOP IN THE SILT FENCE.

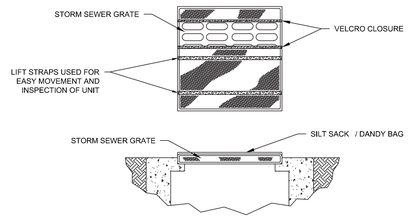
SILT FENCE
N.T.S.



DETAIL NOTES:

1. THIS INLET PROTECTION STRUCTURE IS ONLY TO BE USED IN AREAS WHERE PAVEMENT HAS YET TO BE STABILIZED.
2. LAY ONE BLOCK ON EACH SIDE OF THE STRUCTURE ON IT'S SIDE FOR DEWATERING. FOUNDATION SHALL BE 2 INCHES MINIMUM BELOW REST OF INLET AND BLOCKS SHALL BE PLACED AGAINST INLET FOR SUPPORT.
3. HARDWARE CLOTH OR 1/2" WIRE MESH SHALL BE PLACED OVER BLOCK OPENINGS TO SUPPORT STONE.
4. USE CLEAM STONE OR GRAVEL 1/2-3/4 INCH IN DIAMETER PLACED 2 INCHES BELOW TOP OF THE BLOCK ON A 2:1 SLOPE OR FLATTER.
5. FOR STONE STRUCTURES ONLY, A 1 FOOT THICK LAYER OF THE FILTER STONE WILL BE PLACED AGAINST THE 3 INCH STONE AS SHOWN ON THE DRAWINGS.
6. MAXIMUM DRAINAGE AREA LIMIT: 1 ACRE

STONE AND BLOCK DROP INLET PROTECTION
N.T.S. ADAPTED FROM: NYSDEC STANDARDS & SPECIFICATIONS FOR EROSION & SEDIMENT CONTROL



NOTES:

1. INLET SEDIMENT CONTROL DEVICE SHALL BE SILT SACK BY ACF ENVIRONMENTAL PRODUCTS, DANDY BAG BY DANDY PRODUCTS, OR APPROVED EQUAL.
2. INLET SEDIMENT CONTROL DEVICE SHALL BE MAINTAINED AS PER THE STANDARDS AND SPECIFICATIONS OF THE NYSDEC STANDARDS FOR EROSION AND SEDIMENT CONTROL (BLUE BOOK).
3. ONCE THE CONTRIBUTING DRAINAGE AREA HAS BEEN COMPLETELY STABILIZED (GREATER THAN 75% VEGETATIVE COVER) THE INLET SEDIMENT CONTROL DEVICE SHALL BE CLEANED OUT AND REMOVED FROM THE STRUCTURE.

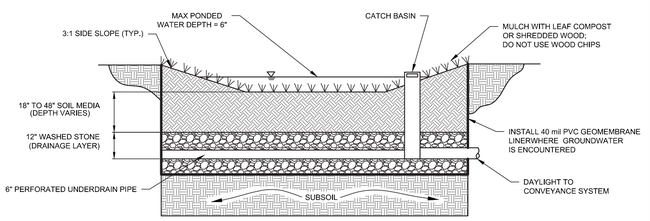
SILT SACK INLET PROTECTION
N.T.S.

CONSTRUCTION ROAD STABILIZATION/ CONSTRUCTION LAYDOWN AREA

1. CONTRACTOR SHALL INSTALL CONSTRUCTION ROAD STABILIZATION IN CONCURRENCE WITH THE CONSTRUCTION LAYDOWN AREA. THE CONSTRUCTION ROAD STABILIZATION/ CONSTRUCTION LAYDOWN AREA SHOULD BE IMPLEMENTED FOR ALL TEMPORARY DRILL ENTRY/EXIT WORK AREAS, ON-SITE VEHICLE TRANSPORTATION ROUTES, AND CONSTRUCTION PARKING AREAS. THIS STABILIZATION MEASURE WILL REDUCE EROSION POTENTIAL, MINIMIZE IMPACT ON EXISTING SITE RESOURCES, AND MAINTAIN OPERATIONS IN A SAFE MANNER.
2. THE CONSTRUCTION ROAD STABILIZATION/ CONSTRUCTION LAYDOWN AREA SHALL BE COMPOSED OF A 6-INCH LAYER OF NYSDOT SUB-BASE TYPES 1, 2, 3, 4 OR EQUIVALENT AS SPECIFIED IN NYS - STANDARDS AND SPECIFICATIONS FOR HIGHWAYS.
3. THE CONSTRUCTION ROAD STABILIZATION/ CONSTRUCTION LAYDOWN AREA CONSTRUCTION SPECIFICATION IS AS FOLLOWS:
   - 3.1. CLEAR AND STRIP ROADBED AND PARKING AREAS OF ALL VEGETATION, ROOTS, AND OTHER OBJECTIONABLE MATERIAL.
   - 3.2. LOCATE PARKING AREAS ON NATURALLY FLAT AREAS AS AVAILABLE. KEEP GRADES SUFFICIENT FOR DRAINAGE, BUT NOT MORE THAN 2 TO 3 PERCENT.
   - 3.3. PROVIDE SURFACE DRAINAGE AND DIVERT EXCESS RUNOFF TO STABILIZED AREAS.
   - 3.4. MAINTAIN CUT AND FILL SLOPES TO 2:1 OR FLATTER AND STABILIZED WITH VEGETATION AS SOON AS GRADING IS ACCOMPLISHED.
   - 3.5. SPREAD 6-INCH LAYER OF SUB-BASE MATERIAL EVENLY OVER THE FULL WIDTH OF THE ROAD AND SMOOTH TO AVOID DEPRESSIONS.
   - 3.6. PROVIDE APPROPRIATE SEDIMENT CONTROL MEASURES TO PREVENT OFFSITE SEDIMENTATION.

DUST CONTROL

1. THE SITE SHALL BE WATERED DOWN DURING CONSTRUCTION TO MINIMIZE DUST. THIS ACTIVITY SHALL BE PERFORMED BY THE CONTRACTOR AS DEEMED NECESSARY BY THE ENGINEER. CONTRACTOR IS RESPONSIBLE FOR DUST CONTROL THROUGHOUT CONSTRUCTION PERIODS AND UNTIL SITE IS PERMANENTLY STABILIZED. SEE THE FOLLOWING WEBSITE FOR THE LATEST LIST OF NYSDOT APPROVED DUST PALLIATIVES: HTTPS://WWW.DOT.NY.GOV/DIVISIONS/ENGINEERING/TECHNICAL-SERVICES/TECHNICAL-SERVICES-REPOSITORY/ALME/LAN.HTML

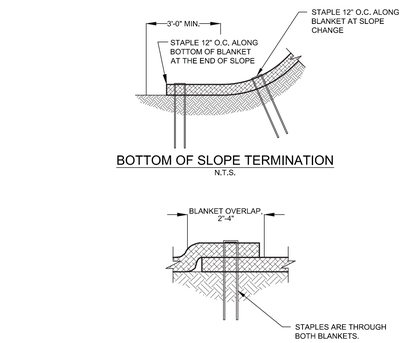


NOTES:

1. REFER TO CONTRACT SPECIFICATIONS FOR BIORETENTION AREA SOIL MEDIA DESIGN.

SOIL MEDIA CHARACTERISTICS	
PARAMETER	VALUE
PH RANGE	5.2 to 7.0
ORGANIC MATTER	1.5 to 4.0%
MAGNESIUM	35 lbs. per acre, minimum
PHOSPHORUS (P2O5)	75 lbs. per acre, minimum
POTASSIUM (K2O)	85 lbs. per acre, minimum
SOLUBLE SALTS	500 ppm
CLAY	10 to 25%
SILT	30 to 55%
SAND	35 to 60%

BIORETENTION AREA
N.T.S.



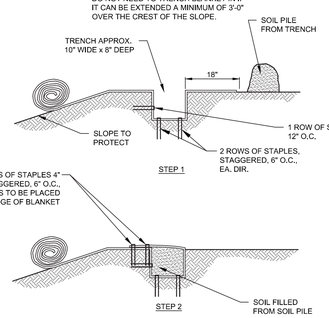
SIDE SEAM OVERLAP STAPLE DETAIL
N.T.S.

END SEAM OF BLANKETS OVERLAP 2"-4". PLACE STAPLES, ONE ON EACH CORNER OF BLANKET, 12" O.C. ALONG BLANKET END THROUGH BOTH BLANKETS. UPSLOPE BLANKET LAPS OVER DOWNSLOPE BLANKETS IN A SHINGLE AFFECT.

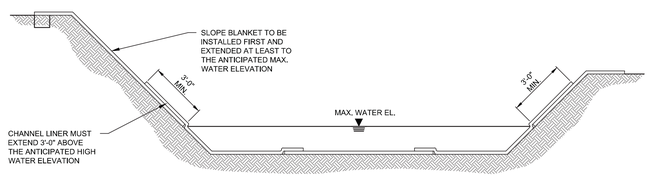
END ROLL OVERLAP
N.T.S.

BOTTOM OF SLOPE TERMINATION
N.T.S.

DO NOT NEED TO TRENCH BLANKET IN IF IT CAN BE EXTENDED A MINIMUM OF 3'-0" OVER THE CREST OF THE SLOPE.

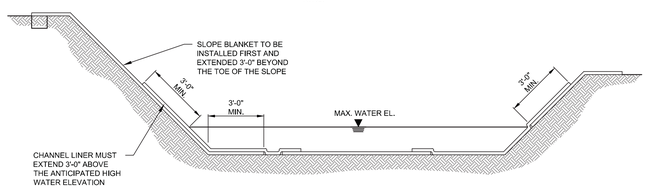


SLOPE TRENCH METHOD "C"
N.T.S.

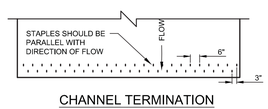


CHANNEL DETAIL
N.T.S.

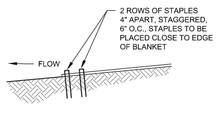
CHANNEL INSTALLATION METHOD 'A'
N.T.S.



CHANNEL INSTALLATION METHOD 'B'
N.T.S.



CHANNEL TERMINATION
N.T.S.



CHANNEL TERMINATION
N.T.S.

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
(816) 472-5794 (FAX)

MASTER PLANNER / LANDSCAPE ARCHITECT

HART | HOWERTON

HART HOWERTON
10 EAST 40TH STREET
NEW YORK, NY 10016
(212) 683-5631 (PHONE)
(212) 481-3768 (FAX)

SITE/CIVIL ENGINEER

AKRF

AKRF ENGINEERING, P.C.
34 SOUTH BROADWAY, SUITE 401
WHITE PLAINS, NY 10601
(914) 949-7336 (PHONE)
(914) 949-7559 (FAX)

SURVEYOR

CONTRACTORS' LINE & GRADE SOUTH, LLC
23 NEPPERHAN AVENUE
ELMSFORD, NY 10523
(914) 347-3141 (PHONE)
(914) 347-3120 (FAX)

GEOTECHNICAL CONSULTANT

MELICK-TULLY AND ASSOCIATES, P.C.
117 CANAL ROAD
SOUTH BOUND BROOK, NJ 08880
(732) 356-3400 (PHONE)
(732) 356-9054 (FAX)

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REVISIONS

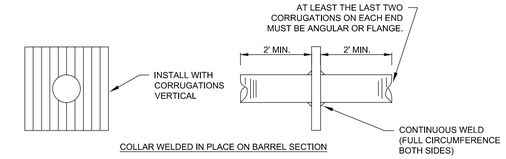
No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

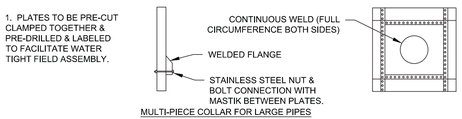
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE: N.T.S.	DATE: 01/30/13

SHEET TITLE
DETAILS I

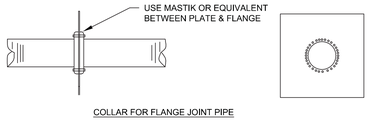
SHEET NO.
C-900



COLLAR WELDED IN PLACE ON BARREL SECTION



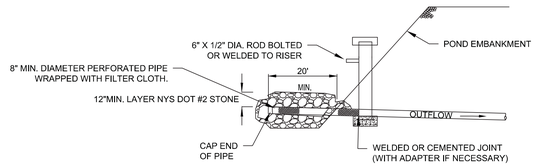
MULTI-PIECE COLLAR FOR LARGE PIPES



COLLAR FOR FLANGE JOINT PIPE

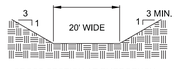
ANTI SEEP COLLAR

N.T.S. - ADAPTED FROM: NYSDEC STANDARDS & SPECIFICATIONS FOR EROSION & SEDIMENT CONTROL

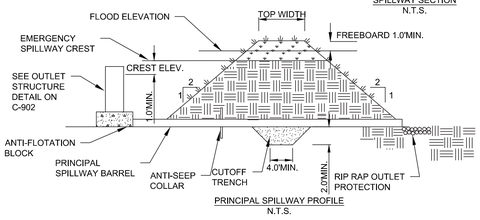


LOW FLOW DEWATERING DEVICE

N.T.S. - ADAPTED FROM: NYSDEC STANDARDS & SPECIFICATIONS FOR EROSION & SEDIMENT CONTROL



CROSS SECTION AT EMERGENCY SPILLWAY SECTION
N.T.S.

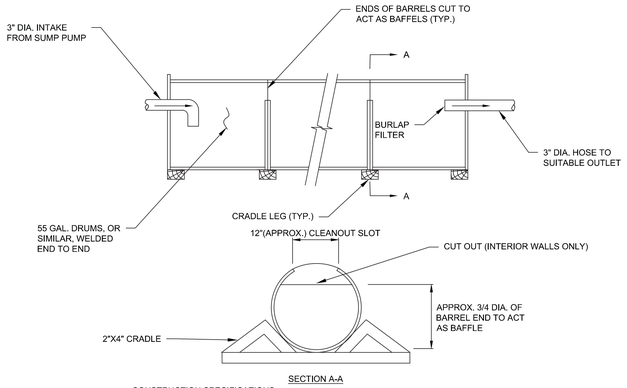


PRINCIPAL SPILLWAY PROFILE
N.T.S.

MAXIMUM DRAINAGE AREA = 100 ACRES

TEMPORARY SEDIMENT BASIN

N.T.S. - ADAPTED FROM: NYSDEC STANDARDS & SPECIFICATIONS FOR EROSION & SEDIMENT CONTROL



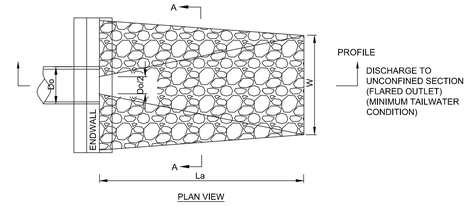
SECTION A-A

CONSTRUCTION SPECIFICATIONS

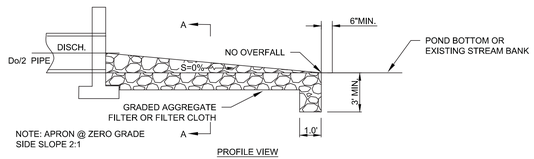
1. CLEAN OUT THE SEDIMENT TANK WHEN ONE THIRD (1/3) FILLED WITH SILT.
2. STEEL DRUMS ARE USED AS EXAMPLE DUE TO THEIR READY AVAILABILITY. ANY TANKS MAY BE USED, PROVIDING THAT THE VOLUME REQUIREMENTS ARE MET.
3. ALL SEDIMENT COLLECTED IN THE TANK SHALL BE DISPOSED OF IN A SEDIMENT TRAPPING DEVICE OR AS APPROVED BY THE INSPECTOR.

PORTABLE SEDIMENT TANK

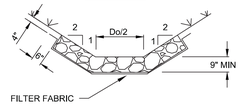
N.T.S. - ADAPTED FROM: NYSDEC STANDARDS & SPECIFICATIONS FOR EROSION & SEDIMENT CONTROL



PLAN VIEW



PROFILE VIEW

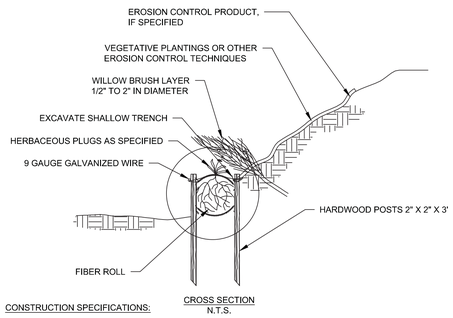


CROSS SECTION A-A

NOTES:
1. FILTER FABRIC MAY BE WOVEN OR NON WOVEN GEOTEXTILE FABRIC WITH A THICKNESS BETWEEN 20-60 MILS, GRAB STRENGTH 90-120 LBS, AND SHALL CONFORM TO ASTM D-1777 AND ASTM D-1582.

RIP RAP OUTLET PROTECTION

N.T.S. - ADAPTED FROM: NYSDEC STANDARDS & SPECIFICATIONS FOR EROSION & SEDIMENT CONTROL



CROSS SECTION
N.T.S.

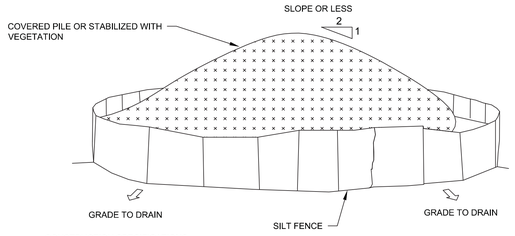
CONSTRUCTION SPECIFICATIONS:

1. EXCAVATE A SHALLOW TRENCH SLIGHTLY BELOW BASEFLOW OR A 4" TRENCH ON SLOPE CONTOURS.
2. PLACE THE ROLL IN THE TRENCH AND ANCHOR WITH 2" x 2" POSTS PLACED ON BOTH SIDES OF THE ROLL AND SPACED LATERALLY ON 2' TO 4' CENTERS. TRIM THE TOP OF THE POSTS EVEN WITH THE EDGE OF THE ROLL, IF NECESSARY.
3. NOTCH THE POSTS AND TIE TOGETHER, ACROSS THE ROLL, WITH 9 GAUGE GALVANIZED WIRE OR 1/8" DIAMETER BRAIDED NYLON ROPE.
4. PLACE SOIL EXCAVATED FROM THE TRENCH BEHIND THE ROLL AND HAND TAMP. PLANT WITH SUITABLE HERBACEOUS OR WOODY VEGETATION AS SPECIFIED ELSEWHERE IN THE CONTRACT DOCUMENTS. VEGETATION SHALL BE PLACED IMMEDIATELY ADJACENT TO THE ROLL TO PROMOTE ROOT GROWTH INTO THE FIBER. HERBACEOUS VEGETATION, IF SPECIFIED, SHALL BE PLANTED INTO THE FIBER ROLL.

FIBER ROLL DETAIL

N.T.S.

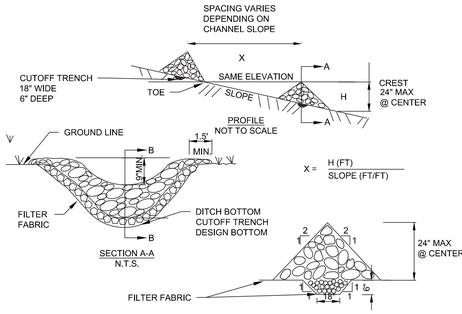
ADAPTED FROM DETAILS PROVIDED BY: USDA - NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE



CONSTRUCTION SPECIFICATIONS
1. AREA CHOSEN FOR SOIL STOCKPILE SHALL BE DRY AND STABLE AND NOT ON PAVEMENT.
2. MAXIMUM SLOPE OF SOIL STOCKPILE SHALL BE 2:1.
3. PRIOR TO DISTURBING FILL MATERIAL, EACH PILE SHALL BE SURROUNDED BY SILT FENCING.
4. UPON COMPLETION OF FILL MATERIAL GRADING, EACH PILE SHALL BE COVERED OR STABILIZED WITH VEGETATION.
5. SEGREGATE CERTIFIED CLEAN MATERIALS FROM OTHER MATERIALS WHEN STOCKPILING.

SOIL STOCKPILE DETAIL

N.T.S.



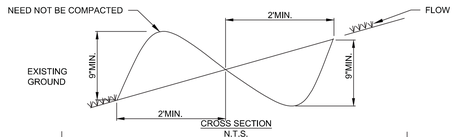
CONSTRUCTION SPECIFICATIONS:

1. STONE WILL BE PLACED ON A FILTER FABRIC FOUNDATION TO THE LINES, GRADES AND LOCATIONS SHOWN IN THE PLAN.
2. SET SPACING OF CHECK DAMS TO ASSUME THAT THE ELEVATIONS OF THE CREST OF THE DOWNSTREAM DAM IS AT THE SAME ELEVATION OF TOE OF THE UPSTREAM DAM.
3. EXTEND THE STONE A MINIMUM OF 1.5 FEET BEYOND THE DITCH BANKS TO PREVENT CUTTING AROUND THE DAM.
4. PROTECT THE CHANNEL DOWNSTREAM OF THE LOWEST CHECK DAM FROM SCOUR AND EROSION WITH STONE OR LINER AS APPROPRIATE.
5. ENSURE THAT CHANNEL APPURTENANCES SUCH AS CULVERT ENTRANCES BELOW CHECK DAMS ARE NOT SUBJECT TO DAMAGE OR BLOCKAGE FROM DISPLACED STONE.

MAX. DRAINAGE AREA LIMIT: 2 ACRES

CHECK DAM

N.T.S. - ADAPTED FROM: NYSDEC STANDARDS & SPECIFICATIONS FOR EROSION & SEDIMENT CONTROL



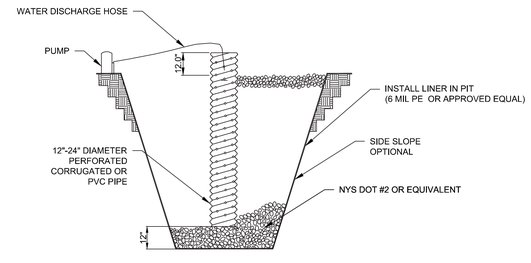
CONSTRUCTION SPECIFICATIONS:

1. ALL PERIMETER DIKES/SWALES SHALL HAVE UNINTERRUPTED POSITIVE GRADE TO AN OUTLET.
2. DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO SEDIMENT TRAPPING DEVICE.
3. DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSION VELOCITY.
4. THE SWALE SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS REQUIRED TO MEET THE CRITERIA SPECIFIED IN THE STANDARD.
5. STABILIZATION OF THE AREA DISTURBED BY THE DIKE AND SWALE SHALL BE DONE IN ACCORDANCE WITH THE STANDARD AND SPECIFICATIONS FOR TEMPORARY SEEDING AND MULCHING, AND SHALL BE DONE WITHIN 10 DAYS.
6. PERIODIC INSPECTION AND REQUIRED MAINTENANCE MUST BE PROVIDED AFTER EACH RAIN EVENT.

MAX. DRAINAGE AREA LIMIT: 2 ACRES

PERIMETER DIKE/SWALE

N.T.S. - ADAPTED FROM: NYSDEC STANDARDS & SPECIFICATIONS FOR EROSION & SEDIMENT CONTROL



CONSTRUCTION SPECIFICATIONS
1. SUMP PIT TO BE USED IN COORDINATION WITH ANTI-TRACKING/DECONTAMINATION PAD. PIT DIMENSIONS ARE OPTIONAL.
2. THE STANDPIPE SHOULD BE CONSTRUCTED BY PERFORATING A 12-24" DIAMETER CORRUGATED OR PVC PIPE.
3. A BASE OF 2" AGGREGATE SHOULD BE PLACED IN THE PIT TO A DEPTH OF 12". AFTER INSTALLING THE STANDPIPE, THE PIT SURROUNDING THE STANDPIPE SHOULD BE BACKFILLED WITH 2" AGGREGATE.
4. THE STANDPIPE SHOULD EXTEND 12-18" ABOVE THE LIP OF THE PIT.
5. WATER TO BE PLACED IN DOT APPROVED CONTAINER FOR OFF-SITE DISPOSAL.

SUMP PIT

N.T.S.

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(732) 356-9054 (FAX)

NYSDEC SWPPP SUBMISSION
NOT FOR CONSTRUCTION

NEW YORK STATE EDUCATION LAW 145, SECTION 7209, PROHIBITS ANY INDIVIDUAL FROM ALTERING THESE DRAWINGS AND/OR ACCOMPANYING SPECIFICATIONS IN ANY WAY, UNLESS IT IS UNDER THE DIRECT SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER. IF ALTERATIONS ARE MADE, THE ALTERING ENGINEER MUST SIGN, SEAL, DATE, AND DESCRIBE THE FULL DESCRIPTION OF THE ALTERATION ON THE DRAWING AND/OR SPECIFICATIONS.

REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

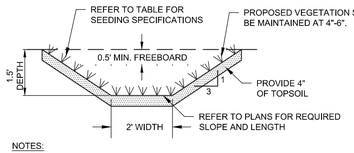
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE: N.T.S.	DATE: 01/30/13

SHEET TITLE

DETAILS II

SHEET NO.

C-901



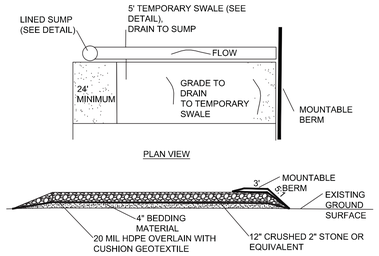
VEGETATED SWALE SEED MIXTURE TABLE		
MIXTURES	RATE PER ACRE (POUNDS)	RATE PER 1,000 SQUARE FEET (POUNDS
A. PERENNIAL RYEGRASS	30	0.68
TALL FESCURE OR SMOOTH BROMEGRASS	20	0.45
REDTOP	2	0.05
OR		
B. KENTUCKY BLUEGRASS[1]	25	0.6
CREEPING RED FESCUE	20	0.5
PERENNIAL RYEGRASS	10	0.2

[1] - USE THIS MIXTURE IN AREAS WHICH ARE MOWED FREQUENTLY. COMMON WHITE CLOVER MAY BE ADDED IF DESIRED AND SEEDED AT 8 POUNDS/ACRE (0.2 POUND/1,000 SQUARE FEET).

NOTES:

1. STRIP VEGETATION, SOIL AND DEBRIS FROM SWALE BY HAND WHERE POSSIBLE.
2. AMMEND SOIL AS NEEDED WITH FERTILIZER AND LIME.
3. REMOVE ALL STONES AND DEBRIS THAT MAY HINDER FLOW AND MAINTENANCE.

VEGETATED SWALE
N.T.S.

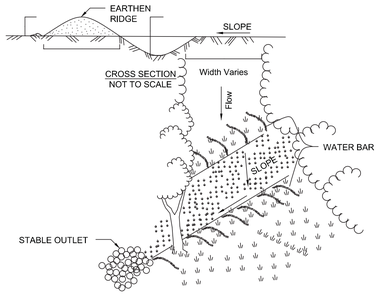


PROFILE VIEW

CONSTRUCTION SPECIFICATIONS

1. ANTI-TRACKING/DECONTAMINATION PAD TO BE USED IN COORDINATION WITH SUMP PIT.
2. STONE SIZE - USE 2" STONE, OR RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
3. LENGTH - NOT LESS THAN 50'.
4. THICKNESS - 12" THICK 2" STONE OVERLAYING 1 LAYER 20 MIL HIGH DENSITY POLYETHYLENE, GEOTEXTILE CUSHION AND 4" BEDDING MATERIAL.
5. WIDTH - 24' MINIMUM.
6. THE 20 MIL HDPE AND CUSHION GEOTEXTILE WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING THE STONE.
7. A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PLACED ALONG THE EXIT SIDE TO PREVENT SURFACE WATER FLOW ONTO THE DECONTAMINATION PAD.
8. MAINTENANCE - THE DECONTAMINATION PAD SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT OUT OF THE EXCLUSION ZONE OR PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO ADJACENT AREAS MUST BE REMOVED IMMEDIATELY.
9. THE DECONTAMINATION PAD WILL BE STABILIZED WITH STONE AND DRAIN ON SITE TO A SUMP. ALL WASH WATER PUMPED FROM THE SUMP WILL BE TEMPORARILY STORED IN DRUMS AND PROPERLY DISPOSED OF OFF-SITE.
10. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED AT REGULAR INTERVALS.

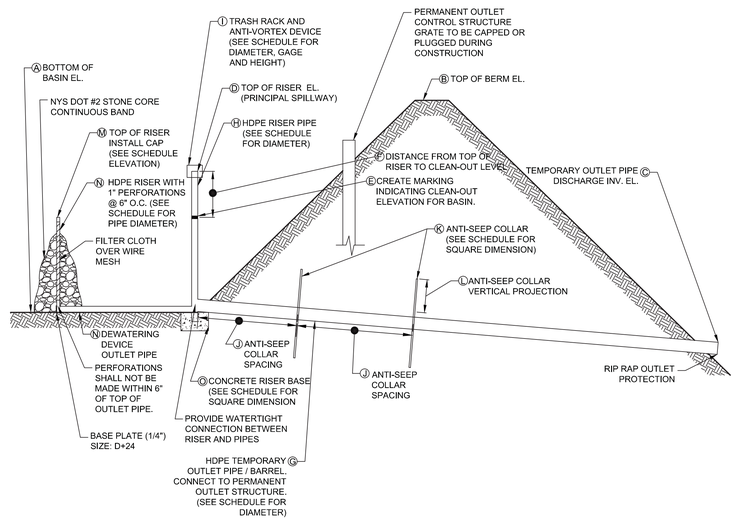
VEHICLE WASH
N.T.S.



CONSTRUCTION SPECIFICATIONS:

1. INSTALL THE WATER BAR AS SOON AS THE RIGHT OF WAY IS CLEARED AND GRADED.
2. DISK OR STRIP THE SOD FROM THE BASE FOR THE CONSTRUCTED RIDGE BEFORE PLACING FILL.
3. TRACK THE RIDGE TO COMPACT IT TO THE DESIGN CROSS SECTION.
4. THE OUTLET SHALL BE LOCATED ON AN UNDISTURBED AREA. FIELD SPACING WILL BE ADJUSTED TO USE THE MOST STABLE OUTLET AREAS. OUTLET PROTECTION WILL BE PROVIDED WHEN NATURAL AREAS ARE NOT ADEQUATE.
5. VEHICLE CROSSING SHALL BE STABILIZED WITH GRAVEL. EXPOSED AREAS SHALL BE IMMEDIATELY SEEDED AND MULCHED.
6. PERIODICALLY INSPECT WATER BARS FOR EROSION DAMAGE AND SEDIMENT. CHECK OUTLET AREAS AND MAKE REPAIRS AS NEEDED TO RESTORE OPERATION.

WATER BAR
N.T.S. - ADAPTED FROM: USDA-NRCS, NEW YORK STATE DEPARTMENT OF TRANSPORTATION, NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION, AND NEW YORK STATE SOIL & WATER CONSERVATION COMMITTEE

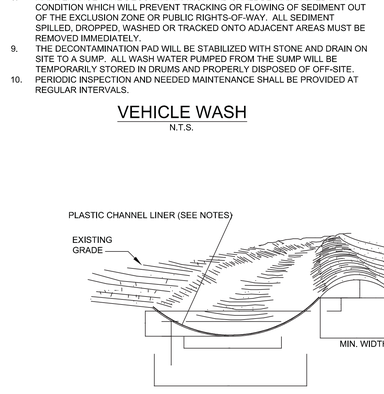


TEMPORARY SEDIMENT BASIN CONSTRUCTION SCHEDULE				
DETAIL DESIGNATION	DESCRIPTION	SEDIMENT BASIN 23	SEDIMENT BASIN 24	SEDIMENT BASIN 26
A	BOTTOM OF BASIN EL.	1377.0	1361.0	1367.0
B	TOP OF BERM EL.	1386.0	1369.0	1375.0
C	TEMPORARY OUTLET PIPE DISCHARGE INV. EL.	1376.0	1360.0	1366.5
D	TOP OF RISER EL.	1383.0	1367.2	1371.4
E	CLEAN OUT MARKING EL.	1381.5	1366.0	1370.6
F	DISTANCE FROM TOP OF RISER (FT)	1.5	1.2	0.8
G	TEMPORARY OUTLET PIPE / BARREL DIAMETER (IN)	18	21	15
H	RISER DIAMETER (IN)	30	48	24
I	TRASH RACK DIAMTER (IN)	54	72	36
	TRASH RACK HEIGHT (IN)	17	21	13
	TRASH RACK GAGE	14	12	16
J	ANTI-SEEP COLLAR SPACING (FT)	19.7	20.3	23.7
K	ANTI-SEEP COLLAR SQUARE DIMENSION (FT)	6.0	6.3	6.5
L	ANTI-SEEP COLLAR VERTICAL PROJECTION (FT)	2.2	2.2	2.6
M	TOP OF DEWATERING DEVICE RISER EL.	1381.5	1366.0	1370.6
N	DEWATERING DEVICE RISER / OUTLET PIPE DIAMETER (IN)	6	6	6
O	CONCRETE BASE SQUARE DIMENSION (IN)	60	96	48

TEMPORARY SEDIMENT BASIN OUTLET STRUCTURE AND DEWATERING DETAIL
NOT TO SCALE

DETAIL NOTES:

1. THE BASIN SHALL CONSTRUCTED ACCORDING TO THE DRAINAGE PLANS. BOTTOM OF BASIN AND TOP OF BERM ELEVATIONS ARE PROVIDED ONLY FOR INFORMATION AND SHOULD NOT BE USED FOR CONSTRUCTION.

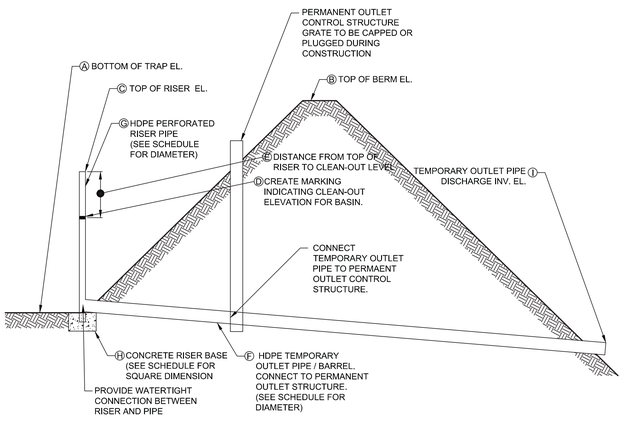


PARABOLIC CROSS-SECTION

DETAIL NOTES:

1. CONTRACTOR TO PROTECT ALL TREES/VEGETATION ALONG THE PATH OF THE PROPOSED GRASS SWALE.
2. FILL SHALL BE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT.
3. SWALE CHANNEL TO BE LINED WITH PLASTIC (6 MIL PE OR APPROVED EQUAL).

TEMPORARY DRAINAGE SWALE
N.T.S.

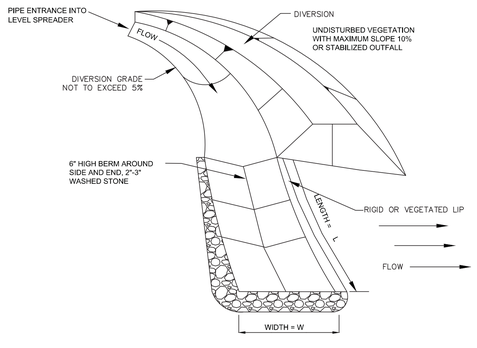


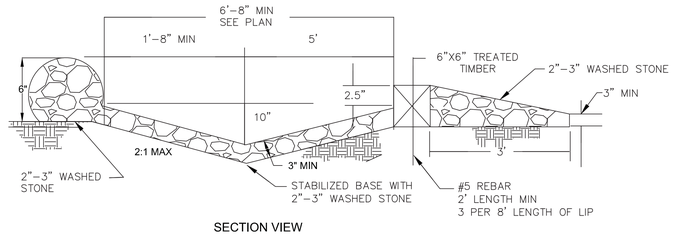
TEMPORARY SEDIMENT TRAP - PIPE OUTLET STRUCTURE DETAIL
NOT TO SCALE

TEMPORARY SEDIMENT TRAP CONSTRUCTION SCHEDULE				
DETAIL DESIGNATION	DESCRIPTION	SEDIMENT TRAP 21A	SEDIMENT TRAP 21B	SEDIMENT TRAP 28
A	BOTTOM OF TRAP EL.	1375.0	1376.0	1373.0
B	TOP OF BERM EL.	1380.0	1381.0	1378.0
C	TOP OF RISER EL.	1377.6	1378.2	13756.0
D	CLEAN OUT MARKING EL.	1376.9	1377.0	1374.8
E	DISTANCE FROM TOP OF RISER (FT)	0.7	1.2	1.2
F	TEMPORARY OUTLET PIPE / BARREL DIAMETER (IN)	21.0	21.0	21.0
G	RISER DIAMETER (IN)	24	24	24
H	CONCRETE BASE SQUARE DIMENSION (IN)	48	48	48
I	TEMPORARY OUTLET PIPE DISCHARGE INV. EL.	1373.5	1375.0	1372.0

CONSTRUCTION SPECIFICATIONS:

1. THE AREA UNDER EMBANKMENT SHALL BE CLEARED, GRUBBED AND STRIPPED OF ANY VEGETATION AND ROOT MAT. THE POOL AREA SHALL BE CLEARED.
2. THE FILL MATERIAL FOR THE EMBANKMENT SHALL BE FREE OF ROOTS OR OTHER WOODY VEGETATION AS WELL AS OVER-SIZED STONES, ROCKS, ORGANIC MATERIAL, OR OTHER OBJECTIONABLE MATERIAL. THE EMBANKMENT SHALL BE COMPACTED BY TRAVERSING WITH EQUIPMENT WHILE IT IS BEING CONSTRUCTED.
3. VOLUME OF SEDIMENT STORAGE SHALL BE 3600 CUBIC FEET PER ACRE OF CONTRIBUTORY DRAINAGE.
4. SEDIMENT SHALL BE REMOVED AND TRAP RESTORED TO ITS ORIGINAL DIMENSIONS WHEN THE SEDIMENT HAS ACCUMULATED TO 1/2 THE DESIGN DEPTH OF THE TRAP. REMOVED SEDIMENT SHALL BE DEPOSITED IN A SUITABLE AREA AND STABILIZED.
5. THE STRUCTURE SHALL BE INSPECTED AFTER EACH RAIN AND REPAIRS MADE AS NEEDED..
6. CONSTRUCTION OPERATIONS SHALL BE CARRIED OUT IN SUCH A MANNER THAT EROSION AND SEDIMENT ARE CONTROLLED.
7. THE STRUCTURE SHALL BE REMOVED AND THE AREA CONVERTED TO A PERMANENT STORMWATER POND WHEN THE DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.
8. ALL FILL LOPES SHALL BE 2:1 OR FLATTER
9. ALL PIPE CONNECTIONS SHALL BE WATERTIGHT.
10. THE TOP 2/3 OF THE RISER SHALL BE PERFORATED WITH WITH ONE (1) INCH DIAMTER HOLES OR SLITS SPACED SIX (6) INCHES VERTICALLY AND HORIZONTALLY AND PLACED IN THE CONCAVE PORTION OF THE PIPE. NO WHOLES WILL BE ALLOWED WITHIN SIX (6) INCHES OF THE HORIZONTAL BARREL.
11. THE RISER SHALL BE WRAPPED WITH 1/4 TO 1/2 INCH HARDWARE CLOTH WIRE THEN WRAPPED WITH FILTER CLOTH (HAVING AN EQUIVALENT SIEVE SIZE OF 40-80). THE FILTER CLOTH SHALL EXTEND SIX (6) INCHES BELOW THE LOWEST HOLE. WHERE ENDS OF THE FILTER CLOTH COME TOGETHER, THEY SHALL BE OVER-LAPPED. FOLDED AND STAPLED TO PREVENT BYPASS.
12. STRAPS OR CONNECTING BANDS SHALL BE USED TO HOLD THE FILTER CLOTH AND WIRE FABRICS IN PLACE. THEY SHALL BE PLACED AT THE TOP AND BOTTOM OF THE CLOTH.
13. FILL MATERIALS AROUND THE PIPE SPILLWAY SHALL BE HAND COMPACTED IN FOUR (4) INCH LAYERS. A MINIMUM OF TWO (2) FEET OF HAND COMPACTED BACKFILL SHALL BE PLACED OVER THE PIPE SPILLWAY BEFORE CROSSING IT WITH CONSTRUCTION EQUIPMENT.
14. THE RISER SHALL BE ANCHORED WITH EITHER A CONCRETE BASE OR STEEL PLATE BASE TO PREVENT FLOTATION. FOR CONCRETE BASED THE DEPTH SHALL BE TWELVE (12) INCHES WITH THE RISER EMBEDDED NINE (9) INCHES. A 1/4 INCH MINIMUM THICKNESS STEEL PLATE SHALL BE ATTACHED TO THE RISER BY A CONTINUOUS WELD (2) FEET OF STONE, GRAVEL, OR TAMPED EARTH ON THE PLATE.





SECTION VIEW

LEVEL SPREADER
NOT TO SCALE

APPLICANT

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NYSDEC SWPPP SUBMISSION
NOT FOR CONSTRUCTION

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

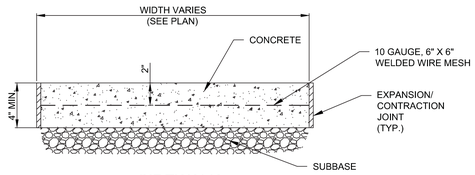
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
N.T.S.	01/30/13

SHEET TITLE

DETAILS III

SHEET NO.

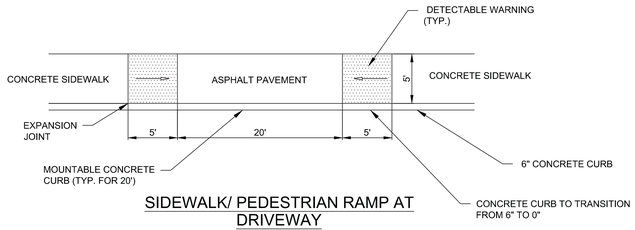
C-902



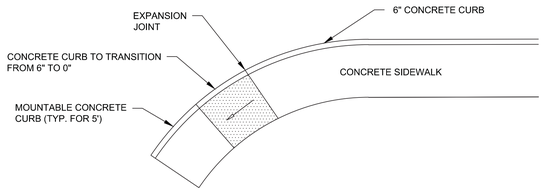
SIDEWALK
N.T.S.

NOTES:

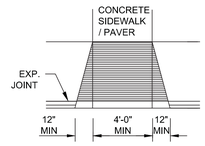
1. CONTRACTOR TO CONSTRUCT SIDEWALK IN ACCORDANCE WITH THE CONCRETE JOINT DETAIL.



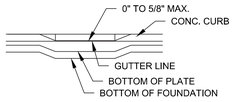
SIDEWALK/ PEDESTRIAN RAMP AT DRIVEWAY
N.T.S.



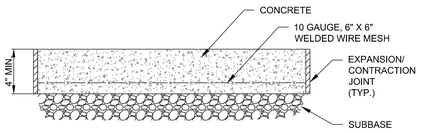
SIDEWALK/ PEDESTRIAN RAMP AT SITE ENTRANCE
N.T.S.



SIDEWALK/ PEDESTRIAN RAMPS
N.T.S.



SIDEWALK/ PEDESTRIAN RAMP ELEVATION
N.T.S.

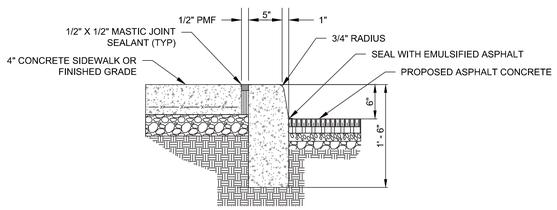


CONCRETE RAMP / PAD DETAIL
N.T.S.

EXPANSION/CONTRACTION JOINT NOTES:

1. EXPANSION JOINTS SHALL BE PROVIDED AT EQUAL DISTANCES OF NO MORE THAN 20 FEET. ALL EXISTING AND PROPOSED BUILDINGS, CURBING AND EXISTING PAVEMENT JOINTS SHALL BE FILLED WITH PREFORMED EXPANSION JOINT FILLER, 1/2" THICK. THE JOINT SHALL BE RECESSED 1/4" FROM THE TOP OF THE SLAB.

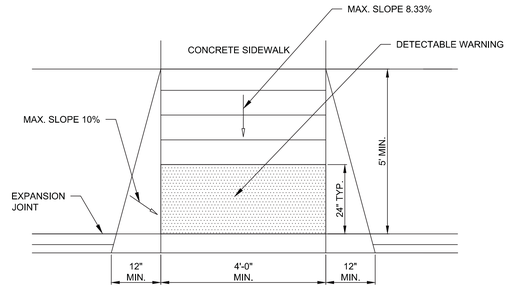
2. TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT EQUAL DISTANCES OF NO MORE THAN 5 FEET. JOINTS SHALL BE SPACED TO RESULT IN A NEAT AND ORDERLY ARRAY OF CONCRETE PAVERS.



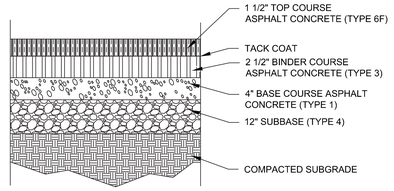
DETAIL NOTES:

1. PROVIDE 3/4" PREMOLDED EXPANSION JOINT FILLER MATERIAL AT ALL INTERSECTION AND AT STOP OF EACH PLACEMENT.

CONCRETE CURB DETAIL
N.T.S.



SIDEWALK/ PEDESTRIAN RAMPS
N.T.S.

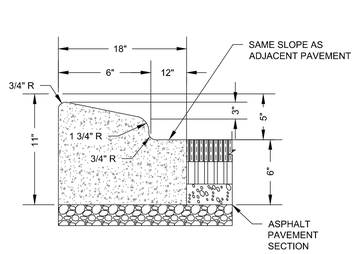


TYPICAL ASPHALT PAVEMENT SECTION (LIGHT DUTY)
N.T.S.

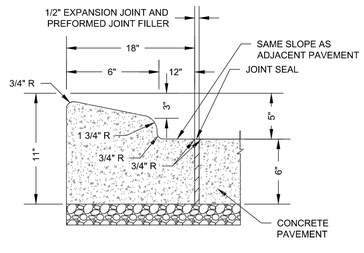
ROADWAY SECTION

SHOULDER SECTION

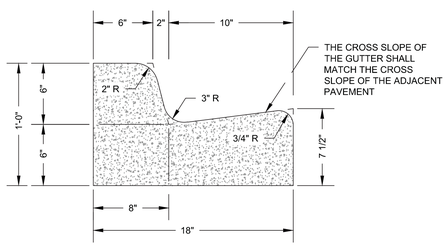
TYPICAL ASPHALT PAVEMENT SECTION (HEAVY DUTY)
N.T.S.



CONCRETE CURB AND GUTTER DETAIL (ADJACENT TO ASPHALT PAVEMENT - NO EXPANSION JOINT)
N.T.S.

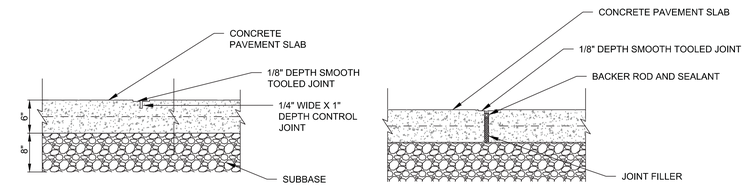


CONCRETE CURB AND GUTTER DETAIL (ADJACENT TO CONCRETE PAVEMENT - WITH EXPANSION JOINT)
N.T.S.



CONCRETE CURB AND GUTTER DETAIL (ADJACENT TO ROADWAY)
N.T.S.

CROSSWALK DETAIL
N.T.S.



SECTION CONTROL JOINT

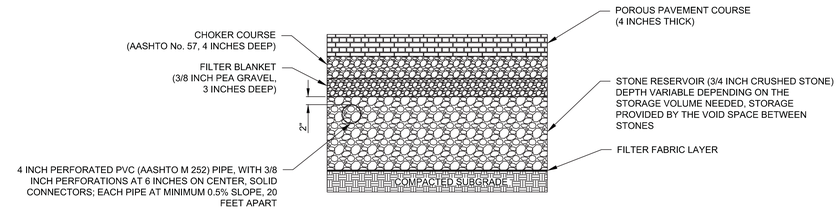
SECTION EXPANSION JOINT

CONCRETE JOINT DETAIL
N.T.S.

EXPANSION/CONTRACTION JOINT NOTES:

1. EXPANSION JOINTS SHALL BE PROVIDED AT EQUAL DISTANCES OF NO MORE THAN 20 FEET. ALL EXISTING AND PROPOSED BUILDINGS, CURBING AND EXISTING PAVEMENT JOINTS SHALL BE FILLED WITH PREFORMED EXPANSION JOINT FILLER, 1/2" THICK. THE JOINT SHALL BE RECESSED 1/4" FROM THE TOP OF THE SLAB.

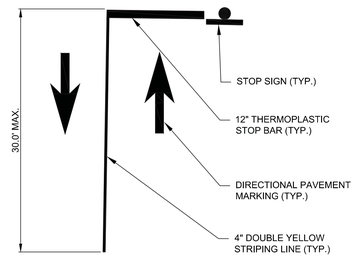
2. TOOLED CONTRACTION JOINTS SHALL BE PROVIDED AT EQUAL DISTANCES OF NO MORE THAN 5 FEET. JOINTS SHALL BE SPACED TO RESULT IN A NEAT AND ORDERLY ARRAY OF CONCRETE PAVERS.



DETAIL NOTES:

1. A MINIMUM OF ONE OBSERVATION WELL SHALL BE PROVIDED AT THE LOW POINT OF EACH POROUS PAVEMENT SYSTEM. IF THE SUBGRADE IS TERRACED, A WELL SHALL BE PROVIDED FOR EACH TERRACE. OBSERVATION WELLS SHALL CONSIST OF PERFORATED 4-6 INCH VERTICAL PVC PIPE (AASHTO M 252), WITH CAST IRON LOCKABLE CAP INSTALLED FLUSH WITH THE SURFACE.

POROUS PAVEMENT DETAIL
N.T.S



TYPICAL STOP BAR DETAIL
N.T.S.

NOTE:
ALL FLOW ARROWS TO BE SOLID WHITE REFLECTIVE TRAFFIC PAINT AS PER ABOVE OR NYSDOT STANDARD

PAINTED TRAFFIC LEFT TURN ARROW (MIRROR IMAGE FOR RIGHT TURN)
N.T.S.

NOTE:
ALL FLOW ARROWS TO BE SOLID WHITE REFLECTIVE TRAFFIC PAINT AS PER ABOVE OR NYSDOT STANDARD

PAINTED TRAFFIC ARROW
N.T.S.

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(732) 356-9054 (FAX)

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

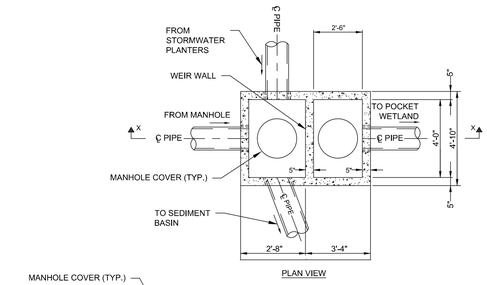
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
N.T.S.	01/30/13

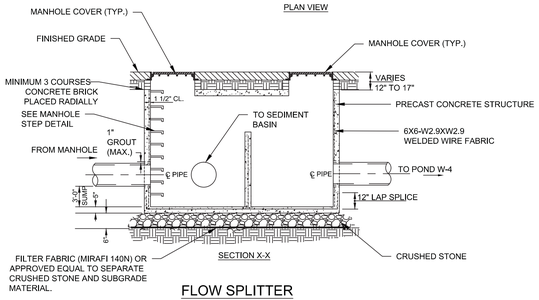
SHEET TITLE

DETAILS IV

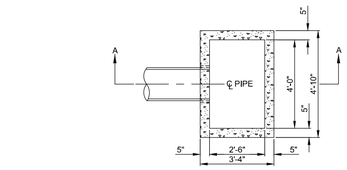
SHEET NO.

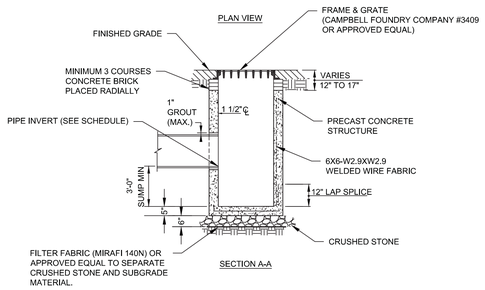
C-903





FLOW SPLITTER (TYPICAL DETAIL)
N.T.S.

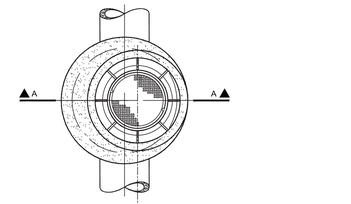




NOTES:

1. DEPTH OF SUMP SHALL BE 3 TIMES THE DIAMETER OF THE OUTLET PIPE WITH A MAXIMUM DEPTH OF SUMP AT 5 FEET.

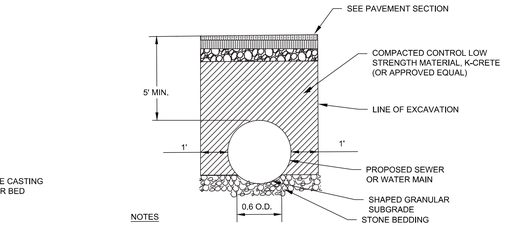
PRE-CAST CATCH BASIN AND YARD DRAIN
N.T.S.



PRECAST MANHOLE SECTIONS TO BE IN ACCORDANCE WITH ASTM DESIGNATION C 478. CONCRETE TO ATTAIN A MIN. COMPRESSIVE STRENGTH OF 4000 P.S.I. @ 28 DAYS.

SECTION "A" - "A"

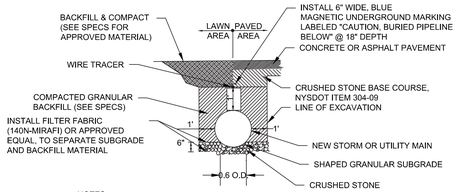
PRECAST CONCRETE MANHOLE DETAIL
N.T.S.



NOTES

1. THE CONTRACTOR SHALL PLACE STONE BEDDING UNDER THE PIPE.

TYPICAL TRENCH DETAIL (ROADWAY)
N.T.S.

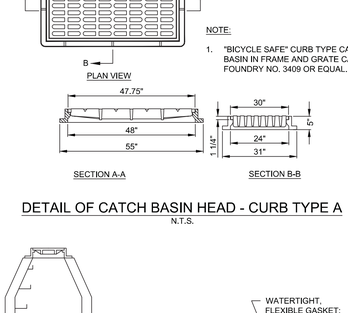


NOTES:

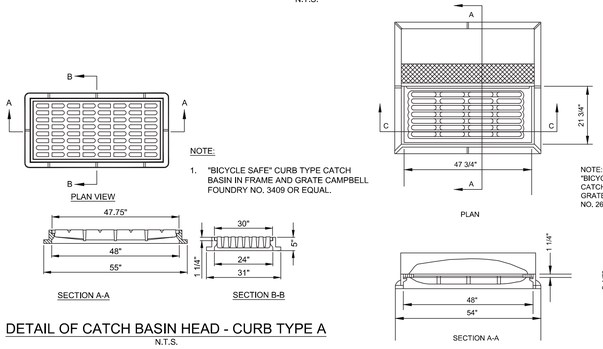
1. GAS, WATER, AND SANITARY SEWER PIPE REQUIRE THE COLORED TAPE AND TRACER WIRE. REFER TO THE TABLE FOR COLOR DESIGNATION.

TAPE COLOR DESIGNATION	
COLOR	UTILITY
RED	ELECTRIC
YELLOW	GAS, OIL, DANGEROUS MATERIALS
ORANGE	TELEPHONE, TELEGRAPH, TELEVISION, POLICE AND FIRE COMMUNICATIONS
BLUE	WATER LINES
GREEN	SANITARY SEWER LINES

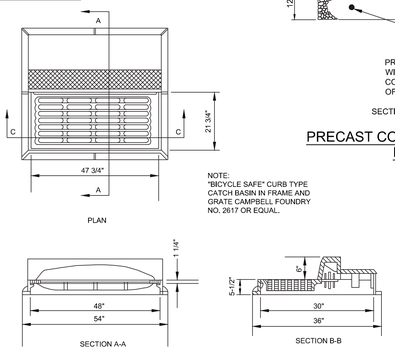
TYPICAL TRENCH DETAIL (ON-SITE)
N.T.S.



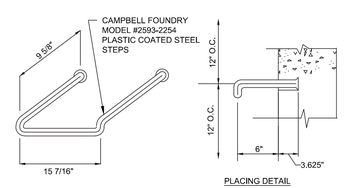
OUTLET CONTROL STRUCTURE TYPICAL
N.T.S.



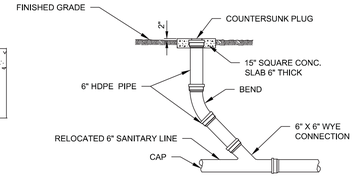
DETAIL OF CATCH BASIN HEAD - CURB TYPE A
N.T.S.



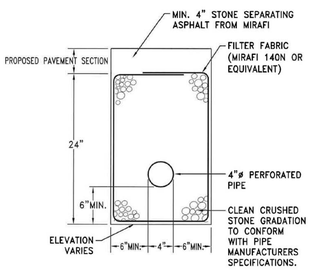
DETAIL OF CATCH BASIN HEAD - CURB TYPE B
N.T.S.



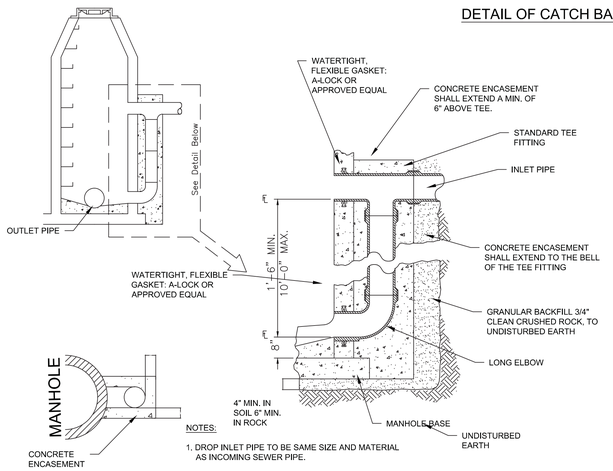
MANHOLE STEP DETAIL
N.T.S.



TYPICAL CLEANOUT DETAIL
N.T.S.



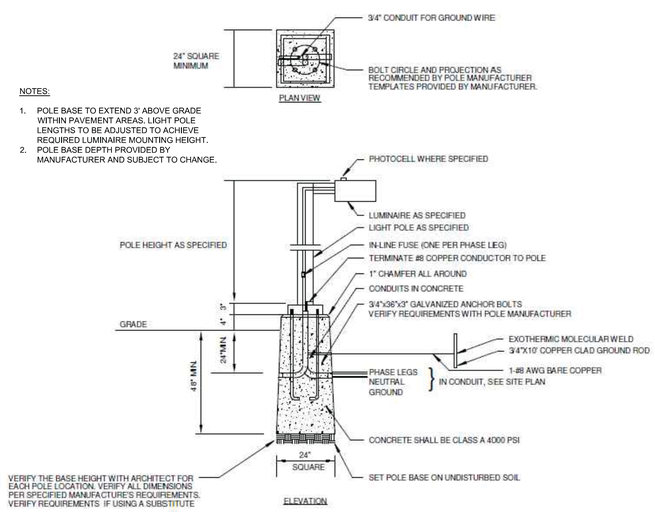
SUBSURFACE DRAIN DETAIL
NOT TO SCALE



NOTES:

1. DROP INLET PIPE TO BE SAME SIZE AND MATERIAL AS INCOMING SEWER PIPE.
2. ALIGNMENT OF TEE: DROP INLET PIPE AND LONG ELBOW MAY BE ADJUSTED TO MAXIMUM OF 5% DEFLECTION TO COMPENSATE FOR SLOPE OF SEWER LINE.

TYPICAL DROP MANHOLE SEWER CONNECTIONS
NOT TO SCALE



EXTERIOR LIGHT FIXTURE DETAIL
NOT TO SCALE

APPLICANT

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

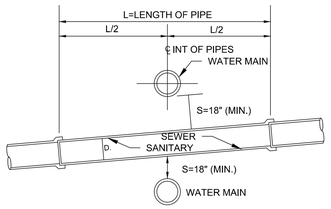
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
N.T.S.	01/30/13

SHEET TITLE

DETAILS V

SHEET NO.

C-904



NOTES:

IF NON-PRESSURE CAST IRON, VITRIFIED TILE OR ASBESTOS CEMENT SEWER PIPE PASSES BENEATH A WATER MAIN WITH A VERTICAL SEPARATION (S) OF LESS THAN 18" INCHES, THEN THE SEWER LINE MUST BE INSTALLED AS FOLLOWS:

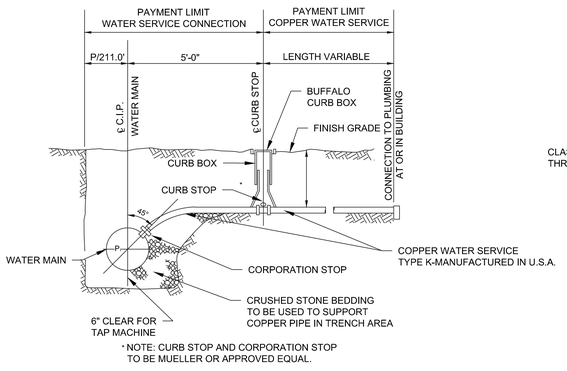
A) THREE (3) LENGTHS OF EITHER CAST IRON OR ASBESTOS CEMENT PRESSURE PIPE MUST BE USED. THE MIDDLE LENGTH SHALL BE PLACE SO THAT THE JOINTS ARE EQUIDISTANT FROM THE WATER MAIN. (SEE DETAIL)

B) THE THREE (3) LENGTHS OF PRESSURE PIPE MUST BE TESTED IN THE SAME MANNER AS REQUIRED FOR WATER MAINS. (SEE SPECIFICATION)

C) IN THOSE CASES WHERE, DUE TO FIELD CONDITIONS, THE SEWER MUST BE PLACED ABOVE THE WATER MAIN, THEN THE REQUIREMENTS AS STATED IN (A) & (B) MUST BE ADHERED TO.

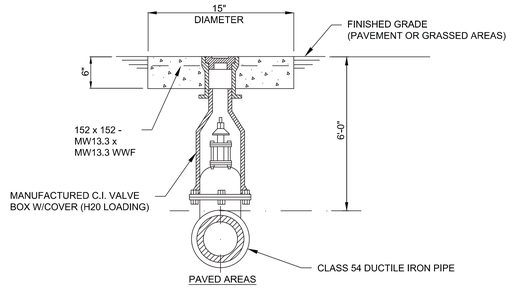
D) EACH VARIATION OF WATER-SEWER CROSSINGS FROM THAT SHOWN ON THIS DETAIL SHALL BE INDIVIDUALLY REVIEWED AND APPROVED BY THE HEALTH DEPARTMENT.

DETAIL OF SANITARY SEWER - WATER MAIN CROSSING
N.T.S.



* NOTE: CURB STOP AND CORPORATION STOP TO BE MUELLER OR APPROVED EQUAL.

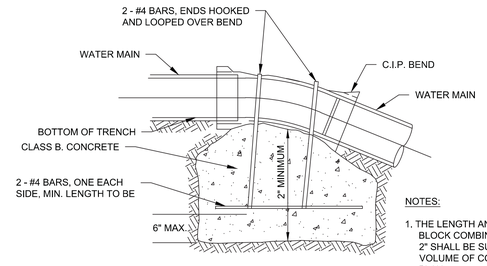
DETAIL OF WATER SERVICE CONNECTION
N.T.S.



NOTES:

1. WORD "WATER" TO BE CAST INTO CENTER OF CAST IRON CAP.
2. VALVE BOX AND COVER SHALL BE CAMPBELL FOUNDRY MODEL NO. 4425 OR APPROVED EQUAL.

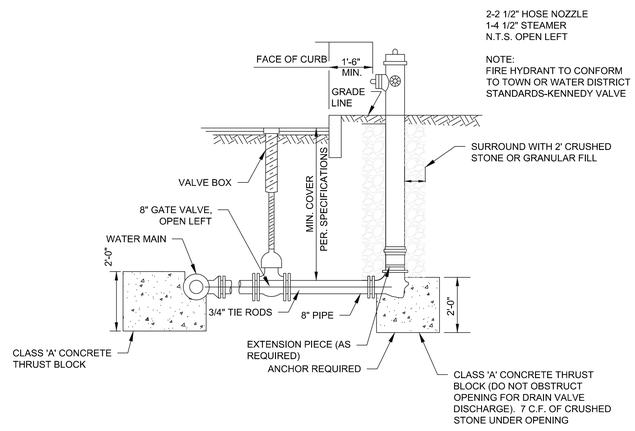
TYPICAL VALVE BOX DETAILS
N.T.S.



NOTES:

1. THE LENGTH AND WIDTH OF THE CONCRETE BLOCK COMBINED WITH THE MINIMUM DEPTH OF 2" SHALL BE SUFFICIENT TO GIVE A MINIMUM VOLUME OF CONCRETE AS INDICATED ON THE PLAN.

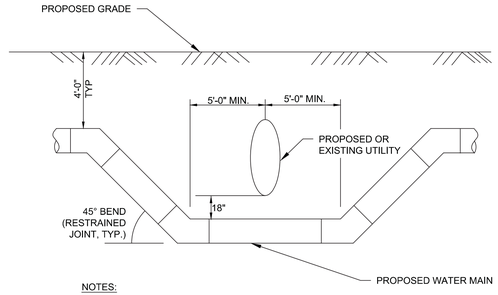
DETAIL OF CONCRETE ANCHOR
N.T.S.



NOTES:

1. ALL CONCRETE BLOCKS TO BEAR UNDISTURBED GROUND.
2. 4 - 3/4" D BITUMINOUS COATED RODS WILL BE REQUIRED TIEING HYDRANT TO VALVE TO WATER MAIN.
3. WHERE THE WATER TABLE IS WITHIN 7 FEET OF THE HYDRANT, DRAINS SHOULD BE PLUGGED. WHEN THE DRAINS ARE PLUGGED THE BARRELS MUST BE PUMPED DRY AFTER USE DURING FREEZING WEATHER. WHERE HYDRANT DRAINS ARE NOT PLUGGED, A GRAVEL POCKET OR DRYWELL SHALL BE PROVIDED UNLESS THE NATURAL SOILS WILL PROVIDE ADEQUATE DRAINAGE. HYDRANT DRAINS SHALL NOT BE CONNECTED TO BE LOCATED WITHIN 10 FEET OF SANITARY OR STORM DRAINS.
4. FIRE HYDRANT TO CONFORM TO TOWN OR WATER DISTRICT STANDARDS-KENNEDY VALVE.
5. 2 - 2 1/2" HOSE NOZZLE, 1 - 4 1/2" STEAMER

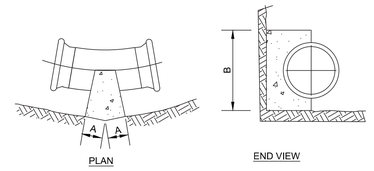
DETAIL OF TYPICAL HYDRANT
N.T.S.



NOTES:

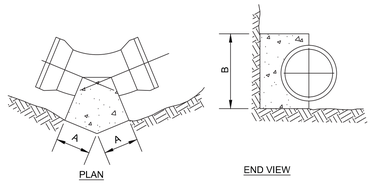
1. WHEN WATER MAIN CROSSES ELECTRICAL DUCT, THE 5' OFFSET SHALL BE FROM THE EDGE OF THE CONCRETE ENCASEMENT.

WATER MAIN CROSSING
N.T.S.



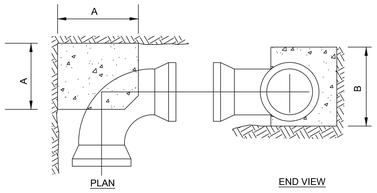
PIPE SIZE	A	B
6"-8"	5"	16"
10"-12"	7"	24"
14"-16"	8"	30"
18"-20"	9"	36"
24"	12"	42"

DETAIL OF 22 1/2° BEND ANCHOR
N.T.S.



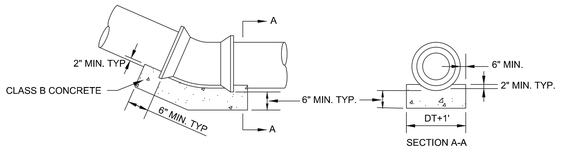
PIPE SIZE	A	B
6"-8"	6"	16"
10"-12"	10"	24"
14"-16"	16"	32"
18"-20"	18"	36"
24"	24"	42"

DETAIL OF 45° BEND ANCHOR
N.T.S.

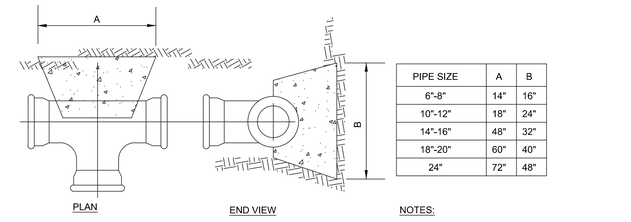


PIPE SIZE	A	B
6"-8"	14"	16"
10"-12"	20"	24"
14"-16"	24"	32"
18"-20"	30"	40"
24"	36"	48"

DETAIL OF 90° BEND ANCHOR
N.T.S.



DETAIL OF THRUST DISTRIBUTION BLOCK
N.T.S.



PIPE SIZE	A	B
6"-8"	14"	16"
10"-12"	18"	24"
14"-16"	48"	32"
18"-20"	60"	40"
24"	72"	48"

NOTES:

1. FOR MECHANICAL JOINT PIPE, TITON AND PVC PIPE TIE RODS MUST BE USED IN CONJUNCTION WITH CONCRETE THRUST BLOCKS FOR HYDRANTS, VALVES ON TEES, AND WHEREVER REQUIRED BY ENGINEER.

DETAIL OF TEE ANCHOR
N.T.S.

APPLICANT

EPT CONCORD II, LLC
909 WALNUT, SUITE 200
KANSAS CITY, MO 64106
(816) 472-1700 (PHONE)
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REVISIONS

No.	DATE	DESCRIPTION

PROJECT

EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

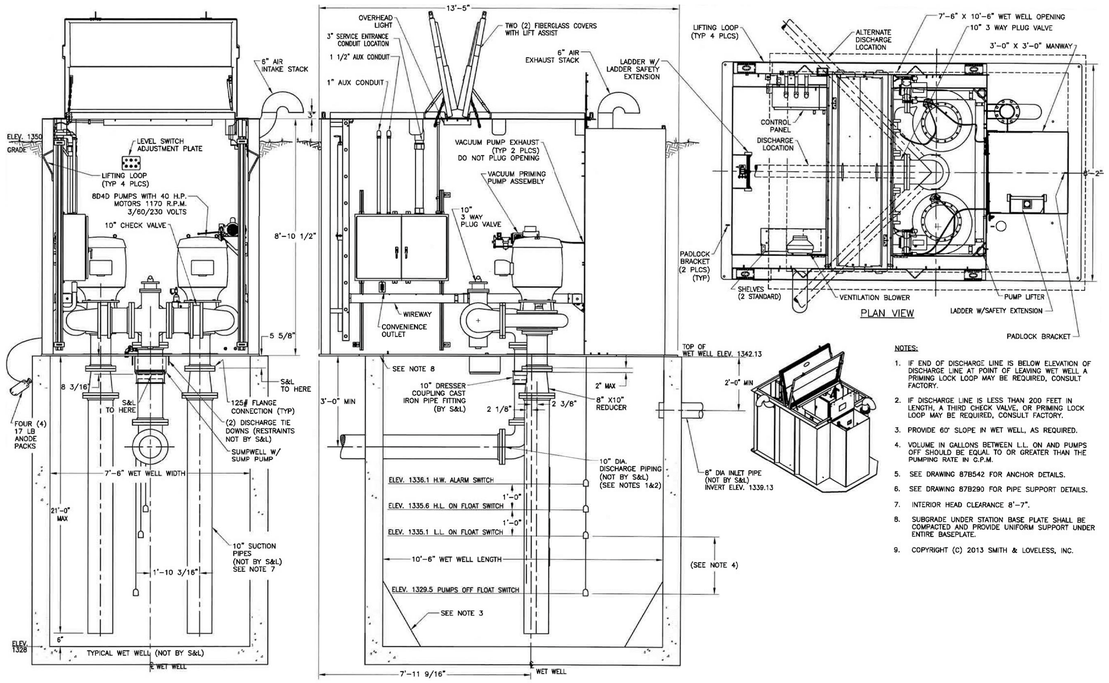
DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
N.T.S.	01/30/13

SHEET TITLE

DETAILS VI

SHEET NO.

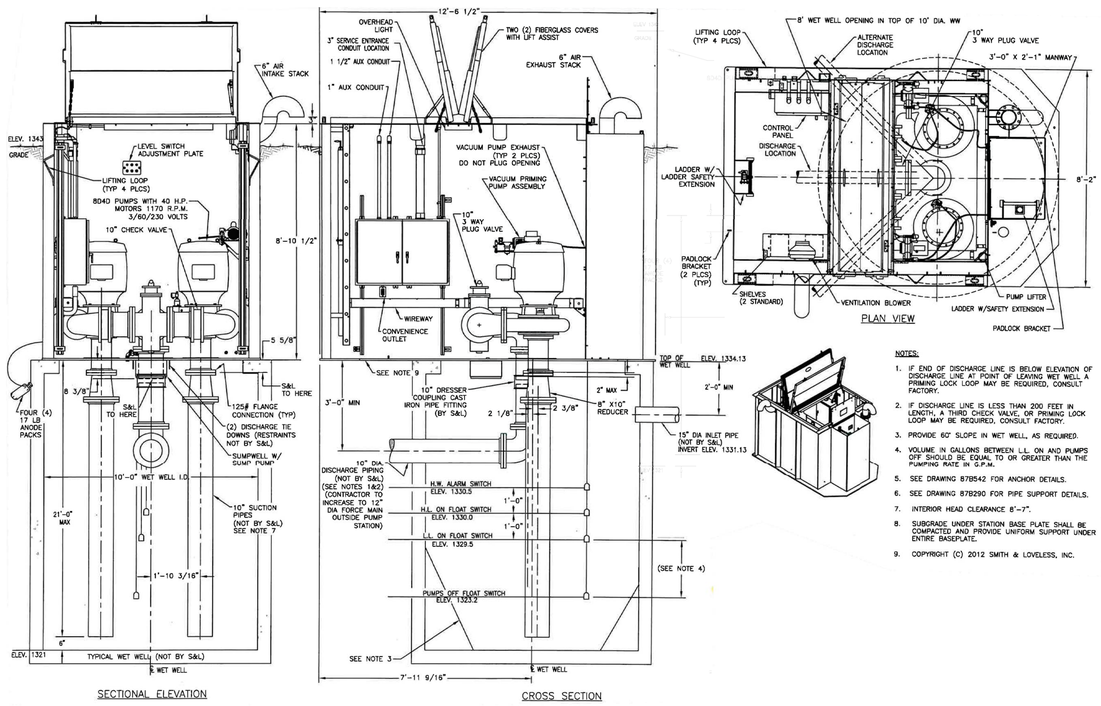
C-905



NOTES:

1. IF END OF DISCHARGE LINE IS BELOW ELEVATION OF DISCHARGE LINE AT POINT OF LEAVING WET WELL A PRIMING LOCK LOOP MAY BE REQUIRED, CONSULT FACTORY.
2. IF DISCHARGE LINE IS LESS THAN 200 FEET IN LENGTH, A THIRD CHECK VALVE, OR PRIMING LOCK LOOP MAY BE REQUIRED, CONSULT FACTORY.
3. PROVIDE 60' SLOPE IN WET WELL, AS REQUIRED.
4. VOLUME IN GALLONS BETWEEN L.L. ON AND PUMPS OFF SHOULD BE EQUAL TO OR GREATER THAN THE PUMPING RATE IN G.P.M.
5. SEE DRAWING 87B542 FOR ANCHOR DETAILS.
6. SEE DRAWING 87B290 FOR PIPE SUPPORT DETAILS.
7. INTERIOR HEAD CLEARANCE 8'-7".
8. SUBGRADE UNDER STATION BASE PLATE SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT UNDER ENTIRE BASEPLATE.
9. COPYRIGHT (C) 2013 SMITH & LOVELESS, INC.

PUMP STATION # 1



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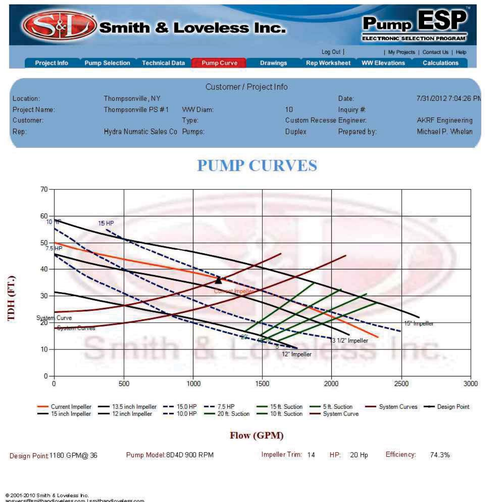
8. SUBGRADE UNDER STATION BASE PLATE SHALL BE COMPACTED AND PROVIDE UNIFORM SUPPORT UNDER ENTIRE BASEPLATE.
9. COPYRIGHT (C) 2012 SMITH & LOVELESS, INC.

PUMP STATION # 2



NOTES:

1. PUMP STATION #1 CONTAINS A DUPLEX PUMPING SYSTEM (TWO IDENTICAL PUMPS) IN ACCORDANCE WITH REQUIREMENTS OF NYSDEC DESIGN STANDARDS FOR WASTEWATER TREATMENT WORKS 1988.
2. PUMPS PROVIDED SHALL MEET THE FOLLOWING CONSISTENT WITH PUMP CURVE SHOWN ON THIS DRAWING:
   a. MOTOR DATA: 20 HORSEPOWER, 900 RPM
   b. PUMP MODEL #8D4D 900 RPM AS MANUFACTURED BY SMITH AND LOVELESS INC.
   c. POWER REQUIREMENTS: 200 AMP SERVICE AT 240 VOLT, THREE PHASE.
   d. OPERATING POINT: 1180 GPM @ 36 FEET TDH.
3. PUMP STATION WILL BE EQUIPPED WITH A VISUAL ALARM SYSTEM, AND REMOTE MONITORING.
4. A PORTABLE GENERATOR MUST BE PURCHASED AND STORED ON-SITE TO BE USED IN EMERGENCY CASES FOR POWER BACKUP FOR THE PUMP STATIONS. PROVIDE INDUSTRIAL DIESEL GENERATOR SET MODEL #SD100 BY GENERAC INDUSTRIAL, OR EQUIVALENT APPROVED BY ENGINEER. SEE SHEET NO. C-907 FOR DETAIL.

SERIES B1B TRASH BASKET

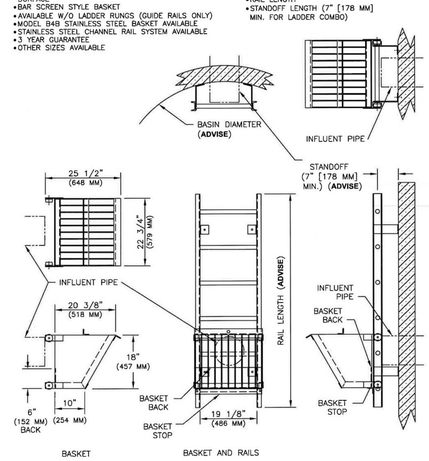
HP HALLIDAY PRODUCTS — www.HallidayProducts.com Phone 800-298-1027 Fax 407-298-4534 Sales@HallidayProducts.com

STANDARD FEATURES:

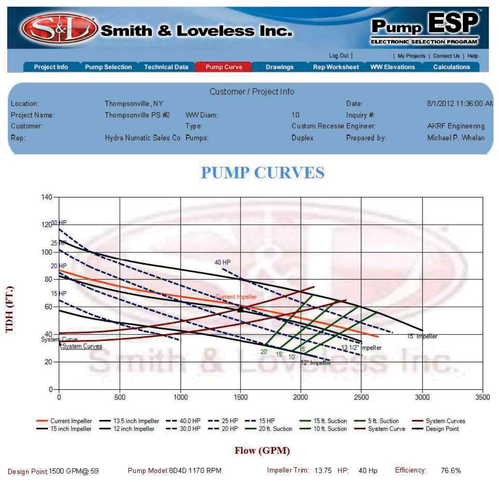
- ALL ALUMINUM BASKET AND RAILS
- SOLID ALUMINUM WHEELS AND STAINLESS STEEL AXLES
- HEAVY DUTY LADDER/GUIDERAIL COMBINATION
- 1 3/8" TYPE "D" RUNG WITH FLAT SLIP RESISTANT SURFACE
- BAR SCREEN STYLE BASKET
- AVAILABLE W/O LADDER RUNGS (GUIDE RAILS ONLY)
- MODEL B4B STAINLESS STEEL BASKET AVAILABLE
- STAINLESS STEEL CHANNEL RAIL SYSTEM AVAILABLE
- 3 YEAR GUARANTEE
- OTHER SIZES AVAILABLE

REQUIRED INFORMATION:

- BASIN DIAMETER
- RAIL LENGTH
- STANDOFF LENGTH (7" [178 MM] MIN. FOR LADDER COMBO)



TRASH BASKET



NOTES:

1. PUMP STATION #2 CONTAINS A DUPLEX PUMPING SYSTEM (TWO IDENTICAL PUMPS) IN ACCORDANCE WITH REQUIREMENTS OF NYSDEC DESIGN STANDARDS FOR WASTEWATER TREATMENT WORKS 1988.
2. PUMPS PROVIDED SHALL MEET THE FOLLOWING CONSISTENT WITH PUMP CURVE SHOWN ON THIS DRAWING:
   a. MOTOR DATA: 40 HORSEPOWER, 1170RPM
   b. PUMP MODEL #8D4D 1170 RPM AS MANUFACTURED BY SMITH AND LOVELESS INC.
   c. POWER REQUIREMENTS: 300 AMP SERVICE AT 240 VOLT, THREE PHASE.
   d. OPERATING POINT: 1500 GPM @ 59 FEET TDH.
3. PUMP STATION WILL BE EQUIPPED WITH A VISUAL ALARM SYSTEM, AND REMOTE MONITORING.
4. A PORTABLE GENERATOR MUST BE PURCHASED AND STORED ON-SITE TO BE USED IN EMERGENCY CASES FOR POWER BACKUP FOR THE PUMP STATIONS. PROVIDE INDUSTRIAL DIESEL GENERATOR SET MODEL #SD100 BY GENERAC INDUSTRIAL, OR EQUIVALENT APPROVED BY ENGINEER. SEE SHEET NO. C-907 FOR DETAIL.

APPLICANT

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT

EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE	DATE
N.T.S.	01/30/13

SHEET TITLE

DETAILS VII

SHEET NO.

C-906

GENERAC | INDUSTRIAL

SD100

Industrial Diesel Generator Set

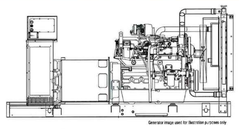
EPA Certified Stationary Emergency

100 KW Diesel

1 of 5

Standby Power Rating
125kVA 100kW 60Hz

Prime Power Rating
113kVA 90KW 60Hz



Generator image used for illustrative purposes only.

*EPA Certified Prime ratings are not available in the U.S. or its Territories for engine model year 2011 and beyond

features

- **Generator Set**
  - PROTOTYPE & TORSIONALLY TESTED
  - VLAIRR TESTED
  - INNOCOAT PAINT SYSTEM
  - WIDE RANGE OF ENCLOSURES AND TANKS
- **Engine**
  - EPA COMPLIANT
  - INDUSTRIAL TESTED, GENERAC APPROVED
  - POWER-MATCHED OUTPUT
  - INDUSTRIAL GRADE
- **Alternator**
  - TWO-THIRDS PITCH
  - LASER WOUND ROTOR & STATOR
  - CLASS H MATERIALS
  - DIGITAL 3-PHASE VOLTAGE CONTROL
- **Controls**
  - ENCAPSULATED BOARD W/ SEALED HARNESS
  - 4-20mA VOLTAGE-TO-CURRENT SENSORS
  - SURFACE-MOUNT TECHNOLOGY
  - ADVANCED DIAGNOSTICS & COMMUNICATIONS

benefits

- PROVIDES A PROVEN UNIT
- ENSURES A QUALITY PRODUCT
- IMPROVES RESISTANCE TO ELEMENTS
- PROVIDES A SINGLE SOURCE SOLUTION
- ENVIRONMENTALLY FRIENDLY
- ENSURES INDUSTRIAL STANDARDS
- ENGINEERED FOR PERFORMANCE
- IMPROVES LONGEVITY AND RELIABILITY
- ELIMINATES HARMFUL IRD HARMONIC
- IMPROVES COOLING
- HEAT TOLERANT DESIGN
- FAST AND ACCURATE RESPONSE
- EASY, AFFORDABLE REPLACEMENT
- NOISE RESISTANT 24/7 MONITORING
- PROVIDES VIBRATION RESISTANCE
- HARDENED RELIABILITY

primary codes and standards

KCMA | ULc | UL | IBC | IEBC | CSA

100 KW Diesel

2 of 5

GENERAC | INDUSTRIAL

SD100 application and engineering data

ENGINE SPECIFICATIONS

General	
Make	Isuzu/EPT
EPA Emissions Compliance	Stationary Emergency
EPA Emissions Reference	See Emissions Data Sheet
Cylinder #	4
Type	In-Line
Displacement - L (cu. in.)	6.7
Bore - mm (in.)	104 (4.09)
Stroke - mm (in.)	126 (5.2)
Compression Ratio	18.5:1
Intake Air Method	Turbocharged/Intercooled
Cylinder Head Type	2- Valve
Piston Type	Alloy Aluminum

Cooling System	
Cooling System Type	Closed Recovery
Water Pump Type	Centrifugal
Fan Type	Pusher
Fan Speed (rpm)	2536 rpm
Fan Diameter mm (in.)	369 (23.6)
Coolant Heater Wattage	1500
Coolant Heater Standard Voltage	120VAC

Fuel System	
Fuel Type*	Ultra Low Sulfur Diesel Fuel
Fuel Specifications	ASTM
Fuel Filtering (microns)	5
Fuel Inject Pump Make	Stanadyne
Fuel Pump Type	Engine Driven Gear
Injector Type	Mechanical
Engine Type	Direct Injection
Fuel Supply Line - mm (in.)	12.7 (1/2")
Fuel Return Line - mm (in.)	12.7 (1/2")

Engine Electrical System	
System Voltage	12VDC
Battery Charging Alternator	35A
Battery Size (cold cranking)	900 CCA
Battery Group	31
Battery Voltage	(1) 12VDC
Ground Polarity	Negative

ALTERNATOR SPECIFICATIONS

Standard Model	360 mm Screwss
Poles	4
Field Type	Revolving
Insulation Class - Rotor	H
Insulation Class - Stator	H
Total Harmonic Distortion	<3%
Telephone Interference Factor (TIF)	<50
Standard Excitation	Synchronous Brushless
Bearings	Single Sealed Cartridge
Coupling	Direct, Flexible Disc
Load Capacity - Standby	100%
Prototype Short Circuit Test	Yes

Voltage Regulator Type	Digital
Number of Sensed Phases	All
Regulation Accuracy (Steady State)	± 0.25%

CODES AND STANDARDS COMPLIANCE (WHERE APPLICABLE)

NFPA 99	ISO3046
NFPA 110	SAE J1349
ISO 8528-5	DRM2011
ISO 17025A-S	IEEE C62.41 TESTING
ISO 3046	NEMA ICS 1

Rating Definitions:
Standby – Applicable for a varying emergency load for the duration of a utility power outage with no overload capability. (Max. load factor = 70%)
Prime – Applicable for supplying power to a varying load in lieu of utility for an unlimited amount of running time. (Max. load factor = 80%.) A 10% overload capacity is available for 1 out of every 12 hours.

100 KW Diesel

3 of 5

GENERAC | INDUSTRIAL

SD100 operating data (60Hz)

POWER RATINGS (kW)

	STANDBY		PRIME	
Single-Phase 120/240VAC @0.8pf	100 kW	Amps: 417	90 kW	Amps: 333
Three-Phase 120/208VAC @0.8pf	100 kW	Amps: 347	90 kW	Amps: 216
Three-Phase 120/240VAC @0.8pf	100 kW	Amps: 301	90 kW	Amps: 241
Three-Phase 277/480VAC @0.8pf	100 kW	Amps: 150	90 kW	Amps: 109
Three-Phase 346/600VAC @0.8pf	100 kW	Amps: 120	90 kW	Amps: 96

STARTING CAPABILITIES (skVA)

skVA vs. Voltage Dip

		480VAC				208/240VAC					
Alternator	kW	10%	15%	20%	25%	30%	10%	15%	20%	25%	30%
Standard	100	79	118	157	197	236	23	59	88	118	148	177	206
Option 1	100	116	174	232	290	348	426	87	131	174	218	261	305
Option 2	150	133	199	265	332	398	464	100	149	199	249	299	348
Option 3	200	167	250	373	467	560	653	140	210	280	350	420	490

FUEL

Fuel Pump 0 ft - in (mm)
36 (900)
Total Fuel Requirement Capacity - gph
29.1

Fuel Consumption Rates*

	STANDBY		PRIME	
Percent Load	gph	lph	Percent Load	gph	lph
25%	2.2	8.3	25%	2	7.6
50%	4.2	15.9	50%	3.8	14.4
75%	5.8	22.3	75%	5.3	20.1
100%	7.3	27.6	100%	6.6	25.2

* Refer to "Emissions Data Sheet" for maximum full FP EPA and EVACHO governing purposes.

COOLING

	STANDBY	PRIME
Coolant Flow per Minute	gpm (lpm)	44.6 (168.8)	44.6 (168.8)
Heat Rejection to Coolant	BTU/hr	356,130	343,330
Inlet Air	cfm (m3/min)	2,500 (223.7)	6,300 (188)
Max. Operating Radiator Air Temp	8°F (°C)	122 (50)	122 (50)
Max. Operating Ambient Temperature	°F (°C)	104 (40)	104 (40)
Coolant System Capacity	gal (L)	13.2 (49.2)	14.5) 17.44
Maximum Radiator Backpressure	in H2O	1.5	1.5

COMBUSTION AIR REQUIREMENTS

	STANDBY	PRIME
Flow at Rated Power cfm (m3/min)	525 (9.7)	293 (8.3)

ENGINE

		STANDBY	PRIME
Rated Engine Speed	rpm	1800	1800
Horsepower at Rated kW**	hp	152	113
Piston Speed	ft/min	1559	1559
BMEP	psi	154	148

** Refer to "Emissions Data Sheet" for maximum kW for EPA and EVACHO governing purposes.

EXHAUST

		STANDBY	PRIME
Exhaust Flow (Rated Output)	cfm (m³/min)	886 (25)	852 (23.9)
Max. Backpressure (Post Silencer)	in Hg (kPa)	1.5 (5.1)	1.5 (5.1)
Exhaust Temp (Rated Output)	°F (°C)	885 (474)	797 (425)
Exhaust Outlet Size (Open End)	MP" (mm)	10.5 (4 in)	10" (5 in)

Elevation - Operational characteristics consider maximum ambient conditions. Derate factors may apply under elevation/ site conditions. Please consult a Service/ Power Systems Industrial Dealer for additional details. All performance ratings in accordance with ISO3046, BS5001, ISO8528 and DIN6271 standards.

5 of 5

GENERAC | INDUSTRIAL

SD100 standard features and options

GENERATOR SET

- ● Genset Vibration Isolation — Std
- ○ IBC Seismic Certified/Seismic Rated Vibration Isolators — Opt
- ● Extended warranty — Opt
- ○ Gen-Link Communications Software — Opt
- ○ Steel Enclosure — Opt
- ● Aluminum Enclosure — Opt

ENGINE SYSTEM

Covered
- ● Oil Drain Extension — Stnd
- ○ Oil Make-Up System — Opt
- ○ Oil Heater — Opt
- ● Air cleaner — Std
- ● Fan guard — Std
- ● Radiator duct adapter — Std
- ● Stainless steel flexible exhaust connection — Std
- ● Industrial Exhaust Silencer — Std
- ○ Critical Exhaust Silencer — Opt

Fuel System
- ● Fuel lockoff solenoid — Std
- ● Secondary fuel filter — Std
- ○ Flexible fuel lines — Opt
- ○ Primary fuel filter — Opt
- ○ Single Wall tank (Export Only) — Opt
- ○ UL 142 Fuel Tank — Opt

Cooling System
- ○ 120VAC Coolant Heater — Opt
- ○ 208VAC Coolant Heater — Opt
- ○ 240VAC Coolant Heater — Opt
- ○ Drain Coolant Heater — Opt
- ● Closed Coolant Recovery System — Std
- ● UV/Ozone resistant hoses — Std
- ● Factory-installed Radiator — Std
- ● Radiator Drain Extension — Std

Engine Electrical System
- ● Battery charging alternator — Std
- ● Battery cables — Std
- ● Battery tray — Std
- ○ Battery box — Opt
- ○ Battery heater — Opt
- ● Solenoid activated starter motor — Std
- ○ 2.5A UL battery charger — Opt
- ○ 10A UL float/equalize battery charger — Opt
- ● Rubber-booted engine electrical connections — Std

ALTERNATOR SYSTEM

- ● UL2200 GENarator/EM — Std
- ○ Main Line Circuit Breaker — Opt
- ○ 2nd Circuit Breaker — Opt
- ○ 3rd Circuit Breaker — -
- ○ Alternator Upsizing — Opt
- ○ Anti-Condensation Heater — Opt
- ○ Tropical coating — Opt
- ○ Permanent Magnet Generator — Opt

CONTROL SYSTEM

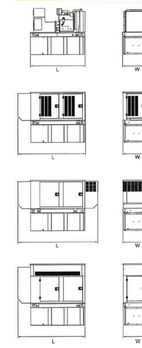
Control Panel
- ● Digital H Control Panel - Dual 4x20 Display — Std
- ○ Digital G-100 Control Panel – Touchscreen — Opt
- ○ Digital G-203 Paralleling Control Panel – Touchscreen — Opt
- ● Programmable Event Limiter — Std
- ○ 21 Light Remote Annunciator — Opt
- ○ Remote Relay Panel (8 or 16) — Opt
- ● 7-Day Programmable Exercise — Std
- ○ Special Applications Programmable PLC — Std
- ● RS-232 — Std
- ● RS-485 — Std
- ● Air Flow Planning Defl — Std
- ● Full System Status — Std
- ● Utility Monitoring (Req. H-Transfer Switch) — Std
- ● 3-Wire Start Compatible — Std
- ● Power Output (kW) — Std
- ● Power Factor — Std
- ● Real/Live Power — Std
- ● All-phase AC Voltage — Std
- ● All-phase Currents — Std
- ● Oil Pressure — Std
- ● Coolant Temperature — Std
- ● Coolant Level — Std
- ○ Oil Temperature — Opt
- ○ Fuel Pressure — -
- ● Engine Speed — Std
- ● Battery Voltage — Std
- ● Frequency — Std
- ● Date/Time Fault History (Event Log) — Std
- ● Low-Speed Exercise — Std
- ● Isochronous Governor Control — Std
- ● 40deg C - 70deg C Operation — Std
- ● Relay/Input Plug-In Connectors — Std
- ● Audible Alarms and Shutdowns — Std
- ● Not-in-Auto Warning Light — Std
- ● Auto/Off/Manual Switch — Std
- ○ E-Stop (Red Mushroom-Type) — Std
- ○ Remote E-Stop (Break Glass-Type, Surface Mount) — Opt
- ○ Remote E-Stop (Red Mushroom-Type, Surface Mount) — Opt
- ○ Remote E-Stop (Red Mushroom-Type, Flush Mount) — Opt
- ● NFPA 110 Level 1 and 2 (Programmable) — Std
- ○ Remote Communication - RS232 — Opt
- ○ Remote Communication - Modem — Opt
- ○ Remote Communication - Ethernet — Opt
- ○ 15A Rate Relay — Opt

Alarms (Programmable Setpoints, Pre-Alarms and Shutdowns)
- ○ Low Fuel — Opt
- ● 4U Pressure (Pre-programmed Low Pressure Shutdown) — Std
- ● Coolant Temperature (Pre-programmed High Temp Shutdown) — Std
- ○ Coolant Level (Pre-programmed Low Level Shutdown) — Std
- ○ Oil Temperature — Opt
- ● Engine Speed (Pre-programmed Overspeed Shutdown) — Std
- ● Voltage (Pre-programmed Overvoltage Shutdown) — Std
- ● Battery Voltage — Std

Other Options
- ○
- ○
- ○

GENERAC | INDUSTRIAL

SD100 dimensions, weights and sound levels



OPEN SET

RUN TIME HOURS	USABLE CAPACITY (GAL)	L	W	H	WT	dBA*
NO TANK	-	110	40	63	3304	
12	92	156	49	77	3913	
20	223	118	40	89	4146	
48	359	156	49	101	4480	67
70	510	117	47	105	4489	
81	599	156	49	107	4940	
99	693	156	53	107	4967	

STANDARD ENCLOSURE

RUN TIME HOURS	USABLE CAPACITY (GAL)	L	W	H	WT	dBA*
NO TANK	-	133	40	64	3954	
12	90	133	40	77	4663	
20	220	133	40	89	4956	
48	356	133	40	101	5355	65
70	510	133	47	105	5339	
81	599	133	45	107	5758	
99	693	156	53	107	5757	

LEVEL 1 SOUND ENCLOSURE

RUN TIME HOURS	USABLE CAPACITY (GAL)	L	W	H	WT	dBA*
NO TANK	-	154	43	64	4514	
12	90	154	43	77	5363	
20	220	154	43	89	5396	
48	356	154	43	101	5738	70
70	510	154	47	105	5739	
81	599	154	49	107	6138	
99	693	154	53	107	6117	

LEVEL 2 SOUND ENCLOSURE

RUN TIME HOURS	USABLE CAPACITY (GAL)	L	W	H	WT	dBA*
NO TANK	-	145	40	81	4392	
12	90	145	40	94	5961	
20	220	145	40	106	5274	
48	359	145	40	118	5616	73.5
70	510	145	47	122	5617	
81	599	145	49	124	6070	
99	693	145	53	124	5995	

*All measurements are approximate and for estimation purposes only. Weights are without fuel in tank. Sound levels measured at 23ft (7m) and then normalized to ambient test conditions.

Tank Options
- ○ MOSD
- ○ Florida UEMC/DEP
- ○ Chicago Fire Code
- ○ FDC Certification
- ○ ULC

QT*:	
QT*:	
CALL	
CALL	

Other Custom Options Available from your Generac Industrial Power Dealer

YOUR FACTORY RECOGNIZED GENERAC INDUSTRIAL DEALER

Specifications shown/available may change without notice. Dimensions and weights are for preliminary purposes only. Please contact a Generac Power Systems Industrial Dealer for detailed installation drawings.

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NOTES:

1. A PORTABLE GENERATOR MUST BE PURCHASE AND STORED ON-SITE TO BE USED IN EMERGENCY CASES FOR POWER BACKUP FOR THE PUMPING STATIONS. PROVIDE INDUSTRIAL DIESEL GENERATOR SET MODEL #SD100 BY GENERAC INDUSTRIAL, 100 KW DIESEL GENSET- SITE RATED 100KW, 6.7L ENGINE WITH UPSIZED 175 KW ALTERNATOR, OR EQUIVALENT APPROVED BY ENGINEER

GENERATOR DETAIL

Page 1 of 5
10/25/2012

GENERAC | INDUSTRIAL — Generac DESIGN PRO

Project Summary

Contact Information	
Project:	Thompsonville, NY
Contact:	
Spec Ref:	
Email:	

Environment	
Ambient Temp:	100 F / 38 C
Elevation:	1000 ft / 305 m

Electrical Configuration	
Phase:	Three Phase
Frequency (Hz):	60 Hz
Voltage (Nominal):	240
Voltage (Specific):	240 volts

Electrical Performance	
Max Running Load:	100%
Maximum Allowable Transients	
Voltage Dip:	20.00%
Frequency Dip:	15 hertz
Maximum Allowable Voltage Distortion (%THVD)	
Continuous:	11%
Momentary:	13%

Prepared By	
Name:	Michael Whelan
Company:	Hydra Numatic Sales Co
Phone:	973-492-0181
Email	mwhelan@hnscompany.com

Engine	
Duty:	Standby
Fuel:	Diesel
U.S. EPA Required:	Yes

Generator Configuration	
Application:	NEC 702 General
Enclosure Type:	Sound Level 2
Sound (desired):	70 dBA
Fuel Tank:	Sub Base UL 142
Run Time (desired):	24 hr

Load Sequence Configuration	
Cyclic #1:	75% After Largest
Cyclic #2:	50% After Largest

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GENERAC | INDUSTRIAL — Generac DESIGN PRO

Generator and Load Summary

Selected Generator & Alternator	
Product Family Method:	Auto Select
Product Family:	SD Diesel (single)
Module Size:	NA
Sizing Method:	Auto Select
Generator:	100 kW, 6.7L Module
Alternator:	175 kW

100 kW Diesel Genset – Site rated 100 kw
6.7 L Engine with Upsized (175 kW) Alternator

Load Level:	Transients		Harmonics	
Running:	36%	Fdip (Hz):	2.3	THVD Corr:	0.0%
Peak:	44%	Vdip (%):	17.1%	THVD Peak:	0.0%
Project Limits		Fdip (Hz):	15.0	THVD Corr:	11.0%
Max Lowering:	196%	Vdip (%):	20.00 %	THVD Peak:	13.0%

Load Summary – Connected Load of 36 kW					
Running		Transients		Harmonics	
kW:	36	kW (Step):	55.4	kVA:	0.0
kVA:	46	kW (Peak):	60.5	THD Corr:	0.0%
PF:	0.78	kVA (Step):	240.0	THD Peak:	0.0%

Load List		Starting		Running		Harmonic Current Distortion			Limits	
Sequence	Description	kW	kVA	kW	kVA	Peak	Cont.	kVA	Vdip	Fdip
Group 2	Motor: Motor #1 7 x 3 HP, Code H, (6.7 kVA/Hp) Across the Line Unloaded at start running at 100%	11.5	33.5	5.1	6.1	0.0%	0.0%	0.0	20.0%	15.0 hertz
Group 2 Summary	All loads on (sequence starting)	11.5	33.5	5.1	6.1	0.0%	0.0%	0.0	20.0% 40.0 volts	15.0% 15.0 hertz
	11.5 kW Sequence Peak 11.5 kW Application Peak									
Group 3	Motor: Motor #2 15 x 3 HP, Code G, (5.8 kVA/Hp) Across the Line Unloaded at start running at 85%	55.4	240.0	30.8	39.8	0.0%	0.0%	0.0	20.6%	16.5 hertz
Group 3 Summary	All loads on (sequence starting)	kW	kVA	kW	kVA	Peak THD	Cont. THD	Base KVA	Vdip	Fdip
	55.4 kW Sequence Peak 66.4 kW Application Peak	55.4	240.0	30.8	39.8	0.0%	0.0%	0.0	20.6% 41.2 volts	25.0% 10.0 hertz

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GENERAC | INDUSTRIAL — Generac DESIGN PRO

Transient Analysis

Most difficult alternator transient requirements (Vdip)	
Sequence:	Group 3
Load:	Motor #2
Starting kVA	240.0
Vdip Tolerance:	20.0%
Vdip Expected:	17.1%

Most difficult engine transient requirements (Fdip)	
Sequence:	Group 3
Load:	Motor #2
Starting kW:	55.4
Fdip Tolerance:	15.0
Fdip Expected:	2.3

Alternator Transient Analysis (Vdip)

Sequence	Allowable Vdip	Expected Vdip	Sequence Starting kVA	Largest Connected Load
Group 2	20.0%	2.4%	33.5	Motor #1
Group 3	20.0%	17.1%	240.0	Motor #2

Engine Transient Analysis (Fdip)

Sequence	Allowable Fdip	Expected Fdip	Sequence Starting kW	Largest Connected Load
Group 2	15.0	2.4	11.5	Motor #1
Group 3	15.0	2.3	55.4	Motor #2

Note: UPS that revert to battery on system transients do not establish a sequence frequency dip limit though they may impact the sitting. The rotating alignment verifies the engine can accept the UPS within its frequency tolerance.

GENERATOR SPECIFICATIONS

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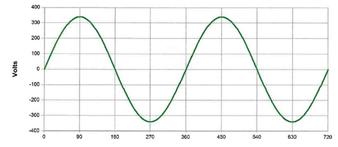
GENERAC | INDUSTRIAL — Generac DESIGN PRO

Harmonic Analysis

Harmonic Profile: Application Total (running) — Sequence: (Total)
kVA Nonlinear Load: 0.0 — THD: 0.0% — THVD: 0.0%
kVA Base (all non-linear): 0.0 — Selected sequence(s) harmonic alternator loading: 0.0%

Selected Harmonic Current and Voltage Profiles

Profile	3rd	5th	7th	9th	11th	13th	15th	17th	19th
Current:	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Voltage:	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%



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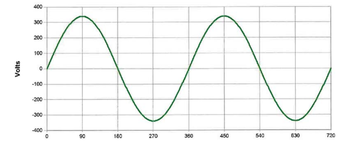
Harmonic Analysis (cont)

Harmonic Profile: Application Total (peak) — Sequence: (Total)
kVA Nonlinear Load: 0.2 — THD: 0.0% — THVD: 0.0%
kVA Base (all non-linear): 0.0 — Selected sequence(s) harmonic alternator loading: 0.1%

Selected Harmonic Current and Voltage Profiles

Profile	3rd	5th	7th	9th	11th	13th	15th	17th	19th
Current:	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Voltage:	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%



GENERATOR SPECIFICATIONS

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REVISIONS

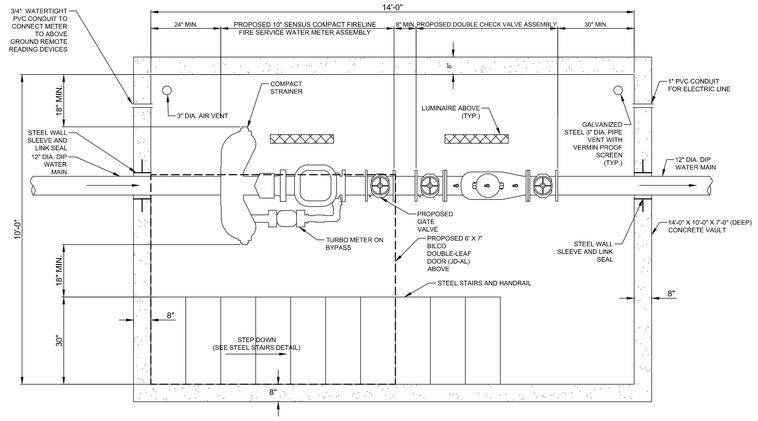
No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT
PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE: N.T.S.	DATE: 01/30/13

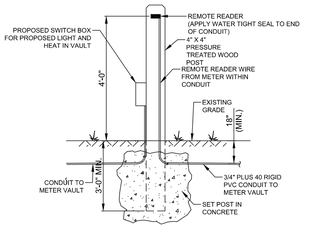
SHEET TITLE
DETAILS VIII

SHEET NO.
C-907



PLAN VIEW - CONCRETE VAULT FOR WATER METER AND BACKFLOW PREVENTER ASSEMBLY

N.T.S.

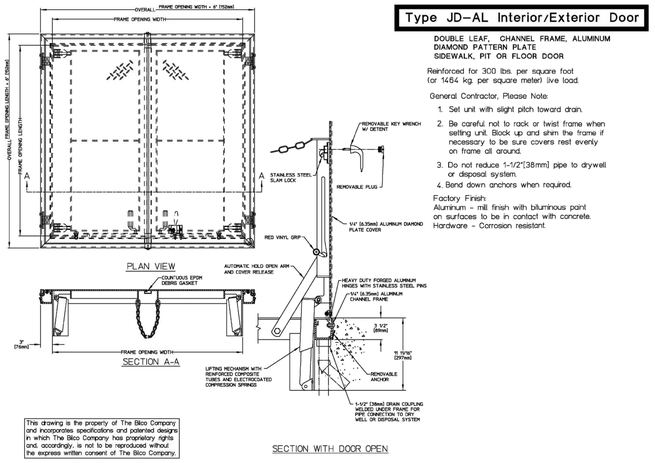


REMOTE READER / SWITCH BOX POST

CONCRETE VAULT FOR WATER METER AND BACKFLOW PREVENTER ASSEMBLY

N.T.S.

SWITCH BOX NOTES:
1. A LOCK SHALL BE PROVIDED FOR SWITCH BOX.



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NOTES:
1. AT WATER METER AND BACKFLOW PREVENTER STRUCTURE M1 THE DRAIN COUPLING SHALL BE CONNECTED TO STORMWATER STRUCTURE B1.
2. AT THE BACKFLOW PREVENTER CHAMBER AT THE SOUTH SIDE OF THE PROPERTY THE DRAINAGE COUPLING WILL BE CONVEYED TO THE PROPOSED DRYWELL.

BILCO® DOUBLE-LEAF DOOR DETAIL

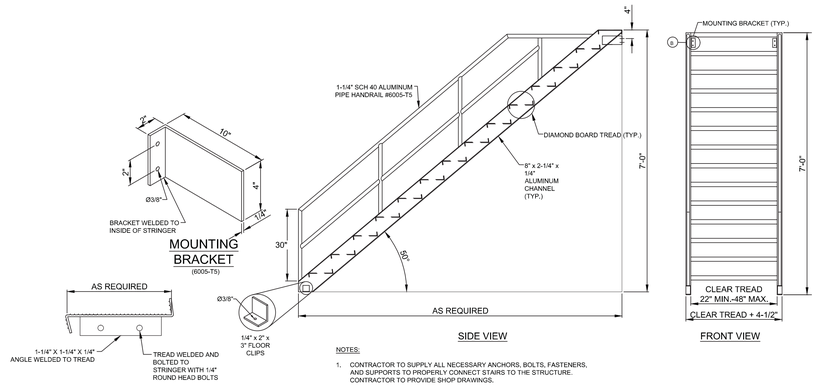
N.T.S.

PROFILE VIEW - CONCRETE VAULT FOR WATER METER (M1) AND BACKFLOW PREVENTER ASSEMBLY

N.T.S.

CONCRETE VAULT FOR WATER METER AND BACKFLOW PREVENTER ASSEMBLY NOTES:

1. ALL FITTINGS AND APPURTENANCES BETWEEN WALL SLEEVES TO BE FLANGED.
2. INTERIOR AND EXTERIOR WALLS TO HAVE 1/2" CEMENT PLASTER COAT.
3. EXTERIOR PLASTER COAT TO HAVE BITUMINOUS WATER PROOF COAT.
4. CONTRACTOR TO ENSURE ALL OPENINGS ARE PROPERLY SIZED TO ALLOW ALL APPURTENANCES AND FITTINGS TO BE REMOVED FROM PIT.
5. GATE VALVES TO BE MUELLER RESILIENT SEAT.
6. REMOTE READING DEVICE, APPROVED BY VOF M. MUST BE INSTALLED ON METER AND MOUNTED TO OUTSIDE OF THE VAULT AS REQUIRED BY TOWN (SEE REMOTE READER POST DETAIL).
7. CONCRETE VAULT TO BE COMPLETELY WATER TIGHT.
8. PROPOSED METER IS A SENSUS 6" FIRELINE COMPACT ASSEMBLY.
9. LOCATION, QUANTITY, AND SIZE OF PROPOSED PIPE SUPPORT SHALL BE IN CONFORMANCE WITH PIPE AND METER MANUFACTURER'S REQUIREMENTS AND SPECIFICATIONS.
10. ALL PIPE PENETRATIONS MUST BE SEALED WITH LINKSEAL.
11. THE CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR THE VAULT STRUCTURE, BACKFLOW PREVENTER, FITTINGS, APPURTENANCES, AND THE 6' X 7' BILCO DOUBLE LEAF DOOR.
12. CONTRACTOR TO PROVIDE CLAMPS AND FASTENERS TO ATTACH VENT PIPE TO INSIDE WALL OF THE VAULT. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF THE VENT AND APPURTENANCES.
13. CONTRACTOR TO PROVIDE SHOP DRAWING OF TRASH SCREEN.
14. CONTRACTOR TO PROVIDE SHOP DRAWINGS FOR PRECAST CONCRETE STRUCTURES IN CONFORMANCE WITH DETAILS AND SPECIFICATIONS.
15. PROPOSED BACKFLOW PREVENTER (BFP) DOUBLE CHECK VALVE ASSEMBLY (DCVA)TO BE MANUFACTURED BY AMES, MODEL 2000SS (OSY). THE DCVA WILL BE INSTALLED ON THE NEW 12' WATER SERVICE LINE WHICH FEEDS BOTH DOMESTIC AND FIRE SERVICES TO THE SITE.
16. HEAT TRACE TAPE WILL BE INSTALLED ON THE WATER MAIN AND BACKFLOW PREVENTER TO PREVENT FREEZING.
17. A LIGHT FIXTURE (LUMINAIRE) WILL BE INSTALLED TO PROVIDE ADEQUATE LIGHTING OF THE CONVRETE VAULT.
18. THE PROPOSED DCVA IS PRECEDED BY A SENSUS COMPACT FIRE LINE METER ASSEMBLY AS SHOWN ON THE PROFILE VIEW. THE SENSUS COMPACT FIRE LINE METER ASSEMBLY INCLUDES A UL RATED COMPACT STRAINER.



NOTES:
1. CONTRACTOR TO SUPPLY ALL NECESSARY ANCHORS, BOLTS, FASTENERS, AND SUPPORTS TO PROPERLY CONNECT STAIRS TO THE STRUCTURE. CONTRACTOR TO PROVIDE SHOP DRAWINGS.
2. STAIRS MANUFACTURED BY PRECISION LADDER, INC. OR APPROVED EQUAL.
3. A POP RAIL OR POLE WILL BE INSTALLED AT THE TOP OF THE STAIRS FOR EASY ACCESS INTO METER VAULT PRIOR TO REACHING THE STATIONARY HANDRAIL. CONTRACTOR TO PROVIDE SHOP DRAWINGS (FABRICATION DRAWINGS).

STEEL STAIRS DETAIL

N.T.S.

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REVISIONS

No.	DATE	DESCRIPTION

PROJECT
EPT CONCORD RESORT PHASE 1 INFRASTRUCTURE
TOWN OF THOMPSON
NEW YORK

DRAWN BY	CHECKED BY
EB, AC, JS, MH	AM
SCALE: N.T.S.	DATE: 01/30/13

SHEET TITLE
DETAILS IX

SHEET NO.
C-908

GENERAL NOTES:

1. DRAWINGS ARE BASED ON THE SURVEY FILE RECEIVED FROM xxxx DATED xxxx. CONTRACTOR TO VERIFY ACCURACY OF SURVEY BEFORE BEGINNING WORK.
2. THE CONTRACTOR SHALL COMPLY WITH ALL CONSTRUCTION REQUIREMENTS OF THE SULLIVAN COUNTY, AND CLIENT REQUIREMENTS WHICHEVER IS MORE STRINGENT.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL CONCURRENT WORK INCLUDING BUT NOT LIMITED TO GENERAL DRAINAGE, IRRIGATION, LIGHTING, MEP, AND GRADING.
4. THE SITE INFORMATION AND BOUNDARY LOCATIONS SHOWN ARE ASSUMED TO BE ACCURATE. NOTIFY THE OWNER OF CONDITIONS DIFFERENT THAN THOSE INDICATED. CONTRACTOR SHALL VERIFY SITE CONDITIONS, TOPOGRAPHIC INFORMATION, UTILITY LOCATIONS PRIOR TO CONSTRUCTION.
5. IT IS THE CONTRACTOR'S RESPONSIBILITY FOR OBTAINING ALL PERMITS AS REQUIRED FOR CONSTRUCTION PRIOR TO BEGINNING WORK. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF ALL APPLICABLE GOVERNMENT AND/OR LOCAL ORDINANCES, STATUTES, CODES, REGULATIONS, AND LAWS. THE CONTRACTOR SHALL ESTABLISH SUCH COMPLIANCE AT NO ADDITIONAL COST TO THE OWNER.
6. IT IS THE CONTRACTOR'S RESPONSIBILITY FOR PROCURING ANY BONDING, LICENSING, AND INSURANCE AS REQUIRED BY APPLICABLE REGULATORY AGENCIES, AS WELL AS PAYING ANY REQUIRED TAXES.
7. CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES AND TAKE FULL RESPONSIBILITY FOR ANY DAMAGES WHICH MAY OCCUR AS A RESULT OF THE CONTRACTOR'S FAILURE TO PRECISELY LOCATE AND PROTECT ANY AND ALL UTILITIES. THE CONTRACTOR SHALL CONTACT LOCAL UTILITY AGENCIES, A MINIMUM OF 72 HOURS PRIOR TO BEGINNING WORK.
8. THE CONTRACTOR SHALL OBTAIN APPROVAL BY THE OWNER FOR TIMES OF DAY DURING WHICH CONSTRUCTION OPERATIONS MAY OCCUR. ALL CONSTRUCTION OPERATIONS SHALL OCCUR WITHIN TIMES SPECIFIED BY LOCAL ORDINANCES/ REGULATIONS AS APPROVED BY OWNER.
9. THE CONTRACTOR SHALL BE FAMILIAR WITH DRAWINGS AND SPECIFICATIONS BY THOROUGH EXAMINATION. THE CONTRACTOR SHALL BE FULLY AWARE OF THE CONDITIONS OF THE SITE. ANY DISCREPANCIES, AMBIGUITIES, OMISSIONS, OR CONFLICTS IN THE CONTRACT DOCUMENTS WITH ACTUAL SITE CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR DIRECTION PRIOR TO BEGINNING WORK. IF DURING CONSTRUCTION THERE IS ANY DOUBT AS TO THE INTENDED MEANING OF CONTRACT DOCUMENT INFORMATION, THESE ITEMS SHALL BE DISCUSSED WITH THE LANDSCAPE ARCHITECT IMMEDIATELY. WRITTEN RESPONSES ARE MANDATORY.
10. THE CONTRACTOR SHALL PROTECT EXISTING CONDITIONS, SUCH AS PAVING, VEGETATION, AND UTILITIES WHEN DISTRIBUTING THEIR MATERIALS, SPREADING STOCKPILES AND MOVING OR STORING EQUIPMENT. ALL STAGING AND STOCKPILE AREAS SHALL BE IDENTIFIED FOR APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO BEGINNING WORK.
11. THE CONTRACTOR SHALL BE PRESENT ON SITE AT THE TIME OF ALL MATERIAL DELIVERIES.
12. SUBSTITUTIONS IN PRODUCTS AND MATERIALS ARE NOT PERMITTED WITHOUT PRIOR WRITTEN APPROVAL BY THE LANDSCAPE ARCHITECT.
13. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL MATERIALS AROUND THE LIMIT OF WORK AS NECESSARY, PRIOR TO ANY DEMOLITION WORK, AND KEEP EROSION CONTROL MEASURES IN PLACE UNTIL WORK IS COMPLETED.
14. THE CONTRACTOR SHALL PROVIDE MOCK-UPS IN THE FIELD OF ALL VERTICAL AND HORIZONTAL SURFACES FOR APPROVAL BY LANDSCAPE ARCHITECT AND OWNER. ALL MOCK-UPS SHALL BE MAINTAINED FOR REFERENCE DURING THE COURSE OF CONSTRUCTION. MOCK-UPS ARE NOT TO BE REMOVED UNTIL CONSTRUCTION IS COMPLETE.
15. THE CONTRACTOR SHALL PROTECT AND PRESERVE ALL EXISTING CONDITIONS UNLESS OTHERWISE NOTED. PROMPTLY REPAIR ANY DAMAGE TO EXISTING PAVEMENT, DRIVEWAYS, AND ADJACENT FACILITIES CAUSED BY CONSTRUCTION OPERATIONS. ANY ALTERATIONS OR DAMAGES OTHER THAN THOSE INDICATED IN THE CONSTRUCTION DOCUMENTS ARE THE RESPONSIBILITY OF THE CONTRACTOR AND MUST BE REPAIRED.
16. THE CONTRACTOR SHALL REMOVE FROM THE SITE AND LEGALLY DISPOSE OF ALL EXCESS SOIL, EROSION CONTROL MEASURES, DEBRIS, TEMPORARY FENCING, AND STABILIZATION MATERIALS UPON COMPLETION OF THE PROJECT. ALL PAVED AREAS, WALLS, ETC. SHALL BE CLEANED AND WASHED THOROUGHLY UPON PROJECT COMPLETION.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR KEEPING ALL WORK AND RELATED ACTIVITIES WITHIN THE DESIGNATED LIMIT OF WORK OR PROPERTY LINES. UNLESS OTHERWISE NOTED, ALL ACCESS TO THE SITE SHALL BE THROUGH DRIVEWAYS. MOVEMENT, ACCESS, OR STORAGE OF DEBRIS, MATERIALS, OR MACHINERY SHALL NOT TAKE PLACE OUTSIDE OF THE PROJECT LIMIT OF WORK OR THROUGH NEIGHBORING SITES.
18. DURING CONSTRUCTION, THE CONTRACTOR SHALL KEEP THE SITE CLEAN AND FREE OF TRASH AT ALL TIMES. THE CONTRACTOR SHALL PROVIDE A TRASH RECEPTACLE TO BE USED ON SITE AND SHALL REMOVE TRASH FROM THE SITE ON A DAILY BASIS DURING CONSTRUCTION. THE CONSTRUCTION ACCESS SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF A SEDIMENT ONTO PUBLIC RIGHTS-OF WAY.

LAYOUT NOTES:

1. FIELD VERIFY POINT OF INTERSECTION OF WALL AND FINISHED SURFACES.
2. ALL DIMENSIONS ARE AS NOTED. ANY CHANGES TO THE LAYOUT PLANS IN THE FIELD DUE TO SITE CONDITIONS OR ANY OTHER UNANTICIPATED CONDITIONS NEED APPROVAL OF LANDSCAPE ARCHITECT TO ENSURE THE ORIGINAL DESIGN INTENT IS MAINTAINED.
3. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL LAYOUTS ARE APPROVED IN THE FIELD BY LANDSCAPE ARCHITECT BEFORE CONSTRUCTION BEGINS.
4. CONTRACTOR SHALL STAKE THE ALIGNMENT OF ALL PAVEMENT, WALLS & OTHER HARDSCAPE FEATURES, PER LAYOUT PLAN DIMENSIONS, IN THE FIELD FOR APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO BEGINNING CONSTRUCTION.
5. VERIFY LOCATION OF ALL VAULTS, ELECTRICAL DUCT BANKS, MANHOLES, CONDUIT AND PIPING, DRAINAGE STRUCTURES, LIGHTING AND OTHER UTILITIES WITH THE APPROPRIATE ENGINEER'S DRAWINGS. ALIGN DRAINS WITH EDGE OF PAVING UNLESS OTHERWISE NOTED. CONTRACTOR TO FIELD VERIFY EXISTING DRAINAGE COURSES.
6. SEE CIVIL ENGINEER'S DRAWINGS FOR ROADWAY CENTERLINE, STATION POINTS, BENCH MARKS, PROPERTY AND PARCEL LINES, WETLAND DESIGNATIONS, AND BUILDING SETBACKS.
7. TAKE ALL DIMENSIONS FROM FACE OF WALL OR BUILDING OR TO CENTERLINE OF BUILDING COLUMNS OR PARCEL BOUNDARIES UNLESS OTHERWISE NOTED.
8. ALL DIMENSIONS CALLED OUT AS "EQUAL" (E.Q.) SHALL BE EQUI-DISTANT MEASUREMENTS BETWEEN THE TWO REFERENCE POINTS SHOWN.
9. ALL ITEMS DESIGNATED AS "SIMILAR" OR "TYPICAL" SHALL BE CONSTRUCTED IN THE MANNER OF THE DETAIL REFERENCED, WITH MINOR ADJUSTMENT FOR SPECIFIC CONDITION.
10. ALL ANGLES SHALL BE 90 DEGREES AND ALL LINES OF PAVING SHALL BE HELD PARALLEL UNLESS OTHERWISE NOTED ON THE DRAWINGS. MAINTAIN HORIZONTAL ALIGNMENT FOR ALL ADJACENT ELEMENTS SO REFERENCED ON THE DRAWINGS.
11. WRITTEN DIMENSIONS TAKE PRECEDENCE OVER SCALE APPARENT ON DRAWINGS. DO NOT SCALE FROM DRAWINGS. SEE ENLARGED PLANS, AND SPECIFIC DETAILS FOR ADDITIONAL INFORMATION.
12. ALL CONCRETE SLABS, RAMPS OR FOOTINGS SHALL BE DOWELED INTO ABUTTING WALLS, FOUNDATIONS OR FOOTINGS USING BARS OF THE SAME SIZE AND SPACING UNLESS NOTED OTHERWISE. PROVIDE CONTINUOUS EXPANSION JOINT AT ALL DOWELED CONNECTIONS.
13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL CONCURRENT WORK WITH OTHER CONTRACTORS. PROVIDE SLEEVES AS REQUIRED FOR DRAINAGE, IRRIGATION, LIGHTING AND ELECTRICAL LINES.
14. IRRIGATION AND ELECTRICAL SLEEVES AND SUBSURFACE DRAINAGE SYSTEMS SHALL BE CONSTRUCTED PRIOR TO PAVING AND LANDSCAPE WORK, AS INDICATED.
15. ALL LAYOUT DIMENSIONS ARE FROM PLAN VIEW CALCULATIONS. ACTUAL FIELD DIMENSIONS MAY VARY FROM PLAN DUE TO ACTUAL LENGTHS ALONG A SLOPED SURFACE.
16. THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE FLOW AWAY FROM ALL BUILDINGS TOWARD DRAIN INLETS, PLANTER/LAWN AREAS OR WEEP HOLES AS INDICATED.
17. HOLD TOPS OF WALLS LEVEL UNLESS INDICATED OTHERWISE. HOLD ALL HANDRAIL AND GUARDRAIL POSTS PLUMB REGARDLESS OF ADJACENT SLOPES.
18. STRUCTURAL DESIGN OF ALL WALLS/ STAIRS/ BOULDERS/ PAVEMENT/ BOARDWALK IS THE RESPONSIBILITY OF THE STRUCTURAL/ CIVIL ENGINEER. ANY CHANGE IN DESIGN DUE TO CHANGES STRUCTURAL, MECHANICAL, CIVIL, PLUMBING WORK SHOULD BE APPROVED BY LANDSCAPE ARCHITECT.

Stan Brenner, Jr.\2011\11-532 concord\60 records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure.vwx - standard\L0.01 Site Notes.dwg , Page Setup: 1ext, H11.ctb, Plot Scale: 1:1, None

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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SCALE: N/A
NOTE: THIS DRAWING IS 30"X42". DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY, OR SEEK CLARIFICATION FROM ARCHITECT FOR MEASUREMENTS THAT ARE NOT INDICATED.

DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE: ##### SITE NOTES

PROJECT #: 11-532
DRAWN BY: SB, GH
CHECKED BY: AH

SHEET #: L0.01

SITE PREPARATION NOTES

1. INSTALL TEMPORARY TREE PROTECTION AND TEMPORARY EROSION CONTROL MEASURES PRIOR TO ANY LAND DISTURBANCE AS REQUIRED BY LOCAL CODES. REFER TO TREE CARE NOTES. IN AREAS OF EXISTING TREES TO REMAIN, THE CONTRACTOR HAS THE OPTION OF NOT DIGGING A TRENCH TO BURY FILTER FABRIC. IN THIS CASE, PROVIDE AN EXTRA ONE FOOT LENGTH OF FILTER FABRIC AT THE BASE OF THE FENCING AND SECURE IT IN PLACE WITH STRAW BALES. REFER TO CIVIL PLANS FOR ALL EROSION CONTROL AND TEMPORARY TREE PROTECTION MEASURES.

2. THE CONTRACTOR SHALL INSPECT ALL EROSION CONTROL DEVICES AND CORRECT ANY DEFICIENCIES AT THE END OF EACH WORK DAY TO ENSURE THEIR PERFORMANCE. THE CONTRACTOR SHALL REMOVE SOIL TRAPPED BY THE EROSION CONTROL FENCE IF THE SOIL LEVEL IS NEAR THE TOP OF THE FABRIC OR BULGING AT ANY POINT DURING CONSTRUCTION.

3. THE CONTRACTOR SHALL STRIP AND STOCK PILE 6" TOPSOIL FROM ALL CONSTRUCTION AREAS PRIOR TO GRADING OPERATIONS. PROTECT STOCK PILE WITH SILT FENCING OR OTHER EROSION CONTROL MEASURES.

TREE CARE NOTES

PRUNING

1. ALL TREE PRUNING AND REMOVAL PERFORMED SHALL BE EXECUTED BY A COMPANY, HAVING IN FULL-TIME EMPLOYMENT, A CERTIFIED ARBORIST. PRUNING SHALL BE PERFORMED TO THE STANDARDS OF THE INTERNATIONAL SOCIETY OF ARBORISTS PRUNING GUIDELINES, AND TO ANSI A-300.

2. TREE PRUNING SHALL BE PERFORMED TO BALANCE THE CROWN AND ELIMINATE HAZARDS. THE MAIN WORK PERFORMED SHALL BE TO REDUCE THE SAIL EFFECT THROUGH THINNING, REDUCING END WEIGHTS, SHORTENING LONG HEAVY LIMBS, REMOVING DEADWOOD, WEAK LIMBS AND SUCKER GROWTH. LIMBS SHALL BE PRUNED BACK TO AN APPROPRIATE LATERAL BRANCH.

ROOT PRUNING

1. TREE ROOTS SHOULD BE ROOT PRUNED TO AVOID TEARING AND SHREDDING BY GRADING EQUIPMENT. ROOT PRUNING SHALL BE TO A DEPTH OF 18". THE CONTRACTOR SHALL TRENCH AROUND THE TREE BEYOND THE EDGE OF THE TREE PROTECTION AREA AND THEN CLEAR THE SOIL BY HAND TO THE EDGE OF THE TREE PROTECTION AREA AND HAND PRUNE THE ROOTS. ROOTS SHALL BE CUT CLEANLY, AS FAR FROM THE TRUNK OF THE TREE AS POSSIBLE.

2. TRENCHING SHALL BE PERFORMED USING A VERMEER TRENCHING MACHINE OR VIBRATORY PLOW OR EQUIVALENT. ROOT PRUNING SHALL BE COMPLETED PRIOR TO BASE OR SUBGRADE PREPARATION, OR TO ANY EXCAVATION ADJACENT TO THE TREE.

3. EXCAVATION IN AN AREA WHERE ROOTS ARE PRESENT SHALL NOT CAUSE THE TEARING OR RIPPING OF TREE ROOTS. ROOTS MUST FIRST BE CLEANLY SEVERED PRIOR TO CONTINUING WITH THE EXCAVATION, OR TUNNELED AROUND TO PREVENT DAMAGE TO THE ROOT.

4. AT SITES WHERE ROOT PRUNING OR EXCAVATION HAS TAKEN PLACE NEAR TREES TO REMAIN, AND MANY LIVING ROOTS REMAIN EXPOSED TO THE AIR, THE CONTRACTOR SHALL COVER THE EXPOSED ROOTS WITHIN 2 HOURS WITH SAND, SOIL, OR MOIST BURLAP. TREE ROOTS SHALL NOT REMAIN EXPOSED TO DRYING OUT. ROOT ENDS SHALL BE COVERED WITH SOIL OR BURLAP AND KEPT MOIST UNTIL THE FINAL BACKFILL OR GRADE IS ESTABLISHED.

TREE PROTECTION

1. CONSTRUCTION MATERIALS, DEBRIS, AND SUPPLIES SHALL NOT BE STORED WITHIN THE DRIP LINE OR PROTECTIVE FENCING AREA UNDER ANY TREE. VEHICLES UNDER ANY TREE SHALL NOT BE PARKED WITHIN THE DRIP LINE OR PROTECTIVE FENCING AREA.

2. WOOD CHIPS OR ANOTHER CUSHIONING SURFACE MATERIAL APPROVED BY THE LANDSCAPE ARCHITECT SHALL BE PLACED OVER AREAS WHERE ROOTS ARE PRESENT AND CONSTRUCTION TRAFFIC OCCURS. CUSHIONING MATERIALS SHALL BE REMOVED AT THE COMPLETION OF CONSTRUCTION.

3. WHERE CALLED FOR ON THE PLANS, PLACE STORM FENCE OR OTHER APPROVED PROTECTIVE BARRIERS AROUND EXISTING TREES TO REMAIN BEFORE ANY CONSTRUCTION BEGINS AND SHALL REMAIN IN PLACE UNTIL ALL CONSTRUCTION IS COMPLETE.

GENERAL PLANTING NOTES:

1. OWNER AND LANDSCAPE ARCHITECT TO SELECT AND PRE-APPROVE ALL TREES .
2. LARGE AND MEDIUM TREES PLANTED WITHIN TEN FEET OF THE UTILITY BASEMENT OR SITE WALL WILL REQUIRE A 36" DEEP ROOT BARRIER.
3. REMOVE ALL DEBRIS LARGER THAN 2" DIAMETER FROM PLANTING BEDS.
4. MULCH: USE DOUBLE BARK MULCH (3" THICK).
5. ALL PLANT MATERIALS SHALL BE OF THE QUALITY AND SIZE IN ACCORDANCE WITH THE **AMERICAN STANDARDS FOR NURSERY STOCK GUIDELINES.**
6. INSTALL ALL PLANT MATERIALS AS PER PLANTING DETAILS AND PLANTING SPECIFICATIONS. PROVIDE LANDSCAPE ARCHITECT WITH COMPLETE SOILS ANALYSIS PRIOR TO PLANTING TO CONFIRM REQUIRED AMENDMENTS. SEE SPECIFICATIONS.
7. CONTRACTOR SHALL BE FAMILIAR WITH THE COUNTY CODE, LANDSCAPE DESIGN GUIDELINES AND WITH THE COUNTY WATER DISTRICT IRRIGATION DESIGN CRITERIA AND SHALL FULLY COMPLY WITH PLANS, SPECS, AND CODES UNDER FIELD REVIEW BY LANDSCAPE ARCHITECT.
8. THE SUCCESSFUL BIDDER SHALL MEET WITH THE LANDSCAPE ARCHITECT AND OWNER'S REPRESENTATIVE TO REVIEW THE PLANS AND WALK THE SITE.
9. CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT 30 DAYS PRIOR TO PLANTING OPERATIONS FOR APPROVAL OF ALL PLANT MATERIAL AT PLACE OF GROWTH. ALL PLANT MATERIAL NOT APPROVED BY THE LANDSCAPE ARCHITECT WILL BE SUBJECT TO REJECTION.
10. LANDSCAPE CONTRACTORS SHALL FIELD VERIFY ALL PLANT QUANTITIES AND DIMENSIONS PRIOR TO INSTALLATION. THE PLANT COUNT IS FOR THE CONVENIENCE OF THE CONTRACTOR. IN CASE OF A DISCREPANCY, THE PLANT AND SPACING REMARKS SHALL GOVERN. CONTRACTOR IS RESPONSIBLE FOR PROVIDING COMPLETE PLANTING COVERAGE USING SPECIFIED, ON-CENTER SPACING FOR ALL AREAS SHOWN ON PLANS.
11. THE LANDSCAPE CONTRACTOR SHALL NOTIFY THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES IN PLANT LOCATIONS OR INSUFFICIENT PLANT QUANTITIES IN THE EVENT OF PLAN AND ACTUAL FIELD CONDITIONS.
12. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL FROM THE OWNERS PROPERTY ALL WASTE MATERIAL GENERATED FROM THE PLANTING AND IRRIGATION OPERATIONS.

PLANTING NOTES : EXTERIOR PLANTING

CONTRACTOR TO CONFORM TO THE FOLLOWING REQUIREMENTS:

SUBMITTALS:
CONTRACTOR IS REQUIRED TO SUBMIT THE FOLLOWING TO THE CLIENT'S REPRESENTATIVE AND LANDSCAPE ARCHITECT OF RECORD

1. PRECONSTRUCTION SUBMITTALS
2. LANDSCAPE CONTRACTOR'S LICENSE
3. TIME RESTRICTIONS AND PLANTING CONDITIONS
4. INDICATE ANTICIPATED PLANTING DATES AND LOCATIONS FOR EACH TYPE OF PLANTING.

5. PRODUCT DATA
   ORGANIC MULCH MATERIAL:
   A. 5 LB OF COMPOST, IN LABELED PLASTIC BAGS.
   FOR EACH TYPE OF MANUFACTURED PRODUCT, SIGNED BY PRODUCT MANUFACTURER, AND COMPLYING WITH THE FOLLOWING:
   - MANUFACTURER'S CERTIFIED ANALYSIS FOR STANDARD PRODUCTS.
   - ANALYSIS OF OTHER MATERIALS BY A RECOGNIZED LABORATORY MADE ACCORDING TO METHODS ESTABLISHED BY THE ASSOCIATION OF OFFICIAL ANALYTICAL CHEMISTS, WHERE APPLICABLE.
   - SUBMIT DOCUMENTATION INDICATING TYPE OF BIOBASED MATERIAL IN PRODUCT AND BIOBASED CONTENT. INDICATE RELATIVE DOLLAR VALUE OF BIOBASED CONTENT PRODUCTS TO TOTAL DOLLAR VALUE OF PRODUCTS INCLUDED IN PROJECT.
   - BIOSOLID COMPOST OR YARD DEBRIS COMPOST LIKE 'LEAFAGRO' CAN BE USED.

   B. FERTILIZER
   C. WEED CONTROL FABRIC
   D. ROOT CONTROL BARRIER
   E. MULCH
   F. GROUND STAKES
   G. ALUMINUM EDGING MATERIAL
   H. STAKING MATERIAL
   I. GROUND STAKES
   J. METAL ANCHORS
   K. ANTIDESICCANTS
   L. EROSION CONTROL MATERIALS
   M. PHOTOGRAPHS OF ALL PLANT MATERIAL LARGER THAN 2" CALIPER

6. TEST REPORTS
   A. PROVIDE TOPSOIL COMPOSITION TESTS FOR EXISTING SURFACE SOIL, IMPORTED TOPSOIL, AND FINISHED PLANTING SOIL, SOIL TEST LOCATION MAP
   B. PERCOLATION TEST: PERCOLATION TEST OF CURRENT GROWING AREA; PERCOLATION TEST OF PROPOSED AREA
   C. AN APPROVED SOIL TESTING LAB SIGNED BY A LICENSED MEMBER OF VIRGINIA BOARD OF SOIL SCIENTISTS

7. CERTIFICATES
   A. NURSERY CERTIFICATIONS

QUALITY ASSURANCE

1. TOPSOIL COMPOSITION TESTS
COMMERCIAL TEST FROM AN INDEPENDENT TESTING LABORATORY INCLUDING BASIC SOIL GROUPS (MOISTURE AND SATURATION PERCENTAGES, NITROGEN-PHOSPHORUS-POTASSIUM (N-P-K) RATIO, PH (ASTM D 4972), SOIL SALINITY), SECONDARY NUTRIENT GROUPS (CALCIUM, MAGNESIUM, SODIUM, SODIUM ABSORPTION RATIO (SAR)), MICRONUTRIENTS (ZINC, MANGANESE, IRON, COPPER), TOXIC SOIL ELEMENTS (BORON, CHLORIDE, SULFATE), CATION EXCHANGE AND BASE SATURATION PERCENTAGES, AND SOIL AMENDMENT AND FERTILIZER RECOMMENDATIONS WITH QUANTITIES FOR PLANT MATERIAL BEING TRANSPLANTED. SOIL REQUIRED FOR EACH TEST SHALL INCLUDE A MAXIMUM DEPTH OF 18 INCHES OF APPROXIMATELY 1 QUART VOLUME FOR EACH TEST. AREAS SAMPLED SHOULD NOT BE LARGER THAN 1 ACRE AND SHOULD CONTAIN AT LEAST 6-8 CORES FOR EACH SAMPLE AREA AND BE THOROUGHLY MIXED. PROBLEM AREAS SHOULD BE SAMPLED SEPARATELY AND COMPARED WITH SAMPLES TAKEN FROM ADJACENT NON-PROBLEM AREAS. THE LOCATION OF THE SAMPLE AREAS SHOULD BE NOTED AND MARKED ON A PARCEL OR PLANTING MAP FOR FUTURE REFERENCE.

2. NURSERY CERTIFICATIONS
   A. COMPANY WITH FIVE YEARS DOCUMENTED EXPERIENCE SPECIALIZING IN GROWING AND CULTIVATING PLANTS. THE SELECTED NURSERY SHALL INDICATE ON ITS LETTERHEAD THE NAME OF PLANTS IN ACCORDANCE WITH THE LHBH, INCLUDING BOTANICAL COMMON NAMES, QUALITY, AND SIZE.
   B. INSPECTION CERTIFICATE
   C. MYCORRHIZAL FUNGI INOCULUM FOR PLANT MATERIAL TREATED

3. CONTRACTOR'S LICENSE
CONSTRUCTION COMPANY SHALL HOLD A LANDSCAPE CONTRACTORS LICENSE IN THE STATE WHERE THE WORK IS PERFORMED AND HAVE A MINIMUM OF FIVE YEARS LANDSCAPE CONSTRUCTION EXPERIENCE. SUBMIT COPY OF LICENSE AND THREE REFERENCES FOR SIMILAR WORK COMPLETED IN THE LAST FIVE YEARS. . PRIOR TO AWARDING OF THE CONTRACT, THE CONTRACTOR SHALL SUBMIT TO THE QUALITY CONTROL REPRESENTATIVE FOR APPROVAL THE SUBCONTRACTOR PROPOSED FOR THE LANDSCAPE WORK SPECIFIED HEREIN. THE SUBCONTRACTOR SHALL BE A MEMBER IN GOOD STANDING OF ONE OF THE FOLLOWING ORGANIZATIONS:
- ASSOCIATED LANDSCAPE CONTRACTORS OF AMERICA.
- AMERICAN ASSOCIATION OF NURSERYMEN.
- A MEMBER OF THE NURSERYMEN'S ASSOCIATION OF VIRGINIA

4. PLANT MATERIAL PHOTOGRAPHS
CONTRACTOR SHALL SUBMIT NURSERY PHOTOGRAPHS, FOR LANDSCAPE ARCHITECT'S APPROVAL PRIOR TO ORDERING, FOR EACH TREE LARGER THAN 24-INCH BOX/ 2-INCH CALIPER SIZE.

5. PERCOLATION TEST
IMMEDIATELY FOLLOWING ROUGH GRADING OPERATION, IDENTIFY A TYPICAL LOCATION FOR ONE OF THE LARGEST TREES AND OR SHRUBS AND EXCAVATE A PIT PER THE PROJECT DETAILS. FILL THE PIT WITH WATER TO A DEPTH OF 12 INCHES. THE LENGTH OF TIME REQUIRED FOR THE WATER TO PERCOLATE INTO THE SOIL, LEAVING THE PIT EMPTY, SHALL BE MEASURED BY THE PROJECT LANDSCAPE ARCHITECT AND VERIFIED BY THE CLIENT'S REPRESENTATIVE. WITHIN SIX HOURS OF THE TIME THE WATER HAS DRAINED FROM THE PIT, THE CONTRACTOR, WITH THE CLIENT'S REPRESENTATIVE, ARBORIST AND/OR PROJECT LANDSCAPE ARCHITECT PRESENT, SHALL AGAIN FILL THE PIT WITH WATER TO A DEPTH OF 12 INCHES. IF THE WATER DOES NOT COMPLETELY PERCOLATE INTO THE SOIL WITHIN 9 HOURS, A DETERMINATION SHALL BE MADE WHETHER A DRAINAGE SYSTEM OR A SOIL PENETRANT WILL BE REQUIRED FOR EACH TREE AND OR SHRUB BEING TRANSPLANTED BY THE ARBORIST. THE DECISION WILL IN WRITING TO THE COTNRACTOR.

6. PRE-INSTALLATION MEETING
CONVENE A PRE-INSTALLATION MEETING A MINIMUM OF ONE WEEK PRIOR TO COMMENCING WORK OF THIS SECTION. REQUIRE ATTENDANCE OF PARTIES DIRECTLY AFFECTING WORK OF THIS SECTION. REVIEW CONDITIONS OF OPERATIONS, PROCEDURES AND COORDINATION WITH RELATED WORK. AGENDA SHALL INCLUDE THE FOLLOWING:
   A. TOUR, INSPECT, AND DISCUSS CONDITIONS OF PLANTING MATERIALS.
   B. REVIEW PLANTING SCHEDULE AND MAINTENANCE.
   C. REVIEW REQUIRED INSPECTIONS.
   D. REVIEW ENVIRONMENTAL PROCEDURES.

DELIVERY

1. BRANCHED PLANT DELIVERY: DELIVER WITH BRANCHES TIED AND EXPOSED BRANCHES COVERED WITH MATERIAL WHICH ALLOWS AIR CIRCULATION. PREVENT DAMAGE TO BRANCHES, TRUNKS, ROOT SYSTEMS, AND ROOT BALLS AND DESICCATION OF LEAVES.
2. SOIL AMENDMENT DELIVERY: DELIVER TO THE SITE IN ORIGINAL, UNOPENED CONTAINERS BEARING MANUFACTURER'S CHEMICAL ANALYSIS, NAME, TRADE NAME, OR TRADEMARK, AND INDICATION OF CONFORMANCE TO STATE AND FEDERAL LAWS. INSTEAD OF CONTAINERS, FERTILIZER, SULFUR, AND LIME MAY BE FURNISHED IN BULK WITH A CERTIFICATE INDICATING THE ABOVE INFORMATION. STORE IN DRY LOCATIONS AWAY FROM CONTAMINATES.
3. PLANT LABELS: DELIVER PLANTS WITH DURABLE WATERPROOF LABELS IN WEATHER-RESISTANT INK. PROVIDE LABELS STATING THE CORRECT BOTANICAL AND COMMON PLANT NAME AND VARIETY AS APPLICABLE AND SIZE AS SPECIFIED IN THE LIST OF REQUIRED PLANTS. ATTACH TO PLANTS, BUNDLES, AND CONTAINERS OF PLANTS. GROUPS OF SHRUBS MAY BE LABELED BY TAGGING ONE PLANT. EACH TREE SHALL HAVE INDIVIDUAL TAGS. LABELS SHALL BE LEGIBLE UNTIL FINAL ACCEPTANCE OF PLANT MATERIAL.

STORAGE

1. PLANT STORAGE AND PROTECTION: STORE AND PROTECT PLANTS NOT PLANTED ON THE DAY OF ARRIVAL AT THE SITE AS FOLLOWS:
   A. SHADE AND PROTECT PLANTS IN OUTSIDE STORAGE AREAS FROM THE WIND AND DIRECT SUNLIGHT UNTIL PLANTED
   B. HEEL-IN BARE ROOT PLANTS.
   C. PROTECT BALLED AND BURLAPPED PLANTS FROM FREEZING OR DRYING OUT BY COVERING THE BALLS OR ROOTS WITH MOIST BURLAP, SAWDUST, WOOD CHIPS, SHREDDED BARK, ORGANIC COMPOST, OR OTHER APPROVED MATERIAL. PROVIDE COVERING WHICH ALLOWS AIR CIRCULATION.
   D. KEEP ROOTBALLS IN A MOIST CONDITION UNTIL PLANTED BY WATERING WITH A FINE MIST SPRAY.
   E. DO NOT STORE PLANT MATERIAL DIRECTLY ON CONCRETE OR BITUMINOUS SURFACES.
2. FERTILIZER, PH ADJUSTERS AND MULCH STORAGE: STORE IN DRY LOCATIONS AWAY FROM CONTAMINANTS.
3. TOPSOIL: PRIOR TO STOCKPILING TOPSOIL, ERADICATE ON SITE UNDESIRABLE GROWING VEGETATION. CLEAR AND GRUB EXISTING VEGETATION THREE TO FOUR WEEKS PRIOR TO STOCKPILING EXISTING TOPSOIL.
4. ROOT CONTROL BARRIER: STORE MATERIALS ON SITE IN ENCLOSURES OR UNDER PROTECTIVE COVERING IN DRY LOCATION. STORE UNDER COVER OUT OF DIRECT SUNLIGHT. DO NOT STORE MATERIALS DIRECTLY ON GROUND.

HANDLING

DO NOT DROP OR DUMP PLANTS FROM VEHICLES. AVOID DAMAGING PLANTS BEING MOVED FROM NURSERY OR STORAGE AREA TO PLANTING SITE. HANDLE BALLED AND BURLAPPED, BARE ROOT, CONTAINER PLANTS CAREFULLY TO AVOID DAMAGING OR BREAKING THE EARTH BALL OR ROOT STRUCTURE. DO NOT HANDLE PLANTS BY THE TRUNK OR STEM. PUDDLE BARE-ROOT PLANTS AFTER REMOVAL FROM THE HEELING-IN BED TO PROTECT ROOTS FROM DRYING OUT. REMOVE DAMAGED PLANTS FROM THE SITE.

TIME LIMITATION

EXCEPT FOR CONTAINER-GROWN PLANT MATERIAL, THE TIME LIMITATION FROM DIGGING TO INSTALLING PLANT MATERIAL SHALL BE A MAXIMUM OF 30 DAYS. THE TIME LIMITATION BETWEEN INSTALLING THE PLANT MATERIAL AND PLACING THE MULCH SHALL BE A MAXIMUM OF 24 HOURS.

PLANTING TIMEFRAMES/CONDITIONS

COORDINATE INSTALLATION OF PLANTING MATERIALS DURING OPTIMAL PLANTING SEASONS FOR EACH TYPE OF PLANT MATERIAL REQUIRED.

1. PLANTING DATES
   A. TREES, SHRUBS, PERENNIALS, GROUNDCOVER- MARCH 1 TO MAY 15TH OR SEPTEMBER 15TH TO NOVEMBER 1ST
   B. IF INSTALLED BETWEEN MAY 16TH AND SEPTEMBER 14TH, THE PLANTS SHALL BE WATERED REGULARLY TO ENSURE SURVIVABILITY OF PLANTS. WATERING SHALL BE A PART OF THE CONTRACTOR RESPONSIBILITY.

2. RESTRICTIONS FOR PLANTING
   A. DO NOT PLANT WHEN AMBIENT TEMPERATURE RISES ABOVE 90DEGREES FAHRENHEIT
   B. IN GENERAL DO NOT INSTALL PLANTS WHEN TEMPERATURES ARE EXPECTED TO FALL BELOW 35 DEGREE F WITHIN A WEEK
   C. DO NOT INSTALL PLANTS WHEN WIND VELOCITY EXCEEDS 30 MPH.

GUARANTEE

1. **ALL PLANTS INCLUDING TREES SHALL BE GUARANTEED FOR ONE YEAR BEGINNING ON THE DATE OF INITIAL ACCEPTANCE BY THE CLIENT'S REPRESENTATIVE TO COMMENCE THE PLANT ESTABLISHMENT PERIOD, AGAINST DEFECTS INCLUDING DEATH AND UNSATISFACTORY GROWTH. ALL TREES GREATER THAT 8" CALIPER SHALL BE GUARANTEED FOR AN ADDITIONAL 2 YEARS.**
2. DECIDUOUS PLANTS, INSTALLED DURING THE DORMANT SEASON, SHALL BE GUARANTEED TO BREAK DORMANCY.
3. REMOVE AND REPLACE DEAD PLANTING MATERIALS IMMEDIATELY DURING CONSTRUCTION OPERATIONS OR DURING THE GUARANTEE PERIOD UNLESS REQUIRED TO PLANT IN THE SUCCEEDING PLANTING SEASON.
4. **AT THE END OF THE WARRANTY PERIOD OF ONE YEAR, ALL PLANTING INCLUDING TREES THAT HAVE BEEN GUARANTEED FOR AN ADDITIONAL 2 YEARS, SHALL ACTIVELY TAKEN ROOT, SHOWN SIGNS OF GROWTH ACTIVITY, AND NO SIGN OF DISTRESS.**
   ARBORIST TO DO A WALK THROUGH OF THE SITE AT THE END OF THE WARRANTY PERIOD TO DETERMINE WHICH PLANTS NEED TO BE REPLACED. THE RECOMMENDATION WILL BE MADE TO THE CLIENT'S REPRESENTATIVE IN WRITING.
5. REPLACEMENTS SHALL BE MADE AT THE END OF THE WARRANTY PERIOD: PLANTS OF SAME SIZE, QUALITY AND SPECIES AS ORIGINALLY SPECIFIED, PLANTED IN THE NEXT GROWING SEASON. FOR LARGE TREES THAT HAVE A 2 YEAR WARRANTY, ARBORIST TO MAKE RECOMMENDATIONS TO CLIENT'S REPRESENTATIVE ON THE HEALTH OF THE TREES AT THE END OF ONE YEAR. IF ARBORIST RECOMMENDS THAT ANY OF THE LARGE TREES NEED TO BE REPLACED, THE CONTRACTOR SHALL DO SO WITHOUT ANY ADDITIONAL COST TO THE CLIENT.
6. ALL PLANTS INCLUDING REPLACED WITHIN THE WARRANTY PERIOD SHALL BE GUARANTEED FOR THE SAME TIME FRAME AS THE FIRST WARRANTY. IF THE PLANT DOES NOT SURVIVE THE SECOND REPLACEMENT (THIRD PLANTING), THE CONTRACTOR SHALL NOT BE RESPONSIBLE FOR ANY FURTHER REPLACEMENTS.

MAINTENANCE SERVICE

1. MAINTENANCE SERVICES: PERFORMED BY INSTALLER UNTIL THE END OF THE WARRANTY PERIOD.
2. BEGIN MAINTENANCE IMMEDIATELY AFTER PLANTING. CONTINUE MAINTENANCE UNTIL TERMINATION OF WARRANTY.
3. MAINTENANCE SHALL INCLUDE:
   - WEEDING PLANT BEDS AND TREE PITS, MINIMUM OF SIXTEEN (16) WEEDINGS.
   - APPLYING APPROVED HERBICIDES FOR WEED CONTROL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
   - APPLY APPROVED PESTICIDES ONLY AS NEEDED.
   - WATER AT A SUFFICIENT FREQUENCY TO SATURATE ROOT SYSTEM AND KEEP SOIL MOIST. CONTRACTOR TO MONITOR SOIL AND VEGETATION AS REQUIRED TO MAINTAIN ADEQUATE MOISTURE LEVELS FOR PLANT MATERIAL. ALL GRASS ZONES AS SHOWN ON PLANS WOULD BE HAND WATERED TILL THE GRASSES GET ESTABLISHED OR UNDER CONDITIONS OF DROUGHT. MONITORING PERIOD SHALL BEGIN AT INSTALLATION AND CONTINUE FOR A PERIOD OF 1 YEAR BEYOND INITIAL ACCEPTANCE OF THE PROJECT BY THE QUALITY CONTROL REPRESENTATIVE.
   - PRUNING, INCLUDING REMOVAL OF DEAD OR BROKEN BRANCHES, AND TREATMENT OF PRUNED AREAS OR OTHER WOUNDS.
   - PROVIDE DISEASE CONTROL ONLY AS NEEDED.
   - MAINTAINING WRAPPING, GUYS, TURNBUCKLES, STAKES (IF USED) AND MULCH. ADJUST TURNBUCKLES TO KEEP GUY WIRES TIGHT. REPAIR OR REPLACE ACCESSORIES WHEN REQUIRED.
   - ADDING TOPSOIL TO PLANTING BEDS IF SETTLING HAS OCCURRED TO BRING SOIL ELEVATIONS BACK UP AS DIRECTED BY THE QUALITY CONTROL REPRESENTATIVE.
   - STRAIGHTEN TREES AND ADJUST ROOTBALL AS NEEDED.
   - REMOVE ALL WRAPPING AND STAKES AT THE END OF THE WARRANTY PERIOD ONE WEEK PRIOR TO FINAL ACCEPTANCE.
   - RAKE OUT THE EDGE OF ALL MULCH RINGS AT THE BASE OF ALL TREES AT THE END OF THE WARRANTY PERIOD ONE WEEK PRIOR TO FINAL ACCEPTANCE.
4. PLANTING AREAS AND PLANTS SHALL BE PROTECTED AT ALL TIMES AGAINST DAMAGE OF ANY KIND FOR THE DURATION OF THE MAINTENANCE AND WARRANTY PERIOD.° IF ANY PLANTS BECOME DAMAGED OR INJURED, THEY SHALL BE TREATED OR REPLACED AS DIRECTED BY THE QUALITY CONTROL REPRESENTATIVE AT NO ADDITIONAL COST TO THE OWNER.° THE CONTRACTOR SHALL NOT BE RESPONSIBLE FOR ACTS OF VANDALISM DURING THE MAINTENANCE AND WARRANTY PERIOD.
5. REFERTILIZATION SHALL BE DONE ONLY FOR THE TREES, SHRUBS, PERENNIALS, GROUNDCOVER, HERBS AND VINES. REFERTILIZATION SHALL BE AT THE RATE RECOMMENDED BY THE ARBORIST. FERTILIZER SHALL BE AN APPROVED BRAND, COMPLETELY WATER SOLUBLE AT A RATE DICTATED BY SOIL TEST RESULTS.
6. FOLLOW THE PARTNER'S PLAN FOR PEST CONTROL (PPPC.) REMEDY DAMAGE RESULTING FROM IMPROPER USE OF PESTICIDES.
7. ALL PLANTING AND PLANT MATERIALS SHALL BE IN SATISFACTORY AND ACCEPTABLE CONDITION DURING AND AT THE END OF THE MAINTENANCE AND WARRANTY PERIOD. TREES WITH ABRASIONS OF THE BARK, SUN-SCALDS, DISFIGURING KNOTS, OR FRESH CUTS OF LIMBS OVER 1 1/4 INCHES WHICH HAVE NOT COMPLETELY CALLUSED OVER WILL BE REJECTED.
8. MAINTENANCE REPORTS: LANDSCAPE CONTRACTOR SHALL PROVIDE LANDSCAPE MAINTENANCE REPORTS WITH EACH SITE VISIT, INCLUDING DATE OF WORK, NAME OF SITE FOREMAN, TASKS COMPLETED, NUMBER OF HOURS SPENT, MATERIALS OR CHEMICALS APPLIED AND AREAS IN WHICH WORK WAS COMPLETED.
9. THE CONTRACTOR SHALL PREPARE WITHIN 10 DAYS OF THE INITIAL ACCEPTANCE OR INSPECTION, A MAINTENANCE MANUAL FOR USE BY THE OWNER AFTER THE WARRANTY PERIOD EXPIRES.

MAINTENANCE MANUAL

1. MAINTENANCE DATA: INCLUDE CUTTING AND TRIMMING METHOD; TYPES, APPLICATION FREQUENCY, AND RECOMMENDED COVERAGE OF FERTILIZER. INCLUDE PROCEDURES FOR PARTNERS PLAN FOR PEST CONTROL.
2. SUBMIT 2 COPIES TO QUALITY CONTROL REPRESENTATIVE AT TIME OF INITIAL ACCEPTANCE

PLANT MATERIAL

1. REGULATIONS AND VARIETIES: EXISTING TREES AND SHRUBS TO REMAIN SHALL BE PROTECTED AND A PLANTING PLAN BE ARRANGED AROUND THEM. FURNISH NURSERY STOCK IN ACCORDANCE WITH ANSI Z60.1, EXCEPT AS OTHERWISE SPECIFIED OR INDICATED. EACH PLANT OR GROUP OF PLANTING SHALL HAVE A "KEY" NUMBER INDICATED ON THE NURSERY CERTIFICATIONS OF THE PLANT SCHEDULE. FURNISH PLANTS GROWN UNDER CLIMATIC CONDITIONS SIMILAR TO THOSE IN THE LOCALITY OF THE PROJECT FOR A MINIMUM OF ATLEAST TWO YEARS. PLANTS SPECIFIED SHALL BE INDIGENOUS, LOW MAINTENANCE VARIETIES, TOLERANT OF SITE'S EXISTING SOILS AND CLIMATE WITHOUT SUPPLEMENTAL IRRIGATION OR FERTILIZATION ONCE ESTABLISHED. SPRAY PLANTS BUDDING INTO LEAF OR HAVING SOFT GROWTH WITH AN ANTIDESICCANT BEFORE DIGGING. PLANTS OF THE SAME SPECIFIED SIZE SHALL BE OF UNIFORM SIZE AND CHARACTER OF GROWTH. PLANTS SHALL BE CHOSEN WITH THEIR MATURE SIZE AND GROWTH HABIT IN MIND TO AVOID OVER-PLANTING AND CONFLICT WITH OTHER PLANTS, STRUCTURES OR UNDERGROUND UTILITY LINES. ALL PLANTS SHALL COMPLY WITH ALL FEDERAL AND STATE LAWS REQUIRING INSPECTION FOR PLANT DISEASES AND INFESTATION.

2. SHAPE AND CONDITION: WELL-BRANCHED, WELL-FORMED, SOUND, VIGOROUS, HEALTHY PLANTING STOCK FREE FROM DISEASE, SUNSCALD, WINDBURN, ABRASION, AND HARMFUL INSECTS OR INSECT EGGS AND HAVING A HEALTHLY NORMAL, AND UNDAMAGED ROOT SYSTEM. ALL TREES WITH 'INCLUDED BARK' AND 'GRAFT REJECTIONS' SHALL NOT BE ACCEPTABLE.

   A. DECIDUOUS TREES AND SHRUBS: SYMMETRICALLY DEVELOPED AND OF UNIFORM HABIT OF GROWTH, WITH STRAIGHT BOLES OR STEMS, AND FREE FROM OBJECTIONABLE DISFIGUREMENTS. TREES SHALL HAVE STRAIGHT TRUNKS WITH THE MAIN LEADER INTACT, UNDAMAGED AND UNCUT.° BRANCHING SHALL BE UNIFORM, FULL AND CONSISTENT WITH THE PLANTS NATURAL GROWTH HABIT. PLANTS LACKING COMPACTNESS OR PROPER PROPORTIONS, TREES WITH STRUCTURALLY WEAK BRANCHING FORMS THAT MAY LEAD TO FUTURE BREAKAGE, OR PLANTS MISSHAPED BY TOO CLOSE PLANTING IN NURSERY ROWS WILL NOT BE ACCEPTED. CONTAINER GROWN STOCK SHALL NOT BE POT BOUND AND SHALL HAVE BEEN GROWN IN A CONTAINER LARGE ENOUGH FOR THE ROOT SYSTEM TO DEVELOP SUFFICIENTLY TO HOLD ITS SOIL TOGETHER WHEN REMOVED. PLANTS SHALL BE GROWN IN THE CONTAINER OF THE SIZE DESIGNATED IN THE PLANT LIST FOR AT LEAST 6 MONTHS.
   B. EVERGREEN TREES AND SHRUBS: WELL DEVELOPED SYMMETRICAL TOPS WITH TYPICAL SPREAD OF BRANCHES FOR EACH PARTICULAR SPECIES OR VARIETY. CONTAINER GROWN STOCK SHALL NOT BE POT BOUND AND SHALL HAVE BEEN GROWN IN A CONTAINER LARGE ENOUGH FOR THE ROOT SYSTEM TO DEVELOP SUFFICIENTLY TO HOLD ITS SOIL TOGETHER WHEN REMOVED. PLANTS SHALL BE GROWN IN THE CONTAINER OF THE SIZE DESIGNATED IN THE PLANT LIST FOR AT LEAST 6 MONTHS.
   C. GROUND COVERS AND VINES: NUMBER AND LENGTH OF RUNNERS AND CLUMP SIZES INDICATED, AND OF THE PROPER AGE FOR THE GRADE OF PLANTS INDICATED, FURNISHED IN REMOVABLE CONTAINERS,INTEGRAL CONTAINERS, OR FORMED HOMOGENEOUS SOIL SECTION. GROUND COVERS GROWN IN PEAT POTS SHALL HAVE ROOTS THROUGHOUT THE CONTAINER OR PROTRUDING THROUGH THE SIDES OF THE PEAT POT
   D. PLANT SIZE: MINIMUM SIZES MEASURED AFTER PRUNING AND WITH BRANCHES IN NORMAL POSITION, SHALL CONFORM TO MEASUREMENTS INDICATED, BASED ON THE AVERAGE WIDTH OR HEIGHT OF THE PLANT FOR THE SPECIES AS SPECIFIED IN ANSI Z60.1. IF A RANGE OF SIZE IS GIVEN, NO PLANT SHALL BE LESS THAN THE MINIMUM SIZE AND NOT LESS THAN 50 PERCENT OF THE PLANTS SHALL BE AS LARGE AS THE MAXIMUM SIZE SPECIFIED. THE MEASUREMENTS SPECIFIED ARE THE MINIMUM SIZE ACCEPTABLE AND ARE THE MEASUREMENTS AFTER PRUNING WHERE PRUNING IS REQUIRED. PLANTS LARGER IN SIZE THAN SPECIFIED MAY BE PROVIDED WITH APPROVAL OF THE CONTRACTING OFFICER. WHEN LARGER PLANTS ARE PROVIDED, INCREASE THE BALL OF EARTH OR SPREAD OF ROOTS IN ACCORDANCE WITH ANSI Z60.1.
   E. ROOT BALL SIZE: ALL BOX-GROWN, FIELD POTTED, FIELD BOXED, COLLECTED, PLANTATION GROWN, BARE ROOT, BALLED AND BURLAPPED, CONTAINER GROWN, PROCESSED-BALLED, AND IN-GROUND FABRIC BAG-GROWN ROOT BALLS SHALL CONFORM TO ANSI Z60.1. ALL WRAPPINGS AND TIES SHALL BE BIODEGRADABLE. ROOT GROWTH IN CONTAINER GROWN PLANTS SHALL BE SUFFICIENT TO HOLD EARTH INTACT WHEN REMOVED FROM CONTAINERS. ROOT BOUND PLANTS WILL NOT BE ACCEPTED.
   F. MYCORRHIZAL FUNGI INOCULUM: BEFORE SHIPMENT, ROOT SYSTEMS SHALL CONTAIN MYCORRHIZAL FUNGI INOCULUM.
   G. GROWTH OF TRUNK AND CROWN
   - DECIDUOUS TREES: A HEIGHT TO CALIPER RELATIONSHIP SHALL BE PROVIDED IN ACCORDANCE WITH ANSI Z60.1. HEIGHT OF BRANCHING SHALL BEAR A RELATIONSHIP TO THE SIZE AND SPECIES OF TREE SPECIFIED AND WITH THE CROWN IN GOOD BALANCE WITH THE TRUNK. THE TREES SHALL NOT BE "POLED" OR THE LEADER REMOVED.
   - SINGLE STEM: THE TRUNK SHALL BE REASONABLY STRAIGHT AND SYMMETRICAL WITH CROWN AND HAVE A PERSISTENT MAIN LEADER.
   - MULTI-STEM: ALL COUNTABLE STEMS, IN AGGREGATE, SHALL AVERAGE THE SIZE SPECIFIED. TO BE CONSIDERED A STEM, THERE SHALL BE NO DIVISION OF THE TRUNK WHICH BRANCHES MORE THAN 6 INCHES FROM GROUND LEVEL.
   - DECIDUOUS SHRUBS: DECIDUOUS SHRUBS SHALL HAVE THE HEIGHT AND NUMBER OF PRIMARY STEMS RECOMMENDED BY ANSI Z60.1. ACCEPTABLE PLANT MATERIAL SHALL BE WELL SHAPED, WITH SUFFICIENT WELL-SPACED SIDE BRANCHES, AND RECOGNIZED BY THE TRADE AS TYPICAL FOR THE SPECIES GROWN IN THE REGION OF THE PROJECT.
   - BROADLEAF EVERGREEN PLANT MATERIAL: BROADLEAF EVERGREEN PLANT MATERIAL SHALL HAVE THE HEIGHT-TO-SPREAD RATIO RECOMMENDED BY ANSI Z60.1. ACCEPTABLE PLANT MATERIAL SHALL BE WELL SHAPED AND RECOGNIZED BY THE TRADE AS TYPICAL FOR THE VARIETY GROWN IN THE REGION OF THE PROJECT.
   - GROUND COVER AND VINE PLANT MATERIAL: GROUND COVER AND VINE PLANT MATERIAL SHALL HAVE THE MINIMUM NUMBER OF RUNNERS AND LENGTH OF RUNNER RECOMMENDED BY ANSI Z60.1. PLANT MATERIAL SHALL HAVE HEAVY, WELL DEVELOPED AND BALANCED CROWN WITH VIGOROUS, WELL DEVELOPED ROOT SYSTEM AND SHALL BE FURNISHED IN CONTAINERS.

PLANTING NOTES CONTINUED ON SHEET L0.03

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

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SCALE: N/A
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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING NOTES

PROJECT #: 11-532
DRAWN BY: SB, GH
CHECKED BY: AH
SHEET #: L0.02

TOPSOIL

1. EXISTING SOIL: MODIFY TO CONFORM TO REQUIREMENTS SPECIFIED IN PARAGRAPH ENTITLED "COMPOSITION."
2. ON-SITE TOPSOIL: STOCKPILE EXISTING TOP SOIL DURING GRADING. SURFACE SOIL STRIPPED AND STOCKPILED ON SITE AND MODIFIED AS NECESSARY TO MEET THE @REQUIREMENTS SPECIFIED FOR TOPSOIL IN PARAGRAPH ENTITLED "COMPOSITION." DISTRIBUTE 6Δ THICKNESS THROUGH THE MORE INTENSELY PLANTED AREAS WHILE DE-COMPACTING THE SITE.
3. OFF-SITE TOPSOIL: CONFORM TO REQUIREMENTS SPECIFIED IN PARAGRAPH ENTITLED "COMPOSITION." ADDITIONAL TOPSOIL SHALL BE FURNISHED BY THE CONTRACTOR OBTAIN FROM TOPSOIL BORROW AREAS INDICATED.
4. COMPOSITION: EVALUATE SOIL FOR USE AS TOPSOIL IN ACCORDANCE WITH ASTM D 5268 AND SOIL TESTS AS LISTED UNDER TEST REPORTS. THE PH SHALL BE TESTED IN ACCORDANCE WITH ASTM D 4972. TOPSOIL SHALL BE FREE OF STICKS, STONES, ROOTS, PLANTS, AND OTHER DEBRIS AND OBJECTIONABLE MATERIALS.

PLANTING SOIL MIXTURES

1. TOPSOIL SHALL BE ORIGINAL SURFACE FRIABLE LOAM TOPSOIL OF UNIFORM QUALITY, FREE FROM GRAVEL AND STONES RETAINED ON A 50 MM (2") SIEVE, HEAVY CLAY, LUMPS, PLANTS, ROOTS, STICKS AND FOREIGN MATERIALS HARMFUL TO PLANT GROWTH SUCH AS 2" OR LARGER FRAGMENTS OF HOT MIX, CONCRETE PAVEMENT AND SURFACE TREATMENT.
2. TOPSOIL SHALL BE REASONABLY FREE OF NOXIOUS PERENNIAL WEEDS OR WOOD VEGETATIONS AND COMPLETELY VOID OF JOHNSONGRASS (SORGHUM HALAPENSE) AS CERTIFIED BY SUPPLIER IN WRITING PRESENTED TO AN AUTHORIZED REPRESENTATIVE OF THE OWNER PRIOR TO PURCHASE.
3. TOPSOIL SOURCE: REUSE SURFACE SOIL STOCKPILED ON-SITE. VERIFY WITH SOIL TESTS THE SUITABILITY OF STOCKPILED SURFACE SOIL TO PRODUCE TOPSOIL PRIOR TO STOCKPILING.
   - SUPPLEMENT WITH IMPORTED TOPSOIL FROM OFF-SITE SOURCES WHEN QUANTITIES ARE INSUFFICIENT.
   - TOPSOIL SOURCE: IMPORTED TOPSOIL FROM OFF-SITE SOURCES. OBTAIN TOPSOIL DISPLACED FROM NATURALLY WELL-DRAINED SITES WHERE TOPSOIL OCCURS AT LEAST 4 INCHES DEEP; DO NOT OBTAIN FROM AGRICULTURAL LAND, BOGS OR MARSHES. THE TOPSOIL SHALL BE CERTIFIED TO MEET THE FOLLOWING REQUIREMENTS:
   - SHALL BE NATURAL, ORIGINAL SURFACE SOIL WITH TEXTURE AND MECHANICAL ANALYSIS TO MATCH EXISTING, ON-SITE TOPSOIL.
   - SOIL NUTRIENT LEVEL, ORGANIC MATTER AND PH SHALL BE AS RECOMMENDED BY ARBORIST.

FERTILIZER: FERTILIZER FOR TREES, PLANTS, AND SHRUBS AND GROUNDCOVER SHALL BE AS RECOMMENDED BY ARBORIST, EXCEPT SYNTHETIC CHEMICAL FERTILIZERS ARE NOT PERMITTED. FERTILIZERS CONTAINING PETROCHEMICAL ADDITIVES OR THAT HAVE BEEN TREATED WITH PESTICIDES OR HERBICIDES ARE NOT PERMITTED.

1. GRANULAR FERTILIZER: ORGANIC, GRANULAR CONTROLLED RELEASE FERTILIZER CONTAINING AS RECOMMENDED BY ARBORIST.
2. FERTILIZER TABLETS: ORGANIC, PLANT TABLETS COMPOSED OF TIGHTLY COMPRESSED FERTILIZER CHIPS FORMING A TABLET THAT IS INSOLUBLE IN WATER, IS DESIGNED TO PROVIDE A CONTINUOUS RELEASE OF NUTRIENTS FOR AT LEAST 24 MONTHS AND CONTAINS THE FOLLOWING MINIMUM PERCENTAGES, BY WEIGHT, OF PLANT FOOD NUTRIENTS:20 PERCENT AVAILABLE NITROGEN, 20 PERCENT AVAILABLE PHOSPHORUS, 5 PERCENT AVAILABLE POTASSIUM
3. MULCH
4. FREE FROM NOXIOUS WEEDS, MOLD, PESTICIDES, OR OTHER DELETERIOUS MATERIALS.
   - MATERIALS
   - BIOBASED CONTENT SHALL BE A MINIMUM OF 95%. BARK MULCH SHALL BE OF UNIFORM IN SIZE, FREE OF GROWTH OR GERMINATION INHIBITING INGREDIENTS AND FOREIGN MATTER, WELL COMPOST IN NATURAL COLOR. GRASS CLIPPINGS ARE NOT ALLOWED. MULCH SHALL NOT BE DYED WITH ANY COLOR

STAKING AND GUYING MATERIAL

1. SUPPORT STAKES: ROUGH SAWN OR SALVAGED HARD WOOD FREE OF KNOTS, ROT, CROSS GRAIN, BARK, LONG SLIVERS, OR OTHER DEFECTS THAT IMPAIR STRENGTH. STAKES SHALL BE MINIMUM 2 INCHES SQUARE OR 2 1/2 INCH DIAMETER BY 8 FEET LONG, POINTED AT ONE END. PAINT OR STAIN WOOD STAKES SHALL BE DARK BROWN.
2. GROUND STAKES: WOOD OR 80% PERCENT POST-CONSUMER RECYCLE CONTENT PLASTIC, 2 INCHES SQUARE ARE BY 3 FEET LONG, POINTED AT ONE END.
3. GUYING WIRE: 12 GAUGE ANNEALED NON CORROSIVE GALVANIZED STEEL, ASTM A 580/A 580M OF SUFFICIENT STRENGTH TO WITHSTAND WIND PRESSURE AND RESULTANT WIND MOVEMENT.
4. GUYING CABLE: MINIMUM FIVE-STRAND, 3/16 INCH DIAMETER GALVANIZED STEEL CABLE OF SUFFICIENT STRENGTH TO WITHSTAND WIND PRESSURE AND RESULTANT WIND MOVEMENT
5. HOSE CHAFING GUARDS: NEW OR USED 2 PLY 3/4 INCH DIAMETER REINFORCED RUBBER OR PLASTIC HOSEBLACK OR DARK GREEN, ALL OF SAME COLOR.
6. FLAGS: WHITE SURVEYOR'S PLASTIC TAPE, 12 INCHES LONG, FASTENED TO GUYING WIRES OR CABLES.
7. TURNBUCKLES: GALVANIZED OR CADMIUM-PLATED STEEL WITH MINIMUM 3 INCH LONG OPENINGS FITTED WITH SCREW EYES. EYE BOLTS SHALL BE GALVANIZED OR CADMIUM-PLATED STEEL WITH ONE INCH DIAMETER EYES AND SCREW LENGTH 1 1/2 INCHES, MINIMUM.
8. DEADMEN: 4 BY 8 INCH RECTANGULAR OR 8 INCH DIAMETER BY36 INCH LONG, PINE WOOD MATERIAL.
9. METAL ANCHORS

10. DRIVEN ANCHORS: MALLEABLE IRON, ARROW SHAPED, GALVANIZED, SIZED AS FOLLOWS:

TREE CALIPER	ANCHOR SIZE
2 INCHES AND UNDER	3 INCHES
3 TO 6 INCHES	4 INCHES
6 TO 8 INCHES	6 INCHES
8 TO 10 INCHES	8 INCHES
10 TO 12 INCHES	10 INCHES

11. SCREW ANCHORS: STEEL, SCREW TYPE WITH WELDED-ON 3 INCH ROUND HELICAL STEEL PLATE, MINIMUM 3/8 INCH DIAMETER, 15 INCHES LONG.

EDGING MATERIAL
1. ALUMINUM EDGING. ANCHORS AND STAKES SHALL BE OF THE SAME MANUFACTURER AND COLOR AS THE EDGING.

ANTIDESICCANTS
1. SPRAYABLE, WATER INSOLUBLE VINYL-VINLEDINE COMPLEX WHICH PRODUCE A MOISTURE RETARDING BARRIER NOT REMOVABLE BY RAIN OR SNOW. FILM SHALL FORM AT TEMPERATURES COMMONLY ENCOUNTERED OUT OF DOORS DURING PLANTING SEASON AND HAVE A MOISTURE VAPOR TRANSMISSION RATE (MVT) OF THE RESULTANT FILM OF MAXIMUM 10 GRAMS PER 24 HOURS AT 70 PERCENT HUMIDITY.

ROOT CONTROL BARRIER
1. FLEXIBLE AND PERMEABLE GEOTEXTILE FABRIC WITH PERMANENTLY ATTACHED TIME-RELEASED NODULES. COLOR TO BE BLACK OR GRAY. PRE-FORMED, LINEAR BARRIER WITH INTEGRAL VERTICAL ROOT DEFLECTING RIBS CONSTRUCTED OF ULTRAVIOLET RESISTANT POLYPROPYLENE MATERIAL.

WATER
1. SOURCE OF WATER TO BE APPROVED BY CLIENT'S REPRESENTATIVE AND SUITABLE QUALITY FOR IRRIGATION AND SHALL NOT CONTAIN ELEMENTS TOXIC TO PLANT LIFE, INCLUDING ACIDS, ALKALIS, SALTS, CHEMICAL POLLUTANTS, AND ORGANIC MATTER.

MYCORRHIZAL FUNGI INOCULUM
1. MYCORRHIZAL FUNGI INOCULUM SHALL BE COMPOSED OF MULTIPLE-FUNGUS INOCULUM AS RECOMMENDED BY THE MANUFACTURER FOR THE PLANT MATERIAL SPECIFIED.

SOURCE QUALITY CONTROL
1. THE CLIENT'S REPRESENTATIVE OR LANDSCAPE ARCHITECT OF RECORD WILL INSPECT PLANT MATERIALS AT THE NURSERY SITE AND APPROVE THEM. TAG PLANT MATERIALS FOR SIZE AND QUALITY.

EXECUTION

EXTENT OF WORK
1. PROVIDE SOIL PREPARATION, FERTILIZING, TREE, SHRUB, GROUNDCOVER PLANTING, EDGING,STAKING AND GUYING, AND ROOT CONTROL BARRIER INSTALLATION AND MULCH TOPDRESSING OF ALL NEWLY GRADED FINISHED EARTH SURFACES, UNLESS INDICATED OTHERWISE, AND AT ALL AREAS INSIDE OR OUTSIDE THE LIMITS OF CONSTRUCTION THAT ARE DISTURBED BY THE CONTRACTOR'S OPERATIONS.

PREPARATION
1. PROTECTION: PROTECT EXISTING AND PROPOSED LANDSCAPE FEATURES, ELEMENTS, AND SITES FROM DAMAGE OR CONTAMINATION. PROTECT TREES, VEGETATION, AND OTHER DESIGNATED FEATURES BY ERECTING HIGH-VISIBILITY, REUSABLE CONSTRUCTION FENCING. LOCATE FENCE NO CLOSER TO TREES THAN THE DRIP LINE. PLAN EQUIPMENT AND VEHICLE ACCESS TO MINIMIZE AND CONFINE SOIL DISTURBANCE AND COMPACTION TO AREAS INDICATED ON DRAWINGS.
2. LAYOUT: STAKE OUT APPROVED PLANT MATERIAL LOCATIONS AND PLANTER BED OUTLINES ON THE PROJECT SITE BEFORE DIGGING PLANT PITS OR BEDS. THE CLIENT'S REPRESENTATIVE RESERVES THE RIGHT TO ADJUST PLANT MATERIAL LOCATIONS TO MEET FIELD CONDITIONS. PROVIDE ON-SITE LOCATIONS FOR EXCAVATED ROCK, SOIL, AND VEGETATION.
3. SOIL PREPARATION
   - PH ADJUSTER APPLICATION RATES: APPLY PH ADJUSTER AT RATES AS DETERMINED BY LABORATORY SOIL ANALYSIS OF THE SOILS AT THE JOB SITE.
   - SOIL CONDITIONER APPLICATION RATES: APPLY SOIL CONDITIONERS AT RATES AS DETERMINED BY LABORATORY SOIL ANALYSIS OF THE SOILS AT THE JOB SITE.
   - FERTILIZER APPLICATION RATES:APPLY FERTILIZER AT RATES AS DETERMINED BY LABORATORY SOIL ANALYSIS OF THE SOILS AT THE JOB SITE
   - ROOT CONTROL BARRIER: INSTALL GEOTEXTILE FABRIC IN THE SOIL IN A VERTICAL AND HORIZONTAL APPLICATION AS SHOWN IN DRAWINGS. USE APPROPRIATE HOLDING DEVICE TO ASSURE FABRIC POSITION. FOR VERTICAL OR HORIZONTAL APPLICATION, A MINIMUM 2 INCH SOIL COVER IS REQUIRED OVER THE TOP SURFACE EDGE.

PLANT BED PREPARATION
1. VERIFY LOCATION OF UNDERGROUND UTILITIES PRIOR TO EXCAVATION. PROTECT EXISTING ADJACENT TURF BEFORE EXCAVATIONS ARE MADE. DO NOT DISTURB TOPSOIL AND VEGETATION IN AREAS OUTSIDE THOSE INDICATED ON DRAWINGS. WHERE PLANTING BEDS OCCUR IN EXISTING TURF AREAS, REMOVE TURF TO A DEPTH THAT WILL ENSURE REMOVAL OF ENTIRE ROOT SYSTEM. REMOVE FOREIGN MATERIALS, LARGE STONE THAT ARE LARGER THAN 2 INCHES IN DIAMETER, OR CONCRETE, TRASH AND ANY WEEDS AND UNDESIRABLE PLANTS AND THEIR ROOTS FROM EXISTING SOIL. REMOVE CONTAMINATED SUBSOIL AND ENOUGH SOIL TO MAKE ROOM FOR TOPSOIL AND ORGANIC MATTER. REMEMBER TO ALLOW FOR SETTLING. MEASURE DEPTH OF PLANT PITS FROM FINISHED GRADE. DEPTH OF PLANT PIT EXCAVATION SHALL BE AS INDICATED AND PROVIDE PROPER RELATION BETWEEN TOP OF ROOT BALL AND FINISHED GRADE. SCARIFY PLANT BED SUBSOIL TO A MINIMUM DEPTH OF 24 INCHES FOR THE ENTIRE PLANTING BED. DIG DEEPER TO ACCOMMODATE LARGER ROOTBALLS IF NECESSARY. INSTALL PLANT MATERIAL AS SPECIFIED IN PARAGRAPH ENTITLED "PLANT INSTALLATION." DO NOT INSTALL TREES WITHIN 10 FEET OF ANY UTILITY LINES OR BUILDING WALLS.

PLANT INSTALLATION

1. INDIVIDUAL PLANT PIT EXCAVATION: EXCAVATE PITS AT LEAST 16 INCHES LARGER IN DIAMETER AS THE SIZE OF BALL OR CONTAINER TO DEPTH SHOWN. TREE PIT DEPTH SHALL BE SUFFICIENT TO ALLOW 1/8 OF ROOTBALL TO BE ABOVE FINISHED GRADE. IF THE TREE WAS GRAFTED OR BUDDED, THE ROOTBALL SHALL BE PLACED TO EXPOSE THE GRAFT/ BUD WITHOUT COVERING IT WITH SOIL. THE ROOT BALL SHALL BE PLACED SO THAT MINIMUM OF TWO MAIN ROOTS MUST BE WITHIN THREE INCHES OF THE ROOT BALL SOIL LINE AS MEASURED FOUR INCHES FROM THE TRUNK. QUALITY REPRESENTATIVE SHALL VERIFY ALL STANDARDS ARE MET WITHIN ONE WEEK OF INSTALLATION. ANY INSTALLATION OF TREES NOT FOLLOWING THE ABOVE STANDARD SHALL BE REJECTED. ANY INCORRECT INSTALLATION SHALL BE RECTIFIED WITHOUT ADDITIONAL COST TO THE OWNER.

2. PLANT BEDS WITH MULTIPLE PLANTS: EXCAVATE PLANT BEDS CONTINUOUSLY THROUGHOUT ENTIRE BED AS OUTLINED TO DEPTH SHOWN.

3. HANDLING AND SETTING: MOVE PLANT MATERIALS ONLY BY SUPPORTING THE ROOT BALL OR CONTAINER. SET PLANTS ON HAND COMPACTED LAYER OF PREPARED BACKFILL SOIL MIXTURE 6ΔINCHES THICK. HOLD PLUMB IN THE CENTER OF THE PIT UNTIL SOIL HAS BEEN TAMPED FIRMLY AROUND ROOT BALL. REMOVE ALL BIODEGRADABLE ROOT CONTAINERS. SET PLANT MATERIALS, IN RELATION TO SURROUNDING FINISH GRADE, ONE TO TWO INCHES DEPTH AT WHICH THEY WERE GROWN IN THE NURSERY, COLLECTING FIELD OR CONTAINER. REPLACE PLANT MATERIAL WHOSE ROOT BALLS ARE CRACKED OR DAMAGED EITHER BEFORE OR DURING THE PLANTING PROCESS. PLANT MATERIAL SHALL BE SET IN PLANT BEDS ACCORDING TO THE DRAWINGS. BACKFILL SOIL MIXTURE SHALL BE PLACED ON PREVIOUSLY SCARIFIED SUBSOIL TO COMPLETELY SURROUND THE ROOT BALLS, AND SHALL BE BROUGHT TO A SMOOTH AND EVEN SURFACE, BLENDING TO EXISTING AREAS.

4. BALLED AND BURLAPPED STOCK: BALLED AND BURLAP TREES/ SHRUBS WITH GROW BAGS EMBEDDED INSIDE THE ROOT PACKAGE SHALL BE REJECTED. REPLACEMENT TREES/ SHRUBS SHALL BE OBTAINED AND INSTALLED AT THE CONTRACTOR EXPENSE. ANY SIGNIFICANT AMOUNT OF SOILS OVER THE TOP OF THE MAIN ROOTS AS INDICATED IN SHALL BE REMOVED. ANY FINE ROOTS GROWING WITHIN THIS ZONE SHALL BE ALSO BE REMOVED TO AVOID BECOMING STEM GIRDLING ROOTS. THE ROOT FREE POTTING MEDIUM UNDER THE ROOT SYSTEMS SHALL ALSO BE REMOVED BEFORE PLACING THE PLANT IN THE PLANTING HOLE. CARE SHALL BE TAKEN TO PREVENT DAMAGE TO THE ROOT SYSTEM

5. BACKFILL WITH PREPARED SOIL MIXTURE TO APPROXIMATELY HALF THE DEPTH OF BALL AND THEN TAMP AND WATER. CAREFULLY REMOVE OR FOLD BACK EXCESS BURLAP AND TYING MATERIALS FROM THE TOP A MINIMUM 1/3 DEPTH FROM THE TOP OF THE ROOTBALL. TAMP AND COMPLETE BACKFILL, PLACE MULCH TOPDRESSING, AND WATER. REMOVE WIRES AND NON-BIODEGRADABLE MATERIALS FROM PLANT PIT PRIOR TO BACKFILL OPERATIONS.

6. BARE-ROOT STOCK: PLANT SO ROOTS ARE ARRANGED IN A NATURAL POSITION. PLACE ROOTS IN WATER A MINIMUM OF 30 MINUTES PRIOR TO PLANTING. . BACKFILL SOIL MIXTURE IN 6 INCH LAYERS. TAMP REMAINDER OF BACKFILL, PLACE MULCH TOPDRESSING AND WATER.

7. BARE-ROOT STOCK: PLANT SO ROOTS ARE ARRANGED IN A NATURAL POSITION. PLACE ROOTS IN WATER A MINIMUM OF 30 MINUTES PRIOR TO PLANTING. . BACKFILL SOIL MIXTURE IN 6 INCH LAYERS. TAMP REMAINDER OF BACKFILL, PLACE MULCH TOPDRESSING AND WATER.

8. CONTAINER GROWN STOCK: REMOVE FROM CONTAINER AND PREVENT DAMAGE TO PLANT OR ROOT SYSTEM. FOR ALL CONTAINER GROWN STOCK, ROOT BOUND PLANT MATERIAL SHALL BE LOOSENED CAREFULLY WITHOUT DAMAGE TO THE ROOTS AND THE ROOTS SHALL BE PLACED IN NATURAL POSITION.

9. GROUND COVERS AND VINES: ALL PLANT MATERIAL TO BE INSTALLED PRIOR TO MULCHING. BEFORE PLANTING, BIODEGRADABLE POTS SHALL BE SLIT IN 3 PLACES AND NON BIODEGRADABLE POTS SHALL BE REMOVED. ROOT SYSTEMS OF ALL POTTED PLANTS SHALL BE SPLIT. PLANT (EITHER POTTED OR BARE ROOT) SO THAT THE ROOTS ARE SURROUNDED BY THE BACKFILL MIXTURE. POTTED PLANTS SHALL BE SET SO THAT THE TOP OF THE POT IS EVEN WITH THE GRADE. SET ALL PLANTS AT DISTANCE AS INDICATED ON PLANT SCHEDULE. DO NOT PLANT IN GRID. START WATERING AREAS PLANTED AS REQUIRED BY TEMPERATURE AND WIND CONDITIONS. APPLY WATER AT A RATE SUFFICIENT TO ENSURE THOROUGH WETTING OF SOIL TO A DEPTH OF 6 INCHES WITHOUT RUN OFF OR PUDDLING. SMOOTH PLANTING AREAS AFTER PLANTING TO PROVIDE EVEN, SMOOTH FINISH.

10. PLACEMENT OF MULCH TOPDRESSING: PLACE MULCH IN PLANTING BEDS WITHIN 24 HOURS OF PLANTING. DEPTH SHALL BE A MINIMUM OF 2 INCH AND A MAXIMUM OF 3 INCHES. MULCH SHALL EXTEND FULLY TO THE EDGES OF PLANTING BEDS. DO NOT COVER SPADED EDGES. TREE FLARE SHOULD BE EXPOSED. PROTECT AND LIFT GROUND COVER VEGETATION TO PLACE MULCH MATERIAL UNDERNEATH AND IN-BETWEEN PLANTINGS. THE MULCH LAYER SURFACES SHOULD APPROXIMATE THE FINAL ELEVATIONS.

11. INSTALLATION OF EDGING: UNIFORMLY EDGE BEDS OF PLANTS TO PROVIDE A CLEAR CUT DIVISION LINE BETWEEN PLANTED AREA AND ADJACENT LAWN. CONSTRUCT BED SHAPES AS INDICATED. INSTALL ALUMINUM EDGING MATERIAL AS PER MANUFACTURER'S INSTRUCTIONS. INSTALL EDGING WITH MINIMUM ONE INCH LEFT ABOVE GROUND LEVEL. WHERE PLANTING BEDS HAVE NO EDGING, USE 4Δ SPADED EDGE.

12. FERTILIZATION: FERTILIZER SHALL BE ADDED FOR TREES, DEPENDING ON THE SOIL QUALITY, SIZE, AND TYPE OF THE PLANT.
    - USE ARBORIST RECOMMENDED QUANTITY OF FERTILIZER PER INCH OF TRUNK DIAMETER AND MANUFACTURER-RECOMMENDED MICRO-RHIZAL BACTERIA.
    - APPLY AFTER INITIAL RAKING OF TOPSOIL.
    - MIX THOROUGHLY FERTILIZER INTO UPPER 2 INCHES OF TOPSOIL.
    - RAKE SMOOTH.
    - LIGHTLY WATER TO AID THE DISSIPATION OF FERTILIZER.
    - REMOVE ALL FERTILIZER FROM FOLIAGE TO AVOID DAMAGE.

12. WATERING: START WATERING AREAS PLANTED AS REQUIRED BY TEMPERATURE AND WIND CONDITIONS. SLOW DEEP WATERING SHALL BE USED. APPLY WATER AT A RATE SUFFICIENT TO ENSURE THOROUGH WETTING OF SOIL TO A DEPTH OF 12 INCHES WITHOUT RUN OFF OR PUDDLING. WATERING OF OTHER PLANT MATERIAL OR ADJACENT AREAS SHALL BE PREVENTED.

13. STAKING AND GUYING
    - STAKING: STAKE PLANTS WITH THE NUMBER OF STAKES INDICATED COMPLETE WITH DOUBLE STRAND OF 12 GAGE GUY WIRE AS DETAILED. ATTACH GUY WIRE HALF THE TREE HEIGHT BUT NOT MORE THAN 5 FEET HIGH. DRIVE STAKES TO A DEPTH OF 2 1/2 TO 3 FEET INTO THE GROUND OUTSIDE THE PLANT PIT. DO NOT INJURE THE ROOT BALL. USE HOSE CHAFER GUARDS WHERE GUY WIRE COMES IN CONTACT WITH TREE TRUNK.
    - GUYING: GUY PLANTS AS INDICATED. ATTACH TWO STRANDS OF GUYING WIRE OR GUYING CABLE AROUND THE TREE TRUNK AT AN ANGLE OF 45 DEGREES AT APPROXIMATELY 1/2 OF THE TRUNK HEIGHT. PROTECT TREE TRUNKS WITH CHAFING GUARDS WHERE GUYING WIRE OR CABLE CONTACTS THE TREE TRUNK. ANCHOR GUYS TO DEADMEN WOOD BLOCKS OR WOOD GROUND STAKES. FASTEN FLAGS TO EACH GUYING WIRE OR CABLE APPROXIMATELY 2/3 OF THE DISTANCE UP FROM GROUND LEVEL.
    - CHAFING GUARDS: USE HOSE CHAFING GUARDS, AS SPECIFIED WHERE GUY WIRE OR CABLE WILL CONTACT THE PLANT.
    - DEADMEN: PLACE DEADMEN MINIMUM 18 INCHES BELOW GROUND SURFACE. PLACE EQUAL DISTANCE FROM TREE TRUNK AND AROUND THE PLANT PIT.
    - WOOD GROUND STAKES: DRIVE WOOD GROUND STAKES INTO FIRM GROUND OUTSIDE OF PLANT PIT WITH TOP OF STAKE FLUSH WITH GROUND. PLACE EQUAL DISTANCE FROM TREE TRUNK AND AROUND THE PLANT PIT.
    - FLAGS: SECURELY FASTEN FLAGS ON EACH GUY WIRE AND CABLE APPROXIMATELY TWO-THIRDS OF THE DISTANCE UP FROM GROUND LEVEL.

14. PRUNING: PRUNE IN ACCORDANCE WITH SAFETY REQUIREMENT OF ANSI Z133.1.
    - TREES AND SHRUBS: REMOVE DEAD AND BROKEN BRANCHES. PRUNE TO CORRECT STRUCTURAL DEFECTS ONLY.
    - RETAIN TYPICAL GROWTH SHAPE OF INDIVIDUAL PLANTS WITH AS MUCH HEIGHT AND SPREAD AS PRACTICAL. DO NOT CUT CENTRAL LEADER ON TREES. MAKE CUTS WITH SHARP INSTRUMENTS. DO NOT FLUSH CUT WITH TRUNK OR ADJACENT BRANCHES. COLLARS SHALL REMAIN IN PLACE. PRUNING SHALL BE ACCOMPLISHED BY TRAINED AND EXPERIENCED PERSONNEL AND SHALL BE ACCORDANCE WITH ANSI A300.
    - WOUND DRESSING: DO NOT APPLY TREE WOUND DRESSING TO CUTS.

RESTORATION AND CLEAN UP

1. RESTORATION: TURF AREAS, PAVEMENTS AND FACILITIES THAT HAVE BEEN DAMAGED FROM THE PLANTING OPERATION SHALL BE RESTORED TO ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

2. CLEAN UP: EXCESS AND WASTE MATERIAL SHALL BE REMOVED FROM THE INSTALLED AREA AND SHALL BE DISPOSED OFFSITE AT AN APPROVED LANDFILL, RECYCLING CENTER, OR COMPOSTING CENTER. SEPARATE AND RECYCLE OR REUSE THE FOLLOWING LANDSCAPE WASTE MATERIALS: WIRE, BALL WRAP, BURLAP AND WOOD STAKES. CLEANING SHALL BE DONE WITHIN THE LIMITS OF THE PROJECT, AND SHALL CONSIST OF COMPLETELY CLEANING THE PROJECT OF EXCESS MATERIAL, SWEEPING PAVEMENTS AND STRUCTURES OF DIRT AND RUBBISH, AND THE REMOVAL OF ANY UNUSED MATERIAL WHICH WILL MAR THE APPEARANCE OF THE CONTRACT OR REPAIRING ANY AREAS AS DETERMINED BY THE QUALITY CONTROL REPRESENTATIVE AS NOT MEETING THE SPECIFICATIONS. CONTRACTOR SHALL VERIFY PLANT IDENTIFICATION TAGS AND TREE STAKING MATERIAL IS REMOVED AS SPECIFIED PRIOR TO FINAL INSPECTION, 1 YEAR AFTER INITIAL INSPECTION

SEEDING NOTES
CONTRACTOR TO CONFORM TO THE FOLLOWING REQUIREMENTS:

SUBMITTALS
CONTRACTOR IS REQUIRED TO SUBMIT THE FOLLOWING TO THE CLIENT'S REPRESENTATIVE AND LANDSCAPE ARCHITECT OF RECORD FOR APPROVAL:

1. PRODUCT DATA: WOOD CELLULOSE FIBER MULCH
2. FERTILIZER: INCLUDE PHYSICAL CHARACTERISTICS, AND RECOMMENDATIONS.
3. TEST REPORTS: TOPSOIL COMPOSITION TESTS (REPORTS AND RECOMMENDATIONS).
4. CERTIFICATES:APPROVAL OF SEED&LABELS OF PROPOSED SEED MIXTURES STATING COMMON AND SCIENTIFIC NAMES OF GRASSES, PERCENTAGE BY WEIGHT, AND PERCENTAGES OF PURITY AND GERMINATION.
5. MANUFACTURER'S INSTRUCTIONS: EROSION CONTROL MATERIALS

DELIVERY

1. SEED PROTECTION: PROTECT FROM DRYING OUT AND FROM CONTAMINATION DURING DELIVERY, ON-SITE STORAGE, AND HANDLING.
2. SOIL AMENDMENTS: DELIVER TO THE SITE IN ORIGINAL, UNOPENED CONTAINERS BEARING MANUFACTURER'S CHEMICAL ANALYSIS, NAME, TRADE NAME, TRADEMARK, AND INDICATION OF CONFORMANCE TO STATE AND FEDERAL LAWS. INSTEAD OF CONTAINERS, FERTILIZER, SULPHUR, IRON, AND LIME MAY BE FURNISHED IN BULK WITH CERTIFICATE INDICATING THE ABOVE INFORMATION.
3. SEED STORAGE: STORE IN COOL, DRY LOCATIONS AWAY FROM CONTAMINANTS.
4. AMENDED SOIL: PRIOR TO STOCKPILING TOPSOIL, TREAT GROWING VEGETATION WITH APPLICATION OF APPROPRIATE SPECIFIED NON-SELECTIVE HERBICIDE. CLEAR AND GRUB EXISTING VEGETATION THREE TO FOUR WEEKS PRIOR TO STOCKPILING TOPSOIL.
5. HANDLING: DO NOT DROP OR DUMP MATERIALS FROM VEHICLES.
6. PLANTING CONDITIONS: DO NOT PLANT WHEN THE GROUND IS MUDDY, OR WHEN AIR TEMPERATURE EXCEEDS 90 DEGREES FAHRENHEIT.
7. TIME LIMITATIONS: APPLY SEED WITHIN TWENTY FOUR HOURS AFTER SEED BED PREPARATION

PRODUCTS

1. SEED
   A. CLASSIFICATION: SEED SHALL BE 100 % PURE LIVE SEED. ALL SEED SHALL BE OF THE LATEST SEASON'S CROP AND DELIVERED IN ORIGINAL SEALED PACKAGES, BEARING PRODUCER'S GUARANTEED ANALYSIS FOR PERCENTAGES OF MIXTURES, PURITY, GERMINATION, WEED SEED CONTENT, AND INERT MATERIAL. LABEL IN CONFORMANCE WITH AMS SEED ACT AND APPLICABLE STATE SEED LAWS. WET, MOLDY, OR OTHERWISE DAMAGED SEED WILL BE REJECTED. FIELD MIX SHALL NOT BE ALLOWED.
   B. PLANTING DATES: SEED FROM MARCH 1ST TO JUNE 15TH FOR WARM SEASON SPRING PLANTING AND FROM SEPTEMBER 15TH TO NOVEMBER 15TH OR MARCH 1ST TO JUNE 15TH FOR COOL SEASON PLANTING.
2. TOPSOIL
   A. EXISTING SOIL: MODIFY TO CONFORM TO REQUIREMENTS SPECIFIED IN PARAGRAPH ENTITLED "COMPOSITION."
   B. ON-SITE TOPSOIL: SURFACE SOIL STRIPPED AND STOCKPILED ON SITE AND MODIFIED AS NECESSARY TO MEET THE REQUIREMENTS SPECIFIED FOR TOPSOIL IN PARAGRAPH ENTITLED "COMPOSITION."
   C. OFF-SITE TOPSOIL: CONFORM TO REQUIREMENTS SPECIFIED IN PARAGRAPH ENTITLED "COMPOSITION." ADDITIONAL TOPSOIL SHALL BE FURNISHED BY THE CONTRACTOR OBTAIN FROM TOPSOIL BORROW AREAS APPROVED BY CLIENT'S REPRESENTATIVE.
   D. COMPOSITION: EVALUATE SOIL FOR USE AS TOPSOIL AS DETERMINED BY LABORATORY SOIL ANALYSIS OF THE SOILS AT THE JOB SITE. THE PH SHALL BE TESTED IN ACCORDANCE WITH ASTM D 4972. TOPSOIL SHALL BE FREE OF STICKS, STONES, ROOTS, PLANTS, AND OTHER DEBRIS AND OBJECTIONABLE MATERIALS.
3. FERTILIZER
   A. GRANULAR FERTILIZER: ORGANIC, GRANULAR CONTROLLED RELEASE FERTILIZE
   B. HYDROSEEDING FERTILIZER: CONTROLLED RELEASE FERTILIZER, TO USE WITH HYDROSEEDING AND COMPOSED OF PILLS COATED WITH PLASTIC RESIN TO PROVIDE A CONTINUOUS RELEASE OF NUTRIENTS FOR AT LEAST 6 MONTHS AND CONTAINING THE FOLLOWING MINIMUM PERCENTAGES, BY WEIGHT, OF PLANT FOOD NUTRIENTS.
4. MULCH
   A. MULCH SHALL BE FREE FROM NOXIOUS WEEDS, MOLD, AND OTHER DELETERIOUS MATERIALS.
   B. STRAW: STALKS FROM OATS, WHEAT, RYE, BARLEY. FURNISH IN AIR-DRY CONDITION AND OF PROPER CONSISTENCY FOR PLACING WITH COMMERCIAL MULCH BLOWING EQUIPMENT. STRAW SHALL CONTAIN NO FERTILE SEED.
   C. WOOD CELLULOSE FIBER MULCH: USE RECOVERED MATERIALS OF EITHER PAPER-BASED (100 PERCENT) OR WOOD-BASED (100 PERCENT) HYDRAULIC MULCH. PROCESSED TO CONTAIN NO GROWTH OR GERMINATION-INHIBITING FACTORS AND DYED AN APPROPRIATE COLOR TO FACILITATE VISUAL METERING OF MATERIALS APPLICATION. COMPOSITION ON AIR-DRY WEIGHT BASIS: 9 TO 15 PERCENT MOISTURE, PH RANGE FROM 5.5 TO 8.2. USE WITH HYDRAULIC APPLICATION OF GRASS SEED AND FERTILIZER.
5. WATER
   A. CLEAN FRESH POTABLE WATER
6. EROSION CONTROL MATERIALS
   A. EROSION CONTROL MATERIAL SHALL CONFORM TO THE FOLLOWING:

   1.1.1. EROSION CONTROL BLANKET: 70 PERCENT AGRICULTURAL STRAW/30 PERCENT JUTE FIBER MATRIX STITCHED WITH DEGRADABLE NETTINGS, DESIGNED TO DEGRADE WITHIN 18 MONTHS OR AS RECOMMENDED BY THE CIVIL ENGINEER WHICHEVER IF MORE STRINGENT. STRAW TO BE CERTIFIED FREE OF SEED OF INVASIVE WEED SPECIES.

   1.1.2. EROSION CONTROL FABRIC: FABRIC SHALL BE KNITTED CONSTRUCTION OF POLYPROPYLENE YARN WITH UNIFORM MESH OPENINGS 3/4 TO 1 INCH SQUARE WITH STRIPS OF BIODEGRADABLE PAPER OR AS RECOMMENDED BY THE CIVIL ENGINEER WHICHEVER IF MORE STRINGENT. FILLER PAPER STRIPS SHALL HAVE A MINIMUM LIFE OF 6 MONTHS.

   1.1.3. EROSION CONTROL NET: NET SHALL BE HEAVY, TWISTED JUTE MESH, OR AS RECOMMENDED BY THE CIVIL ENGINEER WHICHEVER IF MORE STRINGENT, WEIGHING APPROXIMATELY 1.22 POUNDS PER LINEAR YARD AND 4 FEET WIDE WITH MESH OPENINGS OF APPROXIMATELY 1 INCH SQUARE.

   1.1.4. EROSION CONTROL MATERIAL ANCHORS: EROSION CONTROL ANCHORS SHALL BE AS RECOMMENDED BY THE MANUFACTURER.

7. POST EMERGENT WEED CONTROL: POST EMERGENT WEED CONTROL: APPLY TRIMEC OR APPROVED EQUAL. USE OF MATERIAL MUST BE APPROVED PRIOR TO APPLICATION.

PLANTING NOTES CONTINUED ON SHEET L0.04

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

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CONCORD RESORT
PHASE 1 INFRASTRUCTURE
Town Of Thompson, New York
Sullivan County

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SCALE: N/A
NOTE: THIS DRAWING IS 30"X42". DO NOT SCALE DRAWINGS. USE FIGURED DIMENSIONS ONLY, OR SEEK CLARIFICATION FROM ARCHITECT FOR MEASUREMENTS THAT ARE NOT INDICATED.

DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
#####
PLANTING NOTES

PROJECT #: 11-532
DRAWN BY: SB, GH
CHECKED BY: AH
SHEET #: L0.03

Suzi Brenner, h:\2011\11-532 concord\6.0 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructureset - standard\L0.03 Planting Notes.dwg , Page Setup: Full Size_30 42_Window, HH.ctb, Plot Scale: 1:1, DWG To PDF.pc3

EXECUTION

PREPARATION

1. EXTENT OF WORK
PROVIDE SOIL PREPARATION (INCLUDING SOIL CONDITIONERS), FERTILIZING, AND SODDING OF ALL NEWLY GRADED FINISHED EARTH SURFACES, UNLESS INDICATED OTHERWISE, AND AT ALL AREAS INSIDE OR OUTSIDE THE LIMITS OF CONSTRUCTION THAT ARE DISTURBED BY THE CONTRACTOR'S OPERATIONS.

2. SOIL PREPARATION
PROVIDE 4 INCHES OF ON-SITE AMENDED TOPSOIL TO MEET INDICATED FINISH GRADE, 6 INCHES AT BIO RETENTION AREAS. AFTER AREAS HAVE BEEN BROUGHT TO INDICATED FINISH GRADE, INCORPORATE FERTILIZER, PH ADJUSTERS, SOIL CONDITIONERS INTO SOIL A MINIMUM DEPTH OF 4 INCHES BY DISKING, HARROWING, TILLING OR OTHER METHOD APPROVED BY THE CLIENT'S REPRESENTATIVE. REMOVE DEBRIS AND STONES LARGER THAN 3/4 INCH IN ANY DIMENSION REMAINING ON THE SURFACE AFTER FINISH GRADING. CORRECT IRREGULARITIES IN FINISH SURFACES TO ELIMINATE DEPRESSIONS. PROTECT FINISHED TOPSOIL AREAS FROM DAMAGE BY VEHICULAR OR PEDESTRIAN TRAFFIC.

3. SOIL CONDITIONER APPLICATION RATES
APPLY SOIL CONDITIONERS AT RATES AS DETERMINED BY LABORATORY SOIL ANALYSIS OF THE SOILS AT THE JOB SITE.

4. FERTILIZER APPLICATION RATES
APPLY FERTILIZER AT RATES AS DETERMINED BY LABORATORY SOIL ANALYSIS OF THE SOILS AT THE JOB SITE.

SEEDING

1. SEED APPLICATION SEASONS AND CONDITIONS
   - IMMEDIATELY BEFORE SEEDING, RESTORE SOIL TO PROPER GRADE.
   - APPLICATION OF THE HYDROSEED MIX WILL BE TIMED IN LATE SUMMER OR FALL OF THE YEAR TO COINCIDE W/ THE ONSET OF THE RAINY SEASONS & COOLER WEATHER, TO ACCELERATE THE GERMINATION RATE & SUCCESS OF THE MIX. NO SUPPLEMENTAL IRRIGATION OR FERTILIZATION IS TO BE PROVIDED TO BRING IN THE HYDROSEED.
   - DO NOT SEED WHEN GROUND IS MUDDY OR IN AN UNSATISFACTORY CONDITION FOR SEEDING. IF SPECIAL CONDITIONS EXIST THAT MAY WARRANT A VARIANCE IN THE ABOVE SEEDING DATES OR CONDITIONS, SUBMIT A WRITTEN REQUEST TO THE CLIENT'S REPRESENTATIVE STATING THE SPECIAL CONDITIONS AND PROPOSED VARIANCE.
   - APPLY SEED WITHIN TWENTY FOUR HOURS AFTER SEEDBED PREPARATION. SOW SEED BY APPROVED SOWING EQUIPMENT. SOW ONE-HALF THE SEED IN ONE DIRECTION, AND SOW REMAINDER AT RIGHT ANGLES TO THE FIRST SOWING.

2. SEED APPLICATION METHOD
   - SEEDING METHOD SHALL BE HYDROSEEDING.

3. HYDROSEEDING: FIRST, MIX WATER AND FIBER. WOOD CELLULOSE FIBER, PAPER FIBER, OR RECYCLED PAPER SHALL BE APPLIED AS PART OF THE HYDROSEEDING OPERATION. FIBER SHALL BE ADDED AT 1,000 POUNDS, DRY WEIGHT, PER ACRE. THEN ADD AND MIX SEED AND FERTILIZER TO PRODUCE A HOMOGENEOUS SLURRY. SEED SHALL BE MIXED TO ENSURE BROADCASTING AT THE RATE OF 4.5 LBS PER 1000 SQUARE FEET. WHEN HYDRAULICALLY SPRAYED ON THE GROUND, MATERIAL SHALL FORM A BLOTTER LIKE COVER IMPREGNATED UNIFORMLY WITH GRASS SEED. SPREAD WITH ONE APPLICATION WITH NO SECOND APPLICATION OF MULCH.

4. MULCHING: MULCHING SHALL BE ACHIEVED USING ANY OF THE FOLLOWING METHODS:
   - STRAW MULCH:STRAW MULCH SHALL BE SPREAD UNIFORMLY AT THE RATE OF 2 TONS PER ACRE. MULCH SHALL BE SPREAD BY HAND, BLOWER-TYPE MULCH SPREADER, OR OTHER APPROVED METHOD. MULCHING SHALL BE STARTED ON THE WINDWARD SIDE OF RELATIVELY FLAT AREAS OR ON THE UPPER PART OF STEEP SLOPES, AND CONTINUED UNIFORMLY UNTIL THE AREA IS COVERED. THE MULCH SHALL NOT BE BUNCHED OR CLUMPED. SUNLIGHT SHALL NOT BE COMPLETELY EXCLUDED FROM PENETRATING TO THE GROUND SURFACE. ALL AREAS INSTALLED WITH SEED SHALL BE MULCHED ON THE SAME DAY AS THE SEEDING. MULCH SHALL BE ANCHORED IMMEDIATELY FOLLOWING SPREADING.

   - MECHANICAL ANCHOR: MECHANICAL ANCHOR SHALL BE A V-TYPE-WHEEL LAND PACKER; A SCALLOPED-DISK LAND PACKER DESIGNED TO FORCE MULCH INTO THE SOIL SURFACE; OR OTHER SUITABLE EQUIPMENT.

   - ASPHALT ADHESIVE TACKIFIER: ASPHALT ADHESIVE TACKIFIER SHALL BE SPRAYED AT A RATE BETWEEN 10 TO 13 GALLONS PER 1000 SQUARE FEET. SUNLIGHT SHALL NOT BE COMPLETELY EXCLUDED FROM PENETRATING TO THE GROUND SURFACE.

   - NON-ASPHALTIC TACKIFIER: HYDROPHILIC COLLOID SHALL BE APPLIED AT THE RATE RECOMMENDED BY THE MANUFACTURER, USING HYDRAULIC EQUIPMENT SUITABLE FOR THOROUGHLY MIXING WITH WATER. A UNIFORM MIXTURE SHALL BE APPLIED OVER THE AREA.

5. APPLICATION OF WEED CONTROL:APPLY POST-EMERGENT WEED CONTROL TO NEW SEEDING AREAS ONLY. APPLY POST EMERGENT WEED CONTROL AT 1.2 TO 1.5 OUNCES PER 1000 SQUARE FEET, OR ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.

6. EROSION CONTROL MATERIAL: INSTALL IN ACCORDANCE PER CIVIL ENGINEER WITH MANUFACTURER'S INSTRUCTIONS.

7. WATERING: START WATERING AREAS SEEDED AS REQUIRED BY TEMPERATURE AND WIND CONDITIONS. APPLY WATER AT A RATE SUFFICIENT TO INSURE THOROUGH WETTING OF SOIL TO A DEPTH OF [2] INCHES WITHOUT RUN OFF. DURING THE GERMINATION PROCESS, SEED IS TO BE KEPT ACTIVELY GROWING AND NOT ALLOWED TO DRY OUT.

8. TIME LIMIT: THE HYDROSEEDING SLURRY COMPONENTS ARE NOT TO BE LEFT IN THE HYDROSEED MACHINE FOR MORE THAN 2 HOURS, FOR FEAR OF DESTRUCTION OF THE SEED. IF SLURRY COMPONENTS ARE LEFT FOR MORE THAN 2 HOURS IN THE MACHINE, THE CONTRACTOR SHALL ADD 50% MORE OF THE ORIGINALLY SPECIFIED SEED MIX TO ANY SLURRY MIX WHICH HAS NOT BEEN APPLIED WITHIN THE 2 HOURS AFTER MIXING. THE CONTRACTOR SHALL ADD 75% MORE OF THE ORIGINAL SEED MIX TO ANY SLURRY MIXTURE WHICH HAS NOT BEEN APPLIED WITHIN 6 HOURS AFTER MIXING. ANY SLURRY MIXTURE WHICH HAS NOT BEEN APPLIED WITHIN 8 HOURS AFTER MIXING SHALL BE REJECTED AND COMPLETELY RECHARGED WITH SEED. OFF-SITE DISPOSAL AND NEW SEED WILL BE AT CONTRACTOR'S EXPENSE.

ACCEPTANCE OF SEEDING

1. PROVISIONAL ACCEPTANCE:

PROVISIONAL ACCEPTANCE PERIOD SHALL BE DEFINED AS THE ELAPSED TIME BETWEEN APPLICATION OF SEED AND THE ESTABLISHMENT OF A GOOD, HEALTHY UNIFORM GROWTH OF GRASS. PROVISIONAL ACCEPTANCE WILL NOT OCCUR UNTIL THE SEEDED AREAS ARE WELL ESTABLISHED; EXHIBITING A VIGOROUS GROWING CONDITION, DEVOID OF BARE SPOTS GREATER THAN 1 SQUARE FOOT. IT WILL BE THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN SEEDING AREAS IN AN APPROVED CONDITION UNTIL PROVISIONAL ACCEPTANCE. THE CONTRACTOR SHALL KEEP ALL SEEDED AREAS WATERED AND IN GOOD CONDITION, RESEEDING IF AND WHEN NECESSARY DURING THE PROVISIONAL ACCEPTANCE PERIOD. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN NECESSARY DOCUMENTATION TO SHOW THAT PROVISIONAL ACCEPTANCE HAS BEEN GRANTED. THIS SHALL BE DONE UPON WRITTEN REQUEST SUBMITTED BY THE CONTRACTOR TO THE QUALITY CONTROL REPRESENTATIVE TO INSPECT GRASS WORK ON SITE. PROVISIONAL ACCEPTANCE WILL NOT BE GRANTED UNTIL CONTRACTOR HAS OBTAINED, IN WRITING, A STATEMENT FROM THE CLIENT'S REPRESENTATIVE INDICATING THAT GRASS IS SATISFACTORY UNDER THE TERMS OF THE PROVISIONAL ACCEPTANCE.

2. FINAL ACCEPTANCE:

FINAL ACCEPTANCE PERIOD SHALL BE DEFINED AS THE ELAPSED TIME BETWEEN PROVISIONAL ACCEPTANCE AND FINAL CLOSEOUT OF THE PROJECT. ALL SEEDED AREAS SHALL BE GUARANTEED BY THE CONTRACTOR FOR NOT LESS THAN ONE GROWING SEASON FROM THE TIME OF PROVISIONAL ACCEPTANCE. GROWING SEASON SHALL BE DEFINED AS FOLLOWS:

- IF PROVISIONAL ACCEPTANCE IS RECEIVED DURING APRIL, MAY, JUNE OR JULY, NEXT GROWING SEASON SHALL END ON OCTOBER 15.
- IF PROVISIONAL ACCEPTANCE IS RECEIVED DURING SEPTEMBER, OCTOBER, NOVEMBER OR DECEMBER, NEXT GROWING SEASON SHALL END ON JUNE 1.

AT THE END OF THE GUARANTEE PERIOD, INSPECTION WILL BE MADE BY THE QUALITY CONTROL REPRESENTATIVE UPON WRITTEN REQUEST SUBMITTED BY THE CONTRACTOR AT LEAST TEN (10) DAYS BEFORE THE ANTICIPATED DATE. AREAS NOT DEMONSTRATING SATISFACTORY STANDS, SATISFACTORY STANDS DEFINED AS 95% GROUNDCOVER OF ESTABLISHED SPECIES, (EXCEPT IF DAMAGED BY VANDALISM) AS DETERMINED, BY THE CLIENT'S REPRESENTATIVE, SHALL BE RENOVATED, RE-SEEDED, AND MAINTAINED MEETING ALL REQUIREMENTS AS SPECIFIED HEREIN.
AFTER ALL NECESSARY CORRECTIVE WORK HAS BEEN COMPLETED, THE CLIENT'S REPRESENTATIVE SHALL CERTIFY IN WRITING THE FINAL ACCEPTANCE OF THE GRASS AREA. DECISION OF OWNER AS TO THE NECESSITY TO REPLACE GRASS AREAS OR REPAIR ANY DEFECTS ON WORKMANSHIP, OR CAUSE OF ANY DESTRUCTION OR LOSS, IMPAIRMENT OR FAILURE TO FLOURISH, SHALL BE CONCLUSIVE AND BINDING UPON CONTRACTOR. REPLACEMENTS SHALL BE THE SAME AS SPECIFIED. ALL REPLACEMENTS SHALL BE PLANTED AS SPECIFIED HEREIN AT CONTRACTOR'S EXPENSE. "VANDALISM", AS NOTED ABOVE, IS INTENDED TO MEAN ANY ACTS, WHETHER INTENTIONAL OR ACCIDENTAL, BY OTHER PERSONS, WHICH CLEARLY RESULT IN DAMAGE, AND WHICH MAY REASONABLY BE CONSIDERED TO BE BEYOND THE CONTRACTOR'S REASONABLE CONTROL, AS DETERMINED BY THE QUALITY CONTROL REPRESENTATIVE.

Stan Brecnner, I:\2011\11-532 concord\(4) records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532 concord phI-infrastructure.rvt - standard\L0.04 Planting Notes.dwg , Page Setup: Full Size_30 x42_Window , HH.ctb, Plot Scale: 1:1, DWG To PDF.pc3

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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

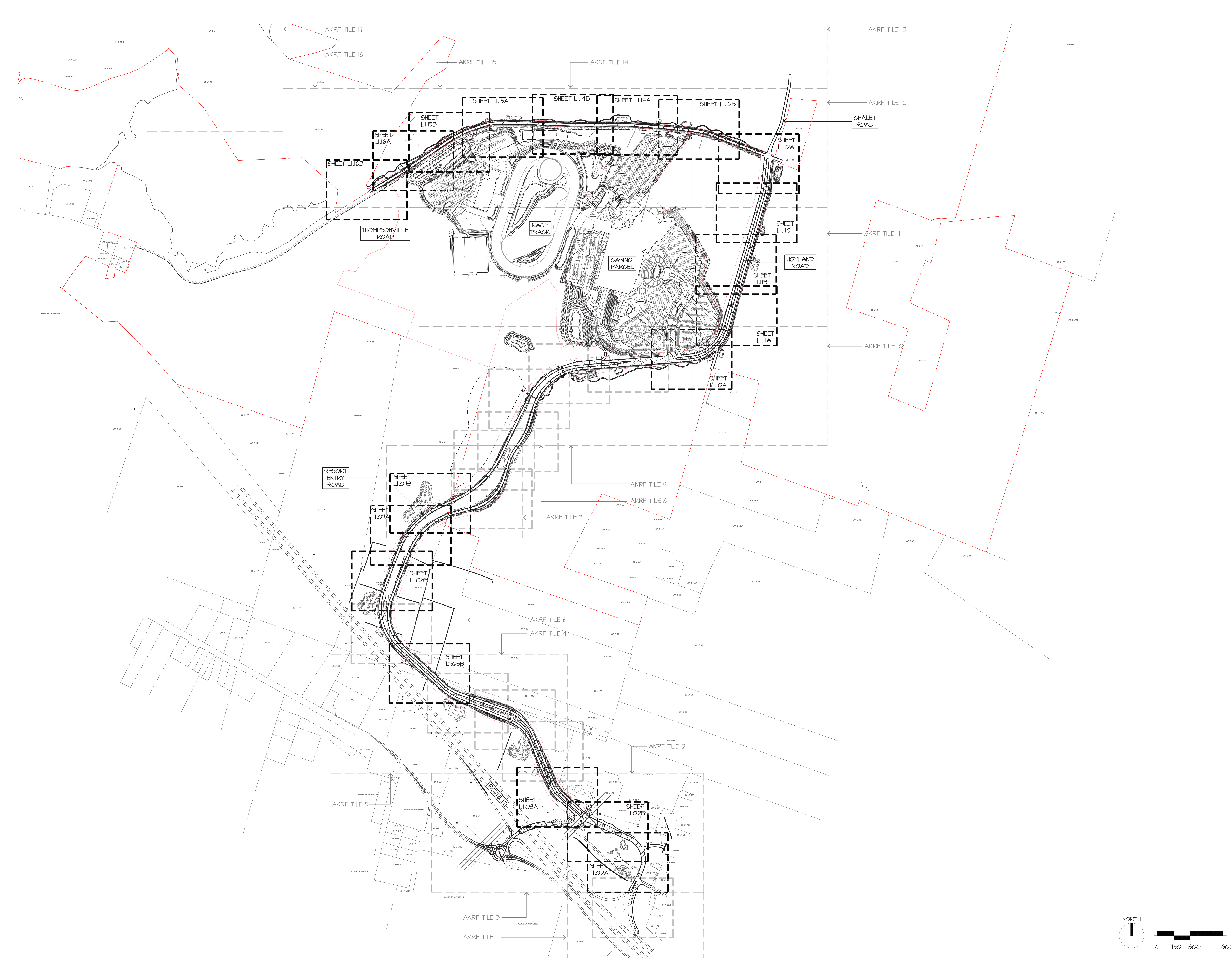
REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE: ##### PLANTING NOTES

PROJECT #: 11-532
DRAWN BY: SB, GH
CHECKED BY: AH

SHEET #: L0.04



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2/11/13	SITE PLAN SUBMISSION

REVISIONS

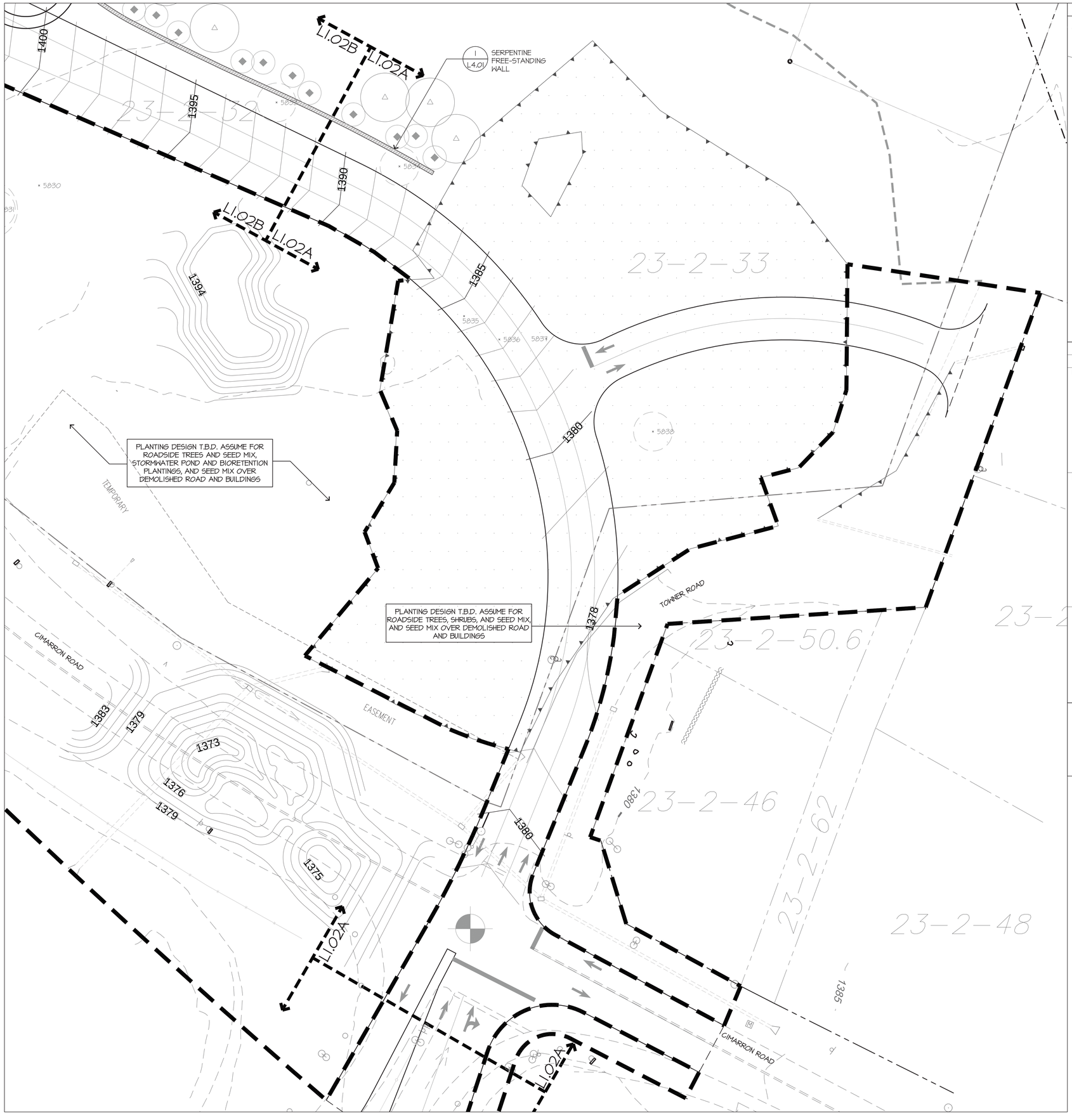
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:

LAYOUT PLAN INDEX SHEET

PROJECT #: 11-532
DRAWN BY: SB,GH
CHECKED BY: AH

SHEET #: L1.00



KEY PLAN

MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
		WALKING TRAIL	6' WIDE
		FUTURE PATH, N.I.C.	
		BOARDWALK AT WETLAND AREAS	6' WIDE 10' WIDE
WALLS/ FENCES:		ENTRY WALL	8'-0" HT.
		SERPENTINE FREE-STANDING WALL	5'-0" HT.
		SERPENTINE RETAINING WALL	1' TO 5' HT.
		EXISTING WALL	HT. VARIES, 18"-36"
		EXISTING WALL TO BE REPAIRED	HT. VARIES, 18"-36"
		FENCE	3'-0" HT.

NOTES:
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2. FOR SITE AND HARDSCAPE NOTES, SEE SHEET L0.01.

NORTH

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

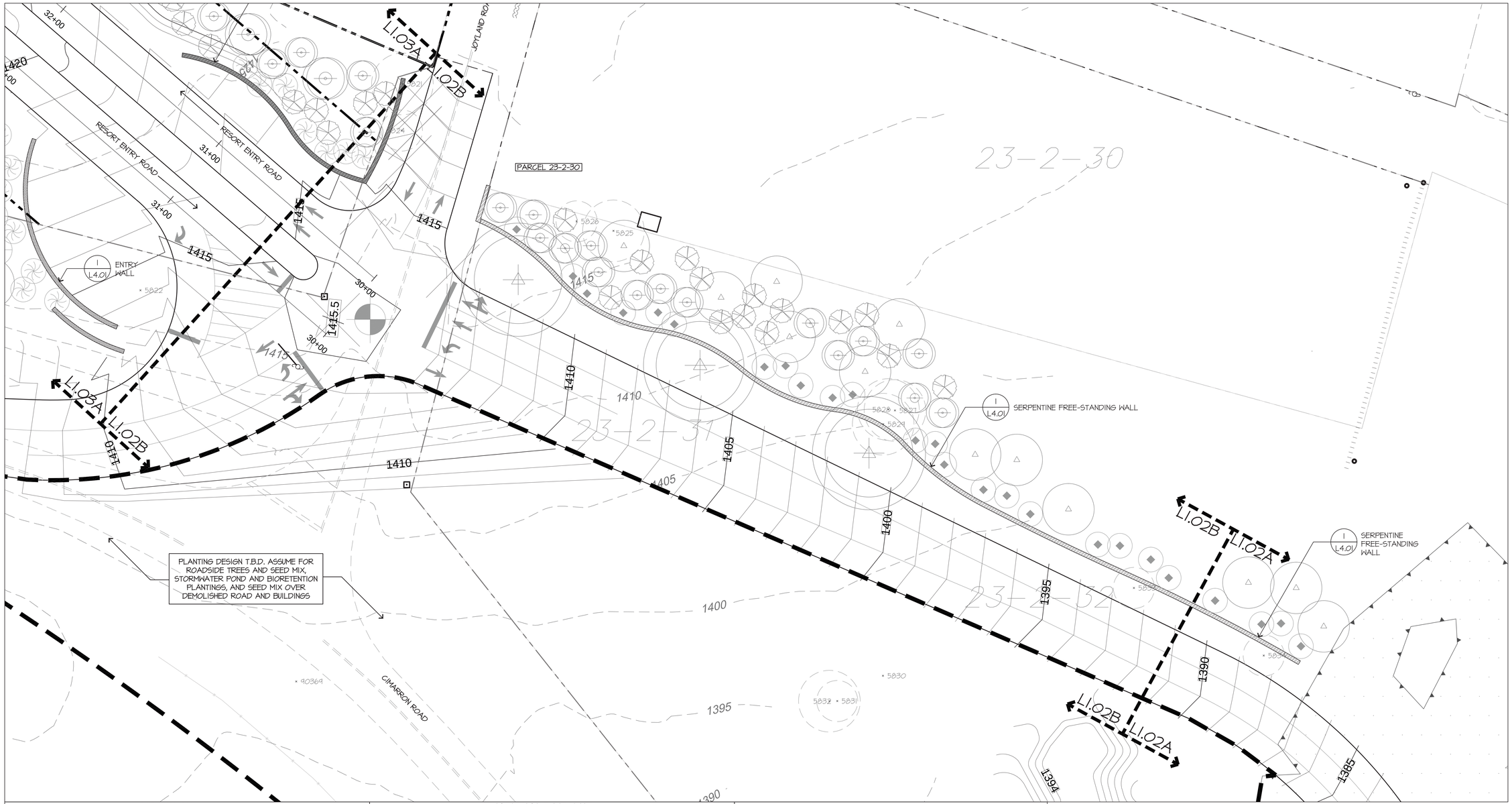
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN
TILE 2

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.02A

Sam Brenner, h:\2011\11-532 concord\(x0) records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L1.02A Hardscape Plan.dwg - Page Setup: Full Size_30"x42"_Window, HH.ctb, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN

MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
		WALKING TRAIL	6' WIDE
		FUTURE PATH, N.I.C.	
		BOARDWALK AT WETLAND AREAS	6' WIDE 10' WIDE
WALLS/ FENCES:		ENTRY WALL	8'-0" HT.
		SERPENTINE FREE-STANDING WALL	5'-0" HT.
		SERPENTINE RETAINING WALL	1' TO 5' HT.
		EXISTING WALL	HT. VARIES, 18"-36"
		EXISTING WALL TO BE REPAIRED	HT. VARIES, 18"-36"
		FENCE	3'-0" HT.

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2. FOR SITE AND HARDSCAPE NOTES, SEE SHEET L0.01.

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN TILE 2

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.02B

Stan Brenner, I:\2011\11-532 concord\GIS records\phase 1 infrastructure\2013\0327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L1.02B Hardscape Plan.dwg , Page Setup: Full Size_30x42_Window , 1101.ctb, Plot Scale: 1:1, DWG To PDF.pc3

PARCEL B

PARCEL 31-1-18

BIORETENTION AREA

STORMWATER MANAGEMENT POND

ROAD RIGHT OF WAY

RESORT ENTRY ROAD

PARCEL LINE

LOFLAND ROAD

L1.03A

L1.02B

3 / L4.01 SERPENTINE RETAINING WALL

1 / L4.01 ENTRY WALL

36+00 / 35+00 / 34+00 / 33+00 / 32+00 / 31+00 / 30+00

1400 1405 1410 1415 1420 1421 1425 1429 1415.5

KEY PLAN

MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
		WALKING TRAIL	6' WIDE
		FUTURE PATH, N.I.C.	
		BOARDWALK AT WETLAND AREAS	6' WIDE 10' WIDE
WALLS/ FENCES:		ENTRY WALL	8'-0" HT.
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2. FOR SITE AND HARDSCAPE NOTES, SEE SHEET L0.01.

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:

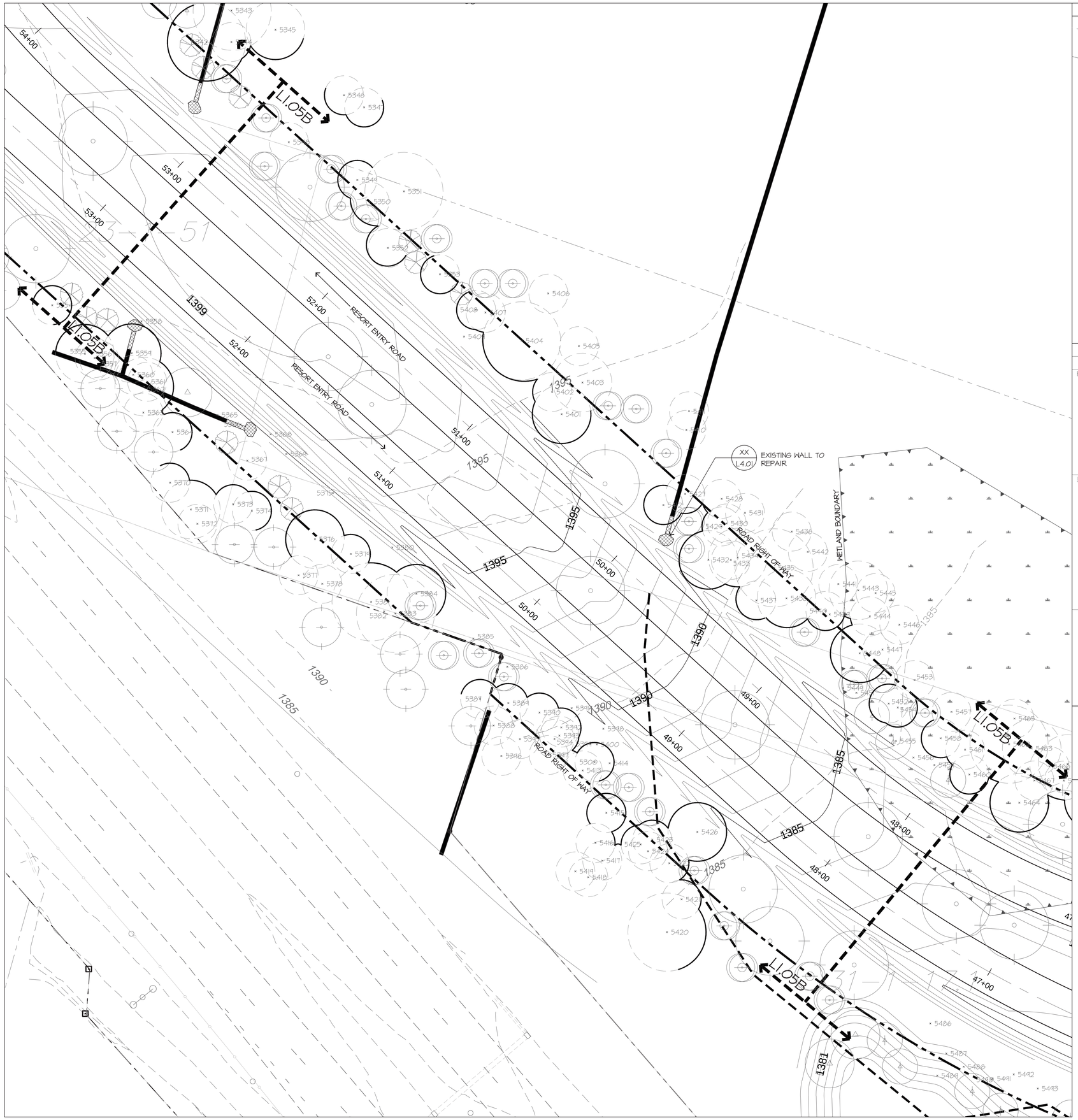
HARDSCAPE PLAN TILE 3

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: MH

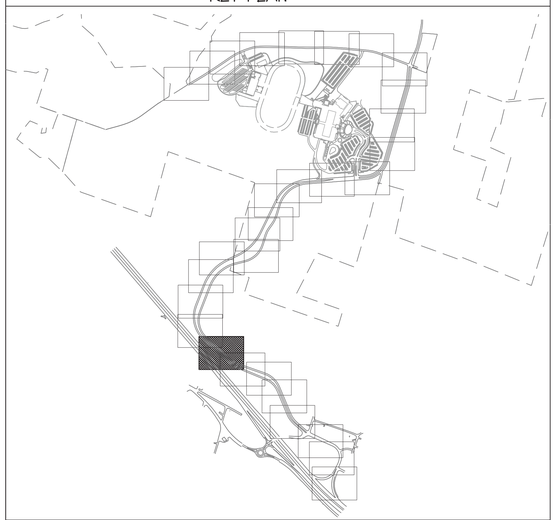
SHEET #:

L1.03A

Stan Brezenoff, Jr.\2011\11-532 concord\6.0 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L1.03A Hardscape Plan.dwg , Page Setup: Full Size_30 x 42, Window, , H11.ctb, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN



MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
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		FUTURE PATH, N.I.C.	
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2. FOR SITE AND HARDSCAPE NOTES, SEE SHEET L0.01.

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

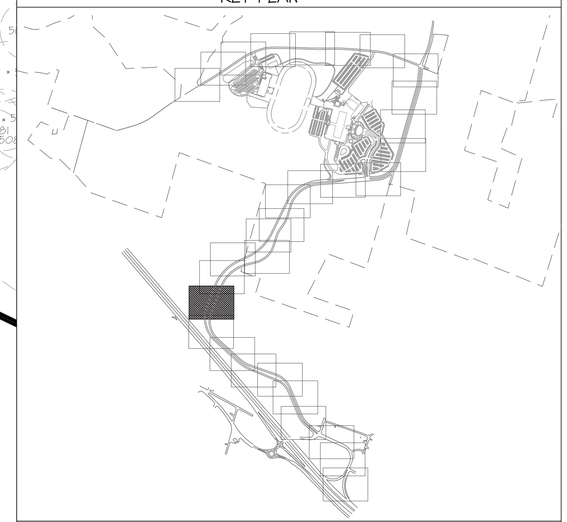
DRAWING TITLE:
HARDSCAPE PLAN TILE 5

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.05B

Suzi Brenner, h:\2011\11-532 concord\(4) records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L1.05B Hardscape Plan.dwg , Page Setup: Full Size_30 x 42_Window, HH eth, Plot Scale: 1:1, DWG To PDF.pc3

KEY PLAN



MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
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NO	DATE	ISSUE
1	3/27/15	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN
TILE 6

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.06B

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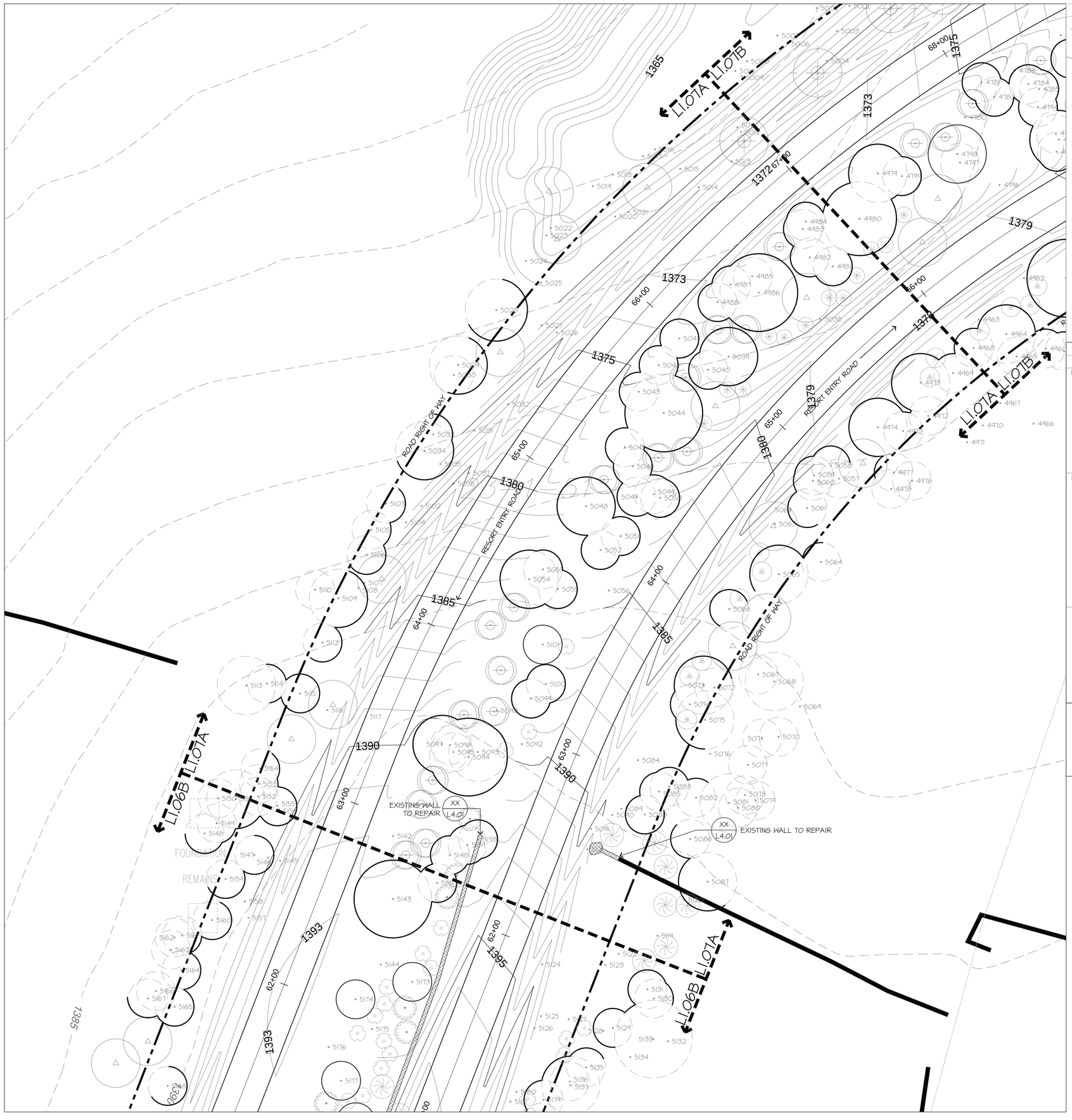
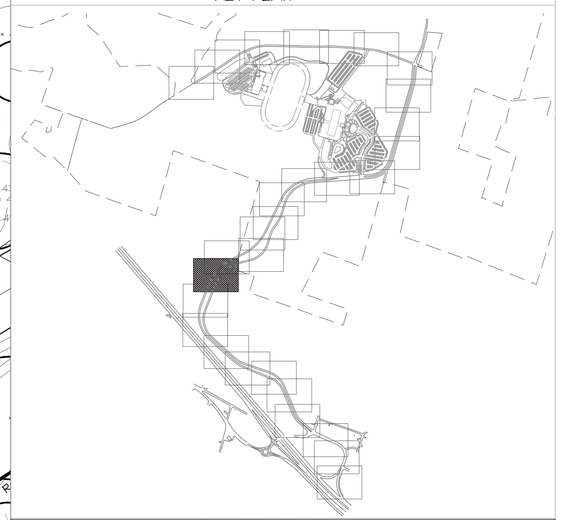


KEY PLAN



MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
		WALKING TRAIL	6' WIDE
		FUTURE PATH, N.I.C.	
		BOARDWALK AT WETLAND AREAS	6' WIDE 10' WIDE
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DRAWING TITLE:
HARDSCAPE PLAN TILE 7

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.07A

Stan Brecznyc, h:\2011\11-532 concord\1.0 records\phase 1 infrastructure\1.2013\0327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L1.07A Hardscape Plan.dwg , Page Setup: Full Size_30 x 42_Window, 1:1 Left, Plot Scale: 1.0000

FUTURE DEVELOPMENT - RV PARK

EXISTING BOULDERS TO BE PRESERVED

STORMWATER MANAGEMENT POND

BOULDER

ROAD RIGHT OF WAY

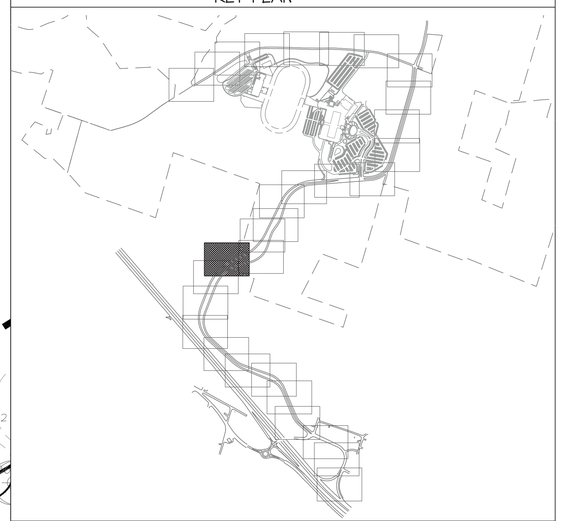
RESORT ENTRY ROAD

L1.07A L1.07B

1355 1358 1360 1362 1364 1365 1369 1370 1372 1373 1375 1378 1379 1380 1385 1390 1395

71+00 69+00 68+00 67+00 66+00 65+00

KEY PLAN



MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
		WALKING TRAIL	6' WIDE
		FUTURE PATH, N.I.C.	
		BOARDWALK AT WETLAND AREAS	6' WIDE 10' WIDE
WALLS/ FENCES:		ENTRY WALL	8'-0" HT.
		SERPENTINE FREE-STANDING WALL	5'-0" HT.
		SERPENTINE RETAINING WALL	1' TO 5' HT.
		EXISTING WALL	HT. VARIES, 18"-36"
		EXISTING WALL TO BE REPAIRED	HT. VARIES, 18"-36"
		FENCE	3'-0" HT.

NOTES:
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2. FOR SITE AND HARDSCAPE NOTES, SEE SHEET L0.01.

NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

HART | HOWERTON
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E-mail: NY@harthowerton.com

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Tel: 914 949 7336

atelier lumiere
13 West 17th St. #901
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CONCORD RESORT
PHASE 1 INFRASTRUCTURE
Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

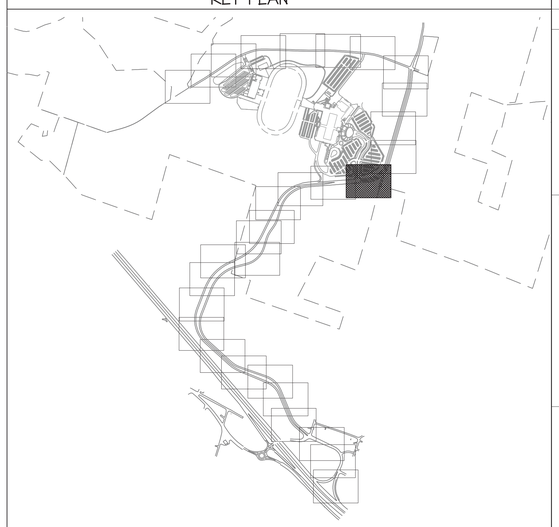
DRAWING TITLE:
HARDSCAPE PLAN TILE 7

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.07B

Stan Brenner, h:\2011\11-532 concord\1.0 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L1.07B Hardscape Plan.dwg , Page Setup: Full Size_30x42_Window, HH refs, Plot Scale: 1:1, DWG To PDF.pc3

KEY PLAN



MATERIALS LEGEND:

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HARDSCAPE:		SHARED USE PATH	10' WIDE
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CONCORD RESORT
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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

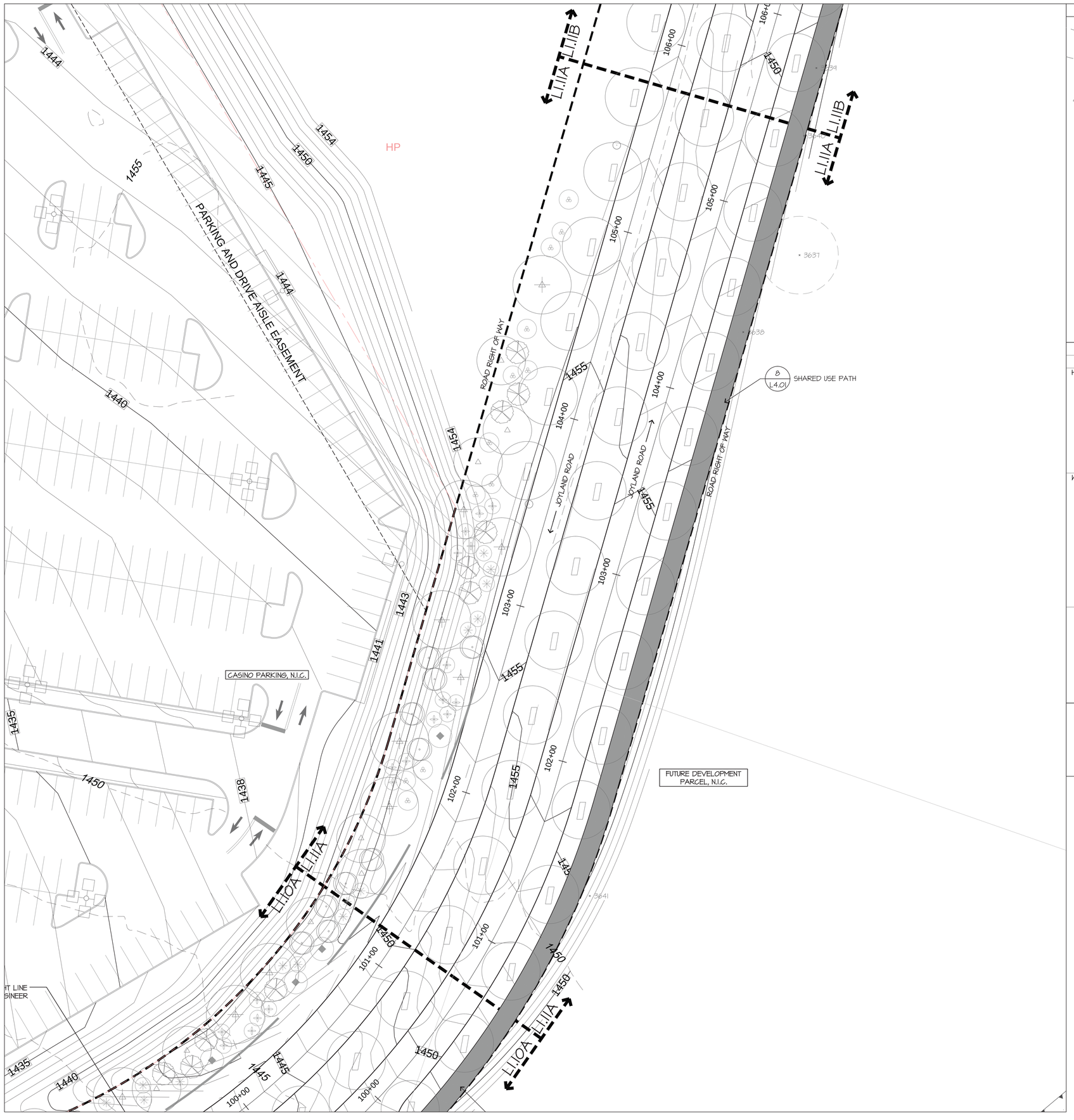
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN TILE 10

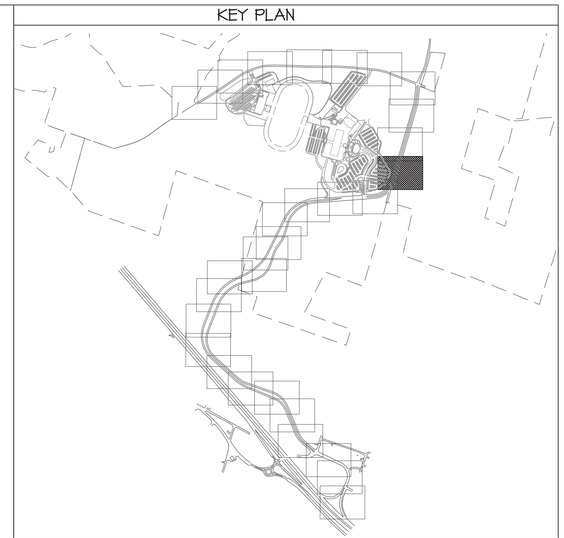
PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.10A

Sara Brenner, Jr:\2011\11-532 concord\03 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L1.10A Hardscape Plan.dwg - Page Setup: Full Size_30 x42_Window, 1:1 cds, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN



MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN TILE 11

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.11A

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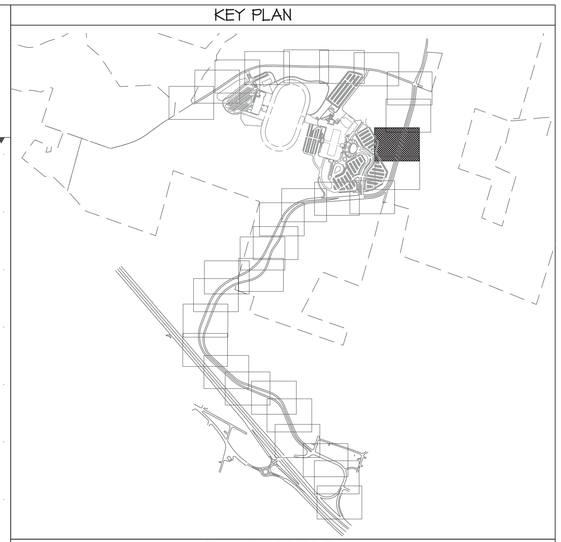
KEY PLAN



MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

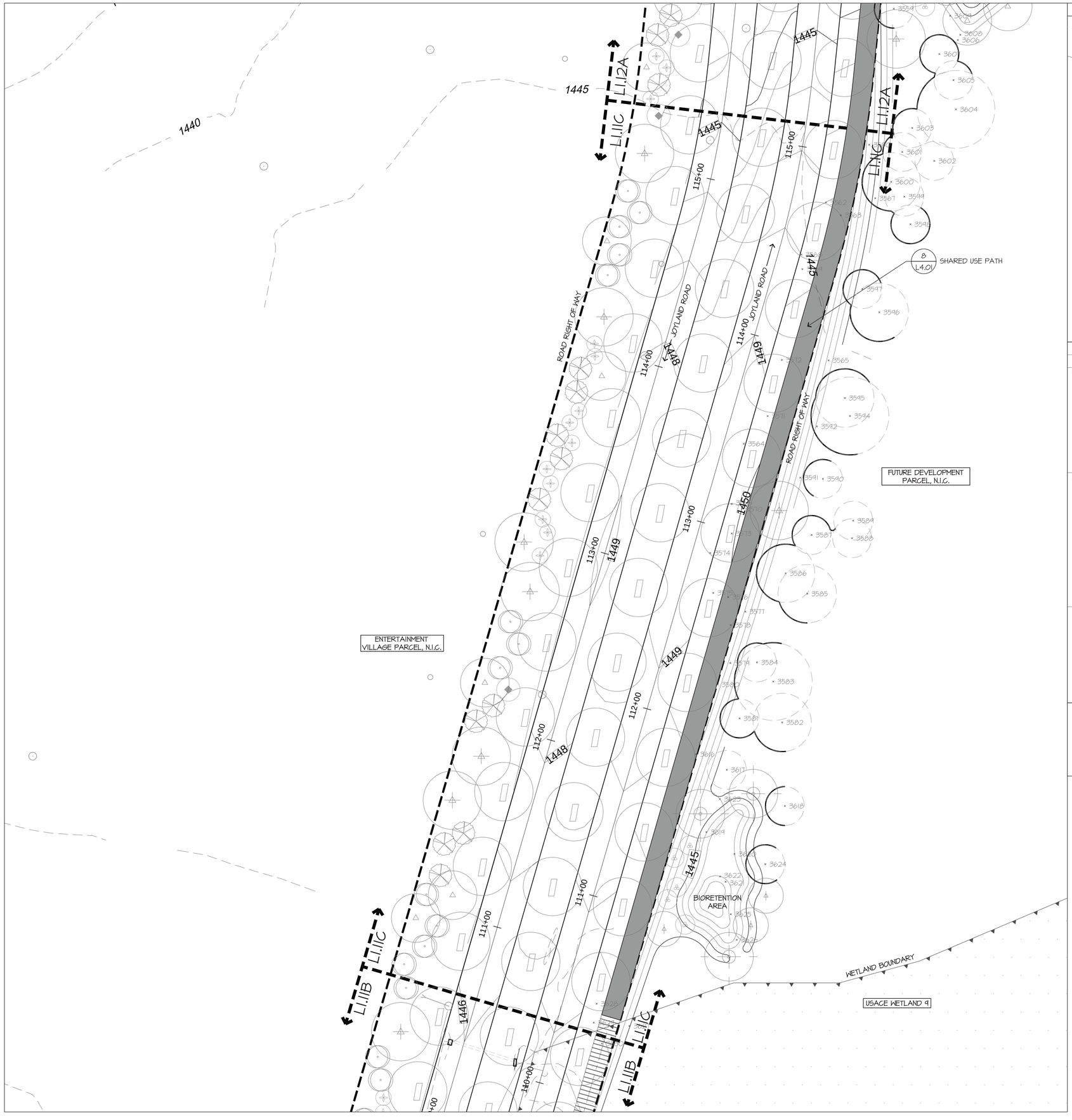
REVISIONS		
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN TILE 11

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.11B

Stan Brenner, I:\2011\11-532 concord\GA records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure.rcst - standard\L1.11B Hardscape Plan.dwg , Page Setup: Full Size_30 x42_Window, HH.ctb, Plot Scale: 1:1, DWG To PDF.pc3



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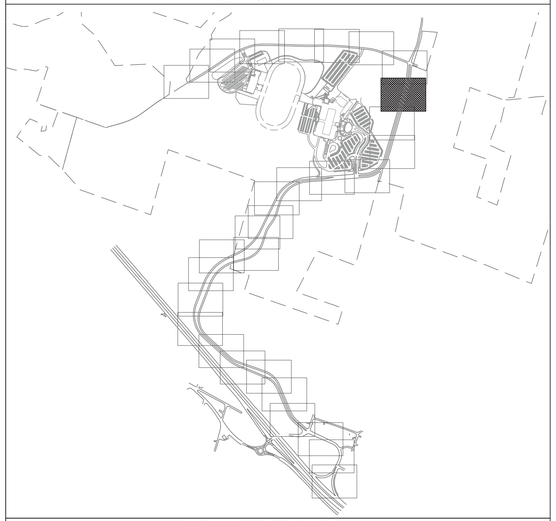

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	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

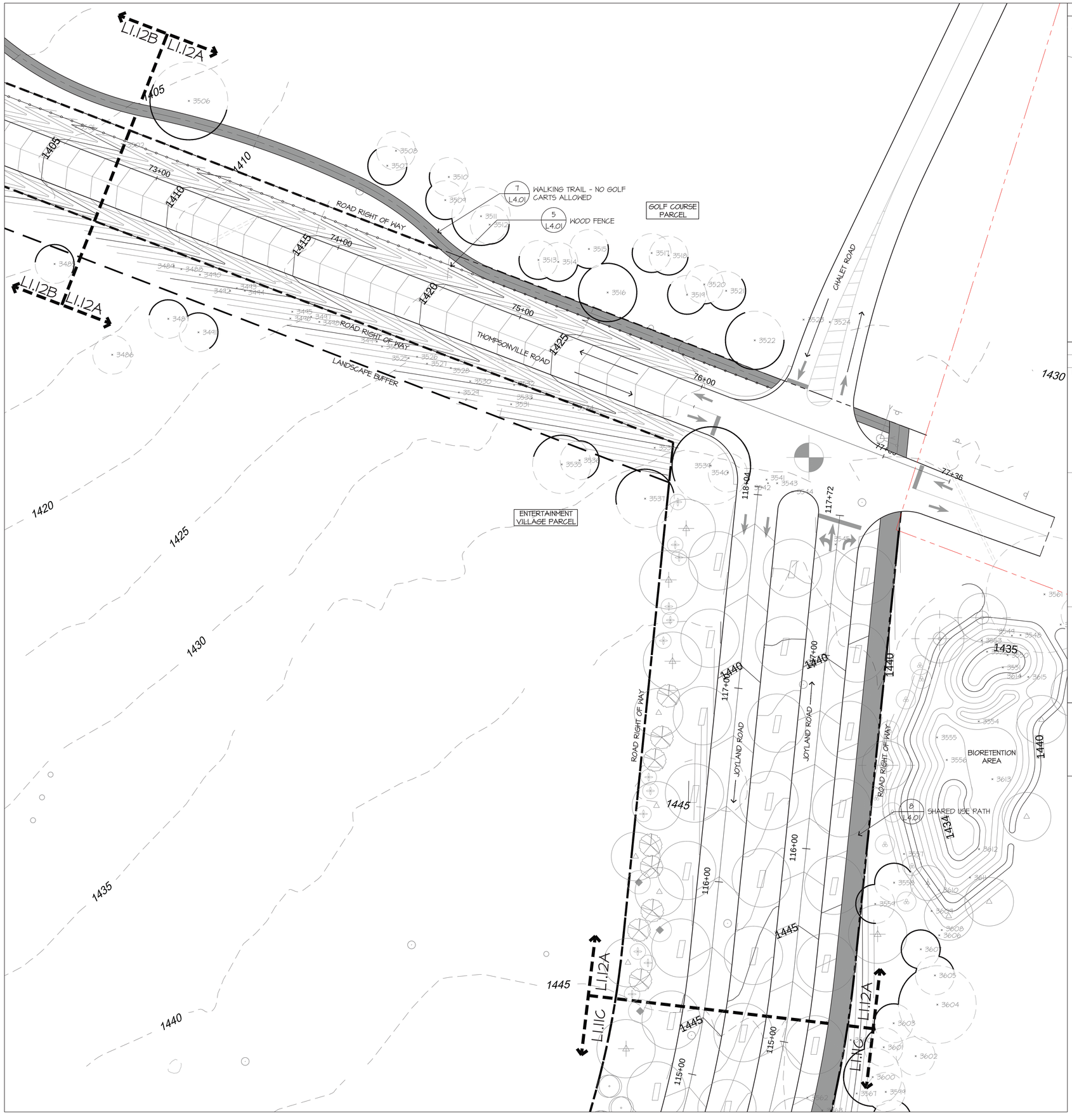
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN
TILE 11

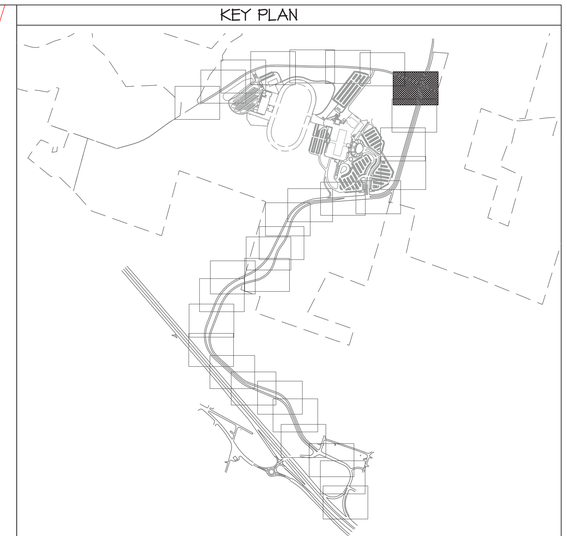
PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: MH

SHEET #:
L1.11C

Stan Brenner, Jr.\2011\11-532 concord\GIS records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.mxd - standard\L1.1 1C Hardscape Plan.dwg , Page Setup: Full Size_30 x 42, Window, 1111.ctb, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN



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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN TILE 12

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.12A

Sara Brenner, h:\2011\11-532 concord\c07 records \phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.set - standard\L1.12A Hardscape Plan.dwg - Page Setup: Full Size_30 42_Window, HH1.ctb, Plot Scale: 1:1, DWG To PDF.pc3

KEY PLAN

MATERIALS LEGEND:

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HARDSCAPE:		SHARED USE PATH	10' WIDE
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REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN
TILE 12

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: MH

SHEET #:
L1.12B

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7 L4.01 WALKING TRAIL - NO GOLF CARTS ALLOWED

6 L4.01 BOARDWALK

5 L4.01 WOOD FENCE

GOLF COURSE PARCEL

WETLAND BOUNDARY

USACE WETLAND 34

BIORETENTION AREA

ROAD RIGHT OF WAY

THOMPSONVILLE ROAD

LANDSCAPE BUFFER

USACE WETLAND 33A

USACE WETLAND 33B

CASINO PARCEL, N.I.C.

CASINO PARKING, N.I.C.

ROCK

L1.14B L1.14A

L1.14A L1.12B

61+00 62+00 63+00 64+00 65+00 66+00 67+00 68+00

1349 1350 1348 1355 1360 1365 1368 1370 1375

KEY PLAN

MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

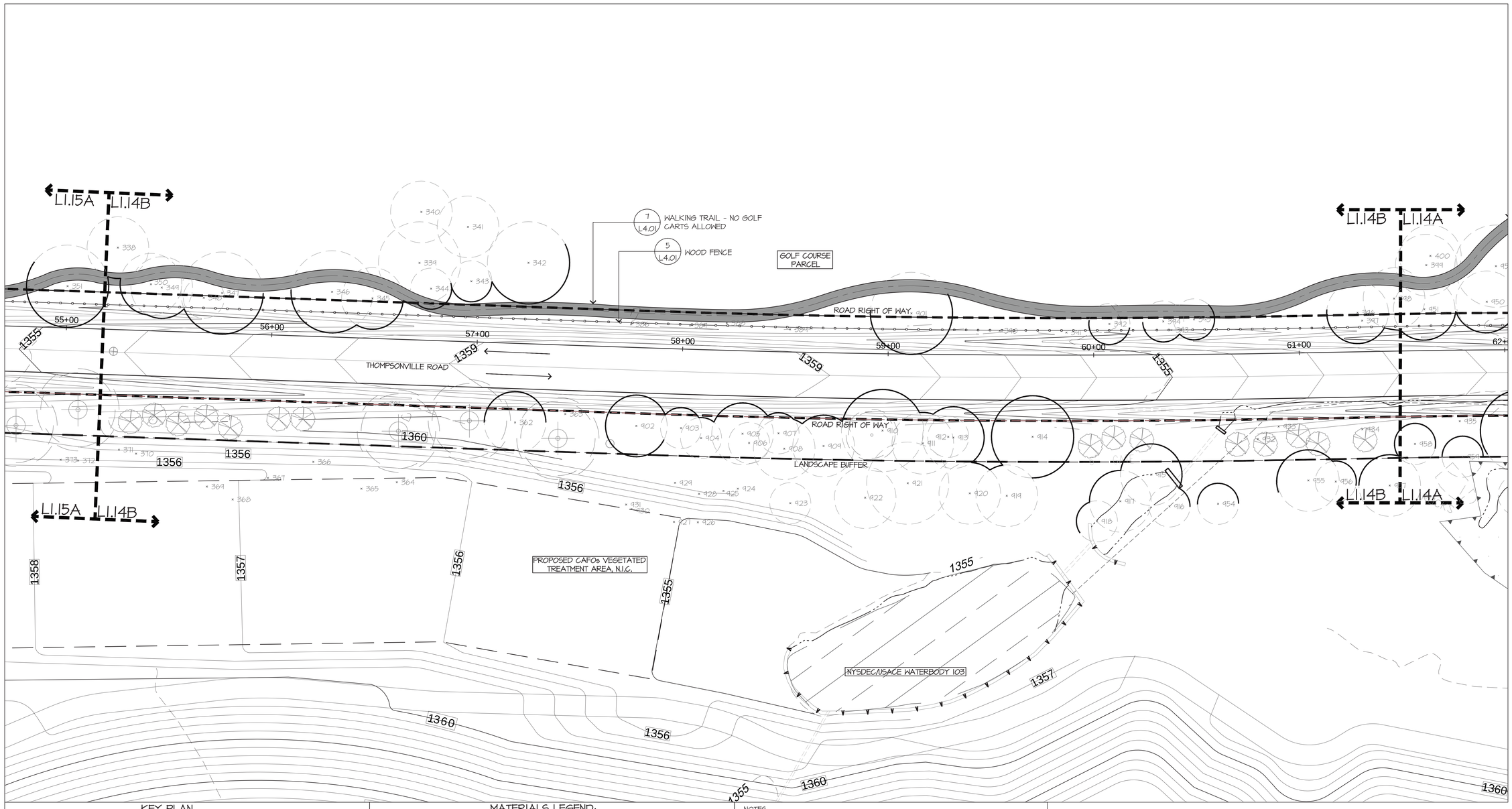
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN TILE 14

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.14A

Stan Brenner, I:\2011\11-532 concord\GIS records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L1.14A Hardscape Plan.dwg - , Page Setup: Full Size_36"x42"_Window, 1101.ctb, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN

MATERIALS LEGEND:

	SYMBOL	ITEM	SIZE
HARDSCAPE:		SHARED USE PATH	10' WIDE
		WALKING TRAIL	6' WIDE
		FUTURE PATH, N.I.C.	
		BOARDWALK AT WETLAND AREAS	6' WIDE 10' WIDE
WALLS/ FENCES:		ENTRY WALL	8'-0" HT.
		SERPENTINE FREE-STANDING WALL	5'-0" HT.
		SERPENTINE RETAINING WALL	1' TO 5' HT.
		EXISTING WALL	HT. VARIES, 18"-36"
		EXISTING WALL TO BE REPAIRED	HT. VARIES, 18"-36"
		FENCE	3'-0" HT.

NOTES:
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2. FOR SITE AND HARDSCAPE NOTES, SEE SHEET L0.01.

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

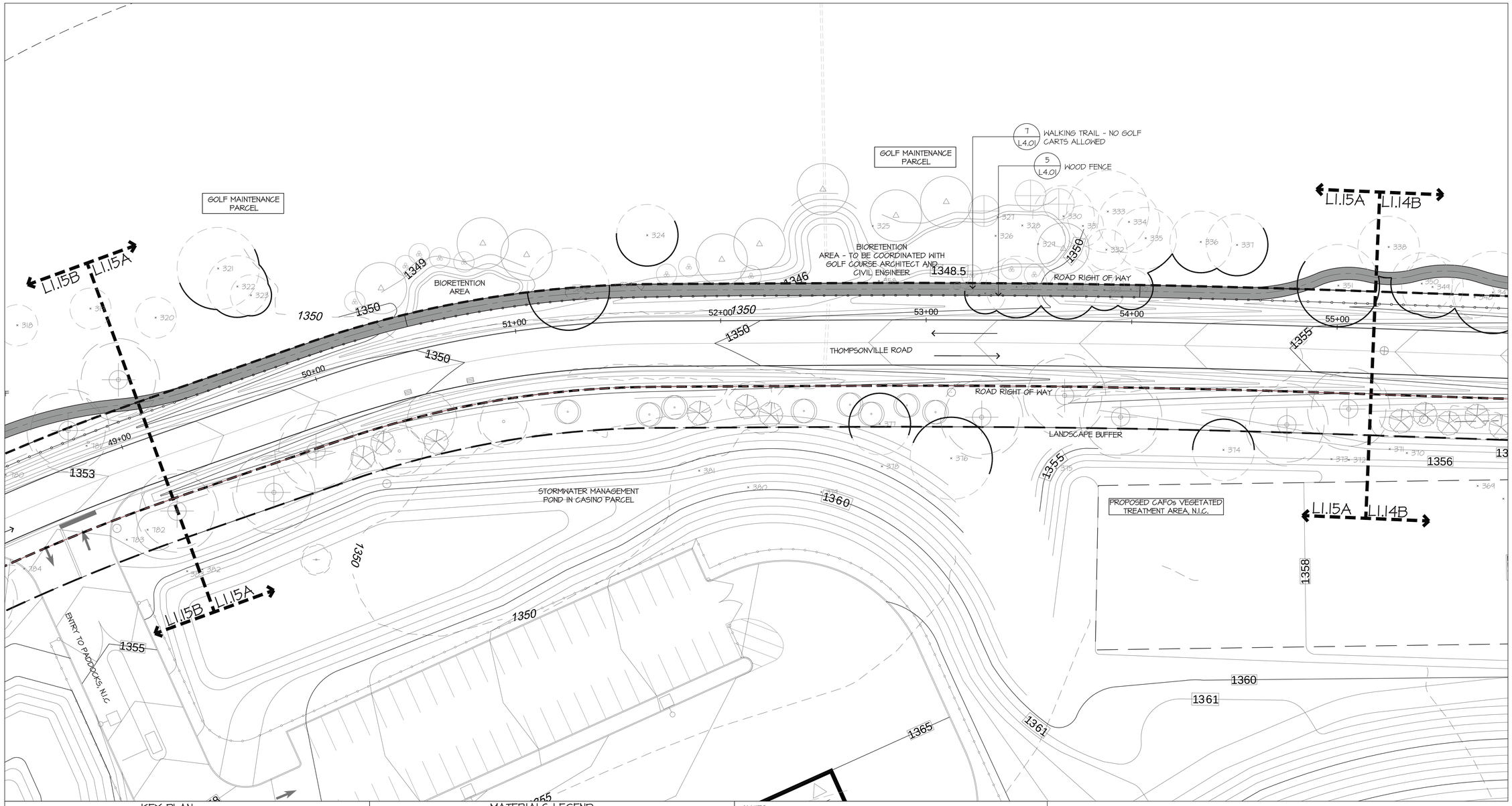
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN TILE 14

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.14B

Stan Brenner, I:\2011\11-532 concord\(6) records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructurexrs - standard\L1.14B Hardscape Plan.dwg , Page Setup: Full Size_30-42_Window, HH.ctb, Plot Scale: 1:1, DWG To PDF.pc3



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DATE	ISSUE
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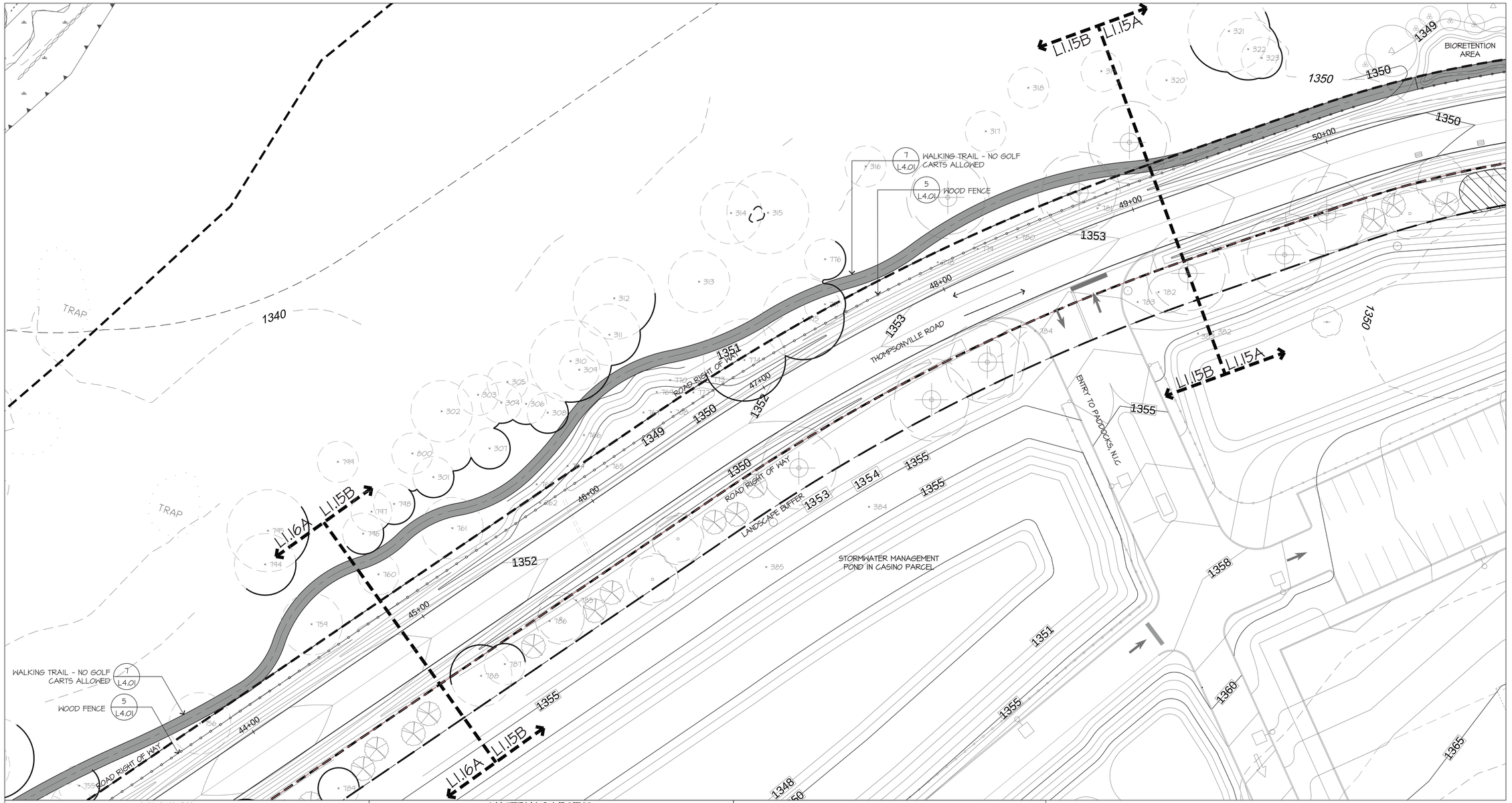
REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN
TILE 15

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH
SHEET #:
L1.15A

Stan Brezenec, Jr.\2011\11-532 concord\6.0 records\phase 1 infrastructure\\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.set - standard\L1.15A Hardscape Plan.dwg , Page Setup: Full Size_30 x 42_Window, , HH.ctb, Plot Scale: 1:1, DWG To PDF.pc3



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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

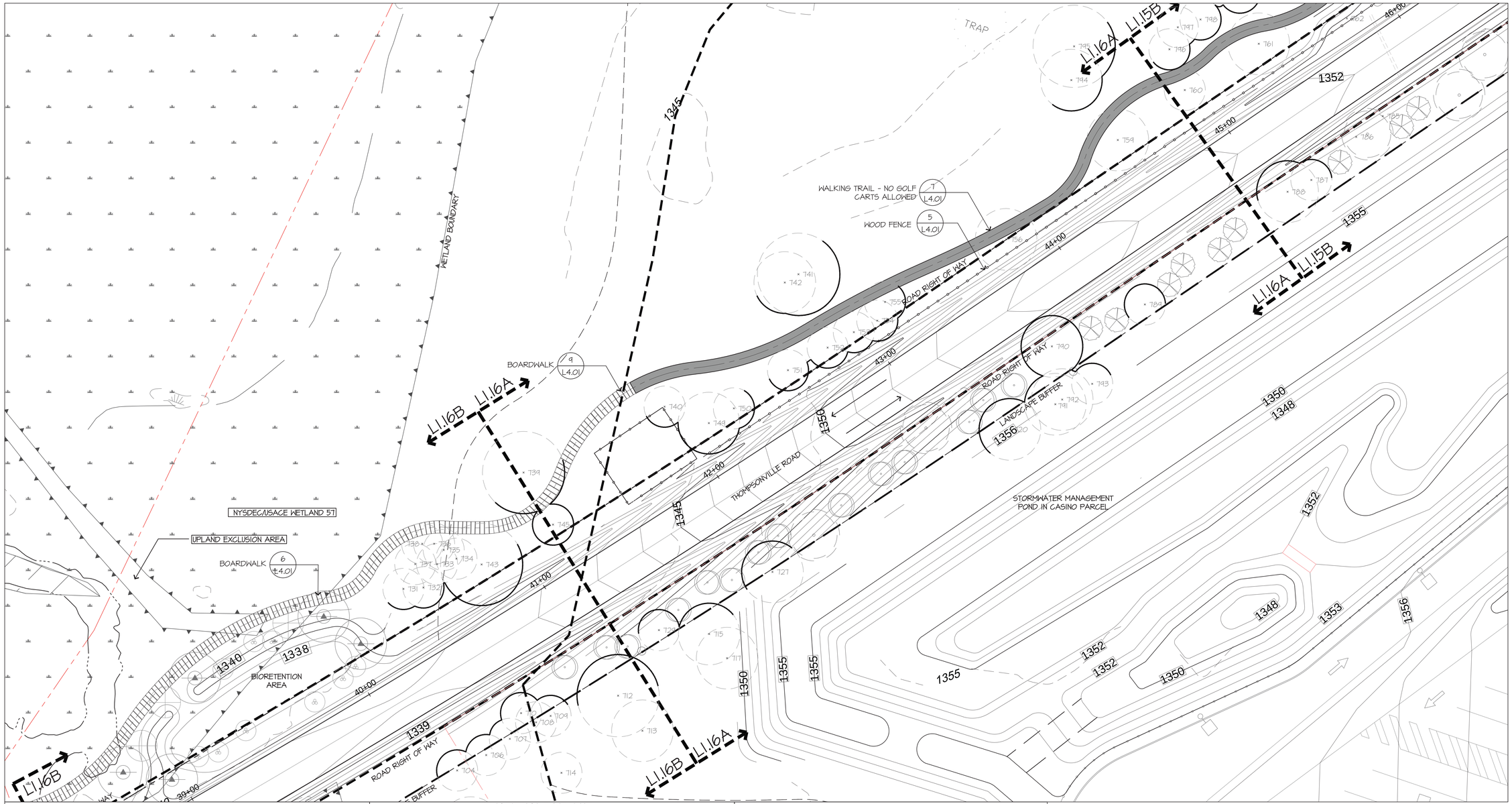
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
HARDSCAPE PLAN
TILE 15

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.15B

Stan Brezner, h:\2011\11-532 concord\(x6 records\phase 1 infrastructure\x20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L1.15B HardscapePlan.dwg , Page Setup: Full Size_30x42_Window, 1Hfeth, Plot Scale: 1:1, DWG To PDF.pc3



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REVISIONS

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DRAWING TITLE:
HARDSCAPE PLAN TILE 16

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.16A

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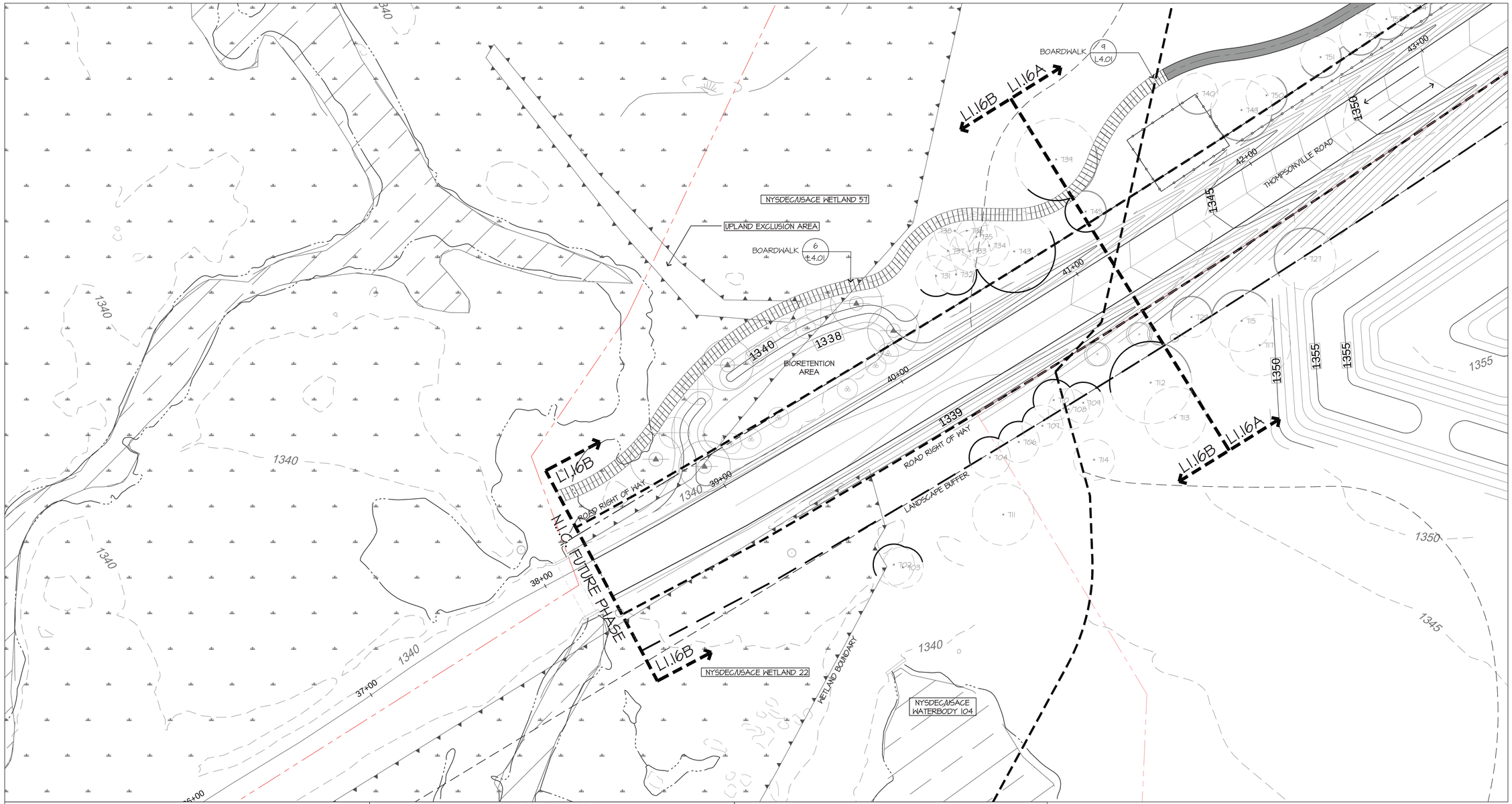

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REVISIONS

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DRAWING TITLE:
HARDSCAPE PLAN TILE 16

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L1.16B

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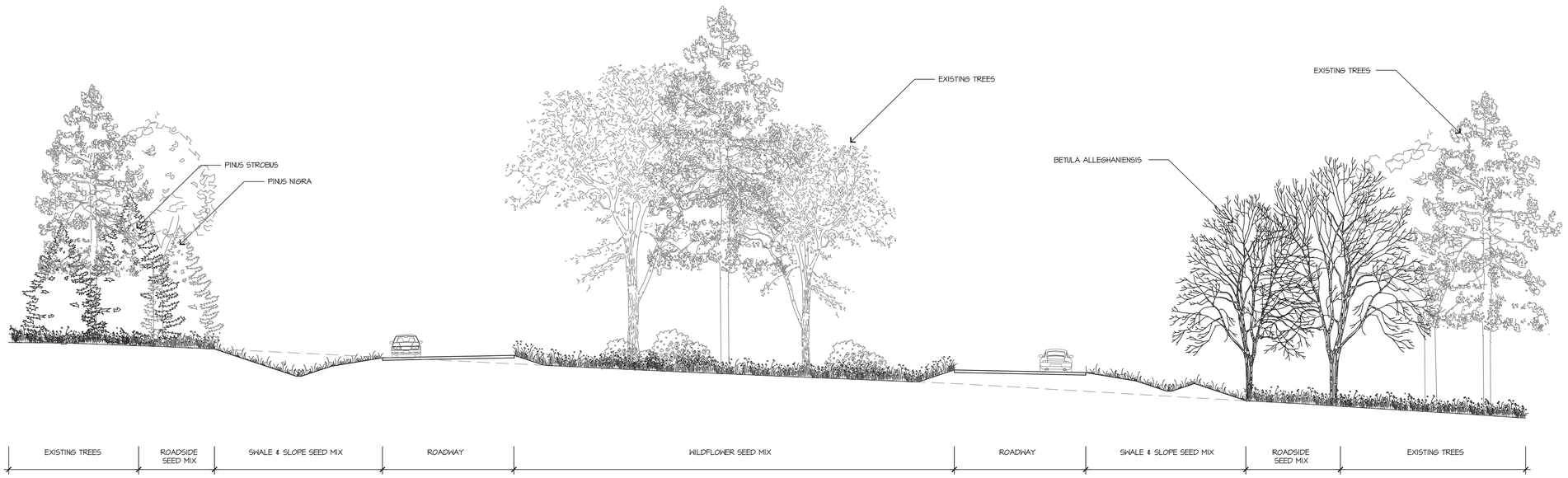
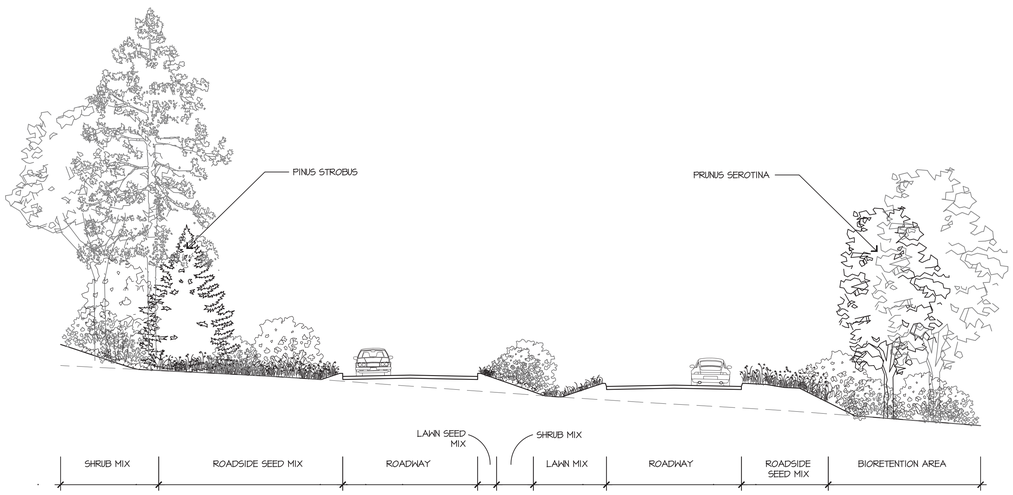
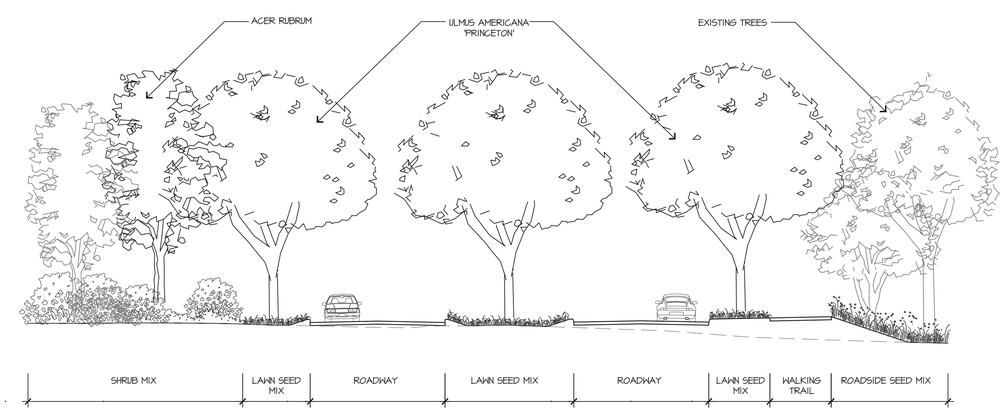


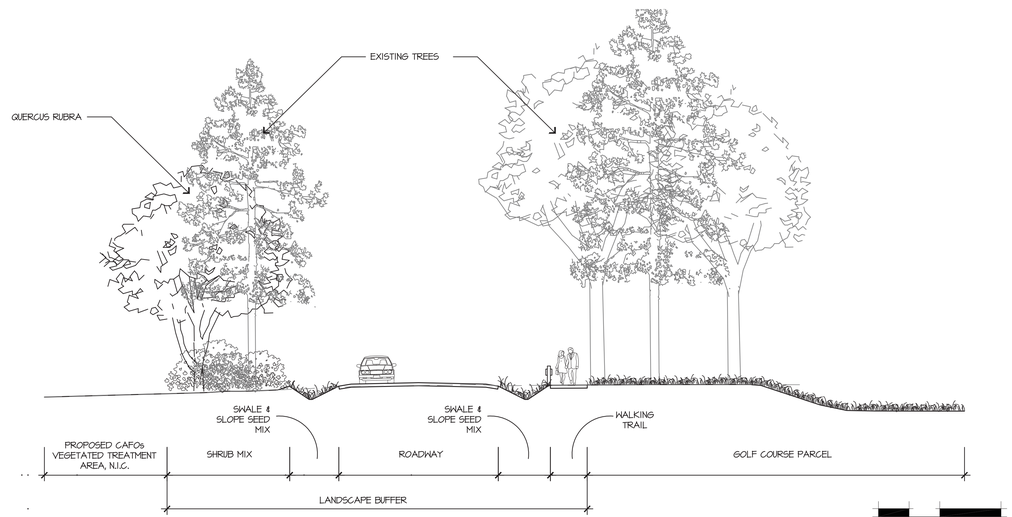
1. SECTION AT ROAD STATION 78+50



2. SECTION AT ROAD STATION 91+50



3. SECTION AT ROAD STATION 112+00



4. SECTION AT ROAD STATION 58+00 (THOMPSONVILLE ROAD)

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DATE	ISSUE
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DRAWING TITLE:
LANDSCAPE SECTIONS

PROJECT #: 11-532
DRAWN BY: GH
CHECKED BY: AH

SHEET #:
L2.01

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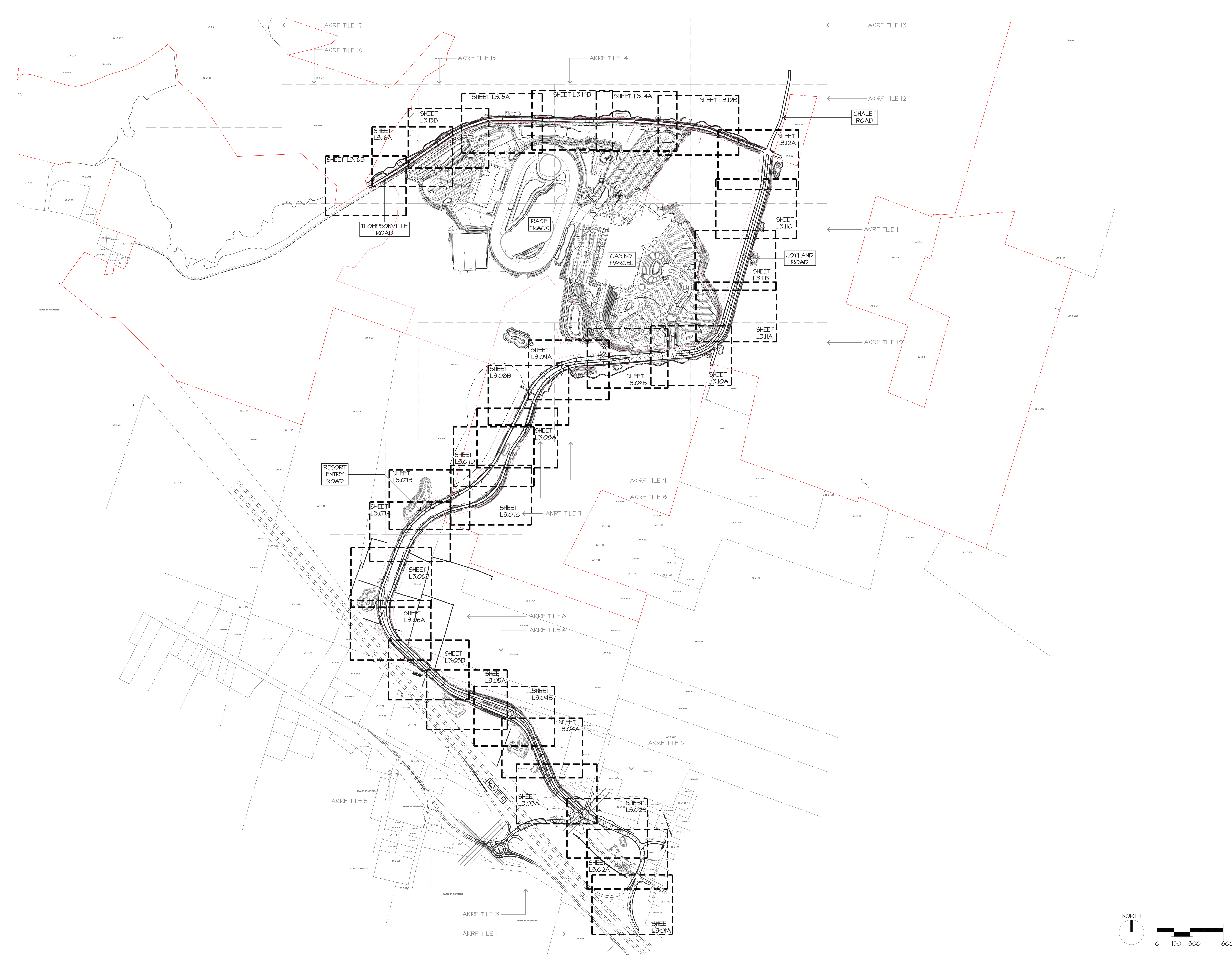

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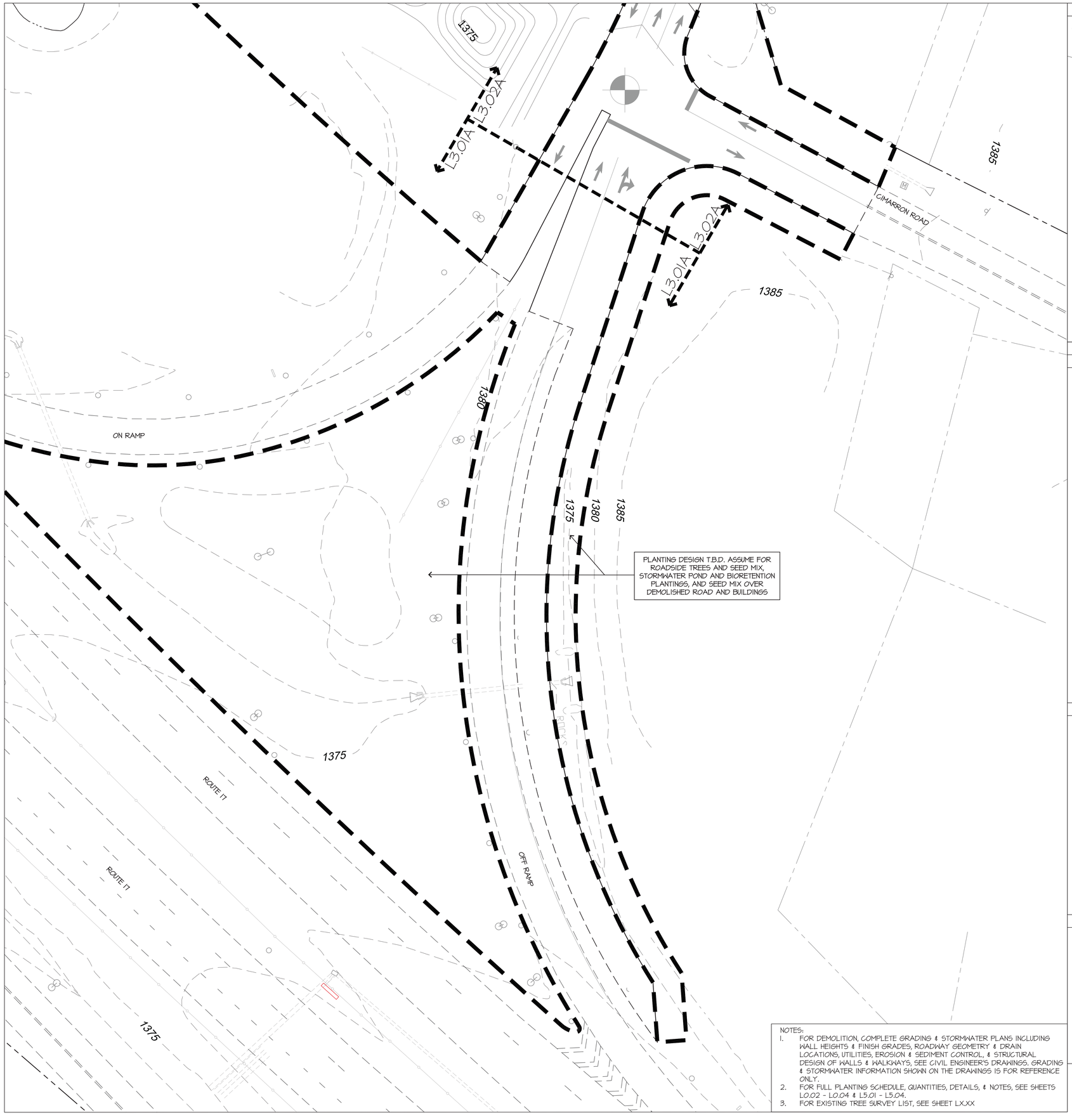
DRAWING TITLE:
PLANTING PLAN INDEX SHEET

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #: L3.00



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2. FOR FULL PLANTING SCHEDULE, QUANTITIES, DETAILS, & NOTES, SEE SHEETS L0.02 - L0.04 & L5.01 - L5.04.
3. FOR EXISTING TREE SURVEY LIST, SEE SHEET LX.XX

KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
BETULA ALLEGHANIENSIS	YELLOW BIRCH
BETULA PAPYRIFERA	PAPER BIRCH
FRAXINUS AMERICANA	WHITE ASH
JUNIPERUS VIRGINIANA	EASTERN REDCEDAR
NYSSA SYLVATICA	BLACK GUM
PICEA GLAUCA	WHITE SPRUCE
PINUS NIGRA	AUSTRIAN PINE
PINUS STROBUS	EASTERN WHITE PINE
PRUNUS SEROTINA	BLACK CHERRY
QUERCUS PALUSTRIS	PIN OAK
QUERCUS RUBRA	RED OAK
TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN
ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM
34" EXISTING TREE TO REMAIN	

ORNAMENTAL TREES, SHRUBS AND SHRUB MIXES:

AMELANCHIER ARBOREA	SERVICEBERRY
AMELANCHIER CANADENSIS	SHADBUSH SERVICEBERRY
CERCIS CANADENSIS	EASTERN REDBUD
CORNUS KOUSA 'AURORA'	'AURORA' DOGWOOD
HAMAMELIS VIRGINIANA	WITCHHAZEL
ILEX VERTICILLATA	AMERICAN WINTERBERRY
LINDERA BENZOIN	COMMON SPICE BUSH
RHODODENDRON MAXIMUM	ROSEBAY RHODODENDRON
SHRUB MIX A: SCREEN BUFFER PLANTING	SHRUB MIX C: THOMPSONVILLE ROAD
SHRUB MIX B: WOODLAND EDGE 1	SHRUB MIX D: WOODLAND EDGE 2
SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	ENTRY WALL

SEED AND GROUNDCOVER MIXES:

SWALE AND SLOPE SEED MIX	STORMWATER POND - EMBANKMENT
ROADSIDE SEED MIX	STORMWATER POND - SIDES
LAWN SEED MIX	WETLAND SEED MIX
MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NORTH

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

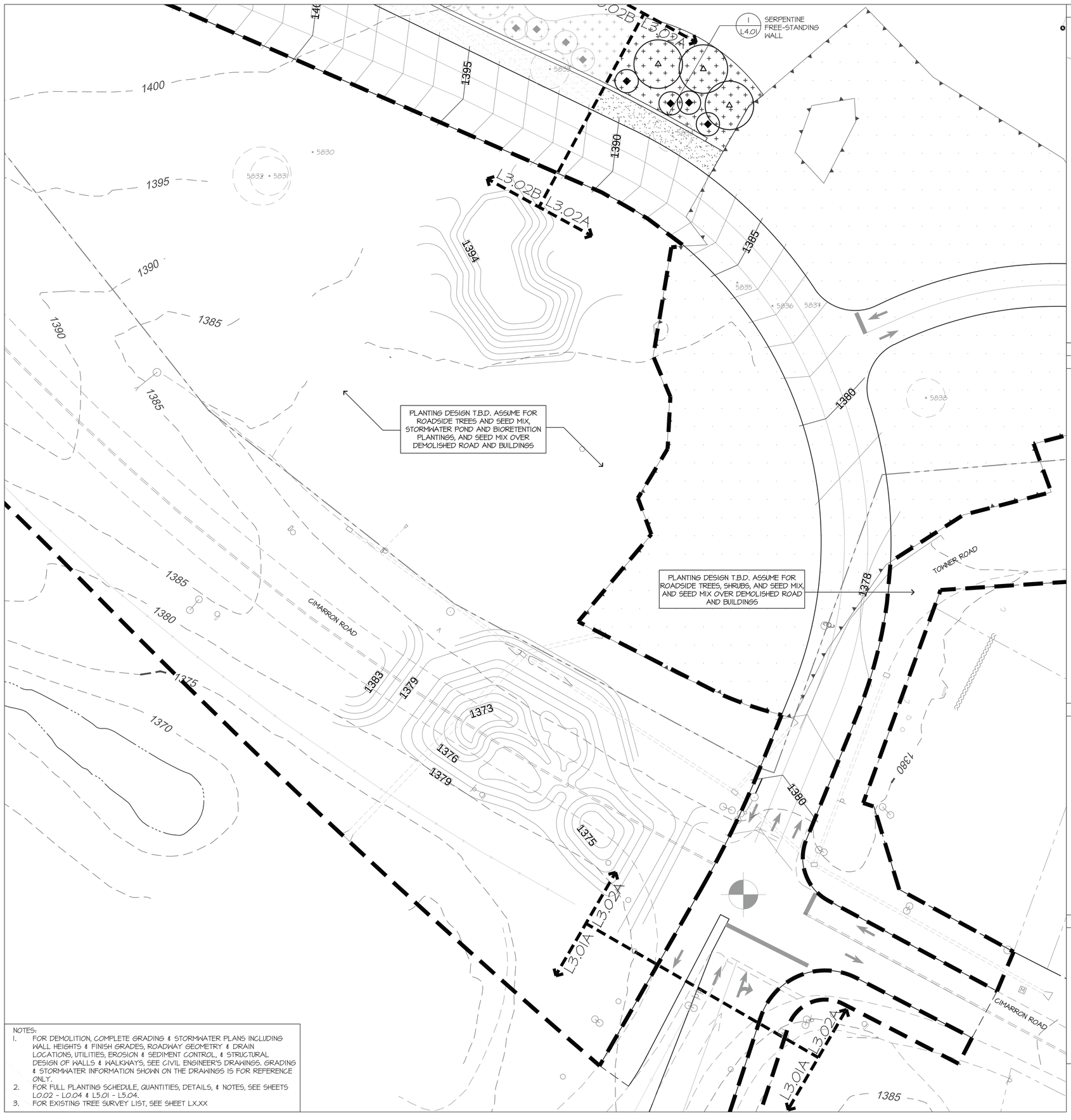
REVISIONS		
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN
TILE 1

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.01A

Stan Brenner, I:\2011\11-532 concord\6 records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L3.01A Planting Plan.dwg , Page Setup: Full Size_36x42_Window , 1 HH cds, Plot Scale: 1:1, DWG To PDF.pc3



NOTES:
1. FOR DEMOLITION, COMPLETE GRADING & STORMWATER PLANS INCLUDING WALL HEIGHTS & FINISH GRADES, ROADWAY GEOMETRY & DRAIN LOCATIONS, UTILITIES, EROSION & SEDIMENT CONTROL, & STRUCTURAL DESIGN OF WALLS & WALKWAYS, SEE CIVIL ENGINEER'S DRAWINGS. GRADING & STORMWATER INFORMATION SHOWN ON THE DRAWINGS IS FOR REFERENCE ONLY.
2. FOR FULL PLANTING SCHEDULE, QUANTITIES, DETAILS, & NOTES, SEE SHEETS L0.02 - L0.04 & L5.01 - L5.04.
3. FOR EXISTING TREE SURVEY LIST, SEE SHEET LX.XX

KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
BETULA ALLEGHANIENSIS	YELLOW BIRCH
BETULA PAPYRIFERA	PAPER BIRCH
FRAXINUS AMERICANA	WHITE ASH
JUNIPERUS VIRGINIANA	EASTERN REDCEDAR
NYSSA SYLVATICA	BLACK GUM
PICEA GLAUCA	WHITE SPRUCE
PINUS NIGRA	AUSTRIAN PINE
PINUS STROBUS	EASTERN WHITE PINE
PRUNUS SEROTINA	BLACK CHERRY
QUERCUS PALUSTRIS	PIN OAK
QUERCUS RUBRA	RED OAK
TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN
ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM
3414 EXISTING TREE TO REMAIN	

ORNAMENTAL TREES, SHRUBS AND SHRUB MIXES:

AMELANCHIER ARBOREA	SERVICEBERRY
AMELANCHIER CANADENSIS	SHADBUSH SERVICEBERRY
CERCIS CANADENSIS	EASTERN REDBUD
CORNUS KOUSA 'AURORA'	'AURORA' DOGWOOD
HAMAMELIS VIRGINIANA	WITCHHAZEL
ILEX VERTICILLATA	AMERICAN WINTERBERRY
LINDERA BENZOIN	COMMON SPICE BUSH
RHODODENDRON MAXIMUM	ROSEBAY RHODODENDRON
SHRUB MIX A: SCREEN BUFFER PLANTING	SHRUB MIX C: THOMPSONVILLE ROAD
SHRUB MIX B: WOODLAND EDGE 1	SHRUB MIX D: WOODLAND EDGE 2
SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	ENTRY WALL

SEED AND GROUNDCOVER MIXES:

SWALE AND SLOPE SEED MIX	STORMWATER POND - EMBANKMENT
ROADSIDE SEED MIX	STORMWATER POND - SIDES
LAWN SEED MIX	WETLAND SEED MIX
MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NORTH

0 10 20 40'

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E-mail: NY@harthowerton.com

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White Plains, NY 10601
Tel: 914 949 7336

atelier lumiere
13 West 17th St #901
New York, NY 10011
Tel: 212 414 0877

CONCORD RESORT
PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
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REVISIONS

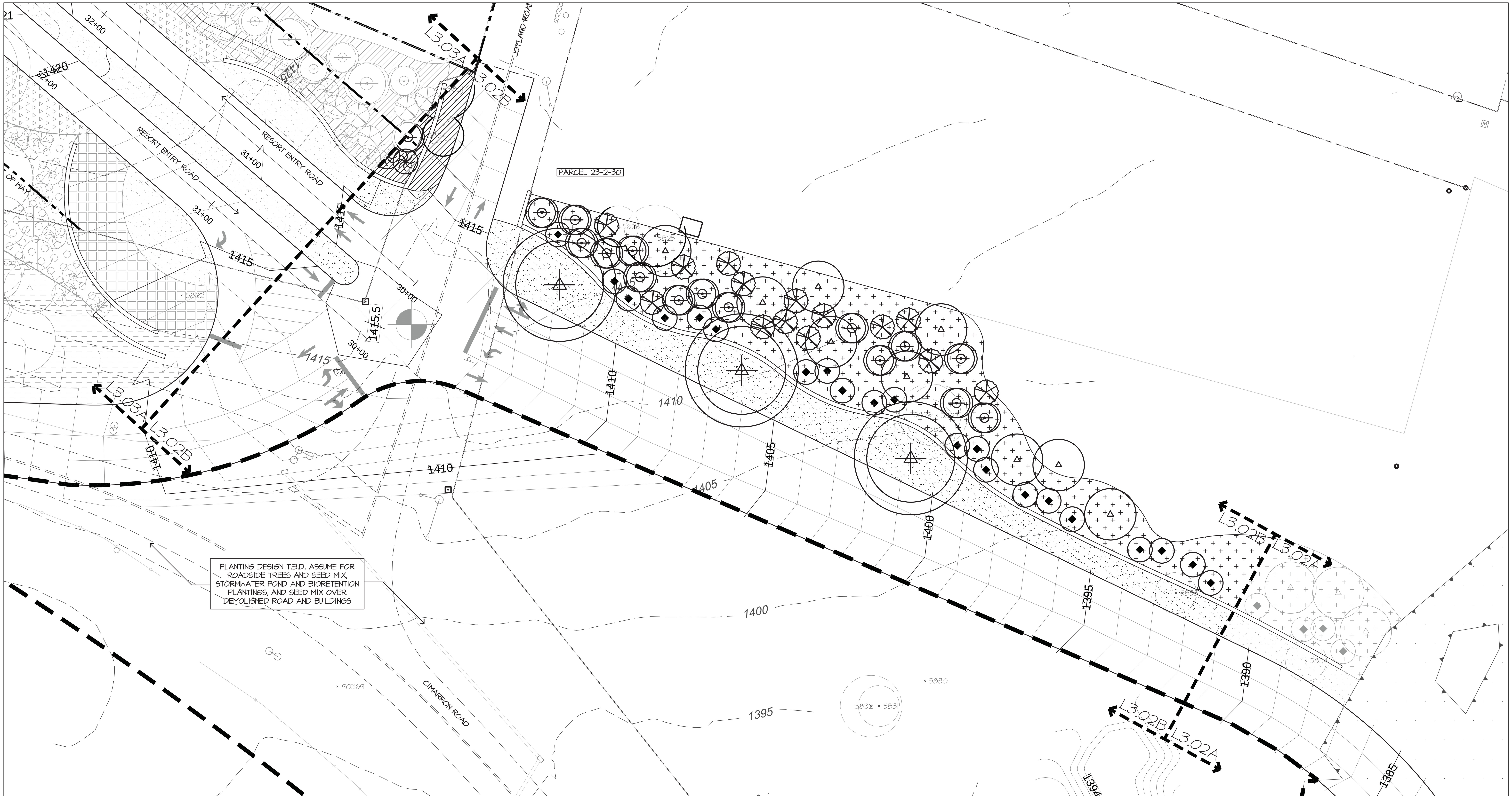
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 2

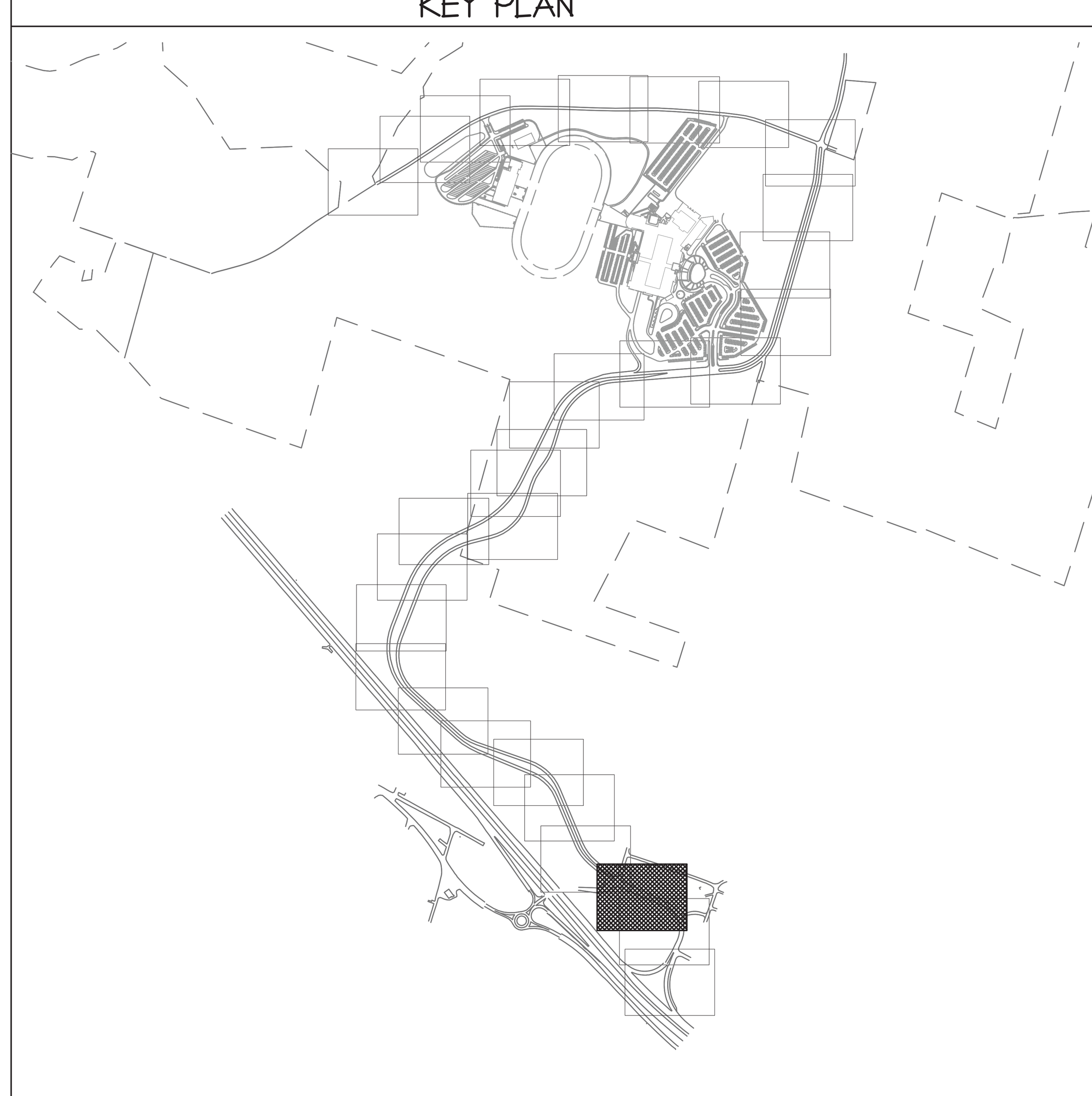
PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.02A

Stan Brezenoff, Jr.\2011\11-532 concord\6ft records\phase 1 infrastructure\2013\0327_predim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L3.02A Planting Plan.dwg , Page Setup: Full Size_30 42_Window, HH refs, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN



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ROADSIDE SEED MIX	STORMWATER POND - SIDES
LAWN SEED MIX	WETLAND SEED MIX
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WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NOTES:
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CONCORD RESORT PHASE 1 INFRASTRUCTURE

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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 2

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH
SHEET #: L3.02B

PARCEL 'B'

PARCEL 31-1-18

BIORETENTION AREA

STORMWATER MANAGEMENT POND

PLANTING EASEMENT TO ALLOW FOR BUFFER PLANTING

LAYERED EVERGREEN SCREEN BETWEEN PARCEL 31-1-18 AND RESORT ENTRY ROAD; PINES TO BE TIGHTLY SPACED FOR SCREENING (15' O.C. OR SIM.)

EXISTING BUILDINGS

RESORT ENTRY ROAD

ROAD RIGHT OF WAY

PARCEL LINE

JOYLAND ROAD

SEE CIVIL ENGINEERS DRAWINGS; PLANTING AS SHOWN

PLANTING T.B.D. WITH N.Y. D.O.T. AT ROUTE 17 OVERPASS

ROCKS

L3.04A L3.03A L3.02B

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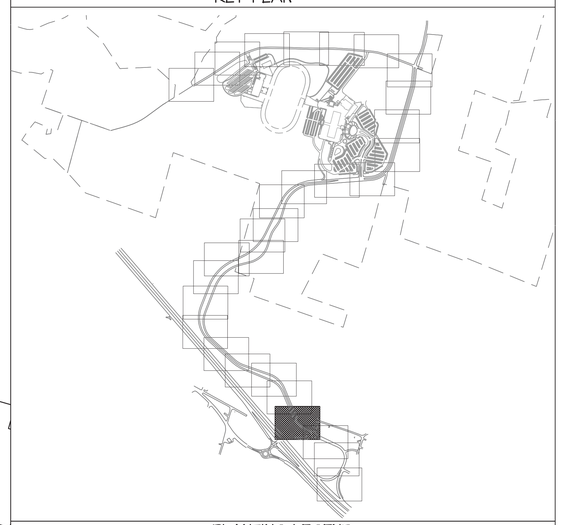
KEY PLAN



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PURPLE ACCENT FLOWERS AT EXISTING WALL	

NORTH

0 10 20 40'

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CONCORD RESORT PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
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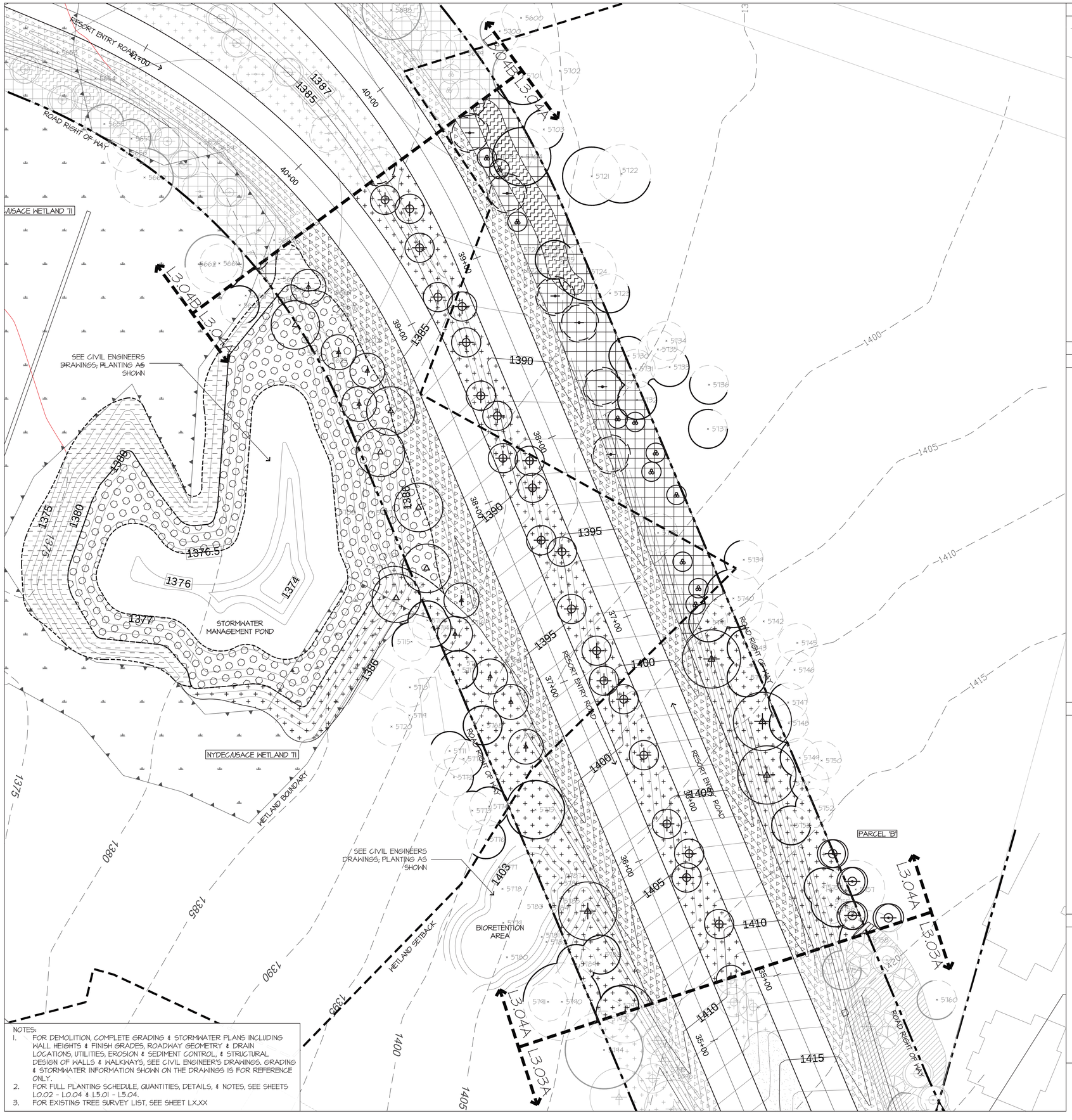
REVISIONS		
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE: PLANTING PLAN TILE 3

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #: L3.03A

Stan Brezner, h:\2011\11-532 concord\(x0 records\phase 1 infrastructure\20130327_preliim site plan submission to town\11-532-concord-ph1-infrastructure.vwx - standard\L3.03A Planting Plan.dwg , Page Setup: Full Size_30 42_Window, HH refs, Plot Scale: 1:1, DWG To PDF.pc3



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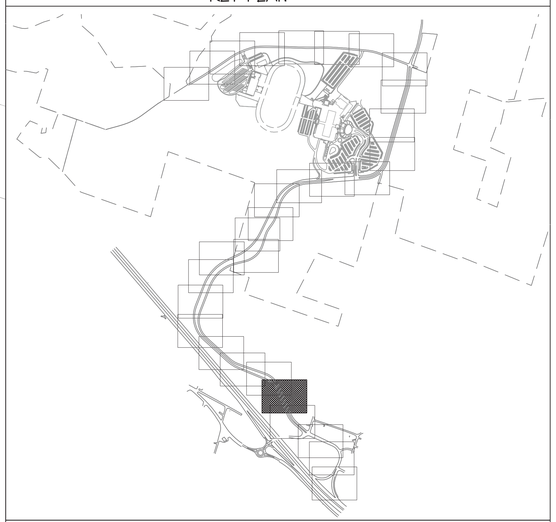
KEY PLAN



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3414 EXISTING TREE TO REMAIN	

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NORTH

0 10 20 40'

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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

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Sullivan County

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REVISIONS		
NO	DATE	ISSUE
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DRAWING TITLE:
PLANTING PLAN TILE 4

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.04A

Stan Brenner, I:\2011\11-532 concord\GIS records\phase 1 infrastructure\2013\0327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L3.04A Planting plan.dwg , Page Setup: Full Size_30 x 42_Window, HH Left, Plot Scale: 1:1, DWG To PDF.pc3

WETLAND BOUNDARY

RIGHT OF WAY

ROAD

L3.05A L3.04B

45+00

44+00

43+00

42+00

41+00

40+00

39+00

1390

1385

1395

1380

1375

RESORT ENTRY ROAD

ROAD RIGHT OF WAY

NYDEC/USACE WETLAND 71

SEE CIVIL ENGINEERS DRAWINGS; PLANTING AS SHOWN

NOTES:

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KEY PLAN

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PURPLE ACCENT FLOWERS AT EXISTING WALL	

NORTH

0 10 20 40'

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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

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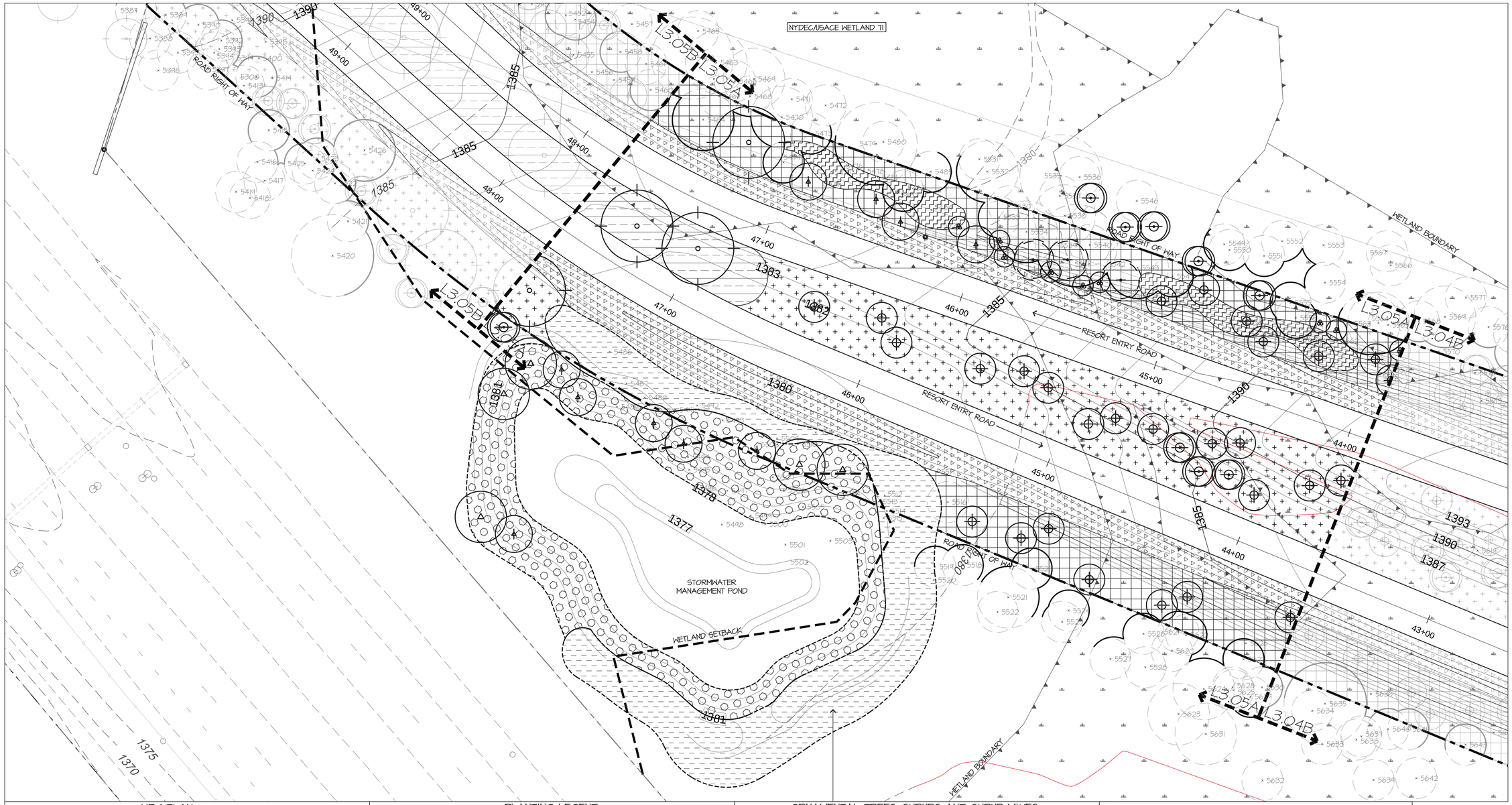
REVISIONS		
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN
TILE 4

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.04B

Stan Brezner, h:\2011\11-532 concord\(x0 records\phase 1 infrastructure\x\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.vwt - standard\L3.04B Planting Plan.dwg , Page Setup: Full Size_30 42_Window, HHeth, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
BETULA ALLEGHANIENSIS	YELLOW BIRCH
BETULA PAPYRIFERA	PAPER BIRCH
FRAXINUS AMERICANA	WHITE ASH
JUNIPERUS VIRGINIANA	EASTERN REDCEDAR
NYSSA SYLVATICA	BLACK GUM
PICEA GLAUCA	WHITE SPRUCE
PINUS NIGRA	AUSTRIAN PINE
PINUS STROBUS	EASTERN WHITE PINE
PRUNUS SEROTINA	BLACK CHERRY
QUERCUS PALUSTRIS	PIN OAK
QUERCUS RUBRA	RED OAK
TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN
ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM
34"14	EXISTING TREE TO REMAIN

ORNAMENTAL TREES, SHRUBS AND SHRUB MIXES:

AMELANCHIER ARBOREA	SERVICEBERRY
AMELANCHIER CANADENSIS	SHADBUSH SERVICEBERRY
CERCIS CANADENSIS	EASTERN REDBUD
CORNUS KOUSA 'AURORA'	'AURORA' DOGWOOD
HAMAMELIS VIRGINIANA	WITCHHAZEL
ILEX VERTICILLATA	AMERICAN WINTERBERRY
LINDERA BENZOIN	COMMON SPICE BUSH
RHODODENDRON MAXIMUM	ROSEBAY RHODODENDRON

SHRUB MIX A: SCREEN BUFFER PLANTING	SHRUB MIX C: THOMPSONVILLE ROAD
SHRUB MIX B: WOODLAND EDGE 1	SHRUB MIX D: WOODLAND EDGE 2
SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	ENTRY WALL

SEED AND GROUNDCOVER MIXES:

SWALE AND SLOPE SEED MIX	STORMWATER POND - EMBANKMENT
ROADSIDE SEED MIX	STORMWATER POND - SIDES
LAWN SEED MIX	WETLAND SEED MIX
MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NOTES:
1. FOR DEMOLITION, COMPLETE GRADING & STORMWATER PLANS INCLUDING WALL HEIGHTS & FINISH GRADES, ROADWAY GEOMETRY & DRAIN LOCATIONS, UTILITIES, EROSION & SEDIMENT CONTROL, & STRUCTURAL DESIGN OF WALLS & WALKWAYS, SEE CIVIL ENGINEER'S DRAWINGS. GRADING & STORMWATER INFORMATION SHOWN ON THE DRAWINGS IS FOR REFERENCE ONLY.
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3. FOR EXISTING TREE SURVEY LIST, SEE SHEET LX.XX

NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

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10 East 40th Street New York, NY 10016
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E-mail: NY@harthowerton.com

AKRF
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atelier lumiere
33 West 19th St #901 New York, NY 10011 Tel: 212 414 0787

CONCORD RESORT PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS		
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

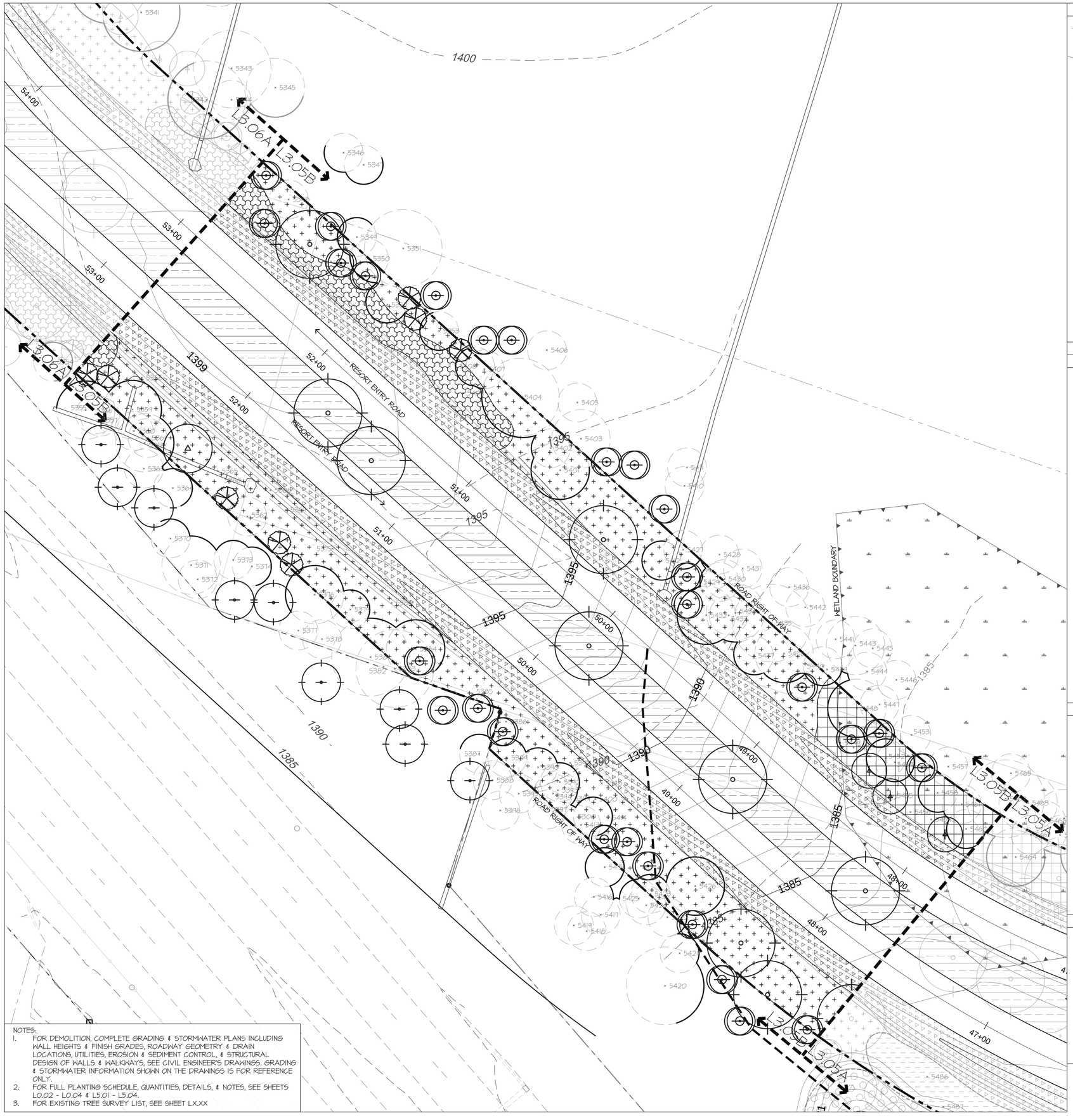
DRAWING TITLE:
PLANTING PLAN TILE 5

PROJECT #: 11-332
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.05A

Stan Brenner, I:\2011\11-332 concord\6.0 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-332-concord-ph1-infrastructure.rcst - standard\L3.05A Planting Plan.dwg , Page Setup: Full Size_36x42_Window , 1 HH cels, Plot Scale: 1:1, DWG To PDF.pc3

Stan Brezenoff, Jr.\2011\11-532 concord\6.0 records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure.vwx - standard\L3.05B Planting Plan.dwg , Page Setup: Full Size_30 x 42_Window, 1H Left, Plot Scale: 1:1, DWG To PDF.pc3



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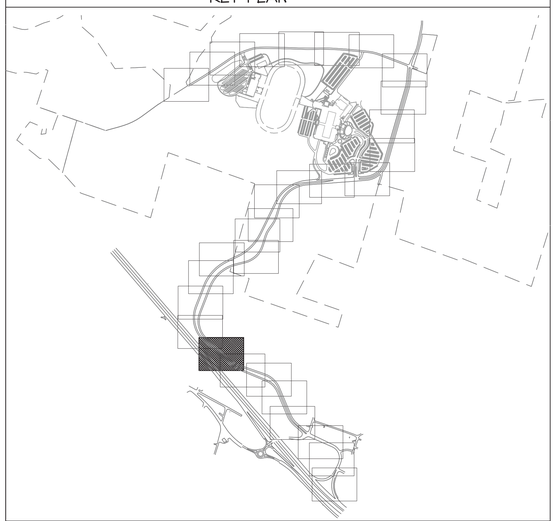
KEY PLAN



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NORTH

0 10 20 40'

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Town Of Thompson, New York
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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

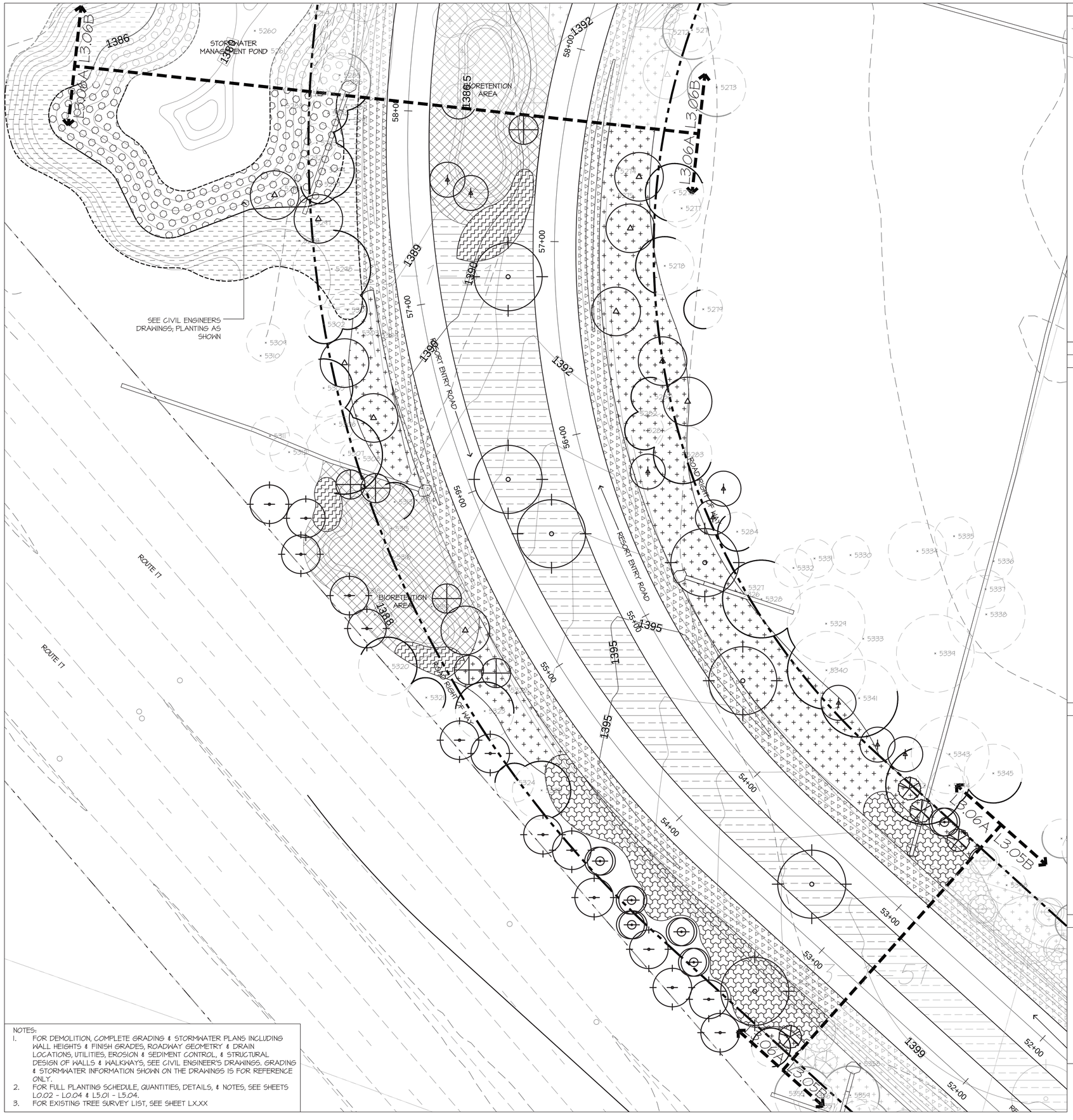
REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 5

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.05B



NOTES:
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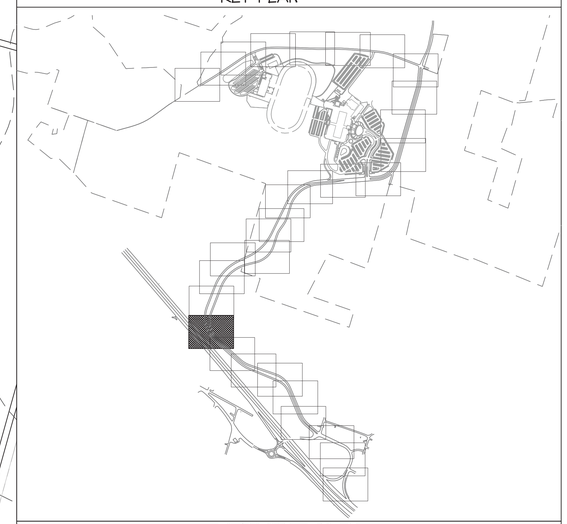
KEY PLAN



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NORTH

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CONCORD RESORT PHASE 1 INFRASTRUCTURE

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS		
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 6

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.06A

Stan Brenner, h:\2011\11-532 concord\6.0 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord ph1-infrastructure.rcst - standard(13.1)\6A's Planting Plan.dwg , Page Setup: Full Size_30x42_Window, 1H1.ctb, Plot Scale: 1:1, DWG To PDF.pc3

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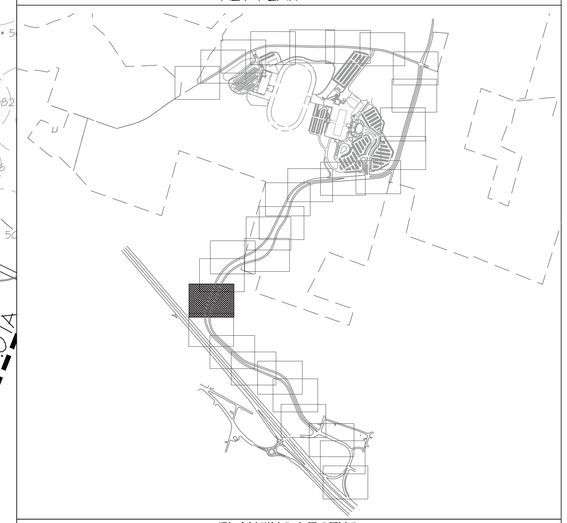
KEY PLAN



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NORTH

0 10 20 40'

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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

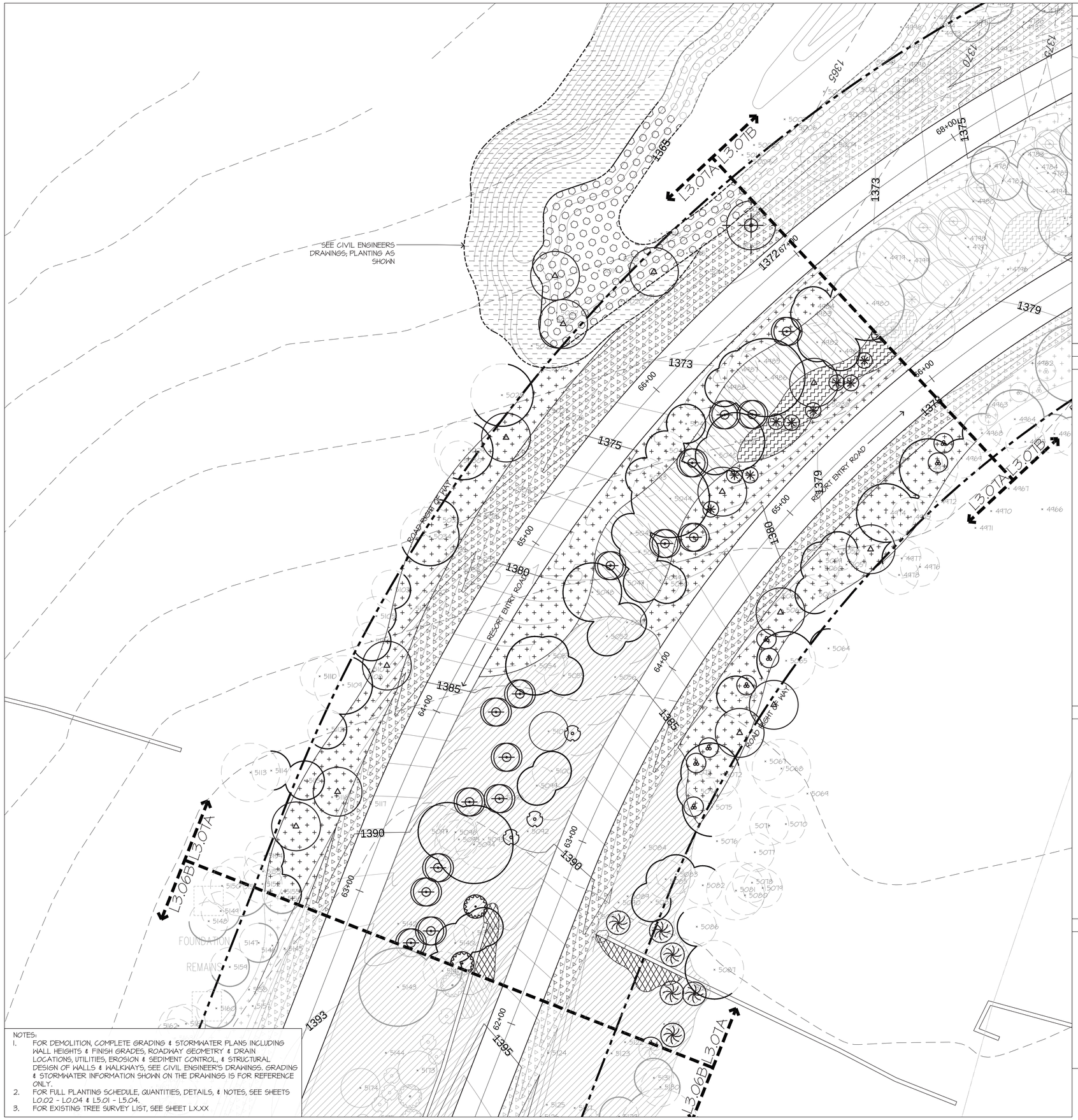
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 6

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.06B

Stan Brezenec, Jr.\2011\11-532 concord\6 records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L3.06B Planting Plan.dwg , "Page Setup: Full Size_30 42, Wendow, 1HI.ctb, Plot Scale: 1:1, DWG To PDF.pc3



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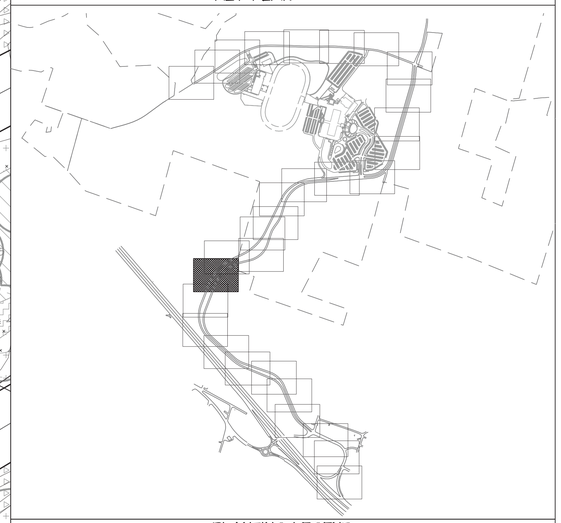
KEY PLAN



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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

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REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

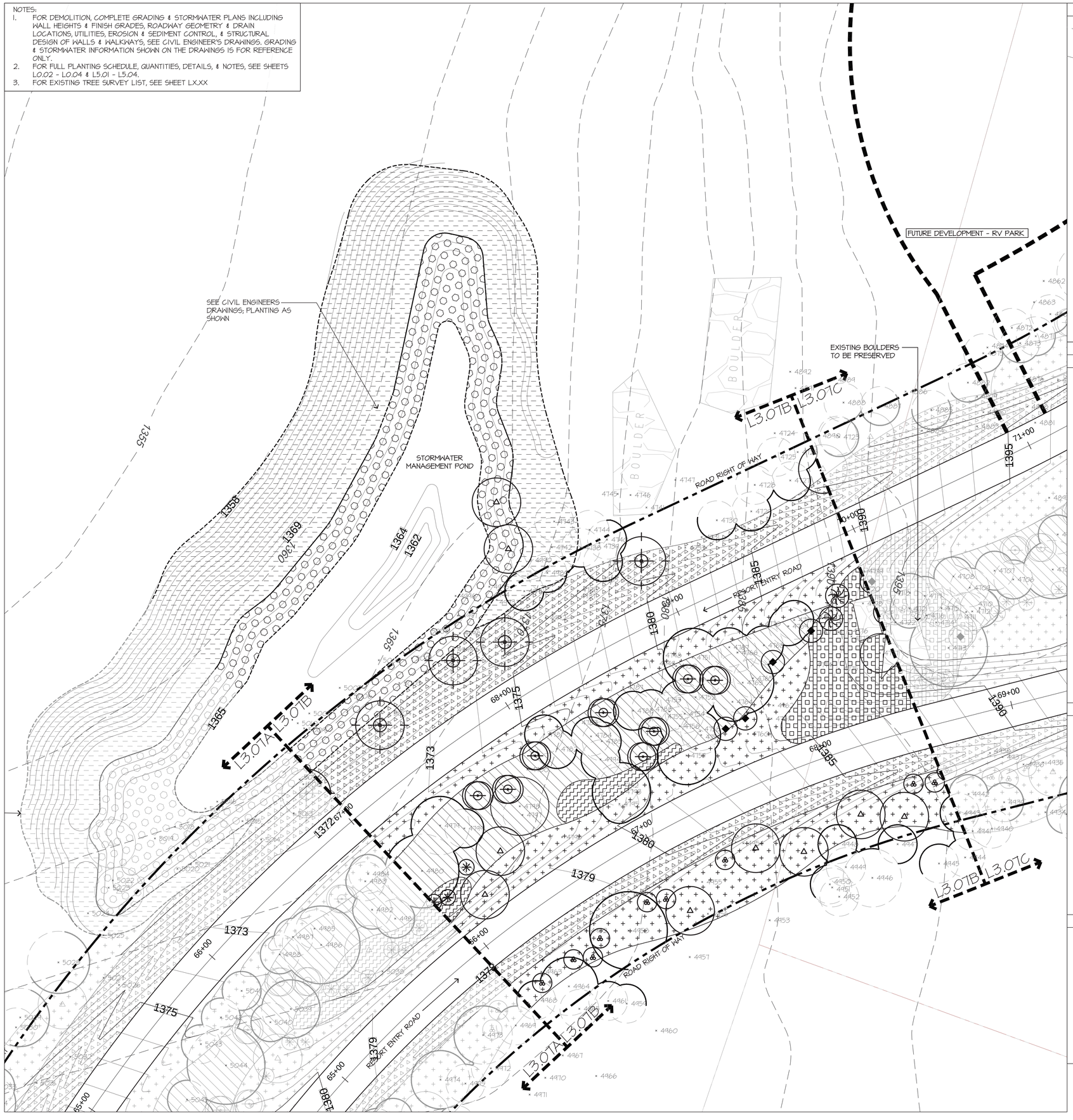
DRAWING TITLE:
PLANTING PLAN TILE 7

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

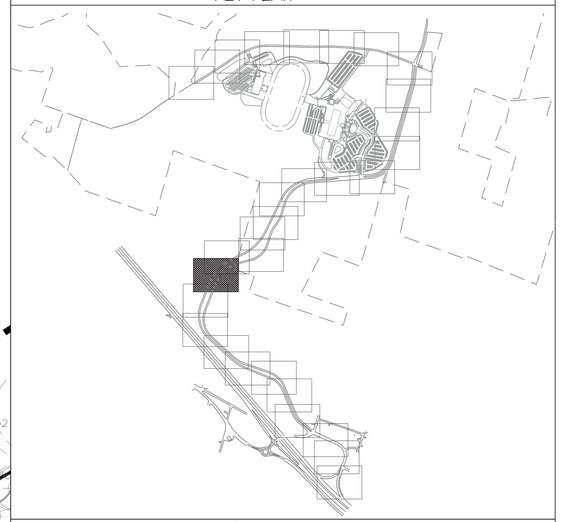
SHEET #:
L3.07A

Stan Brezner, h:\2011\11-532 concord\(x0 records\phase 1 infrastructure\cm\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L3.07A Planting Plan.dwg , Page Setup: Full Size_30 42_Window, HH etls, Plot Scale: 1:1, DWG To PDF.pc3

NOTES:
1. FOR DEMOLITION, COMPLETE GRADING & STORMWATER PLANS INCLUDING WALL HEIGHTS & FINISH GRADES, ROADWAY GEOMETRY & DRAIN LOCATIONS, UTILITIES, EROSION & SEDIMENT CONTROL, & STRUCTURAL DESIGN OF WALLS & WALKWAYS, SEE CIVIL ENGINEER'S DRAWINGS. GRADING & STORMWATER INFORMATION SHOWN ON THE DRAWINGS IS FOR REFERENCE ONLY.
2. FOR FULL PLANTING SCHEDULE, QUANTITIES, DETAILS, & NOTES, SEE SHEETS L0.02 - L0.04 & L5.01 - L5.04.
3. FOR EXISTING TREE SURVEY LIST, SEE SHEET L.X.XX



KEY PLAN



PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
BETULA ALLEGHANIENSIS	YELLOW BIRCH
BETULA PAPYRIFERA	PAPER BIRCH
FRAXINUS AMERICANA	WHITE ASH
JUNIPERUS VIRGINIANA	EASTERN REDCEDAR
NYSSA SYLVATICA	BLACK GUM
PICEA GLAUCA	WHITE SPRUCE
PINUS NIGRA	AUSTRIAN PINE
PINUS STROBUS	EASTERN WHITE PINE
PRUNUS SEROTINA	BLACK CHERRY
QUERCUS PALUSTRIS	PIN OAK
QUERCUS RUBRA	RED OAK
TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN
ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM
3414 EXISTING TREE TO REMAIN	

ORNAMENTAL TREES, SHRUBS AND SHRUB MIXES:

AMELANCHIER ARBOREA	SERVICEBERRY
AMELANCHIER CANADENSIS	SHADBUSH SERVICEBERRY
CERCIS CANADENSIS	EASTERN REDBUD
CORNUS KOUSA 'AURORA'	'AURORA' DOGWOOD
HAMAMELIS VIRGINIANA	WITCHHAZEL
ILEX VERTICILLATA	AMERICAN WINTERBERRY
LINDERA BENZOIN	COMMON SPICE BUSH
RHODODENDRON MAXIMUM	ROSEBAY RHODODENDRON
SHRUB MIX A: SCREEN BUFFER PLANTING	SHRUB MIX C: THOMPSONVILLE ROAD
SHRUB MIX B: WOODLAND EDGE 1	SHRUB MIX D: WOODLAND EDGE 2
SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	ENTRY WALL

SEED AND GROUNDCOVER MIXES:

SWALE AND SLOPE SEED MIX	STORMWATER POND - EMBANKMENT
ROADSIDE SEED MIX	STORMWATER POND - SIDES
LAWN SEED MIX	WETLAND SEED MIX
MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

HART | HOWERTON
10 East 40th Street New York, NY 10016
Tel: 212 683 5611 Fax: 212 481 1768
E-mail: NY@hartHowerton.com

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34 South Broadway
Suite 401
White Plains, NY 10601
Tel: 914 949 7336

atelier lumiere
13 West 17th St #901
New York, NY 10011
Tel: 212 255 0707

CONCORD RESORT
PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

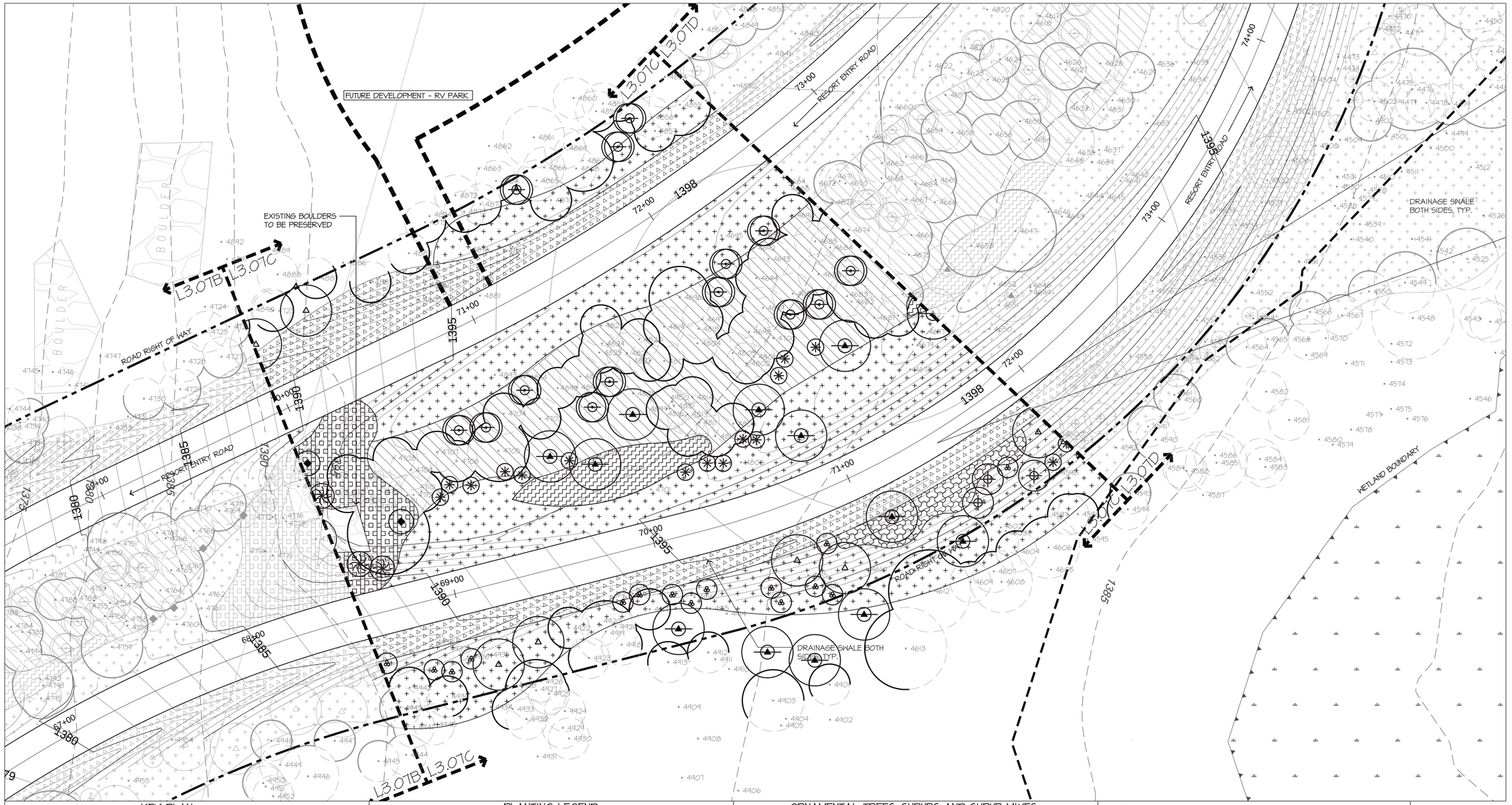
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 7

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.07B

Stan Brezenec, I:\2011\11-532 concord\GIS records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure.vwx - standard\L3.07B Planting Plan.dwg , Page Setup: Full Size_30 x 42_Window, HH cells, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
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QUERCUS RUBRA	RED OAK
TILIA AMERICANA 'REDMOND'	AMERIGAN LINDEN
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3414	EXISTING TREE TO REMAIN

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ROADSIDE SEED MIX	STORMWATER POND - SIDES
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WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NOTES:
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3. FOR EXISTING TREE SURVEY LIST, SEE SHEET LX.XX

NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 7

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.07C

Sun Brenner, Jr:\2011\11-532 concord\07 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L3.07C Planting Plan.dwg , Page Setup: Full Size_30-42_Window , HH.ctb, Plot Scale: 1

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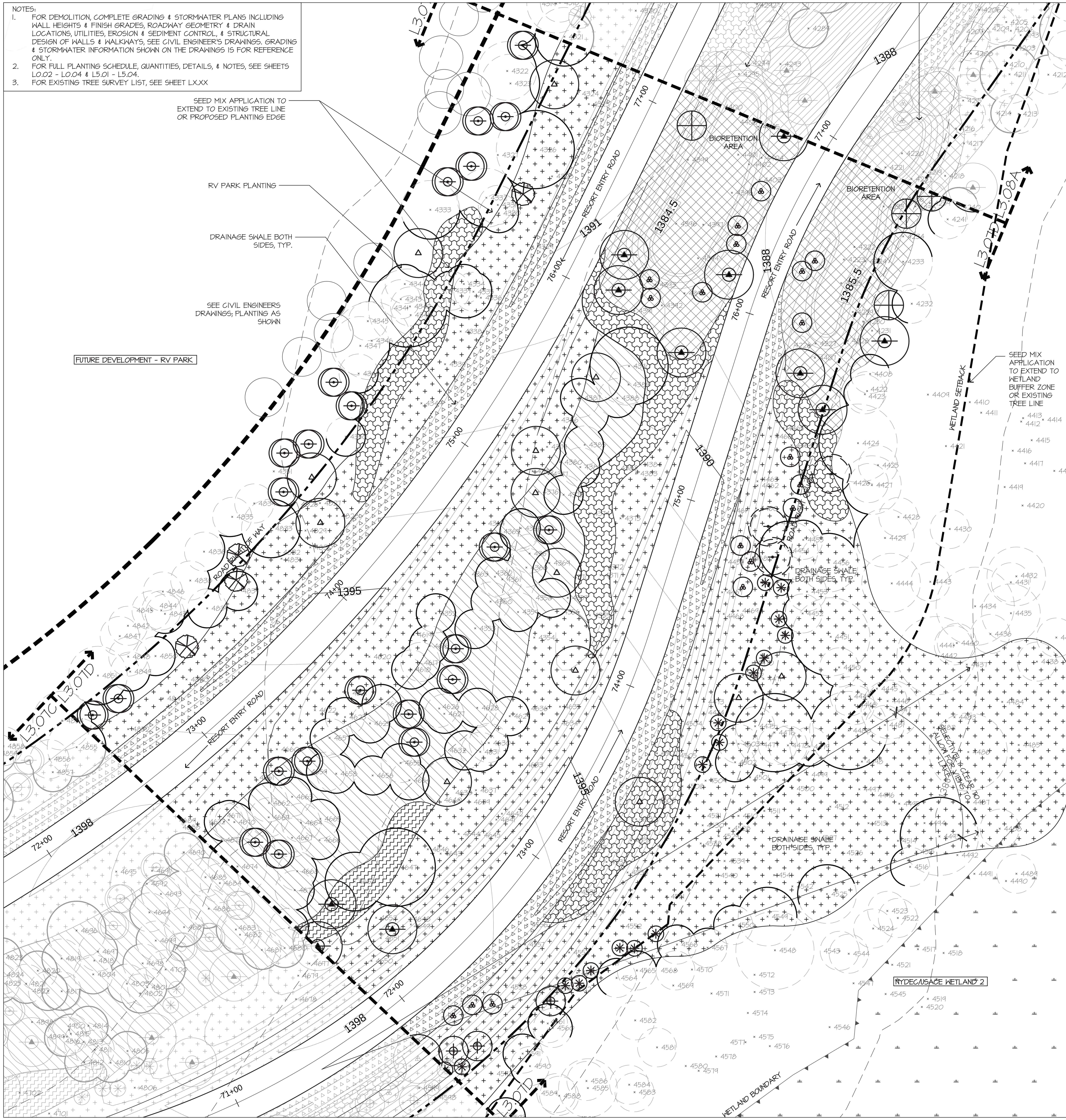

KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

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- SHRUB MIX D: WOODLAND EDGE 2
- ENTRY WALL

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- WILDFLOWER SEED MIX
- PURPLE ACCENT FLOWERS AT EXISTING WALL
- STORMWATER POND - EMBANKMENT
- STORMWATER POND - SIDES
- WETLAND SEED MIX
- BIO-RETENTION AREA
- GROUND TREATMENT UNDER EXISTING TREES

NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

HART | HOWERTON
10 East 40th Street New York, NY 10016
Tel: 212 683 5631 Fax: 212 481 3768
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atelier lumiere
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New York, NY 10011
Tel: 212 533 0757

CONCORD RESORT PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 7

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #: L3.07D

NOTES:
1. FOR DEMOLITION, COMPLETE GRADING & STORMWATER PLANS INCLUDING WALL HEIGHTS & FINISH GRADES, ROADWAY GEOMETRY & DRAIN LOCATIONS, UTILITIES, EROSION & SEDIMENT CONTROL, & STRUCTURAL DESIGN OF WALLS & WALKWAYS, SEE CIVIL ENGINEER'S DRAWINGS. GRADING & STORMWATER INFORMATION SHOWN ON THE DRAWINGS IS FOR REFERENCE ONLY.
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3. FOR EXISTING TREE SURVEY LIST, SEE SHEET L.X.XX

DRAINAGE SWALE BOTH SIDES, TYP.

FUTURE RV PARK BOUNDARY LINE

SEED MIX APPLICATION TO EXTEND TO EXISTING TREE LINE OR PROPOSED PLANTING EDGE

SEE CIVIL ENGINEERS DRAWINGS; PLANTING AS SHOWN

FUTURE DEVELOPMENT - RV PARK

BIO RETENTION AREAS TO BE COORDINATED WITH CIVIL ENGINEER

SEED MIX APPLICATION TO EXTEND TO WETLAND BUFFER ZONE OR EXISTING TREE LINE

SECTION AT ROAD STATION 78+50

BIORETENTION AREA

BIORETENTION AREA

RESORT ENTRY ROAD

ROAD RIGHT OF WAY

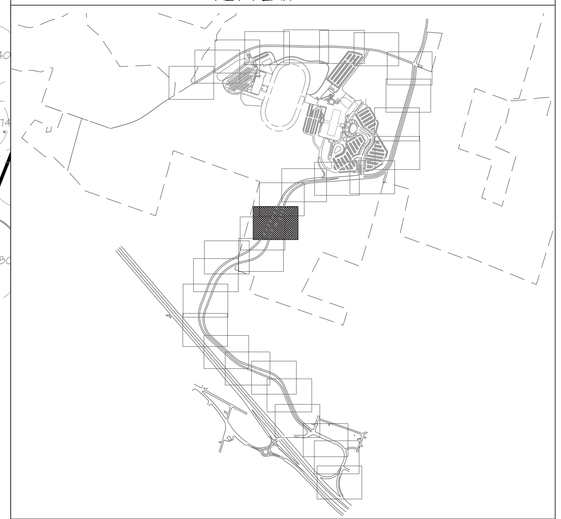
L3.08A L3.08B

L3.01D L3.08A

L3.08A L3.08B

L3.01D L3.08A

KEY PLAN



PLANTING LEGEND:

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TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN
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3414 EXISTING TREE TO REMAIN	

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SEED AND GROUNDCOVER MIXES:

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MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

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CONCORD RESORT PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 8

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.08A

Suzi Brenner, h:\2011\11-532 concord\(6) records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L3.08A Planting Plan.dwg - Page Setup: Full Size_30x42_Window, 1:01 cels, Plot Scale: 1

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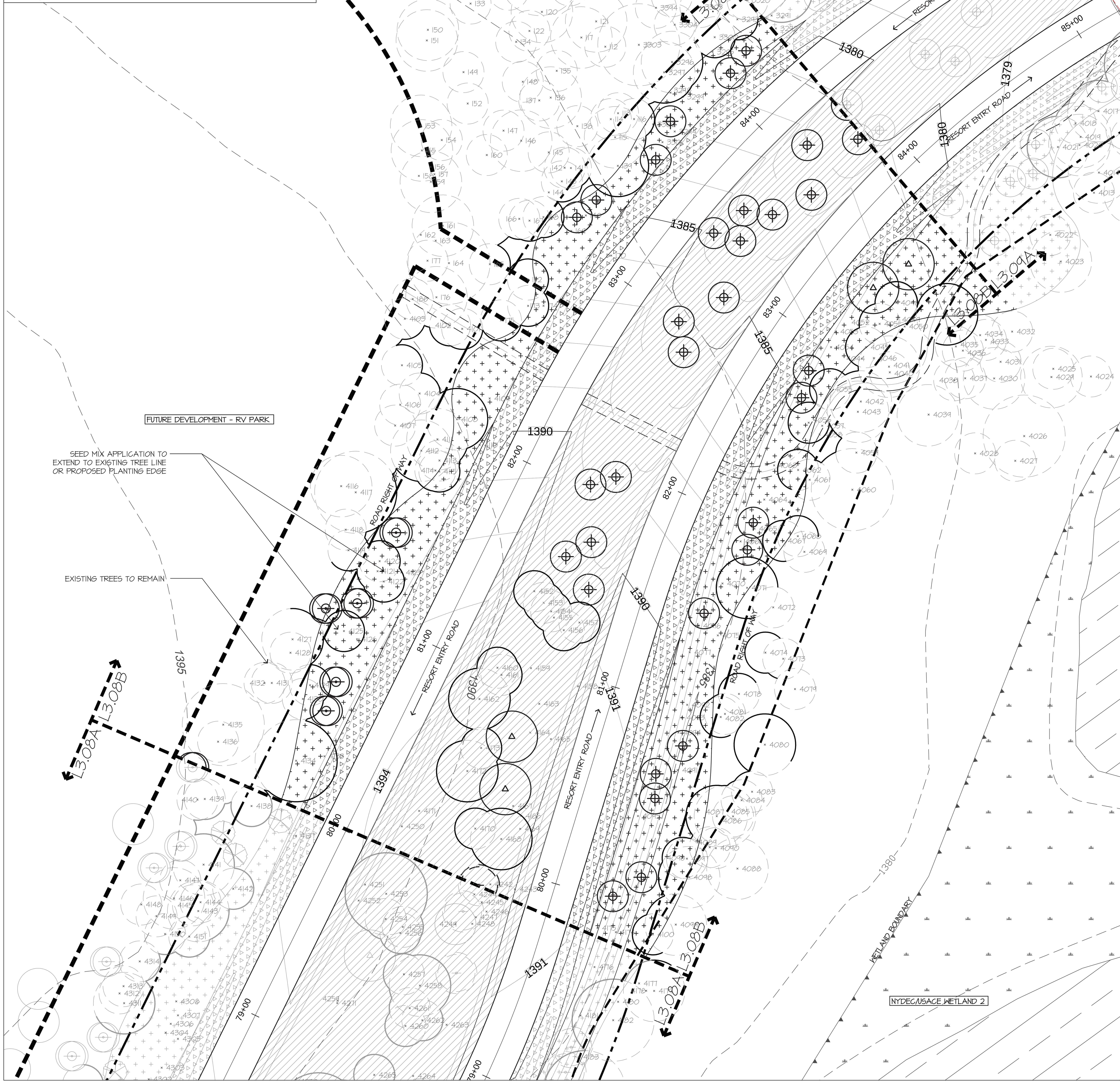
3. FOR EXISTING TREE SURVEY LIST, SEE SHEET LX.XX



KEY PLAN

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3974 EXISTING TREE TO REMAIN	

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ENTRY WALL

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STORMWATER POND - EMBANKMENT
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WETLAND SEED MIX
BIO-RETENTION AREA
GROUND TREATMENT UNDER EXISTING TREES

NORTH
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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 8

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.08B

PLANTING DESIGN AT NEW BRIDGE - T.B.D. TO BE COORDINATED WITH CIVIL ENGINEER, BRIDGE ENGINEER, AND WETLAND ENGINEERS

PLANTING EDGE TO FOLLOW EXISTING TREE LINE

ROAD RIGHT OF WAY

RESORT ENTRY ROAD

STORMWATER MANAGEMENT POND

SEE CIVIL ENGINEERS DRAWINGS; PLANTING AS SHOWN

STORMWATER MANAGEMENT POND TO BE COORDINATED WITH CIVIL ENGINEER

KEY PLAN

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3. FOR EXISTING TREE SURVEY LIST, SEE SHEET LX.XX

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
BETULA ALLEGHANIENSIS	YELLOW BIRCH
BETULA PAPYRIFERA	PAPER BIRCH
FRAXINUS AMERICANA	WHITE ASH
JUNIPERUS VIRGINIANA	EASTERN REDCEDAR
NYSSA SYLVATICA	BLACK GUM
PICEA GLAUCA	WHITE SPRUCE
PINUS NIGRA	AUSTRIAN PINE
PINUS STROBUS	EASTERN WHITE PINE
PRUNUS SEROTINA	BLACK CHERRY
QUERCUS PALUSTRIS	PIN OAK
QUERCUS RUBRA	RED OAK
TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN
ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM
3414	EXISTING TREE TO REMAIN

ORNAMENTAL TREES, SHRUBS AND SHRUB MIXES:

AMELANCHIER ARBOREA	SERVICEBERRY
AMELANCHIER CANADENSIS	SHADBUSH SERVICEBERRY
CERCIS CANADENSIS	EASTERN REDBUD
CORNUS KOUSA 'AURORA'	'AURORA' DOGWOOD
HAMAMELIS VIRGINIANA	WITCHHAZEL
ILEX VERTICILLATA	AMERICAN WINTERBERRY
LINDERA BENZOIN	COMMON SPICE BUSH
RHODODENDRON MAXIMUM	ROSEBAY RHODODENDRON

SHRUB MIX A: SCREEN BUFFER PLANTING	SHRUB MIX C: THOMPSONVILLE ROAD
SHRUB MIX B: WOODLAND EDGE 1	SHRUB MIX D: WOODLAND EDGE 2
SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	ENTRY WALL

SEED AND GROUNDCOVER MIXES:

SWALE AND SLOPE SEED MIX	STORMWATER POND - EMBANKMENT
ROADSIDE SEED MIX	STORMWATER POND - SIDES
LAWN SEED MIX	WETLAND SEED MIX
MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

HART | HOWERTON

10 East 40th Street New York, NY 10016
Tel: 212 683 5651 Fax: 212 481 3768
E-mail: NY@harthowerton.com

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34 South Broadway
Suite 401
White Plains, NY 10601
Tel: 914 949 7336

atelier lumiere
33 West 19th St #901
New York, NY 10011
Tel: 212 334 0787

CONCORD RESORT PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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SCALE: 1"=20'-0"

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:

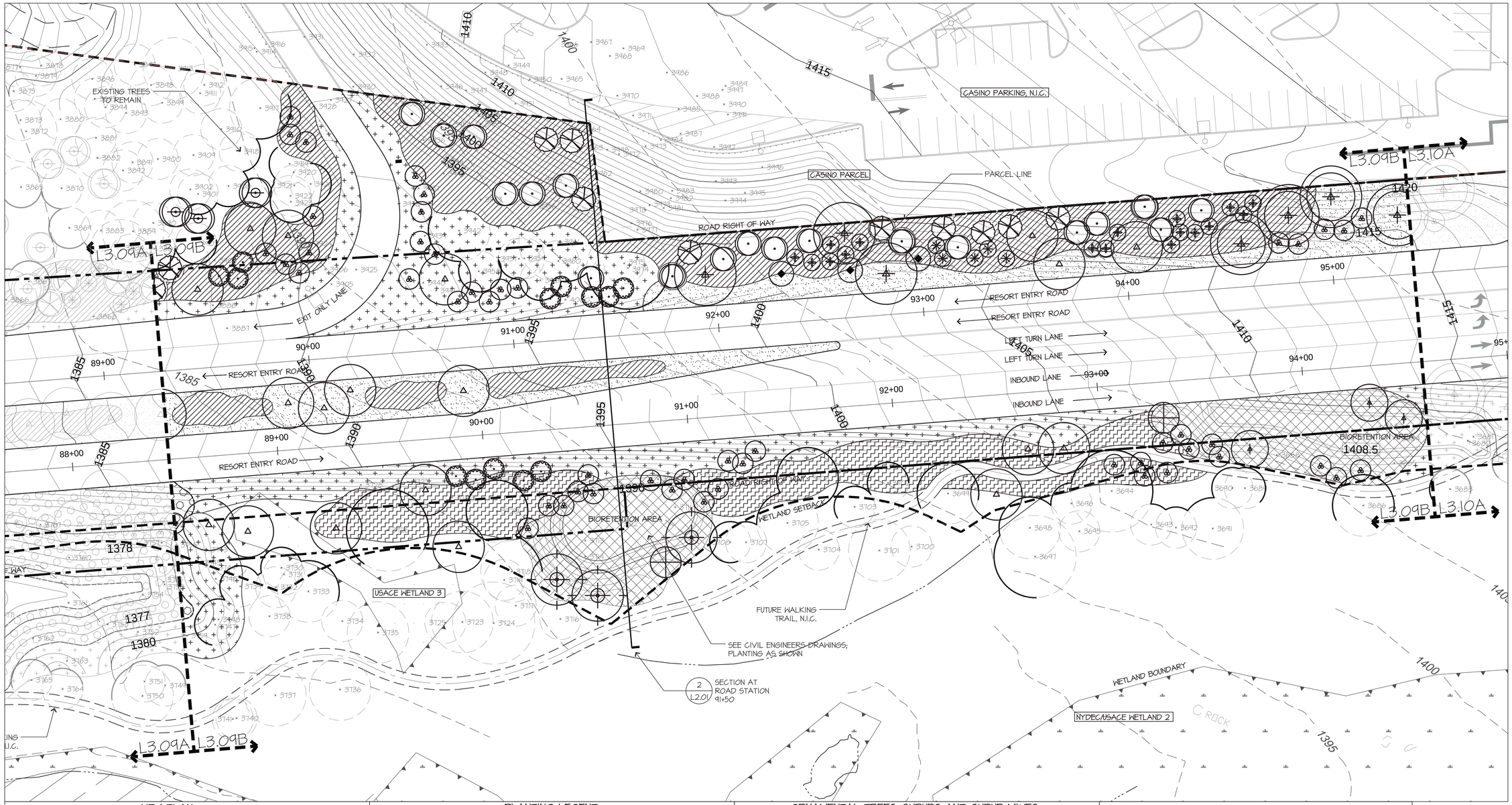
PLANTING PLAN TILE 9

PROJECT #: 11-532
DRAWN BY: GH
CHECKED BY: AH

SHEET #:

L3.09A

Stan Brenner, I:\2011\11-532 concord\6 cd records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L3.09A Planting Plan.dwg , Page Setup: Full Size_36"x42"_Window, , 1HI cds, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
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MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NOTES:
1. FOR DEMOLITION, COMPLETE GRADING & STORMWATER PLANS INCLUDING WALL HEIGHTS & FINISH GRADES, ROADWAY GEOMETRY & DRAIN LOCATIONS, UTILITIES, EROSION & SEDIMENT CONTROL, & STRUCTURAL DESIGN OF WALLS & WALKWAYS, SEE CIVIL ENGINEER'S DRAWINGS. GRADING & STORMWATER INFORMATION SHOWN ON THE DRAWINGS IS FOR REFERENCE ONLY.
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NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

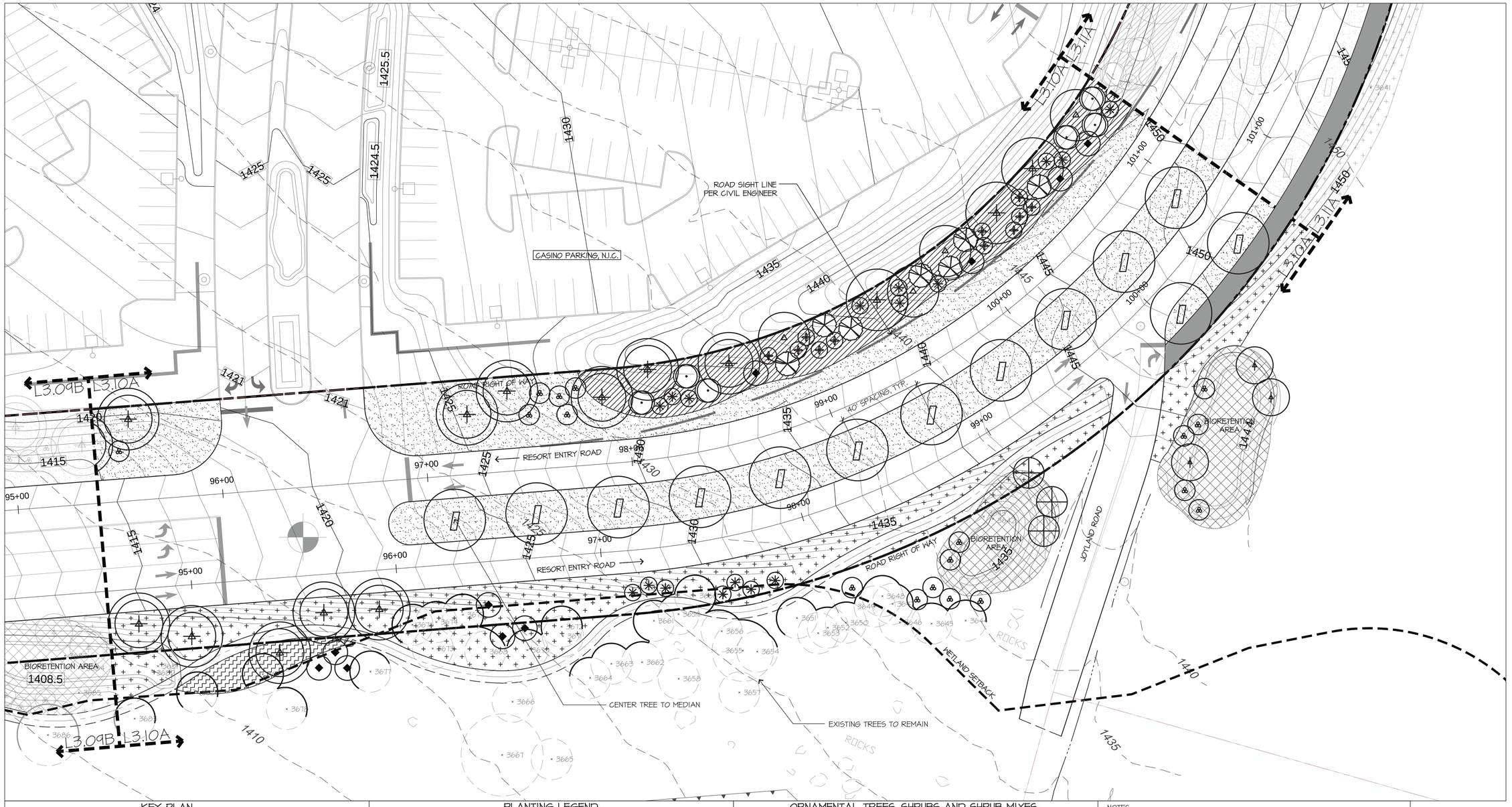
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 9

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.09B

Sara Brenner, h:\2011\11-532 concord\03 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure - standard\L3.09B Planting Plan.dwg , Page Setup: Full Size_20-42_Wendow, HH Letb, Plot Scale: 1:1, DWG To: PDF.pc3



KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

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WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

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NORTH

0 10 20 40'

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atelier lumiere
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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

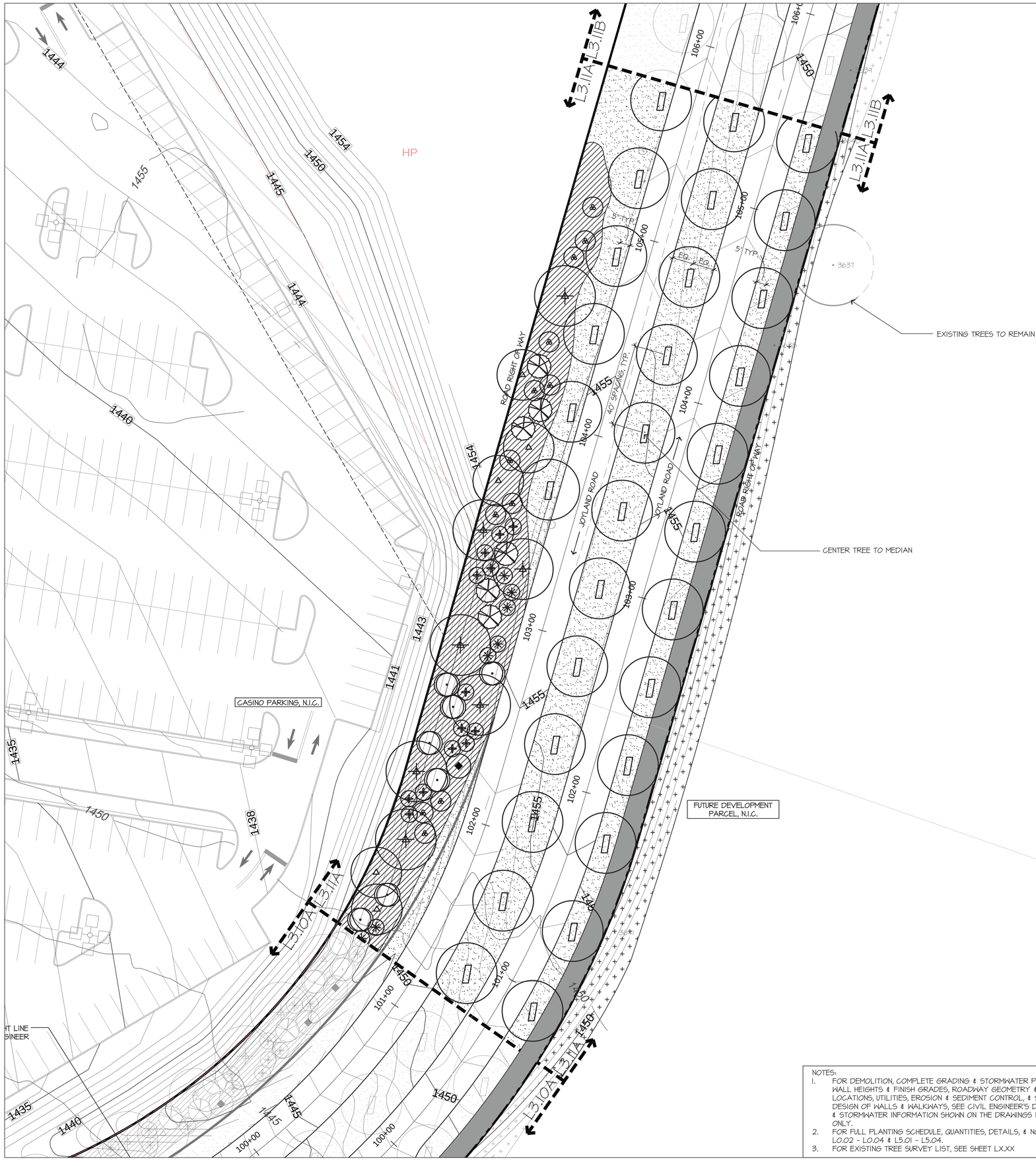
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 10

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.10A

Sara Brenner, h:\2011\11-532 concord\03 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L3.10A Planting Plan.dwg , Page Setup: Full Size_30-42_Wendow, 1HH cells, Plot Scale: 1:1, DWG To PDF.pc3



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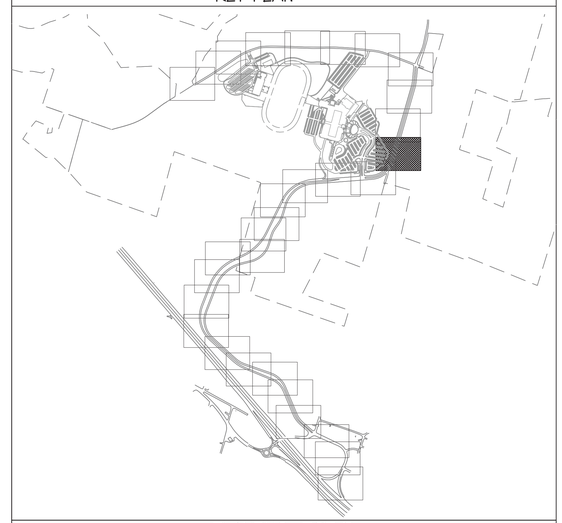
3. FOR EXISTING TREE SURVEY LIST, SEE SHEET L.X.XX

KEY PLAN



PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

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▪ 3474 EXISTING TREE TO REMAIN	

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NORTH

0 10 20 40'

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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

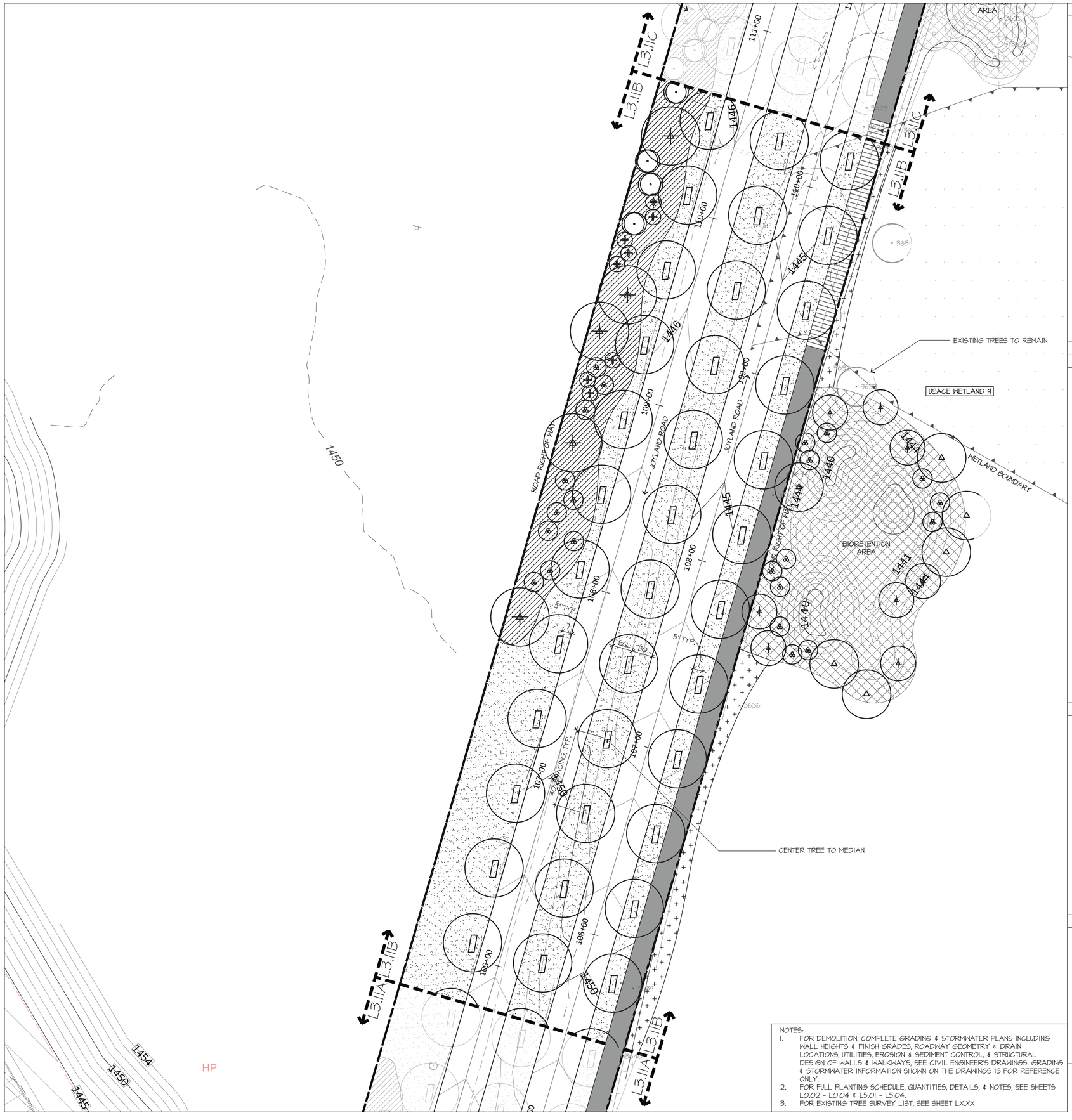
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN
TILE 11

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.11A

Sara Brenner, h:\2011\11-532 concord\ (0) records \phase 1 infrastructure\ 20130327_ prelim site plan submission to town \11-532-concord-ph1-infrastructureset - standard\L3.11A Planting Plan.dwg , Page Setup: Full Size_30-42, Wendow, HH cells, Plot Scale: 1:1, DWG To PDF.pc3



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KEY PLAN

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 11

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH
SHEET #:
L3.11B

Sam Brenner, h:\2011\11-532 concord\GIS records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L3.11B Planting Plan.dwg , Page Setup: Full Size_30x42_Window, 1 H:Lets, Plot Scale: 1:1, DWG To PDF.pc3

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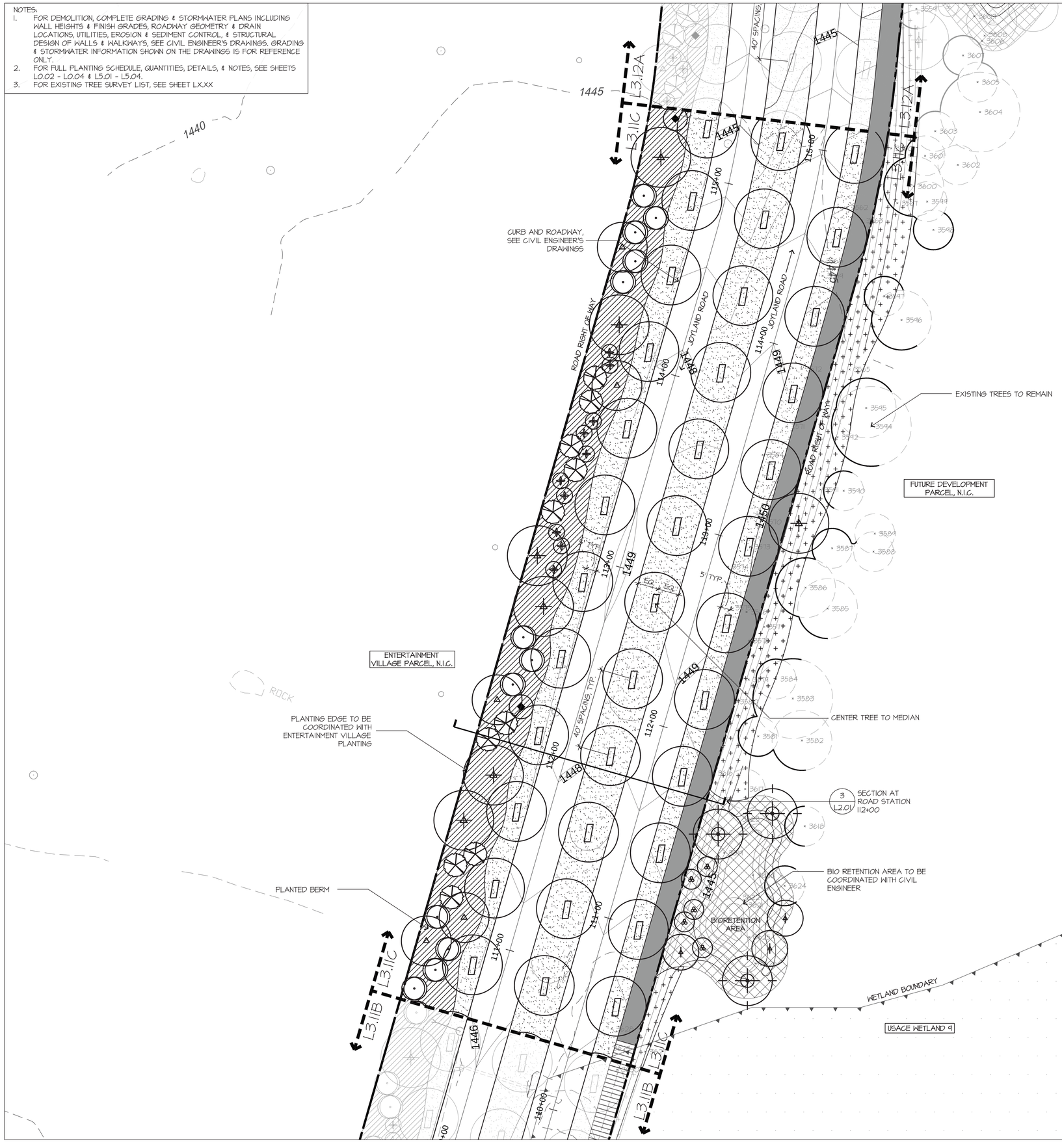

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ILEX VERTICILLATA	AMERICAN WINTERBERRY
LINDERA BENZOIN	COMMON SPICE BUSH
RHODODENDRON MAXIMUM	ROSEBAY RHODODENDRON

SHRUB MIX A: SCREEN BUFFER PLANTING	SHRUB MIX C: THOMPSONVILLE ROAD
SHRUB MIX B: WOODLAND EDGE 1	SHRUB MIX D: WOODLAND EDGE 2
SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	ENTRY WALL

SEED AND GROUNDCOVER MIXES:

SWALE AND SLOPE SEED MIX	STORMWATER POND - EMBANKMENT
ROADSIDE SEED MIX	STORMWATER POND - SIDES
LAWN SEED MIX	WETLAND SEED MIX
MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

HART | HOWERTON
10 East 40th Street New York, NY 10016
Tel: 212 683 5651 Fax: 212 481 3768
E-mail: NY@harthowerton.com

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34 South Broadway
Suite 401
White Plains, NY 10601
Tel: 914 949 7336

atelier lumiere
13 West 17th St #901
New York, NY 10011
Tel: 212 255 0577

CONCORD RESORT
PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

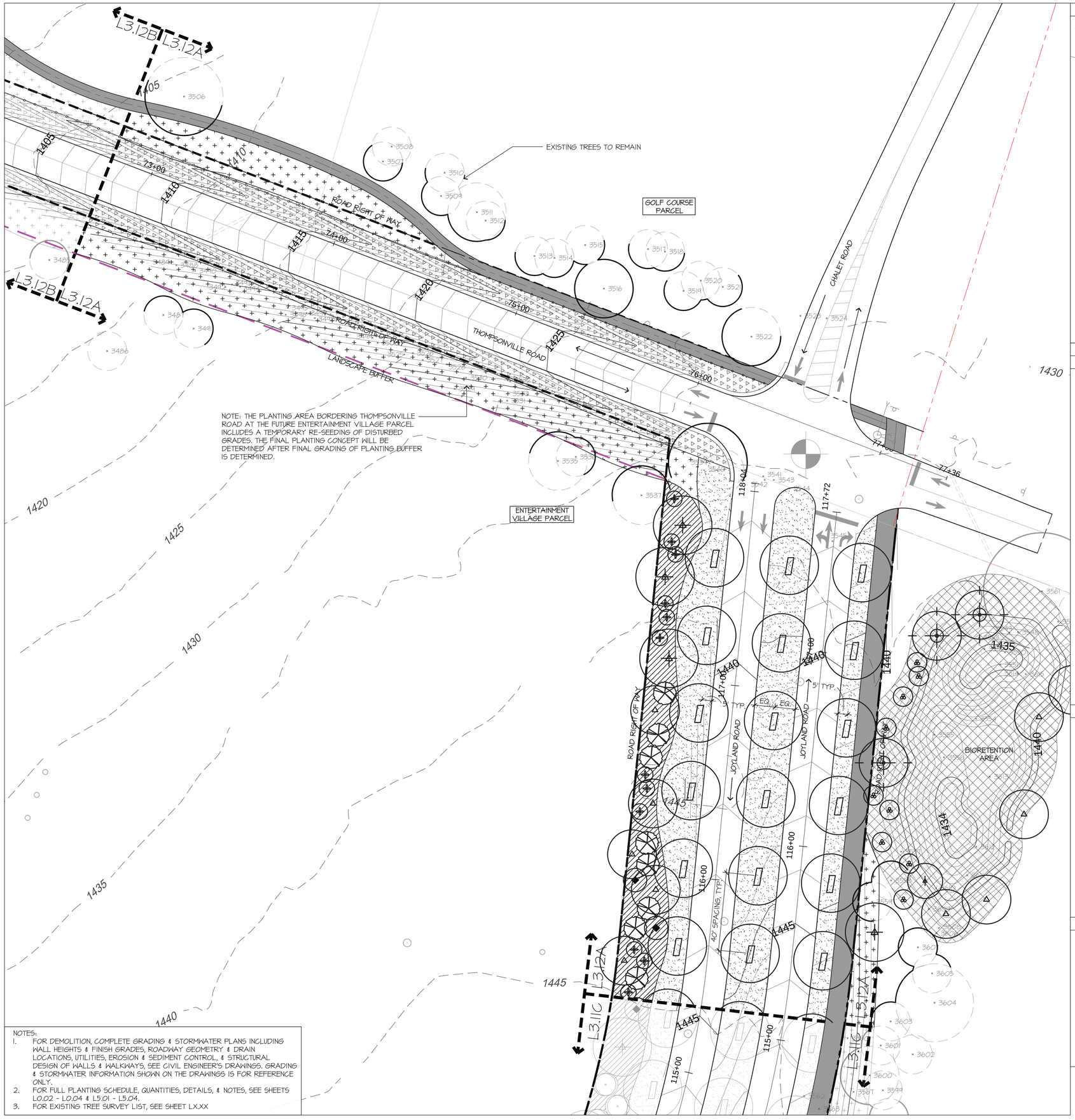
REVISIONS		
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN
TILE 11

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.11C

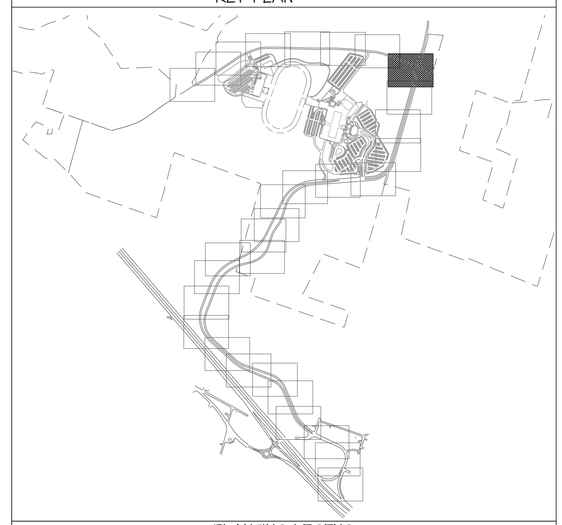
Stan Brezenec, Jr.\2011\11-532 concord\0.0 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L3.11C Planting Plan.dwg , Page Setup: Full Size_30-42, Wyndow, HH eth, Plot Scale: 1:1, DWG To PDF.pc3



NOTES:

1. FOR DEMOLITION, COMPLETE GRADING & STORMWATER PLANS INCLUDING WALL HEIGHTS & FINISH GRADES, ROADWAY GEOMETRY & DRAIN LOCATIONS, UTILITIES, EROSION & SEDIMENT CONTROL, & STRUCTURAL DESIGN OF WALLS & WALKWAYS, SEE CIVIL ENGINEER'S DRAWINGS. GRADING & STORMWATER INFORMATION SHOWN ON THE DRAWINGS IS FOR REFERENCE ONLY.
2. FOR FULL PLANTING SCHEDULE, QUANTITIES, DETAILS, & NOTES, SEE SHEETS L0.02 - L0.04 & L5.01 - L5.04.
3. FOR EXISTING TREE SURVEY LIST, SEE SHEET L.X.XX

KEY PLAN



PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
BETULA ALLEGHANIENSIS	YELLOW BIRCH
BETULA PAPYRIFERA	PAPER BIRCH
FRAXINUS AMERICANA	WHITE ASH
JUNIPERUS VIRGINIANA	EASTERN REDCEDAR
NYSSA SYLVATICA	BLACK GUM
PICEA GLAUCA	WHITE SPRUCE
PINUS NIGRA	AUSTRIAN PINE
PINUS STROBUS	EASTERN WHITE PINE
PRUNUS SEROTINA	BLACK CHERRY
QUERCUS PALUSTRIS	PIN OAK
QUERCUS RUBRA	RED OAK
TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN
ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM
3414 EXISTING TREE TO REMAIN	

ORNAMENTAL TREES, SHRUBS AND SHRUB MIXES:

AMELANCHIER ARBOREA	SERVICEBERRY
AMELANCHIER CANADENSIS	SHADBUSH SERVICEBERRY
CERCIS CANADENSIS	EASTERN REDBUD
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WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NORTH

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CONCORD RESORT PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

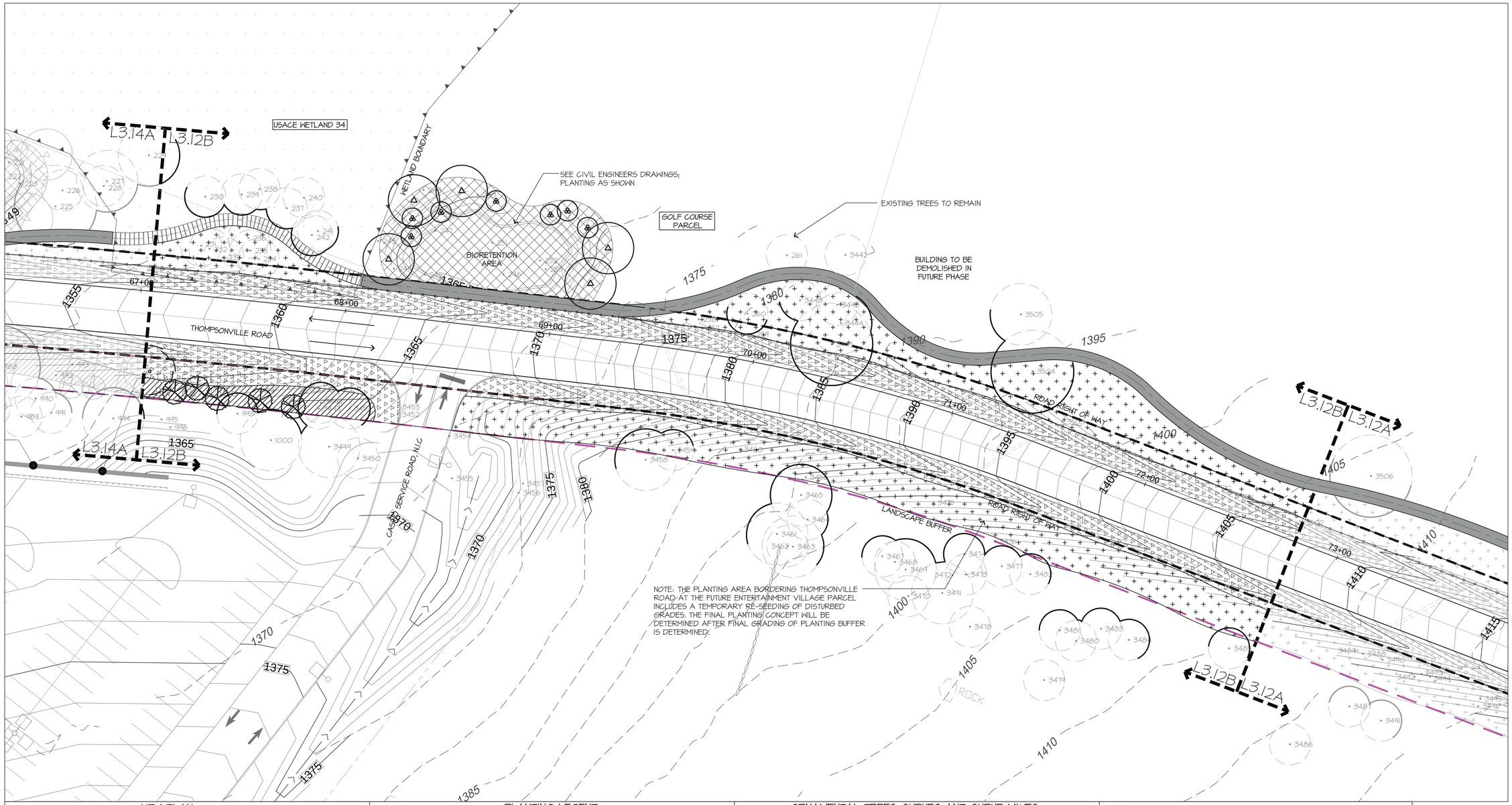
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 12

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.12A

Sam Brenner, h:\2011\11-532 concord\6) records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L3.12A Planting Plan.dwg - , Page Setup: Full Size_30-42_Window, 1H1.ctb, Plot Scale: 1:1, DWG To PDF.pc3



NOTE: THE PLANTING AREA BORDERING THOMPSONVILLE ROAD AT THE FUTURE ENTERTAINMENT VILLAGE PARCEL INCLUDES A TEMPORARY RE-SEEDING OF DISTURBED GRADES. THE FINAL PLANTING CONCEPT WILL BE DETERMINED AFTER FINAL GRADING OF PLANTING BUFFER IS DETERMINED.

KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
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QUERCUS RUBRA	RED OAK
TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN
ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM
3474	EXISTING TREE TO REMAIN

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AMELANCHIER ARBOREA	SERVICEBERRY
AMELANCHIER CANADENSIS	SHADBUSH SERVICEBERRY
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SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	ENTRY WALL

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3. FOR EXISTING TREE SURVEY LIST, SEE SHEET LX.XX

NORTH

0 10 20 40'

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Tel: 212 334 0787

CONCORD RESORT PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

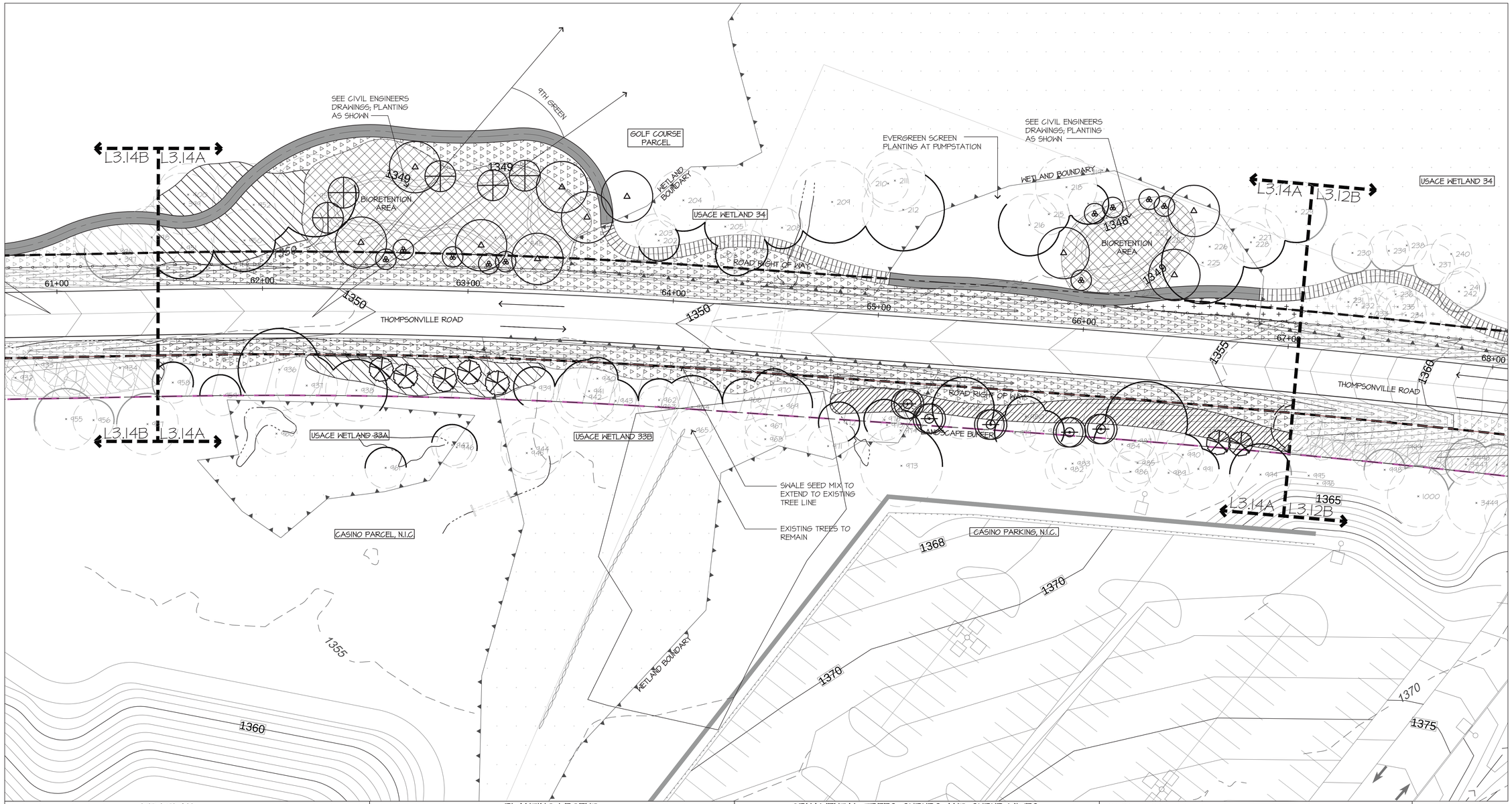
NO	DATE	ISSUE
1	3/27/15	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 12

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.12B

Stan Brenner, I:\2011\11-532 concord\1.6 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.rcst - standard\L3.12B Planting Plan.dwg Page Setup: Full Size_30+42_Window, 1H1 cels, Plot Scale: 1:1, DWG To: PDF.pc3



KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
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ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
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3474	EXISTING TREE TO REMAIN

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HAMAMELIS VIRGINIANA	WITCHHAZEL
ILEX VERTICILLATA	AMERICAN WINTERBERRY
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SEED AND GROUNDCOVER MIXES:

SWALE AND SLOPE SEED MIX	STORMWATER POND - EMBANKMENT
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LAWN SEED MIX	WETLAND SEED MIX
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WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NOTES:
1. FOR DEMOLITION, COMPLETE GRADING & STORMWATER PLANS INCLUDING WALL HEIGHTS & FINISH GRADES, ROADWAY GEOMETRY & DRAIN LOCATIONS, UTILITIES, EROSION & SEDIMENT CONTROL, & STRUCTURAL DESIGN OF WALLS & WALKWAYS, SEE CIVIL ENGINEER'S DRAWINGS. GRADING & STORMWATER INFORMATION SHOWN ON THE DRAWINGS IS FOR REFERENCE ONLY.
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3. FOR EXISTING TREE SURVEY LIST, SEE SHEET LX.XX

NORTH

0 10 20 40'

FOR SITE PLAN PERMIT - NOT FOR CONSTRUCTION

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CONCORD RESORT PHASE 1 INFRASTRUCTURE

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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

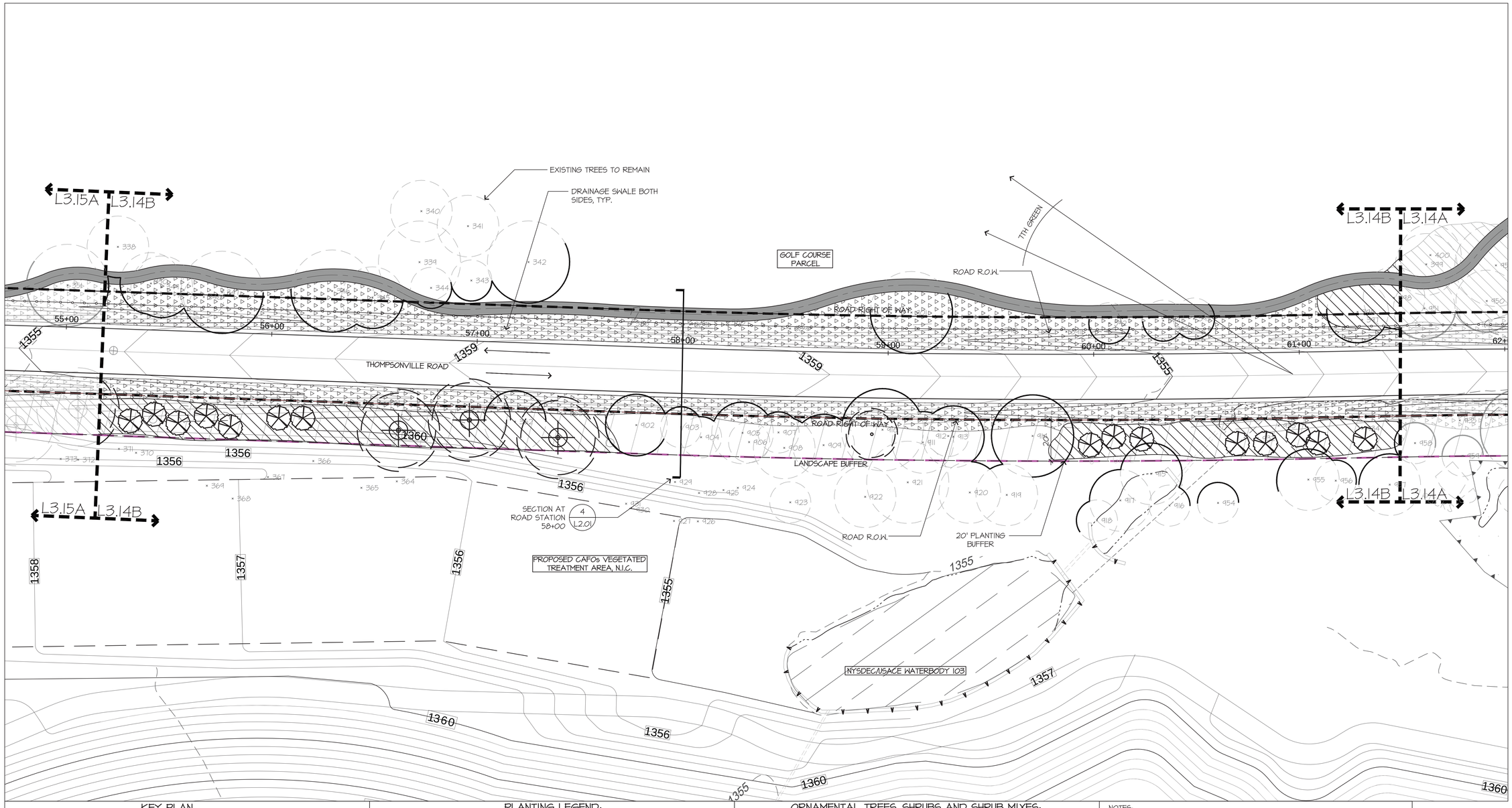
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 14

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.14A

Sean Brenner, h:\2011\11-532 concord\(x6 records\phase 1 infrastructure\)20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L3.14A Planting Plan.dwg , Page Setup: Full Size_30 42_Window, HH refh, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
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34"/14	EXISTING TREE TO REMAIN

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NOTES:
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NORTH

0 10 20 40'

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CONCORD RESORT
PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

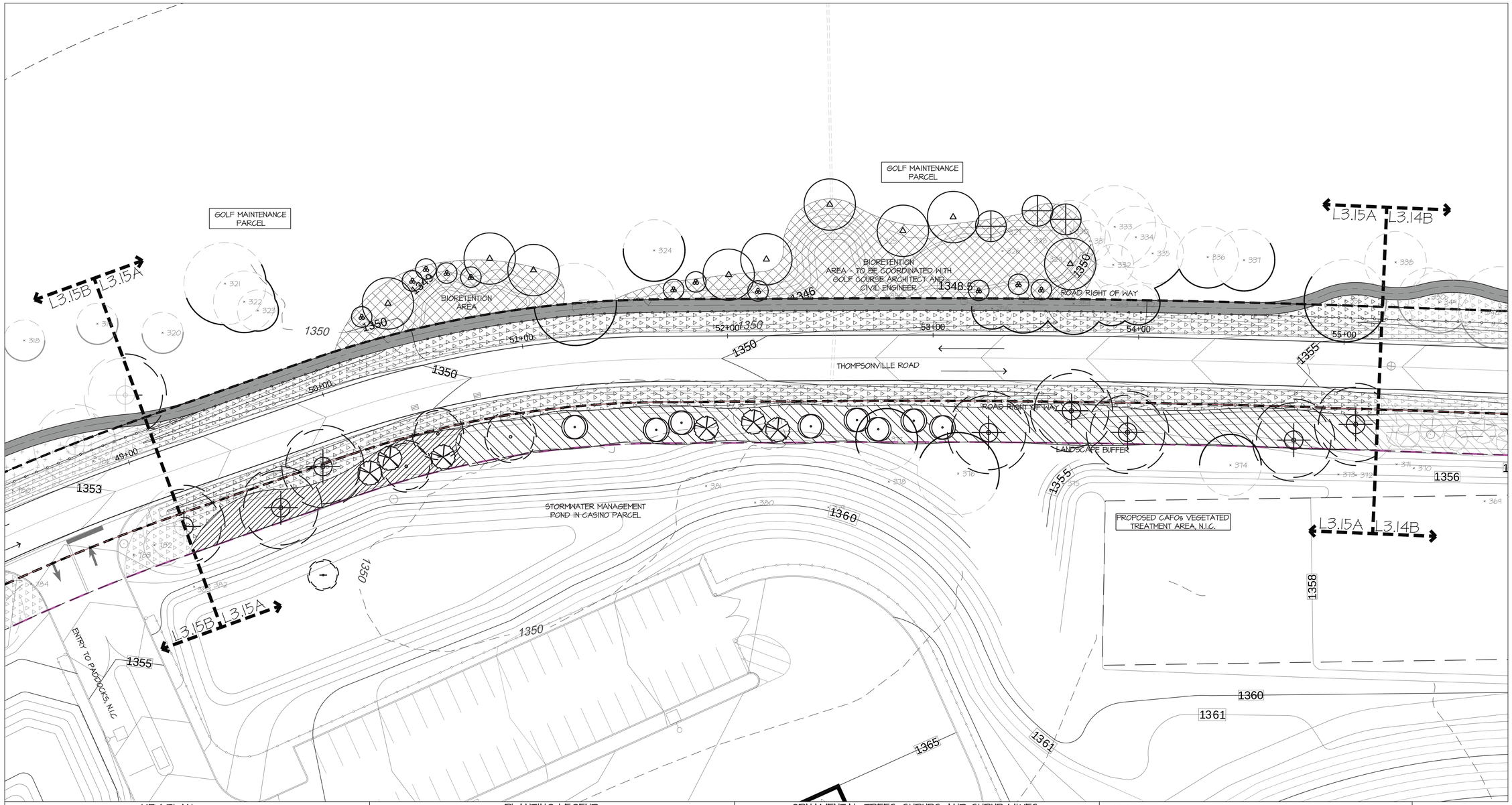
REVISIONS		
NO	DATE	ISSUE
1	3/27/15	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN
TILE 14

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.14B

Stan Brenner, I:\2011\11-532 concord\6 records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure-s - standard\L3.14B Planting Plan.dwg - Page Setup: Full Size_36"x42"_Window, 1 HH cds, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN

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NORTH

0 10 20 40'

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CONCORD RESORT PHASE 1 INFRASTRUCTURE

Town Of Thompson, New York
Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE: PLANTING PLAN TILE 15

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #: L3.15A

Sara Brenner, h:\2011\11-532 concord\03 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L3.15A Planting Plan.dwg , Page Setup: Full Size_30-42_Wendow_HH Leth, Plot Scale: 1:1, DWG To PDF.pc3

EXISTING TREES TO REMAIN

ROAD RIGHT OF WAY

THOMPSONVILLE ROAD

ENTRY TO PADDOCKS, N.I.C.

STORMWATER MANAGEMENT POND IN CASINO PARCEL

LANDSCAPE BUFFER

L3.16A L3.15B

L3.15B L3.15A

KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

ACER RUBRUM 'SCHLESINGERI'	SCHLESINGER RED MAPLE
ACER SACCHARUM	SUGAR MAPLE
ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
BETULA ALLEGHANIENSIS	YELLOW BIRCH
BETULA PAPYRIFERA	PAPER BIRCH
FRAXINUS AMERICANA	WHITE ASH
JUNIPERUS VIRGINIANA	EASTERN REDCEDAR
NYSSA SYLVATICA	BLACK GUM
PICEA GLAUCA	WHITE SPRUCE
PINUS NIGRA	AUSTRIAN PINE
PINUS STROBUS	EASTERN WHITE PINE
PRUNUS SEROTINA	BLACK CHERRY
QUERCUS PALUSTRIS	PIN OAK
QUERCUS RUBRA	RED OAK
TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN
ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM
3478	EXISTING TREE TO REMAIN

ORNAMENTAL TREES, SHRUBS AND SHRUB MIXES:

AMELANCHIER ARBOREA	SERVICEBERRY
AMELANCHIER CANADENSIS	SHADBUSH SERVICEBERRY
CERCIS CANADENSIS	EASTERN REDBUD
CORNUS KOUSA 'AURORA'	'AURORA' DOGWOOD
HAMAMELIS VIRGINIANA	WITCHHAZEL
ILEX VERTICILLATA	AMERICAN WINTERBERRY
LINDERA BENZOIN	COMMON SPICE BUSH
RHODODENDRON MAXIMUM	ROSEBAY RHODODENDRON

SHRUB MIX A: SCREEN BUFFER PLANTING	SHRUB MIX C: THOMPSONVILLE ROAD
SHRUB MIX B: WOODLAND EDGE 1	SHRUB MIX D: WOODLAND EDGE 2
SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	ENTRY WALL

SEED AND GROUNDCOVER MIXES:

SWALE AND SLOPE SEED MIX	STORMWATER POND - EMBANKMENT
ROADSIDE SEED MIX	STORMWATER POND - SIDES
LAWN SEED MIX	WETLAND SEED MIX
MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NOTES:
1. FOR DEMOLITION, COMPLETE GRADING & STORMWATER PLANS INCLUDING WALL HEIGHTS & FINISH GRADES, ROADWAY GEOMETRY & DRAIN LOCATIONS, UTILITIES, EROSION & SEDIMENT CONTROL, & STRUCTURAL DESIGN OF WALLS & WALKWAYS, SEE CIVIL ENGINEER'S DRAWINGS. GRADING & STORMWATER INFORMATION SHOWN ON THE DRAWINGS IS FOR REFERENCE ONLY.
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3. FOR EXISTING TREE SURVEY LIST, SEE SHEET LX.XX

NORTH

0 10 20 40'

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PHASE 1 INFRASTRUCTURE

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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

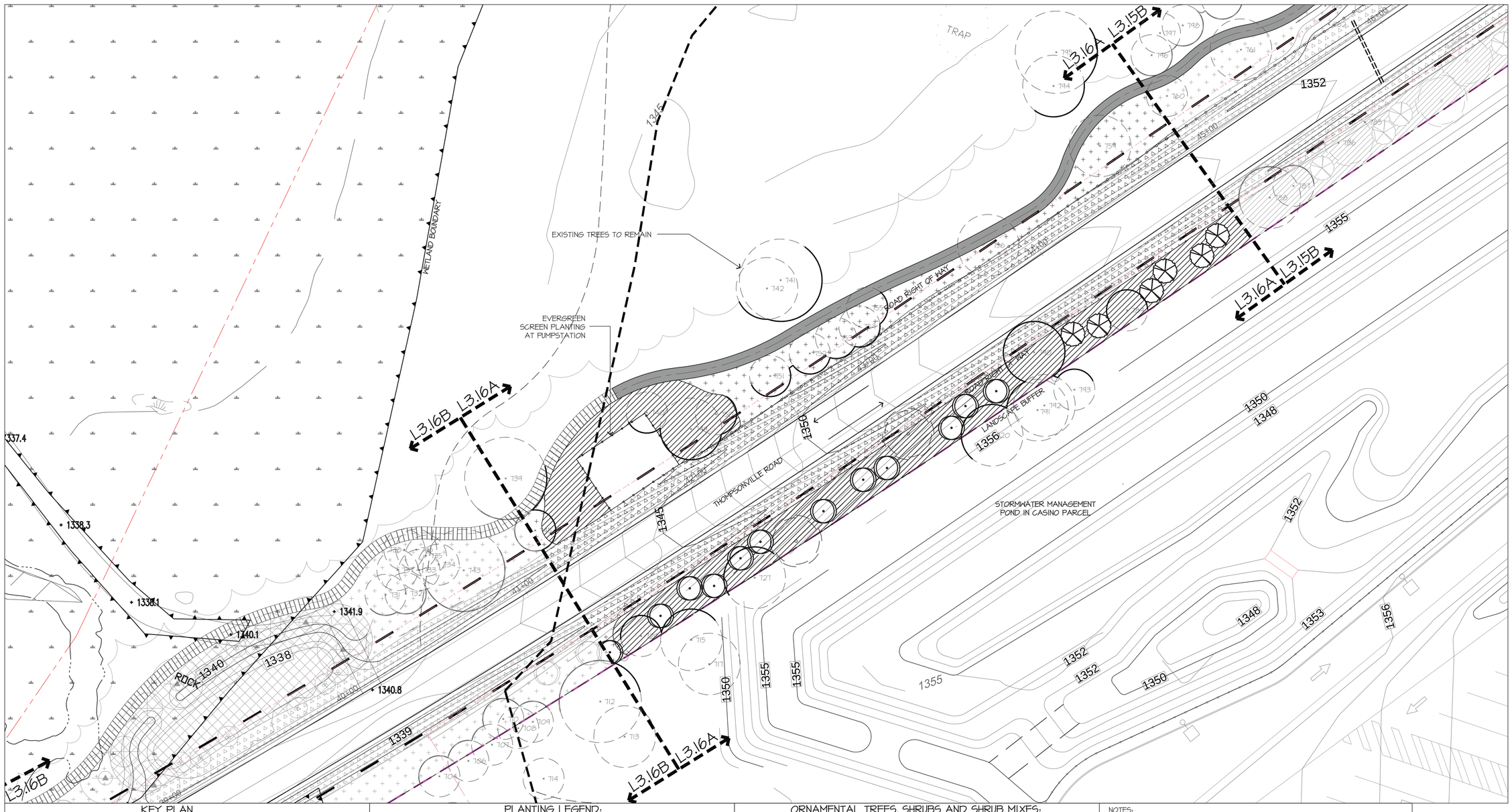
NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 15

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.15B

Stan Brenner, I:\2011\11-532 concord\6.0 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-standard\L3.15B Planting Plan.dwg - Page Setup: Full Size_30 42_Window, HH.ctb, Plot Scale: 1:1, DWG To PDF.pc3



KEY PLAN

PLANTING LEGEND:

DECIDUOUS AND EVERGREEN TREES:

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ACER SACCHARUM - SPECIMEN	SUGAR MAPLE
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3478	EXISTING TREE TO REMAIN

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SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	ENTRY WALL

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ROADSIDE SEED MIX	STORMWATER POND - SIDES
LAWN SEED MIX	WETLAND SEED MIX
MEADOW MIX	BIO-RETENTION AREA
WILDFLOWER SEED MIX	GROUND TREATMENT UNDER EXISTING TREES
PURPLE ACCENT FLOWERS AT EXISTING WALL	

NOTES:
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NORTH

0 10 20 40'

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Sullivan County

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

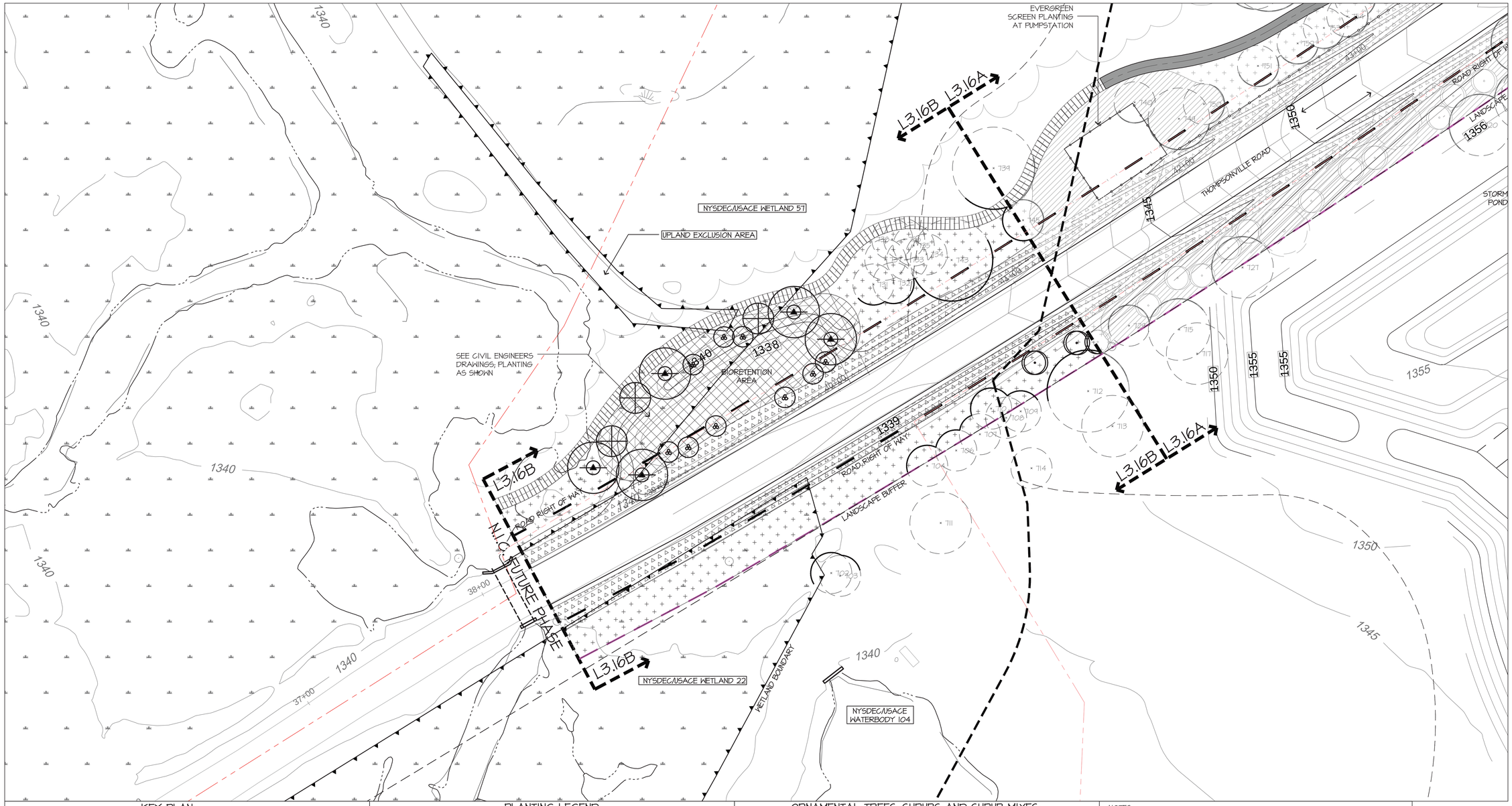
REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 16

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH
SHEET #: L3.16A

Sara Brenner, I:\2011\11-532 concord\16 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure-set - standard\L3.16A Planting Plan.dwg , Page Setup: Full Size_30 x42_Window, 1H1 cells, Plot Scale: 1:1, DWG To PDF.pc3



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- ENTRY WALL

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- LAWN SEED MIX
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- PURPLE ACCENT FLOWERS AT EXISTING WALL
- STORMWATER POND - EMBANKMENT
- STORMWATER POND - SIDES
- WETLAND SEED MIX
- BIO-RETENTION AREA
- GROUND TREATMENT UNDER EXISTING TREES

NOTES:
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NORTH

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING PLAN TILE 16

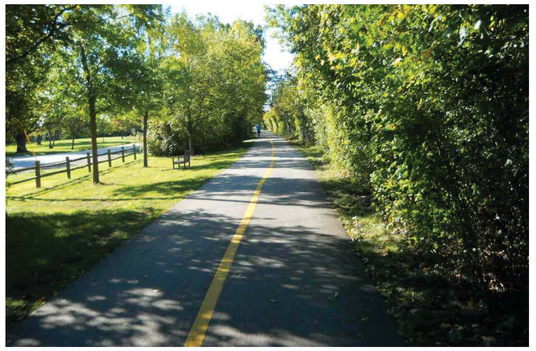
PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L3.16B

Stan Breuner, I:\2011\11-532 concord\GIS records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure.vet - standard\L3.16B Planting Plan.dwg , Page Setup: Full Size_30-42, Window, HH Letb, Plot Scale: 1:1, DWG To PDF.pc3

MATERIALS LEGEND:

	SYMBOL	ITEM	QUANTITY	SIZE	DESCRIPTION	SOURCE
HARDSCAPE:		SHARED USE PATH	1,813 LF	10' WIDE	POROUS ASPHALT WITH PERFORATED UNDERDRAIN PIPE PER CIVIL ENGINEER; PAINTED DIVIDER BETWEEN BIKE AND PEDESTRIAN	
		WALKING TRAIL	3,927 LF	6' WIDE	POROUS ASPHALT WITH PERFORATED UNDERDRAIN PIPE PER CIVIL ENGINEER	
		FUTURE PATH, N.I.C.	N/A			
		BOARDWALK AT WETLAND AREAS	656 LF 121 LF	6' WIDE 10' WIDE	ELEVATED BOARDWALK, RECYCLED WOOD COMPOSITE DECKING WITH CEDAR WOOD POSTS - COLORLESS/ODORLESS WATER REPELLANT/UV PROTECTION OIL TO BE APPLIED. APPLY REGULARLY AS PART OF MAINTENANCE REGIME; ALL EXPOSED FITTINGS TO BE S.S.	WWW.TREX.COM OR APPROVED EQUAL
WALLS/ FENCES:		ENTRY WALL	155 LF	2' WI. X 8' TO 12' HT.	CMU BLOCK WALL WITH 4"-8" THICK BLUESTONE FULL VENEER; DRY-STACK APPEARANCE, COLOR TO MATCH EXISTING SITE STONE (DARK GREY/BLUE); NO CAP; NOTE: WALL WILL RETAIN ON BACK SIDE PER CIVIL GRADING, T.B.D.	LOCALLY SOURCED STONE -EMPIRE BLUESTONE AND GRANITE, LLC OR SIM.
		SERPENTINE SITE WALL SERPENTINE RETAINING WALL	480 LF 167 LF	2' WI. X 5'-0" HT. 2' WI. X 1' TO 5' HT.	CMU BLOCK WALL WITH 4"-8" THICK BLUESTONE FULL VENEER (ONE SIDE ONLY FOR RETAINING WALL); DRY-STACK APPEARANCE, COLOR TO MATCH EXISTING SITE STONE (DARK GREY/BLUE); NO CAP	LOCALLY SOURCED STONE -EMPIRE BLUESTONE AND GRANITE, LLC OR SIM.
		EXISTING WALL TO REPAIR	80 LF	HT. VARIES, 18"-36"	ASSUME APPROX. 10' OF WALL REPAIR WHERE BROKEN DUE TO NEW ROAD; PLACE LARGE BOULDER AT TERMINUS; ADDITIONAL STONE MAY BE REQUIRED	SITE SALVAGED BOULDER
		FENCE	3,403 LF	3'-0" HT.	TIMBER 2-RAIL FENCE, CEDAR MEMBERS; COLORLESS/ODORLESS WATER REPELLANT/UV PROTECTION OIL TO BE APPLIED; ALL EXPOSED BOLTS TO BE S.S.; ASSUME POST SPACING 16'-0"	SUSTAINABLLY HARVESTED



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8 SHARED USED PATH — N/A

H:\2011\11-532 Concord\LD Records\Phase I Infrastructure\20131021_Prelim Site Plan Submission to Town\11-532-Concord-PHI-InfrastructureSet - Standard\L4.01 Hardscape Details.dwg

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7 WALKING TRAIL — N/A

H:\2011\11-532 Concord\LD Records\Phase I Infrastructure\20131021_Prelim Site Plan Submission to Town\11-532-Concord-PHI-InfrastructureSet - Standard\L4.01 Hardscape Details.dwg

THIS IMAGE IS FOR DESIGN INTENT ONLY. CONSTRUCTION DETAIL TO BE PROVIDED BY CIVIL ENGINEER IN A FUTURE SUBMITTAL. MATERIAL TO BE COMPOSITE WOOD DECKING AND WOOD POSTS. SEE PLANS AND MATERIALS LEGEND FOR WIDTH AND LOCATIONS.

6 BOARDWALK AT WETLAND AREAS — N/A

H:\2011\11-532 Concord\LD Records\Phase I Infrastructure\20131021_Prelim Site Plan Submission to Town\11-532-Concord-PHI-InfrastructureSet - Standard\L4.01 Hardscape Details.dwg

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5 WOOD FENCE — N/A

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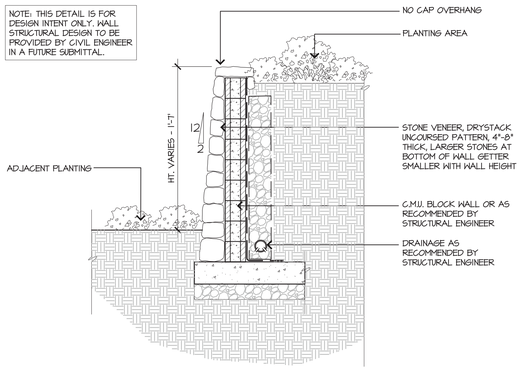
CHARACTER IMAGE

NOTE: THIS DETAIL IS FOR DESIGN INTENT ONLY. WALL STRUCTURAL DESIGN TO BE PROVIDED BY CIVIL ENGINEER IN A FUTURE SUBMITTAL.

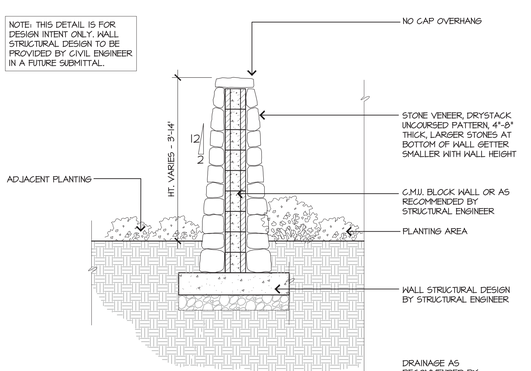


3 SERPENTINE RETAINING WALL — 1/2"=1'-0" — D:\HA-ST-001.DWG

SERPENTINE WALL CHARACTER IMAGE
NOTE: WALL TO BE CMU WALL WITH STONE VENEER, NOT DRY-STACK AS SHOWN IN IMAGE

ENTRY WALL CHARACTER IMAGE

NOTE: THIS DETAIL IS FOR DESIGN INTENT ONLY. WALL STRUCTURAL DESIGN TO BE PROVIDED BY CIVIL ENGINEER IN A FUTURE SUBMITTAL.



1 ENTRY WALL AND SERPENTINE FREE-STANDING WALL — 1/2"=1'-0" — D:\HA-ST-002.DWG

14

13

10

9

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DRAWING TITLE:
HARDSCAPE DETAILS

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: AH

SHEET #:
L4.01

Sara Brenner, H:\2011\11-532 Concord\LD Records\Phase 1 Infrastructure\20130327_Prelim Site Plan Submission to Town\11-532-Concord-PH1 InfrastructureSet - Standard\L4.01 Hardscape Details.dwg , Page Setup: text, HH cth, Plot Scale: 1:1, None

DECIDUOUS AND EVERGREEN TREES

NO. OF PLANTS	BOTANICAL NAME	COMMON NAME	SPEC. SIZE	SPACING	FULL GROWN SZ.	DEER GUARD	NOTES
178	ACER RUBRUM 'SCHLESINGERI' OR SP.	SCHLESINGER RED MAPLE	50%: 8-10' HT. 50%: 2"-2.5" CAL.	PER PLAN			VARIED SIZES ALONG ENTRY ROAD
40	ACER SACCHARUM	SUGAR MAPLE	3"-3.5" CAL., B&B	PER PLAN	60'	YES	
20	ACER SACCHARUM - SPECIMEN	SUGAR MAPLE	12" CAL. FIELD DUG SPECIMEN	100' O.C. AT ENTRY ONLY; PER PLAN	60'	YES	SUPPLIER TO PROVIDE WARRANTY AND ARBORIST ASSESSMENT OF SUITABILITY OF SELECTED SPECIES AND CULTIVAR TO SITE CONDITIONS
48	BETULA ALLEGHANIENSIS	YELLOW BIRCH	2"-2.5" CAL., B&B	PER PLAN	40'X20'	YES	ALLOW FOR APPROX. 30% MULTI-TRUNK FORM, 70% STANDARD TRUNK FORM
150	BETULA PAPYRIFERA	PAPER BIRCH	2"-2.5" CAL., B&B	PER PLAN	50'X25'		ALLOW FOR APPROX. 30% MULTI-TRUNK FORM, 70% STANDARD TRUNK FORM
33	FRAXINUS AMERICANA	WHITE ASH	2"-2.5" CAL., B&B	PER PLAN	70'X10'	YES	
34	JUNIPERUS VIRGINIANA	EASTERN RED CEDAR	10'-14' HT., B&B	PER PLAN			
20	TILIA AMERICANA 'REDMOND'	AMERICAN LINDEN	3"-3.5" CAL., B&B	PER PLAN		YES	
57	NYSSA SYLVATICA	BLACK GUM	10'-12' HT., B&B	PER PLAN	40'X25'		
70	PICEA GLAUCA	WHITE SPRUCE	12'-14' HT., B&B	PER PLAN	50'X20'		
157	PINUS NIGRA	AUSTRIAN PINE	60%: 10'-12' HT. 40%: 12'-14' HT.	PER PLAN	40'X20'		LARGER SIZE TO BE USED ADJACENT TO PARCEL 31-1-18 AND CASINO PARCEL
248	PINUS STROBUS	EASTERN WHITE PINE	70%: 10'-12' HT. 30%: 14'-16' HT.	PER PLAN	60'X25'	YES	LARGER SIZE TO BE USED ADJACENT TO PARCEL 31-1-18 AND CASINO PARCEL
15	PRUNUS SEROTINA	BLACK CHERRY	2"-2.5" CAL., B&B	PER PLAN		YES	
10	QUERCUS PALUSTRIS	PIN OAK	2"-2.5" CAL., B&B	PER PLAN	60'X25'	YES	
17	QUERCUS RUBRA	RED OAK	2.5"-3" CAL., B&B	PER PLAN	60'X40'	YES	
133	ULMUS AMERICANA 'PRINCETON'	PRINCETON ELM	5" CAL., B&B	40' O.C.	60'X30'		TREES TO BE LIMBED UP FOR VEHICULAR CLEARANCE

ORNAMENTAL TREES AND SHRUBS

NO. OF PLANTS	BOTANICAL NAME	COMMON NAME	SPEC. SIZE	SPACING	FULL GROWN SZ.	DEER GUARD	NOTES
44	AMELANCHIER ARBOREA	SERVICEBERRY	5'-7' HT.	PER PLAN	12' HT.		MULTI-TRUNK FORM
259	AMELANCHIER CANADENSIS	SHADBUSH SERVICEBERRY	6'-7' HT.	PER PLAN	25'X15'		MULTI-TRUNK FORM
49	CERCIS CANADENSIS	EASTERN REDBUD	8'-10' HT.	PER PLAN	20'X25'	YES	
39	CORNUS KOUSA 'AURORA'	'AURORA' DOGWOOD	7'-8' HT.	PER PLAN	20'X20'		
29	HAMAMELIS VIRGINIANA	WITCHHAZEL	5' HT.	PER PLAN	15'X15'	YES	
81	ILEX VERTICILLATA	AMERICAN WINTERBERRY	5' HT.	PER PLAN	12'X12'	YES	SPECIFY MALE ('JIM DANDY') AND FEMALE
40	LINDERA BENZOIN	COMMON SPICE BUSH	5' HT.	PER PLAN			
71	RHODODENDRON MAXIMUM	ROSEBAY RHODODENDRON	6'-7' HT.	PER PLAN	12'X12'	YES	

SHRUB AND GROUNDCOVER MIXES

KEY	MIX NAME	TOTAL SQ. FT.	NO. OF PLANTS	BOTANICAL NAME	COMMON NAME	SPEC. SIZE	SPACING	FULL GROWN HT.	NOTES
	SHRUB MIX A: SCREEN BUFFER PLANTING	78,538	629	ILEX X LYDIA MORRIS/JOHN T. MORRIS (25%)	LYDIA MORRIS/JOHN T. MORRIS HOLLY	5'-6' HT., B&B			SHRUB FORM; PLANT IN INFORMAL MASSES IN BACKGROUND
			1,419	ILEX GLABRA (25%)	INKBERRY	4'-5' HT.			PLANT IN BETWEEN EVERGREEN TREES
			2,014	LEUCOTHOE FONTANESIANA (20%)	DROOPING LEUCOTHOE, FETTERBUSH	3'-4' HT.			PLANT IN FRONT
			544	MYRICA PENNSYLVANICA (15%)	NORTHERN BAYBERRY	4'-5' HT.			PLANT IN MASSINGS, ALTERNATING WITH HOLLY IN IRREGULAR INTERVALS
			1,510	POTENTILLA FRUTICOSA 'CORONATION TRIUMPH' (15%)	CORONATION TRIUMPH CINQUEFOIL	5 GAL.			
	SHRUB MIX B: WOODLAND EDGE 1	24,570	67	AESCULUS PARVIFLORA (15%)	BOTTLEBRUSH BUCKEYE	3'-4' HT.		10'	MASSINGS, GOOD ON SLOPES
			394	CORNUS SERICERA 'BAILEY1' (50%)	RED OSIER DOGWOOD	3'-4' HT.		TO 8'	
			227	SUMAC AROMATICA GRO-LO (20%)	FRAGRANT SUMAC	3 GAL.		2'-0"	USE AS GROUNDCOVER
			266	VIBURNUM CASSINOIDES (15%)	WITHEROD VIBURNUM	5 GAL.		5'-0"	
	SHRUB MIX C: THOMPSONVILLE ROAD	16,703	428	CLETHRA ALNIFOLIA 'CALEB' (20%)	VANILLA SPICE SUMMERSWEET	5 GAL.			CHOSEN FOR FRAGRANT FLOWERS JULY/AUG
			134	ILEX X LYDIA MORRIS/JOHN T. MORRIS (30%)	LYDIA MORRIS/JOHN T. MORRIS HOLLY	4'-5' HT., B&B			SHRUB FORM; EVERGREEN MASSINGS IN BACKGROUND OF SHRUB BORDER
			428	POTENTILLA FRUTICOSA 'ABBOTTSWOOD' (20%)	ABBOTTSWOOD CINQUEFOIL	5 GAL.		2'-0"	PLANT IN FRONT
			154	RHODODENDRON ARBORESCENS (20%)	FRAGRANT RHODODENDRON	4'-5' HT.		5'	NATIVE, CHOSEN FOR FRAGRANT FLOWERS EARLY SUMMER, PT. SHADE
	SHRUB MIX D: WOODLAND EDGE 2	20,229	93	KALMIA LATIFOLIA (10%)	MOUNTAIN LAUREL	3'-4' HT.			USE AS ACCENT IN FOCAL AREAS
			97	FORSYTHIA X INTERMEDIA 'LYNWOOD GOLD' (15%)	LYNWOOD GOLD FORSYTHIA	5 GAL.			PLANT IN MASSINGS
			163	ILEX X LYDIA MORRIS/JOHN T. MORRIS (30%)	LYDIA MORRIS/JOHN T. MORRIS HOLLY	4'-5' HT.			SHRUB FORM; PLANT BOTH MALE AND FEMALE CULTIVARS FOR POLLINATION
			234	VIBURNUM DENTATUM (25%)	ARROWWOOD VIBURNUM	3'-4' HT.			
			2,325	HELLEBORUS SP. (NATIVE) (10%)	LENTEN ROSE	1 GAL.			PLANT IN FRONT IN LARGE SWATHES
			259	POTENTILLA FRUTICOSA 'CORONATION TRIUMPH' (10%)	CORONATION TRIUMPH CINQUEFOIL	5 GAL.			
									PROVIDE SHRUB GUARDS
	SHRUB MIX E: ROCK OUTCROP & EXISTING WALLS	6,293	241	NATIVE AZALEAS	RHODODENDRON SP.	4'-5' HT., B&B			
	ENTRY WALL PLANTING	3,035	351	LOW SHRUB T.B.D. (40%)					
			2,093	GROUNDCOVER OR PERENNIALS T.B.D. (60%)		3 GAL.			

NOTE: APPLY DEER REPELLANT TO ALL SHRUBS AND GROUNDCOVERS, TYPE AND SOURCE T.B.D.

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING SCHEDULE

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: MH

SHEET #:
L5.01

Stan Brenner, Jr.\2011\11-532 concord\60 records\phase 1 infrastructure\20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructure.rvt - standard\L5.01 Planting Schedule.dwg , Page Setup: Full Size_30x42_Window, 1101.ctb, Plot Scale: 1

SEED AND PLANTING MIXES

TYPE	QUANTITY (SF OR NO. OF PLANTS) SF	NO.	% MIX OR SPEC. SIZE	BOTANICAL NAME	COMMON NAME	FULL GROWN HT.	NOTES
SWALE SEED MIX	229,120		30%	FESTUCA RUBRA	CREEPING RED FESCUE		DAWSON, AUDUBON, EPIC OR SEA LINK; CHOSEN FOR SALT TOLERANCE
			20%	OTHER			
			40%	PUCCINELLIA DISTANS 'FULTS'	ALKALI GRASS		CHOSEN FOR HIGH SALT TOLERANCE
ROADSIDE SEED MIX	404,428		25%	SCHIZACHYRIUM SCOPARIUM 'CAMPER'	LITTLE BLUESTEM 'CAMPER'		INCLUDE MAINTENANCE/CLEAN-UP OF THE AREAS UNDER EXISTING TREES THAT
ERNST CONSERVATION SEED MIX ERNMX-140)			20%	ELYMUS VIRGINICUS	VIRGINIA WILDRYE		ARE IN THE MEDIAN AND EDGE OF ROAD
			18%	PANICUM CLANDESTINUM	DEERTONGUE 'TOIGA'		
			5%	CHAMAECRISTA FASCICULATA	PARTIDGE PEA		
			4%	RUDBECKIA HIRTA	BLACKEYED SUSAN		
			4%	SYMPHYOTRICHUM P.	ZIGZAG ASTER		
			3%	PENSTEMON DIGITALIS	TALL WHITE BEARDTONGUE		
			3%	LIATRIS SPICATA	MARSH (DENSE) BLAZING STAR		
			3%	HELIOPSIS HELIANTHOIDES	OXEYE SUNFLOWER		
			3%	ZIZIA AUREA	GOLDEN ALEXANDERS		
			3%	ECHINACEA PURPUREA	PURPLE CONEFLOWER		
			2%	TRADESCANTIA OHIOENSIS	OHIO SPIDERWORT		
			2%	ANEMONE VIRGIANA	THIMBLEWEED		
			2%	AGROSTIS PERENNANS	AUTUMN BENTGRASS		
			1%	LESPEDEZA VIRGINICA	SLENDER LESPEDEZA		
			1%	BAPTISIA AUSTRALIS	BLUE FALSE INDIGO		
			1%	MONARDA FISTULOSA	WILD BERGAMOT		
LAWN SEED MIX	131,105		34%	AGROSTIS PERENNANS	AUTUMN BENT GRASS		NATIVE, CHOSEN FOR LOW HEIGHT, MINIMAL MOWING REQUIRED
			30%	FESTUCA RUBRA	CREEPING RED FESCUE		CHOSEN FOR LOW HEIGHT, MINIMAL MOWING REQUIRED
			26%	FESTUCA OVINA	SHEEP FESCUE		CHOSEN FOR LOW HEIGHT, MINIMAL MOWING REQUIRED
MEADOW MIX	26,828		31%	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM		
ERNST CONSERVATION SEED MIX ERNMX-153			10%	BOUTELOUA CURTIPENDULA	SIDEOATS GRAMA 'BUTTE'		
			10%	ELYMUS VIRGINICUS	VIRGINIA WILDRYE		
			9%	SORGHASTRUM NUTANS	INDIANGRASS		
			4%	CHAMAECHRISTA FASCULATA	PARTRIDGE PEA		
			3%	RUDBECKIA HIRTA	BLACKEYED SUSAN		
			3%	TRADESCANTIA OHIOENSIS	OHIO SPIDERWORT		
			3%	PENSTEMON DIGITALIS	TALL WHITE BEARDTONGUE		
			3%	SPIKED GAYFEATHER	MARSH (DENSE) BLAZING STAR		
			2%	ASTER PRENANTHOIDES	ZIGZAG ASTER		
			2%	PENSTEMON HIRSUTUS	HAIRY BEARDTONGUE		
			2%	AGROSTIS PERENNANS	AUTUMN BENTGRASS		
			2%	ASTER NOVAE-ANGILAE	NEW ENGLAND ASTER		
			2%	HELIOPSIS HELIANTHOIDES	OXEYE SUNFLOWER		
			2%	SENNA HEBECARPA	WILD SENNA		
			1%	BAPTISIA AUSTRALIS	BLUE FALSE INDIGO		
			1%	ASCEPIAS TUBEROSA	BUTTERFLY MILKWEED		
			1%	SENNA MARILANDICA	MARYLAND SENNA		
			1%	SOLIDAGO JUNCEA	EARLY GOLDENROD		
			1%	MONARDA FISTULOSA	WILD BERGAMOT		
			1%	RUDBECKIA FULGIDA	ORANGE CONEFLOWER		
WILDFLOWER SEED MIX	55,424		SEED	T.B.D.	T.B.D.		CUSTOM MIX WILL INCLUDE MIX OF PURPLE WILDFLOWERS THAT BLOOM AT
							DIFFERENT TIMES FOR LONGER PERIOD OF INTEREST
PURPLE ACCENT FLOWERS AT EXISTING WALLS	946		194	DRYOPTERIS MARGINALIS (40%)	MARGINAL WOOD FERN	18"-24"	NV, EV, DR; LOCATE AGAINST WALL AND AMONGST BLUEBELLS
			435	MERTENSIA VIRGINICA (40%)	BLUEBELL	18"-24"	NV; PLUGS; BLOOMS APRIL, BLUE; INTERPLANT WITH FERNS
			140	COLCHICUM 'GIANT' (20%)	COLCHICUM	1'-0"	NV, DR; BULBS; BLOOMS FALL, LAVENDER LOCATE IN FRONT
STORMWATER POND - EMBANKMENT	90,166		22%	SORGHASTRUM NUTANS	INDIANGRASS		GRASSES ONLY - TO BE MOWN TWICE A YEAR
ERNST CONSERVATION SEED MIX ERNMX-181			20%	LOLIUM MULTIFLORUM	ANNUAL RYEGRASS		
			17%	SCHIZACHYRIUM SCOPARIUM	LITTLE BLUESTEM		
			15%	ELYMUS RIPARIUS	RIVERBANK WILDRYE		
			5%	ELYMUS VIRGINICUS	VIRGINIA WILDRYE		
			4%	AGROSTIS SCABRA	TICKLEGRASS (ROUGH BENTGRASS)		
			4%	TRIDENS FLAVUS	PURPLETOP		
			4%	AGROSTIS PERENNANS	AUTUMN BENTGRASS		
			3%	ECHINACEA PURPUREA	PURPLE CONEFLOWER		
			2%	CHAMAECRISTA FASCICULATA	PARTRIDGE PEA		
			1%	COREOPSIS LANCEOLATA	LANCELEAF COREOPSIS		
			1%	PENSTEMON DIGITALIS	TALL WHITE BEARDTONGUE		
			1%	LIATRIS SPICATA	MARSH BLAZING STAR (SPIKED GAYFEATHER)		
			1%	MONARDA FISTULOSA	WILD BERGAMOT		
STORMWATER POND - SIDES		1,540	4"-6" POT	CAREX LURIDA (60%)	LURID SEDGE	18"-36" HT.	PLANT ALONG 18" TOP OF WATER LINE
FACW; FREQUENT INUNDATION		600	4"-6" POT	T.B.D. (40%)	T.B.D.		PLANT ALONG 18" TOP OF WATER LINE
		1,500	5" PLUGS	T.B.D.	T.B.D.		PLANT ON THE SIDE SLOPES
ERNST CONSERVATION SEED MIX ERNMX-137	80,619		25%	CAREX VULPINOIDEA	FOX SEDGE		
			20%	ELYMUS VIRGINICUS	VIRGINIA WILDRYE		
			12%	CAREX GYNANDRA	NODDING SEDGE		
			8%	CAREX LURIDA	LURID SEDGE		
			8%	CAREX SQUARROSA	SQUARROSE SEDGE		
			5%	SPARGANIUM EURYCARPUM	GIANT BUR REED		
			4%	SPARGANIUM AMERICANUM	EASTERN BUR REED		
			3%	CAREX INTUMESCENS	BLADDER (STAR) SEDGE		
			3%	CAREX LUPULINA	HOP SEDGE		
			3%	CAREX COMOSA	COSMOS (BRISTLY) SEDGE		
			2%	CAREX CRINITA	FRINGED (NODDING) SEDGE		
			2%	JUNCUS EFFUSUS	SOFT RUSH		
			2%	SCIRPUS POLYPHYLLUS	MANY LEAVED BULRUSH		
			2%	GINNA ARUNDACEA	WOOD REEDGRASS		
			1%	SCIRPIS CYPERINUS	WOOLGRASS		

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

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NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING SCHEDULE

PROJECT #: 11-532
DRAWN BY: SB
CHECKED BY: MH

SHEET #:
L5.02

Stan Brenner, Jr.\2011\11-532 concord\GIS records\phase 1 infrastructure\20130327_predim site plan submission to town\11-532-concord-ph1-infrastructure.ct - standard\L5.02 Planting Schedule.dwg , Page Setup: Full Size, 30"x42", Window, 1H1.ctb, Plot Scale: 1:1, DWG To PDF.pc3

SEED AND PLANTING MIXES

TYPE	QUANTITY (SF OR NO. OF PLANTS)		% MIX OR SPEC. SIZE	BOTANICAL NAME	COMMON NAME	FULL GROWN HT.	NOTES
BIO-RETENTION AREA		4,588	4"-6" POTS	T.B.D.	T.B.D.		USE EROSION CONTROL MATTING AND INSERT PLUGS THROUGH MATTING
		54,277	3"-5" PLUGS	T.B.D.	T.B.D.		
FACW/FAC	105,841		23%	CAREX VULPINOIDEA	FOX SEDGE		TO INCLUDE PLUGS FOR QUICKER GROUND COVERAGE
ERNST CONSERVATION SEED MIX ERNMX-127			20%	POA PALUSTRIS	FOWL BLUEGRASS		
			20%	ELYMUS VIRGINICUS	VIRGINIA WILDRYE		
			10%	DICHANTHELIUM 'TIOGA'	DEERTONGUE 'TIOGA'		
			8%	CAREX LURIDA	LURID SEDGE		
			4%	VERBENA HASTAT	BLUE VERVAIN		
			4%	SCIRPUS ATROVIRENS	GREEN BULRUSH		
			3%	JUNCUS EFFUSUS	SOFT RUSH		
			2%	AGROSTIS PERENNANS	AUTUMN BENTGRASS		
			2%	SYMPHYOTRICHUM PUNICEUM	PURPLESTEM ASTER		
			2%	SCIRPUS CYPERINUS	WOOLGRASS		
			2%	AGROSTIS SCABRA	TICKLEGRASS		
GROUND TREATMENT UNDER EXISTING TREES	45,152		30% SEED	AGROSTIS PERENNANS (ONLY 30% OF TOTAL AREA)	AUTUMN BENTGRASS		INCLUDE MAINTENANCE/CLEAN-UP OF THE AREAS UNDER EXISTING TREES THAT
							ARE IN THE MEDIAN
WETLAND SEED MIX	41,525			T.B.D.			

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2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE:
PLANTING SCHEDULE

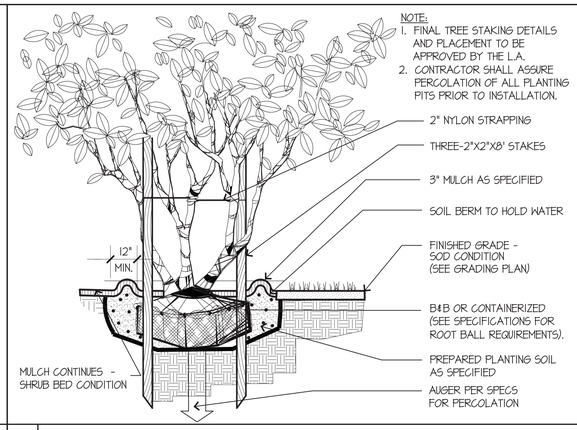
PROJECT #: 11-532
DRAWN BY: SB, GH
CHECKED BY: AH

SHEET #:
L5.03

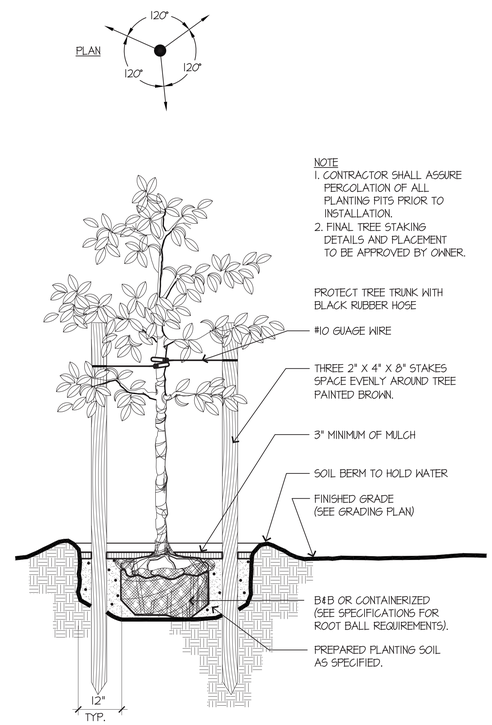
Stan Brenner, h:\2011\11-532 concord \6.0 records \phase 1 infrastructure\ 20130327_prelim site plan submission to town\11-532-concord-ph1-infrastructureset - standard\13.03 Planting Schedule.dwg , Page Setup: Full Size_30 42, Window, HH cells, Plot Scale: 1:1, DWG To PDF.pc3

NOTE:
TREE GUARD TO BE RECYCLED PLASTIC MESH WITH MIN. 3/4" SQUARE OPENINGS, APPROX. 3' HT., COLOR: OLIVE GREEN OR BROWN

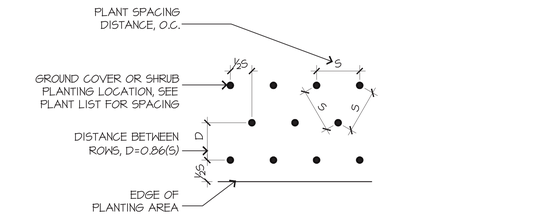
12 TREE DEER GUARD — 1"=1'-0"



8 MULTI-TRUNK TREE PLANTING DETAIL - SECTION — 1"=1'-0"

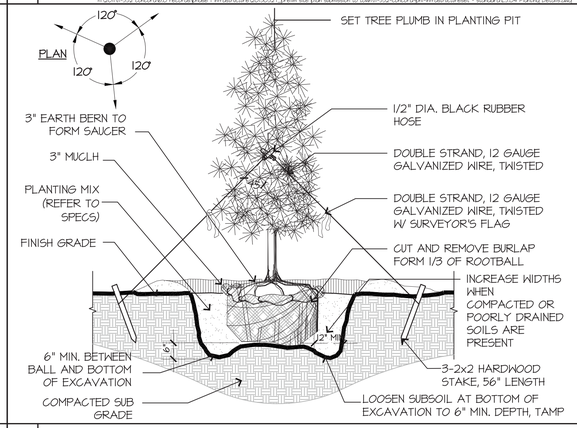


3 SMALL TREE PLANTING DETAIL - SECTION — 1"=1'-0"

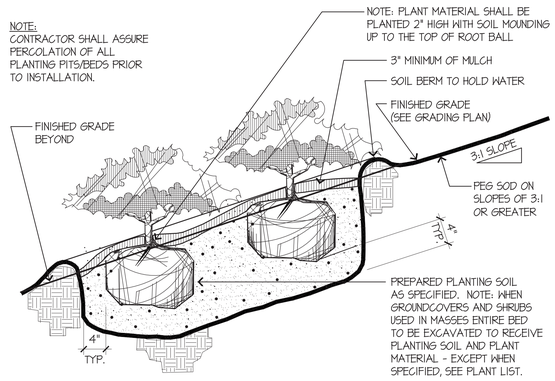


PLANT QUANTITY CHART			
SPACING	# OF PLANTS	SPACING	# OF PLANTS
6" O.C.	4.60	18" O.C.	0.512
8" O.C.	2.60	24" O.C.	0.290
10" O.C.	1.66	30" O.C.	0.185
12" O.C.	1.15	36" O.C.	0.116
15" O.C.	0.738	48" O.C.	0.073

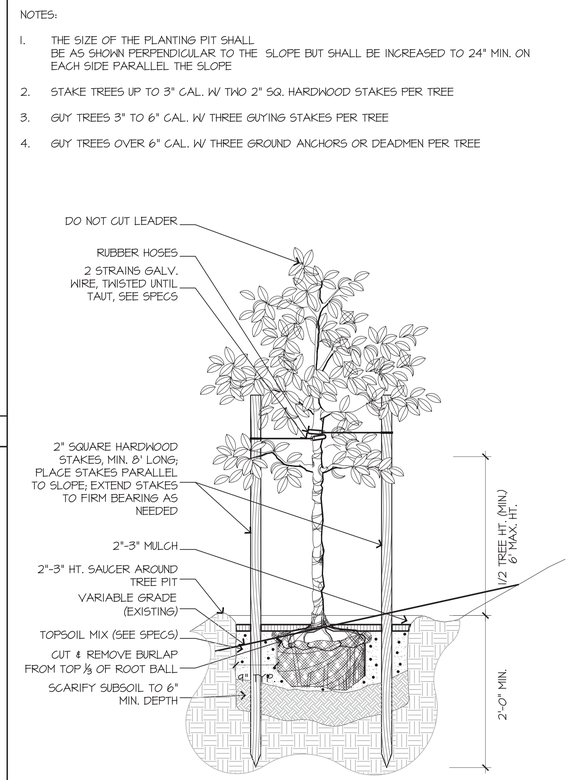
11 GROUND COVER AND SHRUB SPACING — 1"=1'-0"



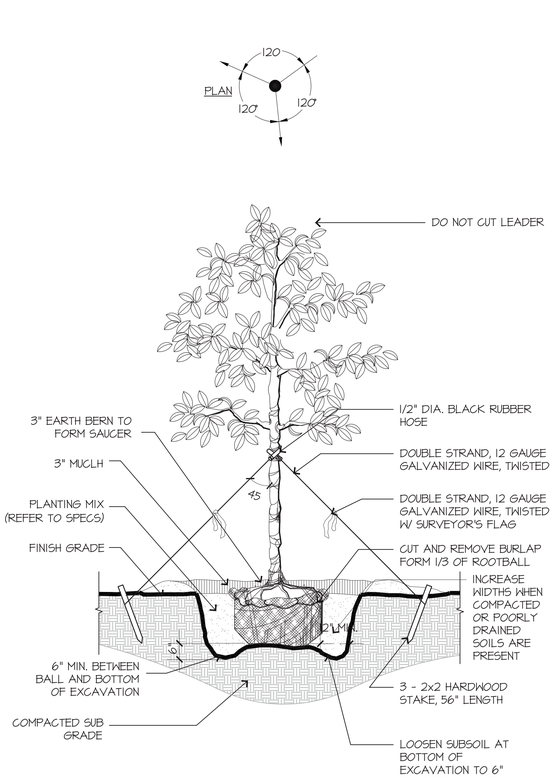
7 EVERGREEN TREE PLANTING DETAIL - SECTION — 1/2"=1'-0"



10 SHRUB ON SLOPE PLANTING DETAIL - SECTION — 1"=1'-0"



9 SHRUB / GROUNDCOVER PLANTING DETAIL - SECTION — 1/2"=1'-0"



5 SMALL TREE ON SLOPE PLANTING DETAIL - SECTION — 1"=1'-0"

1 LARGE TREE PLANTING DETAIL - SECTION — 1/2"=1'-0"

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DATE	ISSUE
2/11/13	SITE PLAN SUBMISSION

REVISIONS

NO	DATE	ISSUE
1	3/27/13	RESUBMISSION PER TOWN COMMENTS

DRAWING TITLE: PLANTING DETAILS

PROJECT #: 11-532
DRAWN BY: SB, GH
CHECKED BY: AH

SHEET #: L5.04

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SWPPP

APPENDIX G

GREEN INFRASTRUCTURE

RUNOFF REDUCTION VOLUME

Concord - Phase 1 - Resort Entry Road
Stormwater Pollution Prevention Plan

Table G1.0: Overall Water Quality Volume (WQv) Calculations

Overall DA Number[1]	P, 90% Rainfall Event Number (inches)	I, Percent Impervious Cover (%)	Rv, Volumetric Runoff Coefficient	Contributing Drainage Area (square feet)	Contributing Drainage Area (acres)	WQv, Water Quality Volume (acre-feet)	WQv, Water Quality Volume (cubic feet)	Notes
POND 21A	1.2	37.5	0.39	125,017.20	2.9	0.11	**4,847.79**	All Developed DA's to Pond 21A
POND 21B	1.2	36.6	0.38	111,949.20	2.6	0.10	**4,245.34**	All Developed DA's to Pond 21B
POND 23	1.2	26.2	0.29	151,893.72	3.5	0.10	**4,334.29**	All Developed DA's to Pond 23
POND 24	1.2	23.2	0.26	202,118.40	4.6	0.12	**5,223.55**	All Developed DA's to Pond 24
NO-POND 25	1.2	24.2	0.27	167,836.68	3.9	0.10	**4,496.18**	All Developed DA's to DP-25
POND 26	1.2	40.9	0.42	85,159.80	2.0	0.08	**3,562.06**	All Developed DA's to Pond 26
POND28	1.2	52.0	0.52	149,149.44	3.4	0.18	**7,728.63**	All Developed DA's to Pond 28
31D	1.2	58.5	0.58	23,391.72	0.5	0.03	**1,347.90**	Developed DA to DP-9
21	UNDISTURBED OFF-SITE AREA							
21C	UNDISTURBED OFF-SITE AREA							
21D	UNDISTURBED OFF-SITE AREA							
SW21A	DIRECT RUNOFF ON POND (0% IMPERVIOUS)							
SW21B	DIRECT RUNOFF ON POND (0% IMPERVIOUS)							
SW21C	DIRECT RUNOFF ON BIORETENTION AREA (0% IMPERVIOUS)							
23	UNDISTURBED OFF-SITE AREA							
23C	UNDISTURBED OFF-SITE AREA							
23P	DIRECT RUNOFF ON POND (0% IMPERVIOUS)							
SW23A	DIRECT RUNOFF ON BIORETENTION AREA (0% IMPERVIOUS)							
SW23B	DIRECT RUNOFF ON BIORETENTION AREA (0% IMPERVIOUS)							
24	UNDISTURBED OFF-SITE AREA							
24C	UNDISTURBED OFF-SITE AREA							
24P	DIRECT RUNOFF ON POND (0% IMPERVIOUS)							
25	UNDISTURBED OFF-SITE AREA							
25C	UNDISTURBED OFF-SITE AREA							
25D	UNDISTURBED OFF-SITE AREA							
26	UNDISTURBED OFF-SITE AREA							
26C	UNDISTURBED OFF-SITE AREA							
26D	UNDISTURBED OFF-SITE AREA & DIRECT RUNOFF ON POND (0% IMPERVIOUS)							
26E	UNDISTURBED OFF-SITE AREA							
26F	UNDISTURBED OFF-SITE AREA							
26G	UNDISTURBED OFF-SITE AREA							
28F	UNDISTURBED OFF-SITE AREA							
SW28A	DIRECT RUNOFF ON BIORETENTION AREA (0% IMPERVIOUS)							
SW28B	DIRECT RUNOFF ON BIORETENTION AREA (0% IMPERVIOUS)							
SW28C	DIRECT RUNOFF ON BIORETENTION AREA (0% IMPERVIOUS)							
SW28D	DIRECT RUNOFF ON POND (0% IMPERVIOUS)							
31	UNDISTURBED OFF-SITE AREA							
SW31	DIRECT RUNOFF ON BIORETENTION AREA (0% IMPERVIOUS)							

Note: Drainage areas in red are not factored into overall as they are conserved natural areas or direct runoff on pond or biortention areas

[1] - Refer to Table G4.0 for breakdown of contributing sub-drainage-areas.

Table D1.1: Water Quality Volume (WQv) Calculations with Impervious Area Reductions for Tree Preservation

Overall DA Number	P, 90% Rainfall Event Number (inches)	I, Percent Impervious Cover (%)[2]	Rv, Volumetric Runoff Coefficient	Contributing Drainage Area (square feet)	Contributing Drainage Area (acres)	WQv, Water Quality Volume (acre-feet)[2]	WQv, Water Quality Volume (cubic feet)[3]	Notes
POND 21A	1.2	37.5	0.39	125,017.20	2.9	0.11	**4,847.79**	All Developed DA's to Pond 21A
POND 21B	1.2	36.6	0.38	111,949.20	2.6	0.10	**4,245.34**	All Developed DA's to Pond 21B
POND 23	1.2	22.8	0.26	151,893.72	3.5	0.09	**3,879.79**	All Developed DA's to Pond 23
POND 24	1.2	14.4	0.18	202,118.40	4.6	0.08	**3,629.15**	All Developed DA's to Pond 24
NO-POND 25	1.2	19.1	0.22	167,836.68	3.9	0.09	**3,722.31**	All Developed DA's to DP-25
POND 26	1.2	39.0	0.40	85,159.80	2.0	0.08	**3,418.15**	All Developed DA's to Pond 26
POND28	1.2	52.0	0.52	149,149.44	3.4	0.18	**7,728.63**	All Developed DA's to Pond 28
31D	1.2	58.5	0.58	23,391.72	0.5	0.03	**1,347.90**	Developed DA to DP-9

[2] - Adjusted impervious cover for tree preservation impervious are reduction. Refer to Table G5.0 for a breakdown of tree canapoy areas within 20-feet of impervious surfaces in each sub-drainage-area.

[3] - Adjusted water quality volume for tree preservation impervious are reduction. Refer to Table G5.0 for a breakdown of tree canapoy areas within 20-feet of impervious surfaces in each sub-drainage-area.

Table G2.0: Green Infrastructure Runoff Reduction Capacity (RRv) Summary

Overall DA Number	Bioretention Areas[4]	Vegetated Swales[5]	Porous Pavement[6]	RRv (ft^3)	RRv ≥ WQv?	RRv - WQv (ft^3)
	WQv Treated (cubic-feet)					
POND 21A	464			**464**	NO	(4,384)
POND 21B	554			**554**	NO	(3,691)
POND 23	1,155	397		**1,551**	NO	(2,329)
POND 24	607		2,083	**2,690**	NO	(939)
NO-POND 25	1,799	450		**2,249**	NO	(1,474)
POND 26		222		**222**	NO	(3,196)
POND28	1,806			**1,806**	NO	(5,922)
31D	539			**539**	NO	(809)

[4] - Refer to Table G6.2

[5] - Refer to Table G7.1

[6] - Refer to Table G8.0

Table G2.1: Composite Green Infrastructure Runoff Reduction Capacity (RRv) Summary

ΣWQV:	32,819
ΣRRV:	10,075
ΣRRV ≥ ΣWQV?	NO

Table G2.2: Green Infrastructure Minimum Runoff Reduction Summary

Overall DA Number	S, HSG Specific Reduction Factor	minimum RRv (acre-feet)	minimum RRv (ft^3)	RRv ≥ minimum RRv?	RRv - minimum RRv (ft^3)
POND 21A	0.30	0.033	1,454	NO	(991)
POND 21B	0.25	0.025	1,074	NO	(521)
POND 23	0.30	0.027	1,164	YES	387
POND 24	0.25	0.021	903	YES	1,786
NO-POND 25	0.30	0.026	1,116	YES	1,133
POND 26	0.30	0.024	1,025	NO	(803)
POND28	0.30	0.053	2,319	NO	(512)
31D	0.30	0.009	404	YES	135

Table G2.3: Composite Green Infrastructure Minimum Runoff Reduction Capacity (RRv) Summary

Σmin.RRv:	9,460
ΣRRV:	10,075
ΣRRV ≥ ΣWQV?	YES

Table G3.0: Stormwater Pond Water Quality Volume (WQv) Summary

Detention Ponds	Potential WQv Provided (cubic-feet)	Potential WQv Provided (acre-feet)	Contributing DA	WQv Treatment Volume (acre-feet)	Treatment Volume Provided?[7]
Pond 21B	10561	0.24	POND 21A	0.10	YES
Pond 21A	3042	0.07	POND 21B	0.11	NO
Pond 23	8931	0.21	POND 23	0.10	YES
Pond 24	10821	0.25	POND 24	0.12	YES
Pond 26	14978	0.34	POND26	0.08	YES
Pond 28	4285	0.10	POND 28	0.18	NO

[7] - Treatment of the WQv in Ponds 21A and 28 is achieved through extended detention

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Table G4.0: Overall Drainage Area Breakdowns

Overall DA Number	POND 21A	Treatment Practice	POND 21B	Treatment Practice	POND 23	Treatment Practice	POND 24	Treatment Practice	NO-POND 25	Treatment Practice	POND 26	Treatment Practice	POND 28	Treatment Practice
Sub-Drainage Areas	21E-1	-	21A-1	Bioretention	23A-1	Veg. Swale	24A-1	Bioretention	25A-1	Veg. Swale & Bioretention	26A-1	Veg. Swale	28A	-
	21E-2	-	21B-1		23A-2		24B-1		25A-2		26B-1		28B	-
	21E-3	-	21A-2	-	23B-1	Veg. Swale & Bioretention	24A-2	Porous Pavement	25B-1	Veg. Swale & Bioretention	26A-2	Veg. Swale	28C	Bioretention
	21F-1	-	21B-2	-	23B-2		24B-2		25B-2		26B-2		28D	
	21F-2	-			23F	Bioretention	24A-3				26A-3		28E	-
	21F-2	-			23G	Veg. Swale & Bioretention	24B-3				26B-3		28G	Bioretention
	21G	Bioretention			23H		24A-4	-					28H	
	21H						24B-4	-					28I	
													31A	Bioretention
													31B	
													31C	
Design Point	DP-21				DP-23		DP-24		DP-25		DP-26		DP-1	

Note: Refer to drainage area figures for a depiction of each sub-drainage-area

Table G5.0: Tree Preservation Impervious Coverage Reduction Summary

Overall DA Number	Sub-DA Number	Existing Trees w/ Canopies[8] within 20-feet of Roadway	Total Canopy Area (sf)	Impervious Area Reduction (sf)
POND 26	26A-1 26B-1	4152 + 4153 + 4156 + 4157	1220	610
		4160 + 4161	647	324
		4172	1331	666
POND 25	25A 25B	4168	1364	682
		4254	386	193
		4249	386	193
		4258 + 4262	1447	724
		4268 + 4272 + 4273 + 4278 + 4285 + 4288 + 4289	6617	3309
		4391 + 4390 + 4387 + 4386 + 4379	4657	2329
		4352 + 4619	723	362
		4623	569	285
		4671 + 4672	479	240
		4690	569	285
POND 24	24A-4 24B-4	4692	504	252
		4696	1230	615
		4823 + 4825	921	461
		4708 + 4713 + 4777	4075	2038
	24A-3 24B-3	4771 + 4768 + 4767 + 4766 + 4751 + 4764 + 4759	3695	1848
		4788 + 4786 + 4785 + 4784 + 4782 + 4781 + 4793	3056	1528
		4797 + 4798	1002	501
		4979	1134	567
	24A-2 24B-2	4981 + 4982 + 4983 + 4984 + 4986 + 4988 + 5039 + 5040 + 5041 + 5042 + 5043 + 5044 + 5045 + 5047 + 5048 + 5049 + 5051 + 5052	9830	4915
	24A-1 24B-1	5053 + 5054	1372	686
		5101 + 5100 + 5099	1383	692
		5094 + 5097	2597	1299
		5143 + 5141 + 5139 + 5138	3257	1629
		5173	710	355
		5174	333	167
		5178	332	166
POND 23	23A-2 23B-2 23F	5215 + 5213 + 5221 + 5222 + 5224 + 5225 + 5231	8597	4299
		5227	283	142
		5229	443	222
		5235	333	167
		5233	444	222

[8] - Refer to Landscape Plans for a depictino of existing trees to be preserved and their respective canopy diameters

Table G6.0: Bioretention Area Water Quality Volume (WQv) Calculations

Overall DA Number	Sub-DA Number	P, 90% Rainfall Event Number (inches)	I, Percent Impervious Cover (%)	Rv, Volumetric Runoff Coefficient	Contributing Drainage Area (acres)	WQv, Water quality Volume (acre-feet)	WQv, Water Quality Volume (cubic feet)
POND 21 A	21G	1.2	43.67	0.44	0.33	0.01	**640.71**
	21H	1.2	46.09	0.46	0.26	0.01	**518.33**
POND 21B	21A-1	1.2	32.27	0.34	0.43	0.01	**640.62**
	21B-1	1.2	38.79	0.40	0.43	0.02	**744.09**
POND 23	23B-1	1.2	25.87	0.28	0.57	0.02	**704.71**
	23B-2	1.2	25.91	0.28	0.63	0.02	**775.92**
	23F	1.2	47.57	0.48	0.21	0.01	**429.04**
	23G	1.2	39.34	0.40	0.27	0.01	**478.74**
	23H	1.2	35.83	0.37	0.31	0.01	**498.10**
POND 24	24A-1	1.2	25.71	0.28	0.60	0.02	**729.31**
	24B-1	1.2	25.34	0.28	0.65	0.02	**788.51**
NO-POND 25	25A-1	1.2	23.44	0.26	1.20	0.03	**1362.95**
	25A-2	1.2	32.06	0.34	0.68	0.02	**1007.21**
	25B-1	1.2	21.27	0.24	1.23	0.03	**1295.66**
	25B-2	1.2	23.11	0.26	0.74	0.02	**831.62**
POND 28	28C	1.2	100.00	0.95	0.44	0.04	**1800.12**
	28D	1.2	100.00	0.95	0.23	0.02	**955.92**
	28G	1.2	100.00	0.95	0.13	0.01	**525.55**
	28H	1.2	0.00	0.05	0.13	0.00	**27.44**
	28I	1.2	100.00	0.95	0.14	0.01	**566.93**
	31A	1.2	100.00	0.95	0.07	0.01	**293.81**
	31B	1.2	0.00	0.05	0.07	0.00	**15.03**
	31C	1.2	100.00	0.95	0.08	0.01	**331.06**
-	31D	1.2	58.47	0.58	0.54	0.03	**1347.90**

Table G6.1: Bioretention Areas Required Filter Bed Area Calculations

Bioretention Area[9]	d_f, Filter Bed Depth (ft)	k, Coefficient of permeability of filter media (ft/day)	h_f, Average height of water above filter bed (ft)	t_f, Design Filter Bed Drain Time (days)	A_f, Surface Area of Filter Bed (ft^2)	Σ Af required for SUB-DA (ft^2)
SW21C	4.0	0.50	0.50	2	570	**1030**
	4.0	0.50	0.50	2	461	
BRA-53	1.0	0.50	0.50	2	427	**923**
	1.0	0.50	0.50	2	496	
BRA-50	4.0	0.50	1.00	2	564	**1185**
	4.0	0.50	1.00	2	621	
SW23A	4.0	0.50	0.50	2	381	**381**
SW23B	2.0	0.50	0.50	2	383	**781**
	2.0	0.50	0.50	2	398	
BRA-46	2.5	0.50	1.00	2	521	**1084**
	2.5	0.50	1.00	2	563	
BRA-37	2.0	0.50	0.50	2	1090	**1896**
	2.0	0.50	0.50	2	806	
BRA-38	2.0	0.50	0.50	2	1037	**1702**
	2.0	0.50	0.50	2	665	
SW28C	4.0	0.50	1.00	2	1440	**2205**
	4.0	0.50	1.00	2	765	
SW28B	4.0	0.50	0.50	2	467	**995**
	4.0	0.50	0.50	2	24	
	4.0	0.50	0.50	2	504	
SW28A	4.0	0.50	1.00	2	235	**512**
	4.0	0.50	1.00	2	12	
	4.0	0.50	1.00	2	265	
SW31	4.0	0.50	1.00	2	1078	**1078**

Table G6.2: Bioretention Areas Design Check

WQv Treatment Provided (40% WQv)	75% WQv (cubic feet)	Design Af, Surface Area of Filter Bed (ft2)	Design Ponding Volume (cubic feet)	Filter Bed > A_f ?	Ponding Volume > 75% WQV ?
464	869	**2129**	997	YES	YES
554	1039	**2399**	1118	YES	YES
592	1110	**2068**	1680	YES	YES
172	322	**744**	329	YES	YES
391	733	**1923**	879	YES	YES
607	1138	**1367**	1139	YES	YES
948	1022	**3939**	1862	YES	YES
851	972	**3650**	1718	YES	YES
1102	2067	**2515**	2197	YES	YES
448	840	**2545**	1169	YES	YES
256	480	**674**	537	YES	YES
539	1011	**1567**	1328	YES	YES

[9] - Refer to Green Infrastructure Figure for a depiction of each bioretention area location

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Table G7.0: Vegetated Swale Water Quality Volume (WQv) Calculations

Overall DA Number	Sub-DA Number	Q_{WQv}, WQv Peak Flow (cfs)	Q_{10}, 10-Year Peak Flow (cfs)	P, 90% Rainfall Event Number (inches)	I, Percent Impervious Cover (%)	Rv, Volumetric Runoff Coefficient	Contributing Drainage Area (acres)	WQv, Water quality Volume (acre-feet)	WQv, Water Quality Volume (cubic feet)
POND 23	23B-1	0.09	3.05	1.2	25.87	0.28	0.57	**0.02**	**704.71**
	23B-2	0.10	3.35	1.2	25.91	0.28	0.63	**0.02**	**775.92**
	23A-1	0.12	4.24	1.2	24.90	0.27	0.81	**0.02**	**962.35**
	23A-2	0.03	3.30	1.2	12.21	0.16	0.70	**0.01**	**484.75**
	23G	0.07	1.53	1.2	39.34	0.40	0.31	**0.01**	**540.35**
	23H	0.08	1.71	1.2	35.83	0.37	0.31	**0.01**	**498.10**
POND 25	25A-1	0.11	6.02	1.2	23.44	0.26	1.20	**0.03**	**1362.95**
	25A-2	0.11	3.61	1.2	32.06	0.34	0.68	**0.02**	**1007.21**
	25B-1	0.15	6.31	1.2	21.27	0.24	1.23	**0.03**	**1295.66**
	25B-2	0.09	3.79	1.2	23.11	0.26	0.74	**0.02**	**831.62**
POND 26	26A-1	0.05	2.06	1.2	27.15	0.29	0.41	**0.01**	**529.54**
	26B-1	0.06	1.80	1.2	28.41	0.31	0.35	**0.01**	**459.40**
	26A-2	0.06	2.66	1.2	26.13	0.29	0.54	**0.02**	**664.58**
	26B-2	0.08	2.22	1.2	28.47	0.31	0.43	**0.01**	**566.92**

Table G7.1: Vegetated Swale Design Checks

WQv Treatment Provided (10% WQv)	Swale Length (feet)	HI El.	LO El.	Swale Slope	Swale Slope < 4%	Swale Bottom Width (feet)	Side Slope	Swale Depth (feet)	WQ Flow Depth (ft)	WQ Manning's n Value[10]	WQ Velocity (fps)	WQ Velocity < 1.0 fps?	WQV Retention Time (min)	WQv Flow Retention > 5 Minutes?	10-Year Flow Depth (ft)	10-Year Manning's n Value[10]	10-Year Velocity (fps)	10-Year Velocity < 5.0 fps?	Freeboard > 0.5 ft?
70.47	150	1389.5	1388.5	0.007	YES	2.00	3	1.50	0.16	0.15	0.21	YES	11.90	YES	0.75	0.075	1.01	YES	YES
77.59	170	1390.5	1388.5	0.012	YES	2.00	3	1.50	0.15	0.15	0.27	YES	10.49	YES	0.71	0.083	1.15	YES	YES
96.23	180	1386.5	1384.5	0.011	YES	2.00	3	1.50	0.18	0.15	0.28	YES	10.71	YES	0.83	0.060	1.67	YES	YES
48.48	150	1386.0	1384.5	0.010	YES	2.00	3	1.50	0.10	0.15	0.20	YES	12.50	YES	0.75	0.075	1.20	YES	YES
54.03	100	1394.0	1391.8	0.022	YES	2.00	3	1.50	0.10	0.15	0.29	YES	5.75	YES	0.50	0.120	0.89	YES	YES
49.81	100	1394.5	1392.0	0.025	YES	2.00	3	1.50	0.11	0.15	0.33	YES	5.05	YES	0.54	0.113	1.06	YES	YES
136.30	150	1389.0	1388.0	0.007	YES	2.00	3	1.50	0.19	0.15	0.24	YES	10.42	YES	0.92	0.045	1.87	YES	YES
100.72	150	1389.0	1388.0	0.007	YES	2.00	3	1.50	0.19	0.15	0.24	YES	10.42	YES	0.83	0.060	1.33	YES	YES
129.57	150	1386.0	1384.5	0.010	YES	2.00	3	1.50	0.20	0.15	0.29	YES	8.62	YES	0.92	0.045	2.24	YES	YES
83.16	150	1385.5	1384.5	0.007	YES	2.00	3	1.50	0.17	0.15	0.22	YES	11.36	YES	0.83	0.060	1.33	YES	YES
52.95	100	1388.3	1384.5	0.038	YES	2.00	3	1.50	0.08	0.15	0.33	YES	5.05	YES	0.50	0.120	1.17	YES	YES
45.94	100	1386.5	1383.0	0.035	YES	2.00	3	1.50	0.08	0.15	0.32	YES	5.21	YES	0.50	0.120	1.13	YES	YES
66.46	200	1380.0	1374.4	0.028	YES	2.00	3	1.50	0.09	0.15	0.31	YES	10.75	YES	0.63	0.098	1.39	YES	YES
56.69	225	1383.0	1375.1	0.035	YES	2.00	3	1.50	0.10	0.15	0.36	YES	10.42	YES	0.54	0.113	1.25	YES	YES

Note: Refer to C-500 plan series for a depiction of vegetated swale locations. Refer to C-900 plan series for vegetated swale typical detail

[10] - Manning's n value varies with flow detph

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Table G8.0: Porous PavmentWater Quality Volume (WQv) Calculations

Overall DA Number	Sub-DA Number	P, 90% Rainfall Event Number (inches)	I, Percent Impervious Cover (%)	Rv, Volumetric Runoff Coefficient	Contributing Drainage Area (acres)	WQv, Water quality Volume (acre-feet)	WQv, Water Quality Volume (cubic feet)
POND 24	24A-2	1.2	28.02	0.30	0.34	0.01	**446.22**
	24A-3	1.2	27.36	0.30	0.50	0.01	**641.34**
	24B-2	1.2	22.92	0.26	0.43	0.01	**482.27**
	24B-3	1.2	22.63	0.25	0.46	0.01	**512.71**

Note: Refer to C-507 plan for a depiction of porous pavement location

Table G8.1: Porous Pavement Storage Volume Calculations

Ap, surface area (ft^2)	n, porosity of gravel bed/reservoir	depth of gravel bed/reservoir (ft)	Required Storage Volume	Storage volume provided (ft^3)
9827	0.30	0.50	1087.56	**1,474.05**
7603	0.30	0.50	994.98	**1,140.45**

Table G9.0: Overall Water Quality Volume (WQv) Calculations

Overall DA Number[11]	P, 90% Rainfall Event Number (inches)	I, Percent Impervious Cover (%)	Rv, Volumetric Runoff Coefficient	Contributing Drainage Area (square feet)	Contributing Drainage Area (acres)	WQv, Water Quality Volume (acre-feet)	WQv, Water Quality Volume (cubic feet)	Notes
A	1.2	41.0	0.42	58,152.60	1.3	0.06	**2,435.22**	
B	1.2	40.5	0.41	20,429.64	0.5	0.02	**847.02**	
C	1.2	32.0	0.34	41,774.04	1.0	0.03	**1,412.43**	
D	1.2	39.5	0.41	33,889.68	0.8	0.03	**1,373.01**	
E	1.2	39.0	0.40	29,185.20	0.7	0.03	**1,169.15**	
F	1.2	44.7	0.45	24,567.84	0.6	0.03	**1,110.78**	
G	1.2	44.2	0.45	29,490.12	0.7	0.03	**1,319.65**	
29A	1.2	53.02	0.53	67,866.48	1.56	0.08	**3,577.79**	
29C	1.2	50.68	0.51	16,073.64	0.37	0.02	**813.52**	
30	1.2	52.39	0.52	39,247.56	0.90	0.05	**2,046.80**	
29	UNDISTURBED OFF-SITE DRAINAGE AREA							
29B	UNDISTURBED OFF-SITE DRAINAGE AREA							
29D	UNDISTURBED OFF-SITE DRAINAGE AREA							
SW29A	DIRECT RUNOFF ON STORMWATER WETLAND (0% IMPERVIOUS)							
SW29B	DIRECT RUNOFF ON STORMWATER WETLAND (0% IMPERVIOUS)							
30A	UNDISTURBED OFF-SITE DRAINAGE AREA							
SW30	DIRECT RUNOFF ON STORMWATER WETLAND (0% IMPERVIOUS)							

Note: Drainage areas in red are not factored into overall as they are conserved natural areas or direct runoff on stormwater wetlands.

[11] - Refer to Table G12.0 for breakdown of contributing sub-drainage-areas.

Table G10.0: Green Infrastructure Runoff Reduction Capacity (RRv) Summary

Green Infrastructure DA Number	Bioretention Areas[12] WQv (cubic-feet)	RRv (ft^3)	RRv ≥ WQv?	RRv - WQv (ft^3)
A	966	**966**	NO	(1,470)
B	333	**333**	NO	(514)
C		-	NO	(1,412)
D	-	-	NO	(1,373)
E		-	NO	(1,169)
F	441	**441**	NO	(670)
G		-	NO	(1,320)
29A		-	NO	(3,578)
29C		-	NO	(814)
30		-	NO	(2,047)

[12] - Refer to Table G13.2

Table G10.1: Composite Green Infrastructure Runoff Reduction Capacity (RRv) Summary

ΣWQV:	16,105
ΣRRV:	1,740
ΣRRV ≥ ΣWQV?	NO

Table G10.2: Green Infrastructure Minimum Runoff Reduction Summary

Green Infrastructure DA Number	S, HSG Specific Reduction Factor	minimum RRv (acre-feet)	minimum RRv (ft^3)	RRv ≥ minimum RRv?	RRv - minimum RRv (ft^3)	
A	0.30	0.017	731	YES	235	
B	0.30	0.006	254	YES	79	
C	0.28	0.009	392	NO	(392)	
D	0.30	0.009	412	NO	(412)	
E	0.30	0.008	351	NO	(351)	
F	0.30	0.008	333	YES	107	
G	0.27	0.008	358	NO	(358)	
29A	0.30	0.025	1,073	NO	(1,073)	
29C	0.30	0.006	244	NO	(244)	
30	0.30	0.014	614	NO	(614)	

Table G10.3: Composite Green Infrastructure Minimum Runoff Reduction Capacity (RRv) Summary

Σmin.RRv:	4,762
ΣRRV:	1,740
ΣRRV ≥ ΣWQV?	NO

Table G11.0: Stormwater Wetland Water Quality Volume (WQv) Summary

Stormwater Wetland	Potential WQv Provided (cubic-feet)	Potential WQv Provided (acre-feet)	Contributing DA	WQv Treatment Volume (acre-feet)	Treatment Volume Provided?
Stormwater Pocket Wetland C3	2214	0.051	C1+C2+C3	0.032	YES
Stormwater Pocket Wetland E	2588	0.059	D1+D2+D3+E1+E2+E4+E5	0.058	YES
Stormwater Pocket Wetland G3	5147	0.118	G1+G2+G3	0.030	YES
Stormwater Pocket Wetland 29A	958	0.022	29C + SW29A	0.019	YES
Stormwater Pocket Wetland 29B	5150	0.118	29A + SW29B	0.082	YES
Stormwater Pocket Wetland 30	5097	0.117	30 + SW30	0.047	YES

Concord - Phase 1 - Thompsonville and Joyland Road (*Redevelopment*)
Stormwater Pollution Prevention Plan

Table G12.0: Overall Drainage Area Breakdowns

Overall DA Number	A	Treatment Practice	B	Treatment Practice	C	Treatment Practice	D	Treatment Practice	E	Treatment Practice	F	Treatment Practice	G	Treatment Practice
Sub-Drainage Areas	A1	Bioretention	B1	Bioretention	C1	-	D1	Bioretention	E1	-	F1	Bioretention	G1	-
	A2		B2		C2	-	D2		E2	-	F2		G2	-
	A3	-	B3	-	C3	-	D3	-	E4	-	F3	-	G3	-
	-	-	-	-	-	-	-	-	E5	-	-	-	-	-
Design Point	DP-3						DP-5							

Note: Refer to drainage area figures for a depiction of each sub-drainage-area

Table G13.0: Bioretention Area/Stormwater Wetland Water Quality Volume (WQv) Calculations

Overall DA Number	DA Number	P, 90% Rainfall Event Number (inches)	I, Percent Impervious Cover (%)	Rv, Volumetric Runoff Coefficient	Contributing Drainage Area (acres)	WQv, Water quality Volume (acre-feet)	WQv, Water Quality Volume (cubic feet)
A	A1	1.2	36.10	0.37	0.734	0.03	1198.67
	A2	1.2	55.84	0.55	0.505	0.03	1215.51
B	B1	1.2	36.97	0.38	0.238	0.01	396.79
	B2	1.2	60.36	0.59	0.169	0.01	436.72
C	C1	1.2	53.98	0.54	0.415	0.02	968.62
	C2	1.2	58.31	0.57	0.439	0.03	1099.16
D	D1	1.2	38.54	0.40	0.371	0.01	641.36
	D2	1.2	51.09	0.51	0.321	0.02	712.86
E	E1	1.2	45.08	0.46	0.264	0.01	524.07
	E2	1.2	43.44	0.44	0.221	0.01	424.50
	E4	1.2	56.79	0.56	0.081	0.00	197.98
F	F1	1.2	39.18	0.40	0.291	0.01	510.36
	F2	1.2	60.00	0.59	0.230	0.01	591.11
G	G1	1.2	44.69	0.45	0.320	0.01	630.34
	G2	1.2	56.93	0.56	0.274	0.02	671.21

Table G13.1: Bioretention Areas Required Filter Bed Area Calculations

Bioretention Area[13]	d_f, Filter Bed Depth (ft)	k, Coefficient of permeability of filter media (ft/day)	h_f, Average height of water above filter bed (ft)	t_f, Design Filter Bed Drain Time (days)	A_f, Surface Area of Filter Bed (ft^2)	Σ Af required SUB-DA (ft^2)
A	4.0	0.50	0.80	2	**999**	***2012***
	4.0	0.50	0.80	2	**1013**	
B	2.0	0.50	0.50	2	**317**	***667***
	2.0	0.50	0.50	2	**349**	
STORMWATER WETLAND						
STORMWATER WETLAND						
F	4.0	0.50	0.50	2	**454**	***979***
	4.0	0.50	0.50	2	**525**	
STORMWATER WETLAND						

Table G13.2: Bioretention Areas Design Check for WQv Event

75% WQv (cubic feet)	Design Af, Surface Area of Filter Bed (ft2)	Design Ponding Volume (cubic feet)	Filter Bed > A_f ?	Ponding Volume > 75% WQV ?	WQv Treatment Provided (40% WQv)
1811	*2271*	*1817*	*YES*	*YES*	965.7
625	*1026*	*650*	*YES*	*YES*	333.4
STORMWATER WETLAND					
STORMWATER WETLAND					
826	*1334*	*831*	*YES*	*YES*	440.6
STORMWATER WETLAND					

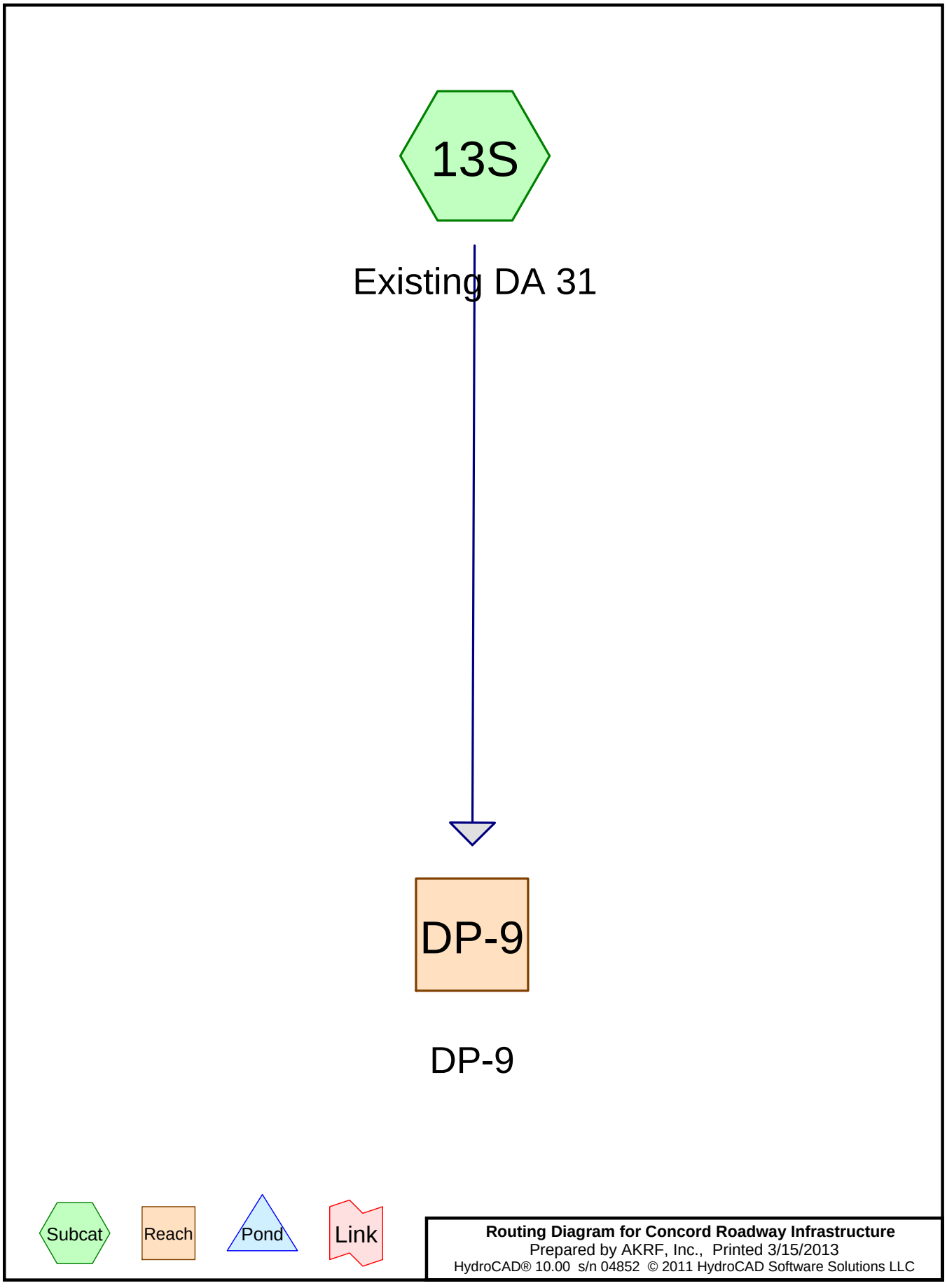
[13] - Refer to Green Infrastructure Figure for a depiction of each bioretention area location

SWPPP

APPENDIX H

PRE-DEVELOPMENT HYDROLOGIC ROUTING CALCULATIONS

- RESORT ENTRY ROAD ANALYSIS
- THOMPSONVILLE ROAD & JOYLAND ROAD ANALYSIS



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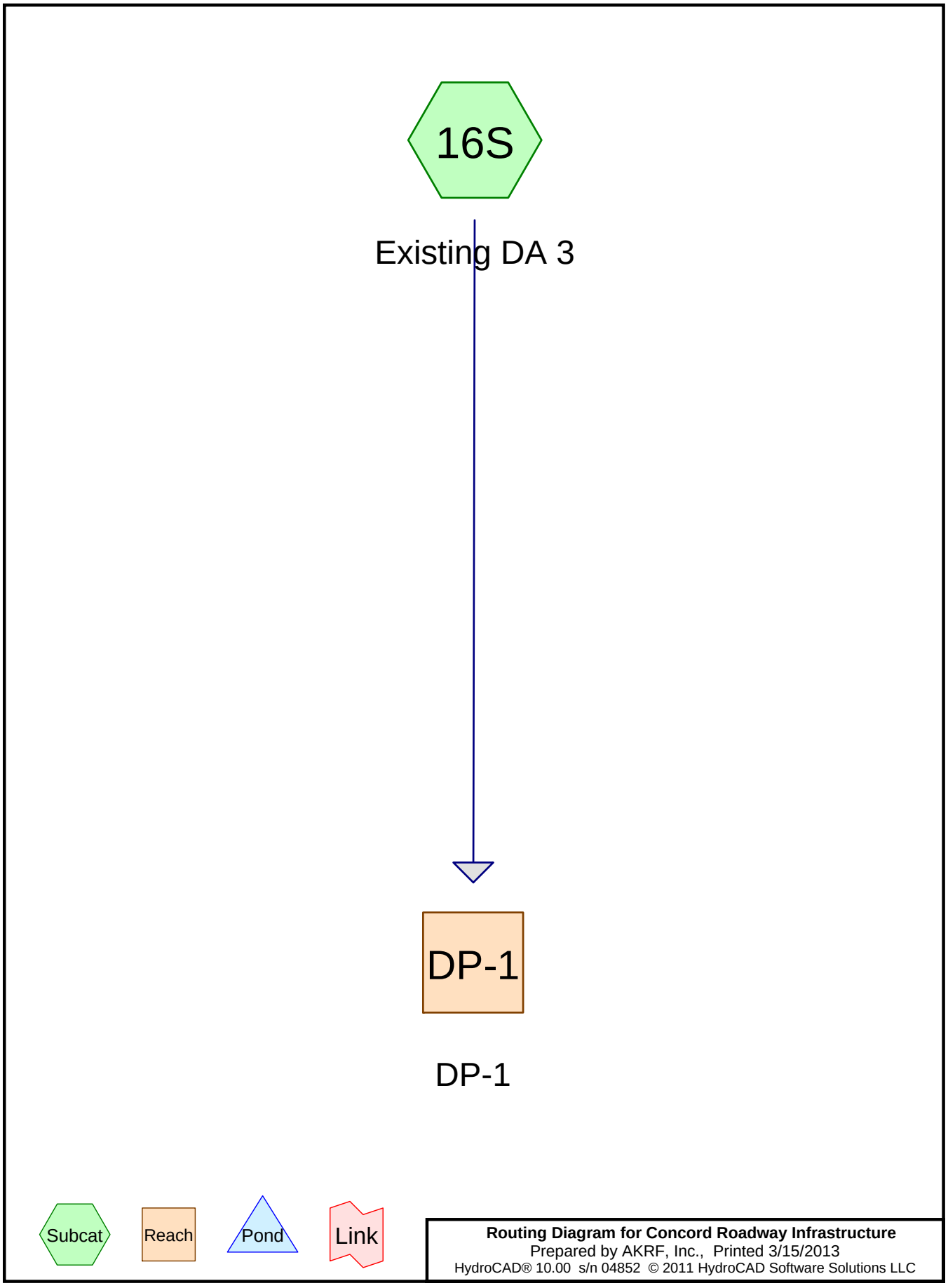

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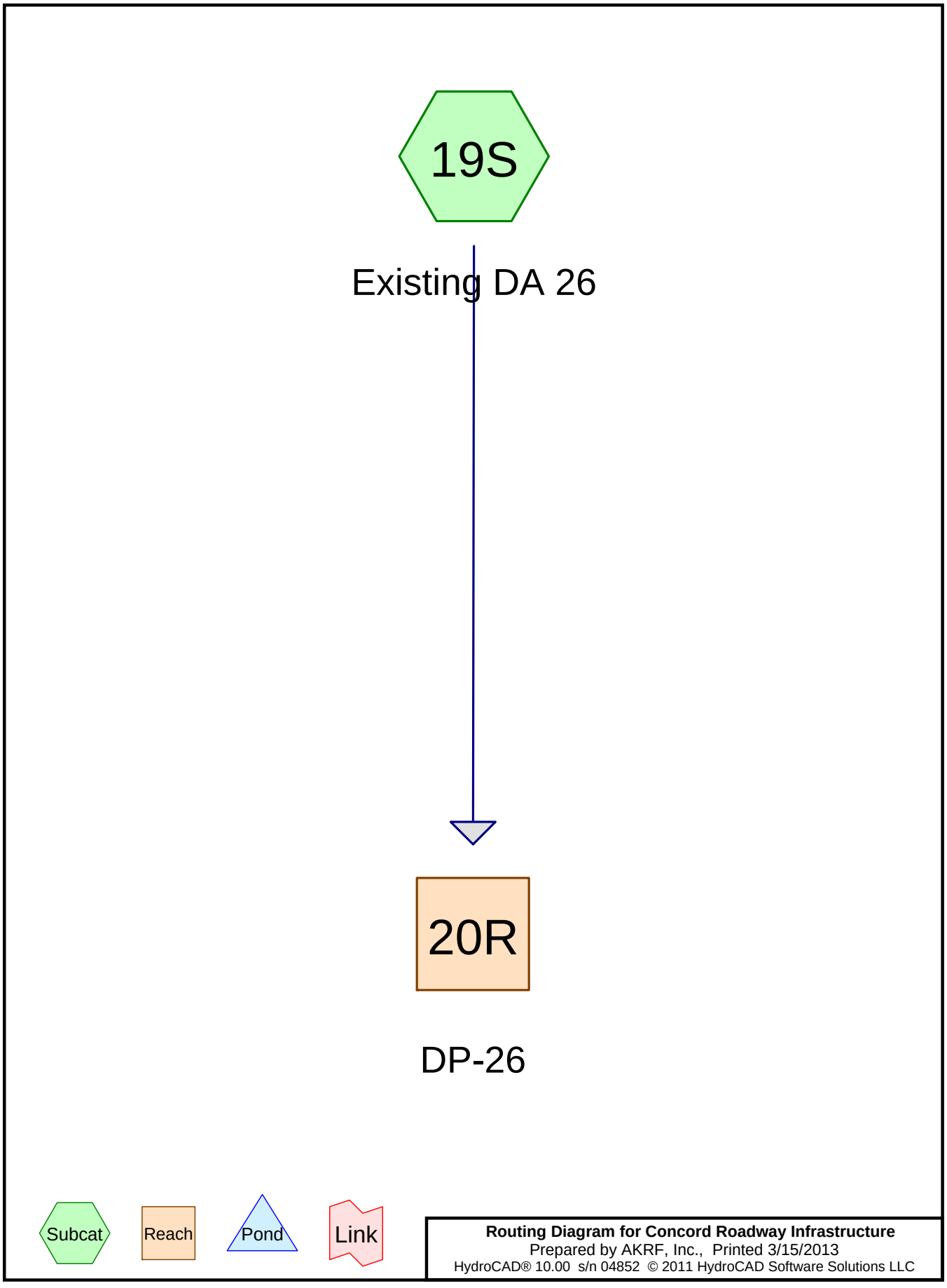

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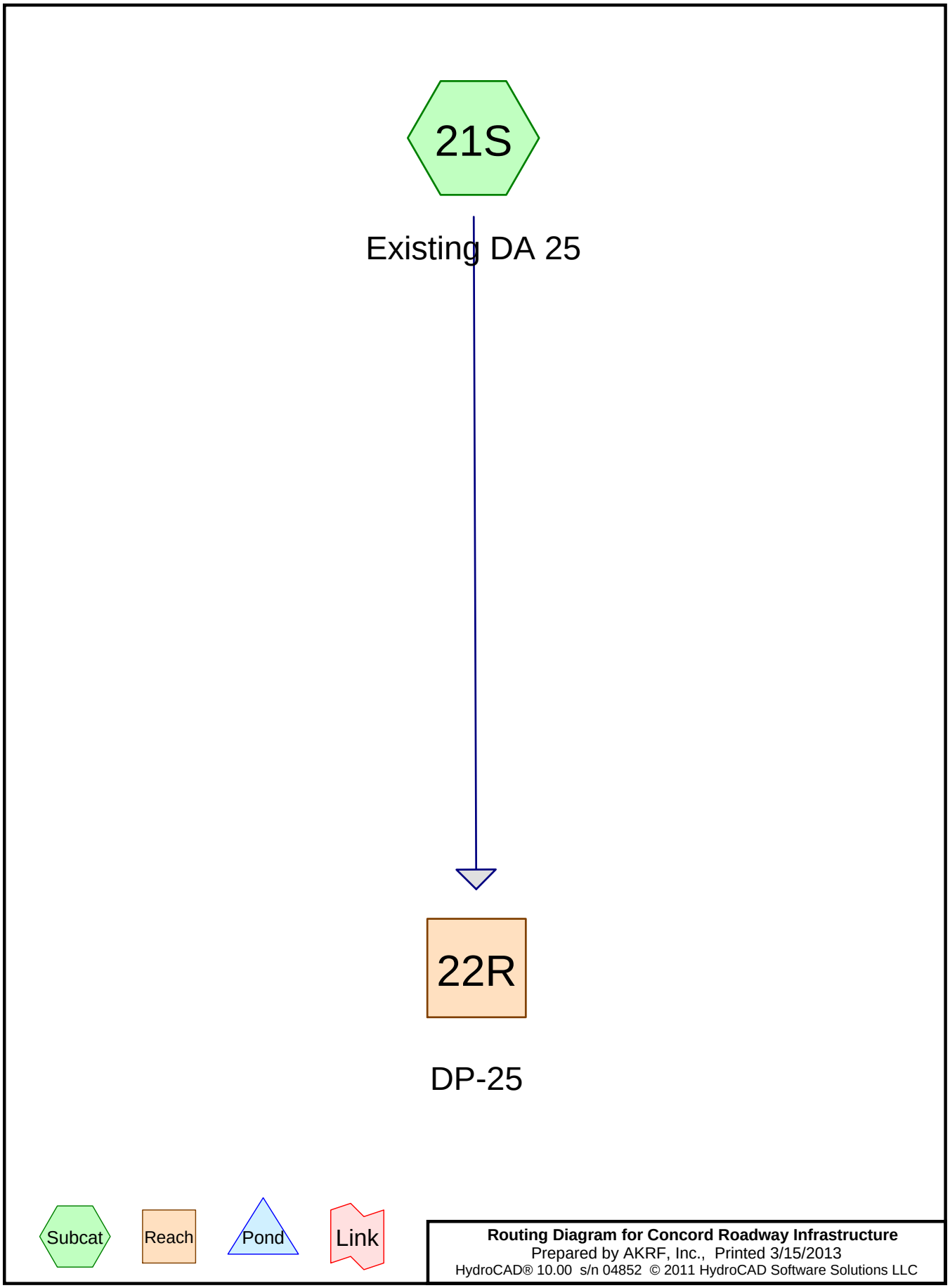

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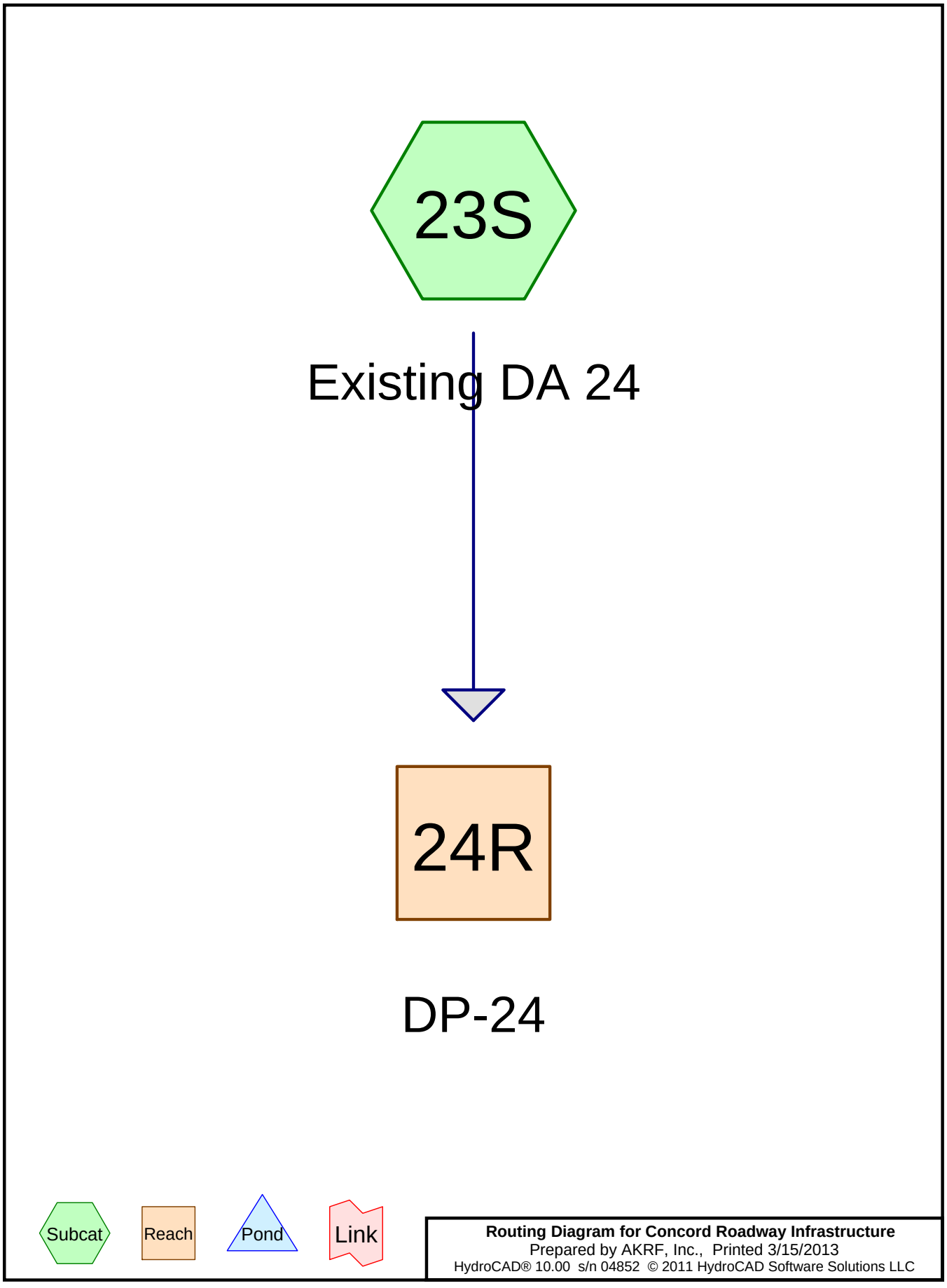

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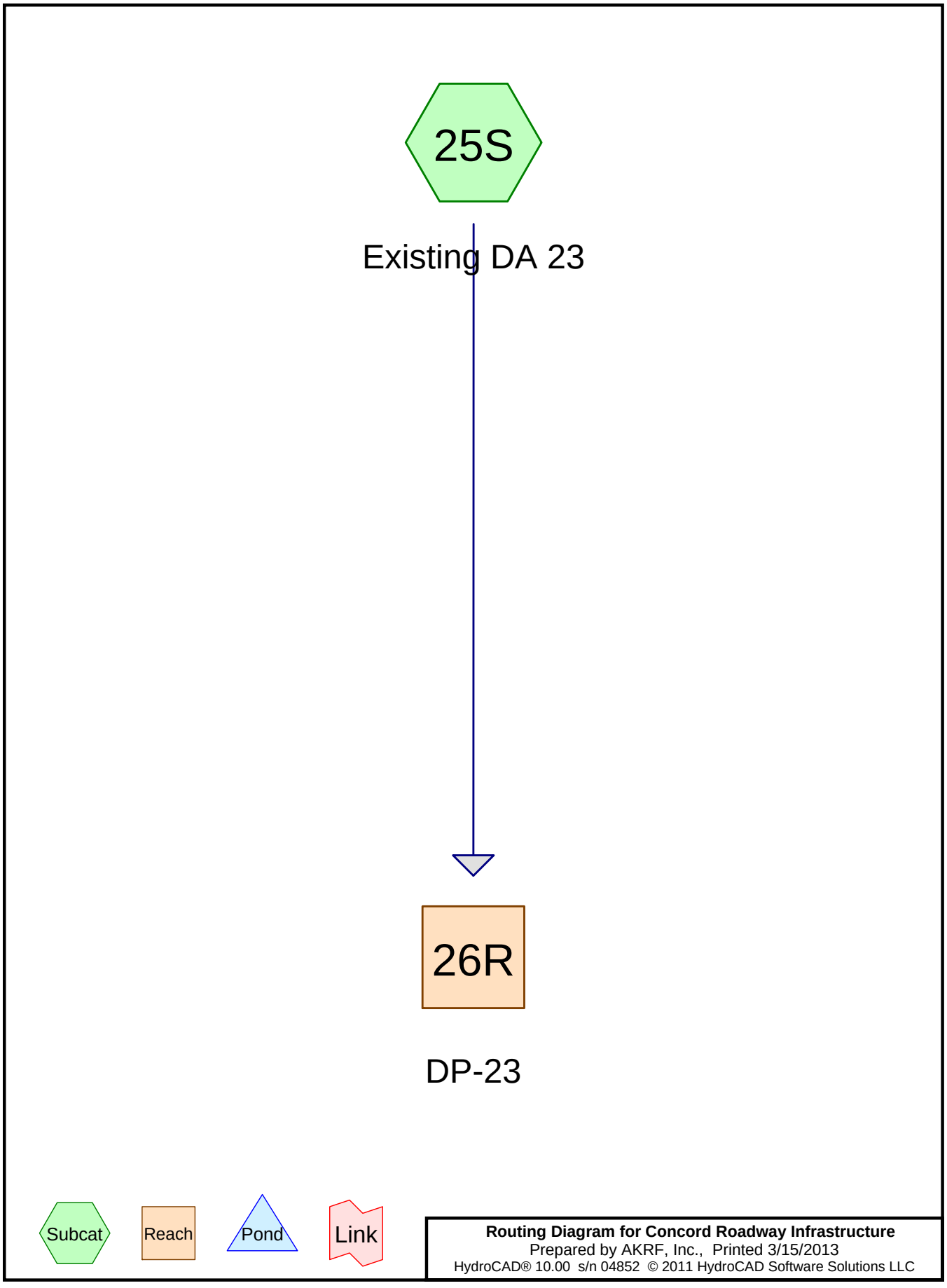

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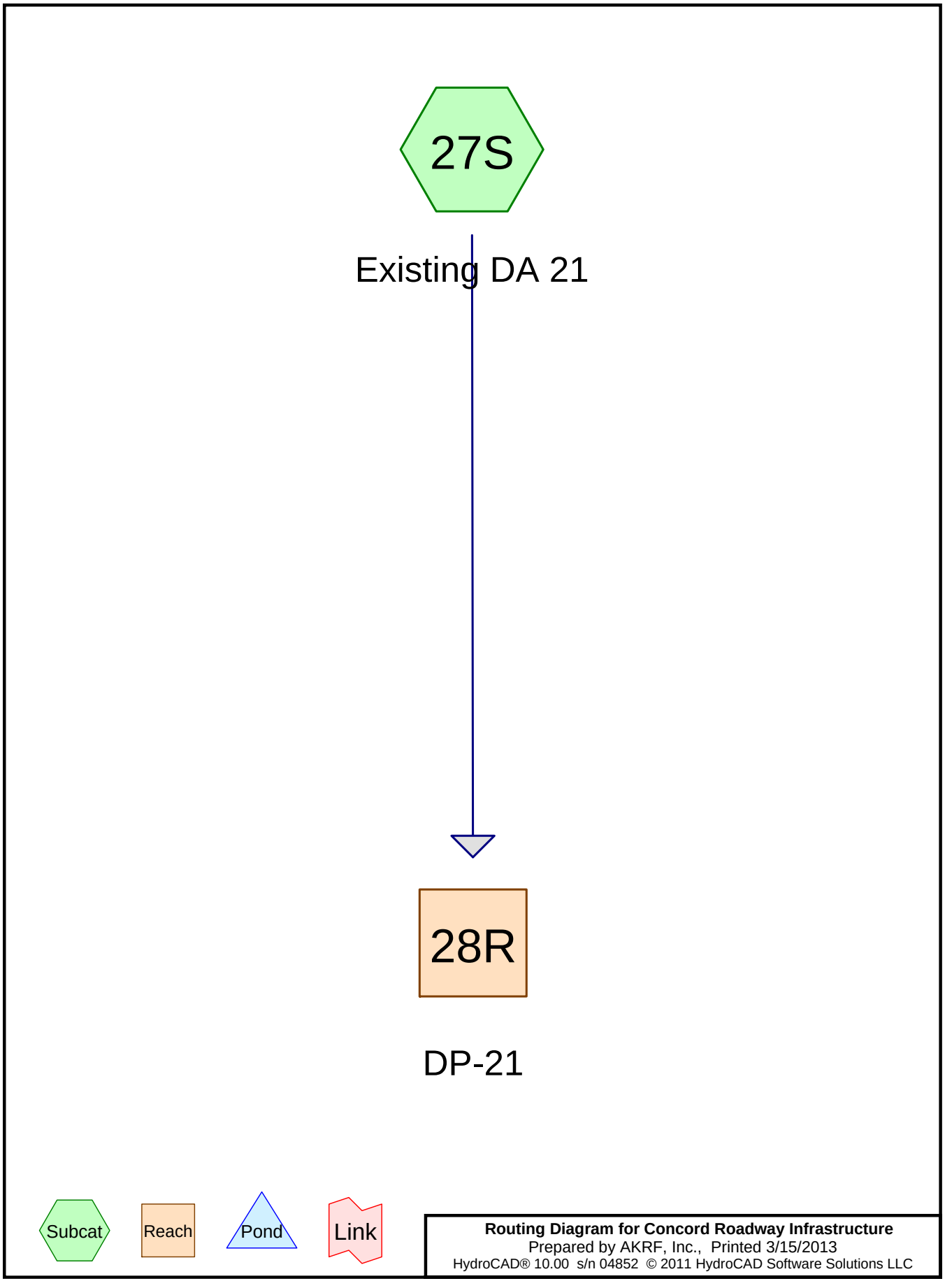
27S
Existing DA 21
28R
DP-21
Subcat
Reach
Pond
Link
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.554	65	Brush, Good, HSG C (25S, 27S)
83.683	70	Woods, Good, HSG C (13S, 16S, 19S, 21S, 23S, 25S, 27S)
6.320	71	Meadow, non-grazed, HSG C (13S, 16S, 19S, 21S, 27S)
0.013	73	Brush, Good, HSG D (25S, 27S)
17.546	74	>75% Grass cover, Good, HSG C (13S, 16S, 25S, 27S)
30.196	74	Pasture/grassland/range, Good, HSG C (27S)
16.730	77	Woods, Good, HSG D (19S, 21S, 23S, 25S, 27S)
2.960	78	Meadow, non-grazed, HSG D (21S, 27S)
0.049	80	>75% Grass cover, Good, HSG D (13S)
0.343	80	Pasture/grassland/range, Good, HSG D (27S)
0.241	96	Gravel surface, HSG C (27S)
1.072	96	Gravel surface, HSG D (23S)
1.160	98	Unconnected pavement, HSG C (13S, 16S, 27S)
0.009	98	Water Surface, HSG D (13S)
160.876	**73**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
139.700	HSG C	13S, 16S, 19S, 21S, 23S, 25S, 27S
21.176	HSG D	13S, 19S, 21S, 23S, 25S, 27S
0.000	Other	
160.876		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	17.546	0.049	0.000	17.595	>75% Grass cover, Good	13S, 16S, 25S, 27S
0.000	0.000	1.160	0.000	0.000	1.160	Unconnected pavement	13S, 16S, 27S
0.000	0.000	0.241	1.072	0.000	1.313	Gravel surface	23S, 27S
0.000	0.000	30.196	0.343	0.000	30.539	Pasture/grassland/range, Good	27S
0.000	0.000	6.320	2.960	0.000	9.280	Meadow, non-grazed	13S, 16S, 19S, 21S, 27S
0.000	0.000	0.554	0.013	0.000	0.567	Brush, Good	25S, 27S
0.000	0.000	83.683	16.730	0.000	100.413	Woods, Good	13S, 16S, 19S, 21S, 23S, 25S, 27S
0.000	0.000	0.000	0.009	0.000	0.009	Water Surface	13S

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	**0.000**	**139.700**	**21.176**	**0.000**	**160.876**	**TOTAL AREA**	

Time span=0.00-168.00 hrs, dt=0.01 hrs, 16801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 13S: Existing DA 31 Runoff Area=3.005 ac 8.52% Impervious Runoff Depth=0.67"
Flow Length=705' Tc=45.5 min UI Adjusted CN=74 Runoff=0.96 cfs 0.167 af

Subcatchment 16S: Existing DA 3 Runoff Area=12.688 ac 0.58% Impervious Runoff Depth=0.50"
Flow Length=1,300' Tc=38.1 min CN=70 Runoff=3.06 cfs 0.533 af

Subcatchment 19S: Existing DA 26 Runoff Area=7.405 ac 0.00% Impervious Runoff Depth=0.62"
Flow Length=979' Tc=50.2 min CN=73 Runoff=2.05 cfs 0.384 af

Subcatchment 21S: Existing DA 25 Runoff Area=15.876 ac 0.00% Impervious Runoff Depth=0.54"
Flow Length=823' Tc=35.5 min CN=71 Runoff=4.40 cfs 0.717 af

Subcatchment 23S: Existing DA 24 Runoff Area=18.733 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=1,225' Tc=40.1 min CN=74 Runoff=6.42 cfs 1.039 af

Subcatchment 25S: Existing DA 23 Runoff Area=15.541 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=1,484' Tc=47.1 min CN=70 Runoff=3.34 cfs 0.653 af

Subcatchment 27S: Existing DA 21 Runoff Area=87.628 ac 0.96% Impervious Runoff Depth=0.62"
Flow Length=3,263' Tc=58.1 min CN=73 Runoff=22.18 cfs 4.546 af

Reach 20R: DP-26 Inflow=2.05 cfs 0.384 af
Outflow=2.05 cfs 0.384 af

Reach 22R: DP-25 Inflow=4.40 cfs 0.717 af
Outflow=4.40 cfs 0.717 af

Reach 24R: DP-24 Inflow=6.42 cfs 1.039 af
Outflow=6.42 cfs 1.039 af

Reach 26R: DP-23 Inflow=3.34 cfs 0.653 af
Outflow=3.34 cfs 0.653 af

Reach 28R: DP-21 Inflow=22.18 cfs 4.546 af
Outflow=22.18 cfs 4.546 af

Reach DP-1: DP-1 Inflow=3.06 cfs 0.533 af
Outflow=3.06 cfs 0.533 af

Reach DP-9: DP-9 Inflow=0.96 cfs 0.167 af
Outflow=0.96 cfs 0.167 af

Total Runoff Area = 160.876 ac Runoff Volume = 8.037 af Average Runoff Depth = 0.60"
99.27% Pervious = 159.707 ac 0.73% Impervious = 1.169 ac

Summary for Subcatchment 13S: Existing DA 31

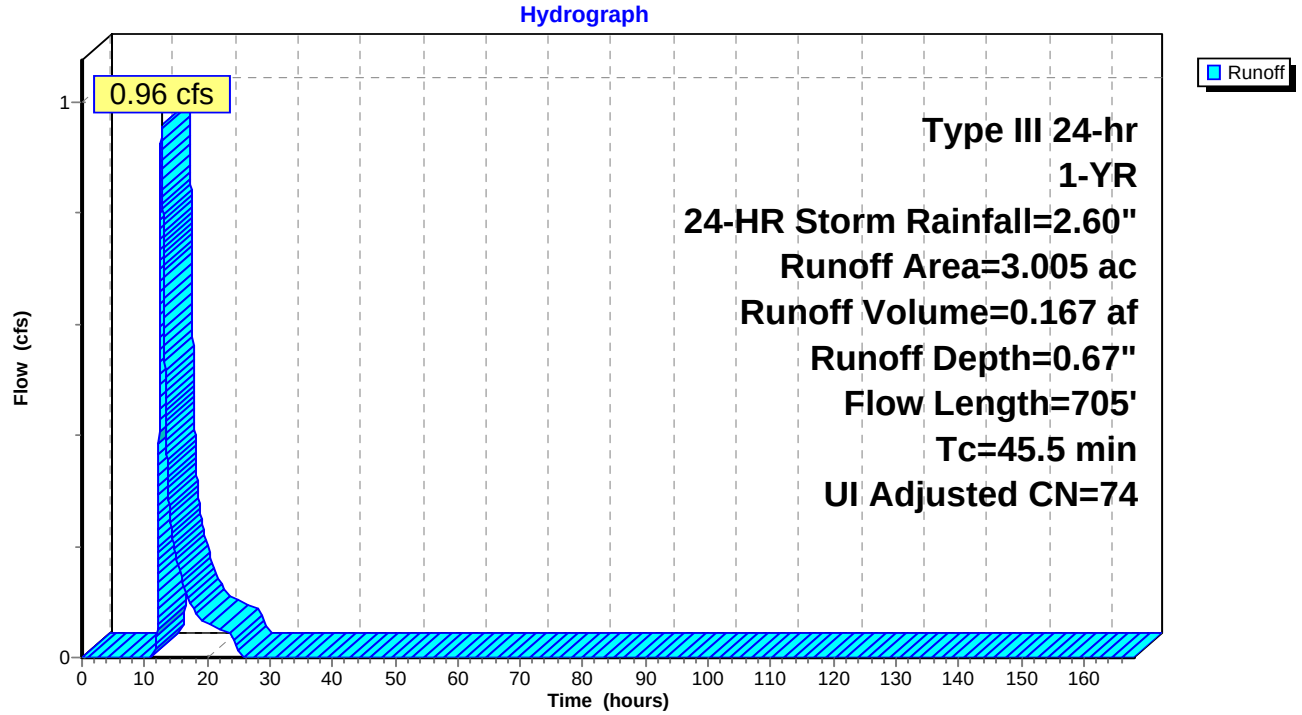
Runoff = 0.96 cfs @ 12.69 hrs, Volume= 0.167 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.247	98	Unconnected pavement, HSG C
2.054	74	>75% Grass cover, Good, HSG C
0.031	71	Meadow, non-grazed, HSG C
0.615	70	Woods, Good, HSG C
0.049	80	>75% Grass cover, Good, HSG D
0.009	98	Water Surface, HSG D
3.005	75	Weighted Average, UI Adjusted CN = 74
2.749		91.48% Pervious Area
0.256		8.52% Impervious Area
0.247		96.48% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
9.2	555	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
45.5	705	Total			

Subcatchment 13S: Existing DA 31



Summary for Subcatchment 16S: Existing DA 3

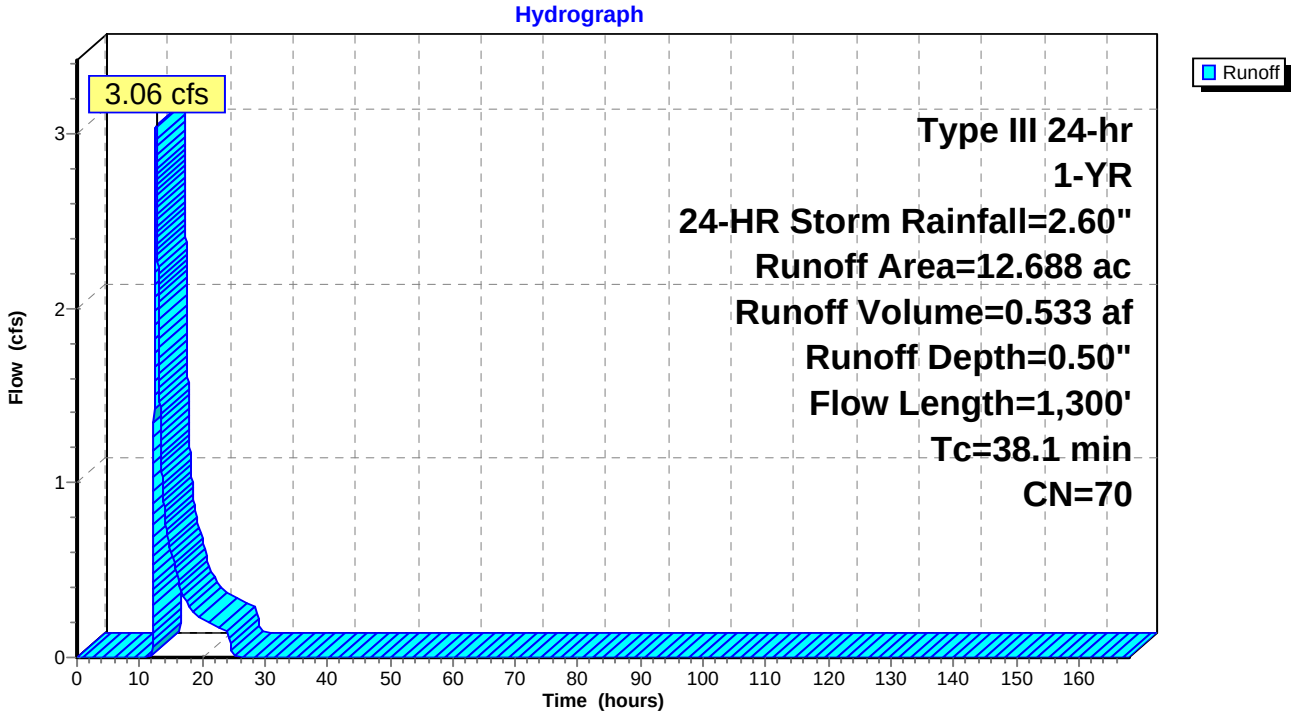
Runoff = 3.06 cfs @ 12.62 hrs, Volume= 0.533 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.073	98	Unconnected pavement, HSG C
0.137	74	>75% Grass cover, Good, HSG C
0.018	71	Meadow, non-grazed, HSG C
12.460	70	Woods, Good, HSG C
12.688	70	Weighted Average
12.615		99.42% Pervious Area
0.073		0.58% Impervious Area
0.073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	150	0.0300	0.11		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
14.8	1,150	0.0670	1.29		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
38.1	1,300	Total			

Subcatchment 16S: Existing DA 3



Summary for Subcatchment 19S: Existing DA 26

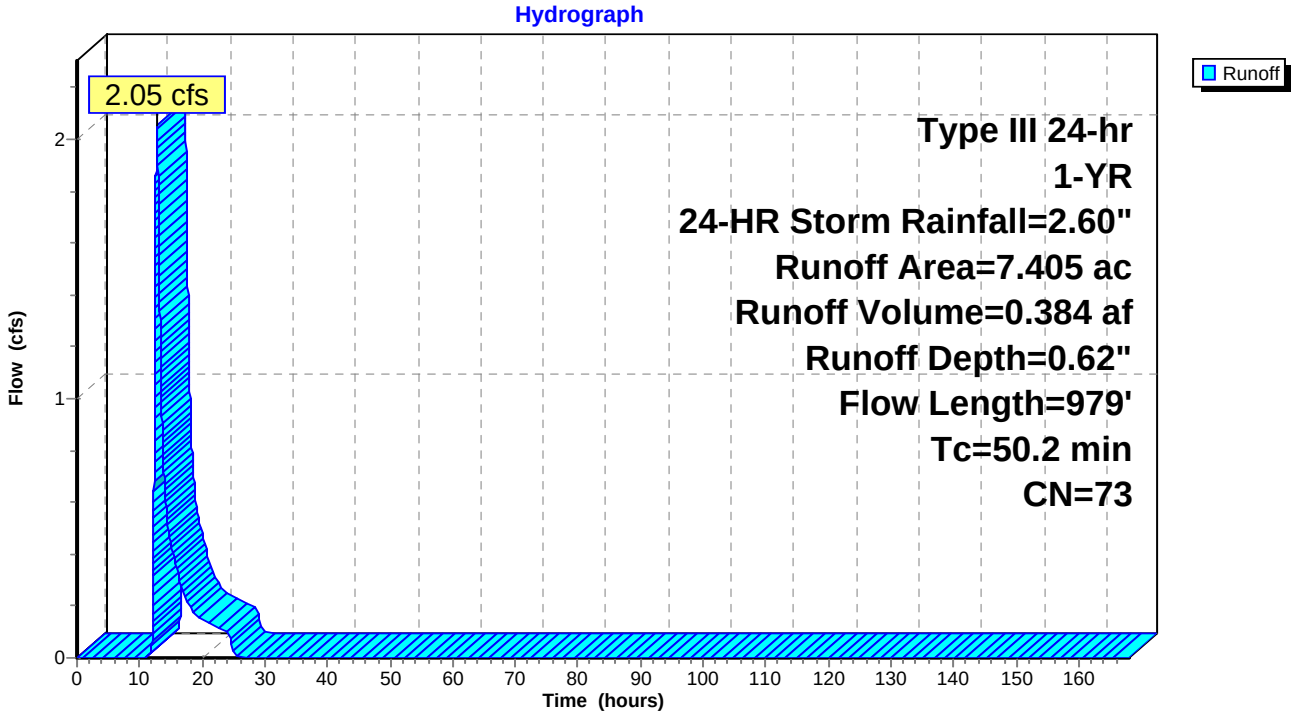
Runoff = 2.05 cfs @ 12.77 hrs, Volume= 0.384 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.161	71	Meadow, non-grazed, HSG C
3.962	70	Woods, Good, HSG C
3.282	77	Woods, Good, HSG D
7.405	73	Weighted Average
7.405		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
14.0	829	0.0390	0.99		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
50.2	979	Total			

Subcatchment 19S: Existing DA 26



Summary for Subcatchment 21S: Existing DA 25

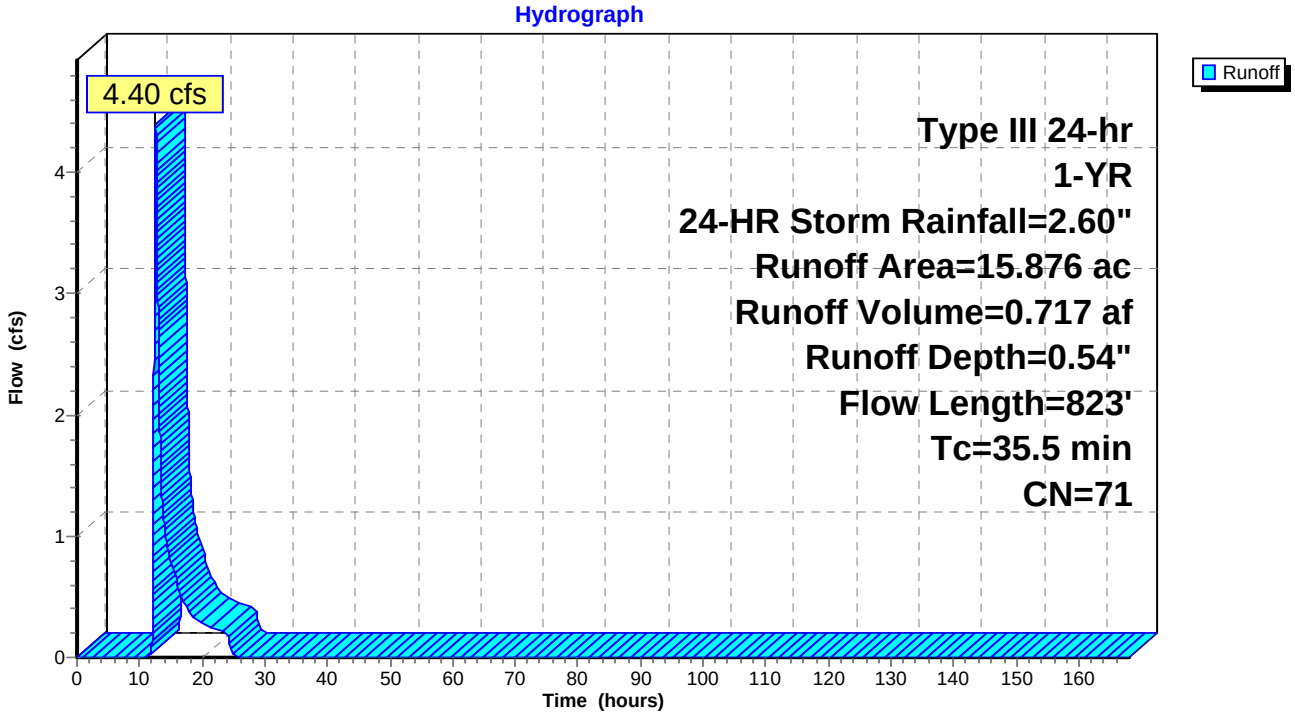
Runoff = 4.40 cfs @ 12.58 hrs, Volume= 0.717 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.575	71	Meadow, non-grazed, HSG C
13.410	70	Woods, Good, HSG C
0.108	78	Meadow, non-grazed, HSG D
1.783	77	Woods, Good, HSG D
15.876	71	Weighted Average
15.876		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3	100	0.0150	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
13.2	723	0.0332	0.91		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
35.5	823	Total			

Subcatchment 21S: Existing DA 25



Summary for Subcatchment 23S: Existing DA 24

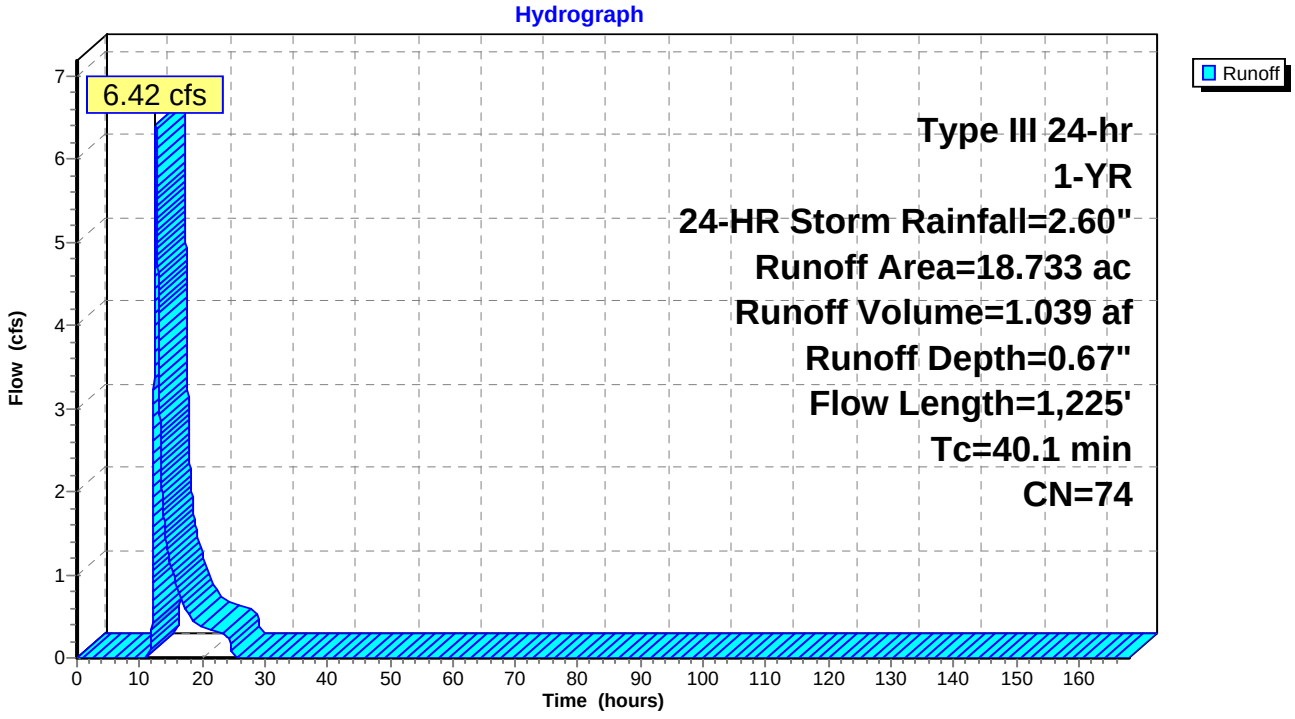
Runoff = 6.42 cfs @ 12.61 hrs, Volume= 1.039 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
11.333	70	Woods, Good, HSG C
1.072	96	Gravel surface, HSG D
6.328	77	Woods, Good, HSG D
18.733	74	Weighted Average
18.733		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	150	0.0270	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
15.8	1,075	0.0516	1.14		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
40.1	1,225	Total			

Subcatchment 23S: Existing DA 24



Summary for Subcatchment 25S: Existing DA 23

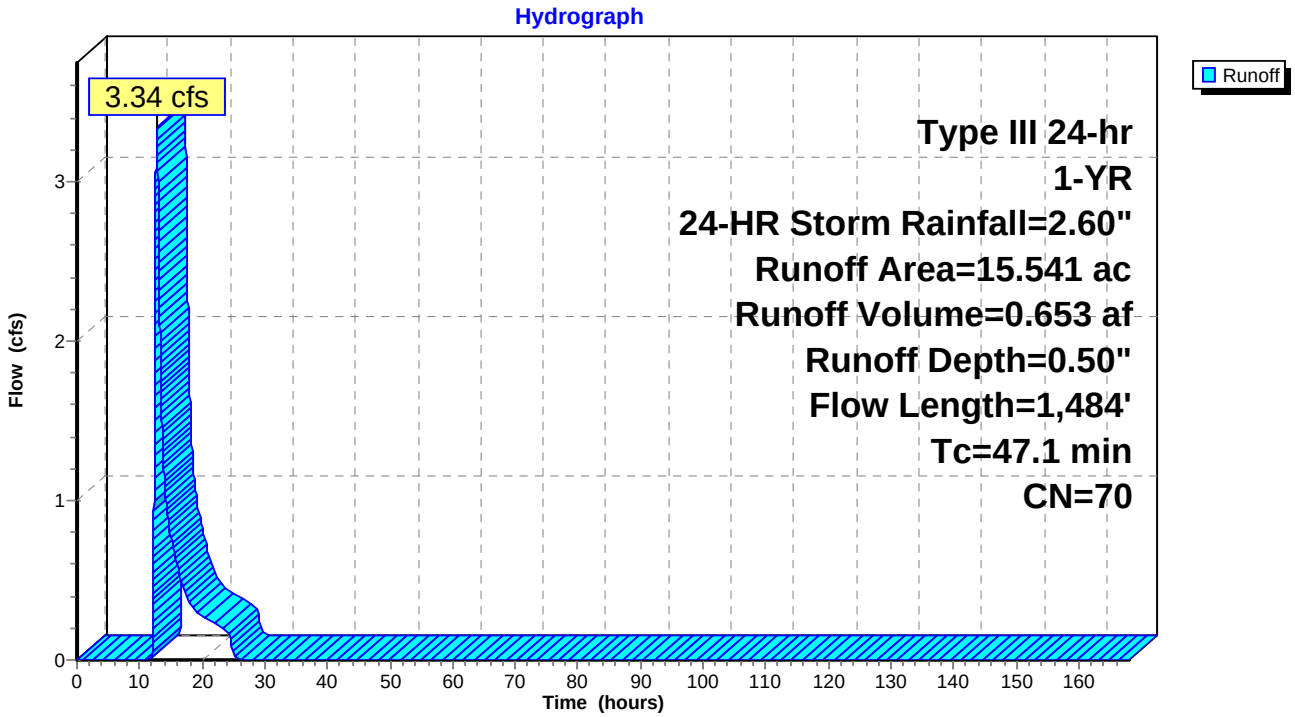
Runoff = 3.34 cfs @ 12.77 hrs, Volume= 0.653 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.415	65	Brush, Good, HSG C
0.469	74	>75% Grass cover, Good, HSG C
14.185	70	Woods, Good, HSG C
0.009	73	Brush, Good, HSG D
0.463	77	Woods, Good, HSG D
15.541	70	Weighted Average
15.541		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	150	0.0233	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
21.3	1,334	0.0435	1.04		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
47.1	1,484	Total			

Subcatchment 25S: Existing DA 23



Summary for Subcatchment 27S: Existing DA 21

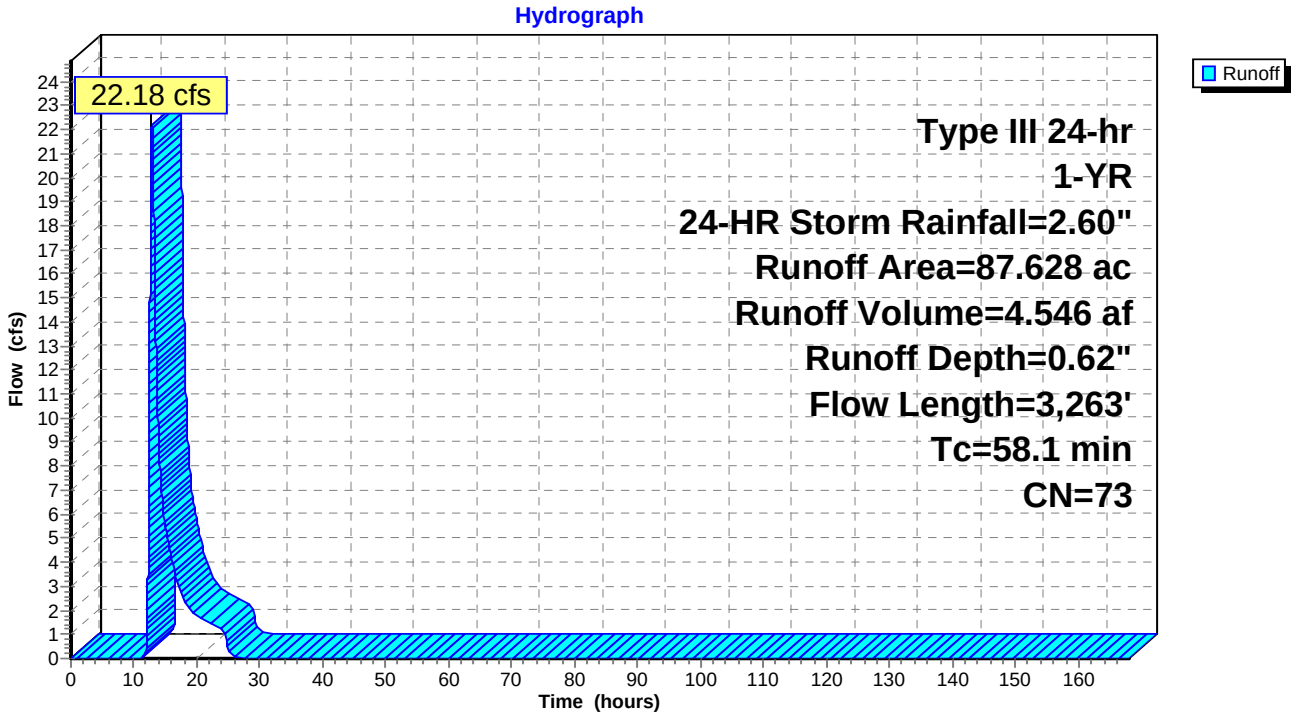
Runoff = 22.18 cfs @ 12.85 hrs, Volume= 4.546 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.840	98	Unconnected pavement, HSG C
0.139	65	Brush, Good, HSG C
14.886	74	>75% Grass cover, Good, HSG C
0.241	96	Gravel surface, HSG C
30.196	74	Pasture/grassland/range, Good, HSG C
5.535	71	Meadow, non-grazed, HSG C
27.718	70	Woods, Good, HSG C
0.004	73	Brush, Good, HSG D
0.343	80	Pasture/grassland/range, Good, HSG D
2.852	78	Meadow, non-grazed, HSG D
4.874	77	Woods, Good, HSG D
87.628	73	Weighted Average
86.788		99.04% Pervious Area
0.840		0.96% Impervious Area
0.840		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	150	0.0467	0.13		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
30.4	1,500	0.0270	0.82		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
8.2	1,613	0.0161	3.27	4.90	**Channel Flow, Existing Rivulet** Area= 1.5 sf Perim= 4.0' r= 0.38' n= 0.030
58.1	3,263	Total			

Subcatchment 27S: Existing DA 21

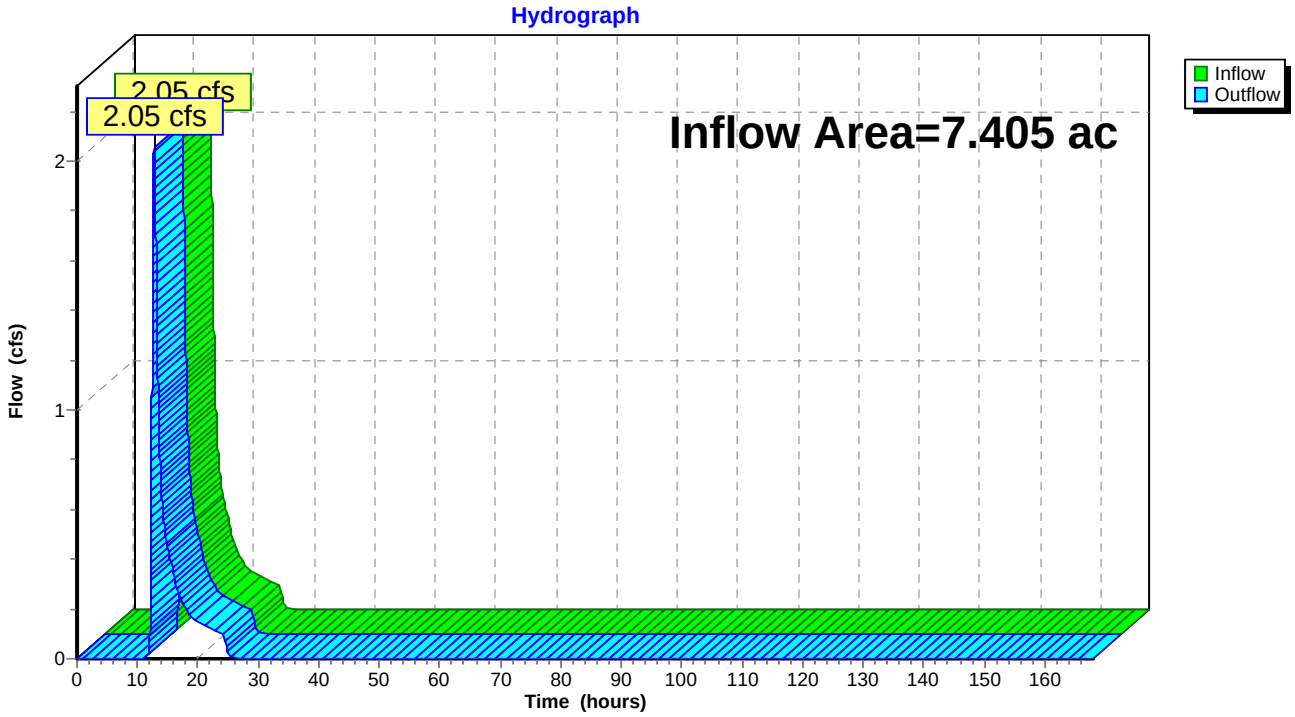


Summary for Reach 20R: DP-26

Inflow Area = 7.405 ac, 0.00% Impervious, Inflow Depth = 0.62" for 1-YR, 24-HR Storm event
Inflow = 2.05 cfs @ 12.77 hrs, Volume= 0.384 af
Outflow = 2.05 cfs @ 12.78 hrs, Volume= 0.384 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 20R: DP-26

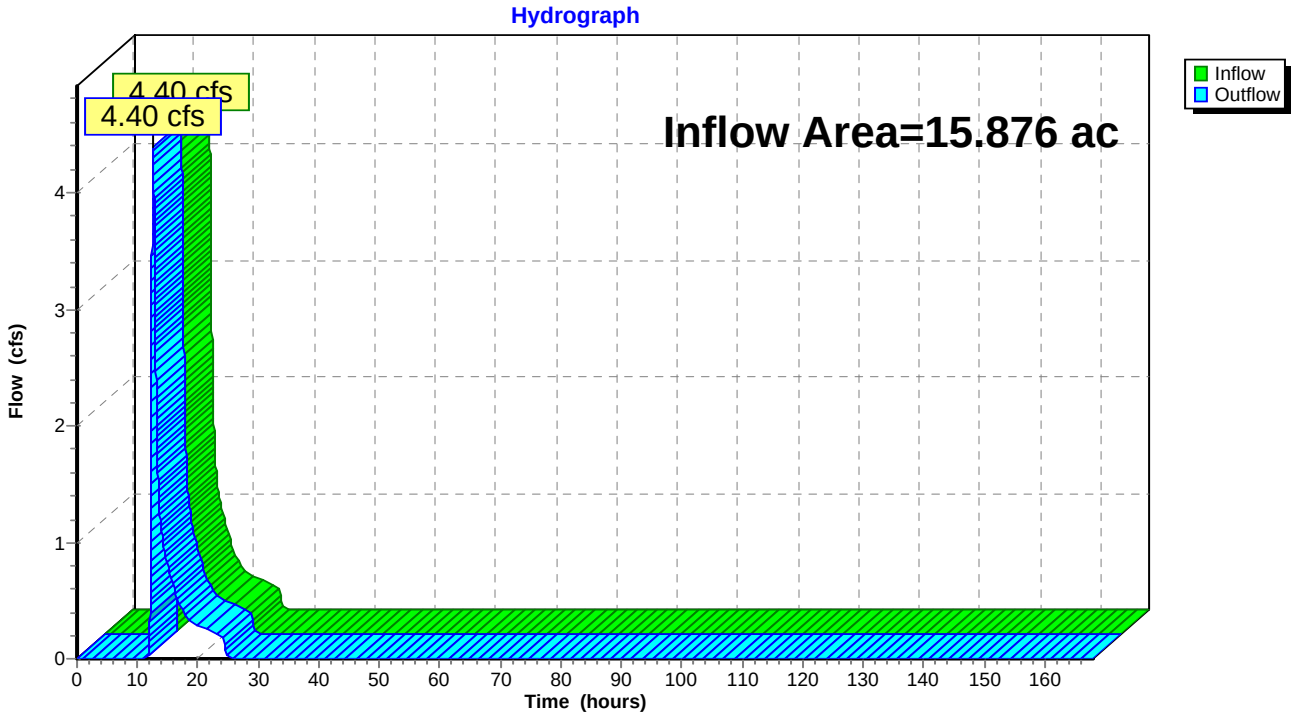


Summary for Reach 22R: DP-25

Inflow Area = 15.876 ac, 0.00% Impervious, Inflow Depth = 0.54" for 1-YR, 24-HR Storm event
Inflow = 4.40 cfs @ 12.58 hrs, Volume= 0.717 af
Outflow = 4.40 cfs @ 12.59 hrs, Volume= 0.717 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 22R: DP-25

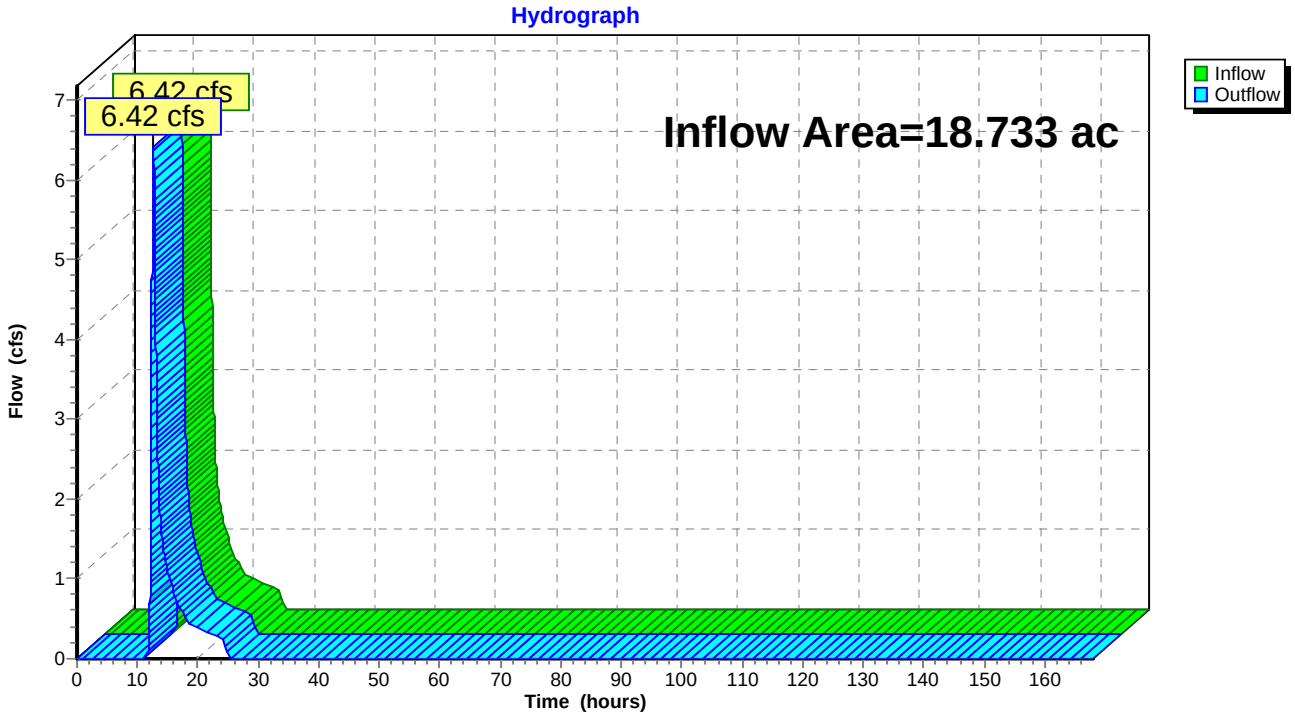


Summary for Reach 24R: DP-24

Inflow Area = 18.733 ac, 0.00% Impervious, Inflow Depth = 0.67" for 1-YR, 24-HR Storm event
Inflow = 6.42 cfs @ 12.61 hrs, Volume= 1.039 af
Outflow = 6.42 cfs @ 12.62 hrs, Volume= 1.039 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 24R: DP-24

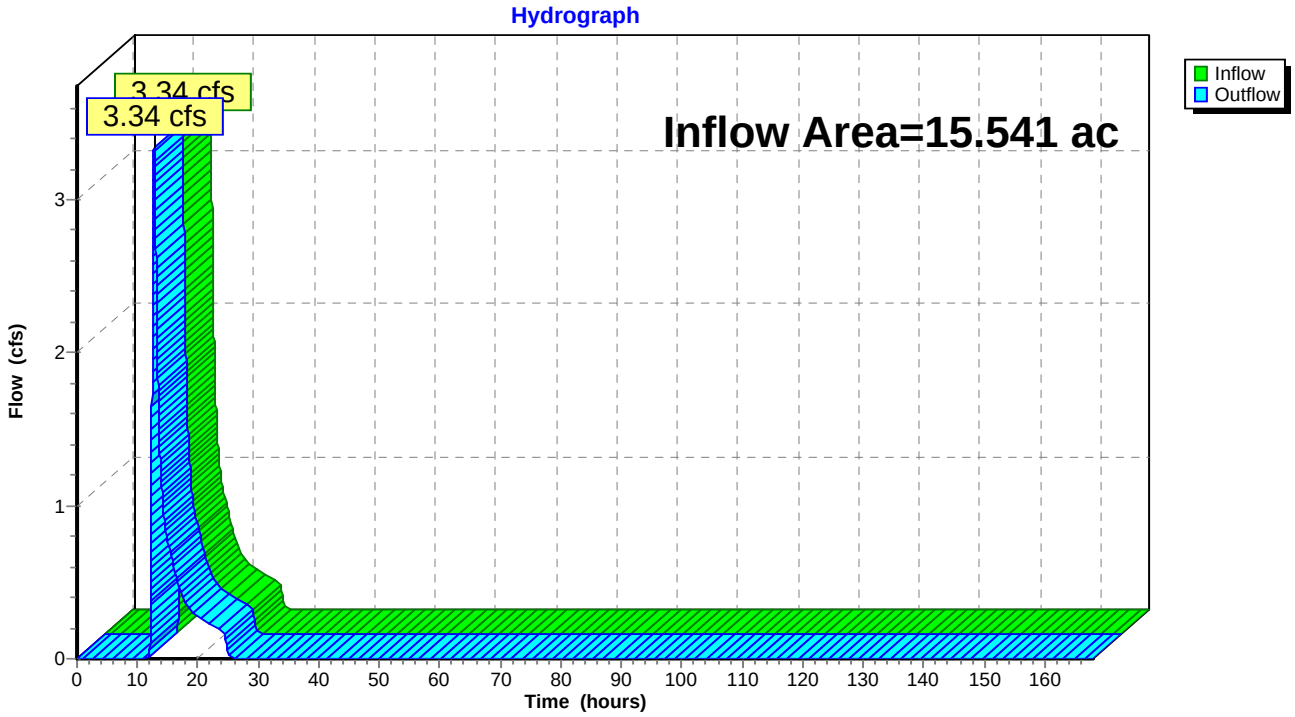


Summary for Reach 26R: DP-23

Inflow Area = 15.541 ac, 0.00% Impervious, Inflow Depth = 0.50" for 1-YR, 24-HR Storm event
Inflow = 3.34 cfs @ 12.77 hrs, Volume= 0.653 af
Outflow = 3.34 cfs @ 12.78 hrs, Volume= 0.653 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 26R: DP-23

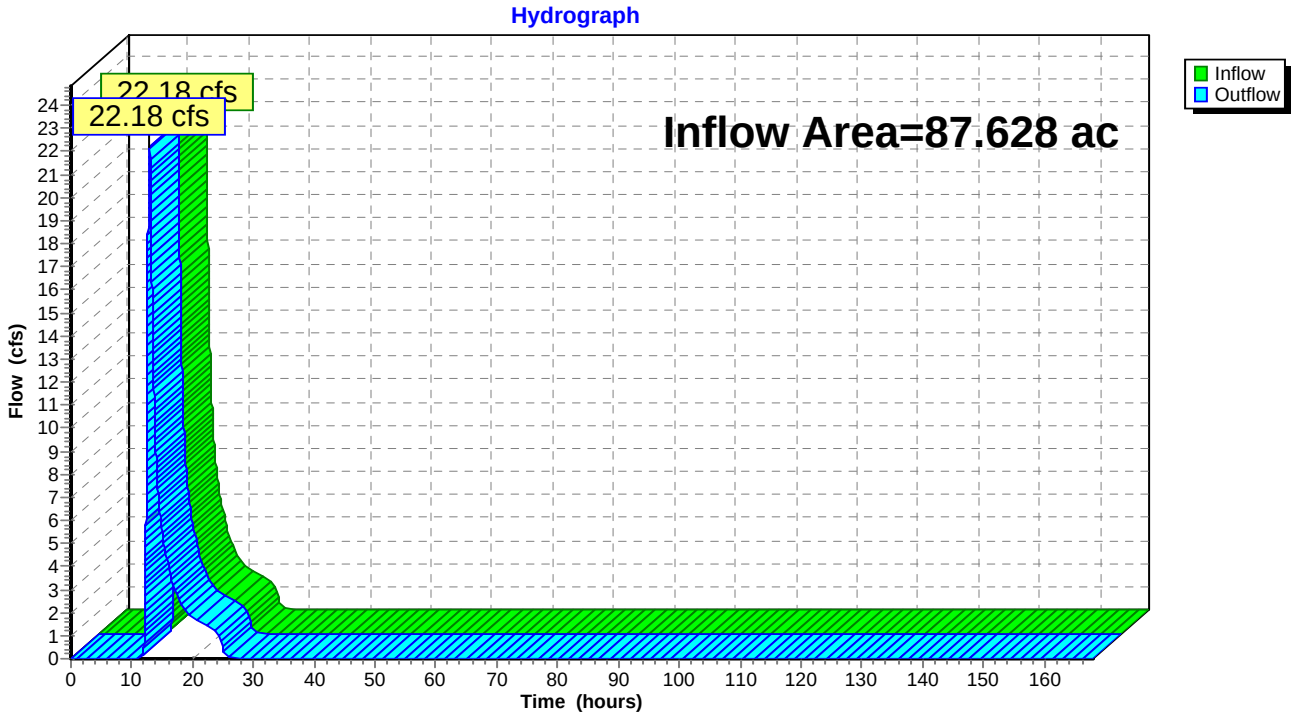


Summary for Reach 28R: DP-21

Inflow Area = 87.628 ac, 0.96% Impervious, Inflow Depth = 0.62" for 1-YR, 24-HR Storm event
Inflow = 22.18 cfs @ 12.85 hrs, Volume= 4.546 af
Outflow = 22.18 cfs @ 12.86 hrs, Volume= 4.546 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 28R: DP-21

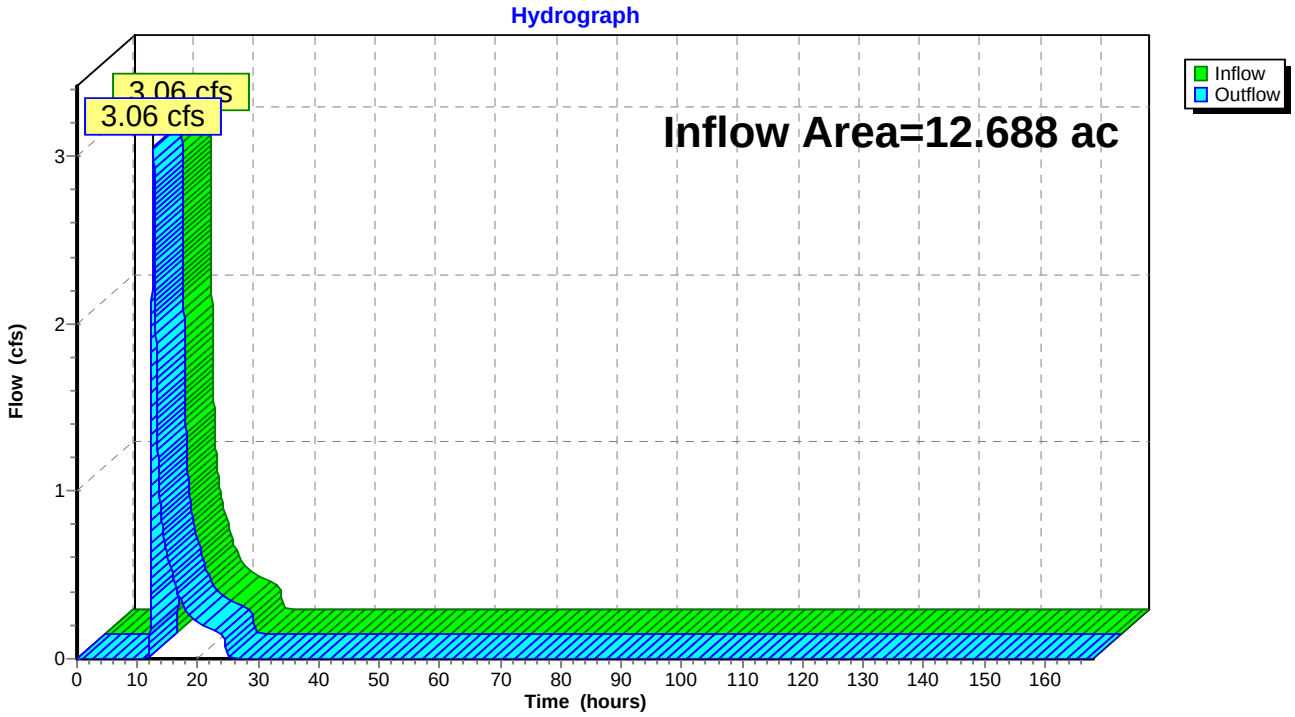


Summary for Reach DP-1: DP-1

Inflow Area = 12.688 ac, 0.58% Impervious, Inflow Depth = 0.50" for 1-YR, 24-HR Storm event
Inflow = 3.06 cfs @ 12.62 hrs, Volume= 0.533 af
Outflow = 3.06 cfs @ 12.63 hrs, Volume= 0.533 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1

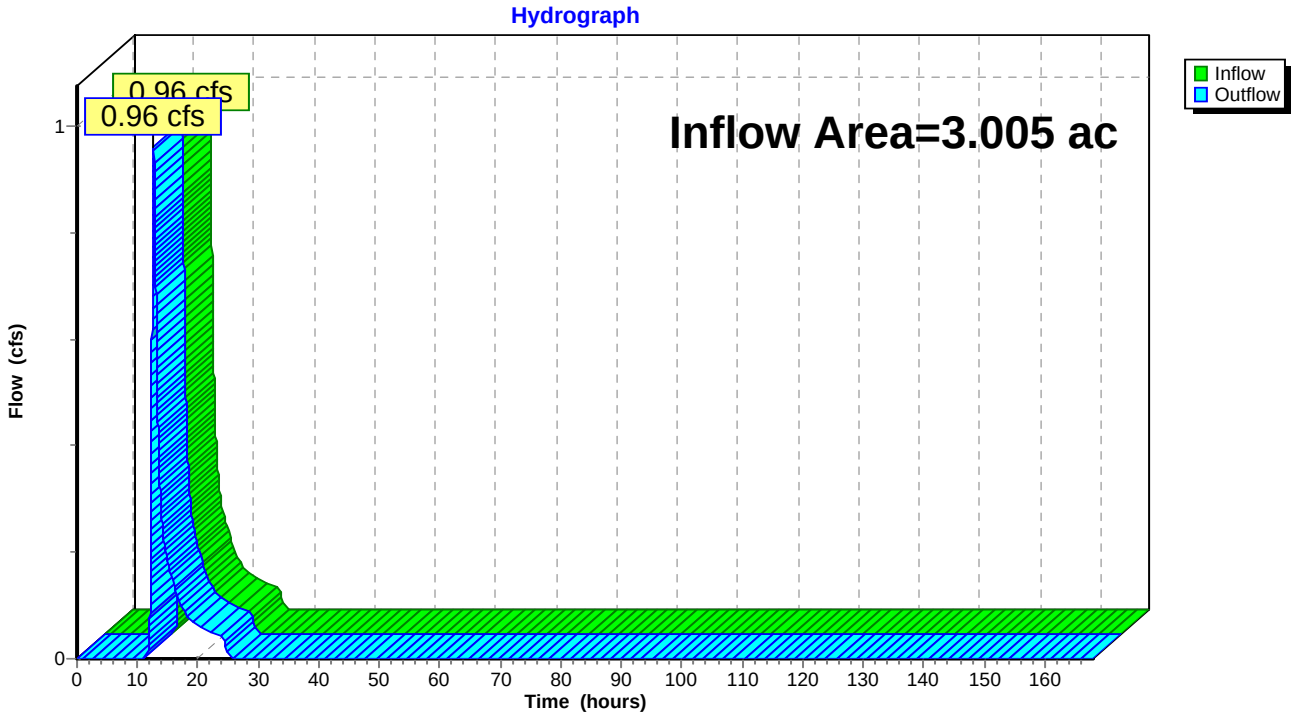


Summary for Reach DP-9: DP-9

Inflow Area = 3.005 ac, 8.52% Impervious, Inflow Depth = 0.67" for 1-YR, 24-HR Storm event
Inflow = 0.96 cfs @ 12.69 hrs, Volume= 0.167 af
Outflow = 0.96 cfs @ 12.70 hrs, Volume= 0.167 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach DP-9: DP-9



Time span=0.00-168.00 hrs, dt=0.01 hrs, 16801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 13S: Existing DA 31 Runoff Area=3.005 ac 8.52% Impervious Runoff Depth=3.18"
Flow Length=705' Tc=45.5 min UI Adjusted CN=74 Runoff=5.15 cfs 0.798 af

Subcatchment 16S: Existing DA 3 Runoff Area=12.688 ac 0.58% Impervious Runoff Depth=2.81"
Flow Length=1,300' Tc=38.1 min CN=70 Runoff=20.87 cfs 2.966 af

Subcatchment 19S: Existing DA 26 Runoff Area=7.405 ac 0.00% Impervious Runoff Depth=3.09"
Flow Length=979' Tc=50.2 min CN=73 Runoff=11.66 cfs 1.906 af

Subcatchment 21S: Existing DA 25 Runoff Area=15.876 ac 0.00% Impervious Runoff Depth=2.90"
Flow Length=823' Tc=35.5 min CN=71 Runoff=28.10 cfs 3.835 af

Subcatchment 23S: Existing DA 24 Runoff Area=18.733 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=1,225' Tc=40.1 min CN=74 Runoff=34.33 cfs 4.972 af

Subcatchment 25S: Existing DA 23 Runoff Area=15.541 ac 0.00% Impervious Runoff Depth=2.81"
Flow Length=1,484' Tc=47.1 min CN=70 Runoff=22.88 cfs 3.633 af

Subcatchment 27S: Existing DA 21 Runoff Area=87.628 ac 0.96% Impervious Runoff Depth=3.09"
Flow Length=3,263' Tc=58.1 min CN=73 Runoff=126.56 cfs 22.554 af

Reach 20R: DP-26 Inflow=11.66 cfs 1.906 af
Outflow=11.66 cfs 1.906 af

Reach 22R: DP-25 Inflow=28.10 cfs 3.835 af
Outflow=28.10 cfs 3.835 af

Reach 24R: DP-24 Inflow=34.33 cfs 4.972 af
Outflow=34.33 cfs 4.972 af

Reach 26R: DP-23 Inflow=22.88 cfs 3.633 af
Outflow=22.88 cfs 3.633 af

Reach 28R: DP-21 Inflow=126.56 cfs 22.554 af
Outflow=126.56 cfs 22.554 af

Reach DP-1: DP-1 Inflow=20.87 cfs 2.966 af
Outflow=20.87 cfs 2.966 af

Reach DP-9: DP-9 Inflow=5.15 cfs 0.798 af
Outflow=5.15 cfs 0.798 af

Total Runoff Area = 160.876 ac Runoff Volume = 40.663 af Average Runoff Depth = 3.03"
99.27% Pervious = 159.707 ac 0.73% Impervious = 1.169 ac

Summary for Subcatchment 13S: Existing DA 31

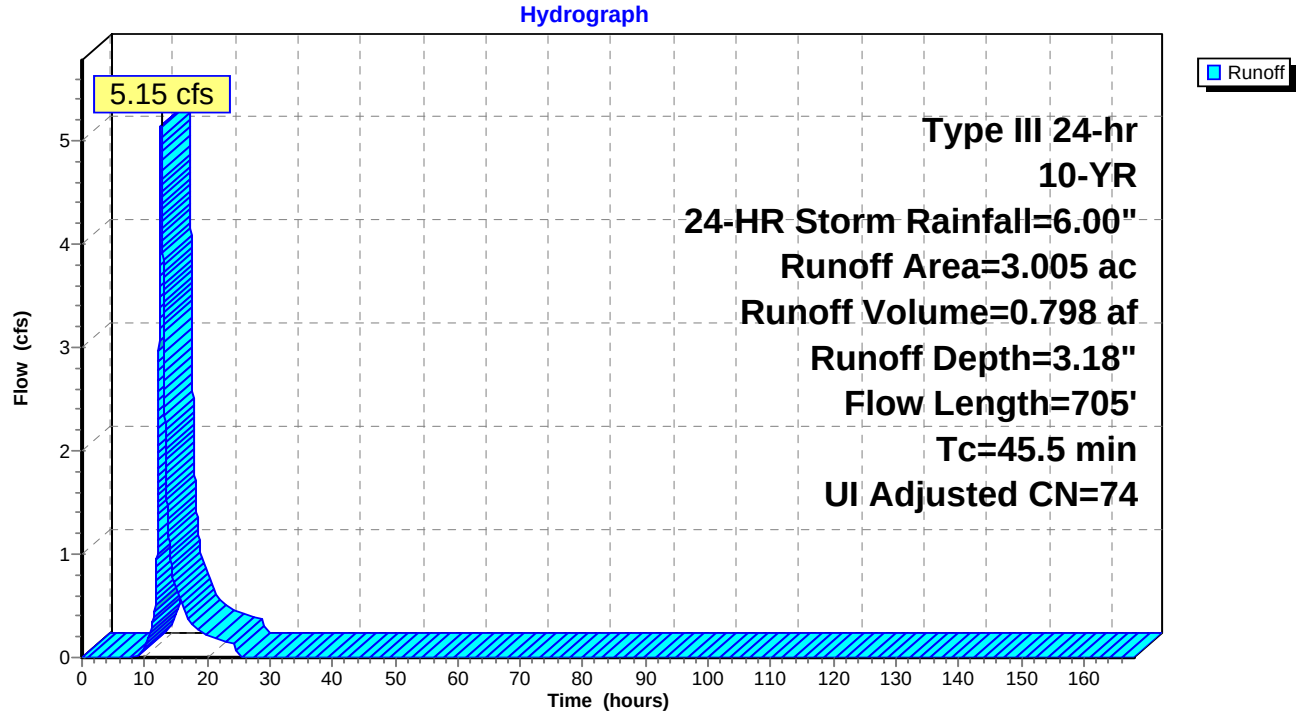
Runoff = 5.15 cfs @ 12.64 hrs, Volume= 0.798 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.247	98	Unconnected pavement, HSG C
2.054	74	>75% Grass cover, Good, HSG C
0.031	71	Meadow, non-grazed, HSG C
0.615	70	Woods, Good, HSG C
0.049	80	>75% Grass cover, Good, HSG D
0.009	98	Water Surface, HSG D
3.005	75	Weighted Average, UI Adjusted CN = 74
2.749		91.48% Pervious Area
0.256		8.52% Impervious Area
0.247		96.48% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
9.2	555	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
45.5	705	Total			

Subcatchment 13S: Existing DA 31



Summary for Subcatchment 16S: Existing DA 3

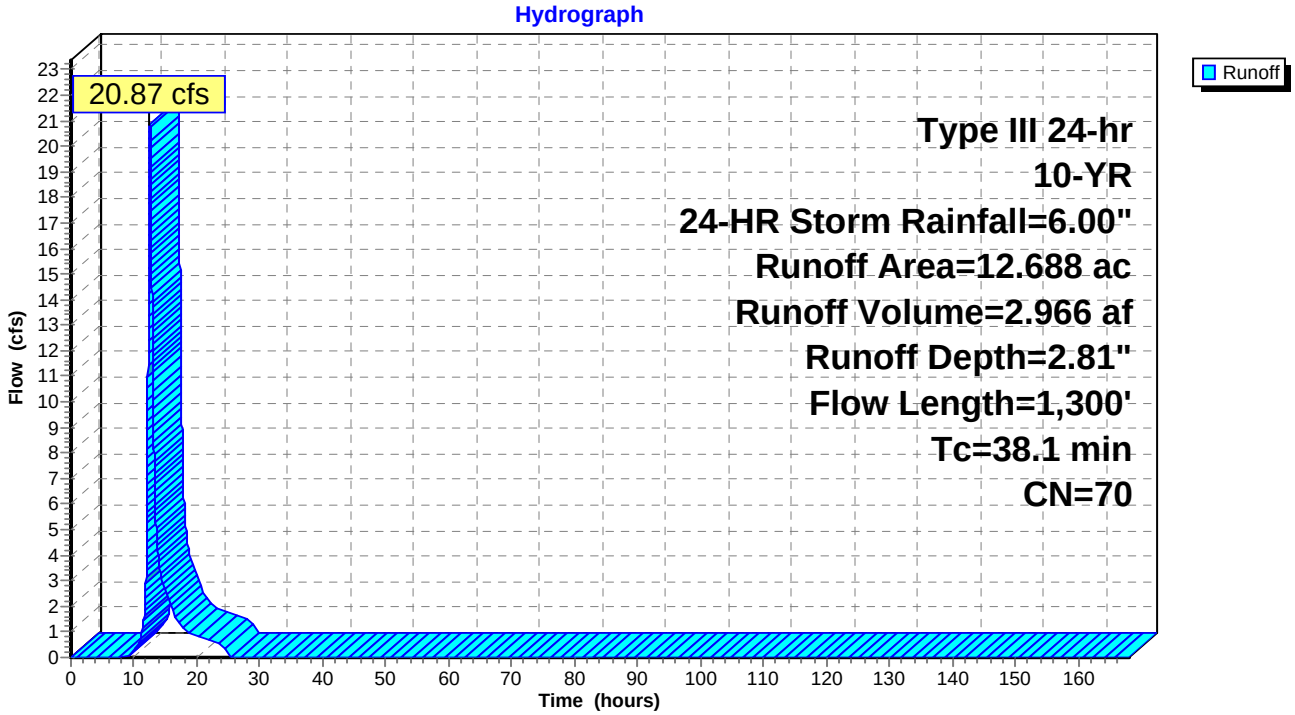
Runoff = 20.87 cfs @ 12.54 hrs, Volume= 2.966 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.073	98	Unconnected pavement, HSG C
0.137	74	>75% Grass cover, Good, HSG C
0.018	71	Meadow, non-grazed, HSG C
12.460	70	Woods, Good, HSG C
12.688	70	Weighted Average
12.615		99.42% Pervious Area
0.073		0.58% Impervious Area
0.073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	150	0.0300	0.11		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
14.8	1,150	0.0670	1.29		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
38.1	1,300	Total			

Subcatchment 16S: Existing DA 3



Summary for Subcatchment 19S: Existing DA 26

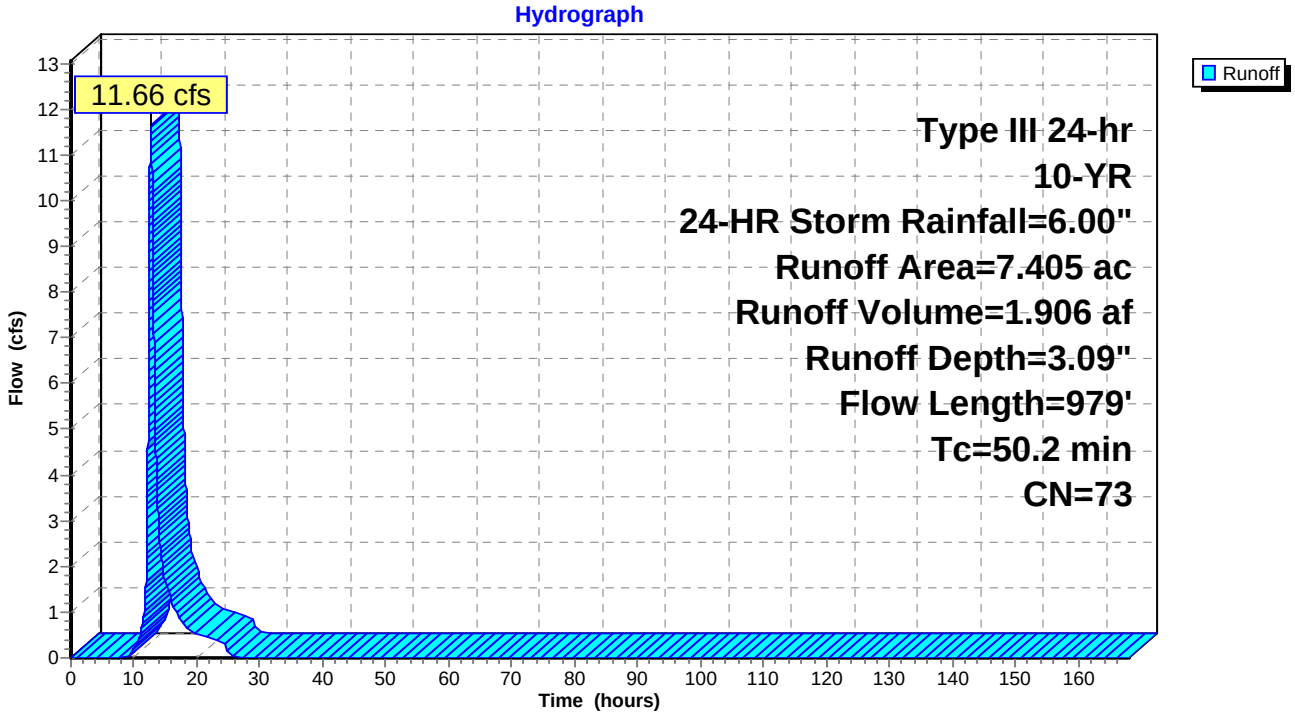
Runoff = 11.66 cfs @ 12.67 hrs, Volume= 1.906 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.161	71	Meadow, non-grazed, HSG C
3.962	70	Woods, Good, HSG C
3.282	77	Woods, Good, HSG D
7.405	73	Weighted Average
7.405		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
14.0	829	0.0390	0.99		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
50.2	979	Total			

Subcatchment 19S: Existing DA 26



Summary for Subcatchment 21S: Existing DA 25

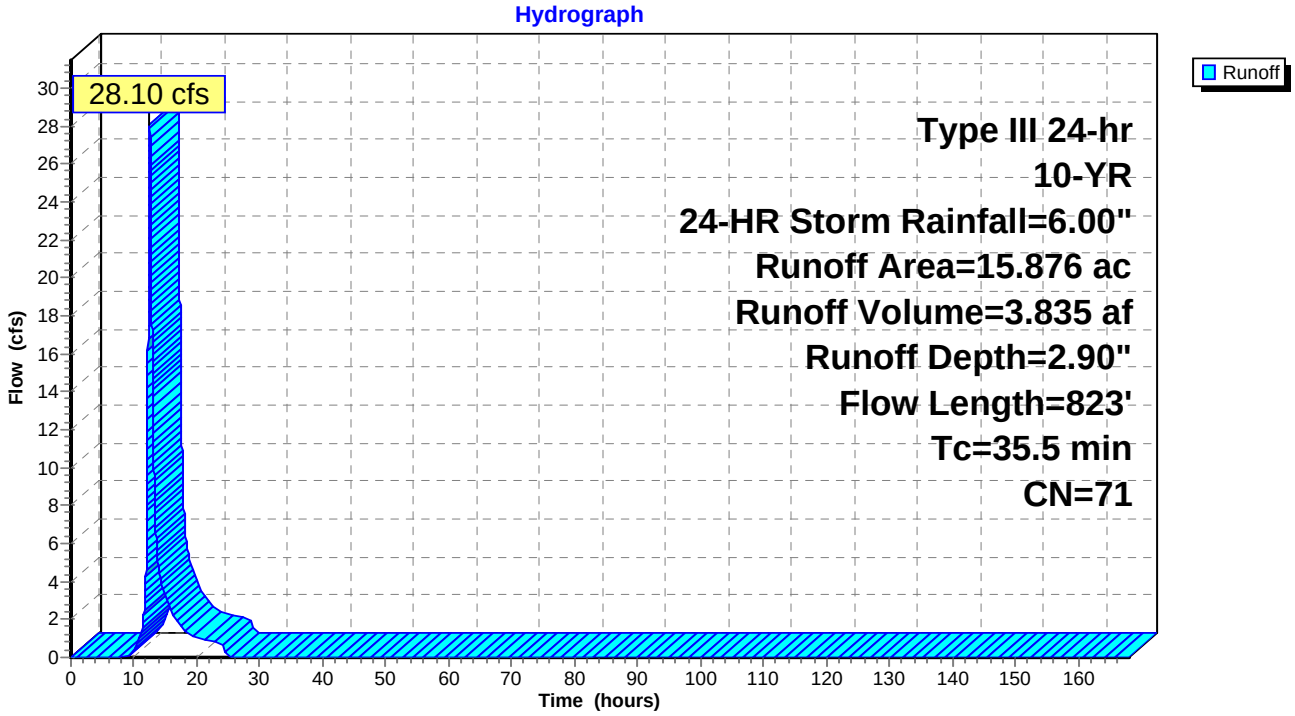
Runoff = 28.10 cfs @ 12.50 hrs, Volume= 3.835 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.575	71	Meadow, non-grazed, HSG C
13.410	70	Woods, Good, HSG C
0.108	78	Meadow, non-grazed, HSG D
1.783	77	Woods, Good, HSG D
15.876	71	Weighted Average
15.876		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3	100	0.0150	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
13.2	723	0.0332	0.91		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
35.5	823	Total			

Subcatchment 21S: Existing DA 25



Summary for Subcatchment 23S: Existing DA 24

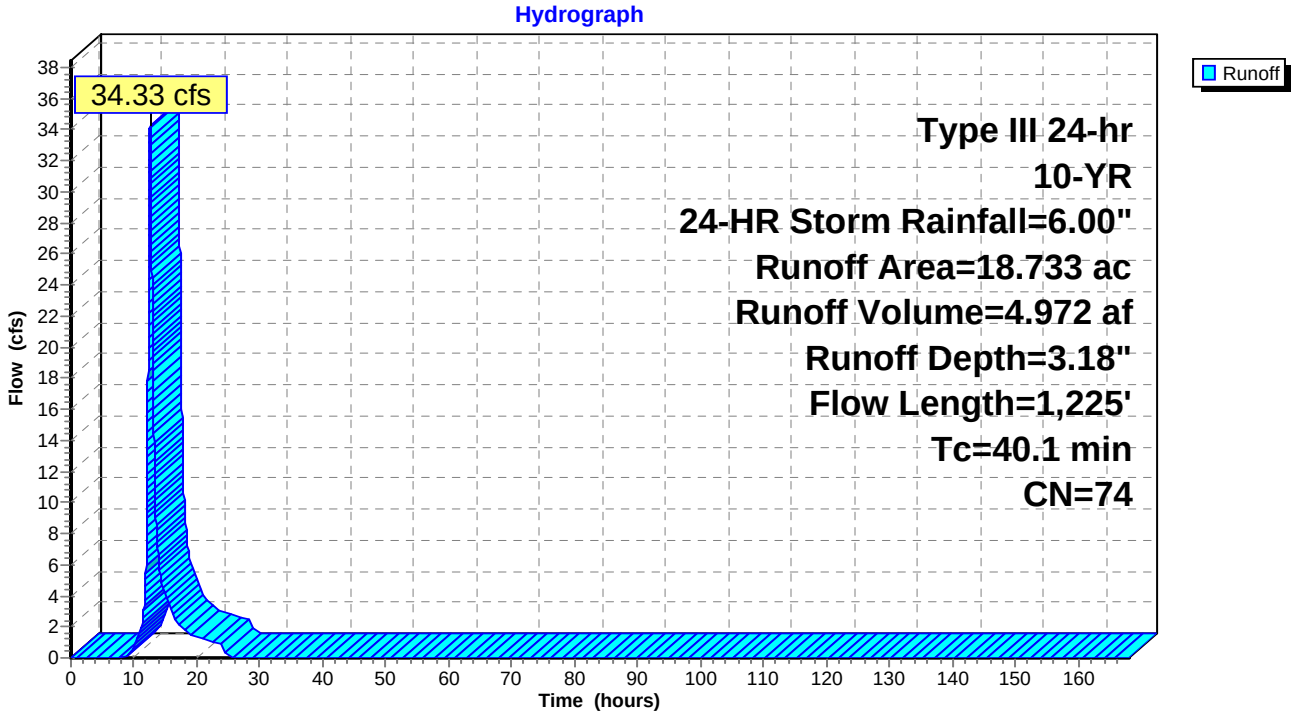
Runoff = 34.33 cfs @ 12.56 hrs, Volume= 4.972 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
11.333	70	Woods, Good, HSG C
1.072	96	Gravel surface, HSG D
6.328	77	Woods, Good, HSG D
18.733	74	Weighted Average
18.733		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	150	0.0270	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
15.8	1,075	0.0516	1.14		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
40.1	1,225	Total			

Subcatchment 23S: Existing DA 24



Summary for Subcatchment 25S: Existing DA 23

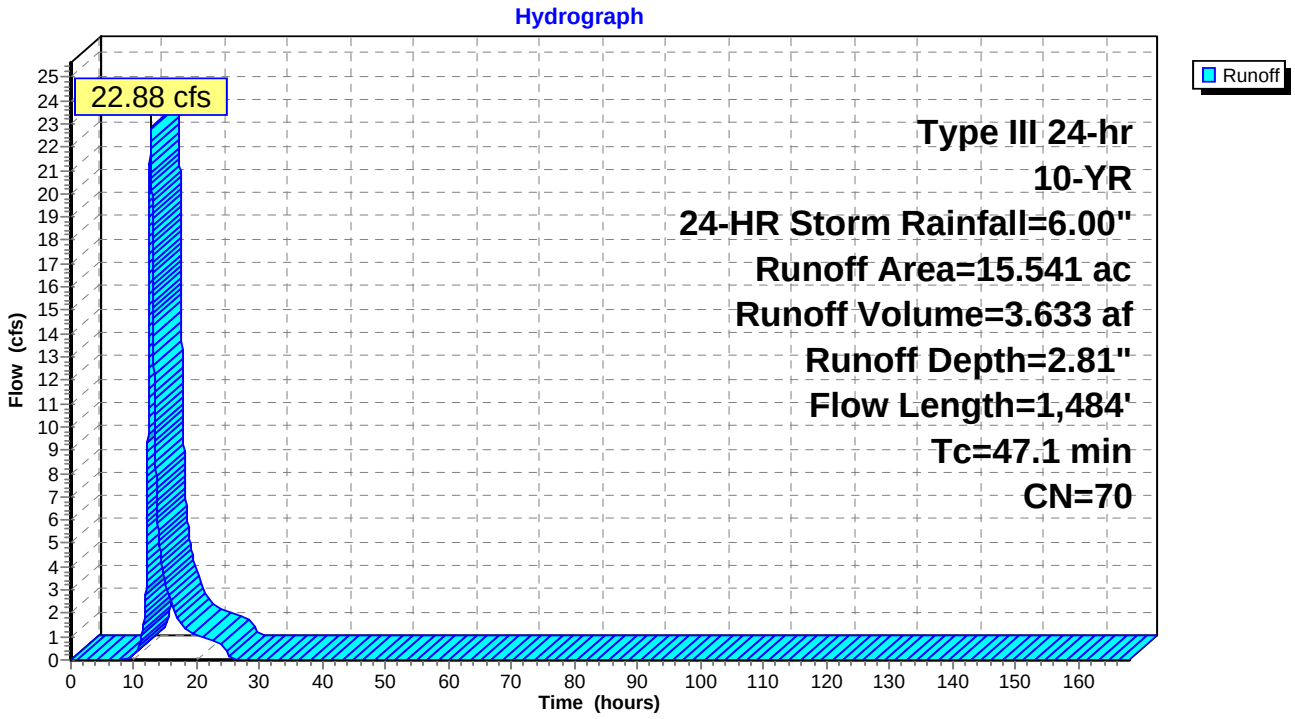
Runoff = 22.88 cfs @ 12.66 hrs, Volume= 3.633 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.415	65	Brush, Good, HSG C
0.469	74	>75% Grass cover, Good, HSG C
14.185	70	Woods, Good, HSG C
0.009	73	Brush, Good, HSG D
0.463	77	Woods, Good, HSG D
15.541	70	Weighted Average
15.541		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	150	0.0233	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
21.3	1,334	0.0435	1.04		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
47.1	1,484	Total			

Subcatchment 25S: Existing DA 23



Summary for Subcatchment 27S: Existing DA 21

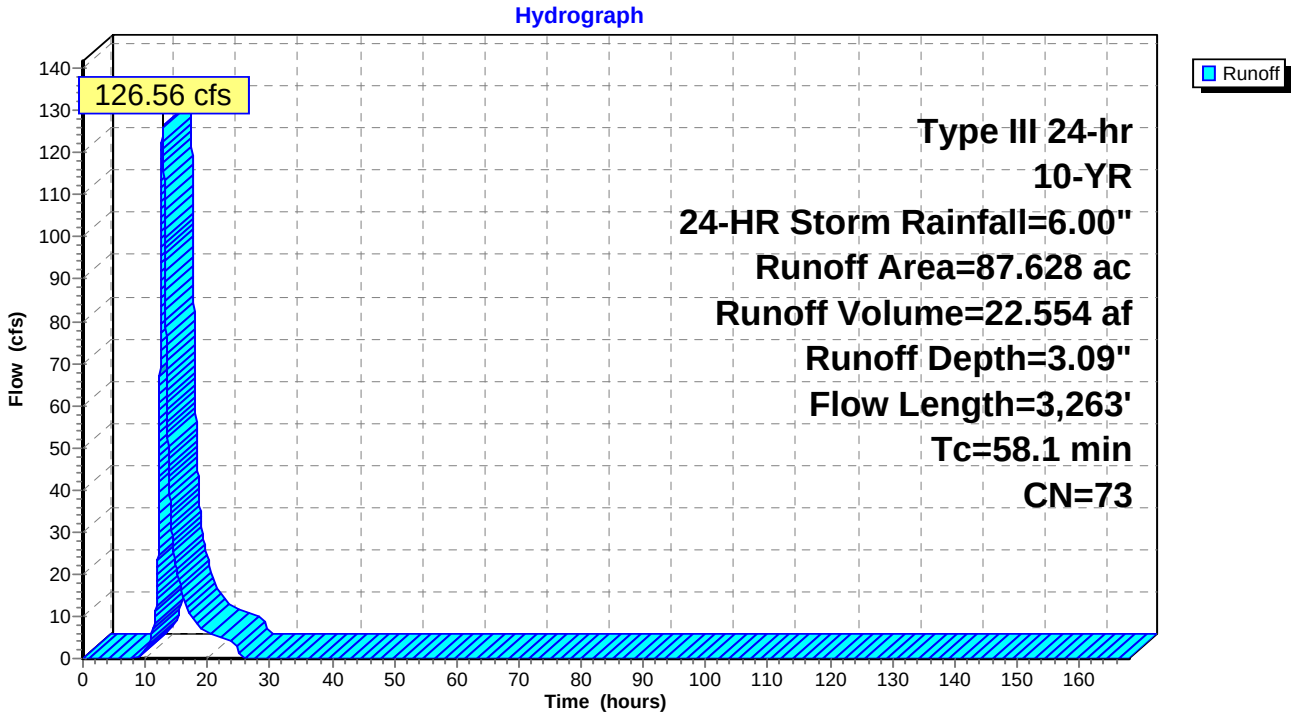
Runoff = 126.56 cfs @ 12.79 hrs, Volume= 22.554 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.840	98	Unconnected pavement, HSG C
0.139	65	Brush, Good, HSG C
14.886	74	>75% Grass cover, Good, HSG C
0.241	96	Gravel surface, HSG C
30.196	74	Pasture/grassland/range, Good, HSG C
5.535	71	Meadow, non-grazed, HSG C
27.718	70	Woods, Good, HSG C
0.004	73	Brush, Good, HSG D
0.343	80	Pasture/grassland/range, Good, HSG D
2.852	78	Meadow, non-grazed, HSG D
4.874	77	Woods, Good, HSG D
87.628	73	Weighted Average
86.788		99.04% Pervious Area
0.840		0.96% Impervious Area
0.840		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	150	0.0467	0.13		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
30.4	1,500	0.0270	0.82		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
8.2	1,613	0.0161	3.27	4.90	**Channel Flow, Existing Rivulet** Area= 1.5 sf Perim= 4.0' r= 0.38' n= 0.030
58.1	3,263	Total			

Subcatchment 27S: Existing DA 21

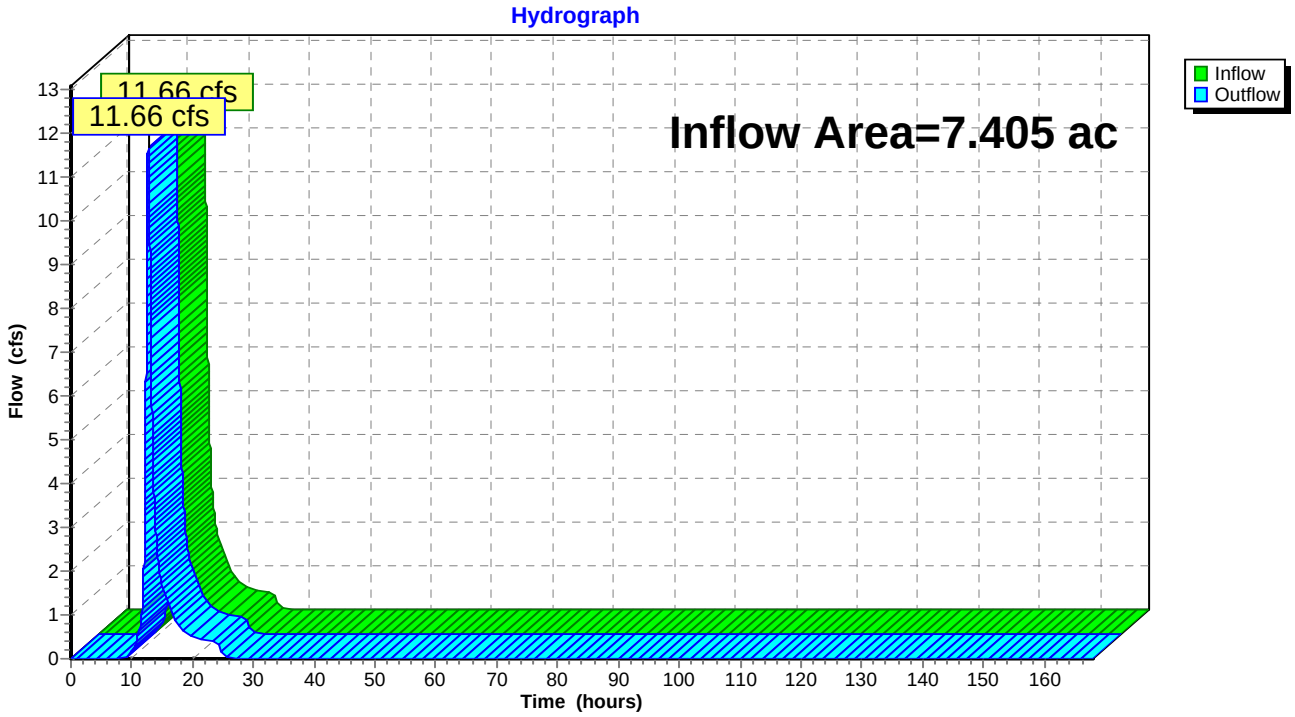


Summary for Reach 20R: DP-26

Inflow Area = 7.405 ac, 0.00% Impervious, Inflow Depth = 3.09" for 10-YR, 24-HR Storm event
Inflow = 11.66 cfs @ 12.67 hrs, Volume= 1.906 af
Outflow = 11.66 cfs @ 12.68 hrs, Volume= 1.906 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 20R: DP-26

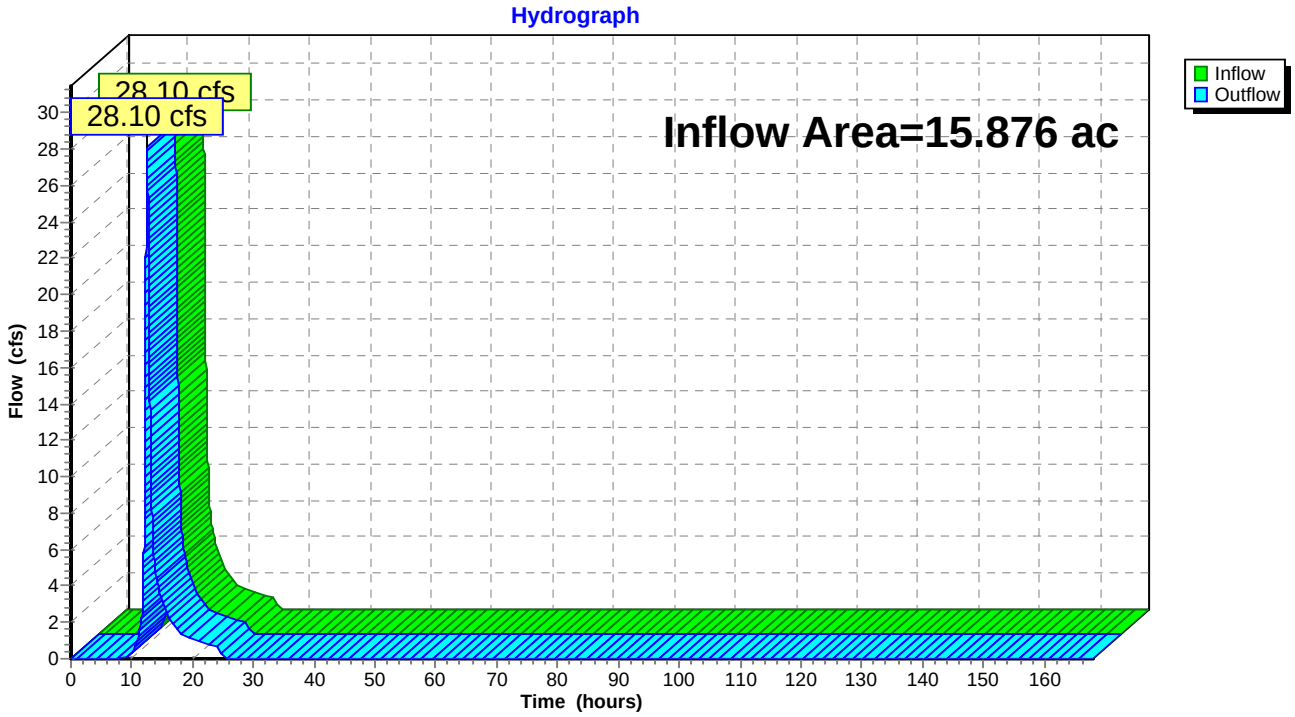


Summary for Reach 22R: DP-25

Inflow Area = 15.876 ac, 0.00% Impervious, Inflow Depth = 2.90" for 10-YR, 24-HR Storm event
Inflow = 28.10 cfs @ 12.50 hrs, Volume= 3.835 af
Outflow = 28.10 cfs @ 12.51 hrs, Volume= 3.835 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 22R: DP-25

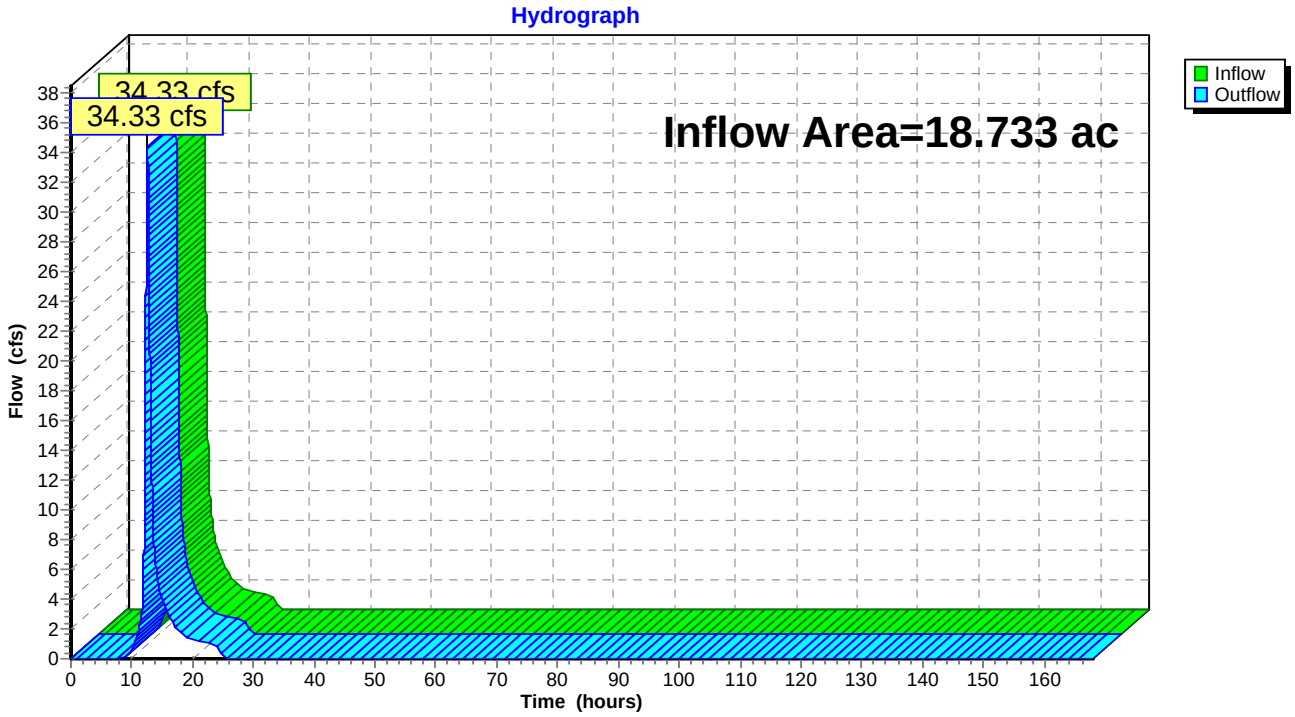


Summary for Reach 24R: DP-24

Inflow Area = 18.733 ac, 0.00% Impervious, Inflow Depth = 3.18" for 10-YR, 24-HR Storm event
Inflow = 34.33 cfs @ 12.56 hrs, Volume= 4.972 af
Outflow = 34.33 cfs @ 12.57 hrs, Volume= 4.972 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 24R: DP-24

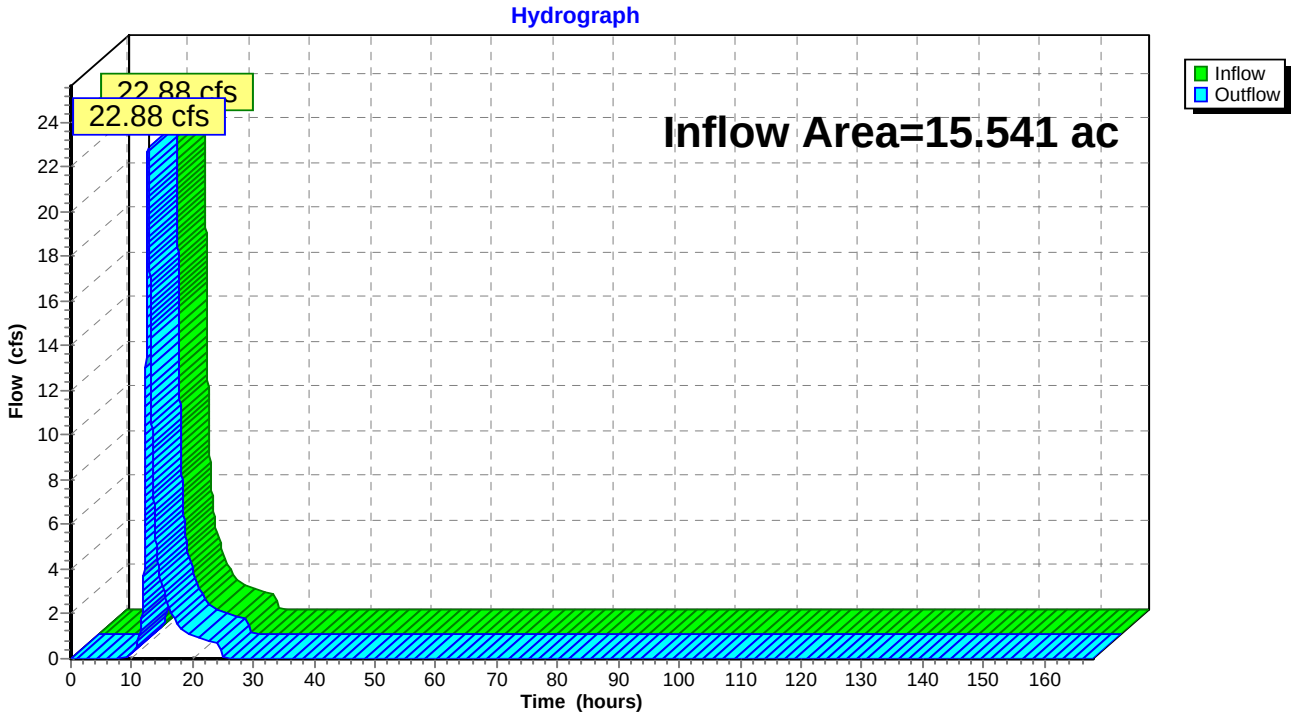


Summary for Reach 26R: DP-23

Inflow Area = 15.541 ac, 0.00% Impervious, Inflow Depth = 2.81" for 10-YR, 24-HR Storm event
Inflow = 22.88 cfs @ 12.66 hrs, Volume= 3.633 af
Outflow = 22.88 cfs @ 12.67 hrs, Volume= 3.633 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 26R: DP-23

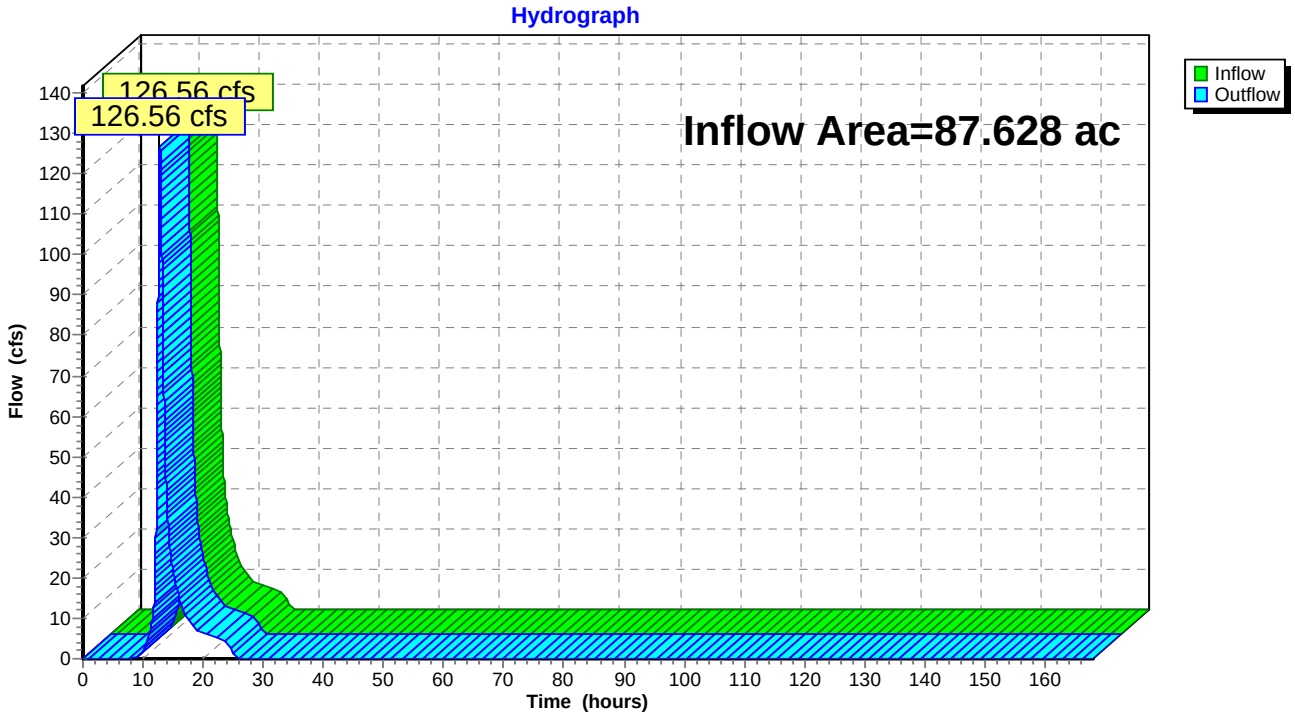


Summary for Reach 28R: DP-21

Inflow Area = 87.628 ac, 0.96% Impervious, Inflow Depth = 3.09" for 10-YR, 24-HR Storm event
Inflow = 126.56 cfs @ 12.79 hrs, Volume= 22.554 af
Outflow = 126.56 cfs @ 12.80 hrs, Volume= 22.554 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 28R: DP-21

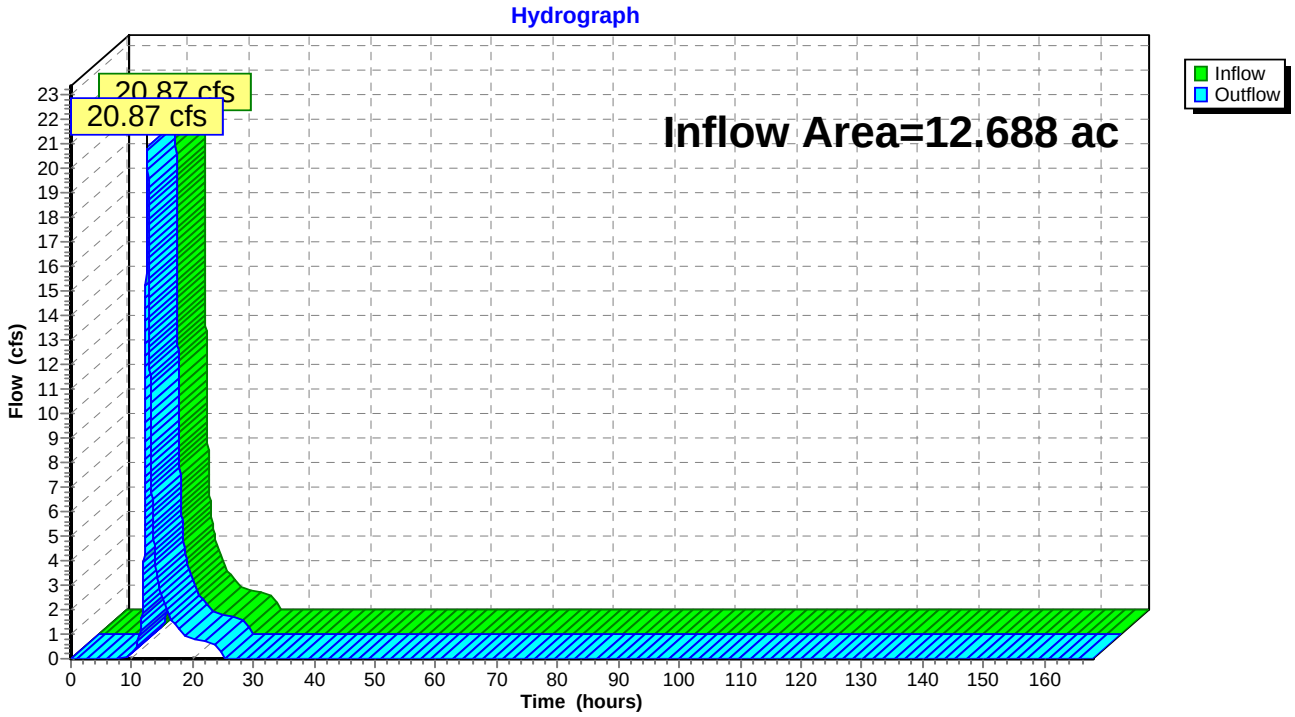


Summary for Reach DP-1: DP-1

Inflow Area = 12.688 ac, 0.58% Impervious, Inflow Depth = 2.81" for 10-YR, 24-HR Storm event
Inflow = 20.87 cfs @ 12.54 hrs, Volume= 2.966 af
Outflow = 20.87 cfs @ 12.55 hrs, Volume= 2.966 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1

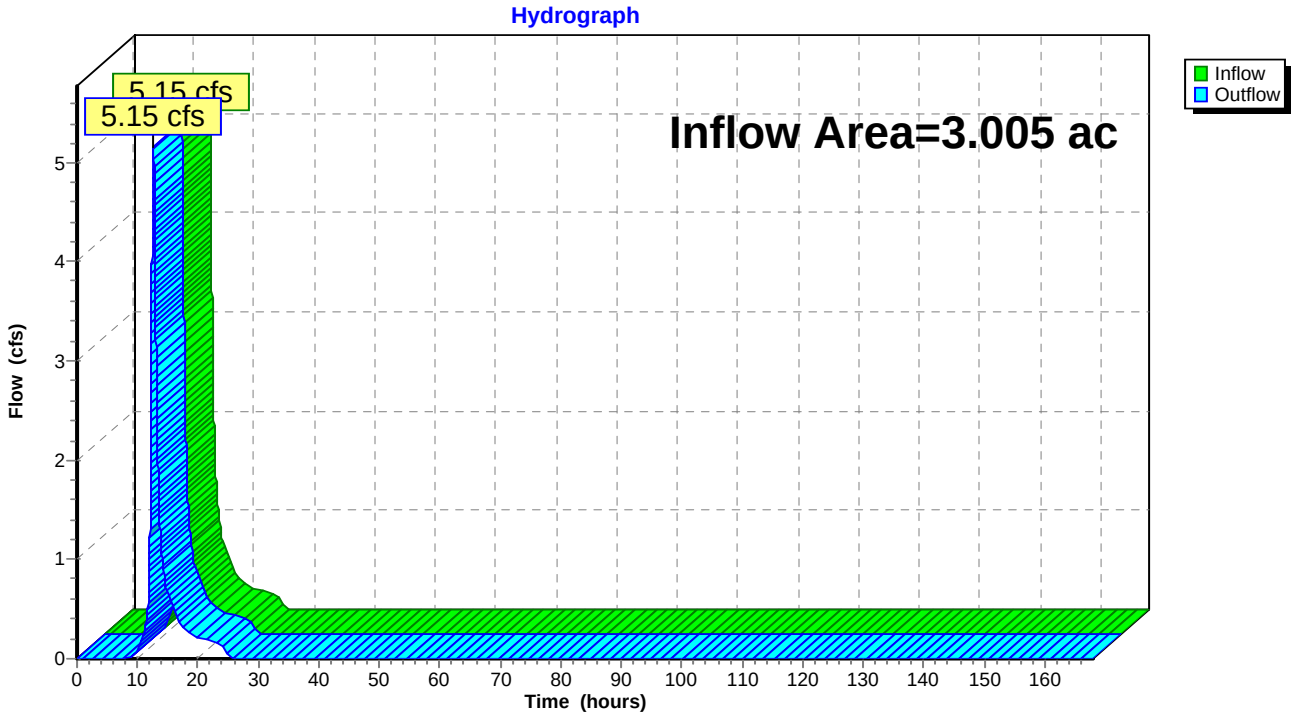


Summary for Reach DP-9: DP-9

Inflow Area = 3.005 ac, 8.52% Impervious, Inflow Depth = 3.18" for 10-YR, 24-HR Storm event
Inflow = 5.15 cfs @ 12.64 hrs, Volume= 0.798 af
Outflow = 5.15 cfs @ 12.65 hrs, Volume= 0.798 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach DP-9: DP-9



Time span=0.00-168.00 hrs, dt=0.01 hrs, 16801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 13S: Existing DA 31 Runoff Area=3.005 ac 8.52% Impervious Runoff Depth=0.06"
Flow Length=705' Tc=45.5 min UI Adjusted CN=74 Runoff=0.03 cfs 0.015 af

Subcatchment 16S: Existing DA 3 Runoff Area=12.688 ac 0.58% Impervious Runoff Depth=0.03"
Flow Length=1,300' Tc=38.1 min CN=70 Runoff=0.04 cfs 0.027 af

Subcatchment 19S: Existing DA 26 Runoff Area=7.405 ac 0.00% Impervious Runoff Depth=0.05"
Flow Length=979' Tc=50.2 min CN=73 Runoff=0.05 cfs 0.031 af

Subcatchment 21S: Existing DA 25 Runoff Area=15.876 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=823' Tc=35.5 min CN=71 Runoff=0.07 cfs 0.043 af

Subcatchment 23S: Existing DA 24 Runoff Area=18.733 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=1,225' Tc=40.1 min CN=74 Runoff=0.20 cfs 0.096 af

Subcatchment 25S: Existing DA 23 Runoff Area=15.541 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=1,484' Tc=47.1 min CN=70 Runoff=0.05 cfs 0.033 af

Subcatchment 27S: Existing DA 21 Runoff Area=87.628 ac 0.96% Impervious Runoff Depth=0.05"
Flow Length=3,263' Tc=58.1 min CN=73 Runoff=0.64 cfs 0.372 af

Reach 20R: DP-26 Inflow=0.05 cfs 0.031 af
Outflow=0.05 cfs 0.031 af

Reach 22R: DP-25 Inflow=0.07 cfs 0.043 af
Outflow=0.07 cfs 0.043 af

Reach 24R: DP-24 Inflow=0.20 cfs 0.096 af
Outflow=0.20 cfs 0.096 af

Reach 26R: DP-23 Inflow=0.05 cfs 0.033 af
Outflow=0.05 cfs 0.033 af

Reach 28R: DP-21 Inflow=0.64 cfs 0.372 af
Outflow=0.64 cfs 0.372 af

Reach DP-1: DP-1 Inflow=0.04 cfs 0.027 af
Outflow=0.04 cfs 0.027 af

Reach DP-9: DP-9 Inflow=0.03 cfs 0.015 af
Outflow=0.03 cfs 0.015 af

Total Runoff Area = 160.876 ac Runoff Volume = 0.618 af Average Runoff Depth = 0.05"
99.27% Pervious = 159.707 ac 0.73% Impervious = 1.169 ac

Summary for Subcatchment 13S: Existing DA 31

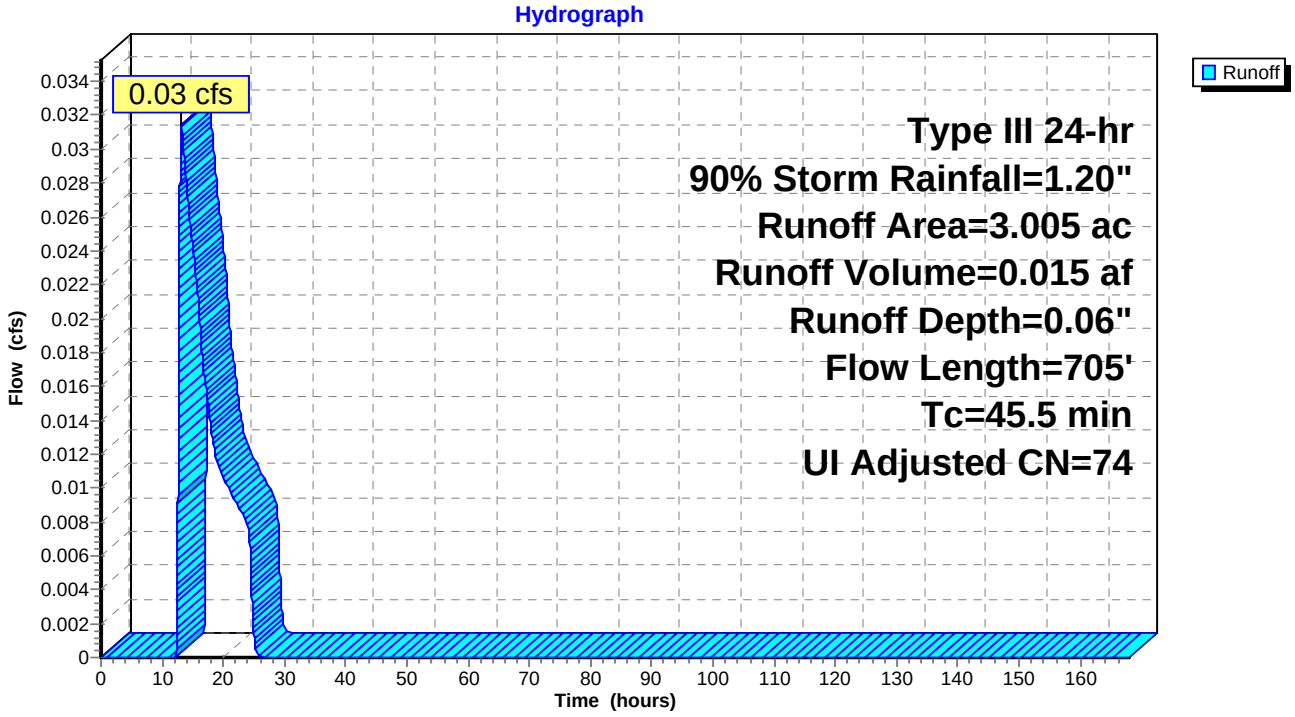
Runoff = 0.03 cfs @ 13.19 hrs, Volume= 0.015 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.247	98	Unconnected pavement, HSG C
2.054	74	>75% Grass cover, Good, HSG C
0.031	71	Meadow, non-grazed, HSG C
0.615	70	Woods, Good, HSG C
0.049	80	>75% Grass cover, Good, HSG D
0.009	98	Water Surface, HSG D
3.005	75	Weighted Average, UI Adjusted CN = 74
2.749		91.48% Pervious Area
0.256		8.52% Impervious Area
0.247		96.48% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
9.2	555	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
45.5	705	Total			

Subcatchment 13S: Existing DA 31



Summary for Subcatchment 16S: Existing DA 3

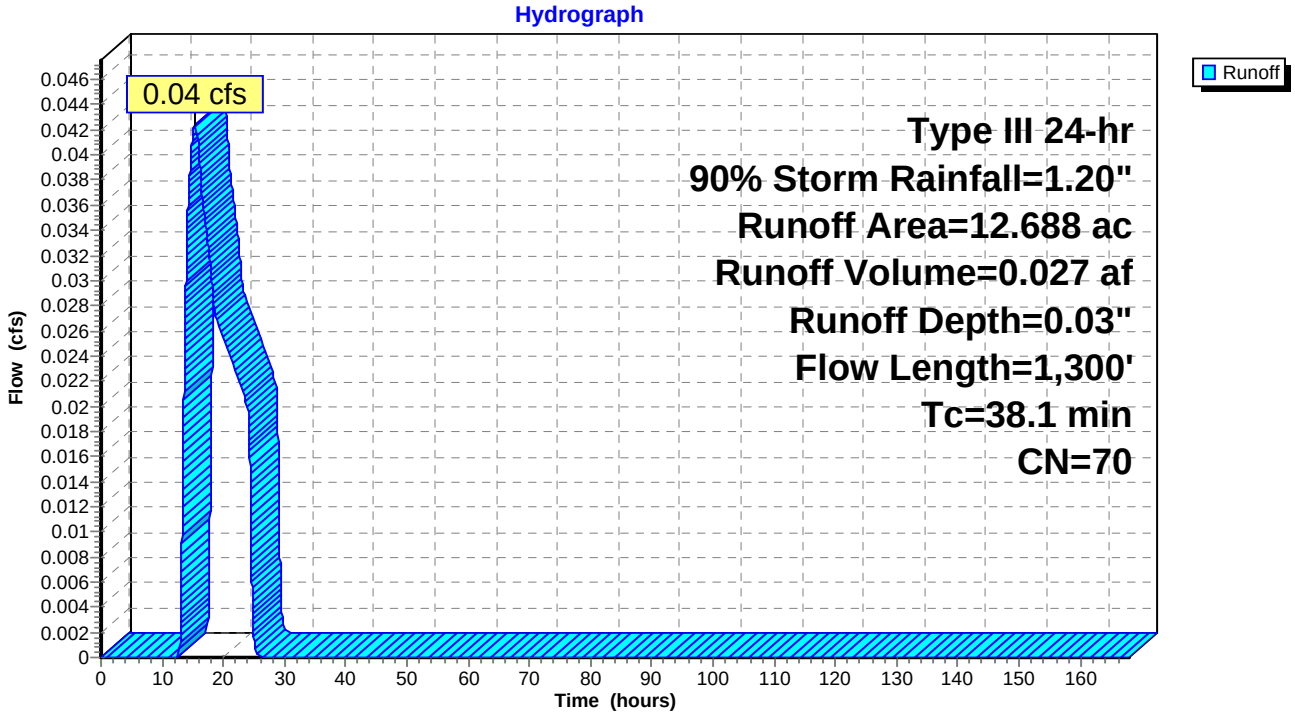
Runoff = 0.04 cfs @ 15.37 hrs, Volume= 0.027 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.073	98	Unconnected pavement, HSG C
0.137	74	>75% Grass cover, Good, HSG C
0.018	71	Meadow, non-grazed, HSG C
12.460	70	Woods, Good, HSG C
12.688	70	Weighted Average
12.615		99.42% Pervious Area
0.073		0.58% Impervious Area
0.073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	150	0.0300	0.11		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
14.8	1,150	0.0670	1.29		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
38.1	1,300	Total			

Subcatchment 16S: Existing DA 3



Summary for Subcatchment 19S: Existing DA 26

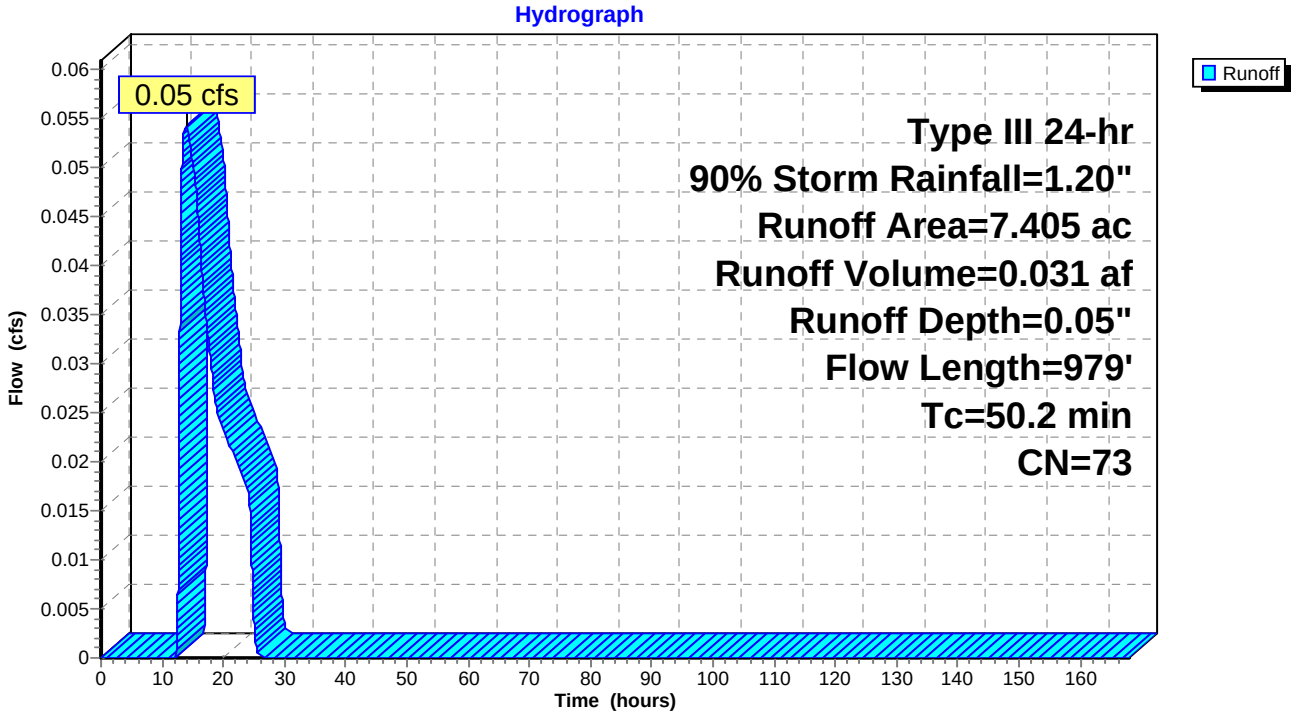
Runoff = 0.05 cfs @ 14.00 hrs, Volume= 0.031 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.161	71	Meadow, non-grazed, HSG C
3.962	70	Woods, Good, HSG C
3.282	77	Woods, Good, HSG D
7.405	73	Weighted Average
7.405		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
14.0	829	0.0390	0.99		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
50.2	979	Total			

Subcatchment 19S: Existing DA 26



Summary for Subcatchment 21S: Existing DA 25

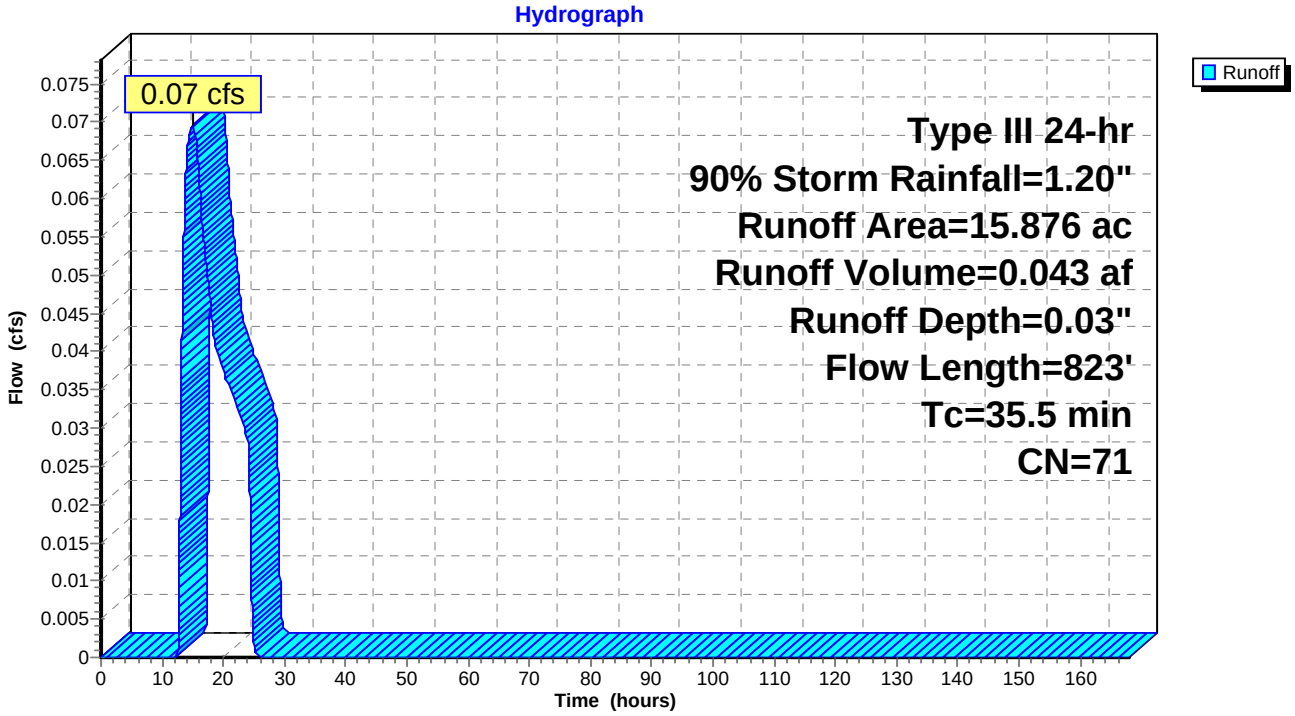
Runoff = 0.07 cfs @ 15.03 hrs, Volume= 0.043 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.575	71	Meadow, non-grazed, HSG C
13.410	70	Woods, Good, HSG C
0.108	78	Meadow, non-grazed, HSG D
1.783	77	Woods, Good, HSG D
15.876	71	Weighted Average
15.876		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3	100	0.0150	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
13.2	723	0.0332	0.91		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
35.5	823	Total			

Subcatchment 21S: Existing DA 25



Summary for Subcatchment 23S: Existing DA 24

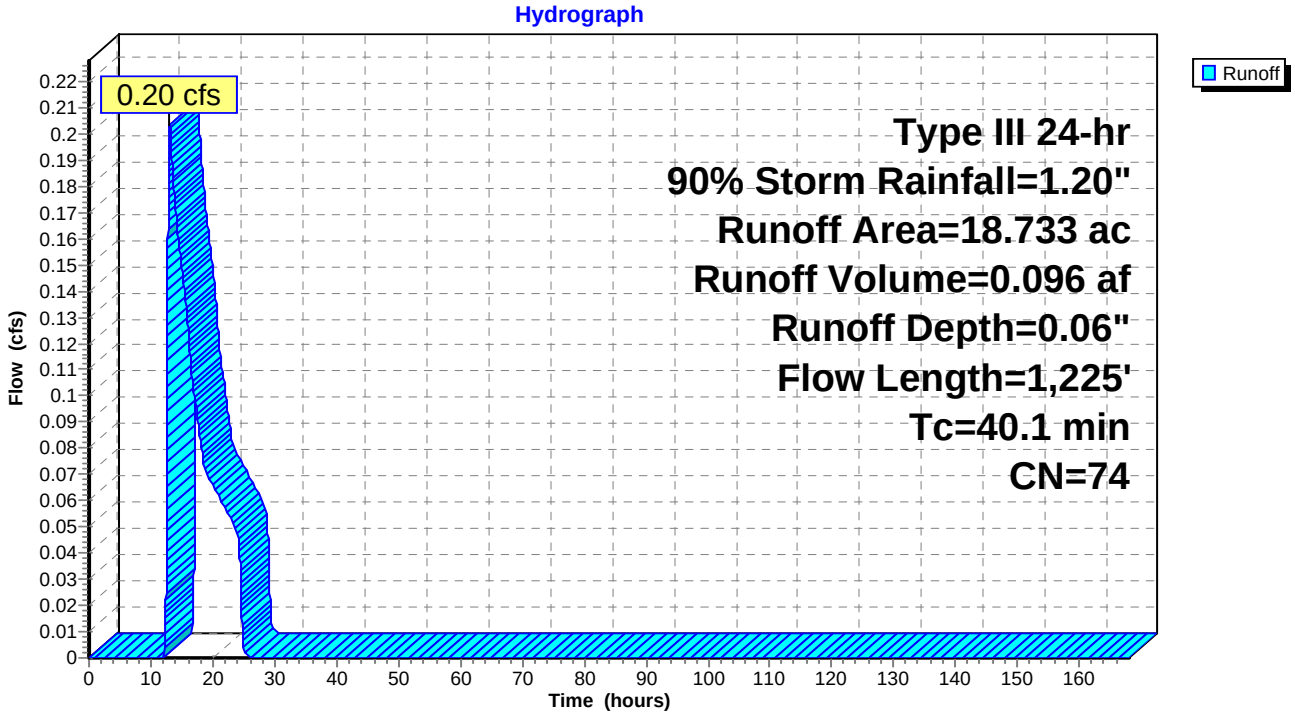
Runoff = 0.20 cfs @ 13.05 hrs, Volume= 0.096 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
11.333	70	Woods, Good, HSG C
1.072	96	Gravel surface, HSG D
6.328	77	Woods, Good, HSG D
18.733	74	Weighted Average
18.733		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	150	0.0270	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
15.8	1,075	0.0516	1.14		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
40.1	1,225	Total			

Subcatchment 23S: Existing DA 24



Summary for Subcatchment 25S: Existing DA 23

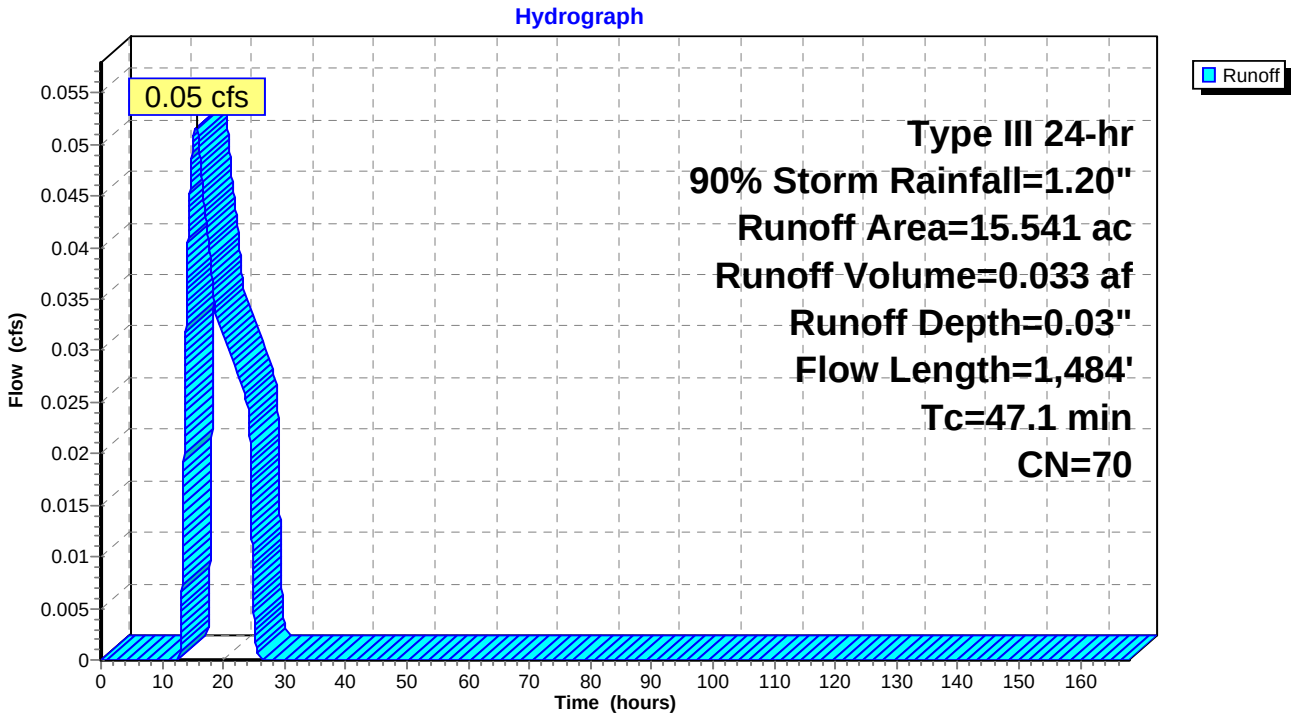
Runoff = 0.05 cfs @ 15.54 hrs, Volume= 0.033 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.415	65	Brush, Good, HSG C
0.469	74	>75% Grass cover, Good, HSG C
14.185	70	Woods, Good, HSG C
0.009	73	Brush, Good, HSG D
0.463	77	Woods, Good, HSG D
15.541	70	Weighted Average
15.541		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	150	0.0233	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
21.3	1,334	0.0435	1.04		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
47.1	1,484	Total			

Subcatchment 25S: Existing DA 23



Summary for Subcatchment 27S: Existing DA 21

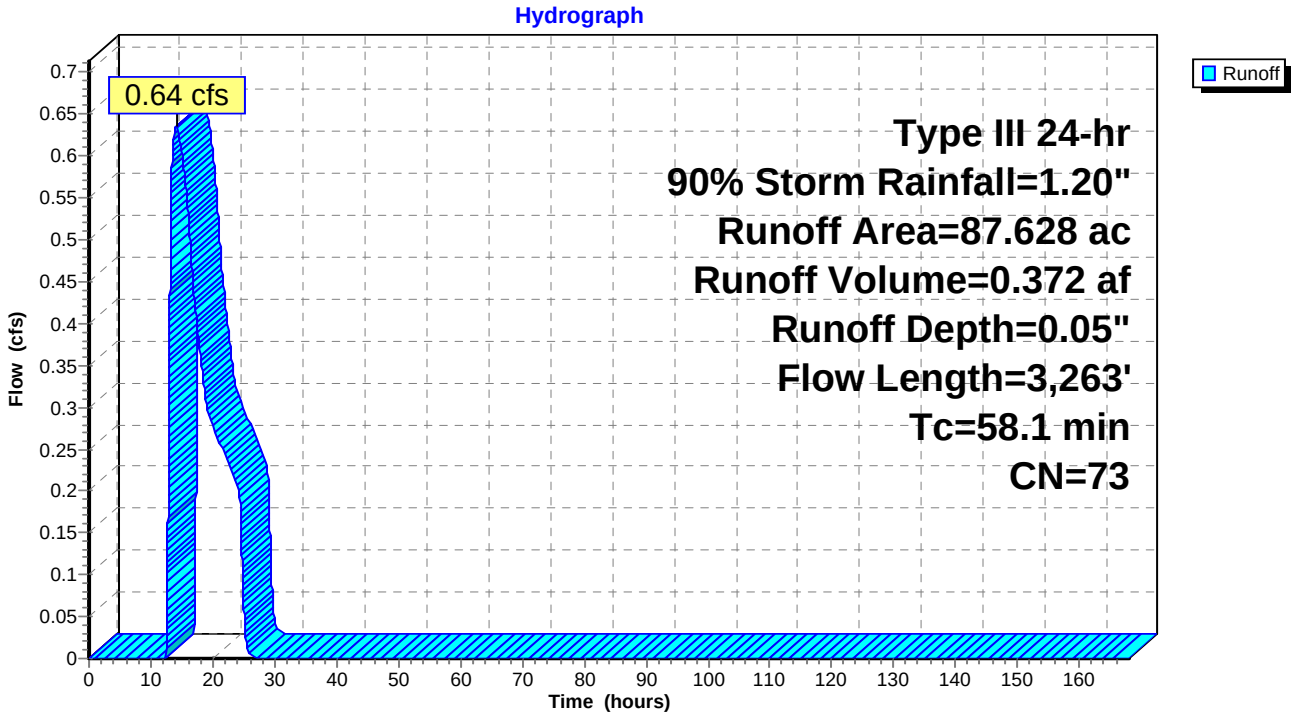
Runoff = 0.64 cfs @ 14.14 hrs, Volume= 0.372 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.840	98	Unconnected pavement, HSG C
0.139	65	Brush, Good, HSG C
14.886	74	>75% Grass cover, Good, HSG C
0.241	96	Gravel surface, HSG C
30.196	74	Pasture/grassland/range, Good, HSG C
5.535	71	Meadow, non-grazed, HSG C
27.718	70	Woods, Good, HSG C
0.004	73	Brush, Good, HSG D
0.343	80	Pasture/grassland/range, Good, HSG D
2.852	78	Meadow, non-grazed, HSG D
4.874	77	Woods, Good, HSG D
87.628	73	Weighted Average
86.788		99.04% Pervious Area
0.840		0.96% Impervious Area
0.840		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	150	0.0467	0.13		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
30.4	1,500	0.0270	0.82		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
8.2	1,613	0.0161	3.27	4.90	**Channel Flow, Existing Rivulet** Area= 1.5 sf Perim= 4.0' r= 0.38' n= 0.030
58.1	3,263	Total			

Subcatchment 27S: Existing DA 21

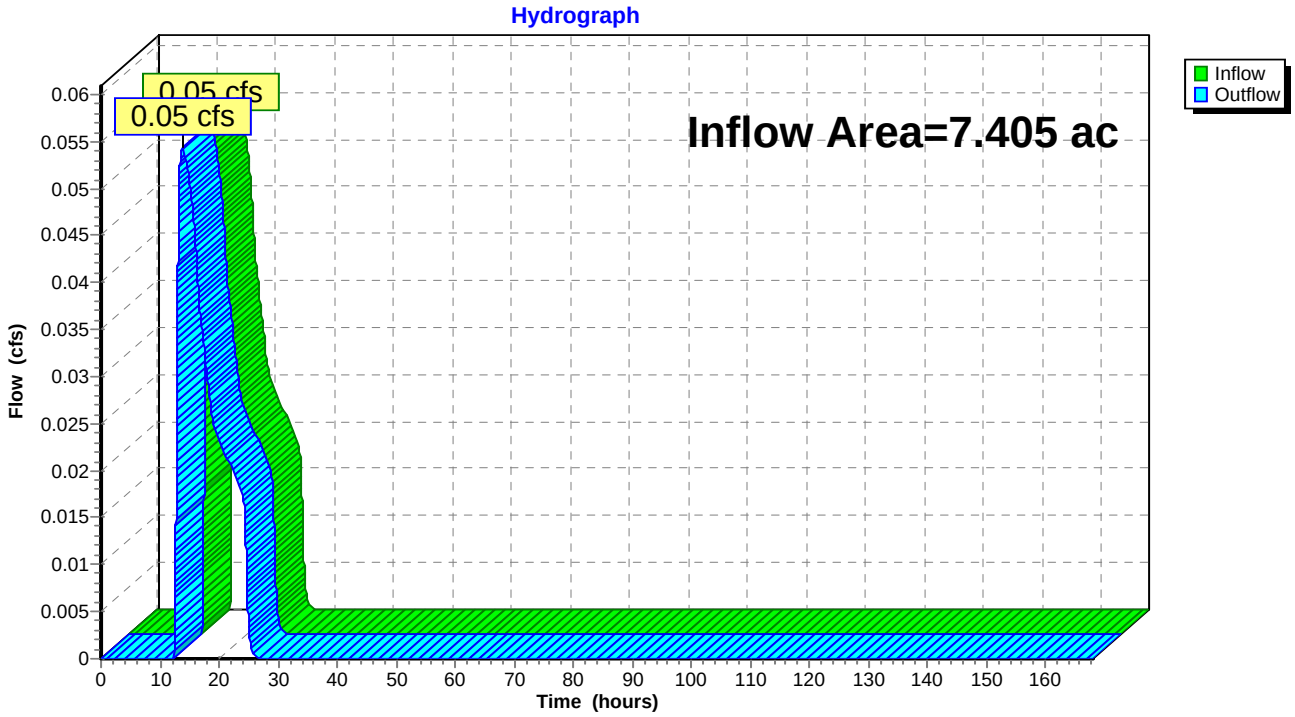


Summary for Reach 20R: DP-26

Inflow Area = 7.405 ac, 0.00% Impervious, Inflow Depth = 0.05" for 90% Storm event
Inflow = 0.05 cfs @ 14.00 hrs, Volume= 0.031 af
Outflow = 0.05 cfs @ 14.01 hrs, Volume= 0.031 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 20R: DP-26

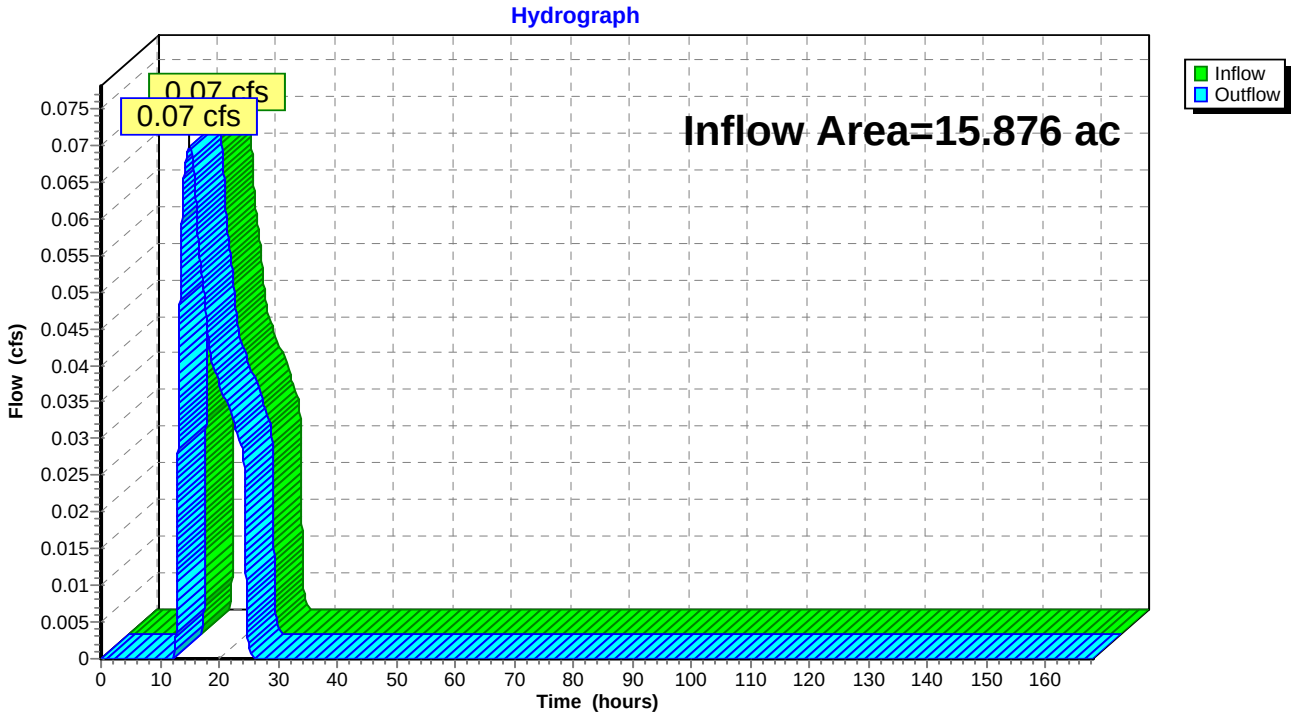


Summary for Reach 22R: DP-25

Inflow Area = 15.876 ac, 0.00% Impervious, Inflow Depth = 0.03" for 90% Storm event
Inflow = 0.07 cfs @ 15.03 hrs, Volume= 0.043 af
Outflow = 0.07 cfs @ 15.04 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 22R: DP-25

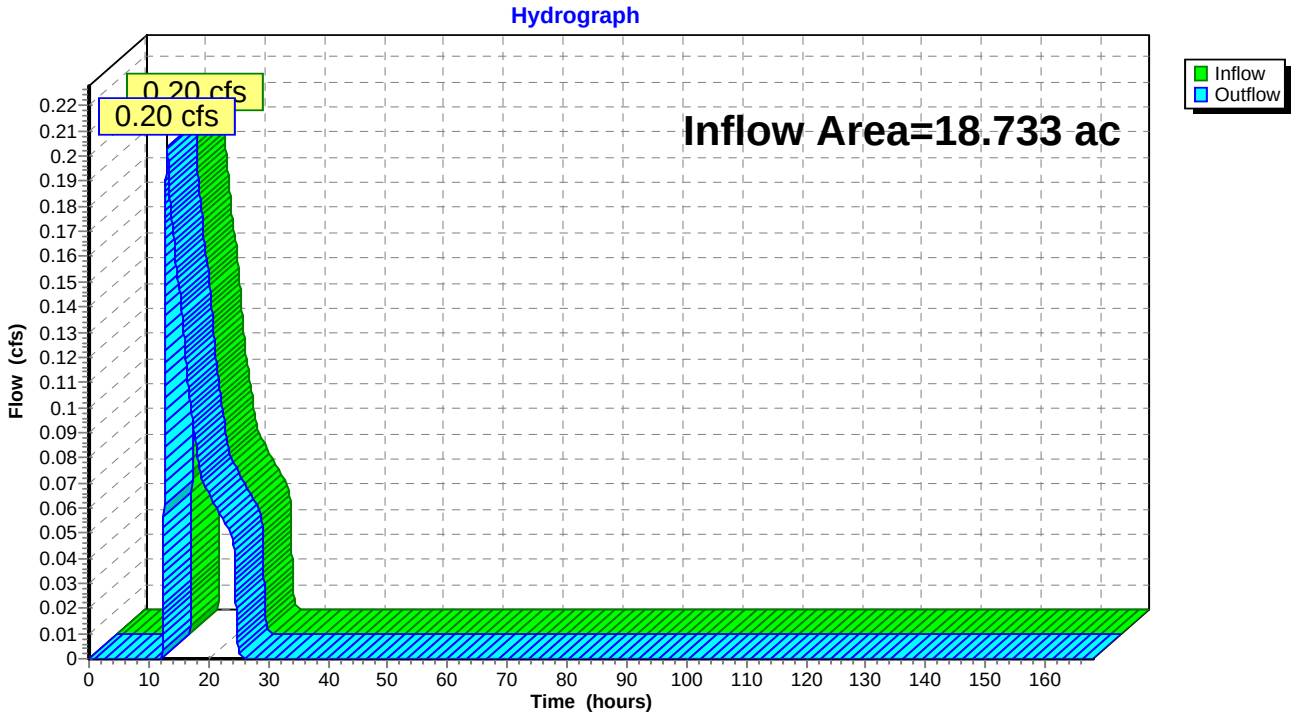


Summary for Reach 24R: DP-24

Inflow Area = 18.733 ac, 0.00% Impervious, Inflow Depth = 0.06" for 90% Storm event
Inflow = 0.20 cfs @ 13.05 hrs, Volume= 0.096 af
Outflow = 0.20 cfs @ 13.06 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 24R: DP-24

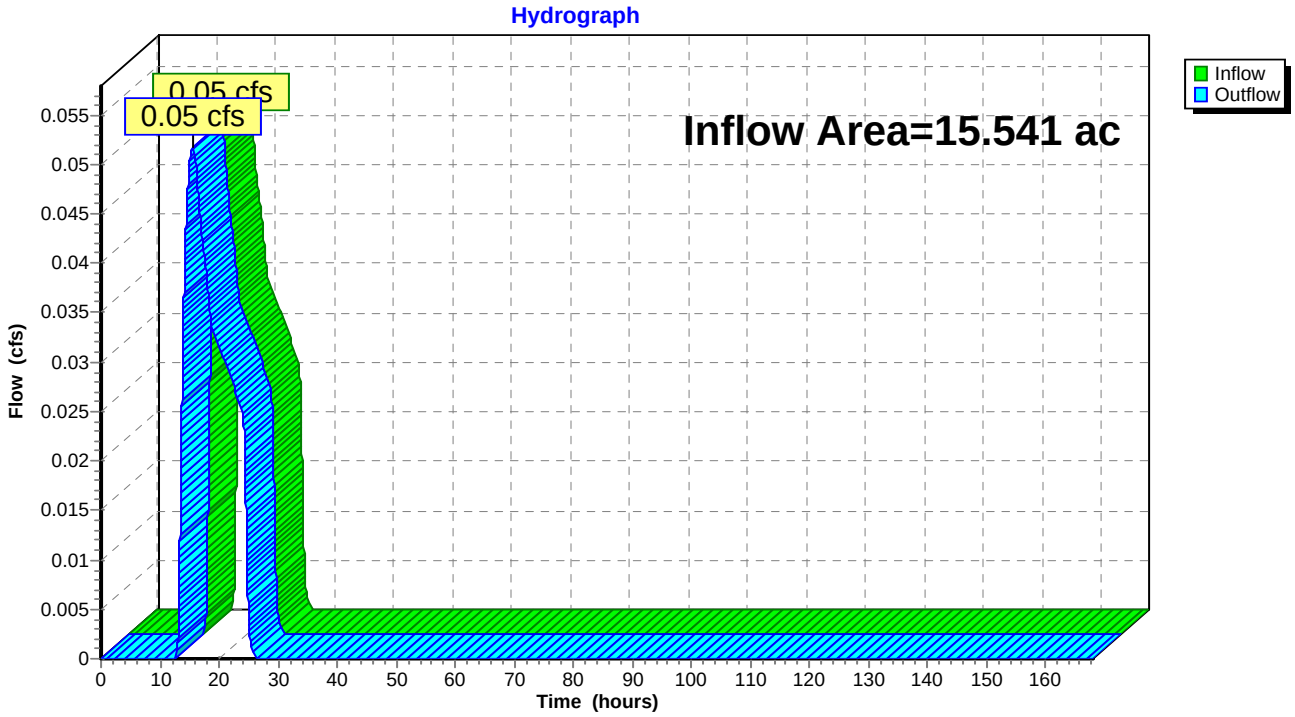


Summary for Reach 26R: DP-23

Inflow Area = 15.541 ac, 0.00% Impervious, Inflow Depth = 0.03" for 90% Storm event
Inflow = 0.05 cfs @ 15.54 hrs, Volume= 0.033 af
Outflow = 0.05 cfs @ 15.55 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 26R: DP-23

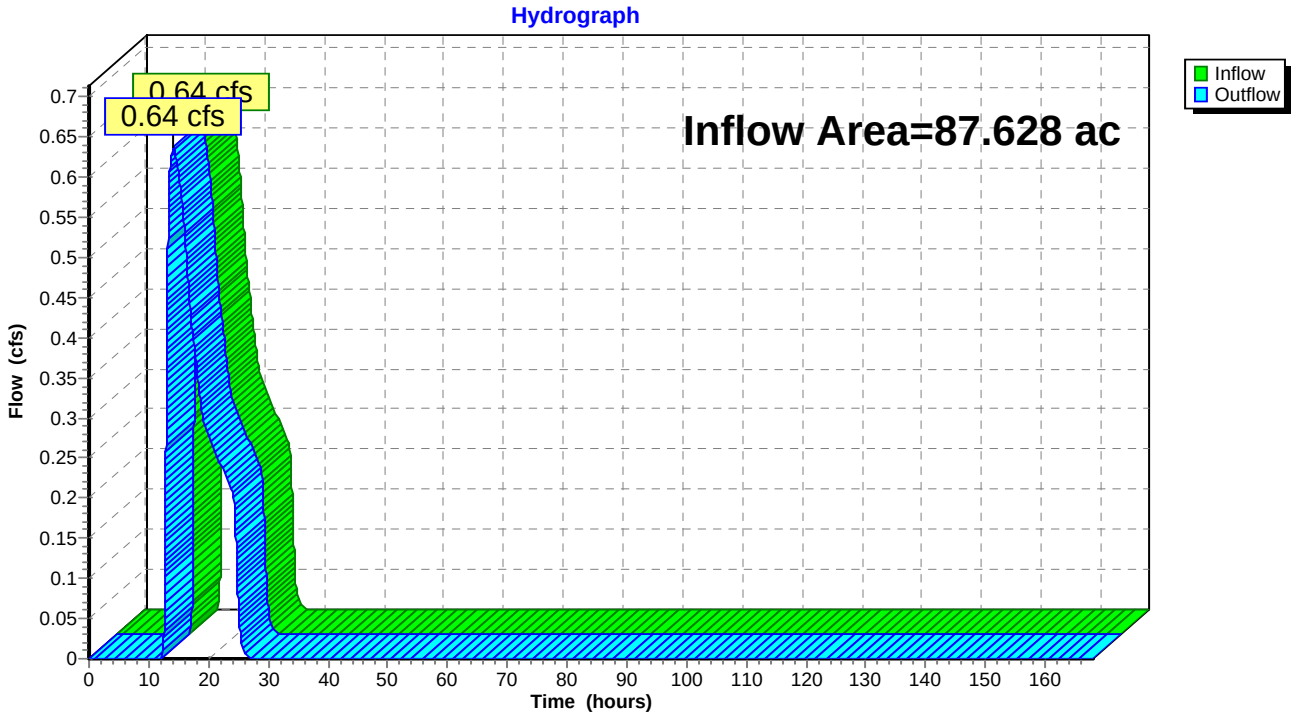


Summary for Reach 28R: DP-21

Inflow Area = 87.628 ac, 0.96% Impervious, Inflow Depth = 0.05" for 90% Storm event
Inflow = 0.64 cfs @ 14.14 hrs, Volume= 0.372 af
Outflow = 0.64 cfs @ 14.15 hrs, Volume= 0.372 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 28R: DP-21

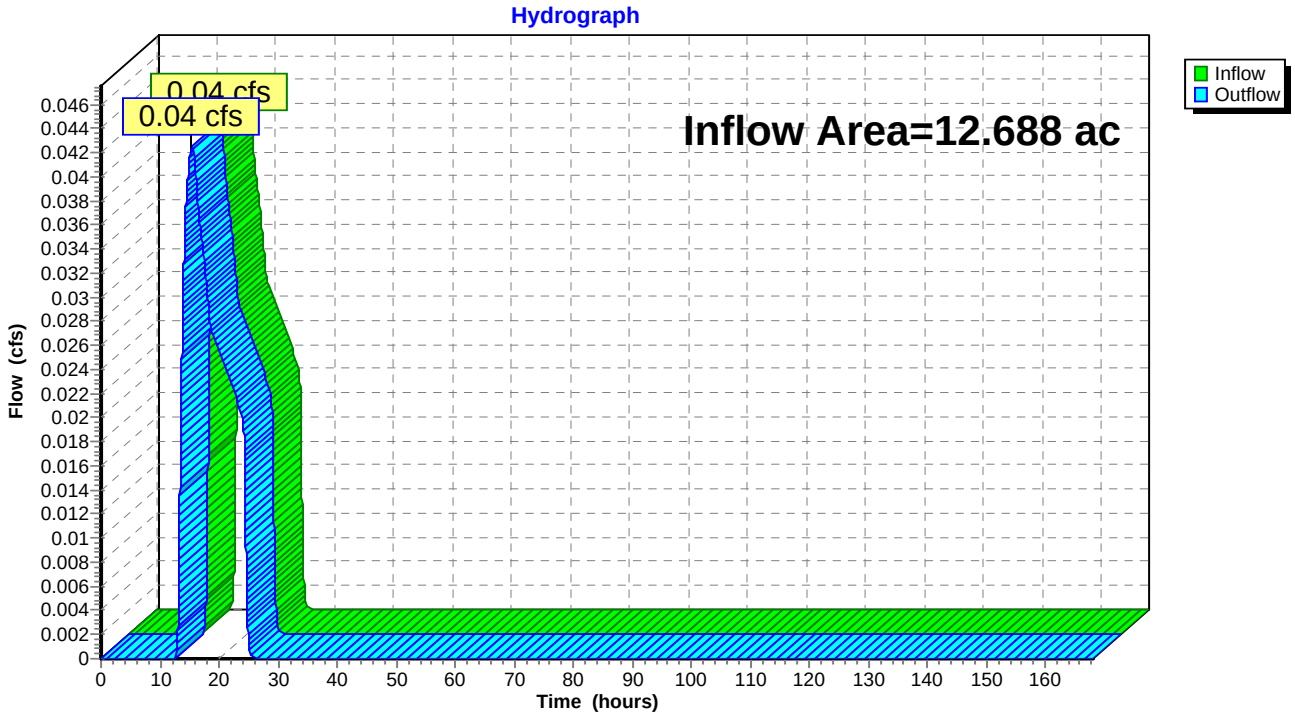


Summary for Reach DP-1: DP-1

Inflow Area = 12.688 ac, 0.58% Impervious, Inflow Depth = 0.03" for 90% Storm event
Inflow = 0.04 cfs @ 15.37 hrs, Volume= 0.027 af
Outflow = 0.04 cfs @ 15.38 hrs, Volume= 0.027 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1

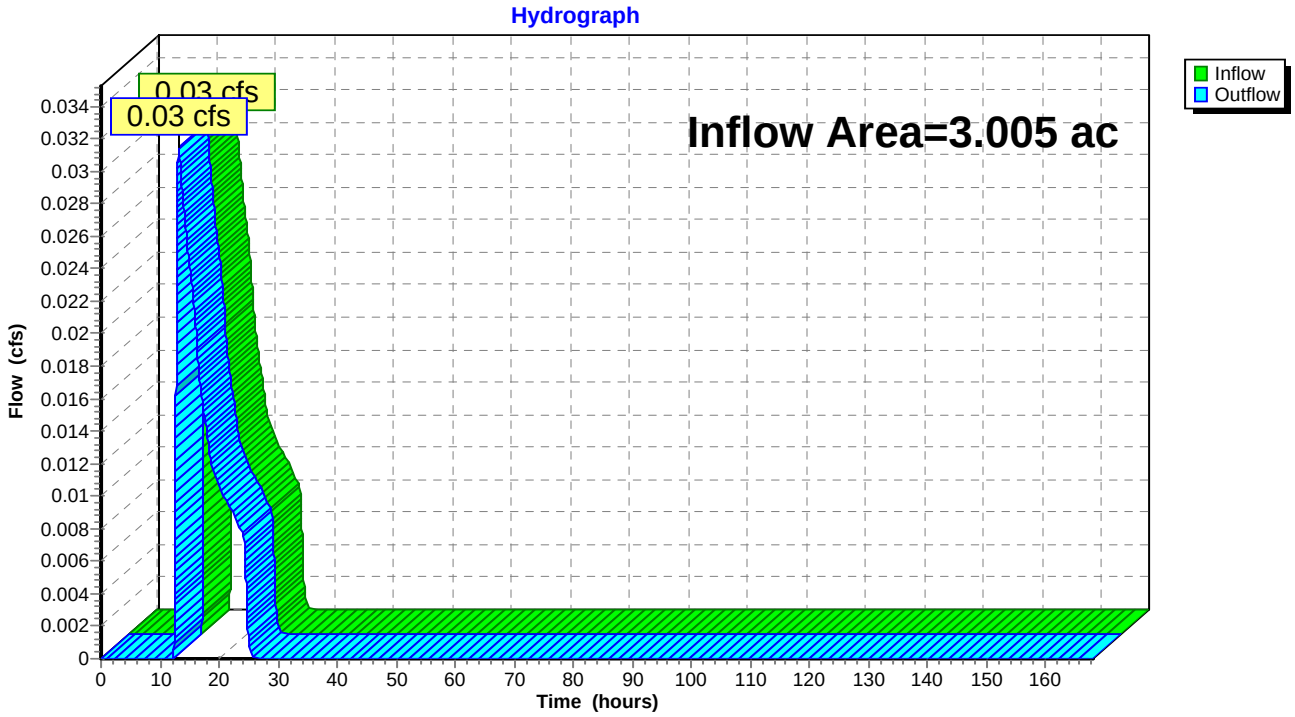


Summary for Reach DP-9: DP-9

Inflow Area = 3.005 ac, 8.52% Impervious, Inflow Depth = 0.06" for 90% Storm event
Inflow = 0.03 cfs @ 13.19 hrs, Volume= 0.015 af
Outflow = 0.03 cfs @ 13.20 hrs, Volume= 0.015 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach DP-9: DP-9



Time span=0.00-168.00 hrs, dt=0.01 hrs, 16801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 13S: Existing DA 31 Runoff Area=3.005 ac 8.52% Impervious Runoff Depth=4.93"
Flow Length=705' Tc=45.5 min UI Adjusted CN=74 Runoff=7.98 cfs 1.233 af

Subcatchment 16S: Existing DA 3 Runoff Area=12.688 ac 0.58% Impervious Runoff Depth=4.46"
Flow Length=1,300' Tc=38.1 min CN=70 Runoff=33.48 cfs 4.720 af

Subcatchment 19S: Existing DA 26 Runoff Area=7.405 ac 0.00% Impervious Runoff Depth=4.81"
Flow Length=979' Tc=50.2 min CN=73 Runoff=18.25 cfs 2.968 af

Subcatchment 21S: Existing DA 25 Runoff Area=15.876 ac 0.00% Impervious Runoff Depth=4.58"
Flow Length=823' Tc=35.5 min CN=71 Runoff=44.61 cfs 6.058 af

Subcatchment 23S: Existing DA 24 Runoff Area=18.733 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=1,225' Tc=40.1 min CN=74 Runoff=53.10 cfs 7.689 af

Subcatchment 25S: Existing DA 23 Runoff Area=15.541 ac 0.00% Impervious Runoff Depth=4.46"
Flow Length=1,484' Tc=47.1 min CN=70 Runoff=36.71 cfs 5.782 af

Subcatchment 27S: Existing DA 21 Runoff Area=87.628 ac 0.96% Impervious Runoff Depth=4.81"
Flow Length=3,263' Tc=58.1 min CN=73 Runoff=197.89 cfs 35.124 af

Reach 20R: DP-26 Inflow=18.25 cfs 2.968 af
Outflow=18.25 cfs 2.968 af

Reach 22R: DP-25 Inflow=44.61 cfs 6.058 af
Outflow=44.61 cfs 6.058 af

Reach 24R: DP-24 Inflow=53.10 cfs 7.689 af
Outflow=53.10 cfs 7.689 af

Reach 26R: DP-23 Inflow=36.71 cfs 5.782 af
Outflow=36.71 cfs 5.782 af

Reach 28R: DP-21 Inflow=197.89 cfs 35.124 af
Outflow=197.89 cfs 35.124 af

Reach DP-1: DP-1 Inflow=33.48 cfs 4.720 af
Outflow=33.48 cfs 4.720 af

Reach DP-9: DP-9 Inflow=7.98 cfs 1.233 af
Outflow=7.98 cfs 1.233 af

Total Runoff Area = 160.876 ac Runoff Volume = 63.575 af Average Runoff Depth = 4.74"
99.27% Pervious = 159.707 ac 0.73% Impervious = 1.169 ac

Summary for Subcatchment 13S: Existing DA 31

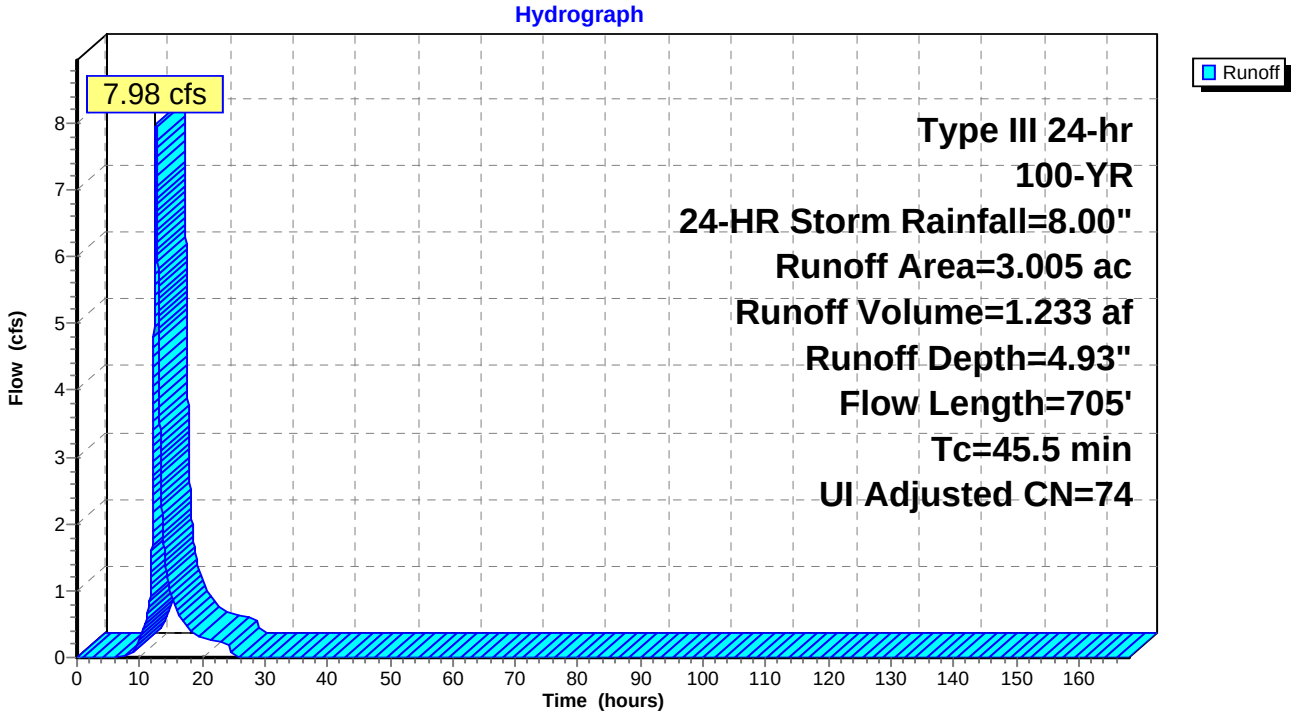
Runoff = 7.98 cfs @ 12.60 hrs, Volume= 1.233 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.247	98	Unconnected pavement, HSG C
2.054	74	>75% Grass cover, Good, HSG C
0.031	71	Meadow, non-grazed, HSG C
0.615	70	Woods, Good, HSG C
0.049	80	>75% Grass cover, Good, HSG D
0.009	98	Water Surface, HSG D
3.005	75	Weighted Average, UI Adjusted CN = 74
2.749		91.48% Pervious Area
0.256		8.52% Impervious Area
0.247		96.48% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
9.2	555	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
45.5	705	Total			

Subcatchment 13S: Existing DA 31



Summary for Subcatchment 16S: Existing DA 3

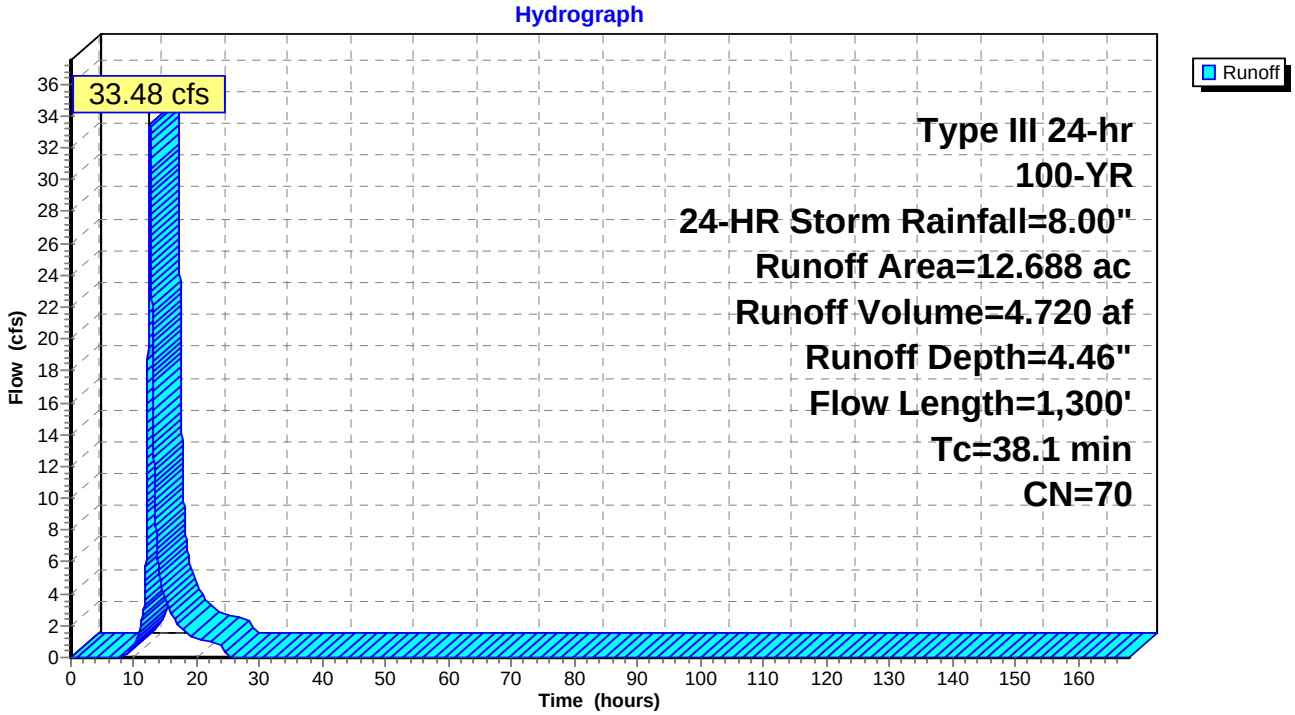
Runoff = 33.48 cfs @ 12.53 hrs, Volume= 4.720 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.073	98	Unconnected pavement, HSG C
0.137	74	>75% Grass cover, Good, HSG C
0.018	71	Meadow, non-grazed, HSG C
12.460	70	Woods, Good, HSG C
12.688	70	Weighted Average
12.615		99.42% Pervious Area
0.073		0.58% Impervious Area
0.073		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	150	0.0300	0.11		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
14.8	1,150	0.0670	1.29		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
38.1	1,300	Total			

Subcatchment 16S: Existing DA 3



Summary for Subcatchment 19S: Existing DA 26

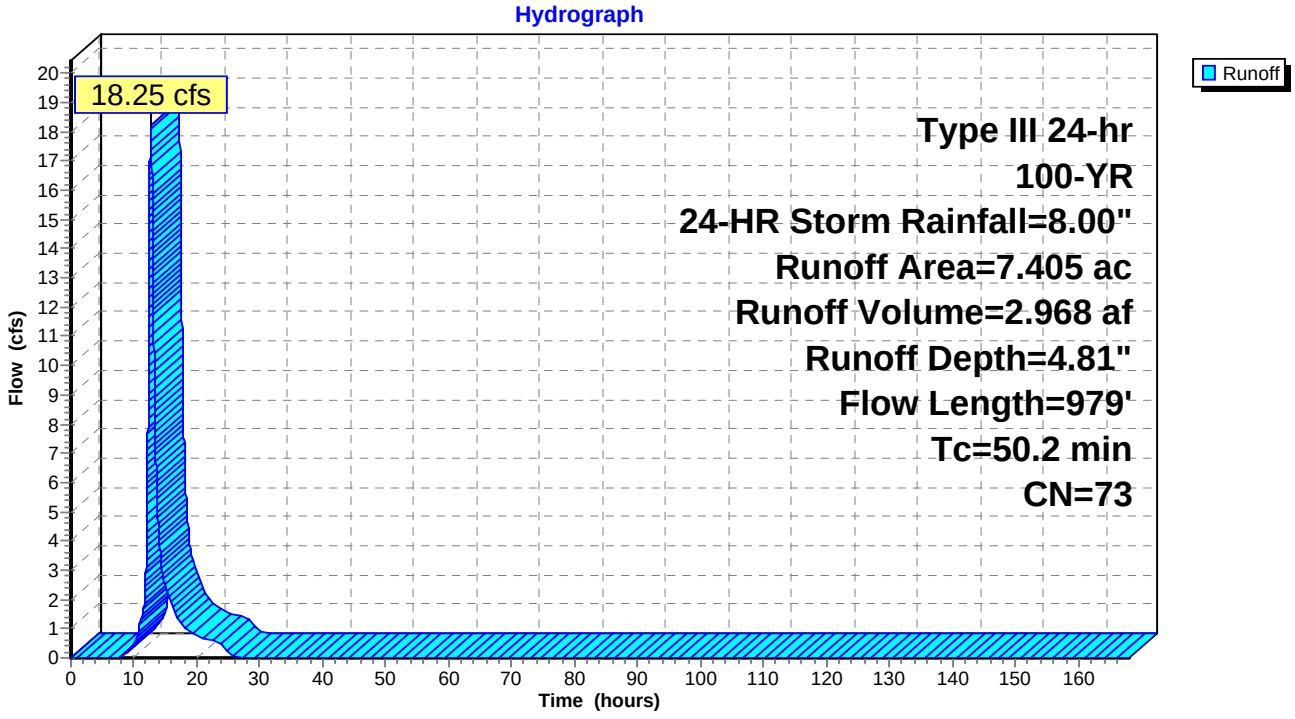
Runoff = 18.25 cfs @ 12.66 hrs, Volume= 2.968 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.161	71	Meadow, non-grazed, HSG C
3.962	70	Woods, Good, HSG C
3.282	77	Woods, Good, HSG D
7.405	73	Weighted Average
7.405		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
14.0	829	0.0390	0.99		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
50.2	979	Total			

Subcatchment 19S: Existing DA 26



Summary for Subcatchment 21S: Existing DA 25

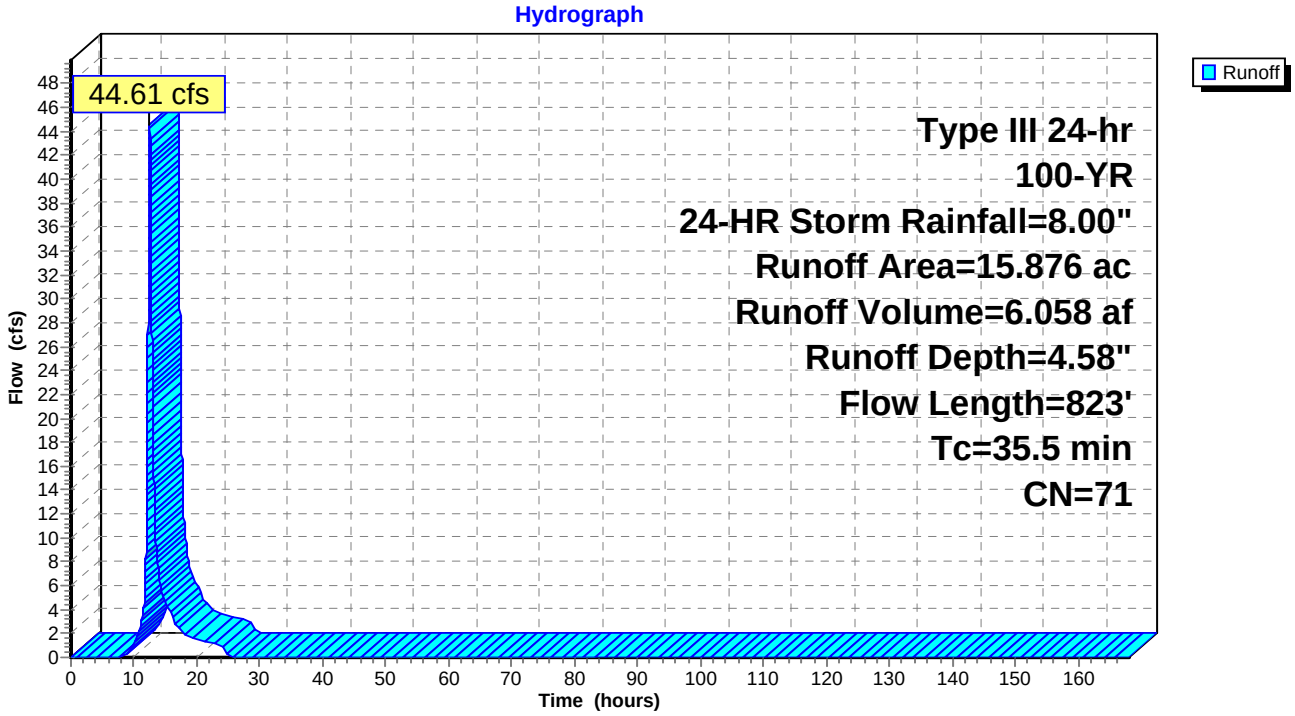
Runoff = 44.61 cfs @ 12.50 hrs, Volume= 6.058 af, Depth= 4.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.575	71	Meadow, non-grazed, HSG C
13.410	70	Woods, Good, HSG C
0.108	78	Meadow, non-grazed, HSG D
1.783	77	Woods, Good, HSG D
15.876	71	Weighted Average
15.876		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
22.3	100	0.0150	0.07		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
13.2	723	0.0332	0.91		**Shallow Concentrated Flow, Shallow Concentrated Flow** Woodland Kv= 5.0 fps
35.5	823	Total			

Subcatchment 21S: Existing DA 25



Summary for Subcatchment 23S: Existing DA 24

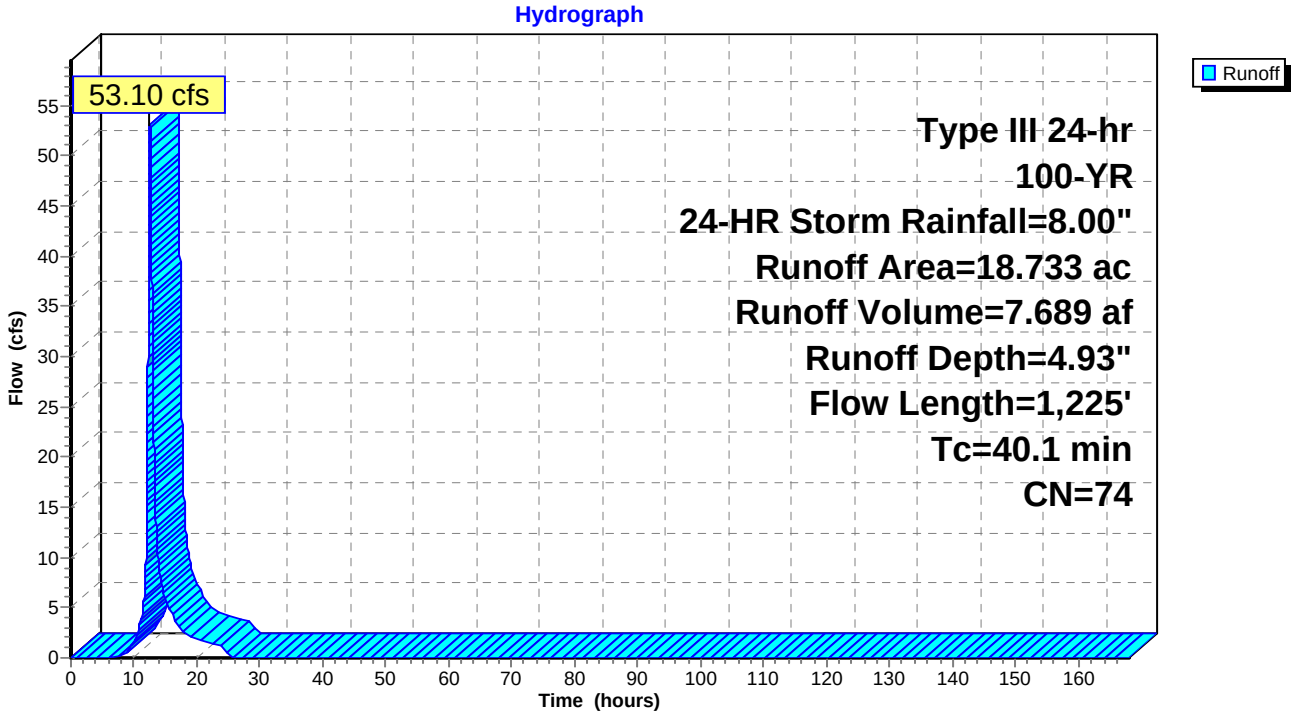
Runoff = 53.10 cfs @ 12.53 hrs, Volume= 7.689 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
11.333	70	Woods, Good, HSG C
1.072	96	Gravel surface, HSG D
6.328	77	Woods, Good, HSG D
18.733	74	Weighted Average
18.733		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	150	0.0270	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
15.8	1,075	0.0516	1.14		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
40.1	1,225	Total			

Subcatchment 23S: Existing DA 24



Summary for Subcatchment 25S: Existing DA 23

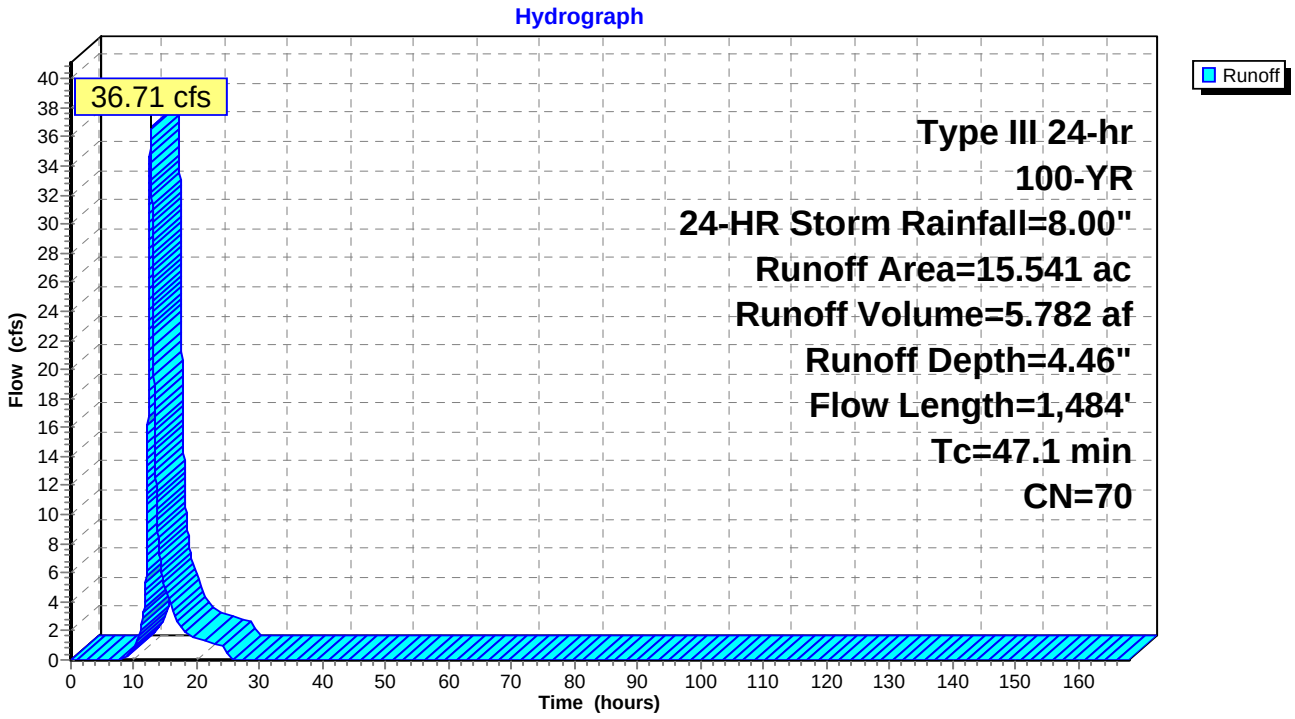
Runoff = 36.71 cfs @ 12.62 hrs, Volume= 5.782 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.415	65	Brush, Good, HSG C
0.469	74	>75% Grass cover, Good, HSG C
14.185	70	Woods, Good, HSG C
0.009	73	Brush, Good, HSG D
0.463	77	Woods, Good, HSG D
15.541	70	Weighted Average
15.541		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	150	0.0233	0.10		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
21.3	1,334	0.0435	1.04		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
47.1	1,484	Total			

Subcatchment 25S: Existing DA 23



Summary for Subcatchment 27S: Existing DA 21

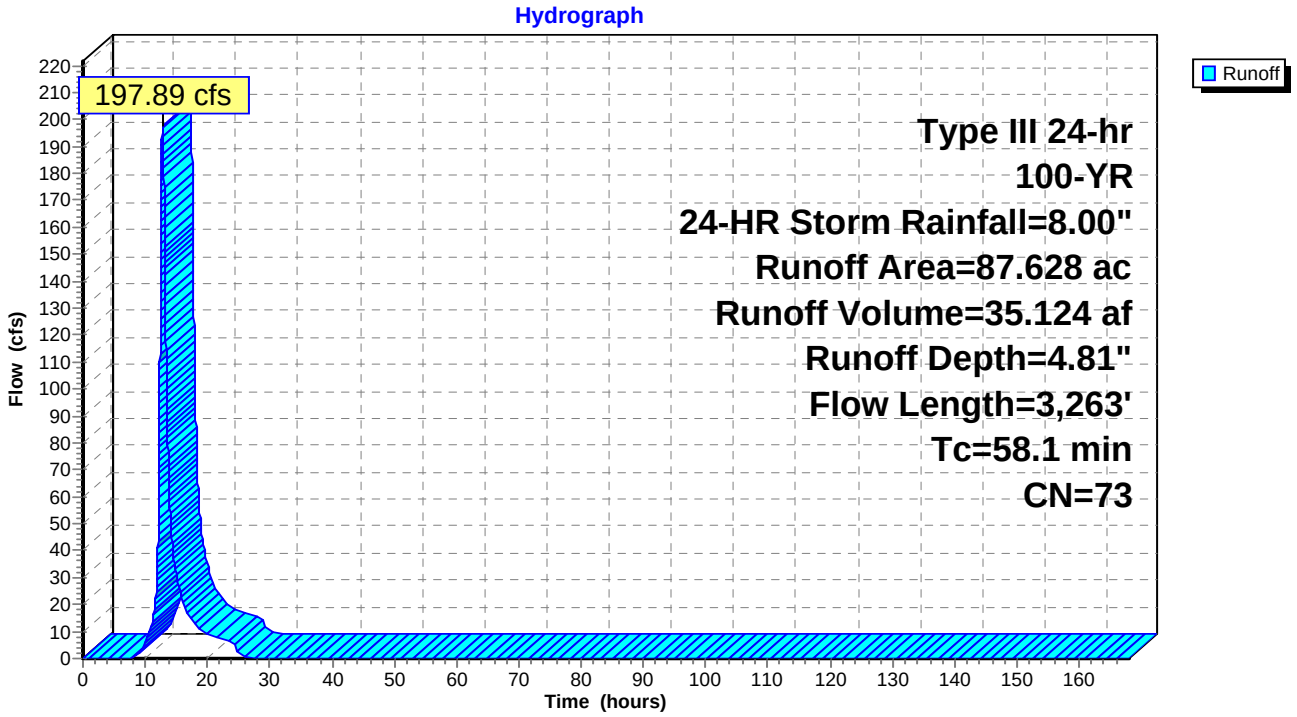
Runoff = 197.89 cfs @ 12.78 hrs, Volume= 35.124 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.840	98	Unconnected pavement, HSG C
0.139	65	Brush, Good, HSG C
14.886	74	>75% Grass cover, Good, HSG C
0.241	96	Gravel surface, HSG C
30.196	74	Pasture/grassland/range, Good, HSG C
5.535	71	Meadow, non-grazed, HSG C
27.718	70	Woods, Good, HSG C
0.004	73	Brush, Good, HSG D
0.343	80	Pasture/grassland/range, Good, HSG D
2.852	78	Meadow, non-grazed, HSG D
4.874	77	Woods, Good, HSG D
87.628	73	Weighted Average
86.788		99.04% Pervious Area
0.840		0.96% Impervious Area
0.840		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	150	0.0467	0.13		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
30.4	1,500	0.0270	0.82		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
8.2	1,613	0.0161	3.27	4.90	**Channel Flow, Existing Rivulet** Area= 1.5 sf Perim= 4.0' r= 0.38' n= 0.030
58.1	3,263	Total			

Subcatchment 27S: Existing DA 21

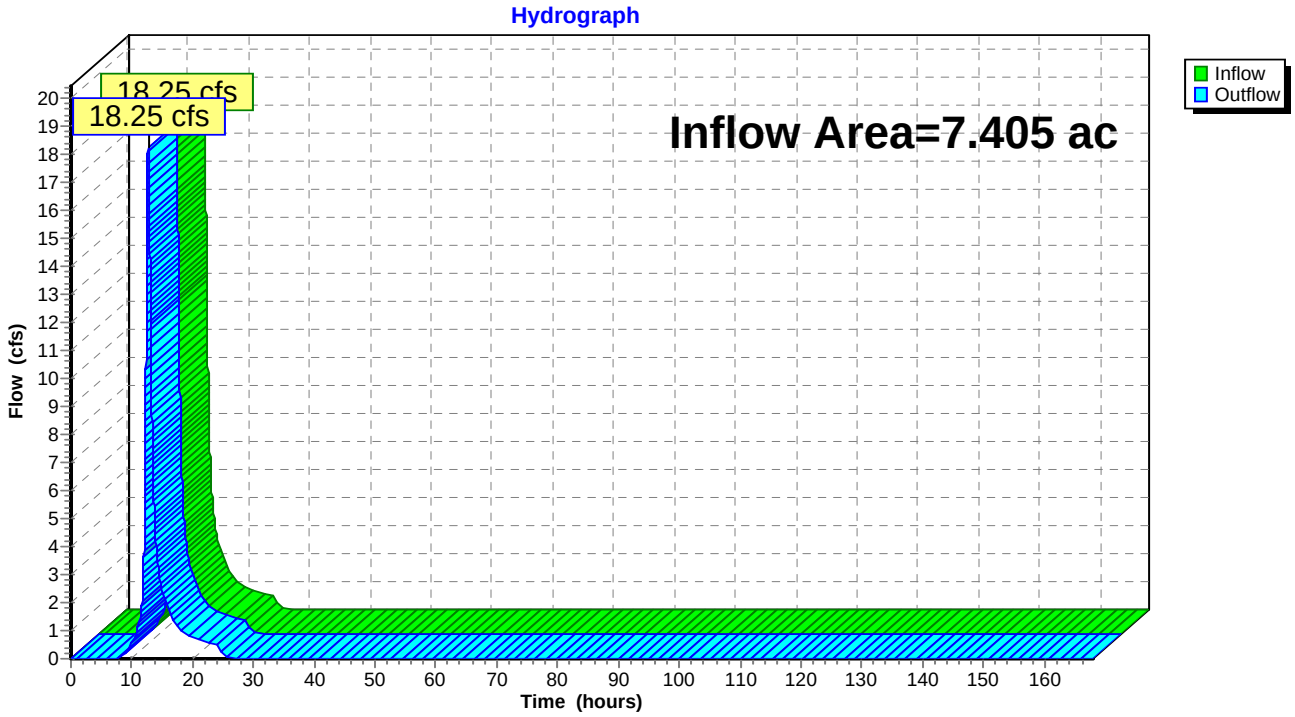


Summary for Reach 20R: DP-26

Inflow Area = 7.405 ac, 0.00% Impervious, Inflow Depth = 4.81" for 100-YR, 24-HR Storm event
Inflow = 18.25 cfs @ 12.66 hrs, Volume= 2.968 af
Outflow = 18.25 cfs @ 12.67 hrs, Volume= 2.968 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 20R: DP-26

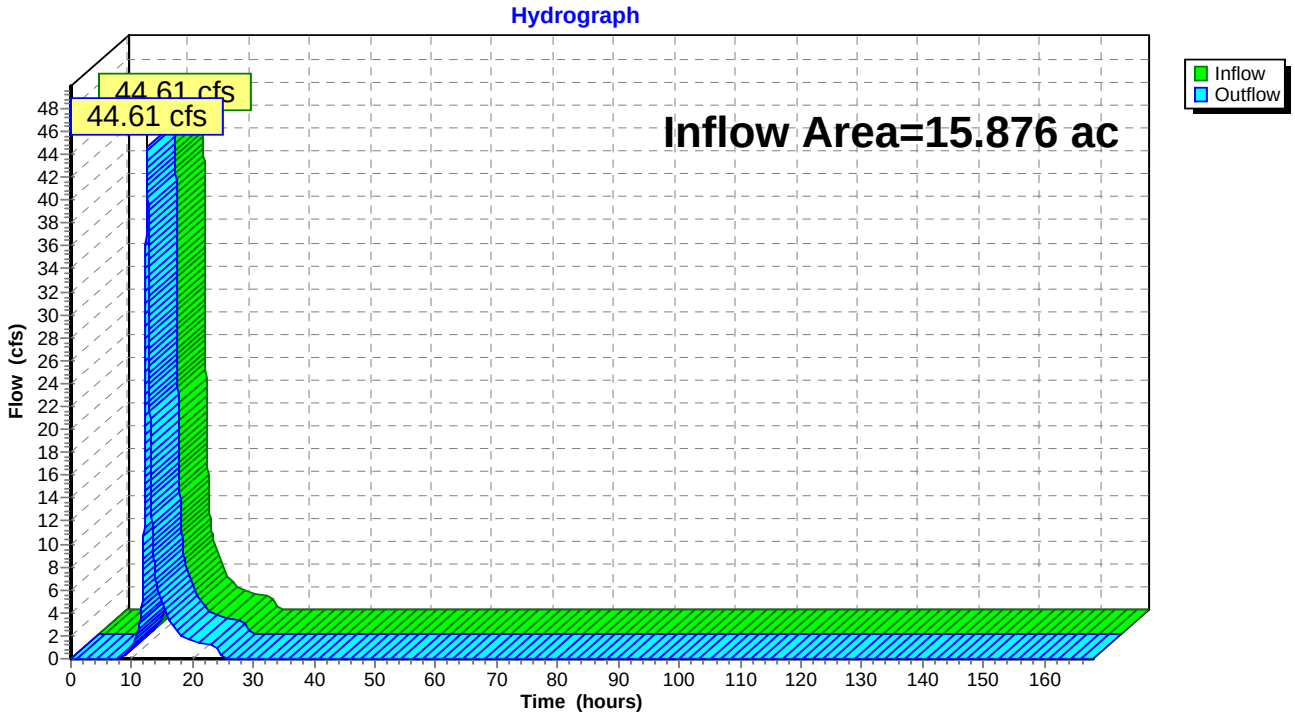


Summary for Reach 22R: DP-25

Inflow Area = 15.876 ac, 0.00% Impervious, Inflow Depth = 4.58" for 100-YR, 24-HR Storm event
Inflow = 44.61 cfs @ 12.50 hrs, Volume= 6.058 af
Outflow = 44.61 cfs @ 12.51 hrs, Volume= 6.058 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 22R: DP-25

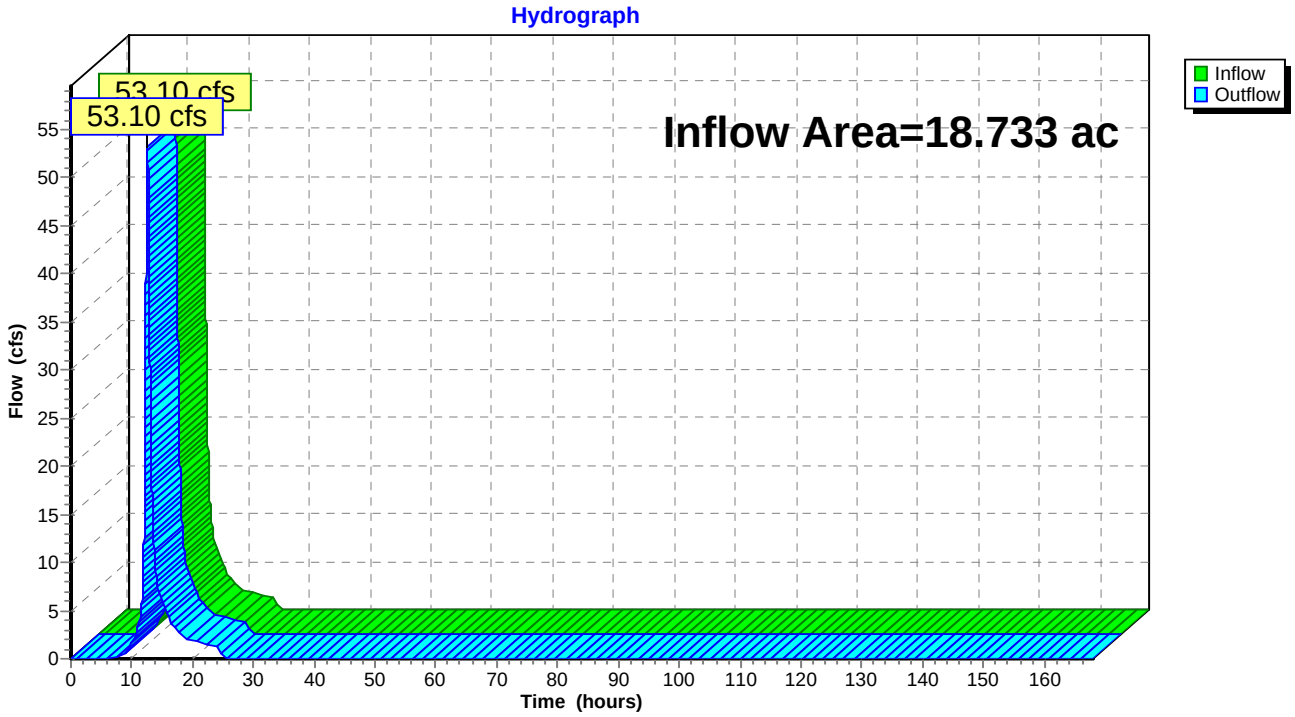


Summary for Reach 24R: DP-24

Inflow Area = 18.733 ac, 0.00% Impervious, Inflow Depth = 4.93" for 100-YR, 24-HR Storm event
Inflow = 53.10 cfs @ 12.53 hrs, Volume= 7.689 af
Outflow = 53.10 cfs @ 12.54 hrs, Volume= 7.689 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 24R: DP-24

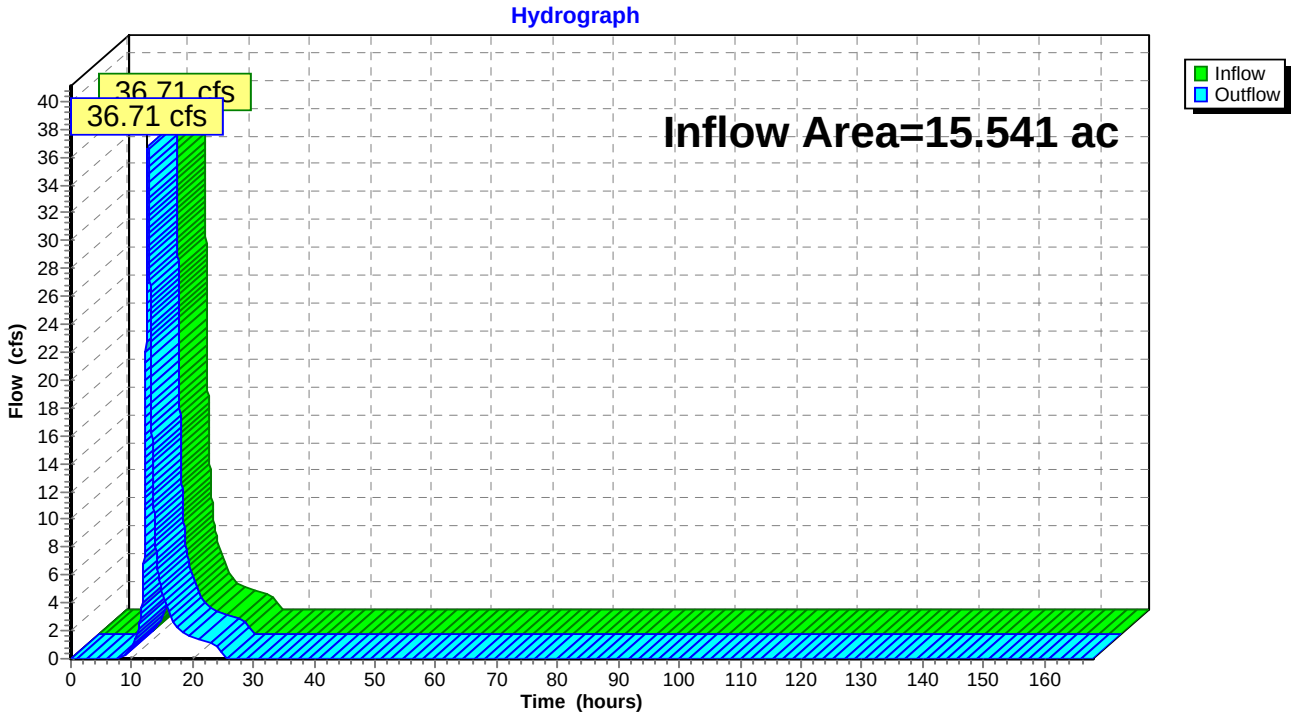


Summary for Reach 26R: DP-23

Inflow Area = 15.541 ac, 0.00% Impervious, Inflow Depth = 4.46" for 100-YR, 24-HR Storm event
Inflow = 36.71 cfs @ 12.62 hrs, Volume= 5.782 af
Outflow = 36.71 cfs @ 12.63 hrs, Volume= 5.782 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 26R: DP-23

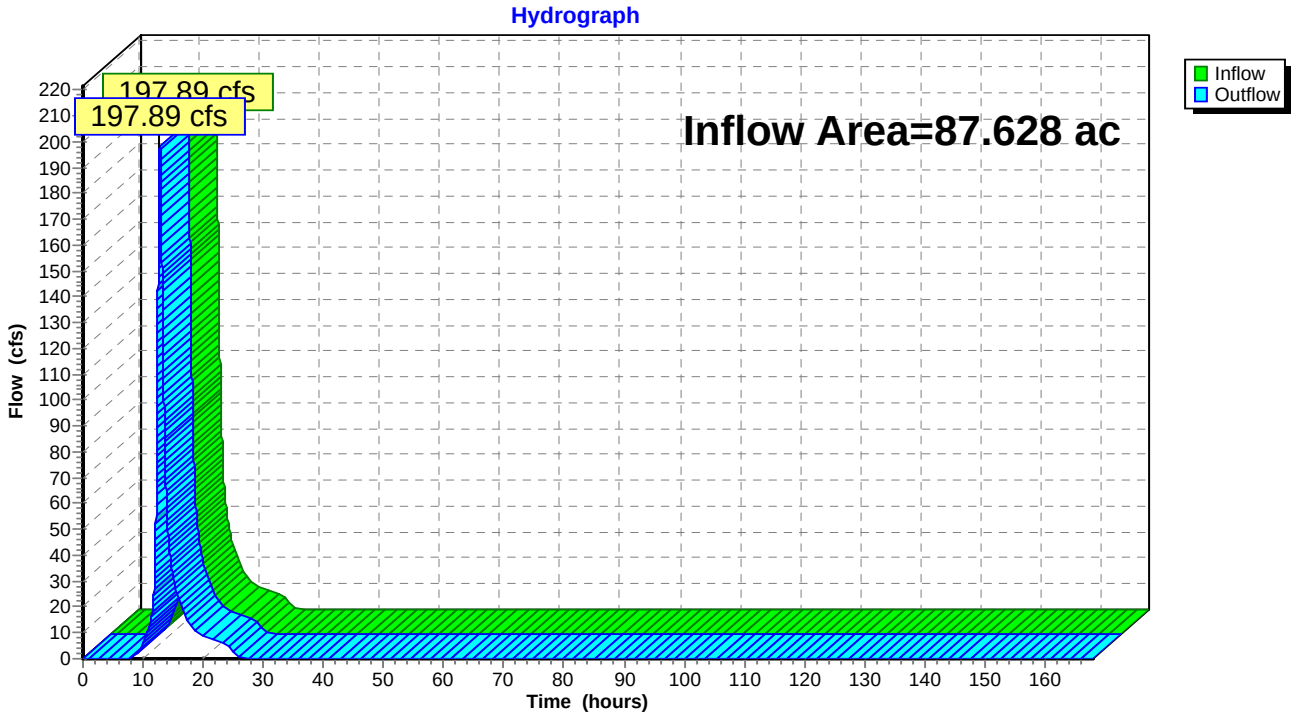


Summary for Reach 28R: DP-21

Inflow Area = 87.628 ac, 0.96% Impervious, Inflow Depth = 4.81" for 100-YR, 24-HR Storm event
Inflow = 197.89 cfs @ 12.78 hrs, Volume= 35.124 af
Outflow = 197.89 cfs @ 12.79 hrs, Volume= 35.124 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 28R: DP-21

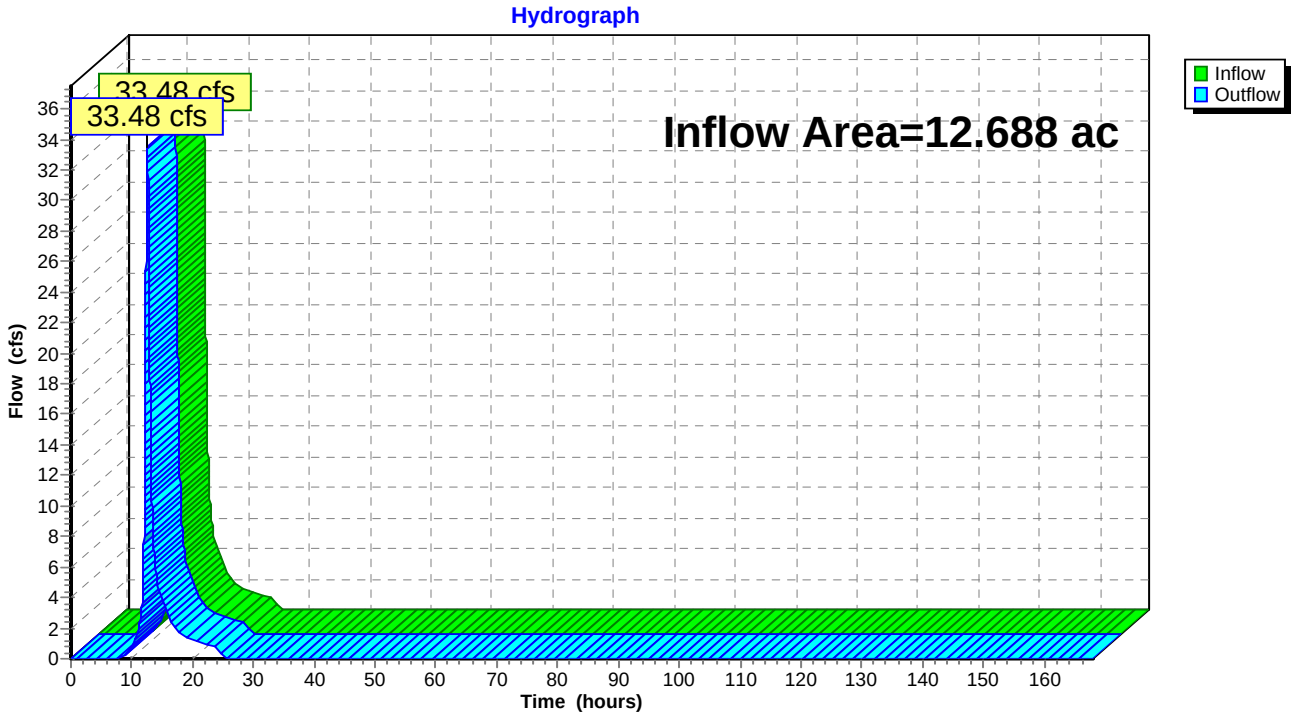


Summary for Reach DP-1: DP-1

Inflow Area = 12.688 ac, 0.58% Impervious, Inflow Depth = 4.46" for 100-YR, 24-HR Storm event
Inflow = 33.48 cfs @ 12.53 hrs, Volume= 4.720 af
Outflow = 33.48 cfs @ 12.54 hrs, Volume= 4.720 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach DP-1: DP-1

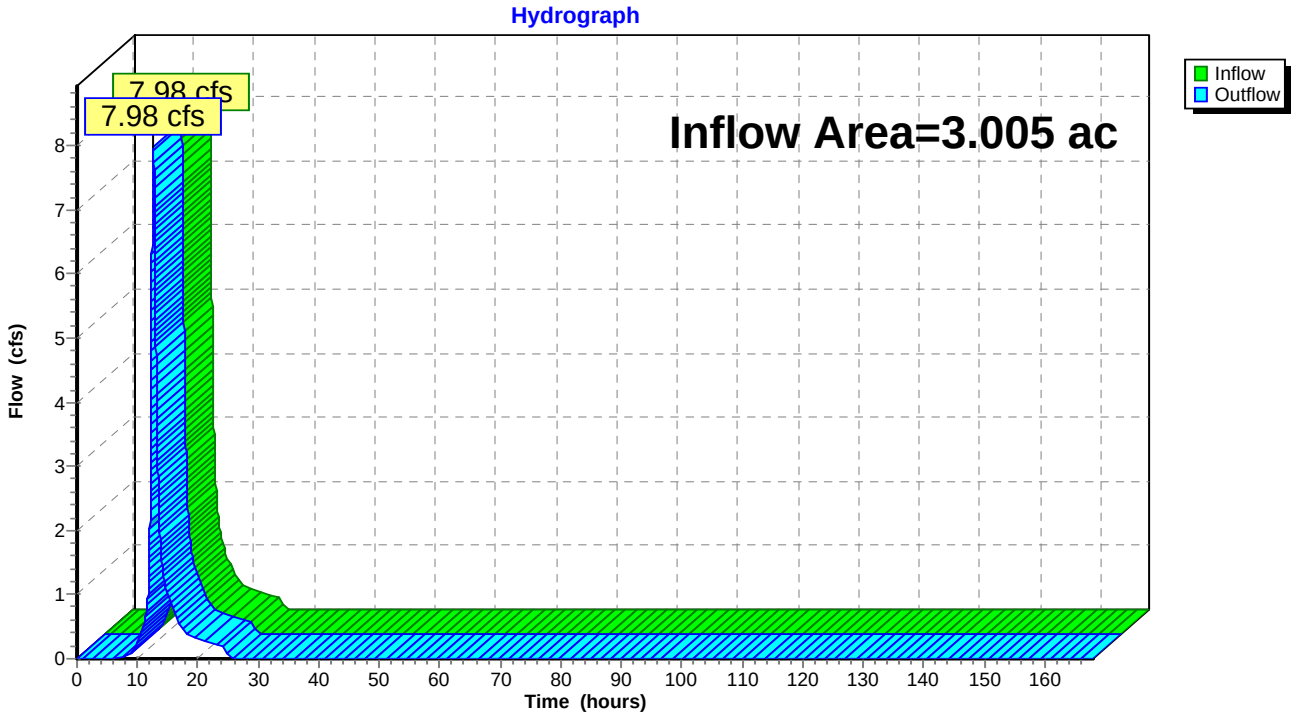


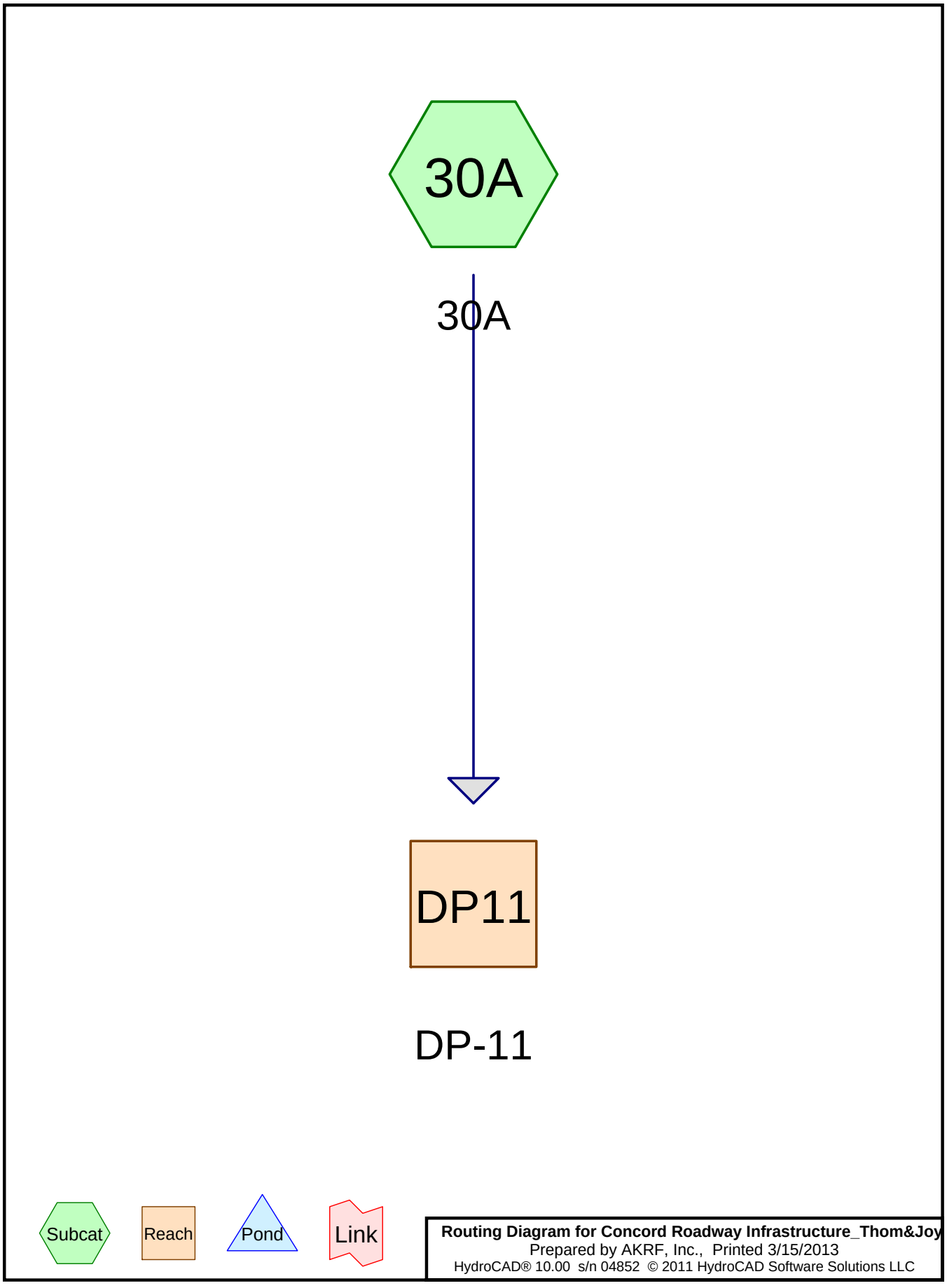
Summary for Reach DP-9: DP-9

Inflow Area = 3.005 ac, 8.52% Impervious, Inflow Depth = 4.93" for 100-YR, 24-HR Storm event
Inflow = 7.98 cfs @ 12.60 hrs, Volume= 1.233 af
Outflow = 7.98 cfs @ 12.61 hrs, Volume= 1.233 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach DP-9: DP-9





Routing Diagram for Concord Roadway Infrastructure_Thom&Joy
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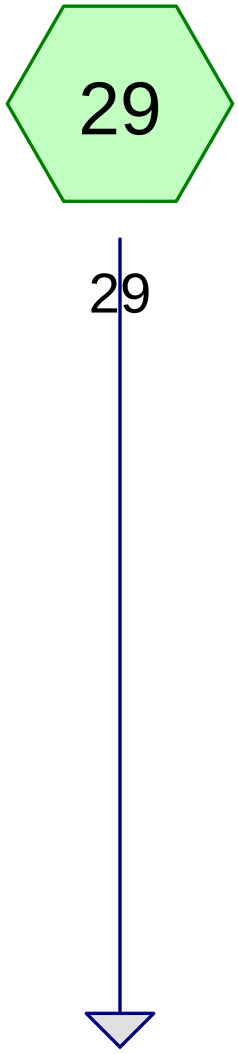

DP-10

Subcat Reach Pond Link

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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
3.247	70	Woods, Good, HSG C (29, 30A)
0.004	71	Meadow, non-grazed, HSG C (29)
5.154	74	>75% Grass cover, Good, HSG C (29, 30A)
0.466	98	Paved parking, HSG C (29)
0.351	98	Paved roads w/curbs & sewers, HSG C (29, 30A)
0.051	98	Roofs, HSG C (29)
9.273	**75**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
9.273	HSG C	29, 30A
0.000	HSG D	
0.000	Other	
9.273		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	5.154	0.000	0.000	5.154	>75% Grass cover, Good	29, 30A
0.000	0.000	0.466	0.000	0.000	0.466	Paved parking	29
0.000	0.000	0.051	0.000	0.000	0.051	Roofs	29
0.000	0.000	0.351	0.000	0.000	0.351	Paved roads w/curbs & sewers	29, 30A
0.000	0.000	0.004	0.000	0.000	0.004	Meadow, non-grazed	29
0.000	0.000	3.247	0.000	0.000	3.247	Woods, Good	29, 30A
0.000	**0.000**	**9.273**	**0.000**	**0.000**	**9.273**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	29	0.00	0.00	46.0	0.0074	0.013	15.0	0.0	0.0

Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 29: 29 Runoff Area=8.461 ac 7.16% Impervious Runoff Depth=0.67"
Flow Length=708' Tc=22.6 min CN=74 Runoff=3.74 cfs 0.469 af

Subcatchment 30A: 30A Runoff Area=0.812 ac 32.27% Impervious Runoff Depth=0.96"
Flow Length=481' Tc=1.9 min CN=80 Runoff=1.03 cfs 0.065 af

Reach DP10: DP-10 Inflow=3.74 cfs 0.469 af
Outflow=3.74 cfs 0.469 af

Reach DP11: DP-11 Inflow=1.03 cfs 0.065 af
Outflow=1.03 cfs 0.065 af

Total Runoff Area = 9.273 ac Runoff Volume = 0.534 af Average Runoff Depth = 0.69"
90.64% Pervious = 8.405 ac 9.36% Impervious = 0.868 ac

Summary for Subcatchment 29: 29

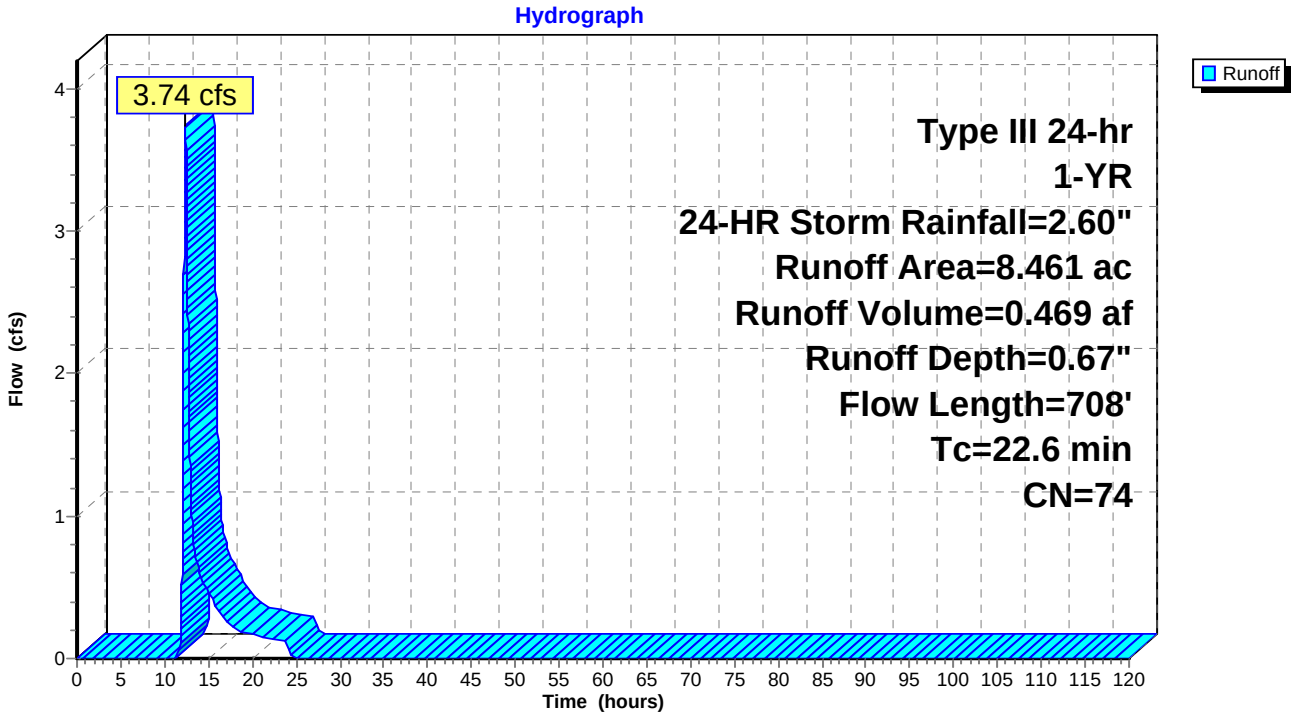
Runoff = 3.74 cfs @ 12.36 hrs, Volume= 0.469 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.466	98	Paved parking, HSG C
0.051	98	Roofs, HSG C
4.961	74	>75% Grass cover, Good, HSG C
0.089	98	Paved roads w/curbs & sewers, HSG C
0.004	71	Meadow, non-grazed, HSG C
2.890	70	Woods, Good, HSG C
8.461	74	Weighted Average
7.855		92.84% Pervious Area
0.606		7.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.0127	0.17		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.75"
6.7	350	0.0157	0.88		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
0.7	162	0.0123	3.92	14.90	**Channel Flow, Roadside Ditch** Area= 3.8 sf Perim= 6.3' r= 0.60' n= 0.030
0.2	46	0.0074	4.53	5.56	**Pipe Channel, Roadway Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
22.6	708	Total			

Subcatchment 29: 29



Summary for Subcatchment 30A: 30A

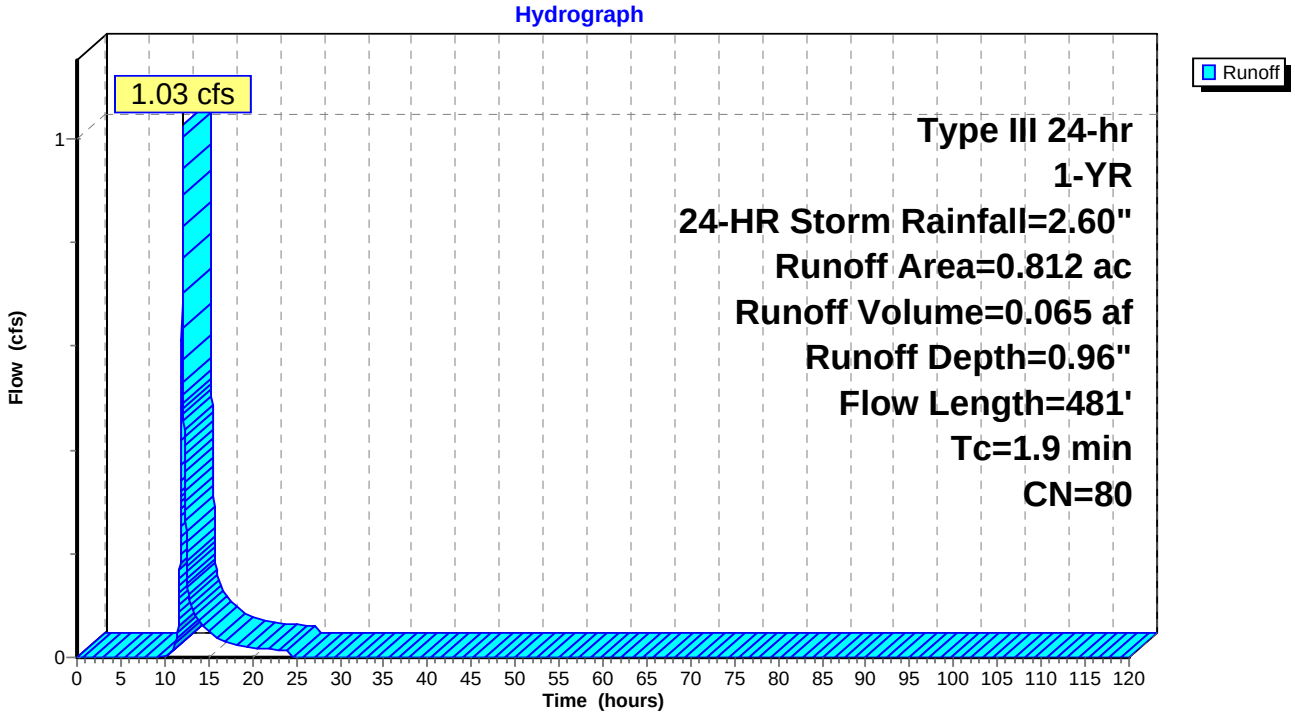
Runoff = 1.03 cfs @ 12.03 hrs, Volume= 0.065 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.262	98	Paved roads w/curbs & sewers, HSG C
0.193	74	>75% Grass cover, Good, HSG C
0.357	70	Woods, Good, HSG C
0.812	80	Weighted Average
0.550		67.73% Pervious Area
0.262		32.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	36	0.0200	1.21		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.75"
1.4	445	0.0220	5.24	19.93	**Channel Flow, Roadside Ditch** Area= 3.8 sf Perim= 6.3' r= 0.60' n= 0.030
1.9	481	Total			

Subcatchment 30A: 30A

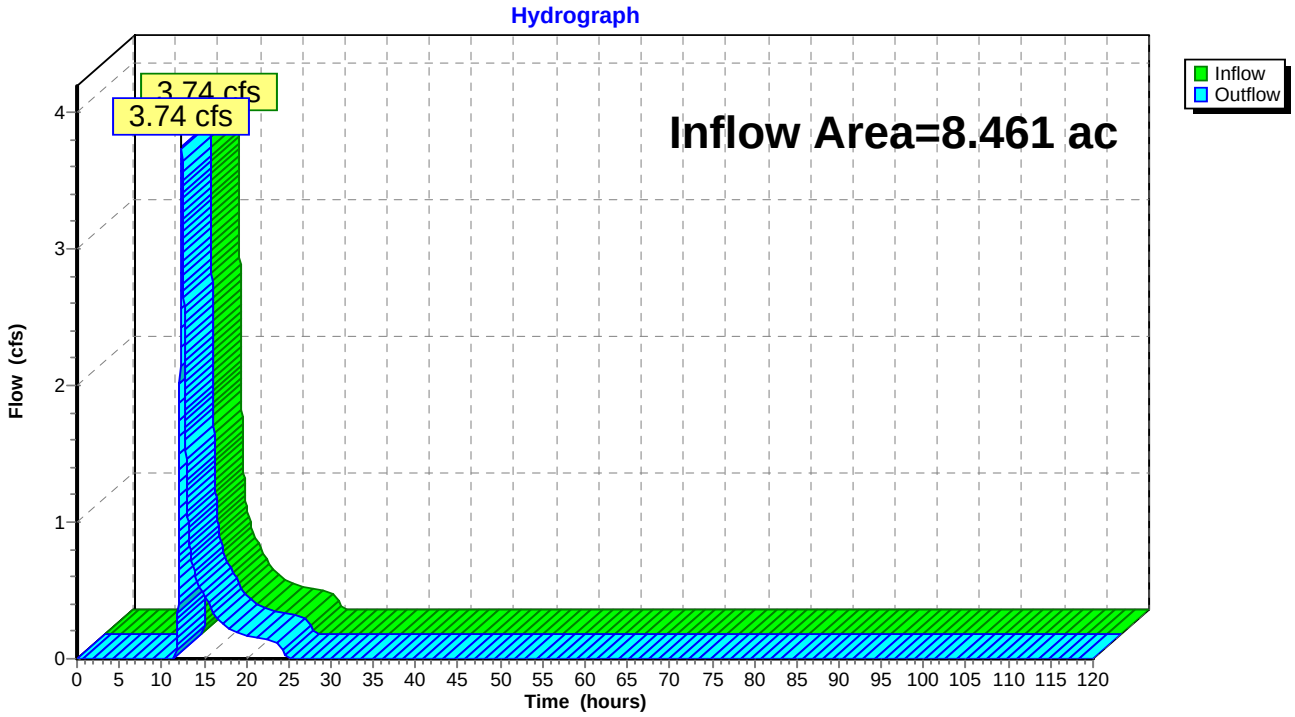


Summary for Reach DP10: DP-10

Inflow Area = 8.461 ac, 7.16% Impervious, Inflow Depth = 0.67" for 1-YR, 24-HR Storm event
Inflow = 3.74 cfs @ 12.36 hrs, Volume= 0.469 af
Outflow = 3.74 cfs @ 12.37 hrs, Volume= 0.469 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP10: DP-10

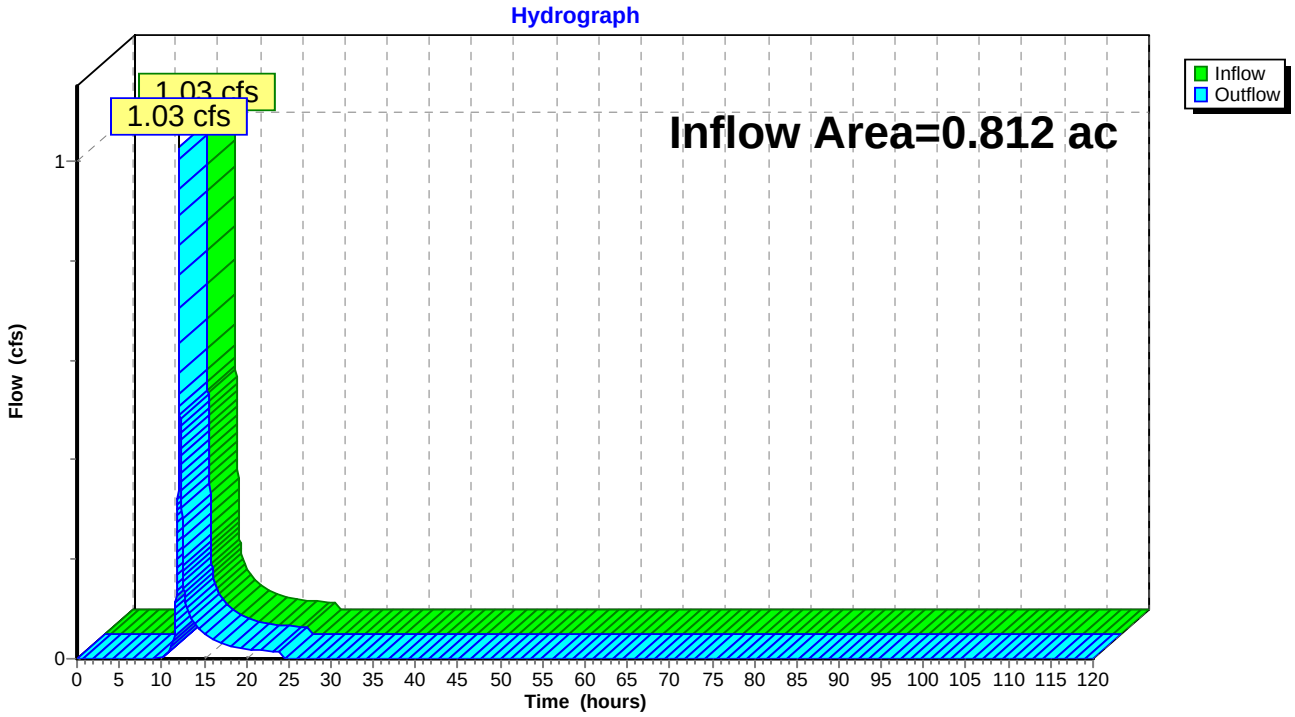


Summary for Reach DP11: DP-11

Inflow Area = 0.812 ac, 32.27% Impervious, Inflow Depth = 0.96" for 1-YR, 24-HR Storm event
Inflow = 1.03 cfs @ 12.03 hrs, Volume= 0.065 af
Outflow = 1.03 cfs @ 12.04 hrs, Volume= 0.065 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP11: DP-11



Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 29: 29 Runoff Area=8.461 ac 7.16% Impervious Runoff Depth=3.18"
Flow Length=708' Tc=22.6 min CN=74 Runoff=20.20 cfs 2.246 af

Subcatchment 30A: 30A Runoff Area=0.812 ac 32.27% Impervious Runoff Depth=3.78"
Flow Length=481' Tc=1.9 min CN=80 Runoff=4.16 cfs 0.256 af

Reach DP10: DP-10 Inflow=20.20 cfs 2.246 af
Outflow=20.20 cfs 2.246 af

Reach DP11: DP-11 Inflow=4.16 cfs 0.256 af
Outflow=4.16 cfs 0.256 af

Total Runoff Area = 9.273 ac Runoff Volume = 2.501 af Average Runoff Depth = 3.24"
90.64% Pervious = 8.405 ac 9.36% Impervious = 0.868 ac

Summary for Subcatchment 29: 29

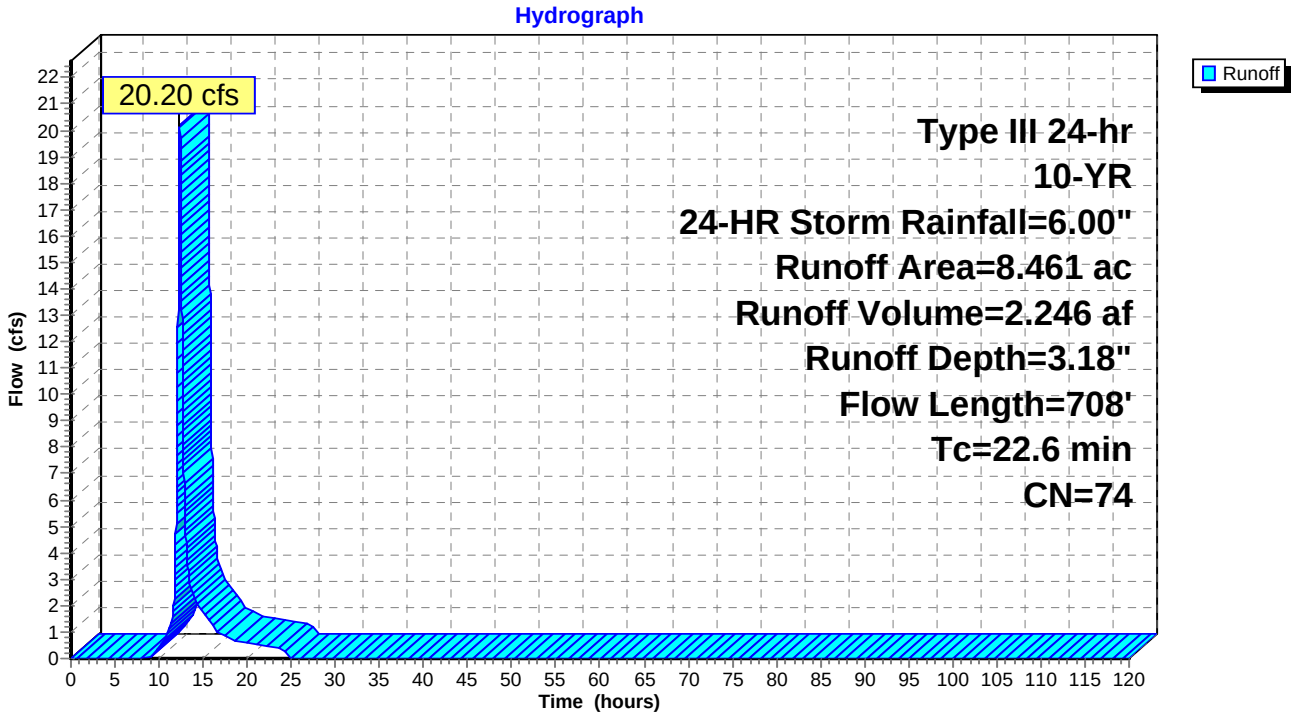
Runoff = 20.20 cfs @ 12.32 hrs, Volume= 2.246 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.466	98	Paved parking, HSG C
0.051	98	Roofs, HSG C
4.961	74	>75% Grass cover, Good, HSG C
0.089	98	Paved roads w/curbs & sewers, HSG C
0.004	71	Meadow, non-grazed, HSG C
2.890	70	Woods, Good, HSG C
8.461	74	Weighted Average
7.855		92.84% Pervious Area
0.606		7.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.0127	0.17		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.75"
6.7	350	0.0157	0.88		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
0.7	162	0.0123	3.92	14.90	**Channel Flow, Roadside Ditch** Area= 3.8 sf Perim= 6.3' r= 0.60' n= 0.030
0.2	46	0.0074	4.53	5.56	**Pipe Channel, Roadway Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
22.6	708	Total			

Subcatchment 29: 29



Summary for Subcatchment 30A: 30A

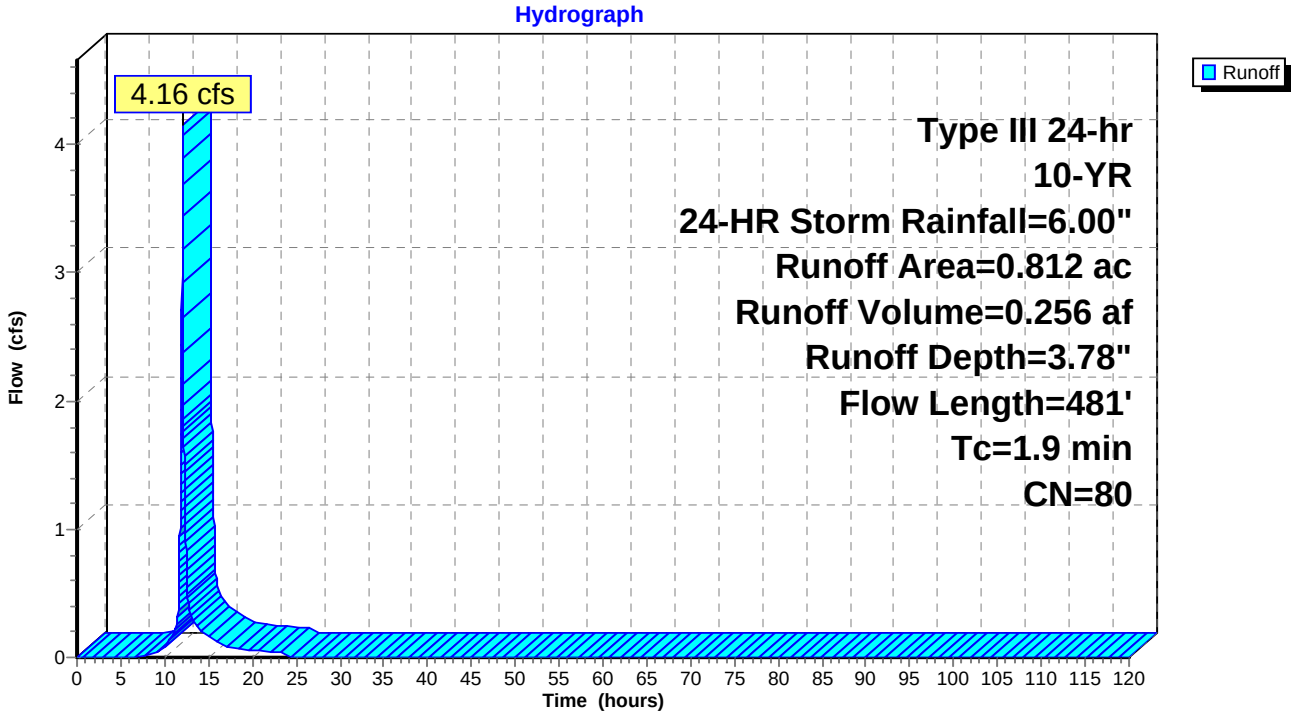
Runoff = 4.16 cfs @ 12.03 hrs, Volume= 0.256 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.262	98	Paved roads w/curbs & sewers, HSG C
0.193	74	>75% Grass cover, Good, HSG C
0.357	70	Woods, Good, HSG C
0.812	80	Weighted Average
0.550		67.73% Pervious Area
0.262		32.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	36	0.0200	1.21		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.75"
1.4	445	0.0220	5.24	19.93	**Channel Flow, Roadside Ditch** Area= 3.8 sf Perim= 6.3' r= 0.60' n= 0.030
1.9	481	Total			

Subcatchment 30A: 30A

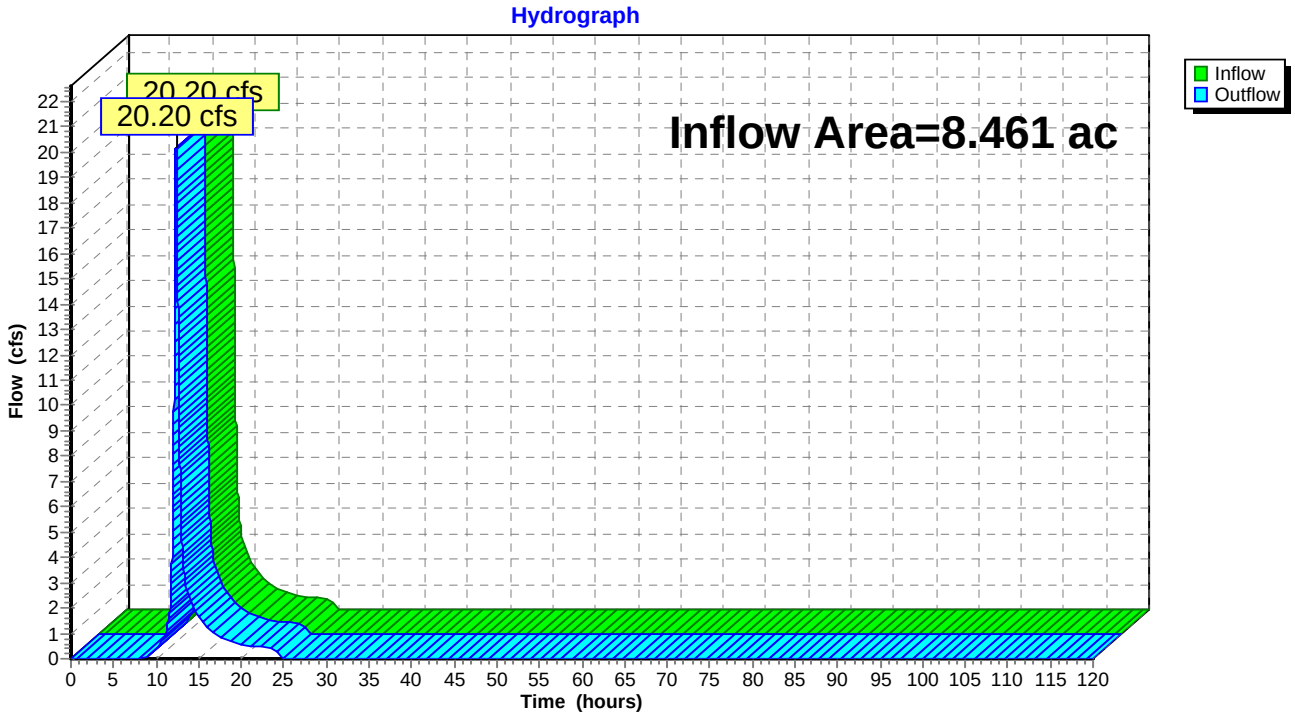


Summary for Reach DP10: DP-10

Inflow Area = 8.461 ac, 7.16% Impervious, Inflow Depth = 3.18" for 10-YR, 24-HR Storm event
Inflow = 20.20 cfs @ 12.32 hrs, Volume= 2.246 af
Outflow = 20.20 cfs @ 12.33 hrs, Volume= 2.246 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP10: DP-10

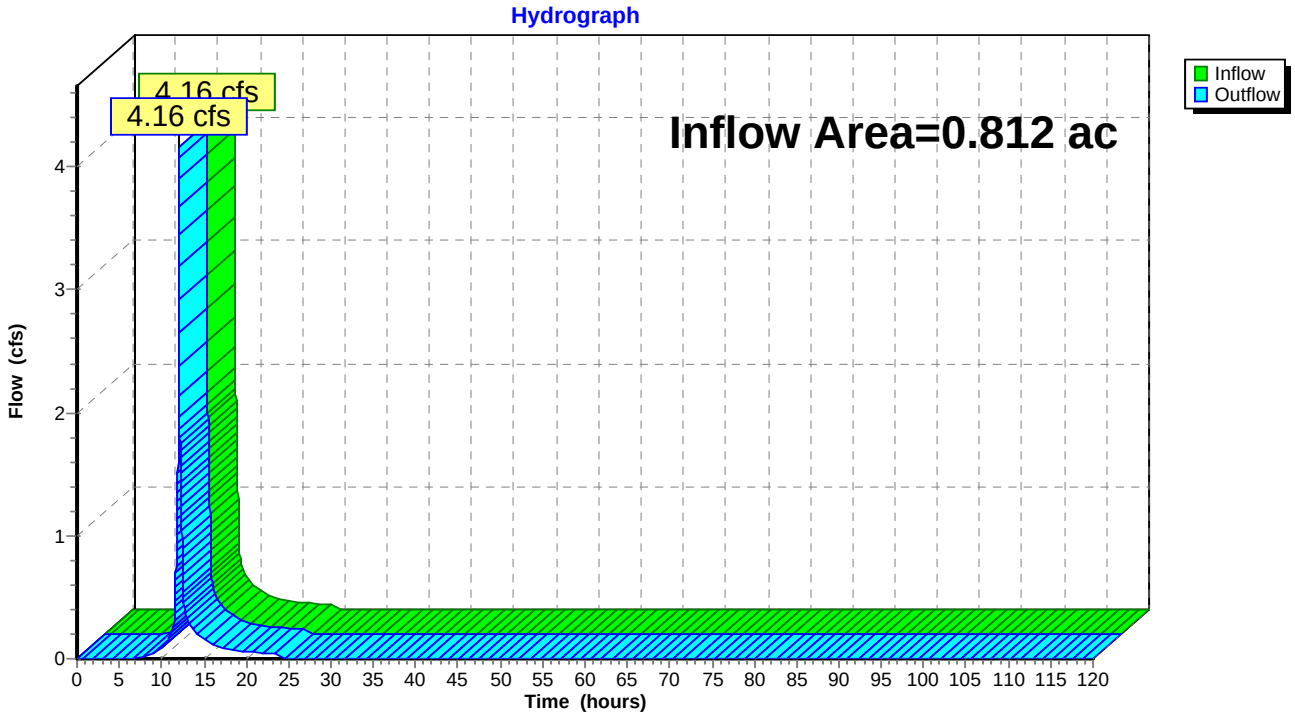


Summary for Reach DP11: DP-11

Inflow Area = 0.812 ac, 32.27% Impervious, Inflow Depth = 3.78" for 10-YR, 24-HR Storm event
Inflow = 4.16 cfs @ 12.03 hrs, Volume= 0.256 af
Outflow = 4.16 cfs @ 12.04 hrs, Volume= 0.256 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP11: DP-11



Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 29: 29 Runoff Area=8.461 ac 7.16% Impervious Runoff Depth=0.06"
Flow Length=708' Tc=22.6 min CN=74 Runoff=0.11 cfs 0.043 af

Subcatchment 30A: 30A Runoff Area=0.812 ac 32.27% Impervious Runoff Depth=0.15"
Flow Length=481' Tc=1.9 min CN=80 Runoff=0.10 cfs 0.010 af

Reach DP10: DP-10 Inflow=0.11 cfs 0.043 af
Outflow=0.11 cfs 0.043 af

Reach DP11: DP-11 Inflow=0.10 cfs 0.010 af
Outflow=0.10 cfs 0.010 af

Total Runoff Area = 9.273 ac Runoff Volume = 0.054 af Average Runoff Depth = 0.07"
90.64% Pervious = 8.405 ac 9.36% Impervious = 0.868 ac

Summary for Subcatchment 29: 29

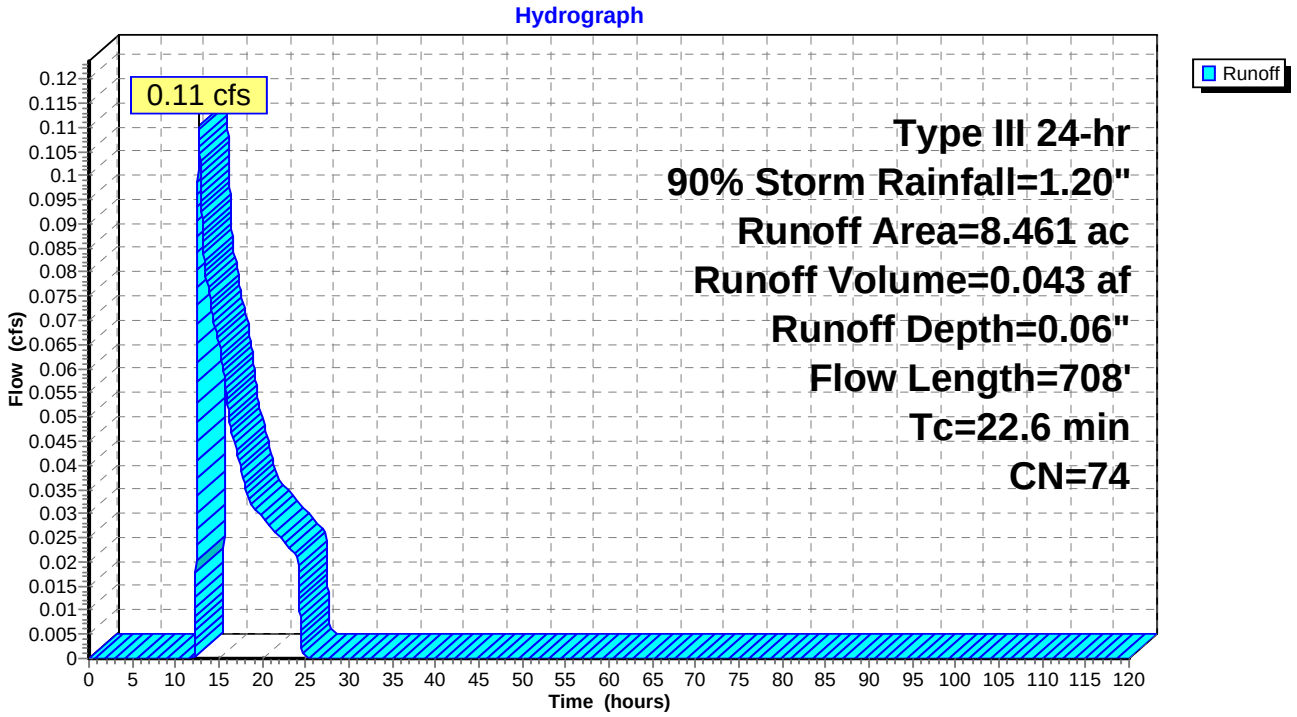
Runoff = 0.11 cfs @ 12.68 hrs, Volume= 0.043 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.466	98	Paved parking, HSG C
0.051	98	Roofs, HSG C
4.961	74	>75% Grass cover, Good, HSG C
0.089	98	Paved roads w/curbs & sewers, HSG C
0.004	71	Meadow, non-grazed, HSG C
2.890	70	Woods, Good, HSG C
8.461	74	Weighted Average
7.855		92.84% Pervious Area
0.606		7.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.0127	0.17		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.75"
6.7	350	0.0157	0.88		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
0.7	162	0.0123	3.92	14.90	**Channel Flow, Roadside Ditch** Area= 3.8 sf Perim= 6.3' r= 0.60' n= 0.030
0.2	46	0.0074	4.53	5.56	**Pipe Channel, Roadway Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
22.6	708	Total			

Subcatchment 29: 29



Summary for Subcatchment 30A: 30A

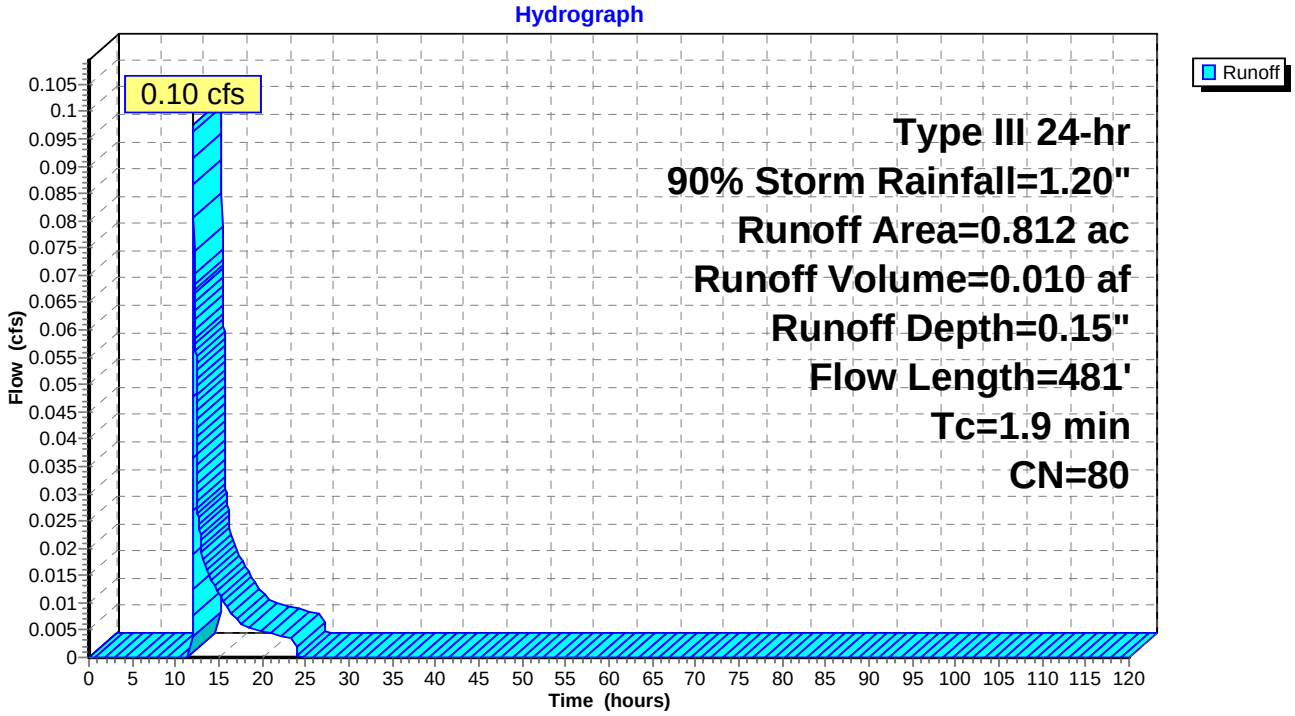
Runoff = 0.10 cfs @ 12.06 hrs, Volume= 0.010 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.262	98	Paved roads w/curbs & sewers, HSG C
0.193	74	>75% Grass cover, Good, HSG C
0.357	70	Woods, Good, HSG C
0.812	80	Weighted Average
0.550		67.73% Pervious Area
0.262		32.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	36	0.0200	1.21		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.75"
1.4	445	0.0220	5.24	19.93	**Channel Flow, Roadside Ditch** Area= 3.8 sf Perim= 6.3' r= 0.60' n= 0.030
1.9	481	Total			

Subcatchment 30A: 30A

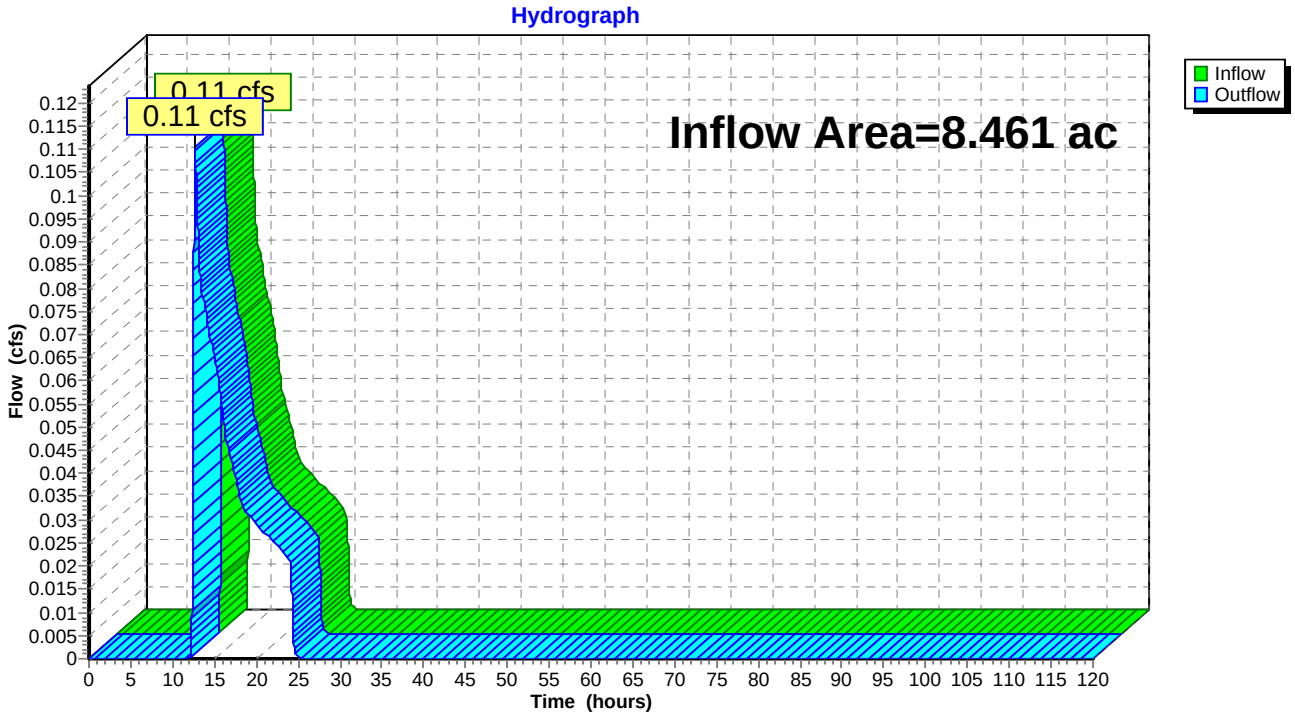


Summary for Reach DP10: DP-10

Inflow Area = 8.461 ac, 7.16% Impervious, Inflow Depth = 0.06" for 90% Storm event
Inflow = 0.11 cfs @ 12.68 hrs, Volume= 0.043 af
Outflow = 0.11 cfs @ 12.69 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP10: DP-10

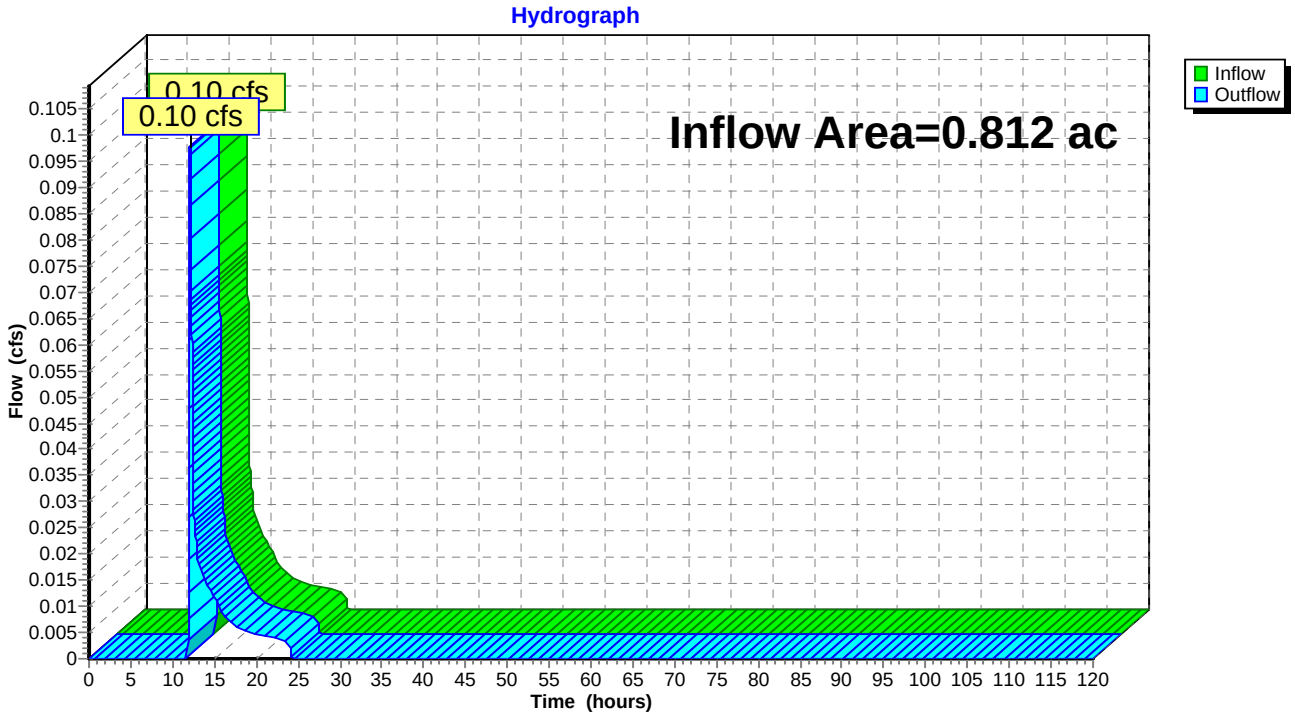


Summary for Reach DP11: DP-11

Inflow Area = 0.812 ac, 32.27% Impervious, Inflow Depth = 0.15" for 90% Storm event
Inflow = 0.10 cfs @ 12.06 hrs, Volume= 0.010 af
Outflow = 0.10 cfs @ 12.07 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP11: DP-11



Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 29: 29 Runoff Area=8.461 ac 7.16% Impervious Runoff Depth=4.93"
Flow Length=708' Tc=22.6 min CN=74 Runoff=31.23 cfs 3.473 af

Subcatchment 30A: 30A Runoff Area=0.812 ac 32.27% Impervious Runoff Depth=5.62"
Flow Length=481' Tc=1.9 min CN=80 Runoff=6.11 cfs 0.381 af

Reach DP10: DP-10 Inflow=31.23 cfs 3.473 af
Outflow=31.23 cfs 3.473 af

Reach DP11: DP-11 Inflow=6.11 cfs 0.381 af
Outflow=6.11 cfs 0.381 af

Total Runoff Area = 9.273 ac Runoff Volume = 3.854 af Average Runoff Depth = 4.99"
90.64% Pervious = 8.405 ac 9.36% Impervious = 0.868 ac

Summary for Subcatchment 29: 29

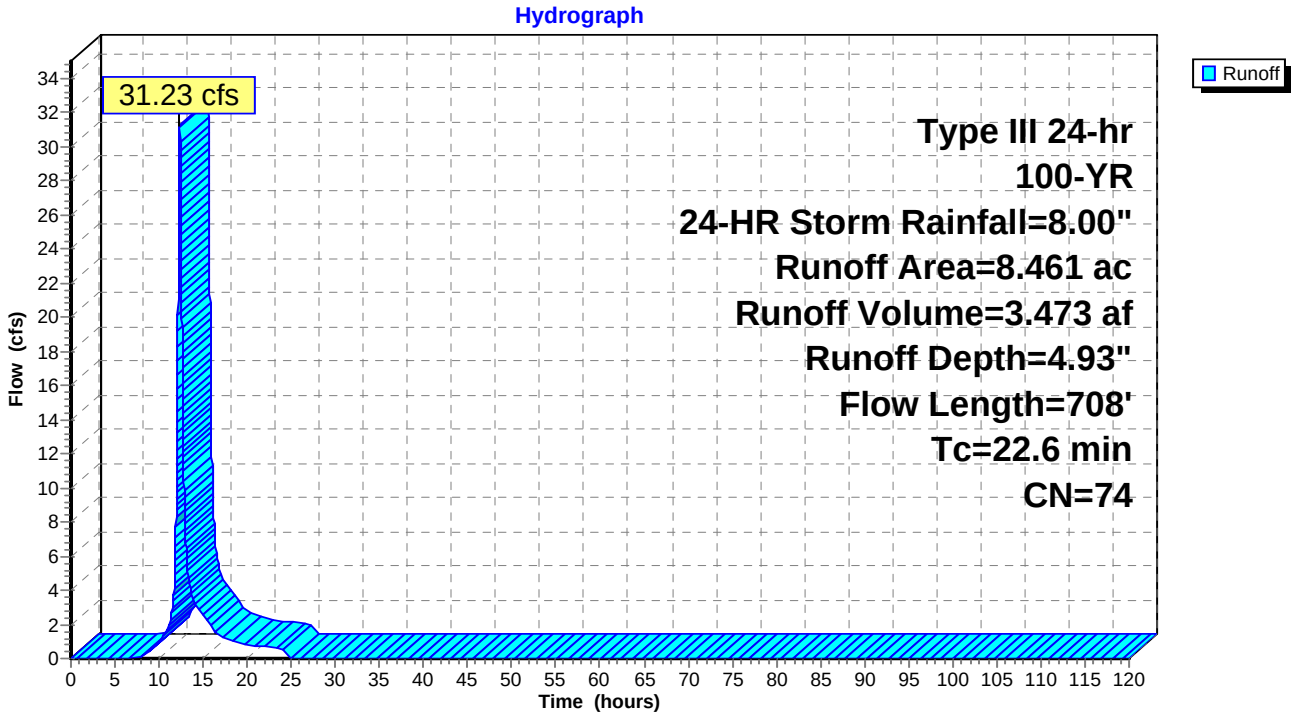
Runoff = 31.23 cfs @ 12.31 hrs, Volume= 3.473 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.466	98	Paved parking, HSG C
0.051	98	Roofs, HSG C
4.961	74	>75% Grass cover, Good, HSG C
0.089	98	Paved roads w/curbs & sewers, HSG C
0.004	71	Meadow, non-grazed, HSG C
2.890	70	Woods, Good, HSG C
8.461	74	Weighted Average
7.855		92.84% Pervious Area
0.606		7.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	150	0.0127	0.17		**Sheet Flow, Sheet Flow** Grass: Short n= 0.150 P2= 3.75"
6.7	350	0.0157	0.88		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
0.7	162	0.0123	3.92	14.90	**Channel Flow, Roadside Ditch** Area= 3.8 sf Perim= 6.3' r= 0.60' n= 0.030
0.2	46	0.0074	4.53	5.56	**Pipe Channel, Roadway Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
22.6	708	Total			

Subcatchment 29: 29



Summary for Subcatchment 30A: 30A

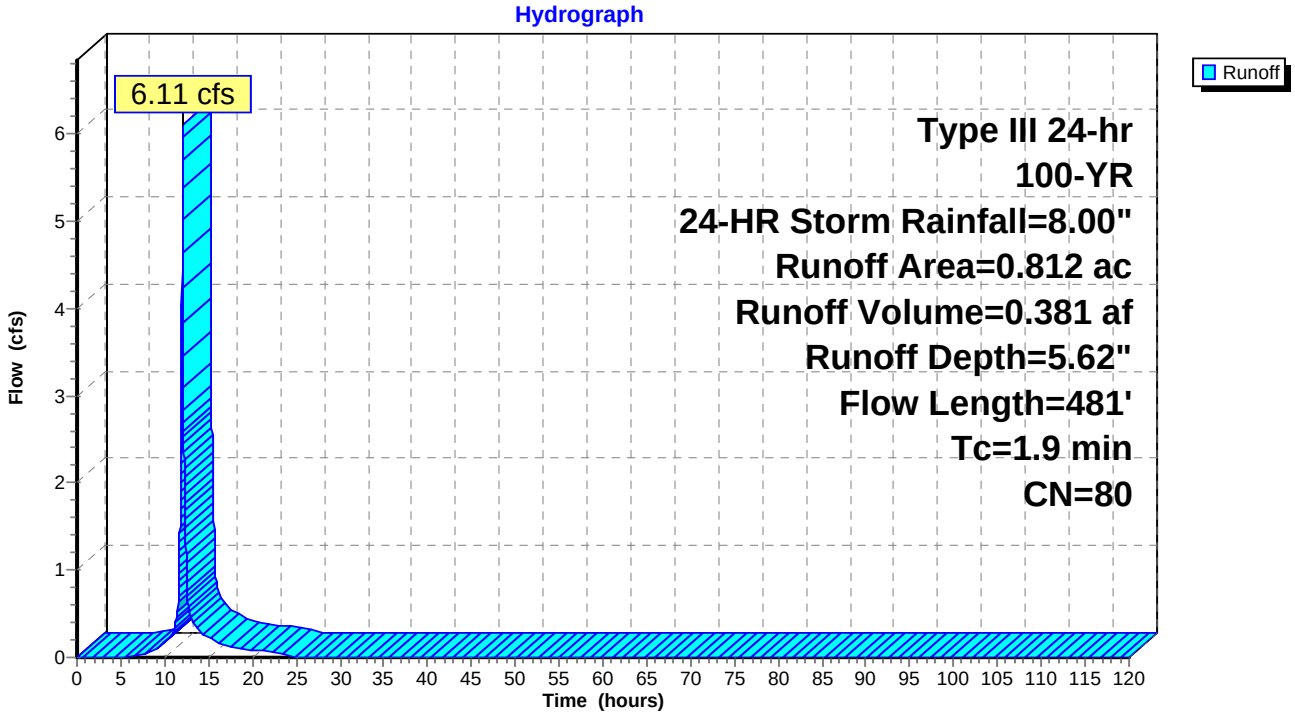
Runoff = 6.11 cfs @ 12.03 hrs, Volume= 0.381 af, Depth= 5.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.262	98	Paved roads w/curbs & sewers, HSG C
0.193	74	>75% Grass cover, Good, HSG C
0.357	70	Woods, Good, HSG C
0.812	80	Weighted Average
0.550		67.73% Pervious Area
0.262		32.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.5	36	0.0200	1.21		**Sheet Flow, Road** Smooth surfaces n= 0.011 P2= 3.75"
1.4	445	0.0220	5.24	19.93	**Channel Flow, Roadside Ditch** Area= 3.8 sf Perim= 6.3' r= 0.60' n= 0.030
1.9	481	Total			

Subcatchment 30A: 30A

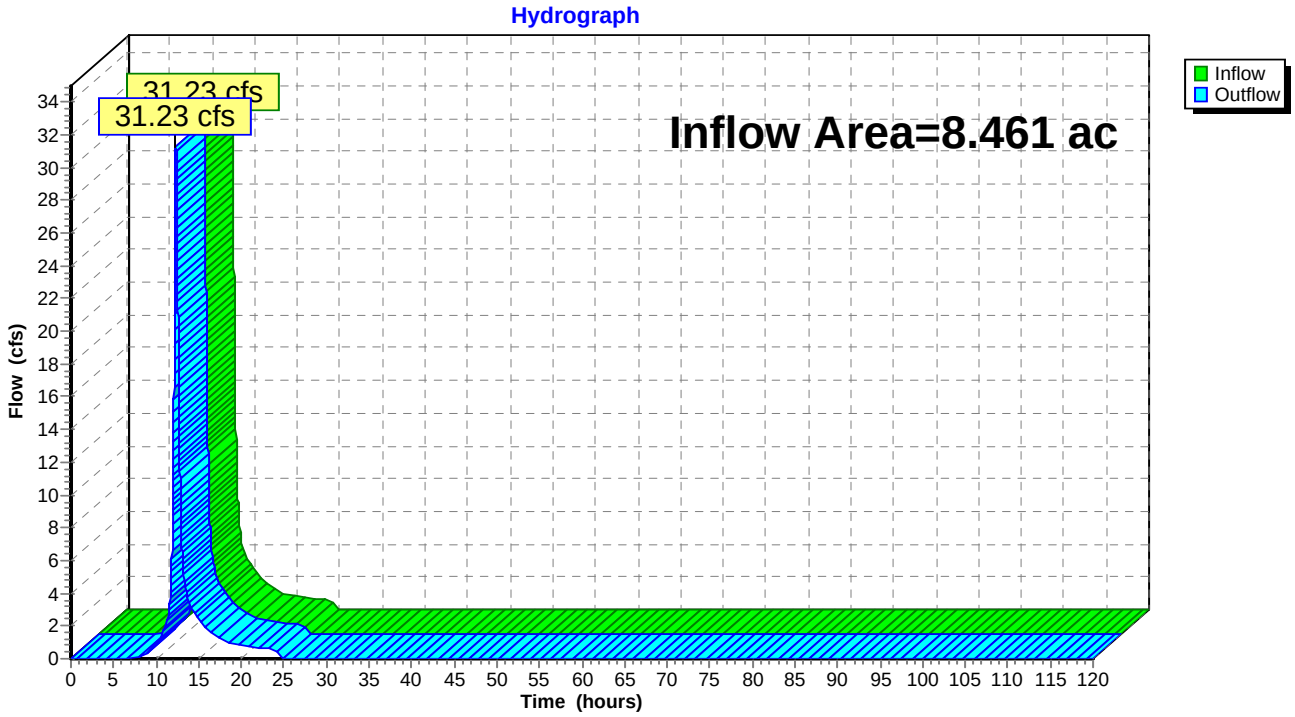


Summary for Reach DP10: DP-10

Inflow Area = 8.461 ac, 7.16% Impervious, Inflow Depth = 4.93" for 100-YR, 24-HR Storm event
Inflow = 31.23 cfs @ 12.31 hrs, Volume= 3.473 af
Outflow = 31.23 cfs @ 12.32 hrs, Volume= 3.473 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP10: DP-10

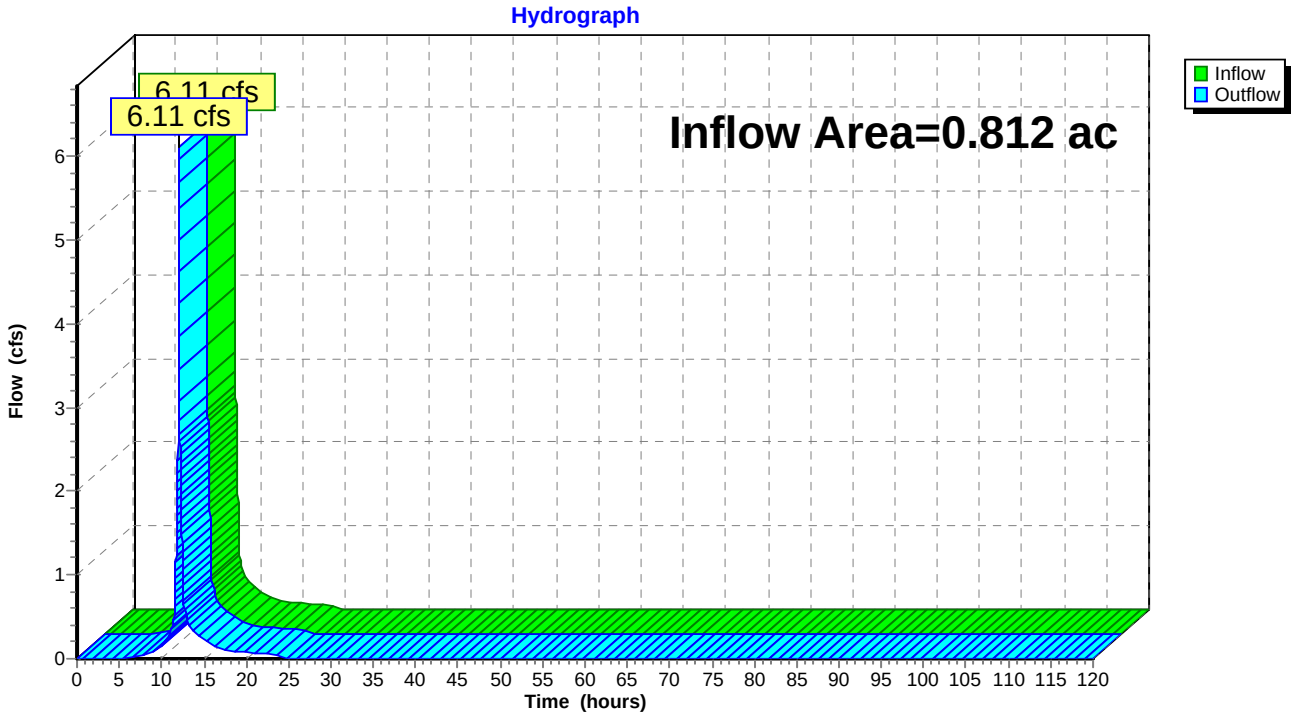


Summary for Reach DP11: DP-11

Inflow Area = 0.812 ac, 32.27% Impervious, Inflow Depth = 5.62" for 100-YR, 24-HR Storm event
Inflow = 6.11 cfs @ 12.03 hrs, Volume= 0.381 af
Outflow = 6.11 cfs @ 12.04 hrs, Volume= 0.381 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP11: DP-11

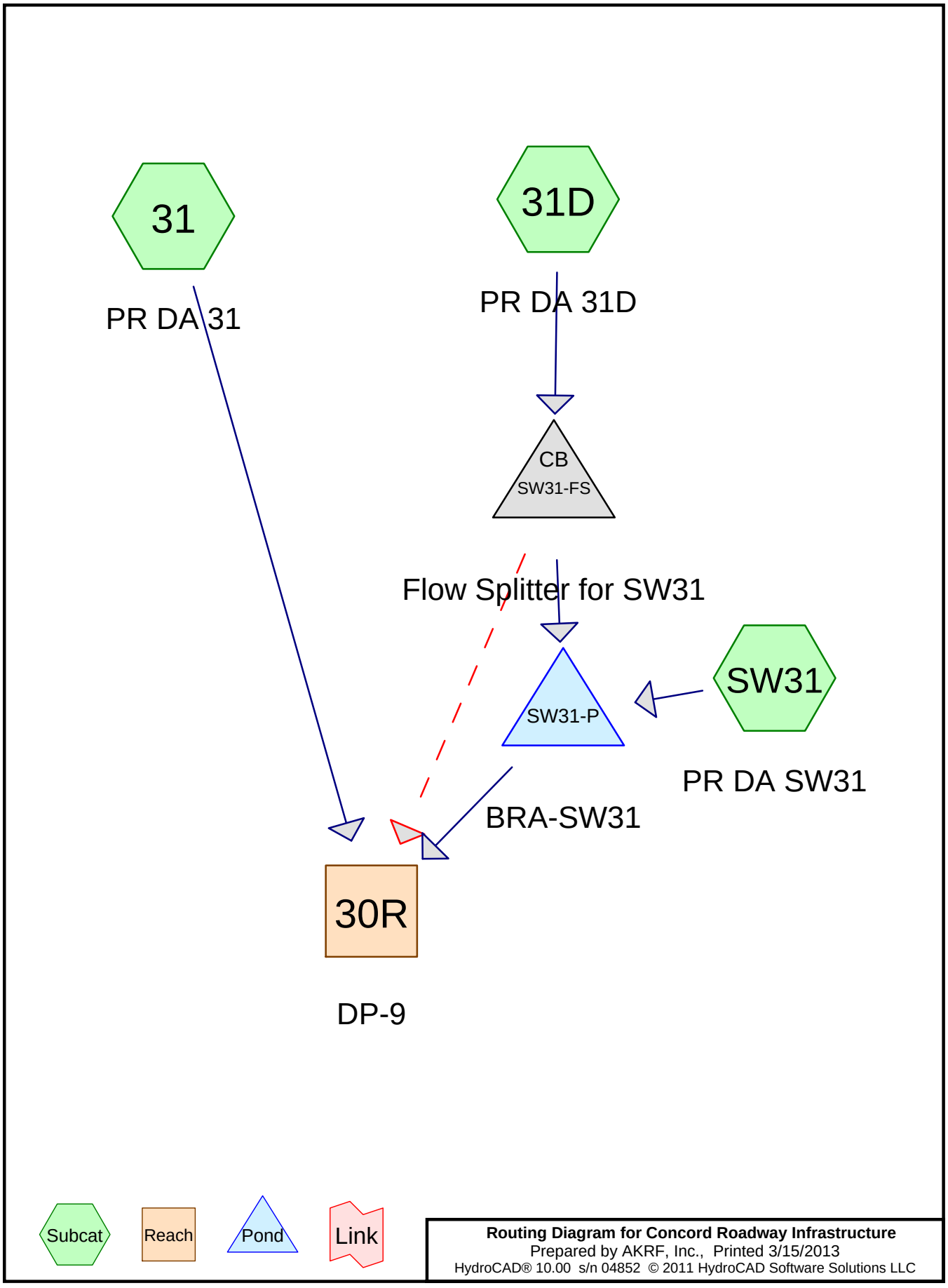


SWPPP

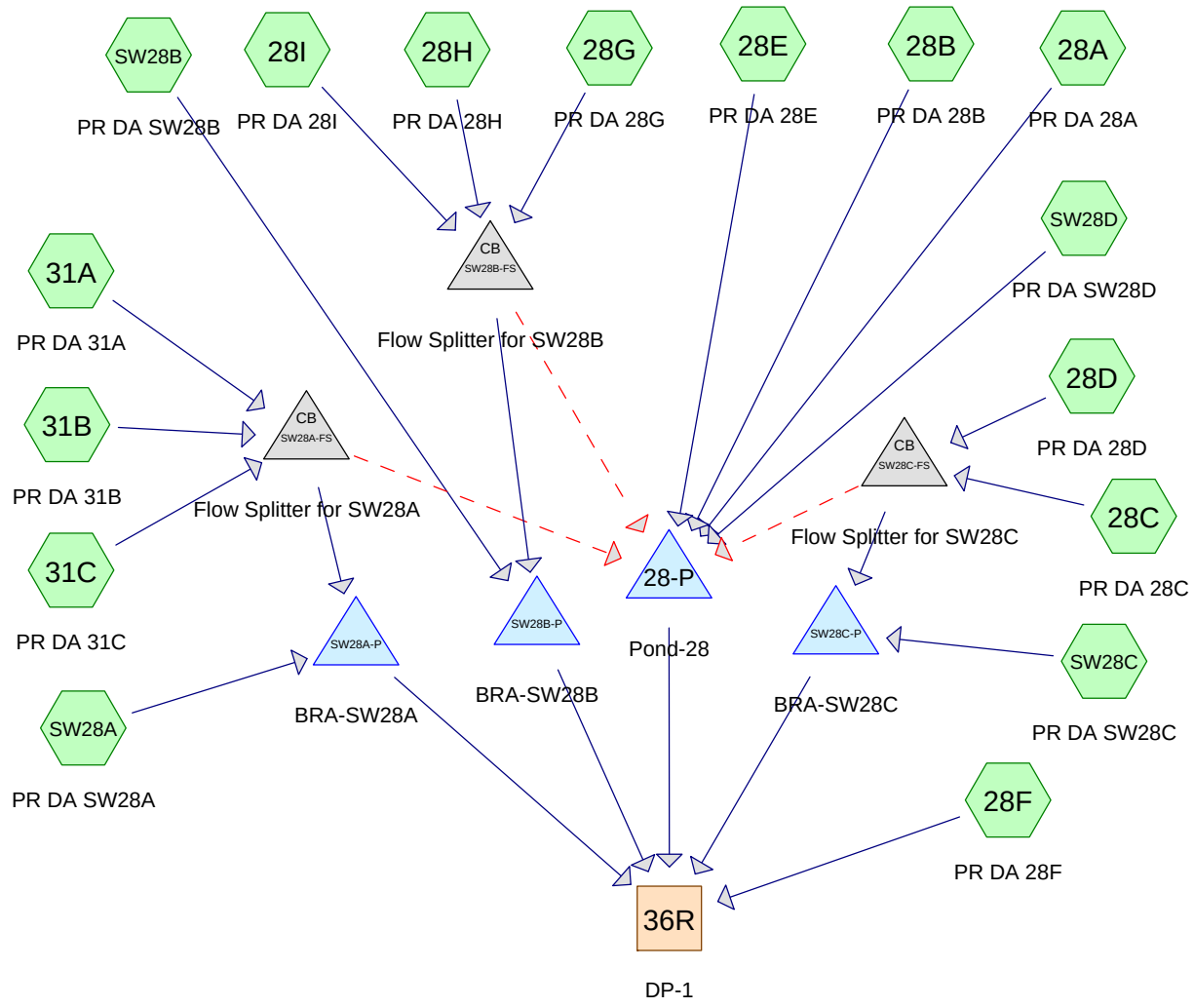
APPENDIX I

POST-DEVELOPMENT HYDROLOGIC ROUTING CALCULATIONS

- RESORT ENTRY ROAD ANALYSIS
- THOMPSONVILLE ROAD & JOYLAND ROAD ANALYSIS



Routing Diagram for Concord Roadway Infrastructure
Prepared by AKRF, Inc., Printed 3/15/2013
HydroCAD® 10.00 s/n 04852 © 2011 HydroCAD Software Solutions LLC



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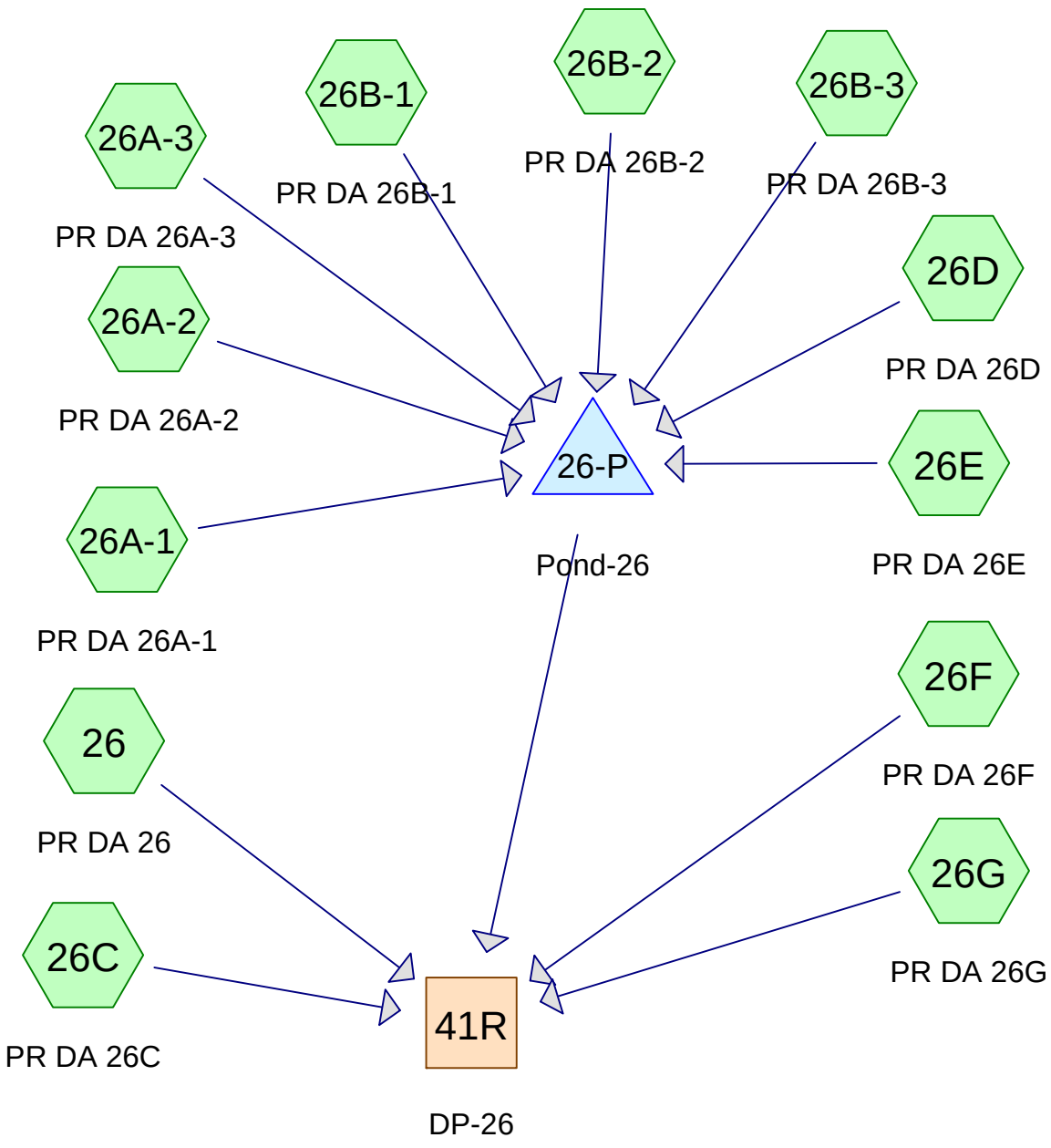

Subcat Reach Pond Link

Routing Diagram for Concord Roadway Infrastructure
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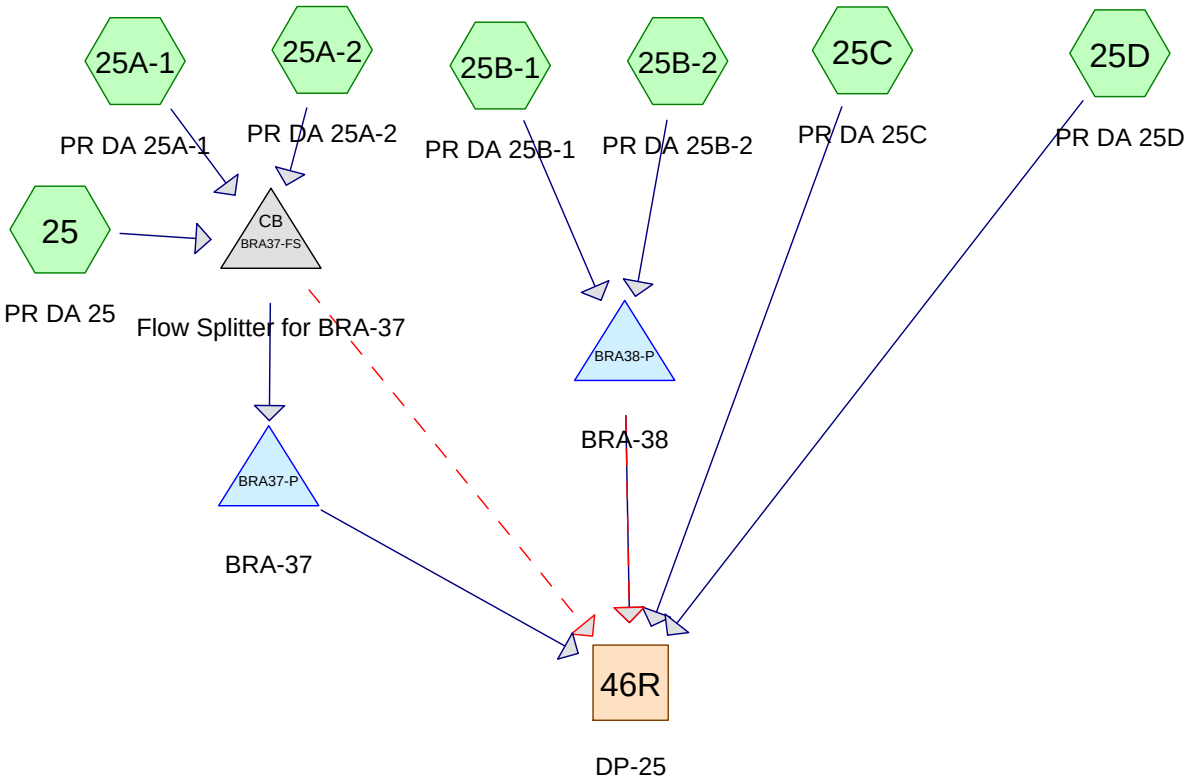

Subcat Reach Pond Link

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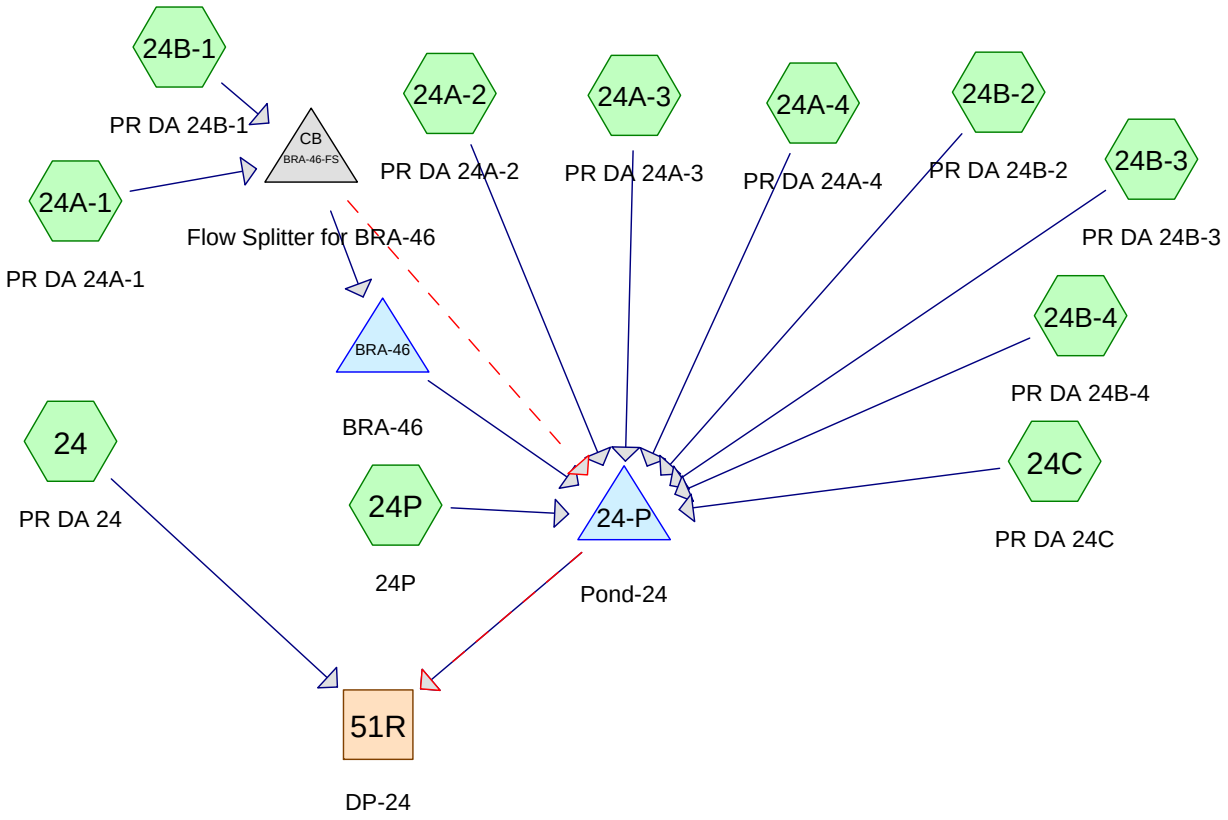

Subcat Reach Pond Link

Routing Diagram for Concord Roadway Infrastructure
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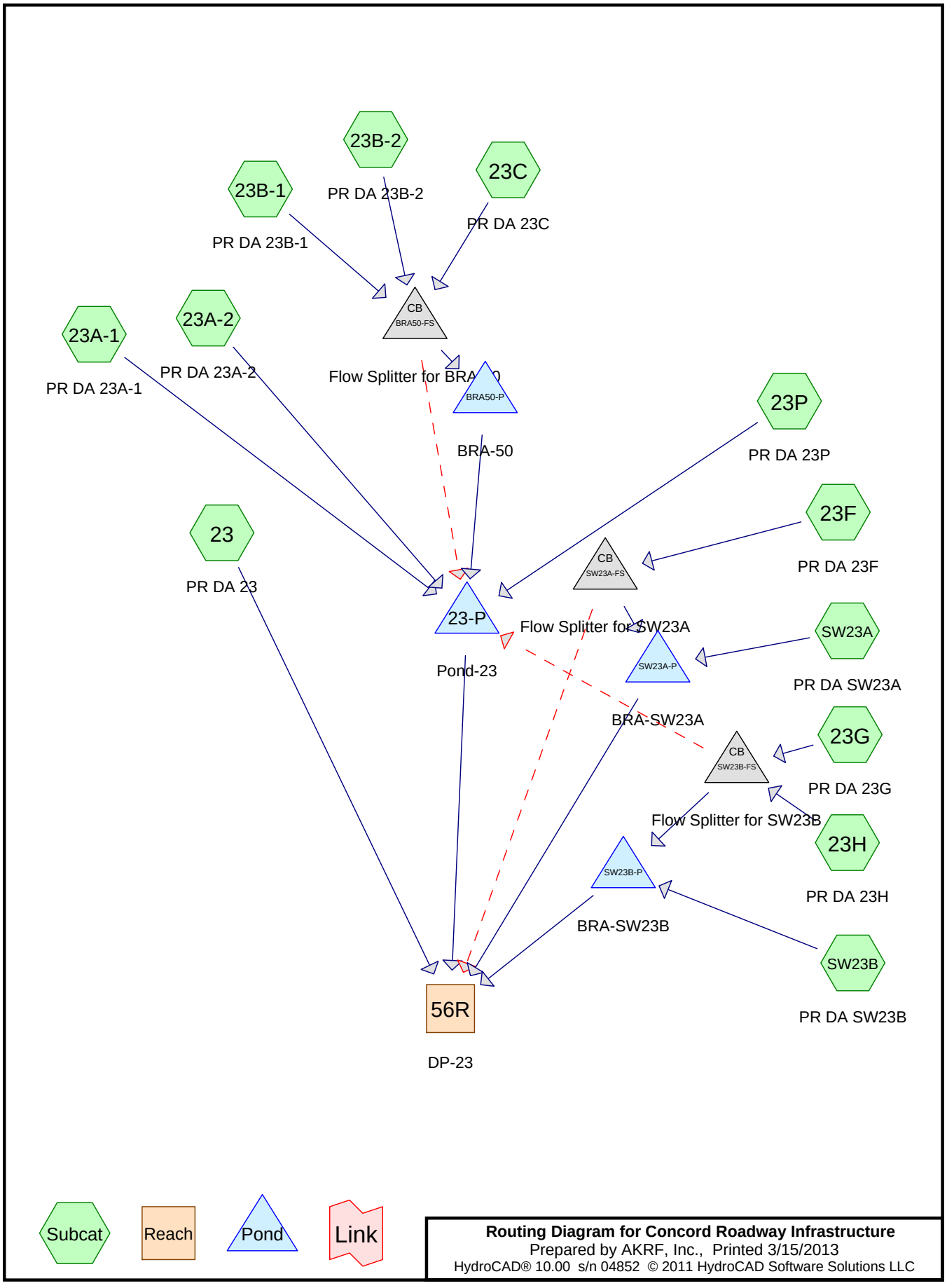
23B-2
PR DA 23B-2
23B-1
PR DA 23B-1
23C
PR DA 23C
CB
BRA50-FS
23A-1
PR DA 23A-1
23A-2
PR DA 23A-2
Flow Splitter for BRA-50
BRA50-P
BRA-50
23P
PR DA 23P
23
PR DA 23
CB
SW23A-FS
23F
PR DA 23F
23-P
Pond-23
Flow Splitter for SW23A
SW23A-P
SW23A
PR DA SW23A
BRA-SW23A
CB
SW23B-FS
23G
PR DA 23G
Flow Splitter for SW23B
23H
PR DA 23H
SW23B-P
BRA-SW23B
SW23B
PR DA SW23B
56R
DP-23
Subcat
Reach
Pond
Link
Routing Diagram for Concord Roadway Infrastructure
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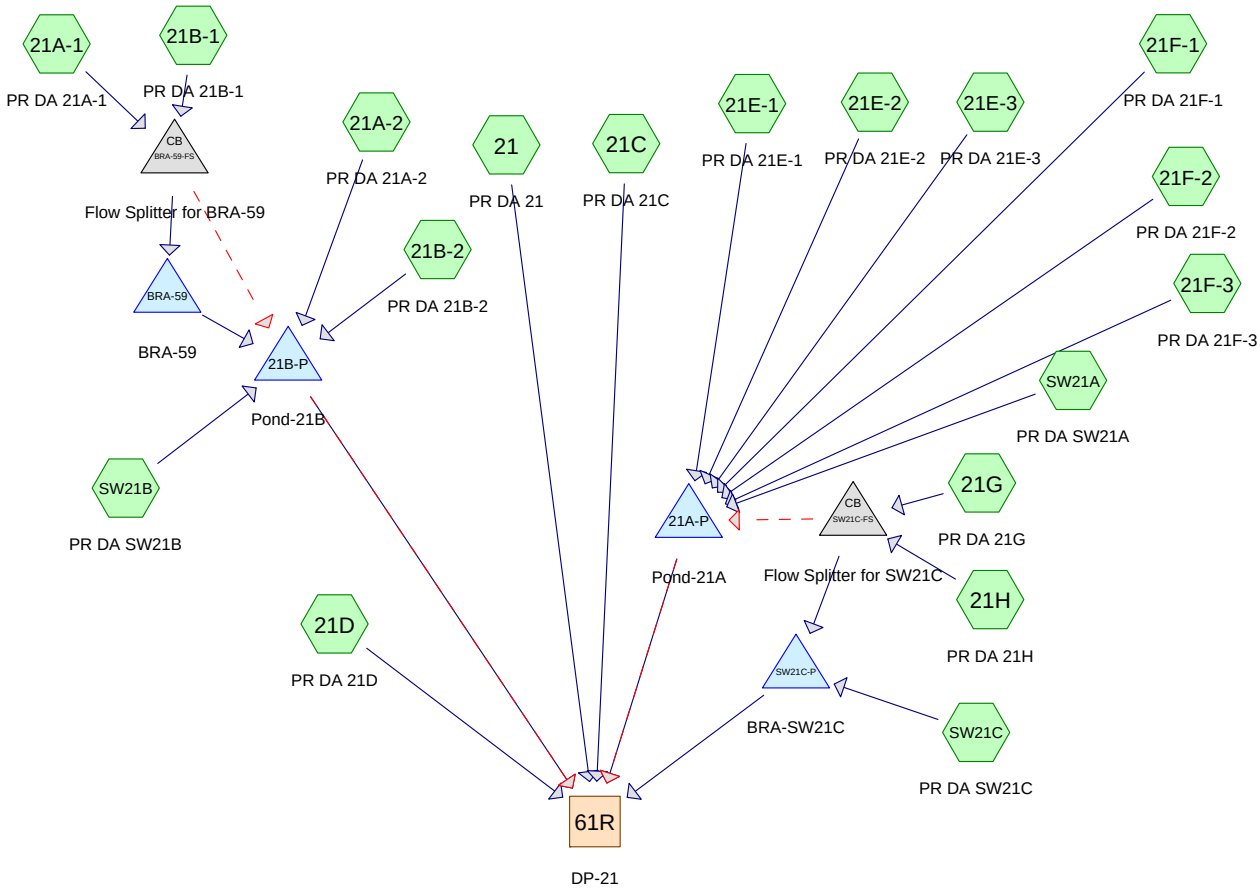

Subcat Reach Pond Link

Routing Diagram for Concord Roadway Infrastructure
Prepared by AKRF, Inc., Printed 3/15/2013
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.480	65	Brush, Good, HSG C (21D, 23)
55.763	70	Woods, Good, HSG C (21, 21B-2, 21C, 21D, 21E-1, 21E-2, 21E-3, 21F-1, 21F-2, 21F-3, 23, 23B-1, 23B-2, 24, 24A-1, 24A-4, 24B-1, 24B-2, 24B-3, 24B-4, 24C, 24P, 25, 25A-1, 25A-2, 25C, 25D, 26, 26A-1, 26A-2, 26C, 26D, 26E, 26G, 28F, 31)
5.611	71	Meadow, non-grazed, HSG C (21, 21C, 21D, 25C, 25D, 26, 26C, 28F, 31)
0.013	73	Brush, Good, HSG D (21D, 23)
59.174	74	>75% Grass cover, Good, HSG C (21, 21A-1, 21A-2, 21B-1, 21B-2, 21C, 21D, 21E-1, 21E-2, 21E-3, 21F-1, 21F-2, 21F-3, 21G, 21H, 23, 23A-1, 23A-2, 23B-1, 23B-2, 23F, 23G, 23H, 23P, 24A-1, 24A-2, 24A-4, 24B-1, 24B-2, 24B-3, 24B-4, 25A-1, 25A-2, 25B-1, 25B-2, 26A-1, 26A-2, 26A-3, 26B-1, 26B-2, 26B-3, 26F, 28A, 28B, 28F, 28H, 31, 31B, 31D, SW21A, SW21B, SW21C, SW23A, SW23B, SW28A, SW28B, SW28C, SW28D, SW31)
0.010	74	Pasture/grassland/range, Good, HSG C (21C)
18.299	77	Woods, Good, HSG D (21, 21B-2, 21D, 23, 23C, 24, 24A-2, 24A-3, 24A-4, 24B-2, 24B-4, 24C, 24P, 25, 25A-1, 25C, 25D, 26, 26D, 26E)
2.338	78	Meadow, non-grazed, HSG D (21, 21D, 25C, 25D)
1.456	80	>75% Grass cover, Good, HSG D (21A-2, 21B-2, 21D, 24A-2, 24A-3, 24A-4, 24B-2, 24B-4, 31)
0.204	80	Pasture/grassland/range, Good, HSG D (21)
0.732	89	Gravel Shoulder, HSG C (21A-1, 21A-2, 21B-1, 21B-2, 21E-1, 21E-2, 21E-3, 21F-1, 21F-2, 21F-3, 23A-1, 23A-2, 23B-1, 23B-2, 23F, 23G, 23H, 24B-1, 24B-2, 24B-3, 24B-4, 25A-1, 25A-2, 25B-1, 25B-2, 26A-1, 26A-2, 26A-3, 26B-1, 26B-2, 26B-3)
0.035	89	Gravel roads, HSG C (24A-1, 24A-2, 24A-4)
0.123	91	Gravel Shoulder, HSG D (21A-2, 24A-2, 24A-3, 24A-4, 24B-2, 24B-4)
0.038	91	Gravel roads, HSG D (21B-2)
0.739	96	Gravel surface, HSG D (24, 24A-2, 24A-3, 24A-4, 24B-2, 24B-3, 24B-4, 24C)
6.774	98	Paved roads w/curbs & sewers, HSG C (21A-1, 21A-2, 21B-1, 21B-2, 21E-1, 21E-2, 21E-3, 21F-1, 21F-2, 21F-3, 21G, 21H, 23A-1, 23A-2, 23B-1, 23B-2, 23F, 23G, 23H, 24A-1, 24A-2, 24A-4, 24B-1, 24B-2, 24B-3, 24B-4, 25A-1, 25A-2, 25B-1, 25B-2, 26A-1, 26A-2, 26A-3, 26B-1, 26B-2, 26B-3, 28A, 28B, 28C, 28D, 28E, 28G, 28I, 31A, 31C, 31D)
0.885	98	Paved roads w/curbs & sewers, HSG D (21A-2, 21B-2, 24A-2, 24A-3, 24A-4, 24B-2, 24B-4)
1.423	98	Unconnected pavement, HSG C (21, 21C, 28F, 31, 31D)
0.009	98	Water Surface, HSG D (31)
154.106	**75**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
130.002	HSG C	21, 21A-1, 21A-2, 21B-1, 21B-2, 21C, 21D, 21E-1, 21E-2, 21E-3, 21F-1, 21F-2, 21F-3, 21G, 21H, 23, 23A-1, 23A-2, 23B-1, 23B-2, 23F, 23G, 23H, 23P, 24, 24A-1, 24A-2, 24A-4, 24B-1, 24B-2, 24B-3, 24B-4, 24C, 24P, 25, 25A-1, 25A-2, 25B-1, 25B-2, 25C, 25D, 26, 26A-1, 26A-2, 26A-3, 26B-1, 26B-2, 26B-3, 26C, 26D, 26E, 26F, 26G, 28A, 28B, 28C, 28D, 28E, 28F, 28G, 28H, 28I, 31, 31A, 31B, 31C, 31D, SW21A, SW21B, SW21C, SW23A, SW23B, SW28A, SW28B, SW28C, SW28D, SW31
24.104	HSG D	21, 21A-2, 21B-2, 21D, 23, 23C, 24, 24A-2, 24A-3, 24A-4, 24B-2, 24B-3, 24B-4, 24C, 24P, 25, 25A-1, 25C, 25D, 26, 26D, 26E, 31
0.000	Other	
154.106		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	59.174	1.456	0.000	60.630	>75% Grass cover, Good	21, 21A-1, 21A-2, 21B-1, 21B-2, 21C, 21D, 21E-1, 21E-2, 21E-3, 21F-1, 21F-2, 21F-3, 21G, 21H, 23, 23A-1, 23A-2, 23B-1, 23B-2, 23F, 23G, 23H, 23P,

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.096	0.000	0.000	0.096	Gravel Shoulder	26A-1, 26A-2, 26A-3, 26B-1, 26B-2, 26B-3
0.000	0.000	0.063	0.000	0.000	0.063	Unconnected pavement	31D
0.000	0.000	0.402	0.000	0.000	0.402	Paved roads w/curbs & sewers	31A, 31C, 31D
0.000	0.000	0.124	0.000	0.000	0.124	Unconnected pavement	28F, 31
0.000	0.000	3.707	0.375	0.000	4.082	Paved roads w/curbs & sewers	24A-3, 24A-4, 24B-1, 24B-2, 24B-3, 24B-4, 25A-1, 25A-2, 25B-1, 25B-2, 26A-1, 26A-2, 26A-3,

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.280	0.082	0.000	0.362	Gravel Shoulder	23F, 23G, 23H, 24A-2, 24A-3, 24A-4, 24B-1, 24B-2, 24B-3, 24B-4, 25A-1, 25A-2, 25B-1, 25B-2
0.000	0.000	0.884	0.075	0.000	0.959	Paved roads w/curbs & sewers	23A-2, 23B-1, 23B-2, 23F, 23G, 23H, 24A-1, 24A-2

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.312	0.000	0.000	0.312	Gravel Shoulder	21B-1, 21B-2, 21E-1, 21E-2, 21E-3, 21F-1, 21F-2, 21F-3, 23A-1, 23A-2, 23B-1, 23B-2
0.000	0.000	1.236	0.000	0.000	1.236	Unconnected pavement	21, 21C
0.000	0.000	1.781	0.435	0.000	2.216	Paved roads w/curbs & sewers	21A-1, 21A-2, 21B-1, 21B-2, 21E-1, 21E-2, 21E-3, 21F-1, 21F-2, 21F-3,

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.044	0.041	0.000	0.085	Gravel Shoulder	21A-1, 21A-2
0.000	0.000	0.035	0.038	0.000	0.073	Gravel roads	21B-2, 24A-1, 24A-2, 24A-4
0.000	0.000	0.000	0.739	0.000	0.739	Gravel surface	24, 24A-2, 24A-3, 24A-4, 24B-2, 24B-3, 24B-4, 24C
0.000	0.000	0.010	0.204	0.000	0.214	Pasture/grassland/range, Good	21, 21C
0.000	0.000	5.611	2.338	0.000	7.949	Meadow, non-grazed	21, 21C, 21D, 25C, 25D, 26, 26C, 28F, 31

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.480	0.013	0.000	0.493	Brush, Good	21D, 23
0.000	0.000	55.763	18.299	0.000	74.062	Woods, Good	21, 21B-2, 21C, 21D, 21E-1, 21E-2, 21E-3, 21F-1, 21F-2, 21F-3, 23, 23B-1, 23B-2, 23C, 24, 24A-1, 24A-2, 24A-3, 24A-4, 24B-1, 24B-2, 24B-3, 24B-4, 24C

Ground Covers (selected nodes) (continued)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.009	0.000	0.009	Water Surface	31
0.000	**0.000**	**130.002**	**24.104**	**0.000**	**154.106**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	21	0.00	0.00	190.0	0.0239	0.013	38.0	24.0	0.0
2	21A-1	0.00	0.00	408.0	0.0200	0.011	15.0	0.0	0.0
3	21A-2	0.00	0.00	408.0	0.0200	0.011	15.0	0.0	0.0
4	21B-1	0.00	0.00	320.0	0.0200	0.013	15.0	0.0	0.0
5	21B-2	0.00	0.00	320.0	0.0200	0.013	15.0	0.0	0.0
6	21C	0.00	0.00	215.0	0.0326	0.013	30.0	19.0	0.0
7	21E-1	0.00	0.00	340.0	0.0200	0.013	15.0	0.0	0.0
8	21E-2	0.00	0.00	340.0	0.0200	0.013	15.0	0.0	0.0
9	21E-3	0.00	0.00	340.0	0.0200	0.013	15.0	0.0	0.0
10	21F-1	0.00	0.00	340.0	0.0200	0.013	15.0	0.0	0.0
11	21F-2	0.00	0.00	340.0	0.0200	0.013	15.0	0.0	0.0
12	21F-3	0.00	0.00	340.0	0.0200	0.013	15.0	0.0	0.0
13	21G	0.00	0.00	100.0	0.0200	0.013	15.0	0.0	0.0
14	21H	0.00	0.00	194.0	0.0200	0.013	15.0	0.0	0.0
15	23C	0.00	0.00	125.0	0.0200	0.013	15.0	0.0	0.0
16	23G	0.00	0.00	131.0	0.0200	0.013	15.0	0.0	0.0
17	23H	0.00	0.00	240.0	0.0200	0.013	15.0	0.0	0.0
18	24A-1	0.00	0.00	312.0	0.0200	0.013	51.0	0.0	0.0
19	24A-2	0.00	0.00	312.0	0.0200	0.013	51.0	0.0	0.0
20	24A-3	0.00	0.00	312.0	0.0200	0.013	51.0	0.0	0.0
21	24A-4	0.00	0.00	312.0	0.0200	0.013	51.0	0.0	0.0
22	24B-1	0.00	0.00	343.0	0.0200	0.013	15.0	0.0	0.0
23	24B-2	0.00	0.00	343.0	0.0200	0.013	15.0	0.0	0.0
24	24B-3	0.00	0.00	343.0	0.0200	0.013	15.0	0.0	0.0
25	24B-4	0.00	0.00	343.0	0.0200	0.013	15.0	0.0	0.0
26	26A-1	0.00	0.00	572.0	0.0200	0.013	15.0	0.0	0.0
27	26A-2	0.00	0.00	572.0	0.0200	0.013	15.0	0.0	0.0
28	26A-3	0.00	0.00	572.0	0.0200	0.013	15.0	0.0	0.0
29	26B-1	0.00	0.00	572.0	0.0200	0.013	15.0	0.0	0.0
30	26B-2	0.00	0.00	572.0	0.0200	0.013	15.0	0.0	0.0
31	26B-3	0.00	0.00	572.0	0.0200	0.013	15.0	0.0	0.0
32	26D	0.00	0.00	573.0	0.0200	0.013	15.0	0.0	0.0
33	28A	0.00	0.00	200.0	0.0200	0.013	15.0	0.0	0.0
34	28B	0.00	0.00	183.0	0.0200	0.013	15.0	0.0	0.0
35	28C	0.00	0.00	275.0	0.0200	0.013	15.0	0.0	0.0
36	28D	0.00	0.00	135.0	0.0200	0.013	15.0	0.0	0.0
37	28E	0.00	0.00	140.0	0.0200	0.013	15.0	0.0	0.0
38	28G	0.00	0.00	226.0	0.0200	0.013	15.0	0.0	0.0
39	28H	0.00	0.00	185.0	0.0200	0.013	15.0	0.0	0.0
40	28I	0.00	0.00	165.0	0.0200	0.013	15.0	0.0	0.0
41	31A	0.00	0.00	60.0	0.0200	0.013	15.0	0.0	0.0
42	31B	0.00	0.00	42.0	0.0200	0.013	15.0	0.0	0.0

Pipe Listing (selected nodes) (continued)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
43	31D	0.00	0.00	122.0	0.0200	0.013	15.0	0.0	0.0
44	21A-P	1,374.00	1,373.50	3.0	0.1667	0.013	15.0	0.0	0.0
45	21B-P	1,376.00	1,375.00	52.0	0.0192	0.013	12.0	0.0	0.0
46	23-P	1,380.00	1,379.00	50.0	0.0200	0.013	18.0	0.0	0.0
47	24-P	1,362.00	1,358.00	150.0	0.0267	0.013	18.0	0.0	0.0
48	26-P	1,368.00	1,367.00	60.0	0.0167	0.013	15.0	0.0	0.0
49	28-P	1,373.00	1,372.00	20.0	0.0500	0.013	18.0	0.0	0.0
50	BRA-46	1,366.00	1,365.20	72.8	0.0110	0.013	15.0	0.0	0.0
51	BRA-46-FS	1,371.45	1,371.00	38.0	0.0118	0.013	15.0	0.0	0.0
52	BRA-46-FS	1,371.45	1,365.12	195.0	0.0325	0.130	15.0	0.0	0.0
53	BRA-59	1,378.50	1,378.00	52.0	0.0096	0.013	15.0	0.0	0.0
54	BRA-59-FS	1,381.75	1,381.25	66.0	0.0076	0.013	15.0	0.0	0.0
55	BRA-59-FS	1,381.50	1,380.50	86.0	0.0116	0.013	15.0	0.0	0.0
56	BRA37-FS	1,385.60	1,385.50	7.9	0.0127	0.013	18.0	0.0	0.0
57	BRA37-FS	1,385.60	1,383.00	89.0	0.0292	0.013	18.0	0.0	0.0
58	BRA37-P	1,382.00	1,381.50	93.4	0.0054	0.013	18.0	0.0	0.0
59	BRA38-P	1,381.50	1,380.90	114.0	0.0053	0.013	18.0	0.0	0.0
60	BRA50-FS	1,386.10	1,386.00	17.5	0.0057	0.013	18.0	0.0	0.0
61	BRA50-FS	1,386.10	1,383.70	71.9	0.0334	0.013	18.0	0.0	0.0
62	BRA50-P	1,382.00	1,381.30	62.2	0.0113	0.013	18.0	0.0	0.0
63	SW21C-FS	1,404.50	1,403.50	102.1	0.0098	0.013	18.0	0.0	0.0
64	SW21C-FS	1,404.50	1,377.20	293.0	0.0932	0.013	15.0	0.0	0.0
65	SW21C-P	1,398.00	1,397.50	37.5	0.0133	0.013	18.0	0.0	0.0
66	SW23A-FS	1,383.75	1,383.50	44.9	0.0056	0.013	15.0	0.0	0.0
67	SW23A-FS	1,383.75	1,381.30	177.6	0.0138	0.013	15.0	0.0	0.0
68	SW23A-P	1,378.00	1,376.50	97.1	0.0154	0.013	15.0	0.0	0.0
69	SW23B-FS	1,388.50	1,387.50	132.6	0.0075	0.013	18.0	0.0	0.0
70	SW23B-FS	1,388.50	1,384.00	268.2	0.0168	0.013	15.0	0.0	0.0
71	SW23B-P	1,384.00	1,383.00	80.5	0.0124	0.013	18.0	0.0	0.0
72	SW28A-FS	1,435.64	1,435.50	7.3	0.0192	0.013	15.0	0.0	0.0
73	SW28A-FS	1,435.64	1,427.30	149.5	0.0558	0.013	15.0	0.0	0.0
74	SW28A-P	1,430.00	1,429.00	77.0	0.0130	0.013	15.0	0.0	0.0
75	SW28B-FS	1,412.00	1,410.50	21.0	0.0714	0.013	18.0	0.0	0.0
76	SW28B-FS	1,412.00	1,406.00	117.0	0.0513	0.013	18.0	0.0	0.0
77	SW28B-P	1,403.50	1,401.00	58.6	0.0427	0.013	15.0	0.0	0.0
78	SW28C-FS	1,392.50	1,392.00	14.4	0.0347	0.013	18.0	0.0	0.0
79	SW28C-FS	1,392.50	1,385.70	189.8	0.0358	0.013	18.0	0.0	0.0
80	SW28C-P	1,384.50	1,384.00	68.9	0.0073	0.013	15.0	0.0	0.0
81	SW31-FS	1,444.60	1,444.50	10.0	0.0100	0.013	18.0	0.0	0.0
82	SW31-FS	1,444.60	1,443.00	48.0	0.0333	0.013	18.0	0.0	0.0
83	SW31-P	1,438.50	1,437.50	87.0	0.0115	0.013	15.0	0.0	0.0

Time span=0.00-168.00 hrs, dt=0.01 hrs, 16801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 21: PR DA 21 Runoff Area=30.406 ac 2.29% Impervious Runoff Depth=0.62"
Flow Length=2,809' Tc=46.3 min UI Adjusted CN=73 Runoff=8.83 cfs 1.577 af

Subcatchment 21A-1: PR DA 21A-1 Runoff Area=0.432 ac 37.27% Impervious Runoff Depth=1.19"
Flow Length=613' Tc=1.8 min CN=84 Runoff=0.70 cfs 0.043 af

Subcatchment 21A-2: PR DA 21A-2 Runoff Area=0.871 ac 35.25% Impervious Runoff Depth=1.33"
Flow Length=613' Tc=1.8 min CN=86 Runoff=1.57 cfs 0.096 af

Subcatchment 21B-1: PR DA 21B-1 Runoff Area=0.428 ac 38.79% Impervious Runoff Depth=1.19"
Flow Length=525' Tc=1.7 min CN=84 Runoff=0.70 cfs 0.043 af

Subcatchment 21B-2: PR DA 21B-2 Runoff Area=0.842 ac 36.34% Impervious Runoff Depth=1.33"
Flow Length=525' Tc=1.7 min CN=86 Runoff=1.53 cfs 0.093 af

Subcatchment 21C: PR DA 21C Runoff Area=39.300 ac 1.38% Impervious Runoff Depth=0.62"
Flow Length=3,341' Tc=68.5 min UI Adjusted CN=73 Runoff=8.98 cfs 2.039 af

Subcatchment 21D: PR DA 21D Runoff Area=7.632 ac 0.00% Impervious Runoff Depth=0.58"
Flow Length=1,018' Tc=42.4 min CN=72 Runoff=2.12 cfs 0.370 af

Subcatchment 21E-1: PR DA 21E-1 Runoff Area=0.450 ac 33.56% Impervious Runoff Depth=1.13"
Flow Length=632' Tc=2.5 min CN=83 Runoff=0.67 cfs 0.042 af

Subcatchment 21E-2: PR DA 21E-2 Runoff Area=0.334 ac 33.53% Impervious Runoff Depth=1.13"
Flow Length=632' Tc=2.5 min CN=83 Runoff=0.50 cfs 0.032 af

Subcatchment 21E-3: PR DA 21E-3 Runoff Area=0.446 ac 33.63% Impervious Runoff Depth=1.13"
Flow Length=632' Tc=2.5 min CN=83 Runoff=0.67 cfs 0.042 af

Subcatchment 21F-1: PR DA 21F-1 Runoff Area=0.384 ac 38.02% Impervious Runoff Depth=1.19"
Flow Length=632' Tc=2.5 min CN=84 Runoff=0.61 cfs 0.038 af

Subcatchment 21F-2: PR DA 21F-2 Runoff Area=0.284 ac 38.03% Impervious Runoff Depth=1.19"
Flow Length=632' Tc=2.5 min CN=84 Runoff=0.45 cfs 0.028 af

Subcatchment 21F-3: PR DA 21F-3 Runoff Area=0.380 ac 38.16% Impervious Runoff Depth=1.19"
Flow Length=632' Tc=2.5 min CN=84 Runoff=0.60 cfs 0.038 af

Subcatchment 21G: PR DA 21G Runoff Area=0.332 ac 43.67% Impervious Runoff Depth=1.19"
Flow Length=340' Tc=2.0 min CN=84 Runoff=0.53 cfs 0.033 af

Subcatchment 21H: PR DA 21H Runoff Area=0.256 ac 46.09% Impervious Runoff Depth=1.26"
Flow Length=434' Tc=2.2 min CN=85 Runoff=0.43 cfs 0.027 af

Subcatchment 23: PR DA 23 Runoff Area=6.968 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=800' Tc=30.3 min CN=70 Runoff=1.87 cfs 0.293 af

Subcatchment 23A-1: PR DA 23A-1 Runoff Area=0.806 ac 24.94% Impervious Runoff Depth=1.01"
Flow Length=424' Tc=1.8 min CN=81 Runoff=1.09 cfs 0.068 af

Subcatchment 23A-2: PR DA 23A-2 Runoff Area=0.696 ac 12.21% Impervious Runoff Depth=0.80"
Flow Length=424' Tc=1.8 min CN=77 Runoff=0.72 cfs 0.047 af

Subcatchment 23B-1: PR DA 23B-1 Runoff Area=0.572 ac 25.87% Impervious Runoff Depth=1.01"
Flow Length=334' Tc=1.5 min CN=81 Runoff=0.78 cfs 0.048 af

Subcatchment 23B-2: PR DA 23B-2 Runoff Area=0.629 ac 25.91% Impervious Runoff Depth=1.01"
Flow Length=334' Tc=1.5 min CN=81 Runoff=0.86 cfs 0.053 af

Subcatchment 23C: PR DA 23C Runoff Area=3.325 ac 0.00% Impervious Runoff Depth=0.80"
Flow Length=820' Tc=32.9 min CN=77 Runoff=1.59 cfs 0.223 af

Subcatchment 23F: PR DA 23F Runoff Area=0.206 ac 47.57% Impervious Runoff Depth=1.33"
Flow Length=384' Tc=1.7 min CN=86 Runoff=0.37 cfs 0.023 af

Subcatchment 23G: PR DA 23G Runoff Area=0.272 ac 39.34% Impervious Runoff Depth=1.19"
Flow Length=377' Tc=1.8 min CN=84 Runoff=0.44 cfs 0.027 af

Subcatchment 23H: PR DA 23H Runoff Area=0.307 ac 35.83% Impervious Runoff Depth=1.19"
Flow Length=458' Tc=2.2 min CN=84 Runoff=0.49 cfs 0.031 af

Subcatchment 23P: PR DA 23P Runoff Area=0.508 ac 0.00% Impervious Runoff Depth=0.67"
Tc=6.0 min CN=74 Runoff=0.35 cfs 0.028 af

Subcatchment 24: PR DA 24 Runoff Area=8.145 ac 0.00% Impervious Runoff Depth=0.62"
Flow Length=737' Tc=26.1 min CN=73 Runoff=3.11 cfs 0.423 af

Subcatchment 24A-1: PR DA 24A-1 Runoff Area=0.595 ac 25.71% Impervious Runoff Depth=1.01"
Flow Length=562' Tc=1.6 min CN=81 Runoff=0.81 cfs 0.050 af

Subcatchment 24A-2: PR DA 24A-2 Runoff Area=0.339 ac 28.02% Impervious Runoff Depth=1.40"
Flow Length=562' Tc=1.6 min CN=87 Runoff=0.65 cfs 0.039 af

Subcatchment 24A-3: PR DA 24A-3 Runoff Area=0.497 ac 27.36% Impervious Runoff Depth=1.97"
Flow Length=562' Tc=1.6 min CN=94 Runoff=1.30 cfs 0.081 af

Subcatchment 24A-4: PR DA 24A-4 Runoff Area=0.704 ac 18.75% Impervious Runoff Depth=1.07"
Flow Length=562' Tc=1.6 min CN=82 Runoff=1.02 cfs 0.063 af

Subcatchment 24B-1: PR DA 24B-1 Runoff Area=0.651 ac 25.35% Impervious Runoff Depth=1.01"
Flow Length=580' Tc=2.6 min CN=81 Runoff=0.86 cfs 0.055 af

Subcatchment 24B-2: PR DA 24B-2 Runoff Area=0.432 ac 22.92% Impervious Runoff Depth=1.26"
Flow Length=580' Tc=2.6 min CN=85 Runoff=0.72 cfs 0.045 af

Subcatchment 24B-3: PR DA 24B-3 Runoff Area=0.464 ac 22.63% Impervious Runoff Depth=1.70"
Flow Length=580' Tc=2.6 min CN=91 Runoff=1.04 cfs 0.066 af

Subcatchment 24B-4: PR DA 24B-4 Runoff Area=0.955 ac 19.79% Impervious Runoff Depth=1.01"
Flow Length=580' Tc=2.6 min CN=81 Runoff=1.26 cfs 0.081 af

Subcatchment 24C: PR DA 24C Runoff Area=6.956 ac 0.00% Impervious Runoff Depth=0.54"
Flow Length=700' Tc=32.6 min CN=71 Runoff=2.00 cfs 0.314 af

Subcatchment 24P: 24P Runoff Area=0.848 ac 0.00% Impervious Runoff Depth=0.80"
Tc=6.0 min CN=77 Runoff=0.75 cfs 0.057 af

Subcatchment 25: PR DA 25 Runoff Area=3.905 ac 0.00% Impervious Runoff Depth=0.62"
Flow Length=491' Tc=25.5 min CN=73 Runoff=1.51 cfs 0.203 af

Subcatchment 25A-1: PR DA 25A-1 Runoff Area=1.199 ac 23.44% Impervious Runoff Depth=0.91"
Flow Length=333' Tc=1.7 min CN=79 Runoff=1.43 cfs 0.090 af

Subcatchment 25A-2: PR DA 25A-2 Runoff Area=0.683 ac 32.06% Impervious Runoff Depth=1.01"
Flow Length=333' Tc=1.7 min CN=81 Runoff=0.93 cfs 0.058 af

Subcatchment 25B-1: PR DA 25B-1 Runoff Area=1.232 ac 21.27% Impervious Runoff Depth=0.96"
Flow Length=337' Tc=1.9 min CN=80 Runoff=1.56 cfs 0.098 af

Subcatchment 25B-2: PR DA 25B-2 Runoff Area=0.740 ac 23.11% Impervious Runoff Depth=0.96"
Flow Length=337' Tc=1.9 min CN=80 Runoff=0.94 cfs 0.059 af

Subcatchment 25C: PR DA 25C Runoff Area=3.283 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=200' Slope=0.0400 '/' Tc=16.7 min CN=70 Runoff=1.11 cfs 0.138 af

Subcatchment 25D: PR DA 25D Runoff Area=1.734 ac 0.00% Impervious Runoff Depth=0.54"
Flow Length=225' Tc=17.4 min CN=71 Runoff=0.64 cfs 0.078 af

Subcatchment 26: PR DA 26 Runoff Area=4.040 ac 0.00% Impervious Runoff Depth=0.62"
Flow Length=920' Tc=49.3 min CN=73 Runoff=1.13 cfs 0.210 af

Subcatchment 26A-1: PR DA 26A-1 Runoff Area=17,991 sf 27.15% Impervious Runoff Depth=0.96"
Flow Length=800' Tc=2.7 min CN=80 Runoff=0.51 cfs 0.033 af

Subcatchment 26A-2: PR DA 26A-2 Runoff Area=0.535 ac 26.17% Impervious Runoff Depth=0.96"
Flow Length=800' Tc=2.7 min CN=80 Runoff=0.66 cfs 0.043 af

Subcatchment 26A-3: PR DA 26A-3 Runoff Area=0.119 ac 93.28% Impervious Runoff Depth=2.26"
Flow Length=800' Tc=2.7 min CN=97 Runoff=0.33 cfs 0.022 af

Subcatchment 26B-1: PR DA 26B-1 Runoff Area=0.345 ac 28.41% Impervious Runoff Depth=1.07"
Flow Length=800' Tc=2.7 min CN=82 Runoff=0.48 cfs 0.031 af

Subcatchment 26B-2: PR DA 26B-2 Runoff Area=0.425 ac 28.47% Impervious Runoff Depth=1.07"
Flow Length=800' Tc=2.7 min CN=82 Runoff=0.59 cfs 0.038 af

Subcatchment 26B-3: PR DA 26B-3 Runoff Area=0.119 ac 93.28% Impervious Runoff Depth=2.26"
Flow Length=800' Tc=2.7 min CN=97 Runoff=0.33 cfs 0.022 af

Subcatchment 26C: PR DA 26C Runoff Area=0.445 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=236' Tc=17.4 min CN=70 Runoff=0.15 cfs 0.019 af

Subcatchment 26D: PR DA 26D Runoff Area=1.151 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=1,038' Tc=36.7 min CN=70 Runoff=0.28 cfs 0.048 af

Subcatchment 26E: PR DA 26E Runoff Area=2.170 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=735' Tc=46.1 min CN=74 Runoff=0.69 cfs 0.120 af

Subcatchment 26F: PR DA 26F Runoff Area=0.087 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=70' Slope=0.0800 '/' Tc=5.7 min CN=74 Runoff=0.06 cfs 0.005 af

Subcatchment 26G: PR DA 26G Runoff Area=1.464 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=495' Tc=25.3 min CN=70 Runoff=0.42 cfs 0.061 af

Subcatchment 28A: PR DA 28A Runoff Area=1.501 ac 21.59% Impervious Runoff Depth=0.91"
Flow Length=1,280' Tc=13.4 min CN=79 Runoff=1.20 cfs 0.113 af

Subcatchment 28B: PR DA 28B Runoff Area=0.520 ac 47.88% Impervious Runoff Depth=1.26"
Flow Length=433' Tc=1.7 min CN=85 Runoff=0.89 cfs 0.055 af

Subcatchment 28C: PR DA 28C Runoff Area=0.435 ac 100.00% Impervious Runoff Depth=2.37"
Flow Length=525' Tc=1.9 min CN=98 Runoff=1.26 cfs 0.086 af

Subcatchment 28D: PR DA 28D Runoff Area=0.231 ac 100.00% Impervious Runoff Depth=2.37"
Flow Length=335' Tc=1.7 min CN=98 Runoff=0.68 cfs 0.046 af

Subcatchment 28E: PR DA 28E Runoff Area=0.127 ac 100.00% Impervious Runoff Depth=2.37"
Flow Length=390' Tc=1.6 min CN=98 Runoff=0.37 cfs 0.025 af

Subcatchment 28F: PR DA 28F Runoff Area=3.829 ac 1.57% Impervious Runoff Depth=0.54"
Flow Length=862' Tc=28.4 min CN=71 Runoff=1.17 cfs 0.173 af

Subcatchment 28G: PR DA 28G Runoff Area=0.127 ac 100.00% Impervious Runoff Depth=2.37"
Flow Length=339' Tc=1.3 min CN=98 Runoff=0.38 cfs 0.025 af

Subcatchment 28H: PR DA 28H Runoff Area=0.126 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=305' Tc=9.6 min CN=74 Runoff=0.08 cfs 0.007 af

Subcatchment 28I: PR DA 28I Runoff Area=0.137 ac 100.00% Impervious Runoff Depth=2.37"
Flow Length=283' Tc=1.2 min CN=98 Runoff=0.41 cfs 0.027 af

Subcatchment 31: PR DA 31 Runoff Area=2.152 ac 3.39% Impervious Runoff Depth=0.67"
Flow Length=708' Tc=51.5 min CN=74 Runoff=0.64 cfs 0.119 af

Subcatchment 31A: PR DA 31A Runoff Area=0.071 ac 100.00% Impervious Runoff Depth=2.37"
Flow Length=190' Tc=0.9 min CN=98 Runoff=0.21 cfs 0.014 af

Subcatchment 31B: PR DA 31B Runoff Area=0.069 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=186' Tc=10.8 min CN=74 Runoff=0.04 cfs 0.004 af

Subcatchment 31C: PR DA 31C Runoff Area=0.080 ac 100.00% Impervious Runoff Depth=2.37"
Flow Length=150' Slope=0.0670 '/' Tc=1.0 min CN=98 Runoff=0.24 cfs 0.016 af

Subcatchment 31D: PR DA 31D Runoff Area=0.537 ac 58.47% Impervious Runoff Depth=1.47"
Flow Length=397' Tc=2.3 min CN=88 Runoff=1.06 cfs 0.066 af

Subcatchment SW21A: PR DA SW21A Runoff Area=0.814 ac 0.00% Impervious Runoff Depth=0.67"
Tc=6.0 min CN=74 Runoff=0.57 cfs 0.045 af

Subcatchment SW21B: PR DA SW21B Runoff Area=0.612 ac 0.00% Impervious Runoff Depth=0.67"
Tc=6.0 min CN=74 Runoff=0.43 cfs 0.034 af

Subcatchment SW21C: PR DA SW21C Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.67"
Tc=6.0 min CN=74 Runoff=0.08 cfs 0.006 af

Subcatchment SW23A: PR DA SW23A Runoff Area=0.056 ac 0.00% Impervious Runoff Depth=0.67"
Tc=6.0 min CN=74 Runoff=0.04 cfs 0.003 af

Subcatchment SW23B: PR DA SW23B Runoff Area=0.093 ac 0.00% Impervious Runoff Depth=0.67"
Tc=6.0 min CN=74 Runoff=0.06 cfs 0.005 af

Subcatchment SW28A: PR DA SW28A Runoff Area=0.081 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=64' Slope=0.1000 '/' Tc=4.8 min CN=74 Runoff=0.06 cfs 0.004 af

Subcatchment SW28B: PR DA SW28B Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.10 cfs 0.006 af

Subcatchment SW28C: PR DA SW28C Runoff Area=0.097 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.08 cfs 0.005 af

Subcatchment SW28D: PR DA SW28D Runoff Area=0.378 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.32 cfs 0.021 af

Subcatchment SW31: PR DA SW31 Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=0.67"
Flow Length=20' Slope=0.0500 '/' Tc=2.5 min CN=74 Runoff=0.05 cfs 0.003 af

Reach 30R: DP-9 Inflow=0.64 cfs 0.125 af
Outflow=0.64 cfs 0.125 af

Reach 36R: DP-1 Inflow=1.20 cfs 0.398 af
Outflow=1.20 cfs 0.398 af

Reach 41R: DP-26 Inflow=1.53 cfs 0.575 af
Outflow=1.53 cfs 0.575 af

Reach 46R: DP-25 Inflow=2.88 cfs 0.505 af
Outflow=2.88 cfs 0.505 af

Reach 51R: DP-24 Inflow=3.15 cfs 1.290 af
Outflow=3.15 cfs 1.290 af

Reach 56R: DP-23 Inflow=1.89 cfs 0.620 af
Outflow=1.89 cfs 0.620 af

Reach 61R: DP-21 Inflow=18.59 cfs 4.425 af
Outflow=18.59 cfs 4.425 af

Pond 21A-P: Pond-21A Peak Elev=1,377.56' Storage=13,905 cf Inflow=4.38 cfs 0.274 af
Primary=0.03 cfs 0.241 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.241 af

Pond 21B-P: Pond-21B Peak Elev=1,378.71' Storage=20,004 cf Inflow=4.18 cfs 0.237 af
Primary=0.02 cfs 0.198 af Secondary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.198 af

Pond 23-P: Pond-23 Peak Elev=1,382.69' Storage=24,632 cf Inflow=3.53 cfs 0.392 af
Outflow=0.03 cfs 0.324 af

Pond 24-P: Pond-24 Peak Elev=1,366.03' Storage=25,655 cf Inflow=6.95 cfs 0.793 af
Primary=1.13 cfs 0.867 af Secondary=0.00 cfs 0.000 af Outflow=1.13 cfs 0.867 af

Pond 26-P: Pond-26 Peak Elev=1,372.06' Storage=28,761 cf Inflow=2.96 cfs 0.358 af
Outflow=0.08 cfs 0.281 af

Pond 28-P: Pond-28 Peak Elev=1,375.39' Storage=12,397 cf Inflow=2.94 cfs 0.220 af
Outflow=0.03 cfs 0.219 af

Pond BRA-46: BRA-46 Peak Elev=1,370.52' Storage=2,599 cf Inflow=1.30 cfs 0.096 af
Outflow=0.10 cfs 0.037 af

Pond BRA-46-FS: Flow Splitter for BRA-46 Peak Elev=1,372.07' Inflow=1.65 cfs 0.105 af
Primary=1.30 cfs 0.096 af Secondary=0.35 cfs 0.010 af Outflow=1.65 cfs 0.105 af

Pond BRA-59: BRA-59 Peak Elev=1,381.14' Storage=3,122 cf Inflow=0.59 cfs 0.072 af
Outflow=0.00 cfs 0.000 af

Pond BRA-59-FS: Flow Splitter for BRA-59 Peak Elev=1,382.16' Inflow=1.40 cfs 0.086 af
Primary=0.59 cfs 0.072 af Secondary=0.80 cfs 0.014 af Outflow=1.40 cfs 0.086 af

Pond BRA37-FS: Flow Splitter for BRA-37 Peak Elev=1,386.20' Inflow=2.60 cfs 0.351 af
Primary=1.23 cfs 0.266 af Secondary=1.38 cfs 0.085 af Outflow=2.60 cfs 0.351 af

Pond BRA37-P: BRA-37 Peak Elev=1,385.56' Storage=5,227 cf Inflow=1.23 cfs 0.266 af
Outflow=0.38 cfs 0.152 af

Pond BRA38-P: BRA-38 Peak Elev=1,385.02' Storage=4,635 cf Inflow=2.49 cfs 0.158 af
Primary=0.11 cfs 0.041 af Secondary=0.03 cfs 0.012 af Outflow=0.14 cfs 0.053 af

Pond BRA50-FS: Flow Splitter for BRA-50 Peak Elev=1,386.62' Inflow=1.92 cfs 0.324 af
Primary=0.88 cfs 0.239 af Secondary=1.04 cfs 0.085 af Outflow=1.92 cfs 0.324 af

Pond BRA50-P: BRA-50 Peak Elev=1,386.06' Storage=3,754 cf Inflow=0.88 cfs 0.239 af
Outflow=0.43 cfs 0.156 af

Pond SW21C-FS: Flow Splitter for SW21C Peak Elev=1,404.85' Inflow=0.97 cfs 0.060 af
Primary=0.51 cfs 0.051 af Secondary=0.46 cfs 0.009 af Outflow=0.97 cfs 0.060 af

Pond SW21C-P: BRA-SW21C Peak Elev=1,402.70' Storage=2,501 cf Inflow=0.57 cfs 0.057 af
Outflow=0.00 cfs 0.000 af

Pond SW23A-FS: Flow Splitter for SW23A Peak Elev=1,383.98' Inflow=0.37 cfs 0.023 af
Primary=0.18 cfs 0.020 af Secondary=0.20 cfs 0.003 af Outflow=0.37 cfs 0.023 af

Pond SW23A-P: BRA-SW23A Peak Elev=1,383.08' Storage=986 cf Inflow=0.21 cfs 0.023 af
Outflow=0.00 cfs 0.000 af

Pond SW23B-FS: Flow Splitter for SW23B Peak Elev=1,388.85' Inflow=0.93 cfs 0.058 af
Primary=0.49 cfs 0.049 af Secondary=0.44 cfs 0.008 af Outflow=0.93 cfs 0.058 af

Pond SW23B-P: BRA-SW23B Peak Elev=1,387.48' Storage=2,372 cf Inflow=0.54 cfs 0.054 af
Outflow=0.00 cfs 0.000 af

Pond SW28A-FS: Flow Splitter for SW28A Peak Elev=1,435.94' Inflow=0.47 cfs 0.034 af
Primary=0.34 cfs 0.033 af Secondary=0.12 cfs 0.001 af Outflow=0.47 cfs 0.034 af

Pond SW28A-P: BRA-SW28A Peak Elev=1,435.50' Storage=1,520 cf Inflow=0.39 cfs 0.037 af
Outflow=0.01 cfs 0.002 af

Pond SW28B-FS: Flow Splitter for SW28B Peak Elev=1,412.37' Inflow=0.82 cfs 0.059 af
Primary=0.56 cfs 0.057 af Secondary=0.25 cfs 0.002 af Outflow=0.82 cfs 0.059 af

Pond SW28B-P: BRA-SW28B Peak Elev=1,407.84' Storage=2,764 cf Inflow=0.65 cfs 0.063 af
Outflow=0.00 cfs 0.000 af

Pond SW28C-FS: Flow Splitter for SW28C Peak Elev=1,393.11' Inflow=1.94 cfs 0.132 af
Primary=1.43 cfs 0.128 af Secondary=0.50 cfs 0.004 af Outflow=1.94 cfs 0.132 af

Pond SW28C-P: BRA-SW28C Peak Elev=1,390.51' Storage=5,681 cf Inflow=1.51 cfs 0.133 af
Outflow=0.02 cfs 0.003 af

Pond SW31-FS: Flow Splitter for SW31 Peak Elev=1,445.01' Inflow=1.06 cfs 0.066 af
Primary=0.60 cfs 0.061 af Secondary=0.45 cfs 0.005 af Outflow=1.06 cfs 0.066 af

Pond SW31-P: BRA-SW31 Peak Elev=1,444.01' Storage=2,764 cf Inflow=0.65 cfs 0.064 af
Outflow=0.01 cfs 0.001 af

Total Runoff Area = 154.106 ac Runoff Volume = 8.942 af Average Runoff Depth = 0.70"
94.10% Pervious = 145.015 ac 5.90% Impervious = 9.091 ac

Summary for Subcatchment 21: PR DA 21

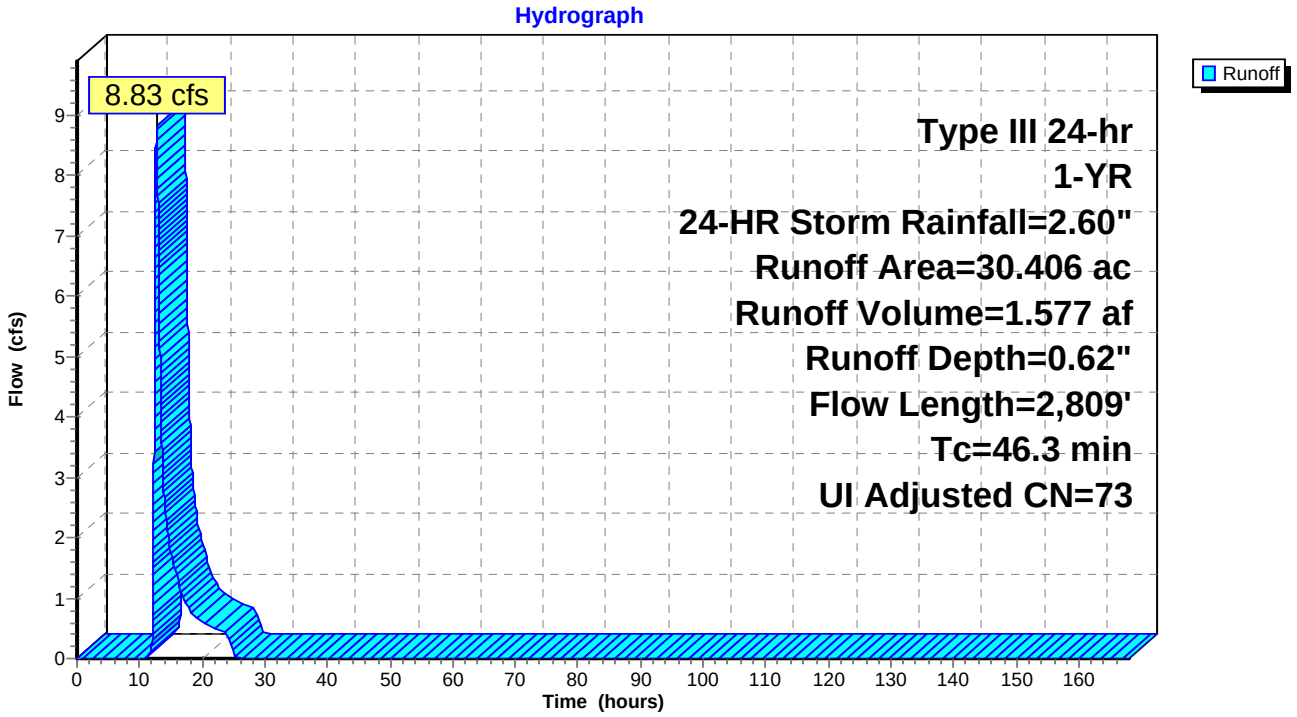
Runoff = 8.83 cfs @ 12.71 hrs, Volume= 1.577 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.695	98	Unconnected pavement, HSG C
10.838	74	>75% Grass cover, Good, HSG C
1.499	71	Meadow, non-grazed, HSG C
11.674	70	Woods, Good, HSG C
0.204	80	Pasture/grassland/range, Good, HSG D
1.601	78	Meadow, non-grazed, HSG D
3.895	77	Woods, Good, HSG D
30.406	74	Weighted Average, UI Adjusted CN = 73
29.711		97.71% Pervious Area
0.695		2.29% Impervious Area
0.695		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0467	0.28		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
31.3	1,500	0.0255	0.80		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
5.9	969	0.0114	2.75	4.13	**Channel Flow, Rivulet** Area= 1.5 sf Perim= 4.0' r= 0.38' n= 0.030
0.2	190	0.0239	12.74	64.94	**Pipe Channel, RCP_Elliptical 38x24** 38.0" x 24.0", R=31.2" Elliptical Area= 5.1 sf Perim= 8.3' r= 0.61' n= 0.013
46.3	2,809	Total			

Subcatchment 21: PR DA 21



Summary for Subcatchment 21A-1: PR DA 21A-1

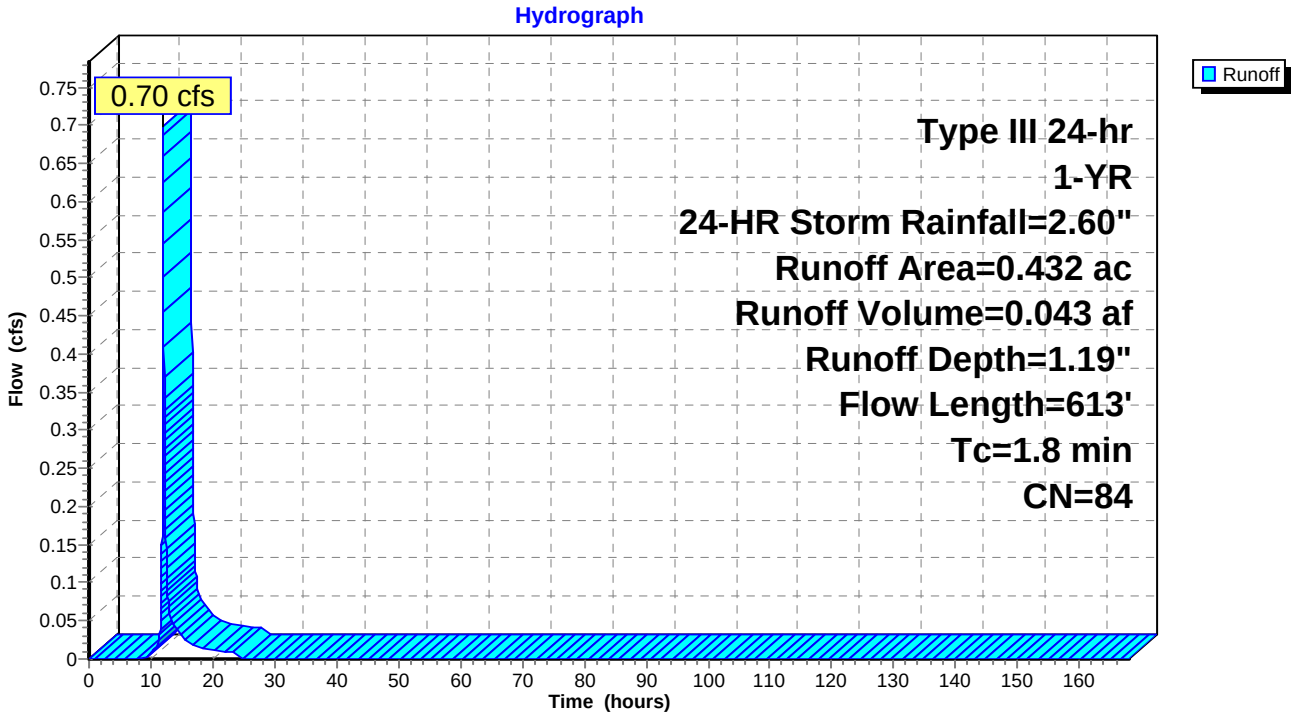
Runoff = 0.70 cfs @ 12.03 hrs, Volume= 0.043 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.242	74	>75% Grass cover, Good, HSG C
0.161	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.432	84	Weighted Average
0.271		62.73% Pervious Area
0.161		37.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.32		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	150	0.0360	7.97	65.36	**Channel Flow, SCF** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	408	0.0200	8.80	10.80	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.8	613	Total			

Subcatchment 21A-1: PR DA 21A-1



Summary for Subcatchment 21A-2: PR DA 21A-2

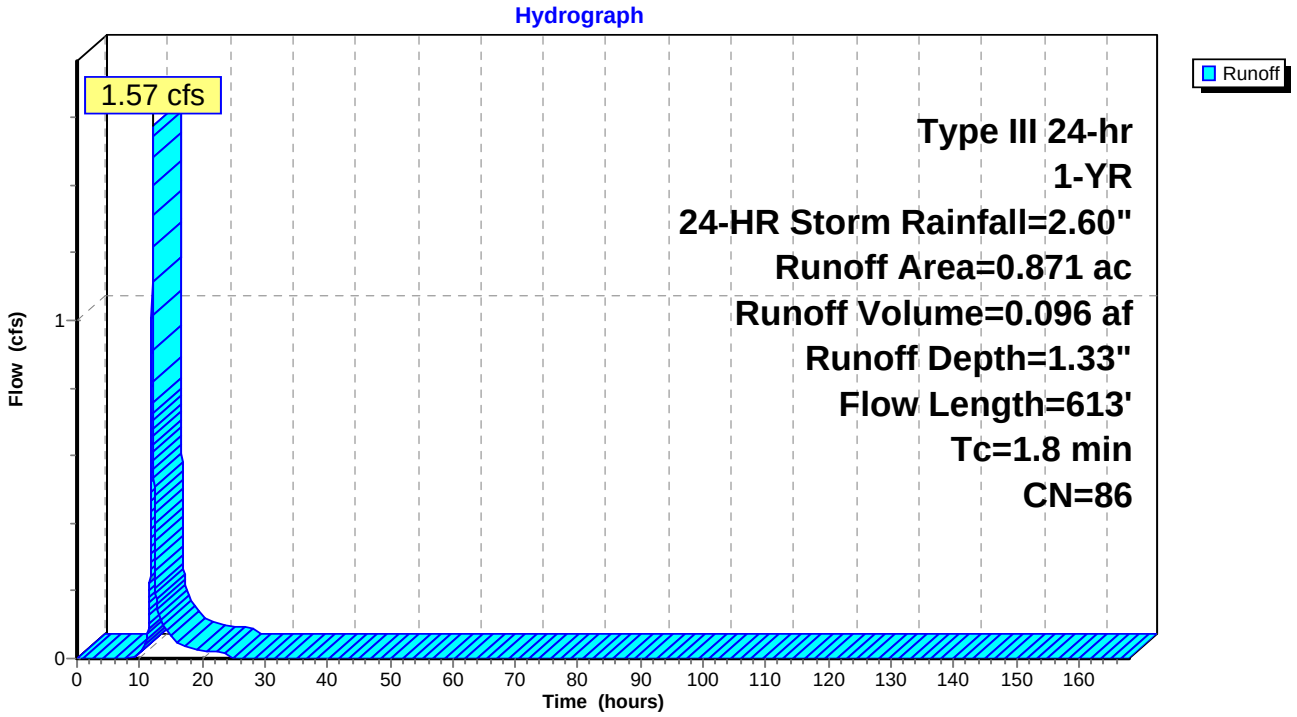
Runoff = 1.57 cfs @ 12.03 hrs, Volume= 0.096 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.134	74	>75% Grass cover, Good, HSG C
0.081	98	Paved roads w/curbs & sewers, HSG C
0.015	89	Gravel Shoulder, HSG C
0.374	80	>75% Grass cover, Good, HSG D
0.226	98	Paved roads w/curbs & sewers, HSG D
0.041	91	Gravel Shoulder, HSG D
0.871	86	Weighted Average
0.564		64.75% Pervious Area
0.307		35.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.32		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	150	0.0360	7.97	65.36	**Channel Flow, SCF** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	408	0.0200	8.80	10.80	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.8	613	Total			

Subcatchment 21A-2: PR DA 21A-2



Summary for Subcatchment 21B-1: PR DA 21B-1

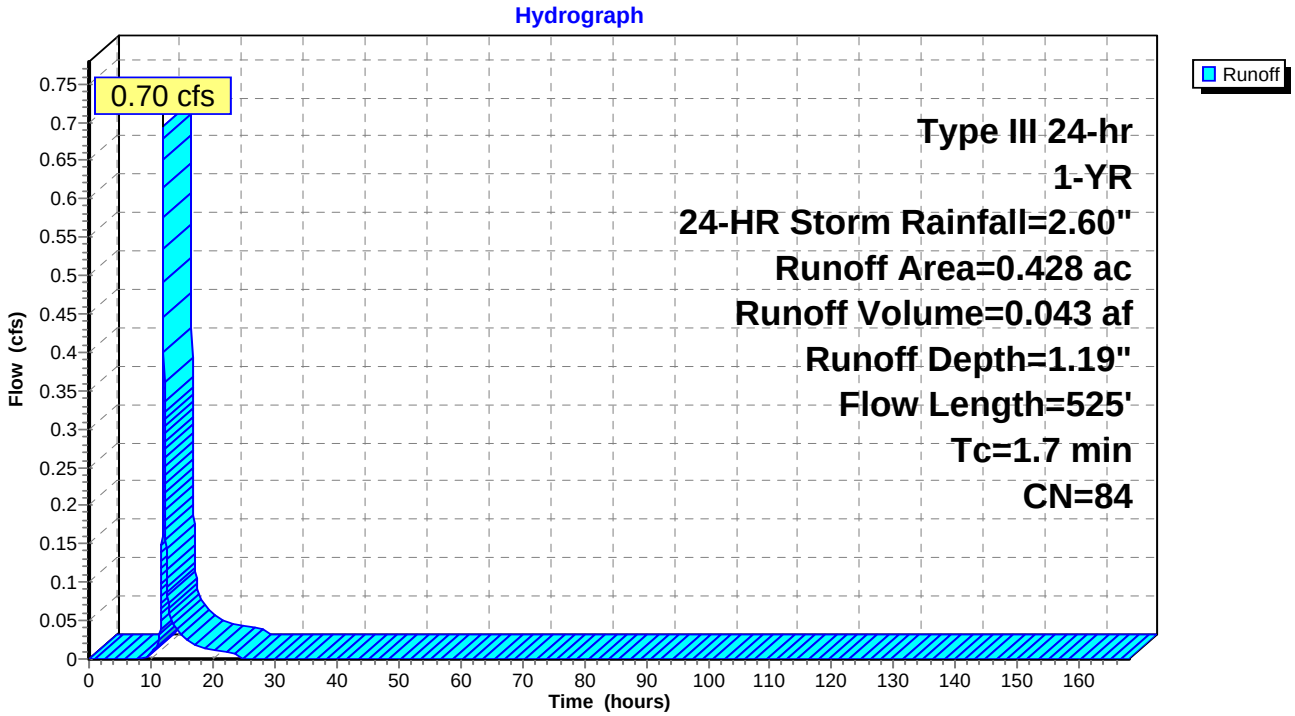
Runoff = 0.70 cfs @ 12.03 hrs, Volume= 0.043 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.232	74	>75% Grass cover, Good, HSG C
	0.166	98	Paved roads w/curbs & sewers, HSG C
*	0.030	89	Gravel Shoulder, HSG C
	0.428	84	Weighted Average
	0.262		61.21% Pervious Area
	0.166		38.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	45	0.0200	1.27		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	160	0.0300	7.28	59.66	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.7	320	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	525	Total			

Subcatchment 21B-1: PR DA 21B-1



Summary for Subcatchment 21B-2: PR DA 21B-2

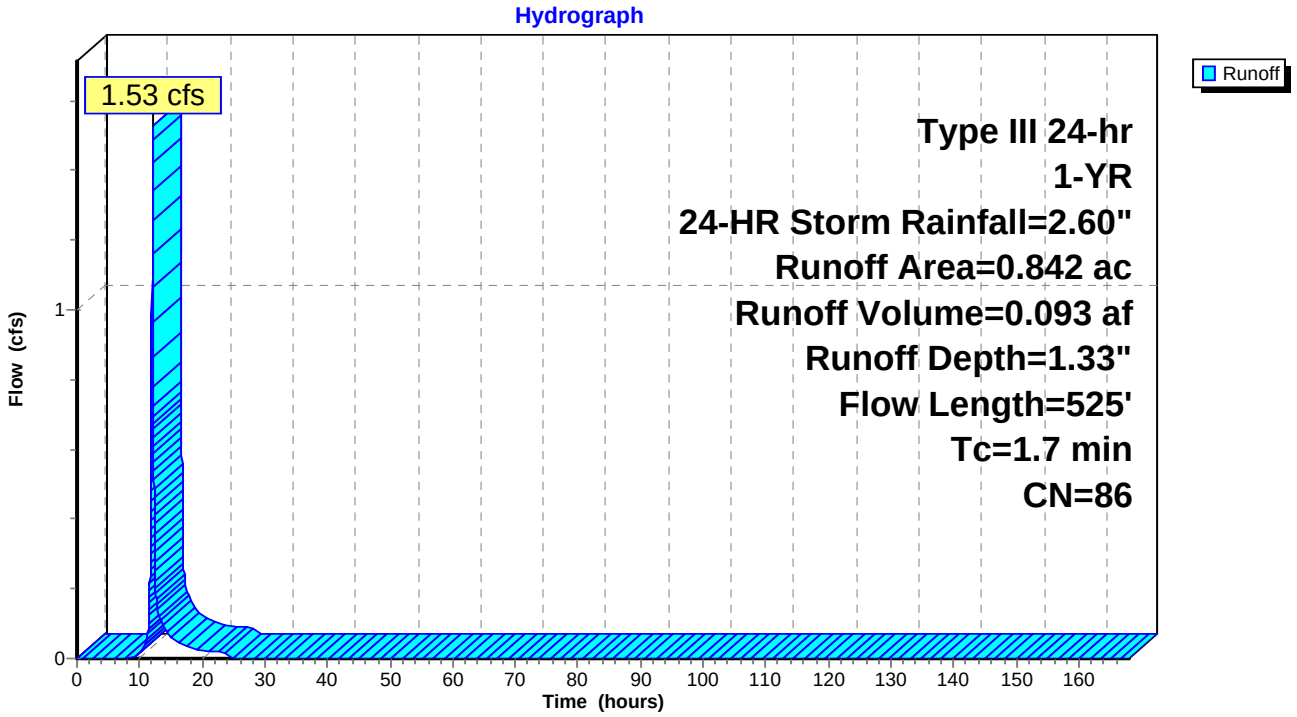
Runoff = 1.53 cfs @ 12.03 hrs, Volume= 0.093 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.011	70	Woods, Good, HSG C
	0.148	74	>75% Grass cover, Good, HSG C
	0.097	98	Paved roads w/curbs & sewers, HSG C
*	0.018	89	Gravel Shoulder, HSG C
	0.012	77	Woods, Good, HSG D
	0.309	80	>75% Grass cover, Good, HSG D
	0.209	98	Paved roads w/curbs & sewers, HSG D
	0.038	91	Gravel roads, HSG D
	0.842	86	Weighted Average
	0.536		63.66% Pervious Area
	0.306		36.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	45	0.0200	1.27		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	160	0.0300	7.28	59.66	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.7	320	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	525	Total			

Subcatchment 21B-2: PR DA 21B-2



Summary for Subcatchment 21C: PR DA 21C

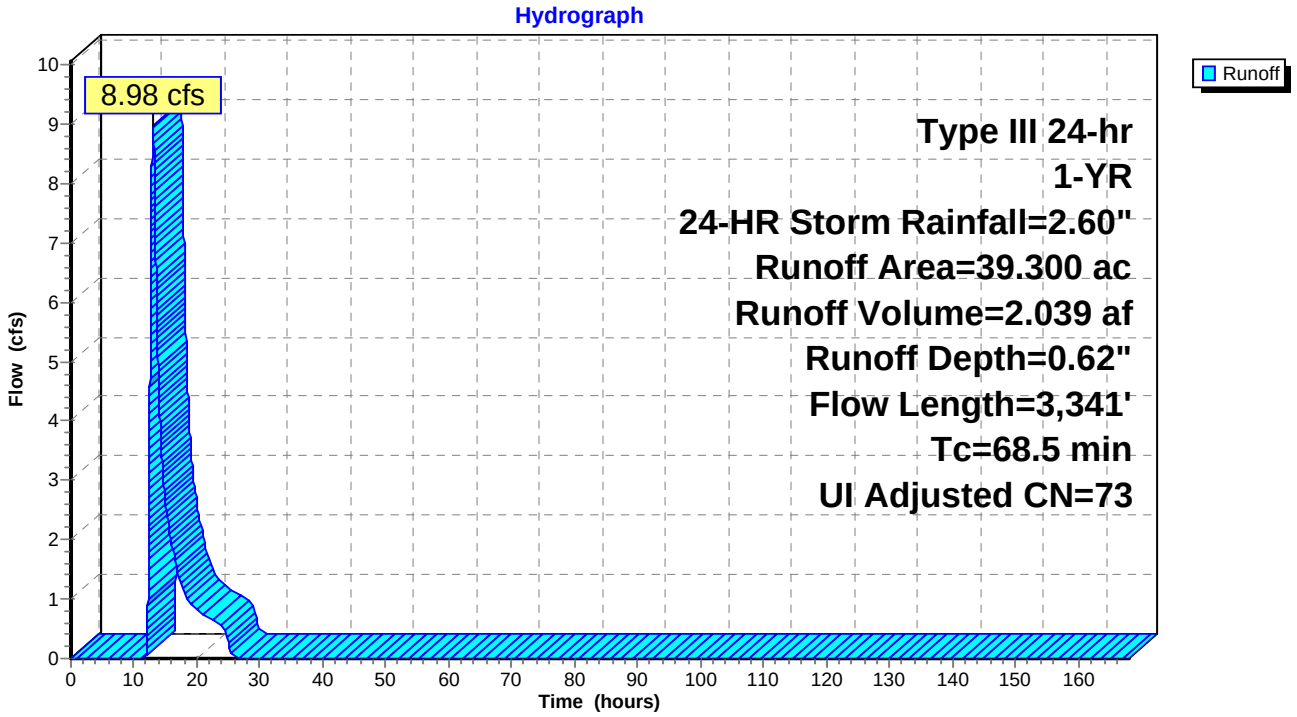
Runoff = 8.98 cfs @ 13.02 hrs, Volume= 2.039 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.541	98	Unconnected pavement, HSG C
31.045	74	>75% Grass cover, Good, HSG C
0.010	74	Pasture/grassland/range, Good, HSG C
0.136	71	Meadow, non-grazed, HSG C
7.568	70	Woods, Good, HSG C
39.300	74	Weighted Average, UI Adjusted CN = 73
38.759		98.62% Pervious Area
0.541		1.38% Impervious Area
0.541		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	150	0.0200	0.20		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
55.7	2,976	0.0317	0.89		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.3	215	0.0326	12.85	42.18	**Pipe Channel, RCP_Elliptical 30x19** 30.0" x 19.0", R=33.5" Elliptical Area= 3.3 sf Perim= 6.7' r= 0.49' n= 0.013
68.5	3,341	Total			

Subcatchment 21C: PR DA 21C



Summary for Subcatchment 21D: PR DA 21D

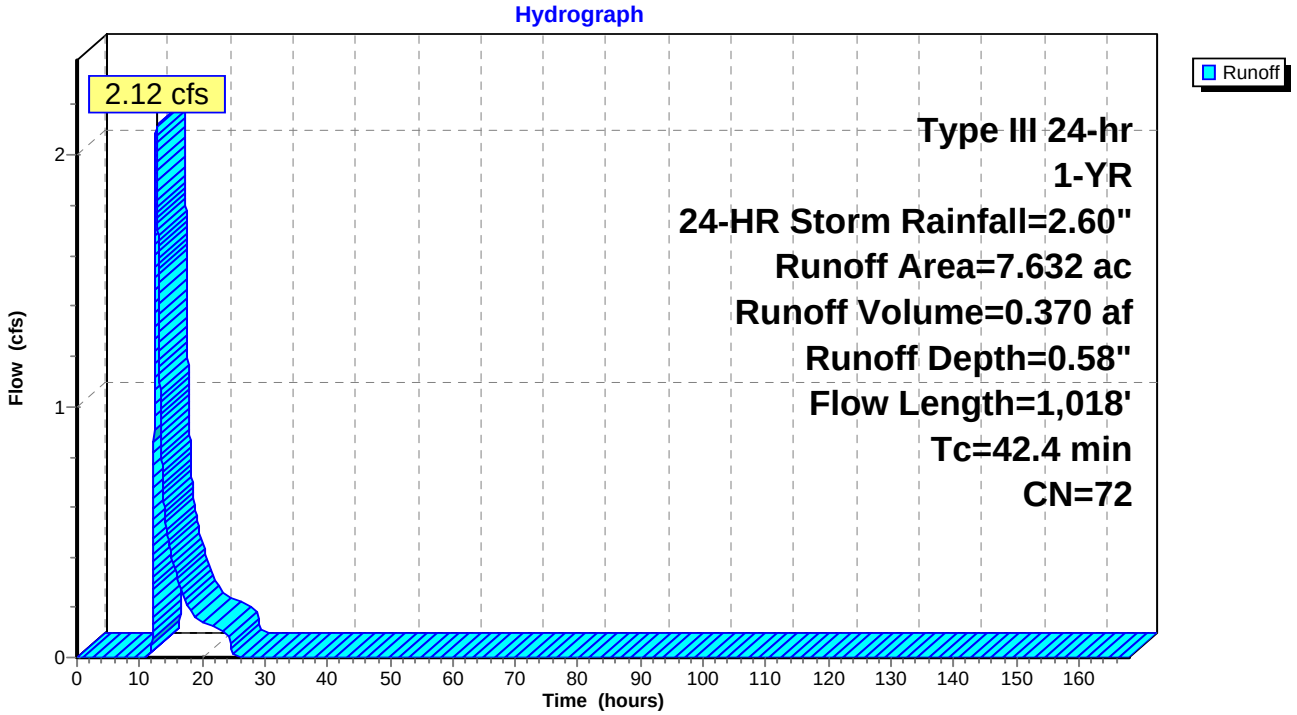
Runoff = 2.12 cfs @ 12.67 hrs, Volume= 0.370 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.065	65	Brush, Good, HSG C
0.260	74	>75% Grass cover, Good, HSG C
3.187	71	Meadow, non-grazed, HSG C
3.137	70	Woods, Good, HSG C
0.004	73	Brush, Good, HSG D
0.631	78	Meadow, non-grazed, HSG D
0.322	77	Woods, Good, HSG D
0.026	80	>75% Grass cover, Good, HSG D
7.632	72	Weighted Average
7.632		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	150	0.0300	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
19.1	868	0.0230	0.76		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
42.4	1,018	Total			

Subcatchment 21D: PR DA 21D



Summary for Subcatchment 21E-1: PR DA 21E-1

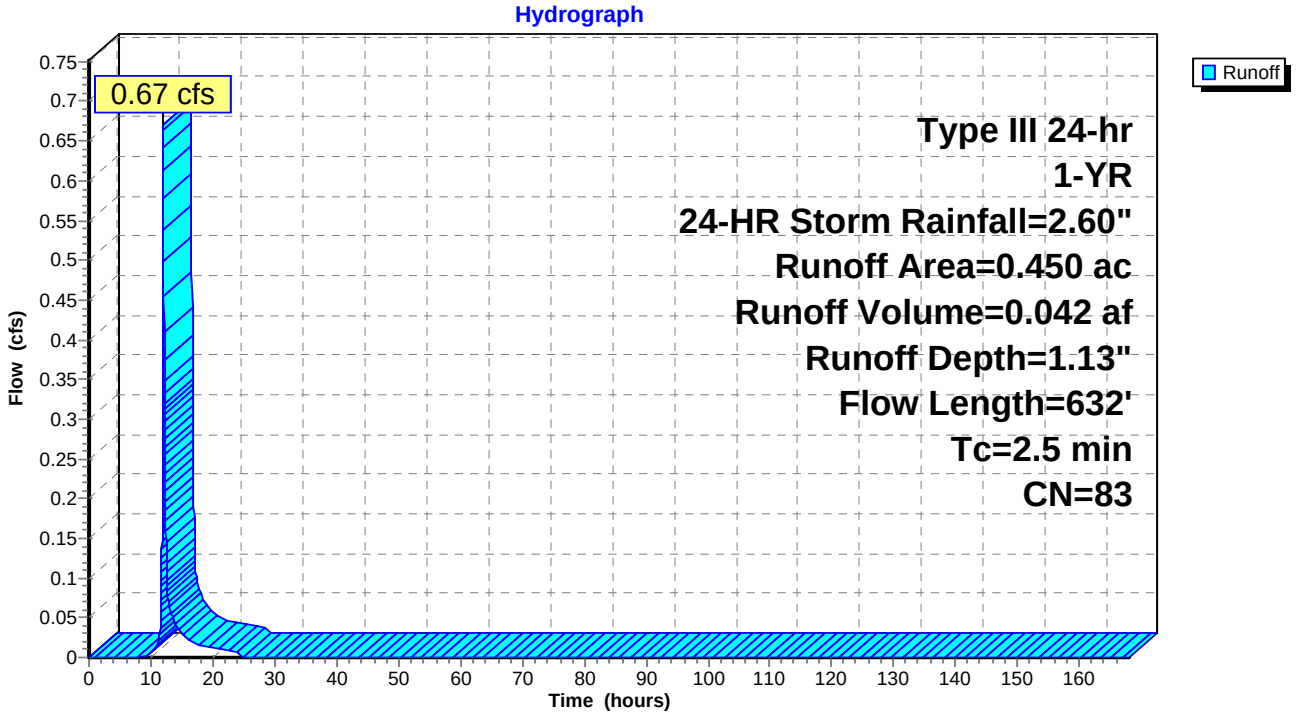
Runoff = 0.67 cfs @ 12.04 hrs, Volume= 0.042 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.007	70	Woods, Good, HSG C
	0.265	74	>75% Grass cover, Good, HSG C
	0.151	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.450	83	Weighted Average
	0.299		66.44% Pervious Area
	0.151		33.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-1: PR DA 21E-1



Summary for Subcatchment 21E-2: PR DA 21E-2

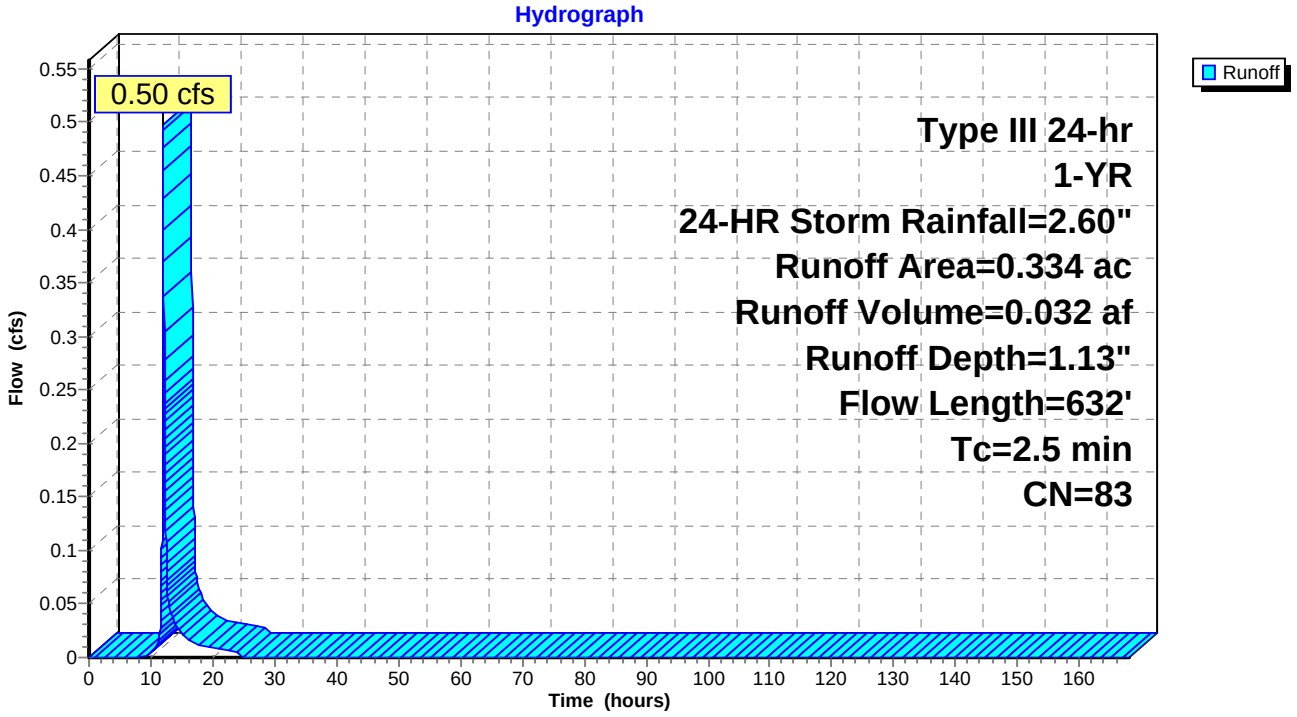
Runoff = 0.50 cfs @ 12.04 hrs, Volume= 0.032 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.005	70	Woods, Good, HSG C
	0.197	74	>75% Grass cover, Good, HSG C
	0.112	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.334	83	Weighted Average
	0.222		66.47% Pervious Area
	0.112		33.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-2: PR DA 21E-2



Summary for Subcatchment 21E-3: PR DA 21E-3

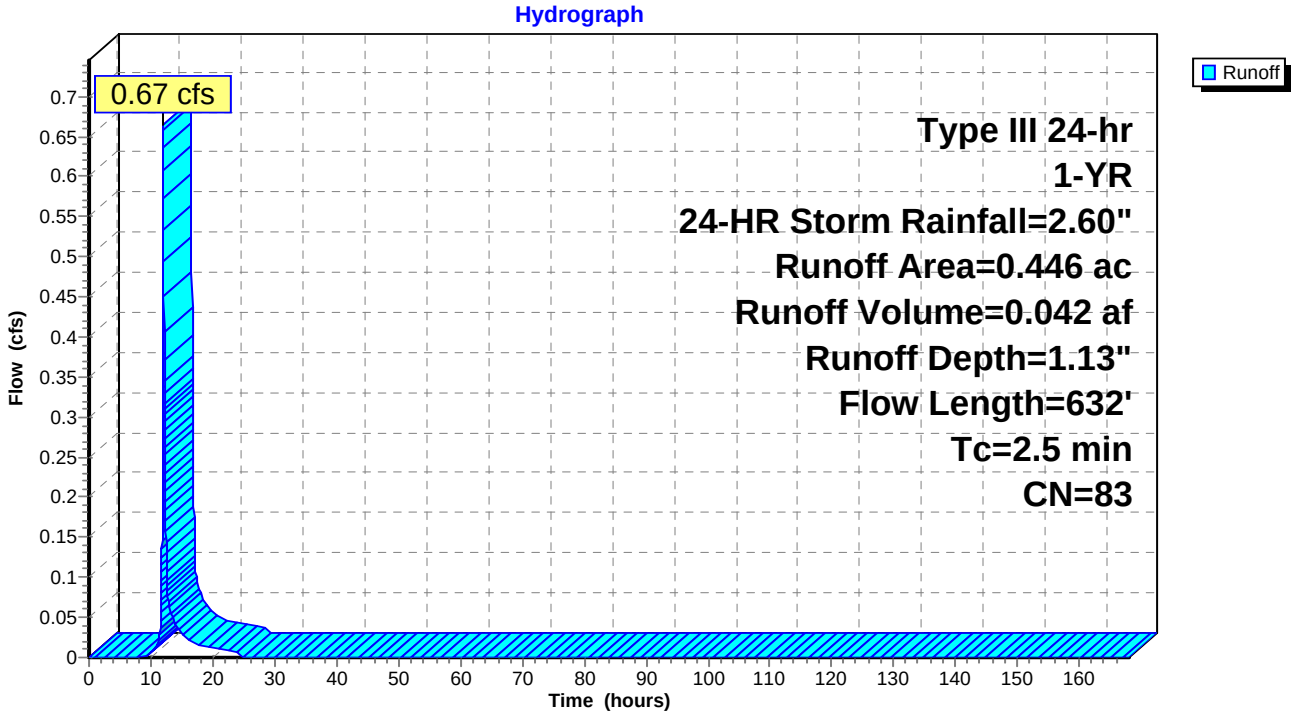
Runoff = 0.67 cfs @ 12.04 hrs, Volume= 0.042 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.006	70	Woods, Good, HSG C
	0.263	74	>75% Grass cover, Good, HSG C
	0.150	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.446	83	Weighted Average
	0.296		66.37% Pervious Area
	0.150		33.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-3: PR DA 21E-3



Summary for Subcatchment 21F-1: PR DA 21F-1

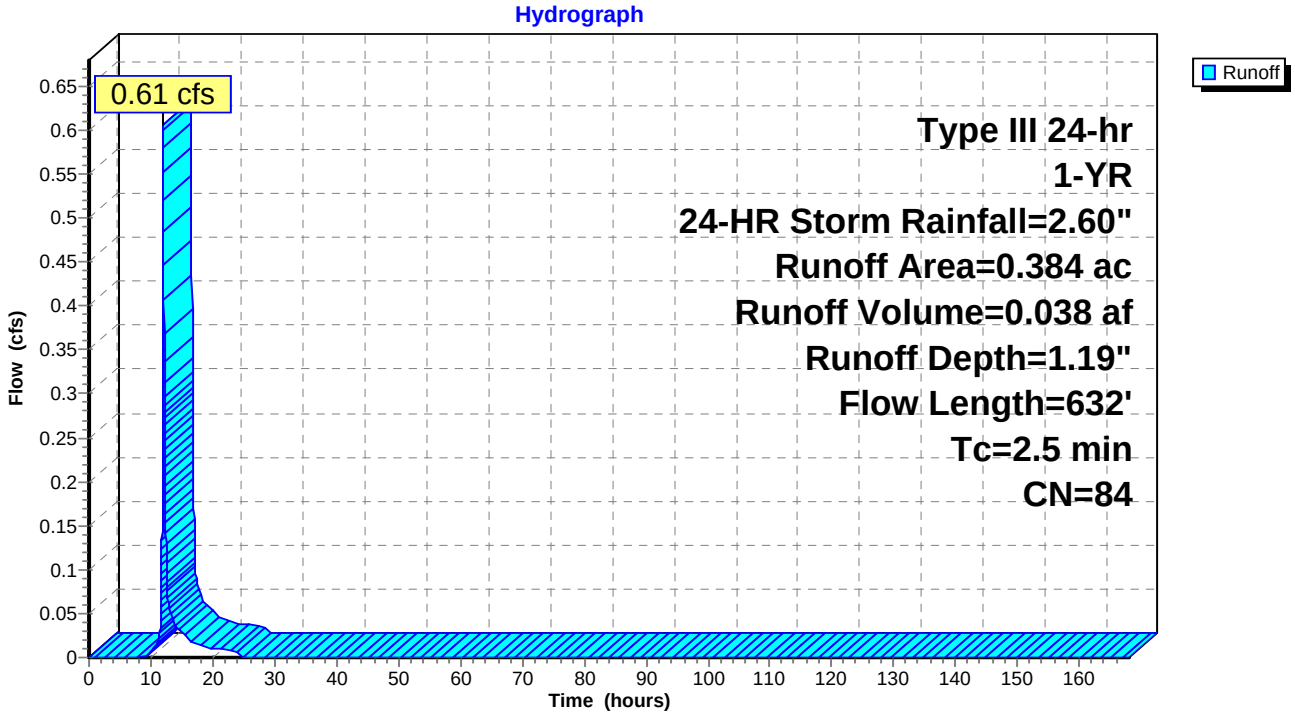
Runoff = 0.61 cfs @ 12.04 hrs, Volume= 0.038 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.004	70	Woods, Good, HSG C
	0.207	74	>75% Grass cover, Good, HSG C
	0.146	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.384	84	Weighted Average
	0.238		61.98% Pervious Area
	0.146		38.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-1: PR DA 21F-1



Summary for Subcatchment 21F-2: PR DA 21F-2

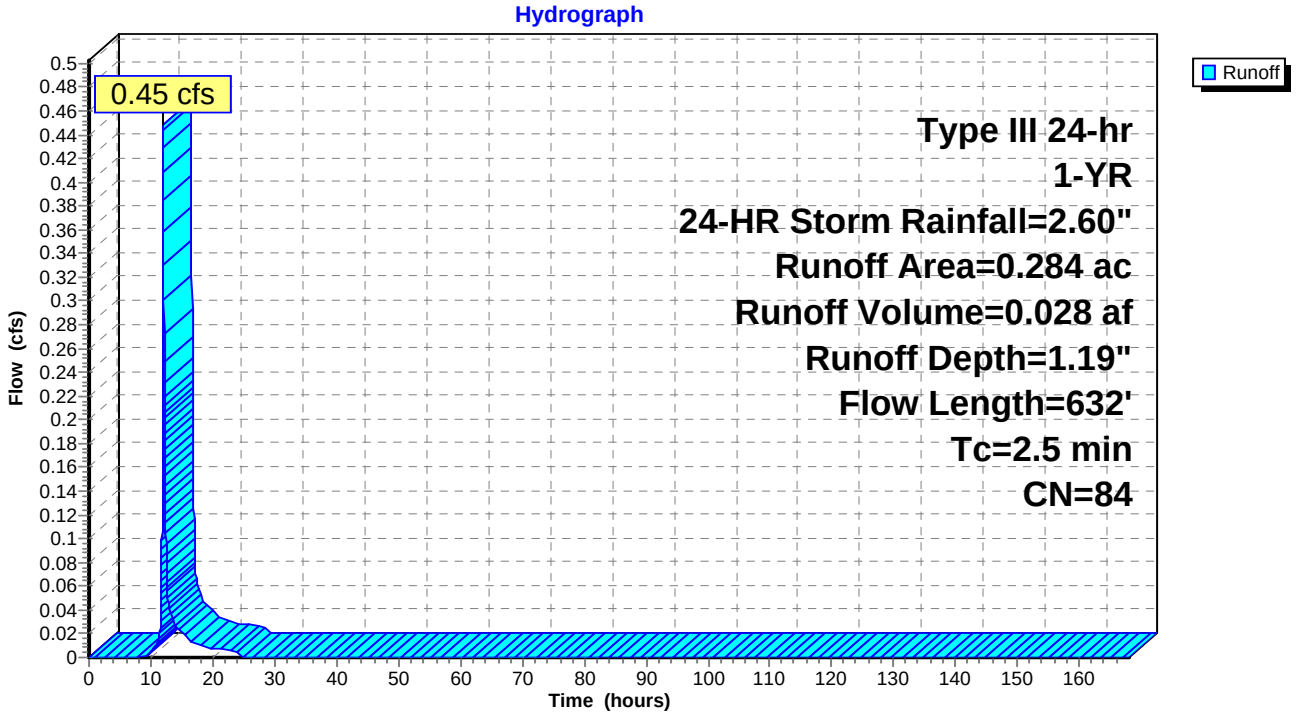
Runoff = 0.45 cfs @ 12.04 hrs, Volume= 0.028 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.003	70	Woods, Good, HSG C
	0.153	74	>75% Grass cover, Good, HSG C
	0.108	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.284	84	Weighted Average
	0.176		61.97% Pervious Area
	0.108		38.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-2: PR DA 21F-2



Summary for Subcatchment 21F-3: PR DA 21F-3

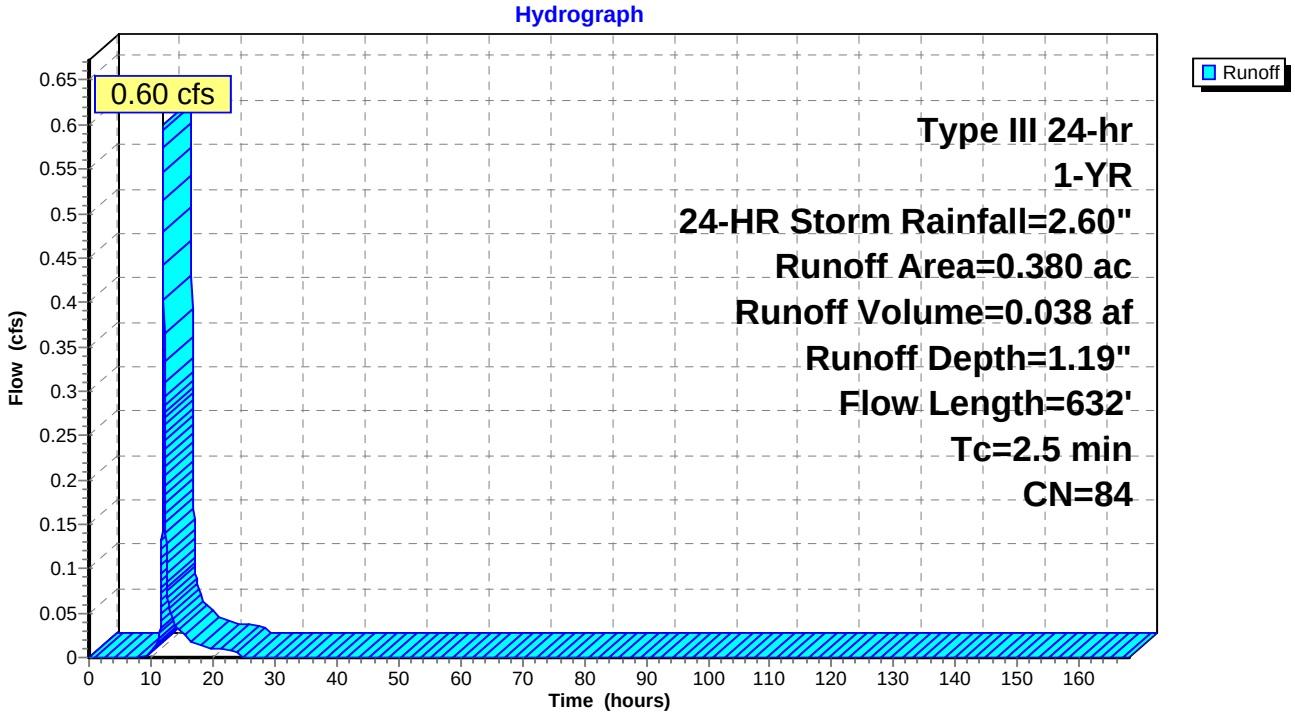
Runoff = 0.60 cfs @ 12.04 hrs, Volume= 0.038 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.004	70	Woods, Good, HSG C
	0.205	74	>75% Grass cover, Good, HSG C
	0.145	98	Paved roads w/curbs & sewers, HSG C
*	0.026	89	Gravel Shoulder, HSG C
	0.380	84	Weighted Average
	0.235		61.84% Pervious Area
	0.145		38.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-3: PR DA 21F-3



Summary for Subcatchment 21G: PR DA 21G

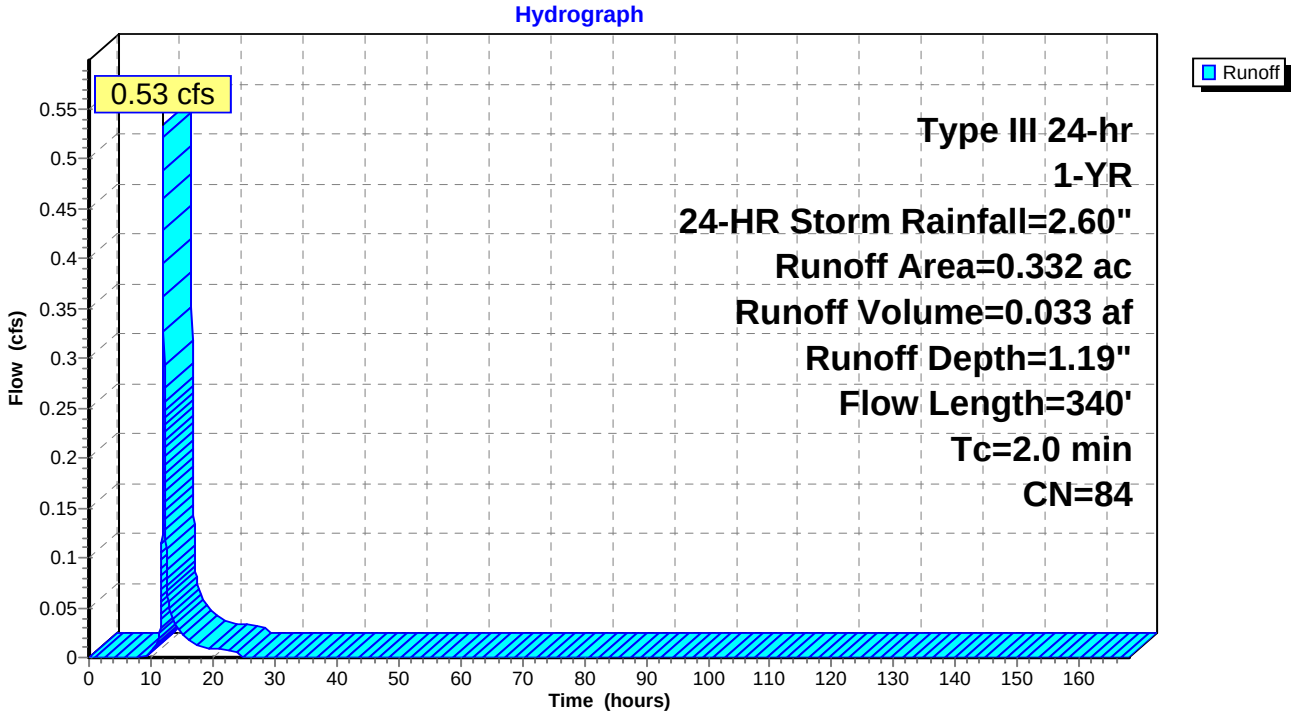
Runoff = 0.53 cfs @ 12.03 hrs, Volume= 0.033 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.187	74	>75% Grass cover, Good, HSG C
0.145	98	Paved roads w/curbs & sewers, HSG C
0.332	84	Weighted Average
0.187		56.33% Pervious Area
0.145		43.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	85	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	93	0.0500	4.54		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.2	62	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.2	100	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.0	340	Total			

Subcatchment 21G: PR DA 21G



Summary for Subcatchment 21H: PR DA 21H

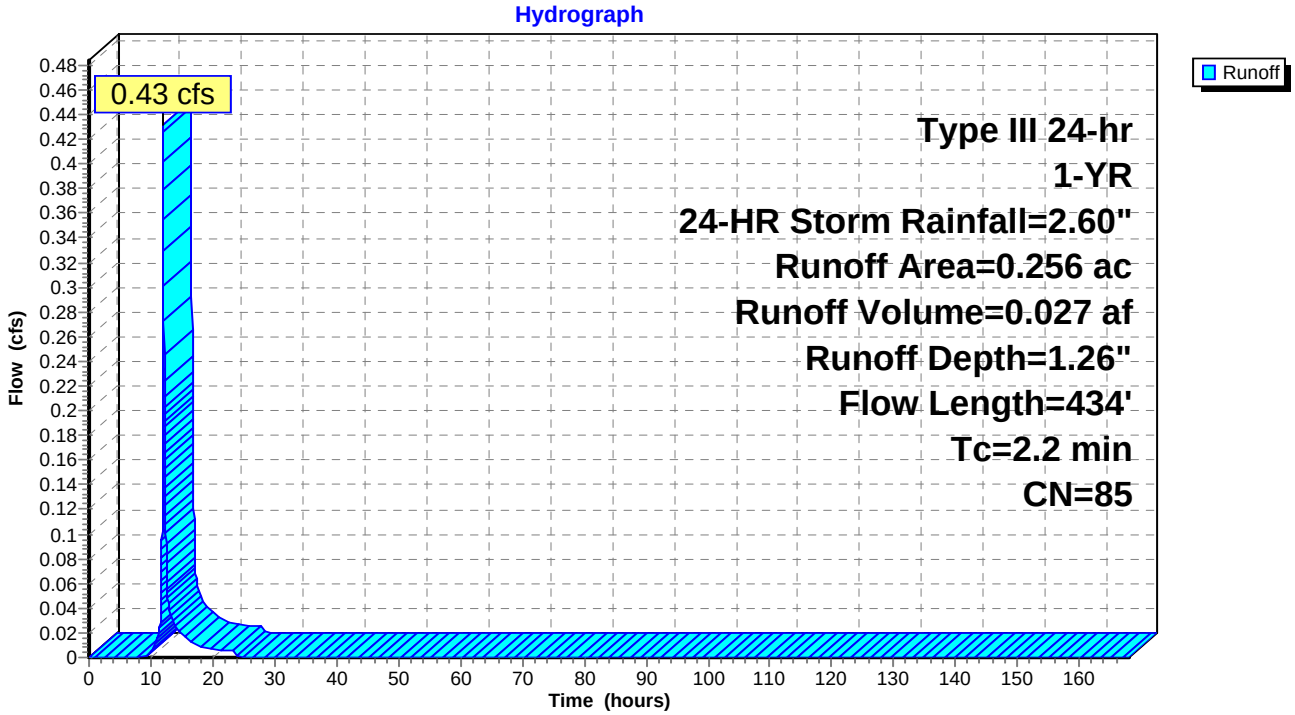
Runoff = 0.43 cfs @ 12.04 hrs, Volume= 0.027 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.138	74	>75% Grass cover, Good, HSG C
0.118	98	Paved roads w/curbs & sewers, HSG C
0.256	85	Weighted Average
0.138		53.91% Pervious Area
0.118		46.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	85	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	93	0.0500	4.54		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.2	62	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.4	194	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.2	434	Total			

Subcatchment 21H: PR DA 21H



Summary for Subcatchment 23: PR DA 23

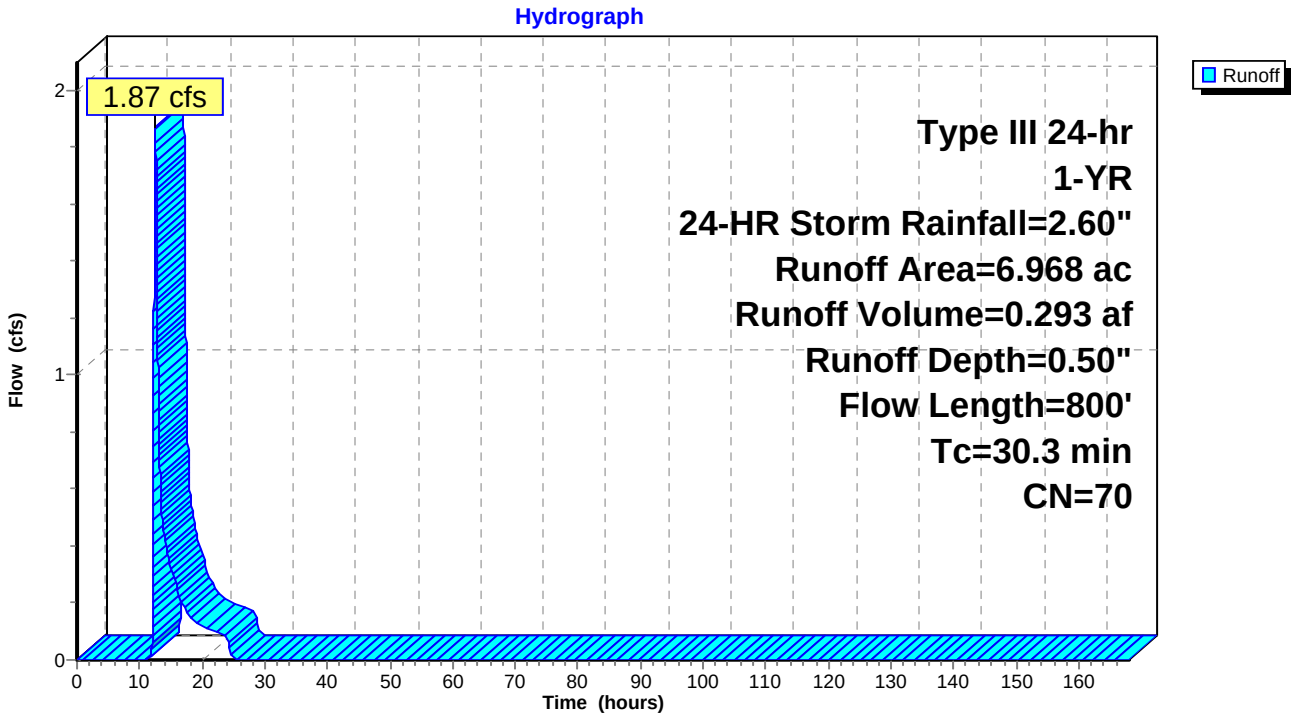
Runoff = 1.87 cfs @ 12.52 hrs, Volume= 0.293 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.415	65	Brush, Good, HSG C
0.170	74	>75% Grass cover, Good, HSG C
5.901	70	Woods, Good, HSG C
0.009	73	Brush, Good, HSG D
0.473	77	Woods, Good, HSG D
6.968	70	Weighted Average
6.968		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	150	0.0367	0.12		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
8.8	650	0.0600	1.22		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
30.3	800	Total			

Subcatchment 23: PR DA 23



Summary for Subcatchment 23A-1: PR DA 23A-1

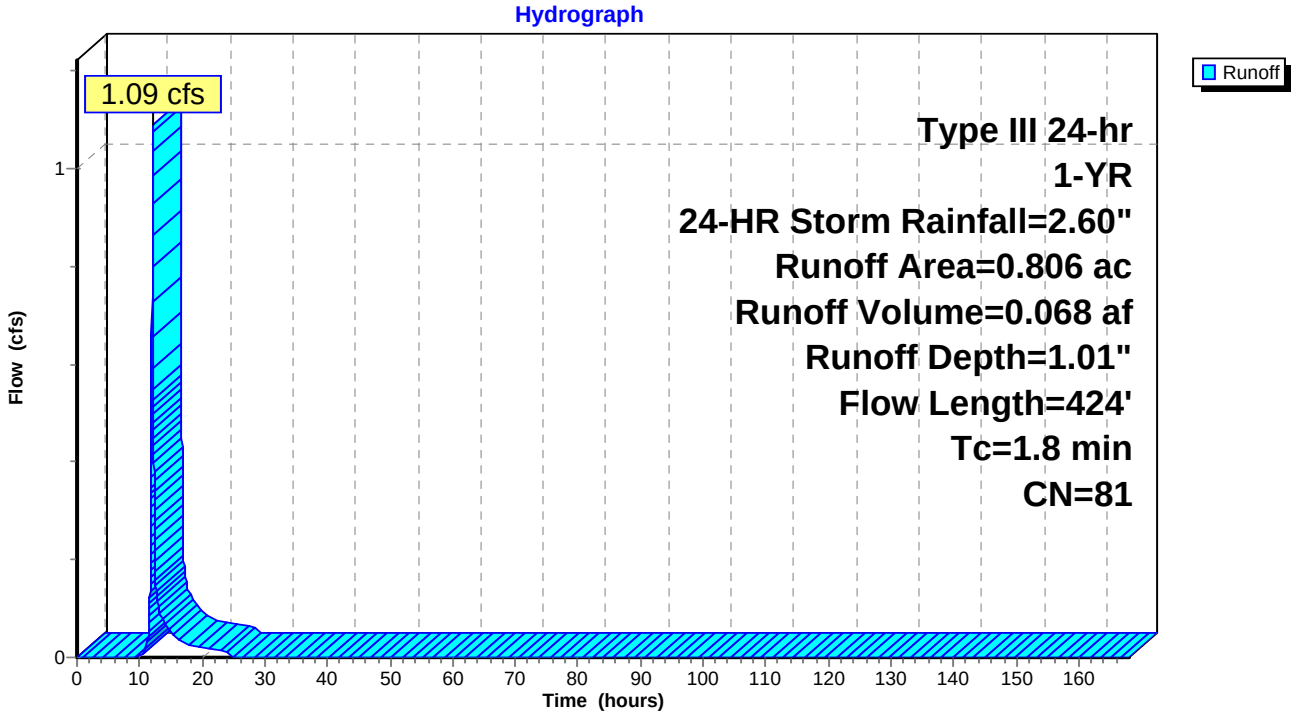
Runoff = 1.09 cfs @ 12.03 hrs, Volume= 0.068 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.562	74	>75% Grass cover, Good, HSG C
0.201	98	Paved roads w/curbs & sewers, HSG C
0.043	89	Gravel Shoulder, HSG C
0.806	81	Weighted Average
0.605		75.06% Pervious Area
0.201		24.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	62	0.0200	1.35		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
1.0	362	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.8	424	Total			

Subcatchment 23A-1: PR DA 23A-1



Summary for Subcatchment 23A-2: PR DA 23A-2

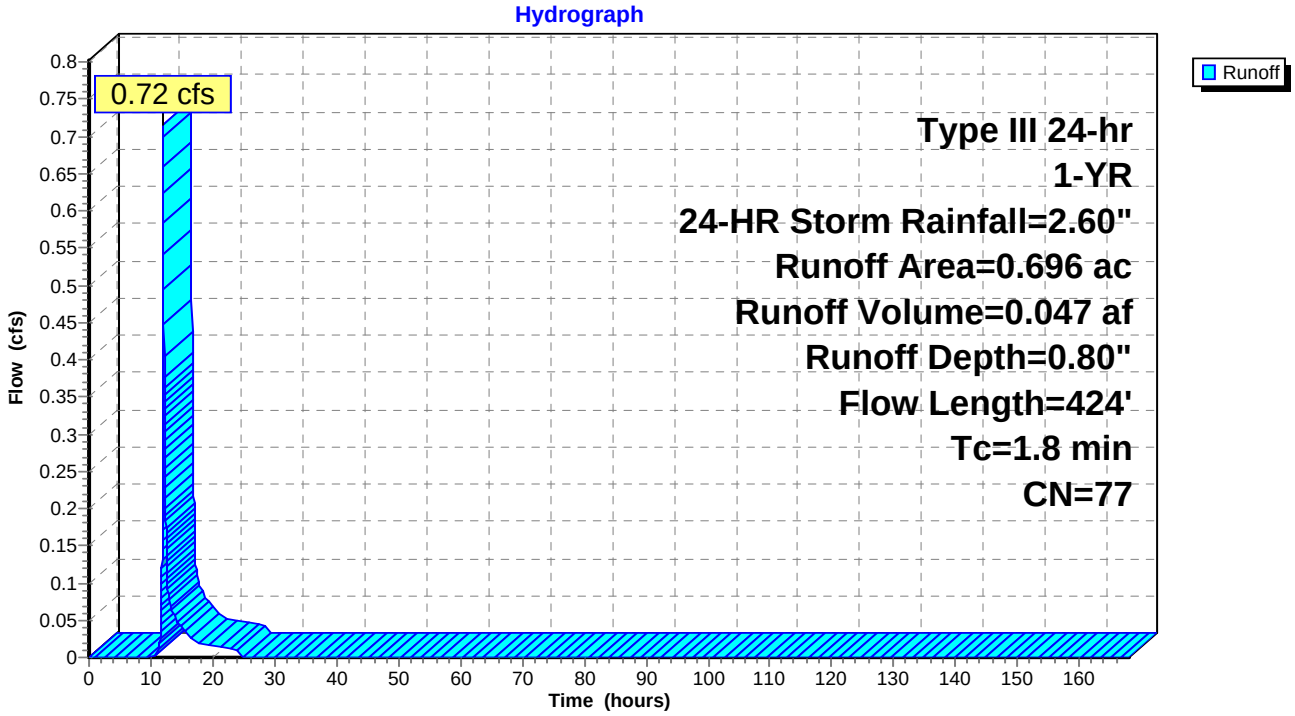
Runoff = 0.72 cfs @ 12.03 hrs, Volume= 0.047 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.593	74	>75% Grass cover, Good, HSG C
0.085	98	Paved roads w/curbs & sewers, HSG C
0.018	89	Gravel Shoulder, HSG C
0.696	77	Weighted Average
0.611		87.79% Pervious Area
0.085		12.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	62	0.0200	1.35		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
1.0	362	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.8	424	Total			

Subcatchment 23A-2: PR DA 23A-2



Summary for Subcatchment 23B-1: PR DA 23B-1

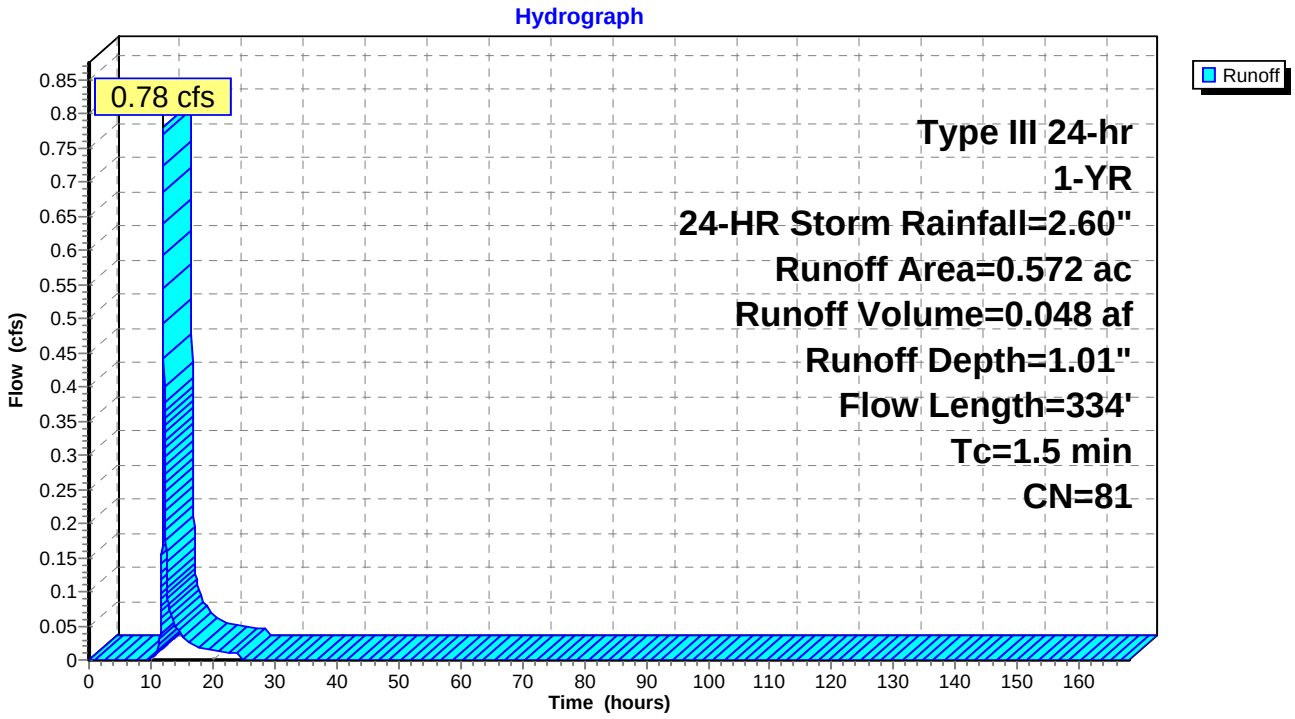
Runoff = 0.78 cfs @ 12.03 hrs, Volume= 0.048 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.005	70	Woods, Good, HSG C
0.392	74	>75% Grass cover, Good, HSG C
0.148	98	Paved roads w/curbs & sewers, HSG C
0.027	89	Gravel Shoulder, HSG C
0.572	81	Weighted Average
0.424		74.13% Pervious Area
0.148		25.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0200	1.34		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	274	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.5	334	Total			

Subcatchment 23B-1: PR DA 23B-1



Summary for Subcatchment 23B-2: PR DA 23B-2

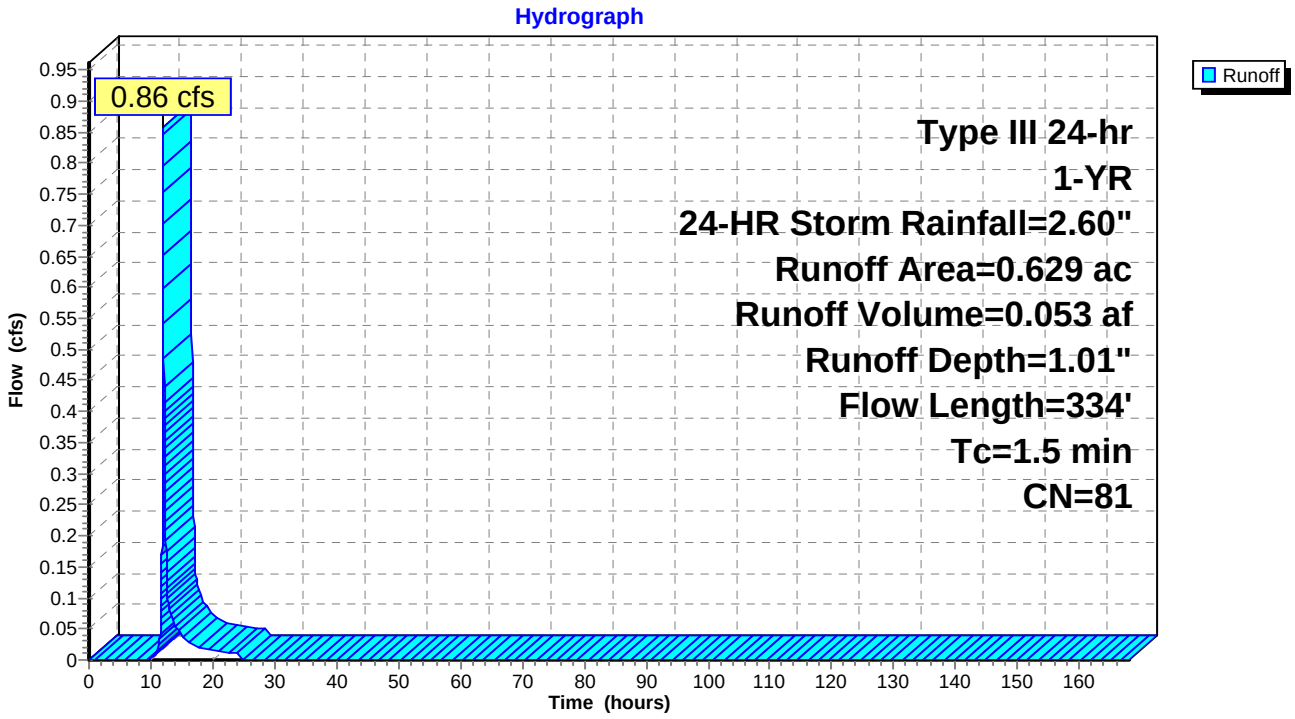
Runoff = 0.86 cfs @ 12.03 hrs, Volume= 0.053 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.005	70	Woods, Good, HSG C
0.432	74	>75% Grass cover, Good, HSG C
0.163	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.629	81	Weighted Average
0.466		74.09% Pervious Area
0.163		25.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0200	1.34		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	274	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.5	334	Total			

Subcatchment 23B-2: PR DA 23B-2



Summary for Subcatchment 23C: PR DA 23C

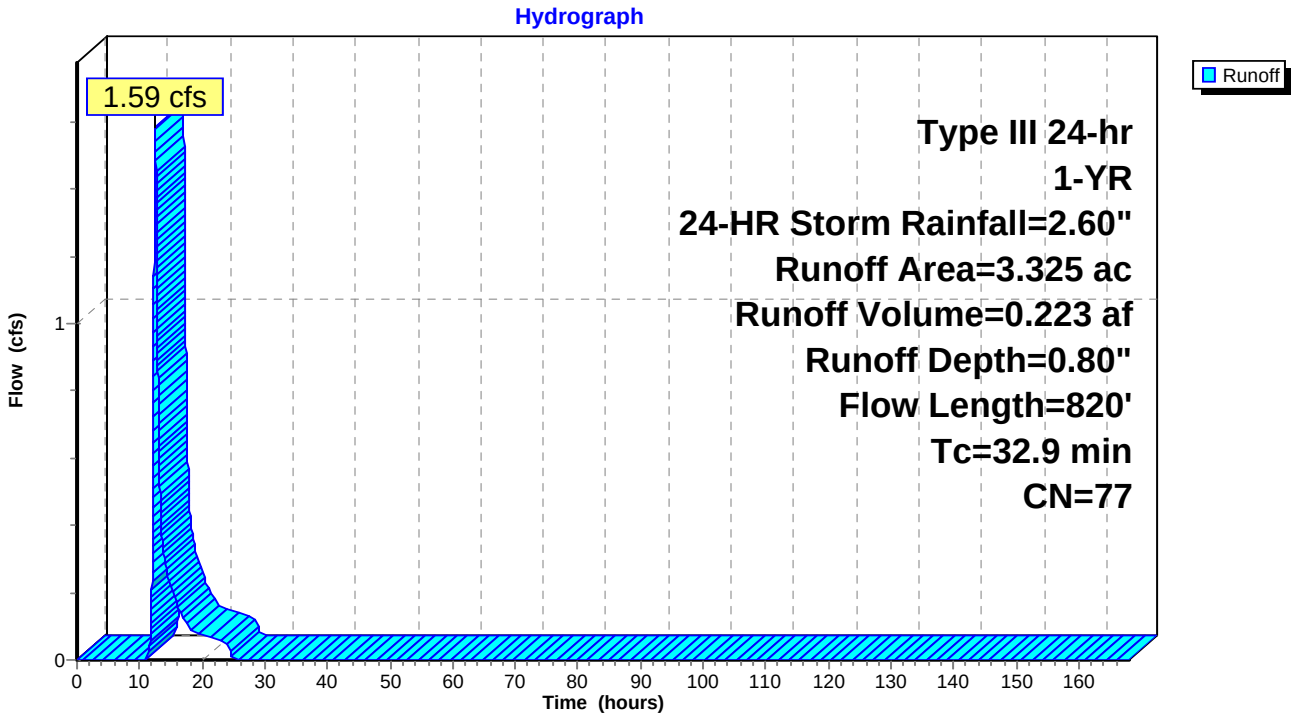
Runoff = 1.59 cfs @ 12.50 hrs, Volume= 0.223 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
3.325	77	Woods, Good, HSG D
3.325		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	150	0.0233	0.10		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
6.3	380	0.0400	1.00		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.5	165	0.0200	5.94	48.71	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	125	0.0200	7.44	9.14	**Pipe Channel, Pipe Crossing** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
32.9	820	Total			

Subcatchment 23C: PR DA 23C



Summary for Subcatchment 23F: PR DA 23F

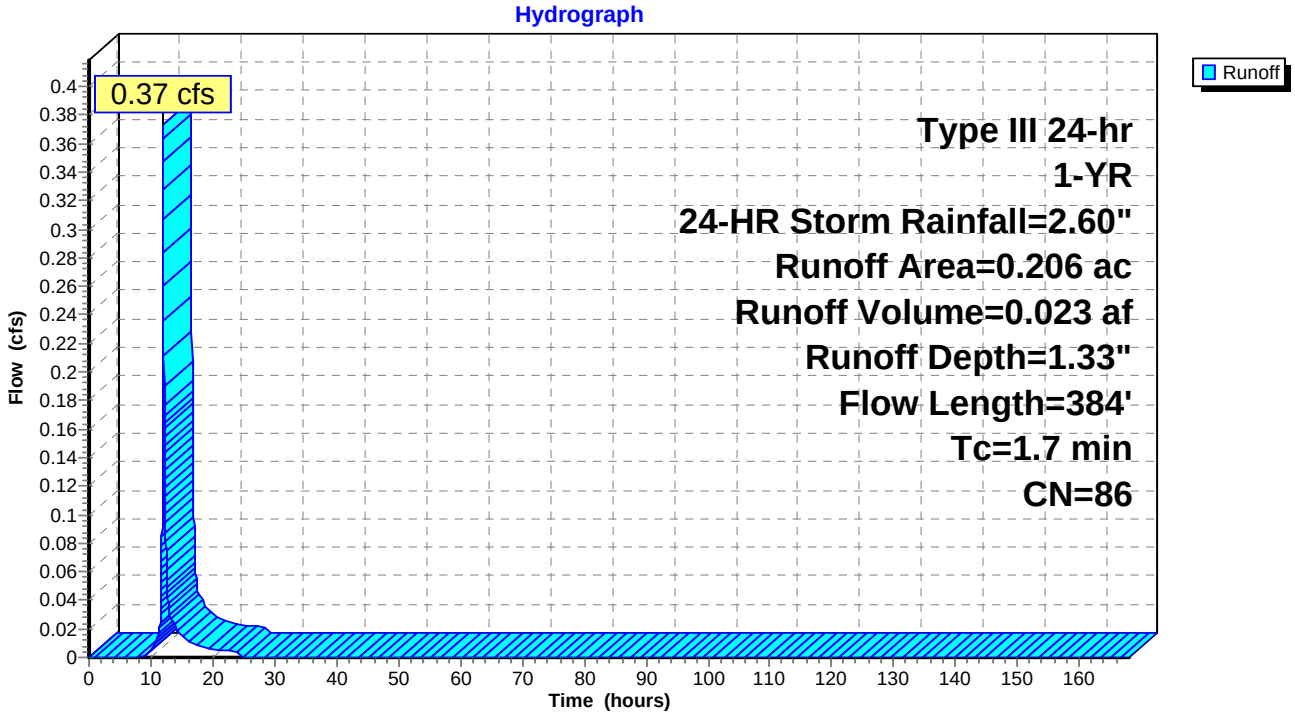
Runoff = 0.37 cfs @ 12.03 hrs, Volume= 0.023 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.099	74	>75% Grass cover, Good, HSG C
	0.098	98	Paved roads w/curbs & sewers, HSG C
*	0.009	89	Gravel Shoulder, HSG C
	0.206	86	Weighted Average
	0.108		52.43% Pervious Area
	0.098		47.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0100	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.75"
0.9	334	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	384	Total			

Subcatchment 23F: PR DA 23F



Summary for Subcatchment 23G: PR DA 23G

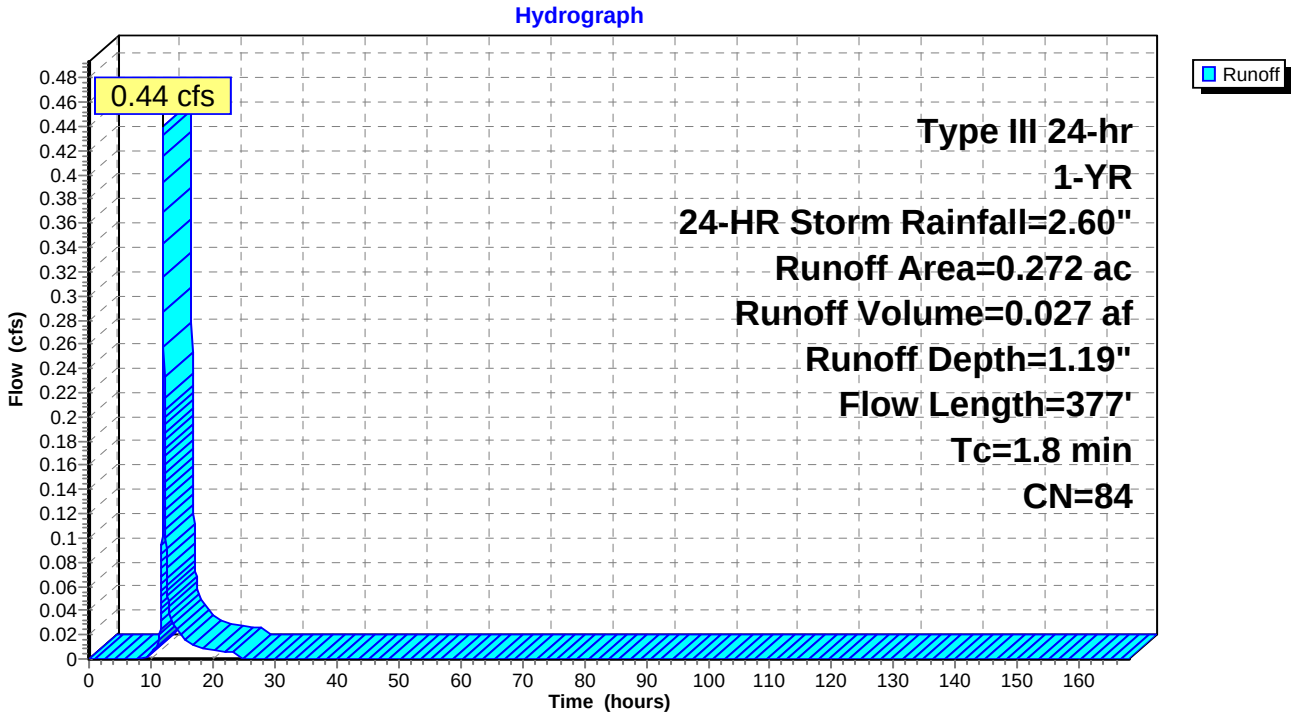
Runoff = 0.44 cfs @ 12.03 hrs, Volume= 0.027 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.146	74	>75% Grass cover, Good, HSG C
	0.107	98	Paved roads w/curbs & sewers, HSG C
*	0.019	89	Gravel Shoulder, HSG C
	0.272	84	Weighted Average
	0.165		60.66% Pervious Area
	0.107		39.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	64	0.0100	1.03		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.5	182	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	131	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	377	Total			

Subcatchment 23G: PR DA 23G



Summary for Subcatchment 23H: PR DA 23H

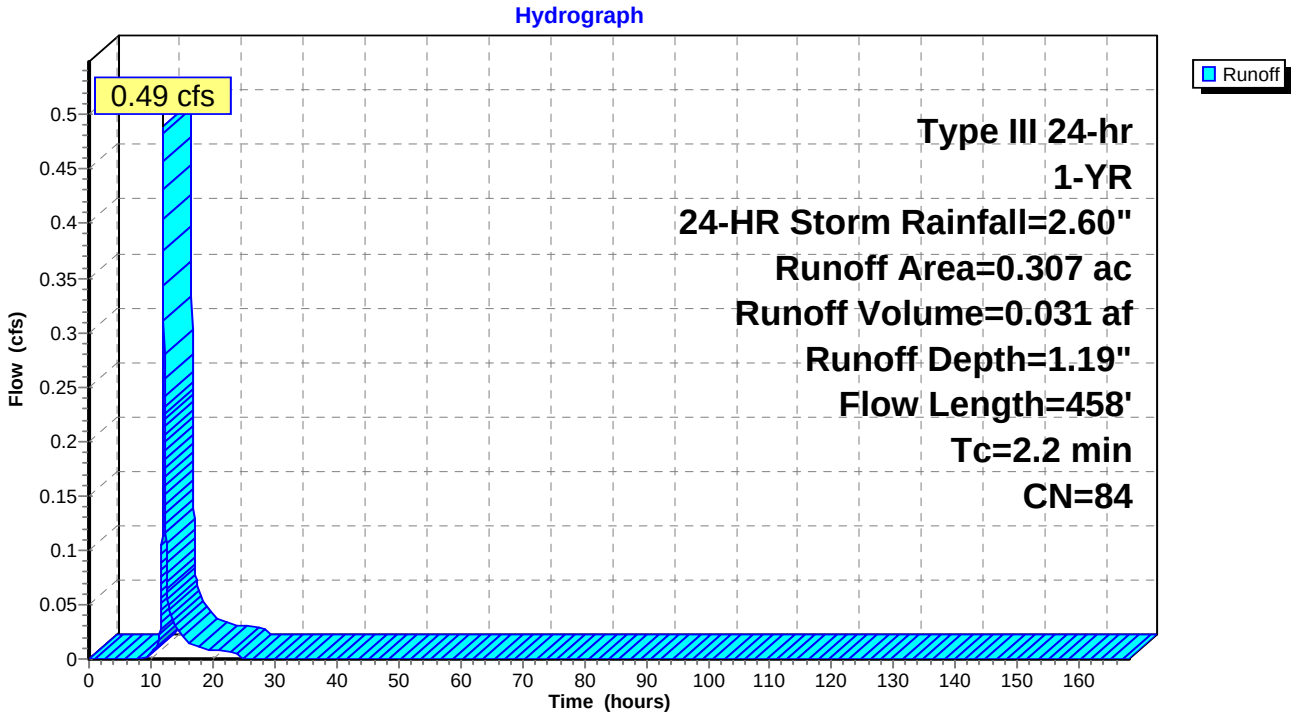
Runoff = 0.49 cfs @ 12.04 hrs, Volume= 0.031 af, Depth= 1.19"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.177	74	>75% Grass cover, Good, HSG C
	0.110	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.307	84	Weighted Average
	0.197		64.17% Pervious Area
	0.110		35.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	83	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	135	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.5	240	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.2	458	Total			

Subcatchment 23H: PR DA 23H



Summary for Subcatchment 23P: PR DA 23P

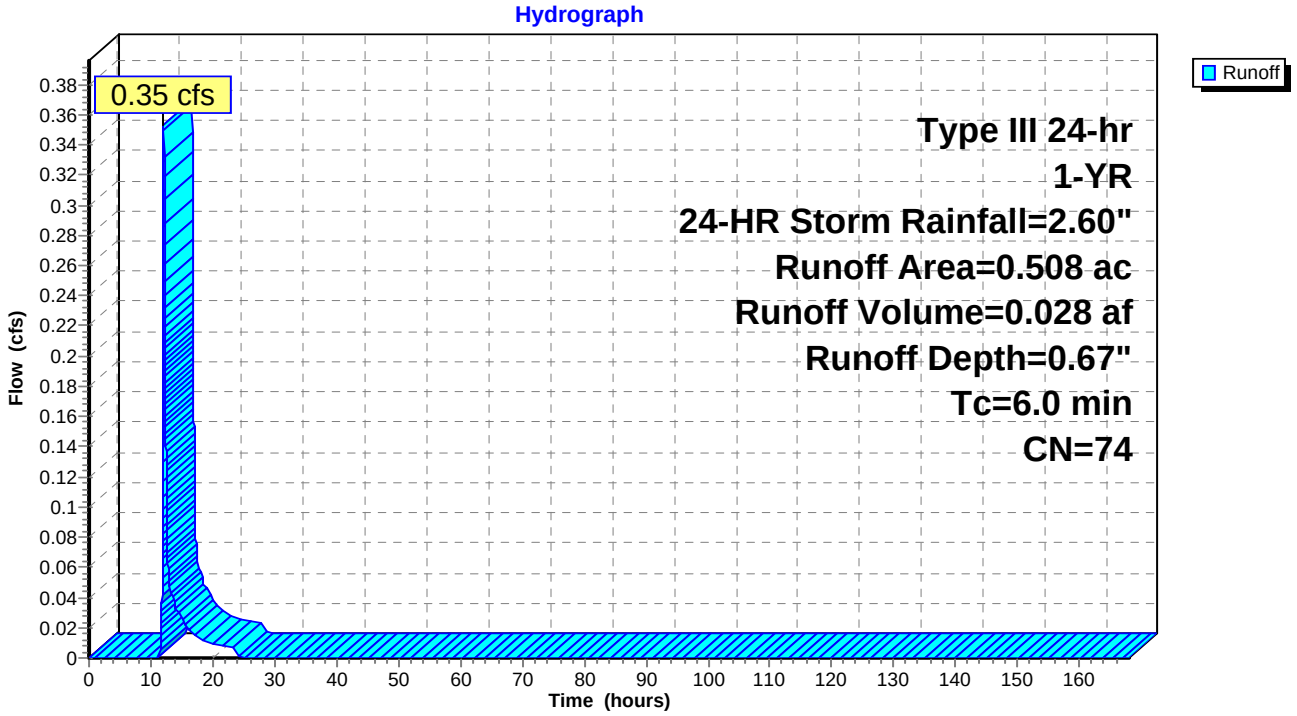
Runoff = 0.35 cfs @ 12.10 hrs, Volume= 0.028 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.508	74	>75% Grass cover, Good, HSG C
0.508		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 23P: PR DA 23P



Summary for Subcatchment 24: PR DA 24

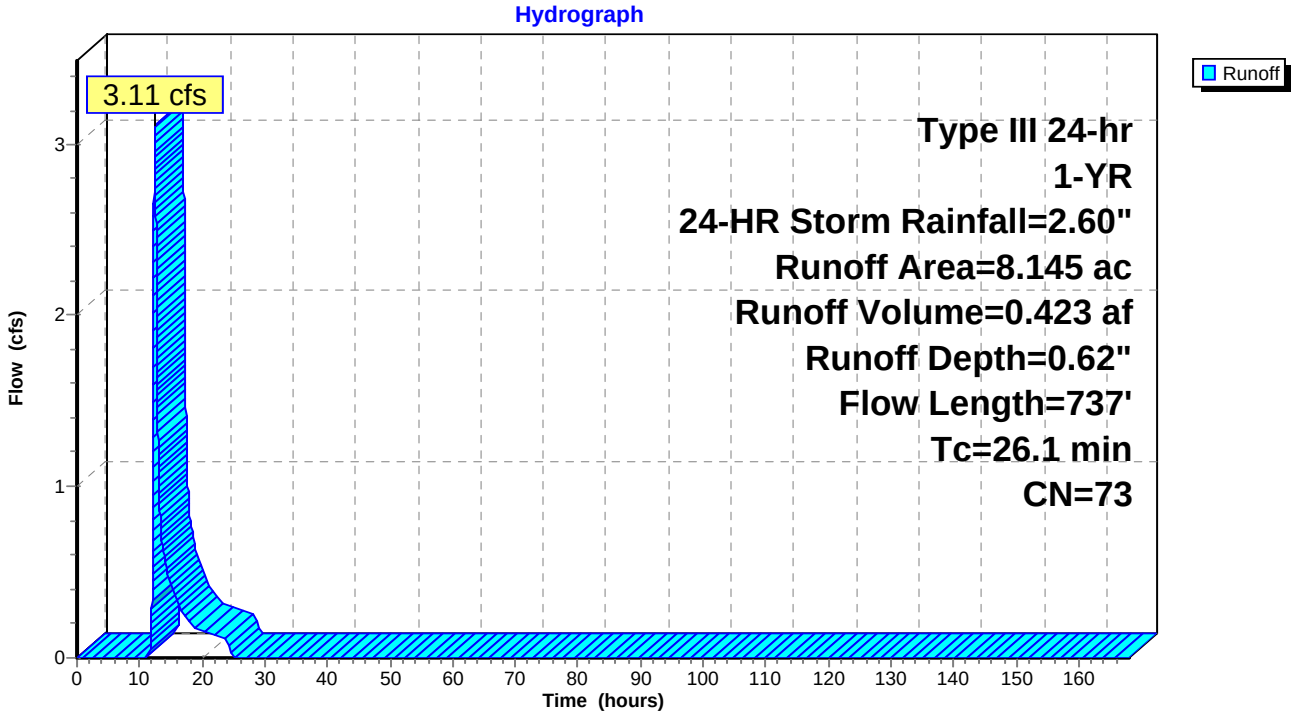
Runoff = 3.11 cfs @ 12.42 hrs, Volume= 0.423 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
4.719	70	Woods, Good, HSG C
0.090	96	Gravel surface, HSG D
3.336	77	Woods, Good, HSG D
8.145	73	Weighted Average
8.145		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	150	0.0533	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
7.6	587	0.0665	1.29		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
26.1	737	Total			

Subcatchment 24: PR DA 24



Summary for Subcatchment 24A-1: PR DA 24A-1

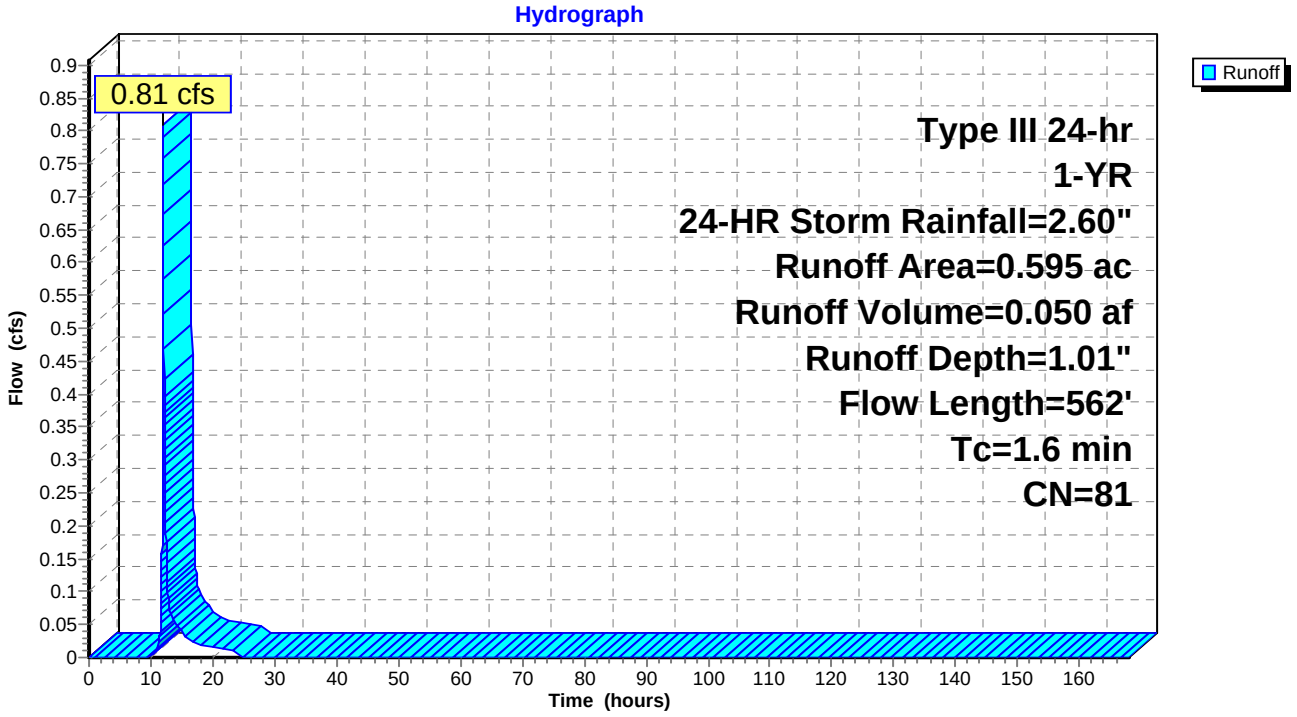
Runoff = 0.81 cfs @ 12.03 hrs, Volume= 0.050 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.003	70	Woods, Good, HSG C
0.411	74	>75% Grass cover, Good, HSG C
0.153	98	Paved roads w/curbs & sewers, HSG C
0.028	89	Gravel roads, HSG C
0.595	81	Weighted Average
0.442		74.29% Pervious Area
0.153		25.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-1: PR DA 24A-1



Summary for Subcatchment 24A-2: PR DA 24A-2

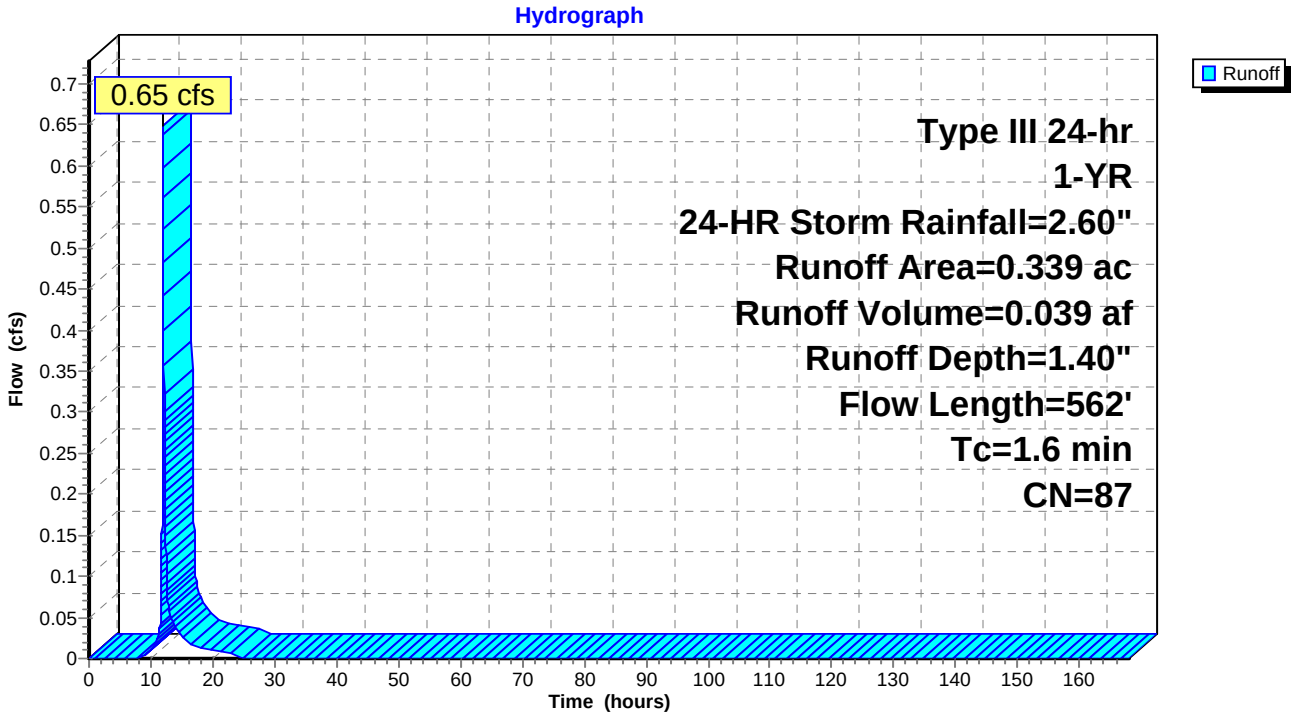
Runoff = 0.65 cfs @ 12.03 hrs, Volume= 0.039 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.053	74	>75% Grass cover, Good, HSG C
0.020	98	Paved roads w/curbs & sewers, HSG C
0.004	89	Gravel roads, HSG C
0.053	96	Gravel surface, HSG D
0.001	77	Woods, Good, HSG D
0.119	80	>75% Grass cover, Good, HSG D
0.075	98	Paved roads w/curbs & sewers, HSG D
0.014	91	Gravel Shoulder, HSG D
0.339	87	Weighted Average
0.244		71.98% Pervious Area
0.095		28.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-2: PR DA 24A-2



Summary for Subcatchment 24A-3: PR DA 24A-3

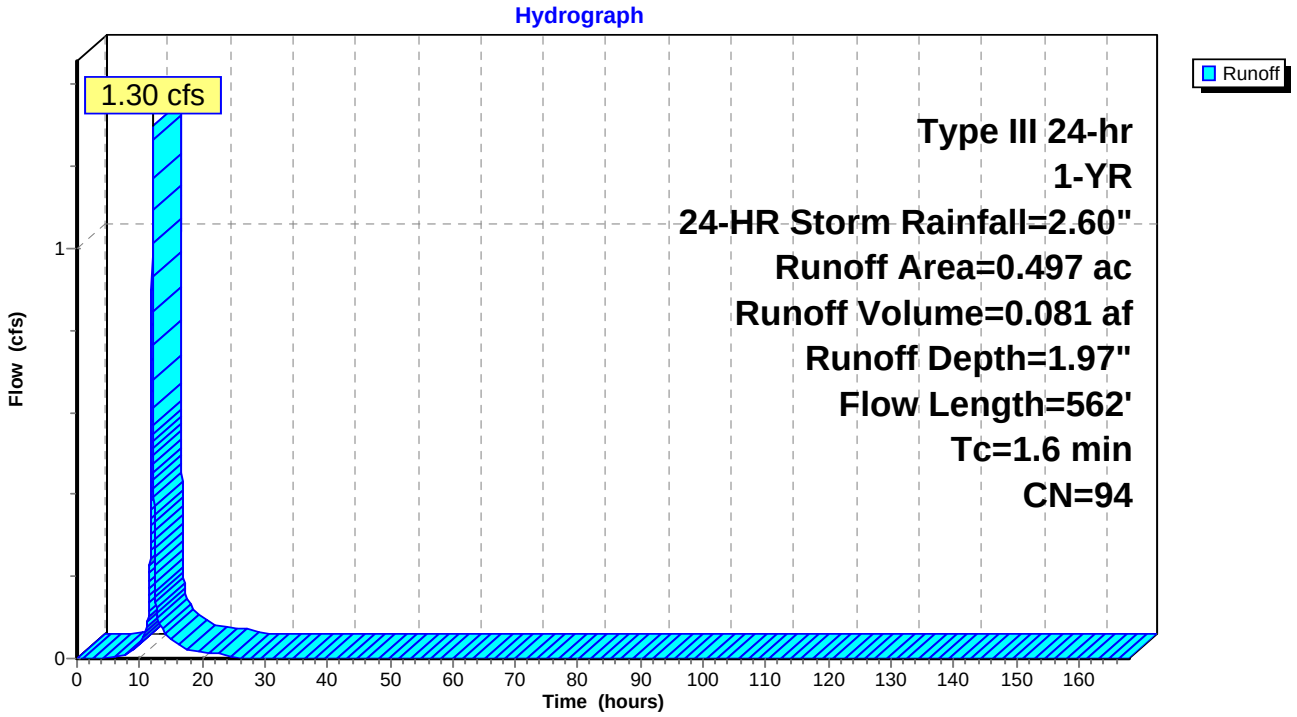
Runoff = 1.30 cfs @ 12.02 hrs, Volume= 0.081 af, Depth= 1.97"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.282	96	Gravel surface, HSG D
0.028	77	Woods, Good, HSG D
0.026	80	>75% Grass cover, Good, HSG D
0.136	98	Paved roads w/curbs & sewers, HSG D
0.025	91	Gravel Shoulder, HSG D
0.497	94	Weighted Average
0.361		72.64% Pervious Area
0.136		27.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-3: PR DA 24A-3



Summary for Subcatchment 24A-4: PR DA 24A-4

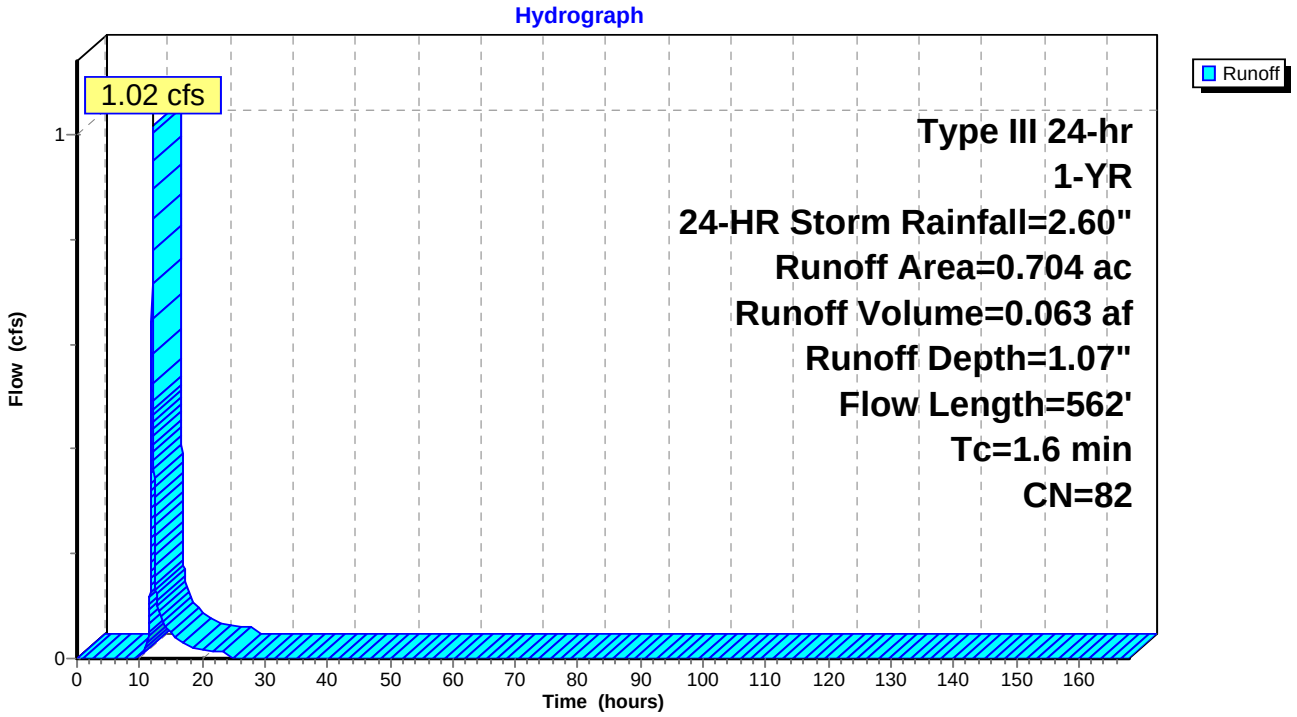
Runoff = 1.02 cfs @ 12.03 hrs, Volume= 0.063 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.127	74	>75% Grass cover, Good, HSG C
0.017	98	Paved roads w/curbs & sewers, HSG C
0.003	89	Gravel roads, HSG C
0.005	96	Gravel surface, HSG D
0.222	77	Woods, Good, HSG D
0.193	80	>75% Grass cover, Good, HSG D
0.115	98	Paved roads w/curbs & sewers, HSG D
0.021	91	Gravel Shoulder, HSG D
0.704	82	Weighted Average
0.572		81.25% Pervious Area
0.132		18.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-4: PR DA 24A-4



Summary for Subcatchment 24B-1: PR DA 24B-1

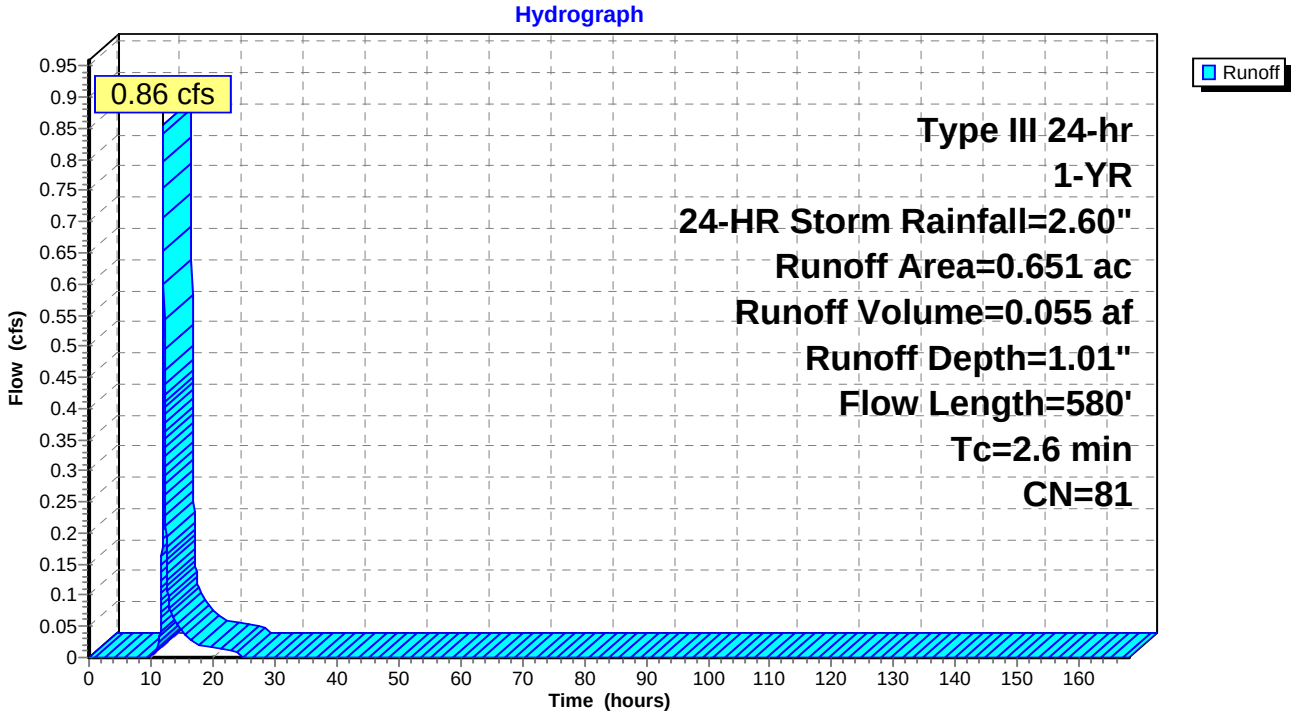
Runoff = 0.86 cfs @ 12.04 hrs, Volume= 0.055 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.455	74	>75% Grass cover, Good, HSG C
0.165	98	Paved roads w/curbs & sewers, HSG C
0.030	89	Gravel Shoulder, HSG C
0.651	81	Weighted Average
0.486		74.65% Pervious Area
0.165		25.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-1: PR DA 24B-1



Summary for Subcatchment 24B-2: PR DA 24B-2

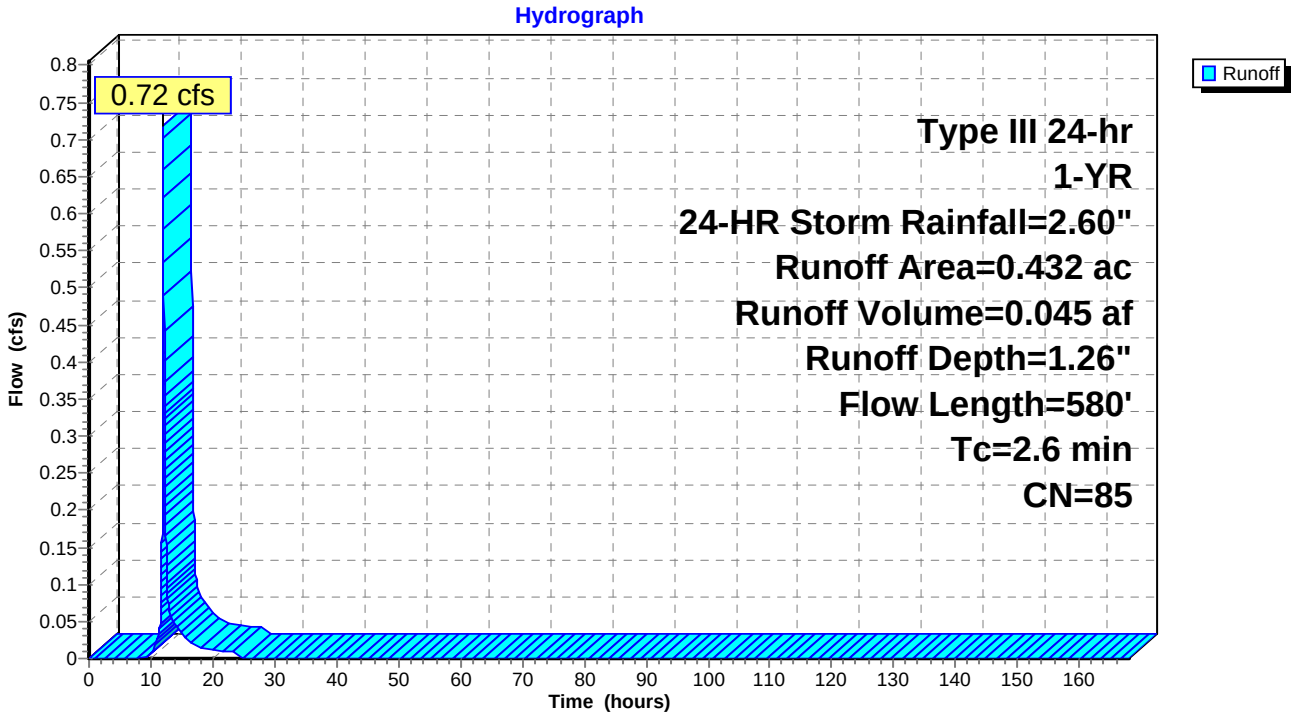
Runoff = 0.72 cfs @ 12.04 hrs, Volume= 0.045 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.114	74	>75% Grass cover, Good, HSG C
0.038	98	Paved roads w/curbs & sewers, HSG C
0.007	89	Gravel Shoulder, HSG C
0.065	96	Gravel surface, HSG D
0.006	77	Woods, Good, HSG D
0.129	80	>75% Grass cover, Good, HSG D
0.061	98	Paved roads w/curbs & sewers, HSG D
0.011	91	Gravel Shoulder, HSG D
0.432	85	Weighted Average
0.333		77.08% Pervious Area
0.099		22.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-2: PR DA 24B-2



Summary for Subcatchment 24B-3: PR DA 24B-3

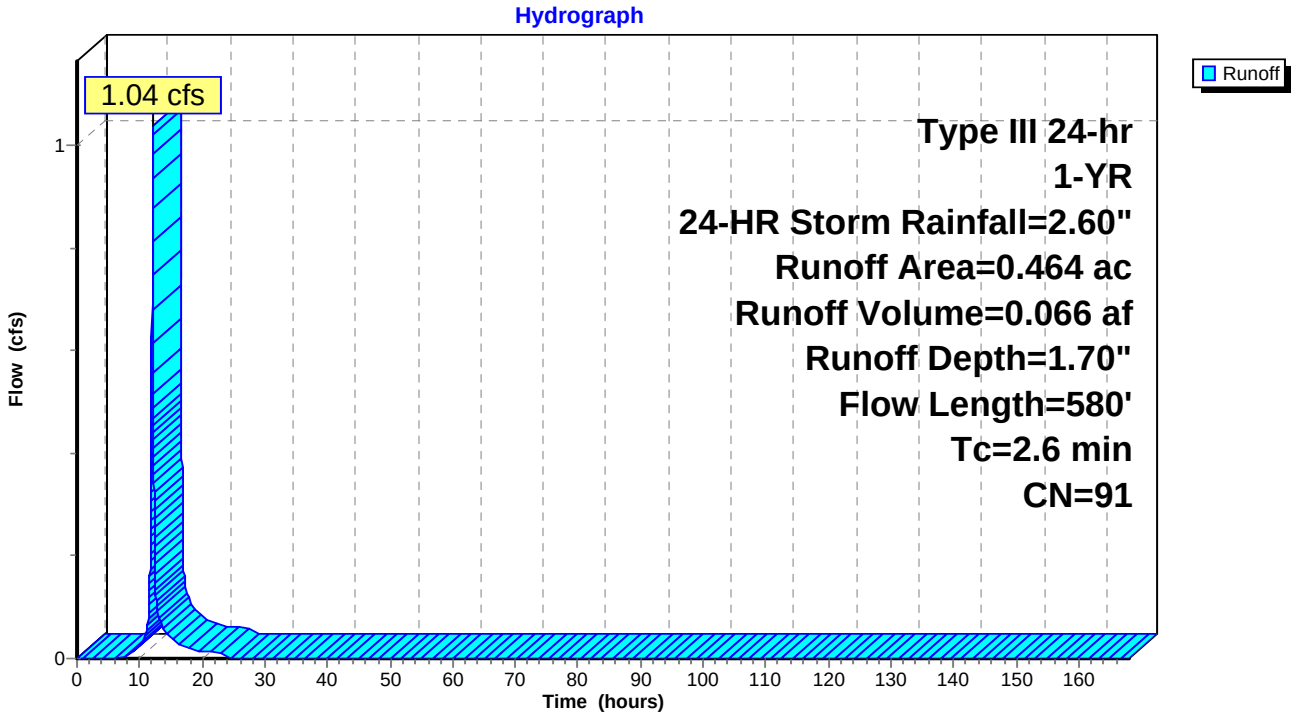
Runoff = 1.04 cfs @ 12.04 hrs, Volume= 0.066 af, Depth= 1.70"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.003	70	Woods, Good, HSG C
0.106	74	>75% Grass cover, Good, HSG C
0.105	98	Paved roads w/curbs & sewers, HSG C
0.019	89	Gravel Shoulder, HSG C
0.231	96	Gravel surface, HSG D
0.464	91	Weighted Average
0.359		77.37% Pervious Area
0.105		22.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-3: PR DA 24B-3



Summary for Subcatchment 24B-4: PR DA 24B-4

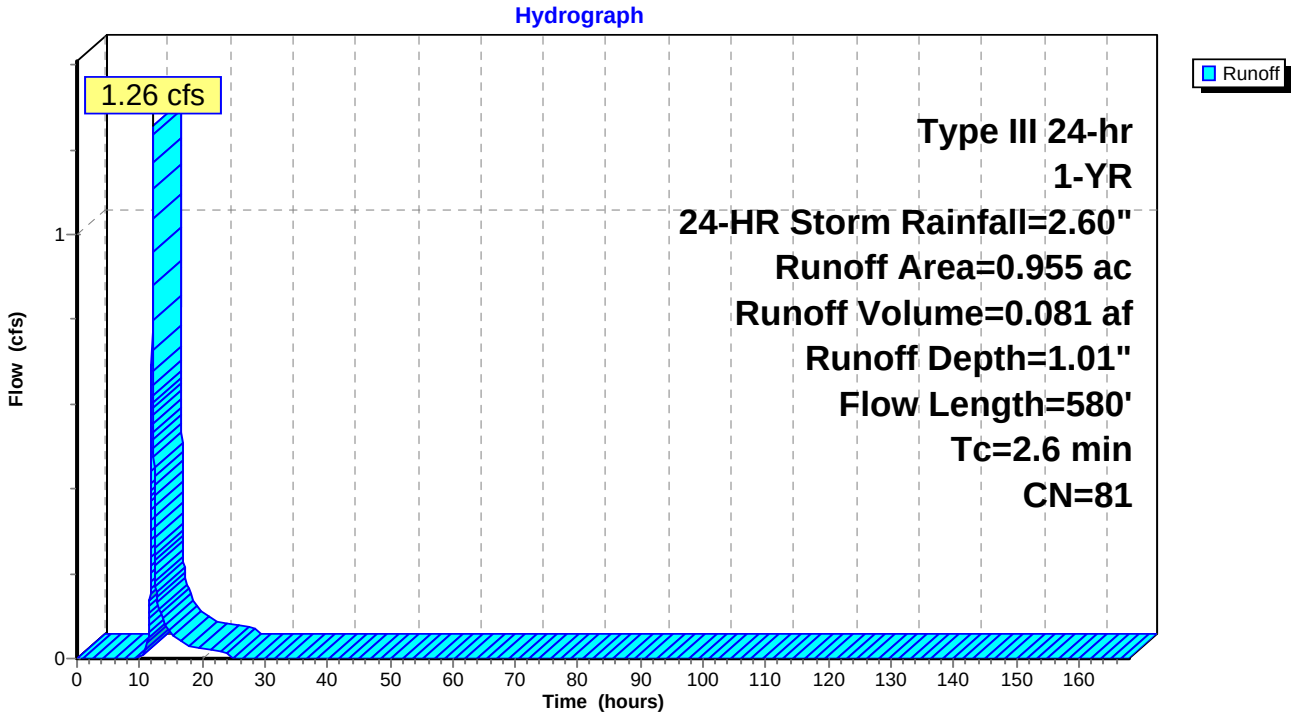
Runoff = 1.26 cfs @ 12.04 hrs, Volume= 0.081 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.007	70	Woods, Good, HSG C
0.480	74	>75% Grass cover, Good, HSG C
0.126	98	Paved roads w/curbs & sewers, HSG C
0.023	89	Gravel Shoulder, HSG C
0.011	96	Gravel surface, HSG D
0.003	77	Woods, Good, HSG D
0.231	80	>75% Grass cover, Good, HSG D
0.063	98	Paved roads w/curbs & sewers, HSG D
0.011	91	Gravel Shoulder, HSG D
0.955	81	Weighted Average
0.766		80.21% Pervious Area
0.189		19.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-4: PR DA 24B-4



Summary for Subcatchment 24C: PR DA 24C

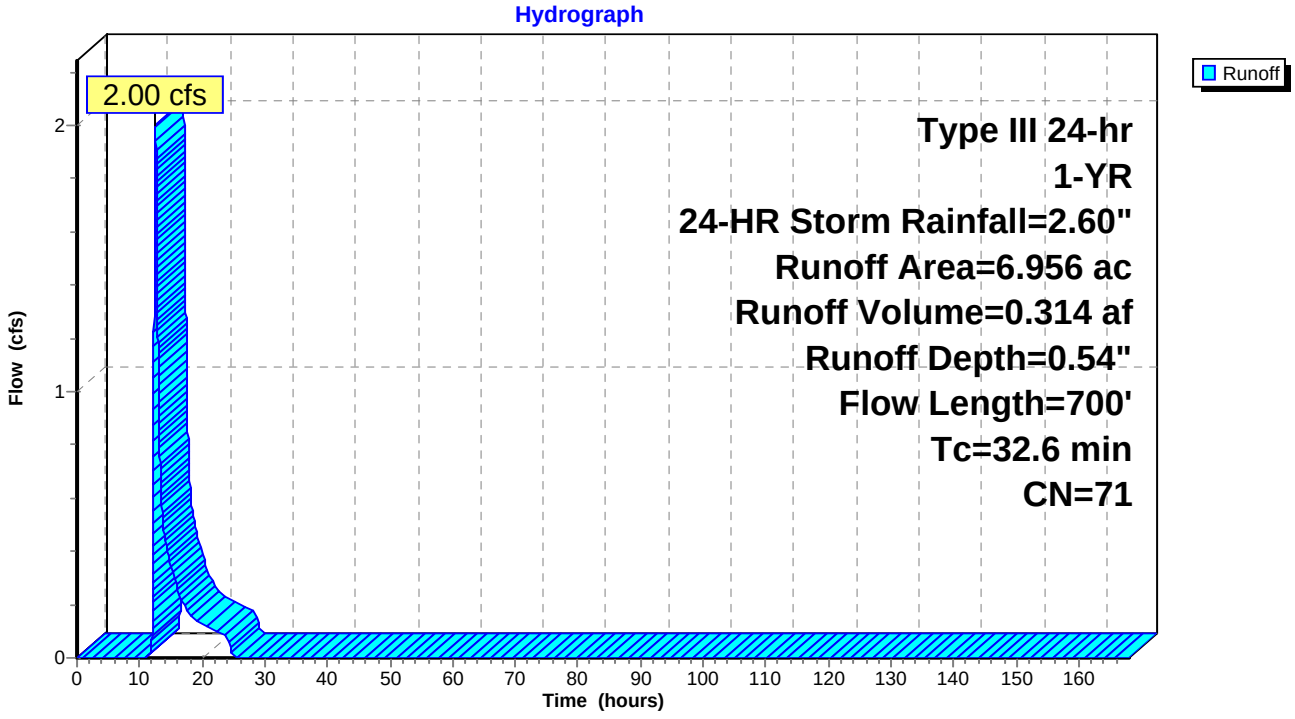
Runoff = 2.00 cfs @ 12.54 hrs, Volume= 0.314 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
6.012	70	Woods, Good, HSG C
0.002	96	Gravel surface, HSG D
0.942	77	Woods, Good, HSG D
6.956	71	Weighted Average
6.956		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	150	0.0270	0.10		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
8.3	550	0.0490	1.11		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
32.6	700	Total			

Subcatchment 24C: PR DA 24C



Summary for Subcatchment 24P: 24P

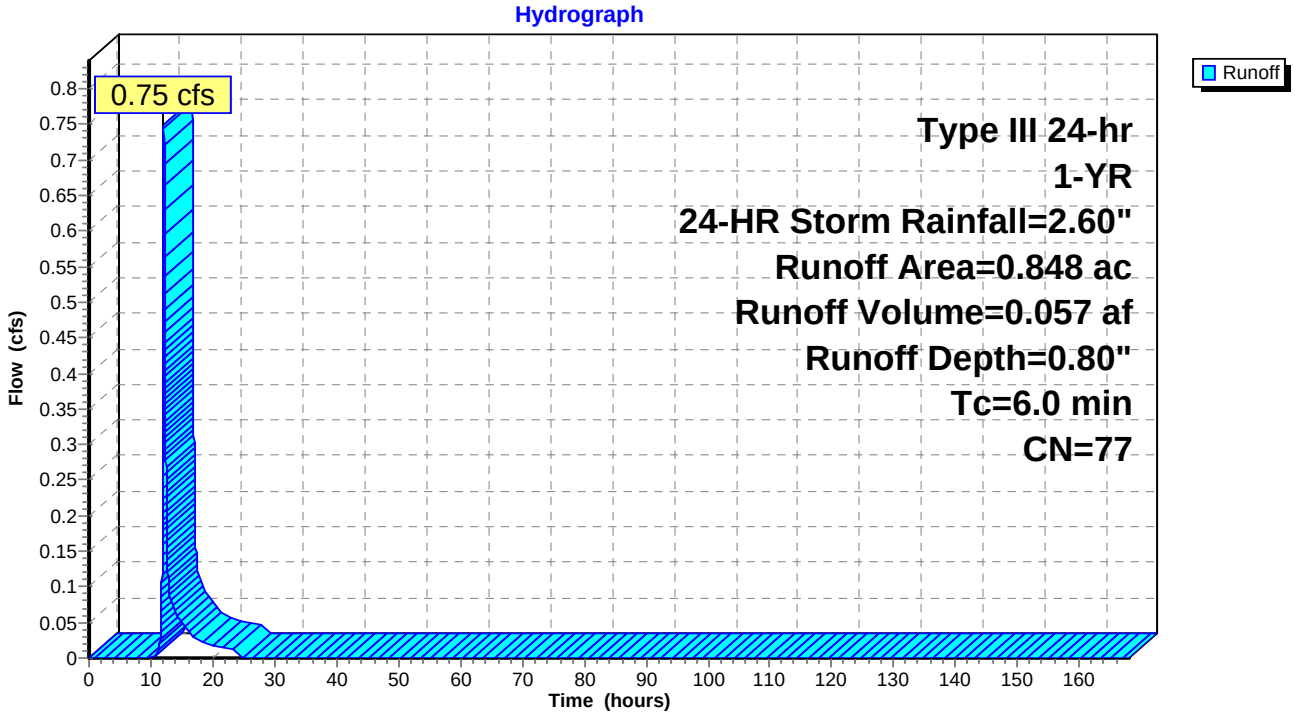
Runoff = 0.75 cfs @ 12.10 hrs, Volume= 0.057 af, Depth= 0.80"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.007	70	Woods, Good, HSG C
0.841	77	Woods, Good, HSG D
0.848	77	Weighted Average
0.848		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct**

Subcatchment 24P: 24P



Summary for Subcatchment 25: PR DA 25

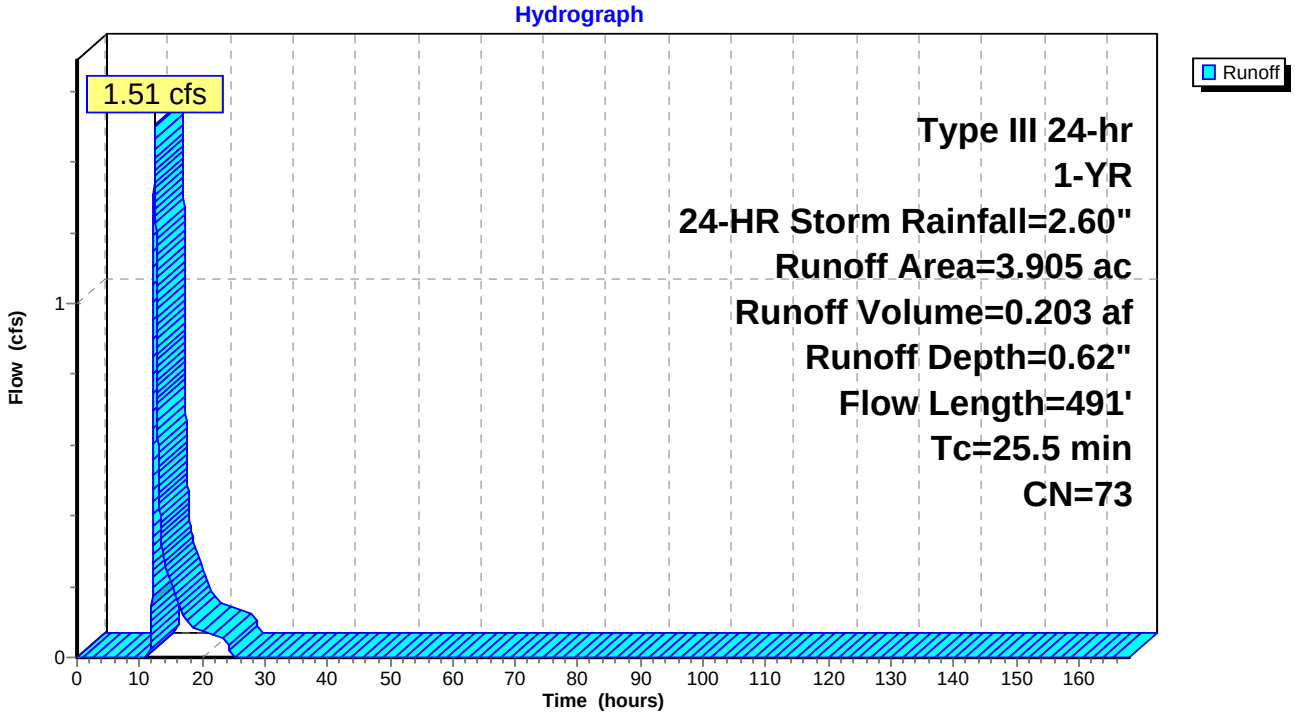
Runoff = 1.51 cfs @ 12.41 hrs, Volume= 0.203 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
2.432	70	Woods, Good, HSG C
1.473	77	Woods, Good, HSG D
3.905	73	Weighted Average
3.905		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.8	100	0.0200	0.08		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
5.2	246	0.0244	0.78		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.5	145	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
25.5	491	Total			

Subcatchment 25: PR DA 25



Summary for Subcatchment 25A-1: PR DA 25A-1

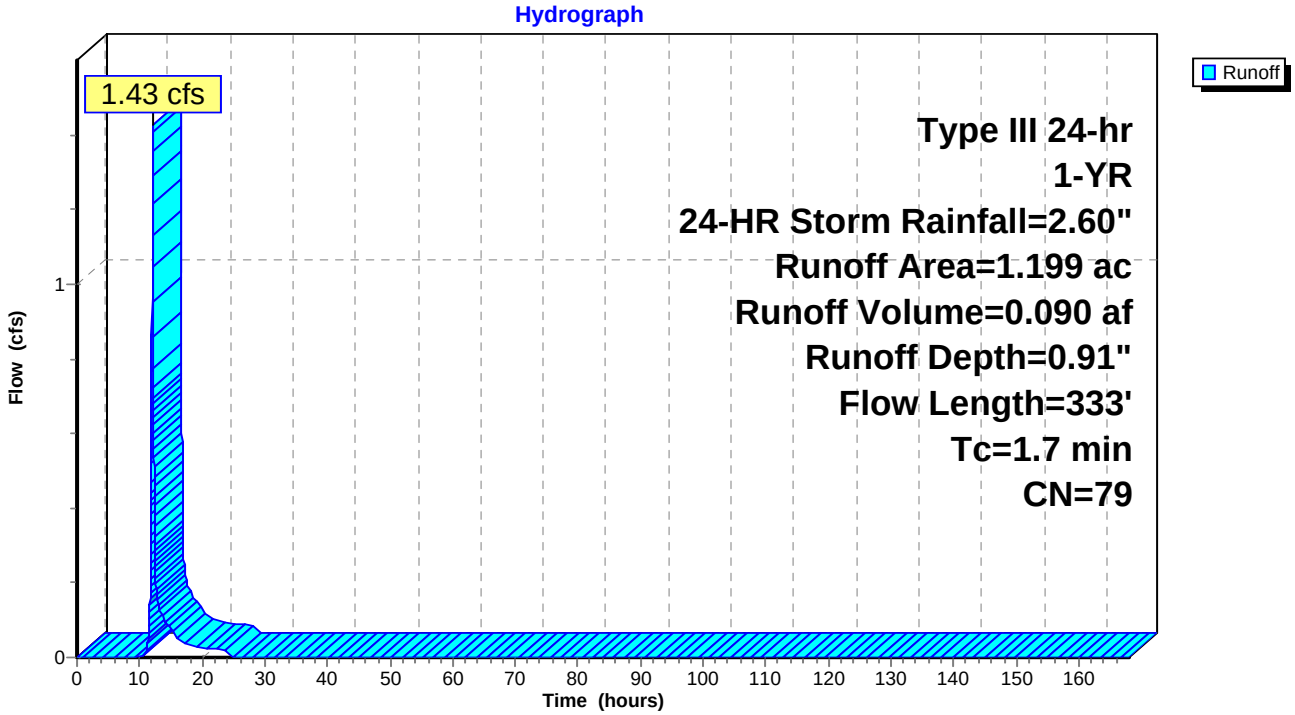
Runoff = 1.43 cfs @ 12.03 hrs, Volume= 0.090 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.303	70	Woods, Good, HSG C
0.562	74	>75% Grass cover, Good, HSG C
0.281	98	Paved roads w/curbs & sewers, HSG C
0.045	89	Gravel Shoulder, HSG C
0.008	77	Woods, Good, HSG D
1.199	79	Weighted Average
0.918		76.56% Pervious Area
0.281		23.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	65	0.0200	1.37		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.9	268	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	333	Total			

Subcatchment 25A-1: PR DA 25A-1



Summary for Subcatchment 25A-2: PR DA 25A-2

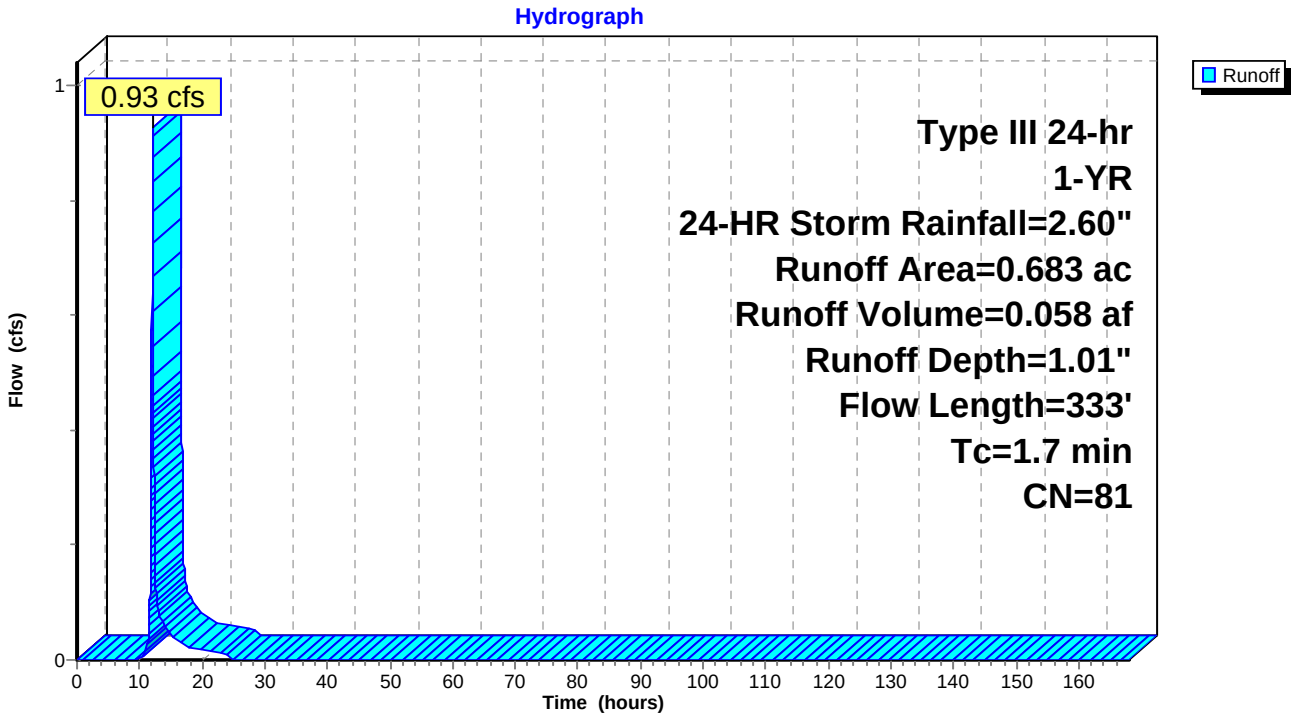
Runoff = 0.93 cfs @ 12.03 hrs, Volume= 0.058 af, Depth= 1.01"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.177	70	Woods, Good, HSG C
0.258	74	>75% Grass cover, Good, HSG C
0.219	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.683	81	Weighted Average
0.464		67.94% Pervious Area
0.219		32.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	65	0.0200	1.37		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.9	268	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	333	Total			

Subcatchment 25A-2: PR DA 25A-2



Summary for Subcatchment 25B-1: PR DA 25B-1

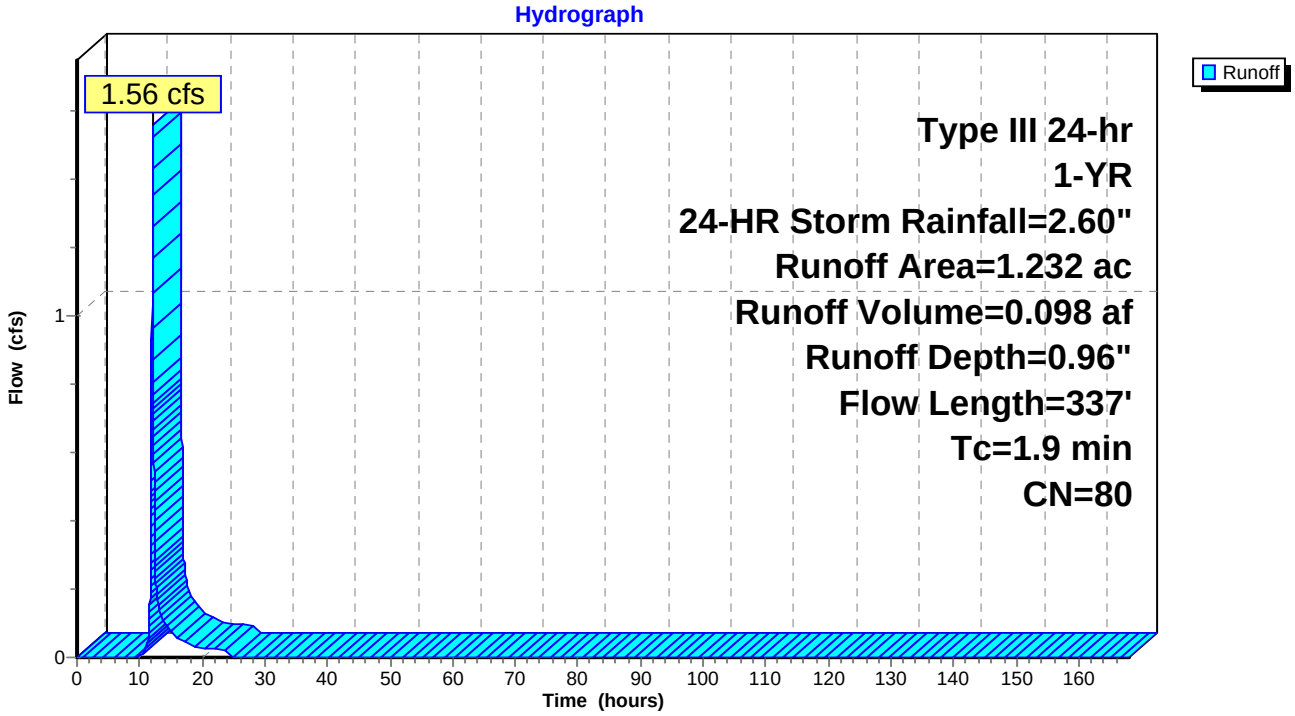
Runoff = 1.56 cfs @ 12.03 hrs, Volume= 0.098 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.922	74	>75% Grass cover, Good, HSG C
0.262	98	Paved roads w/curbs & sewers, HSG C
0.048	89	Gravel Shoulder, HSG C
1.232	80	Weighted Average
0.970		78.73% Pervious Area
0.262		21.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	237	0.0127	4.73	38.82	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.9	337	Total			

Subcatchment 25B-1: PR DA 25B-1



Summary for Subcatchment 25B-2: PR DA 25B-2

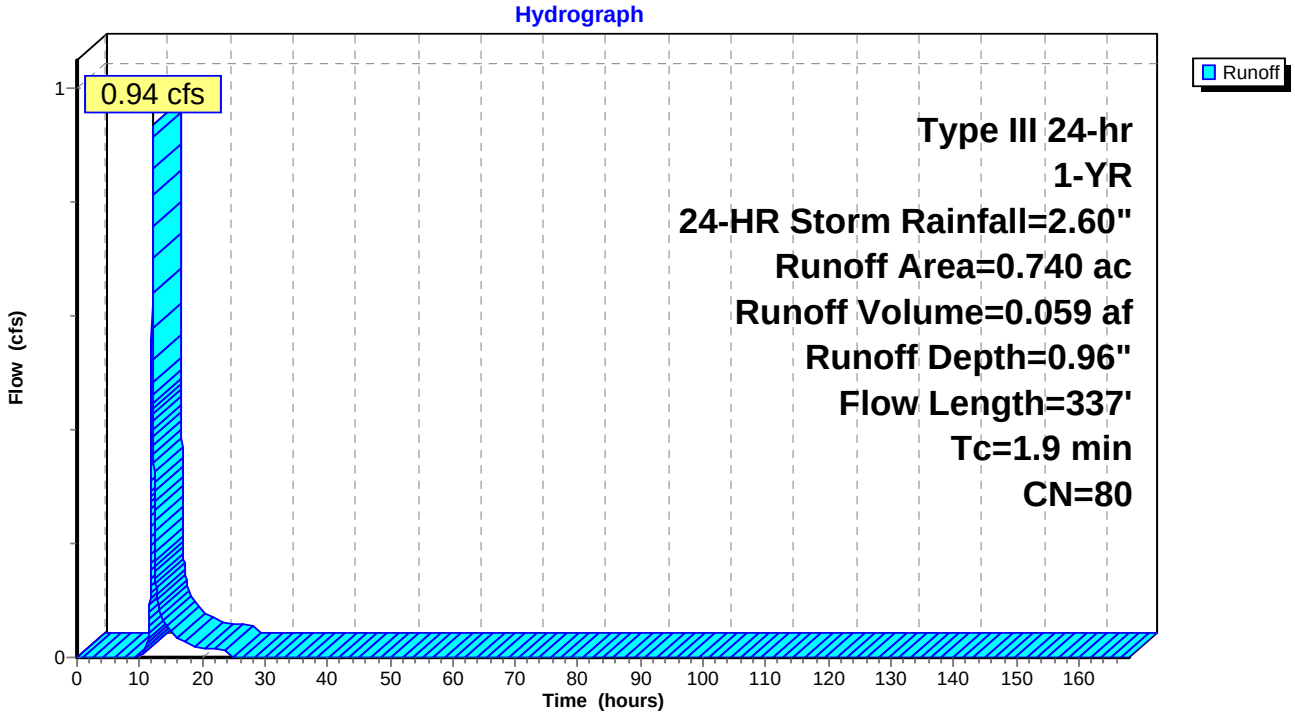
Runoff = 0.94 cfs @ 12.03 hrs, Volume= 0.059 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.538	74	>75% Grass cover, Good, HSG C
0.171	98	Paved roads w/curbs & sewers, HSG C
0.031	89	Gravel Shoulder, HSG C
0.740	80	Weighted Average
0.569		76.89% Pervious Area
0.171		23.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	237	0.0127	4.73	38.82	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.9	337	Total			

Subcatchment 25B-2: PR DA 25B-2



Summary for Subcatchment 25C: PR DA 25C

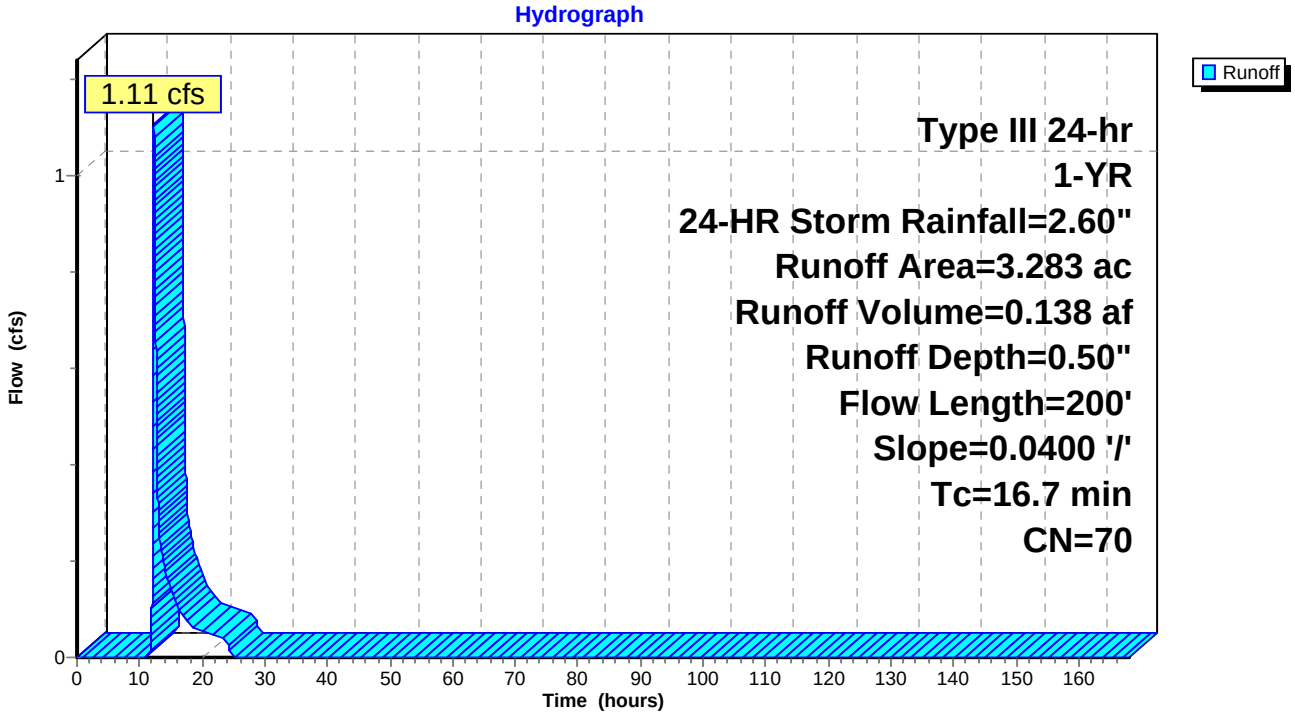
Runoff = 1.11 cfs @ 12.28 hrs, Volume= 0.138 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.023	71	Meadow, non-grazed, HSG C
3.126	70	Woods, Good, HSG C
0.013	78	Meadow, non-grazed, HSG D
0.121	77	Woods, Good, HSG D
3.283	70	Weighted Average
3.283		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0400	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
1.7	100	0.0400	1.00		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
16.7	200	Total			

Subcatchment 25C: PR DA 25C



Summary for Subcatchment 25D: PR DA 25D

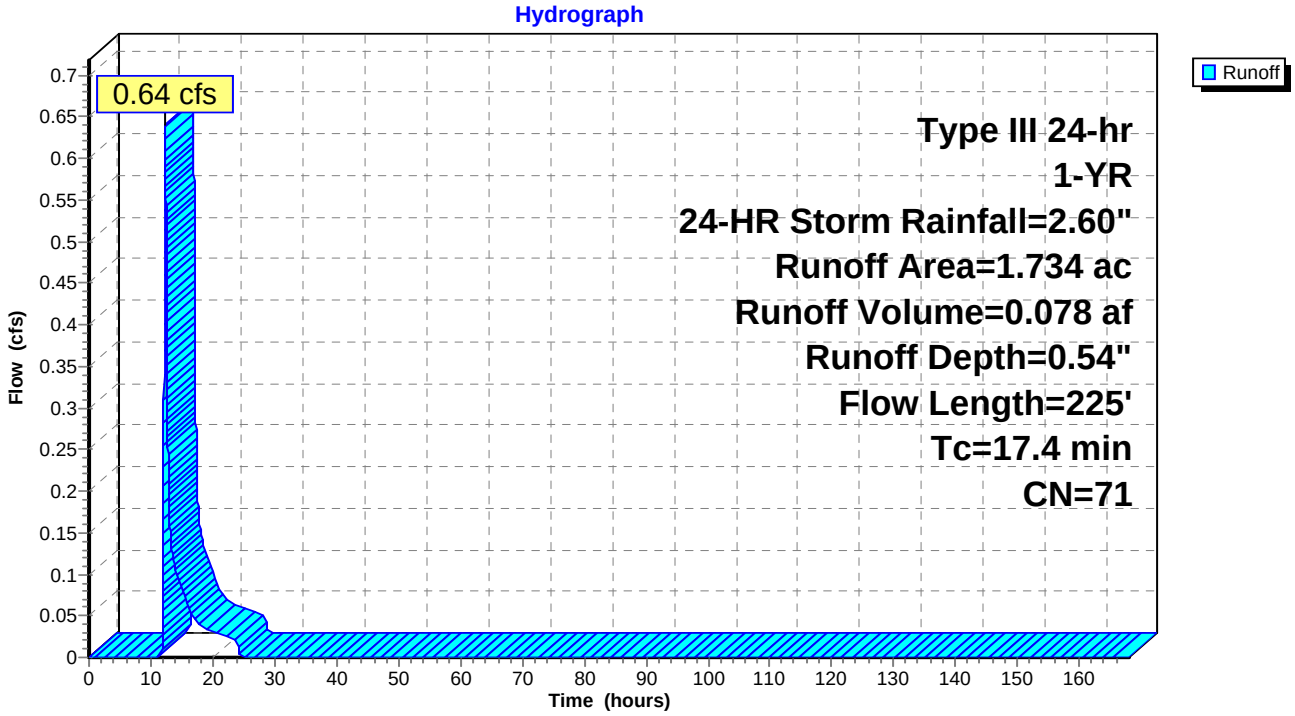
Runoff = 0.64 cfs @ 12.28 hrs, Volume= 0.078 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.543	71	Meadow, non-grazed, HSG C
1.095	70	Woods, Good, HSG C
0.093	78	Meadow, non-grazed, HSG D
0.003	77	Woods, Good, HSG D
1.734	71	Weighted Average
1.734		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0400	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
2.4	125	0.0300	0.87		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
17.4	225	Total			

Subcatchment 25D: PR DA 25D



Summary for Subcatchment 26: PR DA 26

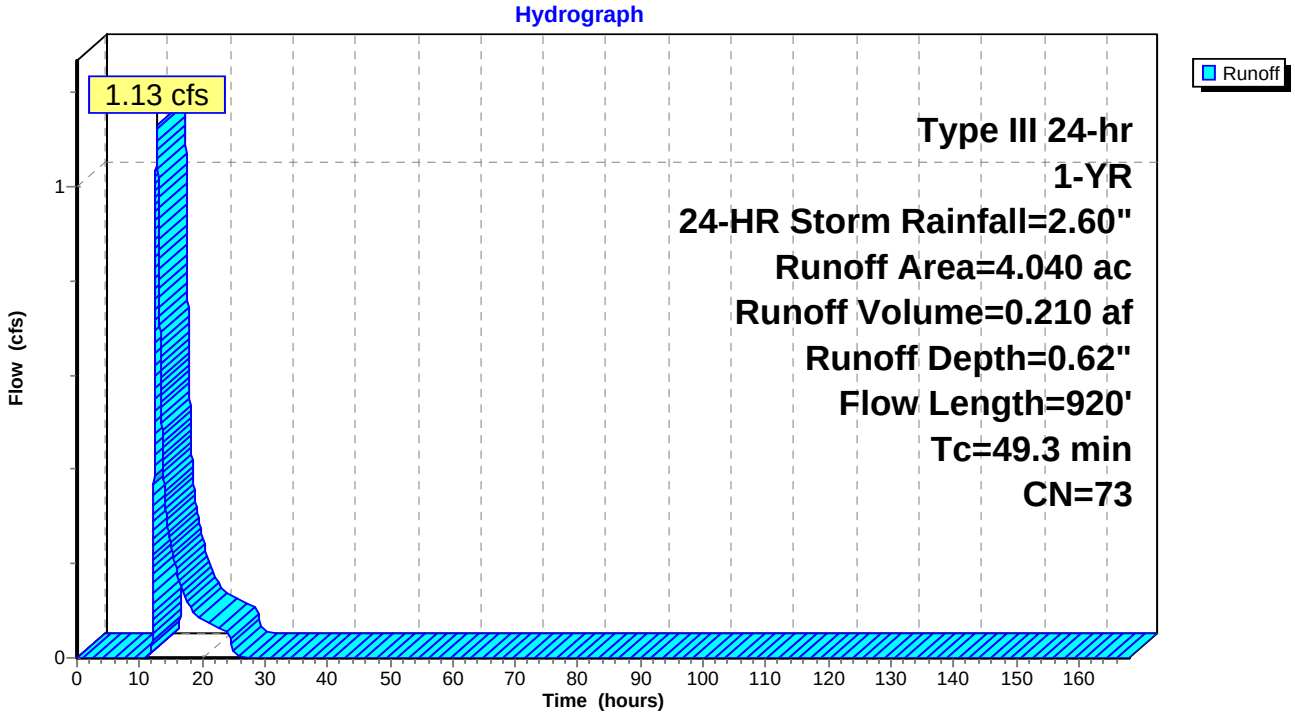
Runoff = 1.13 cfs @ 12.76 hrs, Volume= 0.210 af, Depth= 0.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.005	71	Meadow, non-grazed, HSG C
2.022	70	Woods, Good, HSG C
2.013	77	Woods, Good, HSG D
4.040	73	Weighted Average
4.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
13.1	770	0.0384	0.98		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
49.3	920	Total			

Subcatchment 26: PR DA 26



Summary for Subcatchment 26A-1: PR DA 26A-1

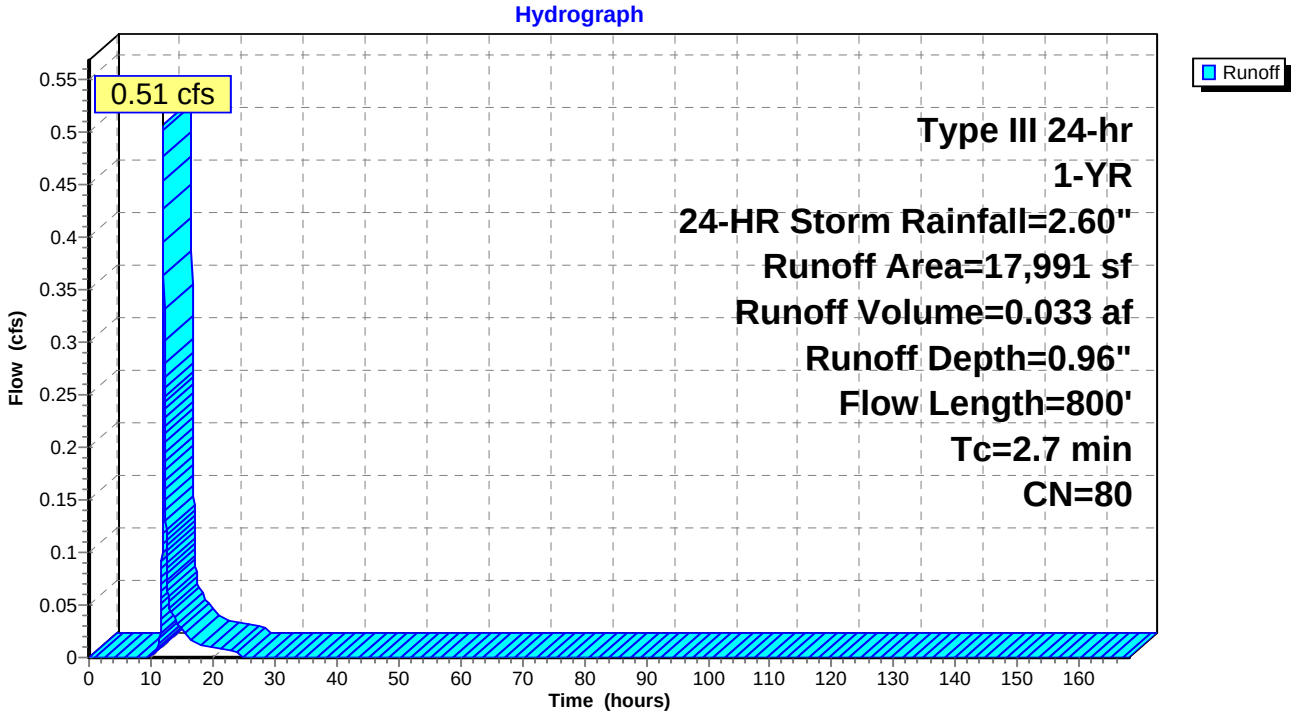
Runoff = 0.51 cfs @ 12.05 hrs, Volume= 0.033 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (sf)	CN	Description
	4,879	70	Woods, Good, HSG C
	7,312	74	>75% Grass cover, Good, HSG C
	4,885	98	Paved roads w/curbs & sewers, HSG C
*	915	89	Gravel Shoulder, HSG C
	17,991	80	Weighted Average
	13,106		72.85% Pervious Area
	4,885		27.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-1: PR DA 26A-1



Summary for Subcatchment 26A-2: PR DA 26A-2

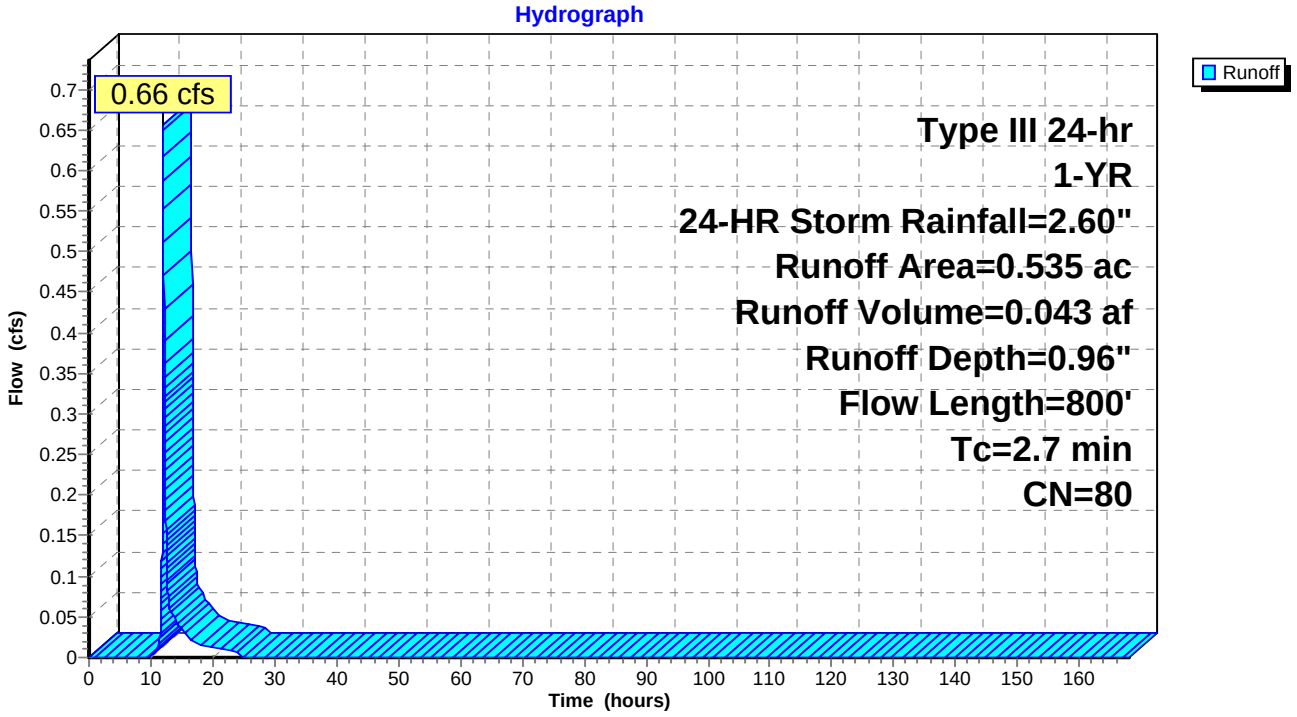
Runoff = 0.66 cfs @ 12.05 hrs, Volume= 0.043 af, Depth= 0.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.146	70	Woods, Good, HSG C
	0.222	74	>75% Grass cover, Good, HSG C
	0.140	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.535	80	Weighted Average
	0.395		73.83% Pervious Area
	0.140		26.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-2: PR DA 26A-2



Summary for Subcatchment 26A-3: PR DA 26A-3

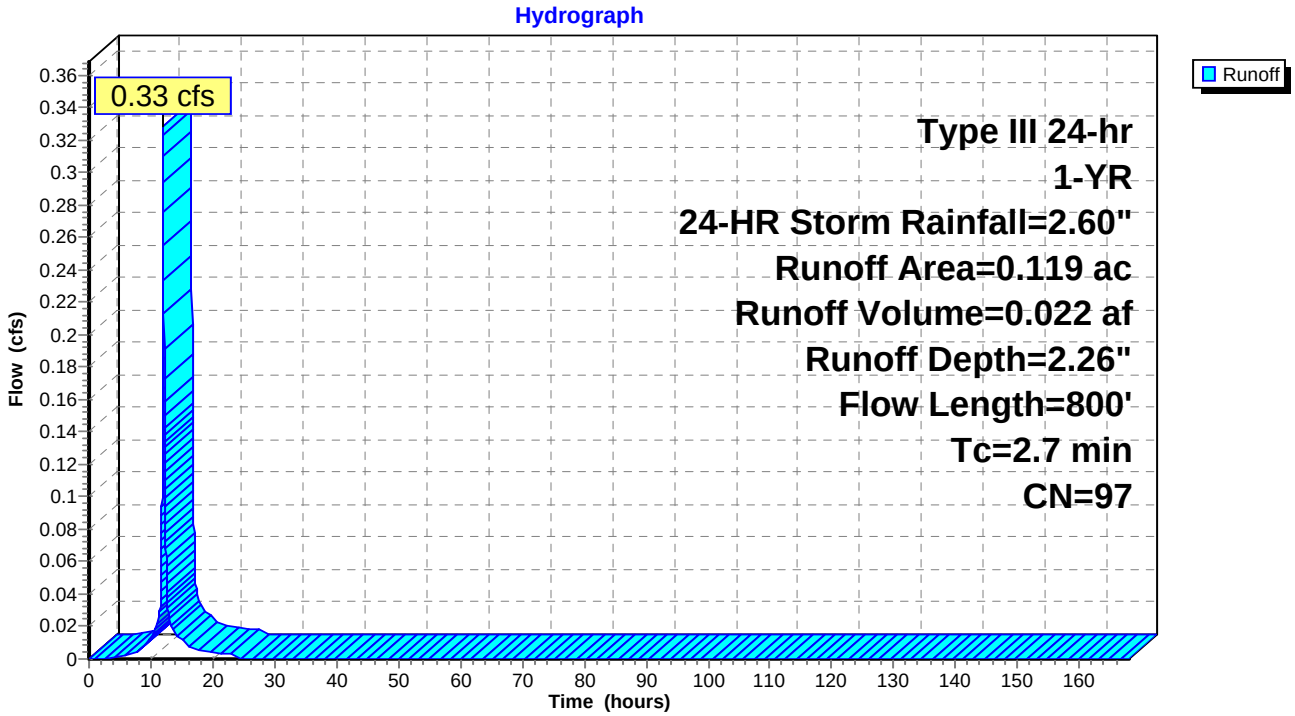
Runoff = 0.33 cfs @ 12.04 hrs, Volume= 0.022 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.005	74	>75% Grass cover, Good, HSG C
	0.111	98	Paved roads w/curbs & sewers, HSG C
*	0.003	89	Gravel Shoulder, HSG C
	0.119	97	Weighted Average
	0.008		6.72% Pervious Area
	0.111		93.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-3: PR DA 26A-3



Summary for Subcatchment 26B-1: PR DA 26B-1

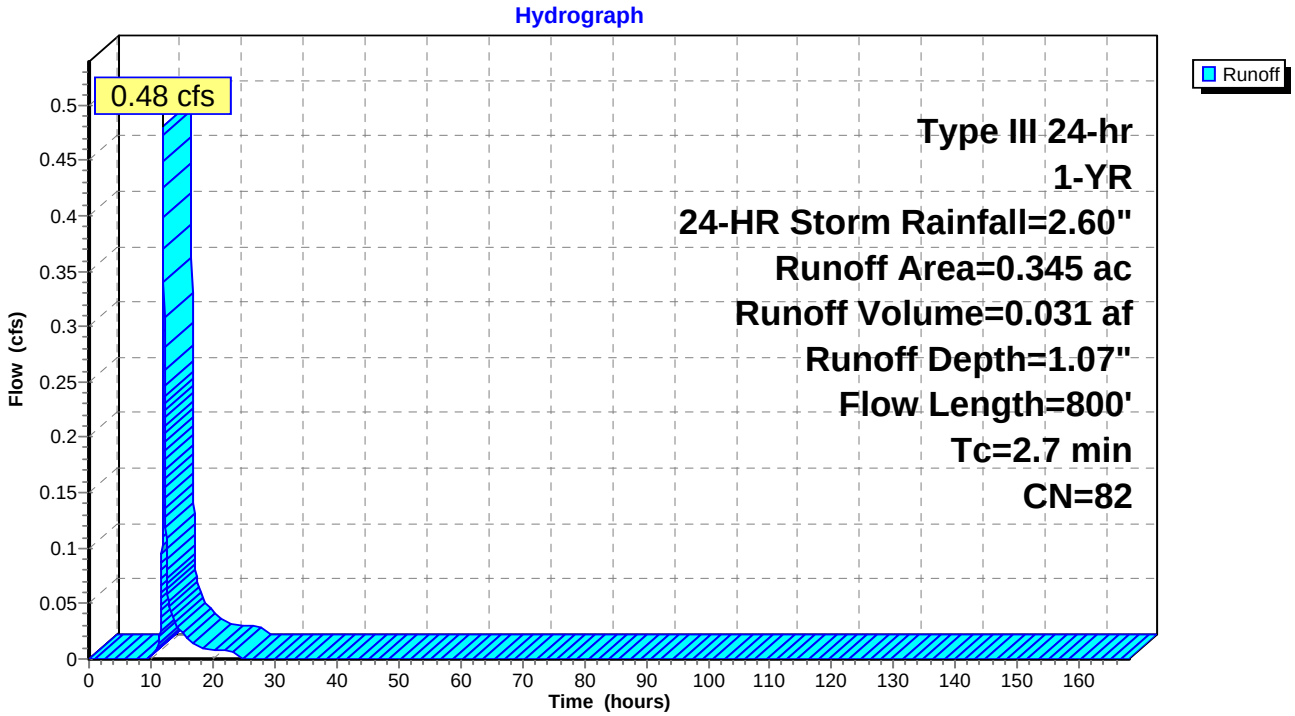
Runoff = 0.48 cfs @ 12.04 hrs, Volume= 0.031 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.228	74	>75% Grass cover, Good, HSG C
	0.098	98	Paved roads w/curbs & sewers, HSG C
*	0.019	89	Gravel Shoulder, HSG C
	0.345	82	Weighted Average
	0.247		71.59% Pervious Area
	0.098		28.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-1: PR DA 26B-1



Summary for Subcatchment 26B-2: PR DA 26B-2

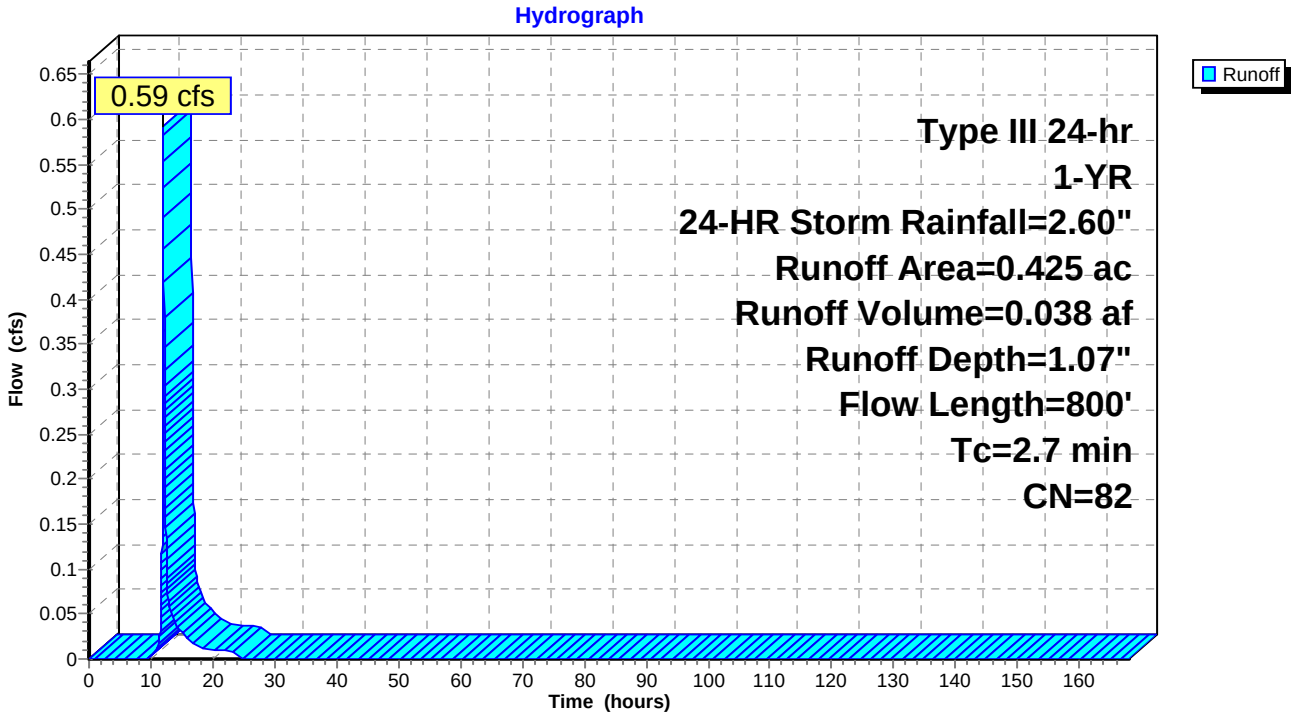
Runoff = 0.59 cfs @ 12.04 hrs, Volume= 0.038 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.281	74	>75% Grass cover, Good, HSG C
	0.121	98	Paved roads w/curbs & sewers, HSG C
*	0.023	89	Gravel Shoulder, HSG C
	0.425	82	Weighted Average
	0.304		71.53% Pervious Area
	0.121		28.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-2: PR DA 26B-2



Summary for Subcatchment 26B-3: PR DA 26B-3

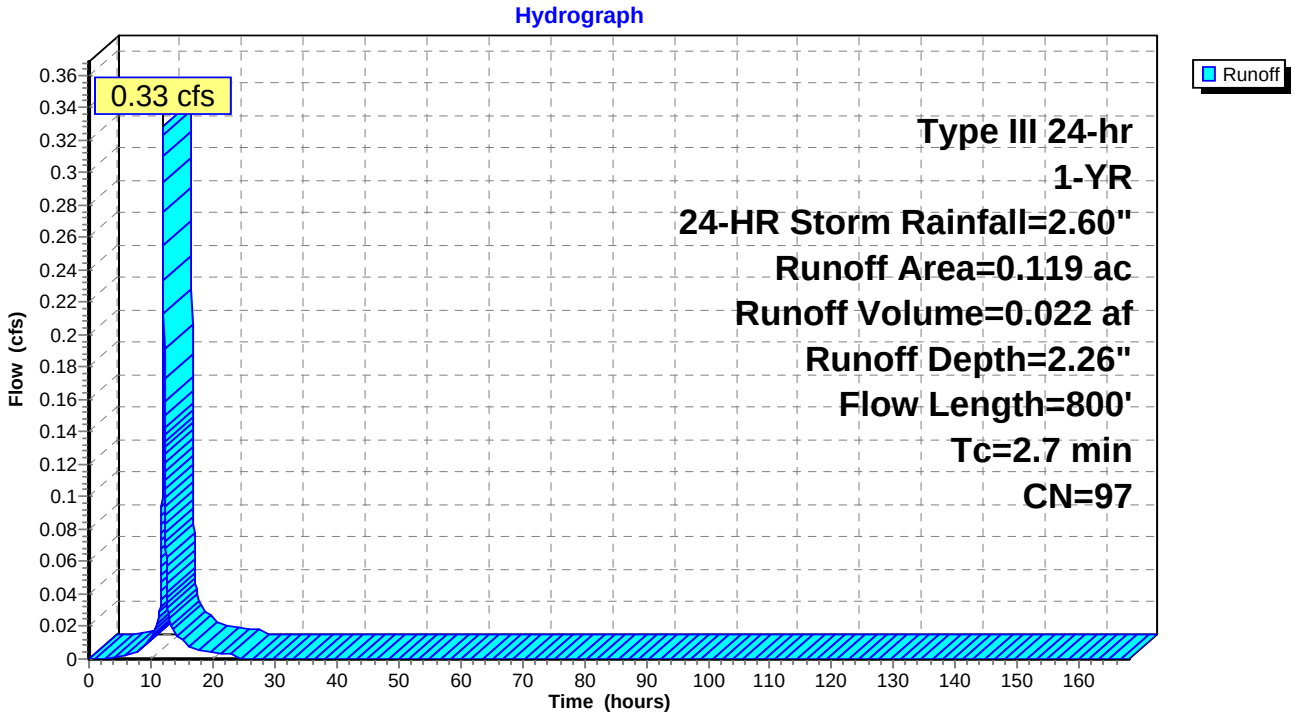
Runoff = 0.33 cfs @ 12.04 hrs, Volume= 0.022 af, Depth= 2.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.005	74	>75% Grass cover, Good, HSG C
	0.111	98	Paved roads w/curbs & sewers, HSG C
*	0.003	89	Gravel Shoulder, HSG C
	0.119	97	Weighted Average
	0.008		6.72% Pervious Area
	0.111		93.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-3: PR DA 26B-3



Summary for Subcatchment 26C: PR DA 26C

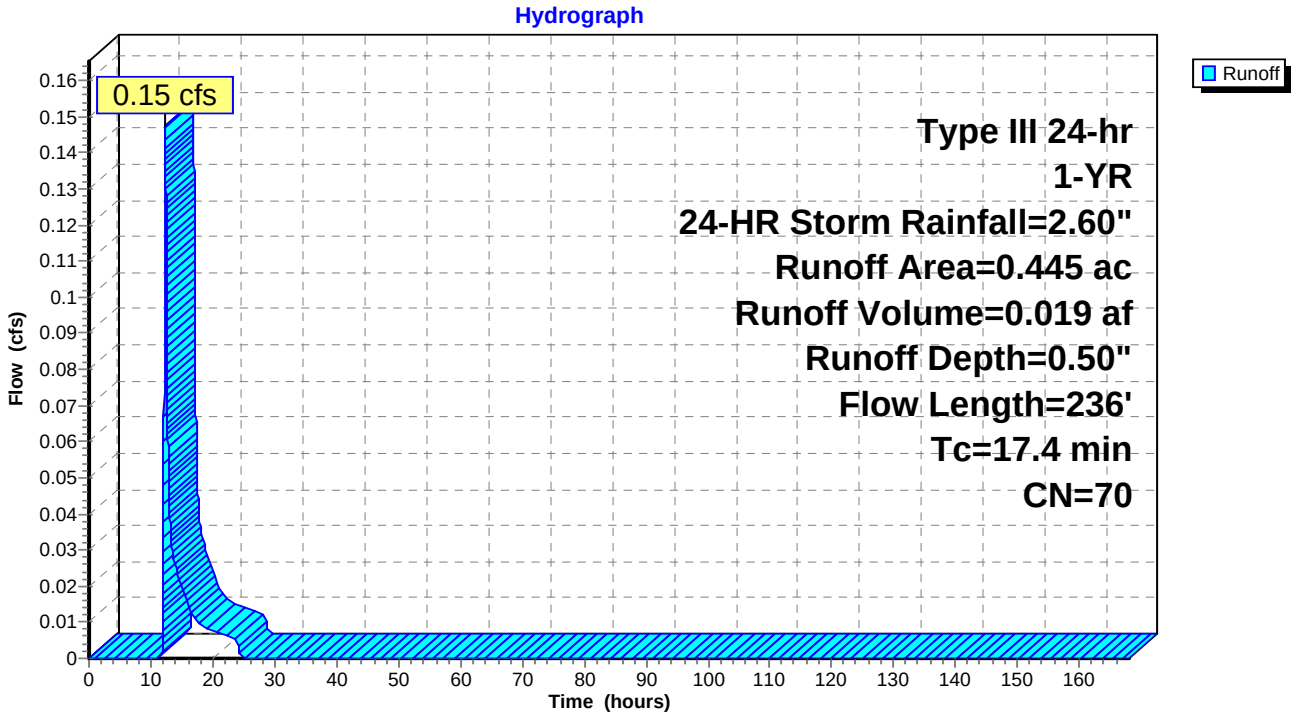
Runoff = 0.15 cfs @ 12.29 hrs, Volume= 0.019 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.176	71	Meadow, non-grazed, HSG C
0.269	70	Woods, Good, HSG C
0.445	70	Weighted Average
0.445		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	123	0.0569	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
2.0	113	0.0354	0.94		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
17.4	236	Total			

Subcatchment 26C: PR DA 26C



Summary for Subcatchment 26D: PR DA 26D

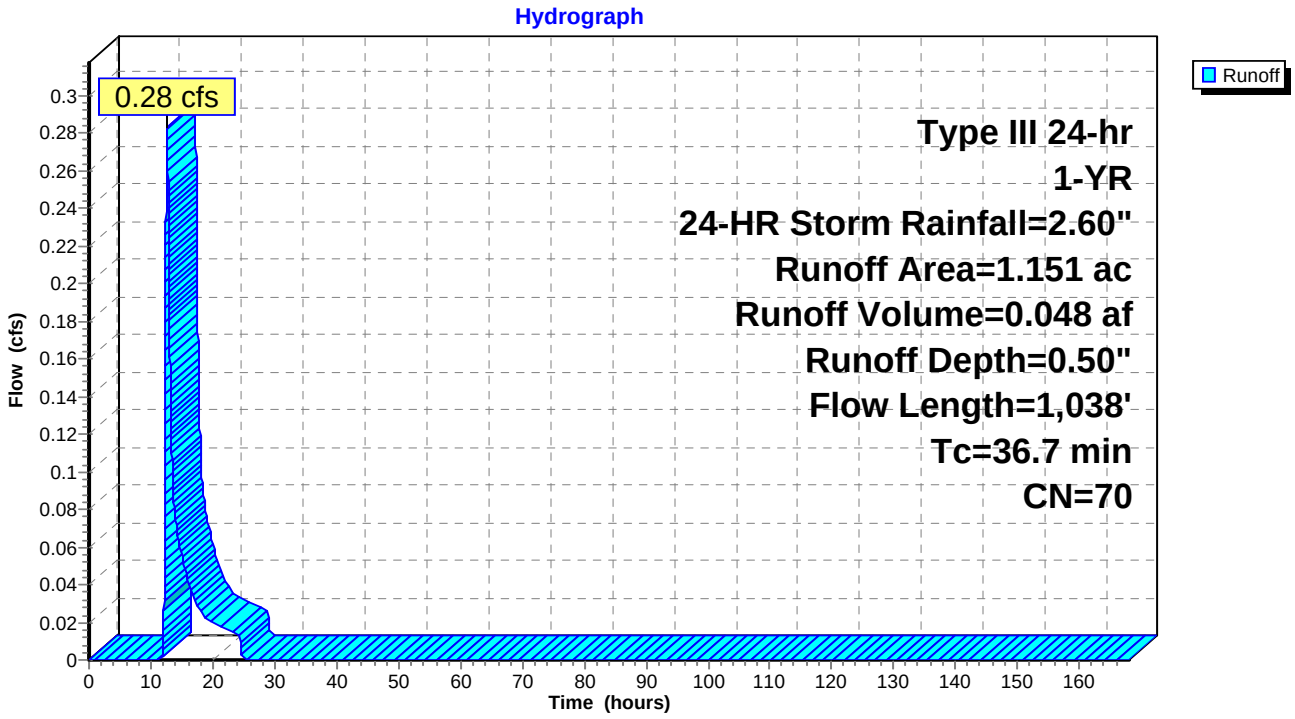
Runoff = 0.28 cfs @ 12.60 hrs, Volume= 0.048 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
1.146	70	Woods, Good, HSG C
0.005	77	Woods, Good, HSG D
1.151	70	Weighted Average
1.151		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.5	150	0.0167	0.08		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
5.9	315	0.0317	0.89		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.3	573	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
36.7	1,038	Total			

Subcatchment 26D: PR DA 26D



Summary for Subcatchment 26E: PR DA 26E

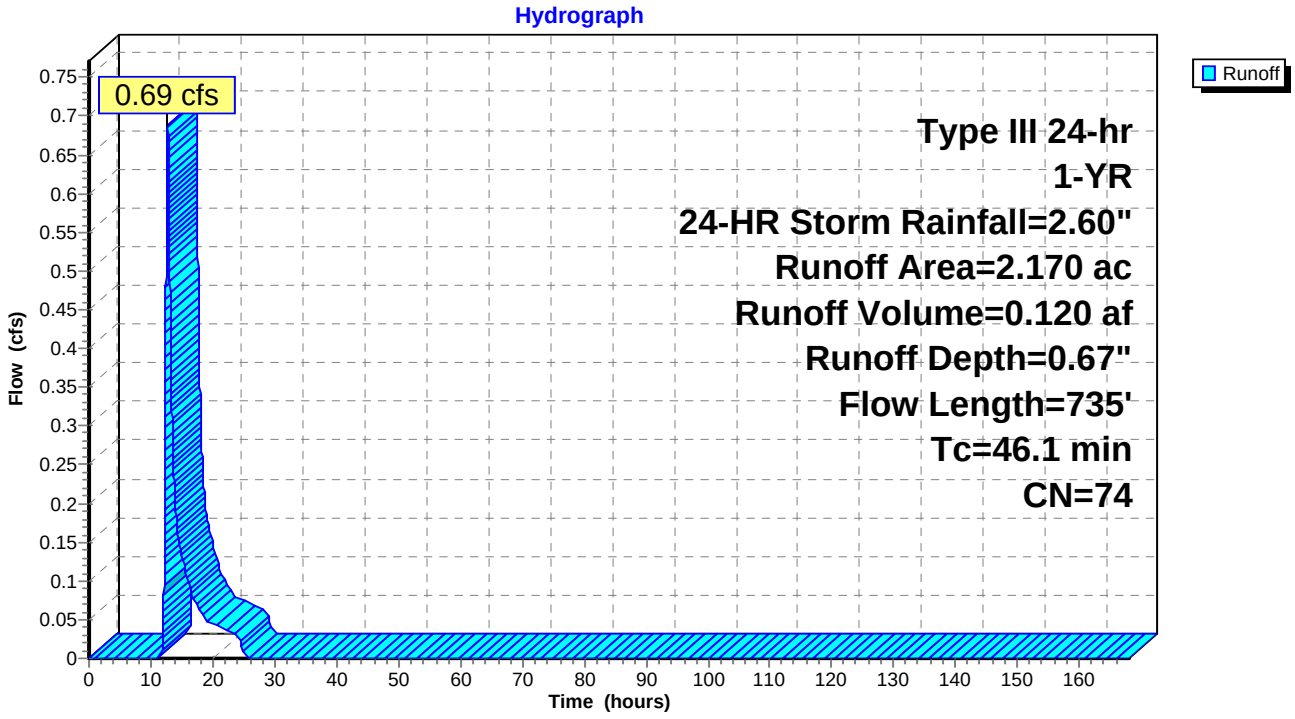
Runoff = 0.69 cfs @ 12.70 hrs, Volume= 0.120 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.900	70	Woods, Good, HSG C
1.270	77	Woods, Good, HSG D
2.170	74	Weighted Average
2.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
9.9	585	0.0387	0.98		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
46.1	735	Total			

Subcatchment 26E: PR DA 26E



Summary for Subcatchment 26F: PR DA 26F

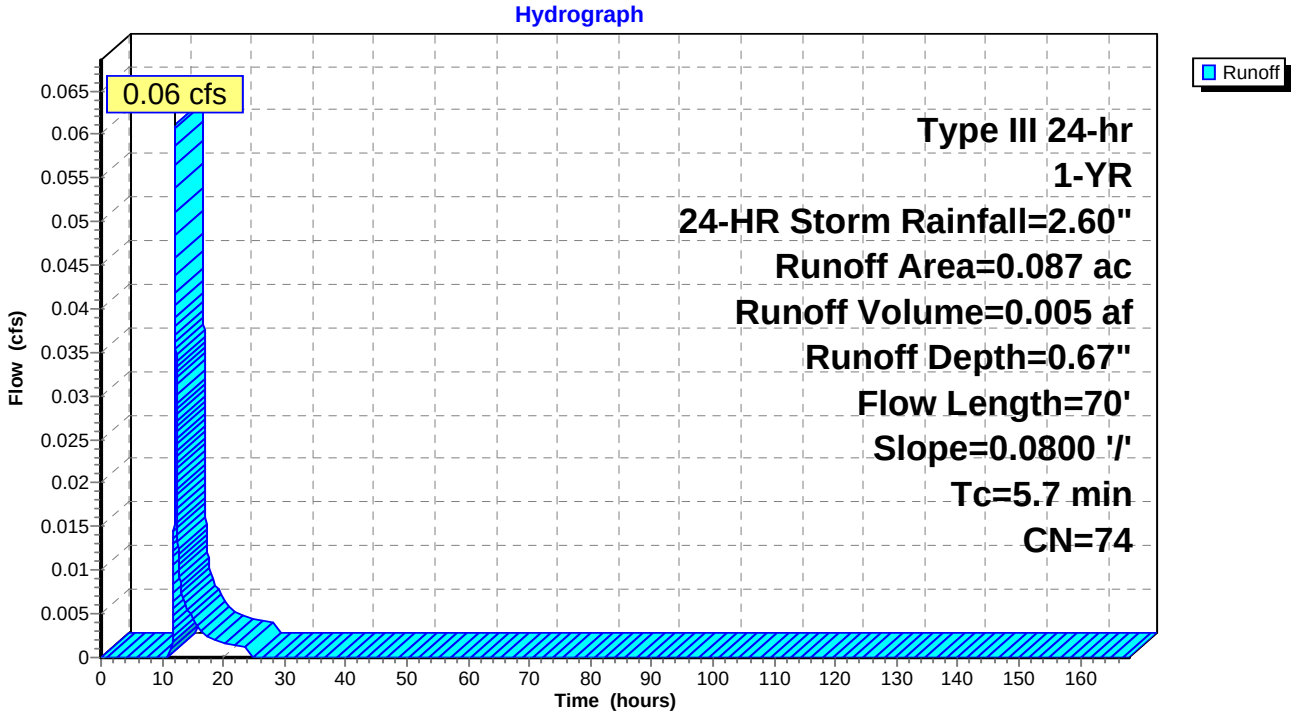
Runoff = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.087	74	>75% Grass cover, Good, HSG C
0.087		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	70	0.0800	0.20		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment 26F: PR DA 26F



Summary for Subcatchment 26G: PR DA 26G

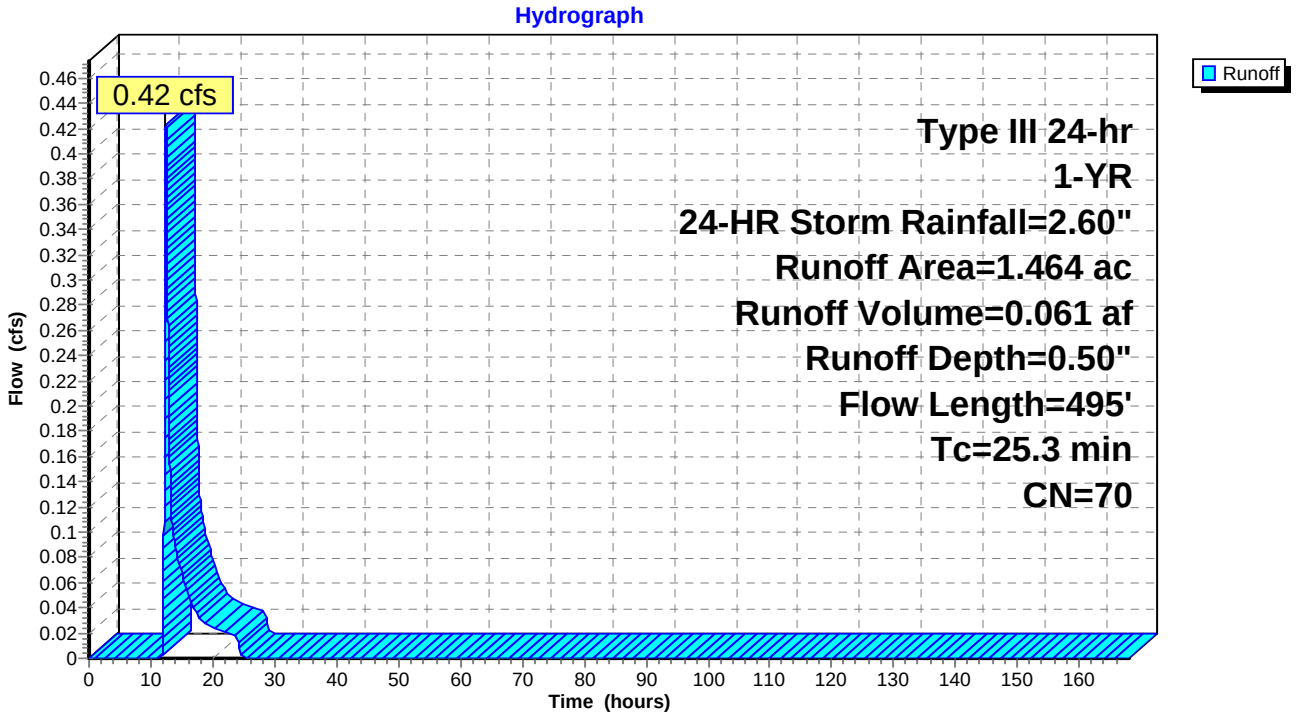
Runoff = 0.42 cfs @ 12.43 hrs, Volume= 0.061 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
1.464	70	Woods, Good, HSG C
1.464		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	150	0.0467	0.13		**Sheet Flow, 150** Woods: Light underbrush n= 0.400 P2= 3.75"
5.7	345	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
25.3	495	Total			

Subcatchment 26G: PR DA 26G



Summary for Subcatchment 28A: PR DA 28A

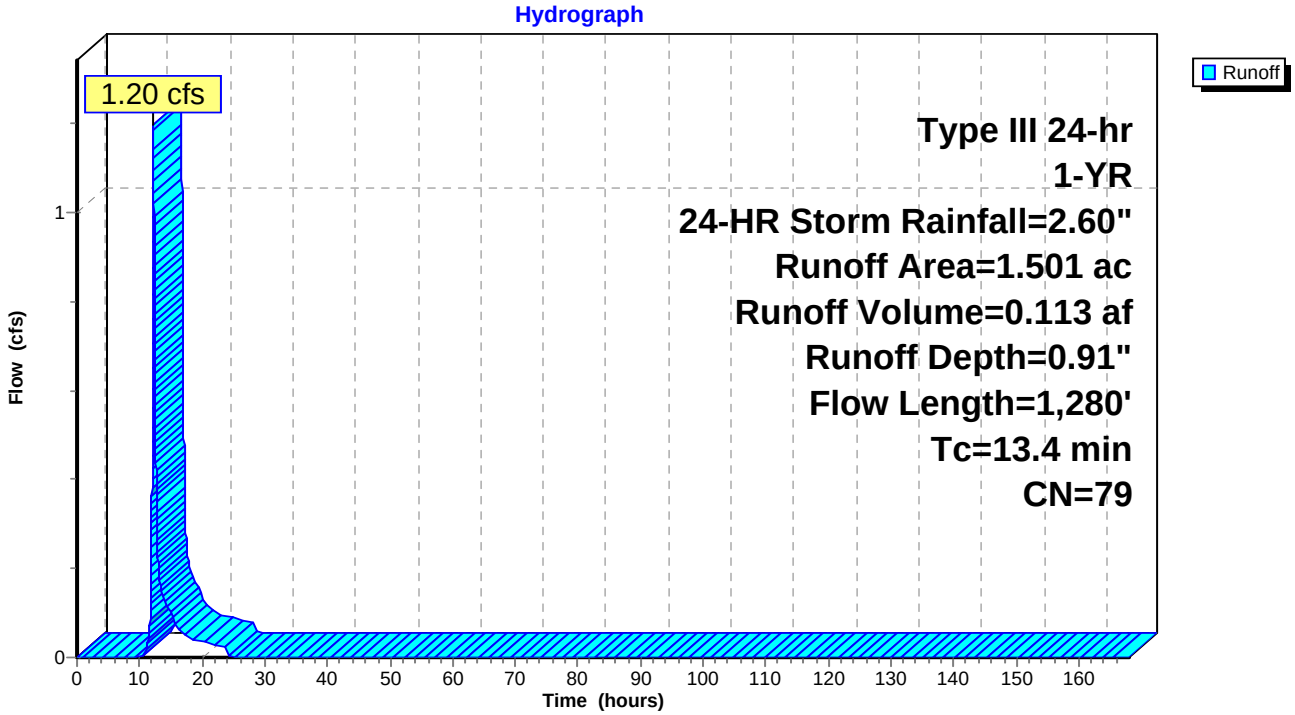
Runoff = 1.20 cfs @ 12.19 hrs, Volume= 0.113 af, Depth= 0.91"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
1.177	74	>75% Grass cover, Good, HSG C
0.324	98	Paved roads w/curbs & sewers, HSG C
1.501	79	Weighted Average
1.177		78.41% Pervious Area
0.324		21.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	150	0.0500	0.29		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
4.3	930	0.0500	3.60		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps
0.4	200	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
13.4	1,280	Total			

Subcatchment 28A: PR DA 28A



Summary for Subcatchment 28B: PR DA 28B

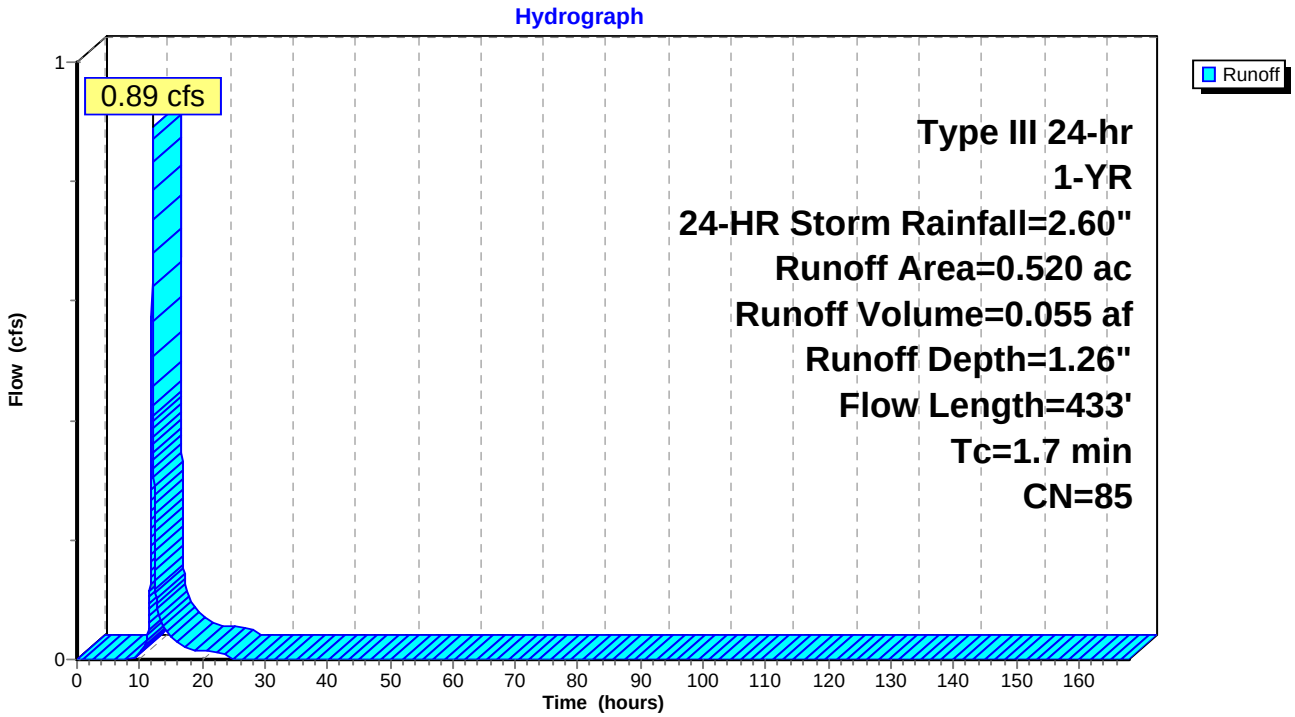
Runoff = 0.89 cfs @ 12.03 hrs, Volume= 0.055 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.271	74	>75% Grass cover, Good, HSG C
0.249	98	Paved roads w/curbs & sewers, HSG C
0.520	85	Weighted Average
0.271		52.12% Pervious Area
0.249		47.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.4	183	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	433	Total			

Subcatchment 28B: PR DA 28B



Summary for Subcatchment 28C: PR DA 28C

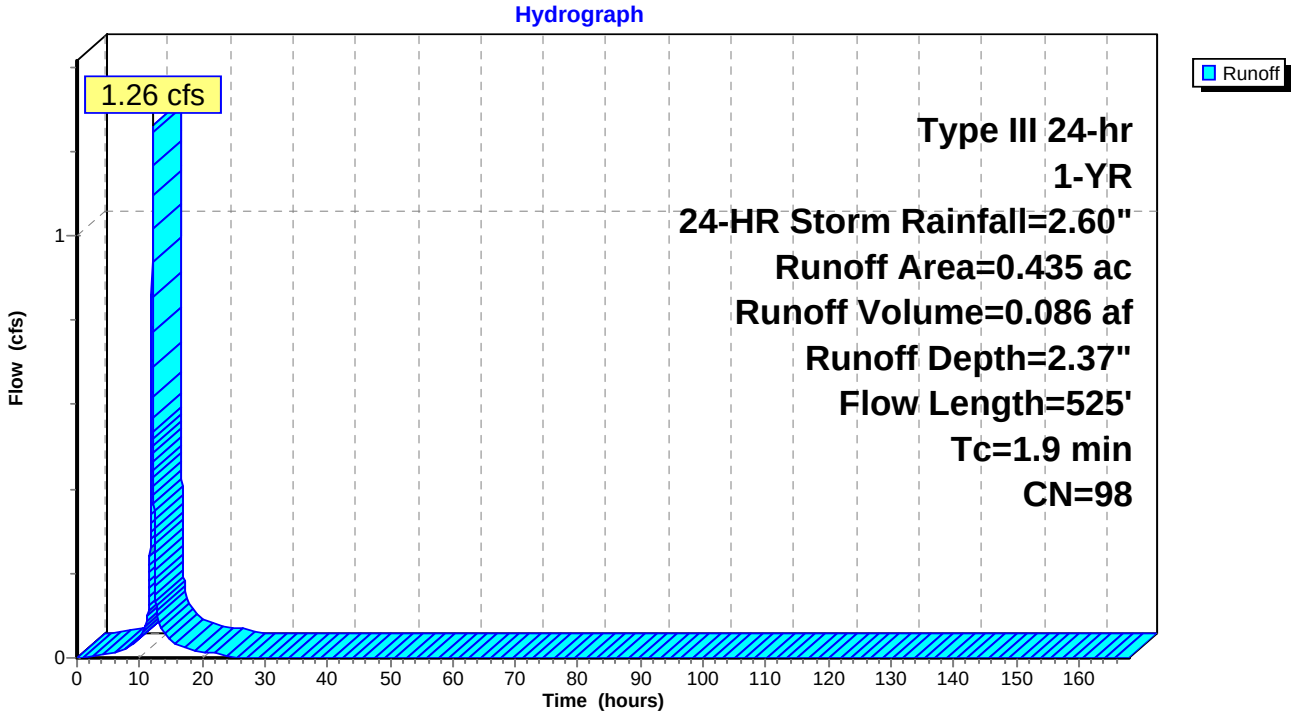
Runoff = 1.26 cfs @ 12.03 hrs, Volume= 0.086 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.435	98	Paved roads w/curbs & sewers, HSG C
0.435		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.6	275	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.9	525	Total			

Subcatchment 28C: PR DA 28C



Summary for Subcatchment 28D: PR DA 28D

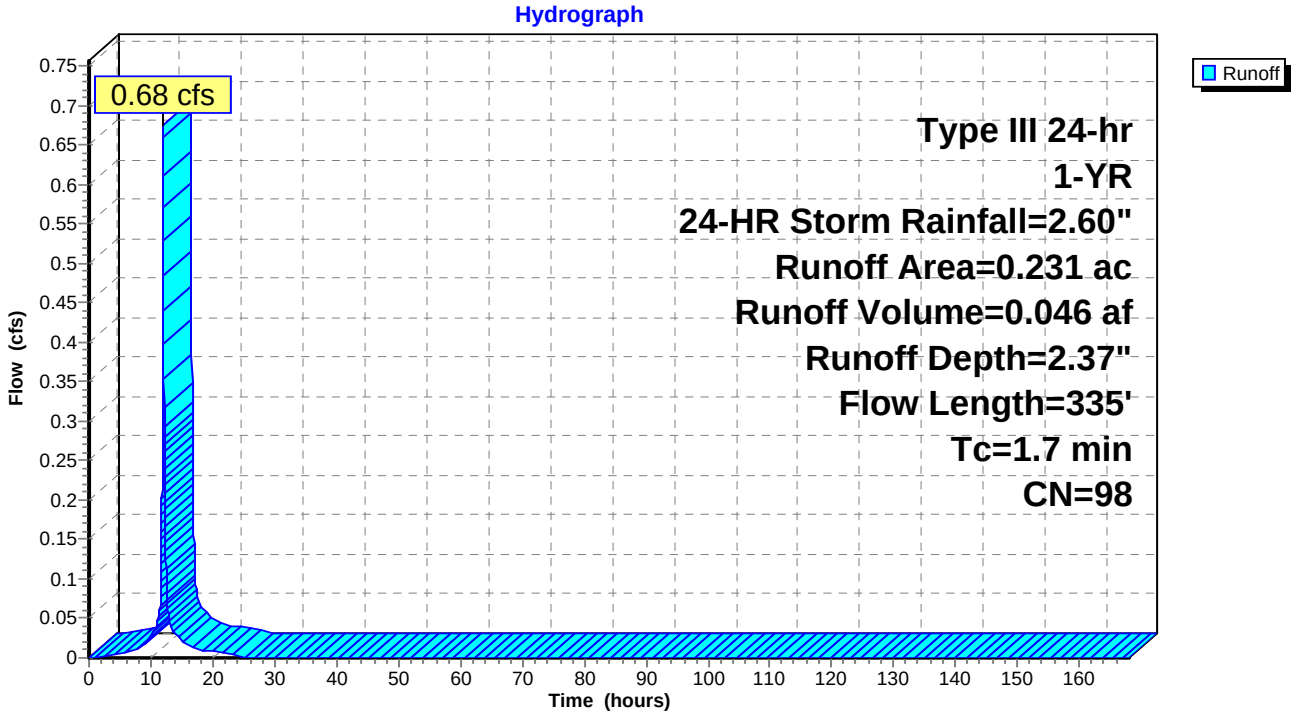
Runoff = 0.68 cfs @ 12.02 hrs, Volume= 0.046 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.231	98	Paved roads w/curbs & sewers, HSG C
0.231		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	150	0.0400	2.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	50	0.0400	4.06		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.3	135	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	335	Total			

Subcatchment 28D: PR DA 28D



Summary for Subcatchment 28E: PR DA 28E

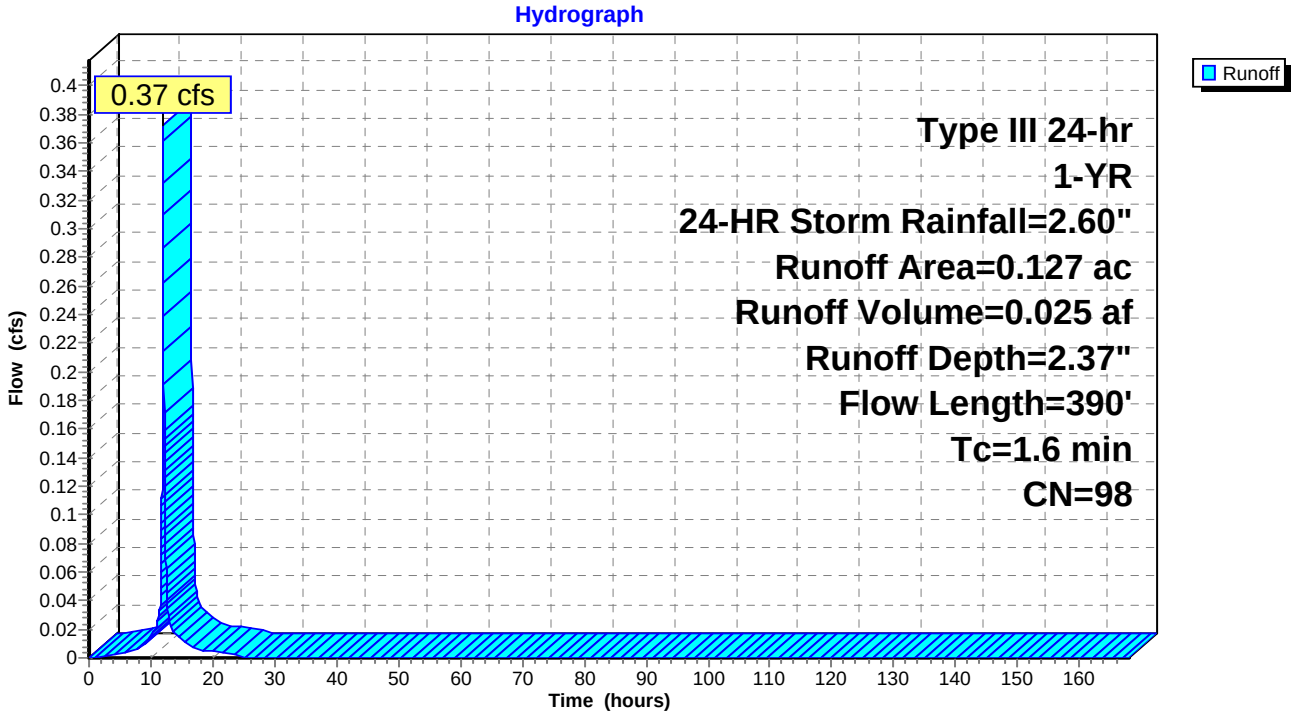
Runoff = 0.37 cfs @ 12.02 hrs, Volume= 0.025 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.127	98	Paved roads w/curbs & sewers, HSG C
0.127		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.3	140	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.6	390	Total			

Subcatchment 28E: PR DA 28E



Summary for Subcatchment 28F: PR DA 28F

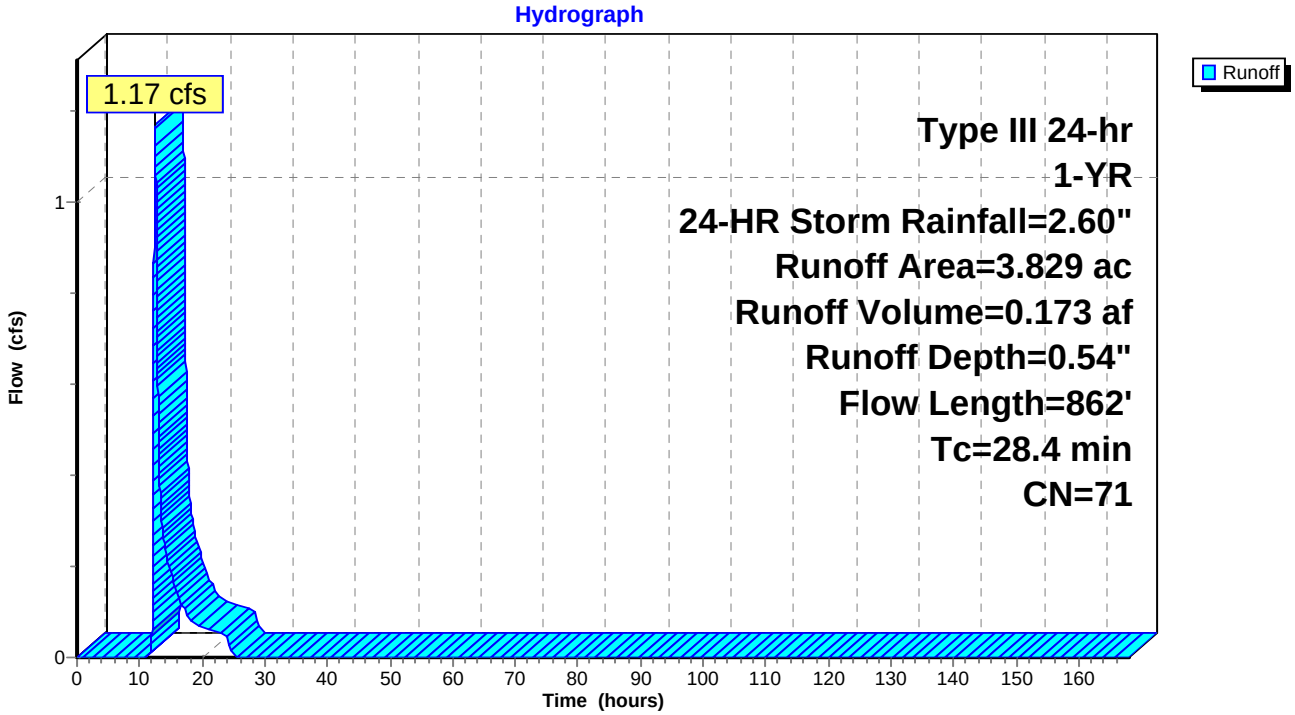
Runoff = 1.17 cfs @ 12.47 hrs, Volume= 0.173 af, Depth= 0.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.011	71	Meadow, non-grazed, HSG C
0.060	98	Unconnected pavement, HSG C
0.571	74	>75% Grass cover, Good, HSG C
3.187	70	Woods, Good, HSG C
3.829	71	Weighted Average
3.769		98.43% Pervious Area
0.060		1.57% Impervious Area
0.060		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	150	0.0500	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
9.4	712	0.0640	1.26		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
28.4	862	Total			

Subcatchment 28F: PR DA 28F



Summary for Subcatchment 28G: PR DA 28G

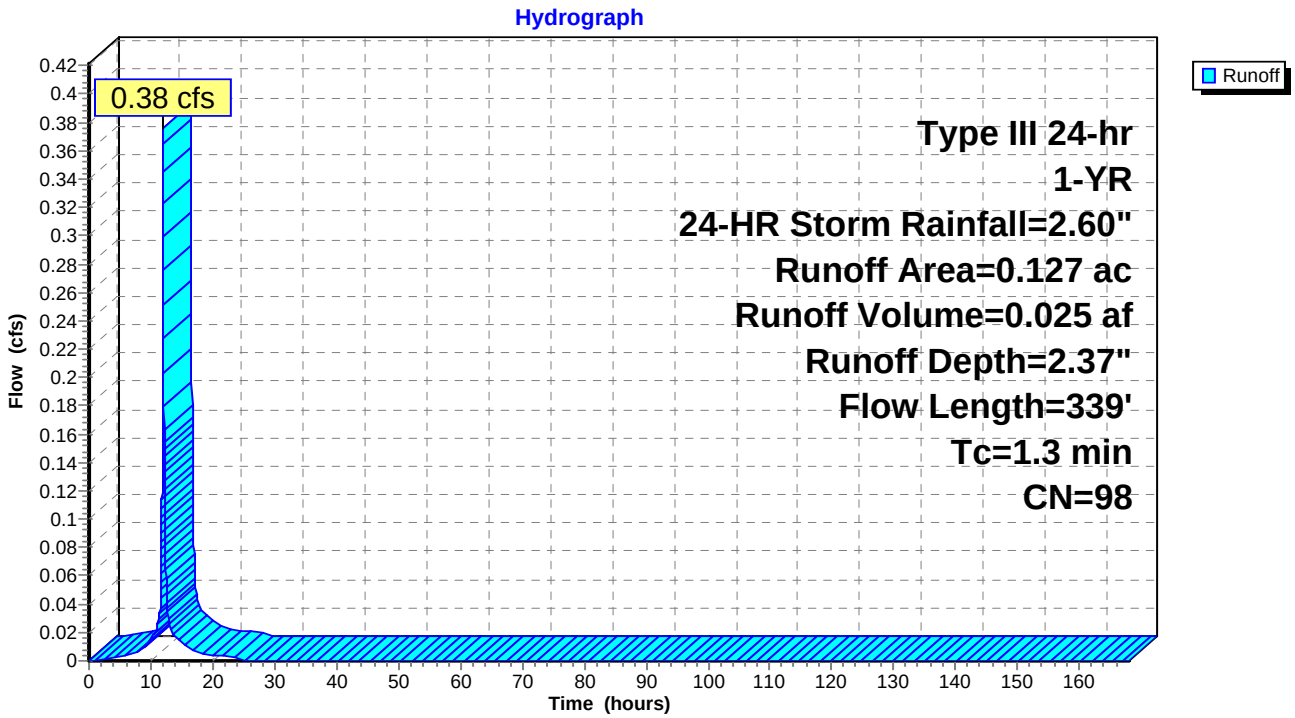
Runoff = 0.38 cfs @ 12.02 hrs, Volume= 0.025 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.127	98	Paved roads w/curbs & sewers, HSG C
0.127		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	113	0.0670	2.47		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.5	226	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.3	339	Total			

Subcatchment 28G: PR DA 28G



Summary for Subcatchment 28H: PR DA 28H

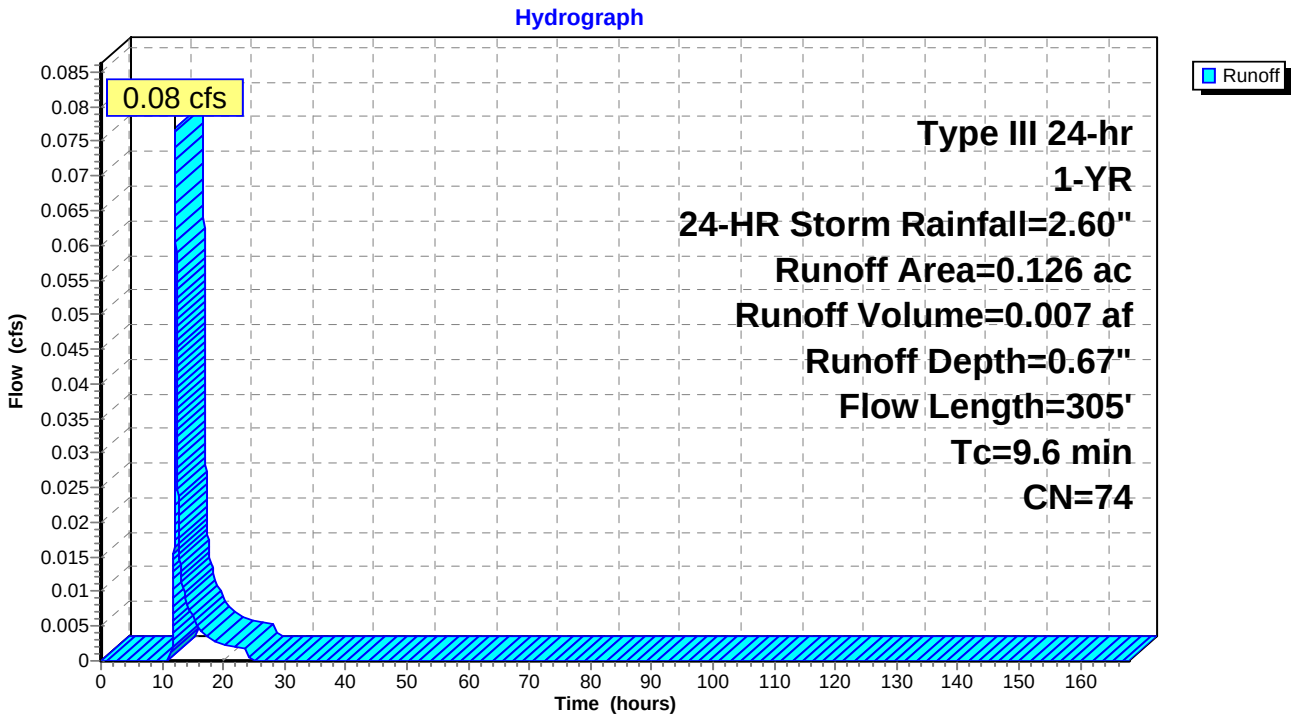
Runoff = 0.08 cfs @ 12.15 hrs, Volume= 0.007 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.126	74	>75% Grass cover, Good, HSG C
0.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	120	0.0700	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"
0.4	185	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
9.6	305	Total			

Subcatchment 28H: PR DA 28H



Summary for Subcatchment 28I: PR DA 28I

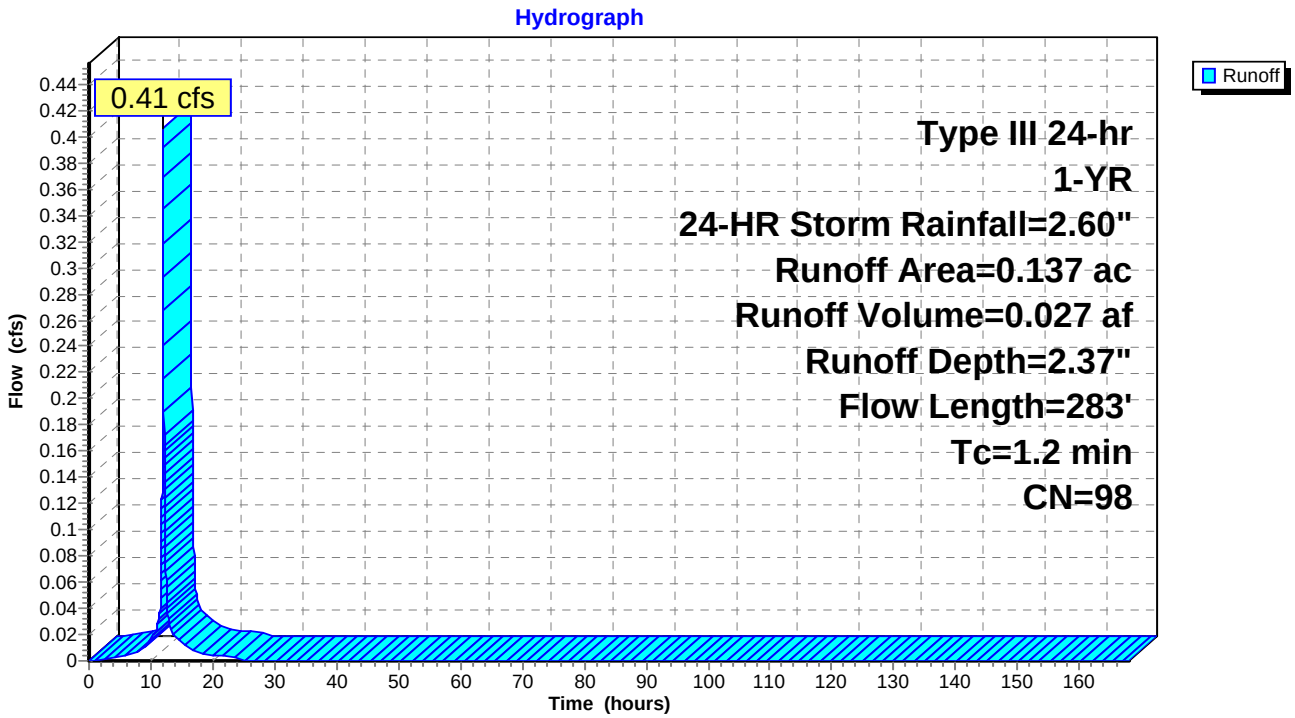
Runoff = 0.41 cfs @ 12.02 hrs, Volume= 0.027 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.137	98	Paved roads w/curbs & sewers, HSG C
0.137		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	118	0.0670	2.50		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	165	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.2	283	Total			

Subcatchment 28I: PR DA 28I



Summary for Subcatchment 31: PR DA 31

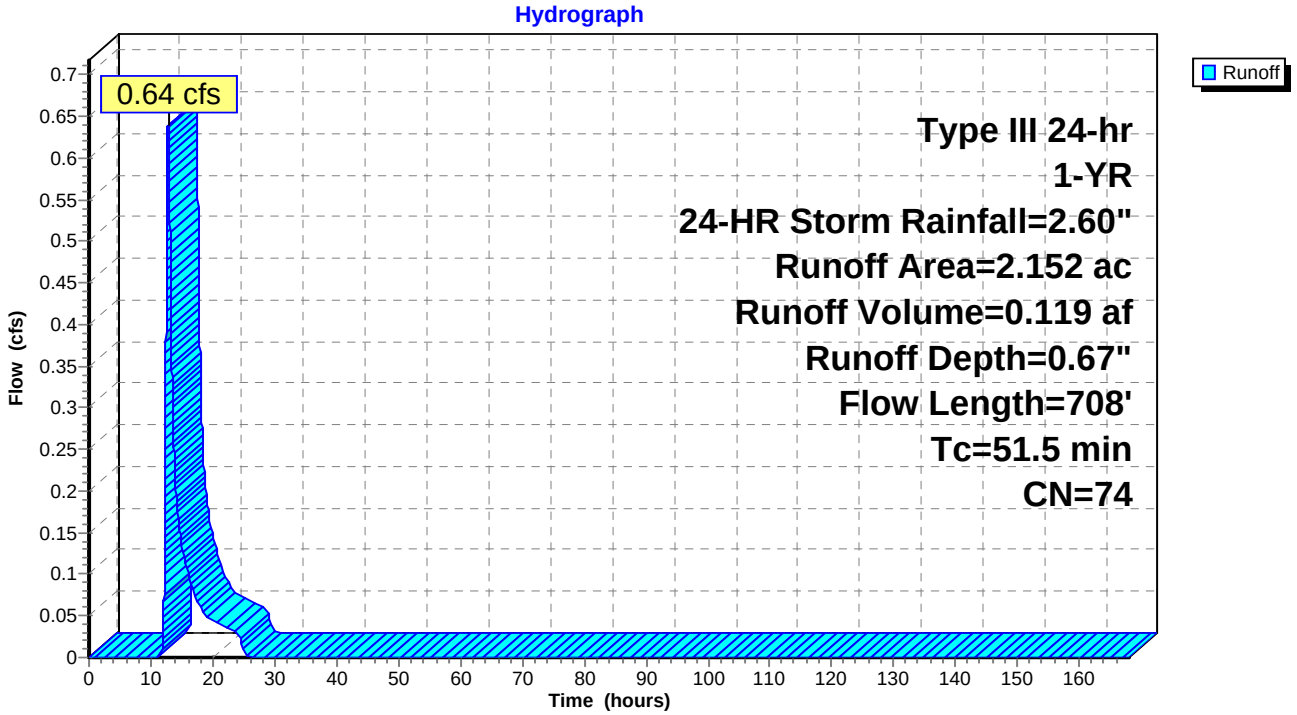
Runoff = 0.64 cfs @ 12.77 hrs, Volume= 0.119 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.064	98	Unconnected pavement, HSG C
1.699	74	>75% Grass cover, Good, HSG C
0.031	71	Meadow, non-grazed, HSG C
0.300	70	Woods, Good, HSG C
0.049	80	>75% Grass cover, Good, HSG D
0.009	98	Water Surface, HSG D
2.152	74	Weighted Average
2.079		96.61% Pervious Area
0.073		3.39% Impervious Area
0.064		87.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.5	150	0.0067	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
9.0	558	0.0430	1.04		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
51.5	708	Total			

Subcatchment 31: PR DA 31



Summary for Subcatchment 31A: PR DA 31A

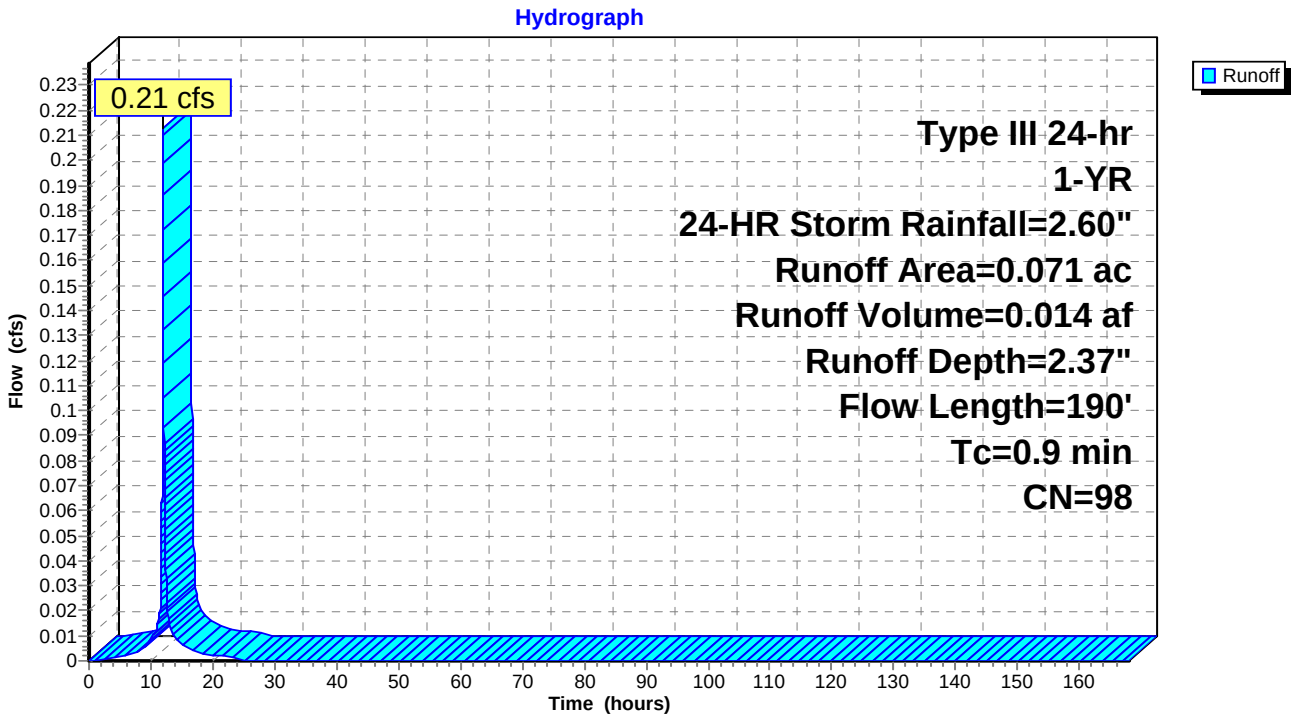
Runoff = 0.21 cfs @ 12.01 hrs, Volume= 0.014 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
*	0.071	98	Paved roads w/curbs & sewers, HSG C
	0.071		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	130	0.0690	2.58		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.1	60	0.0200	7.44	9.14	**Pipe Channel, Stormwater** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.9	190	Total			

Subcatchment 31A: PR DA 31A



Summary for Subcatchment 31B: PR DA 31B

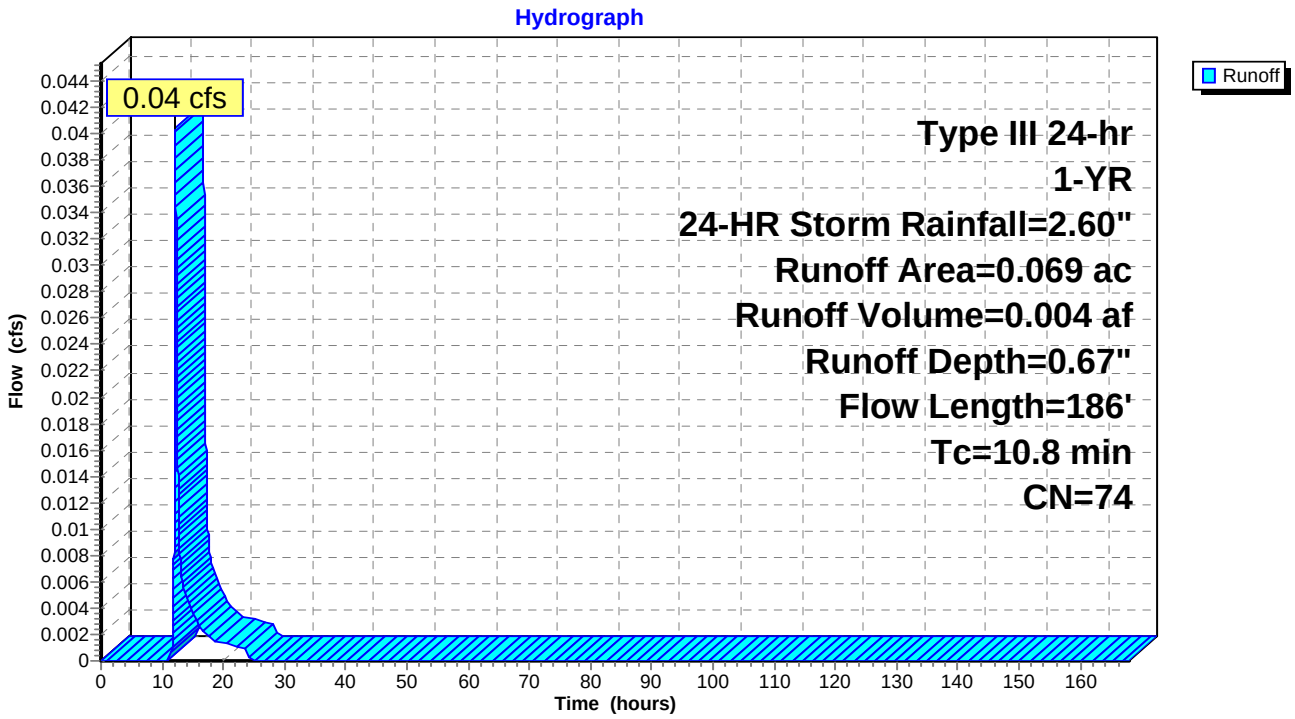
Runoff = 0.04 cfs @ 12.17 hrs, Volume= 0.004 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.069	74	>75% Grass cover, Good, HSG C
0.069		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	144	0.0700	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"
0.1	42	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
10.8	186	Total			

Subcatchment 31B: PR DA 31B



Summary for Subcatchment 31C: PR DA 31C

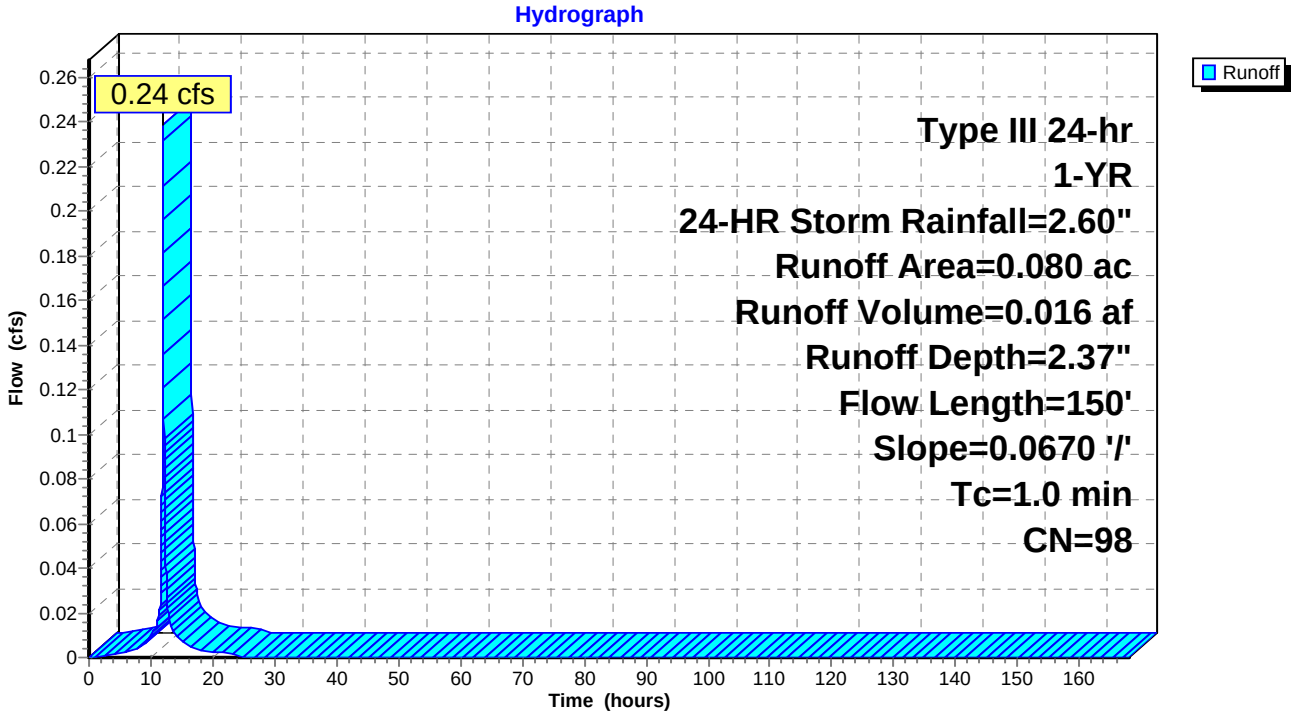
Runoff = 0.24 cfs @ 12.01 hrs, Volume= 0.016 af, Depth= 2.37"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.080	98	Paved roads w/curbs & sewers, HSG C
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0670	2.62		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"

Subcatchment 31C: PR DA 31C



Summary for Subcatchment 31D: PR DA 31D

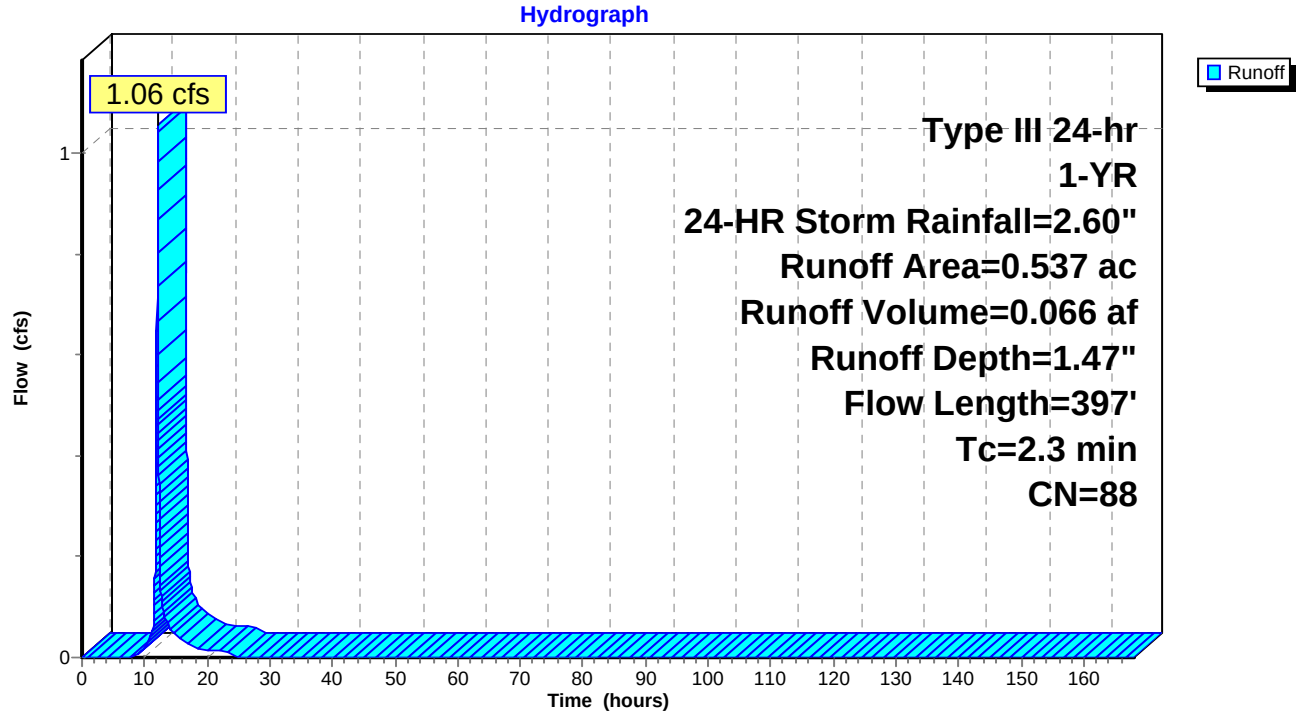
Runoff = 1.06 cfs @ 12.04 hrs, Volume= 0.066 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.223	74	>75% Grass cover, Good, HSG C
0.063	98	Unconnected pavement, HSG C
0.251	98	Paved roads w/curbs & sewers, HSG C
0.537	88	Weighted Average
0.223		41.53% Pervious Area
0.314		58.47% Impervious Area
0.063		20.06% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	150	0.0270	1.82		**Sheet Flow, Gutter** Smooth surfaces n= 0.011 P2= 3.75"
0.6	125	0.0270	3.34		**Shallow Concentrated Flow, Gutter** Paved Kv= 20.3 fps
0.3	122	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.3	397	Total			

Subcatchment 31D: PR DA 31D



Summary for Subcatchment SW21A: PR DA SW21A

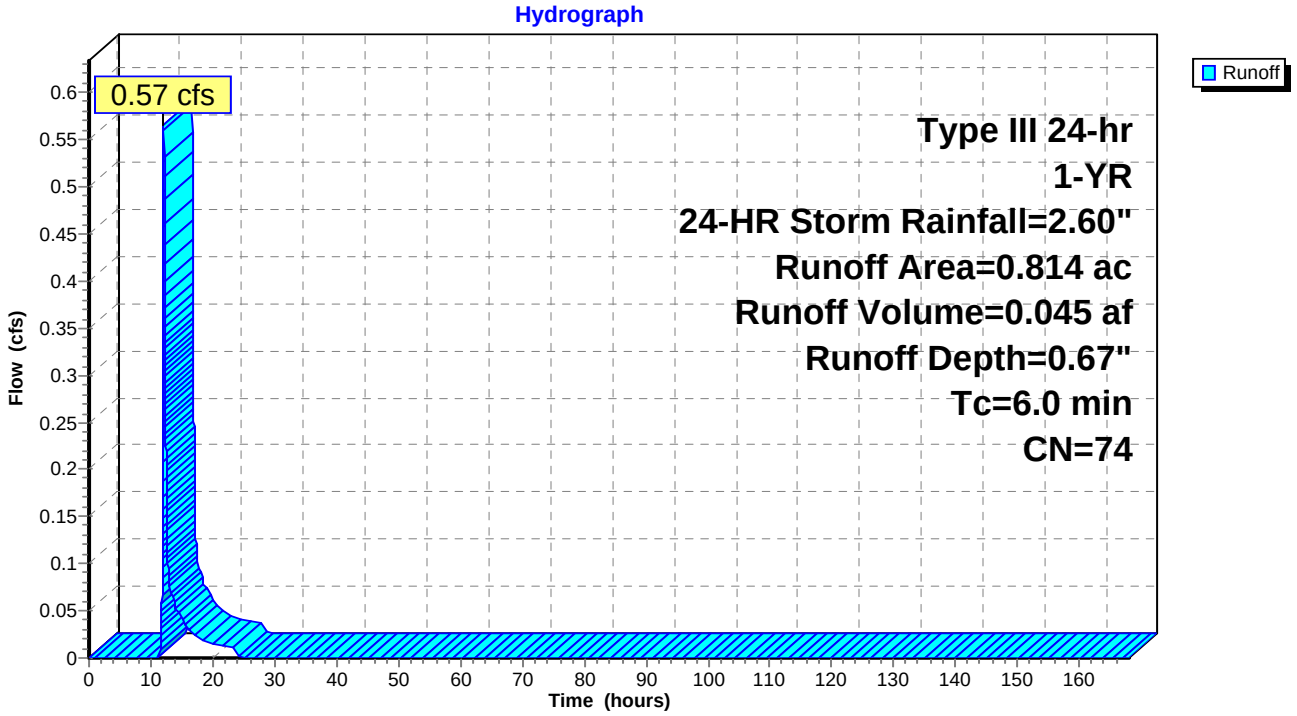
Runoff = 0.57 cfs @ 12.10 hrs, Volume= 0.045 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.814	74	>75% Grass cover, Good, HSG C
0.814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21A: PR DA SW21A



Summary for Subcatchment SW21B: PR DA SW21B

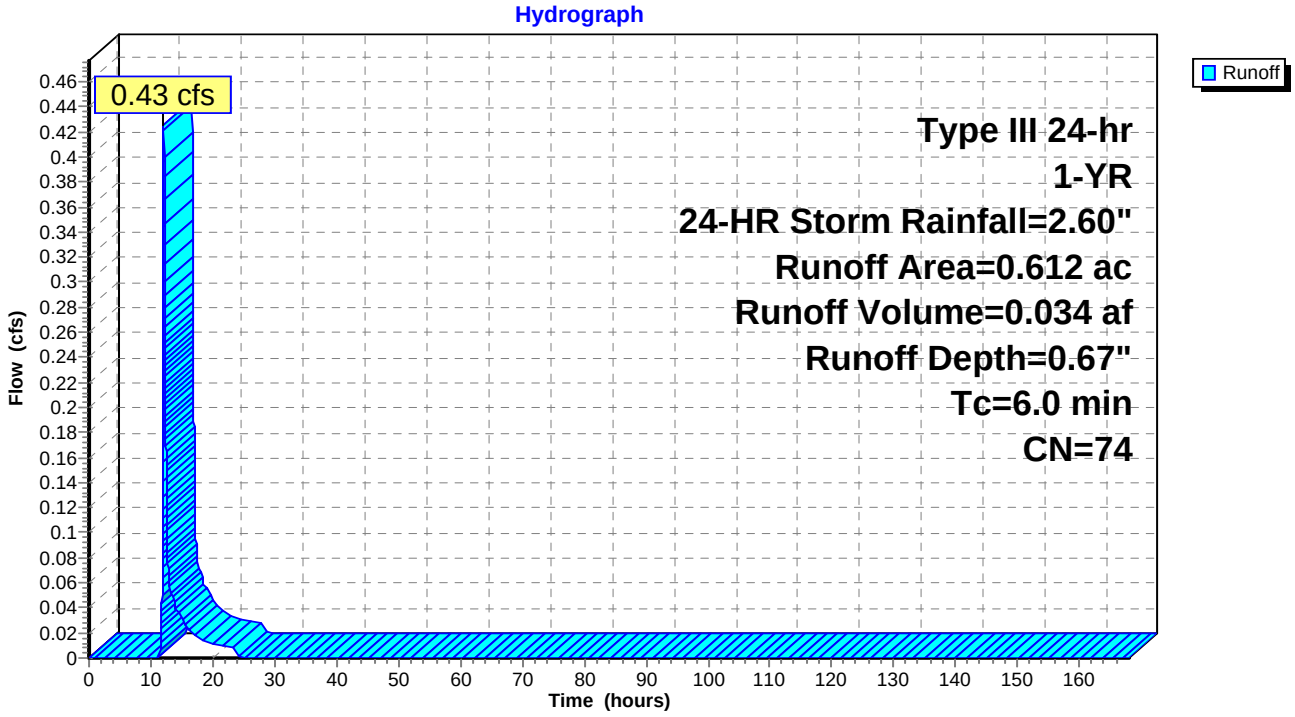
Runoff = 0.43 cfs @ 12.10 hrs, Volume= 0.034 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.433	74	>75% Grass cover, Good, HSG C
0.179	74	>75% Grass cover, Good, HSG C
0.612	74	Weighted Average
0.612		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21B: PR DA SW21B



Summary for Subcatchment SW21C: PR DA SW21C

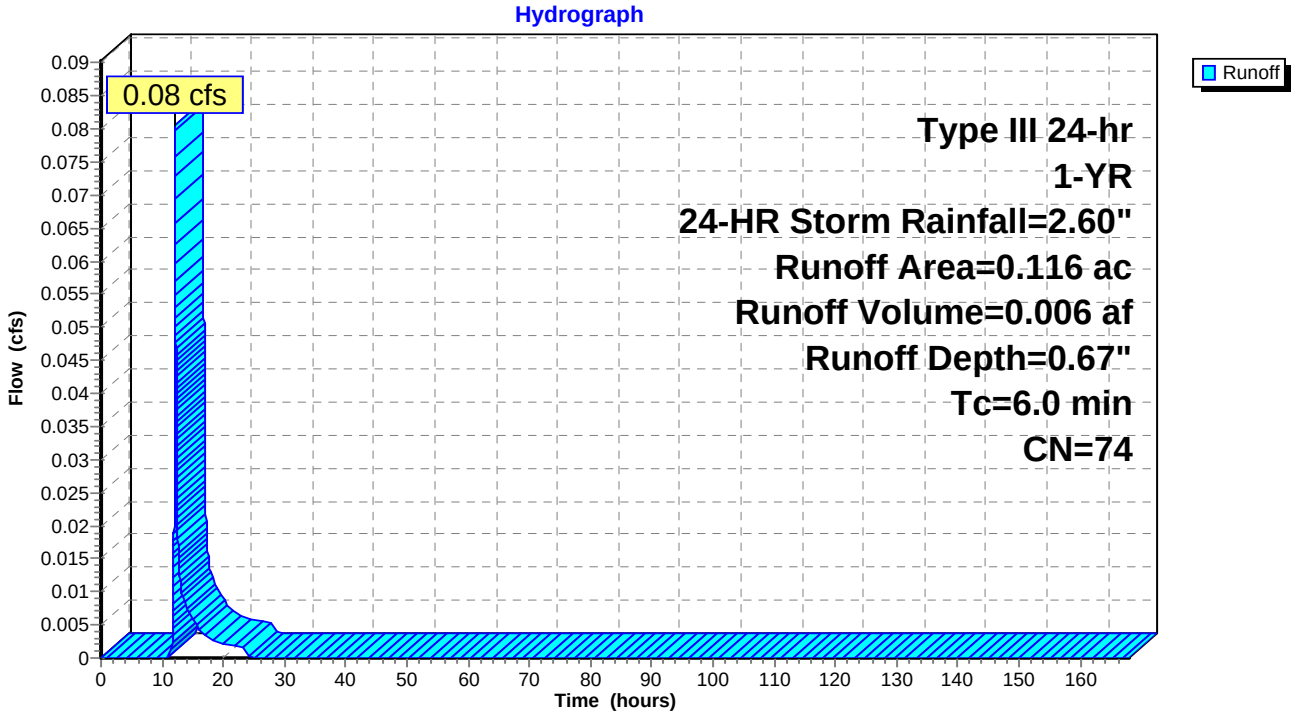
Runoff = 0.08 cfs @ 12.10 hrs, Volume= 0.006 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.116	74	>75% Grass cover, Good, HSG C
0.116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21C: PR DA SW21C



Summary for Subcatchment SW23A: PR DA SW23A

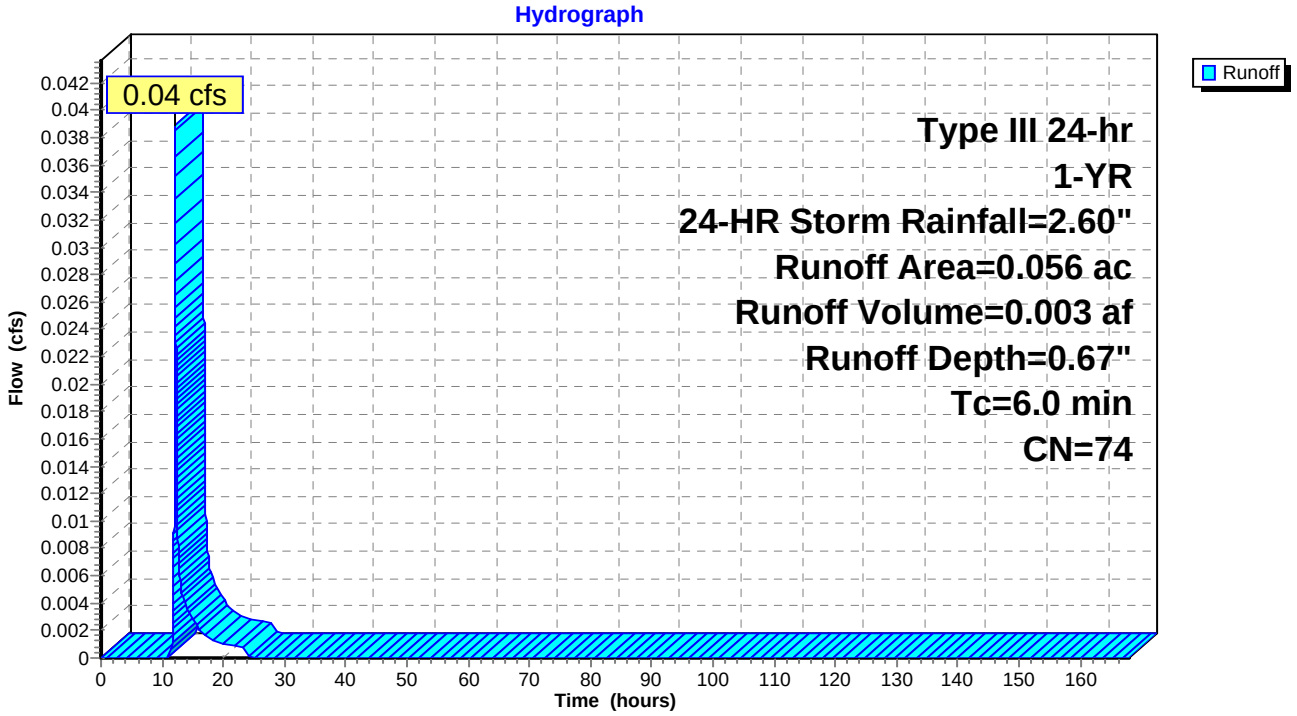
Runoff = 0.04 cfs @ 12.10 hrs, Volume= 0.003 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.056	74	>75% Grass cover, Good, HSG C
0.056		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW23A: PR DA SW23A



Summary for Subcatchment SW23B: PR DA SW23B

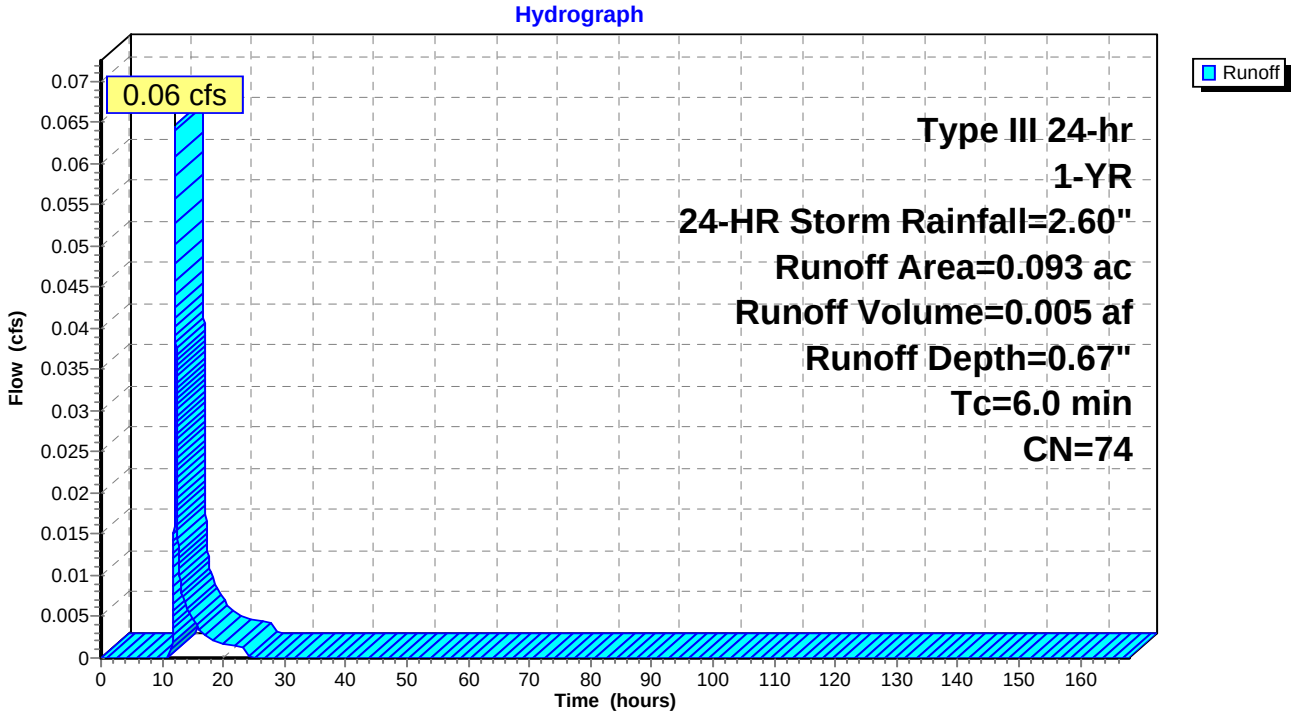
Runoff = 0.06 cfs @ 12.10 hrs, Volume= 0.005 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.093	74	>75% Grass cover, Good, HSG C
0.093		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW23B: PR DA SW23B



Summary for Subcatchment SW28A: PR DA SW28A

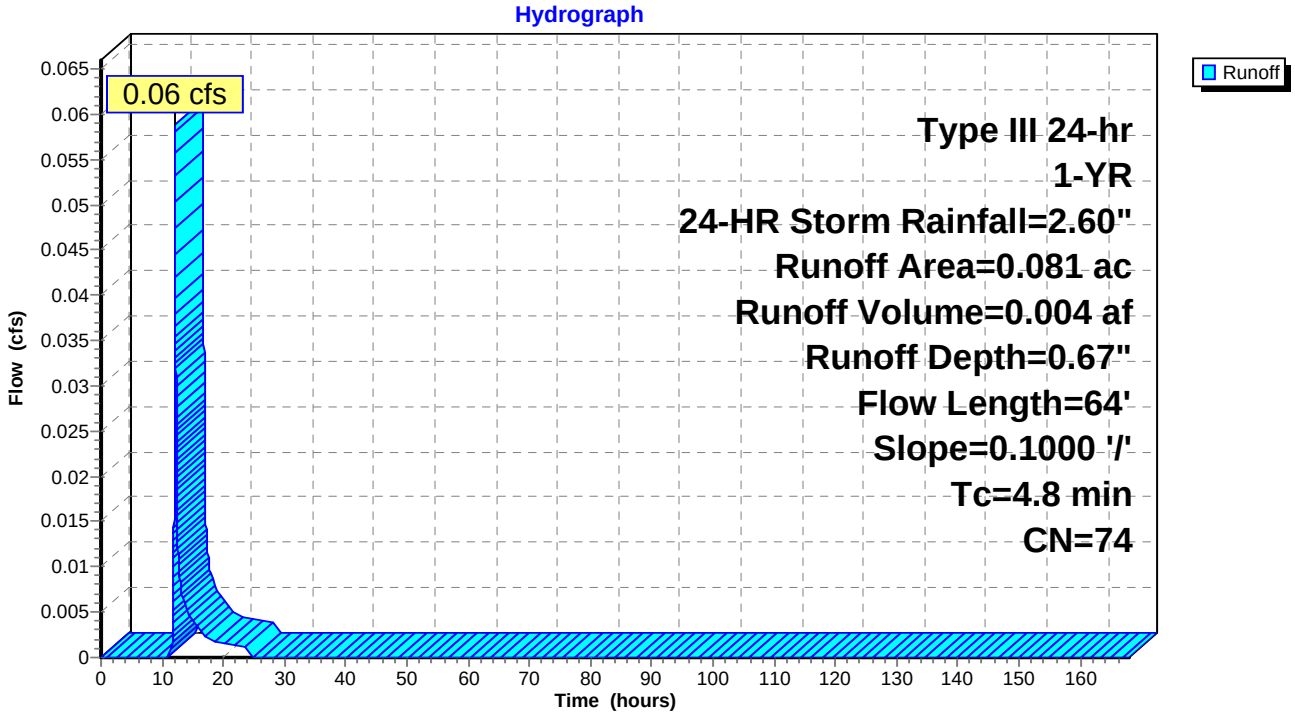
Runoff = 0.06 cfs @ 12.08 hrs, Volume= 0.004 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.081	74	>75% Grass cover, Good, HSG C
0.081		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	64	0.1000	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment SW28A: PR DA SW28A



Summary for Subcatchment SW28B: PR DA SW28B

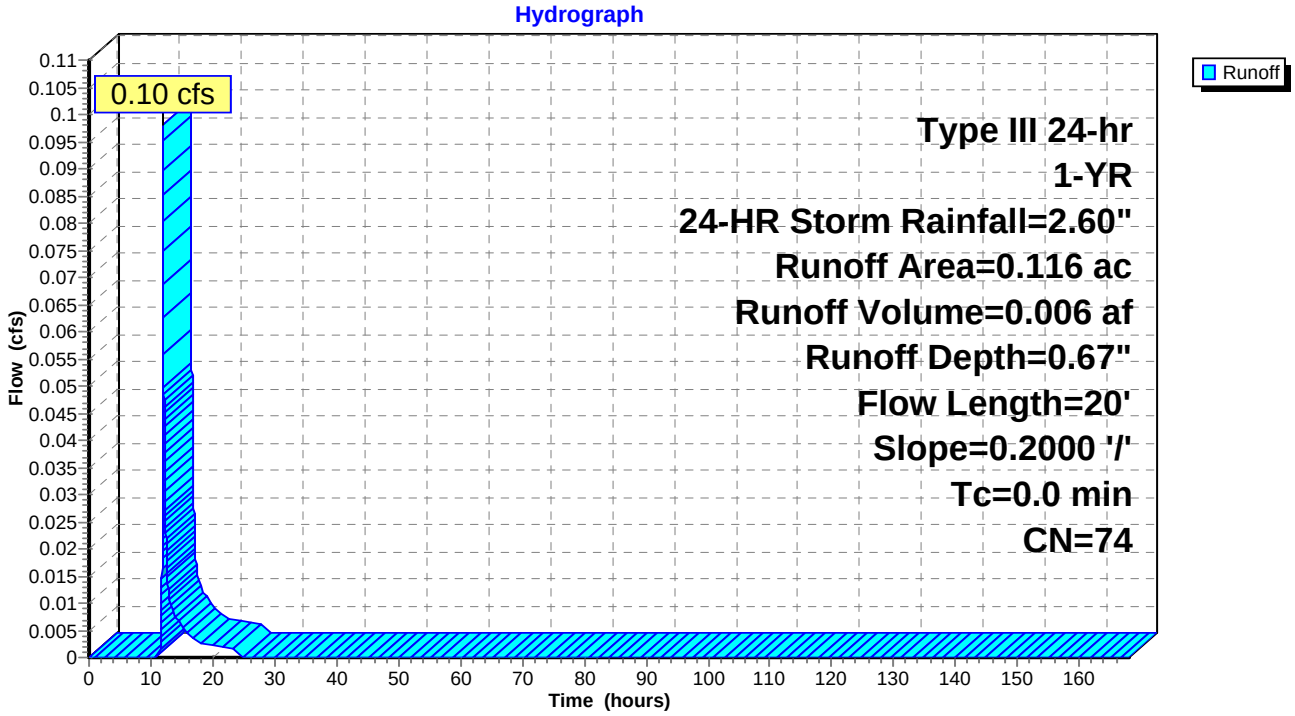
Runoff = 0.10 cfs @ 12.00 hrs, Volume= 0.006 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.116	74	>75% Grass cover, Good, HSG C
0.116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28B: PR DA SW28B



Summary for Subcatchment SW28C: PR DA SW28C

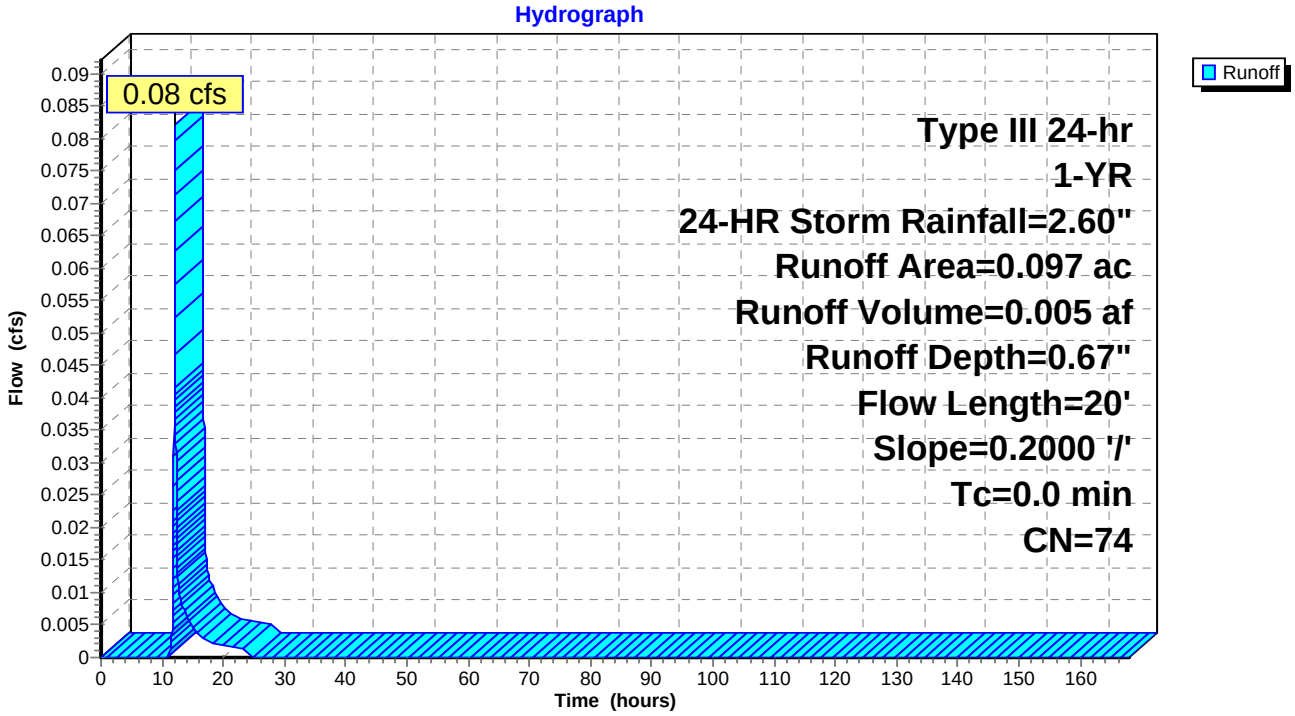
Runoff = 0.08 cfs @ 12.00 hrs, Volume= 0.005 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.097	74	>75% Grass cover, Good, HSG C
0.097		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28C: PR DA SW28C



Summary for Subcatchment SW28D: PR DA SW28D

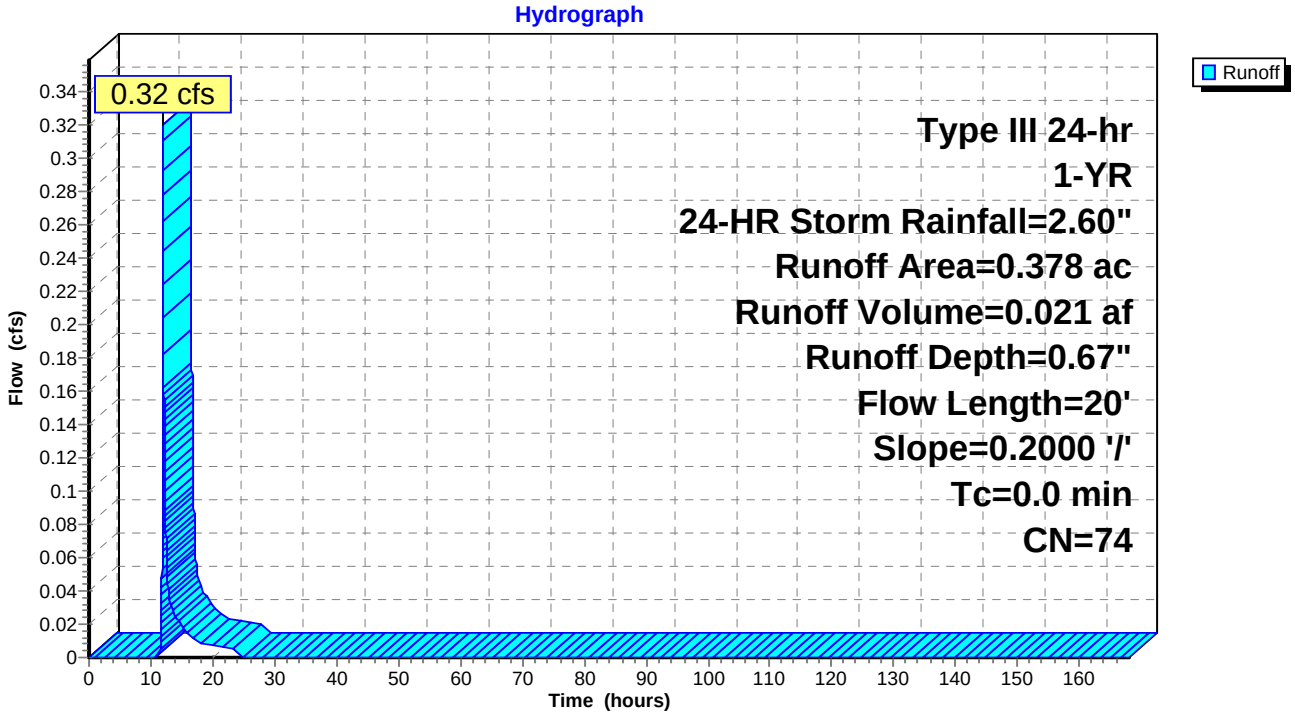
Runoff = 0.32 cfs @ 12.00 hrs, Volume= 0.021 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.378	74	>75% Grass cover, Good, HSG C
0.378		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28D: PR DA SW28D



Summary for Subcatchment SW31: PR DA SW31

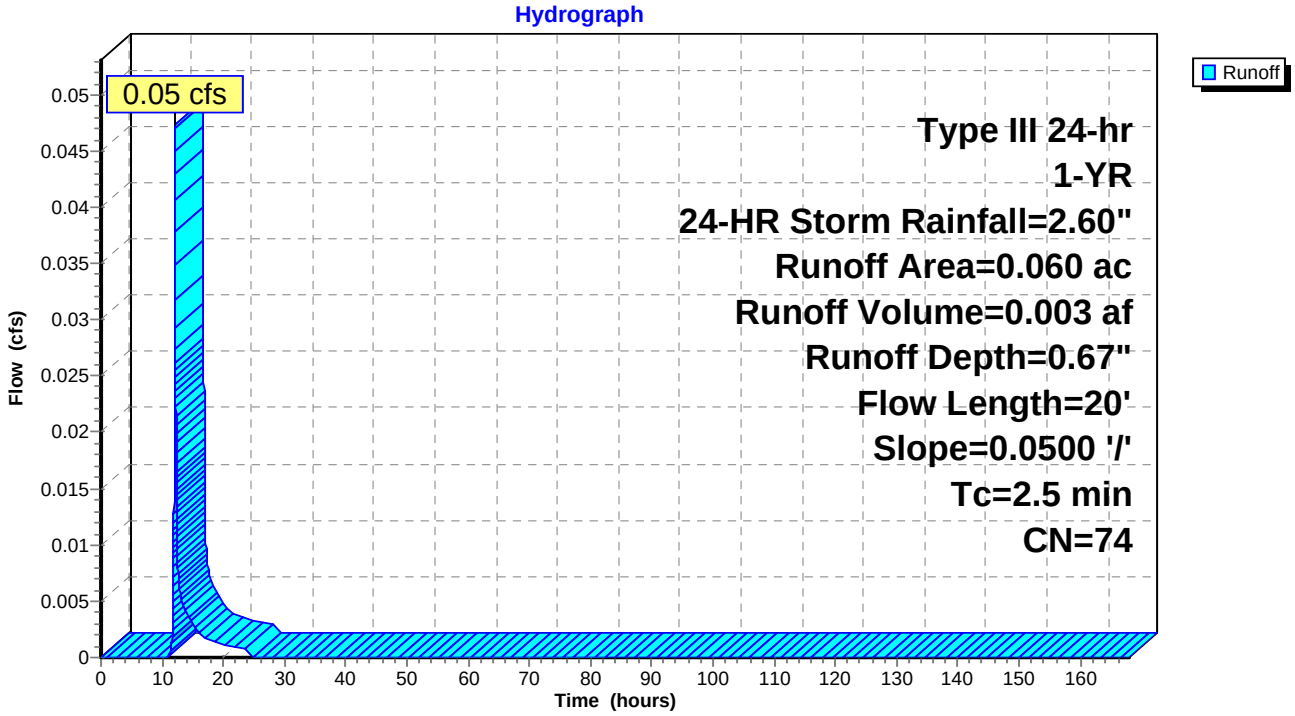
Runoff = 0.05 cfs @ 12.05 hrs, Volume= 0.003 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.060	74	>75% Grass cover, Good, HSG C
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0500	0.13		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment SW31: PR DA SW31

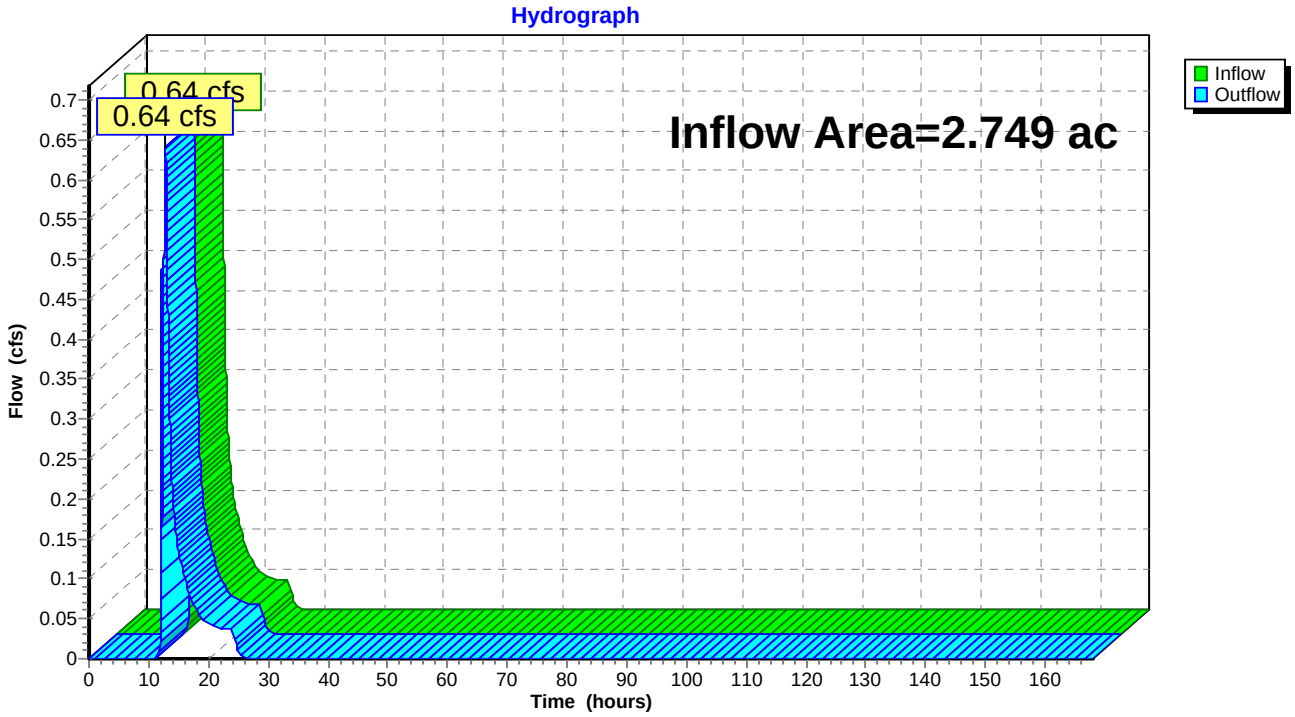


Summary for Reach 30R: DP-9

Inflow Area = 2.749 ac, 14.08% Impervious, Inflow Depth = 0.55" for 1-YR, 24-HR Storm event
Inflow = 0.64 cfs @ 12.77 hrs, Volume= 0.125 af
Outflow = 0.64 cfs @ 12.78 hrs, Volume= 0.125 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 30R: DP-9

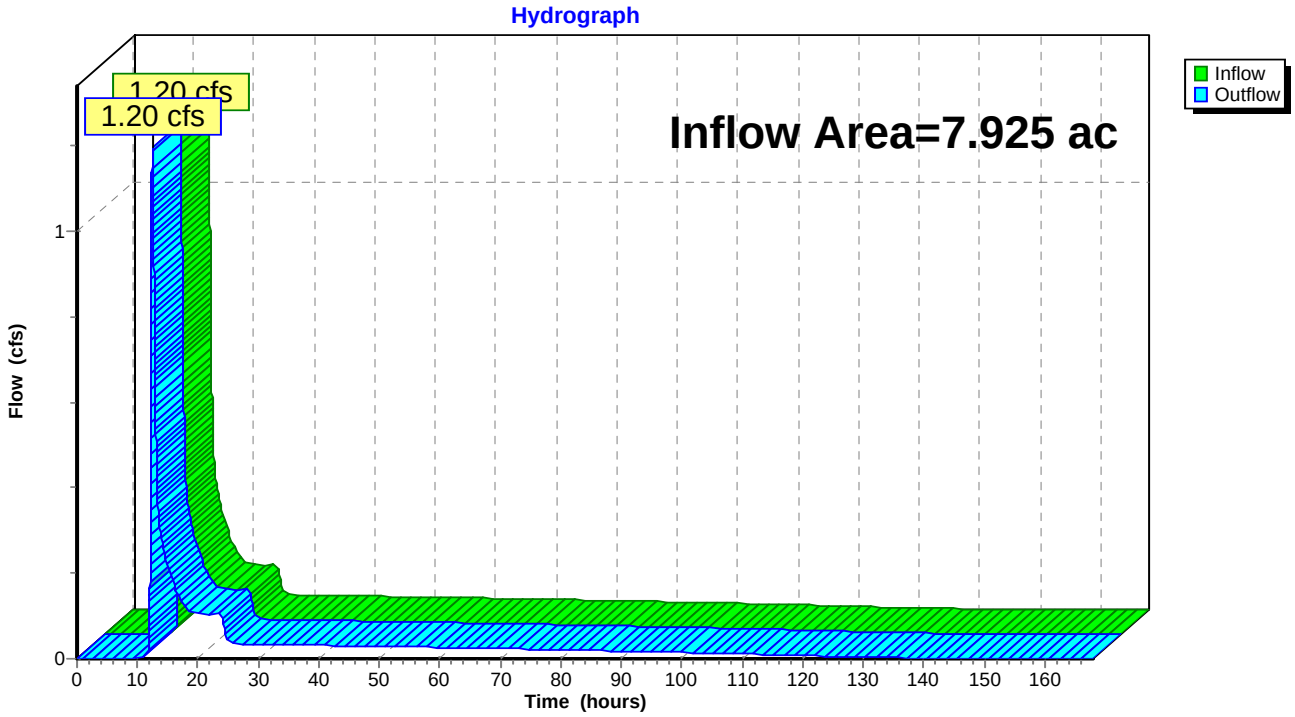


Summary for Reach 36R: DP-1

Inflow Area = 7.925 ac, 23.23% Impervious, Inflow Depth > 0.60" for 1-YR, 24-HR Storm event
Inflow = 1.20 cfs @ 12.47 hrs, Volume= 0.398 af
Outflow = 1.20 cfs @ 12.48 hrs, Volume= 0.398 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 36R: DP-1

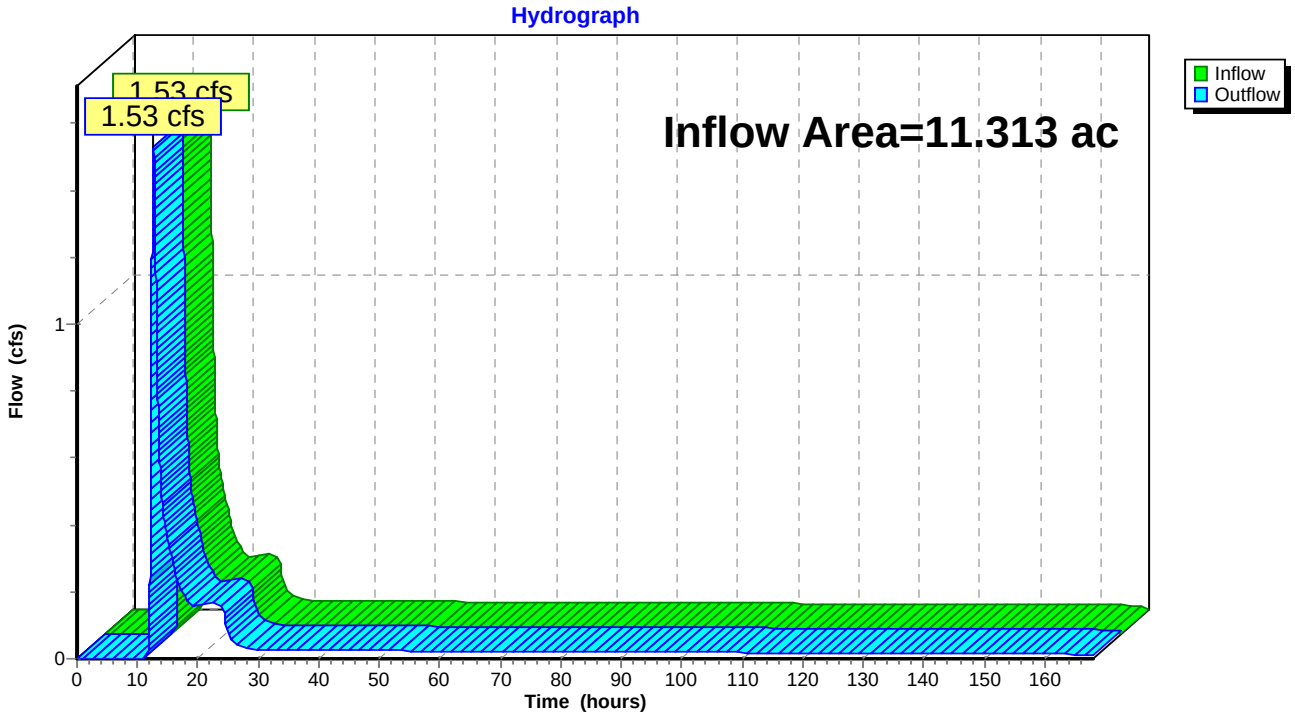


Summary for Reach 41R: DP-26

Inflow Area = 11.313 ac, 6.13% Impervious, Inflow Depth > 0.61" for 1-YR, 24-HR Storm event
Inflow = 1.53 cfs @ 12.65 hrs, Volume= 0.575 af
Outflow = 1.53 cfs @ 12.66 hrs, Volume= 0.575 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 41R: DP-26

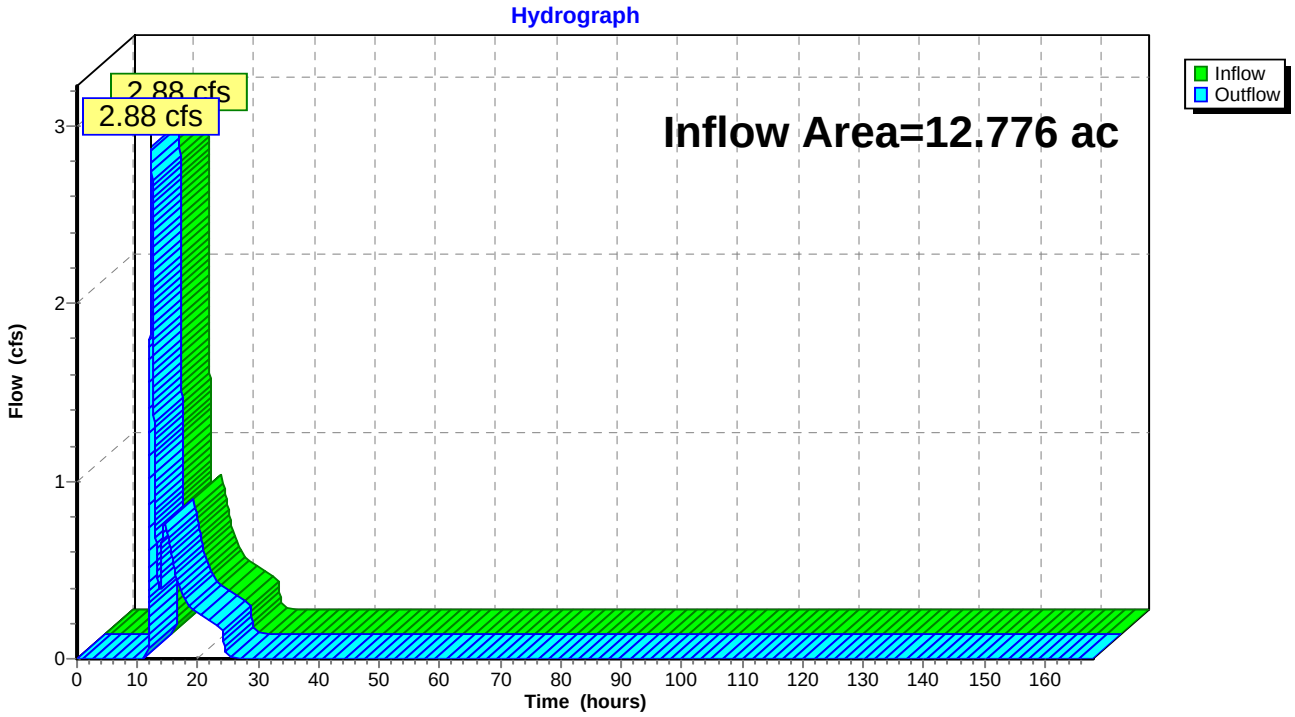


Summary for Reach 46R: DP-25

Inflow Area = 12.776 ac, 7.30% Impervious, Inflow Depth = 0.47" for 1-YR, 24-HR Storm event
Inflow = 2.88 cfs @ 12.30 hrs, Volume= 0.505 af
Outflow = 2.88 cfs @ 12.31 hrs, Volume= 0.505 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 46R: DP-25

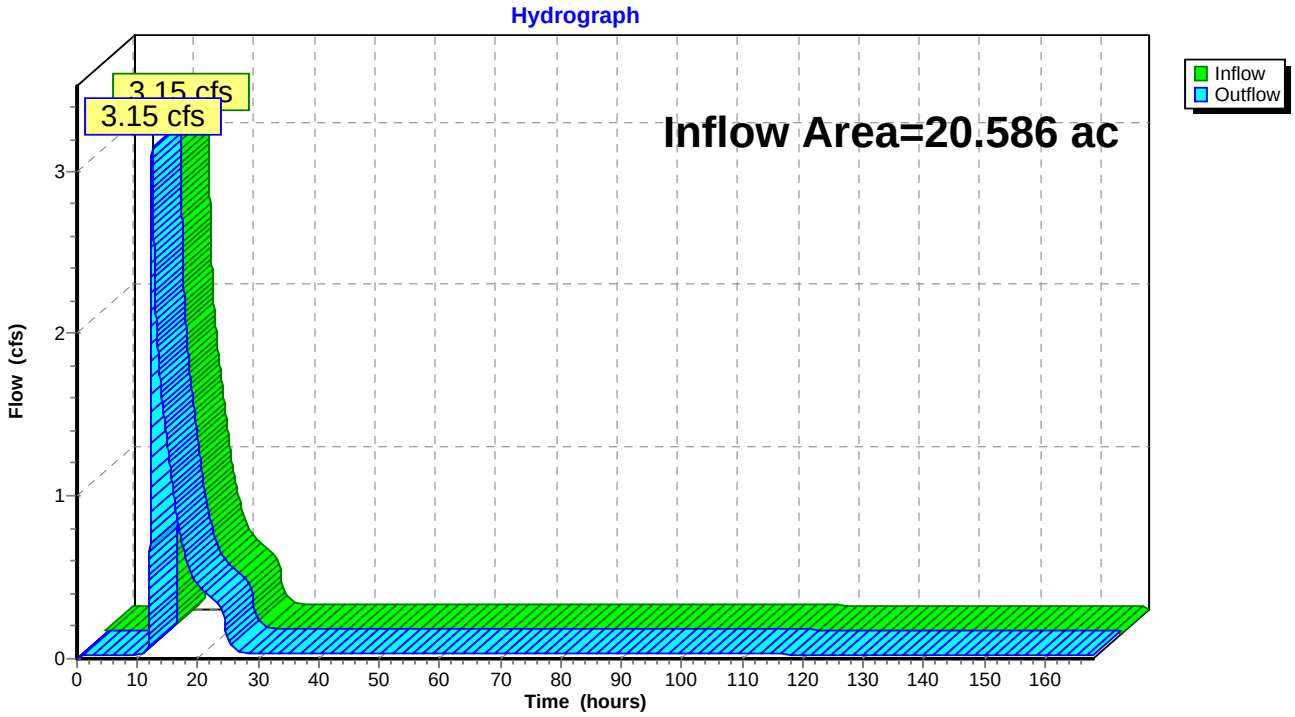


Summary for Reach 51R: DP-24

Inflow Area = 20.586 ac, 5.22% Impervious, Inflow Depth > 0.75" for 1-YR, 24-HR Storm event
Inflow = 3.15 cfs @ 12.42 hrs, Volume= 1.290 af
Outflow = 3.15 cfs @ 12.43 hrs, Volume= 1.290 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 51R: DP-24

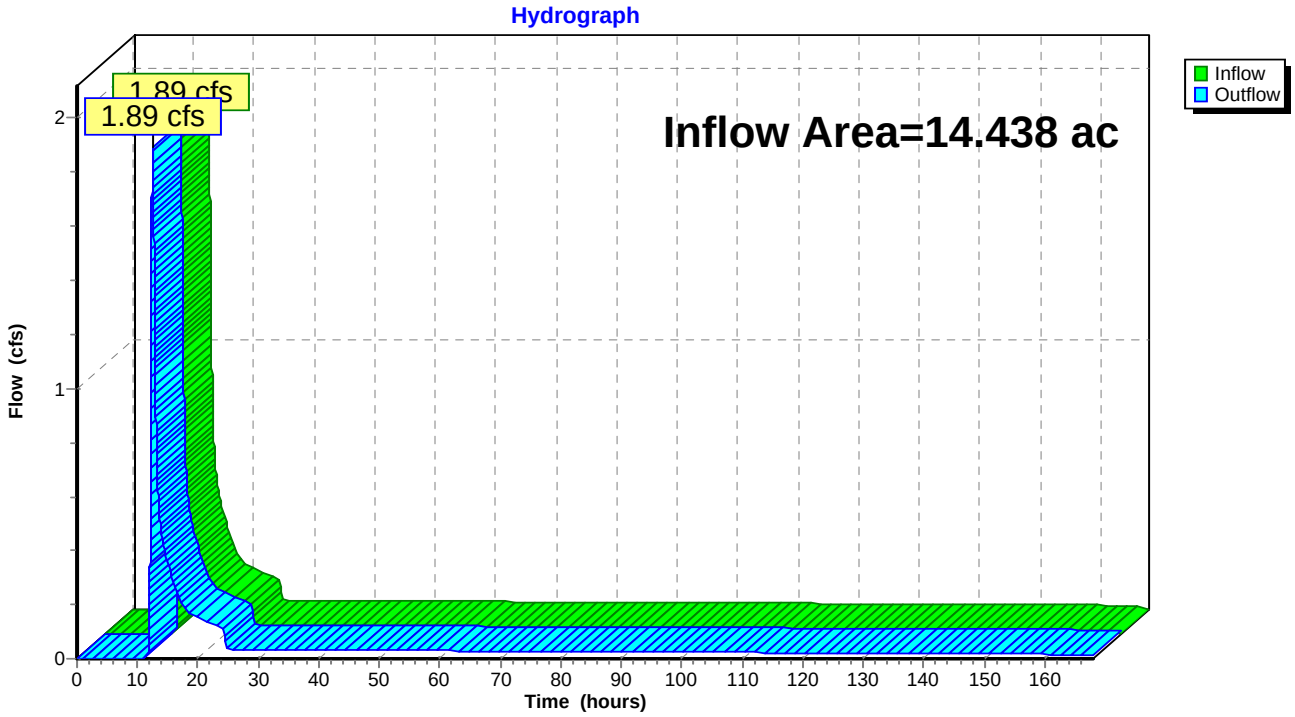


Summary for Reach 56R: DP-23

Inflow Area = 14.438 ac, 6.32% Impervious, Inflow Depth > 0.52" for 1-YR, 24-HR Storm event
Inflow = 1.89 cfs @ 12.52 hrs, Volume= 0.620 af
Outflow = 1.89 cfs @ 12.53 hrs, Volume= 0.620 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 56R: DP-23

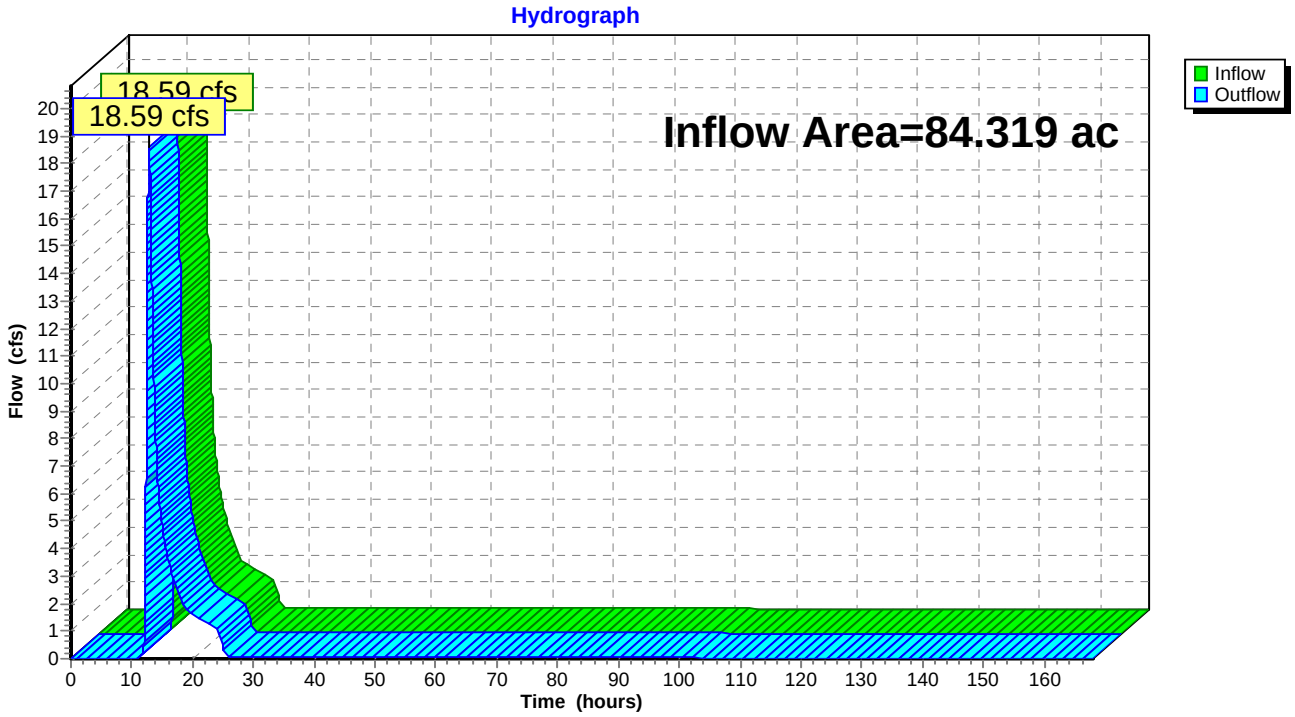


Summary for Reach 61R: DP-21

Inflow Area = 84.319 ac, 3.86% Impervious, Inflow Depth > 0.63" for 1-YR, 24-HR Storm event
Inflow = 18.59 cfs @ 12.81 hrs, Volume= 4.425 af
Outflow = 18.59 cfs @ 12.82 hrs, Volume= 4.425 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 61R: DP-21



Summary for Pond 21A-P: Pond-21A

Inflow Area = 3.092 ac, 26.26% Impervious, Inflow Depth = 1.06" for 1-YR, 24-HR Storm event
Inflow = 4.38 cfs @ 12.04 hrs, Volume= 0.274 af
Outflow = 0.03 cfs @ 24.04 hrs, Volume= 0.241 af, Atten= 99%, Lag= 719.9 min
Primary = 0.03 cfs @ 24.04 hrs, Volume= 0.241 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,376.50' Surf.Area= 2,567 sf Storage= 3,042 cf
Peak Elev= 1,377.56' @ 24.04 hrs Surf.Area= 11,876 sf Storage= 13,905 cf (10,863 cf above start)

Plug-Flow detention time= 5,125.8 min calculated for 0.171 af (62% of inflow)
Center-of-Mass det. time= 3,817.3 min (4,658.1 - 840.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,374.00'	51,415 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

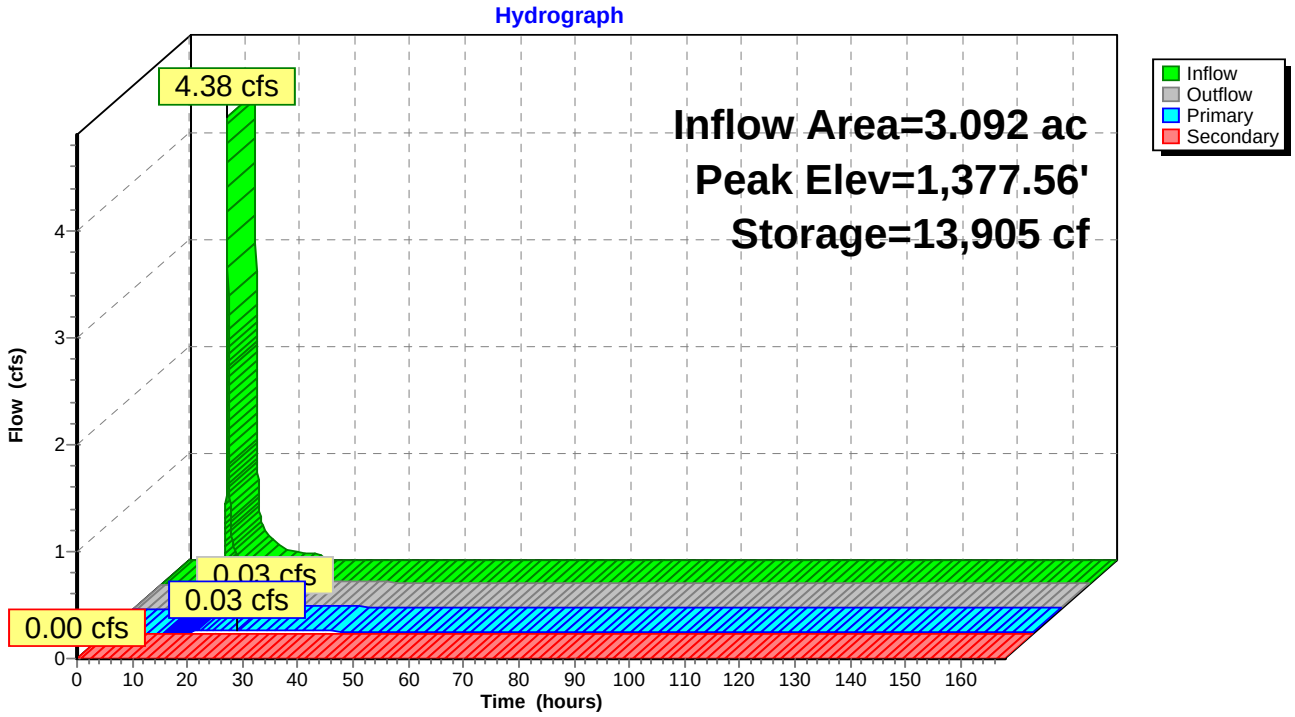
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,374.00	277	79.1	0	0	277
1,375.00	875	200.4	548	548	2,979
1,376.00	1,938	331.0	1,372	1,920	8,508
1,376.50	2,567	347.4	1,123	3,042	9,409
1,376.51	9,076	469.5	55	3,097	17,346
1,377.00	10,035	482.1	4,680	7,778	18,329
1,378.00	13,431	599.0	11,692	19,469	28,400
1,379.00	15,954	633.4	14,674	34,144	31,830
1,380.00	18,622	668.8	17,271	51,415	35,555

Device	Routing	Invert	Outlet Devices
#1	Primary	1,374.00'	**15.0" Round Culvert** L= 3.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,374.00' / 1,373.50' S= 0.1667 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,376.50'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,379.00'	**10.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

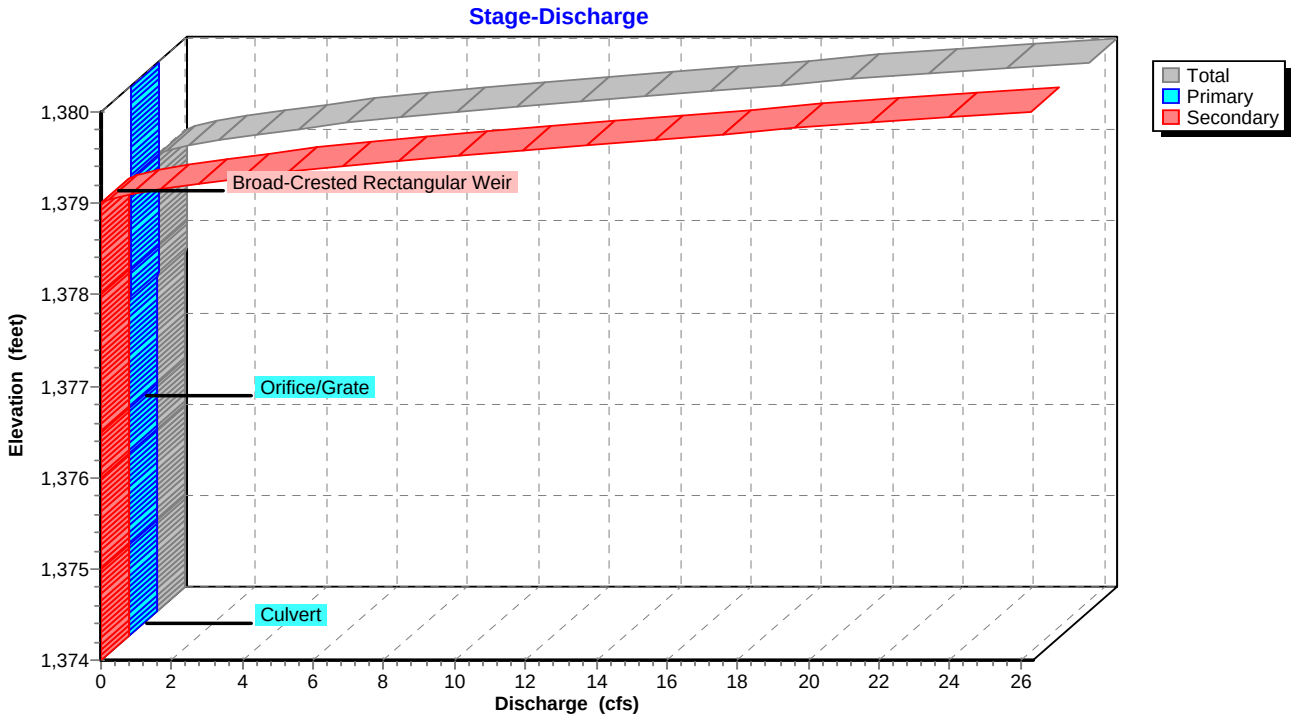
Primary OutFlow Max=0.03 cfs @ 24.04 hrs HW=1,377.56' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 0.03 cfs of 7.99 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.03 cfs @ 4.86 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,376.50' TW=0.00' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

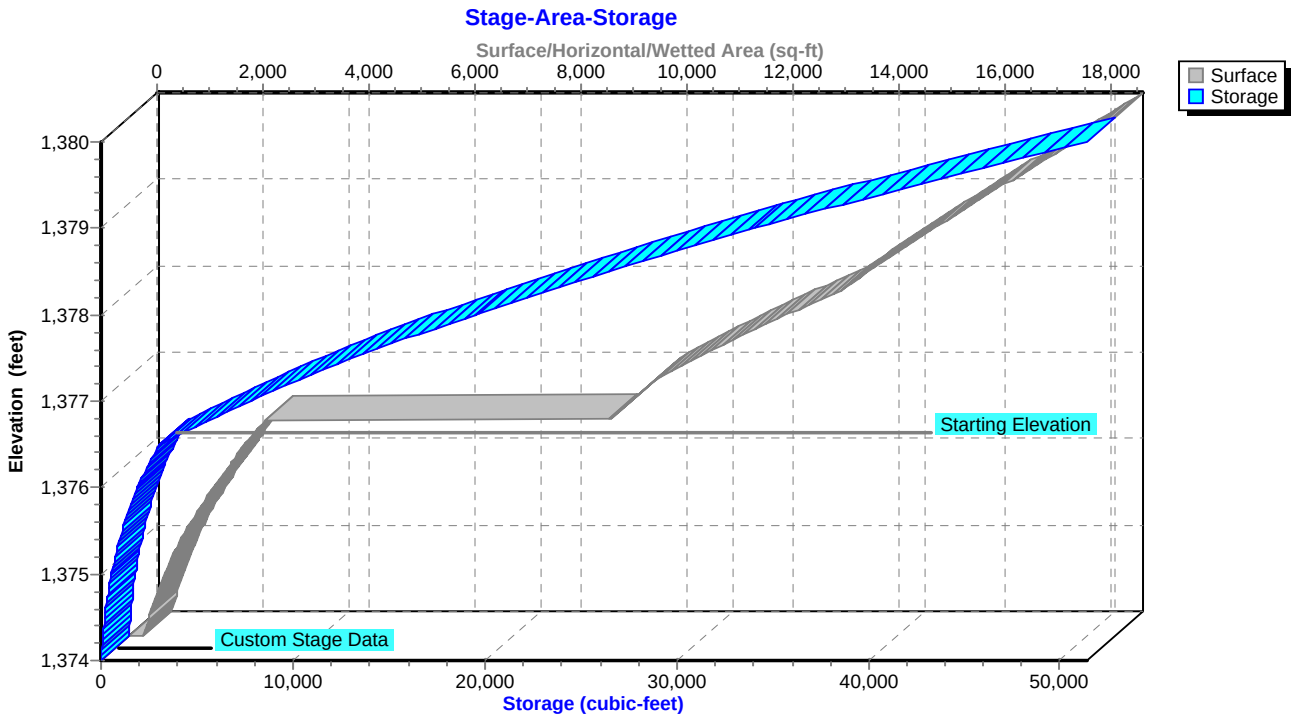
Pond 21A-P: Pond-21A



Pond 21A-P: Pond-21A



Pond 21A-P: Pond-21A



Summary for Pond 21B-P: Pond-21B

Inflow Area = 3.185 ac, 29.51% Impervious, Inflow Depth = 0.89" for 1-YR, 24-HR Storm event
Inflow = 4.18 cfs @ 12.03 hrs, Volume= 0.237 af
Outflow = 0.02 cfs @ 24.03 hrs, Volume= 0.198 af, Atten= 99%, Lag= 719.9 min
Primary = 0.02 cfs @ 24.03 hrs, Volume= 0.198 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,378.00' Surf.Area= 5,813 sf Storage= 10,561 cf
Peak Elev= 1,378.71' @ 24.03 hrs Surf.Area= 14,060 sf Storage= 20,004 cf (9,442 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 3,874.0 min (4,702.8 - 828.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,375.00'	58,169 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

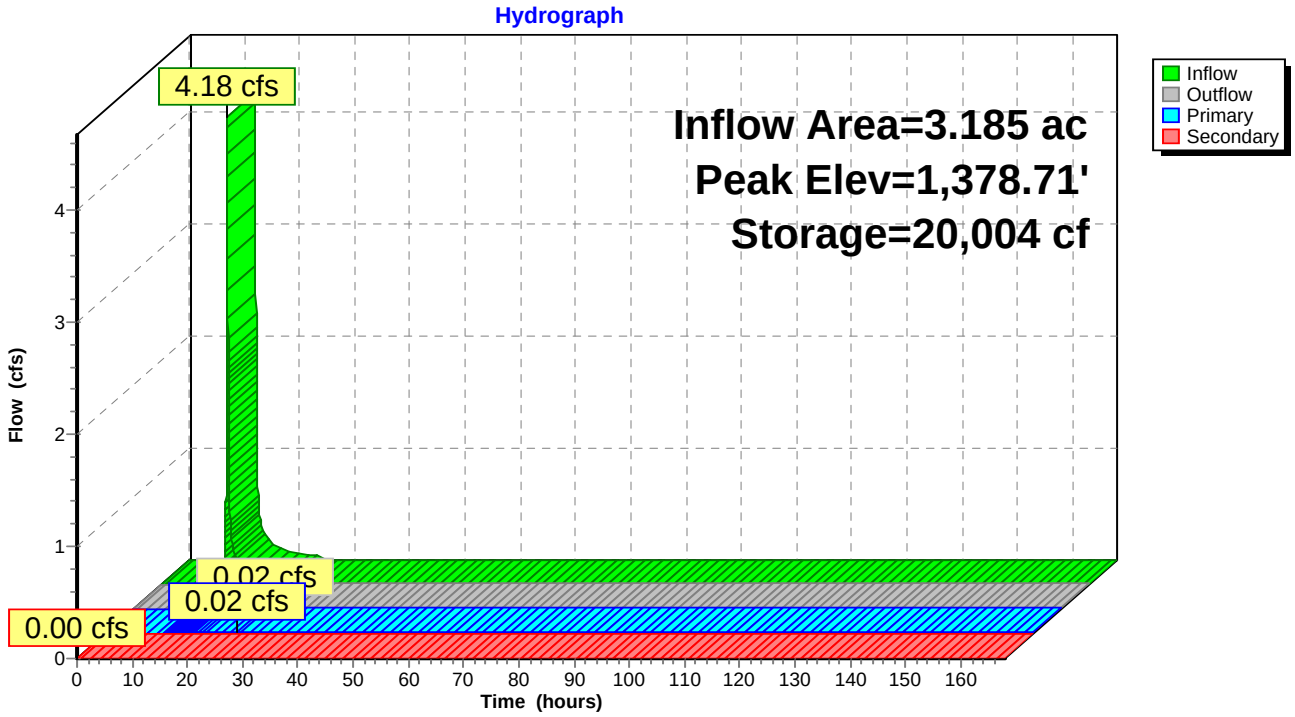
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,375.00	1,530	196.8	0	0	1,530
1,376.00	2,694	275.3	2,085	2,085	4,489
1,377.00	4,273	340.8	3,453	5,538	7,715
1,378.00	5,813	381.6	5,023	10,561	10,088
1,378.01	12,538	491.4	90	10,651	17,716
1,379.00	14,705	523.2	13,471	24,122	20,332
1,380.00	16,999	554.8	15,838	39,960	23,096
1,381.00	19,446	587.7	18,209	58,169	26,141

Device	Routing	Invert	Outlet Devices
#1	Primary	1,376.00'	**12.0" Round Culvert** L= 52.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,376.00' / 1,375.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,378.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,379.00'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Secondary	1,380.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

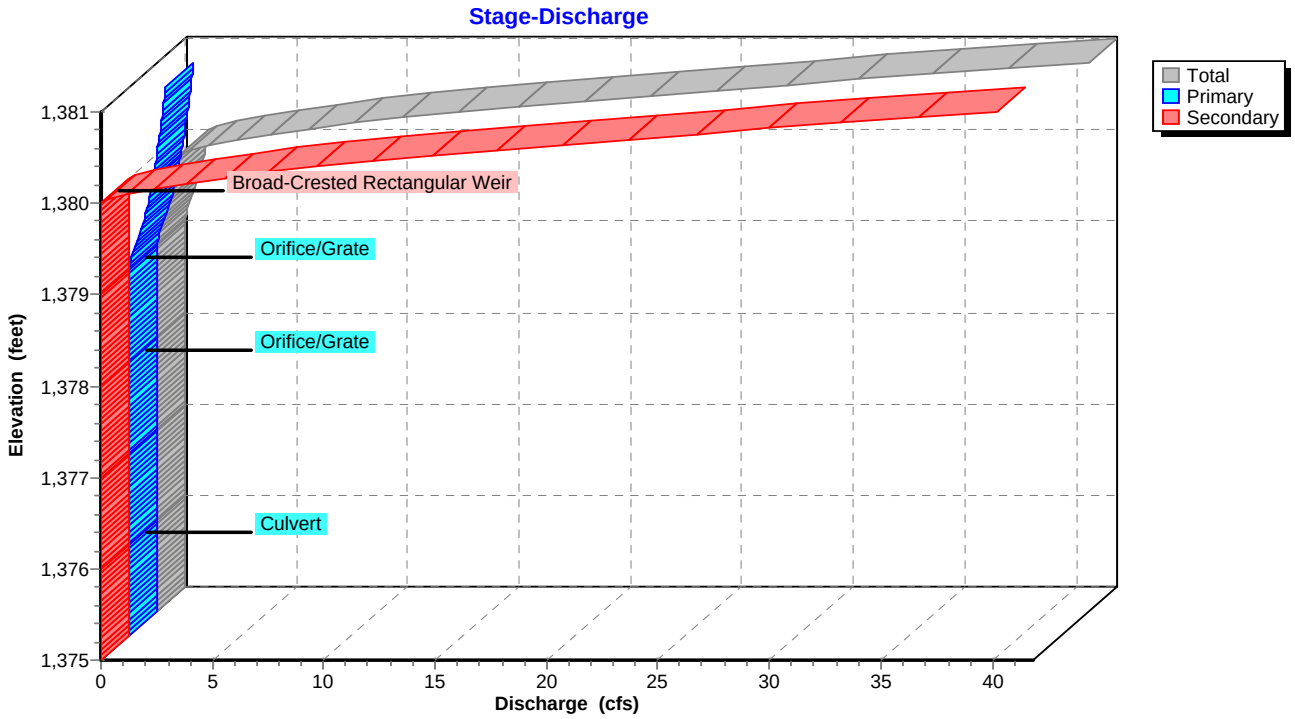
Primary OutFlow Max=0.02 cfs @ 24.03 hrs HW=1,378.71' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.02 cfs of 4.96 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 3.95 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,378.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

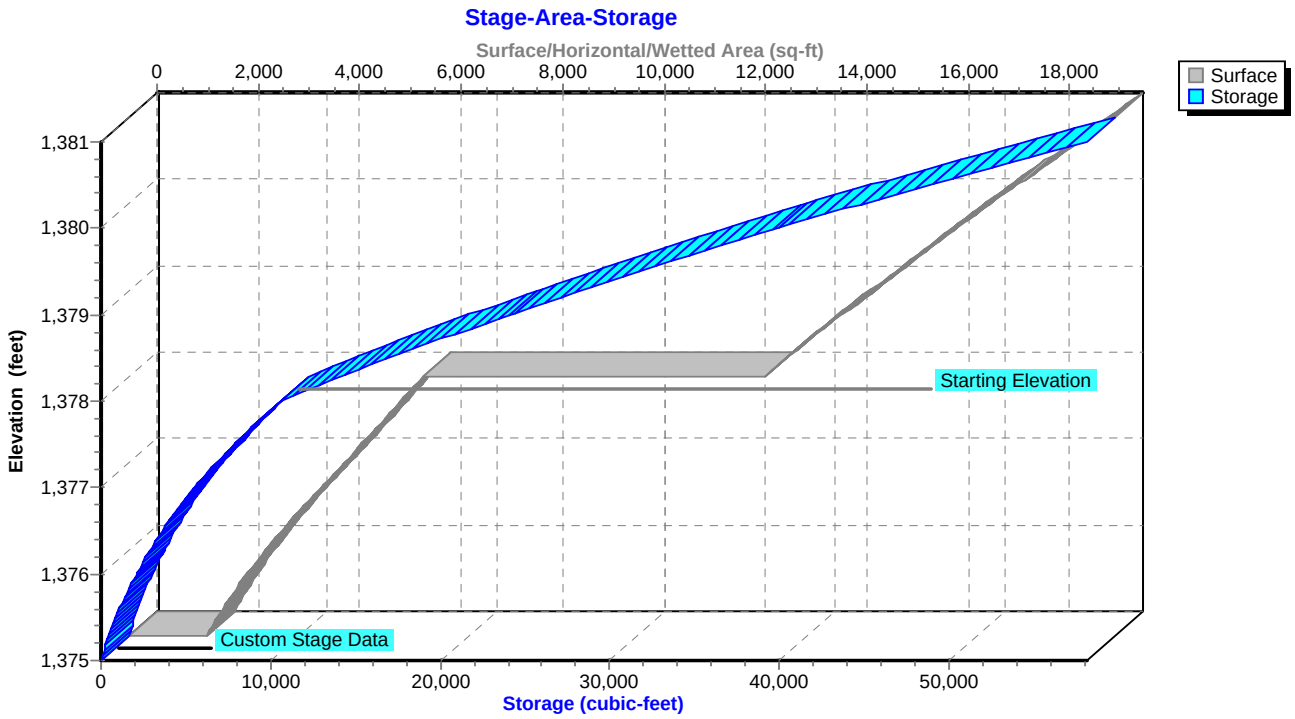
Pond 21B-P: Pond-21B



Pond 21B-P: Pond-21B



Pond 21B-P: Pond-21B



Summary for Pond 23-P: Pond-23

Inflow Area = 6.536 ac, 9.13% Impervious, Inflow Depth = 0.72" for 1-YR, 24-HR Storm event
Inflow = 3.53 cfs @ 12.04 hrs, Volume= 0.392 af
Outflow = 0.03 cfs @ 24.50 hrs, Volume= 0.324 af, Atten= 99%, Lag= 747.8 min
Primary = 0.03 cfs @ 24.50 hrs, Volume= 0.324 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,381.00' Surf.Area= 7,857 sf Storage= 8,931 cf
Peak Elev= 1,382.69' @ 24.50 hrs Surf.Area= 10,826 sf Storage= 24,632 cf (15,702 cf above start)

Plug-Flow detention time= 7,016.0 min calculated for 0.119 af (30% of inflow)
Center-of-Mass det. time= 3,939.3 min (4,837.4 - 898.1)

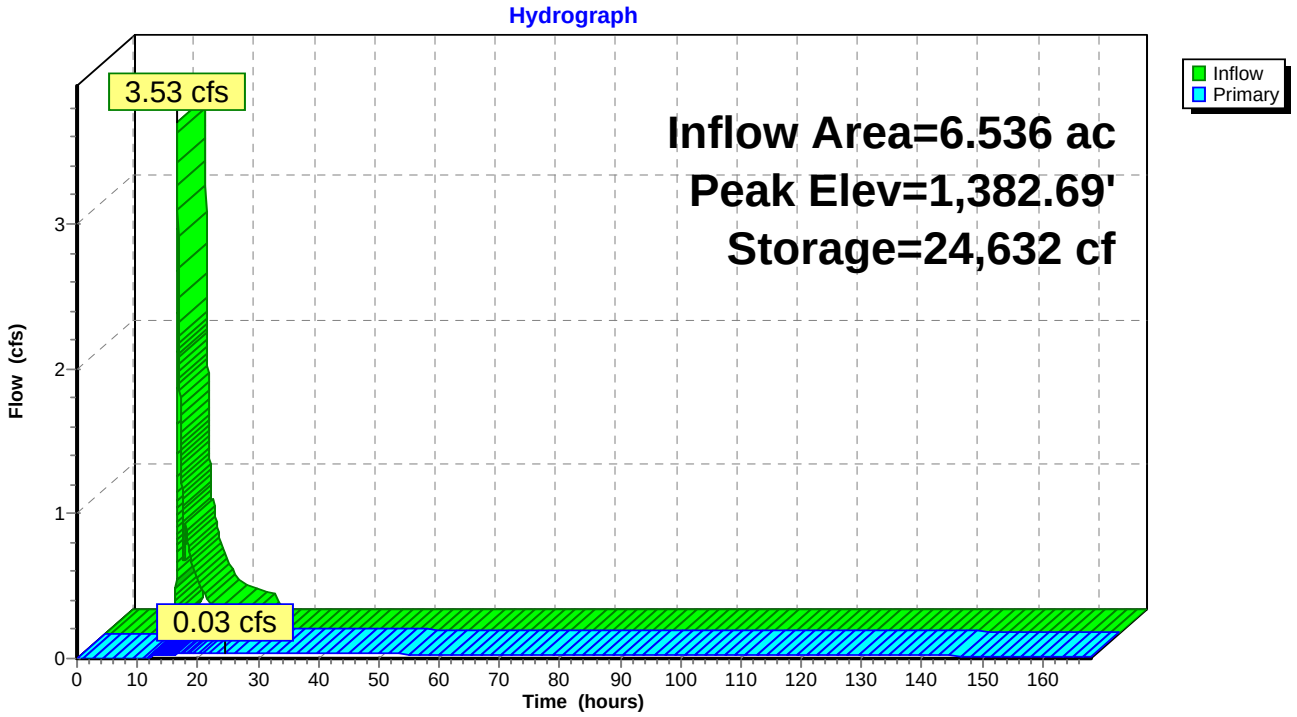
Volume	Invert	Avail.Storage	Storage Description
#1	1,377.00'	71,310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,377.00	234	63.1	0	0	234
1,378.00	802	196.1	490	490	2,980
1,379.00	1,699	233.8	1,223	1,713	4,288
1,380.00	2,685	258.9	2,173	3,886	5,302
1,381.00	7,857	376.4	5,045	8,931	11,251
1,382.00	9,589	415.8	8,709	17,639	13,766
1,383.00	11,418	451.2	10,490	28,130	16,247
1,384.00	13,357	481.7	12,375	40,504	18,559
1,385.00	15,433	511.5	14,383	54,887	20,966
1,386.00	17,433	538.9	16,423	71,310	23,316

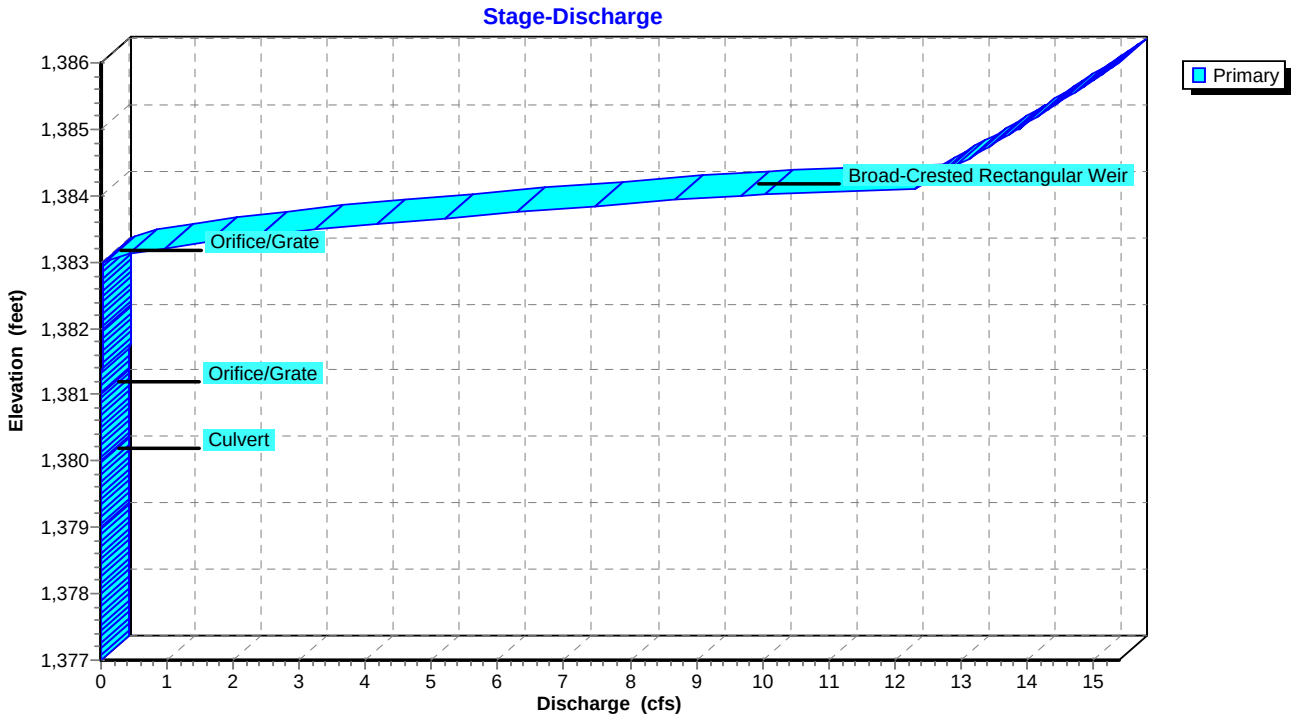
Device	Routing	Invert	Outlet Devices
#1	Primary	1,380.00'	**18.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,380.00' / 1,379.00' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,381.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,383.00'	**36.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,384.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.03 cfs @ 24.50 hrs HW=1,382.69' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.03 cfs of 9.35 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 6.17 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

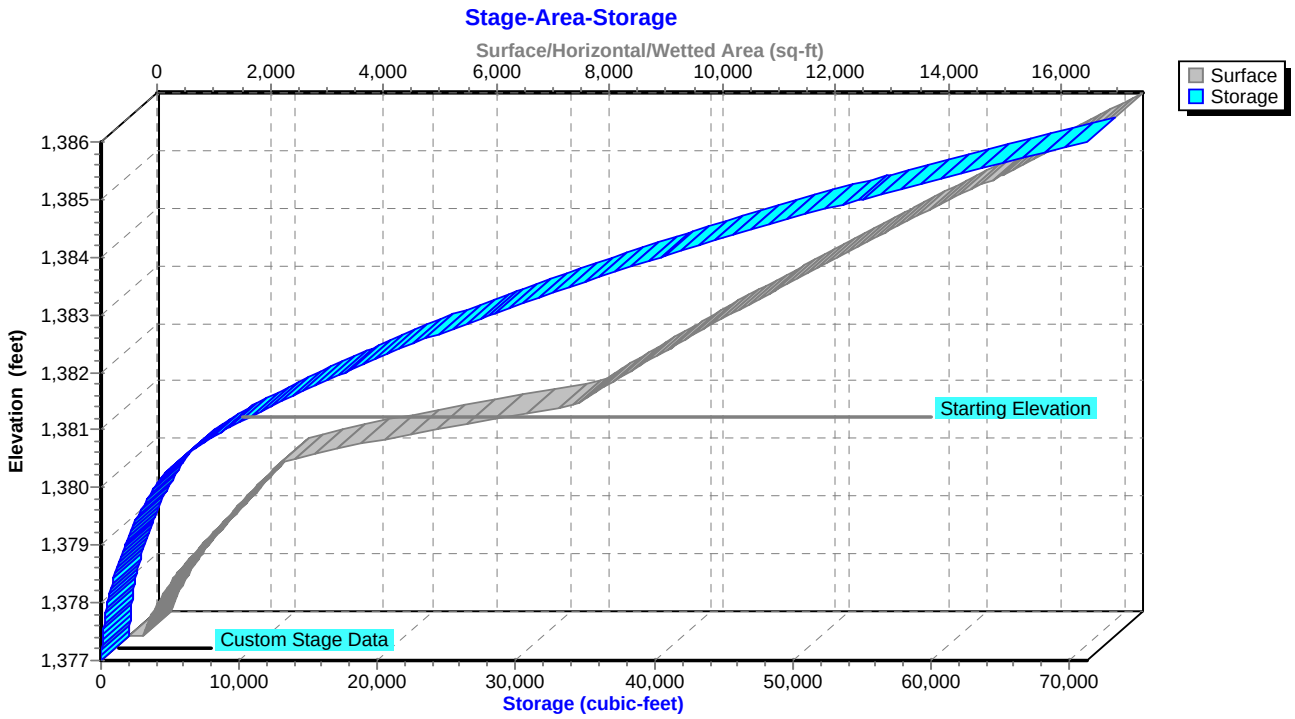
Pond 23-P: Pond-23



Pond 23-P: Pond-23



Pond 23-P: Pond-23



Summary for Pond 24-P: Pond-24

Inflow Area = 12.441 ac, 8.63% Impervious, Inflow Depth = 0.76" for 1-YR, 24-HR Storm event
Inflow = 6.95 cfs @ 12.04 hrs, Volume= 0.793 af
Outflow = 1.13 cfs @ 13.42 hrs, Volume= 0.867 af, Atten= 84%, Lag= 82.6 min
Primary = 1.13 cfs @ 13.42 hrs, Volume= 0.867 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,365.00' Surf.Area= 12,290 sf Storage= 10,821 cf
Peak Elev= 1,366.03' @ 13.42 hrs Surf.Area= 16,625 sf Storage= 25,655 cf (14,834 cf above start)

Plug-Flow detention time= 2,724.1 min calculated for 0.619 af (78% of inflow)
Center-of-Mass det. time= 1,857.4 min (2,729.0 - 871.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,361.00'	90,100 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

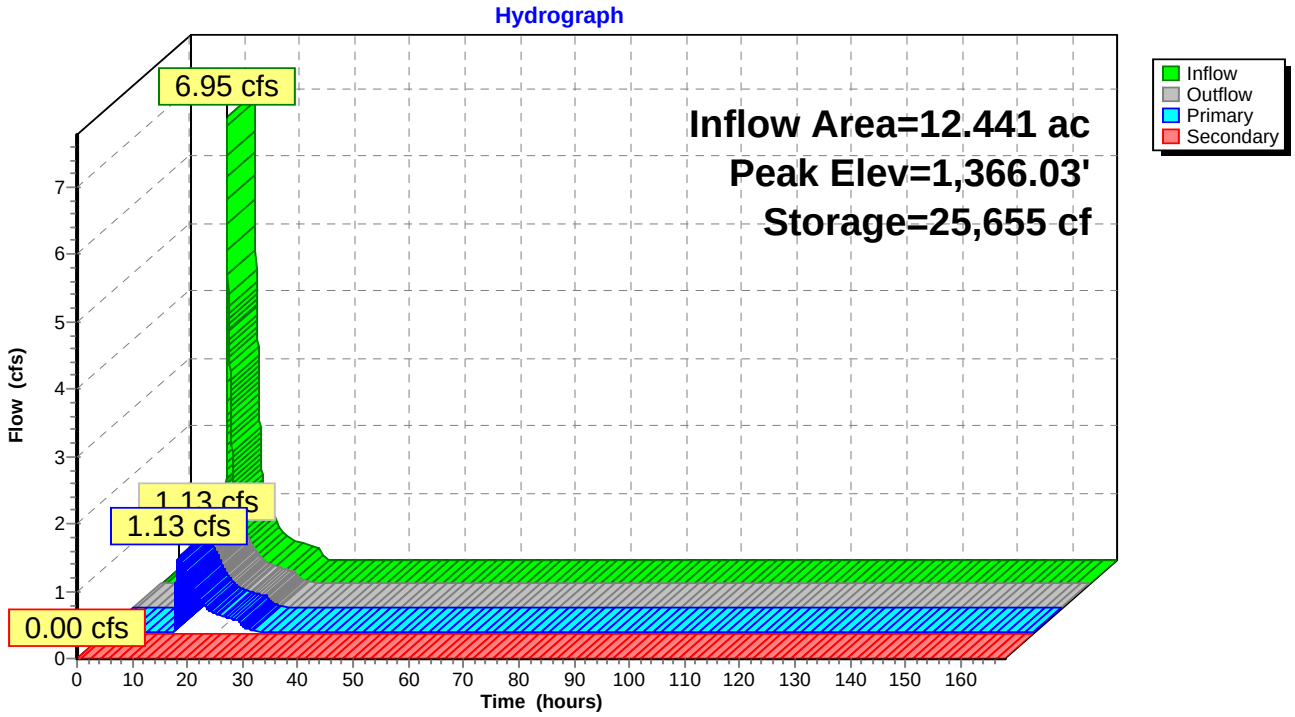
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,361.00	144	79.7	0	0	144
1,362.00	778	180.4	419	419	2,232
1,363.00	1,724	246.8	1,220	1,639	4,500
1,364.00	2,762	271.9	2,223	3,862	5,568
1,365.00	12,290	631.5	6,959	10,821	31,423
1,366.00	16,533	762.9	14,359	25,180	46,021
1,367.00	19,892	828.3	18,187	43,367	54,340
1,368.00	23,383	865.9	21,614	64,981	59,479
1,369.00	26,897	891.0	25,120	90,100	63,097

Device	Routing	Invert	Outlet Devices
#1	Primary	1,362.00'	**18.0" Round Culvert** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,362.00' / 1,358.00' S= 0.0267 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,364.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,365.80'	**12.5" W x 12.5" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,367.00'	**12.0" x 12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,368.00'	**20.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

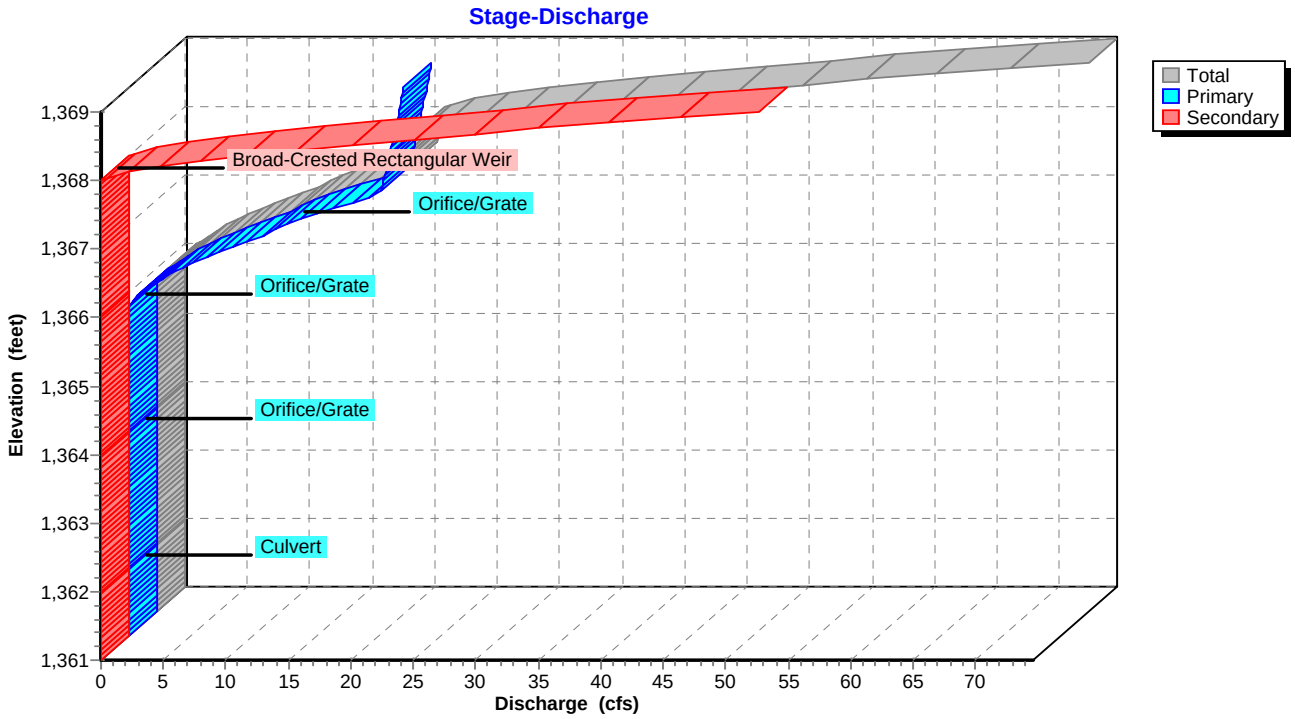
Primary OutFlow Max=1.13 cfs @ 13.42 hrs HW=1,366.03' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.13 cfs of 18.25 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 6.79 fps)
  - **3=Orifice/Grate** (Orifice Controls 1.10 cfs @ 1.53 fps)
  - **4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,365.00' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

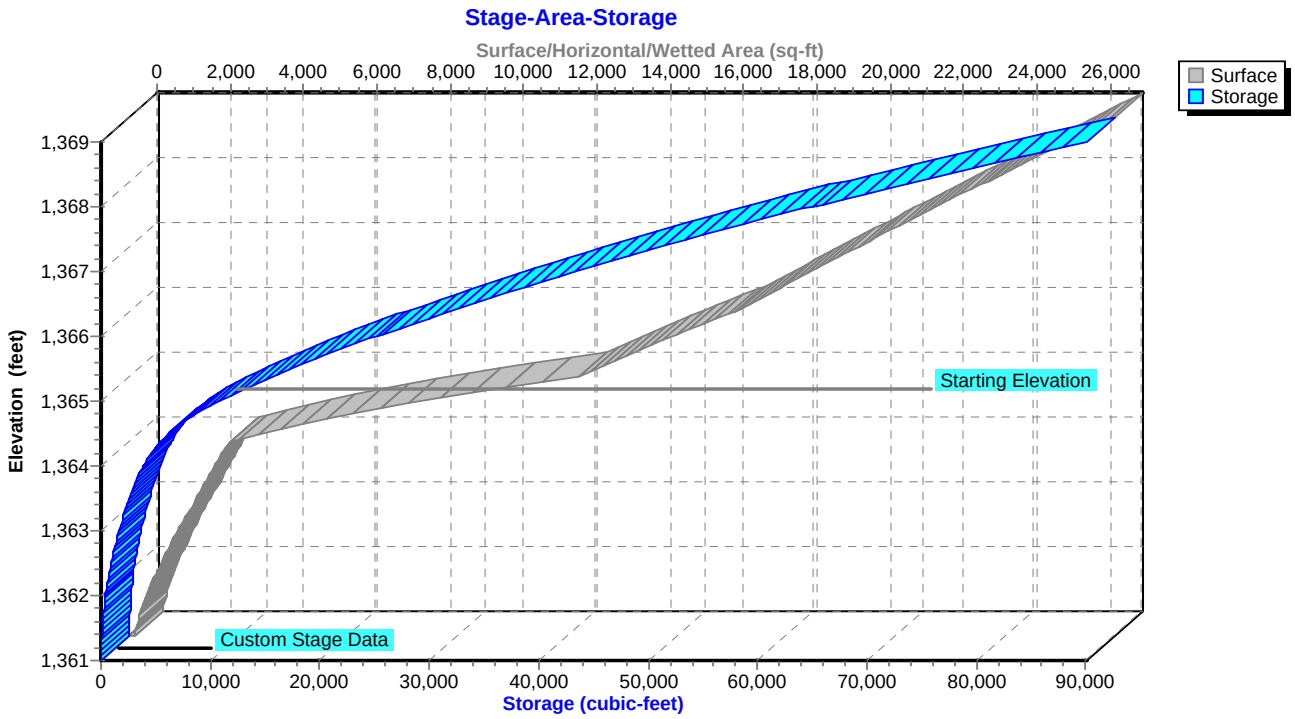
Pond 24-P: Pond-24



Pond 24-P: Pond-24



Pond 24-P: Pond-24



Summary for Pond 26-P: Pond-26

Inflow Area = 5.277 ac, 13.14% Impervious, Inflow Depth = 0.81" for 1-YR, 24-HR Storm event
Inflow = 2.96 cfs @ 12.04 hrs, Volume= 0.358 af
Outflow = 0.08 cfs @ 23.81 hrs, Volume= 0.281 af, Atten= 97%, Lag= 706.2 min
Primary = 0.08 cfs @ 23.81 hrs, Volume= 0.281 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,371.00' Surf.Area= 11,978 sf Storage= 14,978 cf
Peak Elev= 1,372.06' @ 23.81 hrs Surf.Area= 14,166 sf Storage= 28,761 cf (13,783 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 3,711.6 min (4,581.5 - 869.9)

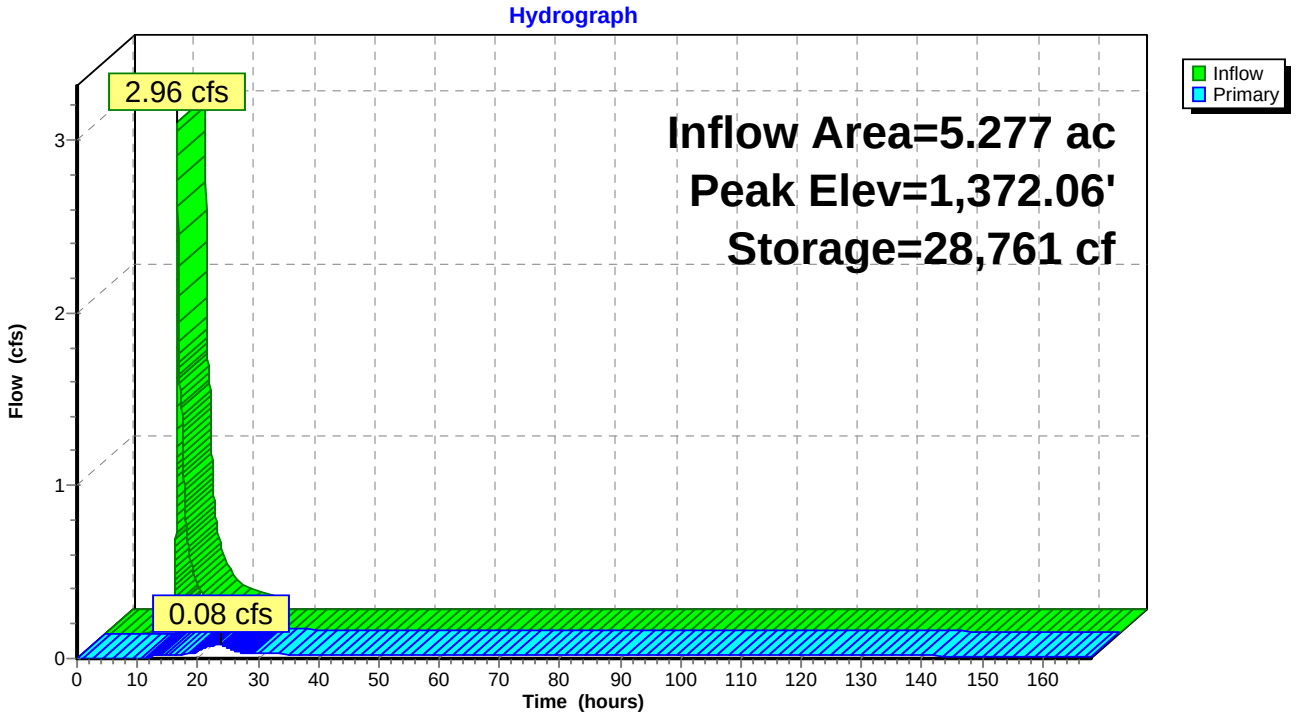
Volume	Invert	Avail.Storage	Storage Description
#1	1,367.00'	80,070 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,367.00	790	132.3	0	0	790
1,368.00	1,854	246.6	1,285	1,285	4,242
1,369.00	2,907	273.0	2,361	3,646	5,364
1,370.00	4,238	315.4	3,552	7,197	7,371
1,371.00	11,978	471.7	7,780	14,978	17,168
1,372.00	14,050	507.1	13,000	27,978	19,969
1,373.00	16,216	538.7	15,120	43,098	22,650
1,374.00	18,484	568.5	17,338	60,435	25,334
1,375.00	20,808	593.7	19,635	80,070	27,736

Device	Routing	Invert	Outlet Devices
#1	Primary	1,368.00'	**15.0" Round RCP_Round 15"** L= 60.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,368.00' / 1,367.00' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,371.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,372.00'	**5.0" W x 5.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,374.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.08 cfs @ 23.81 hrs HW=1,372.06' TW=0.00' (Dynamic Tailwater)
└─**1=RCP_Round 15"** (Passes 0.08 cfs of 9.66 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 4.85 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 0.05 cfs @ 0.76 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 26-P: Pond-26



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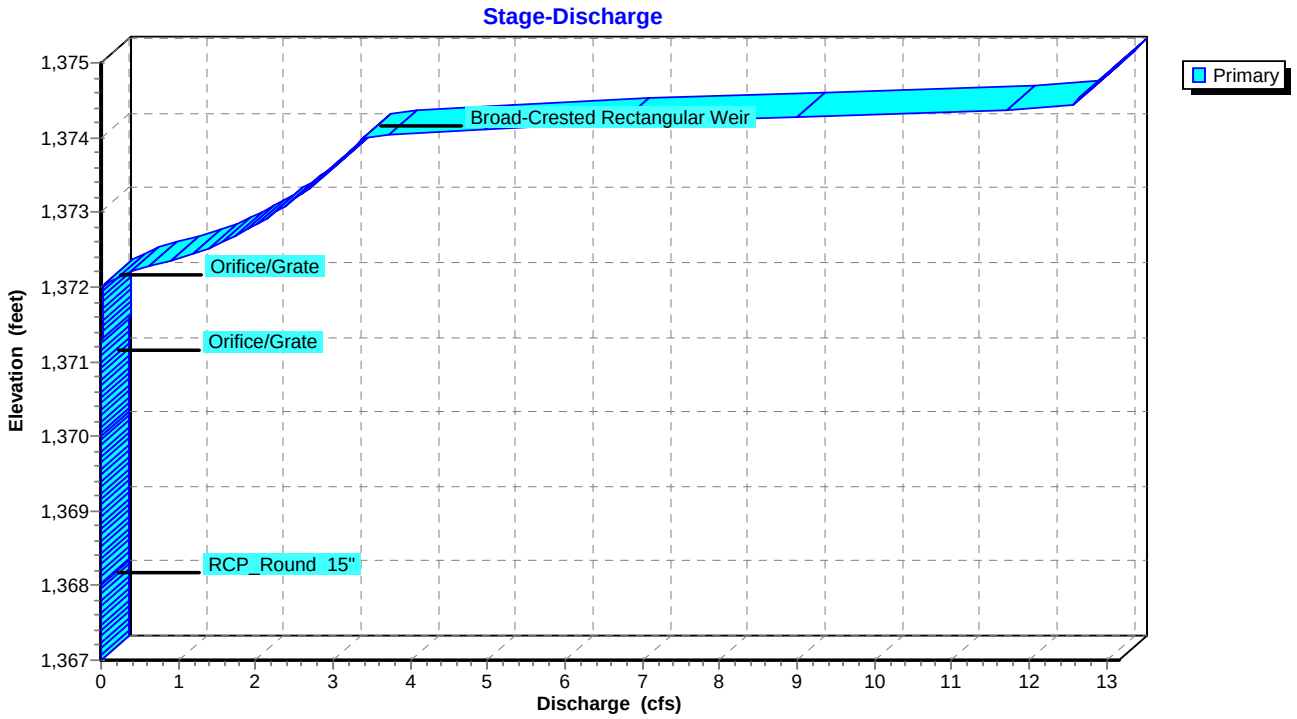

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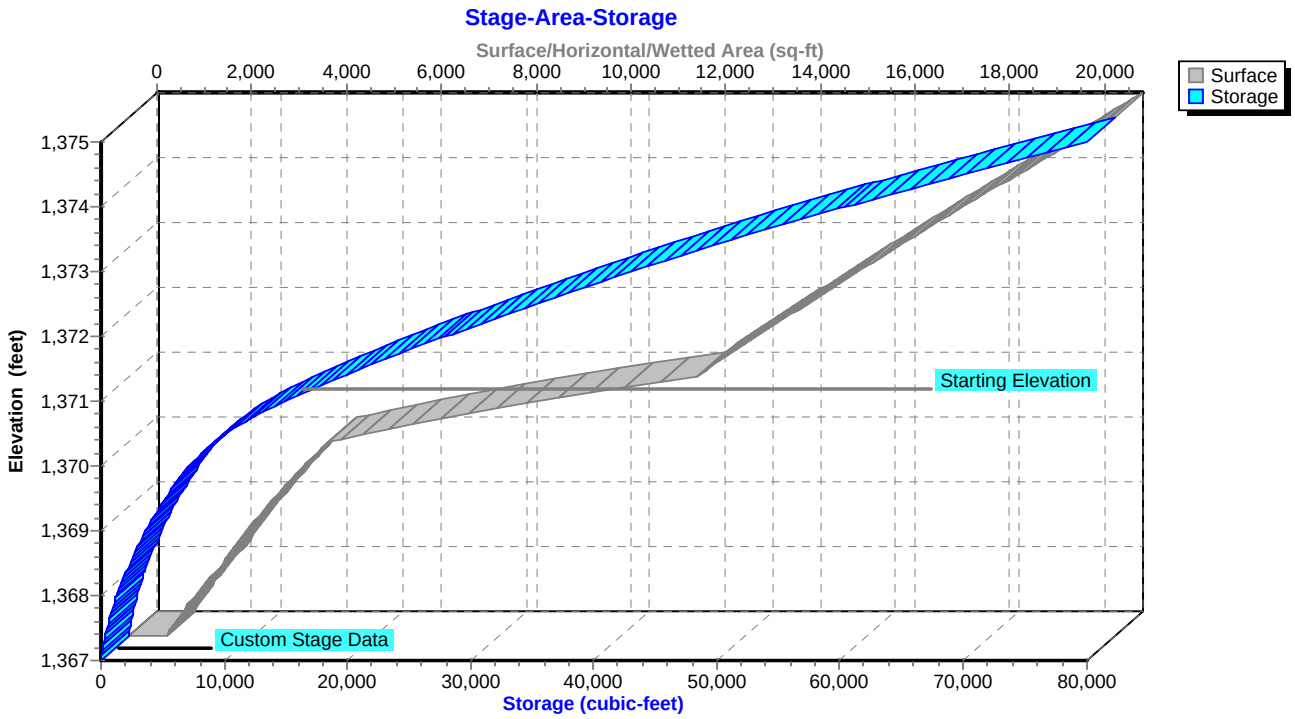


Summary for Pond 28-P: Pond-28

Inflow Area = 2.526 ac, 27.71% Impervious, Inflow Depth = 1.05" for 1-YR, 24-HR Storm event
Inflow = 2.94 cfs @ 12.03 hrs, Volume= 0.220 af
Outflow = 0.03 cfs @ 24.02 hrs, Volume= 0.219 af, Atten= 99%, Lag= 719.0 min
Primary = 0.03 cfs @ 24.02 hrs, Volume= 0.219 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,373.60' Surf.Area= 3,232 sf Storage= 4,285 cf
Peak Elev= 1,375.39' @ 24.02 hrs Surf.Area= 5,919 sf Storage= 12,397 cf (8,112 cf above start)

Plug-Flow detention time= 4,142.4 min calculated for 0.121 af (55% of inflow)
Center-of-Mass det. time= 2,639.7 min (3,480.2 - 840.5)

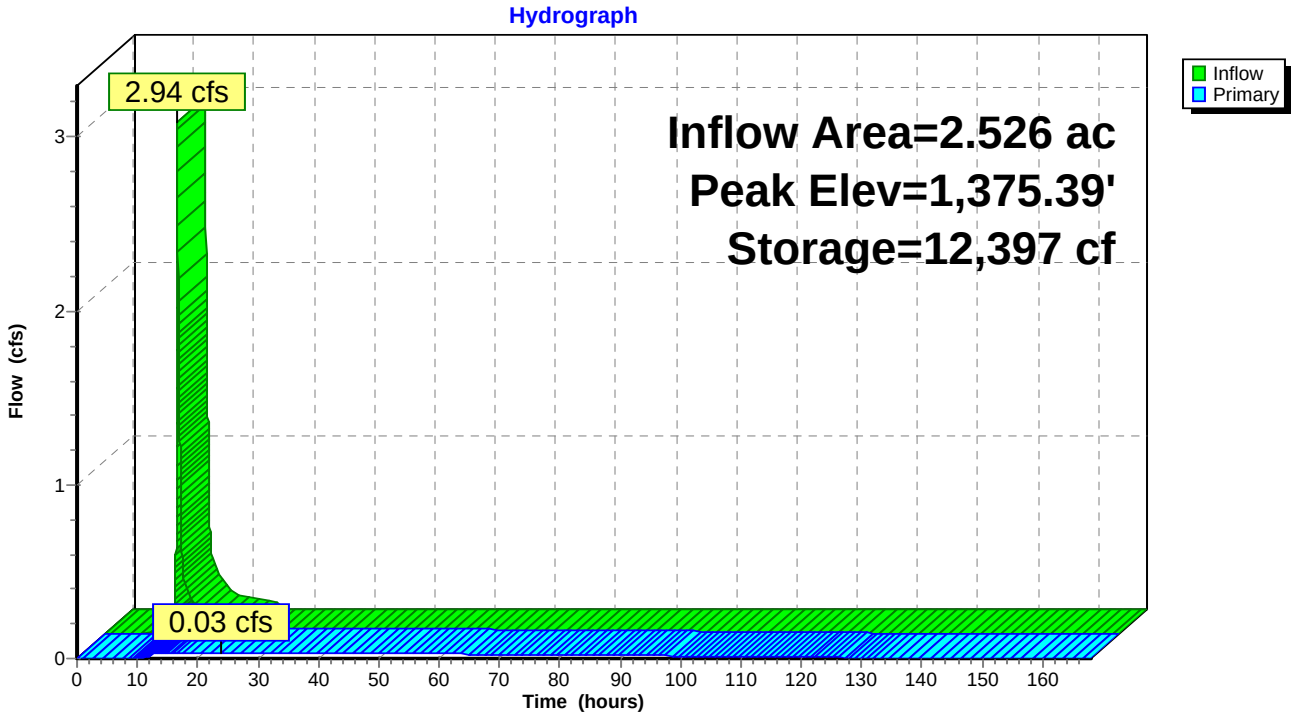
Volume	Invert	Avail.Storage	Storage Description
#1	1,371.50'	34,004 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,371.50	1,192	167.7	0	0	1,192
1,372.00	1,450	177.8	659	659	1,483
1,373.00	2,447	249.8	1,927	2,586	3,942
1,374.00	3,816	343.3	3,106	5,693	8,365
1,375.00	5,311	374.0	4,543	10,236	10,154
1,376.00	6,958	407.2	6,116	16,352	12,254
1,377.00	8,749	443.2	7,836	24,188	14,727
1,378.00	10,923	486.7	9,816	34,004	17,980

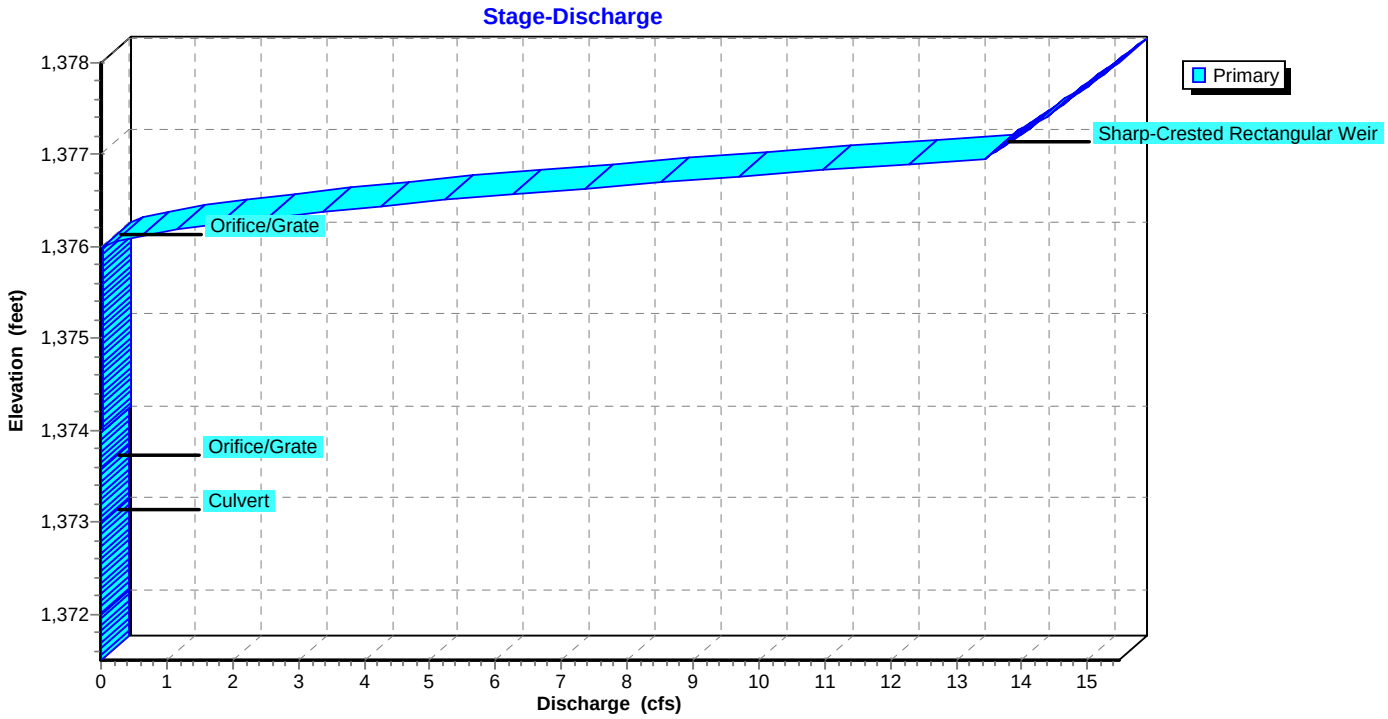
Device	Routing	Invert	Outlet Devices
#1	Primary	1,373.00'	**18.0" Round Culvert** L= 20.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,373.00' / 1,372.00' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,373.60'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,376.00'	**18.0" W x 12.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,377.00'	**16.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.03 cfs @ 24.02 hrs HW=1,375.39' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.03 cfs of 9.60 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 6.36 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

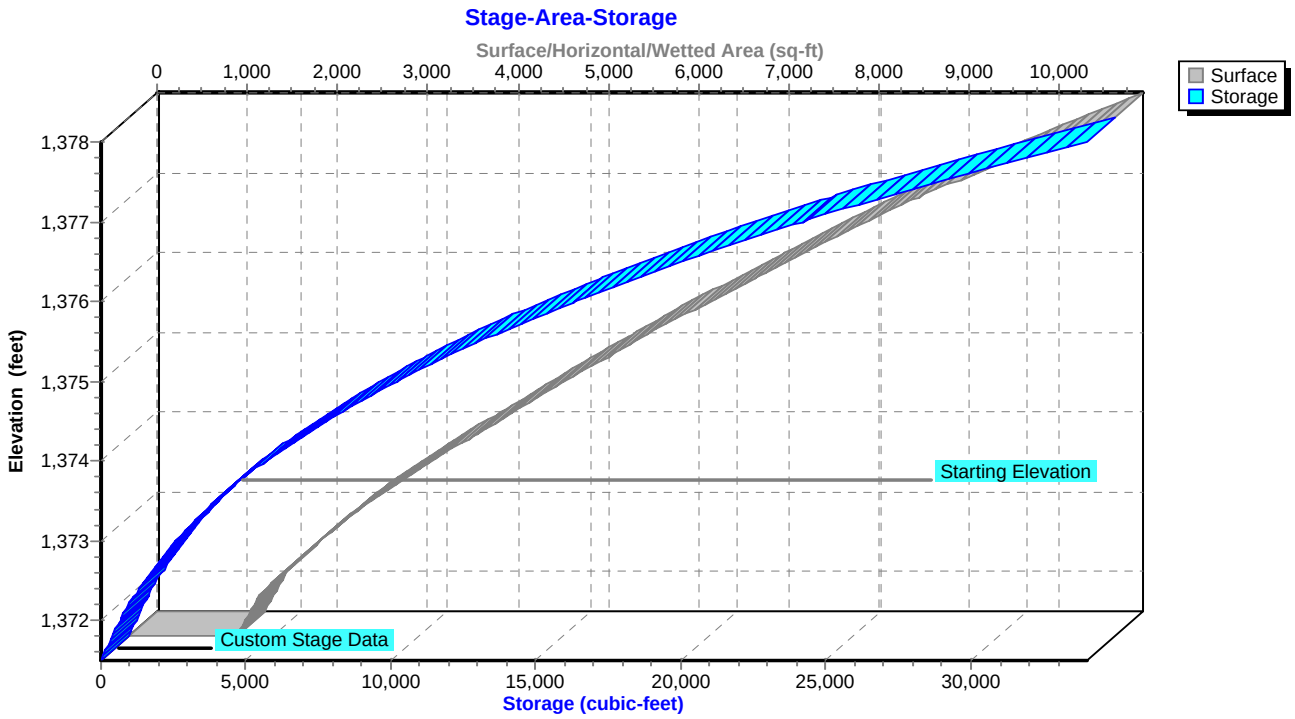
Pond 28-P: Pond-28



Pond 28-P: Pond-28



Pond 28-P: Pond-28



Summary for Pond BRA-46: BRA-46

Inflow Area = 1.246 ac, 25.52% Impervious, Inflow Depth = 0.92" for 1-YR, 24-HR Storm event
Inflow = 1.30 cfs @ 12.05 hrs, Volume= 0.096 af
Outflow = 0.10 cfs @ 14.17 hrs, Volume= 0.037 af, Atten= 92%, Lag= 127.2 min
Primary = 0.10 cfs @ 14.17 hrs, Volume= 0.037 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,370.52' @ 14.17 hrs Surf.Area= 1,391 sf Storage= 2,599 cf

Plug-Flow detention time= 342.4 min calculated for 0.037 af (38% of inflow)
Center-of-Mass det. time= 199.2 min (1,058.7 - 859.5)

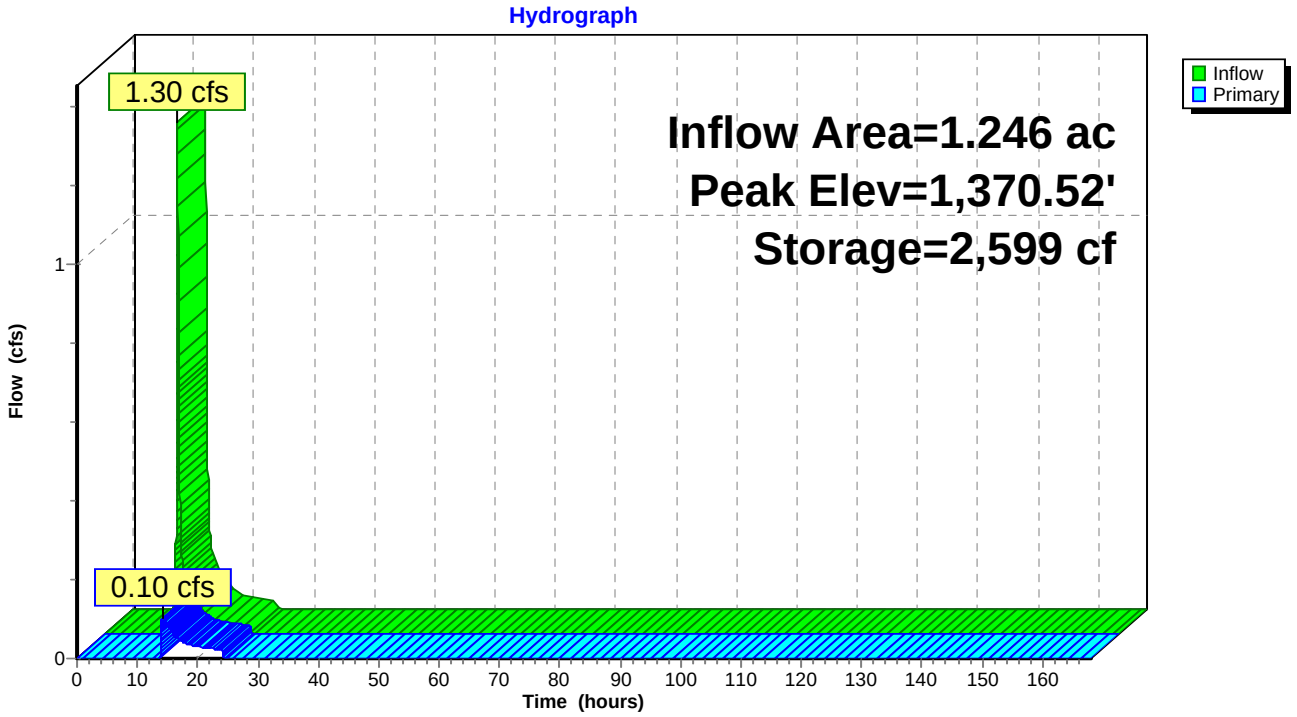
Volume	Invert	Avail.Storage	Storage Description
#1	1,366.00'	3,370 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,366.00	1,368	164.6	0.0	0	0	1,368
1,367.00	1,368	164.6	25.0	342	342	1,533
1,368.00	1,368	164.6	25.0	342	684	1,697
1,369.00	1,368	164.6	25.0	342	1,026	1,862
1,369.50	1,368	164.6	25.0	171	1,197	1,944
1,370.50	1,368	164.6	100.0	1,368	2,565	2,109
1,371.00	1,864	195.6	100.0	805	3,370	3,002

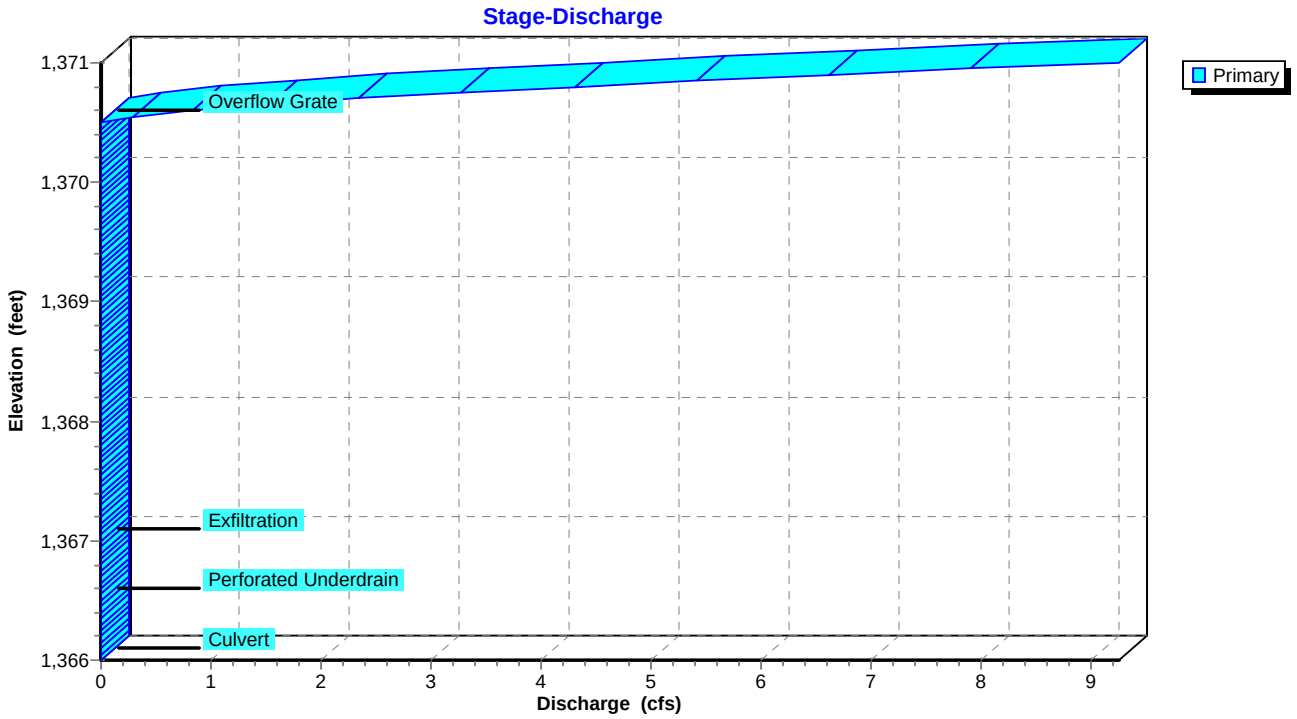
Device	Routing	Invert	Outlet Devices
#1	Primary	1,366.00'	**15.0" Round Culvert** L= 72.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,366.00' / 1,365.20' S= 0.0110 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,366.50'	**0.4" Horiz. Perforated Underdrain X 512.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,367.00'	**0.250 in/hr Exfiltration over Surface area above 1,367.00'** Conductivity to Groundwater Elevation = 1,366.00' Excluded Surface area = 1,368 sf
#4	Device 1	1,370.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.10 cfs @ 14.17 hrs HW=1,370.52' TW=1,366.01' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.10 cfs of 9.21 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 4.32 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 0.10 cfs @ 0.51 fps)

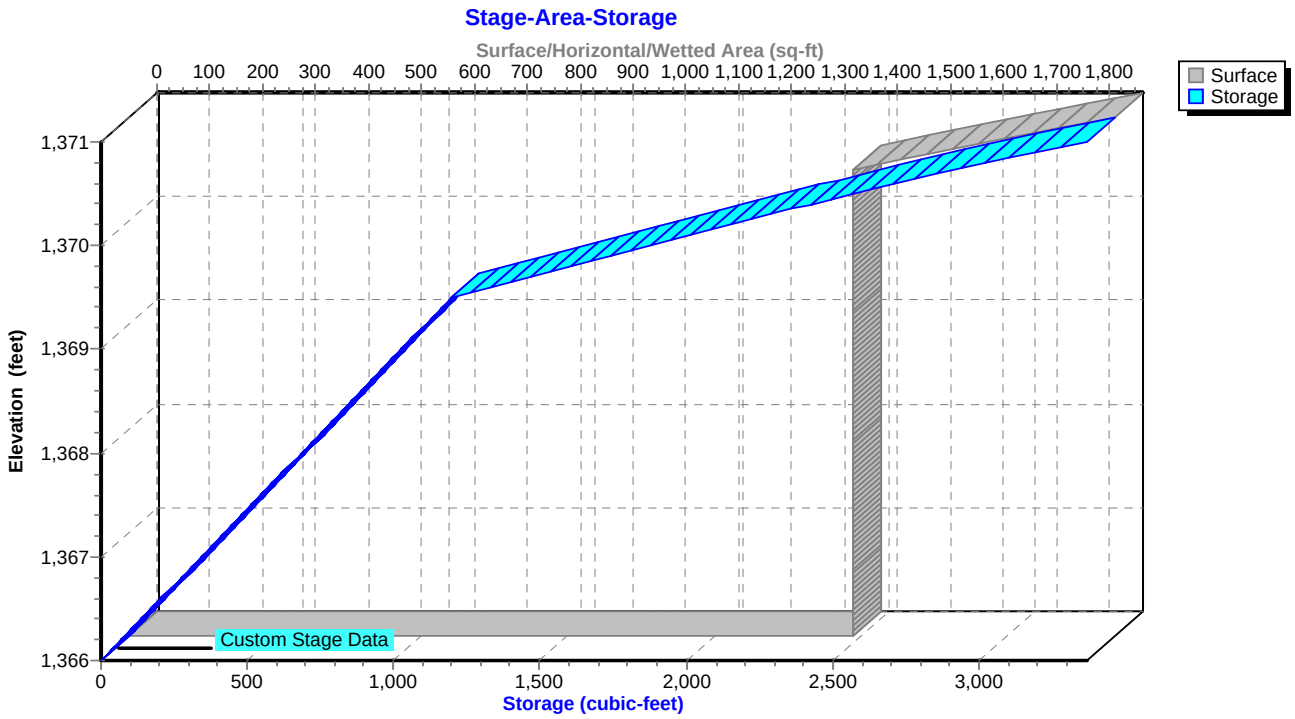
Pond BRA-46: BRA-46



Pond BRA-46: BRA-46



Pond BRA-46: BRA-46



Summary for Pond BRA-46-FS: Flow Splitter for BRA-46

Inflow Area = 1.246 ac, 25.52% Impervious, Inflow Depth = 1.01" for 1-YR, 24-HR Storm event
Inflow = 1.65 cfs @ 12.04 hrs, Volume= 0.105 af
Outflow = 1.65 cfs @ 12.05 hrs, Volume= 0.105 af, Atten= 0%, Lag= 0.6 min
Primary = 1.30 cfs @ 12.05 hrs, Volume= 0.096 af
Secondary = 0.35 cfs @ 12.05 hrs, Volume= 0.010 af

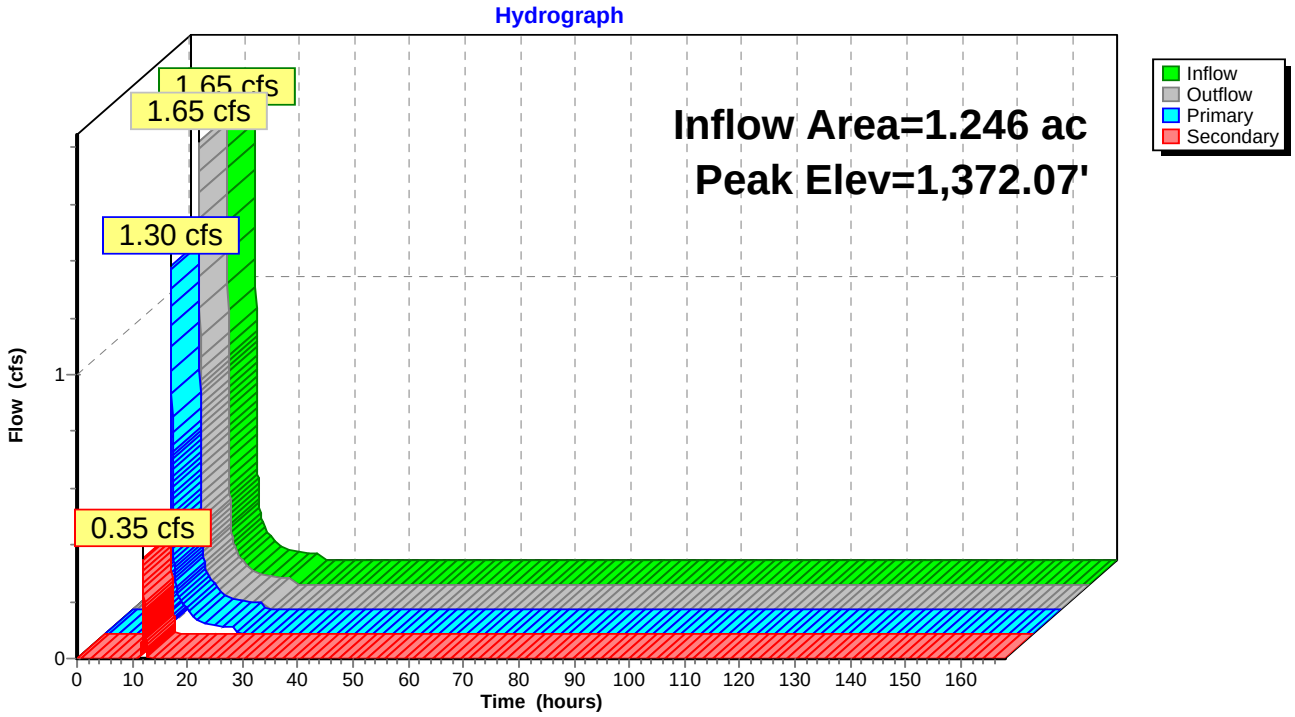
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,372.07' @ 12.05 hrs
Flood Elev= 1,375.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,371.45'	**15.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,371.45' / 1,371.00' S= 0.0118 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,371.45'	**15.0" Round Culvert** L= 195.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,371.45' / 1,365.12' S= 0.0325 '/' Cc= 0.900 n= 0.130, Flow Area= 1.23 sf
#3	Device 2	1,371.67'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

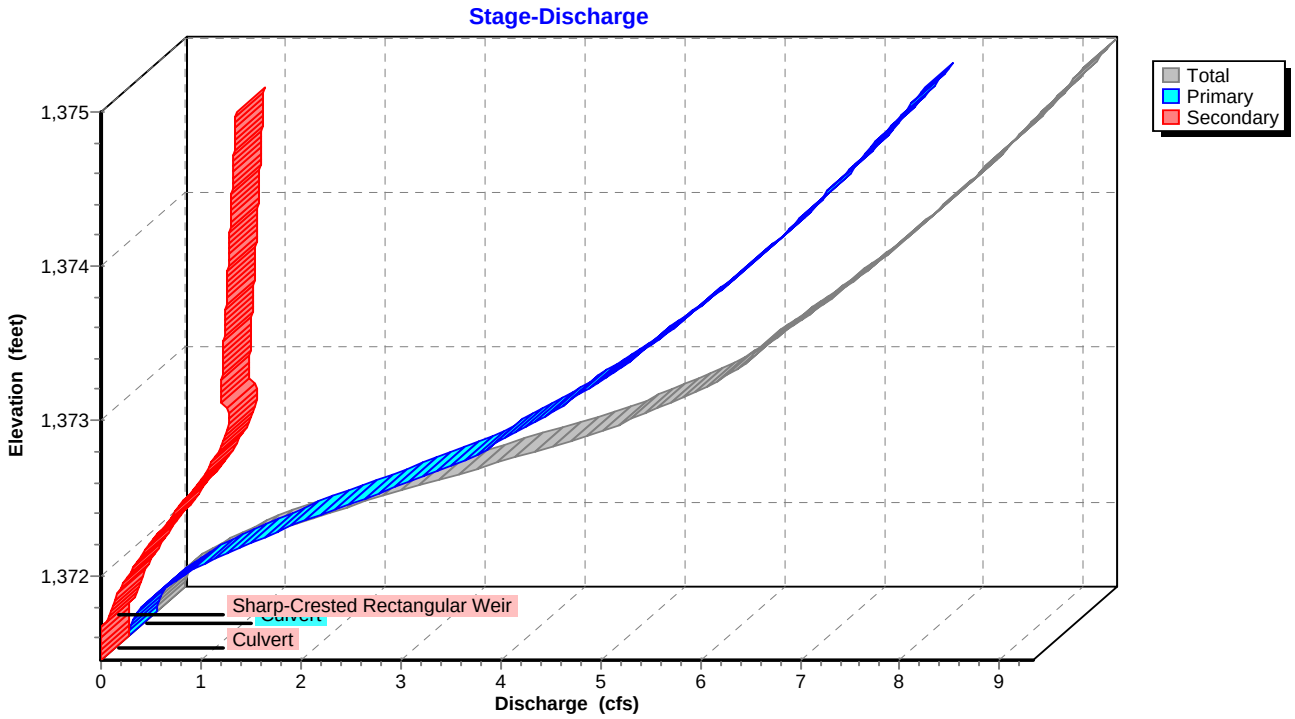
Primary OutFlow Max=1.30 cfs @ 12.05 hrs HW=1,372.07' TW=1,368.42' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.30 cfs @ 2.12 fps)

Secondary OutFlow Max=0.35 cfs @ 12.05 hrs HW=1,372.07' TW=1,365.33' (Dynamic Tailwater)
└**2=Culvert** (Barrel Controls 0.35 cfs @ 0.83 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 0.35 cfs of 3.28 cfs potential flow)

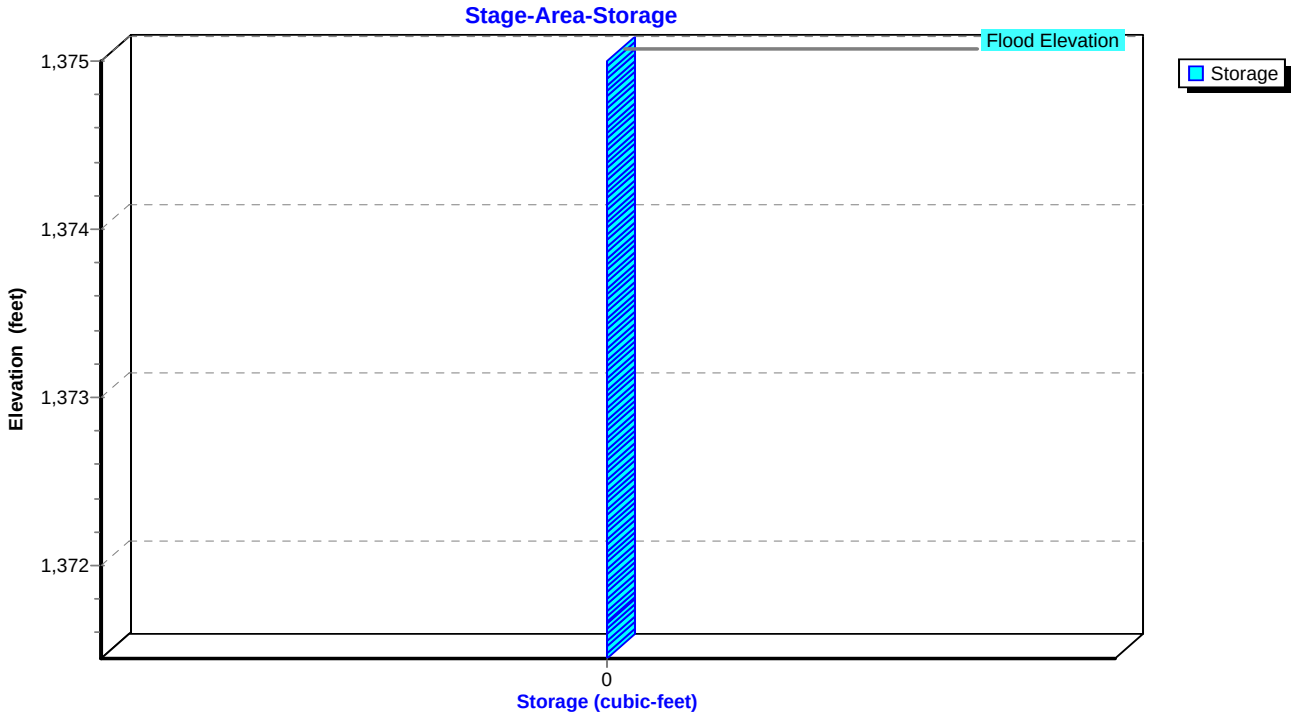
Pond BRA-46-FS: Flow Splitter for BRA-46



Pond BRA-46-FS: Flow Splitter for BRA-46



Pond BRA-46-FS: Flow Splitter for BRA-46



Summary for Pond BRA-59: BRA-59

Inflow Area = 0.860 ac, 38.02% Impervious, Inflow Depth = 1.00" for 1-YR, 24-HR Storm event
Inflow = 0.59 cfs @ 12.04 hrs, Volume= 0.072 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,381.14' @ 24.12 hrs Surf.Area= 2,733 sf Storage= 3,122 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

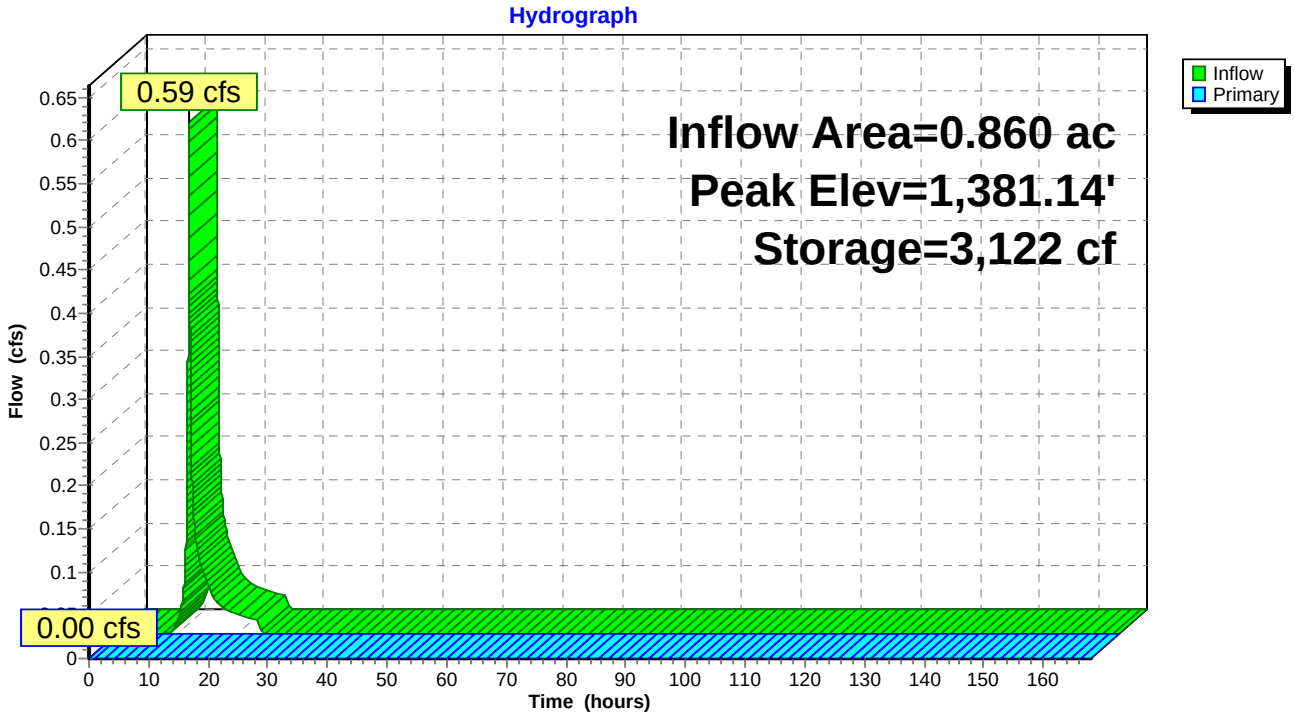
Volume	Invert	Avail.Storage	Storage Description
#1	1,378.50'	5,556 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,378.50	2,733	227.5	0.0	0	0	2,733
1,379.50	2,733	227.5	25.0	683	683	2,961
1,380.50	2,733	227.5	25.0	683	1,367	3,188
1,381.50	2,733	227.5	100.0	2,733	4,100	3,416
1,382.00	3,098	238.0	100.0	1,457	5,556	3,821

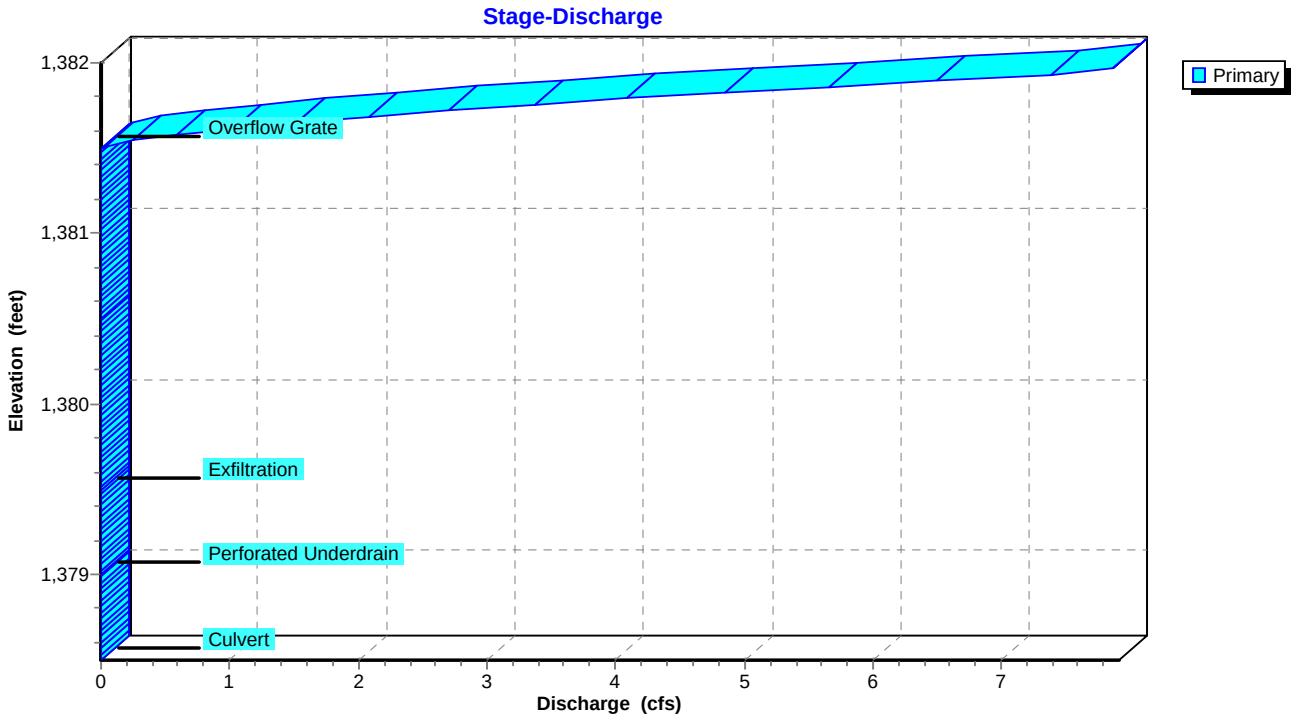
Device	Routing	Invert	Outlet Devices
#1	Primary	1,378.50'	**15.0" Round Culvert** L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,378.50' / 1,378.00' S= 0.0096 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,379.00'	**0.4" Horiz. Perforated Underdrain X 336.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,379.50'	**0.250 in/hr Exfiltration over Surface area above 1,379.50'** Conductivity to Groundwater Elevation = 1,378.50' Excluded Surface area = 2,733 sf
#4	Device 1	1,381.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,378.50' TW=1,378.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
- **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

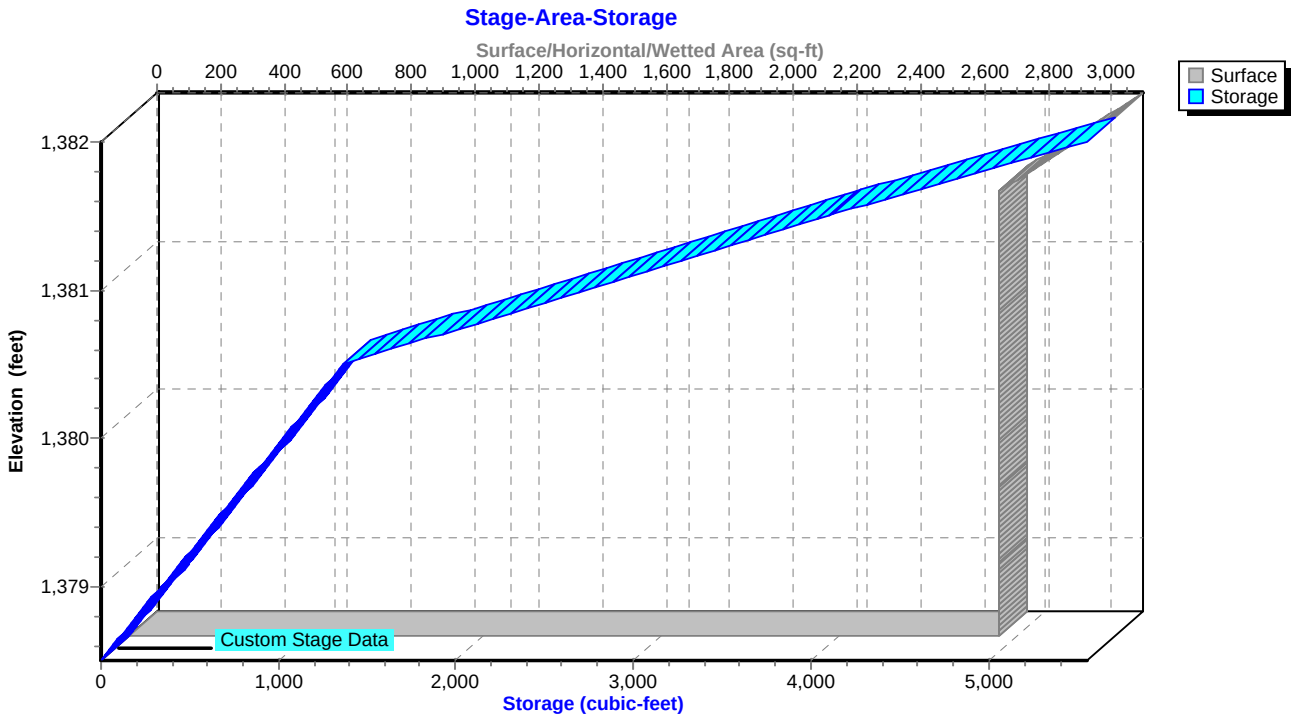
Pond BRA-59: BRA-59



Pond BRA-59: BRA-59



Pond BRA-59: BRA-59



Summary for Pond BRA-59-FS: Flow Splitter for BRA-59

Inflow Area = 0.860 ac, 38.02% Impervious, Inflow Depth = 1.19" for 1-YR, 24-HR Storm event
Inflow = 1.40 cfs @ 12.03 hrs, Volume= 0.086 af
Outflow = 1.40 cfs @ 12.04 hrs, Volume= 0.086 af, Atten= 0%, Lag= 0.6 min
Primary = 0.59 cfs @ 12.04 hrs, Volume= 0.072 af
Secondary = 0.80 cfs @ 12.04 hrs, Volume= 0.014 af

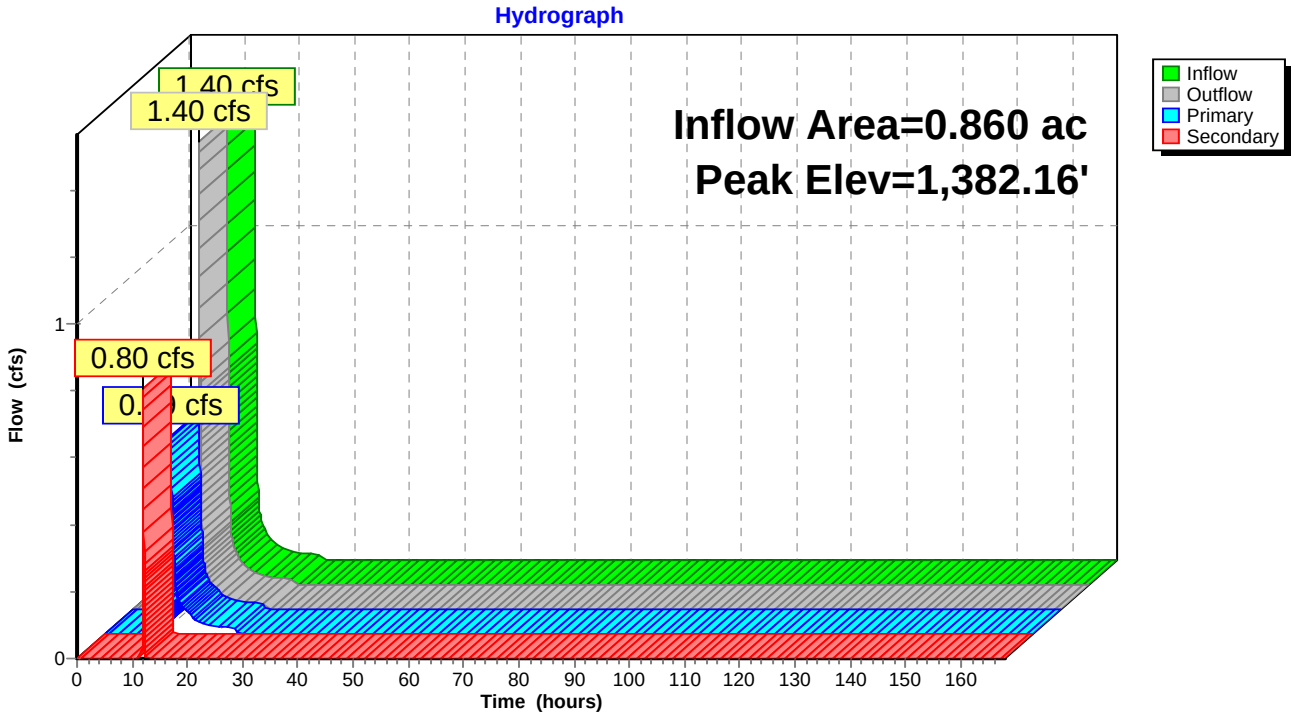
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,382.16' @ 12.04 hrs
Flood Elev= 1,385.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,381.75'	**15.0" Round Culvert to BRA** L= 66.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.75' / 1,381.25' S= 0.0076 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,381.50'	**15.0" Round Culvert to Pond** L= 86.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.50' / 1,380.50' S= 0.0116 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,382.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

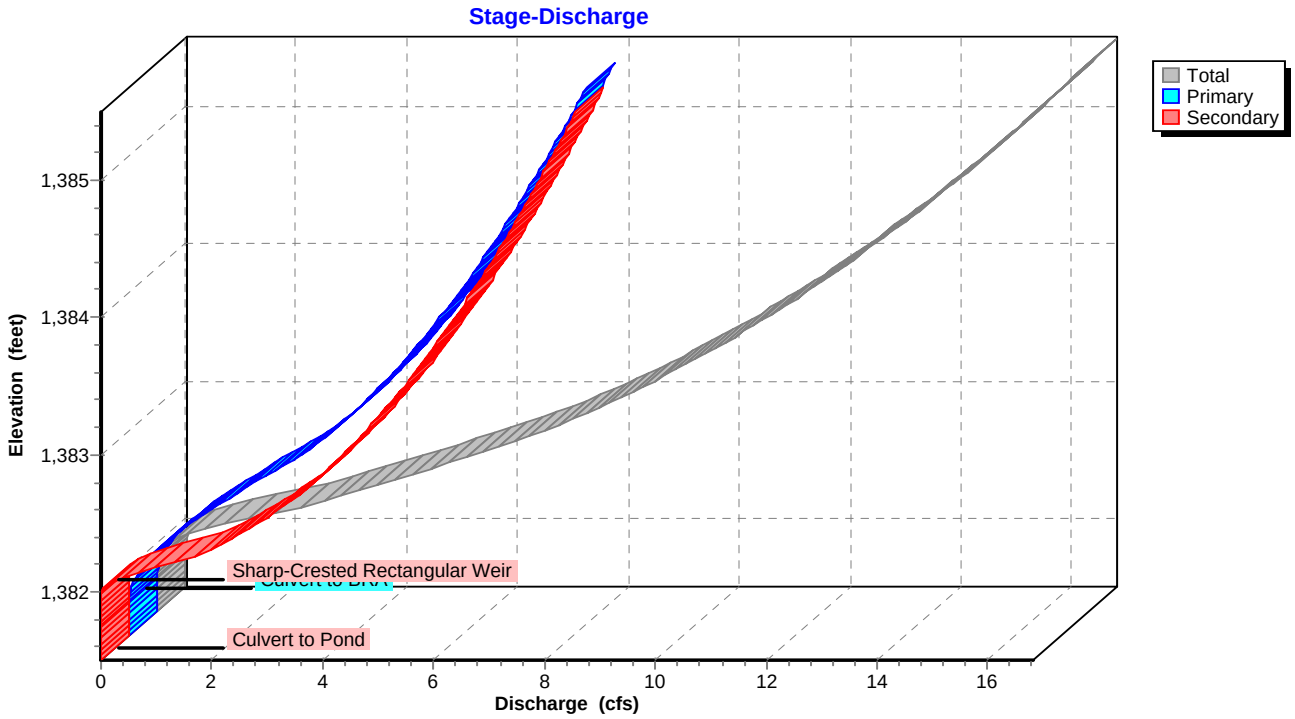
Primary OutFlow Max=0.59 cfs @ 12.04 hrs HW=1,382.16' TW=1,379.53' (Dynamic Tailwater)
└**1=Culvert to BRA** (Inlet Controls 0.59 cfs @ 1.71 fps)

Secondary OutFlow Max=0.80 cfs @ 12.04 hrs HW=1,382.16' TW=1,378.21' (Dynamic Tailwater)
└**2=Culvert to Pond** (Passes 0.80 cfs of 1.42 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.80 cfs @ 1.29 fps)

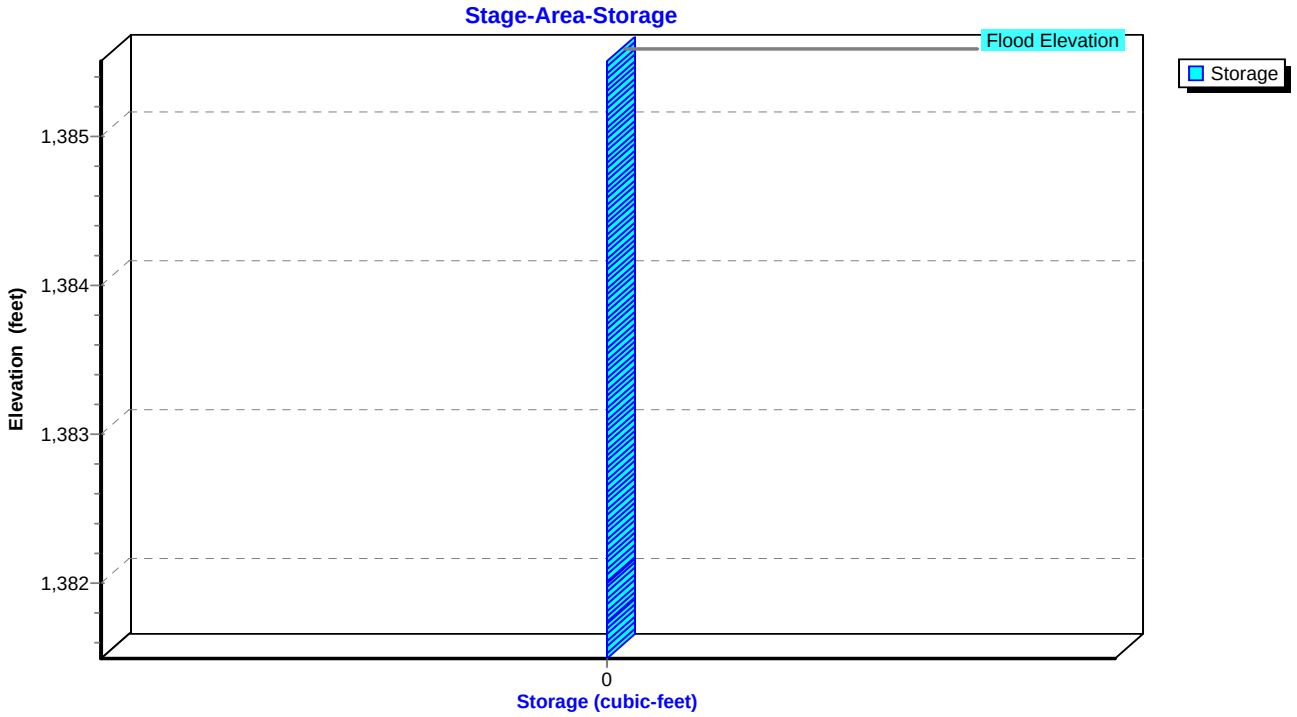
Pond BRA-59-FS: Flow Splitter for BRA-59



Pond BRA-59-FS: Flow Splitter for BRA-59



Pond BRA-59-FS: Flow Splitter for BRA-59



Summary for Pond BRA37-FS: Flow Splitter for BRA-37

Inflow Area = 5.787 ac, 8.64% Impervious, Inflow Depth = 0.73" for 1-YR, 24-HR Storm event
Inflow = 2.60 cfs @ 12.03 hrs, Volume= 0.351 af
Outflow = 2.60 cfs @ 12.04 hrs, Volume= 0.351 af, Atten= 0%, Lag= 0.6 min
Primary = 1.23 cfs @ 12.04 hrs, Volume= 0.266 af
Secondary = 1.38 cfs @ 12.04 hrs, Volume= 0.085 af

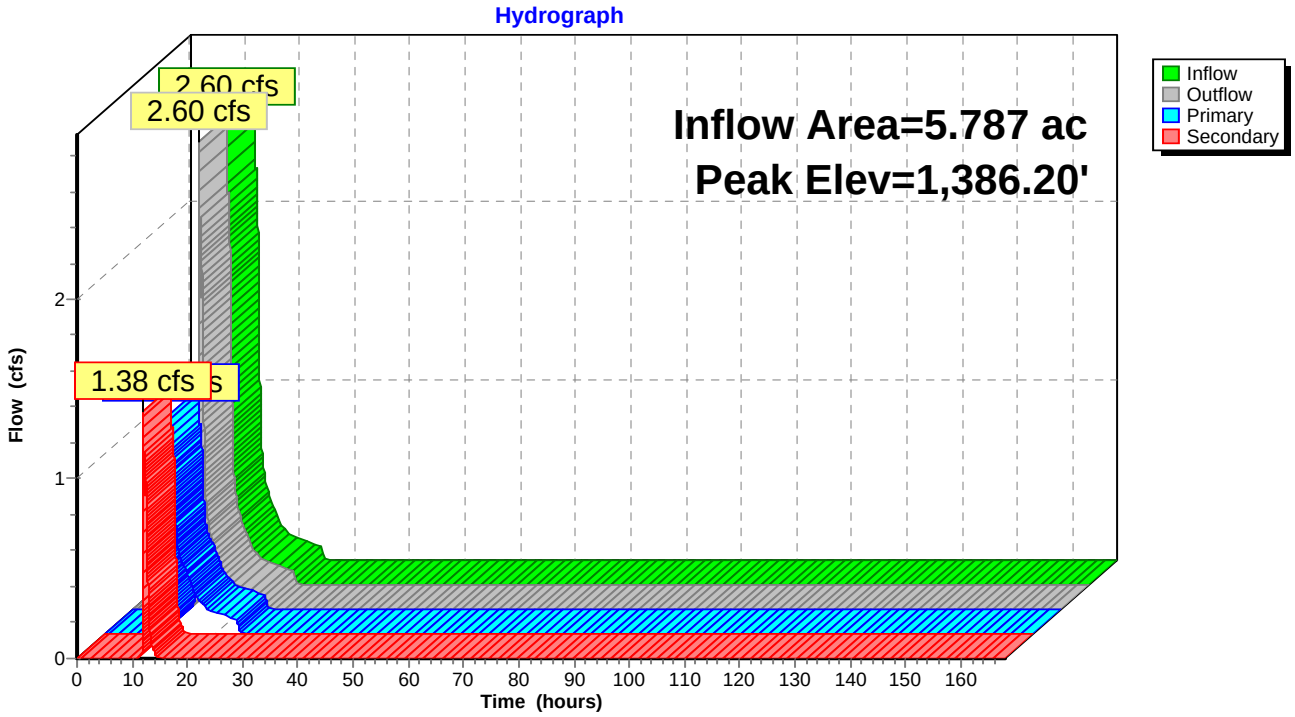
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,386.20' @ 12.04 hrs
Flood Elev= 1,390.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,385.60'	**18.0" Round Culvert to BRA-37** L= 7.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,385.60' / 1,385.50' S= 0.0127 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,385.60'	**18.0" Round Culvert** L= 89.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,385.60' / 1,383.00' S= 0.0292 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,385.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

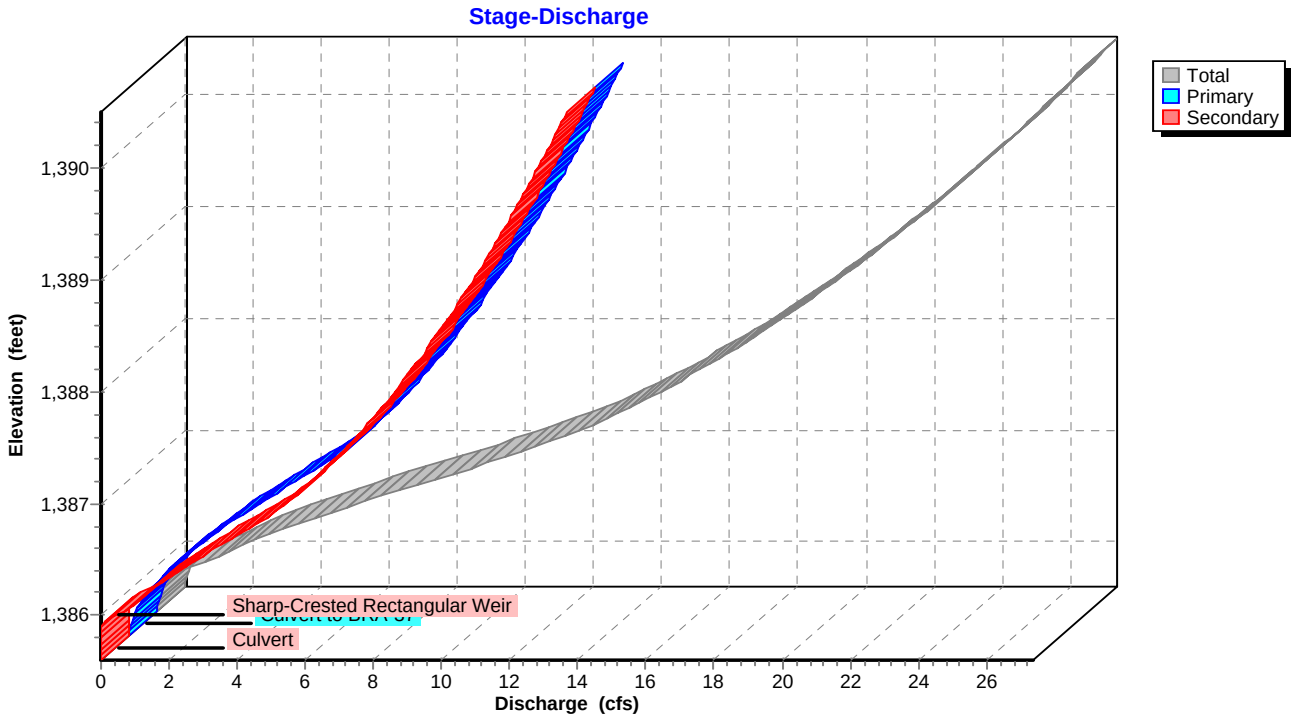
Primary OutFlow Max=1.22 cfs @ 12.04 hrs HW=1,386.20' TW=1,382.99' (Dynamic Tailwater)
└**1=Culvert to BRA-37** (Barrel Controls 1.22 cfs @ 2.74 fps)

Secondary OutFlow Max=1.37 cfs @ 12.04 hrs HW=1,386.20' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 1.37 cfs @ 2.08 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 1.37 cfs of 2.11 cfs potential flow)

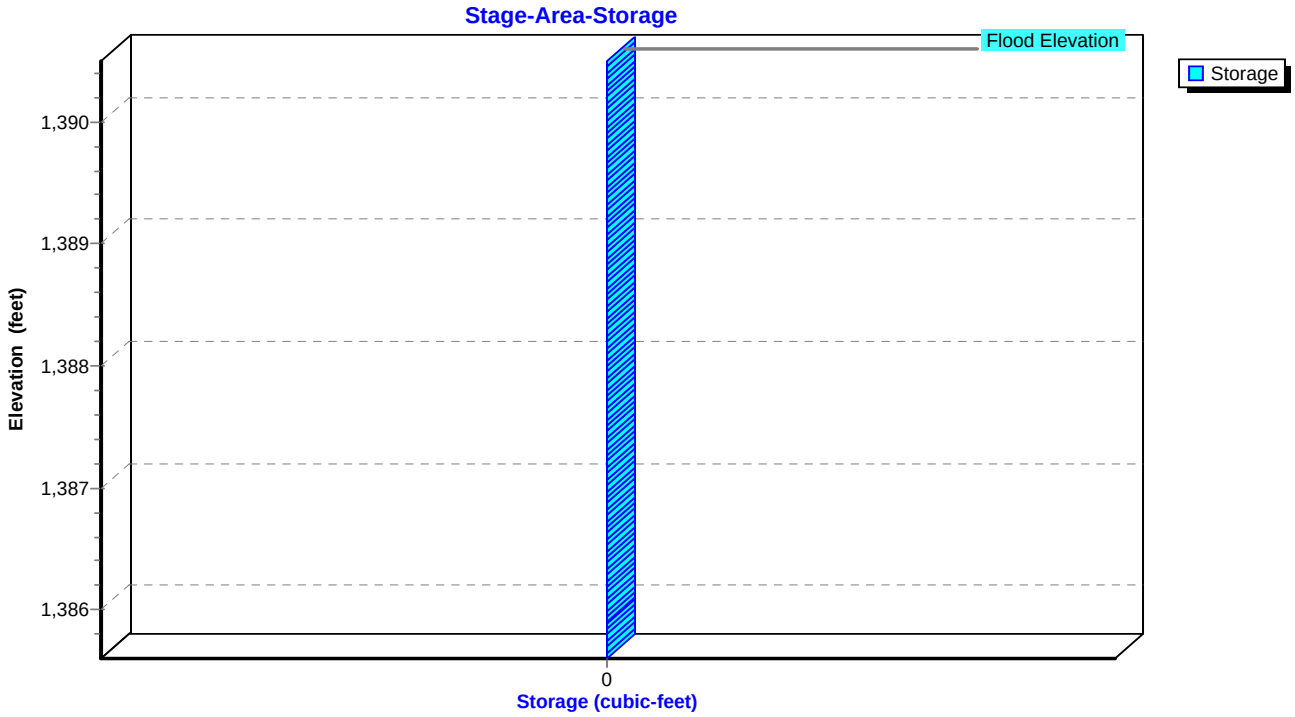
Pond BRA37-FS: Flow Splitter for BRA-37



Pond BRA37-FS: Flow Splitter for BRA-37



Pond BRA37-FS: Flow Splitter for BRA-37



Summary for Pond BRA37-P: BRA-37

Inflow Area = 5.787 ac, 8.64% Impervious, Inflow Depth = 0.55" for 1-YR, 24-HR Storm event
Inflow = 1.23 cfs @ 12.04 hrs, Volume= 0.266 af
Outflow = 0.38 cfs @ 14.25 hrs, Volume= 0.152 af, Atten= 69%, Lag= 132.5 min
Primary = 0.38 cfs @ 14.25 hrs, Volume= 0.152 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,385.56' @ 14.25 hrs Surf.Area= 4,184 sf Storage= 5,227 cf

Plug-Flow detention time= 284.1 min calculated for 0.152 af (57% of inflow)
Center-of-Mass det. time= 141.3 min (1,061.7 - 920.4)

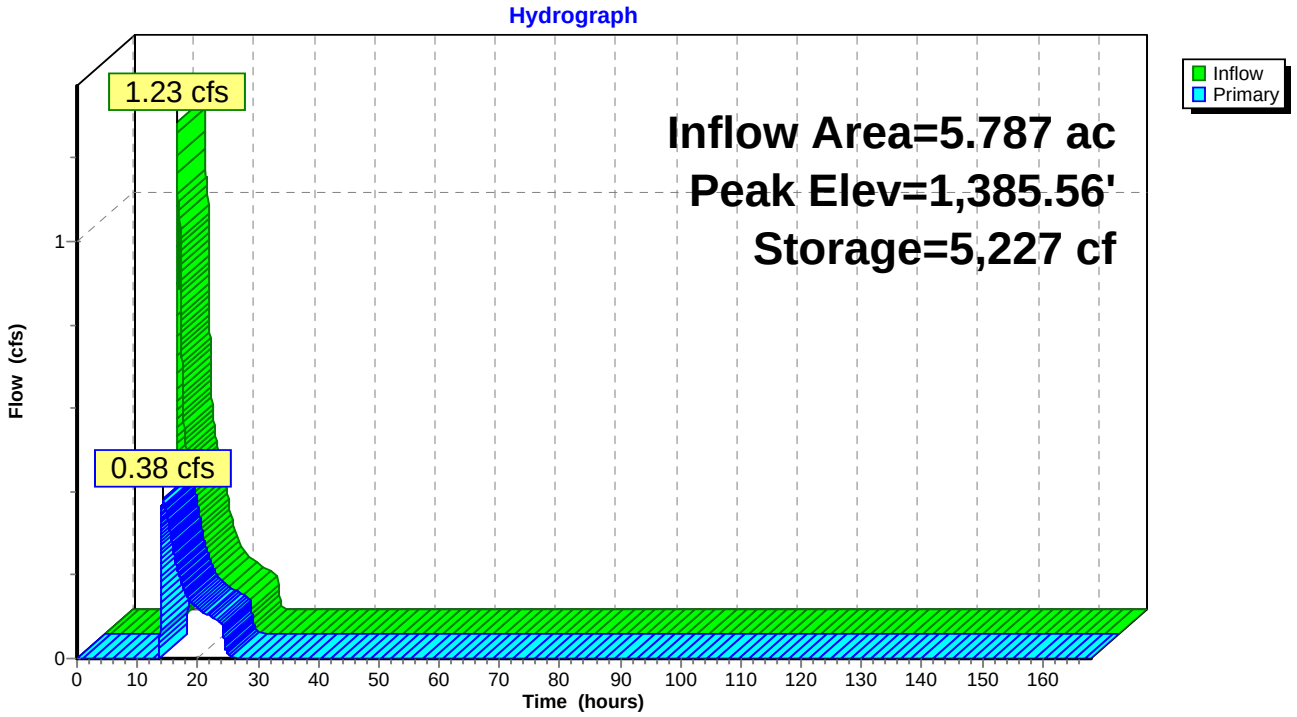
Volume	Invert	Avail.Storage	Storage Description
#1	1,382.00'	11,952 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,382.00	3,939	292.0	0.0	0	0	3,939
1,383.00	3,939	292.0	25.0	985	985	4,231
1,384.00	3,939	292.0	25.0	985	1,970	4,523
1,385.00	3,939	292.0	25.0	985	2,954	4,815
1,386.00	4,382	302.0	100.0	4,159	7,113	5,373
1,387.00	5,312	320.0	100.0	4,840	11,952	6,317

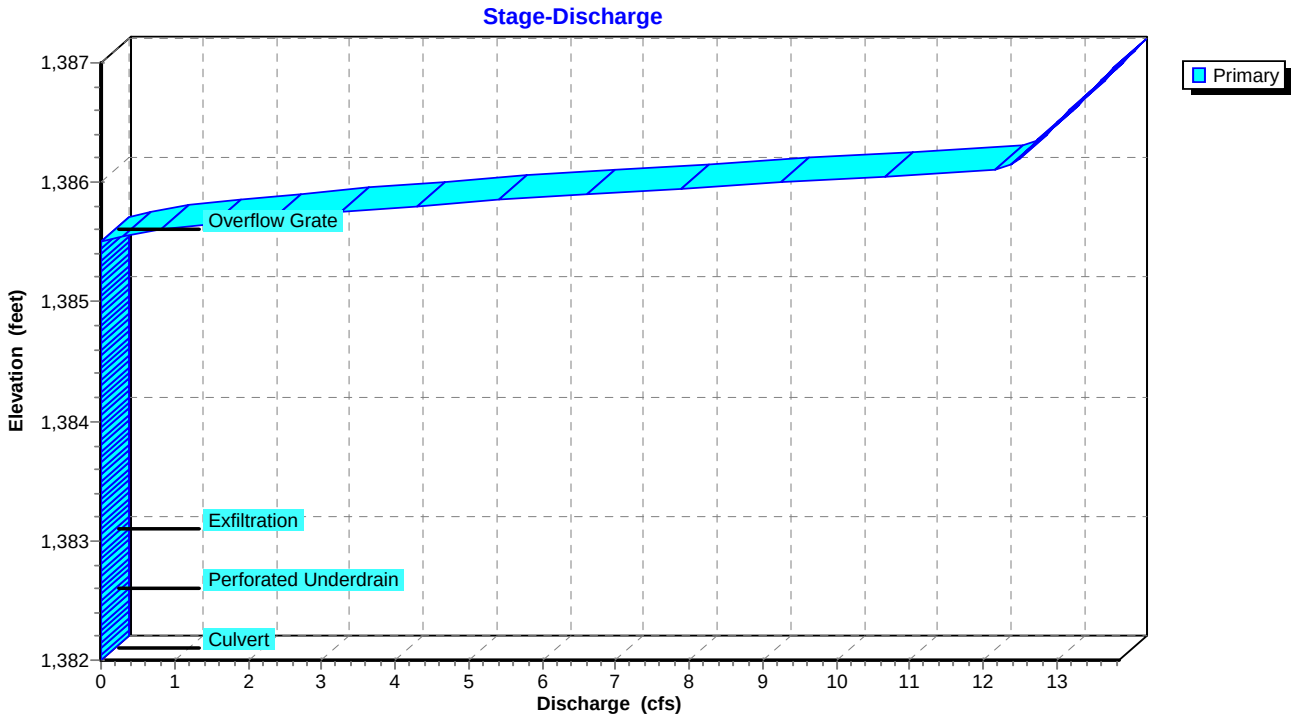
Device	Routing	Invert	Outlet Devices
#1	Primary	1,382.00'	**18.0" Round Culvert** L= 93.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,382.00' / 1,381.50' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.50'	**0.4" Horiz. Perforated Underdrain X 392.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,383.00'	**0.250 in/hr Exfiltration over Surface area above 1,383.00'** Conductivity to Groundwater Elevation = 1,382.00' Excluded Surface area = 3,939 sf
#4	Device 1	1,385.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.38 cfs @ 14.25 hrs HW=1,385.56' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.38 cfs of 11.26 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 11.52 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 0.38 cfs @ 0.80 fps)

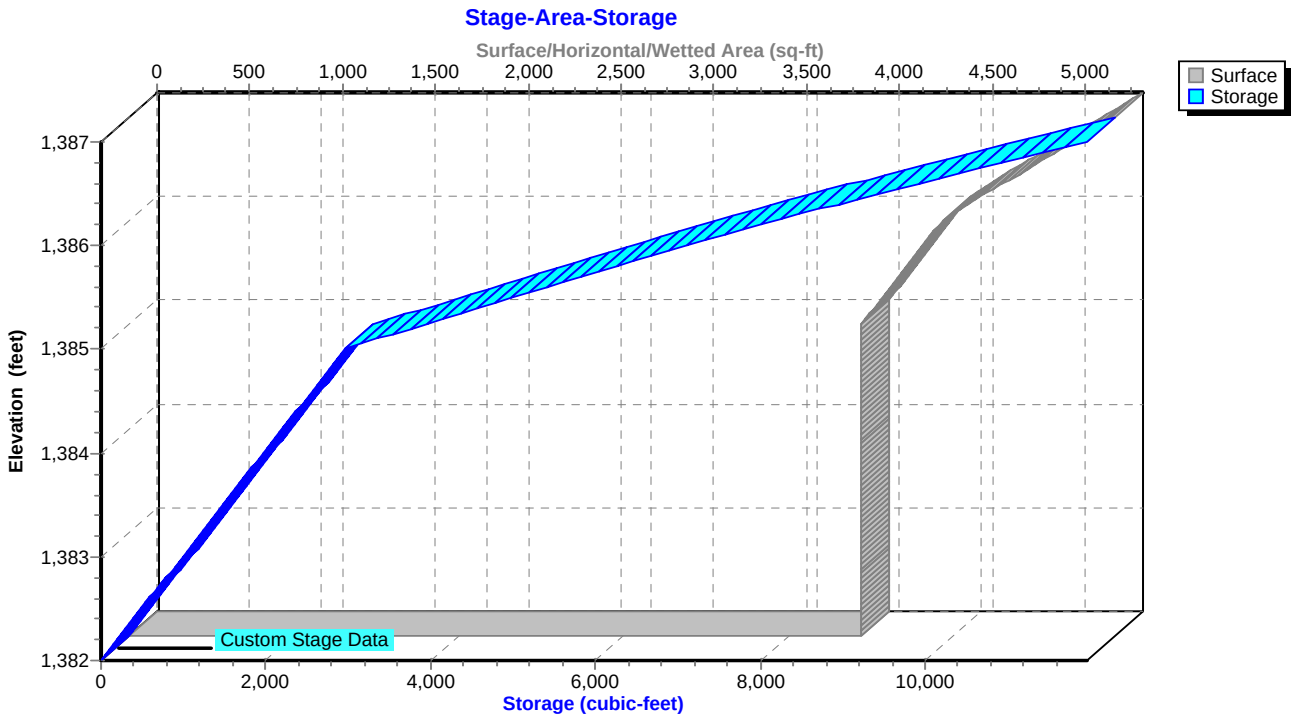
Pond BRA37-P: BRA-37



Pond BRA37-P: BRA-37



Pond BRA37-P: BRA-37



Summary for Pond BRA38-P: BRA-38

Inflow Area = 1.972 ac, 21.96% Impervious, Inflow Depth = 0.96" for 1-YR, 24-HR Storm event
Inflow = 2.49 cfs @ 12.03 hrs, Volume= 0.158 af
Outflow = 0.14 cfs @ 14.54 hrs, Volume= 0.053 af, Atten= 94%, Lag= 150.6 min
Primary = 0.11 cfs @ 14.54 hrs, Volume= 0.041 af
Secondary = 0.03 cfs @ 14.54 hrs, Volume= 0.012 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,385.02' @ 14.54 hrs Surf.Area= 3,650 sf Storage= 4,635 cf

Plug-Flow detention time= 362.4 min calculated for 0.053 af (34% of inflow)
Center-of-Mass det. time= 226.2 min (1,076.4 - 850.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,381.50'	6,388 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

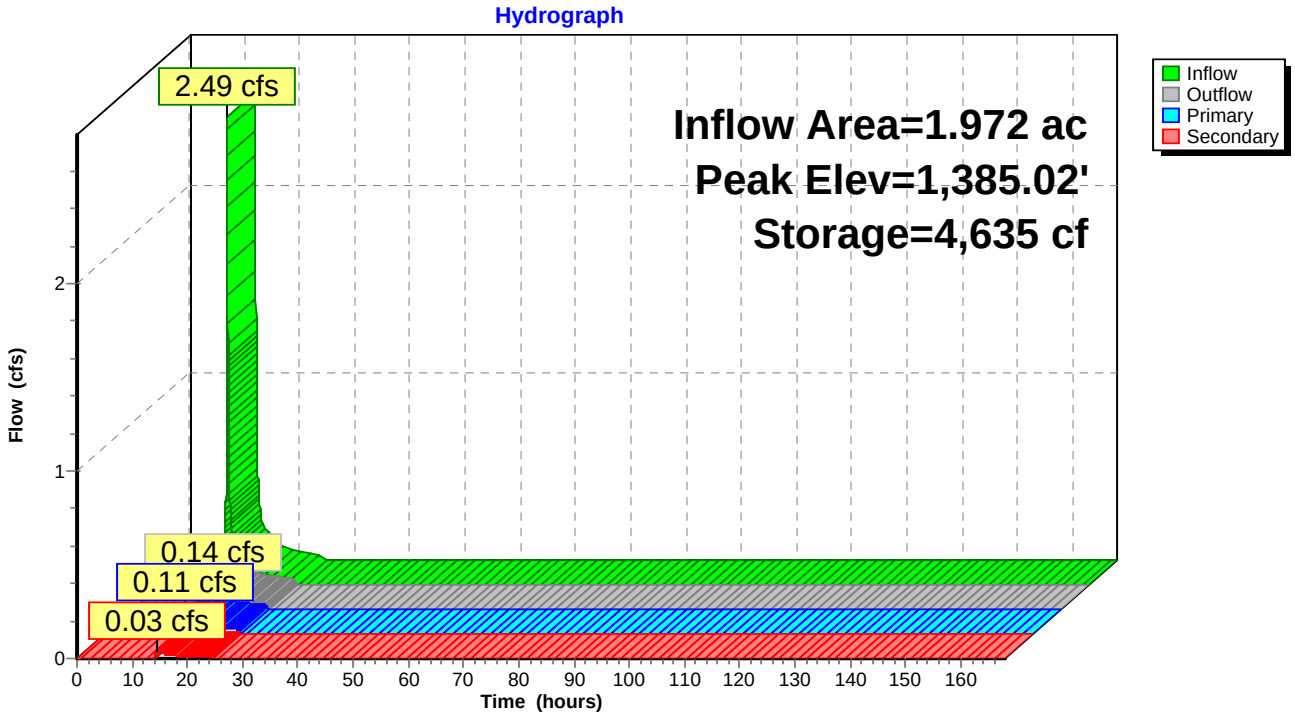
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,381.50	3,650	290.0	0.0	0	0	3,650
1,382.50	3,650	290.0	25.0	913	913	3,940
1,383.50	3,650	290.0	25.0	913	1,825	4,230
1,384.50	3,650	290.0	25.0	913	2,738	4,520
1,385.00	3,650	290.0	100.0	1,825	4,563	4,665
1,385.50	3,650	290.0	100.0	1,825	6,388	4,810

Device	Routing	Invert	Outlet Devices
#1	Primary	1,381.50'	**18.0" Round Culvert** L= 114.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.50' / 1,380.90' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.00'	**0.4" Horiz. Perforated Underdain X 452.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,382.50'	**0.250 in/hr Exfiltration over Surface area above 1,382.50'** Conductivity to Groundwater Elevation = 1,381.50' Excluded Surface area = 3,650 sf
#4	Device 1	1,385.00'	**36.0" x 36.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,385.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

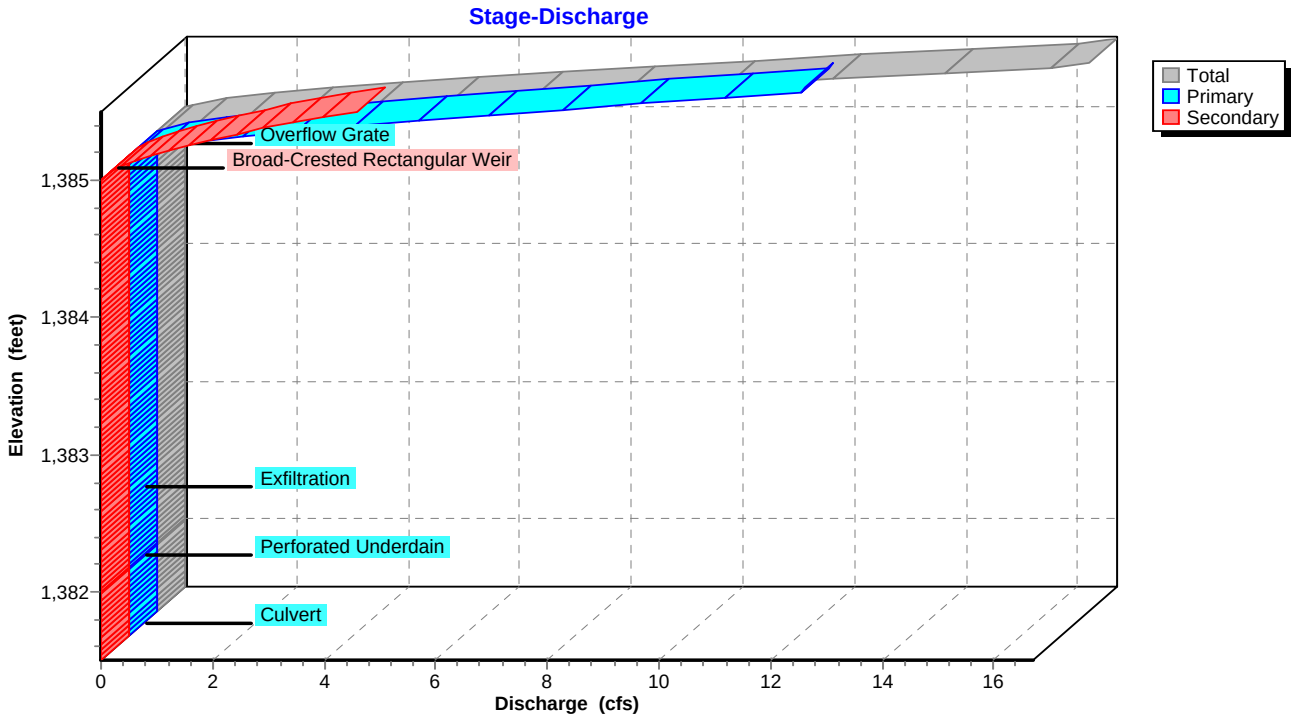
Primary OutFlow Max=0.11 cfs @ 14.54 hrs HW=1,385.02' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.11 cfs of 11.18 cfs potential flow)
  - **2=Perforated Underdain** (Passes 0.00 cfs of 13.20 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 0.11 cfs @ 0.46 fps)

Secondary OutFlow Max=0.03 cfs @ 14.54 hrs HW=1,385.02' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 0.03 cfs @ 0.33 fps)

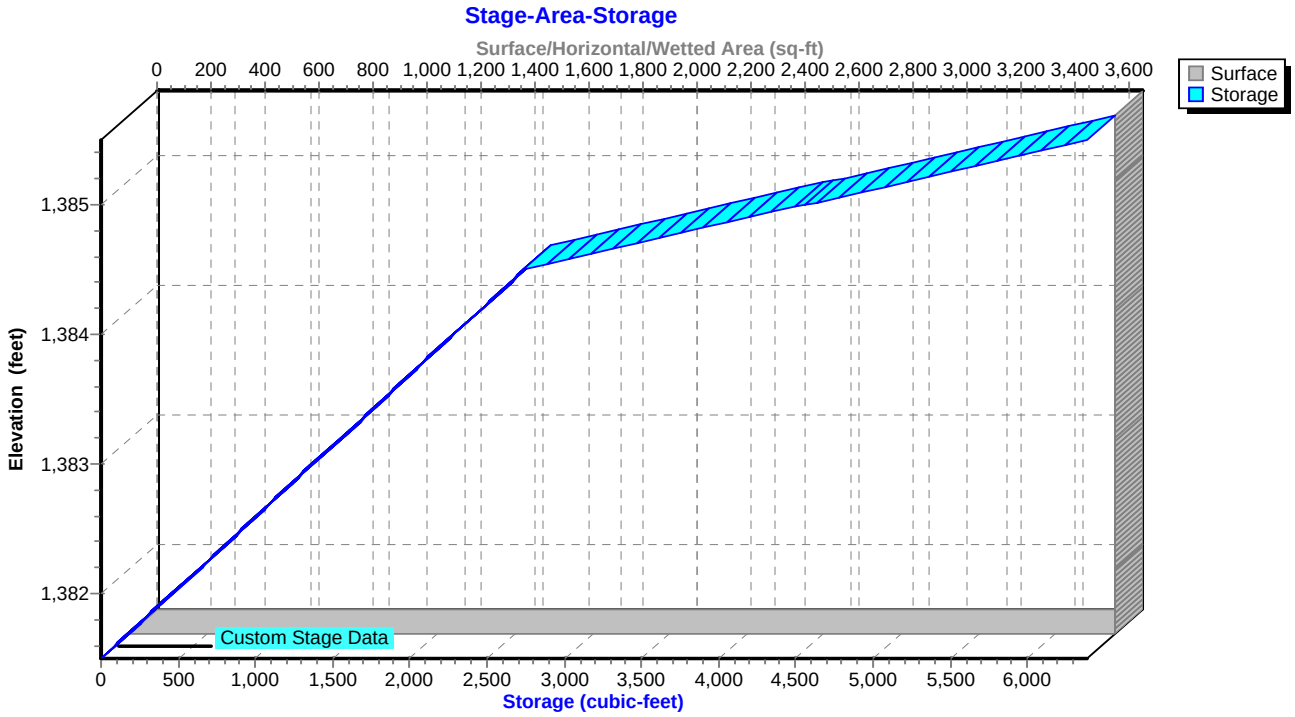
Pond BRA38-P: BRA-38



Pond BRA38-P: BRA-38



Pond BRA38-P: BRA-38



Summary for Pond BRA50-FS: Flow Splitter for BRA-50

Inflow Area = 4.526 ac, 6.87% Impervious, Inflow Depth = 0.86" for 1-YR, 24-HR Storm event
Inflow = 1.92 cfs @ 12.03 hrs, Volume= 0.324 af
Outflow = 1.92 cfs @ 12.04 hrs, Volume= 0.324 af, Atten= 0%, Lag= 0.6 min
Primary = 0.88 cfs @ 12.04 hrs, Volume= 0.239 af
Secondary = 1.04 cfs @ 12.04 hrs, Volume= 0.085 af

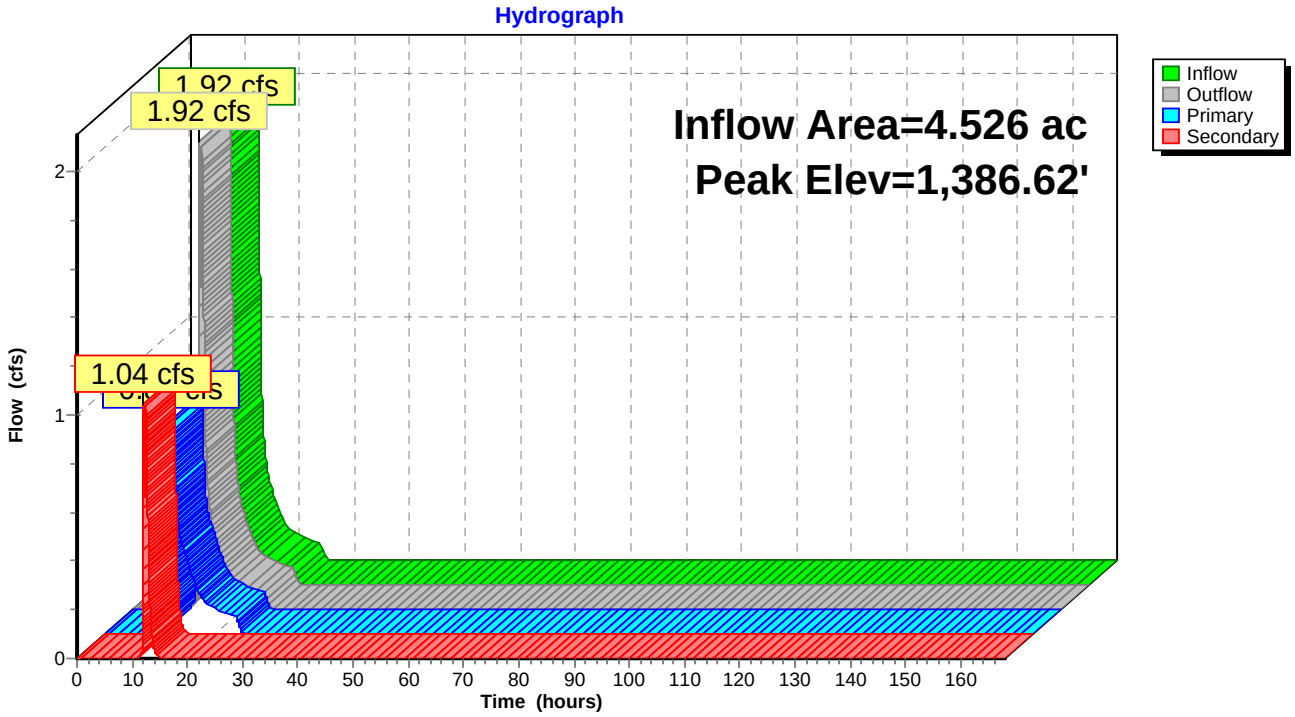
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,386.62' @ 12.04 hrs
Flood Elev= 1,390.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,386.10'	**18.0" Round Culvert to BRA-50** L= 17.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,386.10' / 1,386.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,386.10'	**18.0" Round Culvert to Pond 23** L= 71.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,386.10' / 1,383.70' S= 0.0334 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,386.40'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

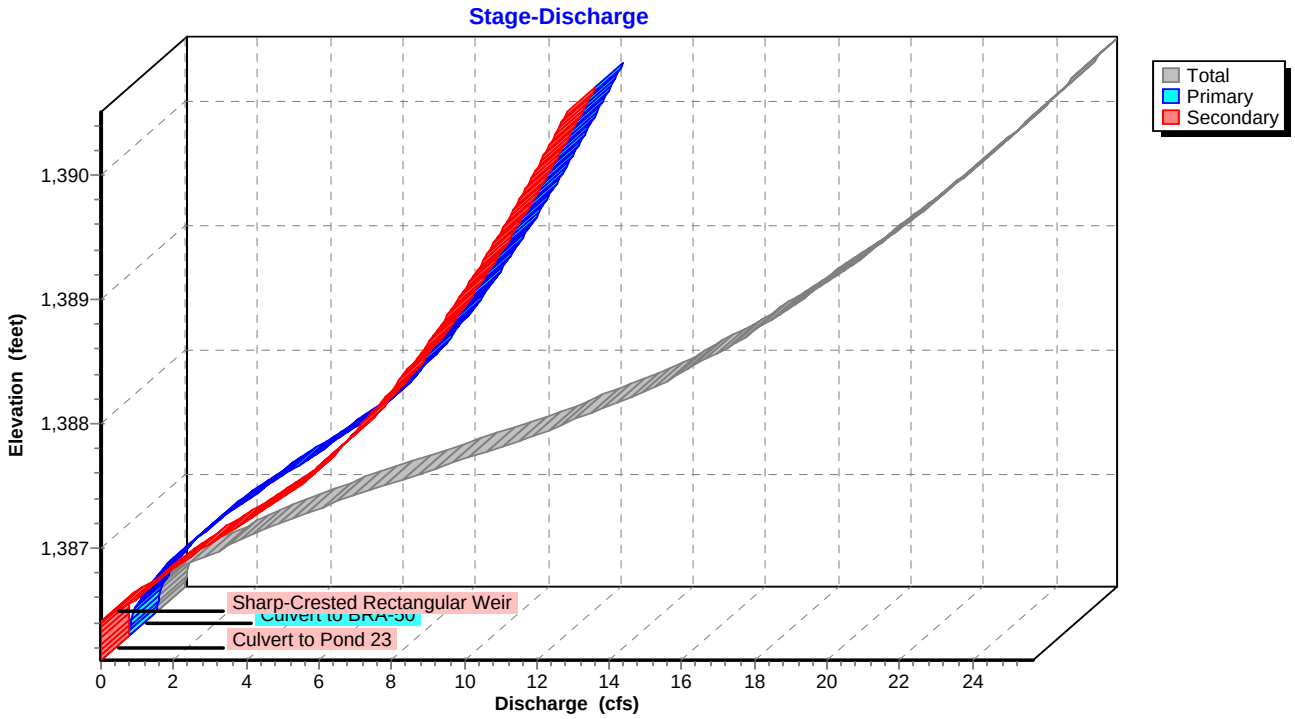
Primary OutFlow Max=0.88 cfs @ 12.04 hrs HW=1,386.62' TW=1,383.64' (Dynamic Tailwater)
└**1=Culvert to BRA-50** (Barrel Controls 0.88 cfs @ 2.42 fps)

Secondary OutFlow Max=1.04 cfs @ 12.04 hrs HW=1,386.62' TW=1,381.19' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Inlet Controls 1.04 cfs @ 1.93 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 1.04 cfs of 1.31 cfs potential flow)

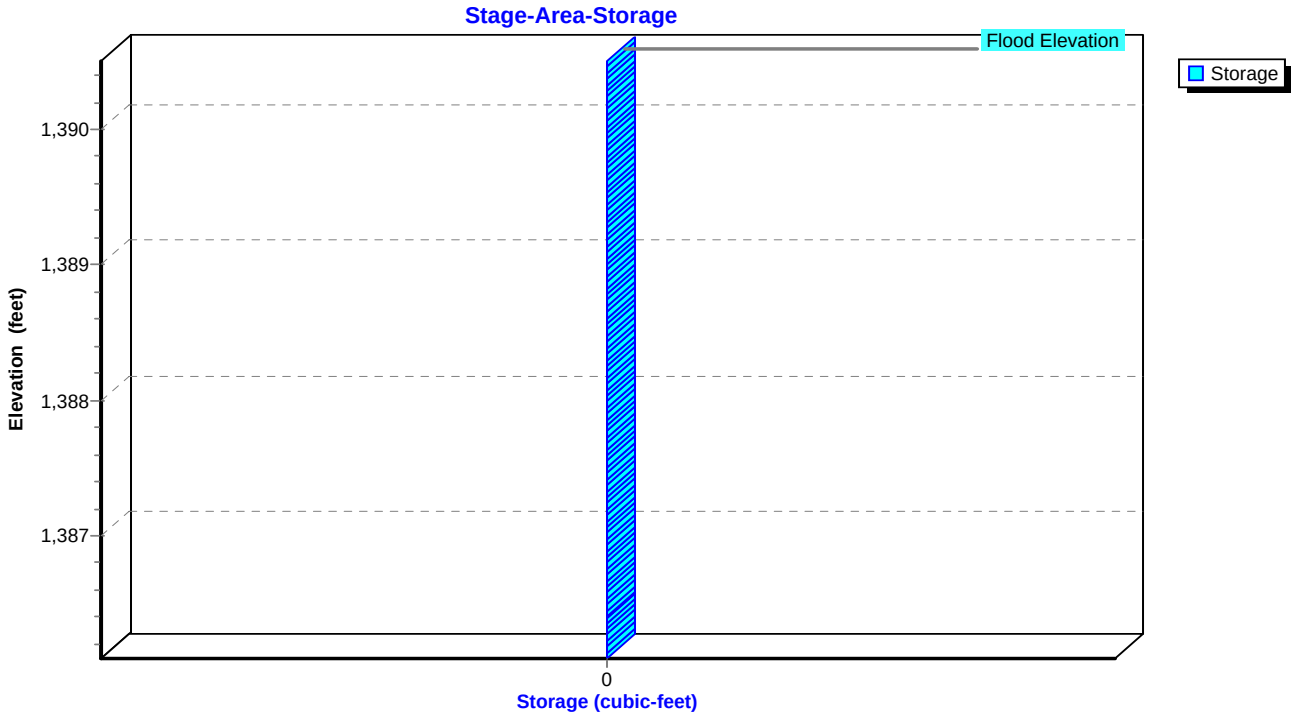
Pond BRA50-FS: Flow Splitter for BRA-50



Pond BRA50-FS: Flow Splitter for BRA-50



Pond BRA50-FS: Flow Splitter for BRA-50



Summary for Pond BRA50-P: BRA-50

Inflow Area = 4.526 ac, 6.87% Impervious, Inflow Depth = 0.63" for 1-YR, 24-HR Storm event
Inflow = 0.88 cfs @ 12.04 hrs, Volume= 0.239 af
Outflow = 0.43 cfs @ 13.37 hrs, Volume= 0.156 af, Atten= 51%, Lag= 80.0 min
Primary = 0.43 cfs @ 13.37 hrs, Volume= 0.156 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,386.06' @ 13.37 hrs Surf.Area= 2,117 sf Storage= 3,754 cf

Plug-Flow detention time= 227.1 min calculated for 0.156 af (65% of inflow)
Center-of-Mass det. time= 102.5 min (1,022.8 - 920.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,382.00'	9,428 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

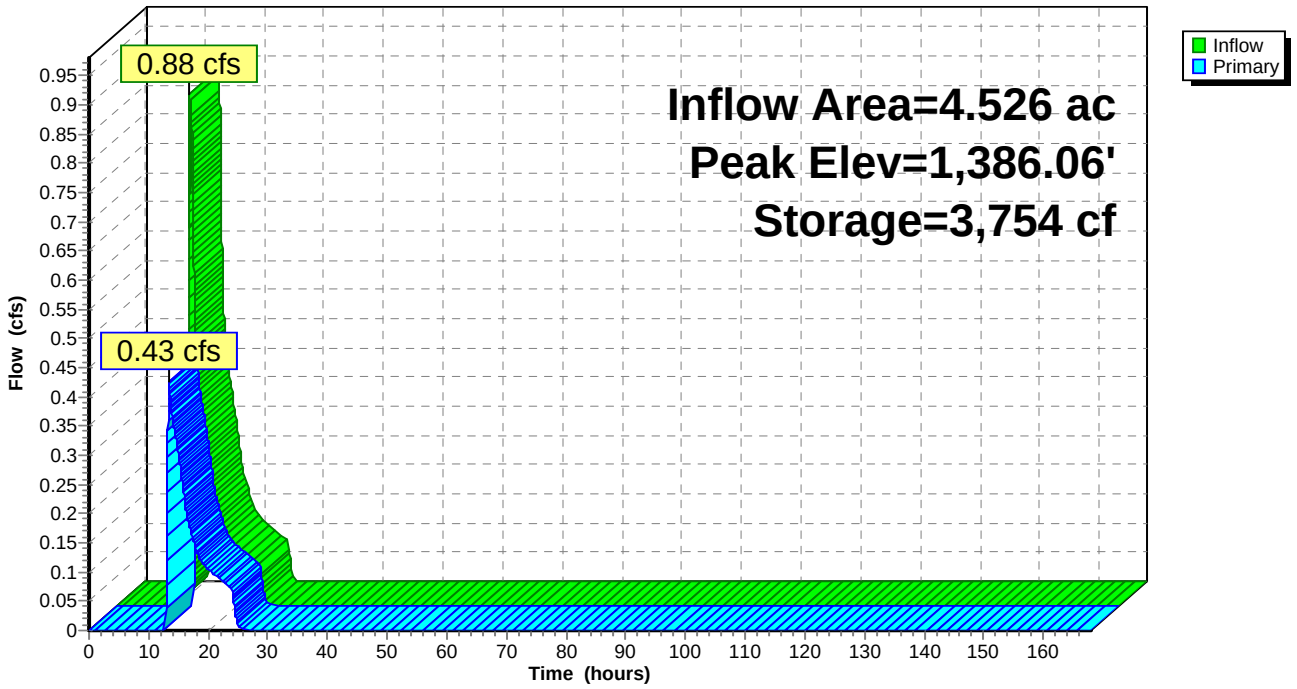
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,382.00	2,068	270.0	0.0	0	0	2,068
1,383.00	2,068	270.0	25.0	517	517	2,338
1,384.00	2,068	270.0	25.0	517	1,034	2,608
1,385.00	2,068	270.0	25.0	517	1,551	2,878
1,386.00	2,068	270.0	100.0	2,068	3,619	3,148
1,387.00	2,901	288.8	100.0	2,473	6,092	4,029
1,388.00	3,791	307.6	100.0	3,336	9,428	4,970

Device	Routing	Invert	Outlet Devices
#1	Primary	1,382.00'	**18.0" Round Culvert** L= 62.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,382.00' / 1,381.30' S= 0.0113 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.50'	**0.4" Horiz. Perforated Underdrain X 460.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,383.00'	**0.250 in/hr Exfiltration over Surface area above 1,383.00'** Conductivity to Groundwater Elevation = 1,382.00' Excluded Surface area = 2,068 sf
#4	Device 1	1,386.00'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.43 cfs @ 13.37 hrs HW=1,386.06' TW=1,381.88' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.43 cfs of 12.23 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 14.60 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 0.43 cfs @ 0.83 fps)

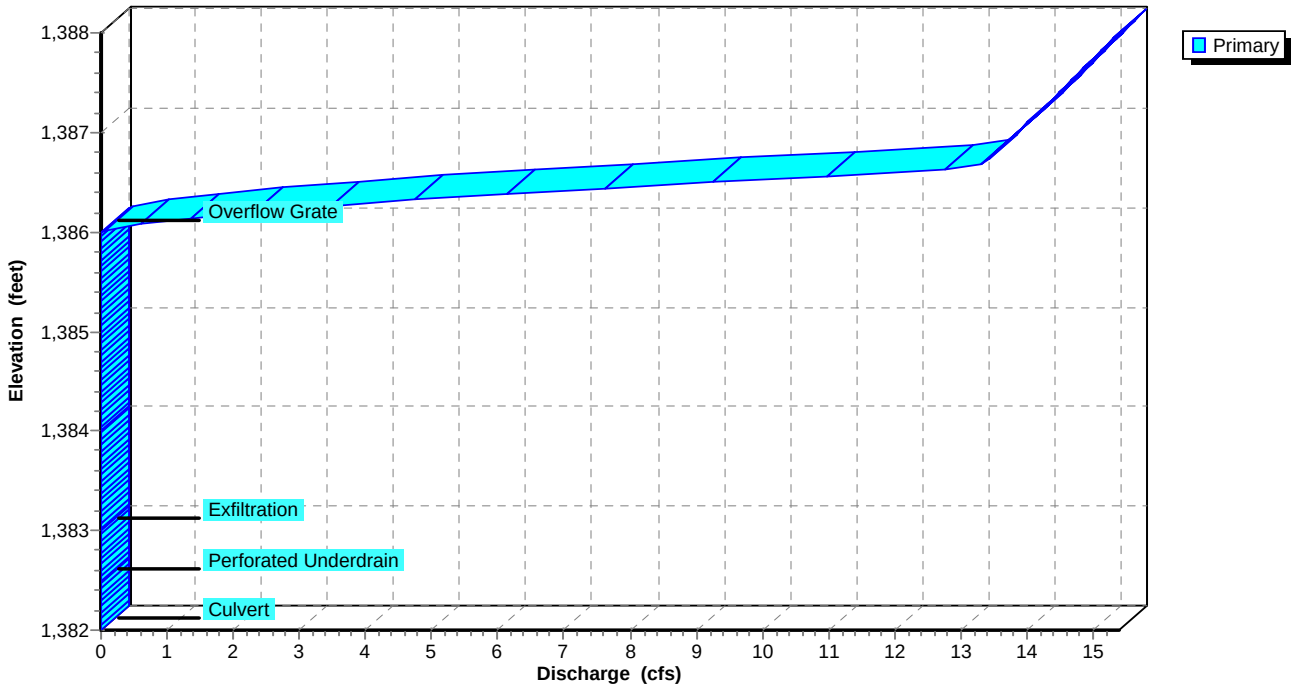
Pond BRA50-P: BRA-50

Hydrograph

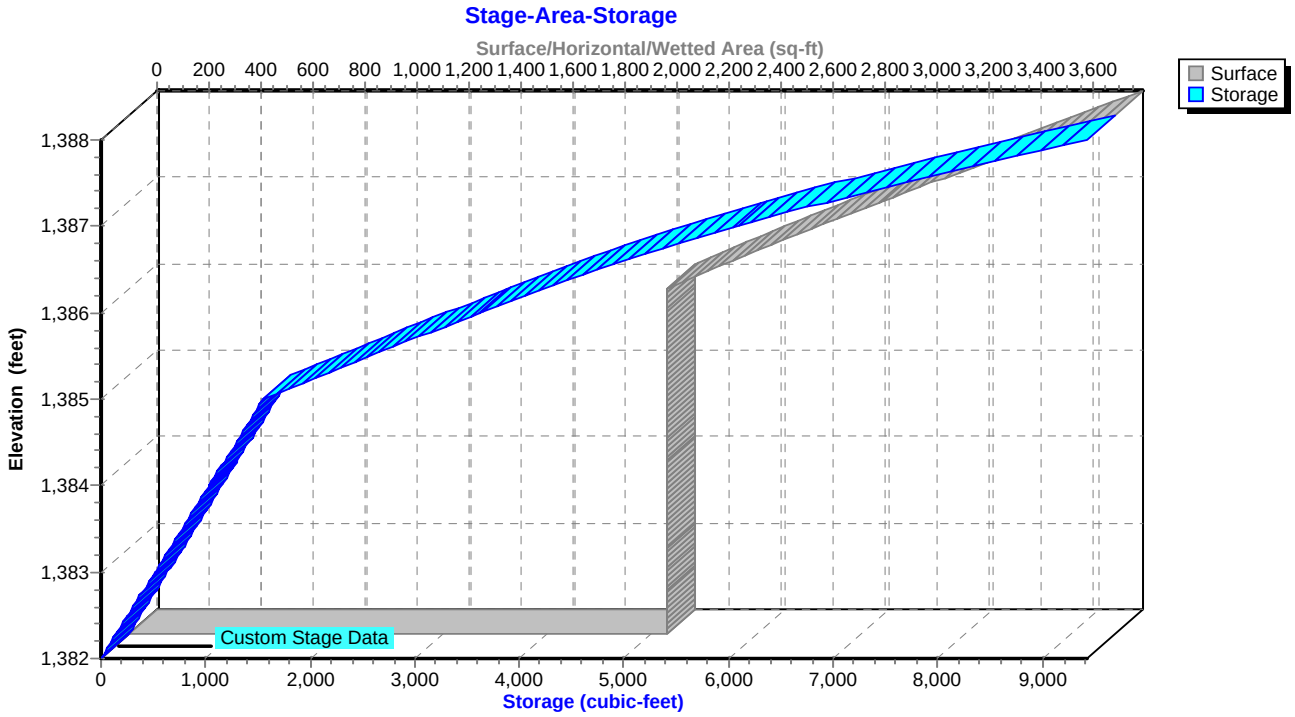


Pond BRA50-P: BRA-50

Stage-Discharge



Pond BRA50-P: BRA-50



Summary for Pond SW21C-FS: Flow Splitter for SW21C

Inflow Area = 0.588 ac, 44.73% Impervious, Inflow Depth = 1.22" for 1-YR, 24-HR Storm event
Inflow = 0.97 cfs @ 12.03 hrs, Volume= 0.060 af
Outflow = 0.97 cfs @ 12.04 hrs, Volume= 0.060 af, Atten= 0%, Lag= 0.6 min
Primary = 0.51 cfs @ 12.04 hrs, Volume= 0.051 af
Secondary = 0.46 cfs @ 12.04 hrs, Volume= 0.009 af

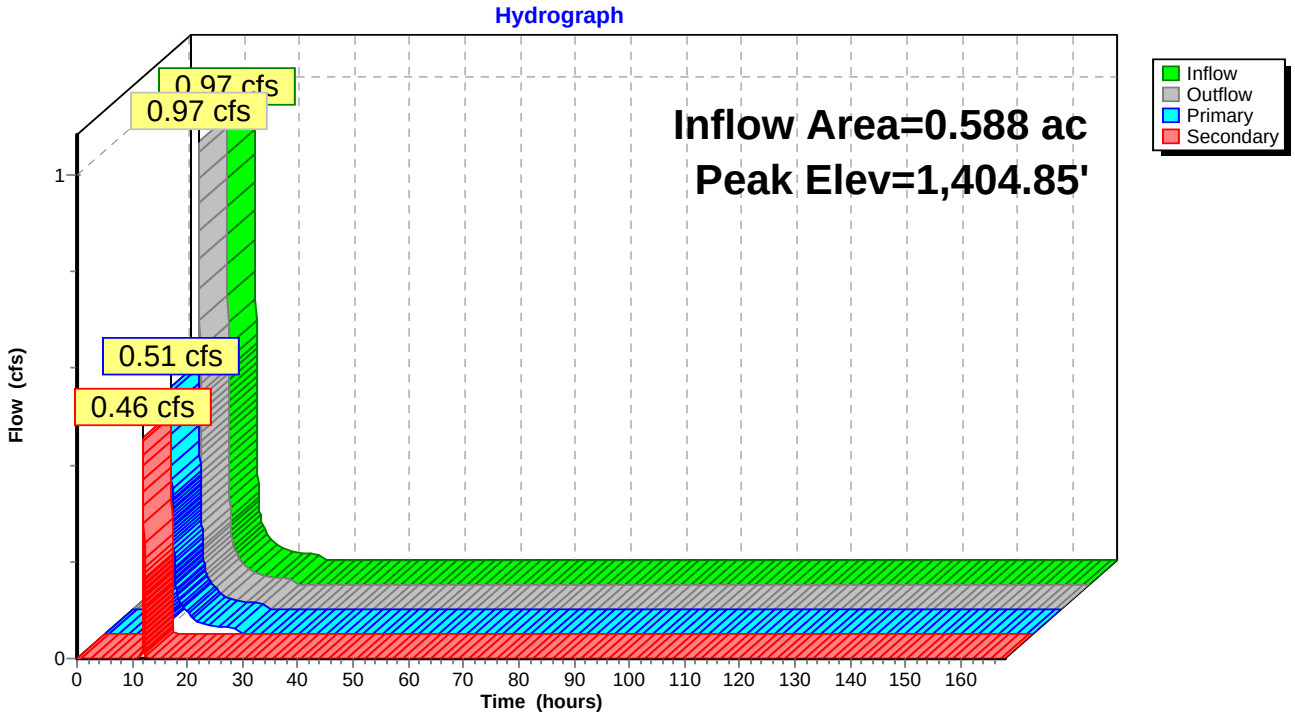
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,404.85' @ 12.04 hrs
Flood Elev= 1,408.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,404.50'	**18.0" Round Culvert to BRA-SW21C** L= 102.1' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,404.50' / 1,403.50' S= 0.0098 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,404.50'	**15.0" Round Culvert to Pond-SW21B** L= 293.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,404.50' / 1,377.20' S= 0.0932 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,404.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

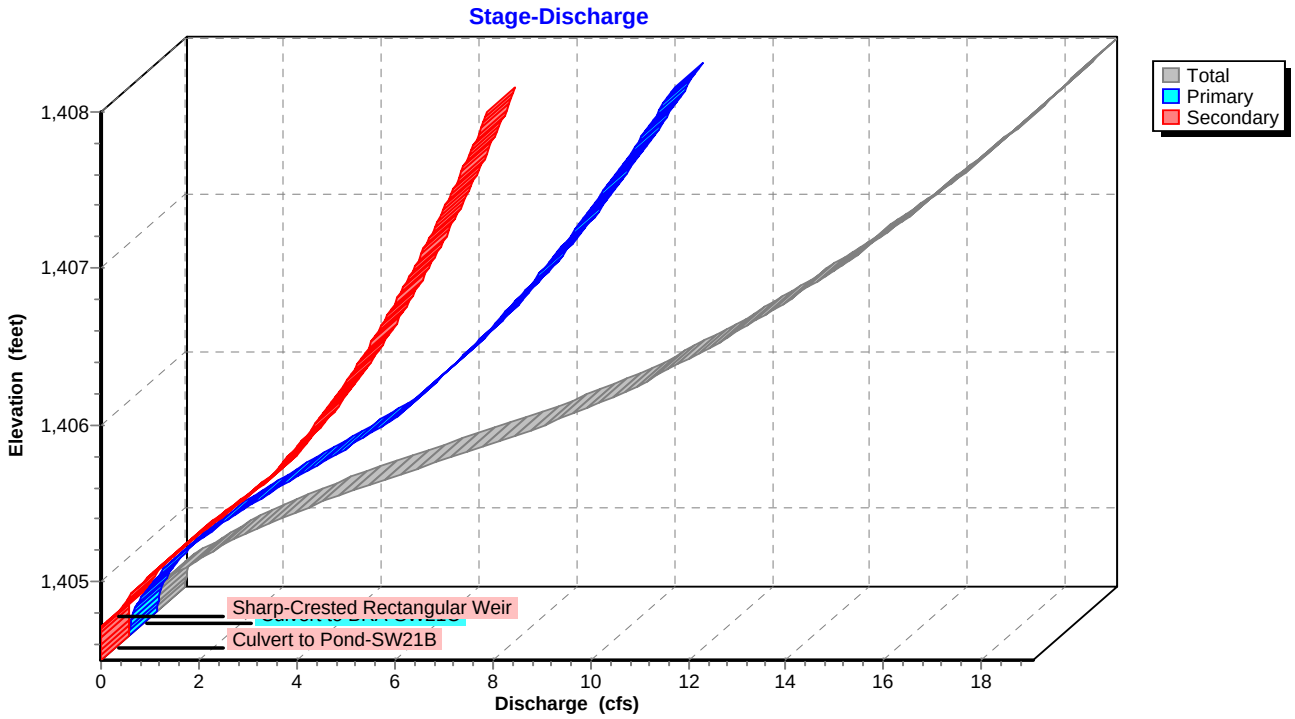
Primary OutFlow Max=0.51 cfs @ 12.04 hrs HW=1,404.85' TW=1,399.02' (Dynamic Tailwater)
└─**1=Culvert to BRA-SW21C** (Inlet Controls 0.51 cfs @ 1.60 fps)

Secondary OutFlow Max=0.46 cfs @ 12.04 hrs HW=1,404.85' TW=1,376.79' (Dynamic Tailwater)
└─**2=Culvert to Pond-SW21B** (Inlet Controls 0.46 cfs @ 1.60 fps)
└─**3=Sharp-Crested Rectangular Weir** (Passes 0.46 cfs of 0.78 cfs potential flow)

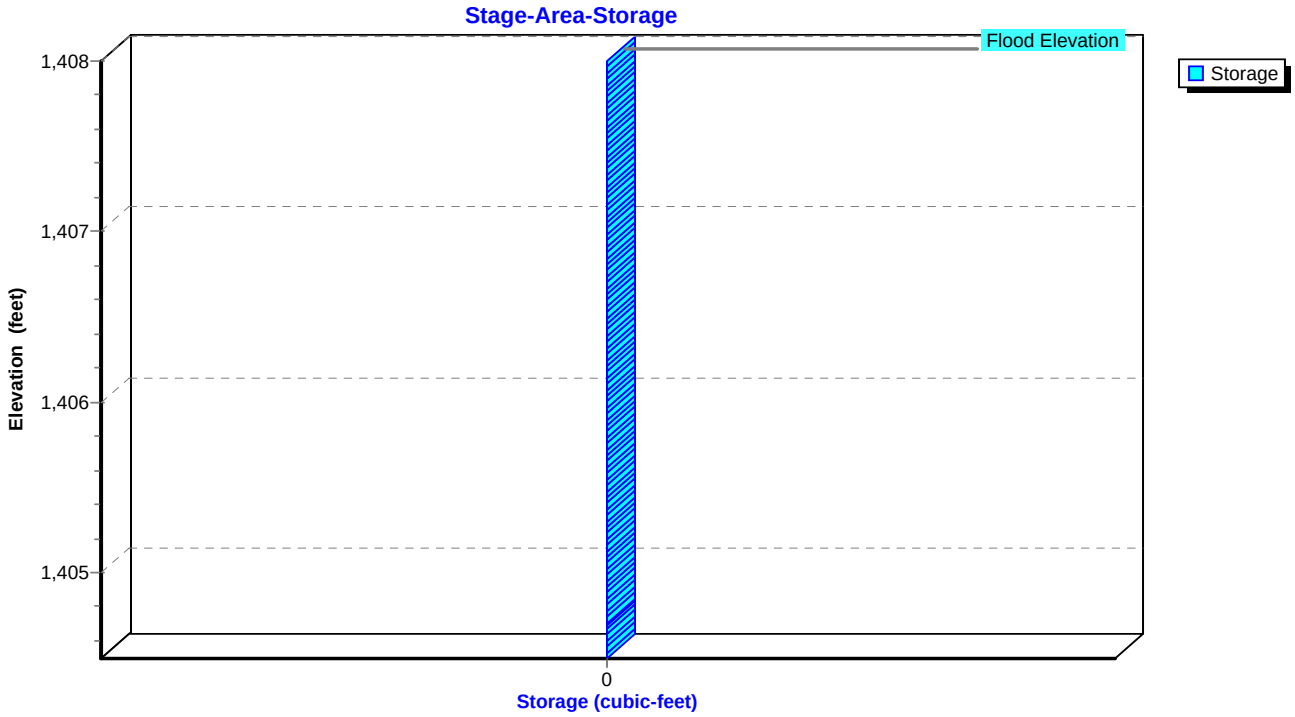
Pond SW21C-FS: Flow Splitter for SW21C



Pond SW21C-FS: Flow Splitter for SW21C



Pond SW21C-FS: Flow Splitter for SW21C



Summary for Pond SW21C-P: BRA-SW21C

Inflow Area = 0.704 ac, 37.36% Impervious, Inflow Depth = 0.98" for 1-YR, 24-HR Storm event
Inflow = 0.57 cfs @ 12.05 hrs, Volume= 0.057 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,402.70' @ 24.34 hrs Surf.Area= 2,129 sf Storage= 2,501 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

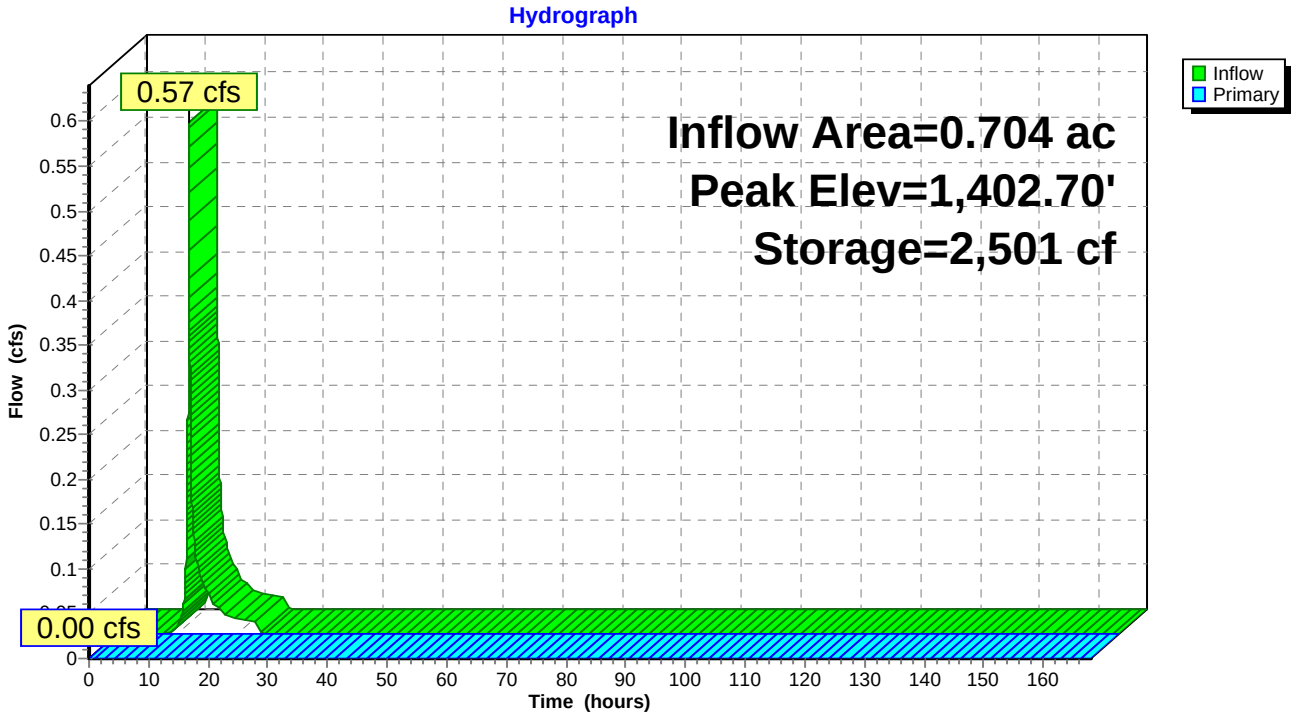
Volume	Invert	Avail.Storage	Storage Description
#1	1,398.00'	4,790 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,398.00	2,129	186.4	0.0	0	0	2,129
1,399.00	2,129	186.4	25.0	532	532	2,315
1,400.00	2,129	186.4	25.0	532	1,065	2,502
1,401.00	2,129	186.4	25.0	532	1,597	2,688
1,402.00	2,129	186.4	25.0	532	2,129	2,875
1,403.00	2,129	186.4	25.0	532	2,661	3,061
1,403.50	2,129	186.4	100.0	1,065	3,726	3,154
1,404.00	2,129	186.4	100.0	1,065	4,790	3,247

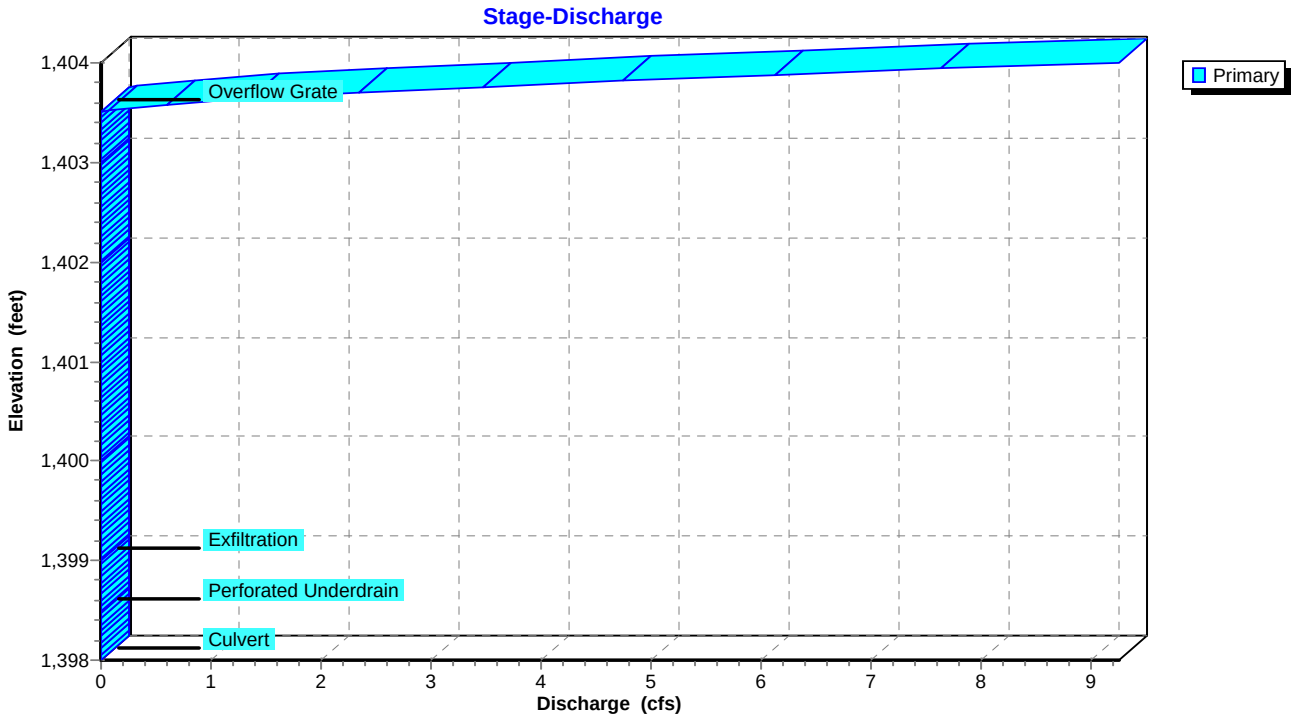
Device	Routing	Invert	Outlet Devices
#1	Primary	1,398.00'	**18.0" Round Culvert** L= 37.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,398.00' / 1,397.50' S= 0.0133 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,398.50'	**0.4" Horiz. Perforated Underdrain X 264.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,399.00'	**0.250 in/hr Exfiltration over Surface area above 1,399.00'** Conductivity to Groundwater Elevation = 1,398.00' Excluded Surface area = 2,129 sf
#4	Device 1	1,403.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,398.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

Pond SW21C-P: BRA-SW21C



Pond SW21C-P: BRA-SW21C



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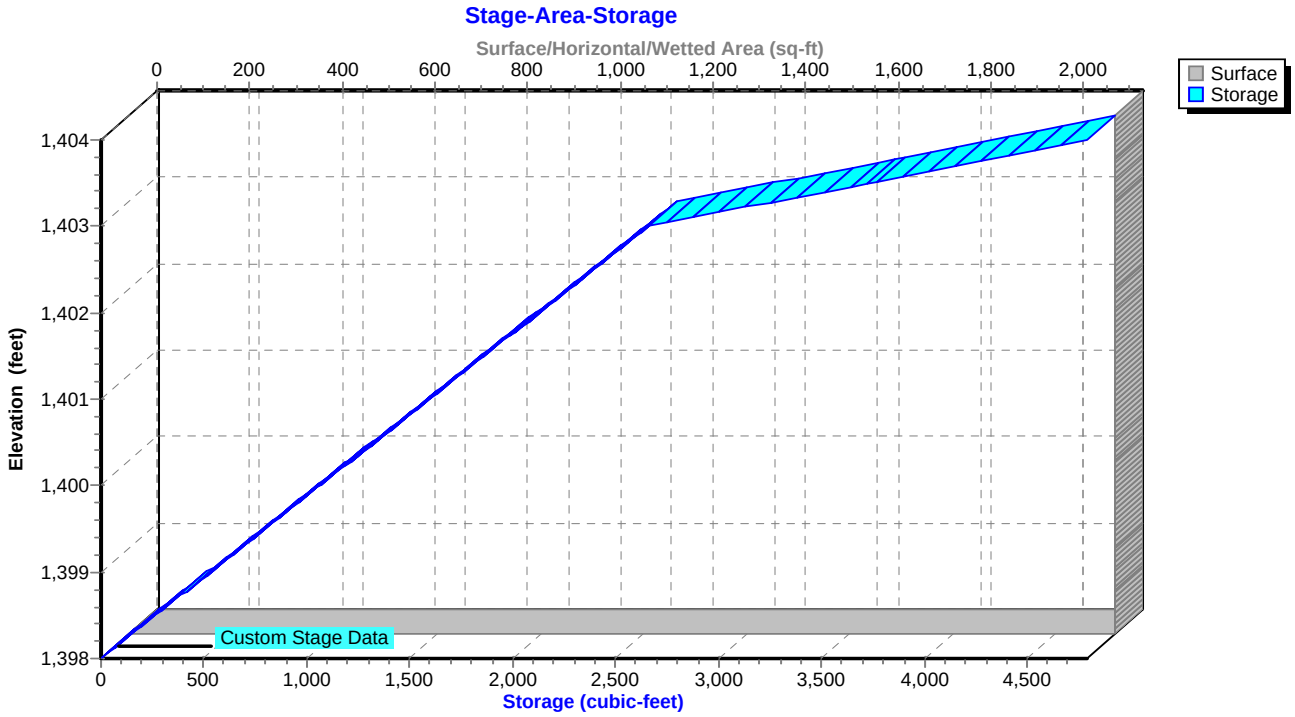


Summary for Pond SW23A-FS: Flow Splitter for SW23A

Inflow Area = 0.206 ac, 47.57% Impervious, Inflow Depth = 1.33" for 1-YR, 24-HR Storm event
Inflow = 0.37 cfs @ 12.03 hrs, Volume= 0.023 af
Outflow = 0.37 cfs @ 12.04 hrs, Volume= 0.023 af, Atten= 0%, Lag= 0.6 min
Primary = 0.18 cfs @ 12.04 hrs, Volume= 0.020 af
Secondary = 0.20 cfs @ 12.04 hrs, Volume= 0.003 af

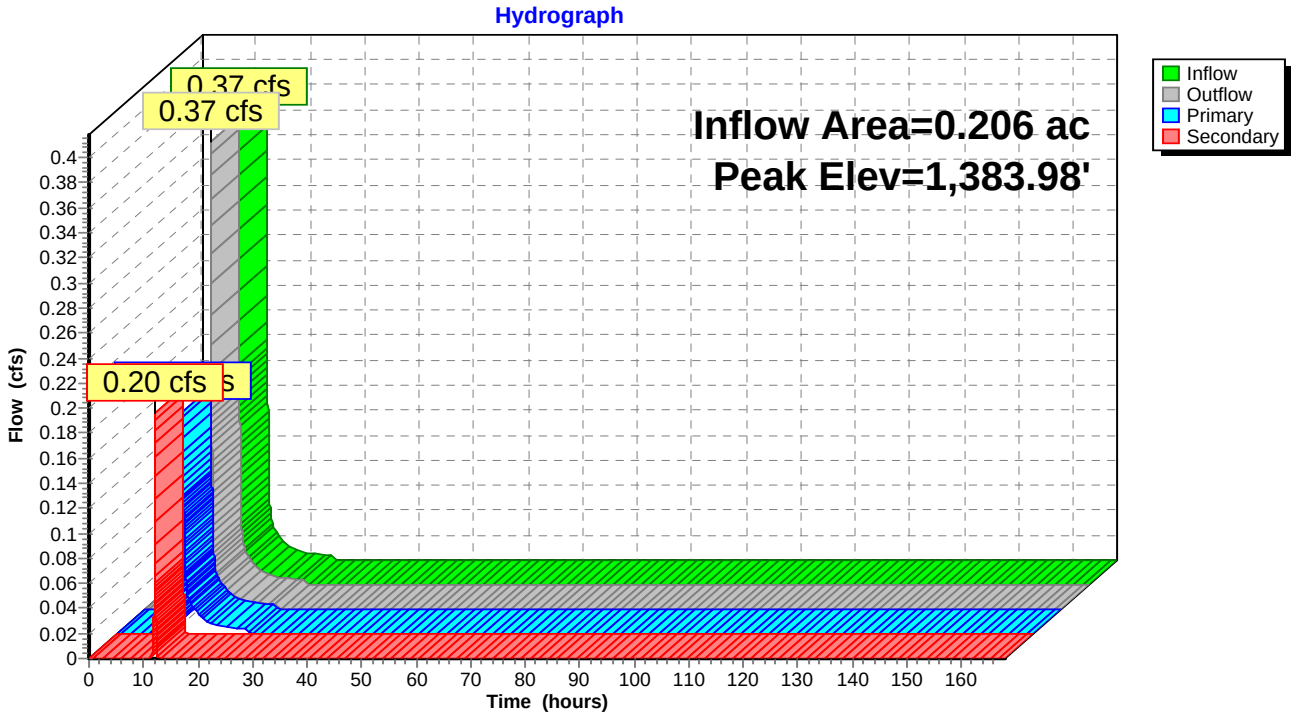
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,383.98' @ 12.04 hrs
Flood Elev= 1,387.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,383.75'	**15.0" Round Culvert to BRA-SW23A** L= 44.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,383.75' / 1,383.50' S= 0.0056 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,383.75'	**15.0" Round Culvert to Pond 23** L= 177.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,383.75' / 1,381.30' S= 0.0138 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,383.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

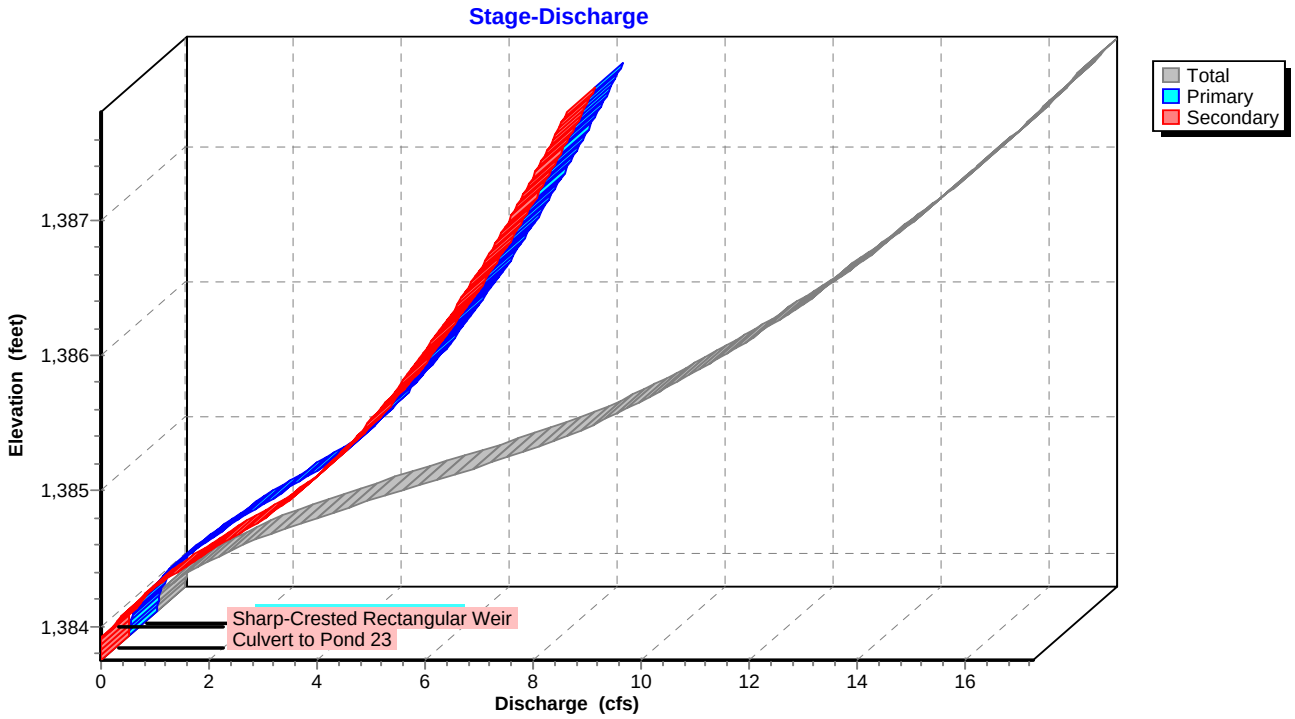
Primary OutFlow Max=0.18 cfs @ 12.04 hrs HW=1,383.98' TW=1,379.22' (Dynamic Tailwater)
└**1=Culvert to BRA-SW23A** (Barrel Controls 0.18 cfs @ 1.77 fps)

Secondary OutFlow Max=0.19 cfs @ 12.04 hrs HW=1,383.98' TW=0.00' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Inlet Controls 0.19 cfs @ 1.28 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 0.19 cfs of 0.28 cfs potential flow)

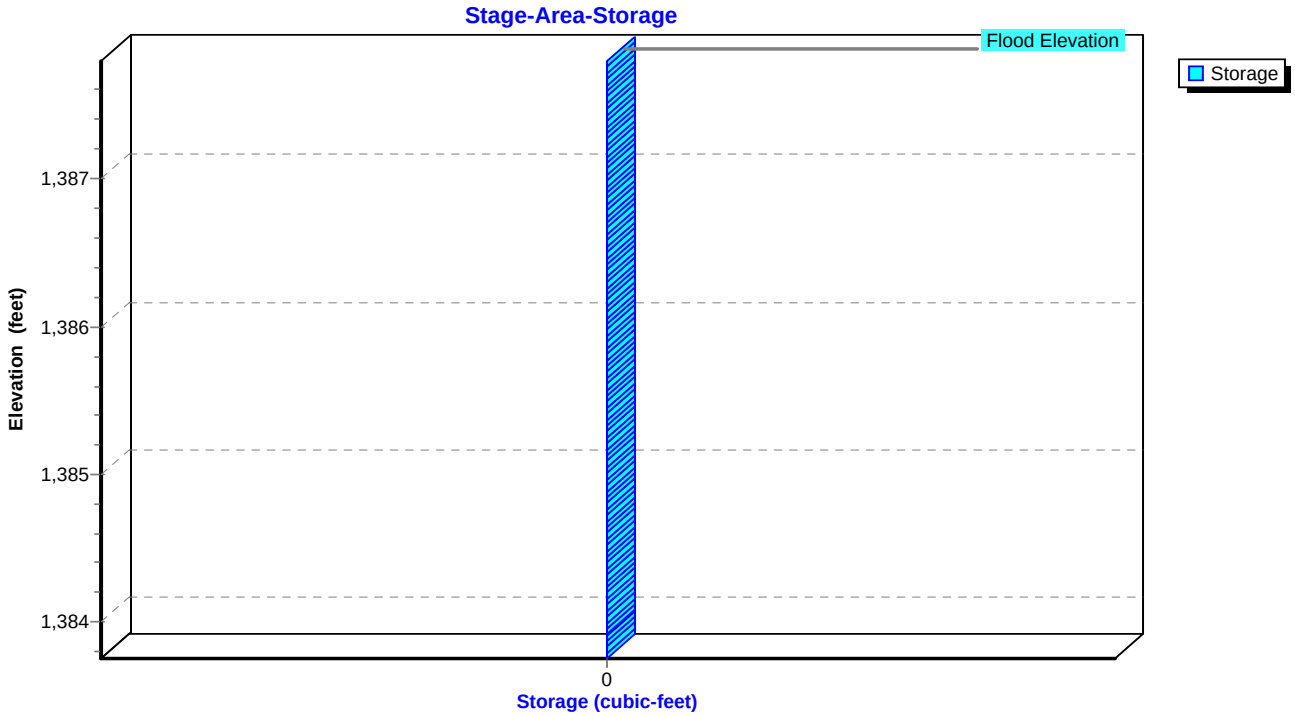
Pond SW23A-FS: Flow Splitter for SW23A



Pond SW23A-FS: Flow Splitter for SW23A



Pond SW23A-FS: Flow Splitter for SW23A



Summary for Pond SW23A-P: BRA-SW23A

Inflow Area = 0.262 ac, 37.40% Impervious, Inflow Depth = 1.04" for 1-YR, 24-HR Storm event
Inflow = 0.21 cfs @ 12.04 hrs, Volume= 0.023 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,383.08' @ 24.34 hrs Surf.Area= 743 sf Storage= 986 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

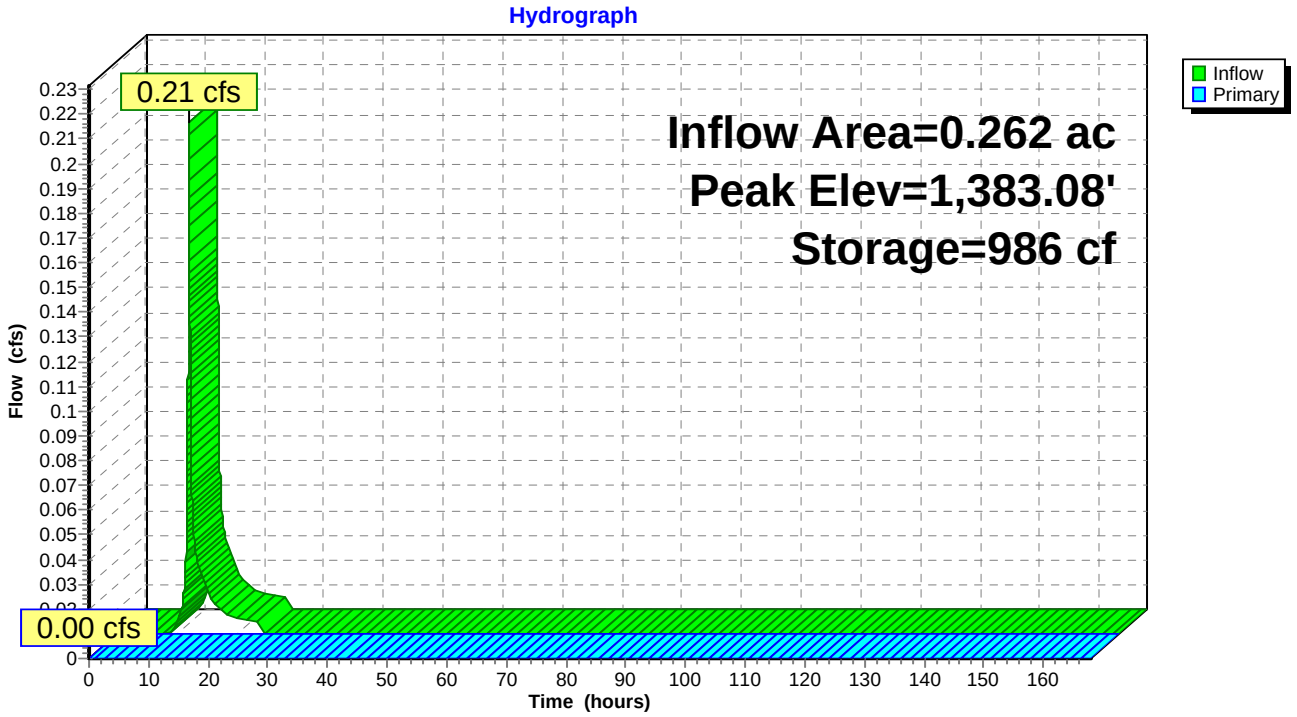
Volume	Invert	Avail.Storage	Storage Description
#1	1,378.00'	1,718 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,378.00	743	120.0	0.0	0	0	743
1,379.00	743	120.0	25.0	186	186	863
1,380.00	743	120.0	25.0	186	372	983
1,381.00	743	120.0	25.0	186	557	1,103
1,382.00	743	120.0	25.0	186	743	1,223
1,383.00	743	120.0	25.0	186	929	1,343
1,383.50	743	120.0	100.0	372	1,300	1,403
1,384.00	930	120.0	100.0	417	1,718	1,463

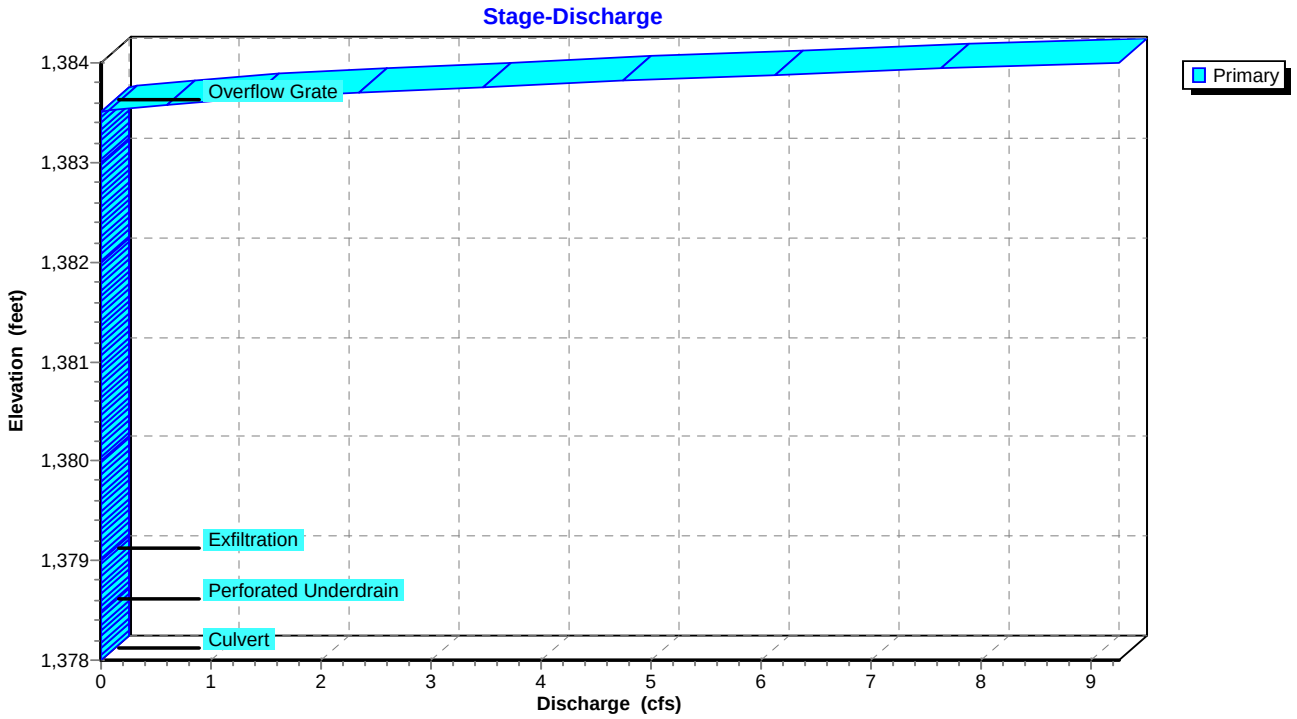
Device	Routing	Invert	Outlet Devices
#1	Primary	1,378.00'	**15.0" Round Culvert** L= 97.1' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,378.00' / 1,376.50' S= 0.0154 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,378.50'	**0.4" Horiz. Perforated Underdrain X 608.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,379.00'	**0.250 in/hr Exfiltration over Surface area above 1,379.00'** Conductivity to Groundwater Elevation = 1,378.00' Excluded Surface area = 743 sf
#4	Device 1	1,383.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,378.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

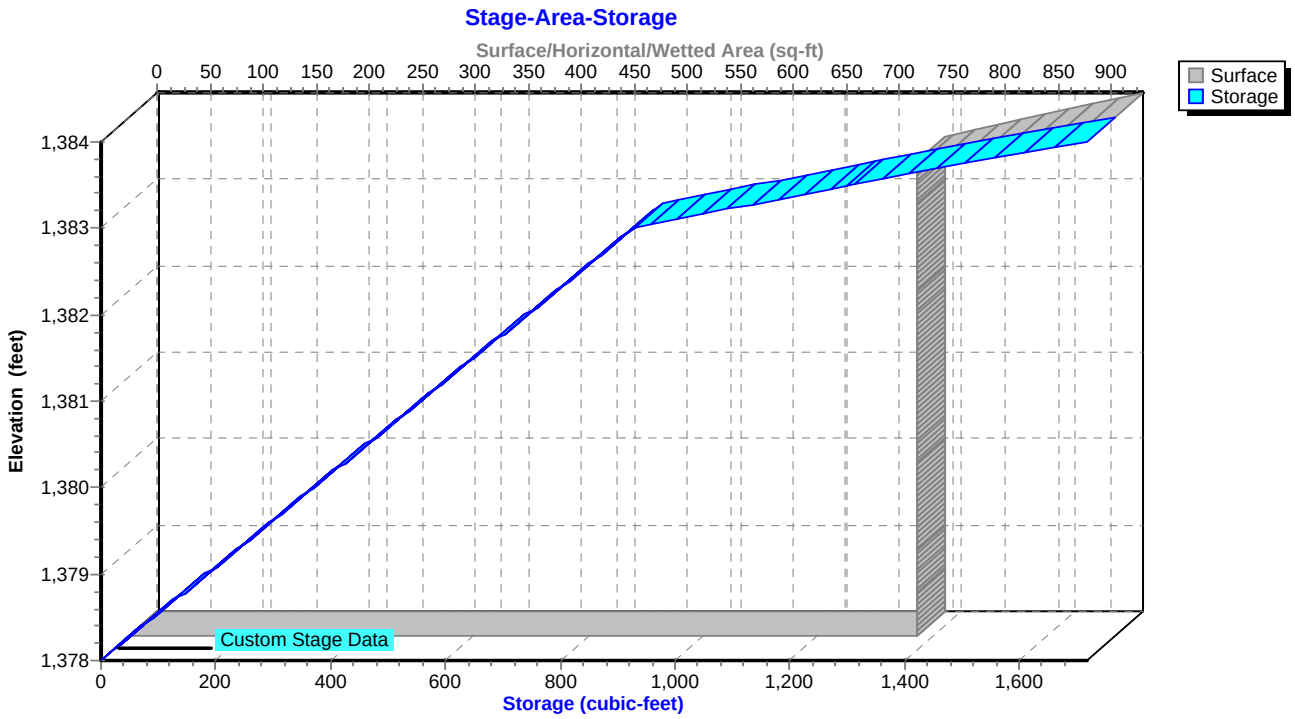
Pond SW23A-P: BRA-SW23A



Pond SW23A-P: BRA-SW23A



Pond SW23A-P: BRA-SW23A



Summary for Pond SW23B-FS: Flow Splitter for SW23B

Inflow Area = 0.579 ac, 37.48% Impervious, Inflow Depth = 1.19" for 1-YR, 24-HR Storm event
Inflow = 0.93 cfs @ 12.03 hrs, Volume= 0.058 af
Outflow = 0.93 cfs @ 12.04 hrs, Volume= 0.058 af, Atten= 0%, Lag= 0.6 min
Primary = 0.49 cfs @ 12.04 hrs, Volume= 0.049 af
Secondary = 0.44 cfs @ 12.04 hrs, Volume= 0.008 af

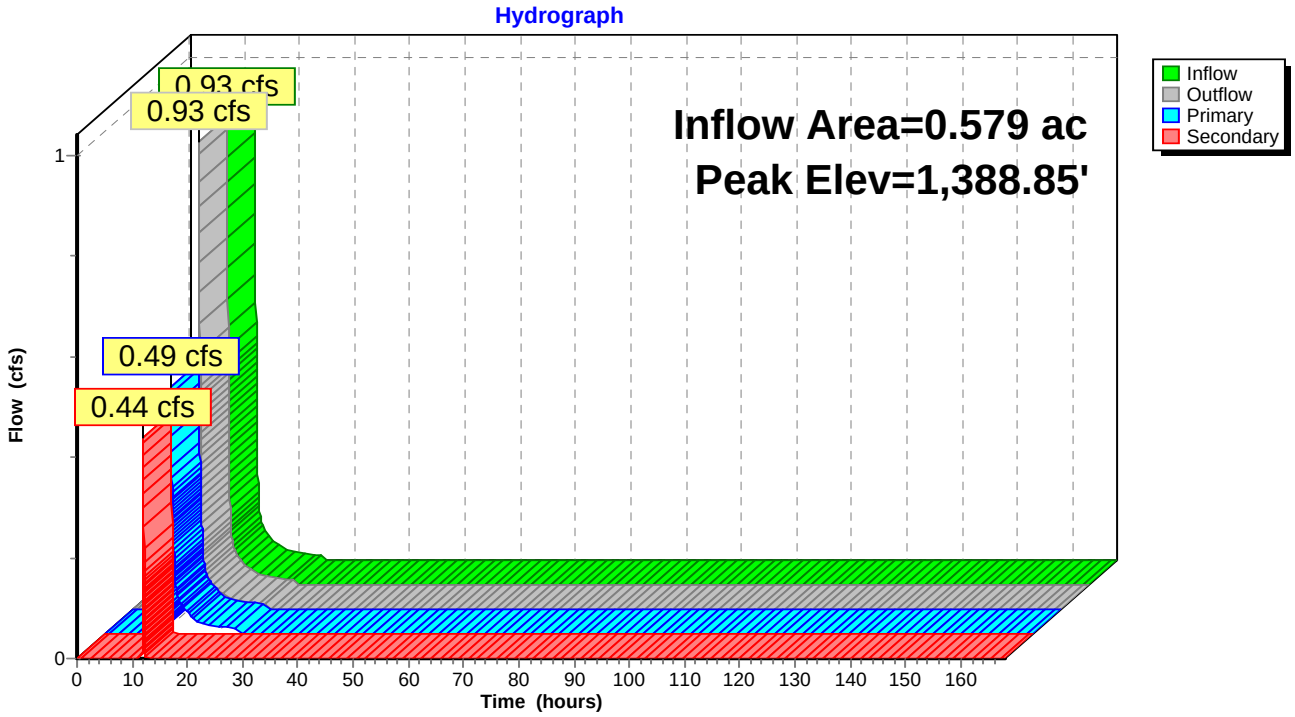
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,388.85' @ 12.04 hrs
Flood Elev= 1,391.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,388.50'	**18.0" Round Culvert to SW23B** L= 132.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,388.50' / 1,387.50' S= 0.0075 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,388.50'	**15.0" Round Culvert to Pond 23** L= 268.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,388.50' / 1,384.00' S= 0.0168 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,388.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

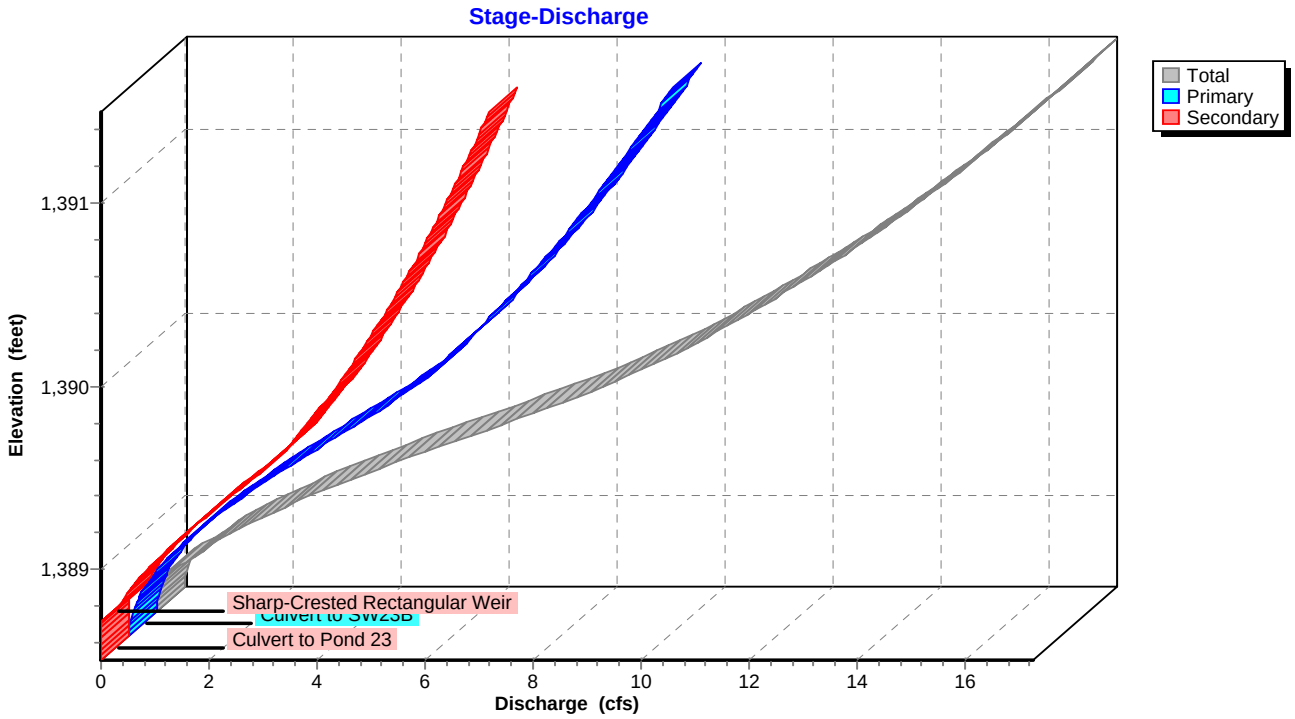
Primary OutFlow Max=0.49 cfs @ 12.04 hrs HW=1,388.85' TW=1,385.06' (Dynamic Tailwater)
└**1=Culvert to SW23B** (Inlet Controls 0.49 cfs @ 1.58 fps)

Secondary OutFlow Max=0.44 cfs @ 12.04 hrs HW=1,388.85' TW=1,381.20' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Inlet Controls 0.44 cfs @ 1.58 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 0.44 cfs of 0.73 cfs potential flow)

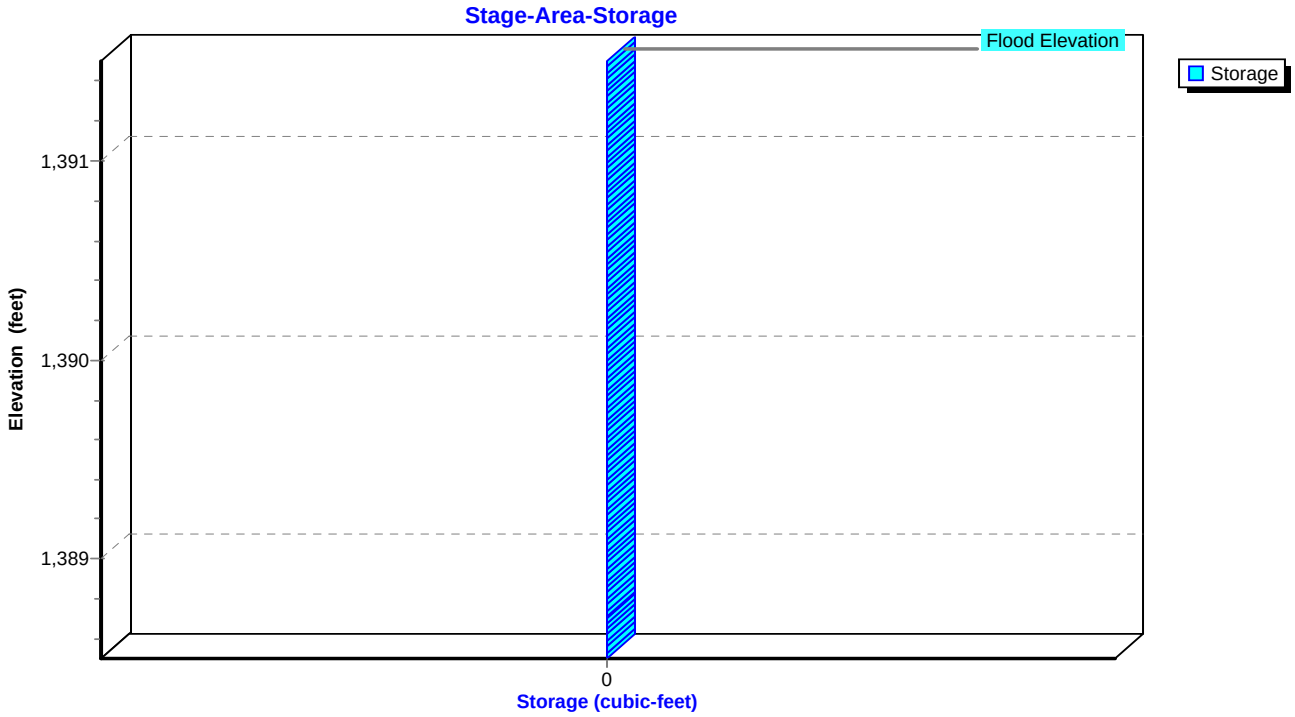
Pond SW23B-FS: Flow Splitter for SW23B



Pond SW23B-FS: Flow Splitter for SW23B



Pond SW23B-FS: Flow Splitter for SW23B



Summary for Pond SW23B-P: BRA-SW23B

Inflow Area = 0.672 ac, 32.29% Impervious, Inflow Depth = 0.97" for 1-YR, 24-HR Storm event
Inflow = 0.54 cfs @ 12.05 hrs, Volume= 0.054 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,387.48' @ 24.34 hrs Surf.Area= 1,923 sf Storage= 2,372 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

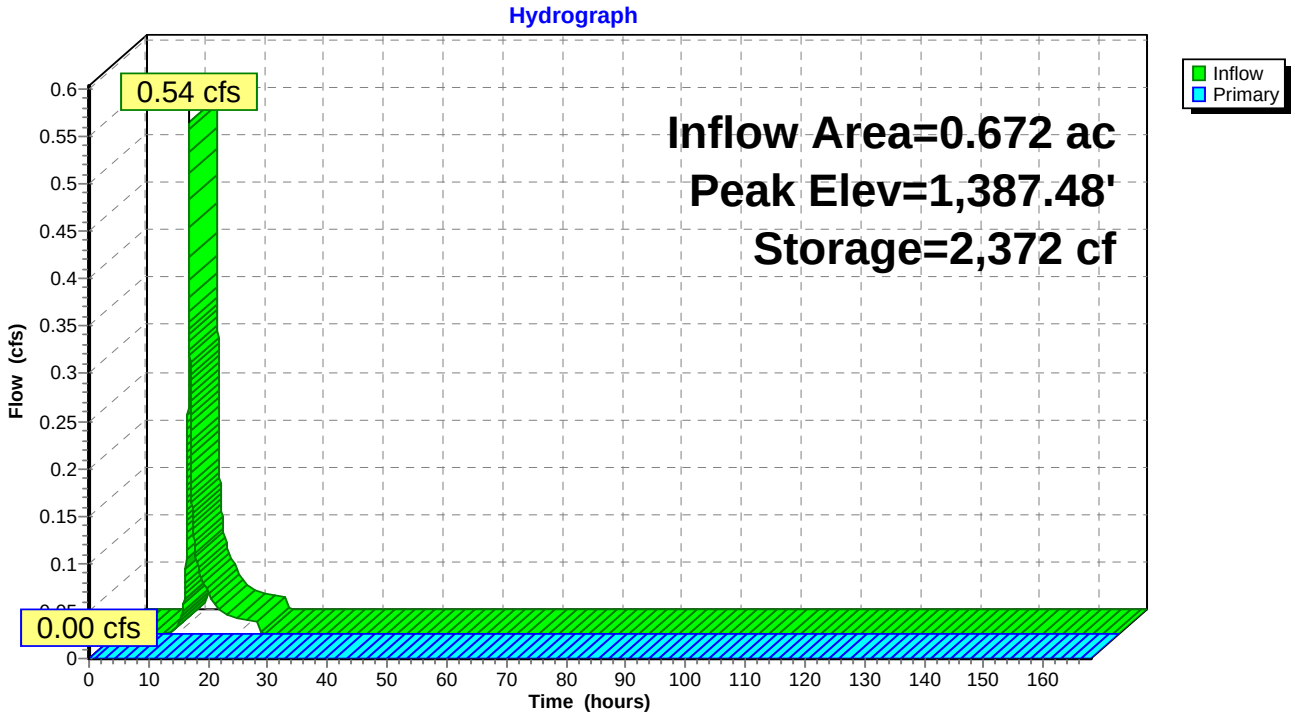
Volume	Invert	Avail.Storage	Storage Description
#1	1,384.00'	3,450 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,384.00	1,923	225.0	0.0	0	0	1,923
1,385.00	1,923	225.0	25.0	481	481	2,148
1,386.00	1,923	225.0	25.0	481	962	2,373
1,387.00	1,923	225.0	25.0	481	1,442	2,598
1,387.50	1,923	225.0	100.0	962	2,404	2,711
1,388.00	2,268	234.4	100.0	1,047	3,450	3,073

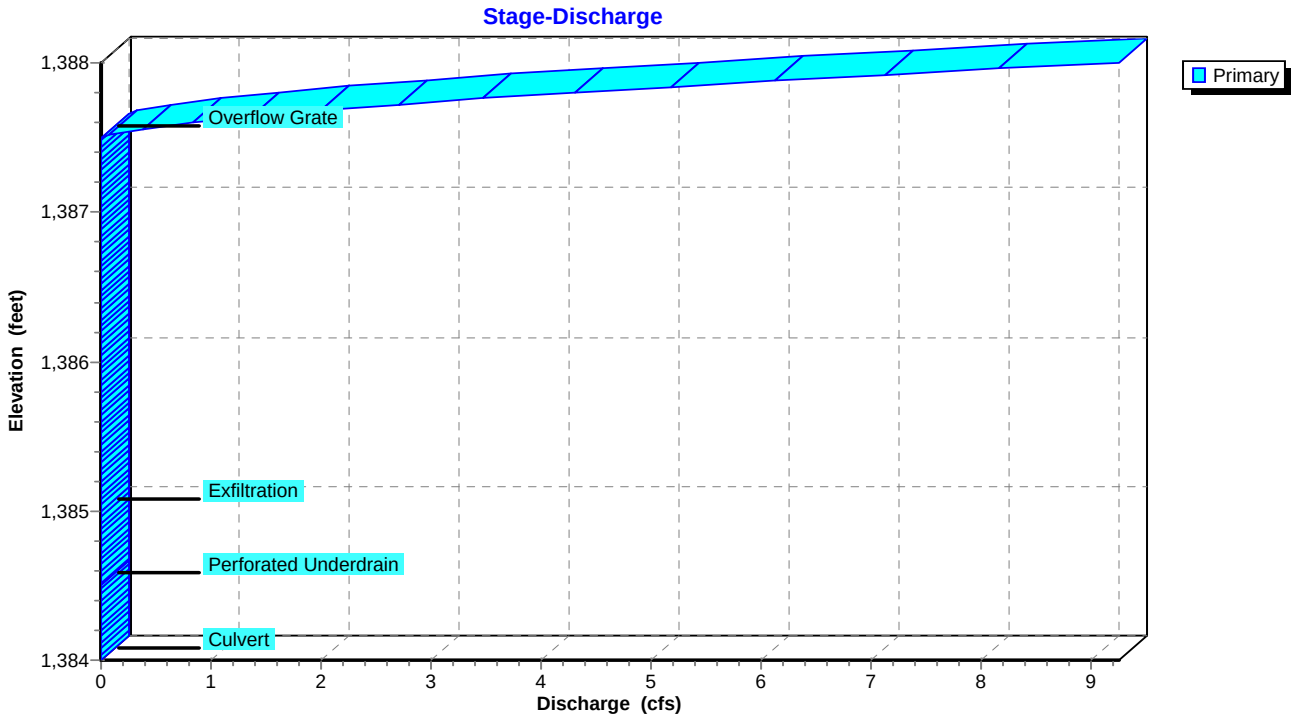
Device	Routing	Invert	Outlet Devices
#1	Primary	1,384.00'	**18.0" Round Culvert** L= 80.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,384.00' / 1,383.00' S= 0.0124 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,384.50'	**0.4" Horiz. Perforated Underdrain X 324.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,385.00'	**0.250 in/hr Exfiltration over Surface area above 1,385.00'** Conductivity to Groundwater Elevation = 1,384.00' Excluded Surface area = 1,923 sf
#4	Device 1	1,387.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,384.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

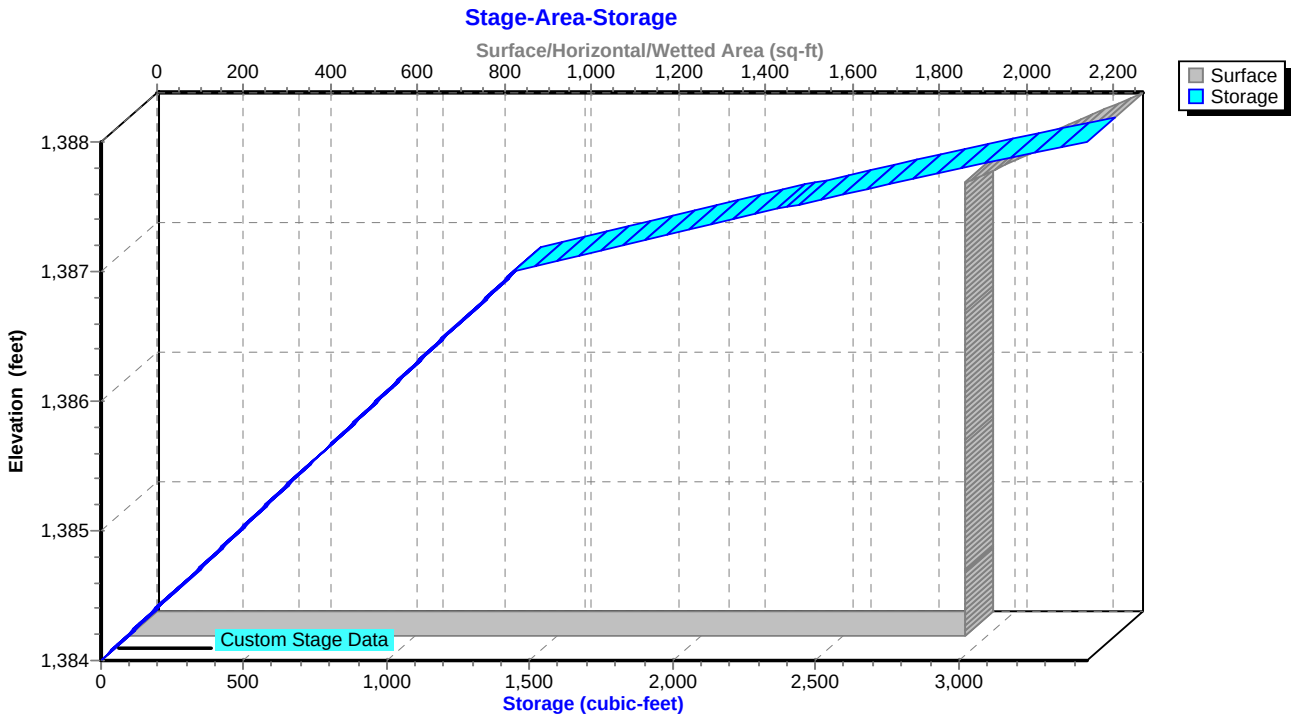
Pond SW23B-P: BRA-SW23B



Pond SW23B-P: BRA-SW23B



Pond SW23B-P: BRA-SW23B



Summary for Pond SW28A-FS: Flow Splitter for SW28A

Inflow Area = 0.220 ac, 68.64% Impervious, Inflow Depth = 1.84" for 1-YR, 24-HR Storm event
Inflow = 0.47 cfs @ 12.01 hrs, Volume= 0.034 af
Outflow = 0.47 cfs @ 12.02 hrs, Volume= 0.034 af, Atten= 0%, Lag= 0.6 min
Primary = 0.34 cfs @ 12.02 hrs, Volume= 0.033 af
Secondary = 0.12 cfs @ 12.02 hrs, Volume= 0.001 af

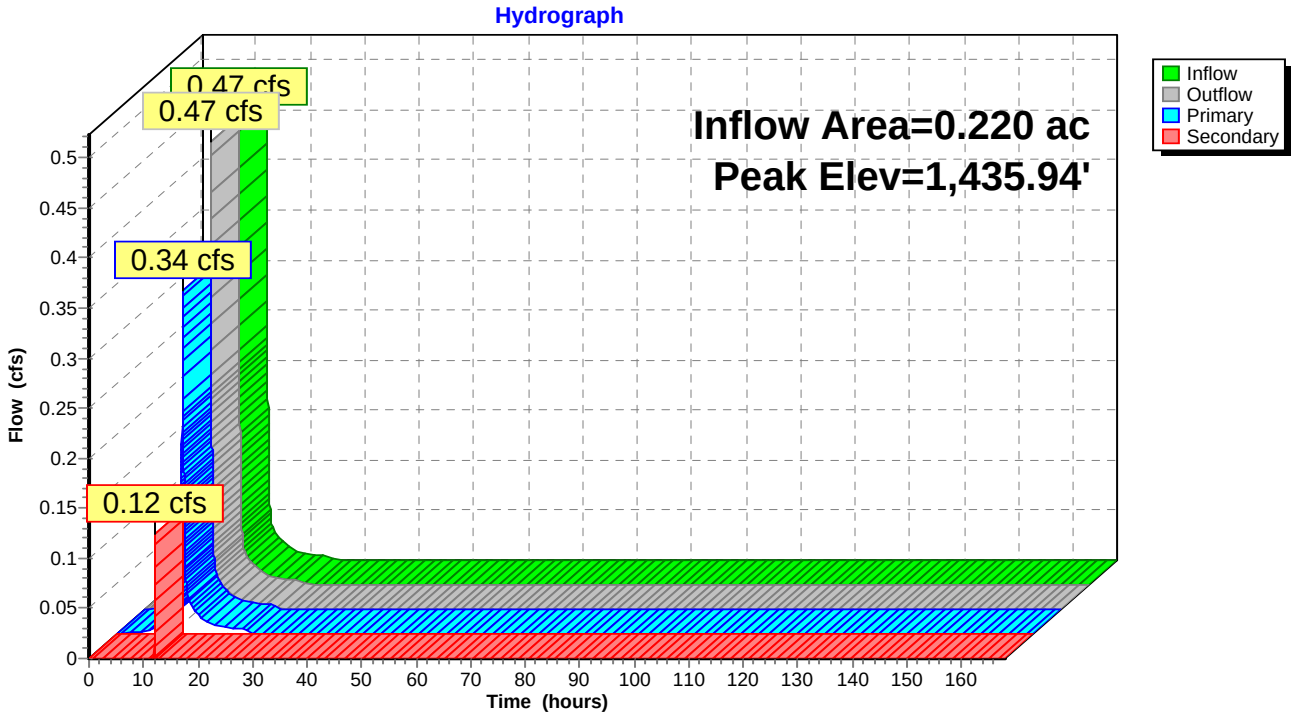
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,435.94' @ 12.02 hrs
Flood Elev= 1,439.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,435.64'	**15.0" Round Outlet to BRA-SW28A** L= 7.3' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,435.64' / 1,435.50' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,435.64'	**15.0" Round Culvert to Pond SW28D** L= 149.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,435.64' / 1,427.30' S= 0.0558 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,435.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

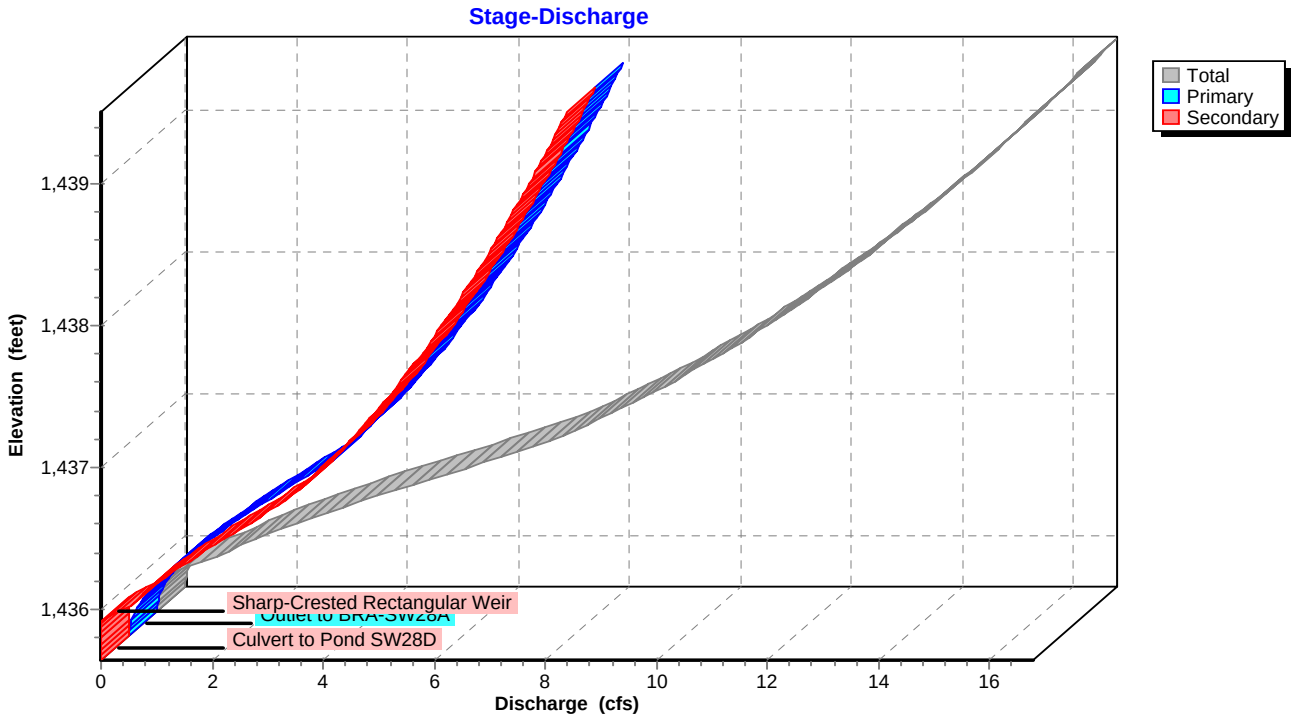
Primary OutFlow Max=0.34 cfs @ 12.02 hrs HW=1,435.94' TW=1,433.02' (Dynamic Tailwater)
└─**1=Outlet to BRA-SW28A** (Inlet Controls 0.34 cfs @ 1.48 fps)

Secondary OutFlow Max=0.12 cfs @ 12.02 hrs HW=1,435.94' TW=1,374.07' (Dynamic Tailwater)
└─**2=Culvert to Pond SW28D** (Passes 0.12 cfs of 0.34 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.12 cfs @ 0.69 fps)

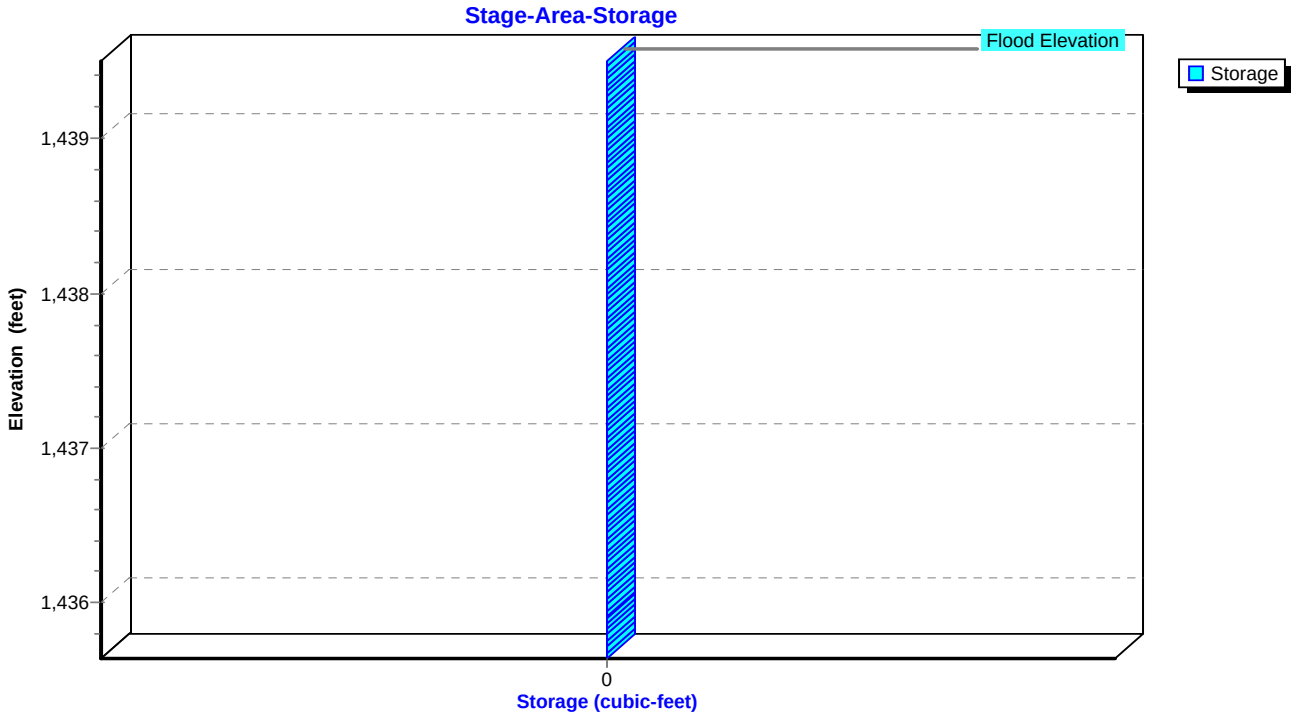
Pond SW28A-FS: Flow Splitter for SW28A



Pond SW28A-FS: Flow Splitter for SW28A



Pond SW28A-FS: Flow Splitter for SW28A



Summary for Pond SW28A-P: BRA-SW28A

Inflow Area = 0.301 ac, 50.17% Impervious, Inflow Depth = 1.49" for 1-YR, 24-HR Storm event
Inflow = 0.39 cfs @ 12.03 hrs, Volume= 0.037 af
Outflow = 0.01 cfs @ 20.01 hrs, Volume= 0.002 af, Atten= 98%, Lag= 478.5 min
Primary = 0.01 cfs @ 20.01 hrs, Volume= 0.002 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,435.50' @ 20.01 hrs Surf.Area= 674 sf Storage= 1,520 cf

Plug-Flow detention time= 905.3 min calculated for 0.002 af (7% of inflow)
Center-of-Mass det. time= 523.0 min (1,307.7 - 784.7)

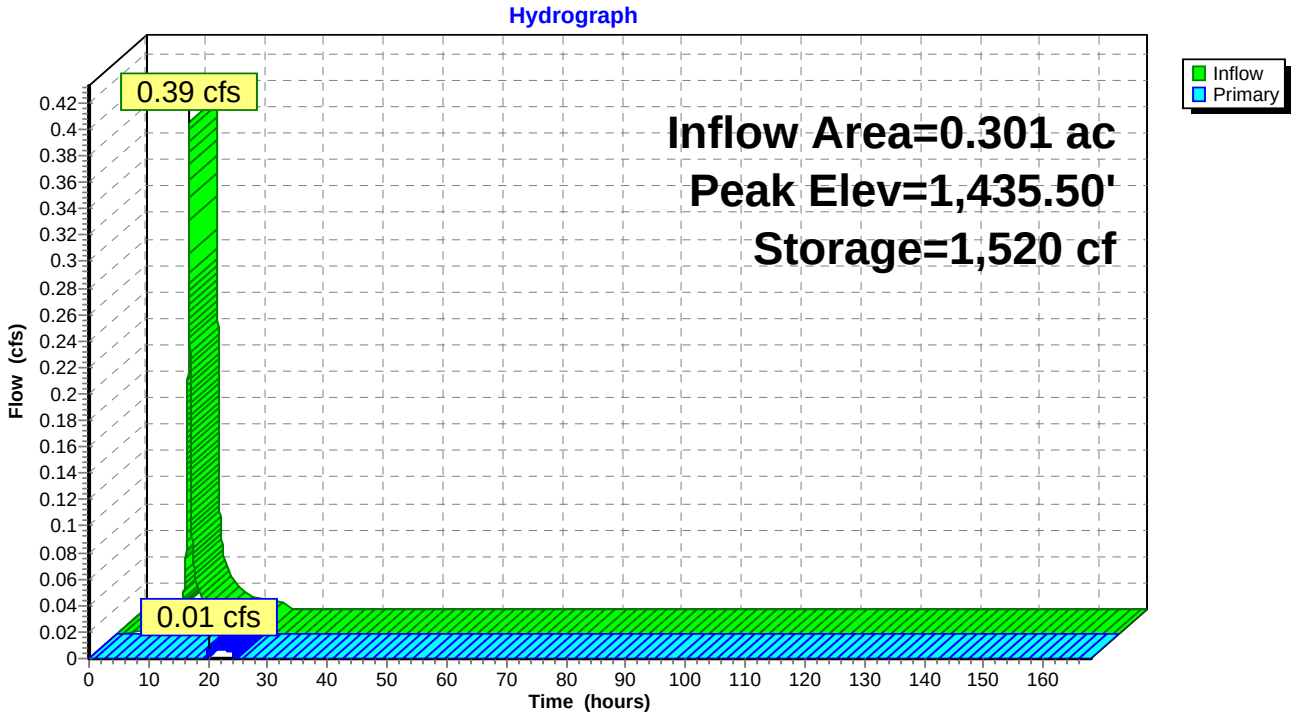
Volume	Invert	Avail.Storage	Storage Description
#1	1,429.50'	1,854 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,429.50	674	100.6	0.0	0	0	674
1,430.50	674	100.6	25.0	169	169	775
1,432.00	674	100.6	25.0	253	421	926
1,433.00	674	100.6	25.0	169	590	1,026
1,434.00	674	100.6	25.0	169	758	1,127
1,434.50	674	100.6	25.0	84	843	1,177
1,435.50	674	100.6	100.0	674	1,517	1,278
1,436.00	674	100.6	100.0	337	1,854	1,328

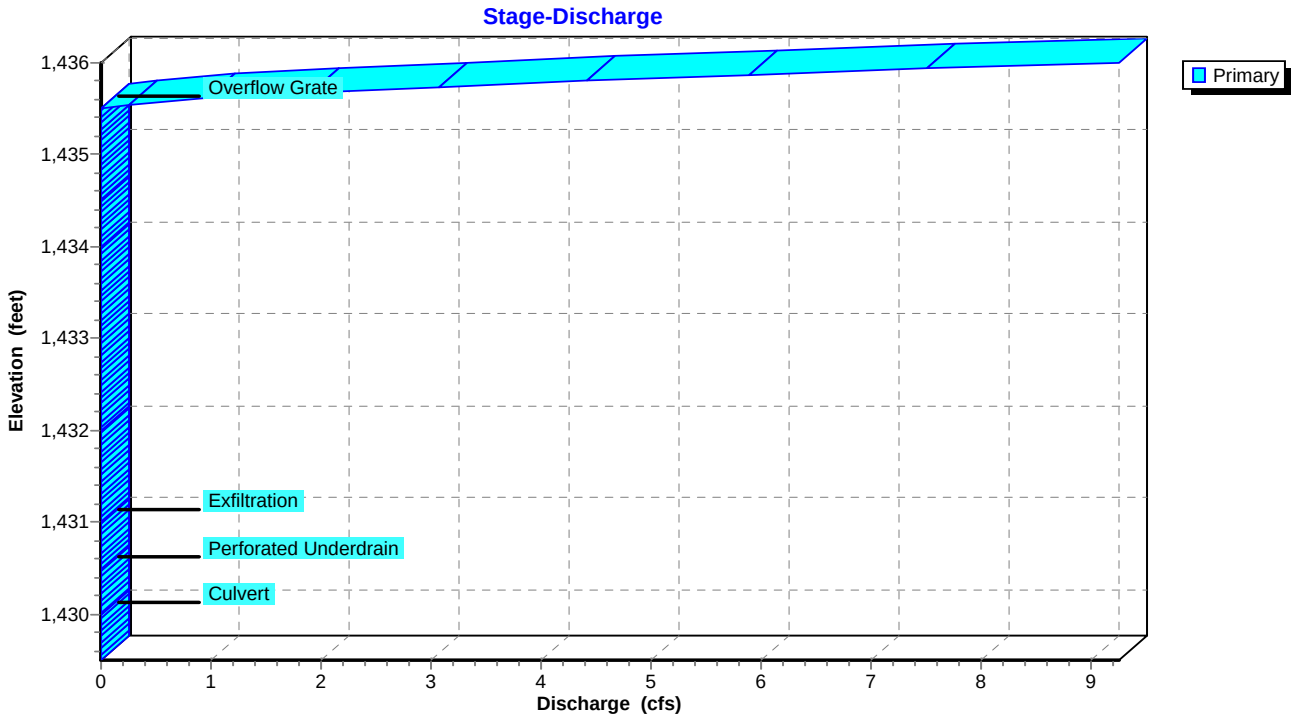
Device	Routing	Invert	Outlet Devices
#1	Primary	1,430.00'	**15.0" Round Culvert** L= 77.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,430.00' / 1,429.00' S= 0.0130 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,430.50'	**0.4" Horiz. Perforated Underdrain** X 512 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,431.00'	**0.250 in/hr Exfiltration over Surface area above 1,431.00'** Conductivity to Groundwater Elevation = 1,430.00' Excluded Surface area = 674 sf
#4	Device 1	1,435.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 20.01 hrs HW=1,435.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.01 cfs of 10.30 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 4.81 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 0.01 cfs @ 0.22 fps)

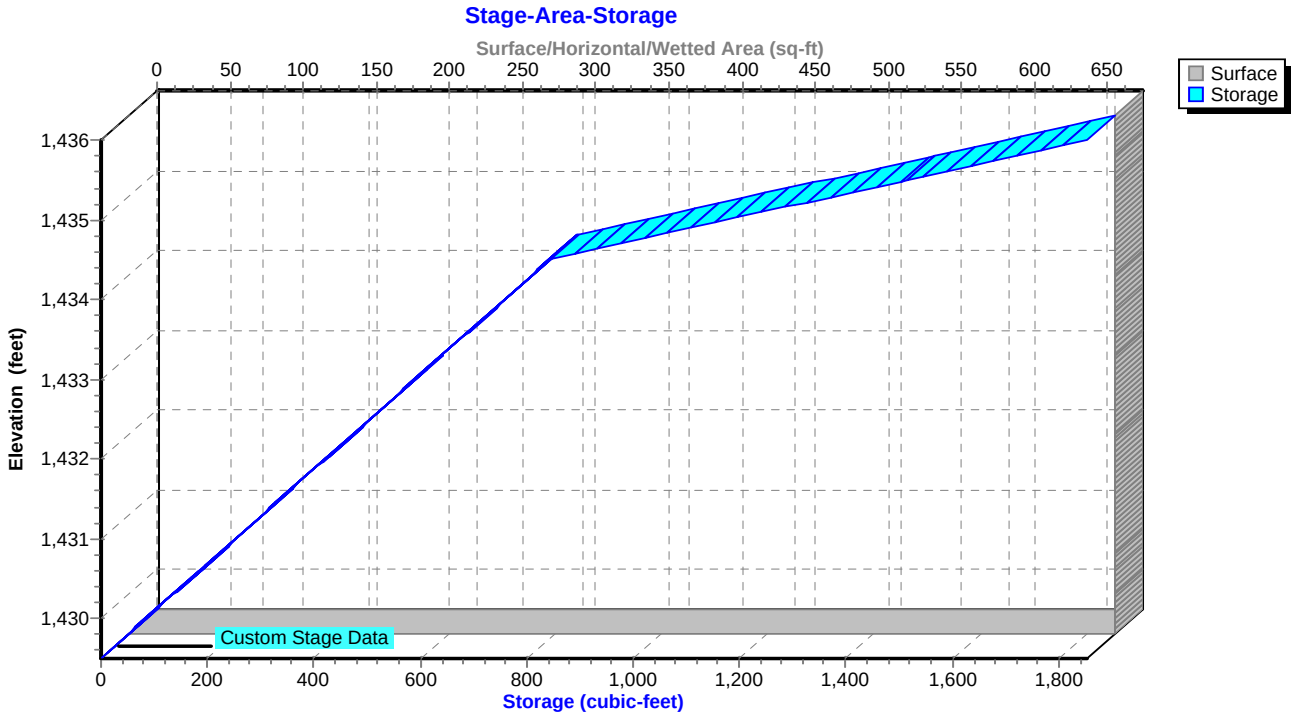
Pond SW28A-P: BRA-SW28A



Pond SW28A-P: BRA-SW28A



Pond SW28A-P: BRA-SW28A



Summary for Pond SW28B-FS: Flow Splitter for SW28B

Inflow Area = 0.390 ac, 67.69% Impervious, Inflow Depth = 1.82" for 1-YR, 24-HR Storm event
Inflow = 0.82 cfs @ 12.02 hrs, Volume= 0.059 af
Outflow = 0.82 cfs @ 12.03 hrs, Volume= 0.059 af, Atten= 0%, Lag= 0.6 min
Primary = 0.56 cfs @ 12.03 hrs, Volume= 0.057 af
Secondary = 0.25 cfs @ 12.03 hrs, Volume= 0.002 af

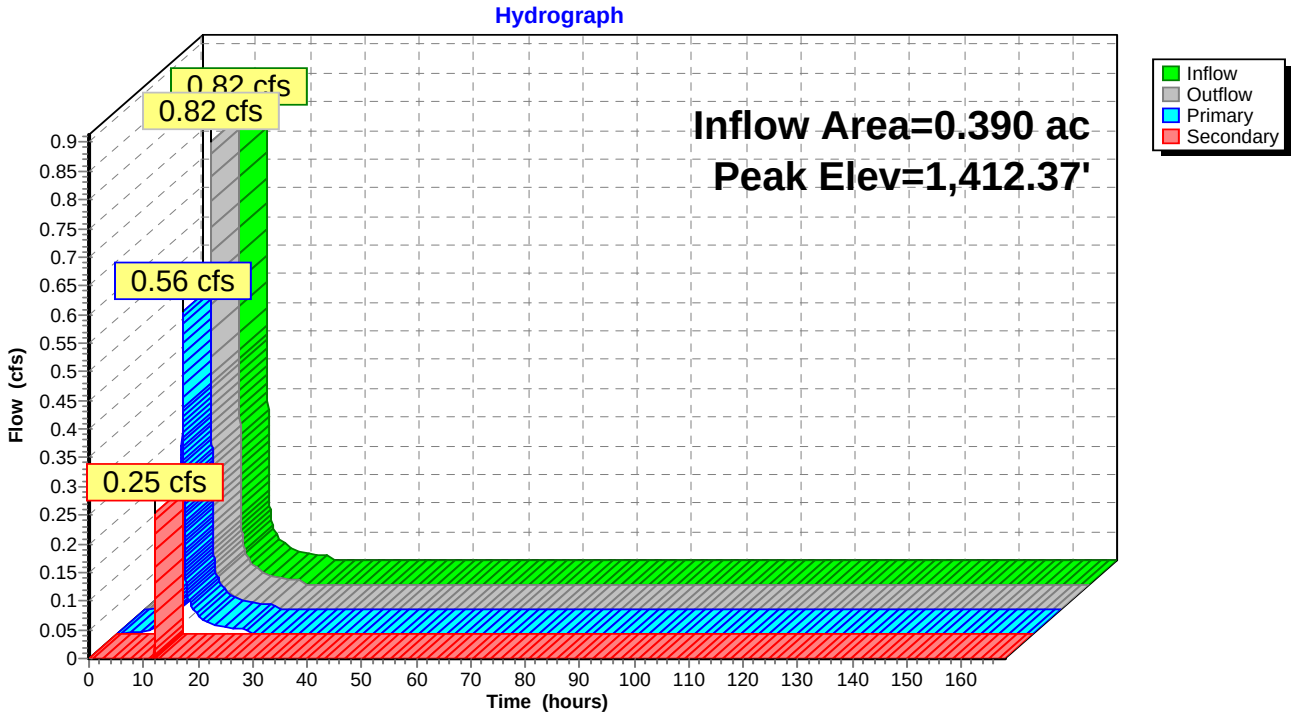
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,412.37' @ 12.03 hrs
Flood Elev= 1,414.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,412.00'	**18.0" Round Culvert** L= 21.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,412.00' / 1,410.50' S= 0.0714 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,412.00'	**18.0" Round Culvert** L= 117.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,412.00' / 1,406.00' S= 0.0513 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,412.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

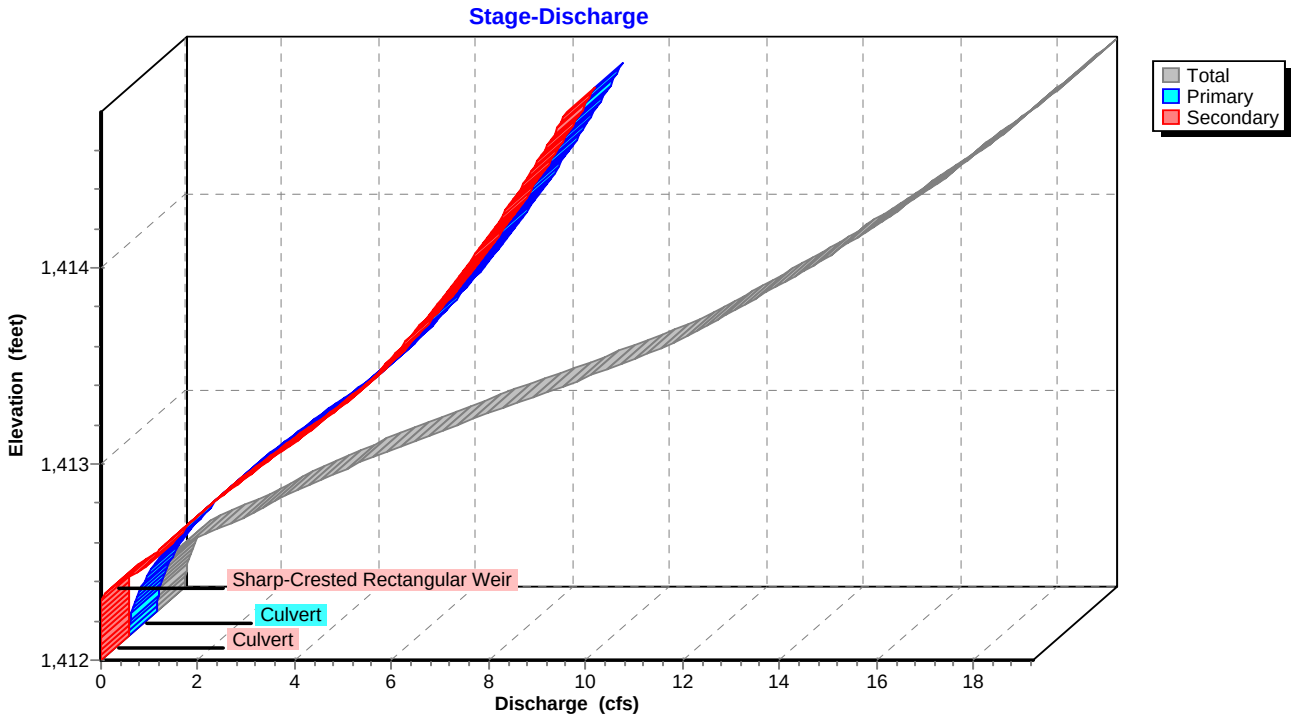
Primary OutFlow Max=0.56 cfs @ 12.03 hrs HW=1,412.37' TW=1,405.15' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.56 cfs @ 1.64 fps)

Secondary OutFlow Max=0.25 cfs @ 12.03 hrs HW=1,412.37' TW=1,374.08' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.25 cfs of 0.56 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.25 cfs @ 0.88 fps)

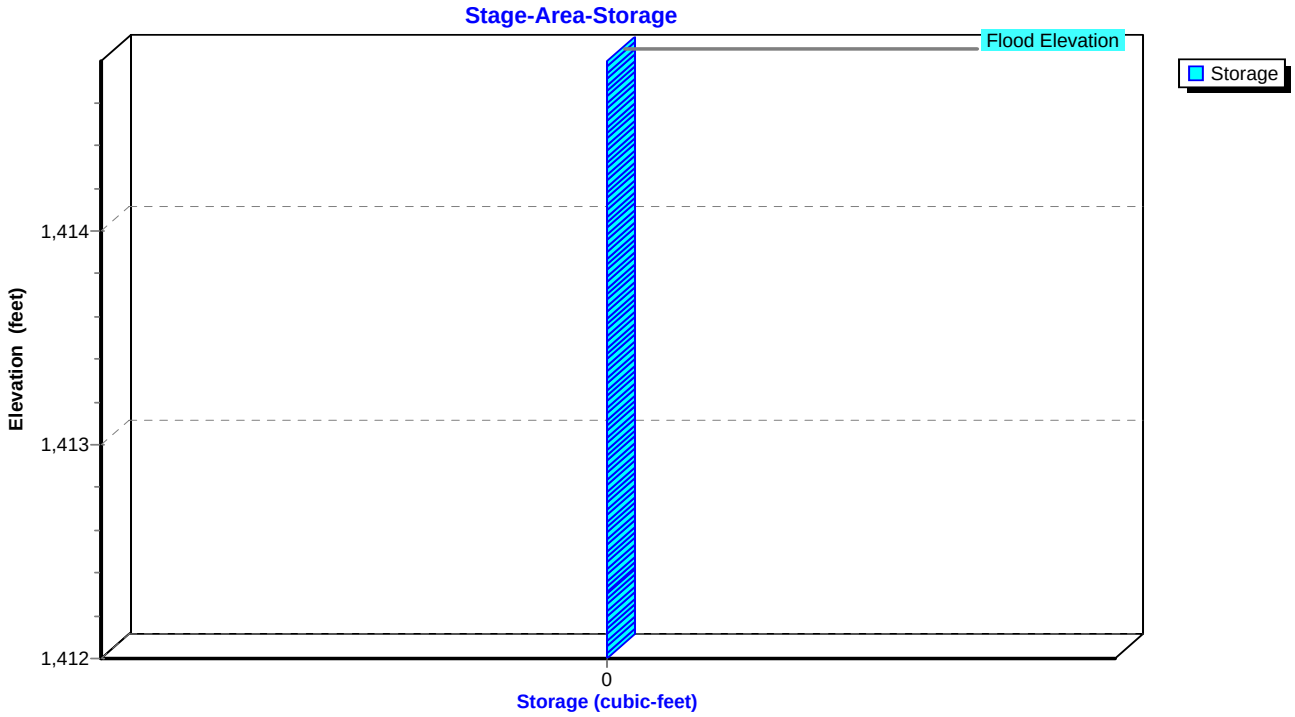
Pond SW28B-FS: Flow Splitter for SW28B



Pond SW28B-FS: Flow Splitter for SW28B



Pond SW28B-FS: Flow Splitter for SW28B



Summary for Pond SW28B-P: BRA-SW28B

Inflow Area = 0.506 ac, 52.17% Impervious, Inflow Depth = 1.50" for 1-YR, 24-HR Storm event
Inflow = 0.65 cfs @ 12.03 hrs, Volume= 0.063 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,407.84' @ 24.55 hrs Surf.Area= 2,545 sf Storage= 2,764 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

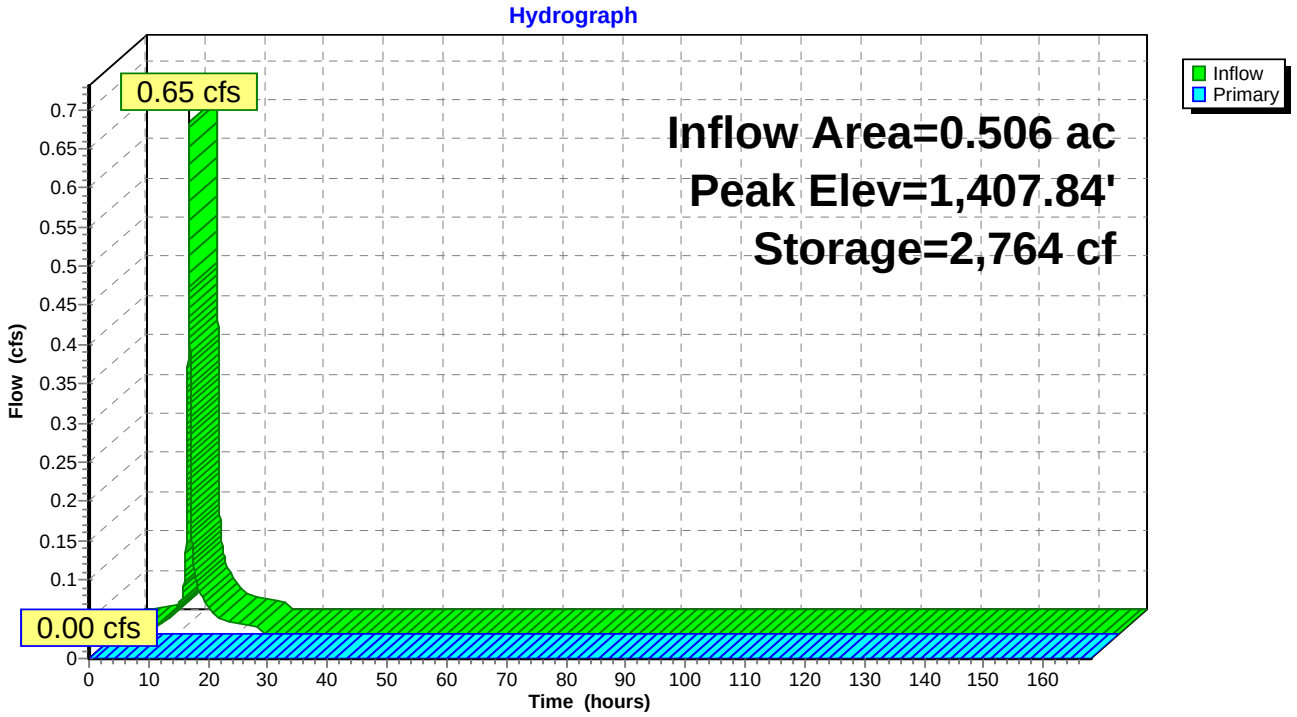
Volume	Invert	Avail.Storage	Storage Description
#1	1,403.50'	5,829 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,403.50	2,545	273.4	0.0	0	0	2,545
1,404.50	2,545	273.4	25.0	636	636	2,818
1,405.50	2,545	273.4	25.0	636	1,273	3,092
1,406.50	2,545	273.4	25.0	636	1,909	3,365
1,407.50	2,545	273.4	25.0	636	2,545	3,639
1,408.50	2,545	273.4	25.0	636	3,181	3,912
1,409.00	2,545	273.4	100.0	1,273	4,454	4,049
1,409.50	2,962	282.9	100.0	1,375	5,829	4,492

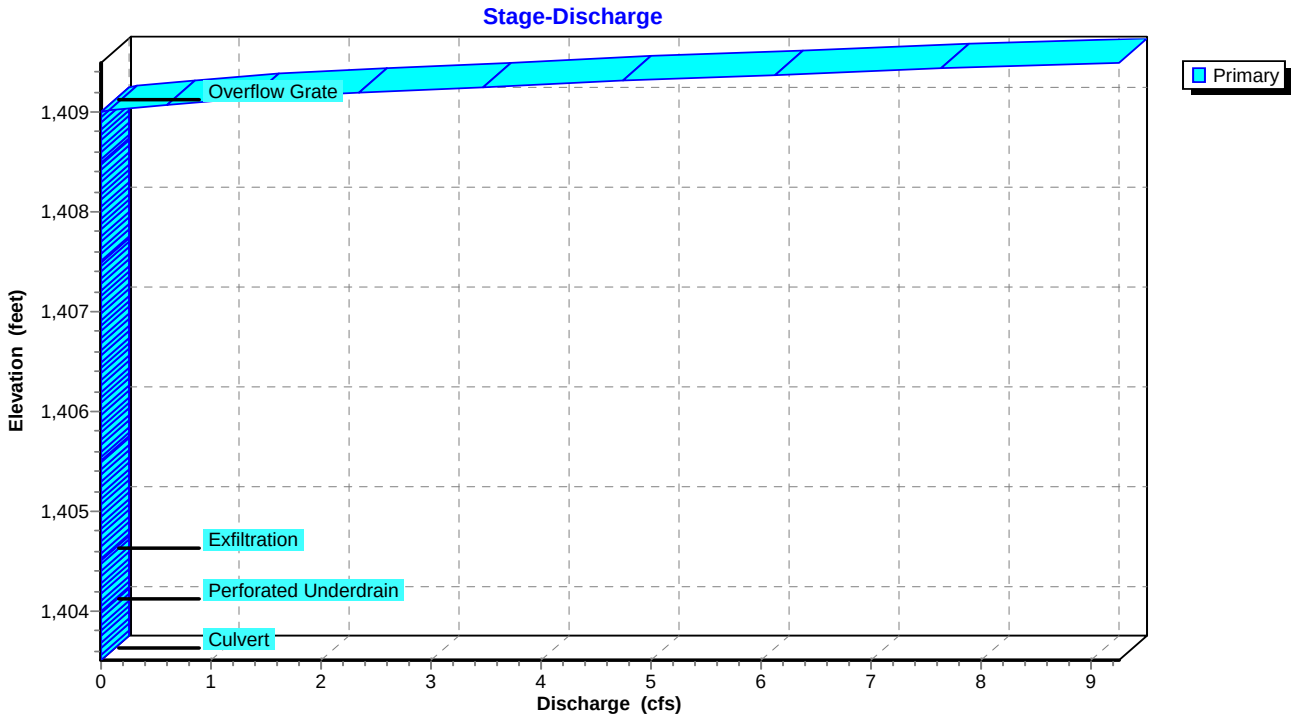
Device	Routing	Invert	Outlet Devices
#1	Primary	1,403.50'	**15.0" Round Culvert** L= 58.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,403.50' / 1,401.00' S= 0.0427 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,404.00'	**0.4" Horiz. Perforated Underdrain X 468.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,404.50'	**0.250 in/hr Exfiltration over Surface area above 1,404.50'** Conductivity to Groundwater Elevation = 1,403.50' Excluded Surface area = 2,545 sf
#4	Device 1	1,409.00'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,403.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

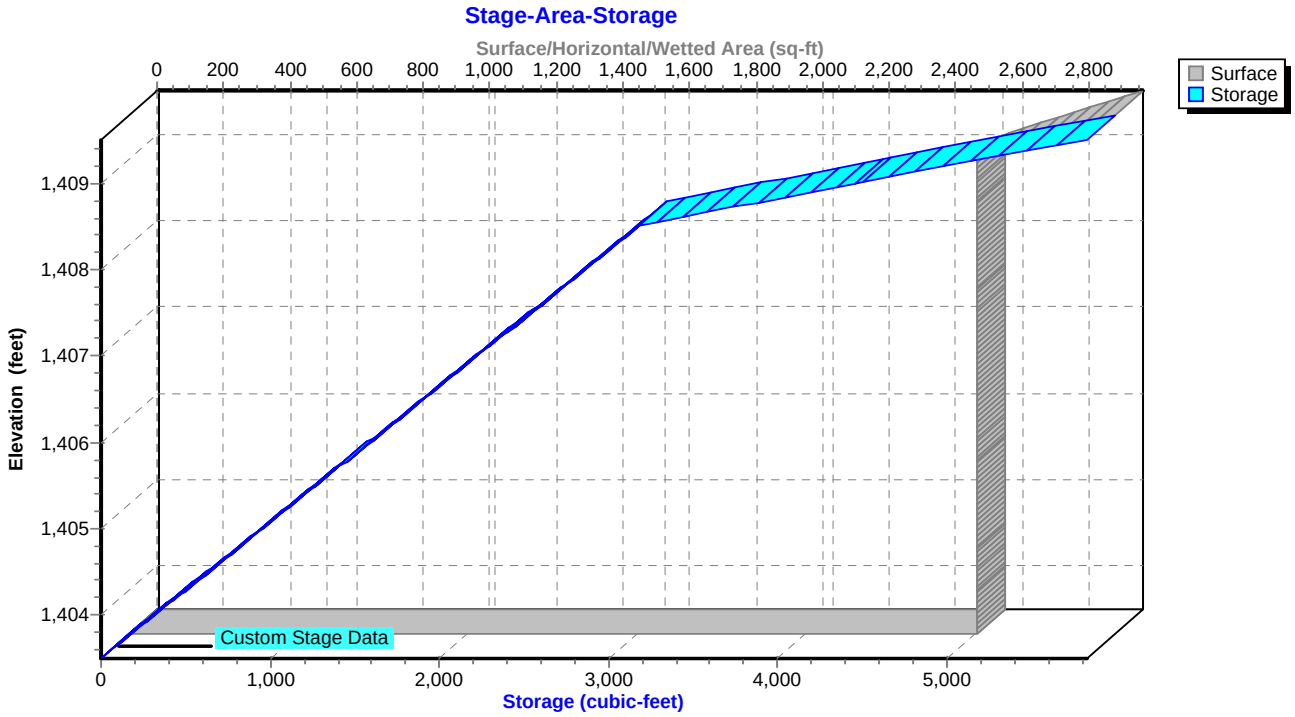
Pond SW28B-P: BRA-SW28B



Pond SW28B-P: BRA-SW28B



Pond SW28B-P: BRA-SW28B



Summary for Pond SW28C-FS: Flow Splitter for SW28C

Inflow Area = 0.666 ac,100.00% Impervious, Inflow Depth = 2.37" for 1-YR, 24-HR Storm event
Inflow = 1.94 cfs @ 12.03 hrs, Volume= 0.132 af
Outflow = 1.94 cfs @ 12.04 hrs, Volume= 0.132 af, Atten= 0%, Lag= 0.6 min
Primary = 1.43 cfs @ 12.04 hrs, Volume= 0.128 af
Secondary = 0.50 cfs @ 12.04 hrs, Volume= 0.004 af

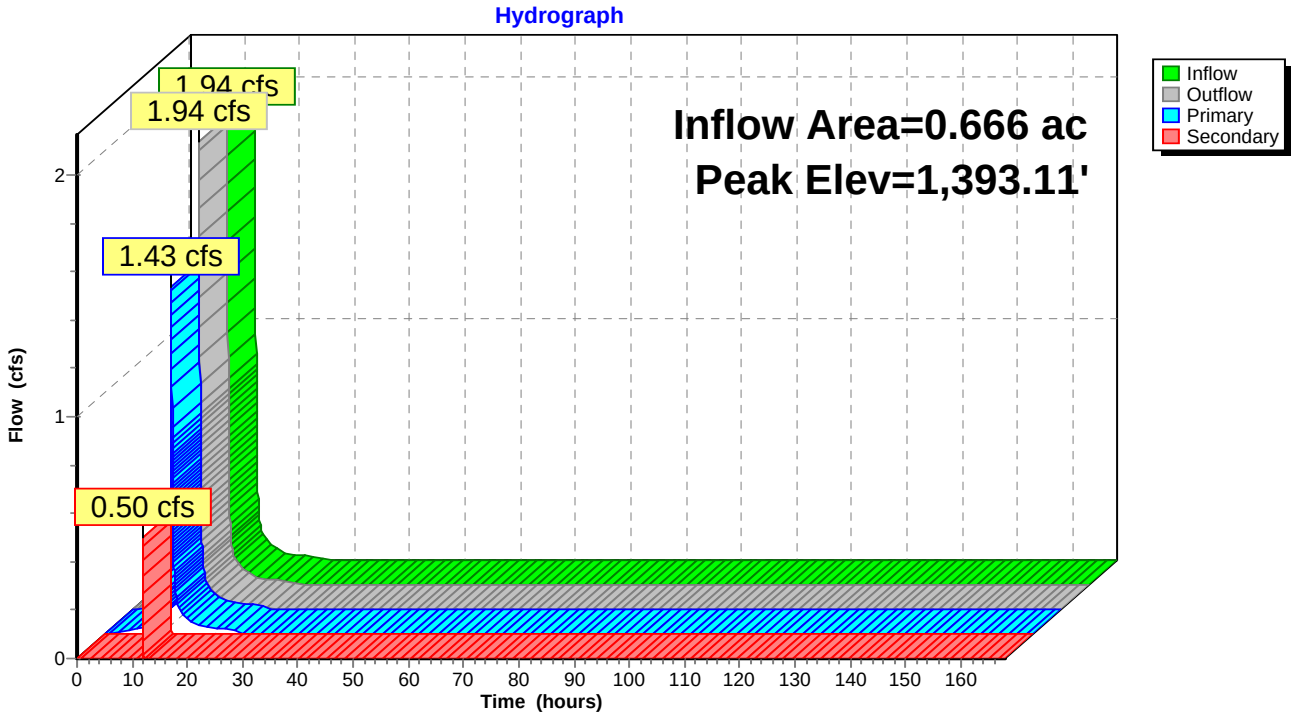
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,393.11' @ 12.04 hrs
Flood Elev= 1,396.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,392.50'	**18.0" Round Culvert to BRA-SW28A** L= 14.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,392.50' / 1,392.00' S= 0.0347 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,392.50'	**18.0" Round Culvert to Pond SW28D** L= 189.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,392.50' / 1,385.70' S= 0.0358 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,393.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

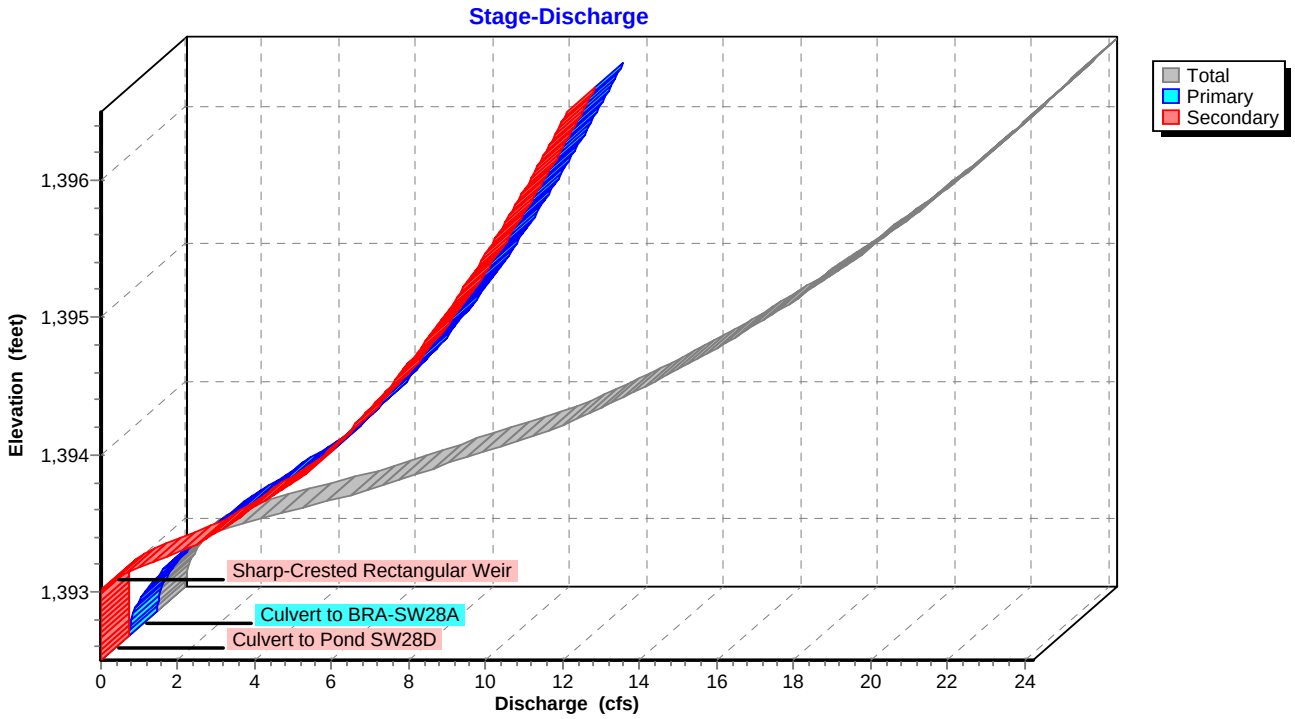
Primary OutFlow Max=1.43 cfs @ 12.04 hrs HW=1,393.11' TW=1,388.54' (Dynamic Tailwater)
└**1=Culvert to BRA-SW28A** (Inlet Controls 1.43 cfs @ 2.11 fps)

Secondary OutFlow Max=0.50 cfs @ 12.04 hrs HW=1,393.11' TW=1,374.10' (Dynamic Tailwater)
└**2=Culvert to Pond SW28D** (Passes 0.50 cfs of 1.43 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.50 cfs @ 1.10 fps)

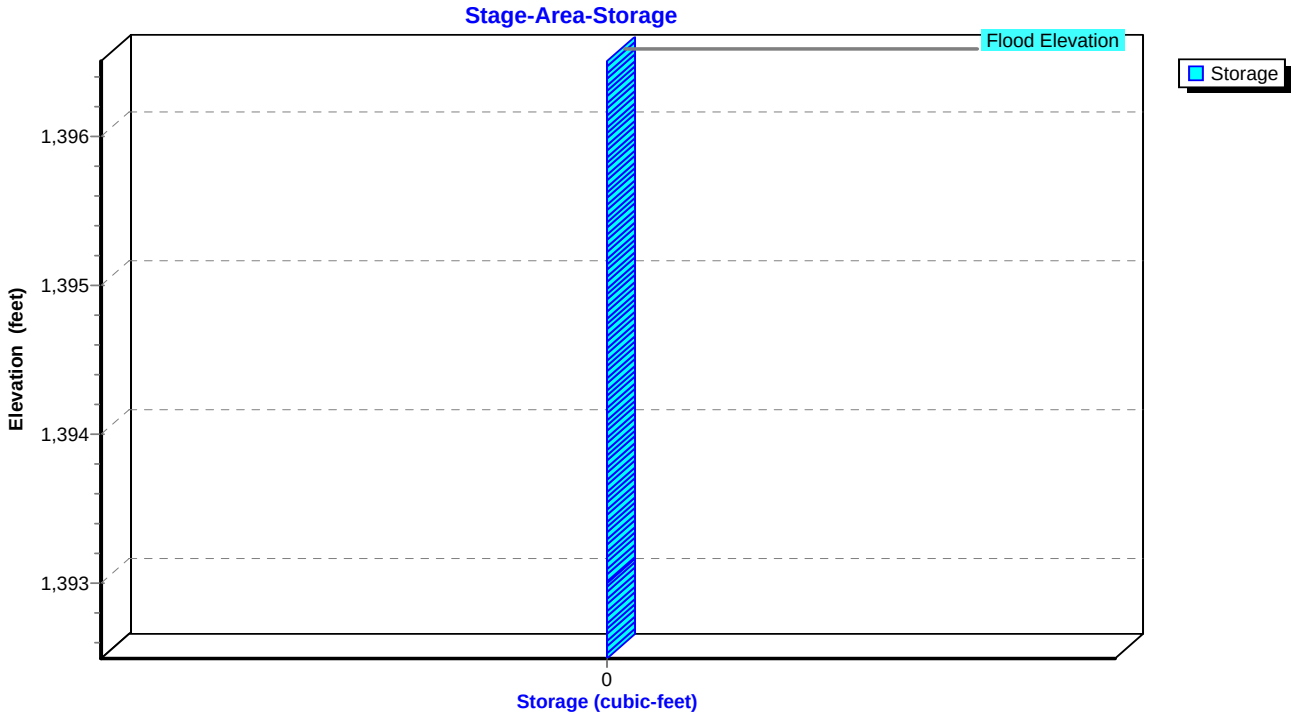
Pond SW28C-FS: Flow Splitter for SW28C



Pond SW28C-FS: Flow Splitter for SW28C



Pond SW28C-FS: Flow Splitter for SW28C



Summary for Pond SW28C-P: BRA-SW28C

Inflow Area = 0.763 ac, 87.29% Impervious, Inflow Depth = 2.10" for 1-YR, 24-HR Storm event
Inflow = 1.51 cfs @ 12.04 hrs, Volume= 0.133 af
Outflow = 0.02 cfs @ 22.78 hrs, Volume= 0.003 af, Atten= 99%, Lag= 644.4 min
Primary = 0.02 cfs @ 22.78 hrs, Volume= 0.003 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,390.51' @ 22.78 hrs Surf.Area= 2,516 sf Storage= 5,681 cf

Plug-Flow detention time= 1,125.5 min calculated for 0.003 af (2% of inflow)
Center-of-Mass det. time= 632.6 min (1,395.9 - 763.3)

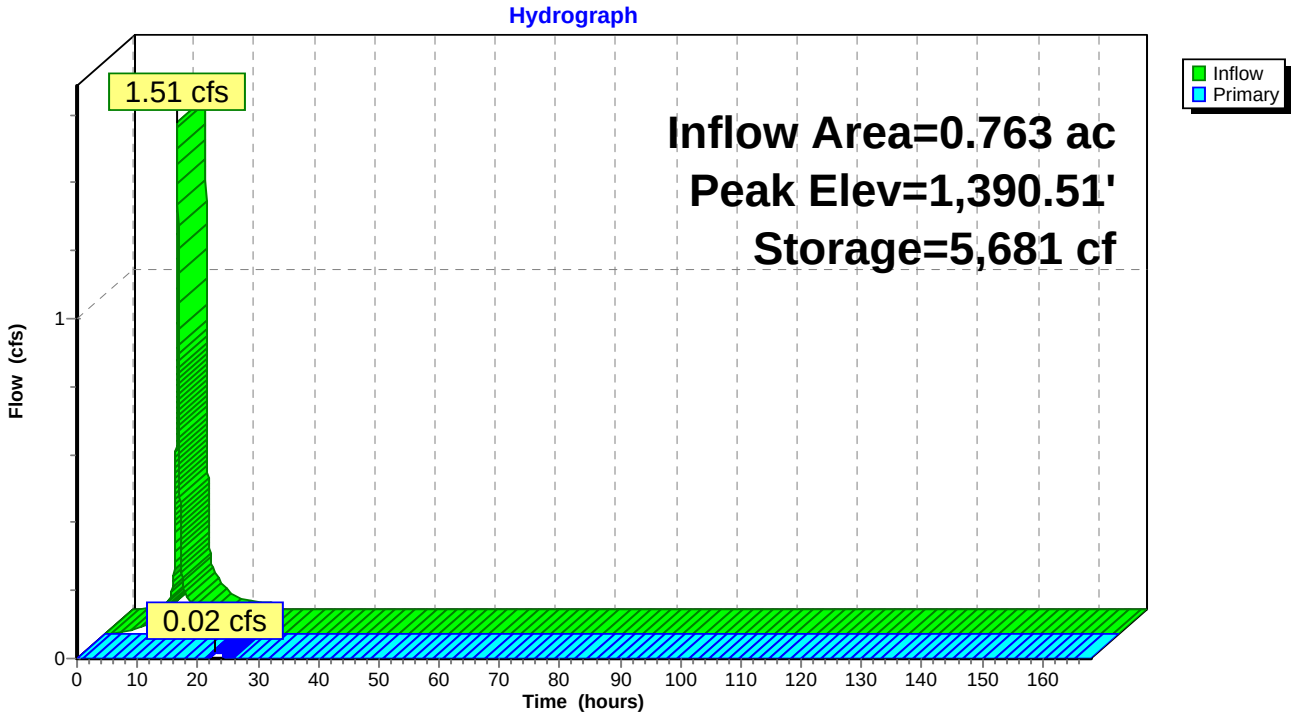
Volume	Invert	Avail.Storage	Storage Description
#1	1,384.50'	6,919 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,384.50	2,516	222.0	0.0	0	0	2,516
1,385.50	2,516	222.0	25.0	629	629	2,738
1,387.00	2,516	222.0	25.0	944	1,573	3,071
1,388.00	2,516	222.0	25.0	629	2,202	3,293
1,389.00	2,516	222.0	25.0	629	2,831	3,515
1,389.50	2,516	222.0	25.0	315	3,145	3,626
1,390.50	2,516	222.0	100.0	2,516	5,661	3,848
1,391.00	2,516	222.0	100.0	1,258	6,919	3,959

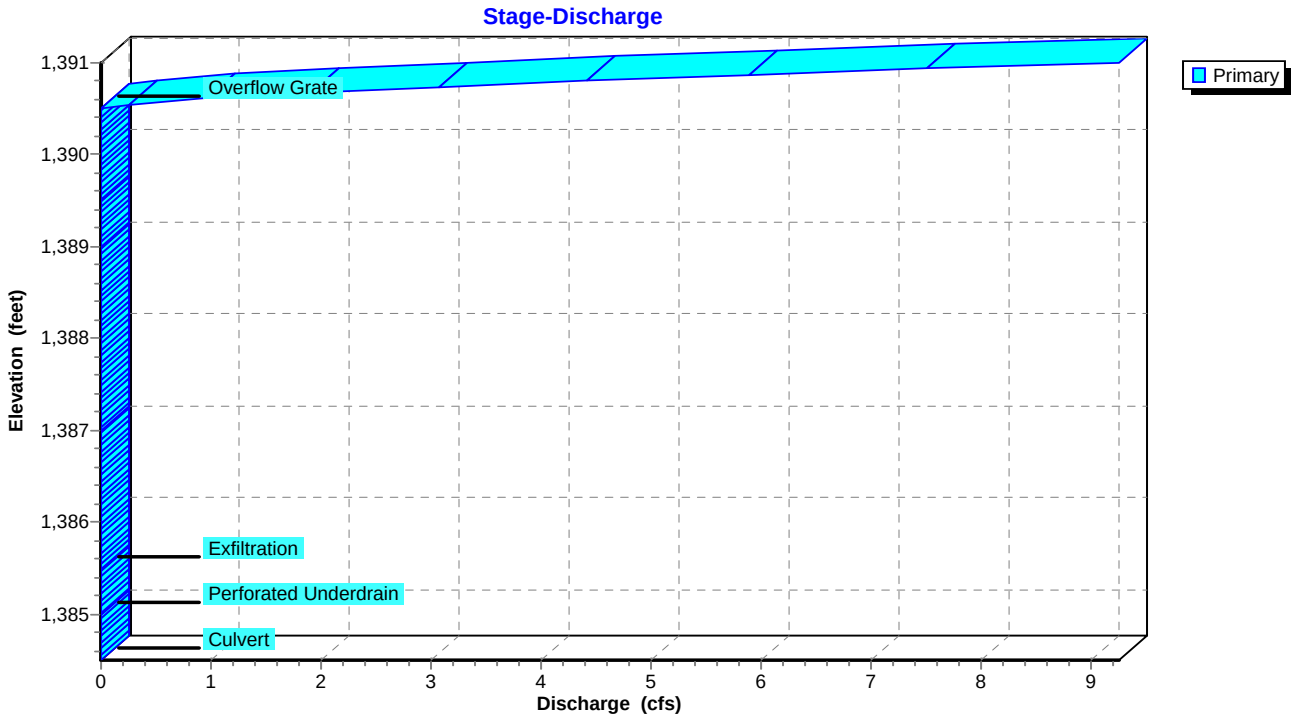
Device	Routing	Invert	Outlet Devices
#1	Primary	1,384.50'	**15.0" Round Culvert** L= 68.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,384.50' / 1,384.00' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,385.00'	**0.4" Horiz. Perforated Underdrain X 286.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,385.50'	**0.250 in/hr Exfiltration over Surface area above 1,385.50'** Conductivity to Groundwater Elevation = 1,385.00' Excluded Surface area = 2,516 sf
#4	Device 1	1,390.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.02 cfs @ 22.78 hrs HW=1,390.51' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.02 cfs of 10.82 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 11.28 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 0.02 cfs @ 0.29 fps)

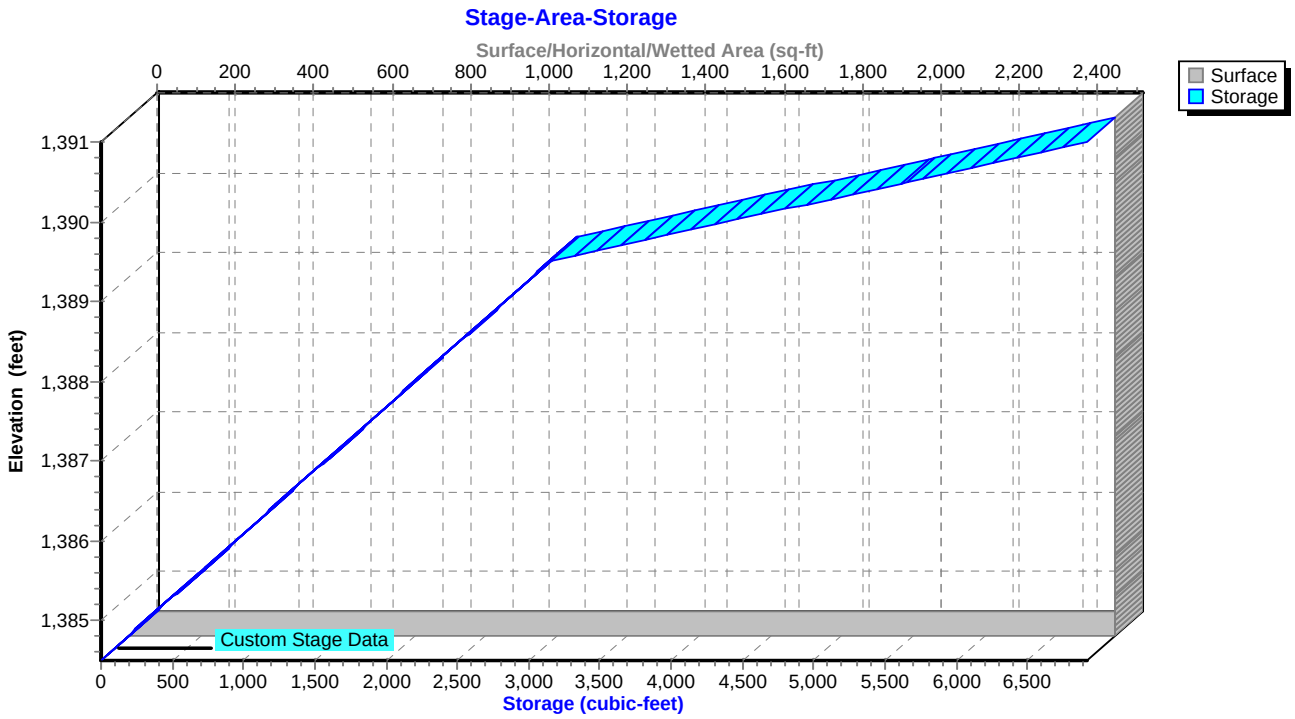
Pond SW28C-P: BRA-SW28C



Pond SW28C-P: BRA-SW28C



Pond SW28C-P: BRA-SW28C



Summary for Pond SW31-FS: Flow Splitter for SW31

Inflow Area = 0.537 ac, 58.47% Impervious, Inflow Depth = 1.47" for 1-YR, 24-HR Storm event
Inflow = 1.06 cfs @ 12.04 hrs, Volume= 0.066 af
Outflow = 1.06 cfs @ 12.05 hrs, Volume= 0.066 af, Atten= 0%, Lag= 0.6 min
Primary = 0.60 cfs @ 12.05 hrs, Volume= 0.061 af
Secondary = 0.45 cfs @ 12.05 hrs, Volume= 0.005 af

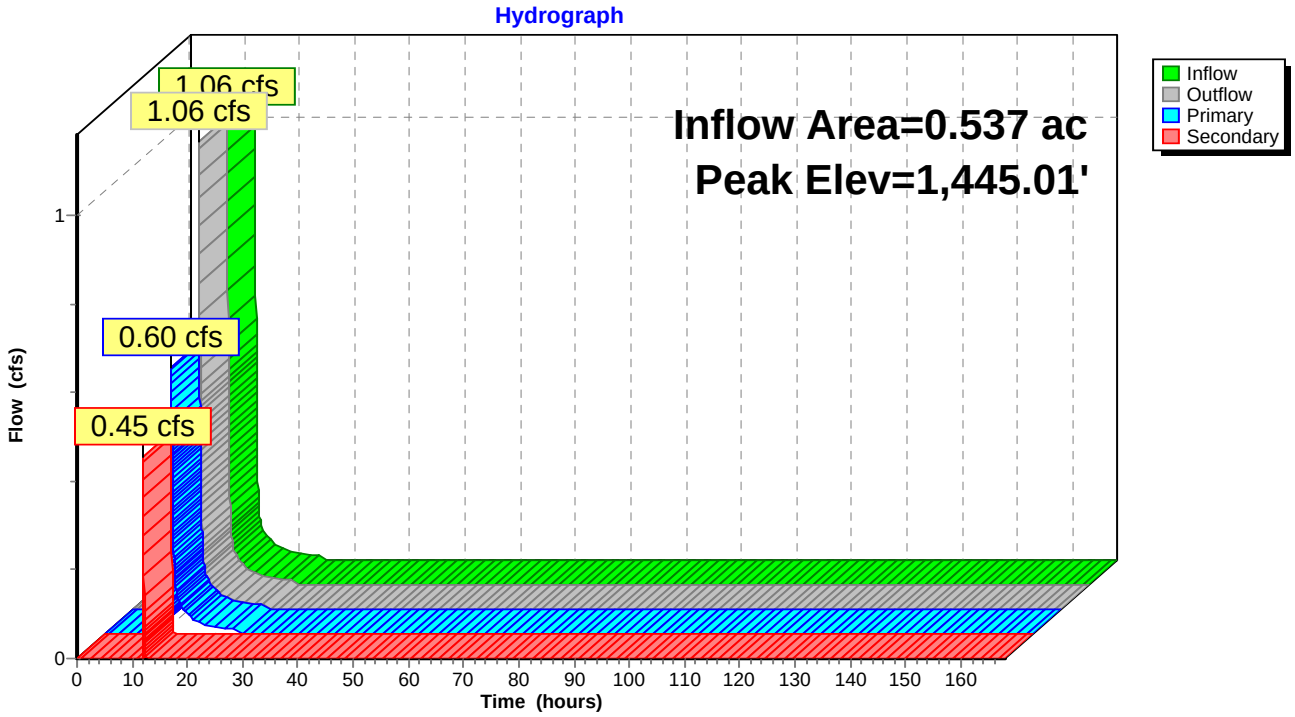
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,445.01' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,444.60'	**18.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,444.60' / 1,444.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,444.60'	**18.0" Round Culvert** L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,444.60' / 1,443.00' S= 0.0333 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,444.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

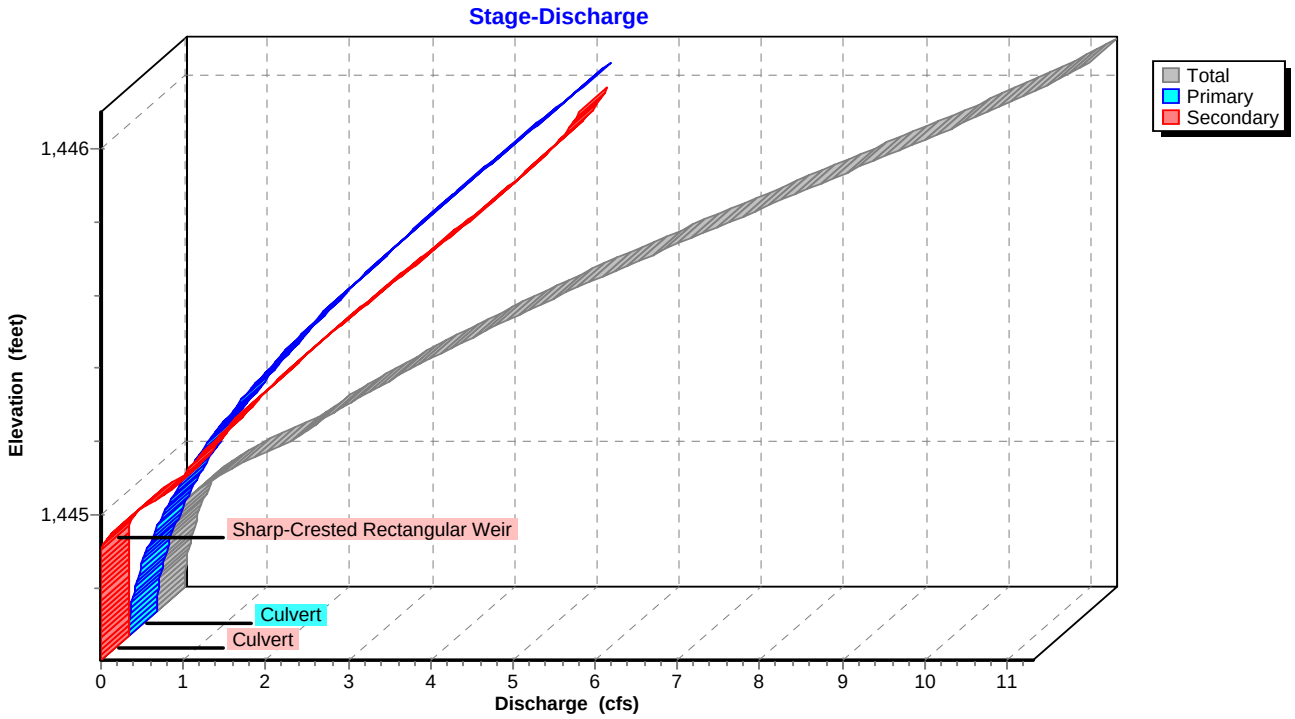
Primary OutFlow Max=0.60 cfs @ 12.05 hrs HW=1,445.01' TW=1,440.49' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.60 cfs @ 2.34 fps)

Secondary OutFlow Max=0.45 cfs @ 12.05 hrs HW=1,445.01' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.45 cfs of 0.66 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.45 cfs @ 1.07 fps)

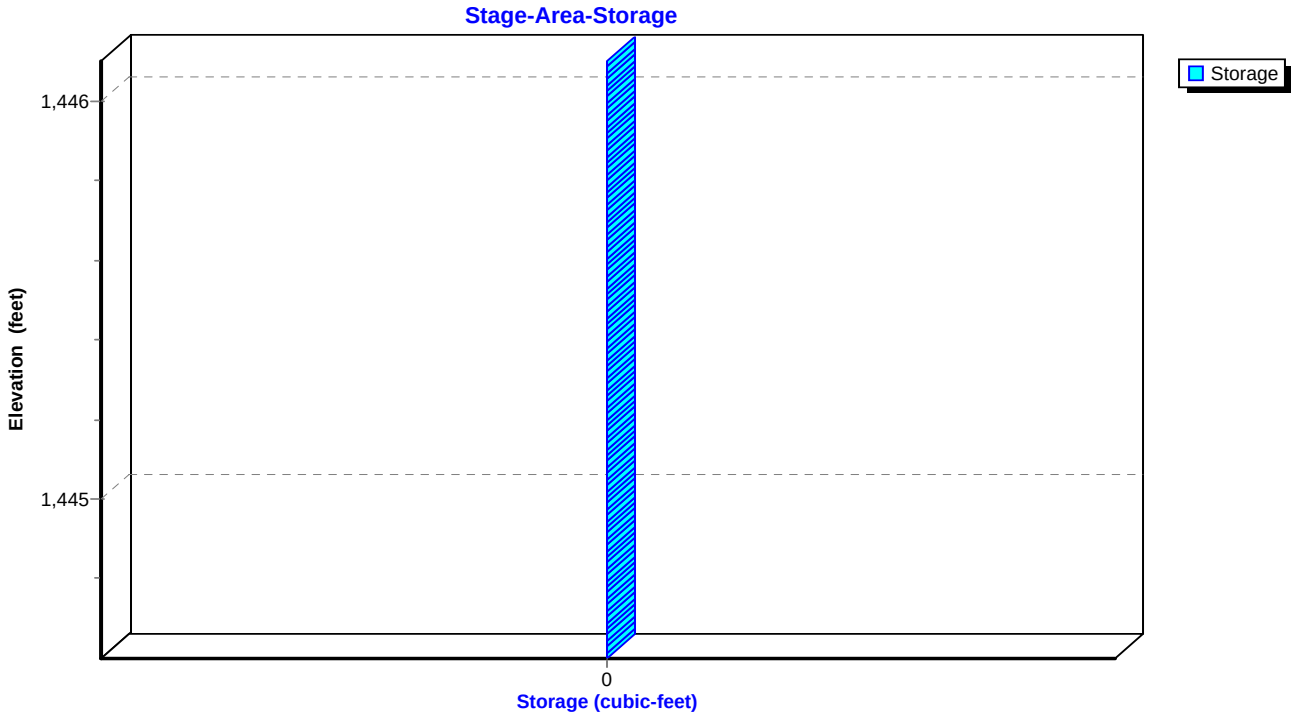
Pond SW31-FS: Flow Splitter for SW31



Pond SW31-FS: Flow Splitter for SW31



Pond SW31-FS: Flow Splitter for SW31



Summary for Pond SW31-P: BRA-SW31

Inflow Area = 0.597 ac, 52.60% Impervious, Inflow Depth = 1.29" for 1-YR, 24-HR Storm event
Inflow = 0.65 cfs @ 12.05 hrs, Volume= 0.064 af
Outflow = 0.01 cfs @ 24.03 hrs, Volume= 0.001 af, Atten= 98%, Lag= 719.0 min
Primary = 0.01 cfs @ 24.03 hrs, Volume= 0.001 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,444.01' @ 24.03 hrs Surf.Area= 1,567 sf Storage= 2,764 cf

Plug-Flow detention time= 911.0 min calculated for 0.001 af (2% of inflow)
Center-of-Mass det. time= 631.9 min (1,463.2 - 831.4)

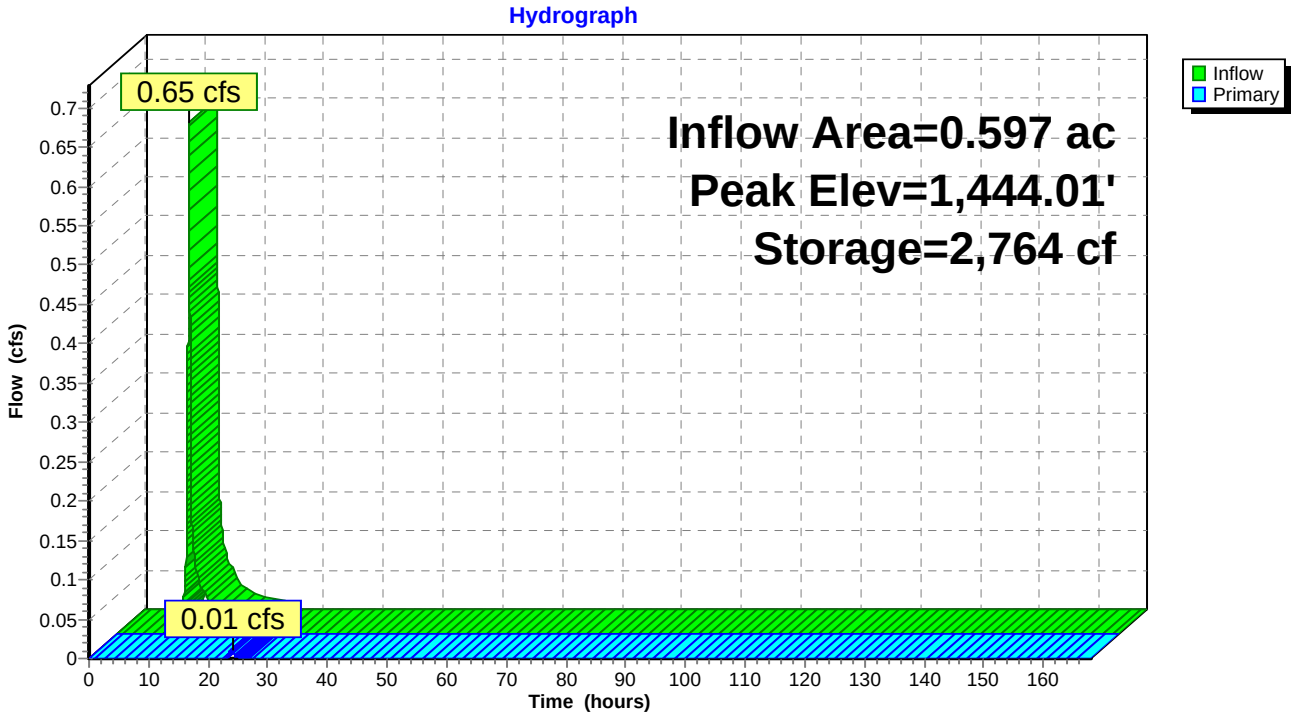
Volume	Invert	Avail.Storage	Storage Description
#1	1,438.50'	4,309 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,438.50	1,567	169.0	0.0	0	0	1,567
1,439.50	1,567	169.0	25.0	392	392	1,736
1,440.50	1,567	169.0	25.0	392	784	1,905
1,441.50	1,567	169.0	25.0	392	1,175	2,074
1,442.50	1,567	169.0	25.0	392	1,567	2,243
1,443.50	1,567	169.0	25.0	392	1,959	2,412
1,444.50	1,567	169.0	100.0	1,567	3,526	2,581
1,445.00	1,567	169.0	100.0	784	4,309	2,666

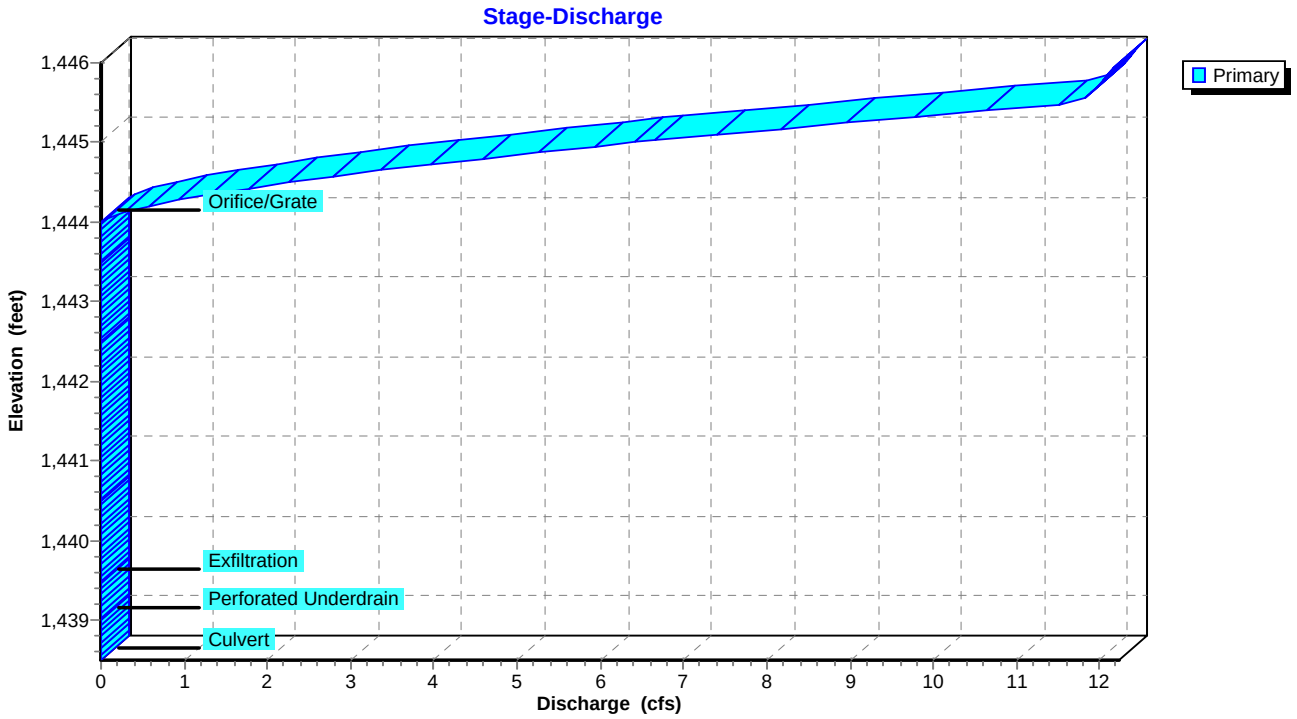
Device	Routing	Invert	Outlet Devices
#1	Primary	1,438.50'	**15.0" Round Culvert** L= 87.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,438.50' / 1,437.50' S= 0.0115 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,439.00'	**0.4" Horiz. Perforated Underdrain X 256.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,439.50'	**0.250 in/hr Exfiltration over Surface area above 1,439.50'** Conductivity to Groundwater Elevation = 1,438.00' Excluded Surface area = 1,567 sf
#4	Device 1	1,444.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.01 cfs @ 24.03 hrs HW=1,444.01' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.01 cfs of 10.31 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 9.63 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Orifice Controls 0.01 cfs @ 0.37 fps)

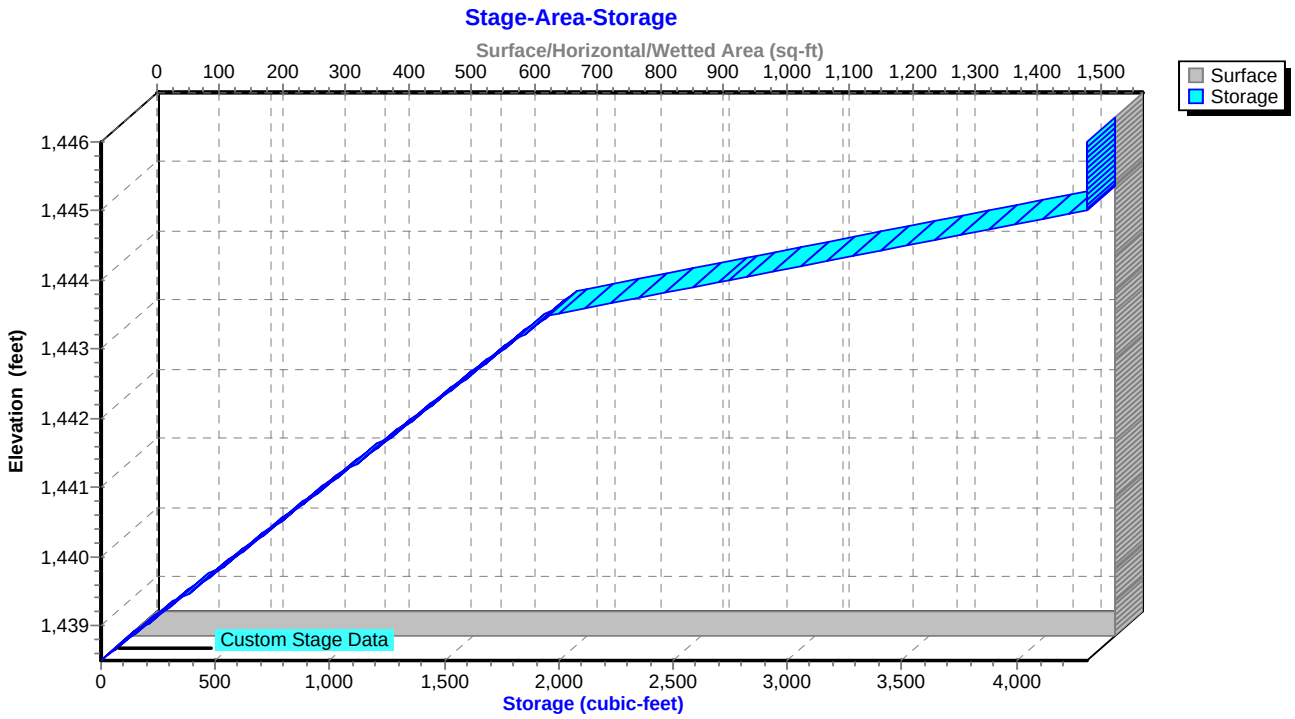
Pond SW31-P: BRA-SW31



Pond SW31-P: BRA-SW31



Pond SW31-P: BRA-SW31



Time span=0.00-168.00 hrs, dt=0.01 hrs, 16801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 21: PR DA 21 Runoff Area=30.406 ac 2.29% Impervious Runoff Depth=3.09"
Flow Length=2,809' Tc=46.3 min UI Adjusted CN=73 Runoff=50.04 cfs 7.826 af

Subcatchment 21A-1: PR DA 21A-1 Runoff Area=0.432 ac 37.27% Impervious Runoff Depth=4.20"
Flow Length=613' Tc=1.8 min CN=84 Runoff=2.43 cfs 0.151 af

Subcatchment 21A-2: PR DA 21A-2 Runoff Area=0.871 ac 35.25% Impervious Runoff Depth=4.41"
Flow Length=613' Tc=1.8 min CN=86 Runoff=5.11 cfs 0.320 af

Subcatchment 21B-1: PR DA 21B-1 Runoff Area=0.428 ac 38.79% Impervious Runoff Depth=4.20"
Flow Length=525' Tc=1.7 min CN=84 Runoff=2.42 cfs 0.150 af

Subcatchment 21B-2: PR DA 21B-2 Runoff Area=0.842 ac 36.34% Impervious Runoff Depth=4.41"
Flow Length=525' Tc=1.7 min CN=86 Runoff=4.96 cfs 0.309 af

Subcatchment 21C: PR DA 21C Runoff Area=39.300 ac 1.38% Impervious Runoff Depth=3.09"
Flow Length=3,341' Tc=68.5 min UI Adjusted CN=73 Runoff=51.32 cfs 10.115 af

Subcatchment 21D: PR DA 21D Runoff Area=7.632 ac 0.00% Impervious Runoff Depth=2.99"
Flow Length=1,018' Tc=42.4 min CN=72 Runoff=12.77 cfs 1.904 af

Subcatchment 21E-1: PR DA 21E-1 Runoff Area=0.450 ac 33.56% Impervious Runoff Depth=4.09"
Flow Length=632' Tc=2.5 min CN=83 Runoff=2.42 cfs 0.153 af

Subcatchment 21E-2: PR DA 21E-2 Runoff Area=0.334 ac 33.53% Impervious Runoff Depth=4.09"
Flow Length=632' Tc=2.5 min CN=83 Runoff=1.80 cfs 0.114 af

Subcatchment 21E-3: PR DA 21E-3 Runoff Area=0.446 ac 33.63% Impervious Runoff Depth=4.09"
Flow Length=632' Tc=2.5 min CN=83 Runoff=2.40 cfs 0.152 af

Subcatchment 21F-1: PR DA 21F-1 Runoff Area=0.384 ac 38.02% Impervious Runoff Depth=4.20"
Flow Length=632' Tc=2.5 min CN=84 Runoff=2.11 cfs 0.134 af

Subcatchment 21F-2: PR DA 21F-2 Runoff Area=0.284 ac 38.03% Impervious Runoff Depth=4.20"
Flow Length=632' Tc=2.5 min CN=84 Runoff=1.56 cfs 0.099 af

Subcatchment 21F-3: PR DA 21F-3 Runoff Area=0.380 ac 38.16% Impervious Runoff Depth=4.20"
Flow Length=632' Tc=2.5 min CN=84 Runoff=2.09 cfs 0.133 af

Subcatchment 21G: PR DA 21G Runoff Area=0.332 ac 43.67% Impervious Runoff Depth=4.20"
Flow Length=340' Tc=2.0 min CN=84 Runoff=1.86 cfs 0.116 af

Subcatchment 21H: PR DA 21H Runoff Area=0.256 ac 46.09% Impervious Runoff Depth=4.30"
Flow Length=434' Tc=2.2 min CN=85 Runoff=1.45 cfs 0.092 af

Subcatchment 23: PR DA 23 Runoff Area=6.968 ac 0.00% Impervious Runoff Depth=2.81"
Flow Length=800' Tc=30.3 min CN=70 Runoff=12.81 cfs 1.629 af

Subcatchment 23A-1: PR DA 23A-1 Runoff Area=0.806 ac 24.94% Impervious Runoff Depth=3.88"
Flow Length=424' Tc=1.8 min CN=81 Runoff=4.24 cfs 0.261 af

Subcatchment 23A-2: PR DA 23A-2 Runoff Area=0.696 ac 12.21% Impervious Runoff Depth=3.48"
Flow Length=424' Tc=1.8 min CN=77 Runoff=3.30 cfs 0.202 af

Subcatchment 23B-1: PR DA 23B-1 Runoff Area=0.572 ac 25.87% Impervious Runoff Depth=3.88"
Flow Length=334' Tc=1.5 min CN=81 Runoff=3.05 cfs 0.185 af

Subcatchment 23B-2: PR DA 23B-2 Runoff Area=0.629 ac 25.91% Impervious Runoff Depth=3.88"
Flow Length=334' Tc=1.5 min CN=81 Runoff=3.35 cfs 0.204 af

Subcatchment 23C: PR DA 23C Runoff Area=3.325 ac 0.00% Impervious Runoff Depth=3.48"
Flow Length=820' Tc=32.9 min CN=77 Runoff=7.36 cfs 0.964 af

Subcatchment 23F: PR DA 23F Runoff Area=0.206 ac 47.57% Impervious Runoff Depth=4.41"
Flow Length=384' Tc=1.7 min CN=86 Runoff=1.21 cfs 0.076 af

Subcatchment 23G: PR DA 23G Runoff Area=0.272 ac 39.34% Impervious Runoff Depth=4.20"
Flow Length=377' Tc=1.8 min CN=84 Runoff=1.53 cfs 0.095 af

Subcatchment 23H: PR DA 23H Runoff Area=0.307 ac 35.83% Impervious Runoff Depth=4.20"
Flow Length=458' Tc=2.2 min CN=84 Runoff=1.71 cfs 0.107 af

Subcatchment 23P: PR DA 23P Runoff Area=0.508 ac 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=1.90 cfs 0.135 af

Subcatchment 24: PR DA 24 Runoff Area=8.145 ac 0.00% Impervious Runoff Depth=3.09"
Flow Length=737' Tc=26.1 min CN=73 Runoff=17.70 cfs 2.096 af

Subcatchment 24A-1: PR DA 24A-1 Runoff Area=0.595 ac 25.71% Impervious Runoff Depth=3.88"
Flow Length=562' Tc=1.6 min CN=81 Runoff=3.16 cfs 0.193 af

Subcatchment 24A-2: PR DA 24A-2 Runoff Area=0.339 ac 28.02% Impervious Runoff Depth=4.52"
Flow Length=562' Tc=1.6 min CN=87 Runoff=2.04 cfs 0.128 af

Subcatchment 24A-3: PR DA 24A-3 Runoff Area=0.497 ac 27.36% Impervious Runoff Depth=5.30"
Flow Length=562' Tc=1.6 min CN=94 Runoff=3.32 cfs 0.219 af

Subcatchment 24A-4: PR DA 24A-4 Runoff Area=0.704 ac 18.75% Impervious Runoff Depth=3.99"
Flow Length=562' Tc=1.6 min CN=82 Runoff=3.83 cfs 0.234 af

Subcatchment 24B-1: PR DA 24B-1 Runoff Area=0.651 ac 25.35% Impervious Runoff Depth=3.88"
Flow Length=580' Tc=2.6 min CN=81 Runoff=3.33 cfs 0.211 af

Subcatchment 24B-2: PR DA 24B-2 Runoff Area=0.432 ac 22.92% Impervious Runoff Depth=4.30"
Flow Length=580' Tc=2.6 min CN=85 Runoff=2.42 cfs 0.155 af

Subcatchment 24B-3: PR DA 24B-3 Runoff Area=0.464 ac 22.63% Impervious Runoff Depth=4.96"
Flow Length=580' Tc=2.6 min CN=91 Runoff=2.88 cfs 0.192 af

Subcatchment 24B-4: PR DA 24B-4 Runoff Area=0.955 ac 19.79% Impervious Runoff Depth=3.88"
Flow Length=580' Tc=2.6 min CN=81 Runoff=4.89 cfs 0.309 af

Subcatchment 24C: PR DA 24C Runoff Area=6.956 ac 0.00% Impervious Runoff Depth=2.90"
Flow Length=700' Tc=32.6 min CN=71 Runoff=12.78 cfs 1.680 af

Subcatchment 24P: 24P Runoff Area=0.848 ac 0.00% Impervious Runoff Depth=3.48"
Tc=6.0 min CN=77 Runoff=3.46 cfs 0.246 af

Subcatchment 25: PR DA 25 Runoff Area=3.905 ac 0.00% Impervious Runoff Depth=3.09"
Flow Length=491' Tc=25.5 min CN=73 Runoff=8.57 cfs 1.005 af

Subcatchment 25A-1: PR DA 25A-1 Runoff Area=1.199 ac 23.44% Impervious Runoff Depth=3.68"
Flow Length=333' Tc=1.7 min CN=79 Runoff=6.02 cfs 0.368 af

Subcatchment 25A-2: PR DA 25A-2 Runoff Area=0.683 ac 32.06% Impervious Runoff Depth=3.88"
Flow Length=333' Tc=1.7 min CN=81 Runoff=3.61 cfs 0.221 af

Subcatchment 25B-1: PR DA 25B-1 Runoff Area=1.232 ac 21.27% Impervious Runoff Depth=3.78"
Flow Length=337' Tc=1.9 min CN=80 Runoff=6.31 cfs 0.388 af

Subcatchment 25B-2: PR DA 25B-2 Runoff Area=0.740 ac 23.11% Impervious Runoff Depth=3.78"
Flow Length=337' Tc=1.9 min CN=80 Runoff=3.79 cfs 0.233 af

Subcatchment 25C: PR DA 25C Runoff Area=3.283 ac 0.00% Impervious Runoff Depth=2.81"
Flow Length=200' Slope=0.0400 '/' Tc=16.7 min CN=70 Runoff=7.78 cfs 0.767 af

Subcatchment 25D: PR DA 25D Runoff Area=1.734 ac 0.00% Impervious Runoff Depth=2.90"
Flow Length=225' Tc=17.4 min CN=71 Runoff=4.19 cfs 0.419 af

Subcatchment 26: PR DA 26 Runoff Area=4.040 ac 0.00% Impervious Runoff Depth=3.09"
Flow Length=920' Tc=49.3 min CN=73 Runoff=6.43 cfs 1.040 af

Subcatchment 26A-1: PR DA 26A-1 Runoff Area=17,991 sf 27.15% Impervious Runoff Depth=3.78"
Flow Length=800' Tc=2.7 min CN=80 Runoff=2.06 cfs 0.130 af

Subcatchment 26A-2: PR DA 26A-2 Runoff Area=0.535 ac 26.17% Impervious Runoff Depth=3.78"
Flow Length=800' Tc=2.7 min CN=80 Runoff=2.66 cfs 0.169 af

Subcatchment 26A-3: PR DA 26A-3 Runoff Area=0.119 ac 93.28% Impervious Runoff Depth=5.64"
Flow Length=800' Tc=2.7 min CN=97 Runoff=0.78 cfs 0.056 af

Subcatchment 26B-1: PR DA 26B-1 Runoff Area=0.345 ac 28.41% Impervious Runoff Depth=3.99"
Flow Length=800' Tc=2.7 min CN=82 Runoff=1.80 cfs 0.115 af

Subcatchment 26B-2: PR DA 26B-2 Runoff Area=0.425 ac 28.47% Impervious Runoff Depth=3.99"
Flow Length=800' Tc=2.7 min CN=82 Runoff=2.22 cfs 0.141 af

Subcatchment 26B-3: PR DA 26B-3 Runoff Area=0.119 ac 93.28% Impervious Runoff Depth=5.64"
Flow Length=800' Tc=2.7 min CN=97 Runoff=0.78 cfs 0.056 af

Subcatchment 26C: PR DA 26C Runoff Area=0.445 ac 0.00% Impervious Runoff Depth=2.81"
Flow Length=236' Tc=17.4 min CN=70 Runoff=1.04 cfs 0.104 af

Subcatchment 26D: PR DA 26D Runoff Area=1.151 ac 0.00% Impervious Runoff Depth=2.81"
Flow Length=1,038' Tc=36.7 min CN=70 Runoff=1.94 cfs 0.269 af

Subcatchment 26E: PR DA 26E Runoff Area=2.170 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=735' Tc=46.1 min CN=74 Runoff=3.71 cfs 0.576 af

Subcatchment 26F: PR DA 26F Runoff Area=0.087 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=70' Slope=0.0800 '/' Tc=5.7 min CN=74 Runoff=0.33 cfs 0.023 af

Subcatchment 26G: PR DA 26G Runoff Area=1.464 ac 0.00% Impervious Runoff Depth=2.81"
Flow Length=495' Tc=25.3 min CN=70 Runoff=2.91 cfs 0.342 af

Subcatchment 28A: PR DA 28A Runoff Area=1.501 ac 21.59% Impervious Runoff Depth=3.68"
Flow Length=1,280' Tc=13.4 min CN=79 Runoff=5.11 cfs 0.460 af

Subcatchment 28B: PR DA 28B Runoff Area=0.520 ac 47.88% Impervious Runoff Depth=4.30"
Flow Length=433' Tc=1.7 min CN=85 Runoff=3.00 cfs 0.186 af

Subcatchment 28C: PR DA 28C Runoff Area=0.435 ac 100.00% Impervious Runoff Depth=5.76"
Flow Length=525' Tc=1.9 min CN=98 Runoff=2.96 cfs 0.209 af

Subcatchment 28D: PR DA 28D Runoff Area=0.231 ac 100.00% Impervious Runoff Depth=5.76"
Flow Length=335' Tc=1.7 min CN=98 Runoff=1.58 cfs 0.111 af

Subcatchment 28E: PR DA 28E Runoff Area=0.127 ac 100.00% Impervious Runoff Depth=5.76"
Flow Length=390' Tc=1.6 min CN=98 Runoff=0.87 cfs 0.061 af

Subcatchment 28F: PR DA 28F Runoff Area=3.829 ac 1.57% Impervious Runoff Depth=2.90"
Flow Length=862' Tc=28.4 min CN=71 Runoff=7.51 cfs 0.925 af

Subcatchment 28G: PR DA 28G Runoff Area=0.127 ac 100.00% Impervious Runoff Depth=5.76"
Flow Length=339' Tc=1.3 min CN=98 Runoff=0.88 cfs 0.061 af

Subcatchment 28H: PR DA 28H Runoff Area=0.126 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=305' Tc=9.6 min CN=74 Runoff=0.42 cfs 0.033 af

Subcatchment 28I: PR DA 28I Runoff Area=0.137 ac 100.00% Impervious Runoff Depth=5.76"
Flow Length=283' Tc=1.2 min CN=98 Runoff=0.95 cfs 0.066 af

Subcatchment 31: PR DA 31 Runoff Area=2.152 ac 3.39% Impervious Runoff Depth=3.18"
Flow Length=708' Tc=51.5 min CN=74 Runoff=3.45 cfs 0.571 af

Subcatchment 31A: PR DA 31A Runoff Area=0.071 ac 100.00% Impervious Runoff Depth=5.76"
Flow Length=190' Tc=0.9 min CN=98 Runoff=0.50 cfs 0.034 af

Subcatchment 31B: PR DA 31B Runoff Area=0.069 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=186' Tc=10.8 min CN=74 Runoff=0.22 cfs 0.018 af

Subcatchment 31C: PR DA 31C Runoff Area=0.080 ac 100.00% Impervious Runoff Depth=5.76"
Flow Length=150' Slope=0.0670 '/' Tc=1.0 min CN=98 Runoff=0.56 cfs 0.038 af

Subcatchment 31D: PR DA 31D Runoff Area=0.537 ac 58.47% Impervious Runoff Depth=4.63"
Flow Length=397' Tc=2.3 min CN=88 Runoff=3.22 cfs 0.207 af

Subcatchment SW21A: PR DA SW21A Runoff Area=0.814 ac 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=3.04 cfs 0.216 af

Subcatchment SW21B: PR DA SW21B Runoff Area=0.612 ac 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=2.29 cfs 0.162 af

Subcatchment SW21C: PR DA SW21C Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=0.43 cfs 0.031 af

Subcatchment SW23A: PR DA SW23A Runoff Area=0.056 ac 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=0.21 cfs 0.015 af

Subcatchment SW23B: PR DA SW23B Runoff Area=0.093 ac 0.00% Impervious Runoff Depth=3.18"
Tc=6.0 min CN=74 Runoff=0.35 cfs 0.025 af

Subcatchment SW28A: PR DA SW28A Runoff Area=0.081 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=64' Slope=0.1000 '/' Tc=4.8 min CN=74 Runoff=0.32 cfs 0.021 af

Subcatchment SW28B: PR DA SW28B Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.53 cfs 0.031 af

Subcatchment SW28C: PR DA SW28C Runoff Area=0.097 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.44 cfs 0.026 af

Subcatchment SW28D: PR DA SW28D Runoff Area=0.378 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=1.73 cfs 0.100 af

Subcatchment SW31: PR DA SW31 Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=3.18"
Flow Length=20' Slope=0.0500 '/' Tc=2.5 min CN=74 Runoff=0.25 cfs 0.016 af

Reach 30R: DP-9 Inflow=3.85 cfs 0.731 af
Outflow=3.85 cfs 0.731 af

Reach 36R: DP-1 Inflow=14.80 cfs 2.112 af
Outflow=14.80 cfs 2.112 af

Reach 41R: DP-26 Inflow=10.91 cfs 2.940 af
Outflow=10.91 cfs 2.940 af

Reach 46R: DP-25 Inflow=26.92 cfs 3.182 af
Outflow=26.92 cfs 3.182 af

Reach 51R: DP-24 Inflow=34.16 cfs 5.676 af
Outflow=34.16 cfs 5.676 af

Reach 56R: DP-23 Inflow=20.89 cfs 3.617 af
Outflow=20.89 cfs 3.617 af

Reach 61R: DP-21 Inflow=108.76 cfs 21.601 af
Outflow=108.76 cfs 21.601 af

Pond 21A-P: Pond-21A Peak Elev=1,379.09' Storage=35,615 cf Inflow=16.43 cfs 1.053 af
Primary=0.04 cfs 0.464 af Secondary=0.74 cfs 0.288 af Outflow=0.78 cfs 0.753 af

Pond 21B-P: Pond-21B Peak Elev=1,379.78' Storage=36,213 cf Inflow=14.71 cfs 0.999 af
Primary=0.90 cfs 0.901 af Secondary=0.00 cfs 0.000 af Outflow=0.90 cfs 0.901 af

Pond 23-P: Pond-23 Peak Elev=1,383.90' Storage=39,200 cf Inflow=18.47 cfs 1.916 af
Outflow=8.29 cfs 1.805 af

Pond 24-P: Pond-24 Peak Elev=1,367.28' Storage=49,146 cf Inflow=31.33 cfs 3.507 af
Primary=17.20 cfs 3.580 af Secondary=0.00 cfs 0.000 af Outflow=17.20 cfs 3.580 af

Pond 26-P: Pond-26 Peak Elev=1,373.21' Storage=46,545 cf Inflow=11.62 cfs 1.512 af
Outflow=2.54 cfs 1.431 af

Pond 28-P: Pond-28 Peak Elev=1,376.54' Storage=20,370 cf Inflow=11.79 cfs 0.875 af
Outflow=5.80 cfs 0.872 af

Pond BRA-46: BRA-46 Peak Elev=1,370.83' Storage=3,075 cf Inflow=5.24 cfs 0.344 af
Outflow=5.05 cfs 0.286 af

Pond BRA-46-FS: Flow Splitter for BRA-46 Peak Elev=1,373.33' Inflow=6.43 cfs 0.403 af
Primary=5.24 cfs 0.344 af Secondary=1.25 cfs 0.059 af Outflow=6.43 cfs 0.403 af

Pond BRA-59: BRA-59 Peak Elev=1,381.55' Storage=4,250 cf Inflow=1.91 cfs 0.209 af
Outflow=0.34 cfs 0.115 af

Pond BRA-59-FS: Flow Splitter for BRA-59 Peak Elev=1,382.53' Inflow=4.85 cfs 0.301 af
Primary=1.91 cfs 0.209 af Secondary=2.95 cfs 0.092 af Outflow=4.85 cfs 0.301 af

Pond BRA37-FS: Flow Splitter for BRA-37 Peak Elev=1,387.24' Inflow=12.58 cfs 1.594 af
Primary=6.25 cfs 0.925 af Secondary=6.33 cfs 0.669 af Outflow=12.58 cfs 1.594 af

Pond BRA37-P: BRA-37 Peak Elev=1,385.85' Storage=6,455 cf Inflow=6.25 cfs 0.925 af
Outflow=5.39 cfs 0.810 af

Pond BRA38-P: BRA-38 Peak Elev=1,385.33' Storage=5,760 cf Inflow=10.10 cfs 0.621 af
Primary=7.37 cfs 0.397 af Secondary=2.29 cfs 0.119 af Outflow=9.67 cfs 0.517 af

Pond BRA50-FS: Flow Splitter for BRA-50 Peak Elev=1,387.33' Inflow=8.61 cfs 1.353 af
Primary=3.98 cfs 0.778 af Secondary=4.64 cfs 0.574 af Outflow=8.61 cfs 1.353 af

Pond BRA50-P: BRA-50 Peak Elev=1,386.28' Storage=4,237 cf Inflow=3.98 cfs 0.778 af
Outflow=3.95 cfs 0.695 af

Pond SW21C-FS: Flow Splitter for SW21C Peak Elev=1,405.19' Inflow=3.31 cfs 0.208 af
Primary=1.77 cfs 0.157 af Secondary=1.55 cfs 0.051 af Outflow=3.31 cfs 0.208 af

Pond SW21C-P: BRA-SW21C Peak Elev=1,403.58' Storage=3,886 cf Inflow=2.13 cfs 0.188 af
Outflow=0.54 cfs 0.102 af

Pond SW23A-FS: Flow Splitter for SW23A Peak Elev=1,384.17' Inflow=1.21 cfs 0.076 af
Primary=0.58 cfs 0.057 af Secondary=0.63 cfs 0.019 af Outflow=1.21 cfs 0.076 af

Pond SW23A-P: BRA-SW23A Peak Elev=1,383.55' Storage=1,339 cf Inflow=0.75 cfs 0.072 af
Outflow=0.31 cfs 0.042 af

Pond SW23B-FS: Flow Splitter for SW23B Peak Elev=1,389.18' Inflow=3.24 cfs 0.202 af
Primary=1.72 cfs 0.153 af Secondary=1.51 cfs 0.049 af Outflow=3.24 cfs 0.202 af

Pond SW23B-P: BRA-SW23B Peak Elev=1,387.65' Storage=2,695 cf Inflow=2.01 cfs 0.178 af
Outflow=1.48 cfs 0.123 af

Pond SW28A-FS: Flow Splitter for SW28A Peak Elev=1,436.04' Inflow=1.17 cfs 0.091 af
Primary=0.58 cfs 0.079 af Secondary=0.58 cfs 0.011 af Outflow=1.17 cfs 0.091 af

Pond SW28A-P: BRA-SW28A Peak Elev=1,435.60' Storage=1,584 cf Inflow=0.85 cfs 0.101 af
Outflow=0.84 cfs 0.066 af

Pond SW28B-FS: Flow Splitter for SW28B Peak Elev=1,412.51' Inflow=2.06 cfs 0.160 af
Primary=1.03 cfs 0.138 af Secondary=1.03 cfs 0.023 af Outflow=2.06 cfs 0.160 af

Pond SW28B-P: BRA-SW28B Peak Elev=1,409.04' Storage=4,565 cf Inflow=1.49 cfs 0.168 af
Outflow=0.24 cfs 0.066 af

Pond SW28C-FS: Flow Splitter for SW28C Peak Elev=1,393.31' Inflow=4.54 cfs 0.320 af
Primary=2.34 cfs 0.287 af Secondary=2.20 cfs 0.033 af Outflow=4.54 cfs 0.320 af

Pond SW28C-P: BRA-SW28C Peak Elev=1,390.70' Storage=6,165 cf Inflow=2.71 cfs 0.313 af
Outflow=2.34 cfs 0.183 af

Pond SW31-FS: Flow Splitter for SW31 Peak Elev=1,445.28' Inflow=3.22 cfs 0.207 af
Primary=1.50 cfs 0.165 af Secondary=1.72 cfs 0.042 af Outflow=3.22 cfs 0.207 af

Pond SW31-P: BRA-SW31 Peak Elev=1,444.26' Storage=3,153 cf Inflow=1.75 cfs 0.181 af
Outflow=0.86 cfs 0.118 af

Total Runoff Area = 154.106 ac Runoff Volume = 41.335 af Average Runoff Depth = 3.22"
94.10% Pervious = 145.015 ac 5.90% Impervious = 9.091 ac

Summary for Subcatchment 21: PR DA 21

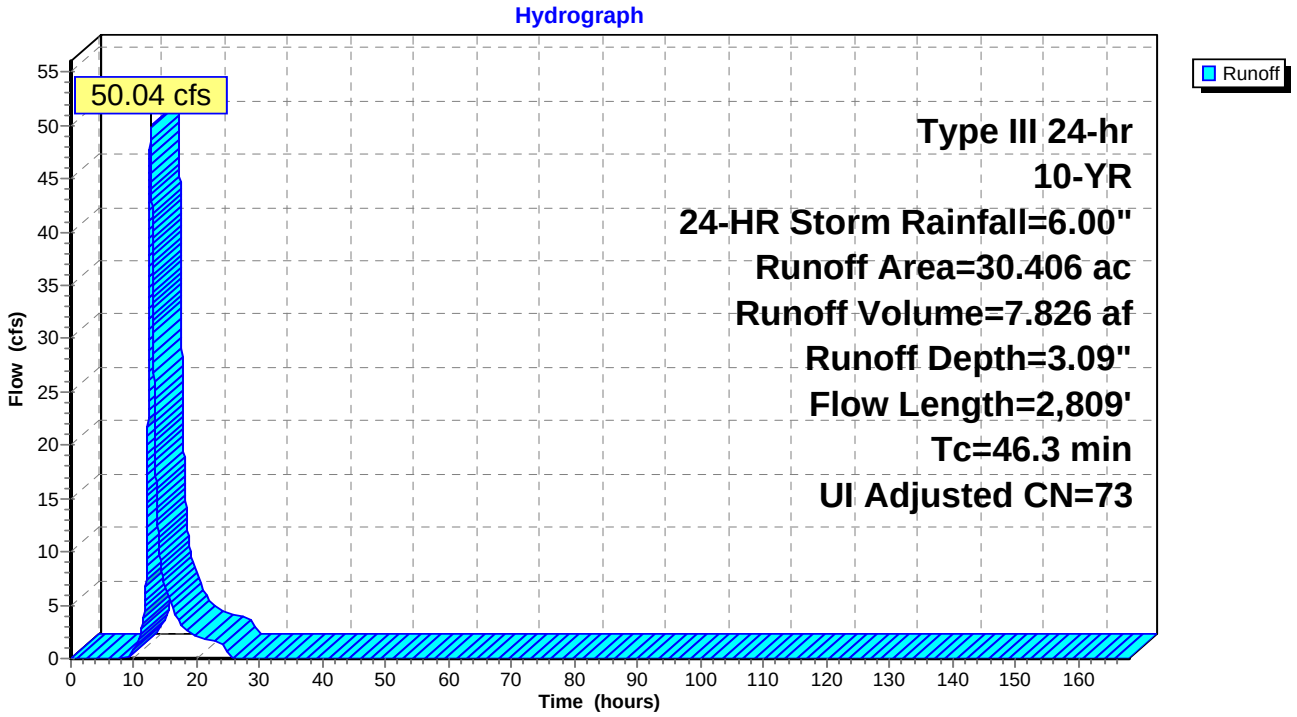
Runoff = 50.04 cfs @ 12.65 hrs, Volume= 7.826 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.695	98	Unconnected pavement, HSG C
10.838	74	>75% Grass cover, Good, HSG C
1.499	71	Meadow, non-grazed, HSG C
11.674	70	Woods, Good, HSG C
0.204	80	Pasture/grassland/range, Good, HSG D
1.601	78	Meadow, non-grazed, HSG D
3.895	77	Woods, Good, HSG D
30.406	74	Weighted Average, UI Adjusted CN = 73
29.711		97.71% Pervious Area
0.695		2.29% Impervious Area
0.695		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0467	0.28		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
31.3	1,500	0.0255	0.80		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
5.9	969	0.0114	2.75	4.13	**Channel Flow, Rivulet** Area= 1.5 sf Perim= 4.0' r= 0.38' n= 0.030
0.2	190	0.0239	12.74	64.94	**Pipe Channel, RCP_Elliptical 38x24** 38.0" x 24.0", R=31.2" Elliptical Area= 5.1 sf Perim= 8.3' r= 0.61' n= 0.013
46.3	2,809	Total			

Subcatchment 21: PR DA 21



Summary for Subcatchment 21A-1: PR DA 21A-1

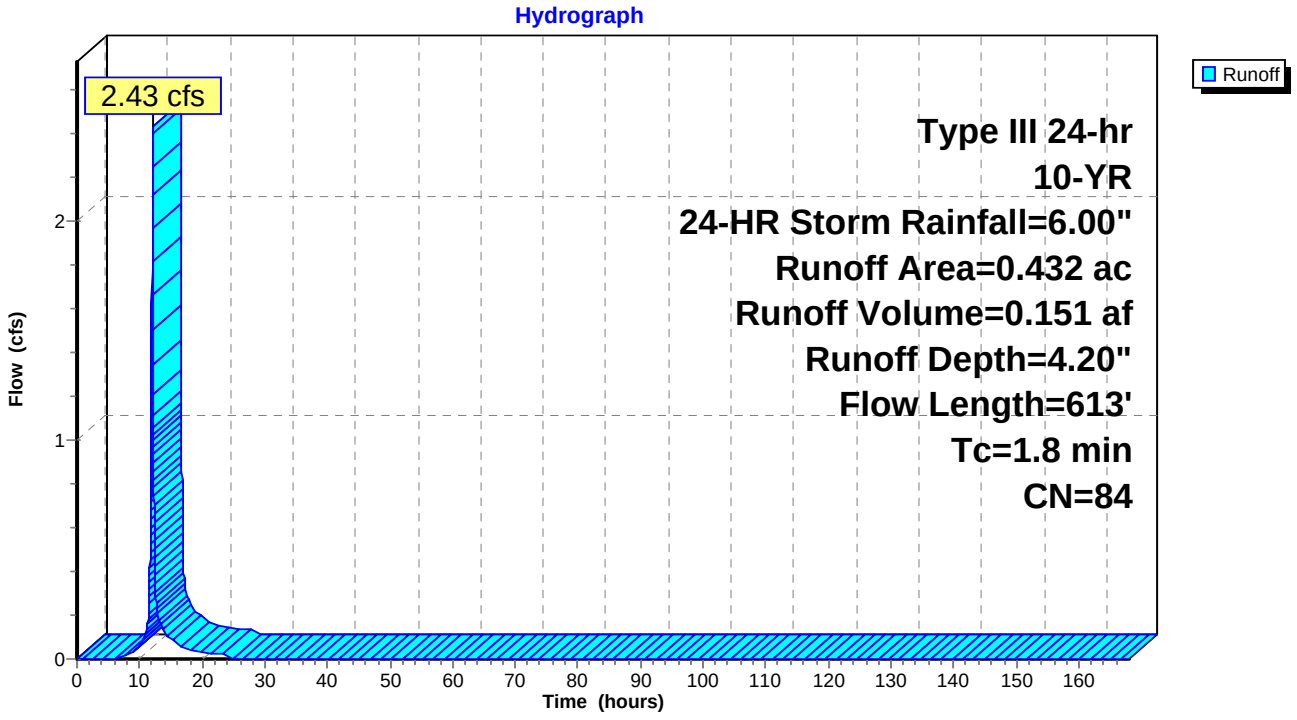
Runoff = 2.43 cfs @ 12.03 hrs, Volume= 0.151 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.242	74	>75% Grass cover, Good, HSG C
0.161	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.432	84	Weighted Average
0.271		62.73% Pervious Area
0.161		37.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.32		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	150	0.0360	7.97	65.36	**Channel Flow, SCF** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	408	0.0200	8.80	10.80	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.8	613	Total			

Subcatchment 21A-1: PR DA 21A-1



Summary for Subcatchment 21A-2: PR DA 21A-2

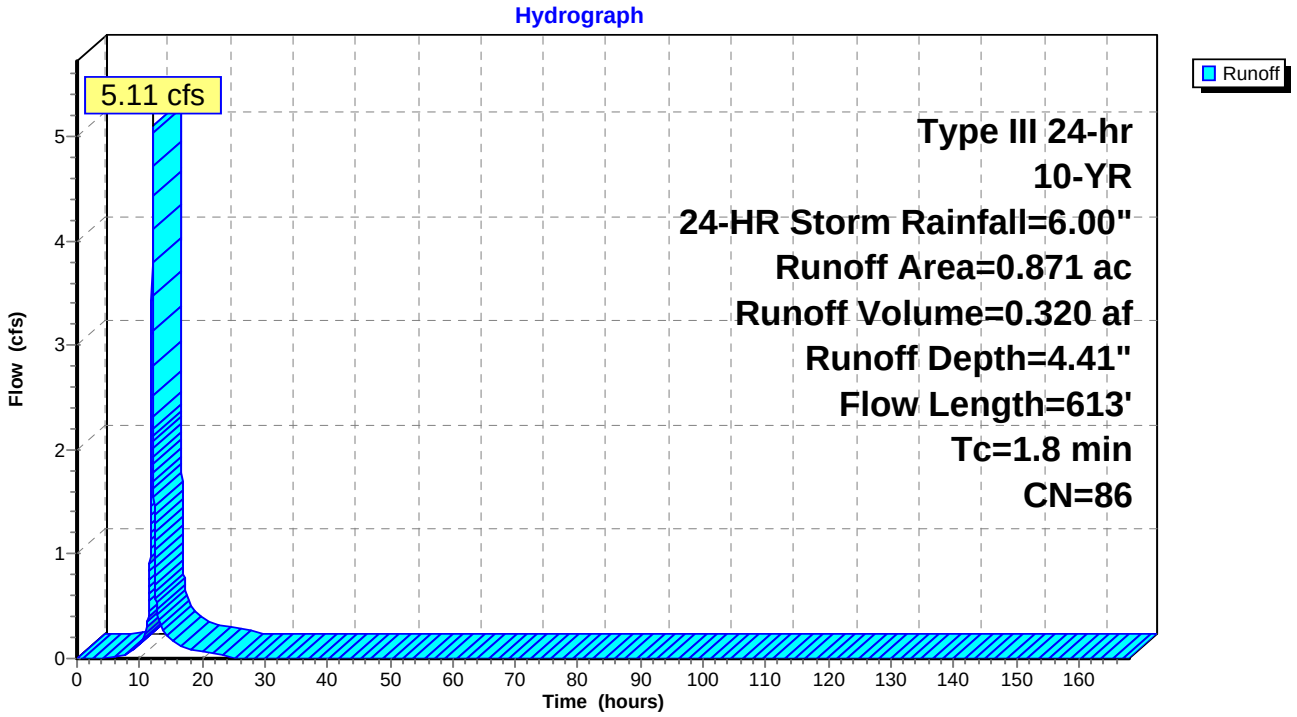
Runoff = 5.11 cfs @ 12.03 hrs, Volume= 0.320 af, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.134	74	>75% Grass cover, Good, HSG C
0.081	98	Paved roads w/curbs & sewers, HSG C
0.015	89	Gravel Shoulder, HSG C
0.374	80	>75% Grass cover, Good, HSG D
0.226	98	Paved roads w/curbs & sewers, HSG D
0.041	91	Gravel Shoulder, HSG D
0.871	86	Weighted Average
0.564		64.75% Pervious Area
0.307		35.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.32		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	150	0.0360	7.97	65.36	**Channel Flow, SCF** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	408	0.0200	8.80	10.80	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.8	613	Total			

Subcatchment 21A-2: PR DA 21A-2



Summary for Subcatchment 21B-1: PR DA 21B-1

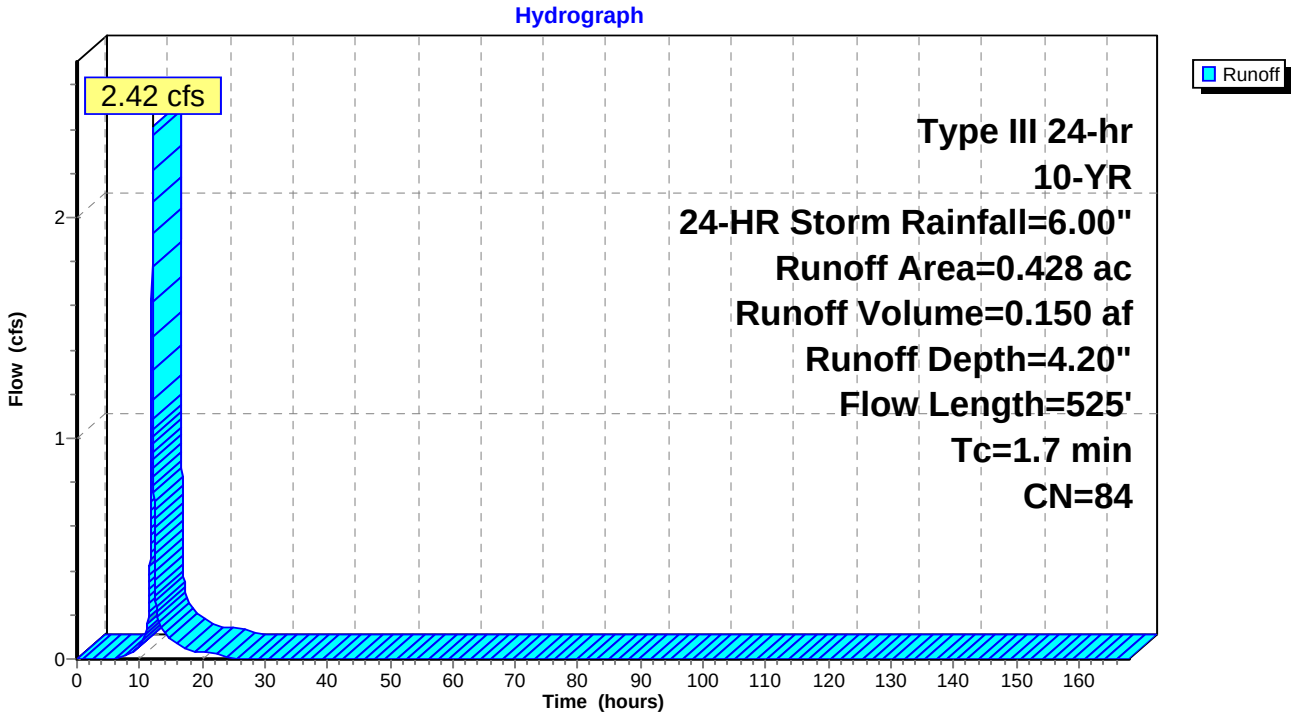
Runoff = 2.42 cfs @ 12.03 hrs, Volume= 0.150 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.232	74	>75% Grass cover, Good, HSG C
	0.166	98	Paved roads w/curbs & sewers, HSG C
*	0.030	89	Gravel Shoulder, HSG C
	0.428	84	Weighted Average
	0.262		61.21% Pervious Area
	0.166		38.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	45	0.0200	1.27		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	160	0.0300	7.28	59.66	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.7	320	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	525	Total			

Subcatchment 21B-1: PR DA 21B-1



Summary for Subcatchment 21B-2: PR DA 21B-2

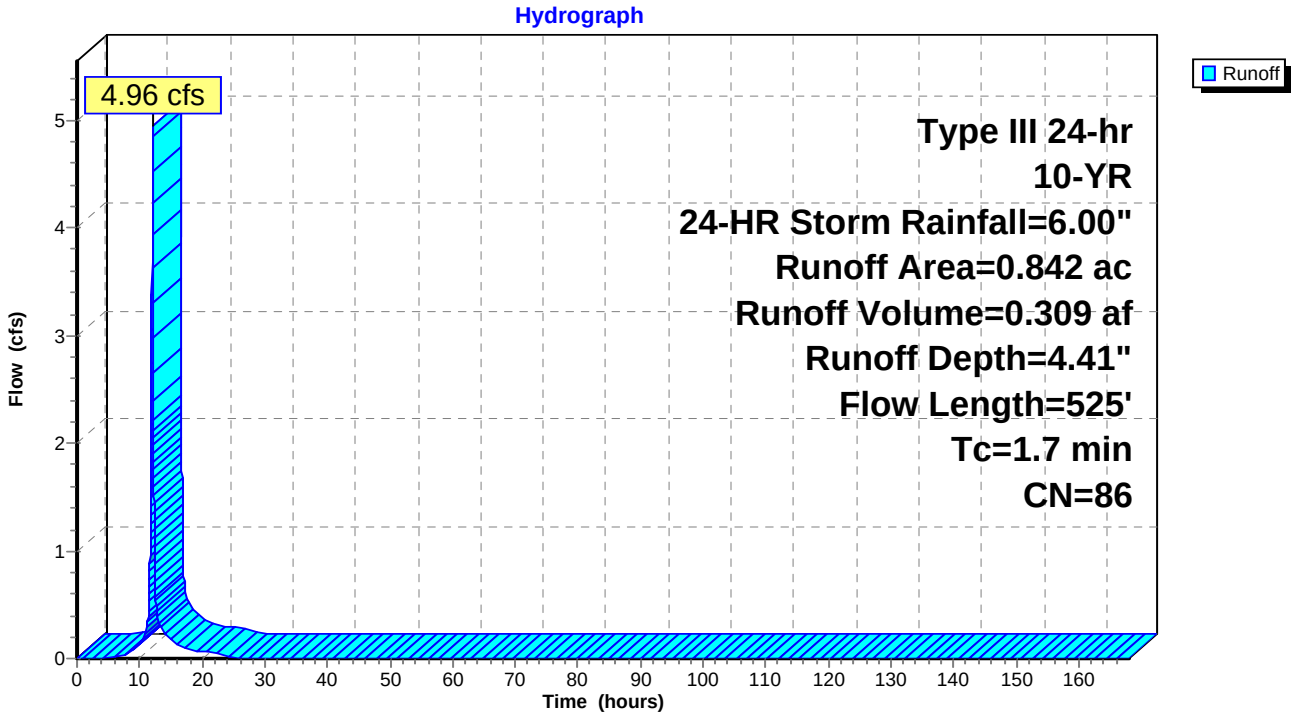
Runoff = 4.96 cfs @ 12.03 hrs, Volume= 0.309 af, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.011	70	Woods, Good, HSG C
	0.148	74	>75% Grass cover, Good, HSG C
	0.097	98	Paved roads w/curbs & sewers, HSG C
*	0.018	89	Gravel Shoulder, HSG C
	0.012	77	Woods, Good, HSG D
	0.309	80	>75% Grass cover, Good, HSG D
	0.209	98	Paved roads w/curbs & sewers, HSG D
	0.038	91	Gravel roads, HSG D
	0.842	86	Weighted Average
	0.536		63.66% Pervious Area
	0.306		36.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	45	0.0200	1.27		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	160	0.0300	7.28	59.66	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.7	320	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	525	Total			

Subcatchment 21B-2: PR DA 21B-2



Summary for Subcatchment 21C: PR DA 21C

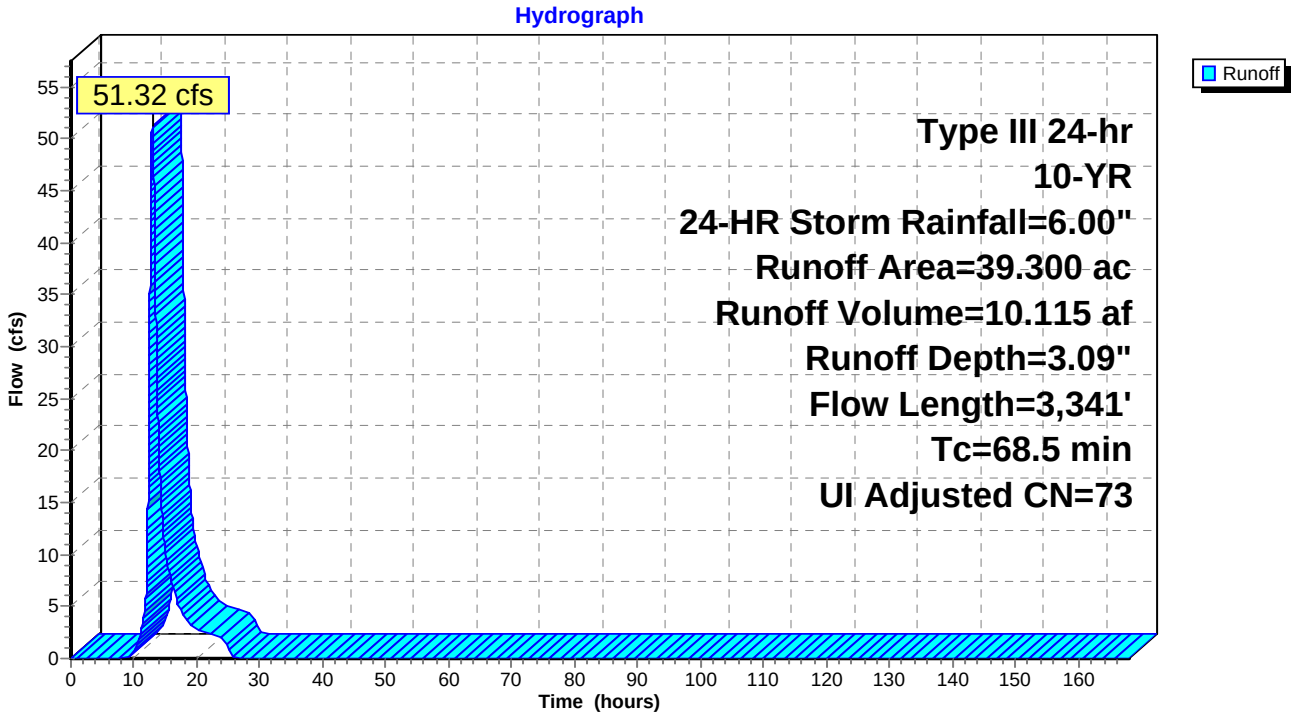
Runoff = 51.32 cfs @ 12.94 hrs, Volume= 10.115 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.541	98	Unconnected pavement, HSG C
31.045	74	>75% Grass cover, Good, HSG C
0.010	74	Pasture/grassland/range, Good, HSG C
0.136	71	Meadow, non-grazed, HSG C
7.568	70	Woods, Good, HSG C
39.300	74	Weighted Average, UI Adjusted CN = 73
38.759		98.62% Pervious Area
0.541		1.38% Impervious Area
0.541		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	150	0.0200	0.20		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
55.7	2,976	0.0317	0.89		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.3	215	0.0326	12.85	42.18	**Pipe Channel, RCP_Elliptical 30x19** 30.0" x 19.0", R=33.5" Elliptical Area= 3.3 sf Perim= 6.7' r= 0.49' n= 0.013
68.5	3,341	Total			

Subcatchment 21C: PR DA 21C



Summary for Subcatchment 21D: PR DA 21D

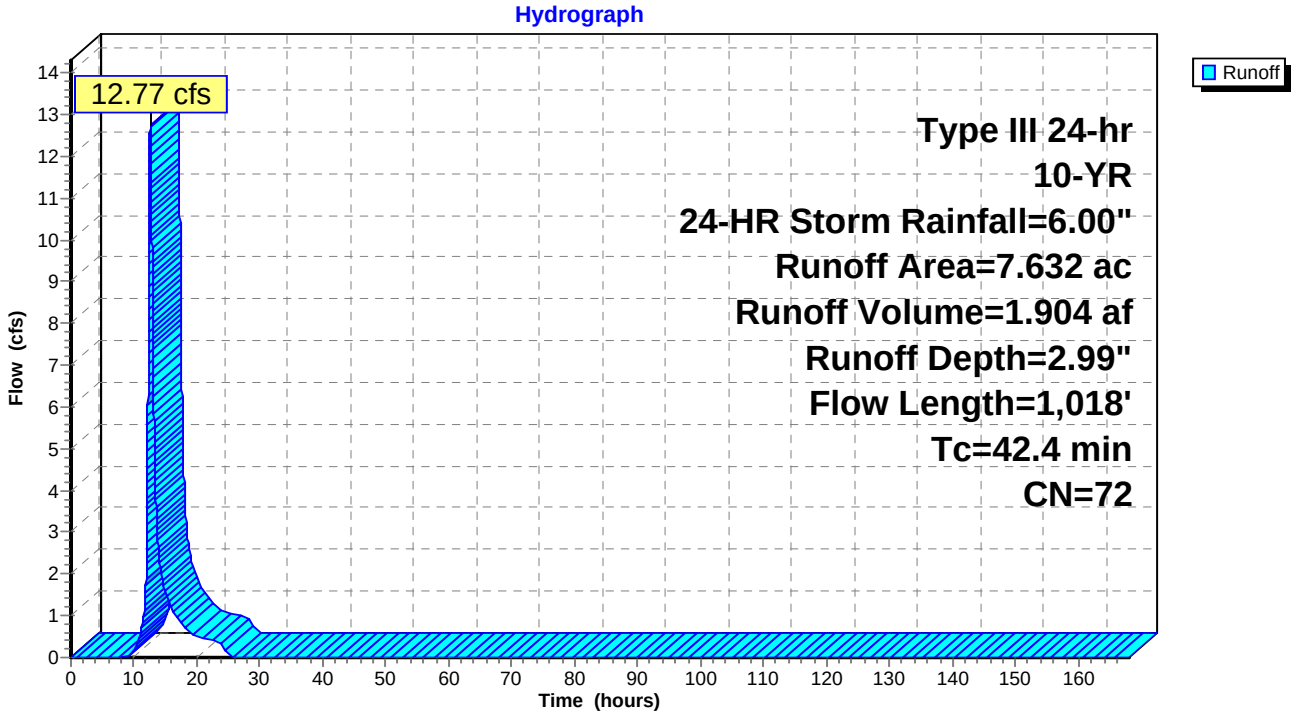
Runoff = 12.77 cfs @ 12.58 hrs, Volume= 1.904 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.065	65	Brush, Good, HSG C
0.260	74	>75% Grass cover, Good, HSG C
3.187	71	Meadow, non-grazed, HSG C
3.137	70	Woods, Good, HSG C
0.004	73	Brush, Good, HSG D
0.631	78	Meadow, non-grazed, HSG D
0.322	77	Woods, Good, HSG D
0.026	80	>75% Grass cover, Good, HSG D
7.632	72	Weighted Average
7.632		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	150	0.0300	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
19.1	868	0.0230	0.76		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
42.4	1,018	Total			

Subcatchment 21D: PR DA 21D



Summary for Subcatchment 21E-1: PR DA 21E-1

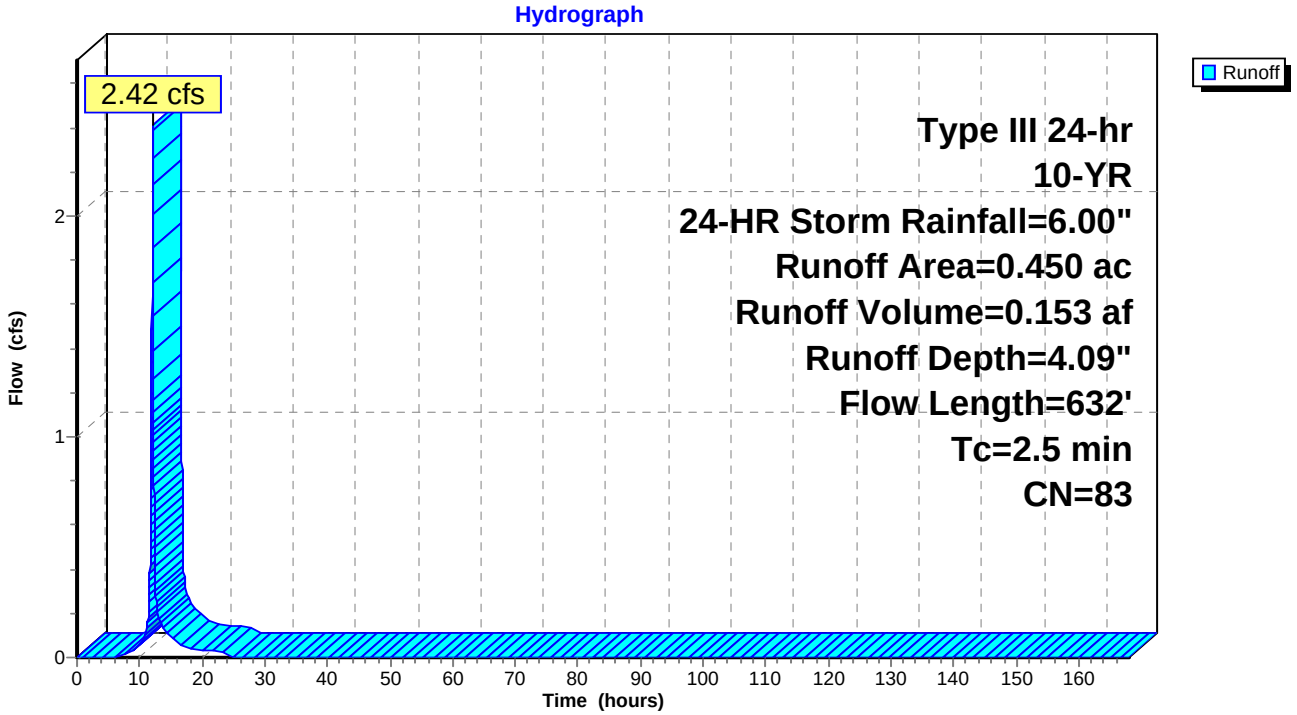
Runoff = 2.42 cfs @ 12.04 hrs, Volume= 0.153 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.007	70	Woods, Good, HSG C
	0.265	74	>75% Grass cover, Good, HSG C
	0.151	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.450	83	Weighted Average
	0.299		66.44% Pervious Area
	0.151		33.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-1: PR DA 21E-1



Summary for Subcatchment 21E-2: PR DA 21E-2

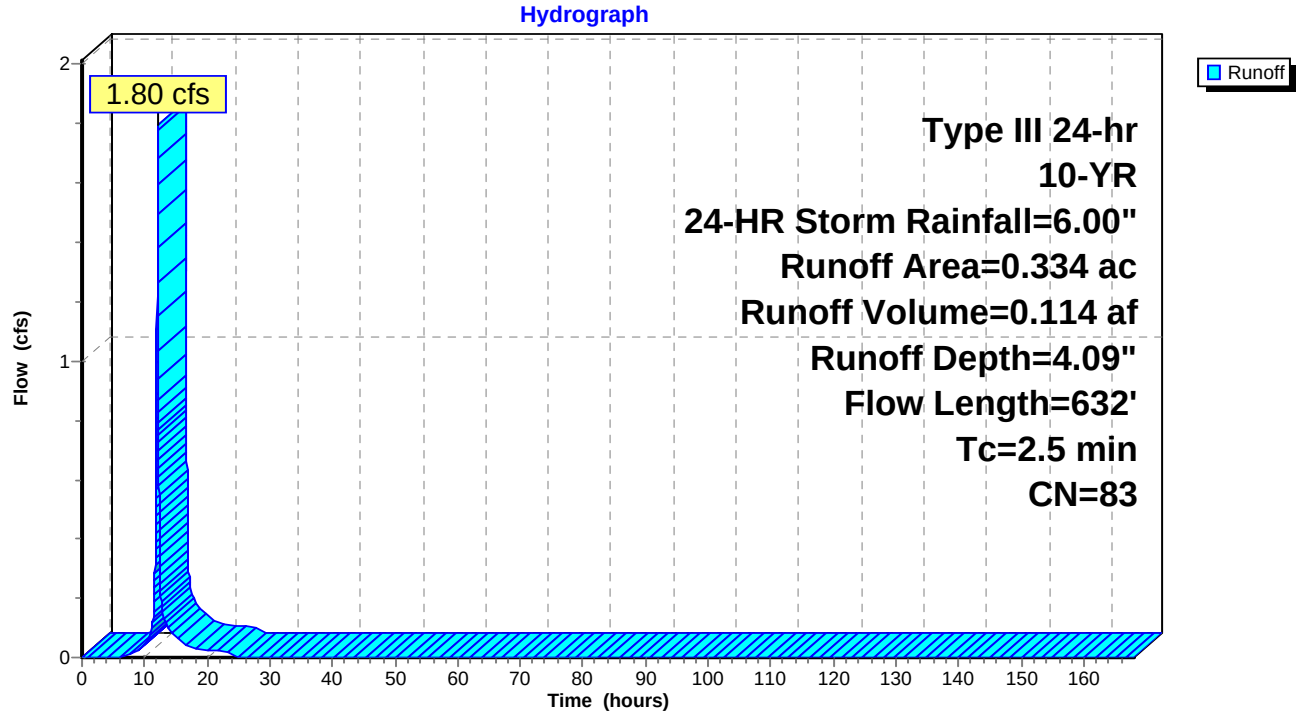
Runoff = 1.80 cfs @ 12.04 hrs, Volume= 0.114 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.005	70	Woods, Good, HSG C
	0.197	74	>75% Grass cover, Good, HSG C
	0.112	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.334	83	Weighted Average
	0.222		66.47% Pervious Area
	0.112		33.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-2: PR DA 21E-2



Summary for Subcatchment 21E-3: PR DA 21E-3

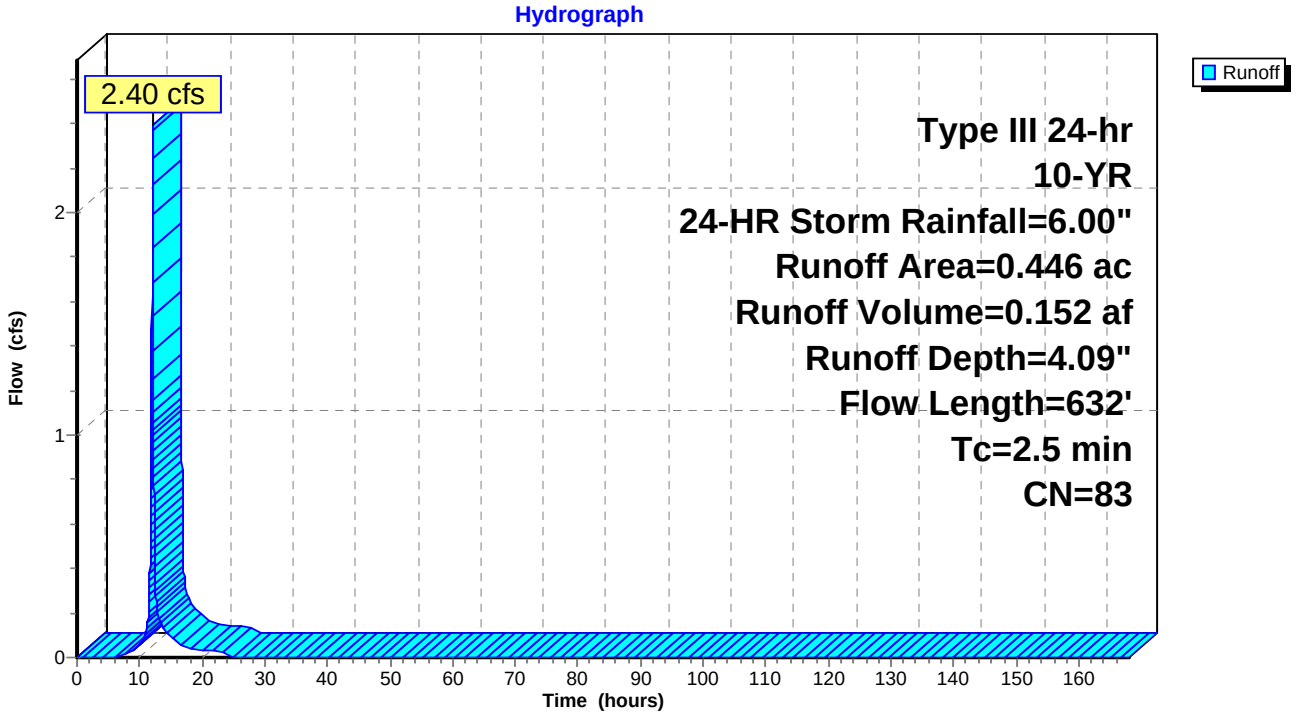
Runoff = 2.40 cfs @ 12.04 hrs, Volume= 0.152 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.006	70	Woods, Good, HSG C
	0.263	74	>75% Grass cover, Good, HSG C
	0.150	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.446	83	Weighted Average
	0.296		66.37% Pervious Area
	0.150		33.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-3: PR DA 21E-3



Summary for Subcatchment 21F-1: PR DA 21F-1

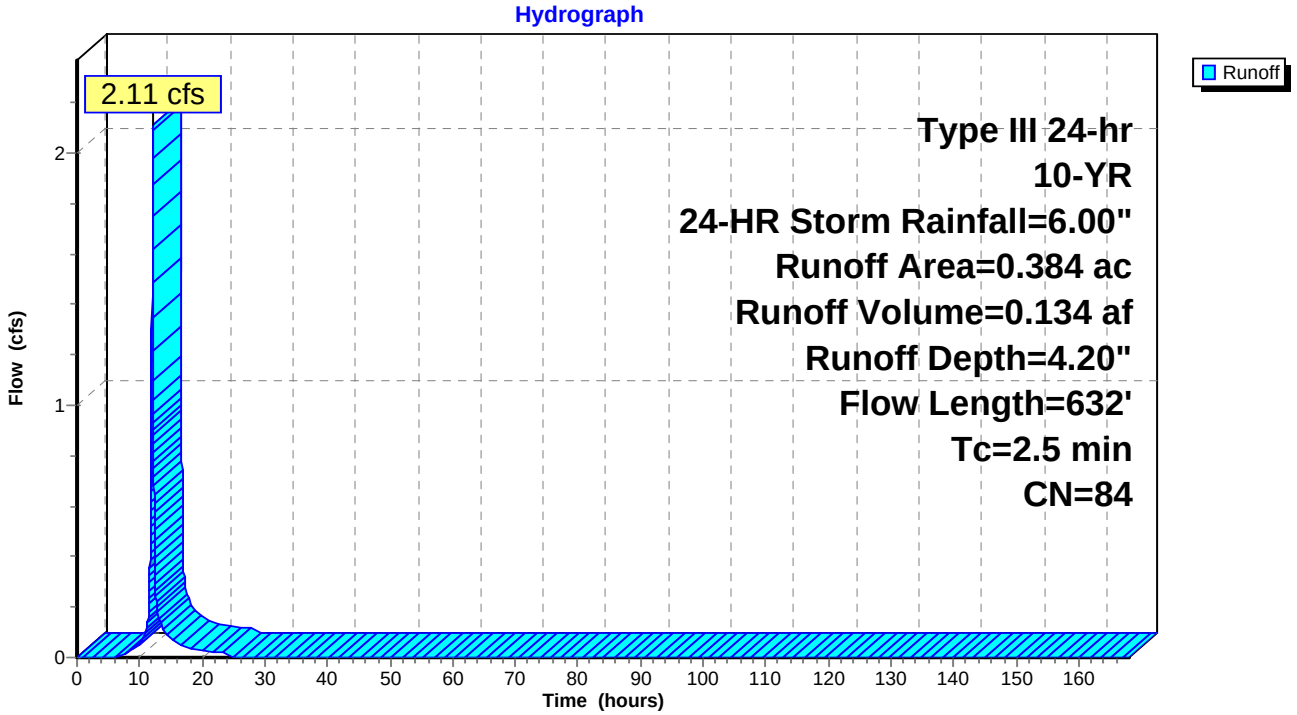
Runoff = 2.11 cfs @ 12.04 hrs, Volume= 0.134 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.004	70	Woods, Good, HSG C
	0.207	74	>75% Grass cover, Good, HSG C
	0.146	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.384	84	Weighted Average
	0.238		61.98% Pervious Area
	0.146		38.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-1: PR DA 21F-1



Summary for Subcatchment 21F-2: PR DA 21F-2

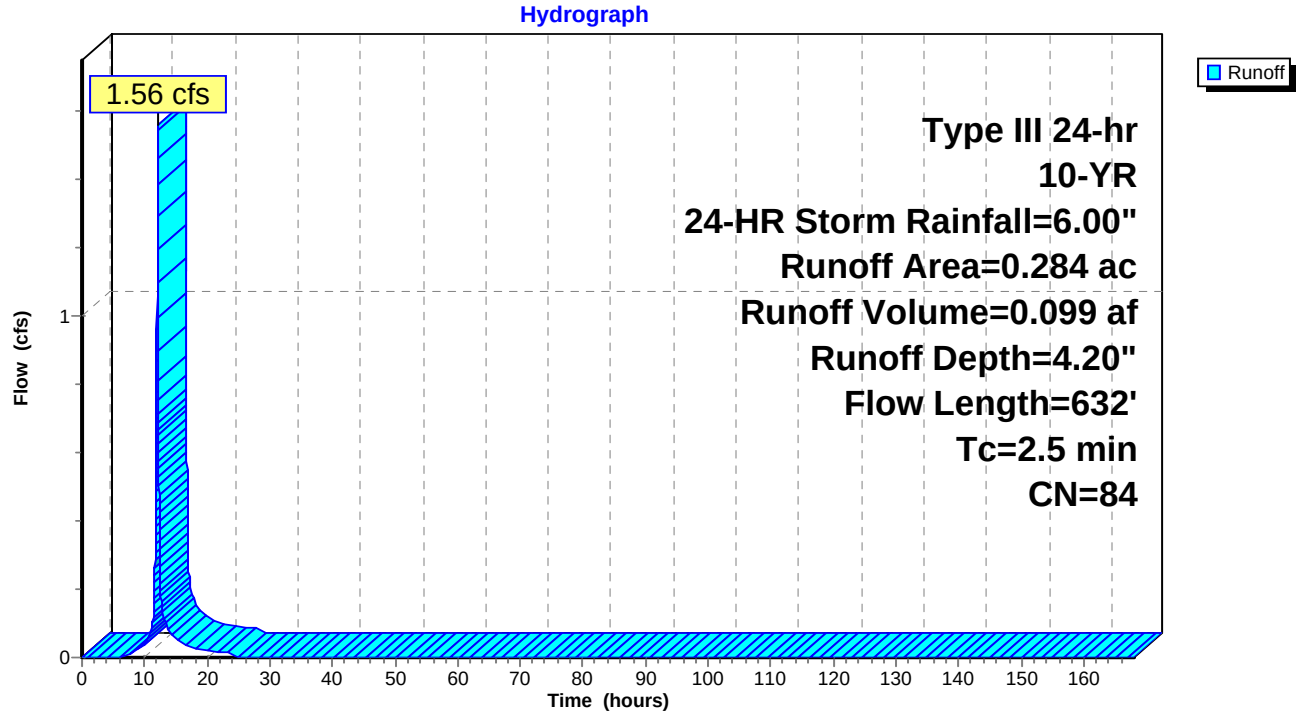
Runoff = 1.56 cfs @ 12.04 hrs, Volume= 0.099 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.003	70	Woods, Good, HSG C
	0.153	74	>75% Grass cover, Good, HSG C
	0.108	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.284	84	Weighted Average
	0.176		61.97% Pervious Area
	0.108		38.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-2: PR DA 21F-2



Summary for Subcatchment 21F-3: PR DA 21F-3

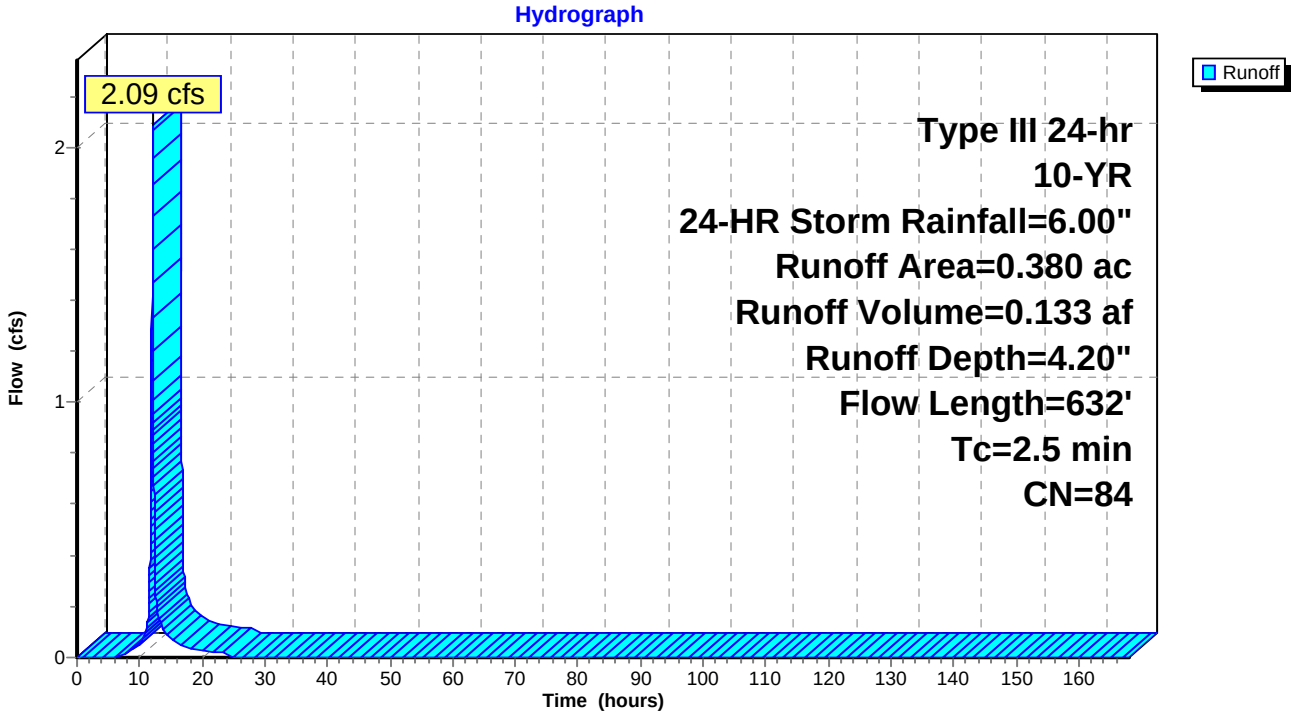
Runoff = 2.09 cfs @ 12.04 hrs, Volume= 0.133 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.004	70	Woods, Good, HSG C
	0.205	74	>75% Grass cover, Good, HSG C
	0.145	98	Paved roads w/curbs & sewers, HSG C
*	0.026	89	Gravel Shoulder, HSG C
	0.380	84	Weighted Average
	0.235		61.84% Pervious Area
	0.145		38.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-3: PR DA 21F-3



Summary for Subcatchment 21G: PR DA 21G

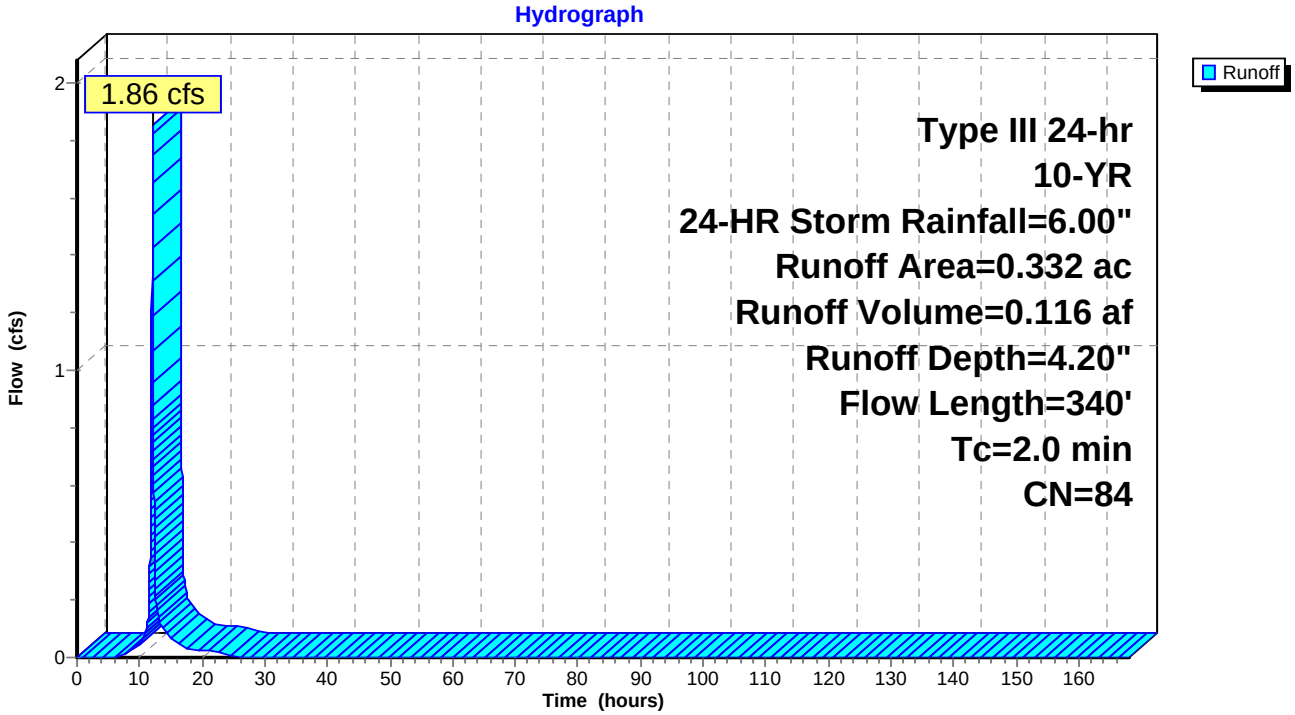
Runoff = 1.86 cfs @ 12.03 hrs, Volume= 0.116 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.187	74	>75% Grass cover, Good, HSG C
0.145	98	Paved roads w/curbs & sewers, HSG C
0.332	84	Weighted Average
0.187		56.33% Pervious Area
0.145		43.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	85	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	93	0.0500	4.54		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.2	62	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.2	100	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.0	340	Total			

Subcatchment 21G: PR DA 21G



Summary for Subcatchment 21H: PR DA 21H

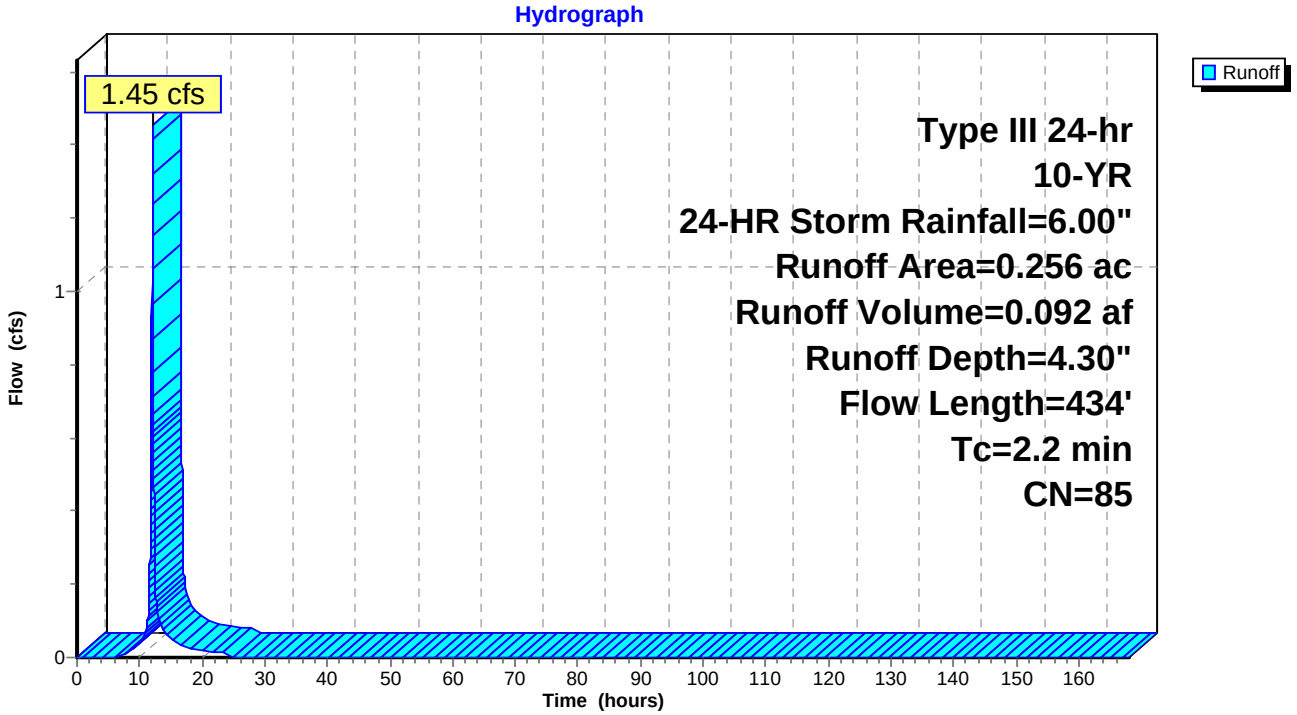
Runoff = 1.45 cfs @ 12.03 hrs, Volume= 0.092 af, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.138	74	>75% Grass cover, Good, HSG C
0.118	98	Paved roads w/curbs & sewers, HSG C
0.256	85	Weighted Average
0.138		53.91% Pervious Area
0.118		46.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	85	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	93	0.0500	4.54		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.2	62	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.4	194	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.2	434	Total			

Subcatchment 21H: PR DA 21H



Summary for Subcatchment 23: PR DA 23

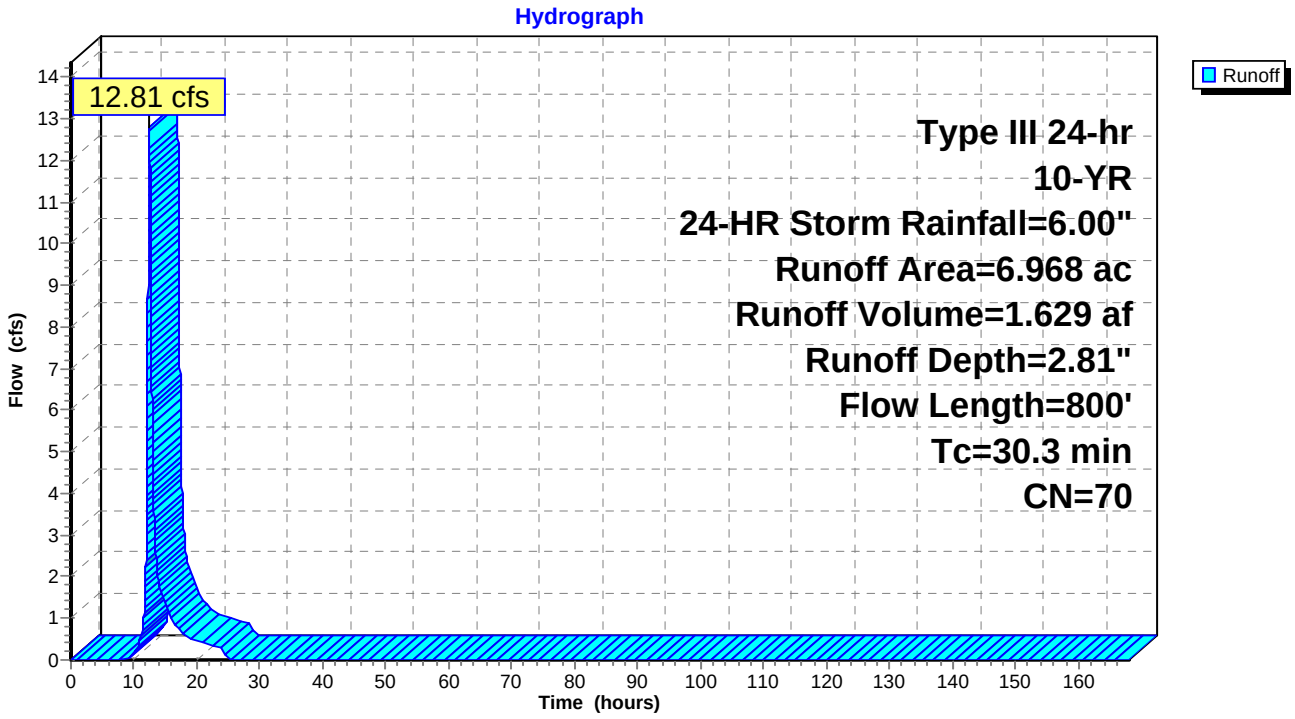
Runoff = 12.81 cfs @ 12.43 hrs, Volume= 1.629 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.415	65	Brush, Good, HSG C
0.170	74	>75% Grass cover, Good, HSG C
5.901	70	Woods, Good, HSG C
0.009	73	Brush, Good, HSG D
0.473	77	Woods, Good, HSG D
6.968	70	Weighted Average
6.968		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	150	0.0367	0.12		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
8.8	650	0.0600	1.22		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
30.3	800	Total			

Subcatchment 23: PR DA 23



Summary for Subcatchment 23A-1: PR DA 23A-1

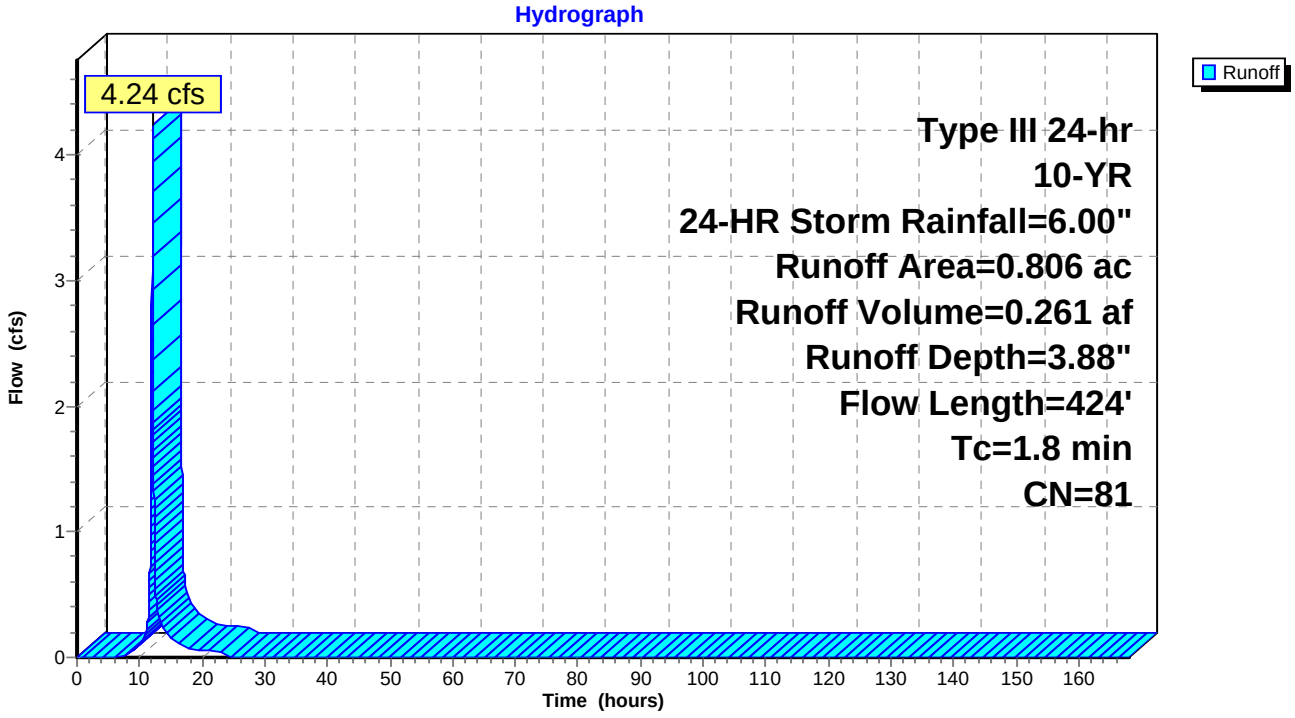
Runoff = 4.24 cfs @ 12.03 hrs, Volume= 0.261 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.562	74	>75% Grass cover, Good, HSG C
0.201	98	Paved roads w/curbs & sewers, HSG C
0.043	89	Gravel Shoulder, HSG C
0.806	81	Weighted Average
0.605		75.06% Pervious Area
0.201		24.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	62	0.0200	1.35		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
1.0	362	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.8	424	Total			

Subcatchment 23A-1: PR DA 23A-1



Summary for Subcatchment 23A-2: PR DA 23A-2

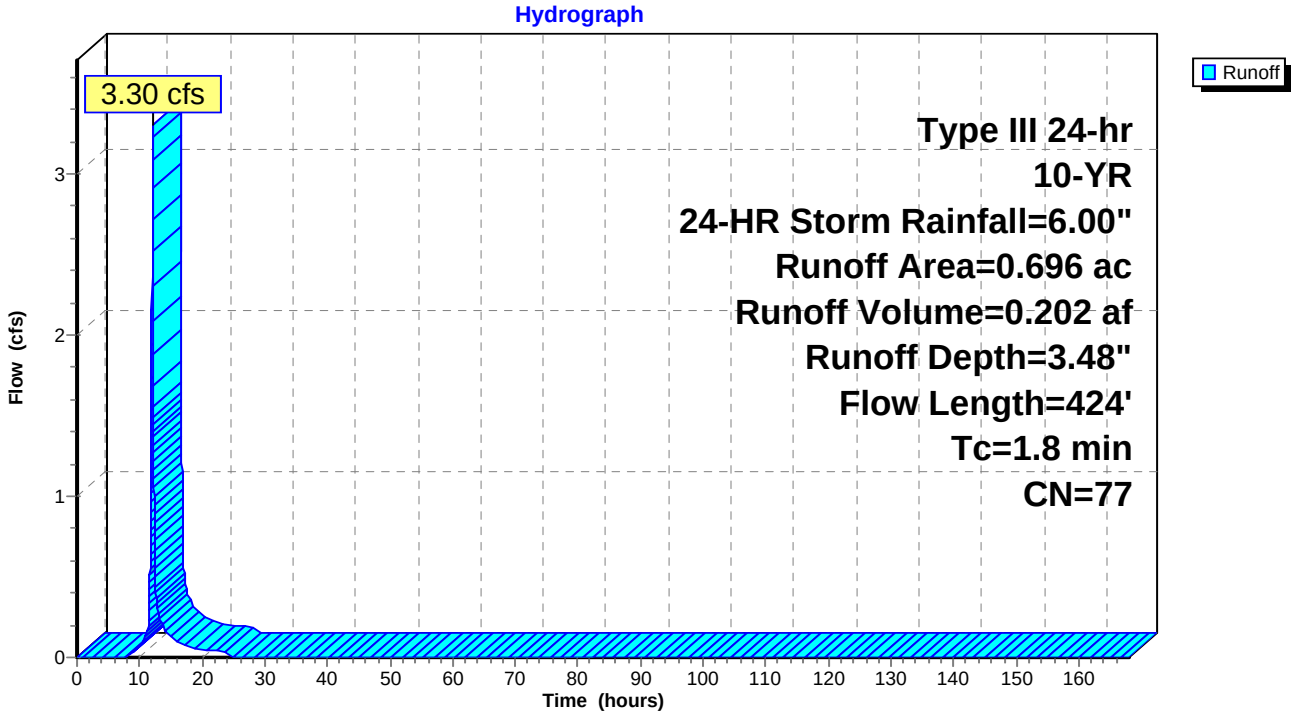
Runoff = 3.30 cfs @ 12.03 hrs, Volume= 0.202 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.593	74	>75% Grass cover, Good, HSG C
0.085	98	Paved roads w/curbs & sewers, HSG C
0.018	89	Gravel Shoulder, HSG C
0.696	77	Weighted Average
0.611		87.79% Pervious Area
0.085		12.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	62	0.0200	1.35		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
1.0	362	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.8	424	Total			

Subcatchment 23A-2: PR DA 23A-2



Summary for Subcatchment 23B-1: PR DA 23B-1

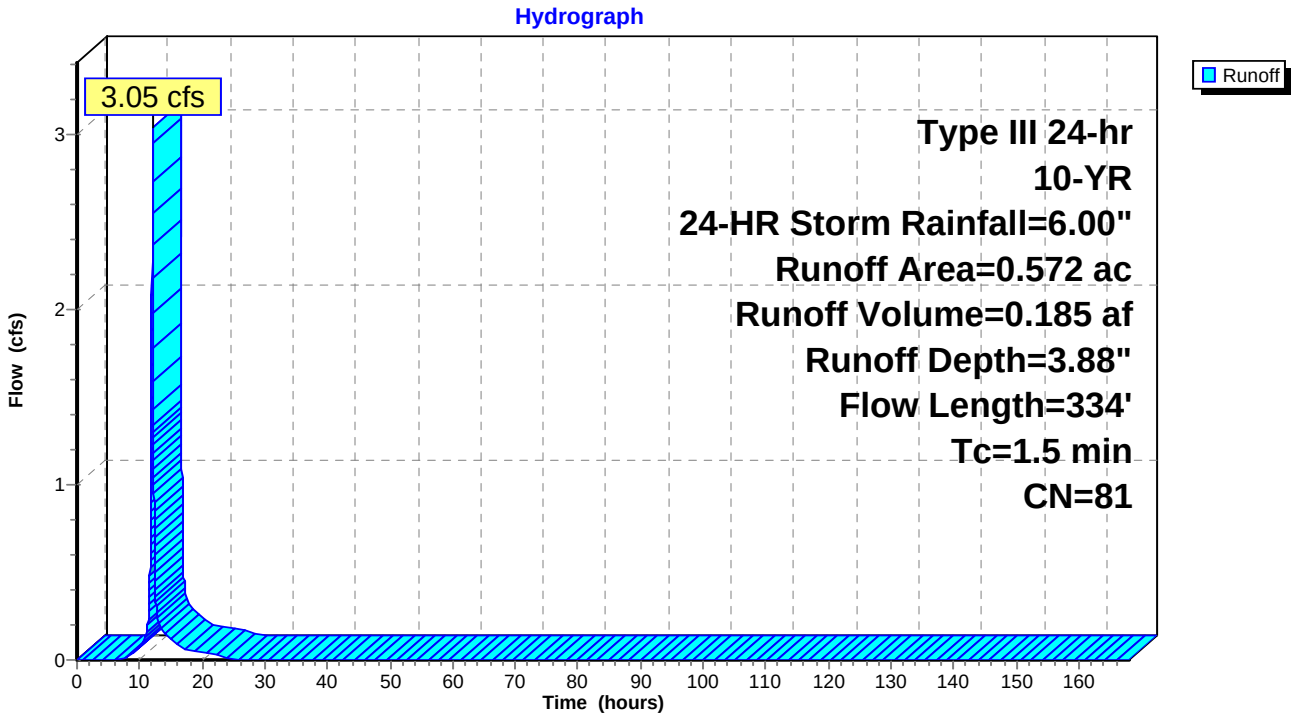
Runoff = 3.05 cfs @ 12.02 hrs, Volume= 0.185 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.005	70	Woods, Good, HSG C
0.392	74	>75% Grass cover, Good, HSG C
0.148	98	Paved roads w/curbs & sewers, HSG C
0.027	89	Gravel Shoulder, HSG C
0.572	81	Weighted Average
0.424		74.13% Pervious Area
0.148		25.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0200	1.34		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	274	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.5	334	Total			

Subcatchment 23B-1: PR DA 23B-1



Summary for Subcatchment 23B-2: PR DA 23B-2

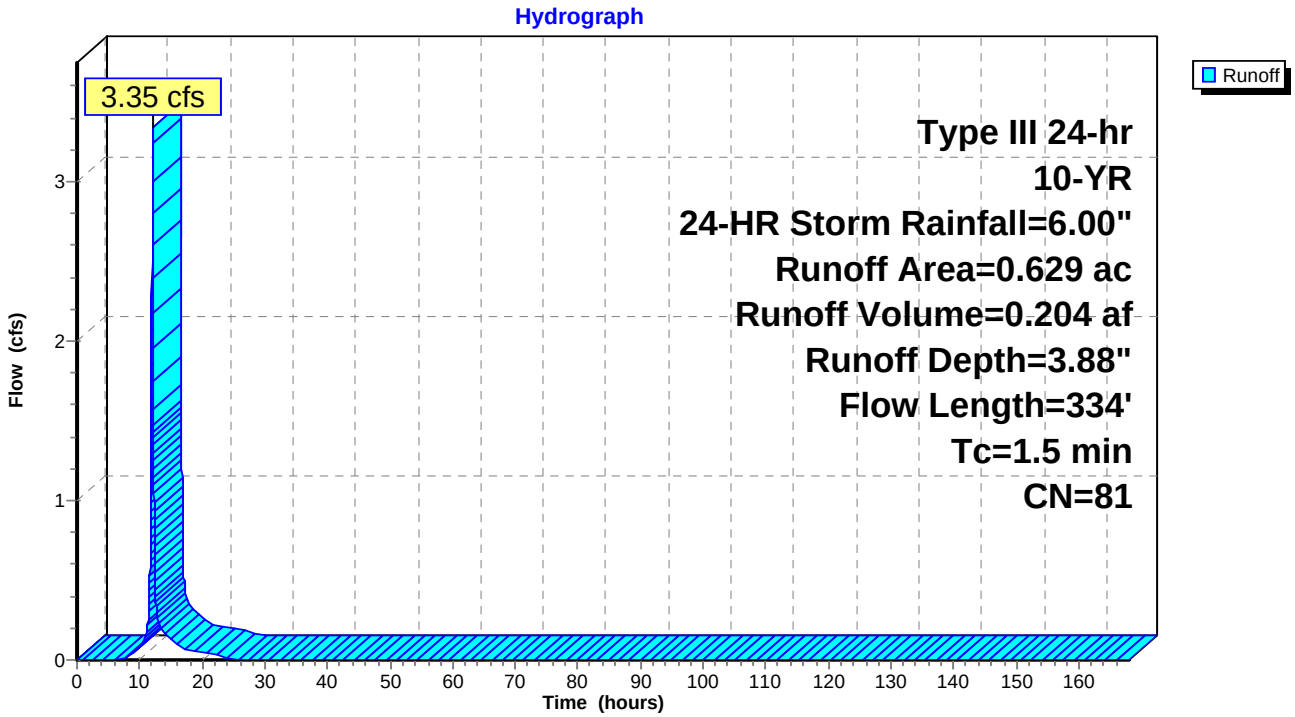
Runoff = 3.35 cfs @ 12.02 hrs, Volume= 0.204 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.005	70	Woods, Good, HSG C
0.432	74	>75% Grass cover, Good, HSG C
0.163	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.629	81	Weighted Average
0.466		74.09% Pervious Area
0.163		25.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0200	1.34		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	274	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.5	334	Total			

Subcatchment 23B-2: PR DA 23B-2



Summary for Subcatchment 23C: PR DA 23C

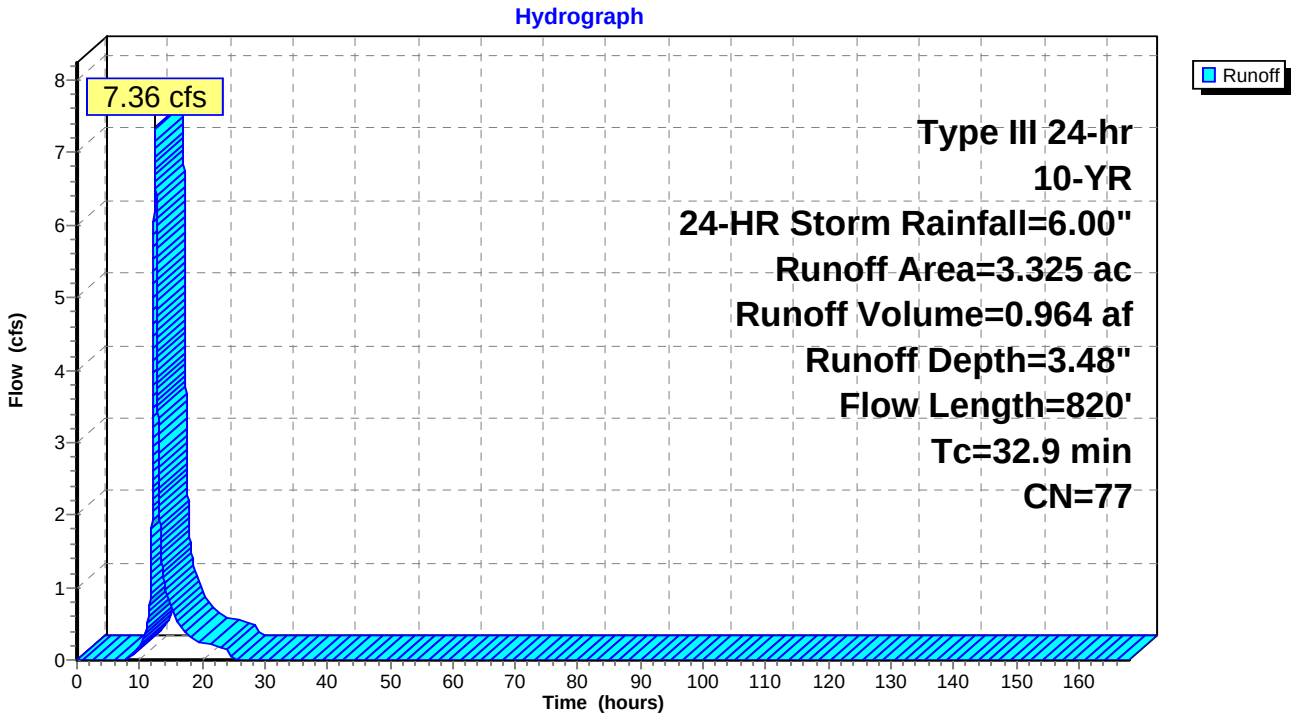
Runoff = 7.36 cfs @ 12.46 hrs, Volume= 0.964 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
3.325	77	Woods, Good, HSG D
3.325		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	150	0.0233	0.10		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
6.3	380	0.0400	1.00		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.5	165	0.0200	5.94	48.71	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	125	0.0200	7.44	9.14	**Pipe Channel, Pipe Crossing** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
32.9	820	Total			

Subcatchment 23C: PR DA 23C



Summary for Subcatchment 23F: PR DA 23F

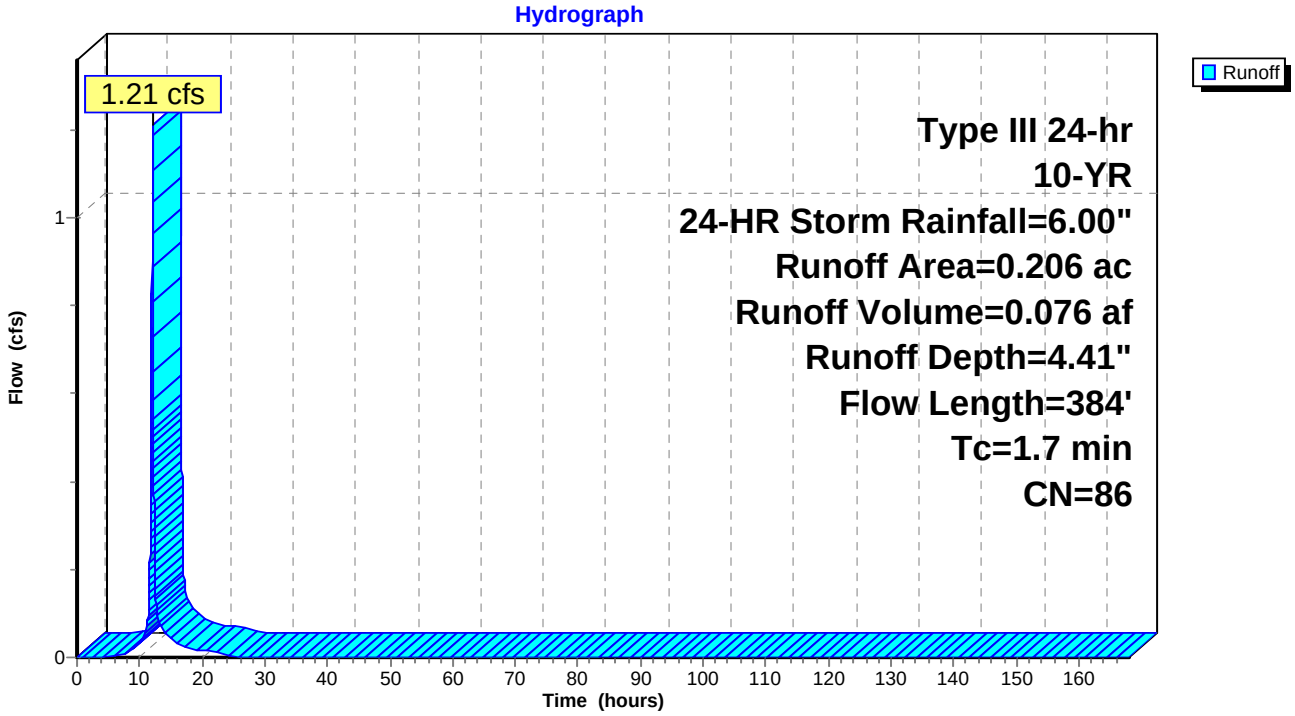
Runoff = 1.21 cfs @ 12.03 hrs, Volume= 0.076 af, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.099	74	>75% Grass cover, Good, HSG C
	0.098	98	Paved roads w/curbs & sewers, HSG C
*	0.009	89	Gravel Shoulder, HSG C
	0.206	86	Weighted Average
	0.108		52.43% Pervious Area
	0.098		47.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0100	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.75"
0.9	334	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	384	Total			

Subcatchment 23F: PR DA 23F



Summary for Subcatchment 23G: PR DA 23G

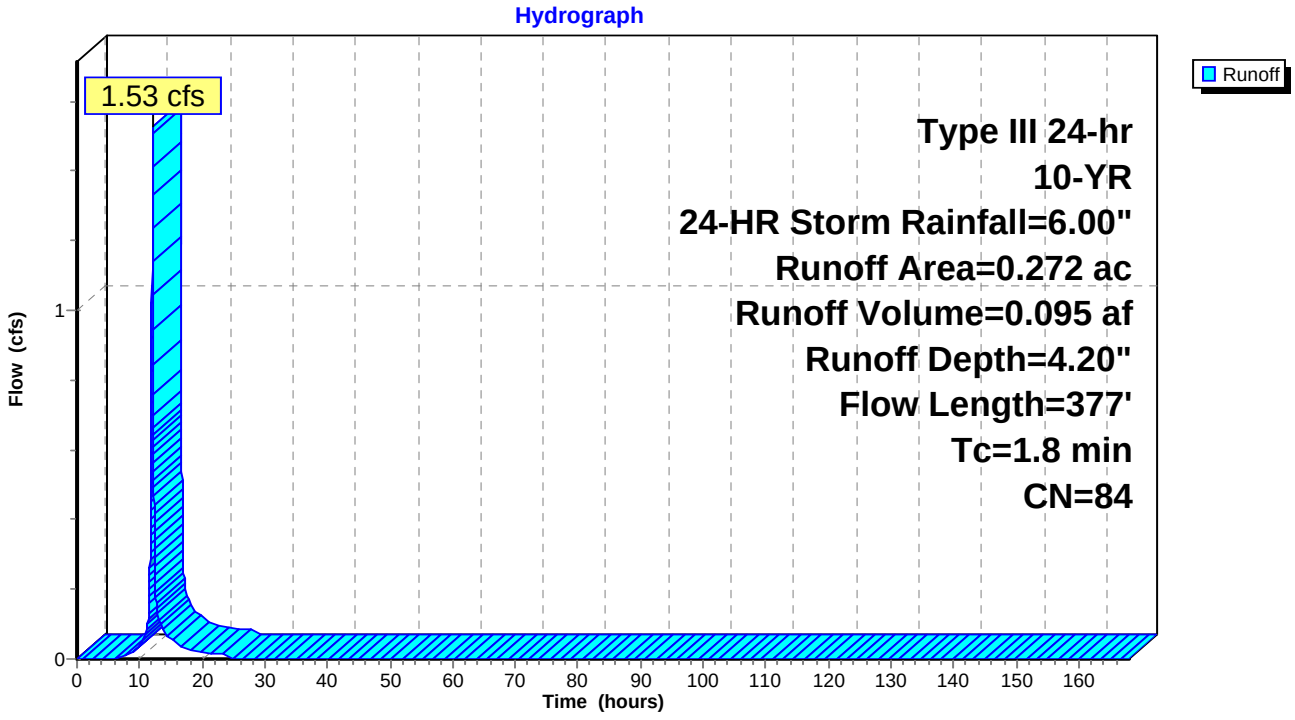
Runoff = 1.53 cfs @ 12.03 hrs, Volume= 0.095 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.146	74	>75% Grass cover, Good, HSG C
	0.107	98	Paved roads w/curbs & sewers, HSG C
*	0.019	89	Gravel Shoulder, HSG C
	0.272	84	Weighted Average
	0.165		60.66% Pervious Area
	0.107		39.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	64	0.0100	1.03		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.5	182	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	131	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	377	Total			

Subcatchment 23G: PR DA 23G



Summary for Subcatchment 23H: PR DA 23H

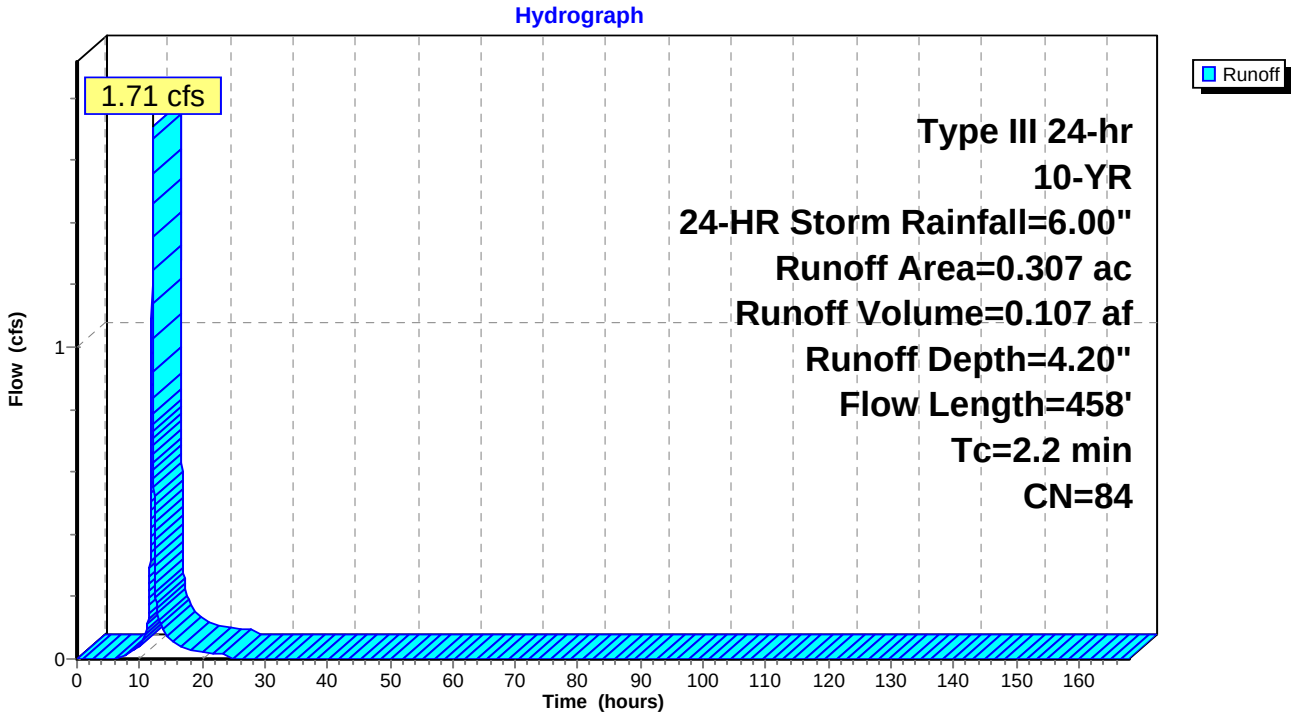
Runoff = 1.71 cfs @ 12.03 hrs, Volume= 0.107 af, Depth= 4.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.177	74	>75% Grass cover, Good, HSG C
	0.110	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.307	84	Weighted Average
	0.197		64.17% Pervious Area
	0.110		35.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	83	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	135	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.5	240	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.2	458	Total			

Subcatchment 23H: PR DA 23H



Summary for Subcatchment 23P: PR DA 23P

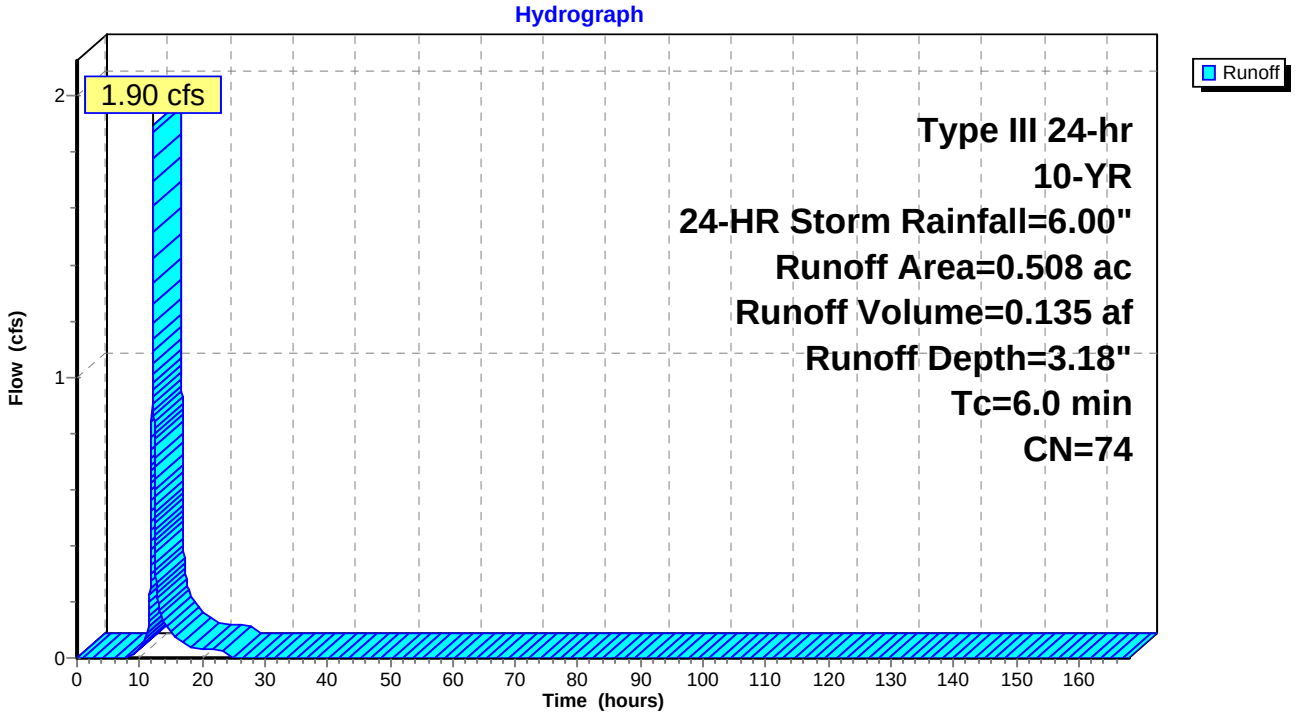
Runoff = 1.90 cfs @ 12.09 hrs, Volume= 0.135 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.508	74	>75% Grass cover, Good, HSG C
0.508		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 23P: PR DA 23P



Summary for Subcatchment 24: PR DA 24

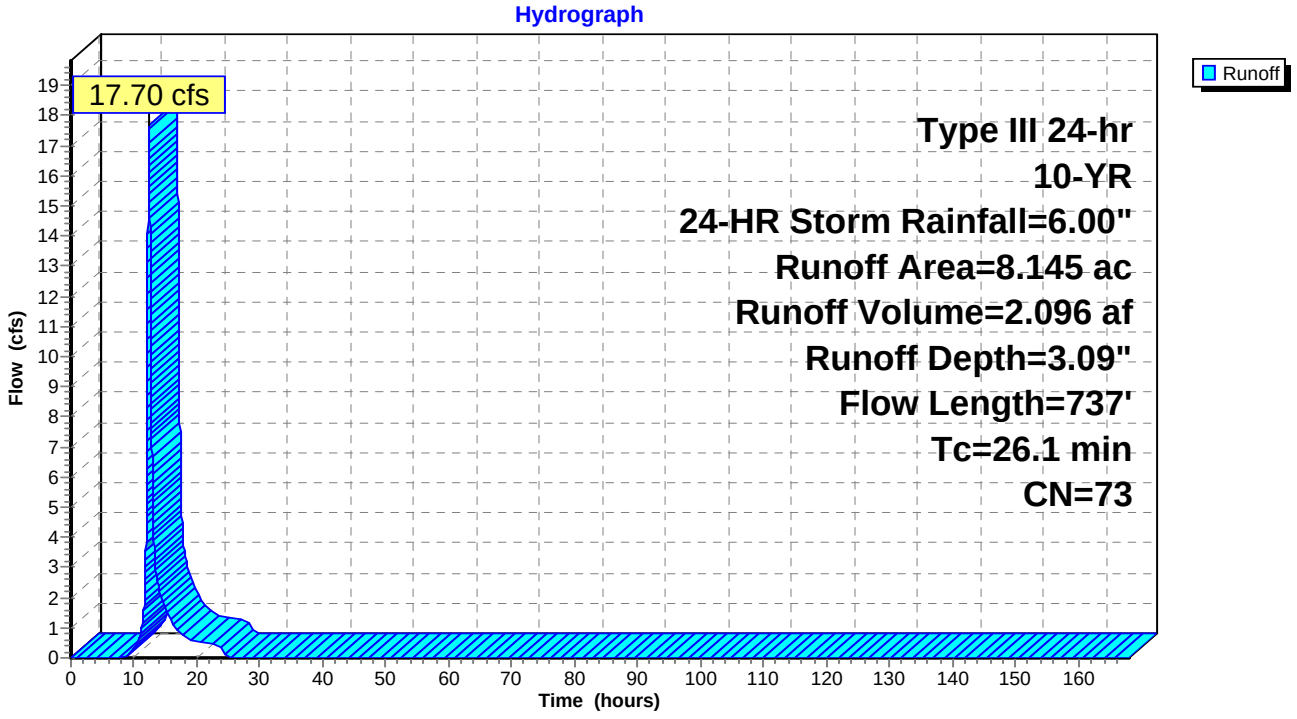
Runoff = 17.70 cfs @ 12.38 hrs, Volume= 2.096 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
4.719	70	Woods, Good, HSG C
0.090	96	Gravel surface, HSG D
3.336	77	Woods, Good, HSG D
8.145	73	Weighted Average
8.145		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	150	0.0533	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
7.6	587	0.0665	1.29		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
26.1	737	Total			

Subcatchment 24: PR DA 24



Summary for Subcatchment 24A-1: PR DA 24A-1

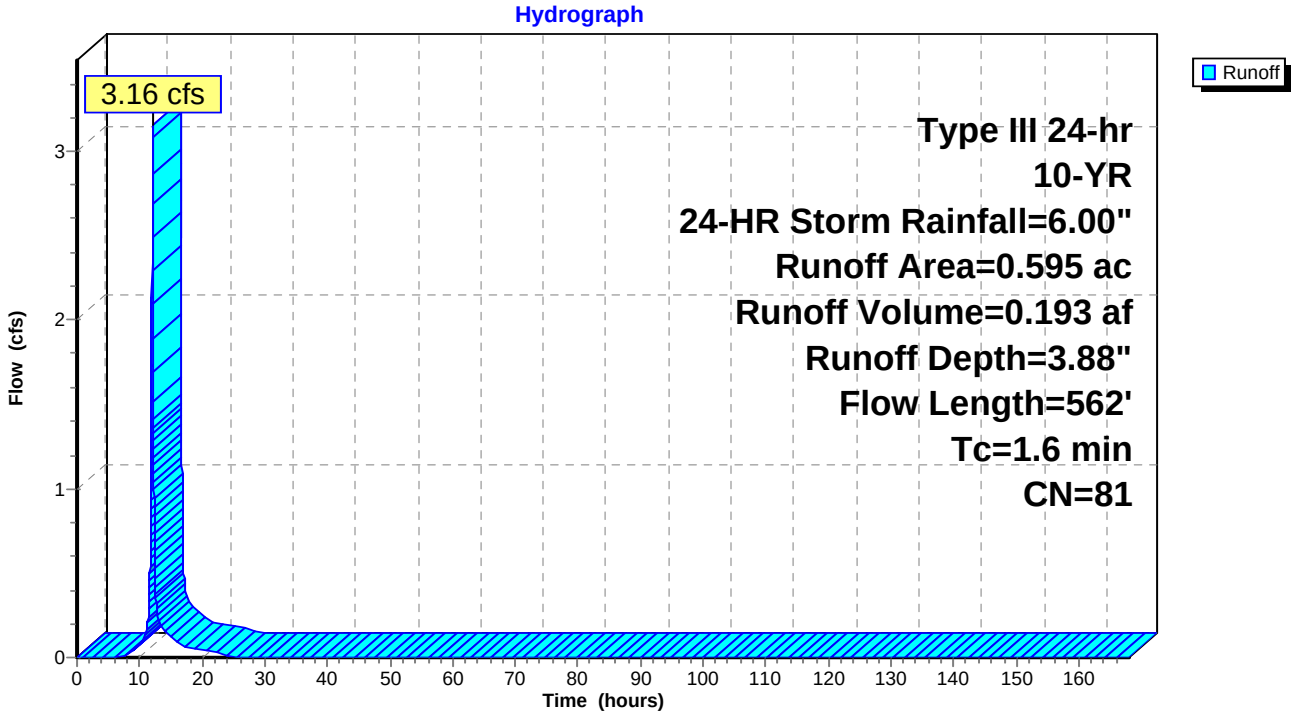
Runoff = 3.16 cfs @ 12.02 hrs, Volume= 0.193 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.003	70	Woods, Good, HSG C
0.411	74	>75% Grass cover, Good, HSG C
0.153	98	Paved roads w/curbs & sewers, HSG C
0.028	89	Gravel roads, HSG C
0.595	81	Weighted Average
0.442		74.29% Pervious Area
0.153		25.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-1: PR DA 24A-1



Summary for Subcatchment 24A-2: PR DA 24A-2

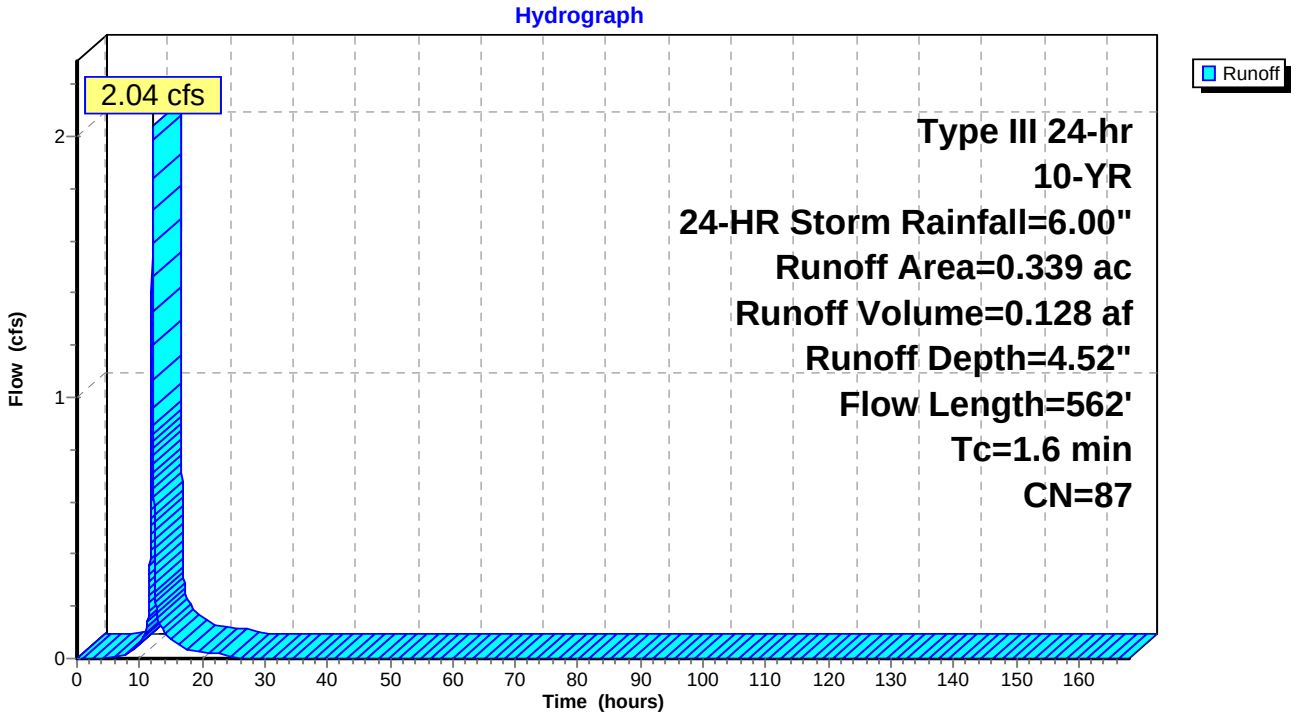
Runoff = 2.04 cfs @ 12.02 hrs, Volume= 0.128 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.053	74	>75% Grass cover, Good, HSG C
0.020	98	Paved roads w/curbs & sewers, HSG C
0.004	89	Gravel roads, HSG C
0.053	96	Gravel surface, HSG D
0.001	77	Woods, Good, HSG D
0.119	80	>75% Grass cover, Good, HSG D
0.075	98	Paved roads w/curbs & sewers, HSG D
0.014	91	Gravel Shoulder, HSG D
0.339	87	Weighted Average
0.244		71.98% Pervious Area
0.095		28.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-2: PR DA 24A-2



Summary for Subcatchment 24A-3: PR DA 24A-3

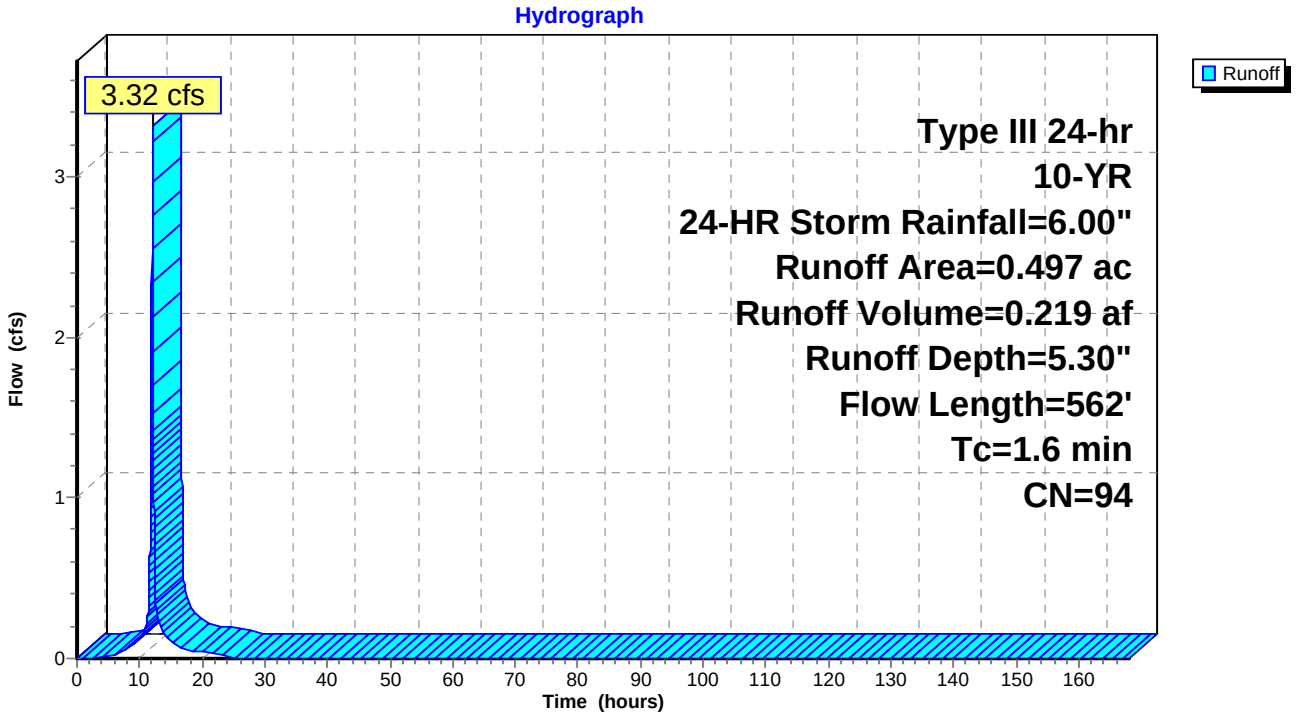
Runoff = 3.32 cfs @ 12.02 hrs, Volume= 0.219 af, Depth= 5.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.282	96	Gravel surface, HSG D
0.028	77	Woods, Good, HSG D
0.026	80	>75% Grass cover, Good, HSG D
0.136	98	Paved roads w/curbs & sewers, HSG D
0.025	91	Gravel Shoulder, HSG D
0.497	94	Weighted Average
0.361		72.64% Pervious Area
0.136		27.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-3: PR DA 24A-3



Summary for Subcatchment 24A-4: PR DA 24A-4

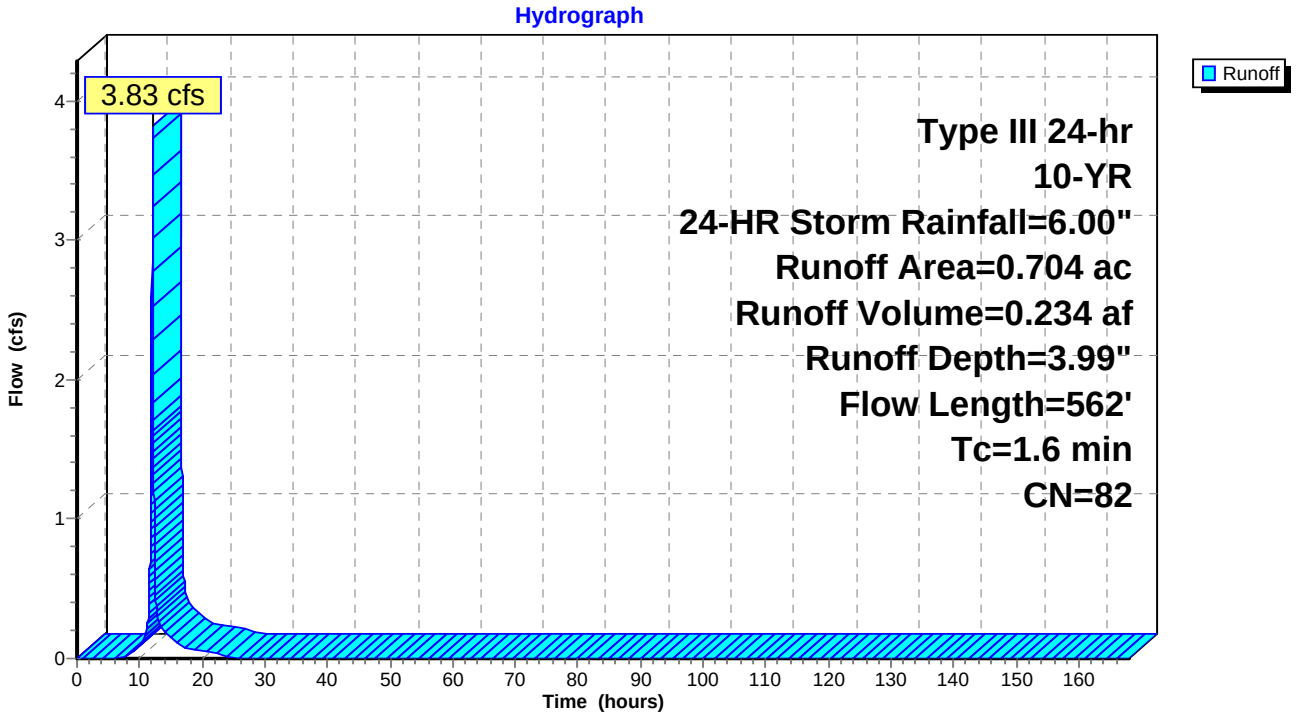
Runoff = 3.83 cfs @ 12.02 hrs, Volume= 0.234 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.127	74	>75% Grass cover, Good, HSG C
0.017	98	Paved roads w/curbs & sewers, HSG C
0.003	89	Gravel roads, HSG C
0.005	96	Gravel surface, HSG D
0.222	77	Woods, Good, HSG D
0.193	80	>75% Grass cover, Good, HSG D
0.115	98	Paved roads w/curbs & sewers, HSG D
0.021	91	Gravel Shoulder, HSG D
0.704	82	Weighted Average
0.572		81.25% Pervious Area
0.132		18.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-4: PR DA 24A-4



Summary for Subcatchment 24B-1: PR DA 24B-1

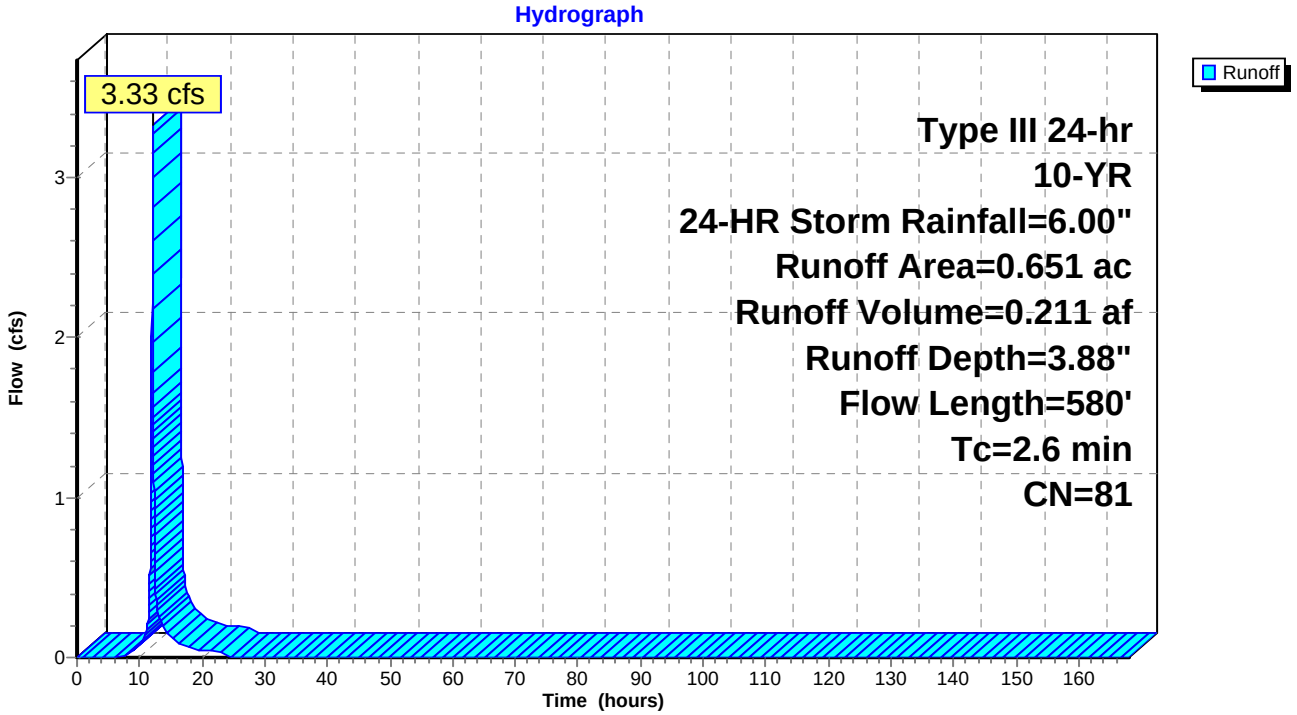
Runoff = 3.33 cfs @ 12.04 hrs, Volume= 0.211 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.455	74	>75% Grass cover, Good, HSG C
0.165	98	Paved roads w/curbs & sewers, HSG C
0.030	89	Gravel Shoulder, HSG C
0.651	81	Weighted Average
0.486		74.65% Pervious Area
0.165		25.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-1: PR DA 24B-1



Summary for Subcatchment 24B-2: PR DA 24B-2

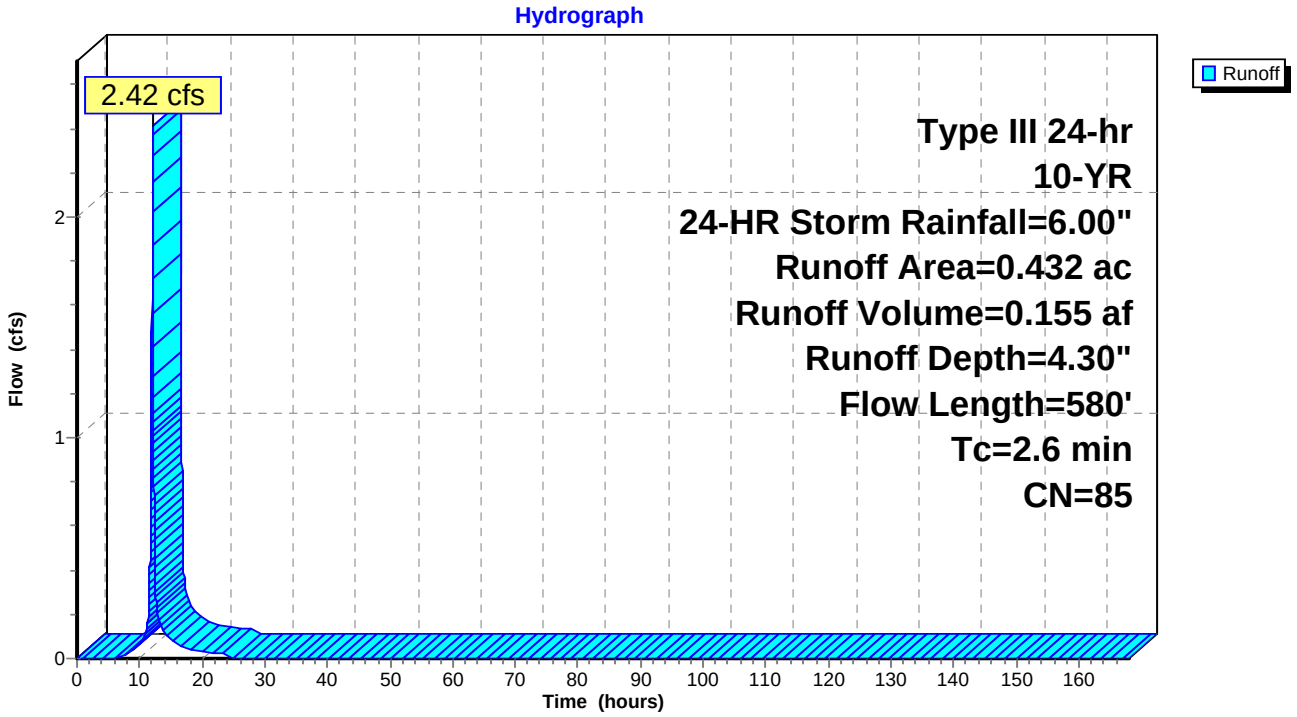
Runoff = 2.42 cfs @ 12.04 hrs, Volume= 0.155 af, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.114	74	>75% Grass cover, Good, HSG C
0.038	98	Paved roads w/curbs & sewers, HSG C
0.007	89	Gravel Shoulder, HSG C
0.065	96	Gravel surface, HSG D
0.006	77	Woods, Good, HSG D
0.129	80	>75% Grass cover, Good, HSG D
0.061	98	Paved roads w/curbs & sewers, HSG D
0.011	91	Gravel Shoulder, HSG D
0.432	85	Weighted Average
0.333		77.08% Pervious Area
0.099		22.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-2: PR DA 24B-2



Summary for Subcatchment 24B-3: PR DA 24B-3

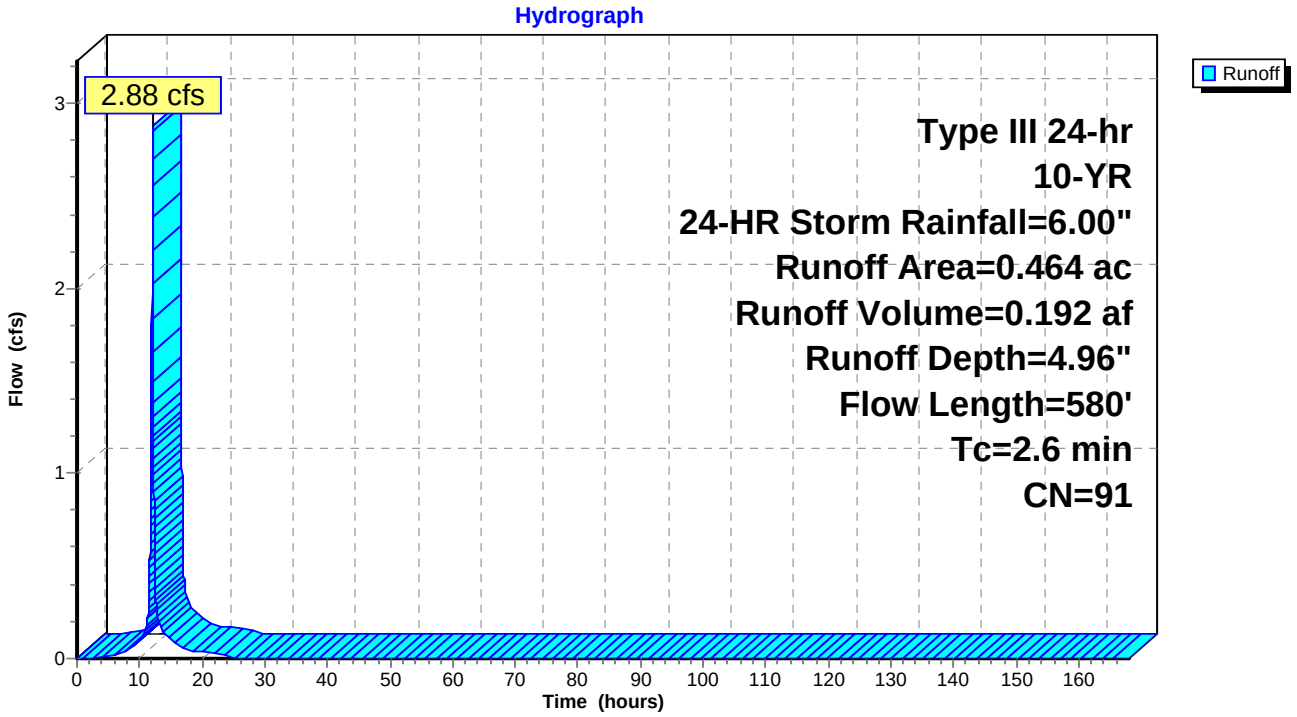
Runoff = 2.88 cfs @ 12.04 hrs, Volume= 0.192 af, Depth= 4.96"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.003	70	Woods, Good, HSG C
0.106	74	>75% Grass cover, Good, HSG C
0.105	98	Paved roads w/curbs & sewers, HSG C
0.019	89	Gravel Shoulder, HSG C
0.231	96	Gravel surface, HSG D
0.464	91	Weighted Average
0.359		77.37% Pervious Area
0.105		22.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-3: PR DA 24B-3



Summary for Subcatchment 24B-4: PR DA 24B-4

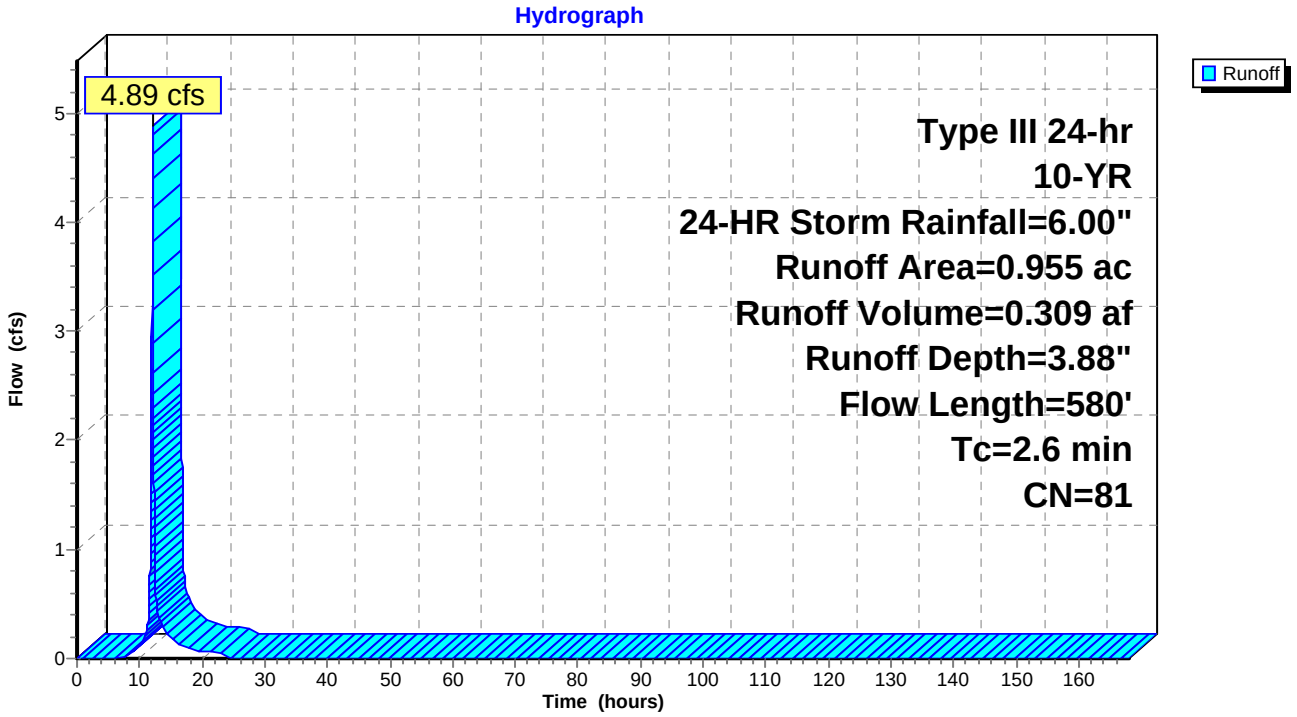
Runoff = 4.89 cfs @ 12.04 hrs, Volume= 0.309 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.007	70	Woods, Good, HSG C
0.480	74	>75% Grass cover, Good, HSG C
0.126	98	Paved roads w/curbs & sewers, HSG C
0.023	89	Gravel Shoulder, HSG C
0.011	96	Gravel surface, HSG D
0.003	77	Woods, Good, HSG D
0.231	80	>75% Grass cover, Good, HSG D
0.063	98	Paved roads w/curbs & sewers, HSG D
0.011	91	Gravel Shoulder, HSG D
0.955	81	Weighted Average
0.766		80.21% Pervious Area
0.189		19.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-4: PR DA 24B-4



Summary for Subcatchment 24C: PR DA 24C

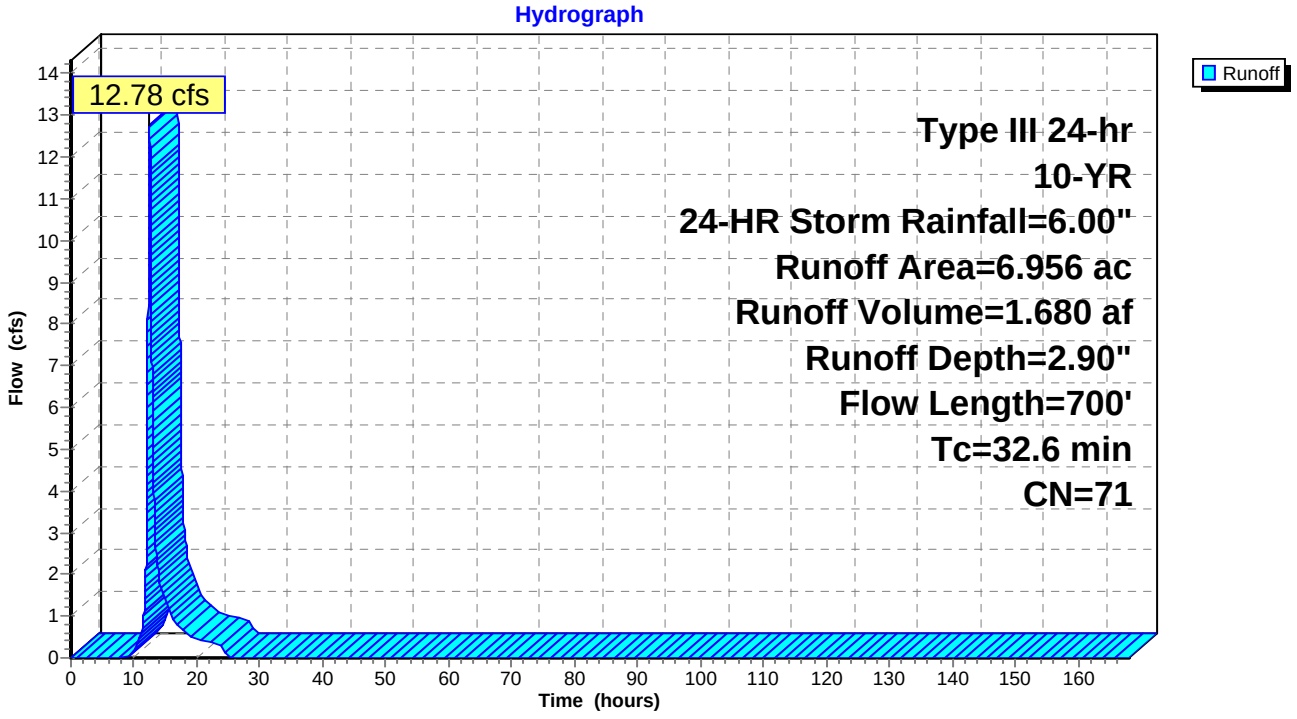
Runoff = 12.78 cfs @ 12.46 hrs, Volume= 1.680 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
6.012	70	Woods, Good, HSG C
0.002	96	Gravel surface, HSG D
0.942	77	Woods, Good, HSG D
6.956	71	Weighted Average
6.956		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	150	0.0270	0.10		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
8.3	550	0.0490	1.11		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
32.6	700	Total			

Subcatchment 24C: PR DA 24C



Summary for Subcatchment 24P: 24P

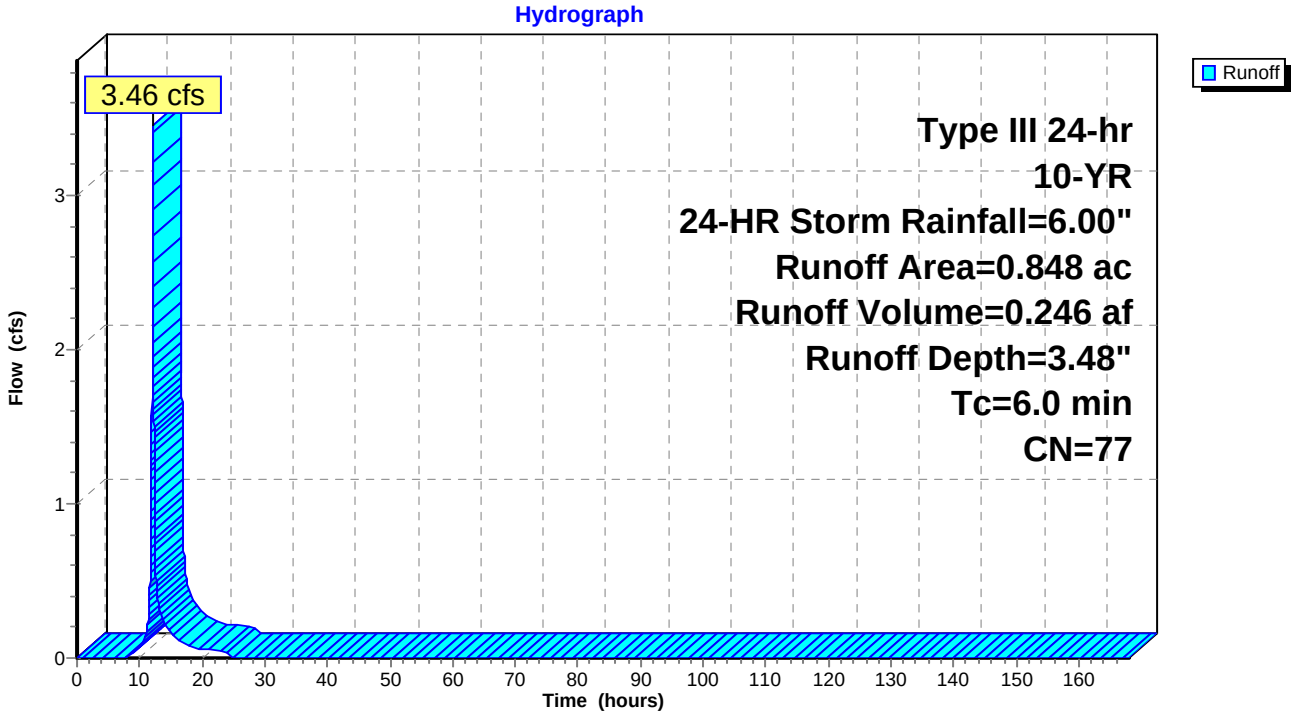
Runoff = 3.46 cfs @ 12.09 hrs, Volume= 0.246 af, Depth= 3.48"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.007	70	Woods, Good, HSG C
0.841	77	Woods, Good, HSG D
0.848	77	Weighted Average
0.848		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct**

Subcatchment 24P: 24P



Summary for Subcatchment 25: PR DA 25

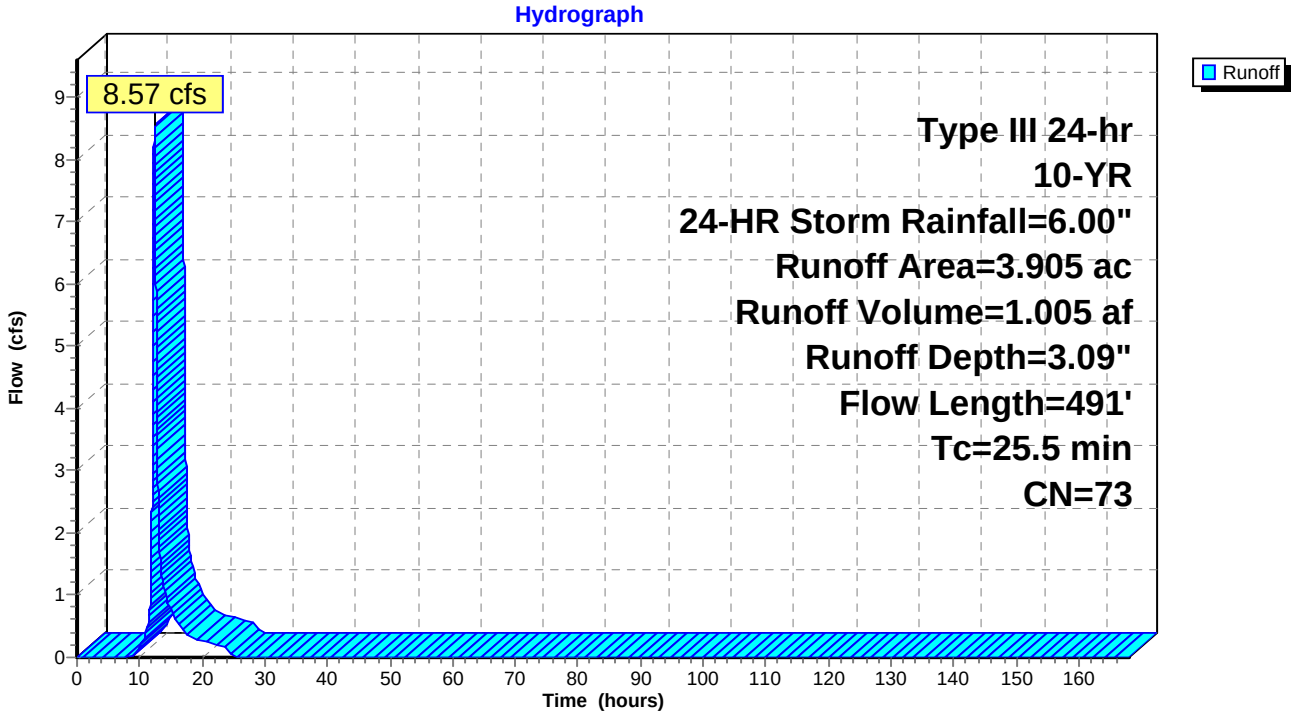
Runoff = 8.57 cfs @ 12.36 hrs, Volume= 1.005 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
2.432	70	Woods, Good, HSG C
1.473	77	Woods, Good, HSG D
3.905	73	Weighted Average
3.905		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.8	100	0.0200	0.08		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
5.2	246	0.0244	0.78		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.5	145	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
25.5	491	Total			

Subcatchment 25: PR DA 25



Summary for Subcatchment 25A-1: PR DA 25A-1

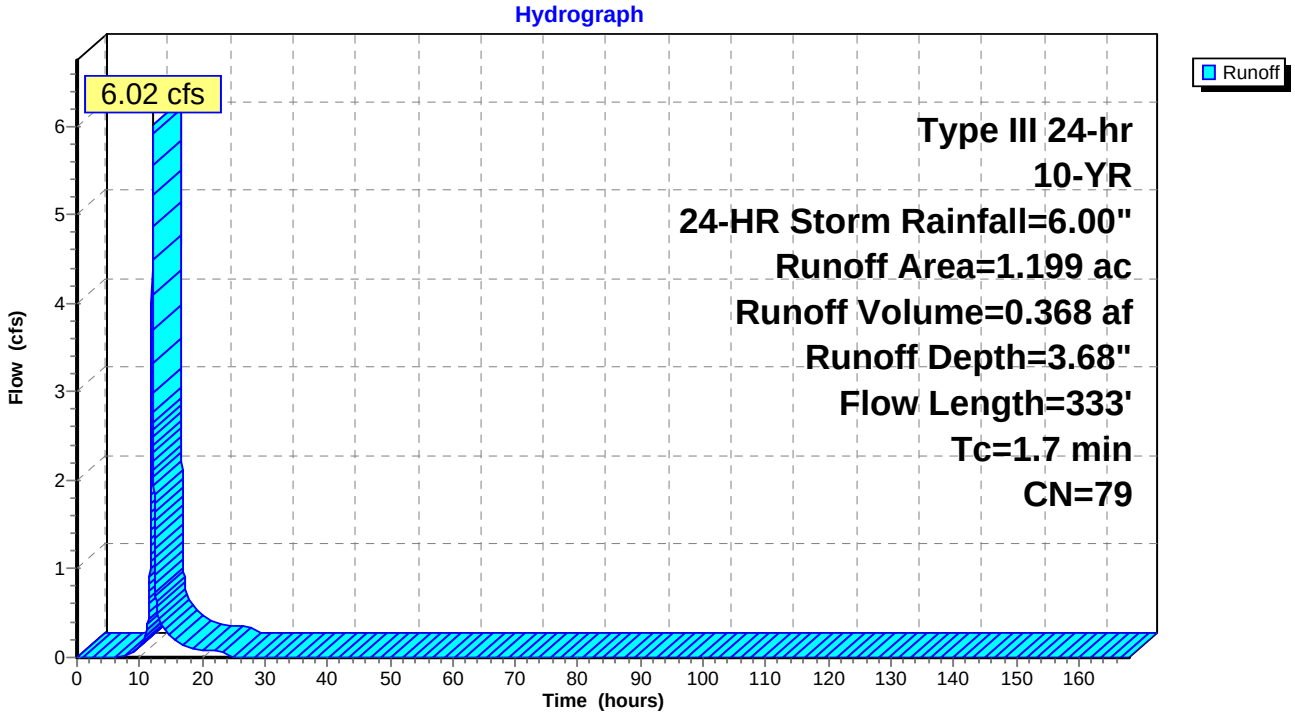
Runoff = 6.02 cfs @ 12.03 hrs, Volume= 0.368 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.303	70	Woods, Good, HSG C
0.562	74	>75% Grass cover, Good, HSG C
0.281	98	Paved roads w/curbs & sewers, HSG C
0.045	89	Gravel Shoulder, HSG C
0.008	77	Woods, Good, HSG D
1.199	79	Weighted Average
0.918		76.56% Pervious Area
0.281		23.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	65	0.0200	1.37		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.9	268	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	333	Total			

Subcatchment 25A-1: PR DA 25A-1



Summary for Subcatchment 25A-2: PR DA 25A-2

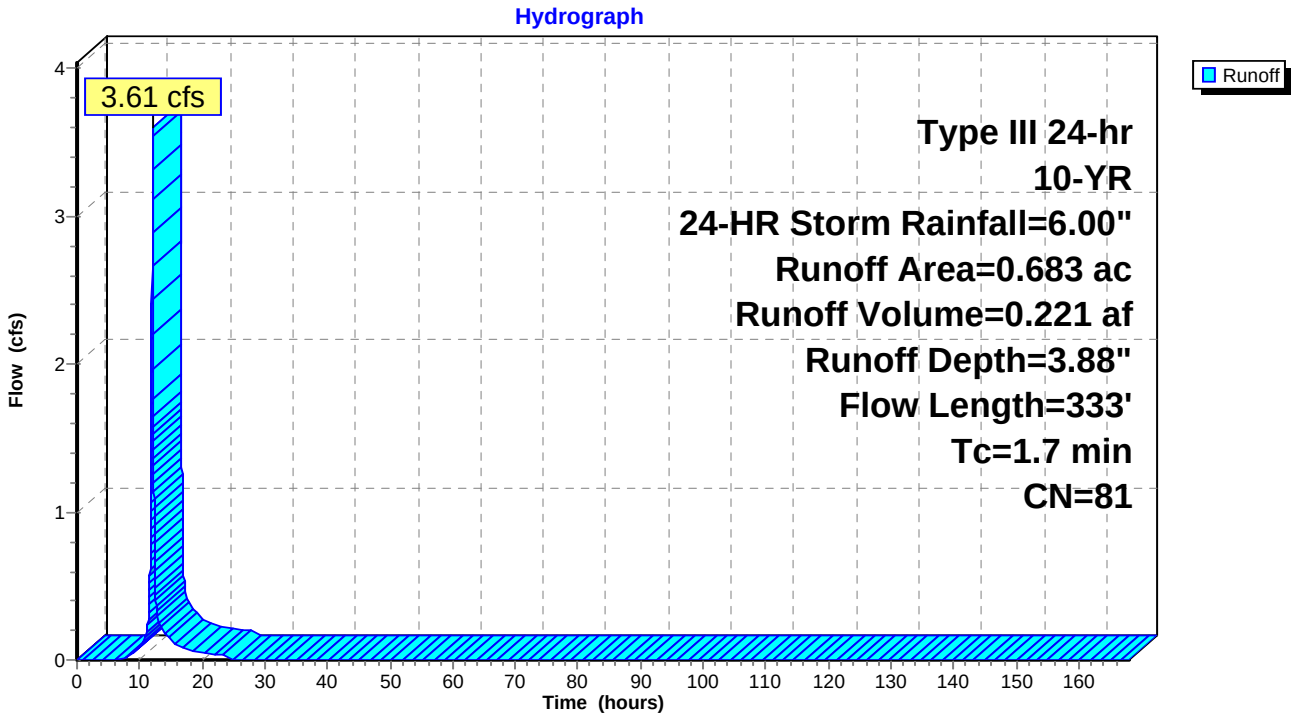
Runoff = 3.61 cfs @ 12.03 hrs, Volume= 0.221 af, Depth= 3.88"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.177	70	Woods, Good, HSG C
0.258	74	>75% Grass cover, Good, HSG C
0.219	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.683	81	Weighted Average
0.464		67.94% Pervious Area
0.219		32.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	65	0.0200	1.37		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.9	268	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	333	Total			

Subcatchment 25A-2: PR DA 25A-2



Summary for Subcatchment 25B-1: PR DA 25B-1

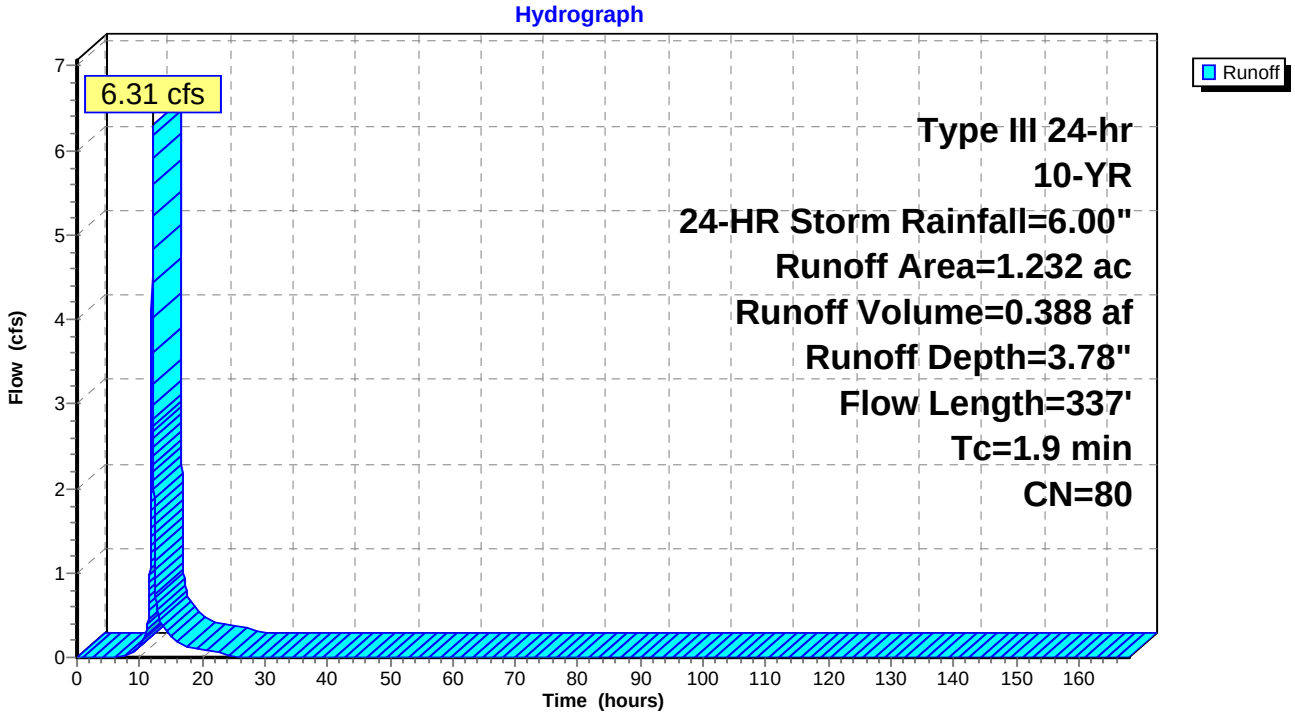
Runoff = 6.31 cfs @ 12.03 hrs, Volume= 0.388 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.922	74	>75% Grass cover, Good, HSG C
0.262	98	Paved roads w/curbs & sewers, HSG C
0.048	89	Gravel Shoulder, HSG C
1.232	80	Weighted Average
0.970		78.73% Pervious Area
0.262		21.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	237	0.0127	4.73	38.82	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.9	337	Total			

Subcatchment 25B-1: PR DA 25B-1



Summary for Subcatchment 25B-2: PR DA 25B-2

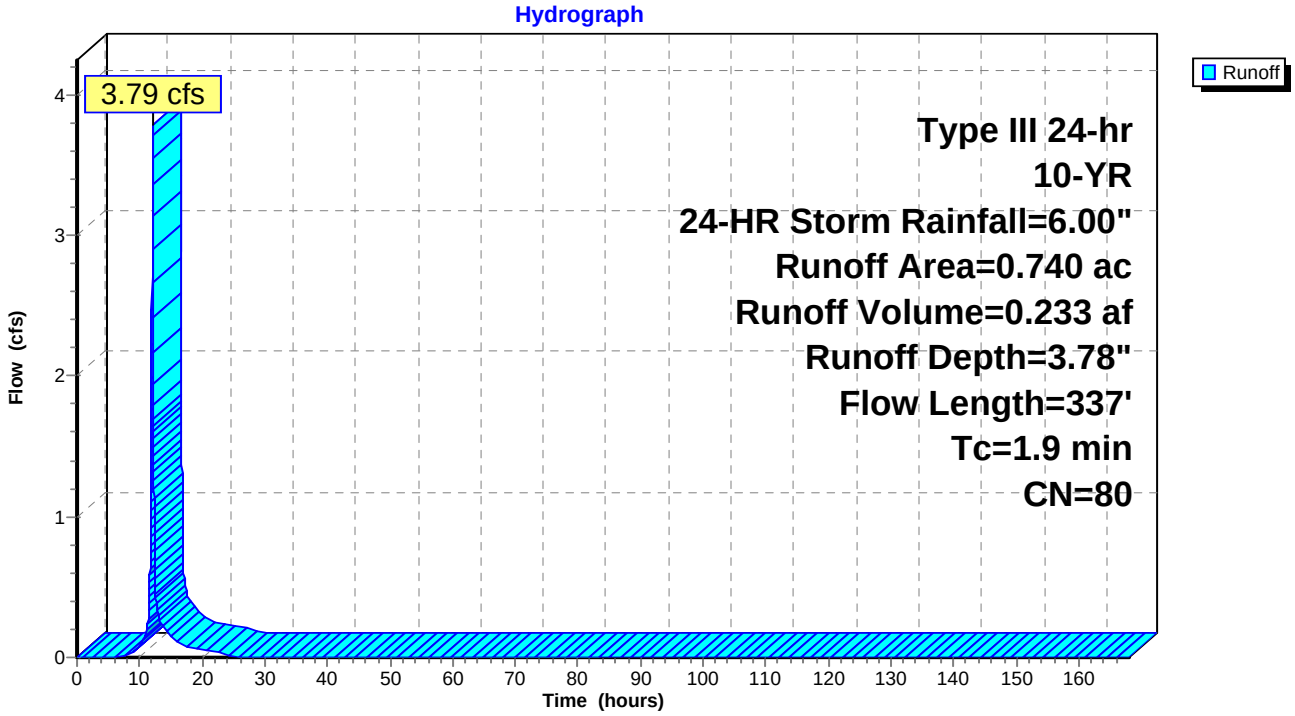
Runoff = 3.79 cfs @ 12.03 hrs, Volume= 0.233 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.538	74	>75% Grass cover, Good, HSG C
0.171	98	Paved roads w/curbs & sewers, HSG C
0.031	89	Gravel Shoulder, HSG C
0.740	80	Weighted Average
0.569		76.89% Pervious Area
0.171		23.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	237	0.0127	4.73	38.82	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.9	337	Total			

Subcatchment 25B-2: PR DA 25B-2



Summary for Subcatchment 25C: PR DA 25C

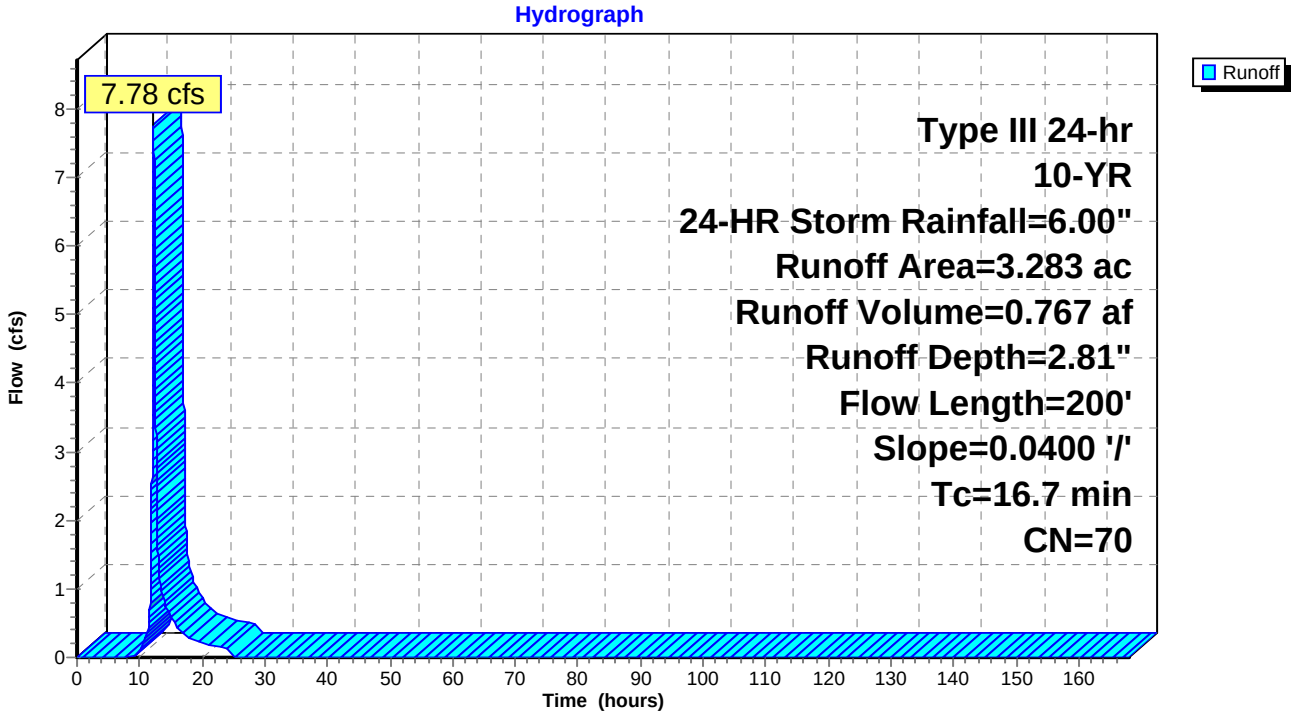
Runoff = 7.78 cfs @ 12.23 hrs, Volume= 0.767 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.023	71	Meadow, non-grazed, HSG C
3.126	70	Woods, Good, HSG C
0.013	78	Meadow, non-grazed, HSG D
0.121	77	Woods, Good, HSG D
3.283	70	Weighted Average
3.283		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0400	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
1.7	100	0.0400	1.00		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
16.7	200	Total			

Subcatchment 25C: PR DA 25C



Summary for Subcatchment 25D: PR DA 25D

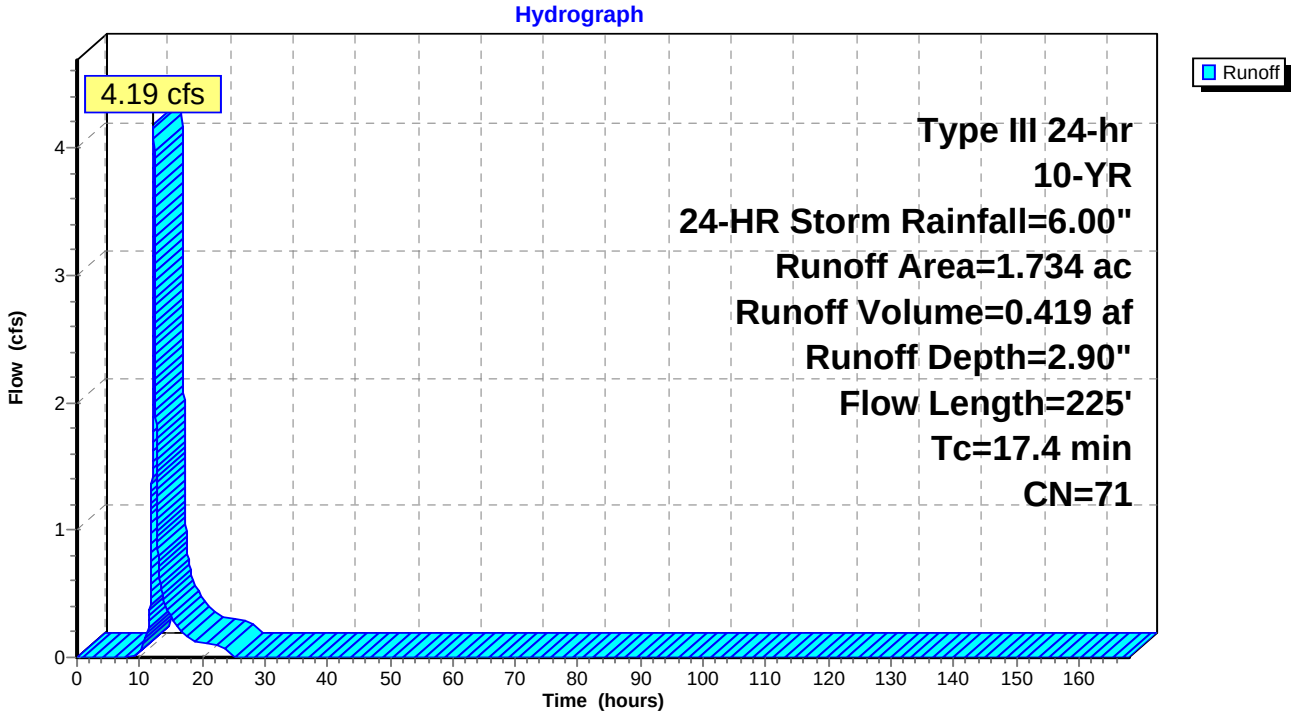
Runoff = 4.19 cfs @ 12.24 hrs, Volume= 0.419 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.543	71	Meadow, non-grazed, HSG C
1.095	70	Woods, Good, HSG C
0.093	78	Meadow, non-grazed, HSG D
0.003	77	Woods, Good, HSG D
1.734	71	Weighted Average
1.734		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0400	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
2.4	125	0.0300	0.87		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
17.4	225	Total			

Subcatchment 25D: PR DA 25D



Summary for Subcatchment 26: PR DA 26

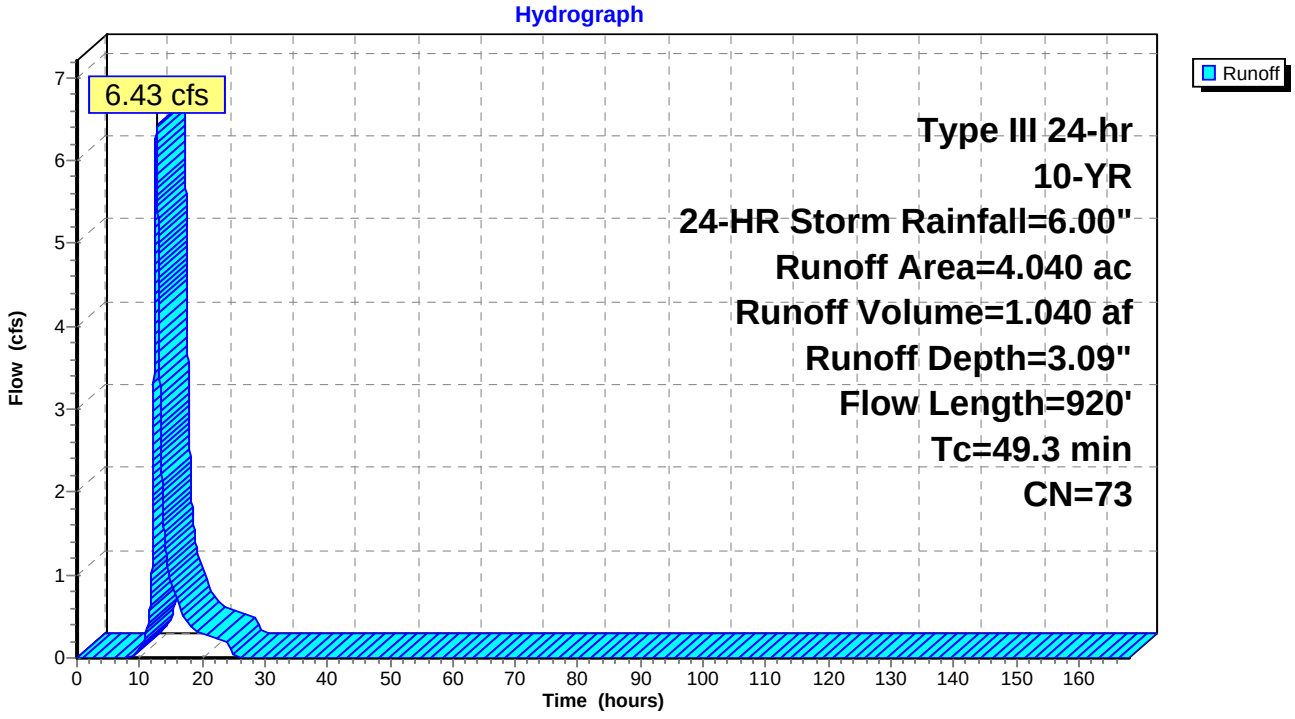
Runoff = 6.43 cfs @ 12.66 hrs, Volume= 1.040 af, Depth= 3.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.005	71	Meadow, non-grazed, HSG C
2.022	70	Woods, Good, HSG C
2.013	77	Woods, Good, HSG D
4.040	73	Weighted Average
4.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
13.1	770	0.0384	0.98		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
49.3	920	Total			

Subcatchment 26: PR DA 26



Summary for Subcatchment 26A-1: PR DA 26A-1

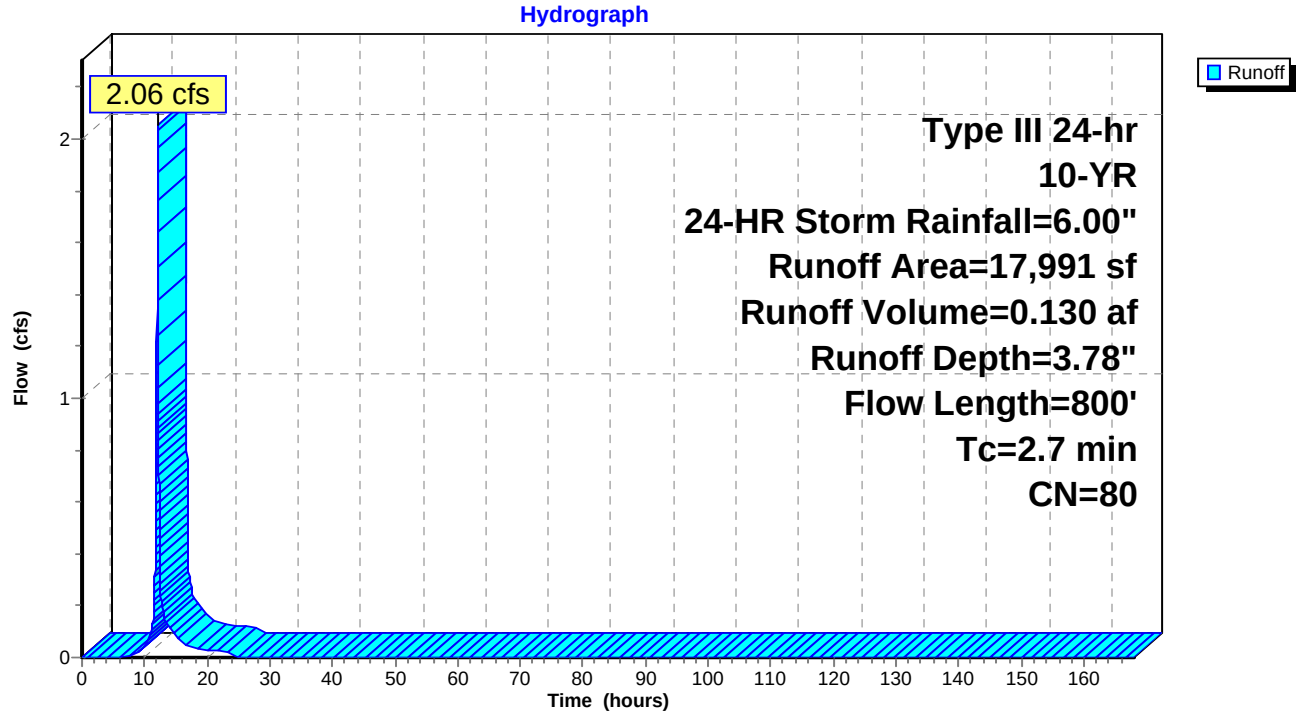
Runoff = 2.06 cfs @ 12.04 hrs, Volume= 0.130 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (sf)	CN	Description
	4,879	70	Woods, Good, HSG C
	7,312	74	>75% Grass cover, Good, HSG C
	4,885	98	Paved roads w/curbs & sewers, HSG C
*	915	89	Gravel Shoulder, HSG C
	17,991	80	Weighted Average
	13,106		72.85% Pervious Area
	4,885		27.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-1: PR DA 26A-1



Summary for Subcatchment 26A-2: PR DA 26A-2

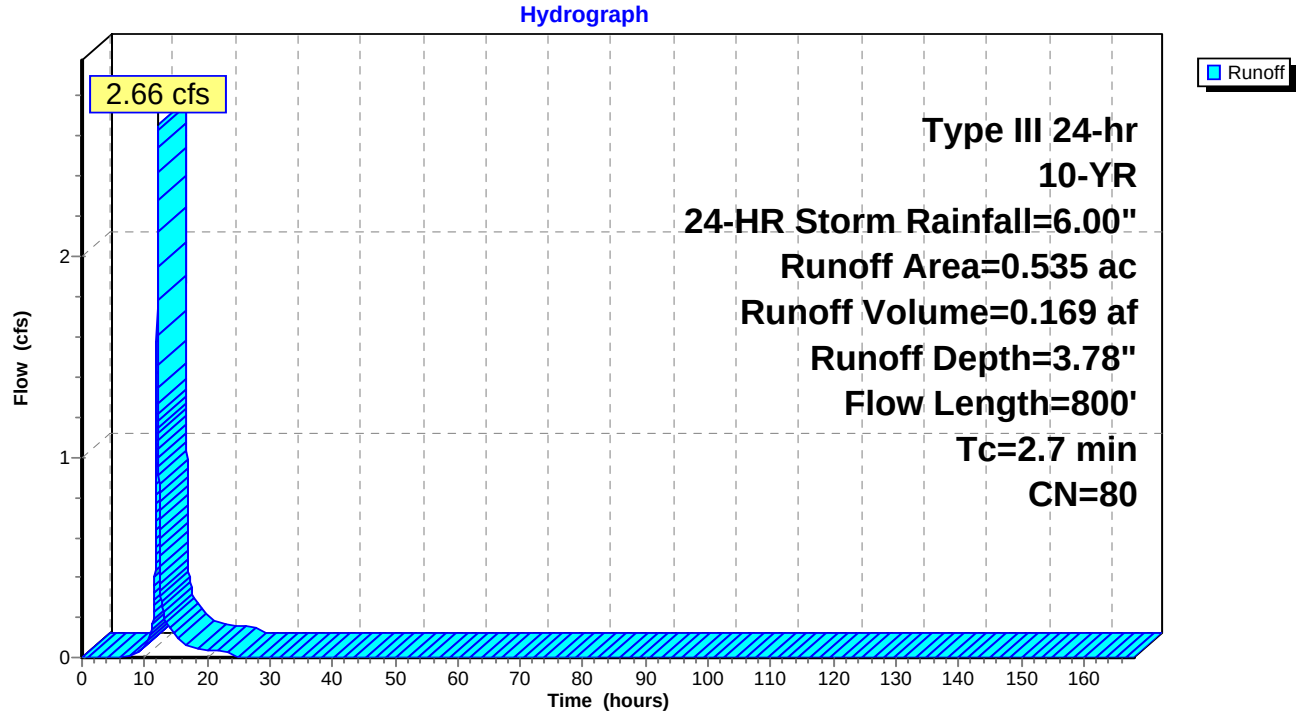
Runoff = 2.66 cfs @ 12.04 hrs, Volume= 0.169 af, Depth= 3.78"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.146	70	Woods, Good, HSG C
	0.222	74	>75% Grass cover, Good, HSG C
	0.140	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.535	80	Weighted Average
	0.395		73.83% Pervious Area
	0.140		26.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-2: PR DA 26A-2



Summary for Subcatchment 26A-3: PR DA 26A-3

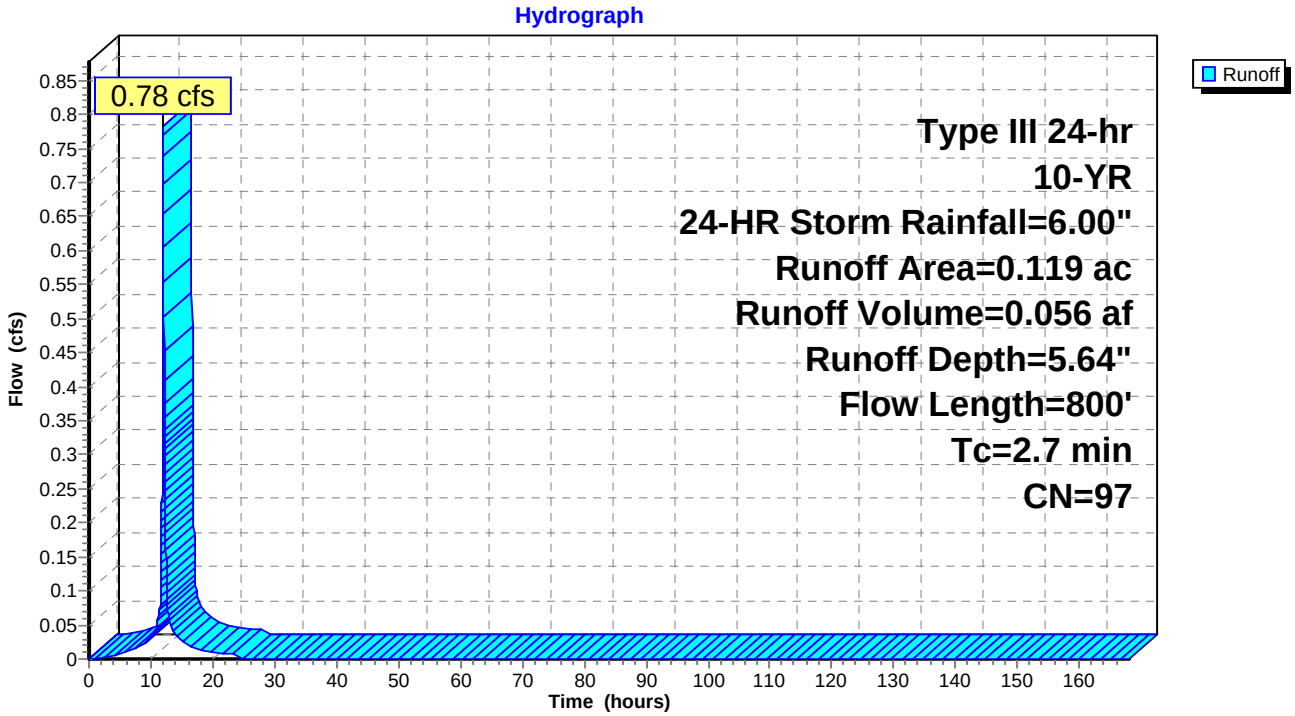
Runoff = 0.78 cfs @ 12.04 hrs, Volume= 0.056 af, Depth= 5.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.005	74	>75% Grass cover, Good, HSG C
	0.111	98	Paved roads w/curbs & sewers, HSG C
*	0.003	89	Gravel Shoulder, HSG C
	0.119	97	Weighted Average
	0.008		6.72% Pervious Area
	0.111		93.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-3: PR DA 26A-3



Summary for Subcatchment 26B-1: PR DA 26B-1

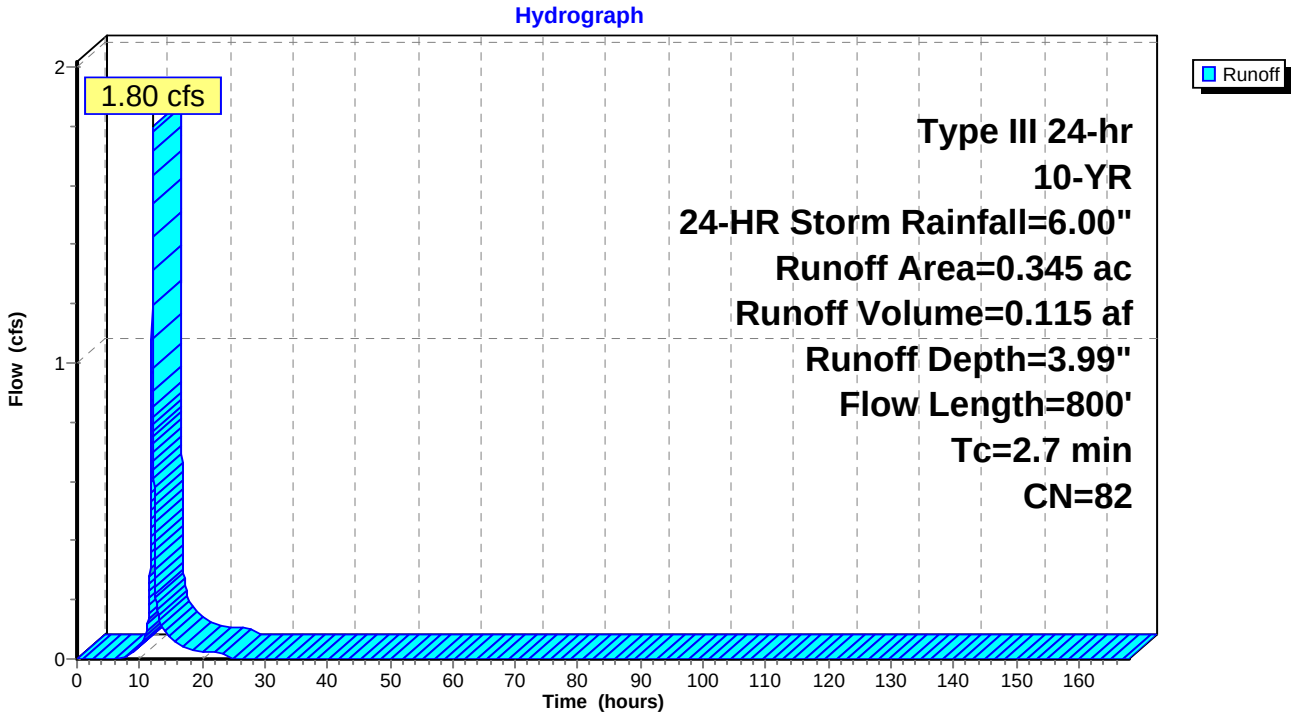
Runoff = 1.80 cfs @ 12.04 hrs, Volume= 0.115 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.228	74	>75% Grass cover, Good, HSG C
	0.098	98	Paved roads w/curbs & sewers, HSG C
*	0.019	89	Gravel Shoulder, HSG C
	0.345	82	Weighted Average
	0.247		71.59% Pervious Area
	0.098		28.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-1: PR DA 26B-1



Summary for Subcatchment 26B-2: PR DA 26B-2

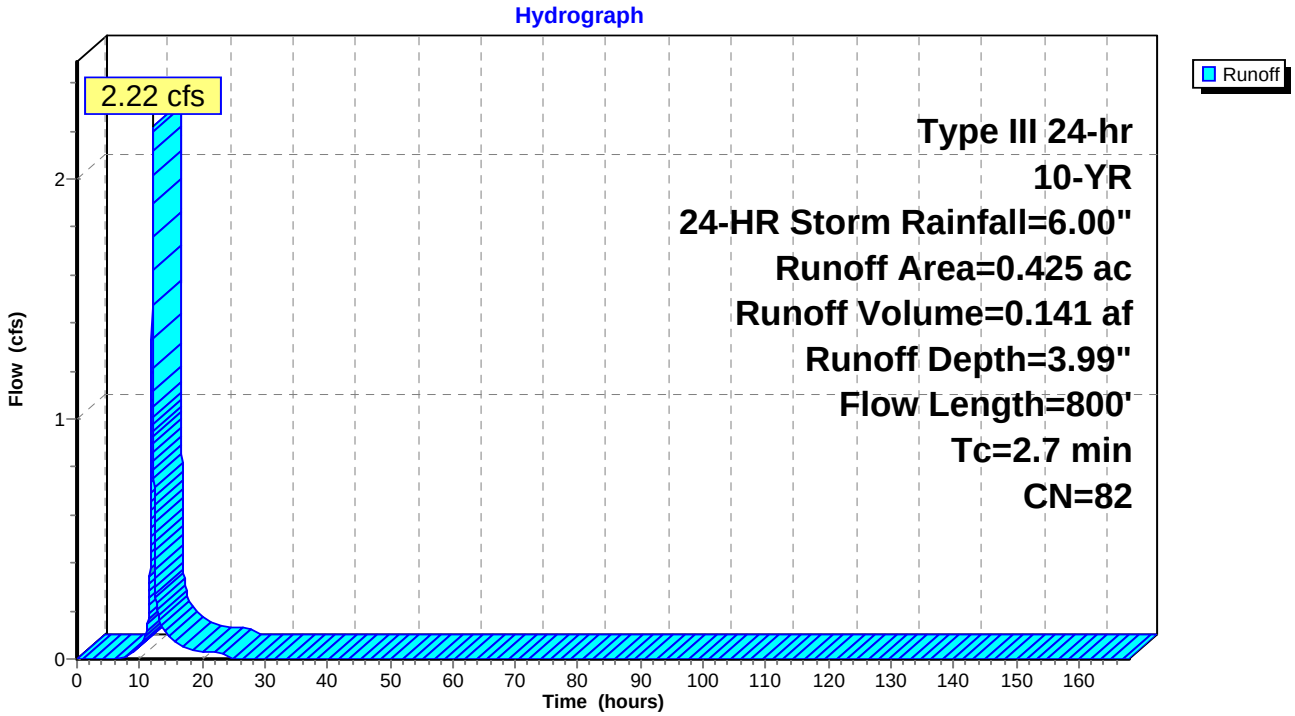
Runoff = 2.22 cfs @ 12.04 hrs, Volume= 0.141 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.281	74	>75% Grass cover, Good, HSG C
	0.121	98	Paved roads w/curbs & sewers, HSG C
*	0.023	89	Gravel Shoulder, HSG C
	0.425	82	Weighted Average
	0.304		71.53% Pervious Area
	0.121		28.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-2: PR DA 26B-2



Summary for Subcatchment 26B-3: PR DA 26B-3

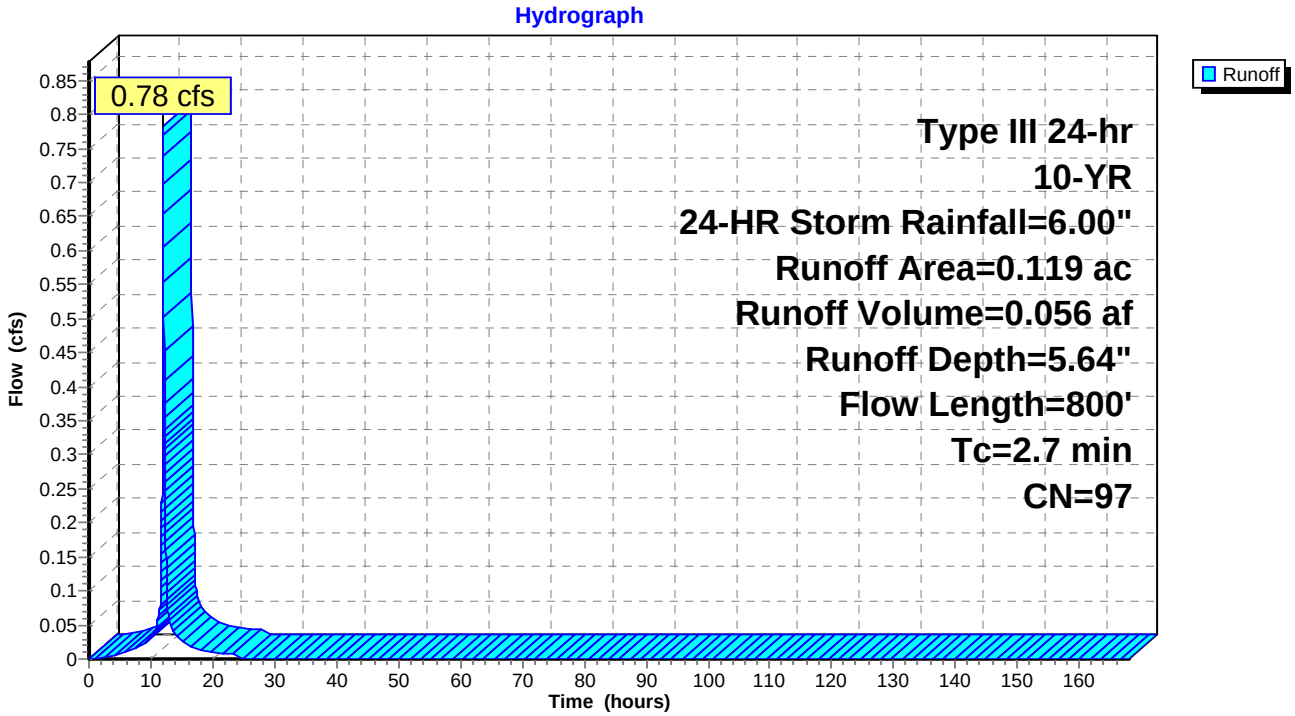
Runoff = 0.78 cfs @ 12.04 hrs, Volume= 0.056 af, Depth= 5.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.005	74	>75% Grass cover, Good, HSG C
	0.111	98	Paved roads w/curbs & sewers, HSG C
*	0.003	89	Gravel Shoulder, HSG C
	0.119	97	Weighted Average
	0.008		6.72% Pervious Area
	0.111		93.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-3: PR DA 26B-3



Summary for Subcatchment 26C: PR DA 26C

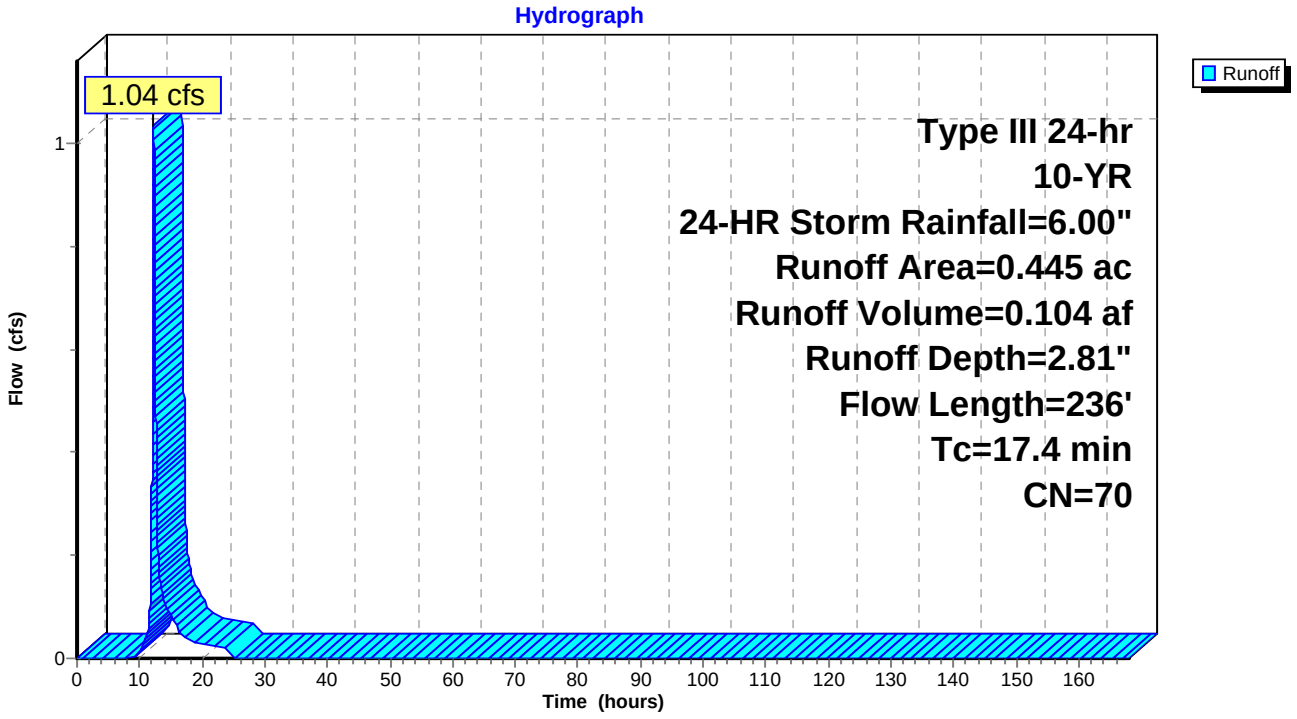
Runoff = 1.04 cfs @ 12.24 hrs, Volume= 0.104 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.176	71	Meadow, non-grazed, HSG C
0.269	70	Woods, Good, HSG C
0.445	70	Weighted Average
0.445		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	123	0.0569	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
2.0	113	0.0354	0.94		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
17.4	236	Total			

Subcatchment 26C: PR DA 26C



Summary for Subcatchment 26D: PR DA 26D

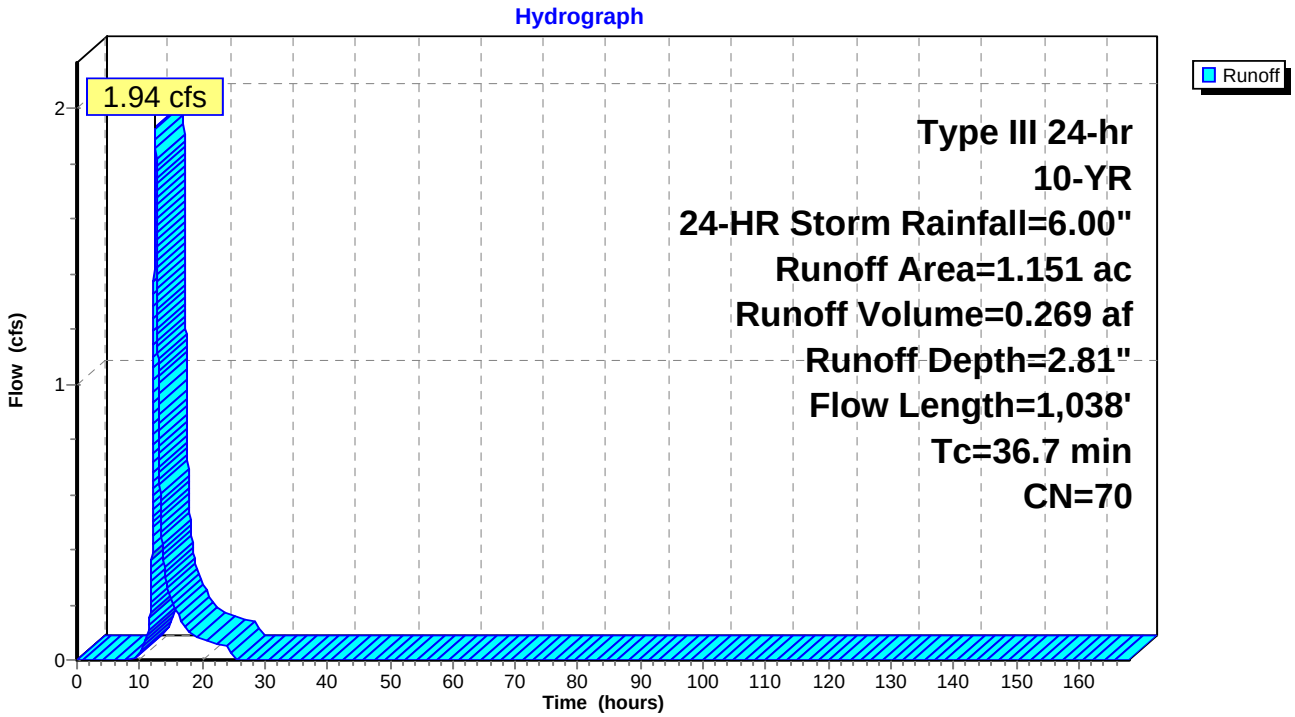
Runoff = 1.94 cfs @ 12.52 hrs, Volume= 0.269 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
1.146	70	Woods, Good, HSG C
0.005	77	Woods, Good, HSG D
1.151	70	Weighted Average
1.151		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.5	150	0.0167	0.08		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
5.9	315	0.0317	0.89		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.3	573	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
36.7	1,038	Total			

Subcatchment 26D: PR DA 26D



Summary for Subcatchment 26E: PR DA 26E

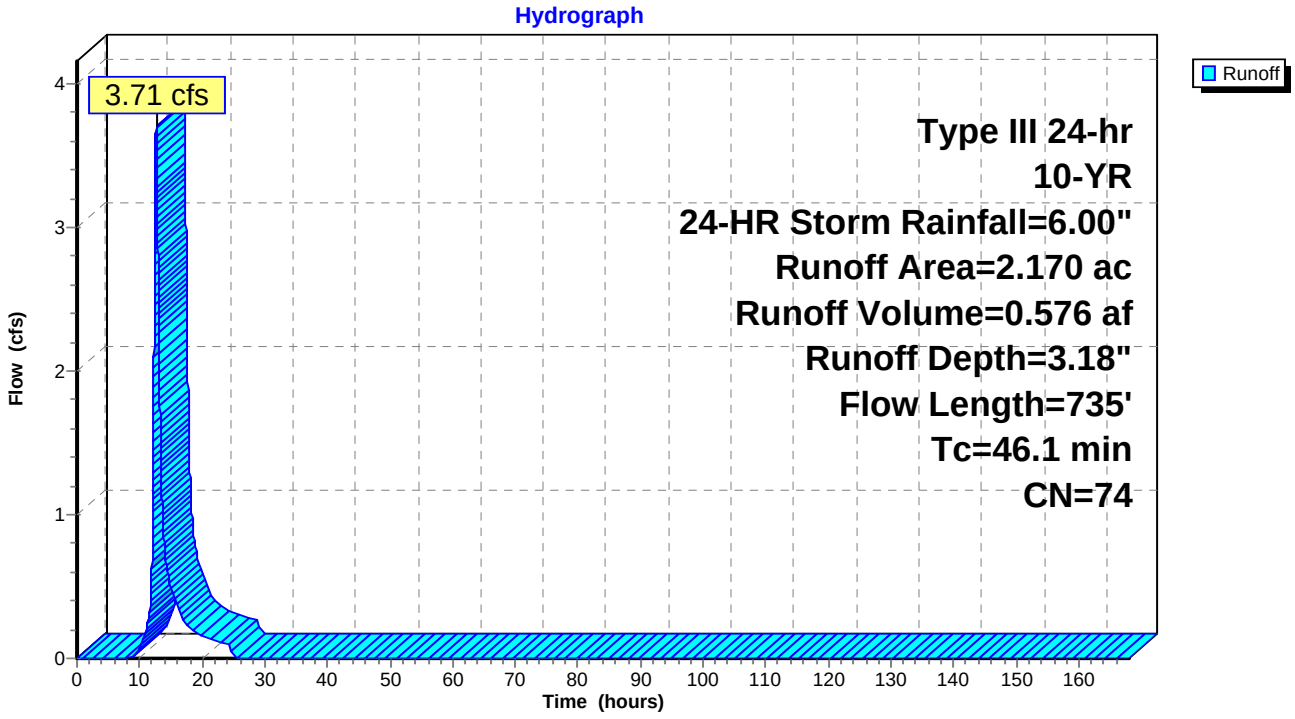
Runoff = 3.71 cfs @ 12.65 hrs, Volume= 0.576 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.900	70	Woods, Good, HSG C
1.270	77	Woods, Good, HSG D
2.170	74	Weighted Average
2.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
9.9	585	0.0387	0.98		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
46.1	735	Total			

Subcatchment 26E: PR DA 26E



Summary for Subcatchment 26F: PR DA 26F

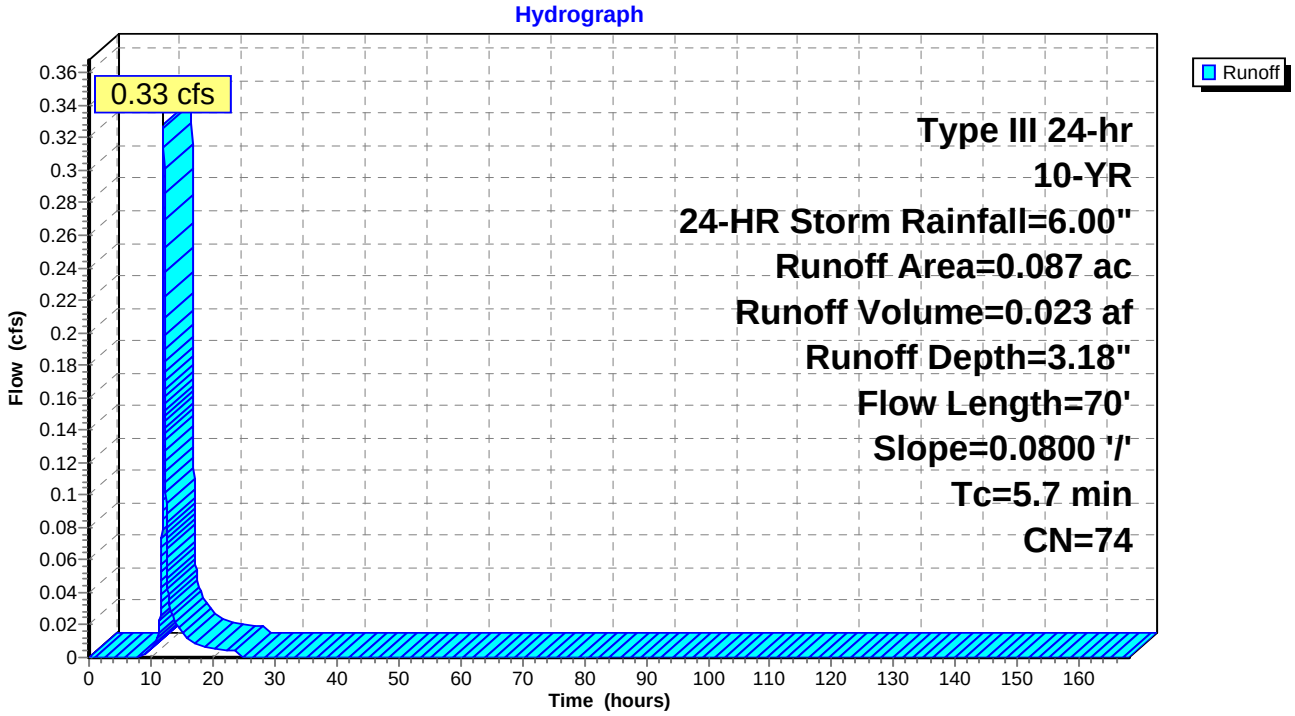
Runoff = 0.33 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.087	74	>75% Grass cover, Good, HSG C
0.087		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	70	0.0800	0.20		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment 26F: PR DA 26F



Summary for Subcatchment 26G: PR DA 26G

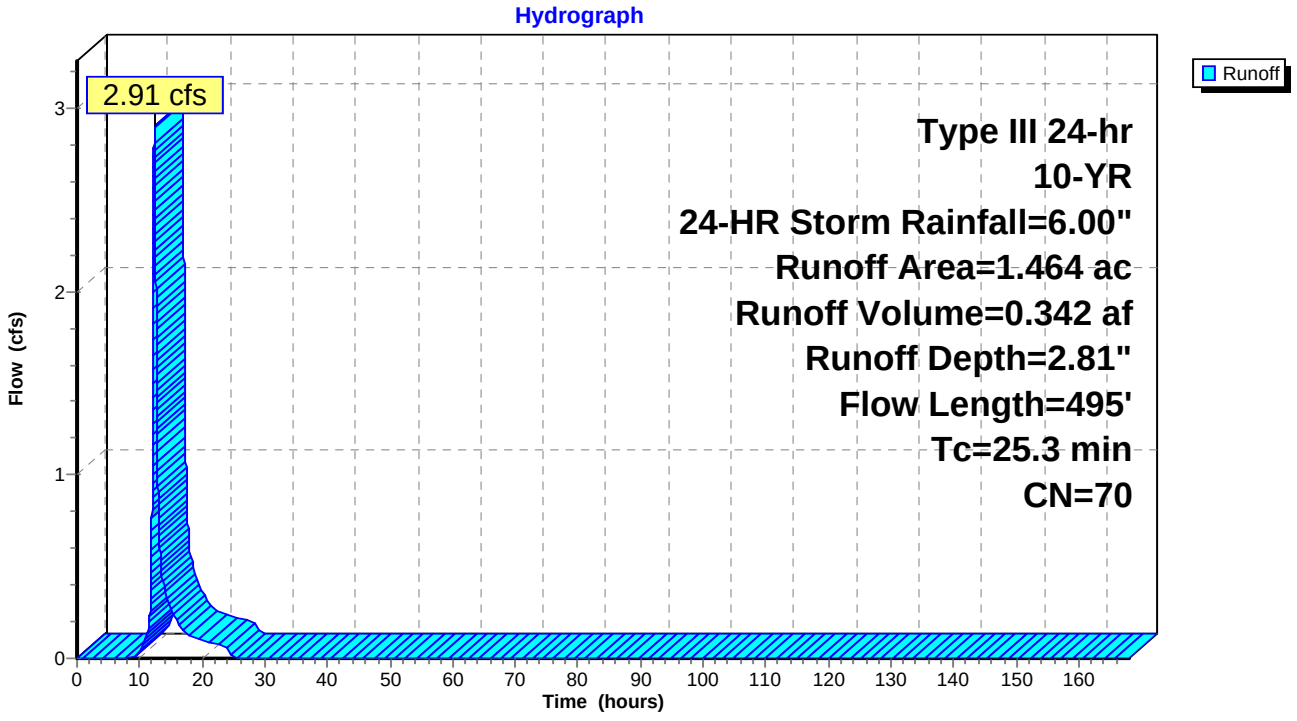
Runoff = 2.91 cfs @ 12.35 hrs, Volume= 0.342 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
1.464	70	Woods, Good, HSG C
1.464		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	150	0.0467	0.13		**Sheet Flow, 150** Woods: Light underbrush n= 0.400 P2= 3.75"
5.7	345	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
25.3	495	Total			

Subcatchment 26G: PR DA 26G



Summary for Subcatchment 28A: PR DA 28A

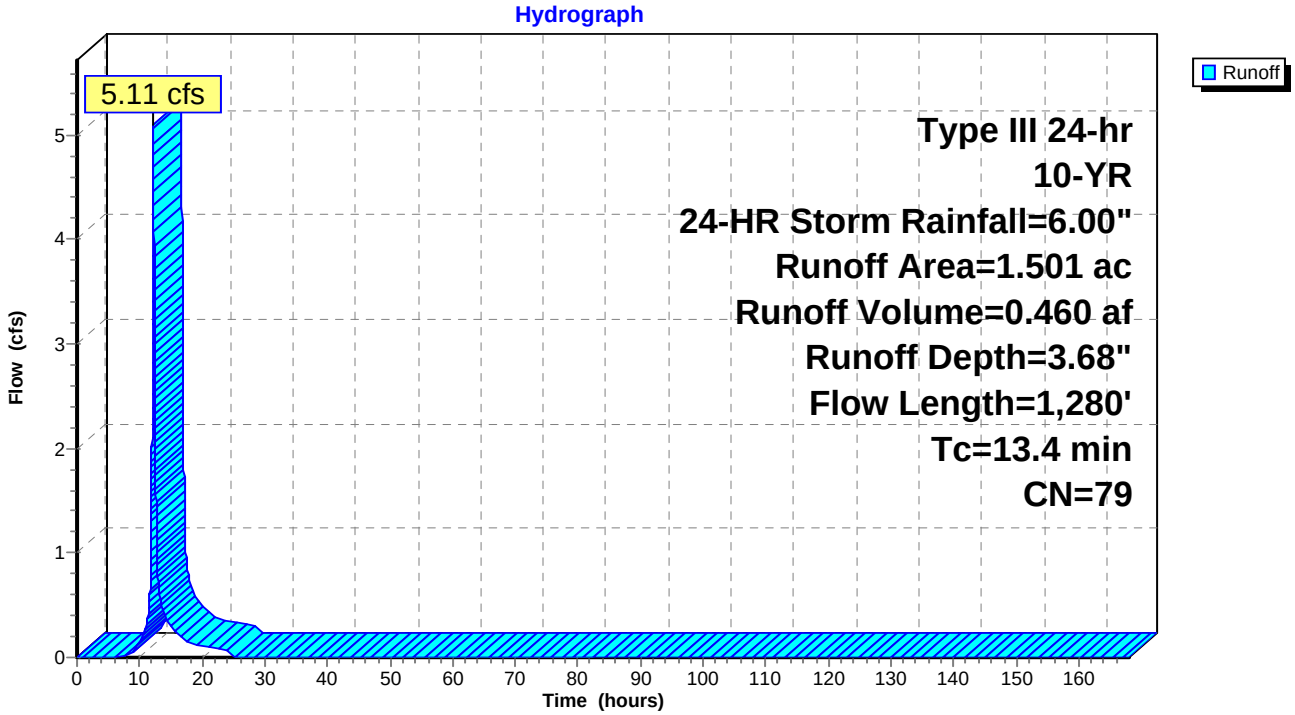
Runoff = 5.11 cfs @ 12.18 hrs, Volume= 0.460 af, Depth= 3.68"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
1.177	74	>75% Grass cover, Good, HSG C
0.324	98	Paved roads w/curbs & sewers, HSG C
1.501	79	Weighted Average
1.177		78.41% Pervious Area
0.324		21.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	150	0.0500	0.29		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
4.3	930	0.0500	3.60		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps
0.4	200	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
13.4	1,280	Total			

Subcatchment 28A: PR DA 28A



Summary for Subcatchment 28B: PR DA 28B

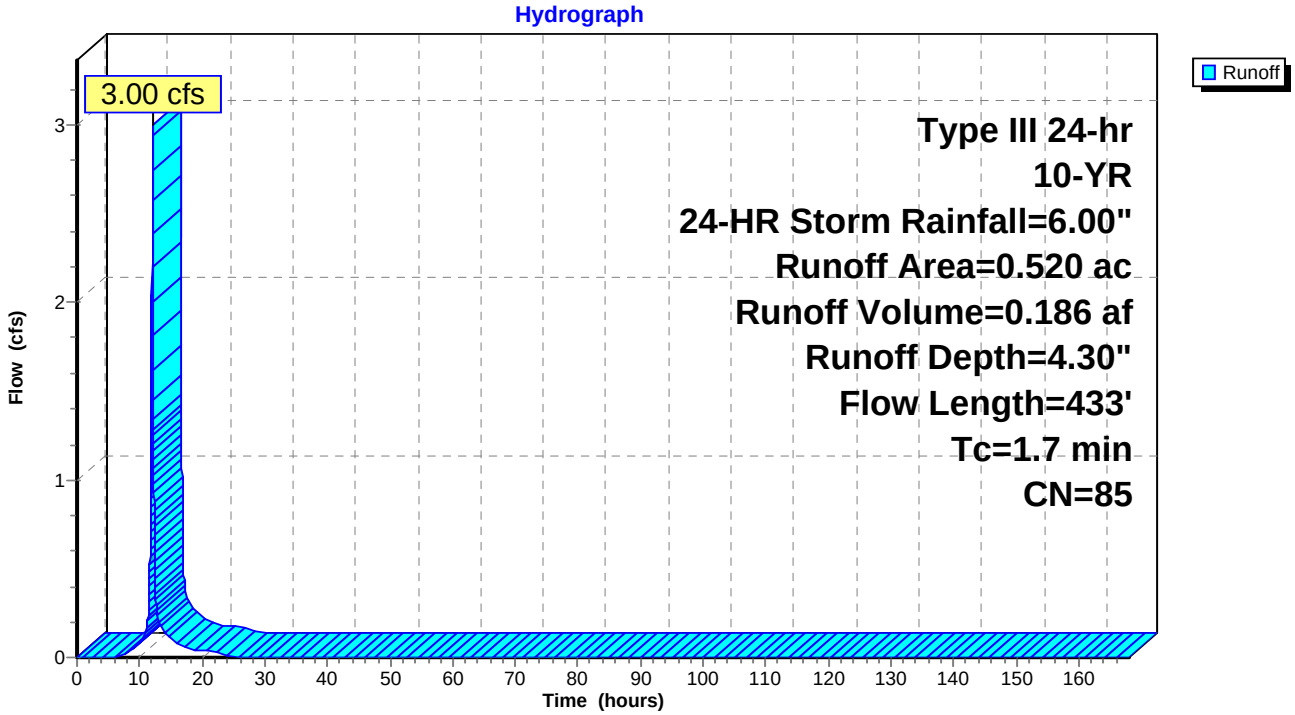
Runoff = 3.00 cfs @ 12.03 hrs, Volume= 0.186 af, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.271	74	>75% Grass cover, Good, HSG C
0.249	98	Paved roads w/curbs & sewers, HSG C
0.520	85	Weighted Average
0.271		52.12% Pervious Area
0.249		47.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.4	183	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	433	Total			

Subcatchment 28B: PR DA 28B



Summary for Subcatchment 28C: PR DA 28C

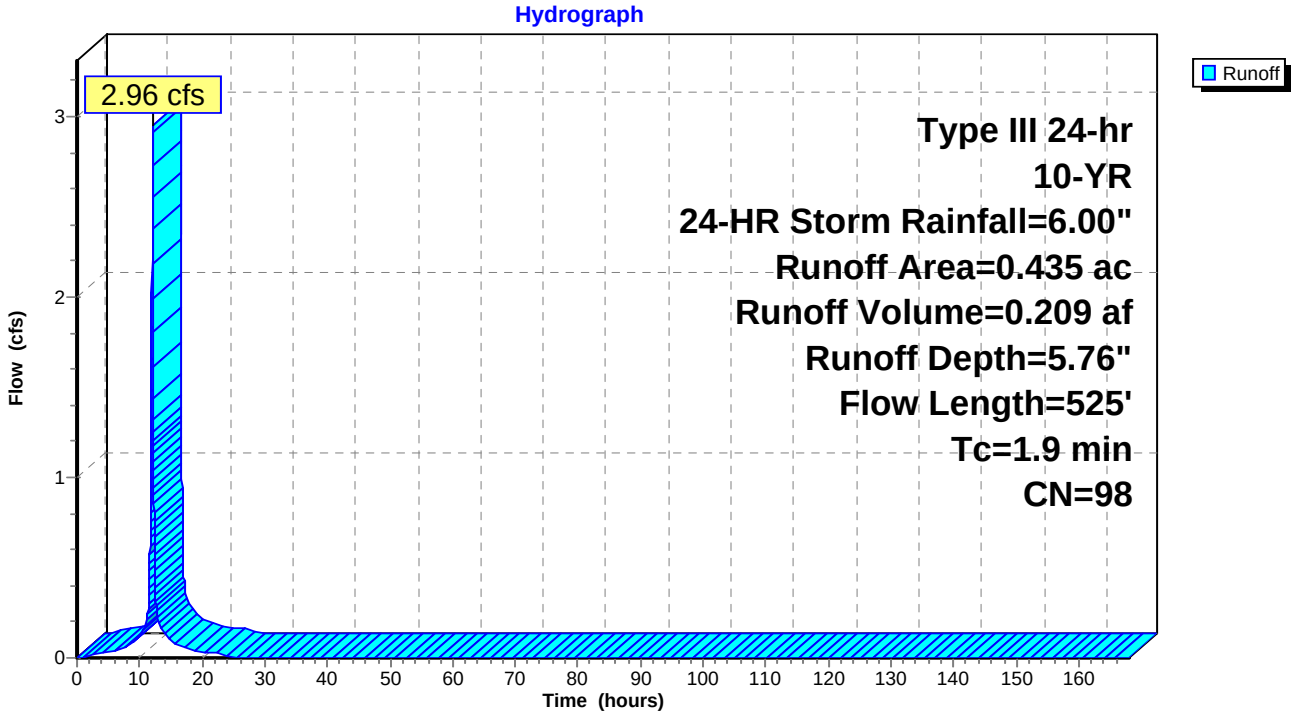
Runoff = 2.96 cfs @ 12.03 hrs, Volume= 0.209 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.435	98	Paved roads w/curbs & sewers, HSG C
0.435		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.6	275	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.9	525	Total			

Subcatchment 28C: PR DA 28C



Summary for Subcatchment 28D: PR DA 28D

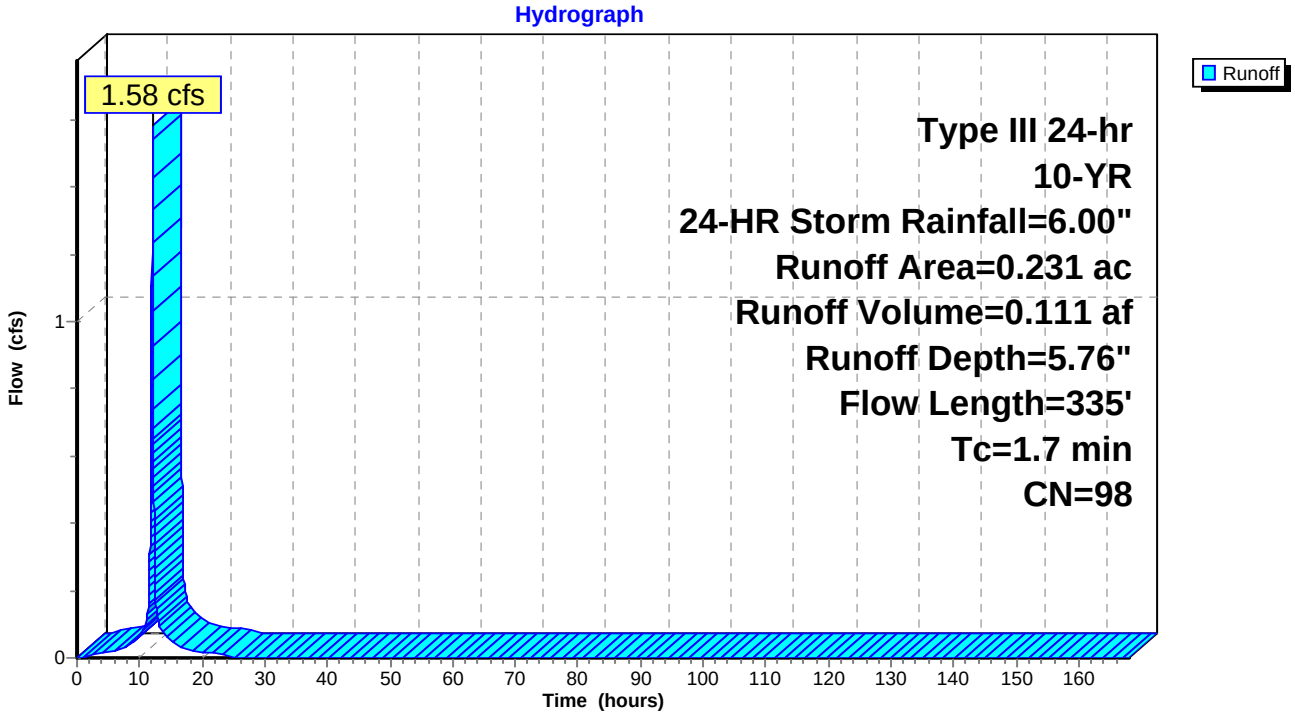
Runoff = 1.58 cfs @ 12.02 hrs, Volume= 0.111 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.231	98	Paved roads w/curbs & sewers, HSG C
0.231		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	150	0.0400	2.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	50	0.0400	4.06		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.3	135	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	335	Total			

Subcatchment 28D: PR DA 28D



Summary for Subcatchment 28E: PR DA 28E

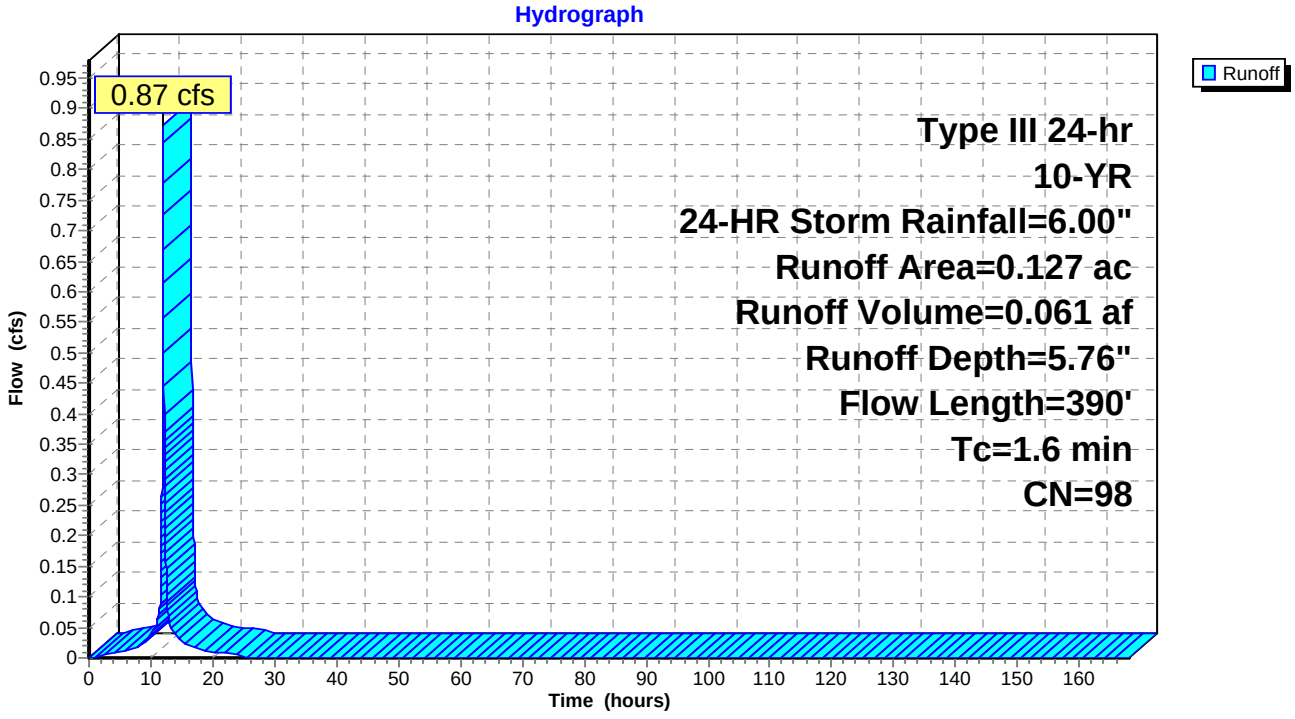
Runoff = 0.87 cfs @ 12.02 hrs, Volume= 0.061 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.127	98	Paved roads w/curbs & sewers, HSG C
0.127		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.3	140	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.6	390	Total			

Subcatchment 28E: PR DA 28E



Summary for Subcatchment 28F: PR DA 28F

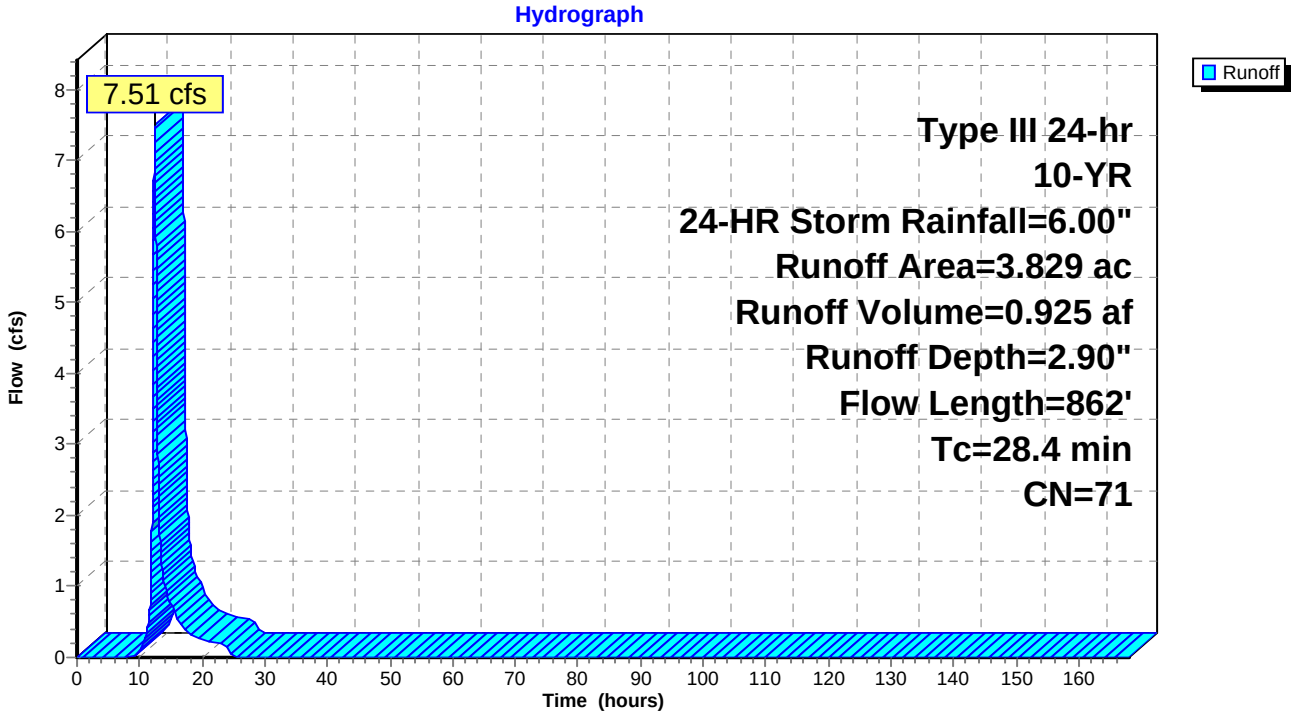
Runoff = 7.51 cfs @ 12.40 hrs, Volume= 0.925 af, Depth= 2.90"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.011	71	Meadow, non-grazed, HSG C
0.060	98	Unconnected pavement, HSG C
0.571	74	>75% Grass cover, Good, HSG C
3.187	70	Woods, Good, HSG C
3.829	71	Weighted Average
3.769		98.43% Pervious Area
0.060		1.57% Impervious Area
0.060		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	150	0.0500	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
9.4	712	0.0640	1.26		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
28.4	862	Total			

Subcatchment 28F: PR DA 28F



Summary for Subcatchment 28G: PR DA 28G

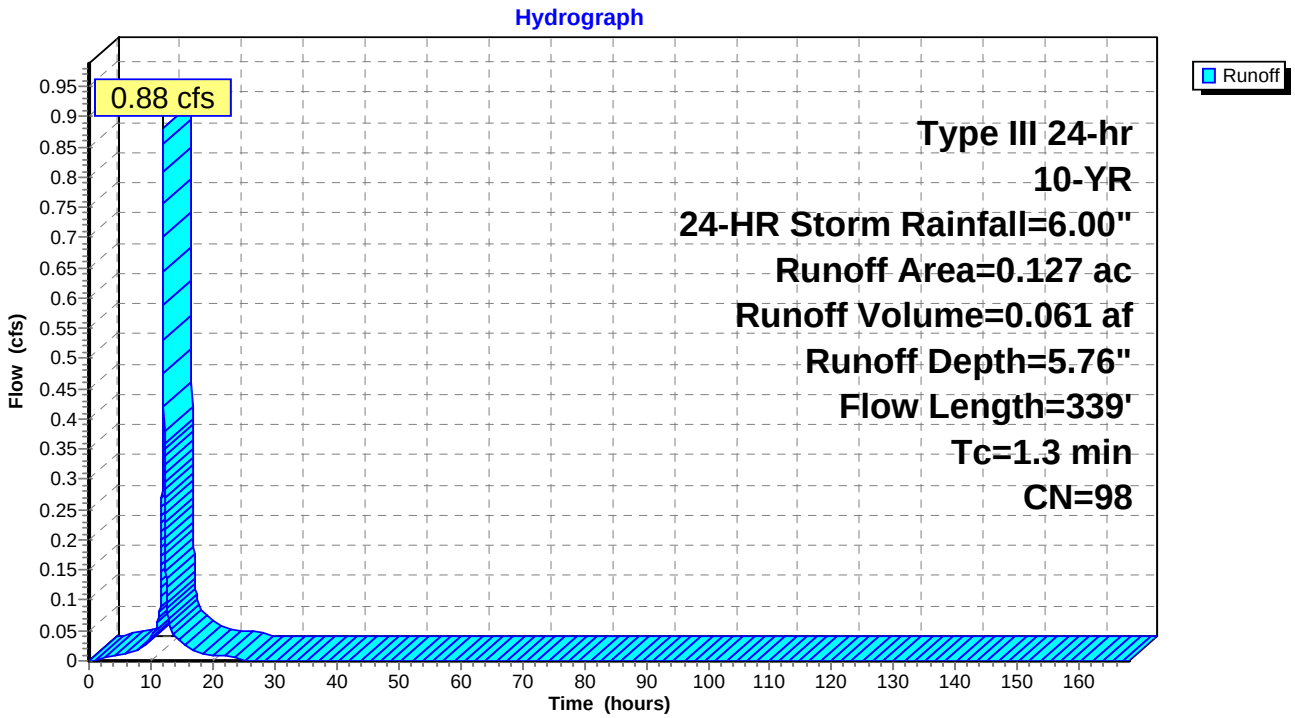
Runoff = 0.88 cfs @ 12.02 hrs, Volume= 0.061 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.127	98	Paved roads w/curbs & sewers, HSG C
0.127		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	113	0.0670	2.47		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.5	226	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.3	339	Total			

Subcatchment 28G: PR DA 28G



Summary for Subcatchment 28H: PR DA 28H

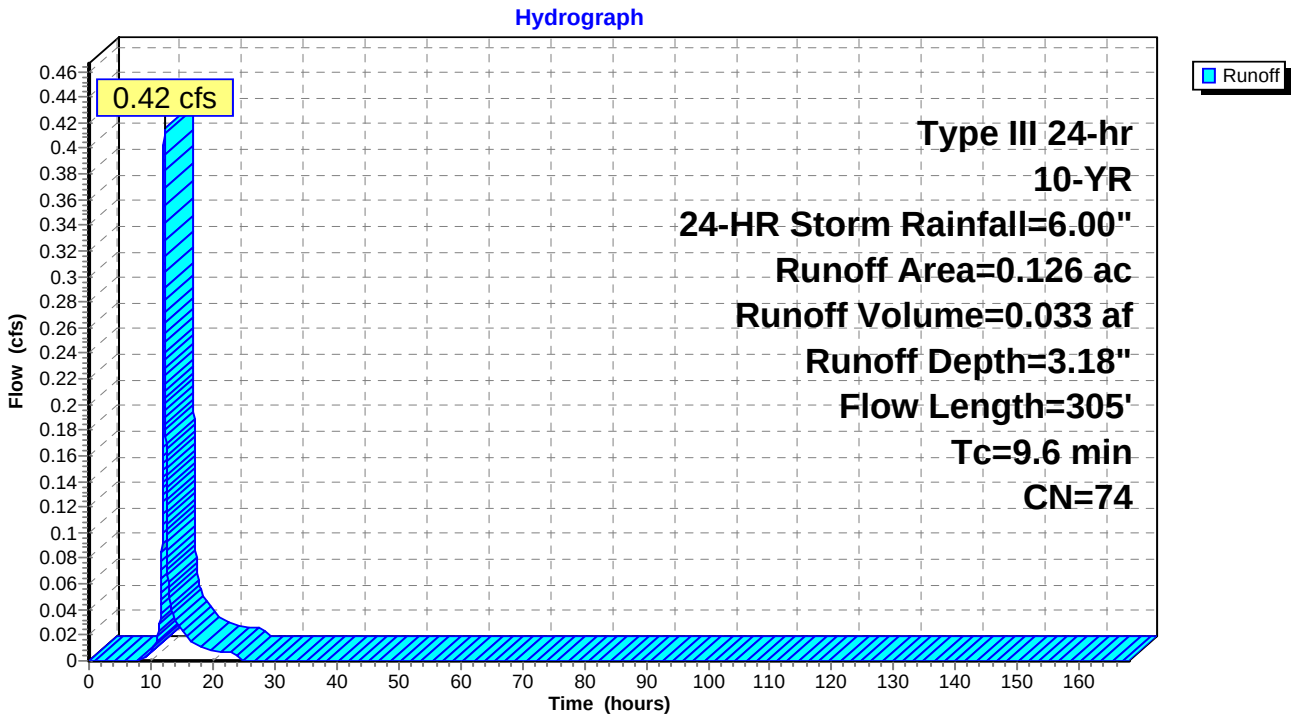
Runoff = 0.42 cfs @ 12.13 hrs, Volume= 0.033 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.126	74	>75% Grass cover, Good, HSG C
0.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	120	0.0700	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"
0.4	185	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
9.6	305	Total			

Subcatchment 28H: PR DA 28H



Summary for Subcatchment 28I: PR DA 28I

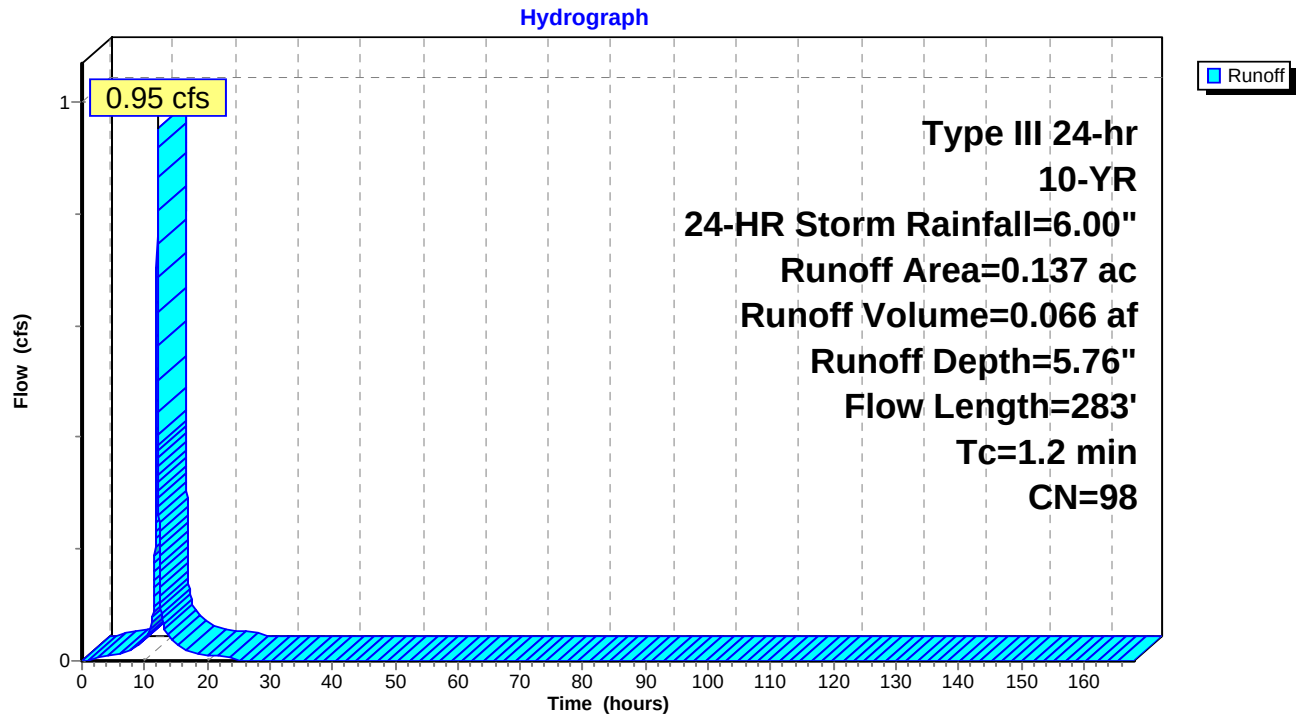
Runoff = 0.95 cfs @ 12.02 hrs, Volume= 0.066 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.137	98	Paved roads w/curbs & sewers, HSG C
0.137		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	118	0.0670	2.50		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	165	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.2	283	Total			

Subcatchment 28I: PR DA 28I



Summary for Subcatchment 31: PR DA 31

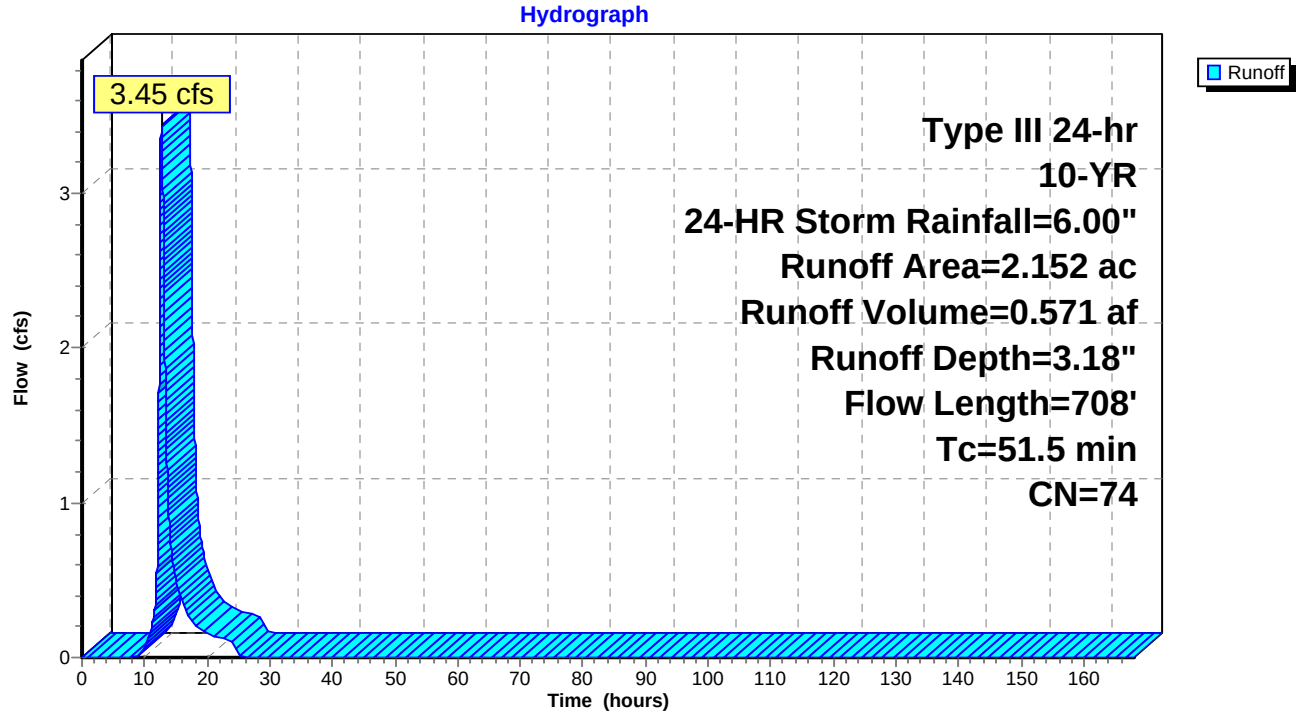
Runoff = 3.45 cfs @ 12.71 hrs, Volume= 0.571 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.064	98	Unconnected pavement, HSG C
1.699	74	>75% Grass cover, Good, HSG C
0.031	71	Meadow, non-grazed, HSG C
0.300	70	Woods, Good, HSG C
0.049	80	>75% Grass cover, Good, HSG D
0.009	98	Water Surface, HSG D
2.152	74	Weighted Average
2.079		96.61% Pervious Area
0.073		3.39% Impervious Area
0.064		87.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.5	150	0.0067	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
9.0	558	0.0430	1.04		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
51.5	708	Total			

Subcatchment 31: PR DA 31



Summary for Subcatchment 31A: PR DA 31A

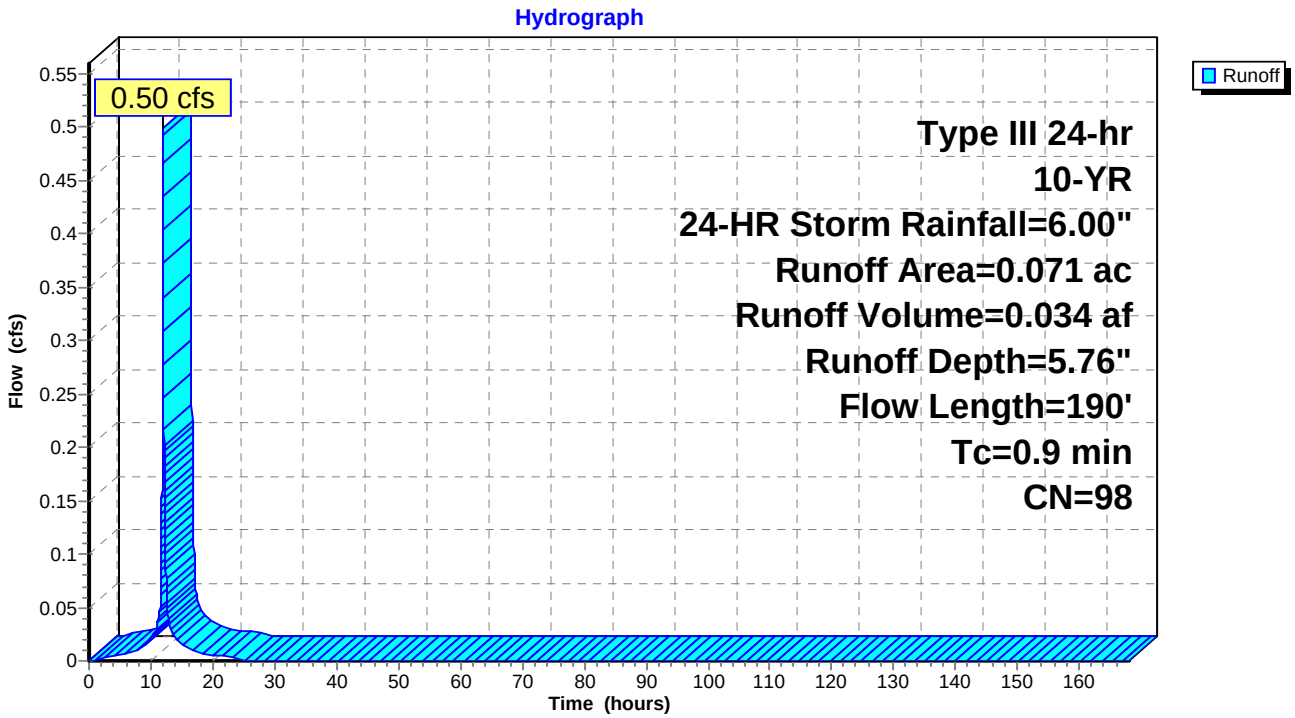
Runoff = 0.50 cfs @ 12.01 hrs, Volume= 0.034 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
*	0.071	98	Paved roads w/curbs & sewers, HSG C
	0.071		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	130	0.0690	2.58		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.1	60	0.0200	7.44	9.14	**Pipe Channel, Stormwater** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.9	190	Total			

Subcatchment 31A: PR DA 31A



Summary for Subcatchment 31B: PR DA 31B

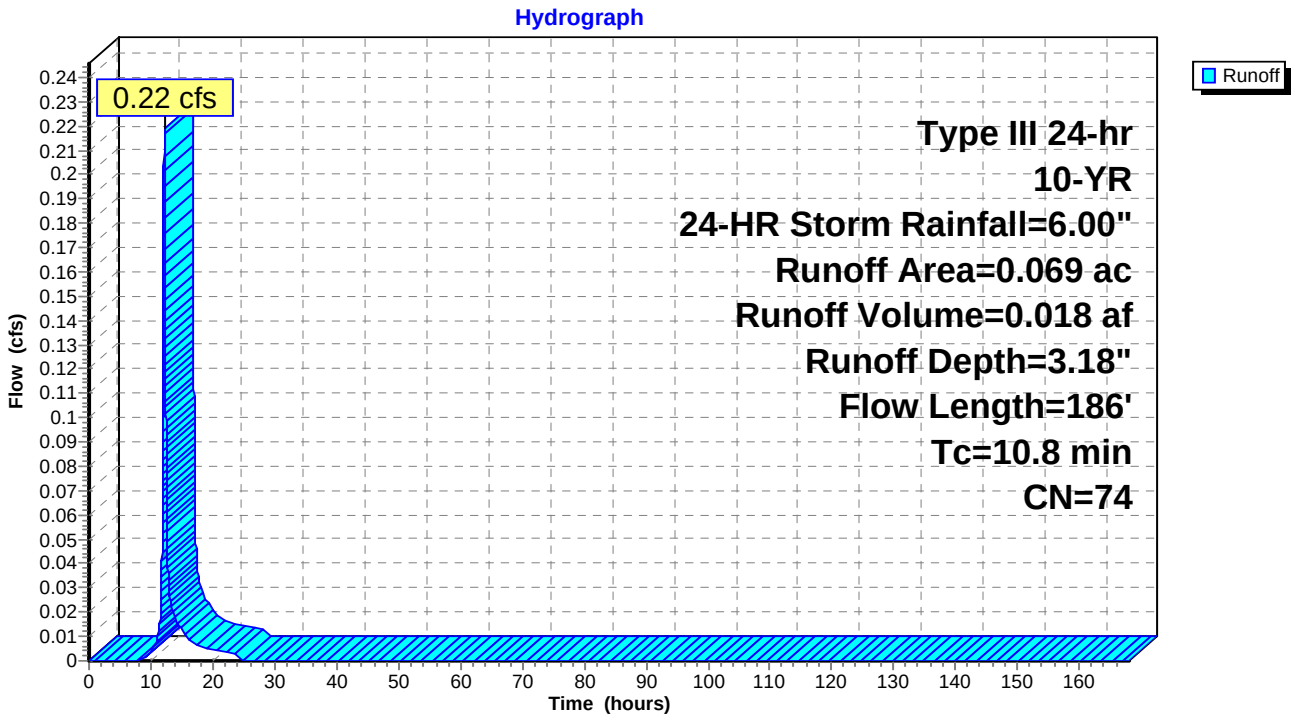
Runoff = 0.22 cfs @ 12.15 hrs, Volume= 0.018 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.069	74	>75% Grass cover, Good, HSG C
0.069		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	144	0.0700	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"
0.1	42	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
10.8	186	Total			

Subcatchment 31B: PR DA 31B



Summary for Subcatchment 31C: PR DA 31C

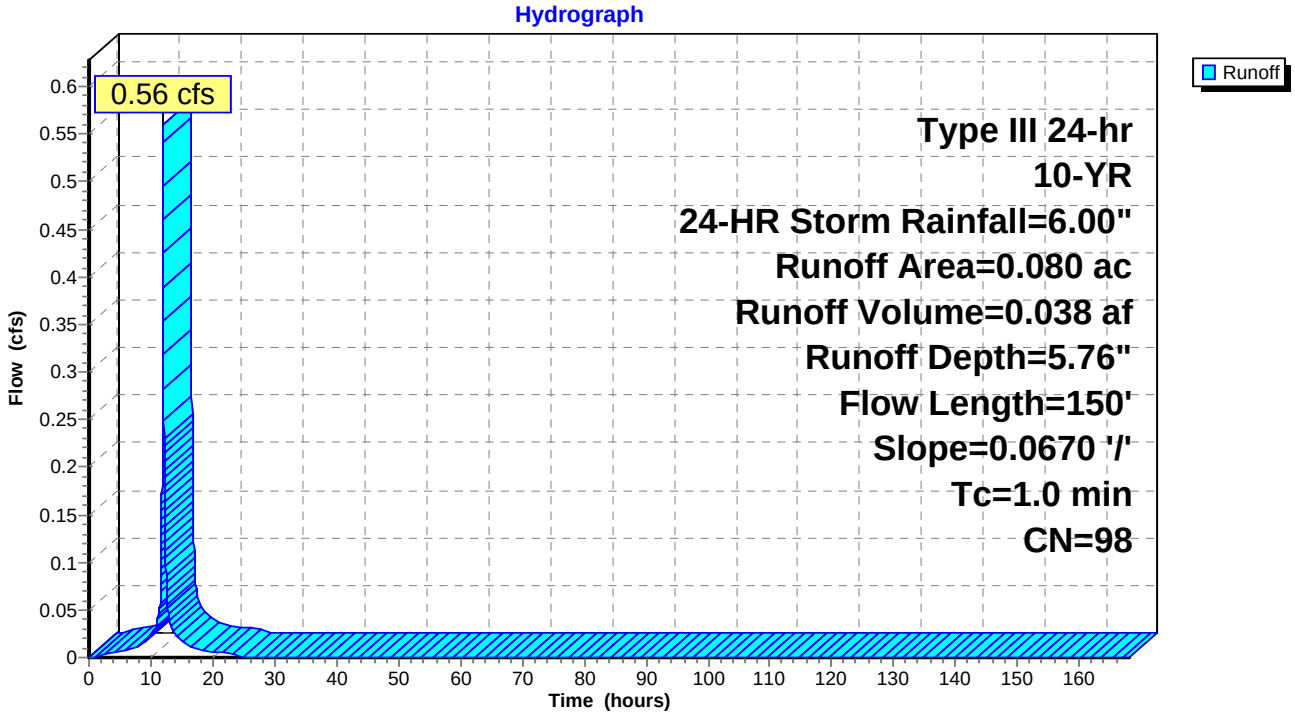
Runoff = 0.56 cfs @ 12.01 hrs, Volume= 0.038 af, Depth= 5.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.080	98	Paved roads w/curbs & sewers, HSG C
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0670	2.62		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"

Subcatchment 31C: PR DA 31C



Summary for Subcatchment 31D: PR DA 31D

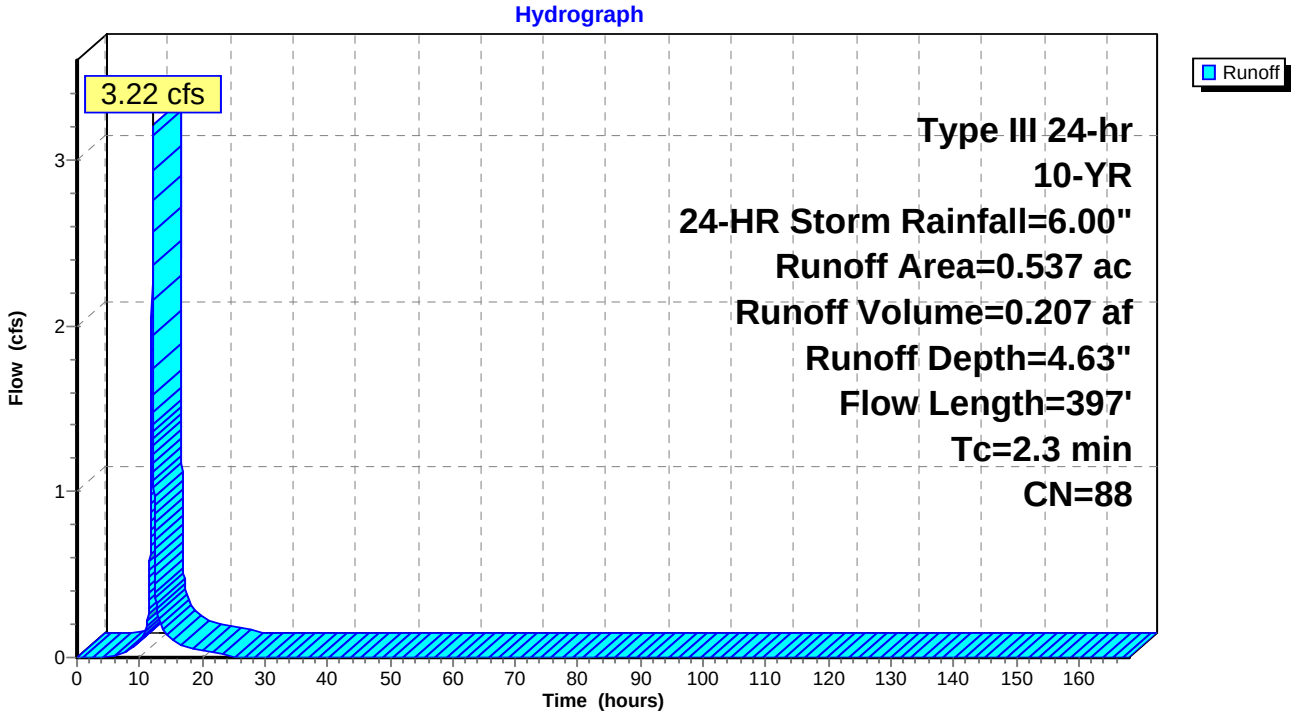
Runoff = 3.22 cfs @ 12.03 hrs, Volume= 0.207 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.223	74	>75% Grass cover, Good, HSG C
0.063	98	Unconnected pavement, HSG C
0.251	98	Paved roads w/curbs & sewers, HSG C
0.537	88	Weighted Average
0.223		41.53% Pervious Area
0.314		58.47% Impervious Area
0.063		20.06% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	150	0.0270	1.82		**Sheet Flow, Gutter** Smooth surfaces n= 0.011 P2= 3.75"
0.6	125	0.0270	3.34		**Shallow Concentrated Flow, Gutter** Paved Kv= 20.3 fps
0.3	122	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.3	397	Total			

Subcatchment 31D: PR DA 31D



Summary for Subcatchment SW21A: PR DA SW21A

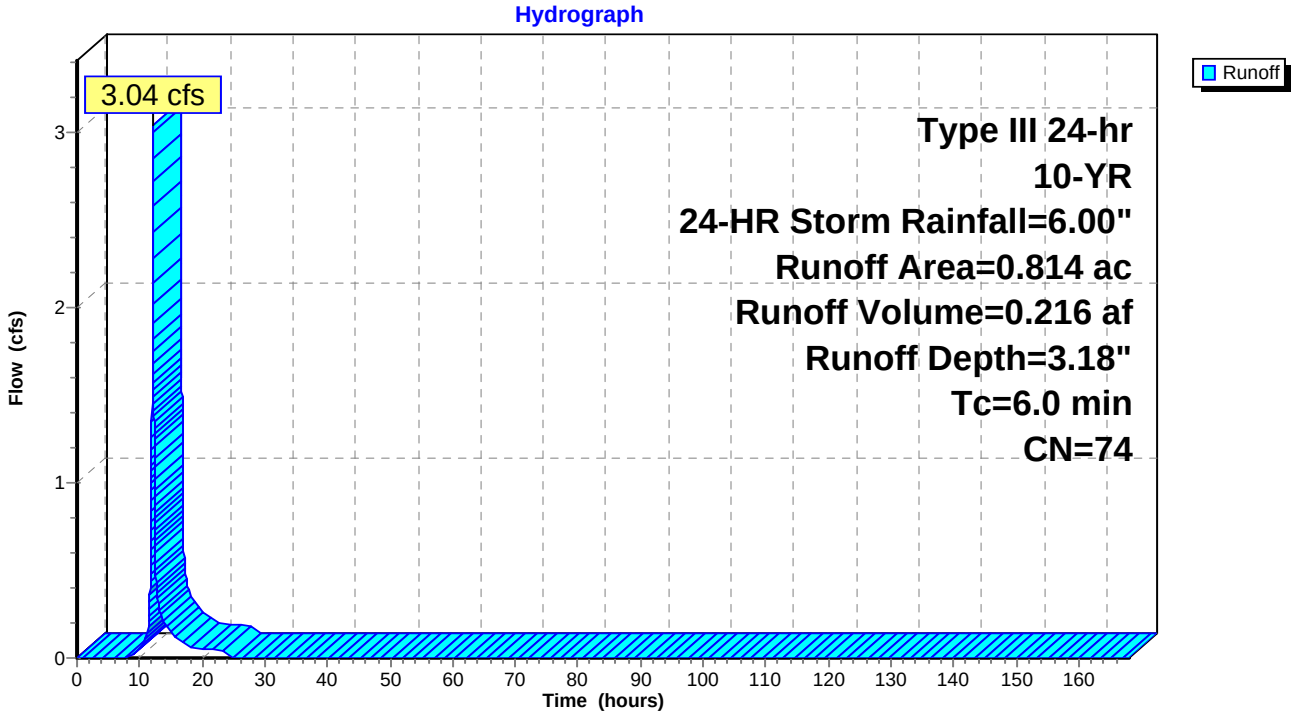
Runoff = 3.04 cfs @ 12.09 hrs, Volume= 0.216 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.814	74	>75% Grass cover, Good, HSG C
0.814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21A: PR DA SW21A



Summary for Subcatchment SW21B: PR DA SW21B

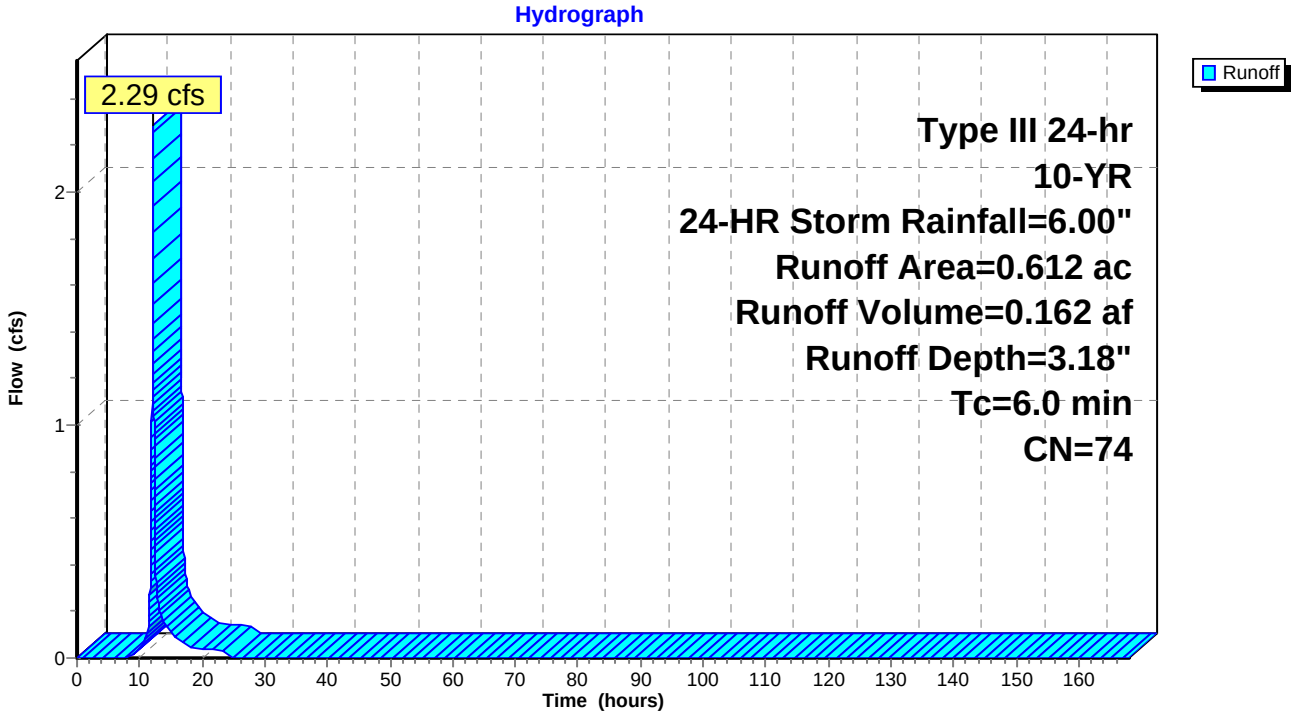
Runoff = 2.29 cfs @ 12.09 hrs, Volume= 0.162 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.433	74	>75% Grass cover, Good, HSG C
0.179	74	>75% Grass cover, Good, HSG C
0.612	74	Weighted Average
0.612		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21B: PR DA SW21B



Summary for Subcatchment SW21C: PR DA SW21C

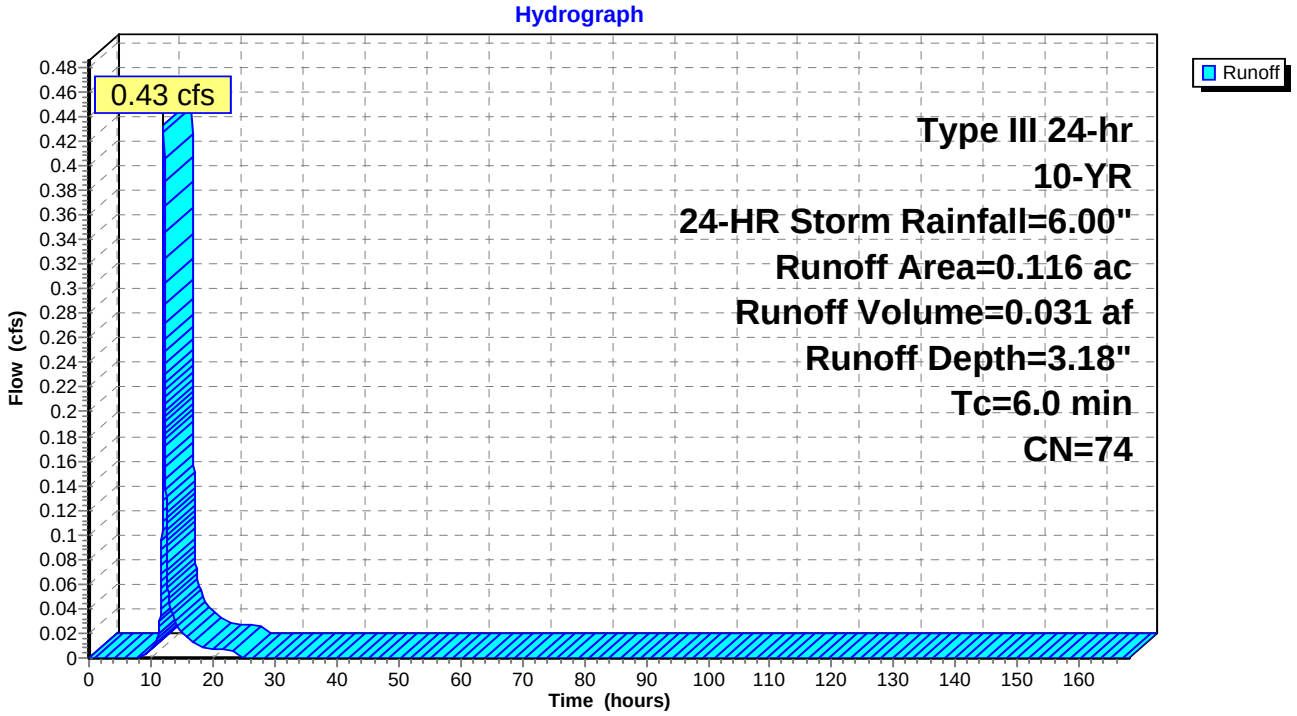
Runoff = 0.43 cfs @ 12.09 hrs, Volume= 0.031 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.116	74	>75% Grass cover, Good, HSG C
0.116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21C: PR DA SW21C



Summary for Subcatchment SW23A: PR DA SW23A

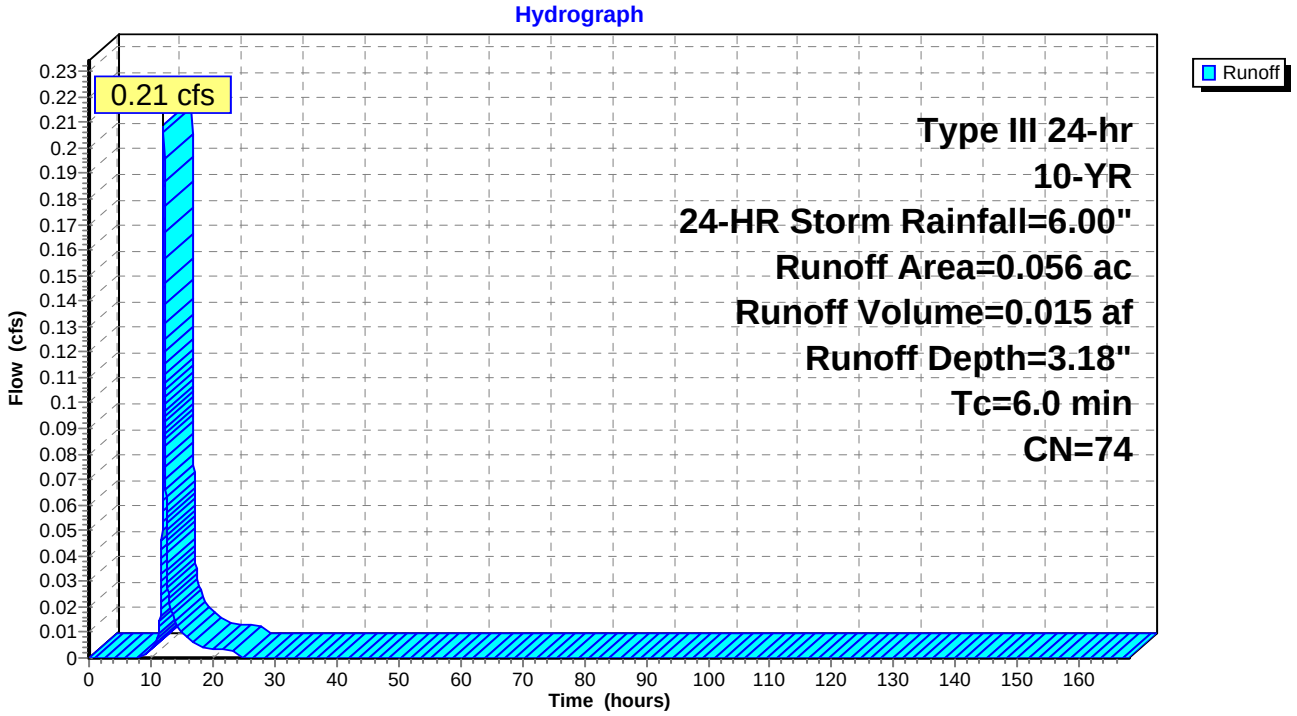
Runoff = 0.21 cfs @ 12.09 hrs, Volume= 0.015 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.056	74	>75% Grass cover, Good, HSG C
0.056		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW23A: PR DA SW23A



Summary for Subcatchment SW23B: PR DA SW23B

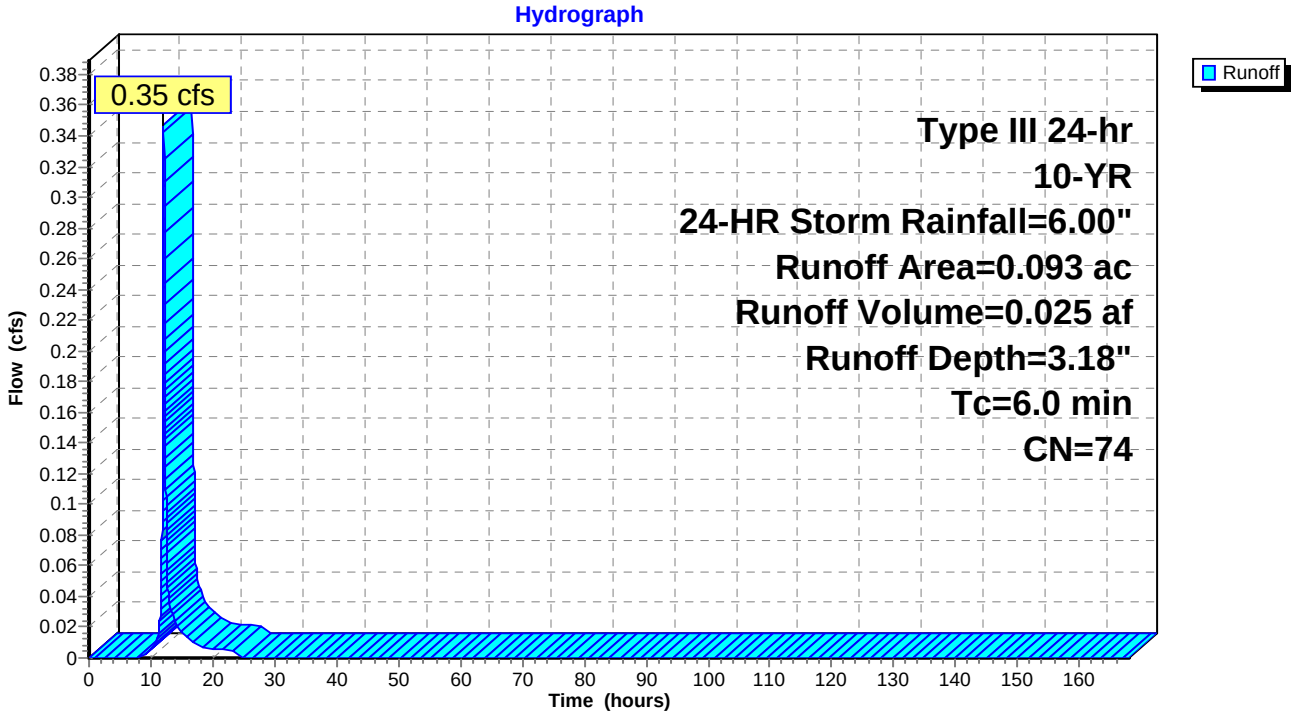
Runoff = 0.35 cfs @ 12.09 hrs, Volume= 0.025 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.093	74	>75% Grass cover, Good, HSG C
0.093		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW23B: PR DA SW23B



Summary for Subcatchment SW28A: PR DA SW28A

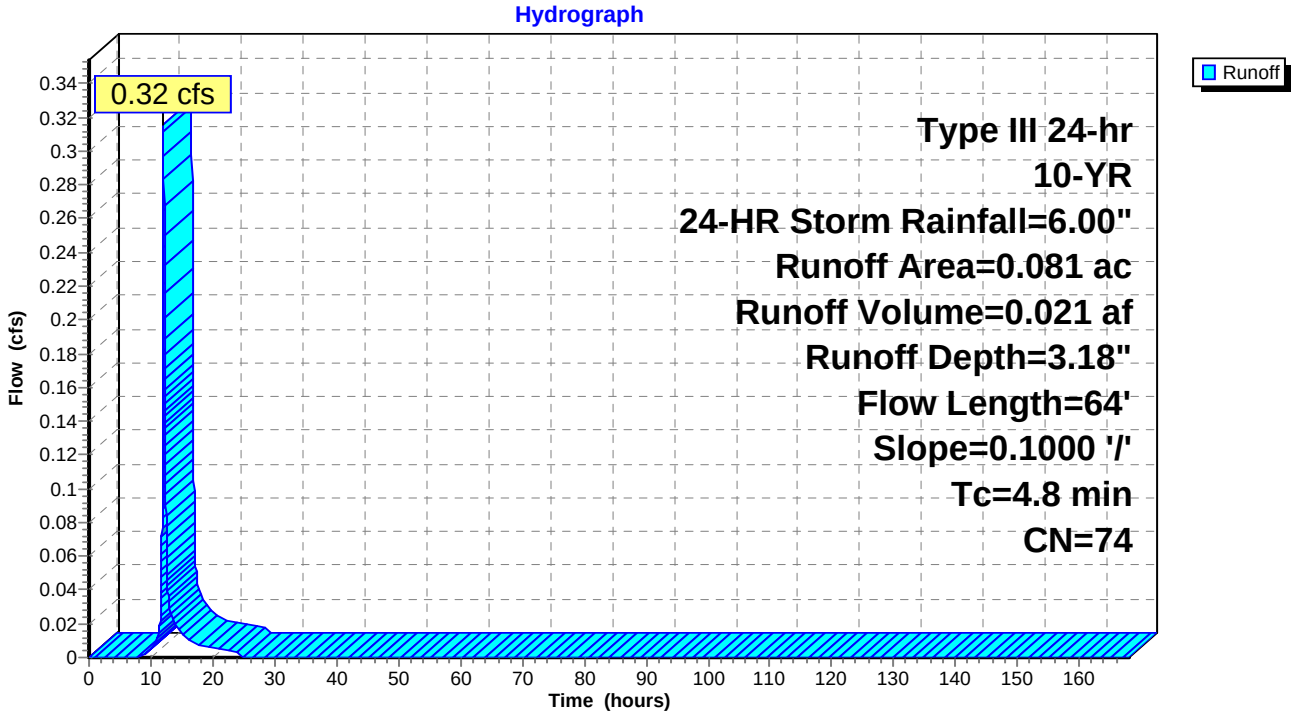
Runoff = 0.32 cfs @ 12.07 hrs, Volume= 0.021 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.081	74	>75% Grass cover, Good, HSG C
0.081		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	64	0.1000	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment SW28A: PR DA SW28A



Summary for Subcatchment SW28B: PR DA SW28B

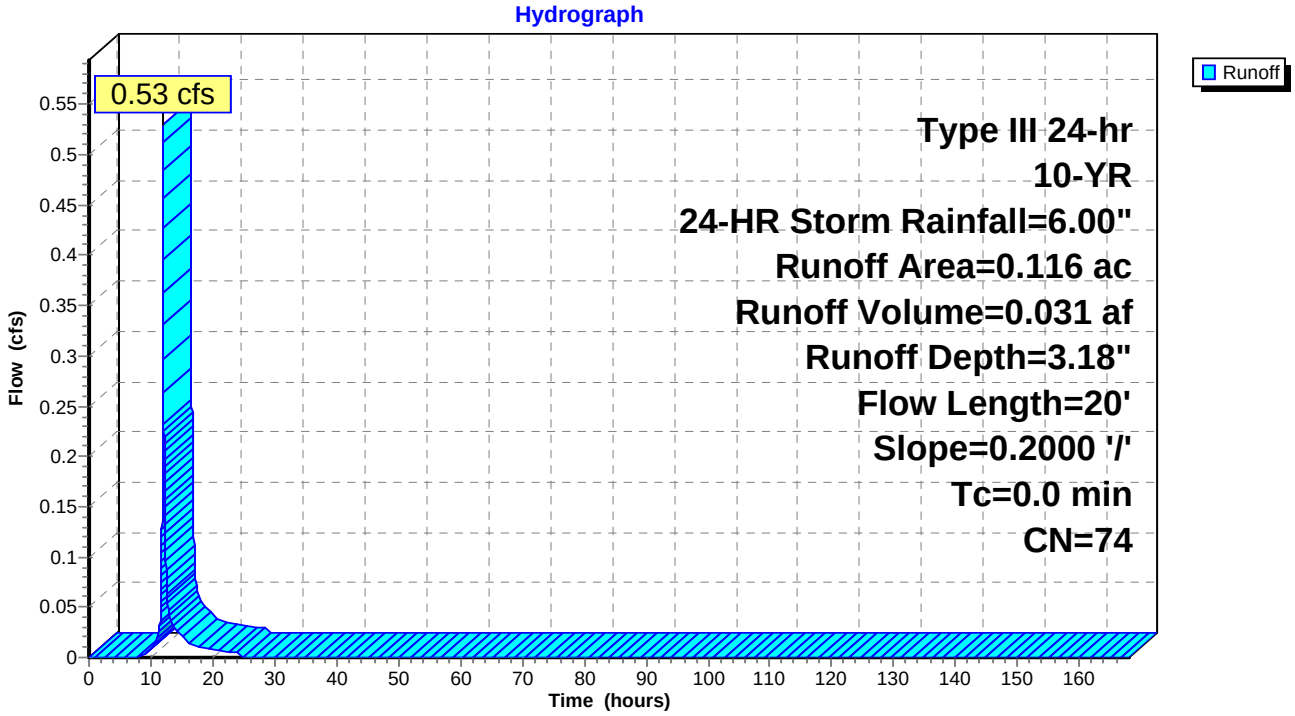
Runoff = 0.53 cfs @ 12.00 hrs, Volume= 0.031 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.116	74	>75% Grass cover, Good, HSG C
0.116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28B: PR DA SW28B



Summary for Subcatchment SW28C: PR DA SW28C

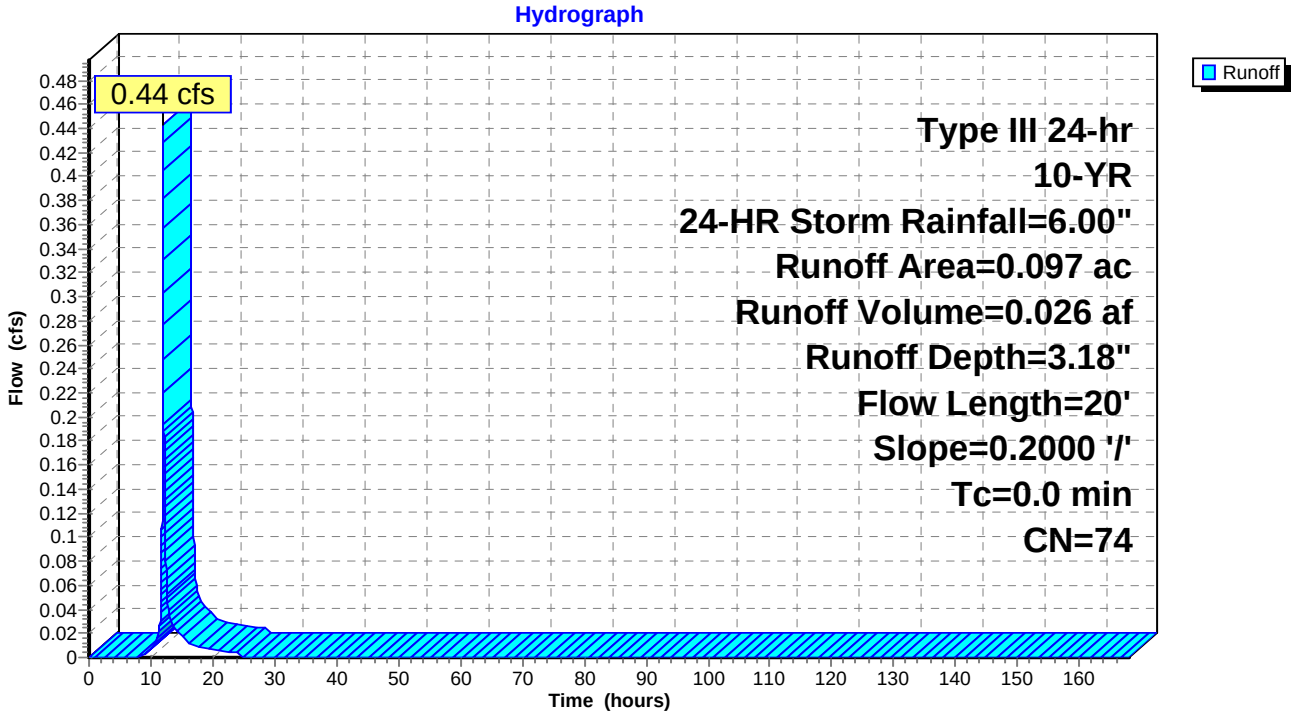
Runoff = 0.44 cfs @ 12.00 hrs, Volume= 0.026 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.097	74	>75% Grass cover, Good, HSG C
0.097		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28C: PR DA SW28C



Summary for Subcatchment SW28D: PR DA SW28D

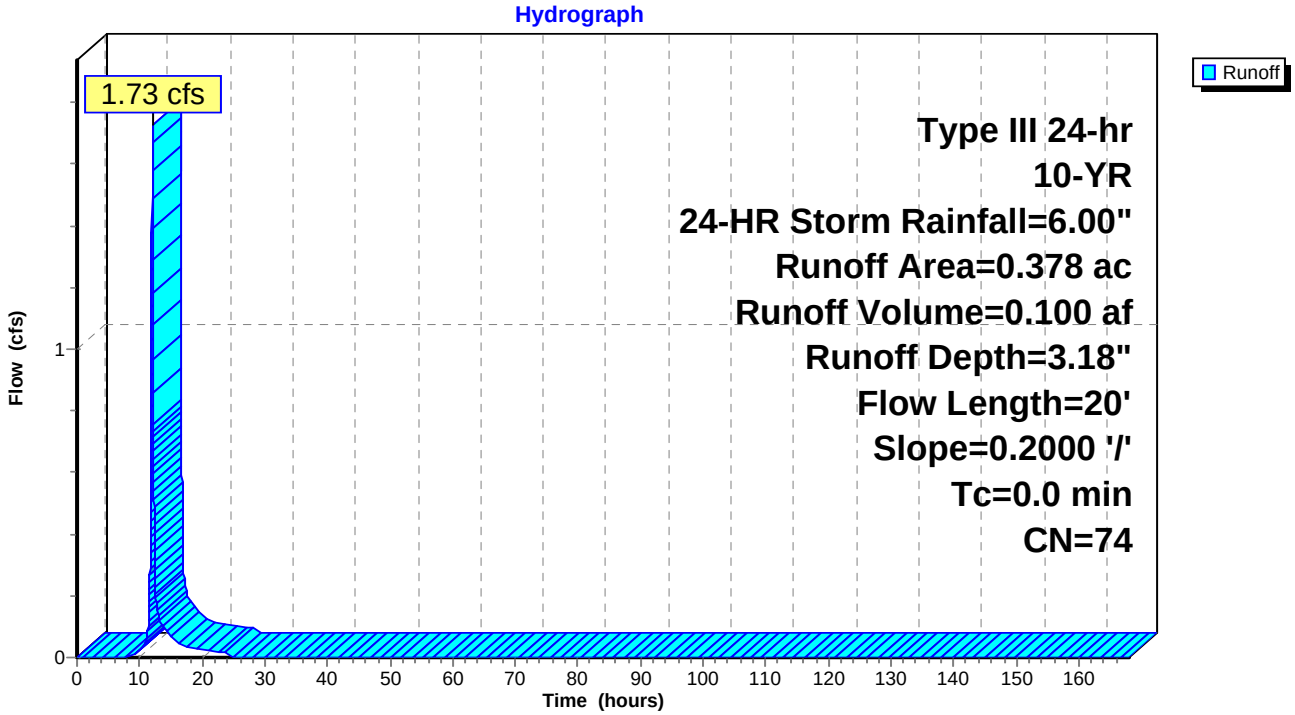
Runoff = 1.73 cfs @ 12.00 hrs, Volume= 0.100 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.378	74	>75% Grass cover, Good, HSG C
0.378		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28D: PR DA SW28D



Summary for Subcatchment SW31: PR DA SW31

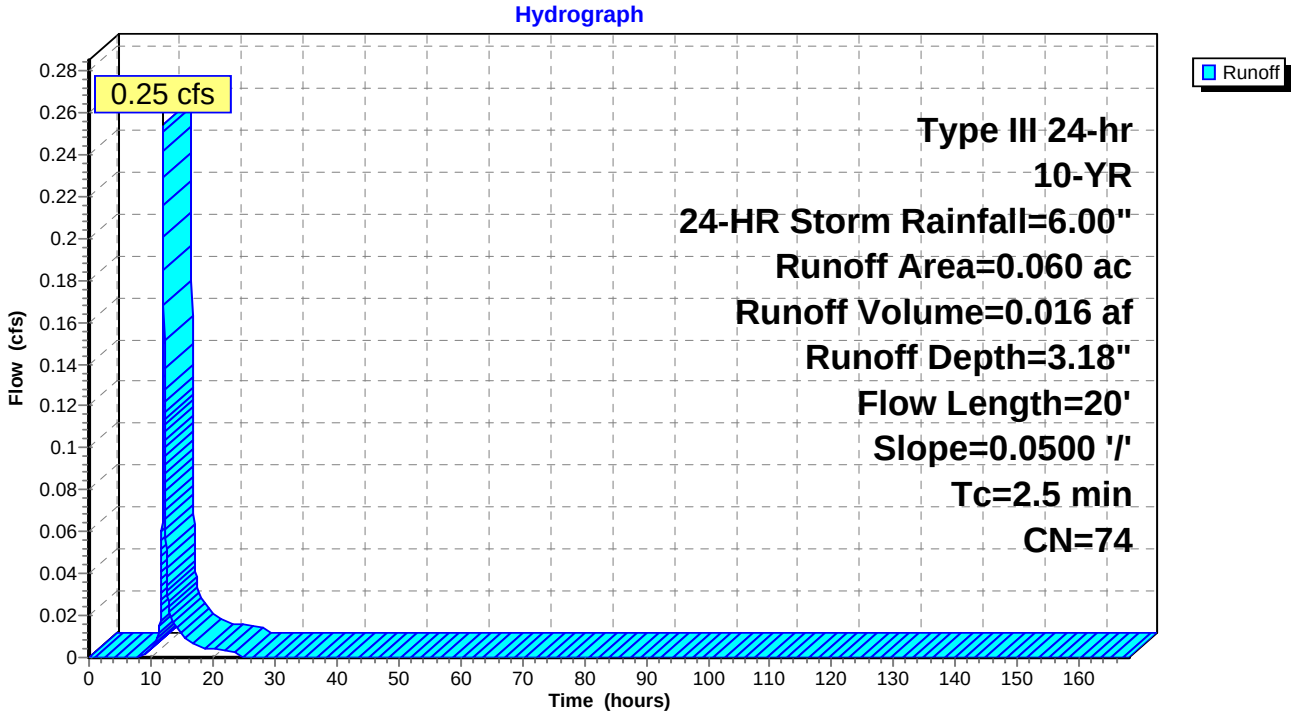
Runoff = 0.25 cfs @ 12.04 hrs, Volume= 0.016 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.060	74	>75% Grass cover, Good, HSG C
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0500	0.13		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment SW31: PR DA SW31

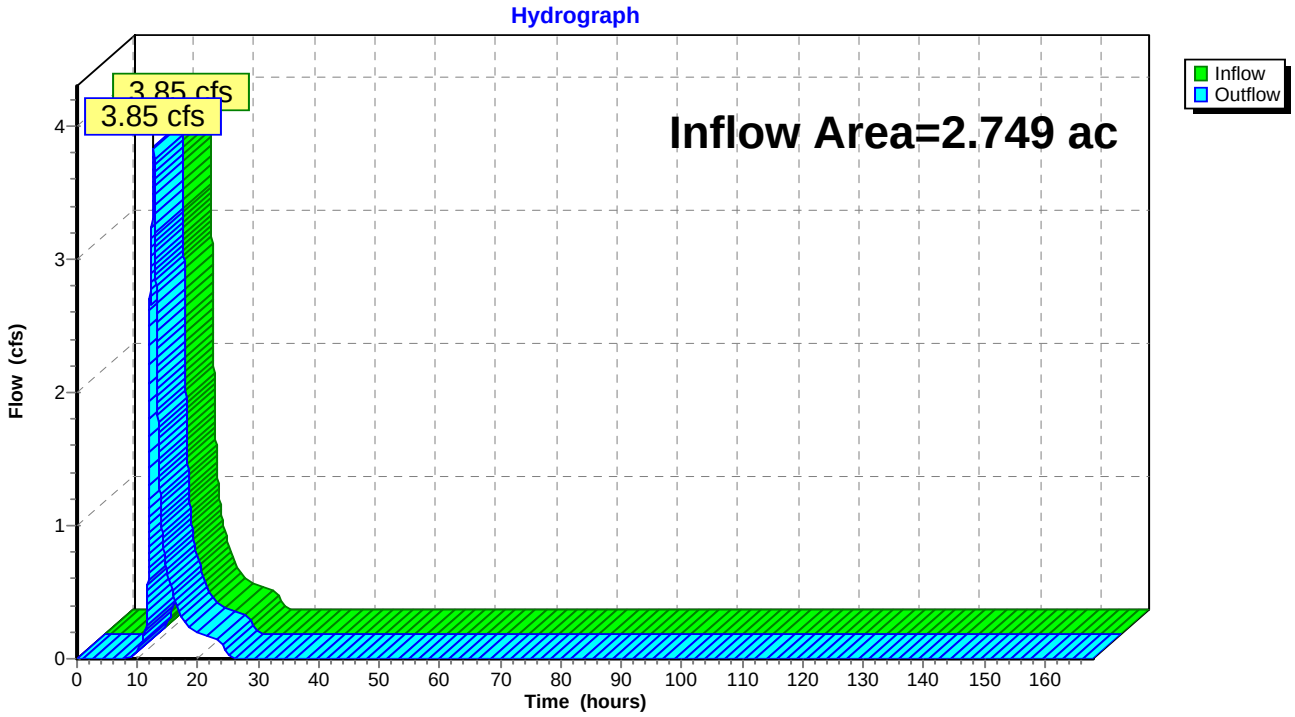


Summary for Reach 30R: DP-9

Inflow Area = 2.749 ac, 14.08% Impervious, Inflow Depth = 3.19" for 10-YR, 24-HR Storm event
Inflow = 3.85 cfs @ 12.70 hrs, Volume= 0.731 af
Outflow = 3.85 cfs @ 12.71 hrs, Volume= 0.731 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 30R: DP-9

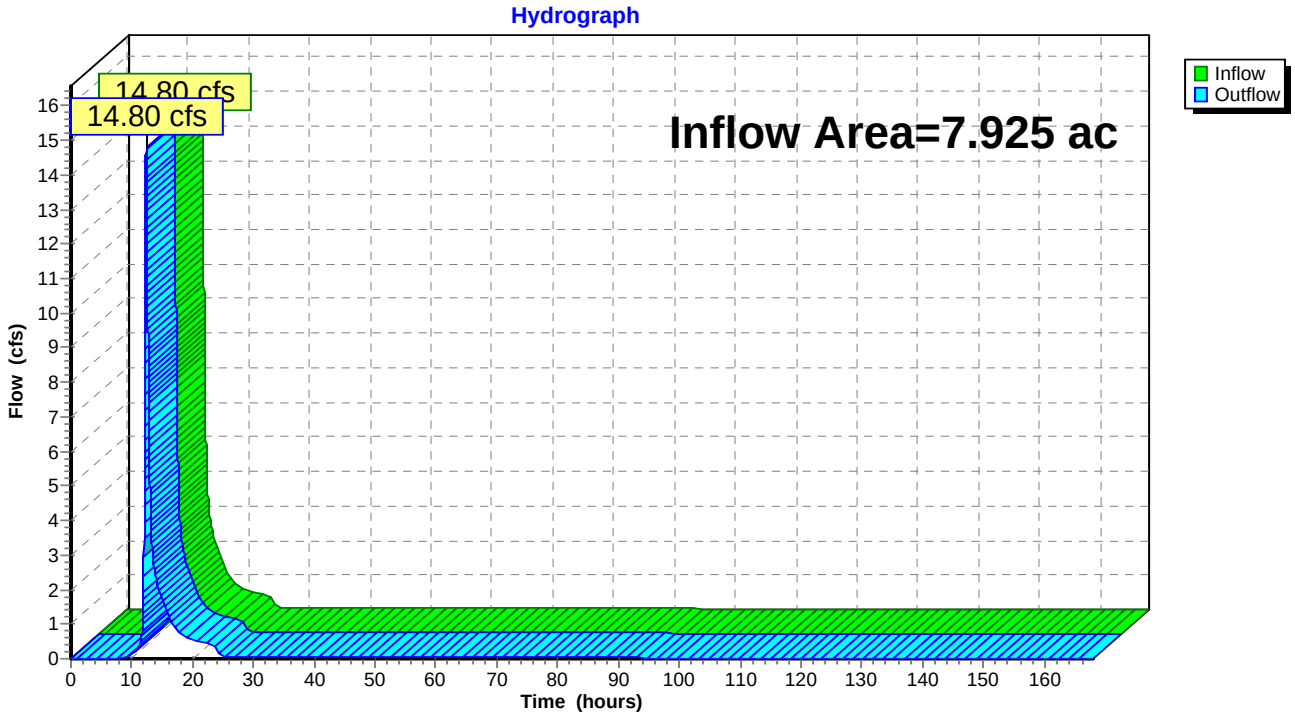


Summary for Reach 36R: DP-1

Inflow Area = 7.925 ac, 23.23% Impervious, Inflow Depth > 3.20" for 10-YR, 24-HR Storm event
Inflow = 14.80 cfs @ 12.34 hrs, Volume= 2.112 af
Outflow = 14.80 cfs @ 12.35 hrs, Volume= 2.112 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 36R: DP-1

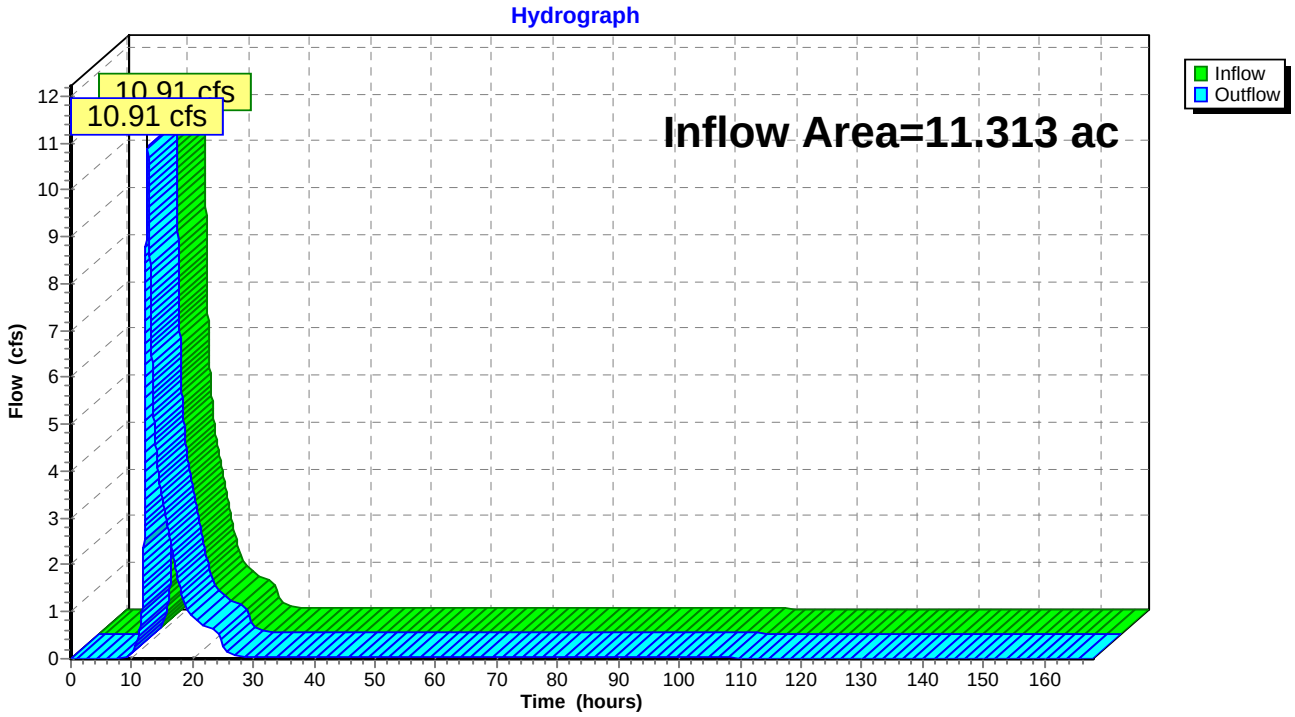


Summary for Reach 41R: DP-26

Inflow Area = 11.313 ac, 6.13% Impervious, Inflow Depth > 3.12" for 10-YR, 24-HR Storm event
Inflow = 10.91 cfs @ 12.60 hrs, Volume= 2.940 af
Outflow = 10.91 cfs @ 12.61 hrs, Volume= 2.940 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 41R: DP-26

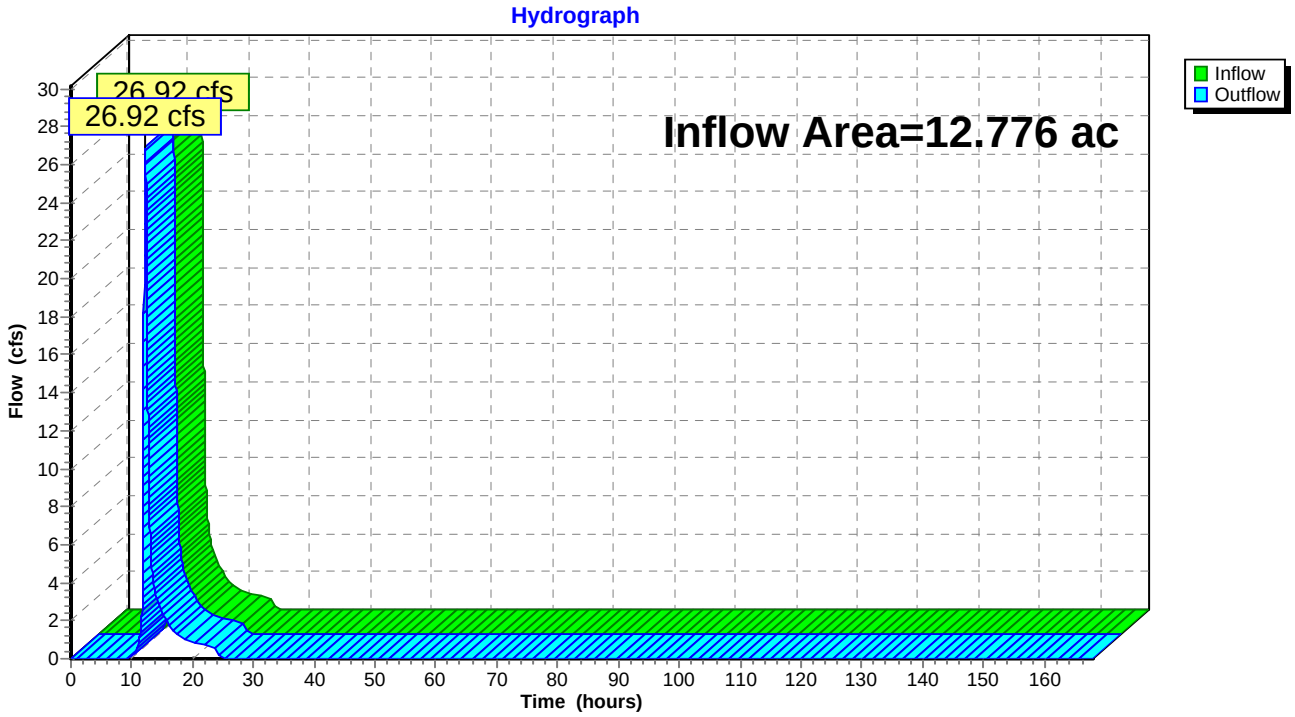


Summary for Reach 46R: DP-25

Inflow Area = 12.776 ac, 7.30% Impervious, Inflow Depth = 2.99" for 10-YR, 24-HR Storm event
Inflow = 26.92 cfs @ 12.07 hrs, Volume= 3.182 af
Outflow = 26.92 cfs @ 12.08 hrs, Volume= 3.182 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 46R: DP-25

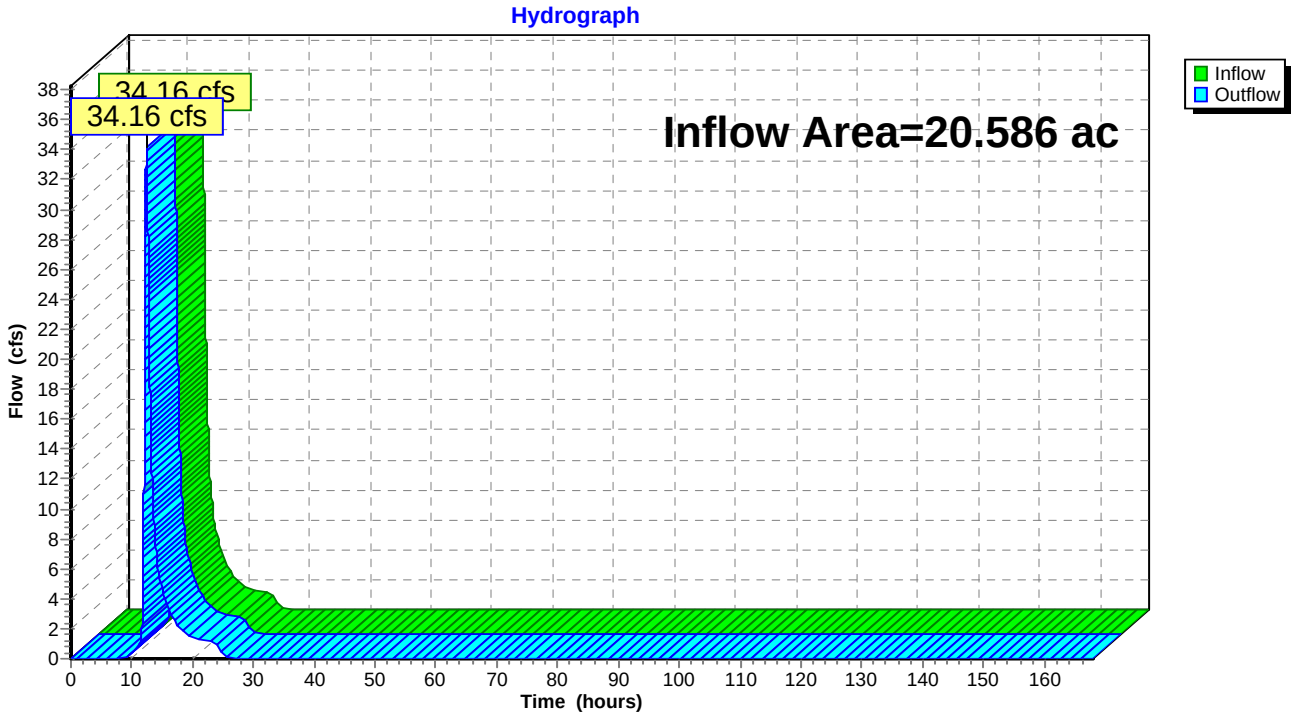


Summary for Reach 51R: DP-24

Inflow Area = 20.586 ac, 5.22% Impervious, Inflow Depth > 3.31" for 10-YR, 24-HR Storm event
Inflow = 34.16 cfs @ 12.40 hrs, Volume= 5.676 af
Outflow = 34.16 cfs @ 12.41 hrs, Volume= 5.676 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 51R: DP-24

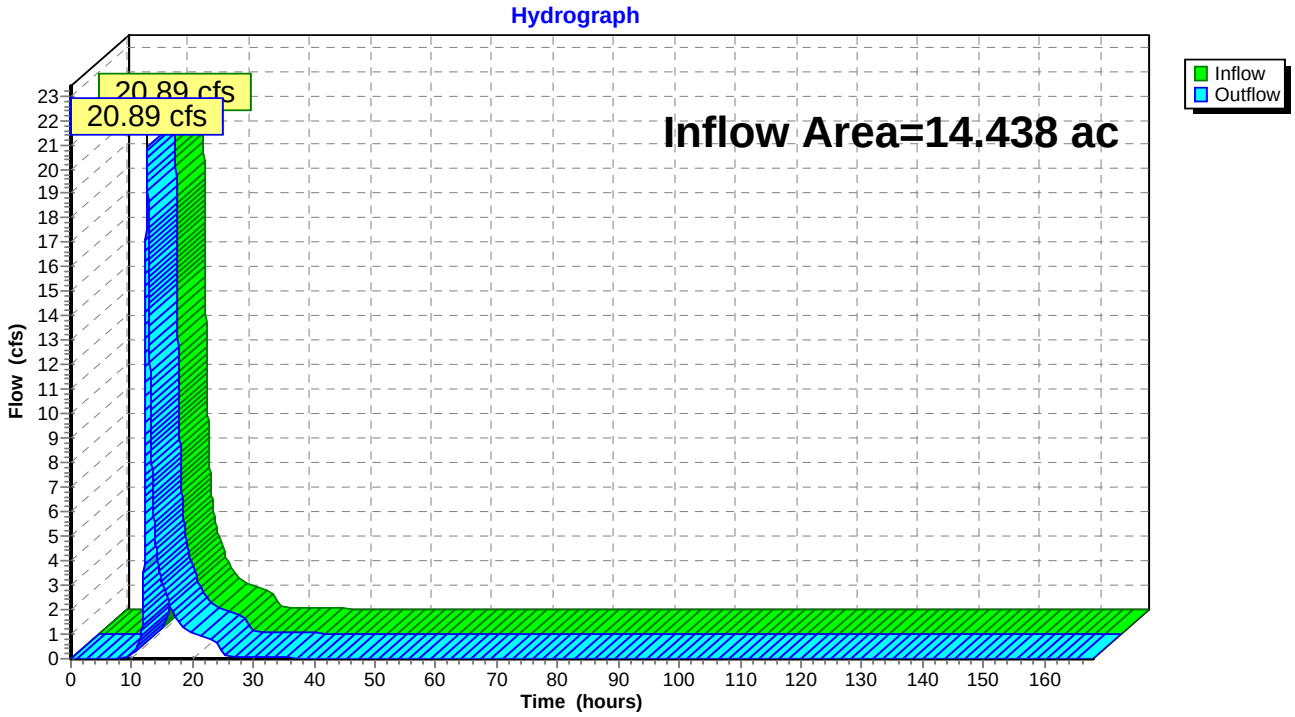


Summary for Reach 56R: DP-23

Inflow Area = 14.438 ac, 6.32% Impervious, Inflow Depth > 3.01" for 10-YR, 24-HR Storm event
Inflow = 20.89 cfs @ 12.49 hrs, Volume= 3.617 af
Outflow = 20.89 cfs @ 12.50 hrs, Volume= 3.617 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 56R: DP-23

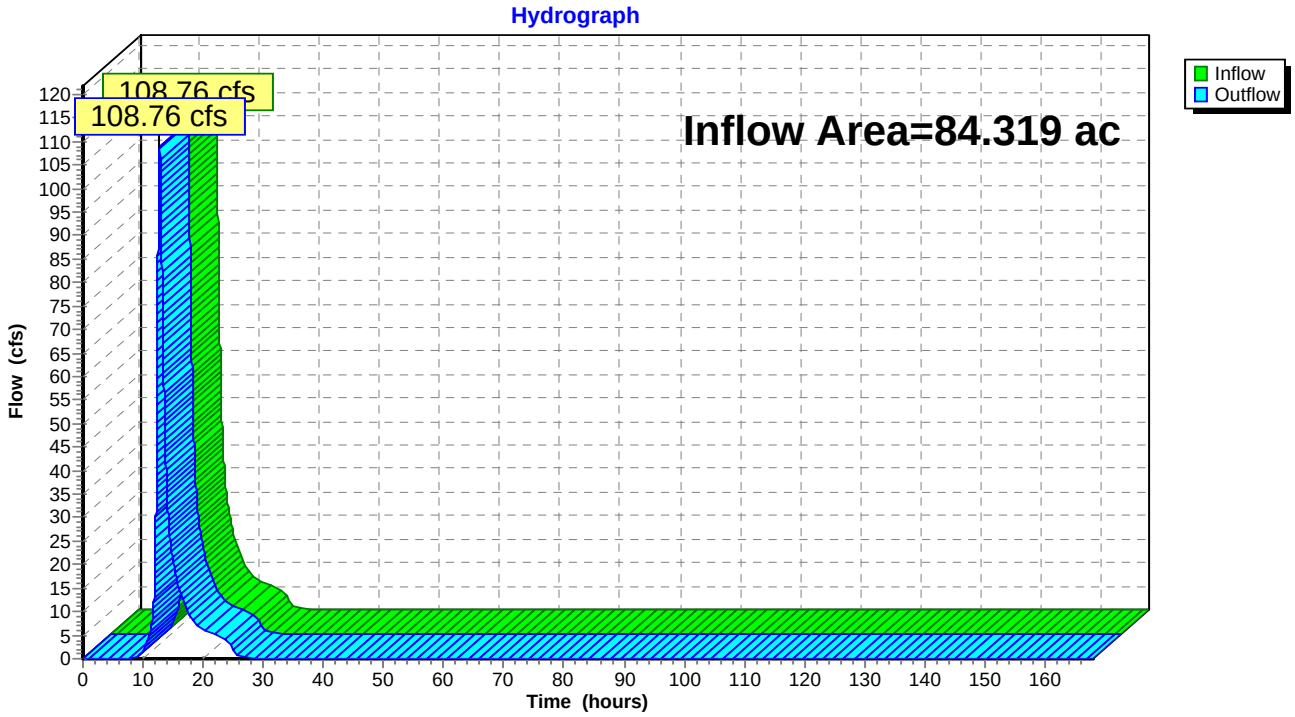


Summary for Reach 61R: DP-21

Inflow Area = 84.319 ac, 3.86% Impervious, Inflow Depth > 3.07" for 10-YR, 24-HR Storm event
Inflow = 108.76 cfs @ 12.72 hrs, Volume= 21.601 af
Outflow = 108.76 cfs @ 12.73 hrs, Volume= 21.601 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 61R: DP-21



Summary for Pond 21A-P: Pond-21A

Inflow Area = 3.092 ac, 26.26% Impervious, Inflow Depth = 4.09" for 10-YR, 24-HR Storm event
Inflow = 16.43 cfs @ 12.04 hrs, Volume= 1.053 af
Outflow = 0.78 cfs @ 14.16 hrs, Volume= 0.753 af, Atten= 95%, Lag= 126.8 min
Primary = 0.04 cfs @ 14.16 hrs, Volume= 0.464 af
Secondary = 0.74 cfs @ 14.16 hrs, Volume= 0.288 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,376.50' Surf.Area= 2,567 sf Storage= 3,042 cf
Peak Elev= 1,379.09' @ 14.16 hrs Surf.Area= 16,190 sf Storage= 35,615 cf (32,573 cf above start)

Plug-Flow detention time= 3,094.2 min calculated for 0.683 af (65% of inflow)
Center-of-Mass det. time= 2,720.8 min (3,524.5 - 803.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,374.00'	51,415 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

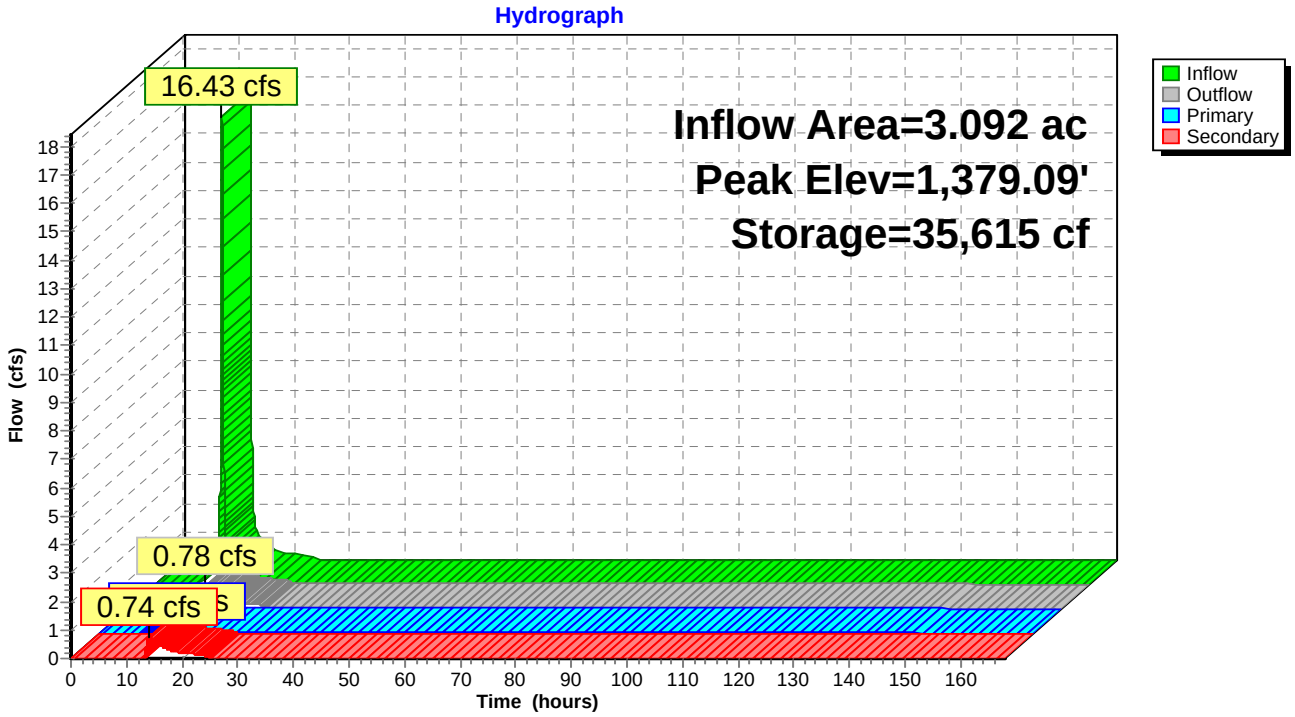
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,374.00	277	79.1	0	0	277
1,375.00	875	200.4	548	548	2,979
1,376.00	1,938	331.0	1,372	1,920	8,508
1,376.50	2,567	347.4	1,123	3,042	9,409
1,376.51	9,076	469.5	55	3,097	17,346
1,377.00	10,035	482.1	4,680	7,778	18,329
1,378.00	13,431	599.0	11,692	19,469	28,400
1,379.00	15,954	633.4	14,674	34,144	31,830
1,380.00	18,622	668.8	17,271	51,415	35,555

Device	Routing	Invert	Outlet Devices
#1	Primary	1,374.00'	**15.0" Round Culvert** L= 3.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,374.00' / 1,373.50' S= 0.1667 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,376.50'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,379.00'	**10.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=0.04 cfs @ 14.16 hrs HW=1,379.09' TW=0.00' (Dynamic Tailwater)
1=Culvert (Passes 0.04 cfs of 9.86 cfs potential flow)
2=Orifice/Grate (Orifice Controls 0.04 cfs @ 7.69 fps)

Secondary OutFlow Max=0.74 cfs @ 14.16 hrs HW=1,379.09' TW=0.00' (Dynamic Tailwater)
3=Broad-Crested Rectangular Weir (Weir Controls 0.74 cfs @ 0.81 fps)

Pond 21A-P: Pond-21A



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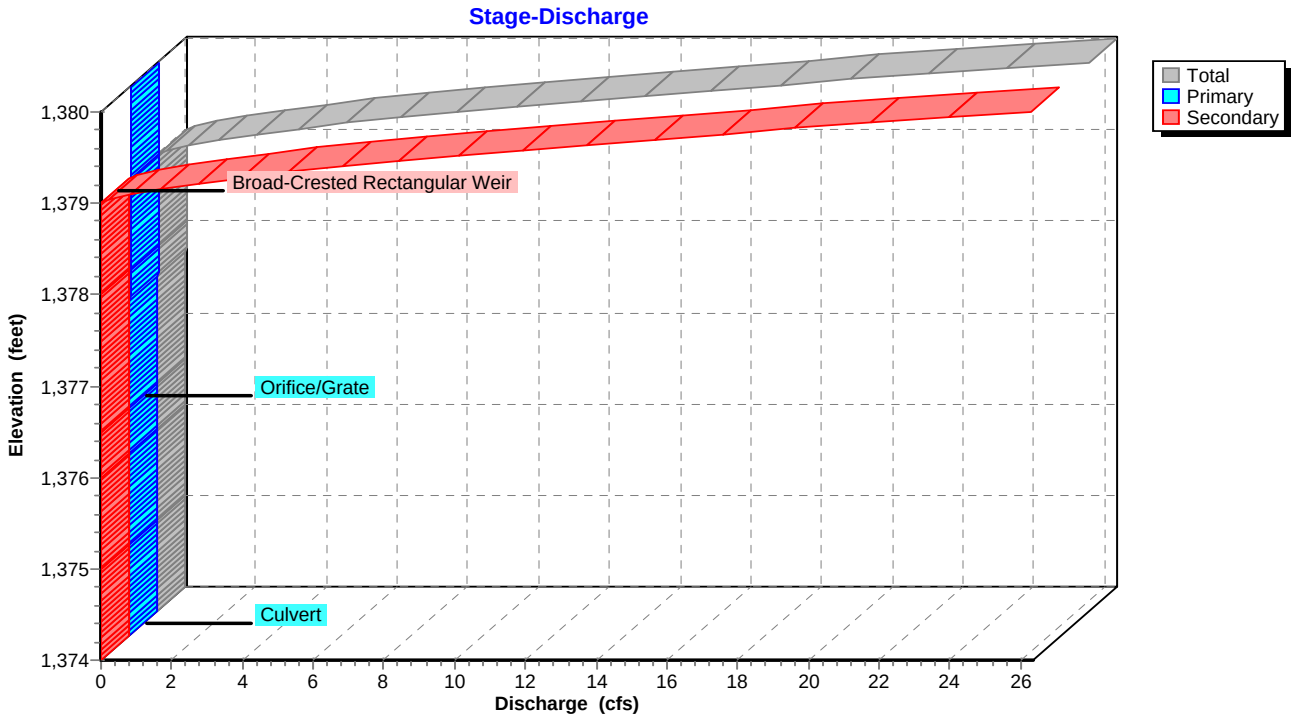

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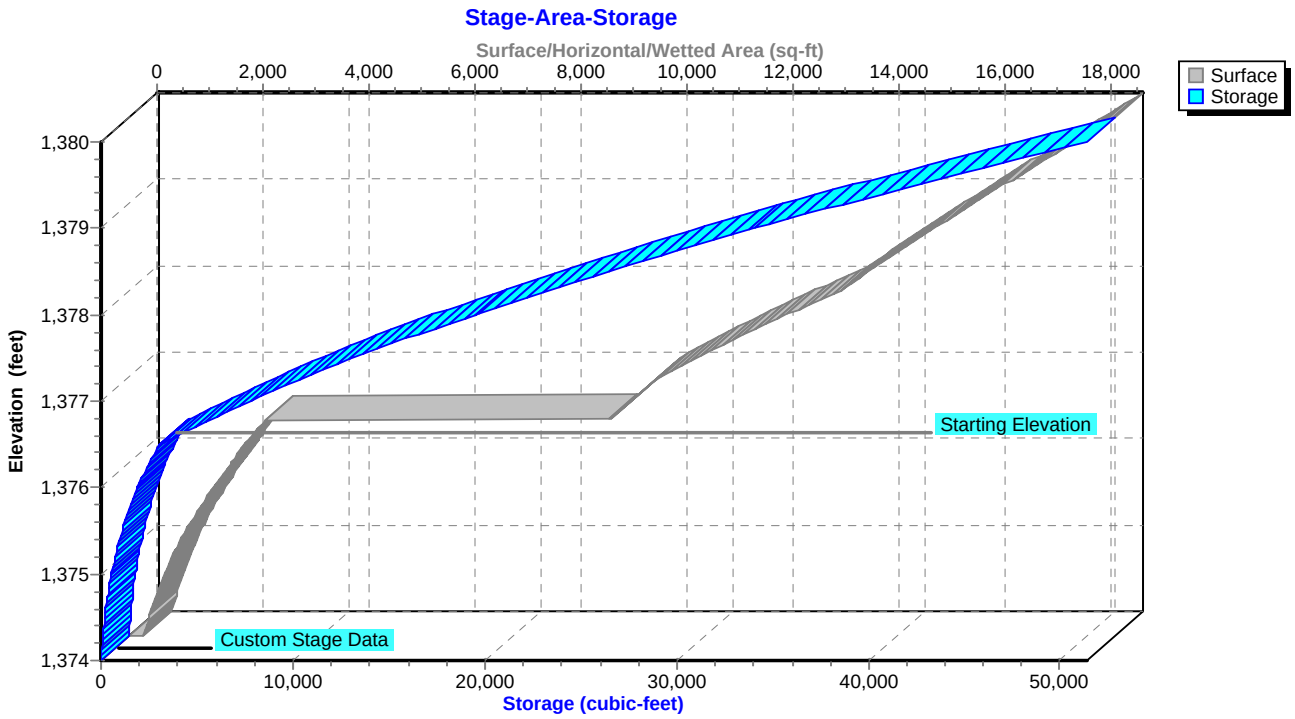


Summary for Pond 21B-P: Pond-21B

Inflow Area = 3.185 ac, 29.51% Impervious, Inflow Depth = 3.76" for 10-YR, 24-HR Storm event
Inflow = 14.71 cfs @ 12.03 hrs, Volume= 0.999 af
Outflow = 0.90 cfs @ 13.93 hrs, Volume= 0.901 af, Atten= 94%, Lag= 114.1 min
Primary = 0.90 cfs @ 13.93 hrs, Volume= 0.901 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,378.00' Surf.Area= 5,813 sf Storage= 10,561 cf
Peak Elev= 1,379.78' @ 13.93 hrs Surf.Area= 16,471 sf Storage= 36,213 cf (25,651 cf above start)

Plug-Flow detention time= 2,032.5 min calculated for 0.658 af (66% of inflow)
Center-of-Mass det. time= 1,415.1 min (2,229.2 - 814.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,375.00'	58,169 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

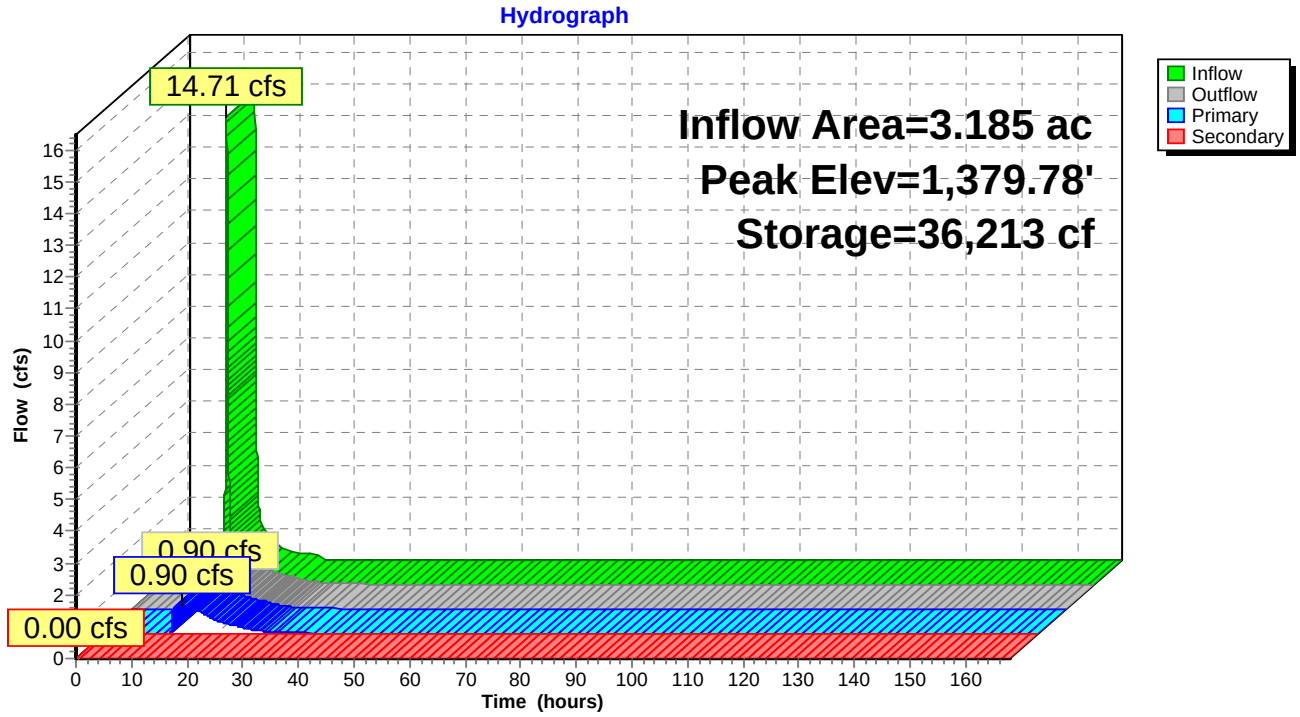
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,375.00	1,530	196.8	0	0	1,530
1,376.00	2,694	275.3	2,085	2,085	4,489
1,377.00	4,273	340.8	3,453	5,538	7,715
1,378.00	5,813	381.6	5,023	10,561	10,088
1,378.01	12,538	491.4	90	10,651	17,716
1,379.00	14,705	523.2	13,471	24,122	20,332
1,380.00	16,999	554.8	15,838	39,960	23,096
1,381.00	19,446	587.7	18,209	58,169	26,141

Device	Routing	Invert	Outlet Devices
#1	Primary	1,376.00'	**12.0" Round Culvert** L= 52.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,376.00' / 1,375.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,378.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,379.00'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Secondary	1,380.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

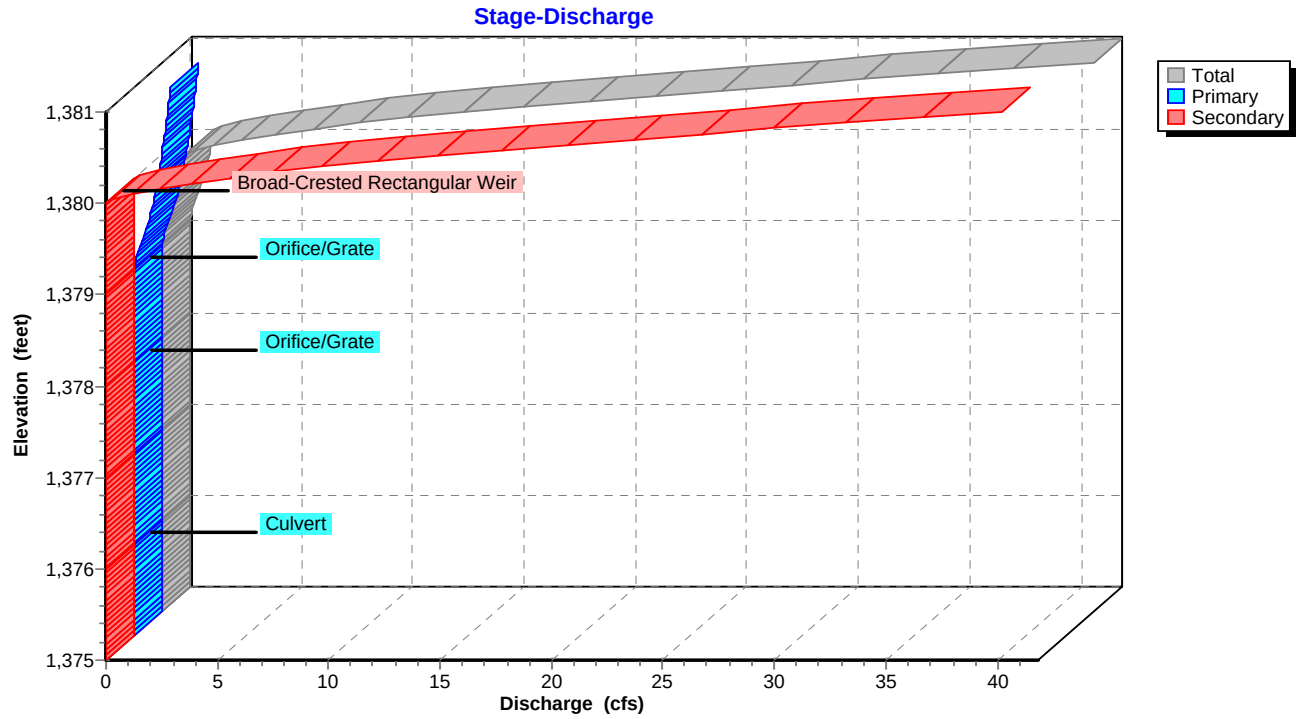
Primary OutFlow Max=0.90 cfs @ 13.93 hrs HW=1,379.78' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.90 cfs of 6.04 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 6.34 fps)
  - **3=Orifice/Grate** (Orifice Controls 0.86 cfs @ 3.46 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,378.00' TW=0.00' (Dynamic Tailwater)
- **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

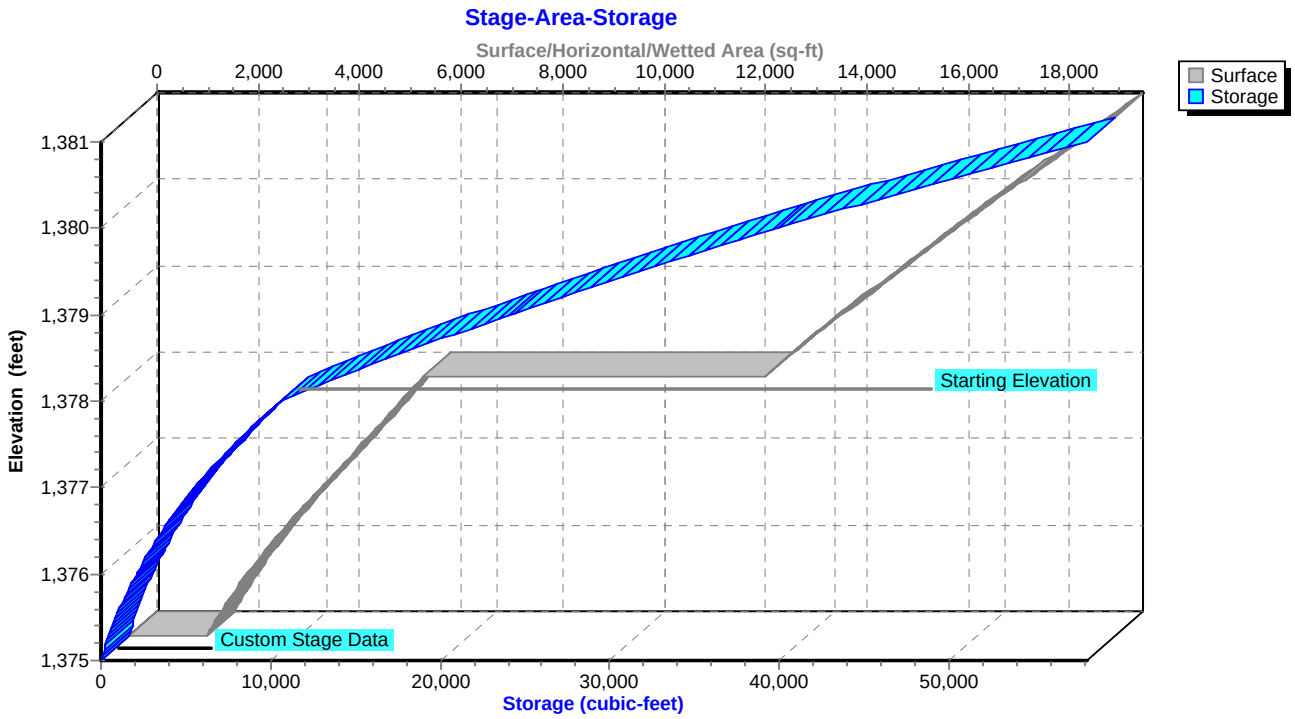
Pond 21B-P: Pond-21B



Pond 21B-P: Pond-21B



Pond 21B-P: Pond-21B



Summary for Pond 23-P: Pond-23

Inflow Area = 6.536 ac, 9.13% Impervious, Inflow Depth = 3.52" for 10-YR, 24-HR Storm event
Inflow = 18.47 cfs @ 12.04 hrs, Volume= 1.916 af
Outflow = 8.29 cfs @ 12.65 hrs, Volume= 1.805 af, Atten= 55%, Lag= 36.5 min
Primary = 8.29 cfs @ 12.65 hrs, Volume= 1.805 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,381.00' Surf.Area= 7,857 sf Storage= 8,931 cf
Peak Elev= 1,383.90' @ 12.65 hrs Surf.Area= 13,159 sf Storage= 39,200 cf (30,269 cf above start)

Plug-Flow detention time= 1,095.8 min calculated for 1.600 af (83% of inflow)
Center-of-Mass det. time= 900.2 min (1,738.0 - 837.8)

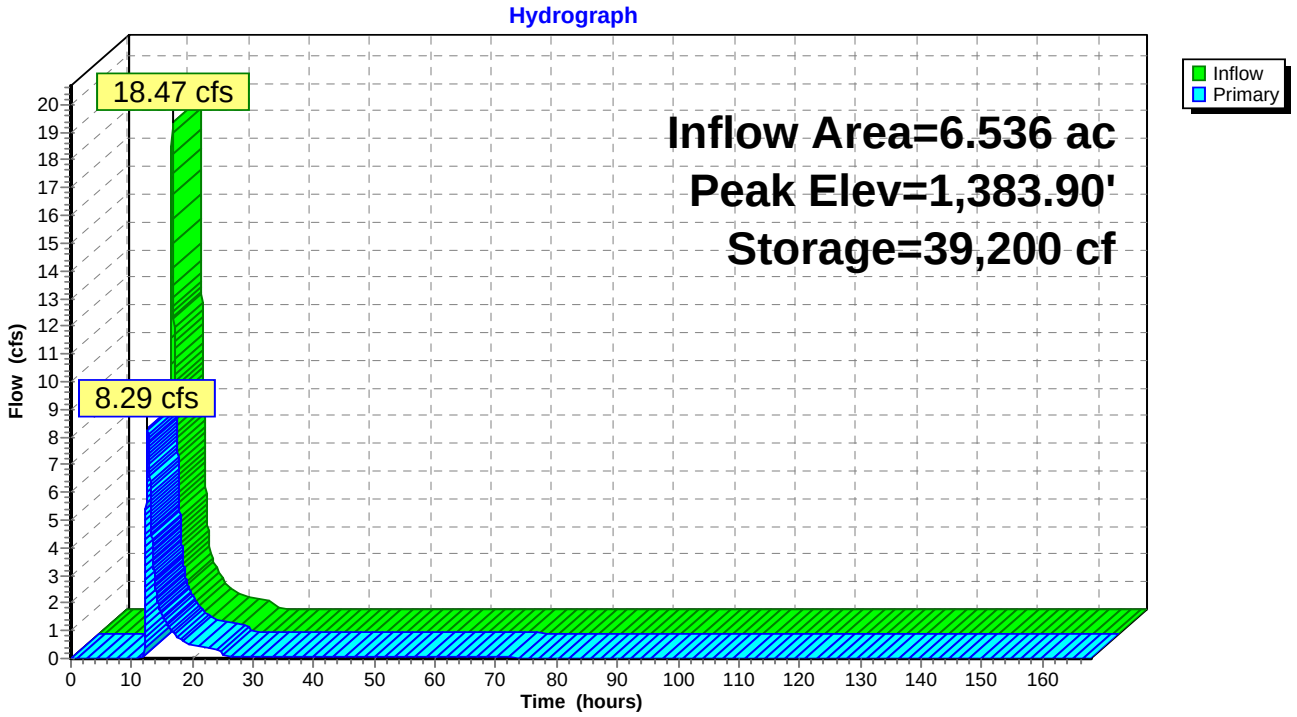
Volume	Invert	Avail.Storage	Storage Description
#1	1,377.00'	71,310 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,377.00	234	63.1	0	0	234
1,378.00	802	196.1	490	490	2,980
1,379.00	1,699	233.8	1,223	1,713	4,288
1,380.00	2,685	258.9	2,173	3,886	5,302
1,381.00	7,857	376.4	5,045	8,931	11,251
1,382.00	9,589	415.8	8,709	17,639	13,766
1,383.00	11,418	451.2	10,490	28,130	16,247
1,384.00	13,357	481.7	12,375	40,504	18,559
1,385.00	15,433	511.5	14,383	54,887	20,966
1,386.00	17,433	538.9	16,423	71,310	23,316

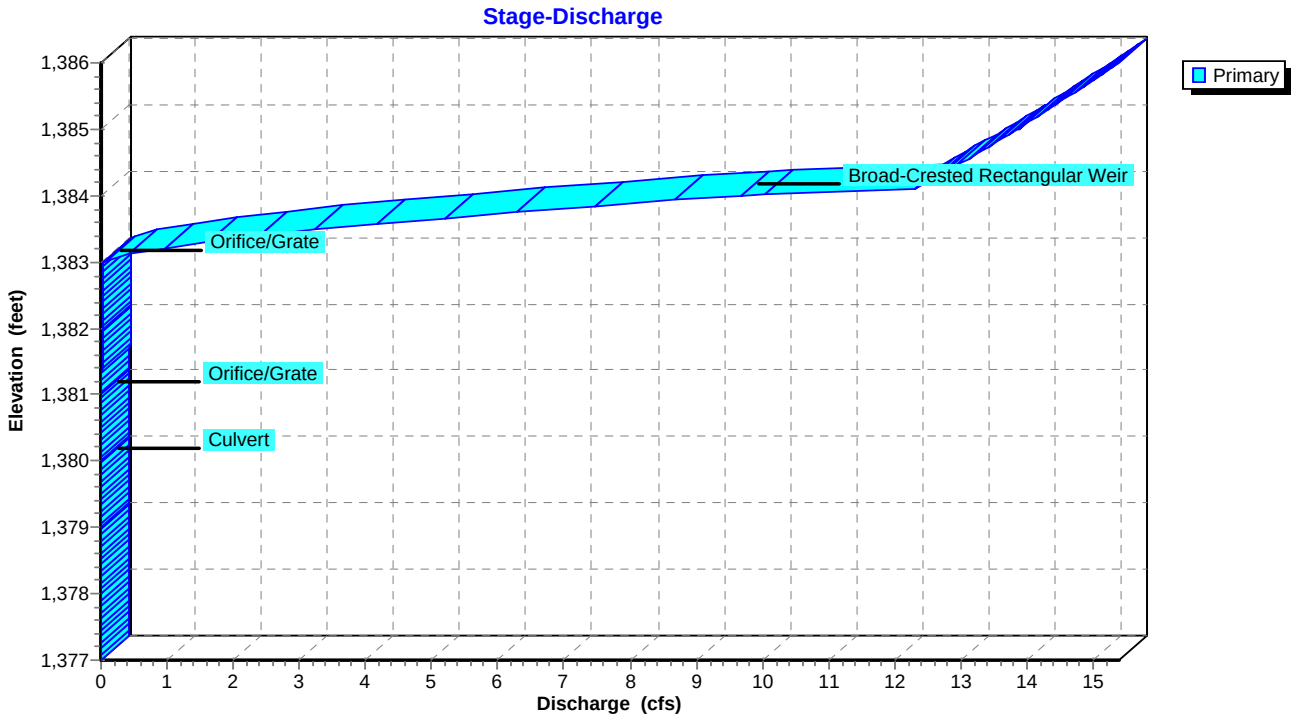
Device	Routing	Invert	Outlet Devices
#1	Primary	1,380.00'	**18.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,380.00' / 1,379.00' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,381.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,383.00'	**36.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,384.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=8.29 cfs @ 12.65 hrs HW=1,383.90' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 8.29 cfs of 11.93 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 8.14 fps)
  ├**3=Orifice/Grate** (Orifice Controls 8.24 cfs @ 3.05 fps)
  └**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

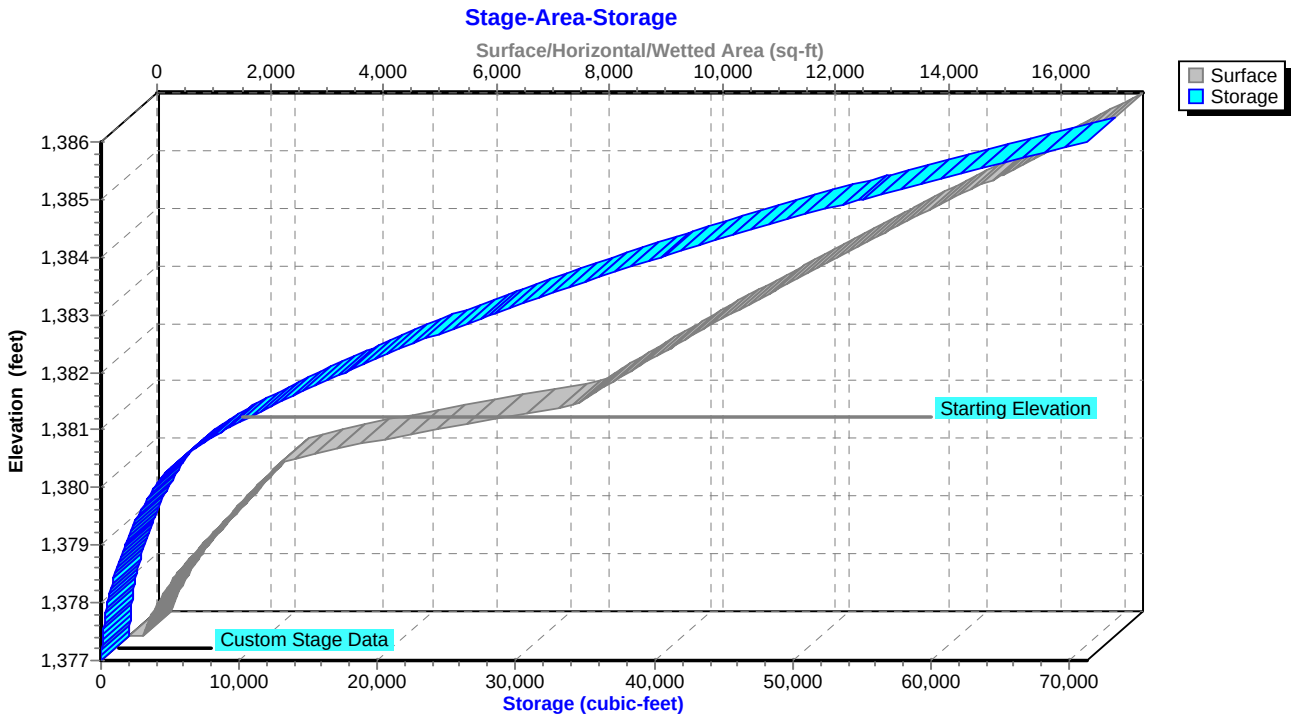
Pond 23-P: Pond-23



Pond 23-P: Pond-23



Pond 23-P: Pond-23



Summary for Pond 24-P: Pond-24

Inflow Area = 12.441 ac, 8.63% Impervious, Inflow Depth = 3.38" for 10-YR, 24-HR Storm event
Inflow = 31.33 cfs @ 12.04 hrs, Volume= 3.507 af
Outflow = 17.20 cfs @ 12.51 hrs, Volume= 3.580 af, Atten= 45%, Lag= 28.0 min
Primary = 17.20 cfs @ 12.51 hrs, Volume= 3.580 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,365.00' Surf.Area= 12,290 sf Storage= 10,821 cf
Peak Elev= 1,367.28' @ 12.51 hrs Surf.Area= 20,854 sf Storage= 49,146 cf (38,325 cf above start)

Plug-Flow detention time= 559.3 min calculated for 3.331 af (95% of inflow)
Center-of-Mass det. time= 484.5 min (1,316.2 - 831.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,361.00'	90,100 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

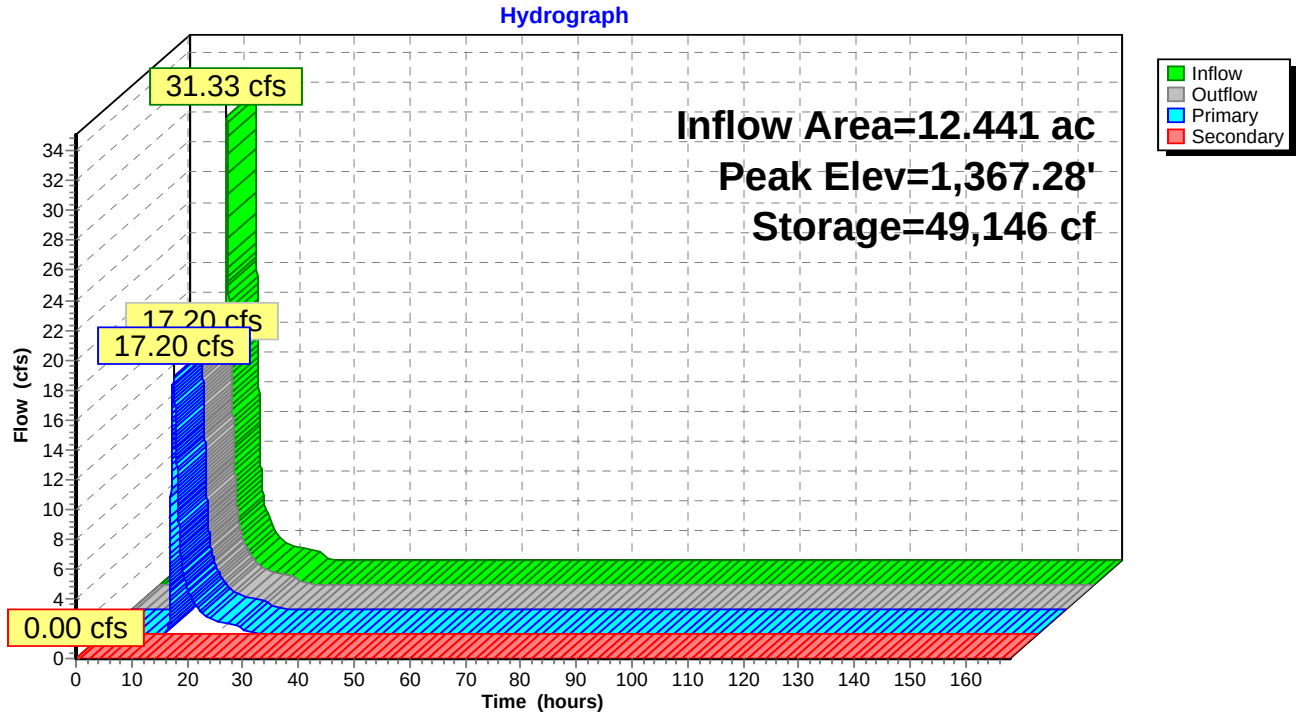
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,361.00	144	79.7	0	0	144
1,362.00	778	180.4	419	419	2,232
1,363.00	1,724	246.8	1,220	1,639	4,500
1,364.00	2,762	271.9	2,223	3,862	5,568
1,365.00	12,290	631.5	6,959	10,821	31,423
1,366.00	16,533	762.9	14,359	25,180	46,021
1,367.00	19,892	828.3	18,187	43,367	54,340
1,368.00	23,383	865.9	21,614	64,981	59,479
1,369.00	26,897	891.0	25,120	90,100	63,097

Device	Routing	Invert	Outlet Devices
#1	Primary	1,362.00'	**18.0" Round Culvert** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,362.00' / 1,358.00' S= 0.0267 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,364.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,365.80'	**12.5" W x 12.5" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,367.00'	**12.0" x 12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,368.00'	**20.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

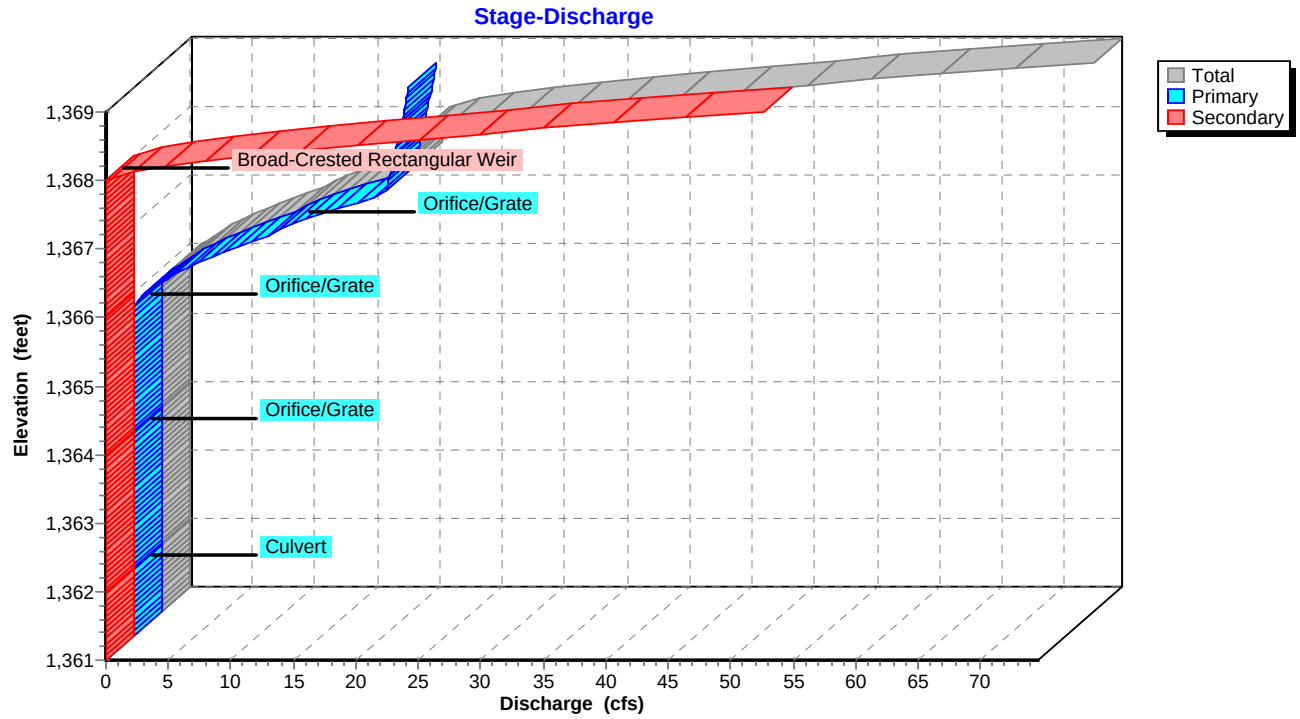
Primary OutFlow Max=17.20 cfs @ 12.51 hrs HW=1,367.28' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 17.20 cfs of 19.92 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.67 fps)
  - **3=Orifice/Grate** (Orifice Controls 15.18 cfs @ 4.66 fps)
  - **4=Orifice/Grate** (Weir Controls 1.98 cfs @ 1.74 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,365.00' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

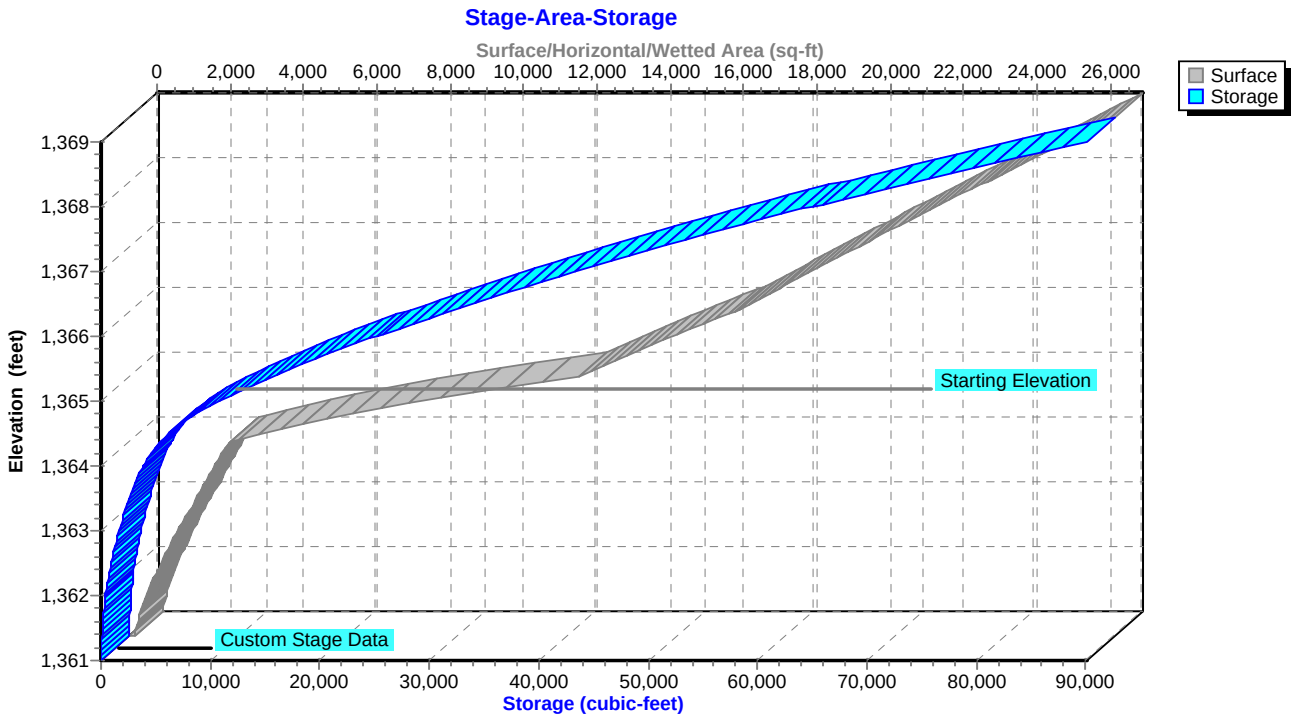
Pond 24-P: Pond-24



Pond 24-P: Pond-24



Pond 24-P: Pond-24



Summary for Pond 26-P: Pond-26

Inflow Area = 5.277 ac, 13.14% Impervious, Inflow Depth = 3.44" for 10-YR, 24-HR Storm event
Inflow = 11.62 cfs @ 12.04 hrs, Volume= 1.512 af
Outflow = 2.54 cfs @ 13.41 hrs, Volume= 1.431 af, Atten= 78%, Lag= 82.2 min
Primary = 2.54 cfs @ 13.41 hrs, Volume= 1.431 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,371.00' Surf.Area= 11,978 sf Storage= 14,978 cf
Peak Elev= 1,373.21' @ 13.41 hrs Surf.Area= 16,679 sf Storage= 46,545 cf (31,568 cf above start)

Plug-Flow detention time= 1,226.6 min calculated for 1.087 af (72% of inflow)
Center-of-Mass det. time= 848.9 min (1,685.4 - 836.4)

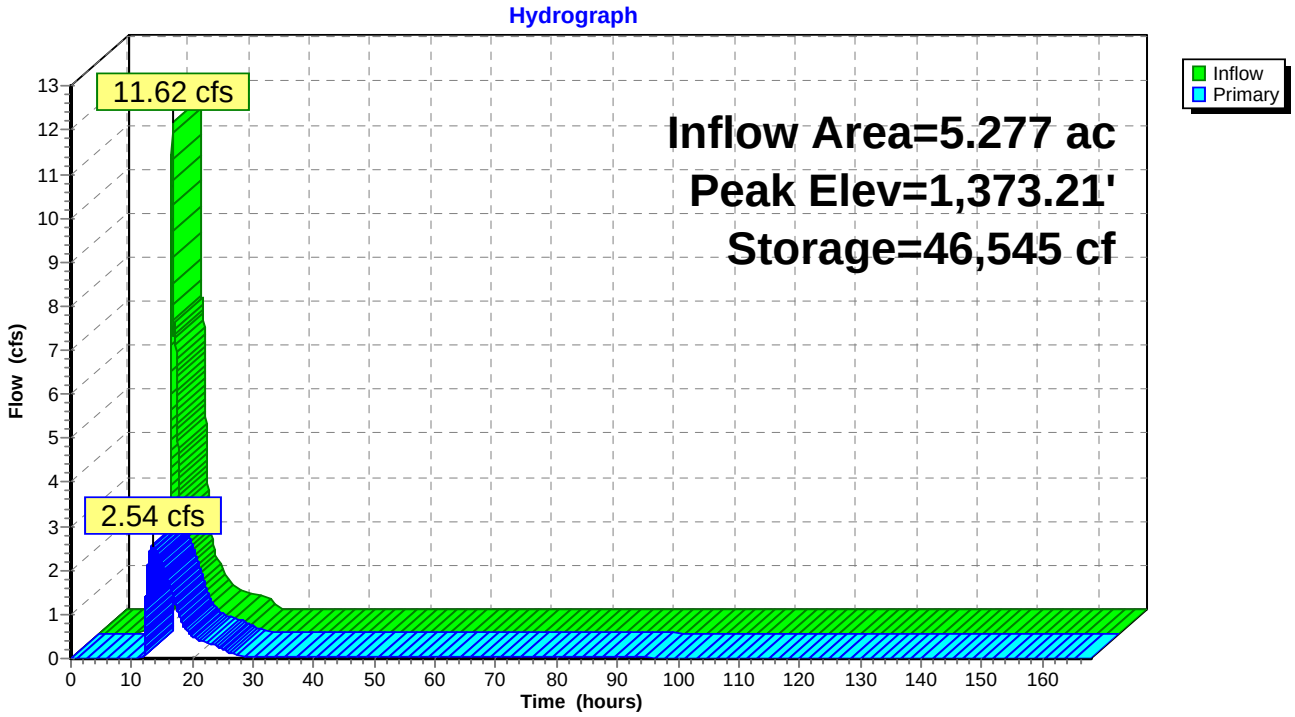
Volume	Invert	Avail.Storage	Storage Description
#1	1,367.00'	80,070 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,367.00	790	132.3	0	0	790
1,368.00	1,854	246.6	1,285	1,285	4,242
1,369.00	2,907	273.0	2,361	3,646	5,364
1,370.00	4,238	315.4	3,552	7,197	7,371
1,371.00	11,978	471.7	7,780	14,978	17,168
1,372.00	14,050	507.1	13,000	27,978	19,969
1,373.00	16,216	538.7	15,120	43,098	22,650
1,374.00	18,484	568.5	17,338	60,435	25,334
1,375.00	20,808	593.7	19,635	80,070	27,736

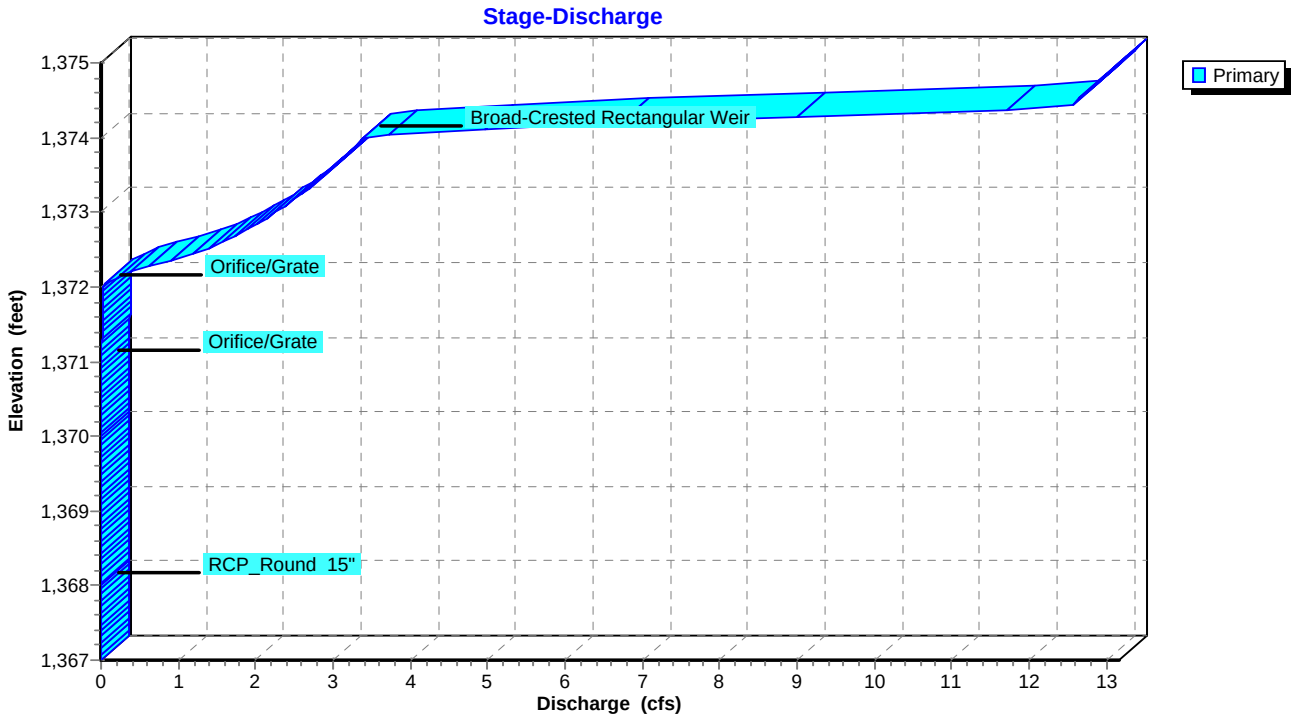
Device	Routing	Invert	Outlet Devices
#1	Primary	1,368.00'	**15.0" Round RCP_Round 15"** L= 60.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,368.00' / 1,367.00' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,371.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,372.00'	**5.0" W x 5.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,374.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=2.54 cfs @ 13.41 hrs HW=1,373.21' TW=0.00' (Dynamic Tailwater)
└─**1=RCP_Round 15"** (Passes 2.54 cfs of 11.16 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.09 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 2.50 cfs @ 4.81 fps)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

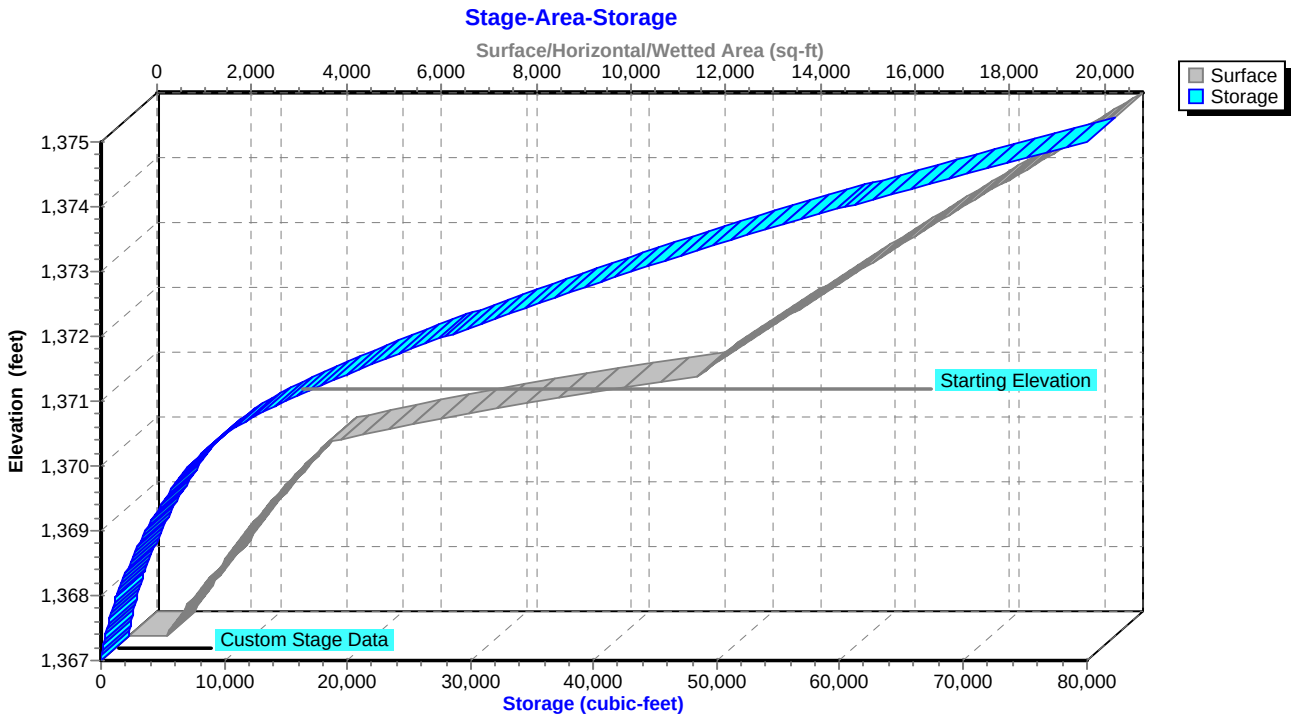
Pond 26-P: Pond-26



Pond 26-P: Pond-26



Pond 26-P: Pond-26



Summary for Pond 28-P: Pond-28

Inflow Area = 2.526 ac, 27.71% Impervious, Inflow Depth = 4.16" for 10-YR, 24-HR Storm event
Inflow = 11.79 cfs @ 12.03 hrs, Volume= 0.875 af
Outflow = 5.80 cfs @ 12.32 hrs, Volume= 0.872 af, Atten= 51%, Lag= 17.2 min
Primary = 5.80 cfs @ 12.32 hrs, Volume= 0.872 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,373.60' Surf.Area= 3,232 sf Storage= 4,285 cf
Peak Elev= 1,376.54' @ 12.32 hrs Surf.Area= 7,902 sf Storage= 20,370 cf (16,085 cf above start)

Plug-Flow detention time= 1,462.0 min calculated for 0.773 af (88% of inflow)
Center-of-Mass det. time= 1,240.8 min (2,045.2 - 804.4)

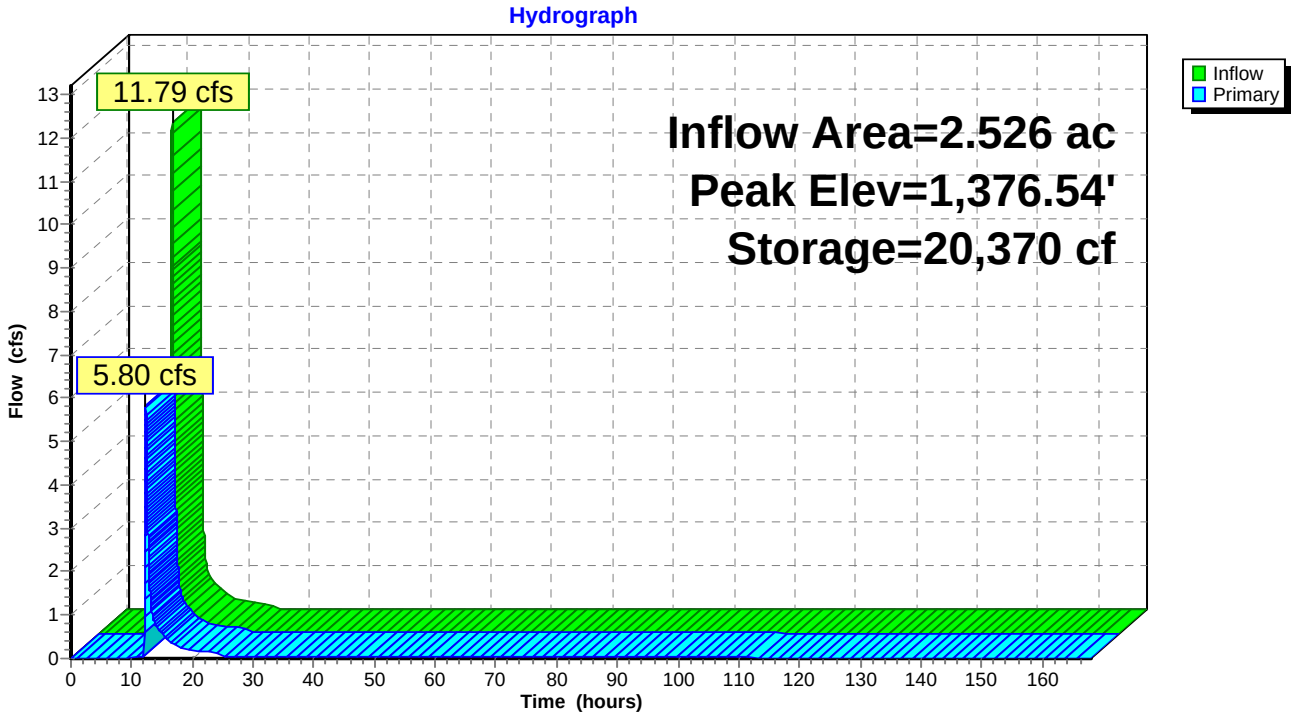
Volume	Invert	Avail.Storage	Storage Description
#1	1,371.50'	34,004 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,371.50	1,192	167.7	0	0	1,192
1,372.00	1,450	177.8	659	659	1,483
1,373.00	2,447	249.8	1,927	2,586	3,942
1,374.00	3,816	343.3	3,106	5,693	8,365
1,375.00	5,311	374.0	4,543	10,236	10,154
1,376.00	6,958	407.2	6,116	16,352	12,254
1,377.00	8,749	443.2	7,836	24,188	14,727
1,378.00	10,923	486.7	9,816	34,004	17,980

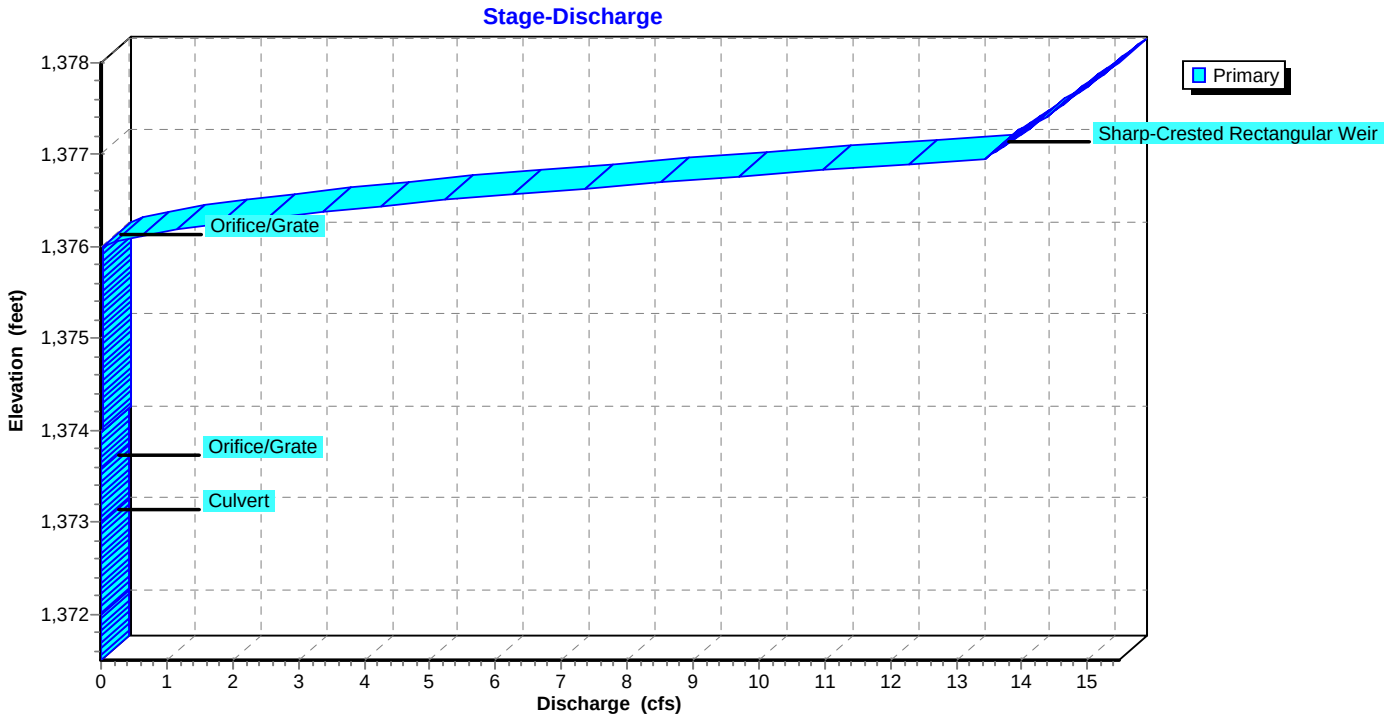
Device	Routing	Invert	Outlet Devices
#1	Primary	1,373.00'	**18.0" Round Culvert** L= 20.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,373.00' / 1,372.00' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,373.60'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,376.00'	**18.0" W x 12.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,377.00'	**16.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=5.79 cfs @ 12.32 hrs HW=1,376.54' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 5.79 cfs of 12.54 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 8.20 fps)
  - **3=Orifice/Grate** (Orifice Controls 5.75 cfs @ 2.36 fps)
  - **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 28-P: Pond-28



Pond 28-P: Pond-28



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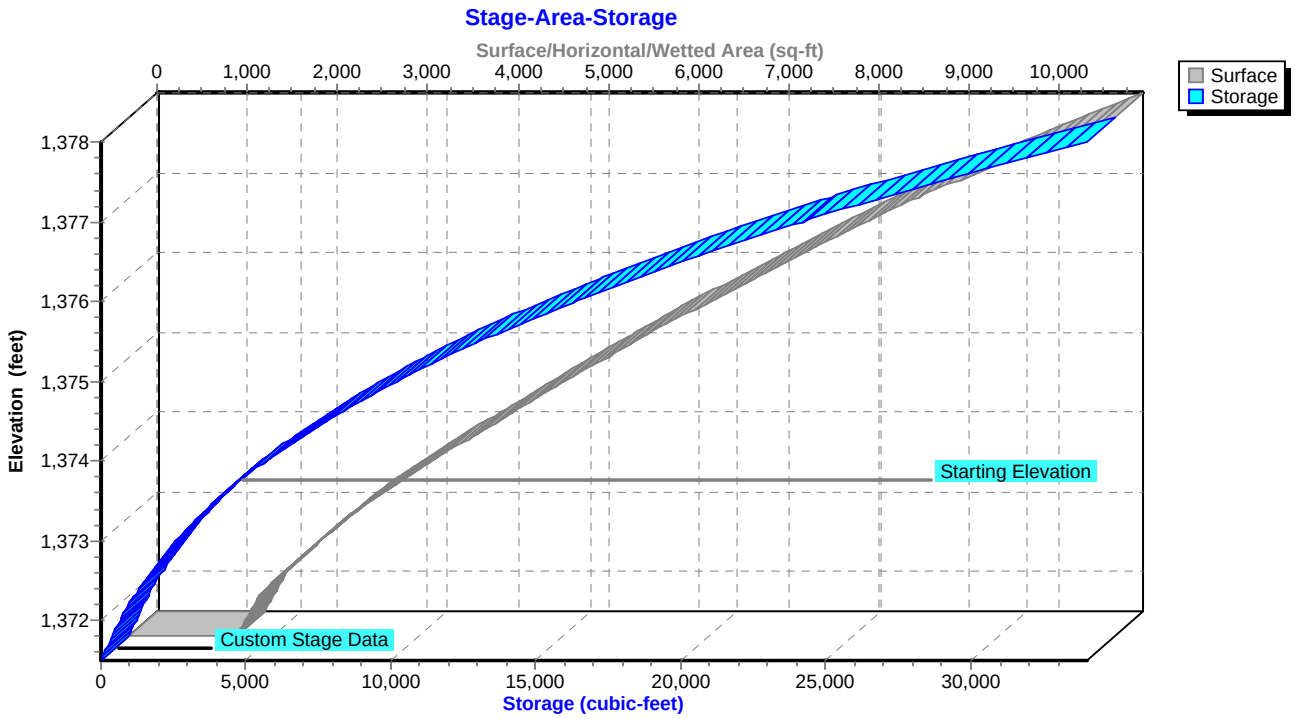


Summary for Pond BRA-46: BRA-46

Inflow Area = 1.246 ac, 25.52% Impervious, Inflow Depth = 3.32" for 10-YR, 24-HR Storm event
Inflow = 5.24 cfs @ 12.04 hrs, Volume= 0.344 af
Outflow = 5.05 cfs @ 12.06 hrs, Volume= 0.286 af, Atten= 4%, Lag= 1.3 min
Primary = 5.05 cfs @ 12.06 hrs, Volume= 0.286 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,370.83' @ 12.06 hrs Surf.Area= 1,691 sf Storage= 3,075 cf

Plug-Flow detention time= 115.3 min calculated for 0.286 af (83% of inflow)
Center-of-Mass det. time= 41.1 min (860.3 - 819.3)

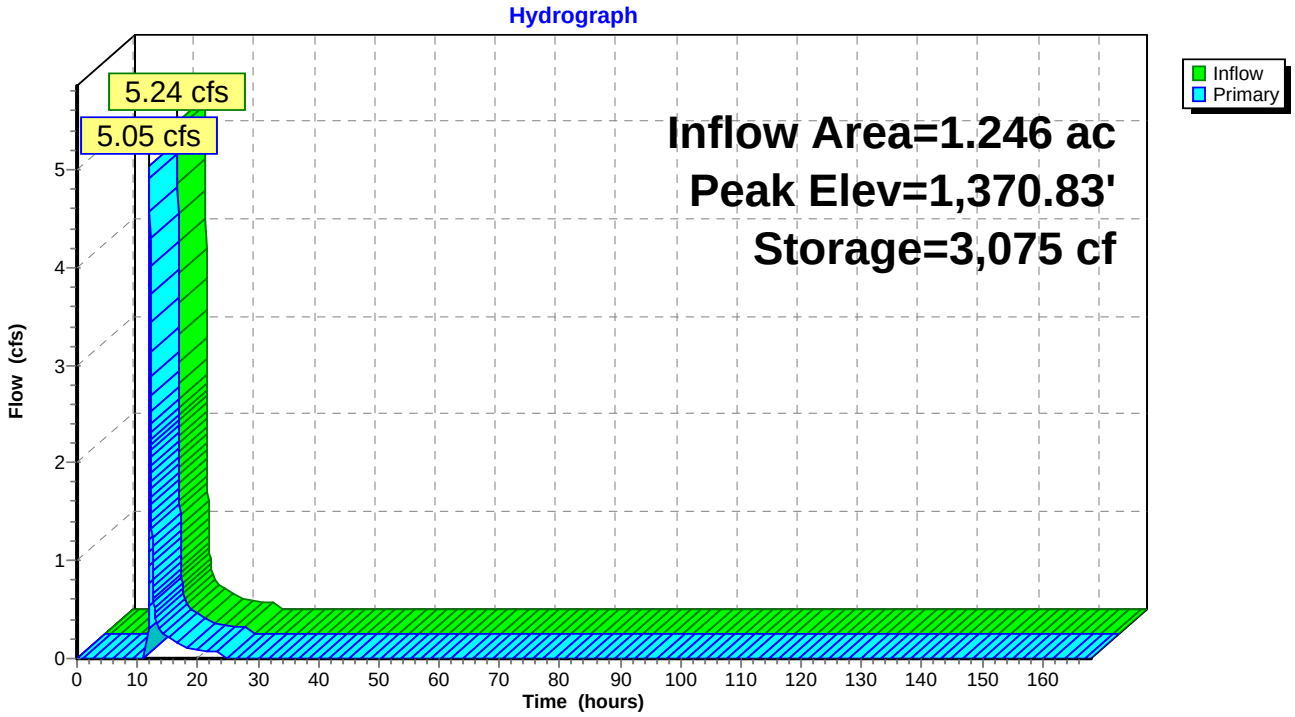
Volume	Invert	Avail.Storage	Storage Description
#1	1,366.00'	3,370 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,366.00	1,368	164.6	0.0	0	0	1,368
1,367.00	1,368	164.6	25.0	342	342	1,533
1,368.00	1,368	164.6	25.0	342	684	1,697
1,369.00	1,368	164.6	25.0	342	1,026	1,862
1,369.50	1,368	164.6	25.0	171	1,197	1,944
1,370.50	1,368	164.6	100.0	1,368	2,565	2,109
1,371.00	1,864	195.6	100.0	805	3,370	3,002

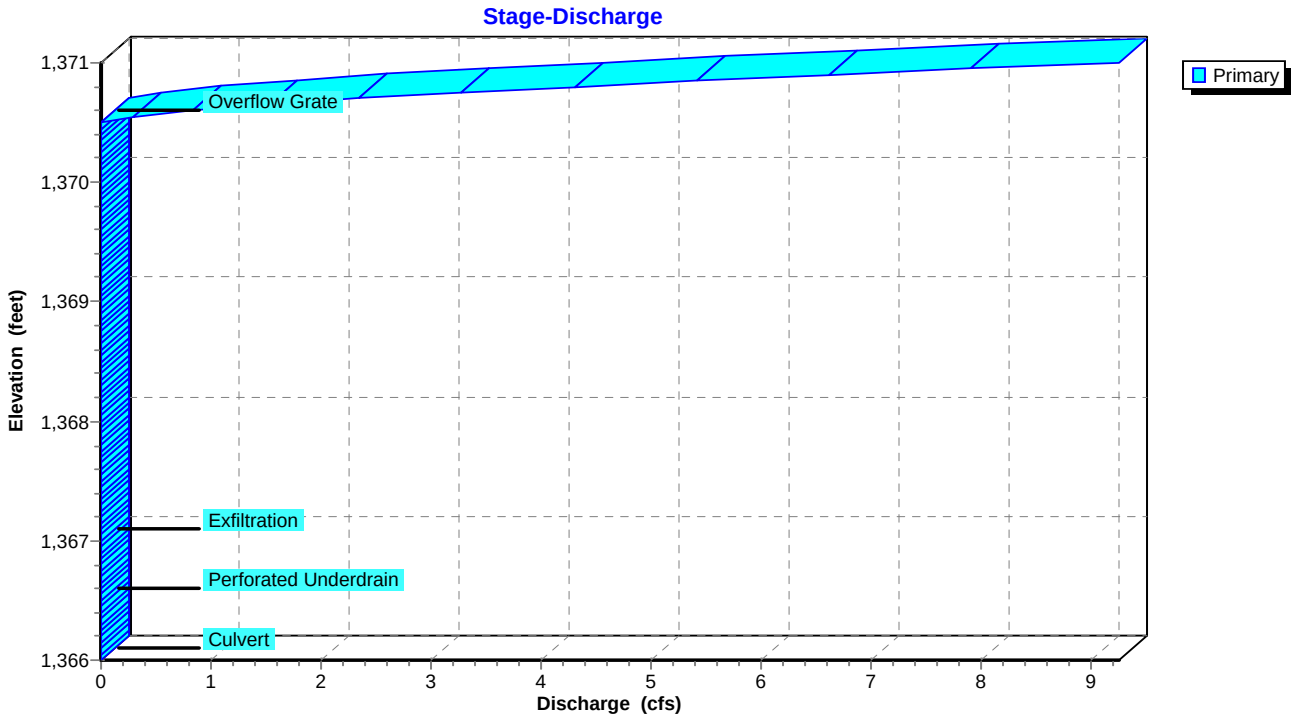
Device	Routing	Invert	Outlet Devices
#1	Primary	1,366.00'	**15.0" Round Culvert** L= 72.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,366.00' / 1,365.20' S= 0.0110 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,366.50'	**0.4" Horiz. Perforated Underdrain X 512.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,367.00'	**0.250 in/hr Exfiltration over Surface area above 1,367.00'** Conductivity to Groundwater Elevation = 1,366.00' Excluded Surface area = 1,368 sf
#4	Device 1	1,370.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.03 cfs @ 12.06 hrs HW=1,370.83' TW=1,366.79' (Dynamic Tailwater)
- **1=Culvert** (Passes 5.03 cfs of 9.38 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 4.33 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 5.03 cfs @ 1.89 fps)

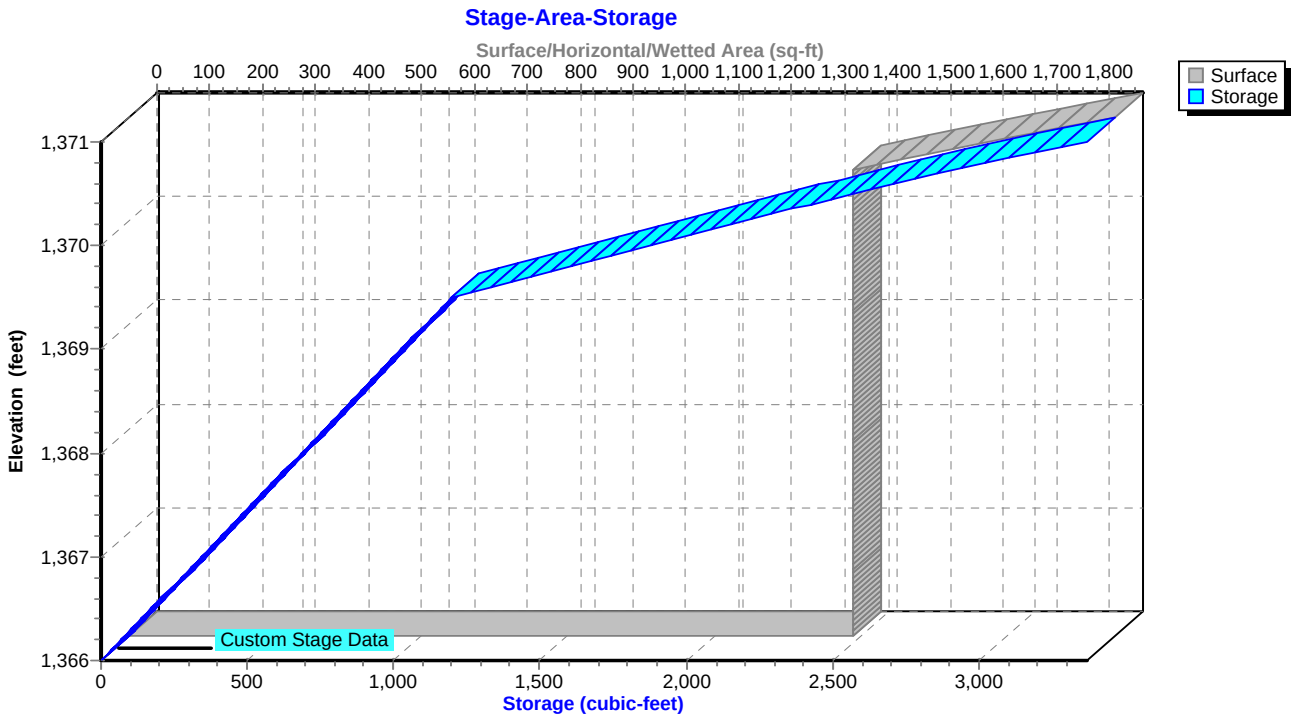
Pond BRA-46: BRA-46



Pond BRA-46: BRA-46



Pond BRA-46: BRA-46



Summary for Pond BRA-46-FS: Flow Splitter for BRA-46

Inflow Area = 1.246 ac, 25.52% Impervious, Inflow Depth = 3.88" for 10-YR, 24-HR Storm event
Inflow = 6.43 cfs @ 12.03 hrs, Volume= 0.403 af
Outflow = 6.43 cfs @ 12.04 hrs, Volume= 0.403 af, Atten= 0%, Lag= 0.6 min
Primary = 5.24 cfs @ 12.04 hrs, Volume= 0.344 af
Secondary = 1.25 cfs @ 12.02 hrs, Volume= 0.059 af

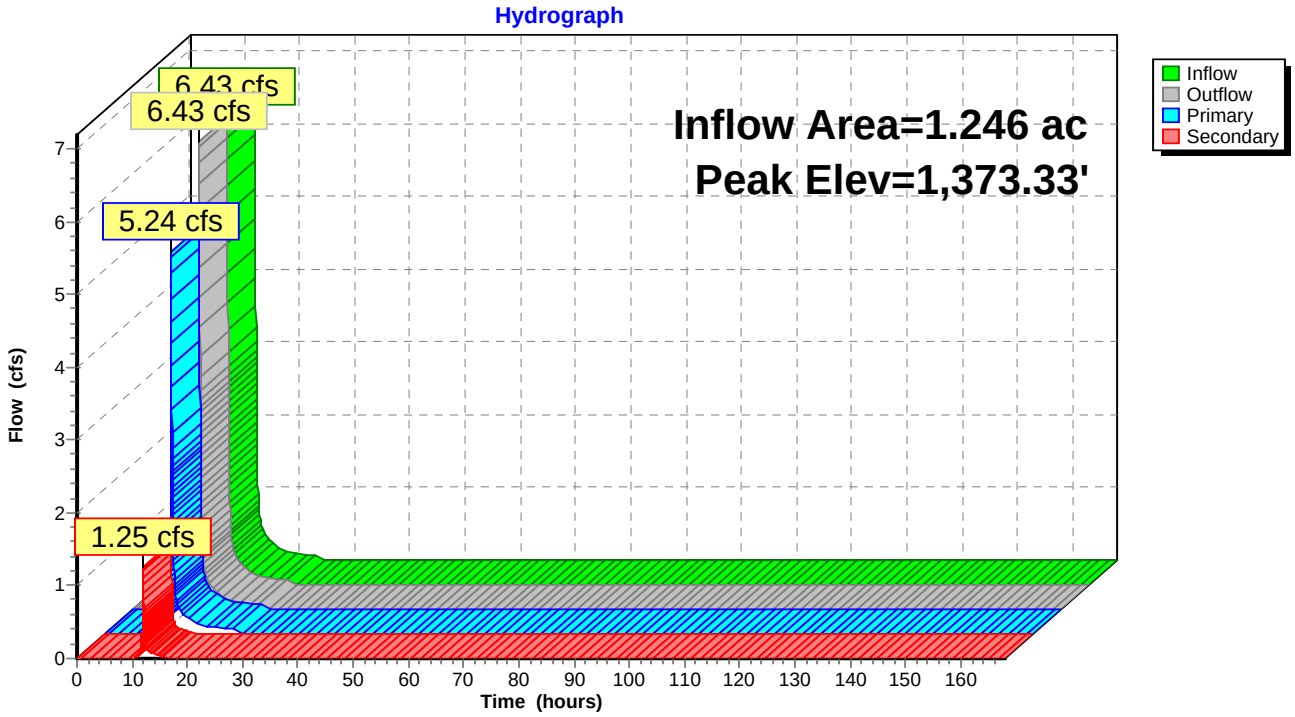
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,373.33' @ 12.04 hrs
Flood Elev= 1,375.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,371.45'	**15.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,371.45' / 1,371.00' S= 0.0118 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,371.45'	**15.0" Round Culvert** L= 195.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,371.45' / 1,365.12' S= 0.0325 '/' Cc= 0.900 n= 0.130, Flow Area= 1.23 sf
#3	Device 2	1,371.67'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

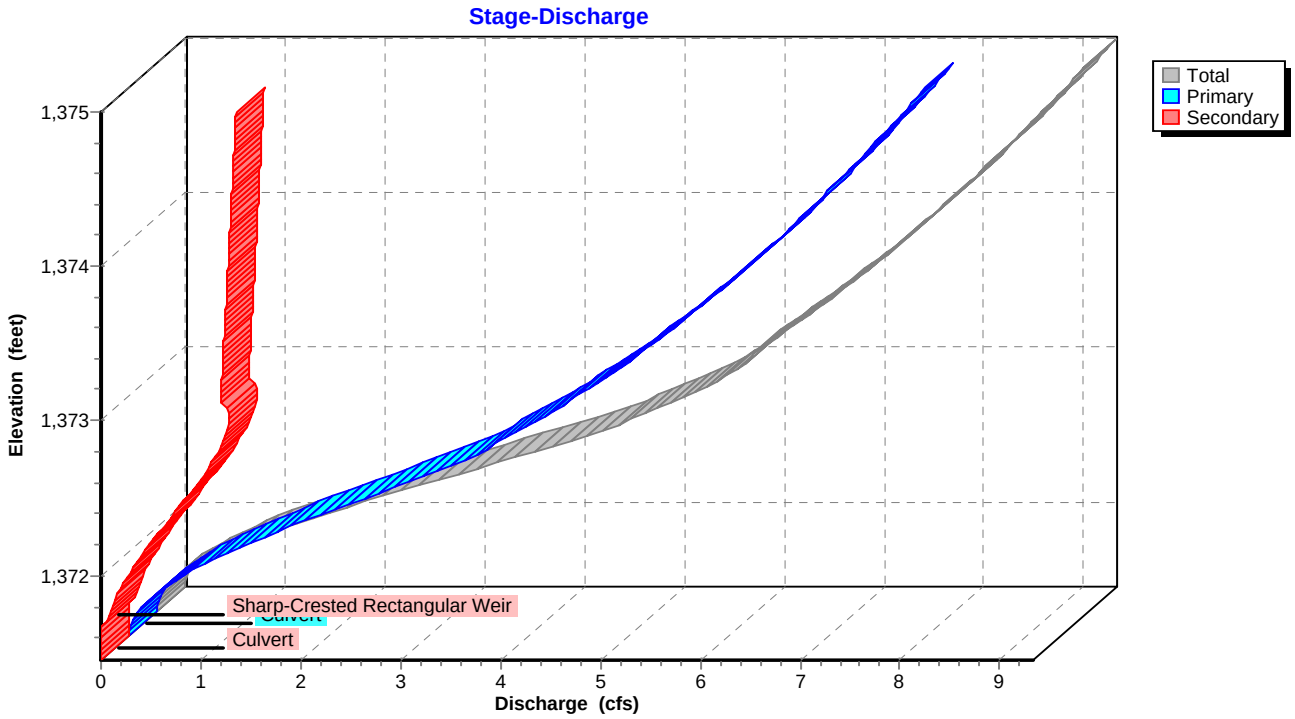
Primary OutFlow Max=5.22 cfs @ 12.04 hrs HW=1,373.33' TW=1,370.82' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 5.22 cfs @ 4.25 fps)

Secondary OutFlow Max=1.25 cfs @ 12.02 hrs HW=1,373.05' TW=1,366.60' (Dynamic Tailwater)
└**2=Culvert** (Outlet Controls 1.25 cfs @ 1.04 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 1.25 cfs of 19.67 cfs potential flow)

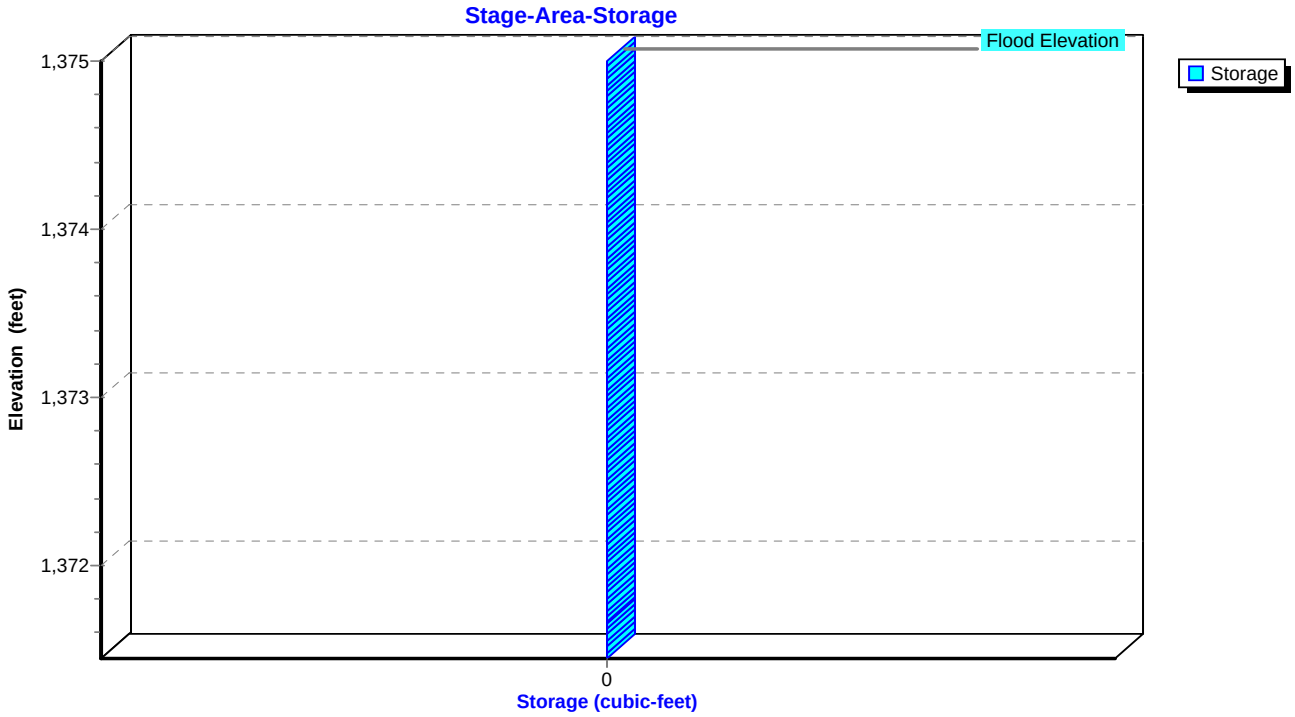
Pond BRA-46-FS: Flow Splitter for BRA-46



Pond BRA-46-FS: Flow Splitter for BRA-46



Pond BRA-46-FS: Flow Splitter for BRA-46



Summary for Pond BRA-59: BRA-59

Inflow Area = 0.860 ac, 38.02% Impervious, Inflow Depth = 2.91" for 10-YR, 24-HR Storm event
Inflow = 1.91 cfs @ 12.04 hrs, Volume= 0.209 af
Outflow = 0.34 cfs @ 12.70 hrs, Volume= 0.115 af, Atten= 82%, Lag= 39.7 min
Primary = 0.34 cfs @ 12.70 hrs, Volume= 0.115 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,381.55' @ 12.70 hrs Surf.Area= 2,772 sf Storage= 4,250 cf

Plug-Flow detention time= 286.7 min calculated for 0.115 af (55% of inflow)
Center-of-Mass det. time= 142.3 min (974.7 - 832.4)

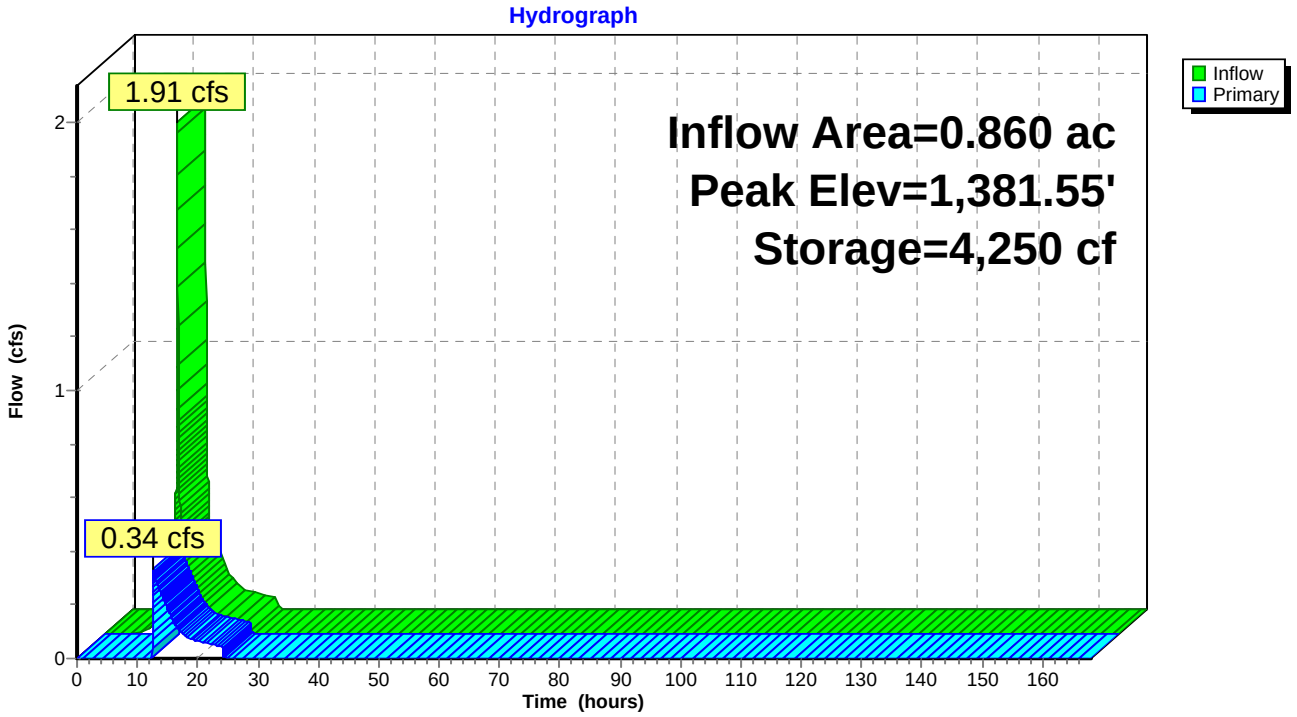
Volume	Invert	Avail.Storage	Storage Description
#1	1,378.50'	5,556 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,378.50	2,733	227.5	0.0	0	0	2,733
1,379.50	2,733	227.5	25.0	683	683	2,961
1,380.50	2,733	227.5	25.0	683	1,367	3,188
1,381.50	2,733	227.5	100.0	2,733	4,100	3,416
1,382.00	3,098	238.0	100.0	1,457	5,556	3,821

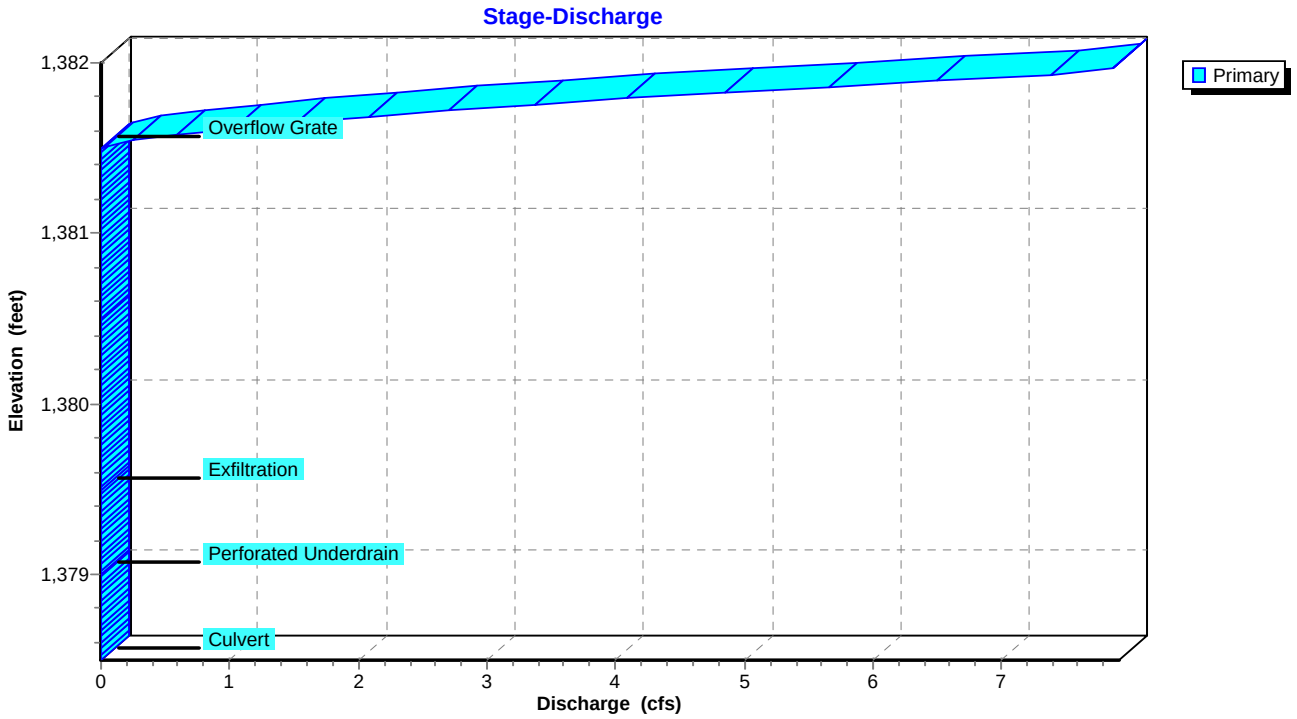
Device	Routing	Invert	Outlet Devices
#1	Primary	1,378.50'	**15.0" Round Culvert** L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,378.50' / 1,378.00' S= 0.0096 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,379.00'	**0.4" Horiz. Perforated Underdrain X 336.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,379.50'	**0.250 in/hr Exfiltration over Surface area above 1,379.50'** Conductivity to Groundwater Elevation = 1,378.50' Excluded Surface area = 2,733 sf
#4	Device 1	1,381.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.34 cfs @ 12.70 hrs HW=1,381.55' TW=1,379.69' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.34 cfs of 6.38 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 7.72 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 0.34 cfs @ 0.77 fps)

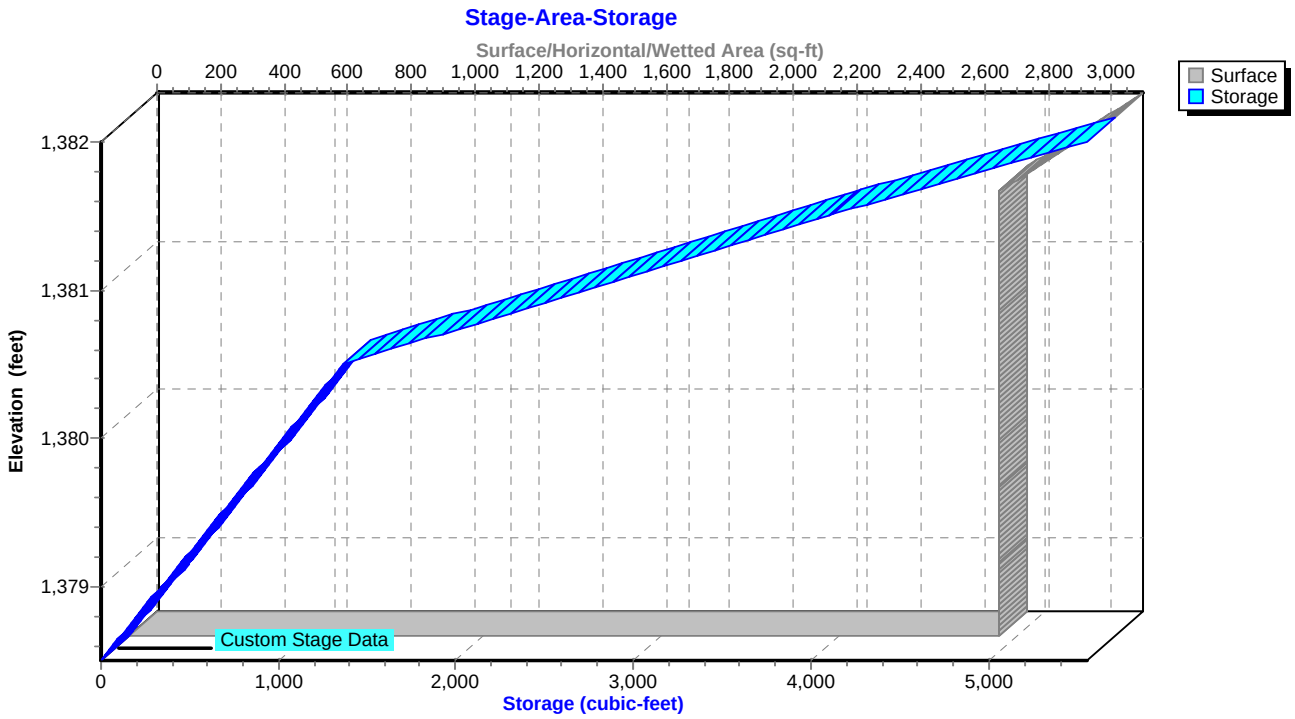
Pond BRA-59: BRA-59



Pond BRA-59: BRA-59



Pond BRA-59: BRA-59



Summary for Pond BRA-59-FS: Flow Splitter for BRA-59

Inflow Area = 0.860 ac, 38.02% Impervious, Inflow Depth = 4.20" for 10-YR, 24-HR Storm event
Inflow = 4.85 cfs @ 12.03 hrs, Volume= 0.301 af
Outflow = 4.85 cfs @ 12.04 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.6 min
Primary = 1.91 cfs @ 12.04 hrs, Volume= 0.209 af
Secondary = 2.95 cfs @ 12.04 hrs, Volume= 0.092 af

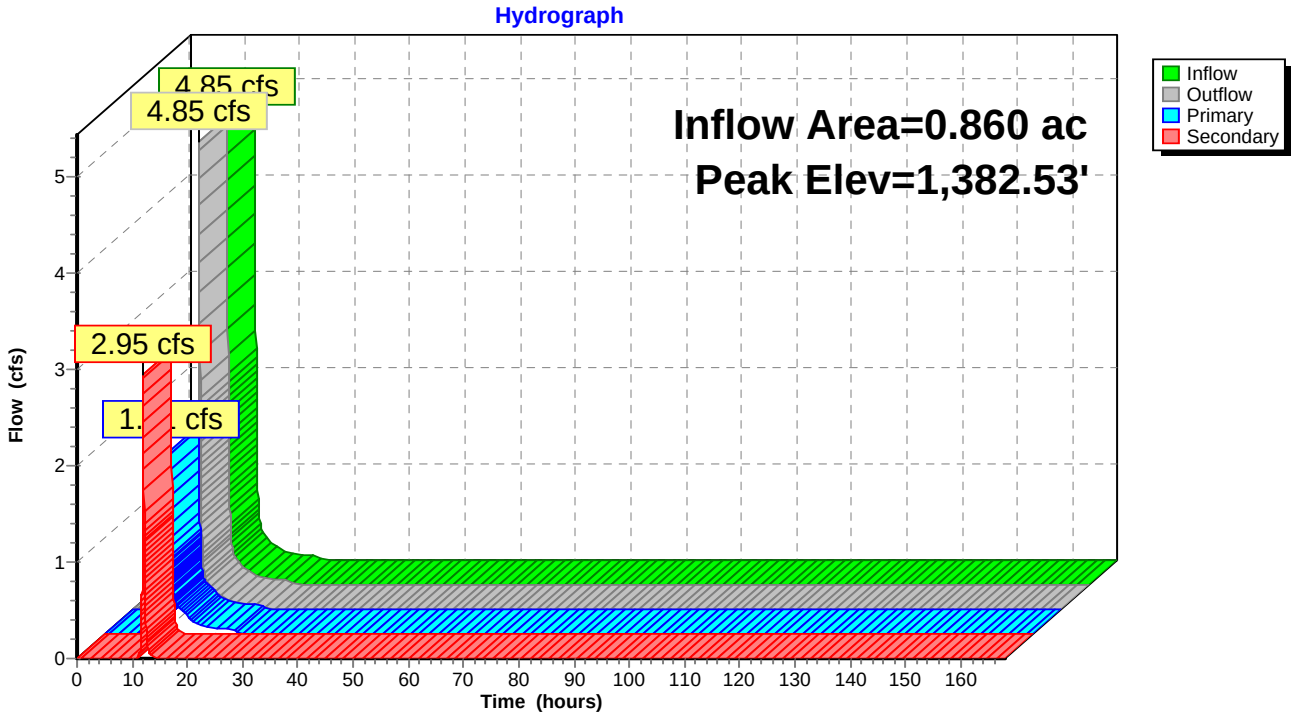
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,382.53' @ 12.04 hrs
Flood Elev= 1,385.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,381.75'	**15.0" Round Culvert to BRA** L= 66.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.75' / 1,381.25' S= 0.0076 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,381.50'	**15.0" Round Culvert to Pond** L= 86.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.50' / 1,380.50' S= 0.0116 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,382.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

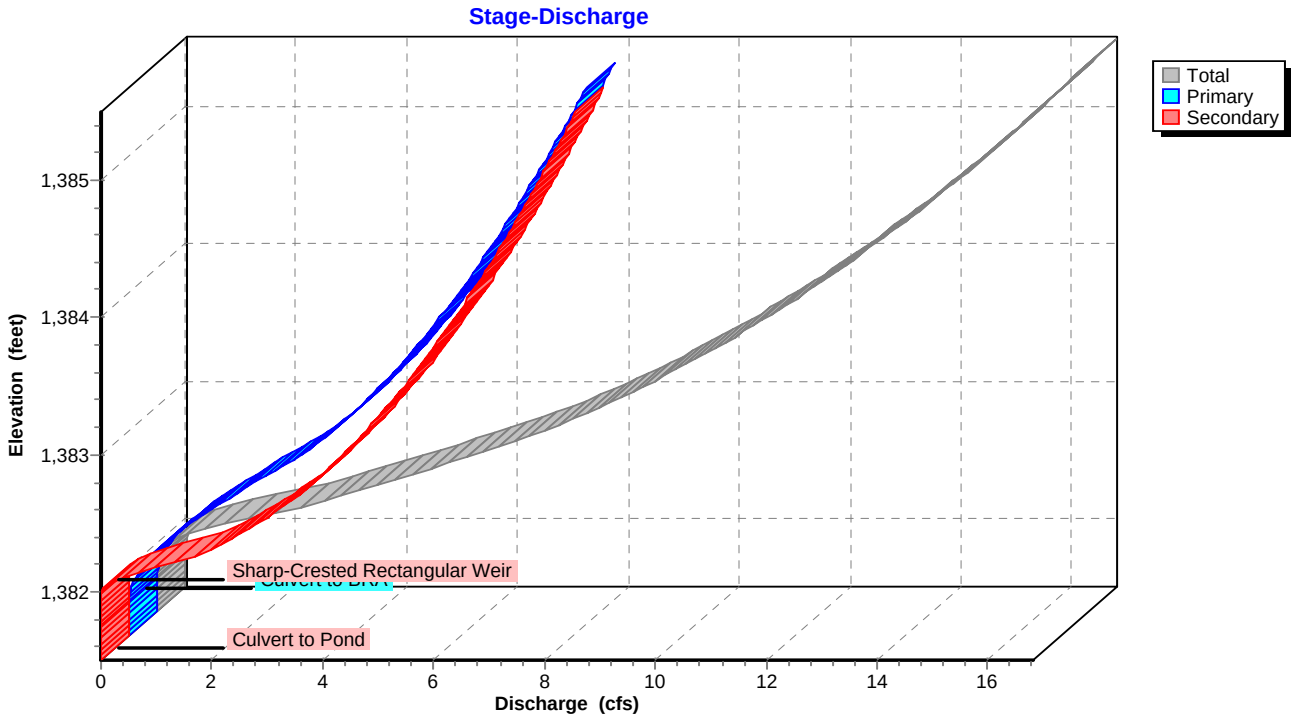
Primary OutFlow Max=1.90 cfs @ 12.04 hrs HW=1,382.53' TW=1,381.08' (Dynamic Tailwater)
└**1=Culvert to BRA** (Inlet Controls 1.90 cfs @ 2.37 fps)

Secondary OutFlow Max=2.94 cfs @ 12.04 hrs HW=1,382.53' TW=1,379.01' (Dynamic Tailwater)
└**2=Culvert to Pond** (Inlet Controls 2.94 cfs @ 2.72 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 2.94 cfs of 4.87 cfs potential flow)

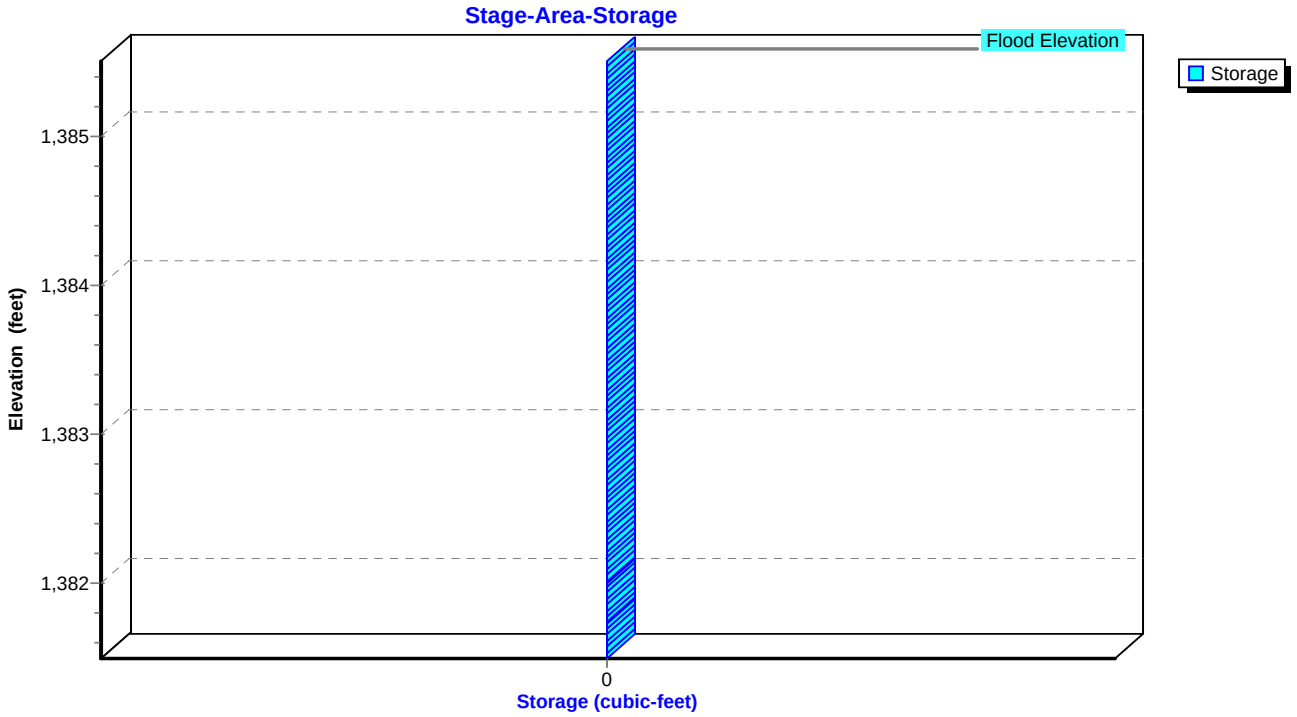
Pond BRA-59-FS: Flow Splitter for BRA-59



Pond BRA-59-FS: Flow Splitter for BRA-59



Pond BRA-59-FS: Flow Splitter for BRA-59



Summary for Pond BRA37-FS: Flow Splitter for BRA-37

Inflow Area = 5.787 ac, 8.64% Impervious, Inflow Depth = 3.30" for 10-YR, 24-HR Storm event
Inflow = 12.58 cfs @ 12.03 hrs, Volume= 1.594 af
Outflow = 12.58 cfs @ 12.04 hrs, Volume= 1.594 af, Atten= 0%, Lag= 0.6 min
Primary = 6.25 cfs @ 12.04 hrs, Volume= 0.925 af
Secondary = 6.33 cfs @ 12.04 hrs, Volume= 0.669 af

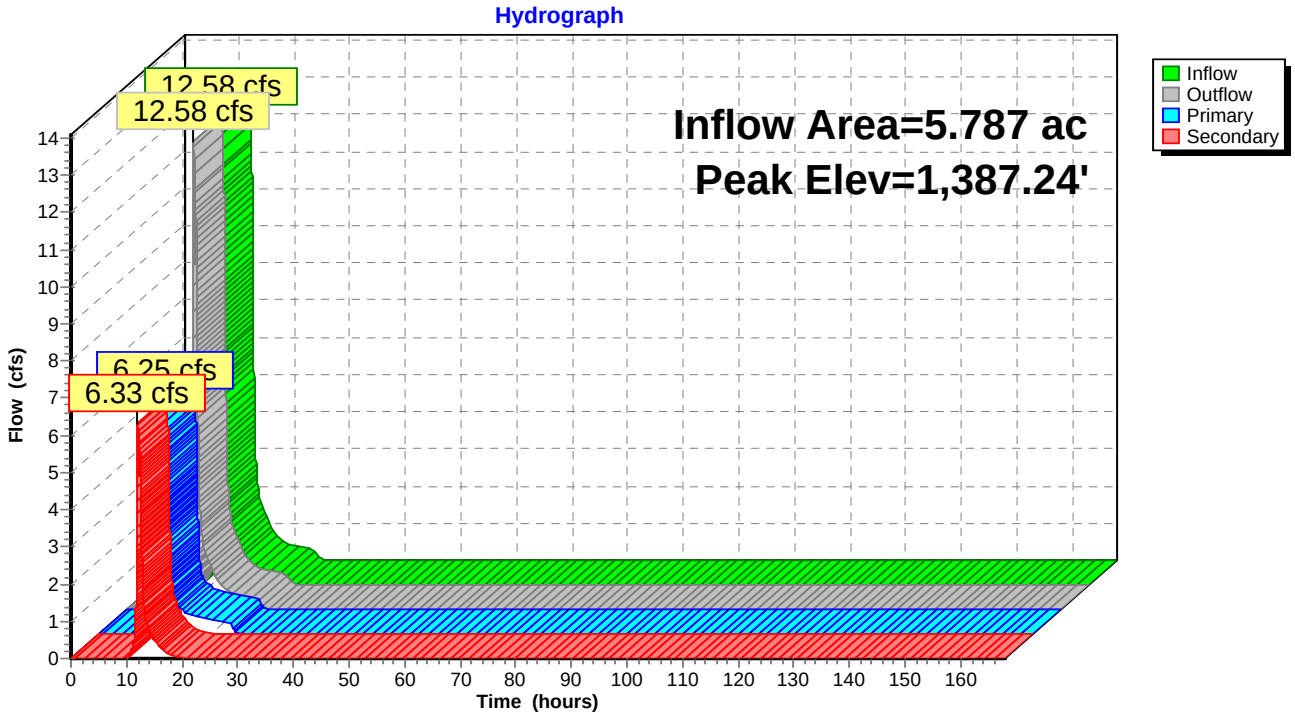
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,387.24' @ 12.04 hrs
Flood Elev= 1,390.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,385.60'	**18.0" Round Culvert to BRA-37** L= 7.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,385.60' / 1,385.50' S= 0.0127 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,385.60'	**18.0" Round Culvert** L= 89.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,385.60' / 1,383.00' S= 0.0292 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,385.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

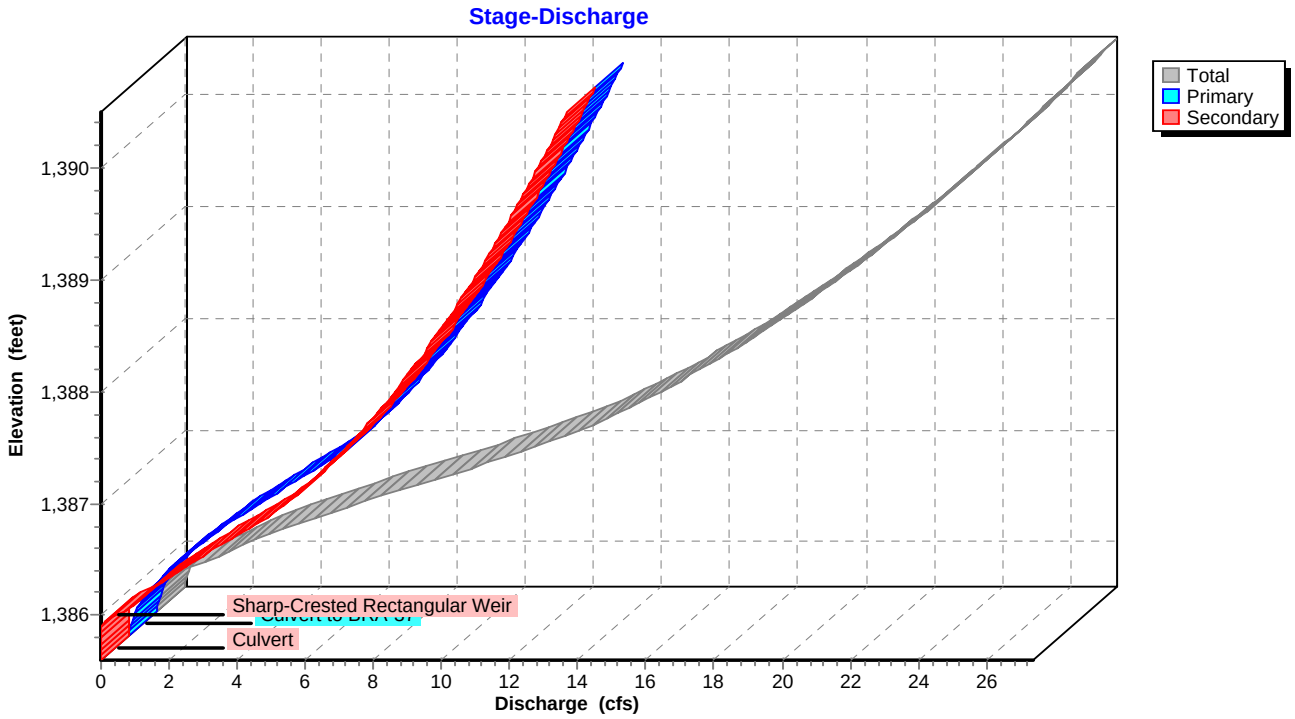
Primary OutFlow Max=6.25 cfs @ 12.04 hrs HW=1,387.24' TW=1,385.81' (Dynamic Tailwater)
└**1=Culvert to BRA-37** (Barrel Controls 6.25 cfs @ 4.04 fps)

Secondary OutFlow Max=6.32 cfs @ 12.04 hrs HW=1,387.24' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 6.32 cfs @ 3.58 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 6.32 cfs of 18.86 cfs potential flow)

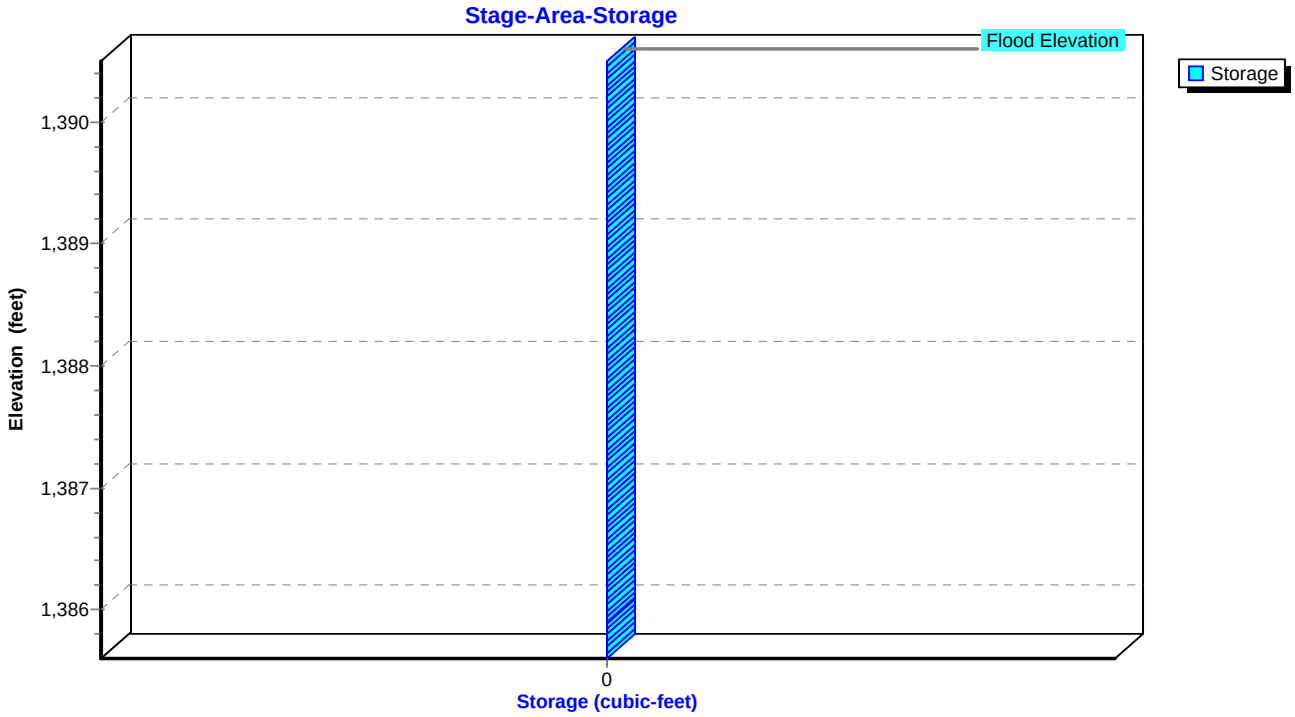
Pond BRA37-FS: Flow Splitter for BRA-37



Pond BRA37-FS: Flow Splitter for BRA-37



Pond BRA37-FS: Flow Splitter for BRA-37



Summary for Pond BRA37-P: BRA-37

Inflow Area = 5.787 ac, 8.64% Impervious, Inflow Depth = 1.92" for 10-YR, 24-HR Storm event
Inflow = 6.25 cfs @ 12.04 hrs, Volume= 0.925 af
Outflow = 5.39 cfs @ 12.37 hrs, Volume= 0.810 af, Atten= 14%, Lag= 19.6 min
Primary = 5.39 cfs @ 12.37 hrs, Volume= 0.810 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,385.85' @ 12.37 hrs Surf.Area= 4,313 sf Storage= 6,455 cf

Plug-Flow detention time= 103.9 min calculated for 0.810 af (88% of inflow)
Center-of-Mass det. time= 41.1 min (917.1 - 876.0)

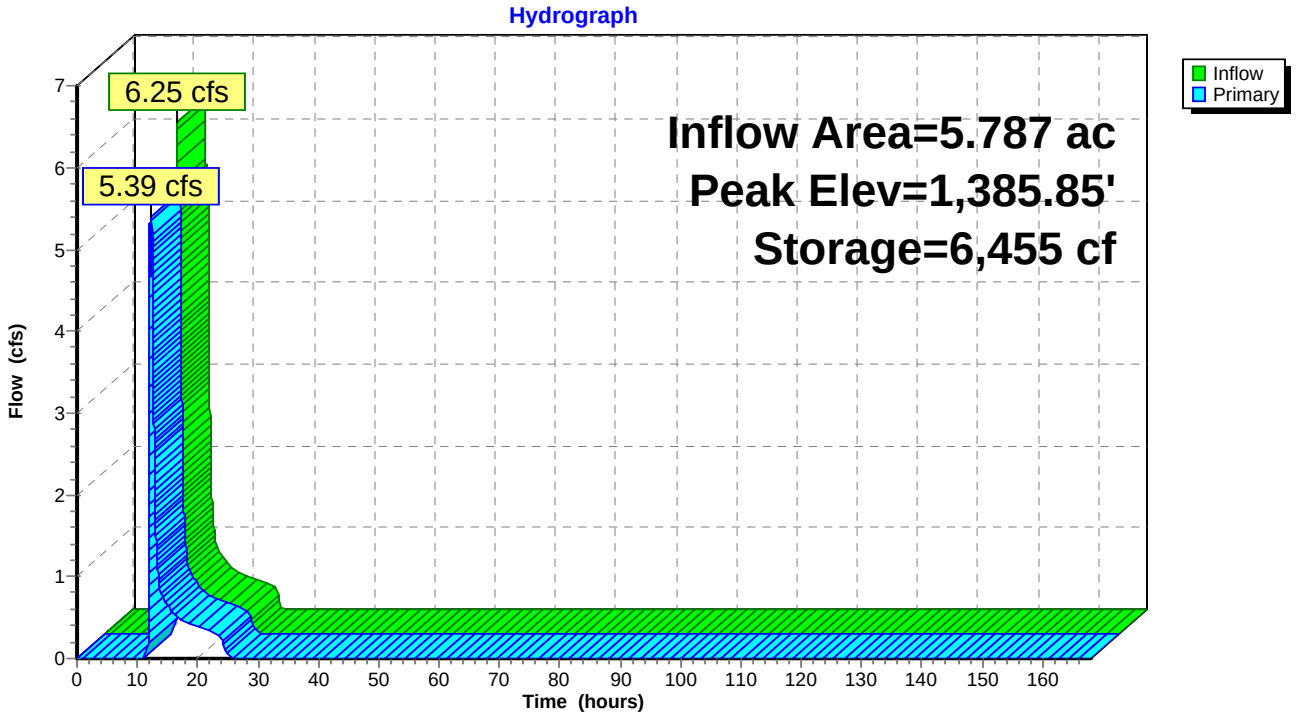
Volume	Invert	Avail.Storage	Storage Description
#1	1,382.00'	11,952 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,382.00	3,939	292.0	0.0	0	0	3,939
1,383.00	3,939	292.0	25.0	985	985	4,231
1,384.00	3,939	292.0	25.0	985	1,970	4,523
1,385.00	3,939	292.0	25.0	985	2,954	4,815
1,386.00	4,382	302.0	100.0	4,159	7,113	5,373
1,387.00	5,312	320.0	100.0	4,840	11,952	6,317

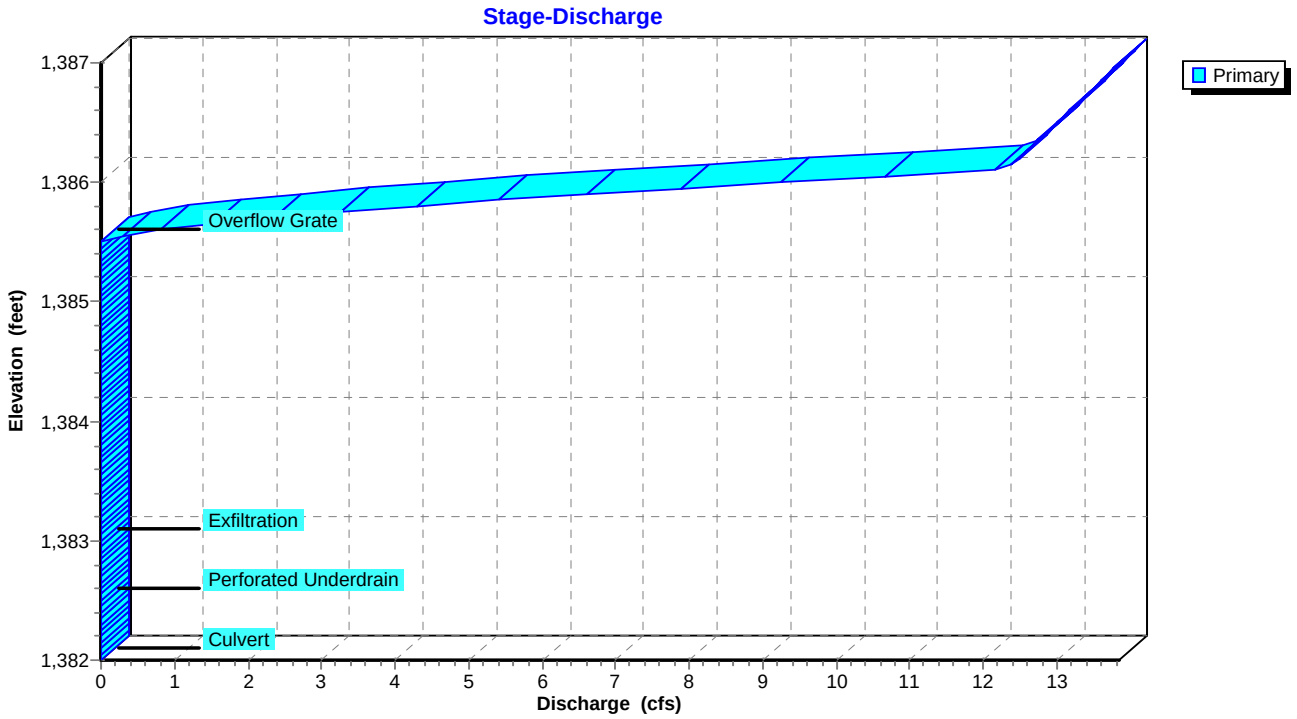
Device	Routing	Invert	Outlet Devices
#1	Primary	1,382.00'	**18.0" Round Culvert** L= 93.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,382.00' / 1,381.50' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.50'	**0.4" Horiz. Perforated Underdrain X 392.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,383.00'	**0.250 in/hr Exfiltration over Surface area above 1,383.00'** Conductivity to Groundwater Elevation = 1,382.00' Excluded Surface area = 3,939 sf
#4	Device 1	1,385.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.39 cfs @ 12.37 hrs HW=1,385.85' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 5.39 cfs of 11.82 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 12.06 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 5.39 cfs @ 1.93 fps)

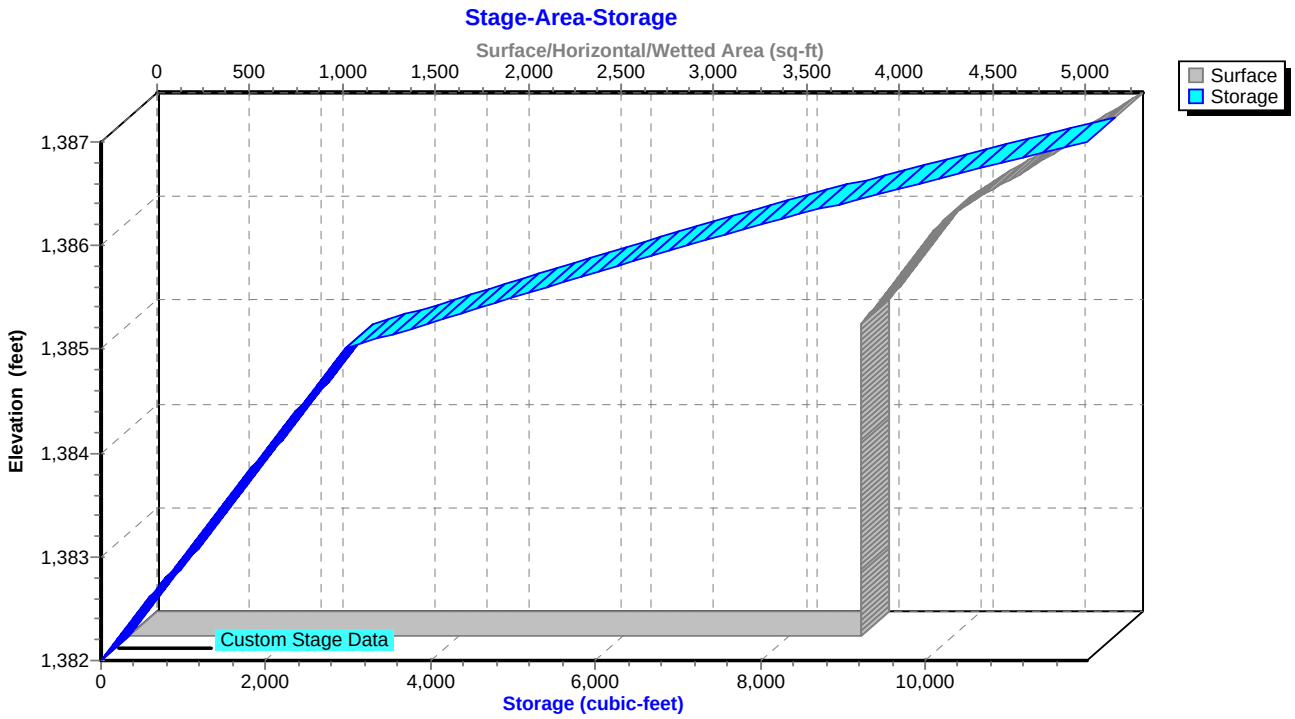
Pond BRA37-P: BRA-37



Pond BRA37-P: BRA-37



Pond BRA37-P: BRA-37



Summary for Pond BRA38-P: BRA-38

Inflow Area = 1.972 ac, 21.96% Impervious, Inflow Depth = 3.78" for 10-YR, 24-HR Storm event
Inflow = 10.10 cfs @ 12.03 hrs, Volume= 0.621 af
Outflow = 9.67 cfs @ 12.05 hrs, Volume= 0.517 af, Atten= 4%, Lag= 1.3 min
Primary = 7.37 cfs @ 12.05 hrs, Volume= 0.397 af
Secondary = 2.29 cfs @ 12.05 hrs, Volume= 0.119 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,385.33' @ 12.05 hrs Surf.Area= 3,650 sf Storage= 5,760 cf

Plug-Flow detention time= 106.8 min calculated for 0.517 af (83% of inflow)
Center-of-Mass det. time= 37.5 min (847.8 - 810.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,381.50'	6,388 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

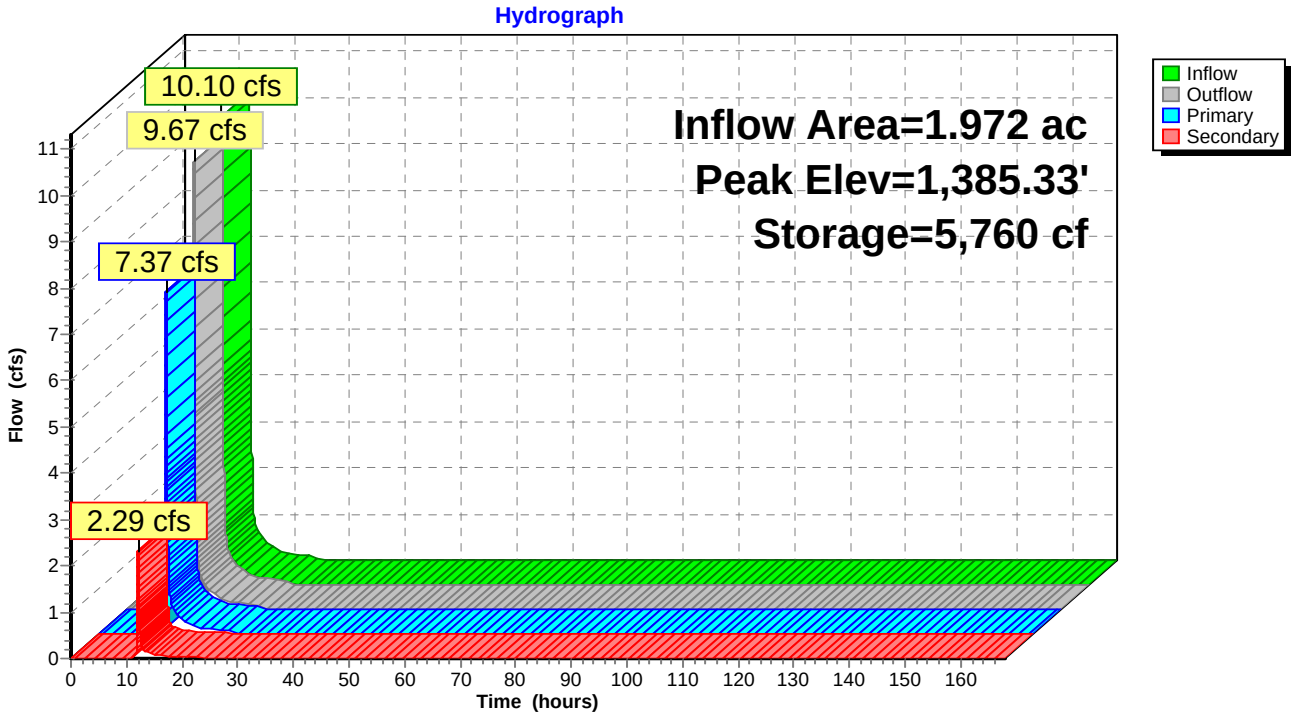
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,381.50	3,650	290.0	0.0	0	0	3,650
1,382.50	3,650	290.0	25.0	913	913	3,940
1,383.50	3,650	290.0	25.0	913	1,825	4,230
1,384.50	3,650	290.0	25.0	913	2,738	4,520
1,385.00	3,650	290.0	100.0	1,825	4,563	4,665
1,385.50	3,650	290.0	100.0	1,825	6,388	4,810

Device	Routing	Invert	Outlet Devices
#1	Primary	1,381.50'	**18.0" Round Culvert** L= 114.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.50' / 1,380.90' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.00'	**0.4" Horiz. Perforated Underdain X 452.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,382.50'	**0.250 in/hr Exfiltration over Surface area above 1,382.50'** Conductivity to Groundwater Elevation = 1,381.50' Excluded Surface area = 3,650 sf
#4	Device 1	1,385.00'	**36.0" x 36.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,385.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

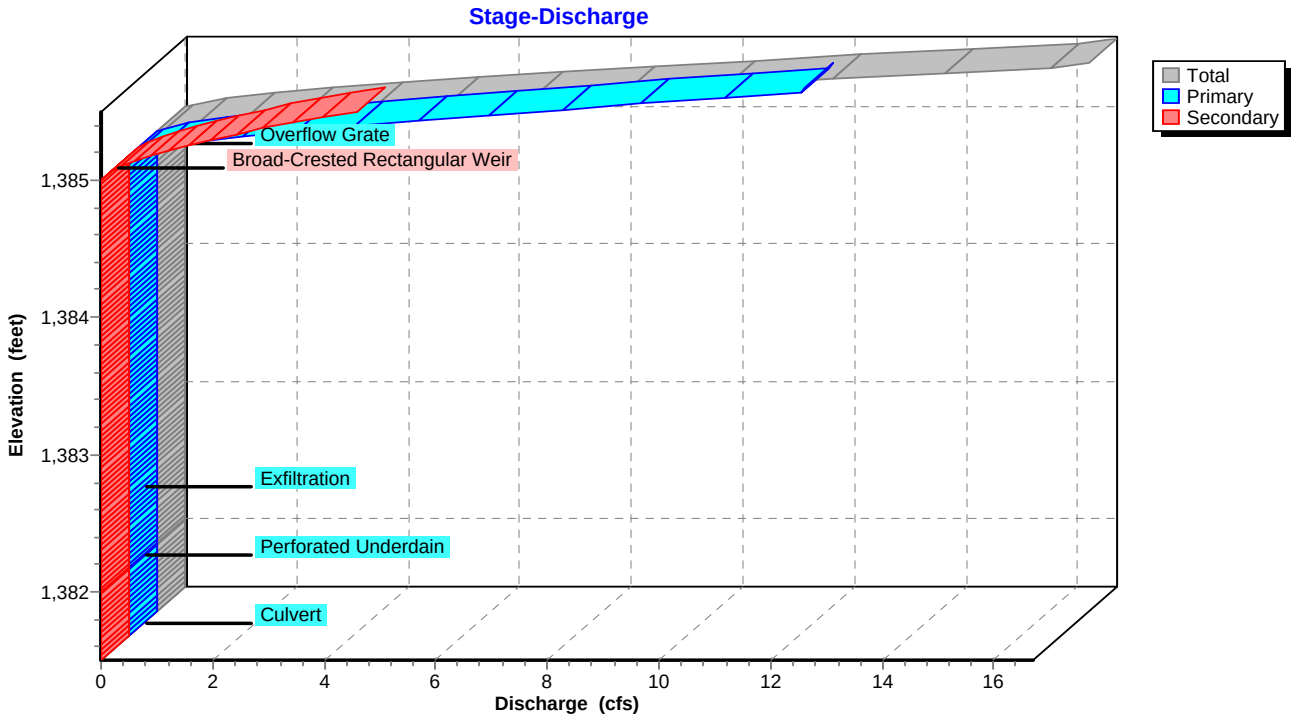
Primary OutFlow Max=7.36 cfs @ 12.05 hrs HW=1,385.33' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 7.36 cfs of 11.78 cfs potential flow)
  - **2=Perforated Underdain** (Passes 0.00 cfs of 13.86 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 7.36 cfs @ 1.87 fps)

Secondary OutFlow Max=2.29 cfs @ 12.05 hrs HW=1,385.33' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 2.29 cfs @ 1.40 fps)

Pond BRA38-P: BRA-38



Pond BRA38-P: BRA-38



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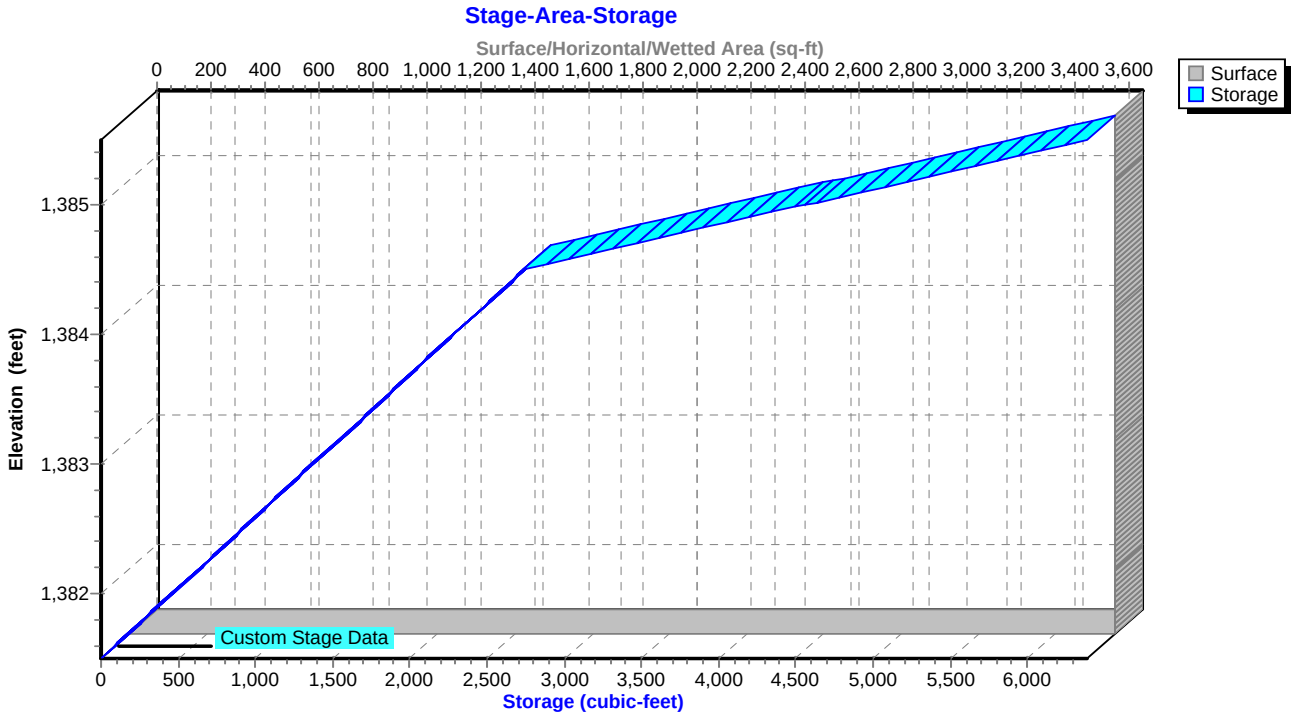


Summary for Pond BRA50-FS: Flow Splitter for BRA-50

Inflow Area = 4.526 ac, 6.87% Impervious, Inflow Depth = 3.59" for 10-YR, 24-HR Storm event
Inflow = 8.61 cfs @ 12.39 hrs, Volume= 1.353 af
Outflow = 8.61 cfs @ 12.40 hrs, Volume= 1.353 af, Atten= 0%, Lag= 0.6 min
Primary = 3.98 cfs @ 12.40 hrs, Volume= 0.778 af
Secondary = 4.64 cfs @ 12.40 hrs, Volume= 0.574 af

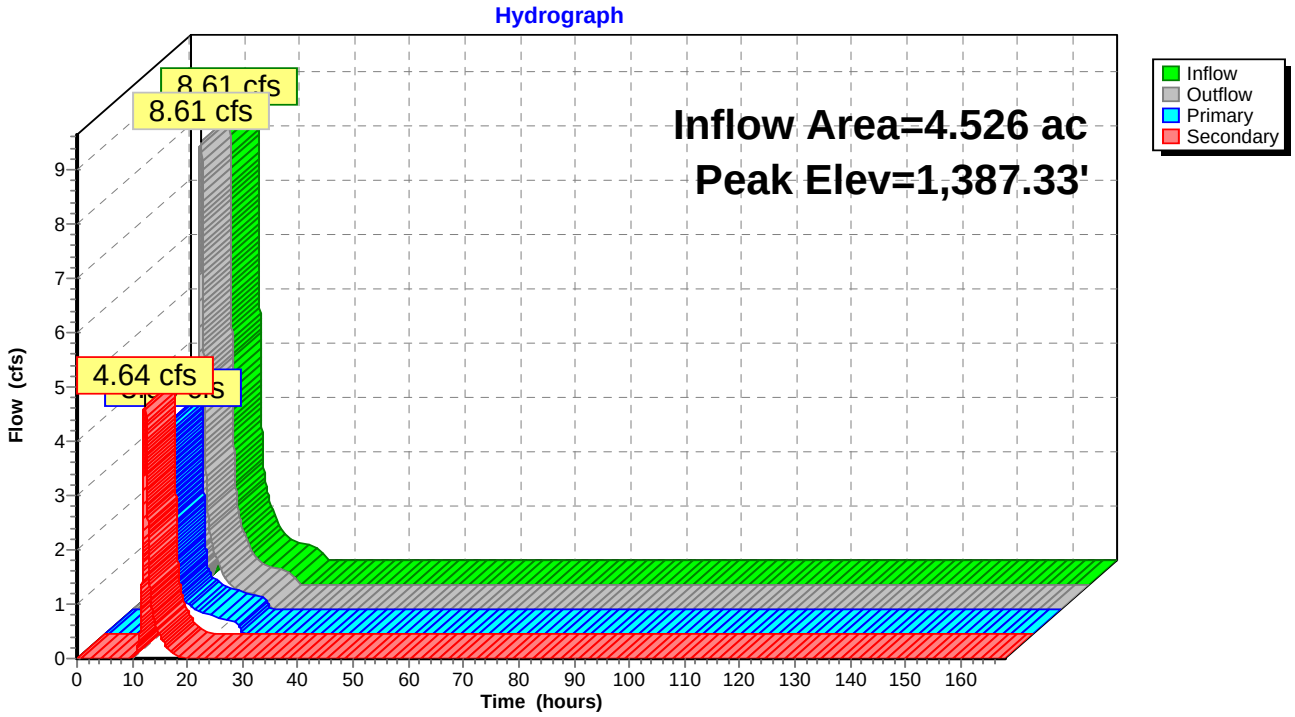
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,387.33' @ 12.40 hrs
Flood Elev= 1,390.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,386.10'	**18.0" Round Culvert to BRA-50** L= 17.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,386.10' / 1,386.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,386.10'	**18.0" Round Culvert to Pond 23** L= 71.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,386.10' / 1,383.70' S= 0.0334 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,386.40'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

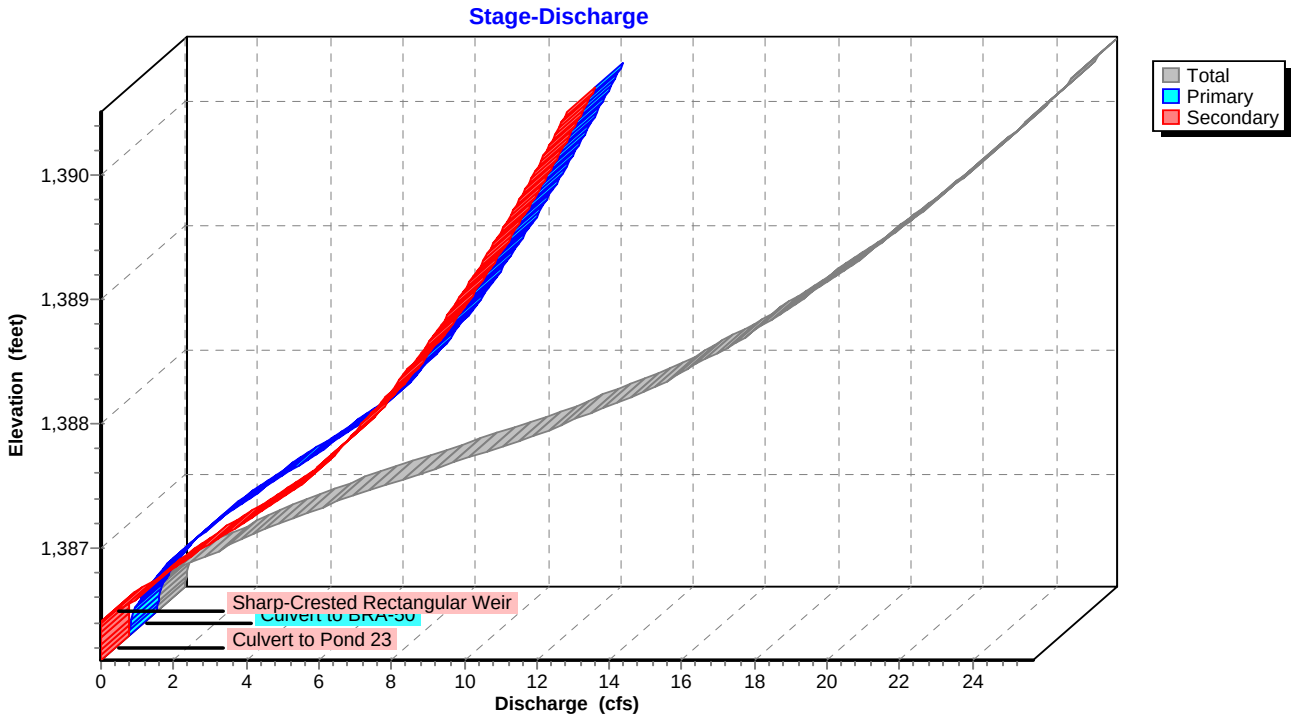
Primary OutFlow Max=3.97 cfs @ 12.40 hrs HW=1,387.33' TW=1,386.28' (Dynamic Tailwater)
└**1=Culvert to BRA-50** (Barrel Controls 3.97 cfs @ 3.48 fps)

Secondary OutFlow Max=4.64 cfs @ 12.40 hrs HW=1,387.33' TW=1,383.76' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Inlet Controls 4.64 cfs @ 2.98 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 4.64 cfs of 11.23 cfs potential flow)

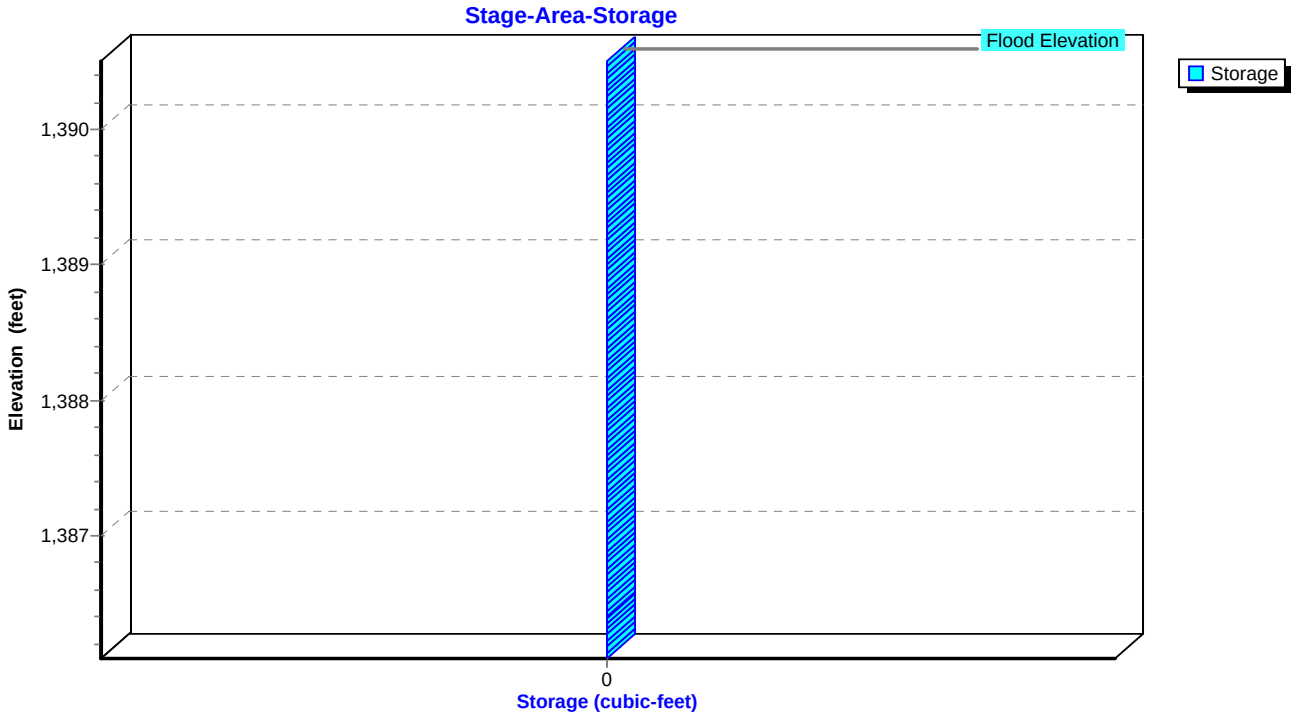
Pond BRA50-FS: Flow Splitter for BRA-50



Pond BRA50-FS: Flow Splitter for BRA-50



Pond BRA50-FS: Flow Splitter for BRA-50



Summary for Pond BRA50-P: BRA-50

Inflow Area = 4.526 ac, 6.87% Impervious, Inflow Depth = 2.06" for 10-YR, 24-HR Storm event
Inflow = 3.98 cfs @ 12.40 hrs, Volume= 0.778 af
Outflow = 3.95 cfs @ 12.44 hrs, Volume= 0.695 af, Atten= 1%, Lag= 2.0 min
Primary = 3.95 cfs @ 12.44 hrs, Volume= 0.695 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,386.28' @ 12.44 hrs Surf.Area= 2,290 sf Storage= 4,237 cf

Plug-Flow detention time= 90.7 min calculated for 0.695 af (89% of inflow)
Center-of-Mass det. time= 35.3 min (913.0 - 877.7)

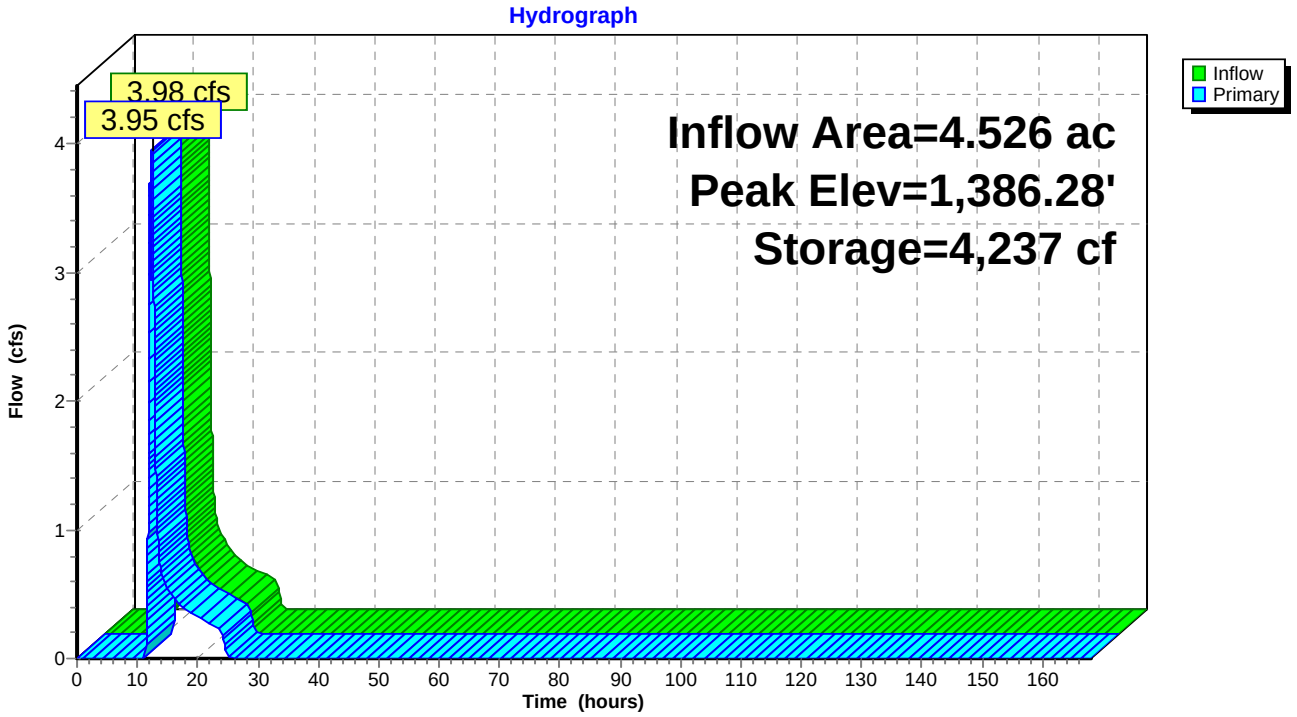
Volume	Invert	Avail.Storage	Storage Description
#1	1,382.00'	9,428 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,382.00	2,068	270.0	0.0	0	0	2,068
1,383.00	2,068	270.0	25.0	517	517	2,338
1,384.00	2,068	270.0	25.0	517	1,034	2,608
1,385.00	2,068	270.0	25.0	517	1,551	2,878
1,386.00	2,068	270.0	100.0	2,068	3,619	3,148
1,387.00	2,901	288.8	100.0	2,473	6,092	4,029
1,388.00	3,791	307.6	100.0	3,336	9,428	4,970

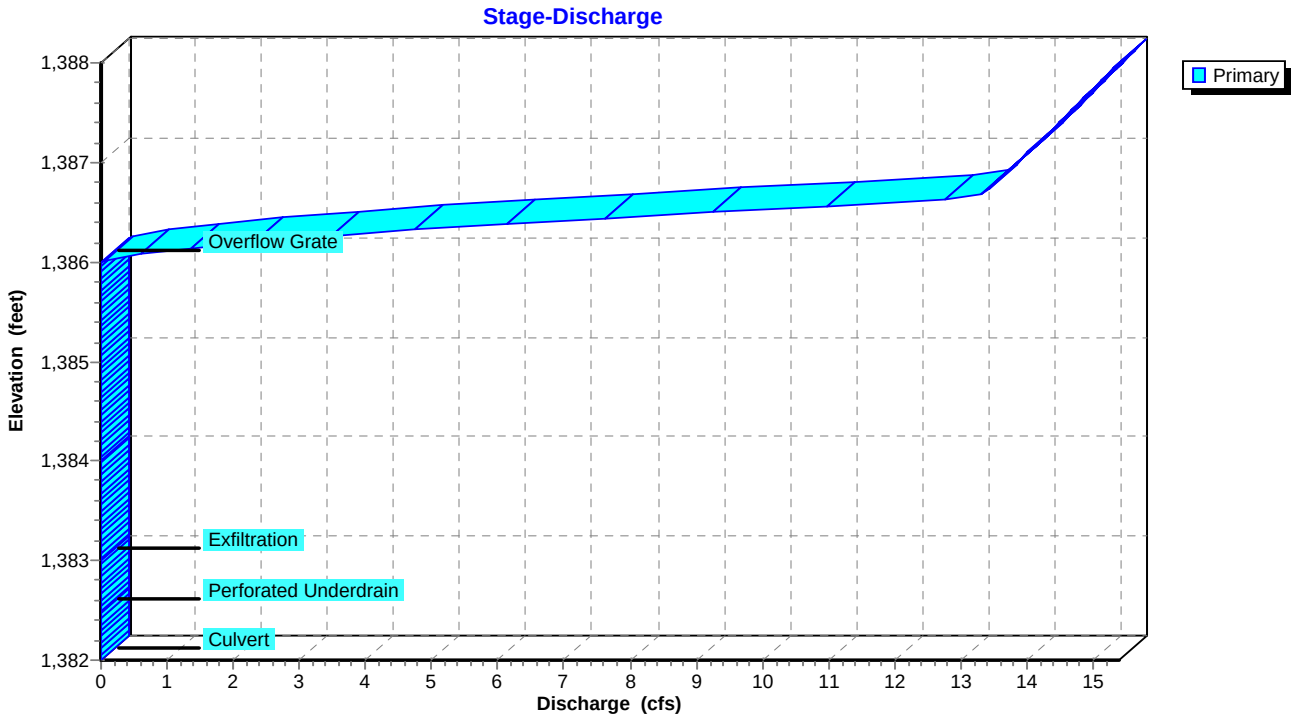
Device	Routing	Invert	Outlet Devices
#1	Primary	1,382.00'	**18.0" Round Culvert** L= 62.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,382.00' / 1,381.30' S= 0.0113 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.50'	**0.4" Horiz. Perforated Underdrain X 460.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,383.00'	**0.250 in/hr Exfiltration over Surface area above 1,383.00'** Conductivity to Groundwater Elevation = 1,382.00' Excluded Surface area = 2,068 sf
#4	Device 1	1,386.00'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.95 cfs @ 12.44 hrs HW=1,386.28' TW=1,383.80' (Dynamic Tailwater)
- **1=Culvert** (Passes 3.95 cfs of 10.58 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 12.18 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 3.95 cfs @ 1.74 fps)

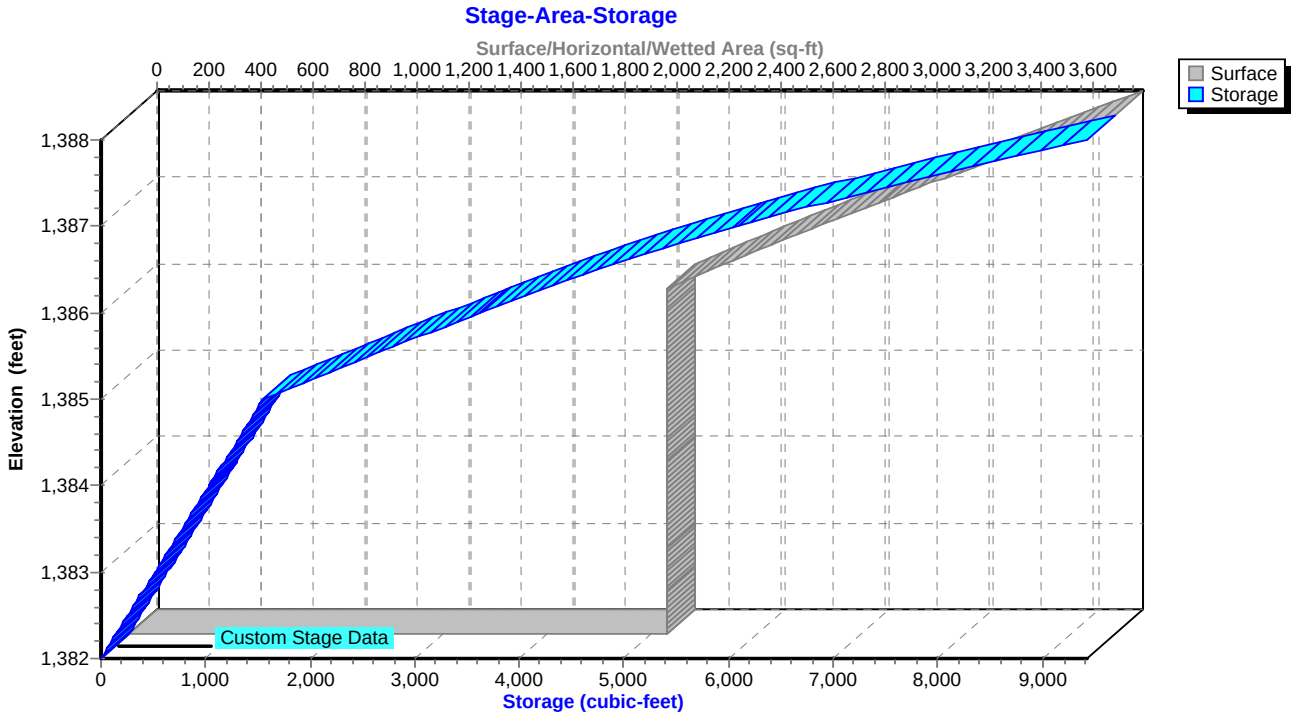
Pond BRA50-P: BRA-50



Pond BRA50-P: BRA-50



Pond BRA50-P: BRA-50



Summary for Pond SW21C-FS: Flow Splitter for SW21C

Inflow Area = 0.588 ac, 44.73% Impervious, Inflow Depth = 4.24" for 10-YR, 24-HR Storm event
Inflow = 3.31 cfs @ 12.03 hrs, Volume= 0.208 af
Outflow = 3.31 cfs @ 12.04 hrs, Volume= 0.208 af, Atten= 0%, Lag= 0.6 min
Primary = 1.77 cfs @ 12.04 hrs, Volume= 0.157 af
Secondary = 1.55 cfs @ 12.04 hrs, Volume= 0.051 af

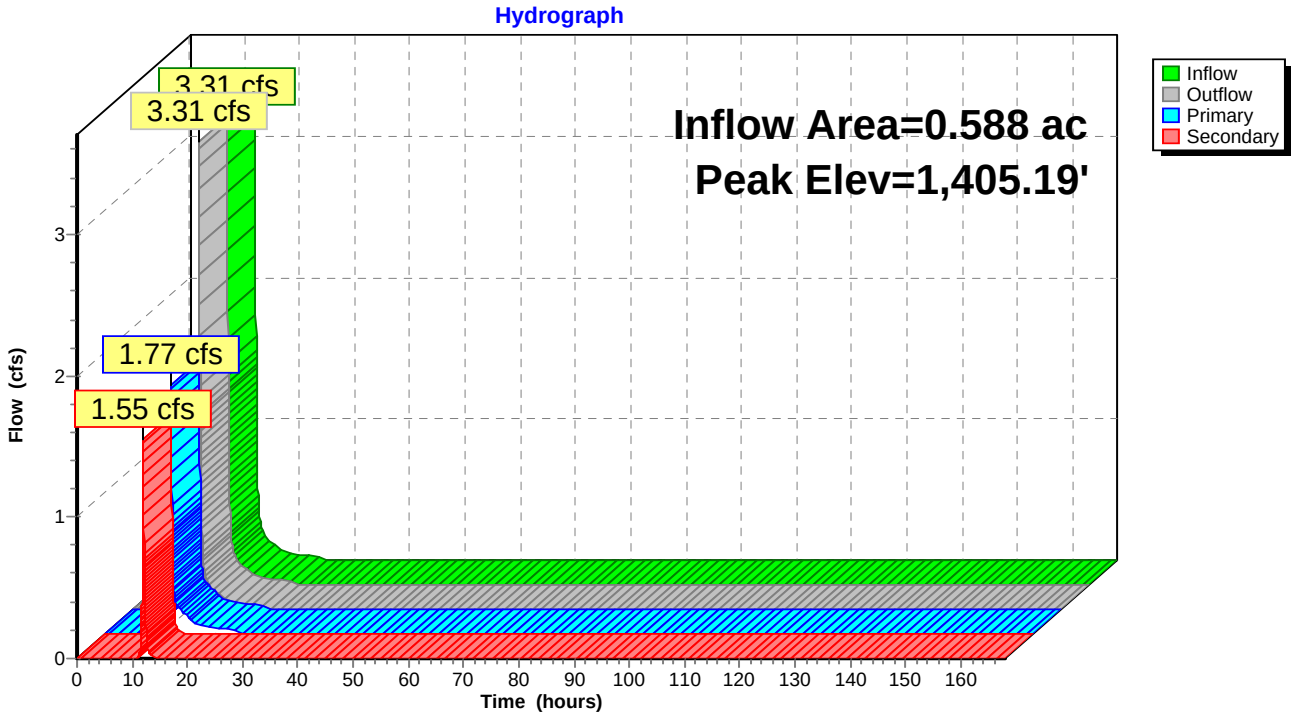
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,405.19' @ 12.04 hrs
Flood Elev= 1,408.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,404.50'	**18.0" Round Culvert to BRA-SW21C** L= 102.1' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,404.50' / 1,403.50' S= 0.0098 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,404.50'	**15.0" Round Culvert to Pond-SW21B** L= 293.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,404.50' / 1,377.20' S= 0.0932 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,404.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

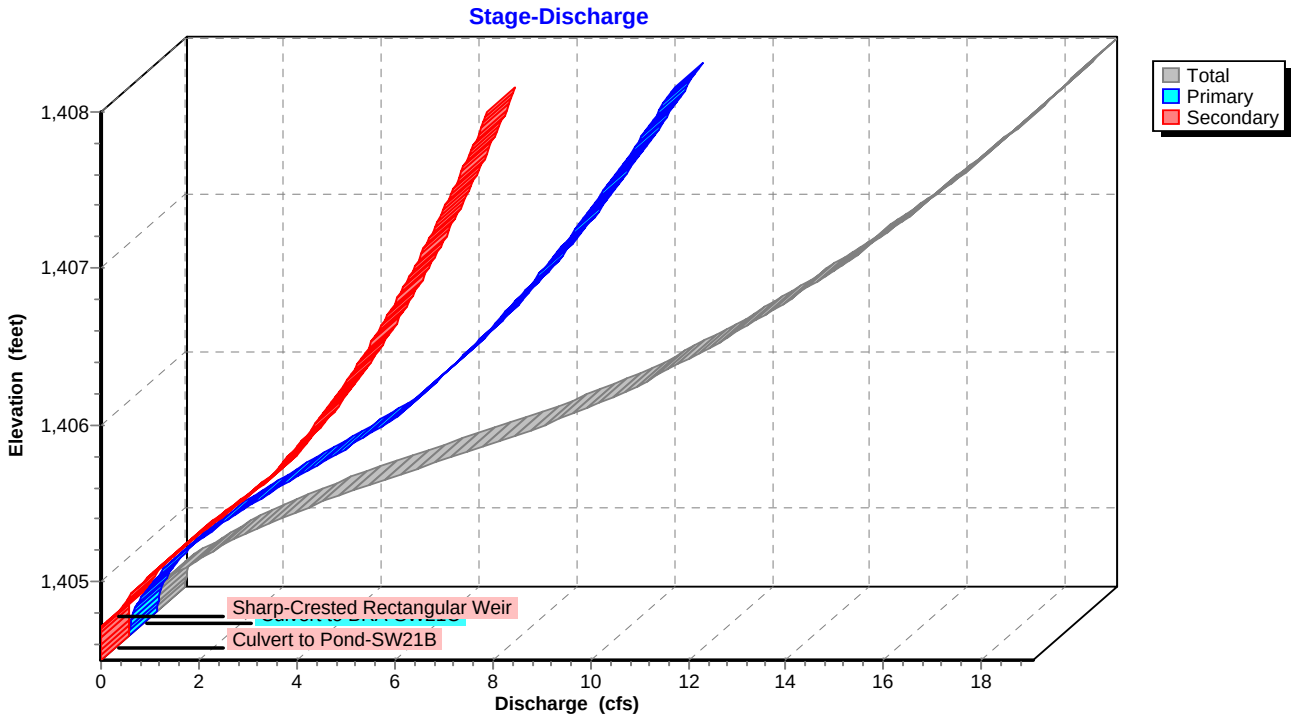
Primary OutFlow Max=1.76 cfs @ 12.04 hrs HW=1,405.19' TW=1,402.90' (Dynamic Tailwater)
└**1=Culvert to BRA-SW21C** (Inlet Controls 1.76 cfs @ 2.23 fps)

Secondary OutFlow Max=1.54 cfs @ 12.04 hrs HW=1,405.19' TW=1,377.90' (Dynamic Tailwater)
└**2=Culvert to Pond-SW21B** (Inlet Controls 1.54 cfs @ 2.23 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 1.54 cfs of 4.35 cfs potential flow)

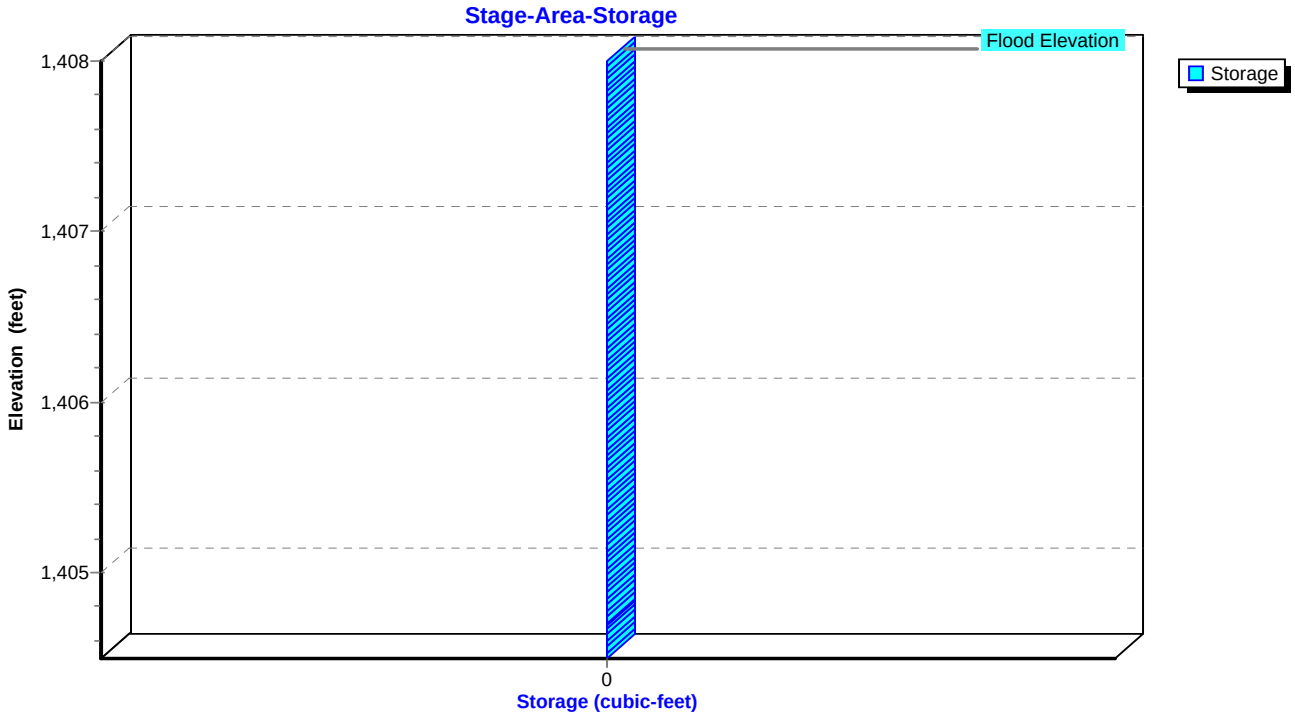
Pond SW21C-FS: Flow Splitter for SW21C



Pond SW21C-FS: Flow Splitter for SW21C



Pond SW21C-FS: Flow Splitter for SW21C



Summary for Pond SW21C-P: BRA-SW21C

Inflow Area = 0.704 ac, 37.36% Impervious, Inflow Depth = 3.20" for 10-YR, 24-HR Storm event
Inflow = 2.13 cfs @ 12.05 hrs, Volume= 0.188 af
Outflow = 0.54 cfs @ 12.41 hrs, Volume= 0.102 af, Atten= 75%, Lag= 22.1 min
Primary = 0.54 cfs @ 12.41 hrs, Volume= 0.102 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,403.58' @ 12.41 hrs Surf.Area= 2,129 sf Storage= 3,886 cf

Plug-Flow detention time= 261.4 min calculated for 0.102 af (54% of inflow)
Center-of-Mass det. time= 128.5 min (952.0 - 823.5)

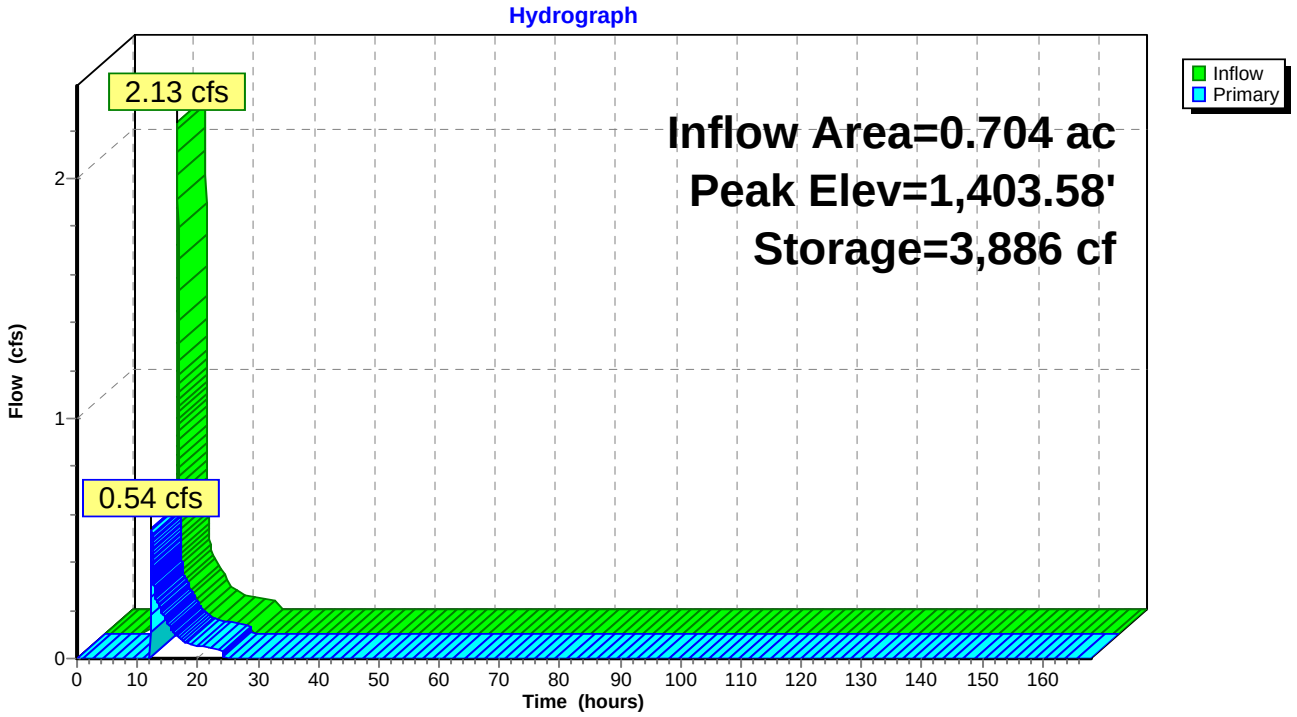
Volume	Invert	Avail.Storage	Storage Description
#1	1,398.00'	4,790 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,398.00	2,129	186.4	0.0	0	0	2,129
1,399.00	2,129	186.4	25.0	532	532	2,315
1,400.00	2,129	186.4	25.0	532	1,065	2,502
1,401.00	2,129	186.4	25.0	532	1,597	2,688
1,402.00	2,129	186.4	25.0	532	2,129	2,875
1,403.00	2,129	186.4	25.0	532	2,661	3,061
1,403.50	2,129	186.4	100.0	1,065	3,726	3,154
1,404.00	2,129	186.4	100.0	1,065	4,790	3,247

Device	Routing	Invert	Outlet Devices
#1	Primary	1,398.00'	**18.0" Round Culvert** L= 37.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,398.00' / 1,397.50' S= 0.0133 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,398.50'	**0.4" Horiz. Perforated Underdrain X 264.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,399.00'	**0.250 in/hr Exfiltration over Surface area above 1,399.00'** Conductivity to Groundwater Elevation = 1,398.00' Excluded Surface area = 2,129 sf
#4	Device 1	1,403.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.54 cfs @ 12.41 hrs HW=1,403.58' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.54 cfs of 14.76 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 10.00 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 0.54 cfs @ 0.90 fps)

Pond SW21C-P: BRA-SW21C



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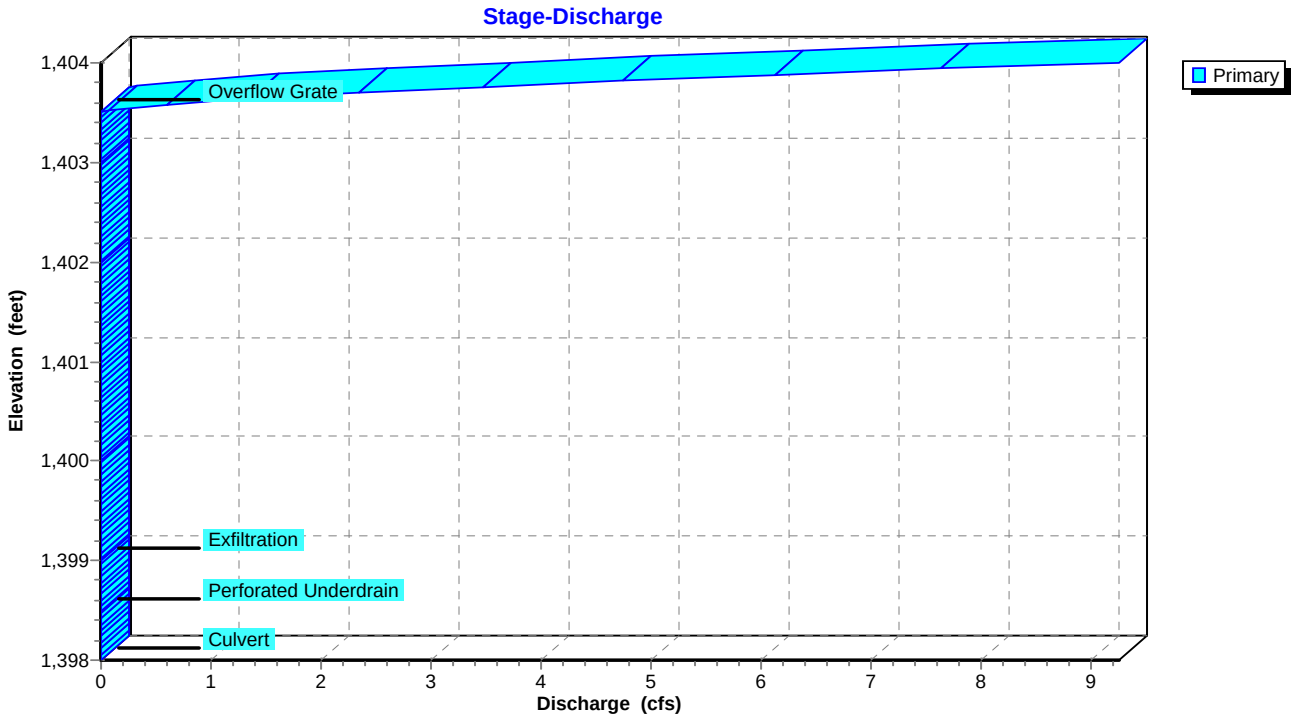
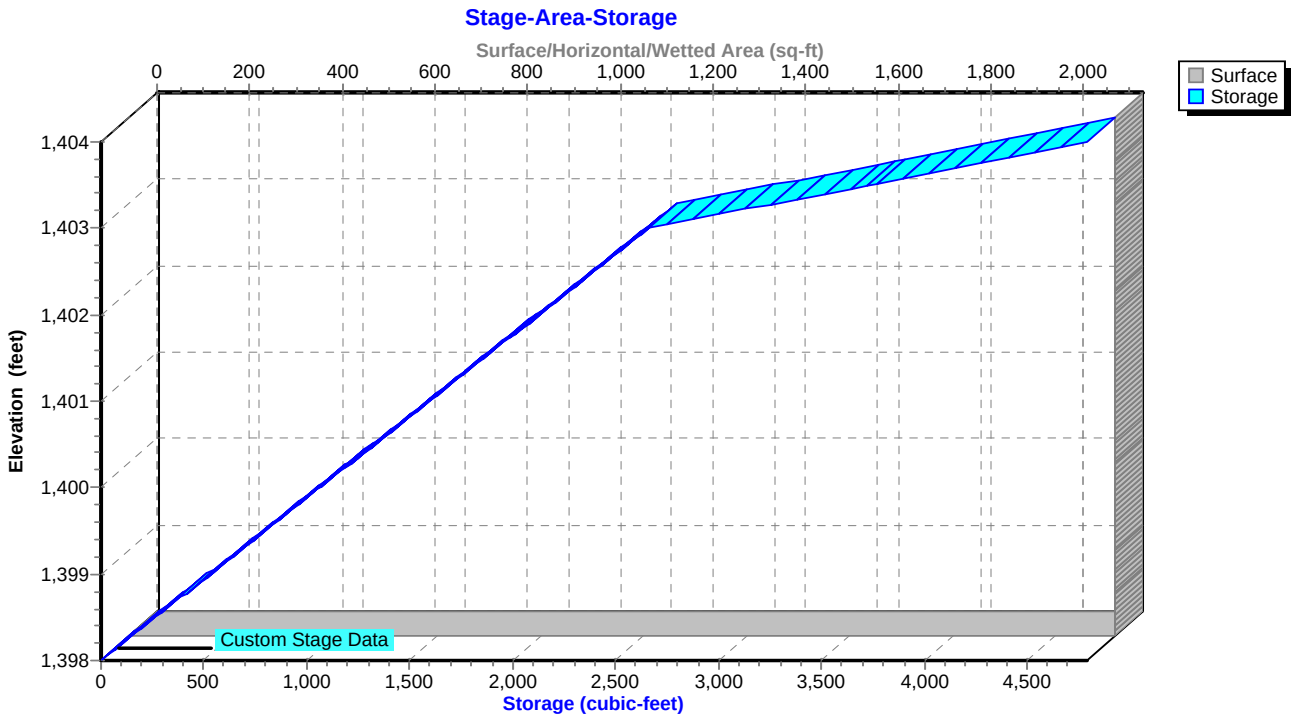


Pond SW21C-P: BRA-SW21C



Summary for Pond SW23A-FS: Flow Splitter for SW23A

Inflow Area = 0.206 ac, 47.57% Impervious, Inflow Depth = 4.41" for 10-YR, 24-HR Storm event
Inflow = 1.21 cfs @ 12.03 hrs, Volume= 0.076 af
Outflow = 1.21 cfs @ 12.04 hrs, Volume= 0.076 af, Atten= 0%, Lag= 0.6 min
Primary = 0.58 cfs @ 12.04 hrs, Volume= 0.057 af
Secondary = 0.63 cfs @ 12.04 hrs, Volume= 0.019 af

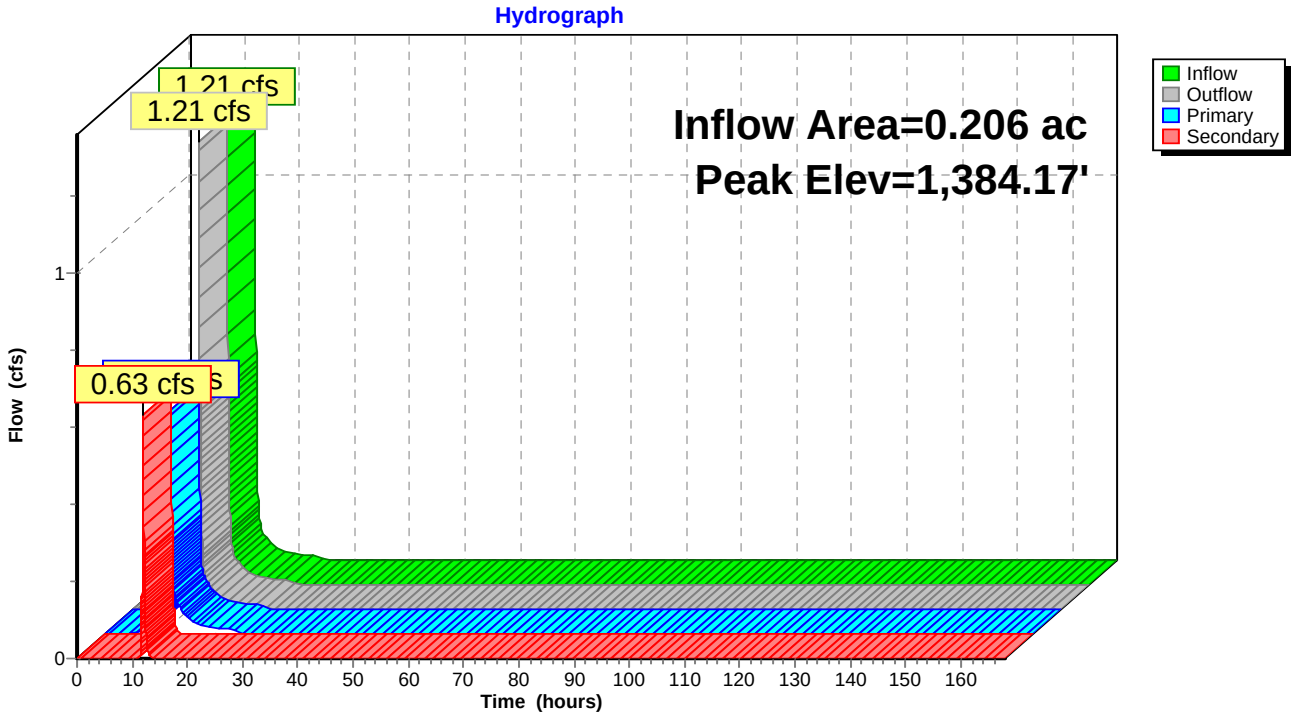
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,384.17' @ 12.04 hrs
Flood Elev= 1,387.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,383.75'	**15.0" Round Culvert to BRA-SW23A** L= 44.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,383.75' / 1,383.50' S= 0.0056 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,383.75'	**15.0" Round Culvert to Pond 23** L= 177.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,383.75' / 1,381.30' S= 0.0138 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,383.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

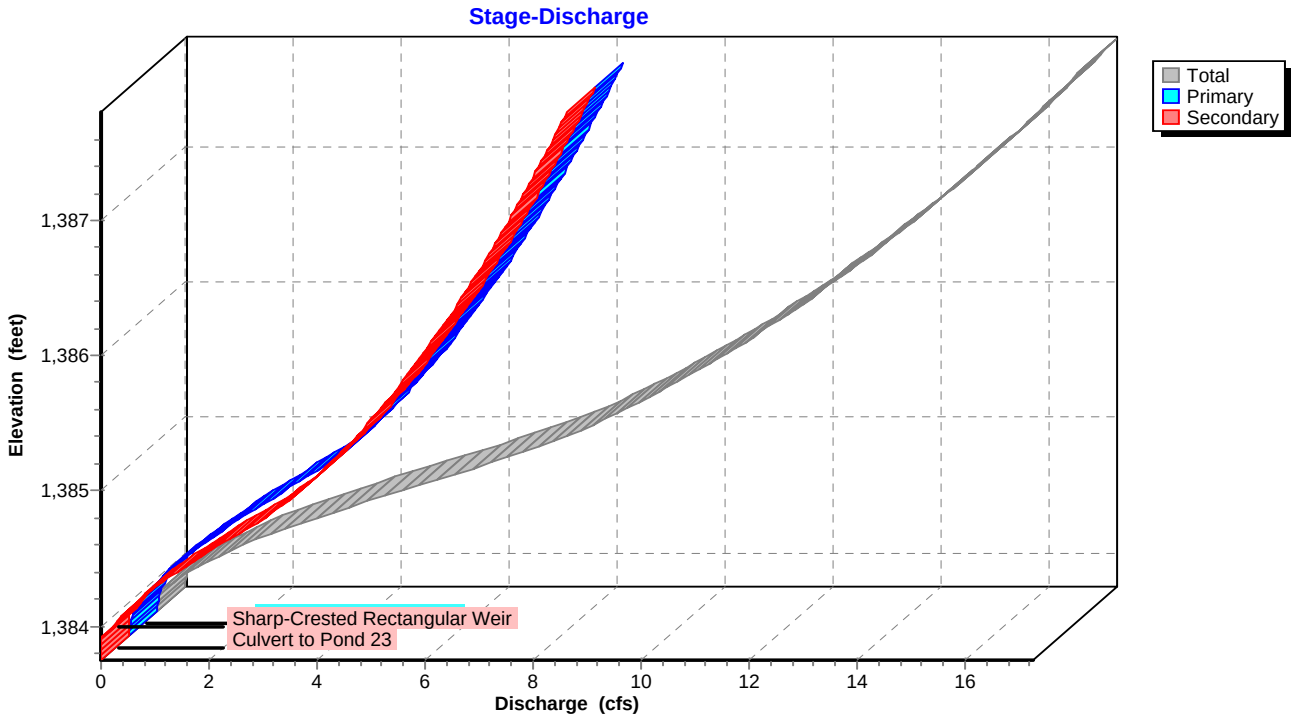
Primary OutFlow Max=0.58 cfs @ 12.04 hrs HW=1,384.17' TW=1,383.10' (Dynamic Tailwater)
└**1=Culvert to BRA-SW23A** (Barrel Controls 0.58 cfs @ 2.39 fps)

Secondary OutFlow Max=0.63 cfs @ 12.04 hrs HW=1,384.17' TW=0.00' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Inlet Controls 0.63 cfs @ 1.74 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 0.63 cfs of 1.81 cfs potential flow)

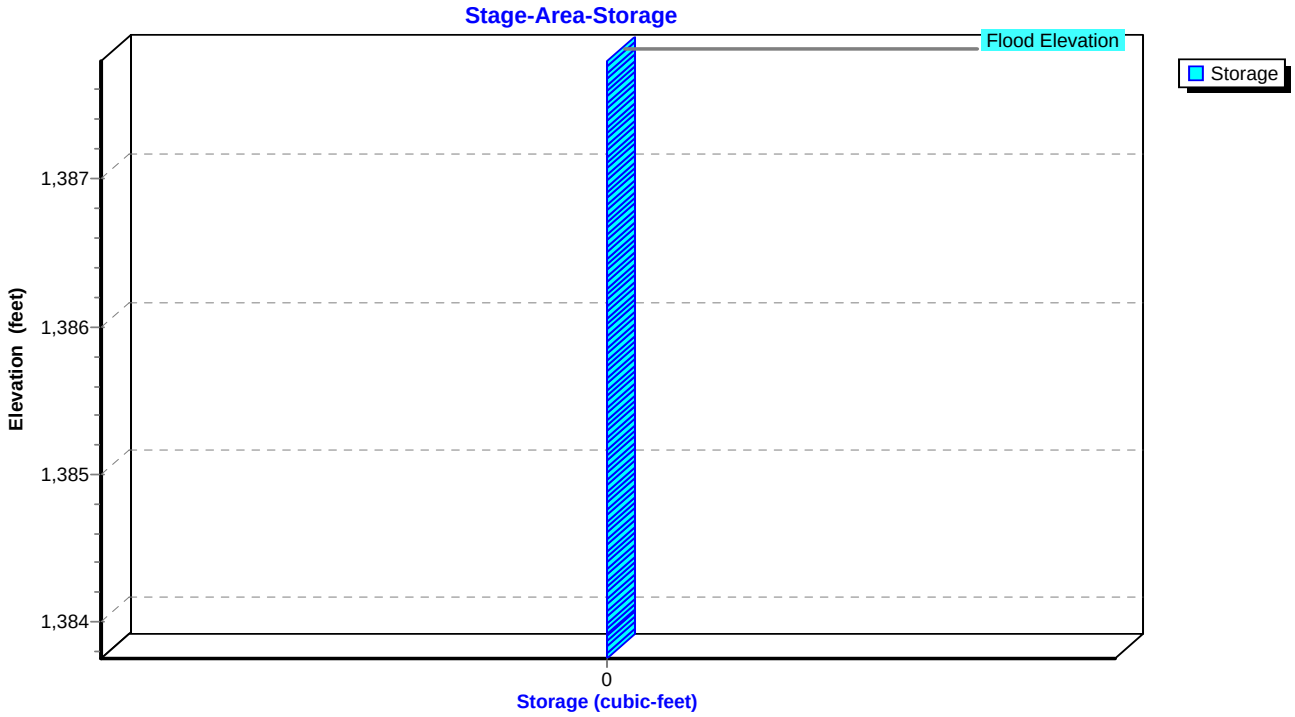
Pond SW23A-FS: Flow Splitter for SW23A



Pond SW23A-FS: Flow Splitter for SW23A



Pond SW23A-FS: Flow Splitter for SW23A



Summary for Pond SW23A-P: BRA-SW23A

Inflow Area = 0.262 ac, 37.40% Impervious, Inflow Depth = 3.29" for 10-YR, 24-HR Storm event
Inflow = 0.75 cfs @ 12.04 hrs, Volume= 0.072 af
Outflow = 0.31 cfs @ 12.25 hrs, Volume= 0.042 af, Atten= 59%, Lag= 12.5 min
Primary = 0.31 cfs @ 12.25 hrs, Volume= 0.042 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,383.55' @ 12.25 hrs Surf.Area= 761 sf Storage= 1,339 cf

Plug-Flow detention time= 237.7 min calculated for 0.042 af (58% of inflow)
Center-of-Mass det. time= 110.6 min (930.3 - 819.7)

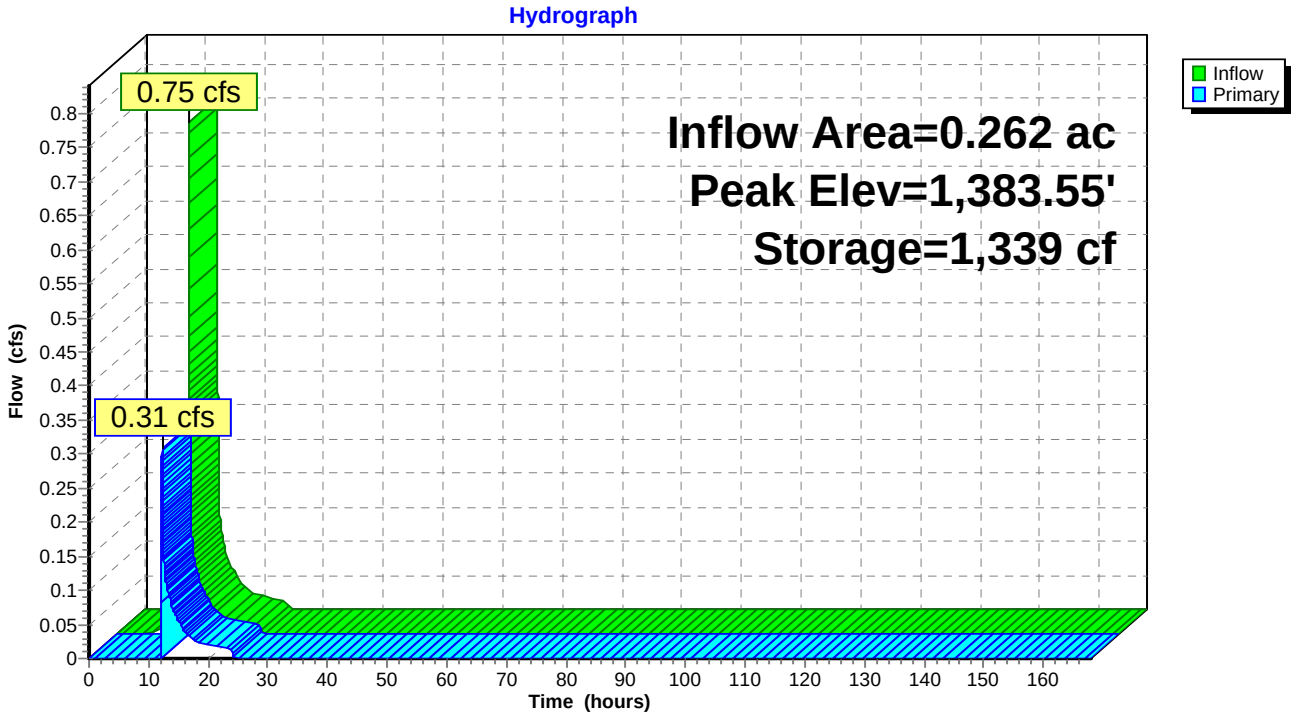
Volume	Invert	Avail.Storage	Storage Description
#1	1,378.00'	1,718 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,378.00	743	120.0	0.0	0	0	743
1,379.00	743	120.0	25.0	186	186	863
1,380.00	743	120.0	25.0	186	372	983
1,381.00	743	120.0	25.0	186	557	1,103
1,382.00	743	120.0	25.0	186	743	1,223
1,383.00	743	120.0	25.0	186	929	1,343
1,383.50	743	120.0	100.0	372	1,300	1,403
1,384.00	930	120.0	100.0	417	1,718	1,463

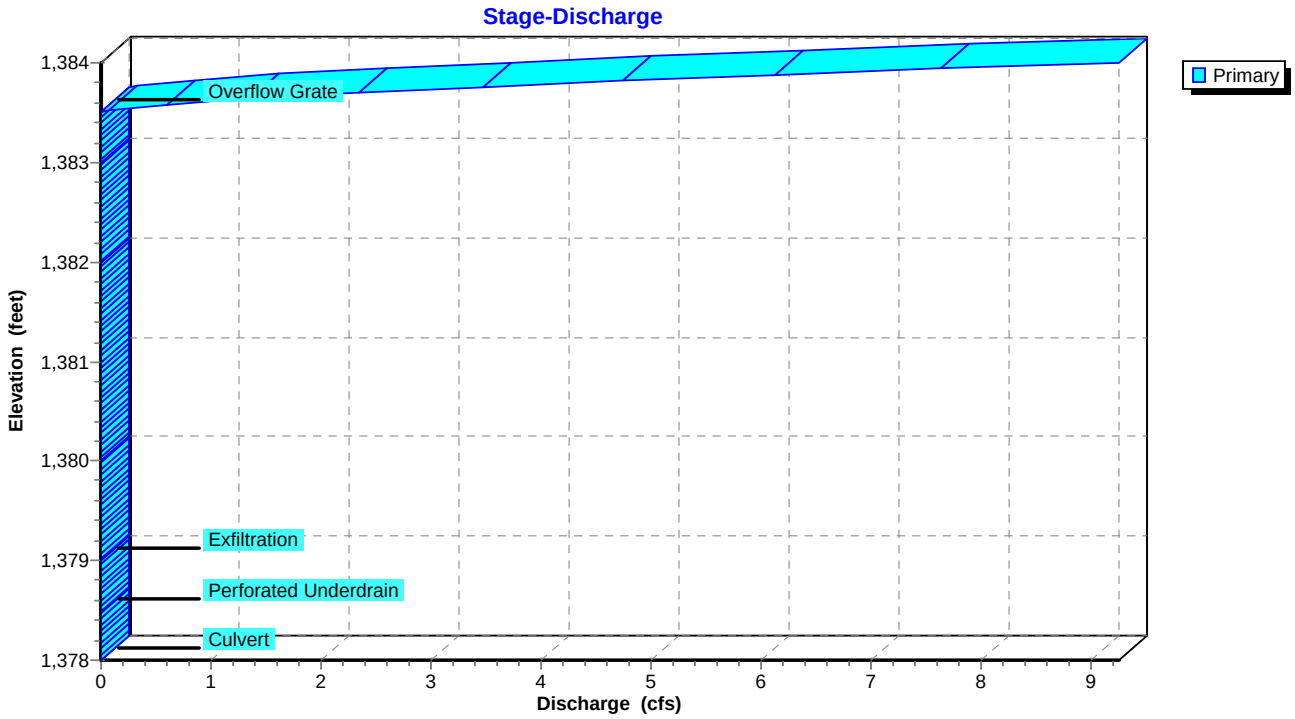
Device	Routing	Invert	Outlet Devices
#1	Primary	1,378.00'	**15.0" Round Culvert** L= 97.1' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,378.00' / 1,376.50' S= 0.0154 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,378.50'	**0.4" Horiz. Perforated Underdrain X 608.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,379.00'	**0.250 in/hr Exfiltration over Surface area above 1,379.00'** Conductivity to Groundwater Elevation = 1,378.00' Excluded Surface area = 743 sf
#4	Device 1	1,383.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.31 cfs @ 12.25 hrs HW=1,383.55' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.31 cfs of 10.35 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 5.74 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 0.31 cfs @ 0.74 fps)

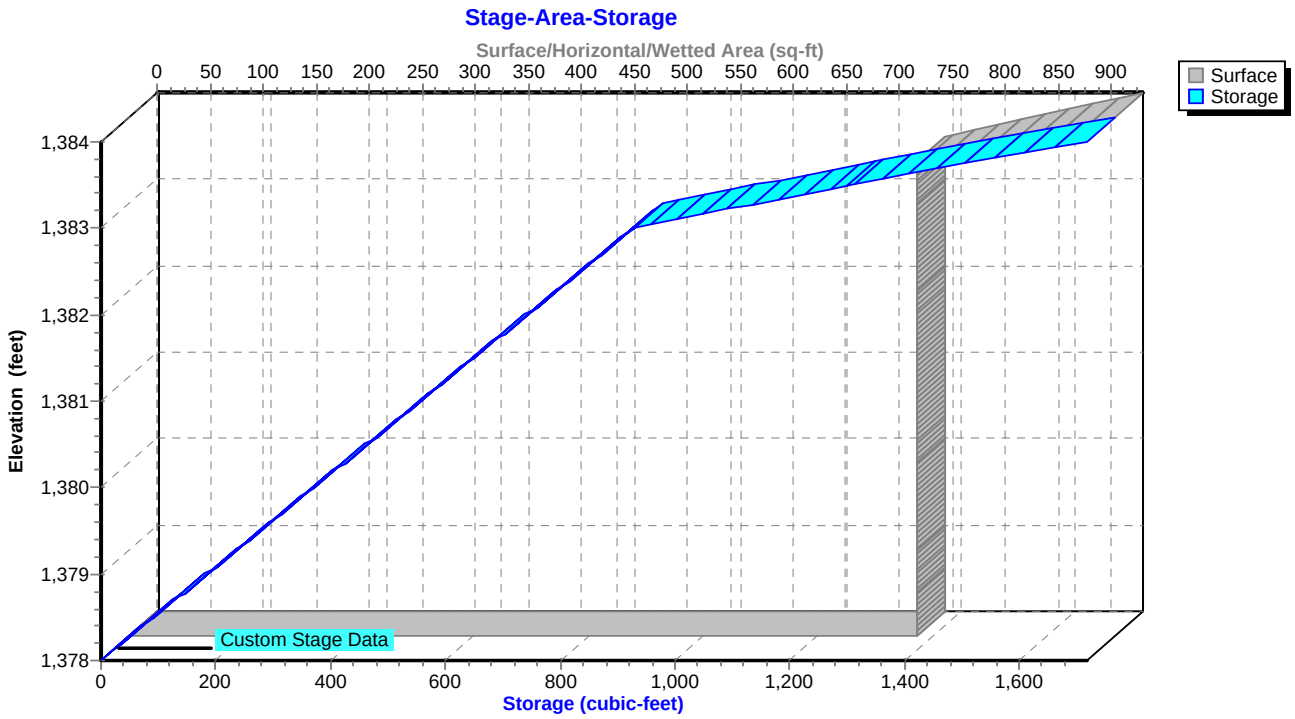
Pond SW23A-P: BRA-SW23A



Pond SW23A-P: BRA-SW23A



Pond SW23A-P: BRA-SW23A



Summary for Pond SW23B-FS: Flow Splitter for SW23B

Inflow Area = 0.579 ac, 37.48% Impervious, Inflow Depth = 4.20" for 10-YR, 24-HR Storm event
Inflow = 3.24 cfs @ 12.03 hrs, Volume= 0.202 af
Outflow = 3.24 cfs @ 12.04 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.6 min
Primary = 1.72 cfs @ 12.04 hrs, Volume= 0.153 af
Secondary = 1.51 cfs @ 12.04 hrs, Volume= 0.049 af

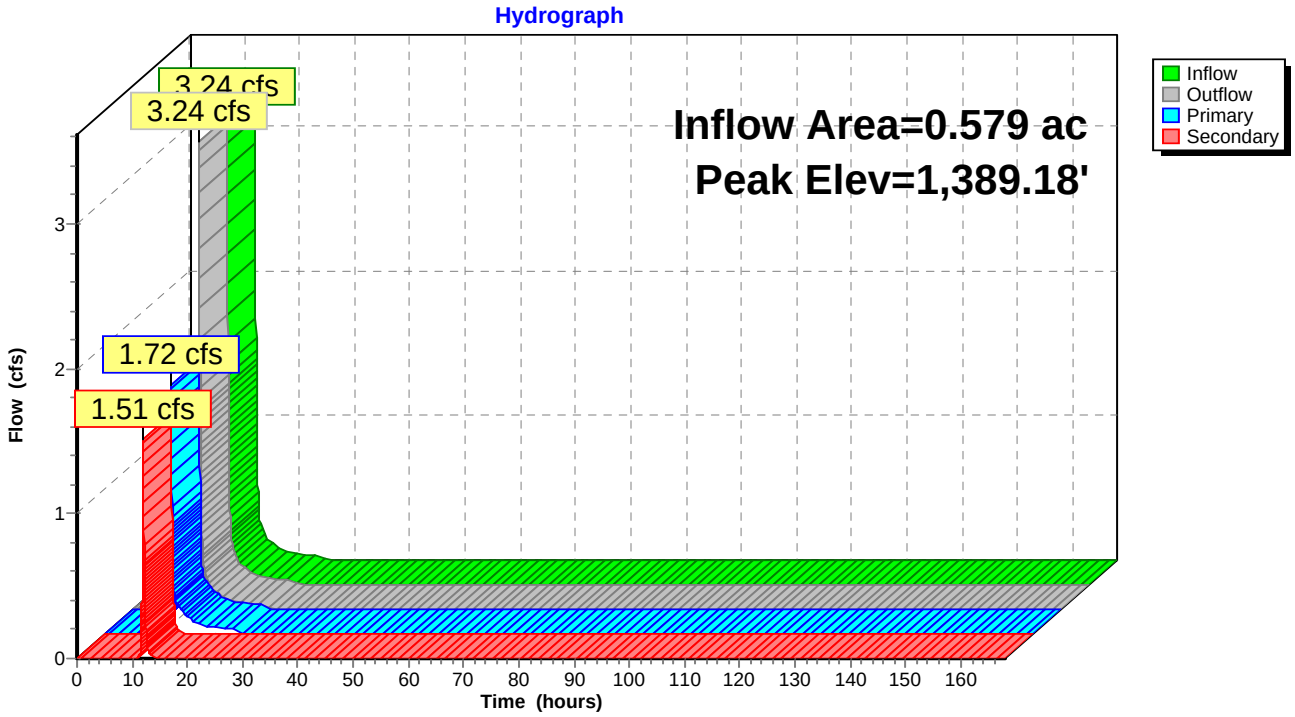
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,389.18' @ 12.04 hrs
Flood Elev= 1,391.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,388.50'	**18.0" Round Culvert to SW23B** L= 132.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,388.50' / 1,387.50' S= 0.0075 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,388.50'	**15.0" Round Culvert to Pond 23** L= 268.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,388.50' / 1,384.00' S= 0.0168 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,388.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

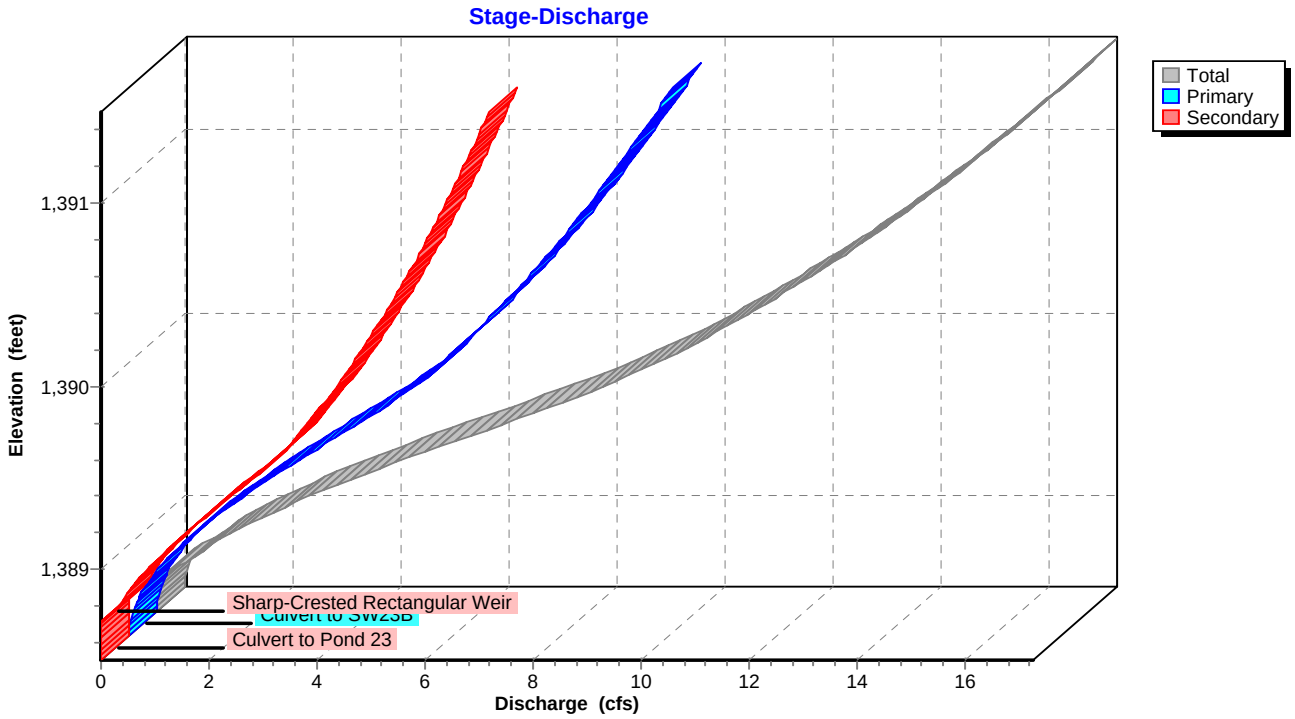
Primary OutFlow Max=1.72 cfs @ 12.04 hrs HW=1,389.18' TW=1,387.53' (Dynamic Tailwater)
└**1=Culvert to SW23B** (Inlet Controls 1.72 cfs @ 2.22 fps)

Secondary OutFlow Max=1.51 cfs @ 12.04 hrs HW=1,389.18' TW=1,382.64' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Inlet Controls 1.51 cfs @ 2.22 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 1.51 cfs of 4.24 cfs potential flow)

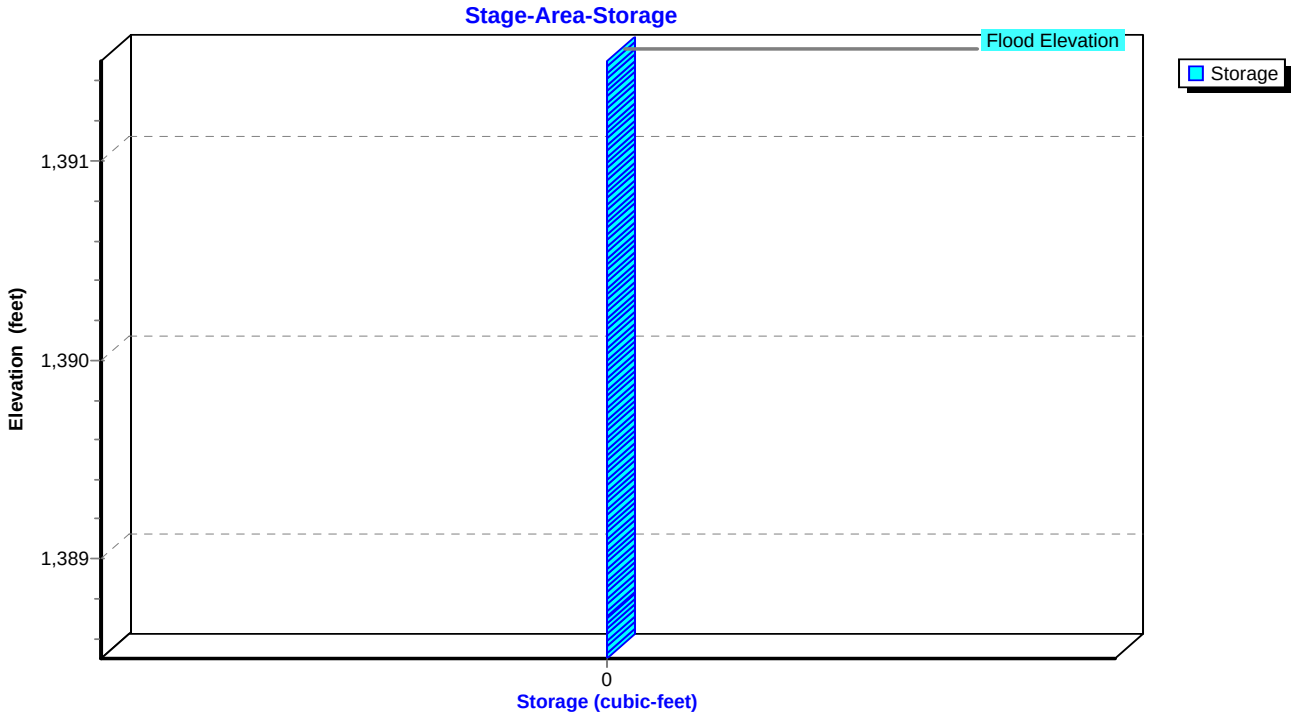
Pond SW23B-FS: Flow Splitter for SW23B



Pond SW23B-FS: Flow Splitter for SW23B



Pond SW23B-FS: Flow Splitter for SW23B



Summary for Pond SW23B-P: BRA-SW23B

Inflow Area = 0.672 ac, 32.29% Impervious, Inflow Depth = 3.18" for 10-YR, 24-HR Storm event
Inflow = 2.01 cfs @ 12.04 hrs, Volume= 0.178 af
Outflow = 1.48 cfs @ 12.11 hrs, Volume= 0.123 af, Atten= 26%, Lag= 4.1 min
Primary = 1.48 cfs @ 12.11 hrs, Volume= 0.123 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,387.65' @ 12.11 hrs Surf.Area= 2,022 sf Storage= 2,695 cf

Plug-Flow detention time= 190.6 min calculated for 0.123 af (69% of inflow)
Center-of-Mass det. time= 81.7 min (906.2 - 824.5)

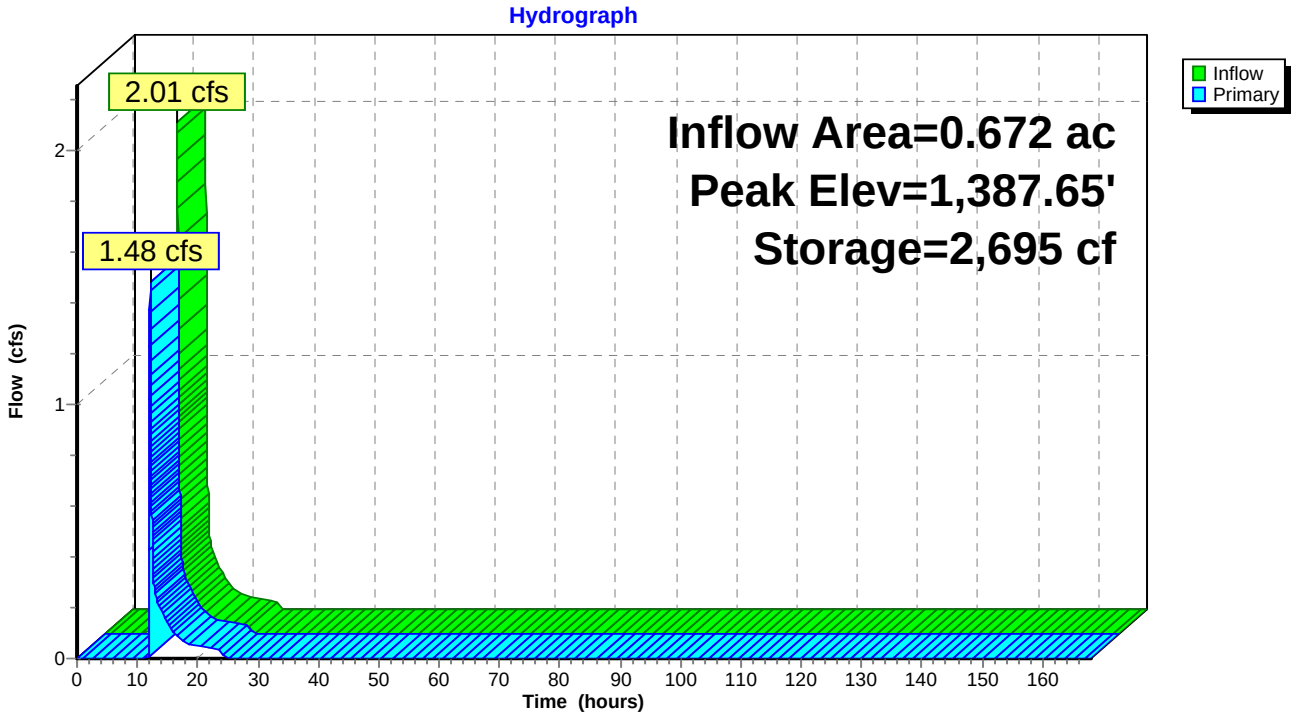
Volume	Invert	Avail.Storage	Storage Description
#1	1,384.00'	3,450 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,384.00	1,923	225.0	0.0	0	0	1,923
1,385.00	1,923	225.0	25.0	481	481	2,148
1,386.00	1,923	225.0	25.0	481	962	2,373
1,387.00	1,923	225.0	25.0	481	1,442	2,598
1,387.50	1,923	225.0	100.0	962	2,404	2,711
1,388.00	2,268	234.4	100.0	1,047	3,450	3,073

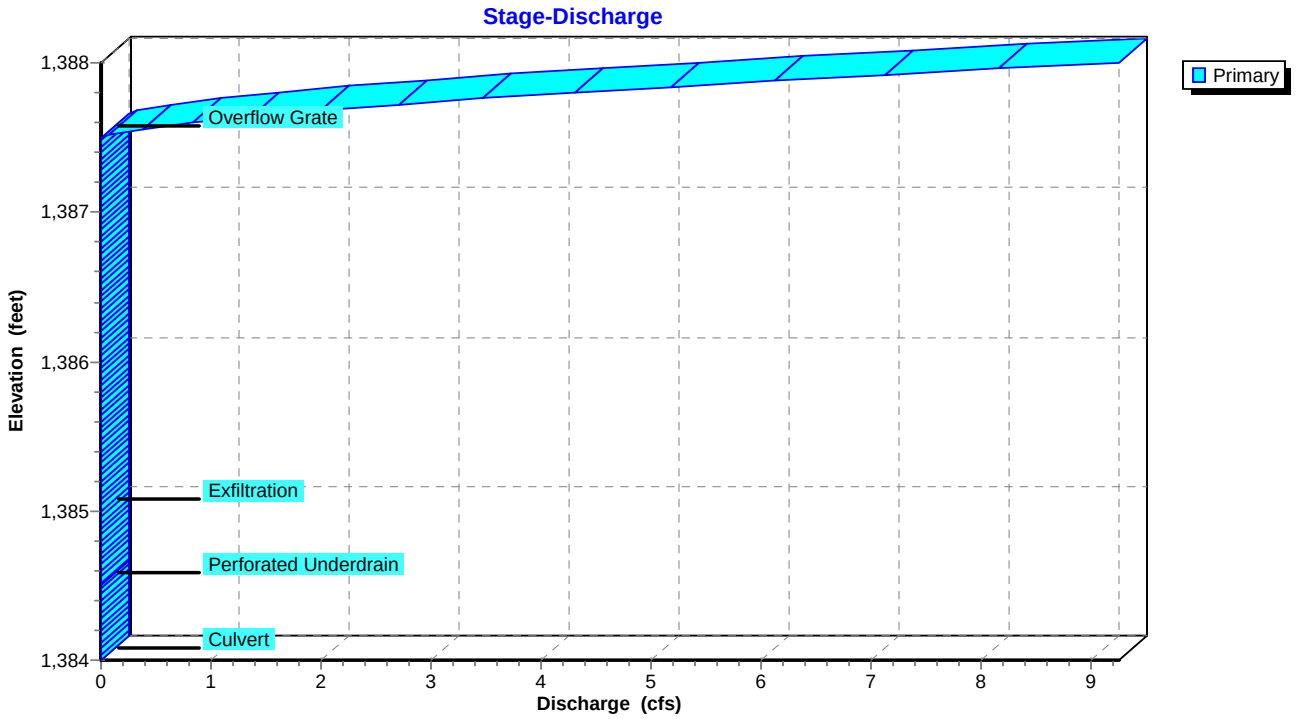
Device	Routing	Invert	Outlet Devices
#1	Primary	1,384.00'	**18.0" Round Culvert** L= 80.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,384.00' / 1,383.00' S= 0.0124 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,384.50'	**0.4" Horiz. Perforated Underdrain X 324.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,385.00'	**0.250 in/hr Exfiltration over Surface area above 1,385.00'** Conductivity to Groundwater Elevation = 1,384.00' Excluded Surface area = 1,923 sf
#4	Device 1	1,387.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.48 cfs @ 12.11 hrs HW=1,387.65' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.48 cfs of 11.43 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 9.66 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 1.48 cfs @ 1.25 fps)

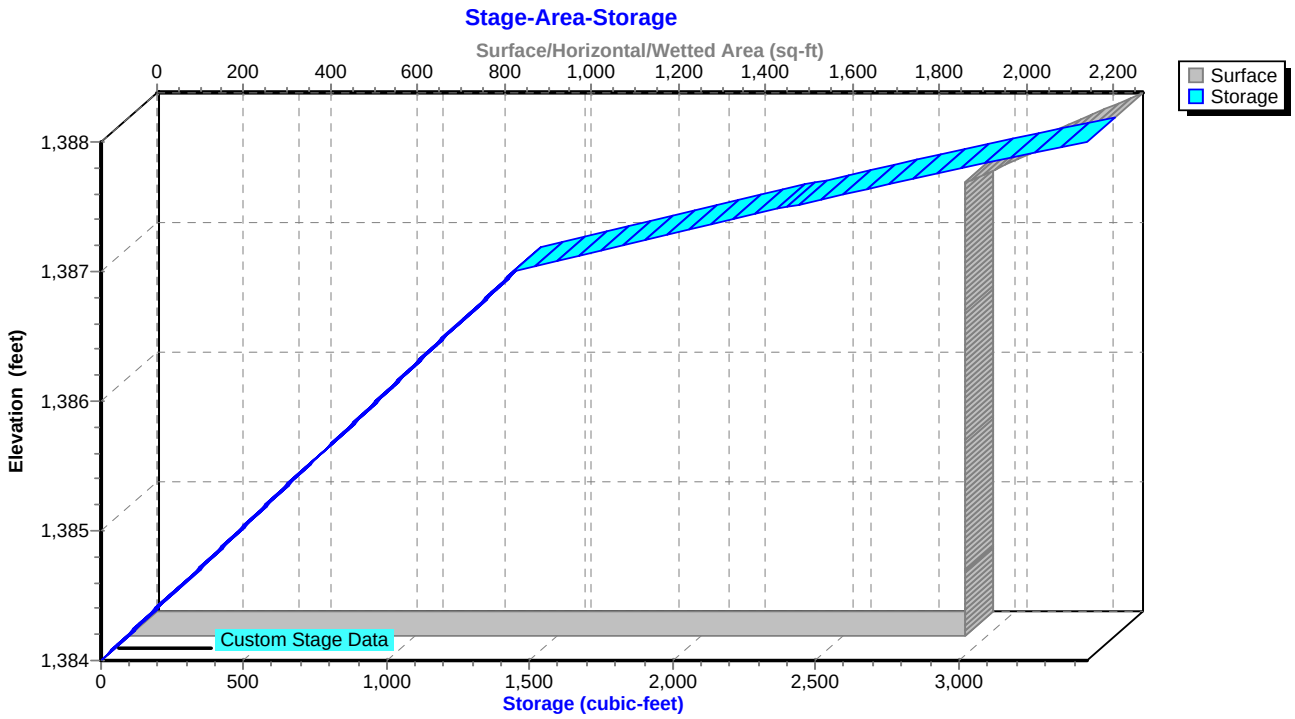
Pond SW23B-P: BRA-SW23B



Pond SW23B-P: BRA-SW23B



Pond SW23B-P: BRA-SW23B



Summary for Pond SW28A-FS: Flow Splitter for SW28A

Inflow Area = 0.220 ac, 68.64% Impervious, Inflow Depth = 4.95" for 10-YR, 24-HR Storm event
Inflow = 1.17 cfs @ 12.01 hrs, Volume= 0.091 af
Outflow = 1.17 cfs @ 12.02 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.6 min
Primary = 0.58 cfs @ 12.02 hrs, Volume= 0.079 af
Secondary = 0.58 cfs @ 12.02 hrs, Volume= 0.011 af

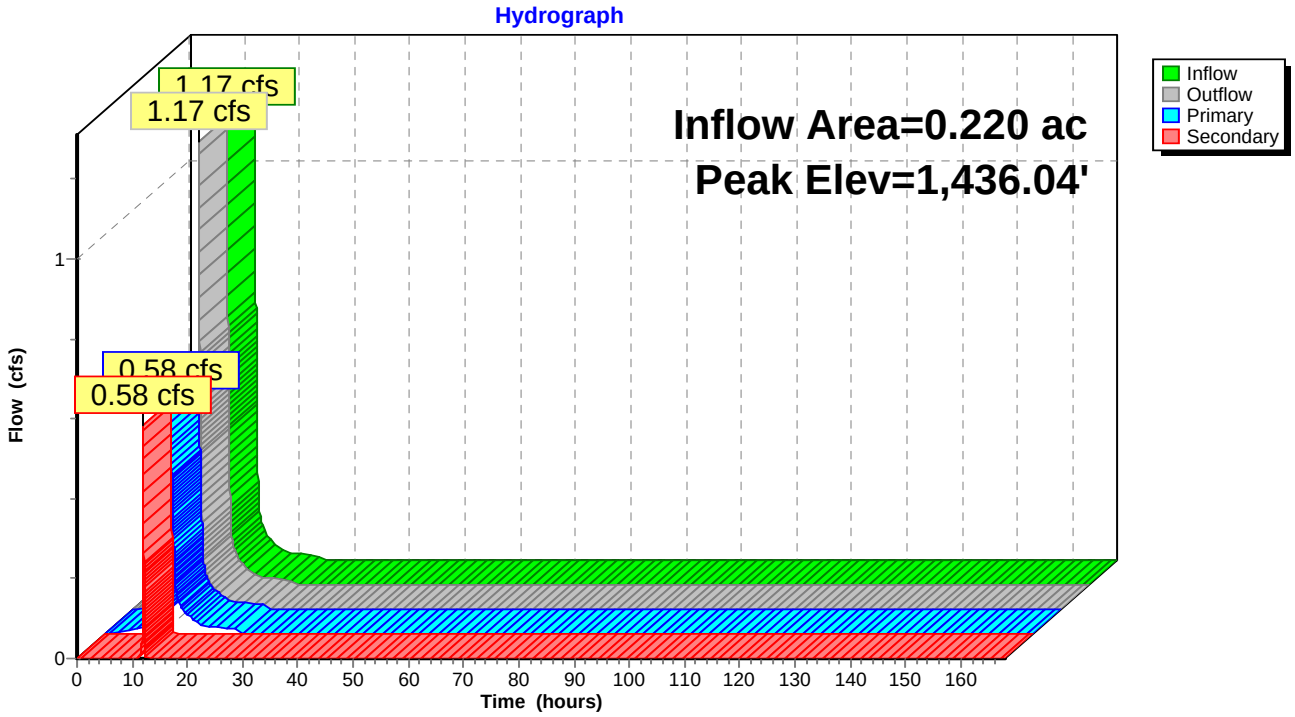
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,436.04' @ 12.02 hrs
Flood Elev= 1,439.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,435.64'	**15.0" Round Outlet to BRA-SW28A** L= 7.3' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,435.64' / 1,435.50' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,435.64'	**15.0" Round Culvert to Pond SW28D** L= 149.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,435.64' / 1,427.30' S= 0.0558 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,435.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

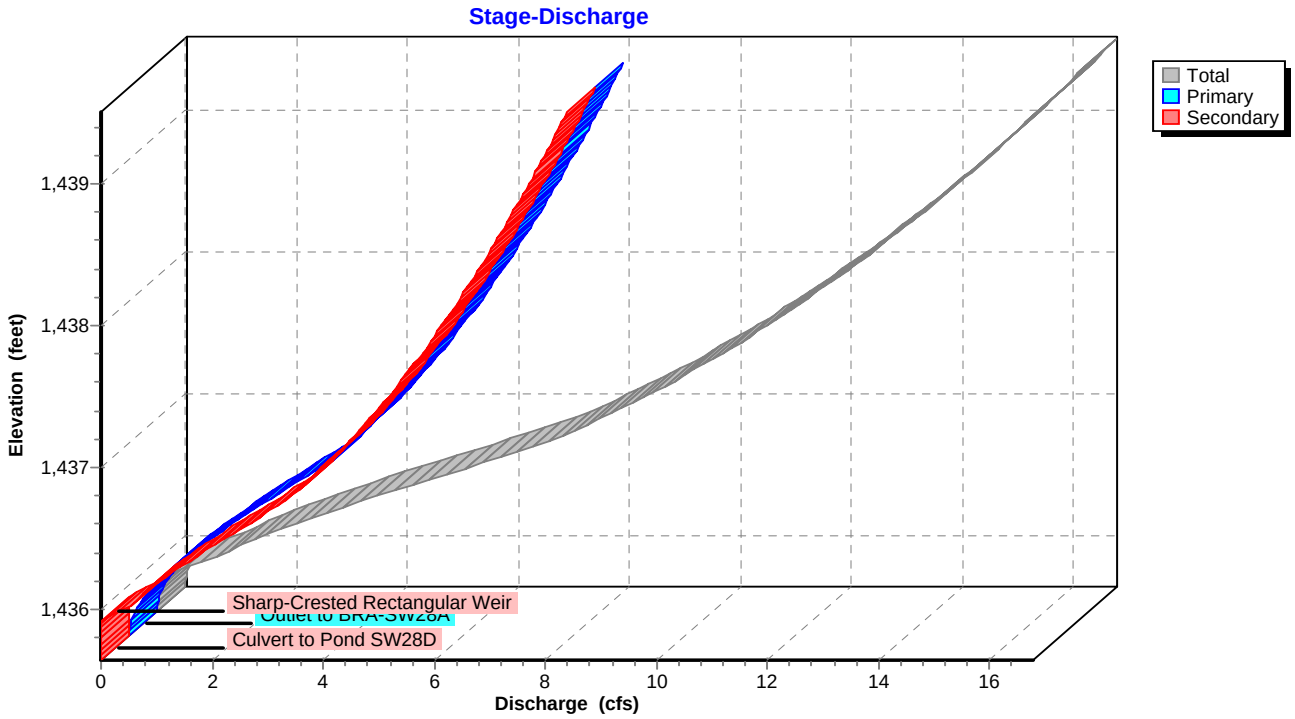
Primary OutFlow Max=0.58 cfs @ 12.02 hrs HW=1,436.04' TW=1,435.59' (Dynamic Tailwater)
└─**1=Outlet to BRA-SW28A** (Inlet Controls 0.58 cfs @ 1.70 fps)

Secondary OutFlow Max=0.58 cfs @ 12.02 hrs HW=1,436.04' TW=1,375.73' (Dynamic Tailwater)
└─**2=Culvert to Pond SW28D** (Inlet Controls 0.58 cfs @ 1.70 fps)
└─**3=Sharp-Crested Rectangular Weir** (Passes 0.58 cfs of 0.69 cfs potential flow)

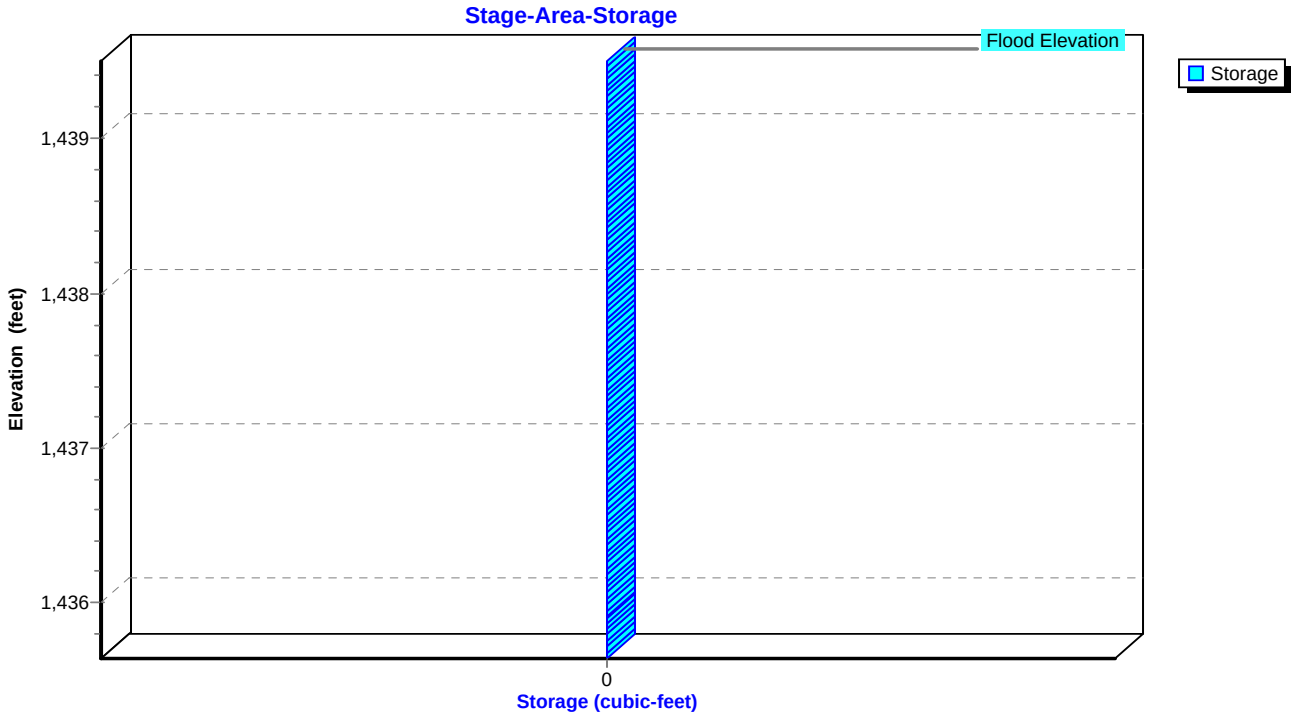
Pond SW28A-FS: Flow Splitter for SW28A



Pond SW28A-FS: Flow Splitter for SW28A



Pond SW28A-FS: Flow Splitter for SW28A



Summary for Pond SW28A-P: BRA-SW28A

Inflow Area = 0.301 ac, 50.17% Impervious, Inflow Depth = 4.03" for 10-YR, 24-HR Storm event
Inflow = 0.85 cfs @ 12.03 hrs, Volume= 0.101 af
Outflow = 0.84 cfs @ 12.05 hrs, Volume= 0.066 af, Atten= 1%, Lag= 1.1 min
Primary = 0.84 cfs @ 12.05 hrs, Volume= 0.066 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,435.60' @ 12.05 hrs Surf.Area= 674 sf Storage= 1,584 cf

Plug-Flow detention time= 211.7 min calculated for 0.066 af (66% of inflow)
Center-of-Mass det. time= 97.7 min (875.9 - 778.3)

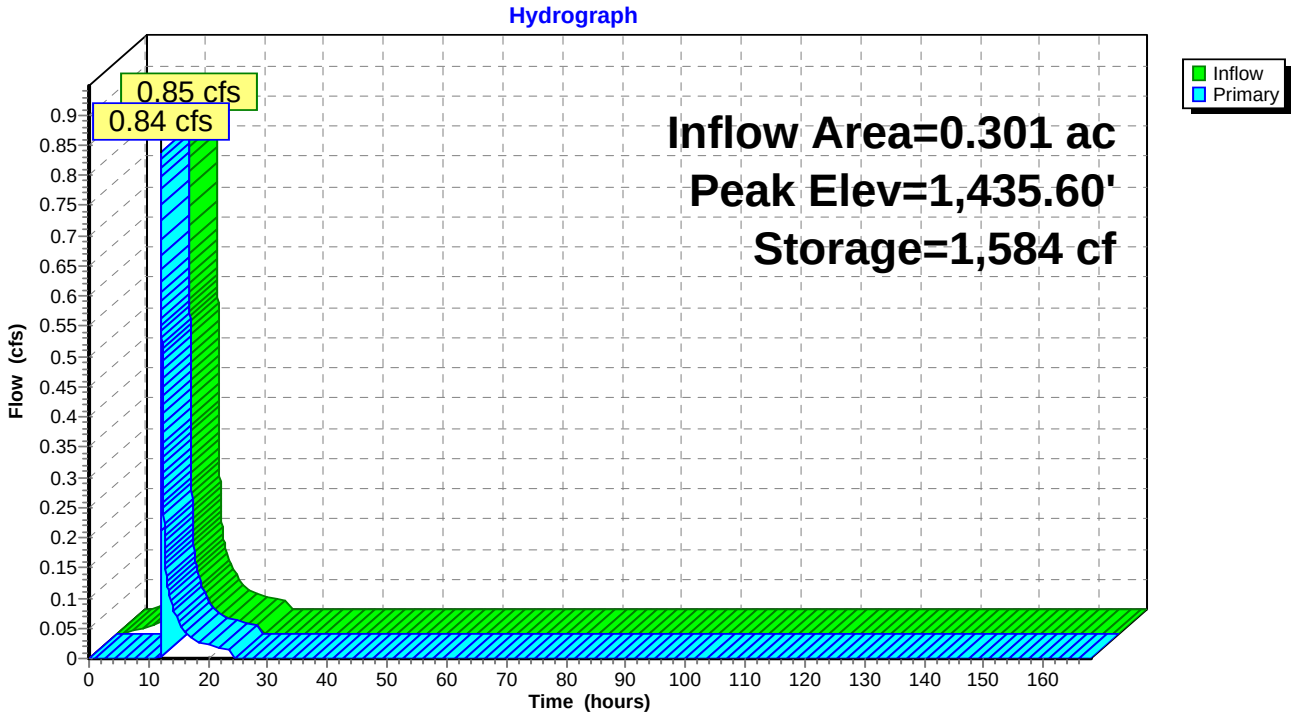
Volume	Invert	Avail.Storage	Storage Description
#1	1,429.50'	1,854 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,429.50	674	100.6	0.0	0	0	674
1,430.50	674	100.6	25.0	169	169	775
1,432.00	674	100.6	25.0	253	421	926
1,433.00	674	100.6	25.0	169	590	1,026
1,434.00	674	100.6	25.0	169	758	1,127
1,434.50	674	100.6	25.0	84	843	1,177
1,435.50	674	100.6	100.0	674	1,517	1,278
1,436.00	674	100.6	100.0	337	1,854	1,328

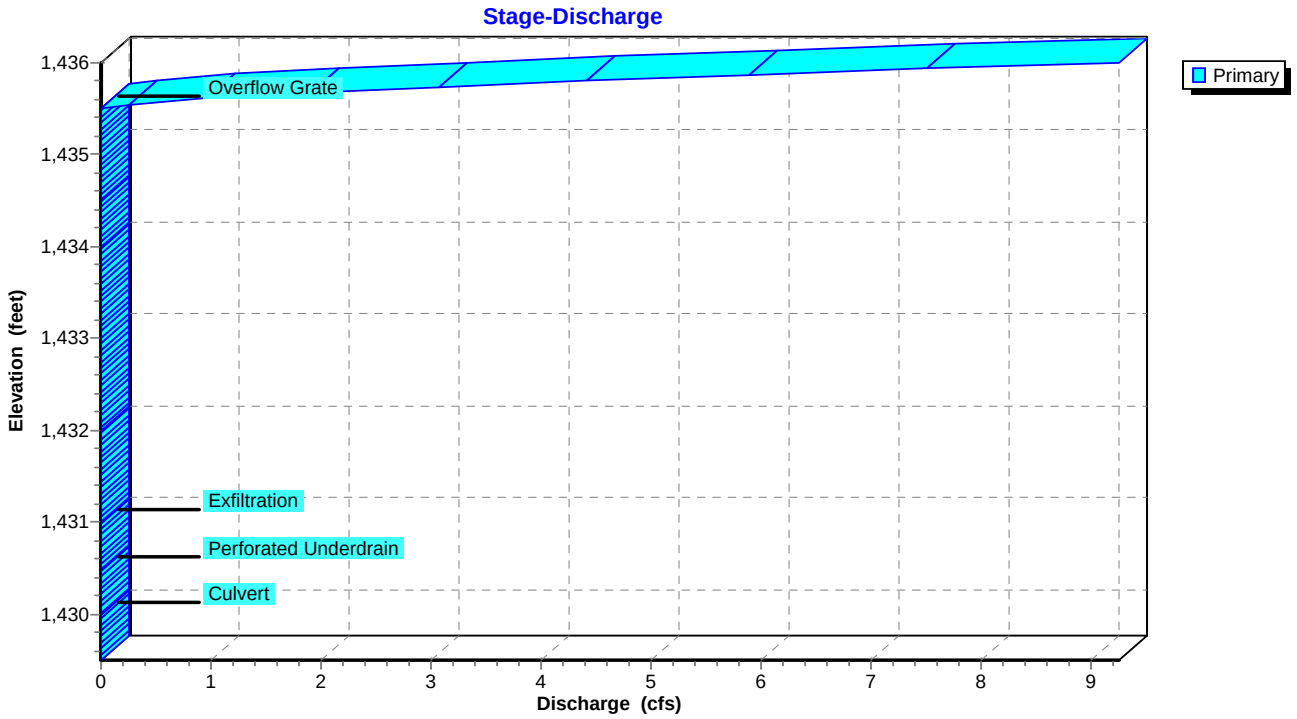
Device	Routing	Invert	Outlet Devices
#1	Primary	1,430.00'	**15.0" Round Culvert** L= 77.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,430.00' / 1,429.00' S= 0.0130 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,430.50'	**0.4" Horiz. Perforated Underdrain** X 512 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,431.00'	**0.250 in/hr Exfiltration over Surface area above 1,431.00'** Conductivity to Groundwater Elevation = 1,430.00' Excluded Surface area = 674 sf
#4	Device 1	1,435.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.84 cfs @ 12.05 hrs HW=1,435.60' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.84 cfs of 10.41 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 4.86 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 0.84 cfs @ 1.04 fps)

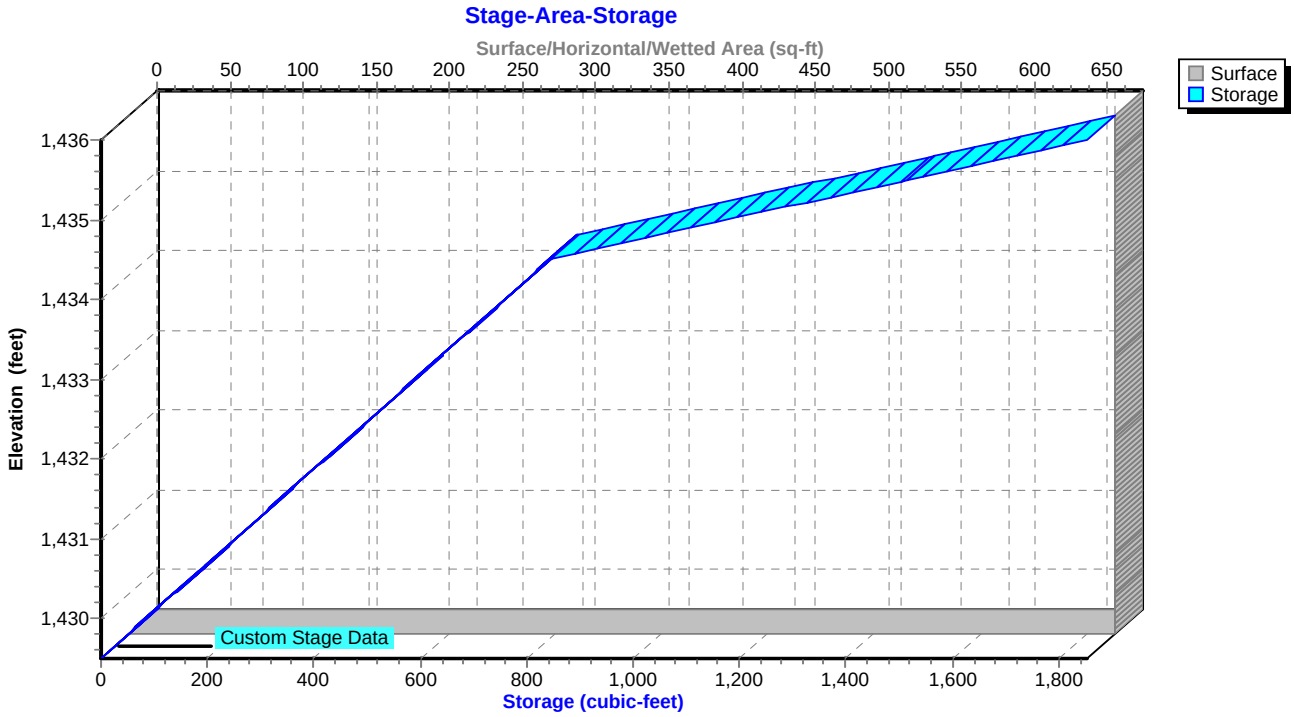
Pond SW28A-P: BRA-SW28A



Pond SW28A-P: BRA-SW28A



Pond SW28A-P: BRA-SW28A



Summary for Pond SW28B-FS: Flow Splitter for SW28B

Inflow Area = 0.390 ac, 67.69% Impervious, Inflow Depth = 4.93" for 10-YR, 24-HR Storm event
Inflow = 2.06 cfs @ 12.02 hrs, Volume= 0.160 af
Outflow = 2.06 cfs @ 12.03 hrs, Volume= 0.160 af, Atten= 0%, Lag= 0.6 min
Primary = 1.03 cfs @ 12.03 hrs, Volume= 0.138 af
Secondary = 1.03 cfs @ 12.03 hrs, Volume= 0.023 af

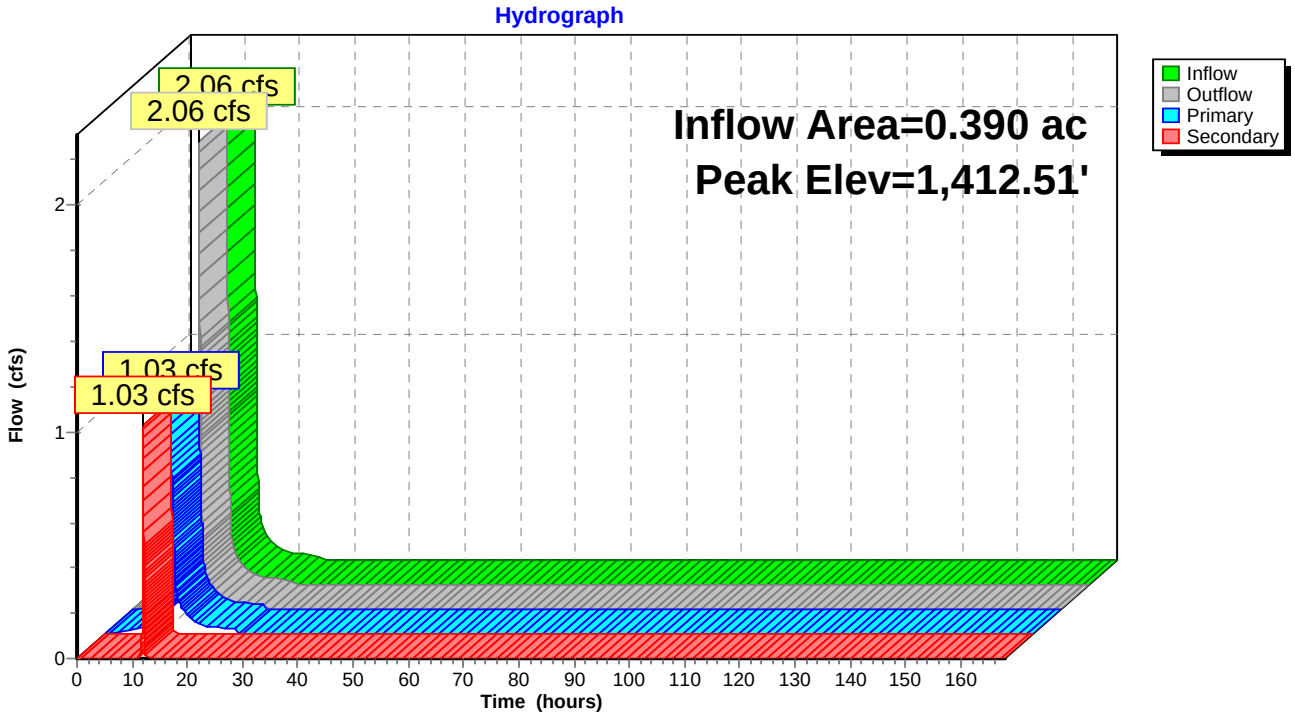
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,412.51' @ 12.03 hrs
Flood Elev= 1,414.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,412.00'	**18.0" Round Culvert** L= 21.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,412.00' / 1,410.50' S= 0.0714 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,412.00'	**18.0" Round Culvert** L= 117.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,412.00' / 1,406.00' S= 0.0513 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,412.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

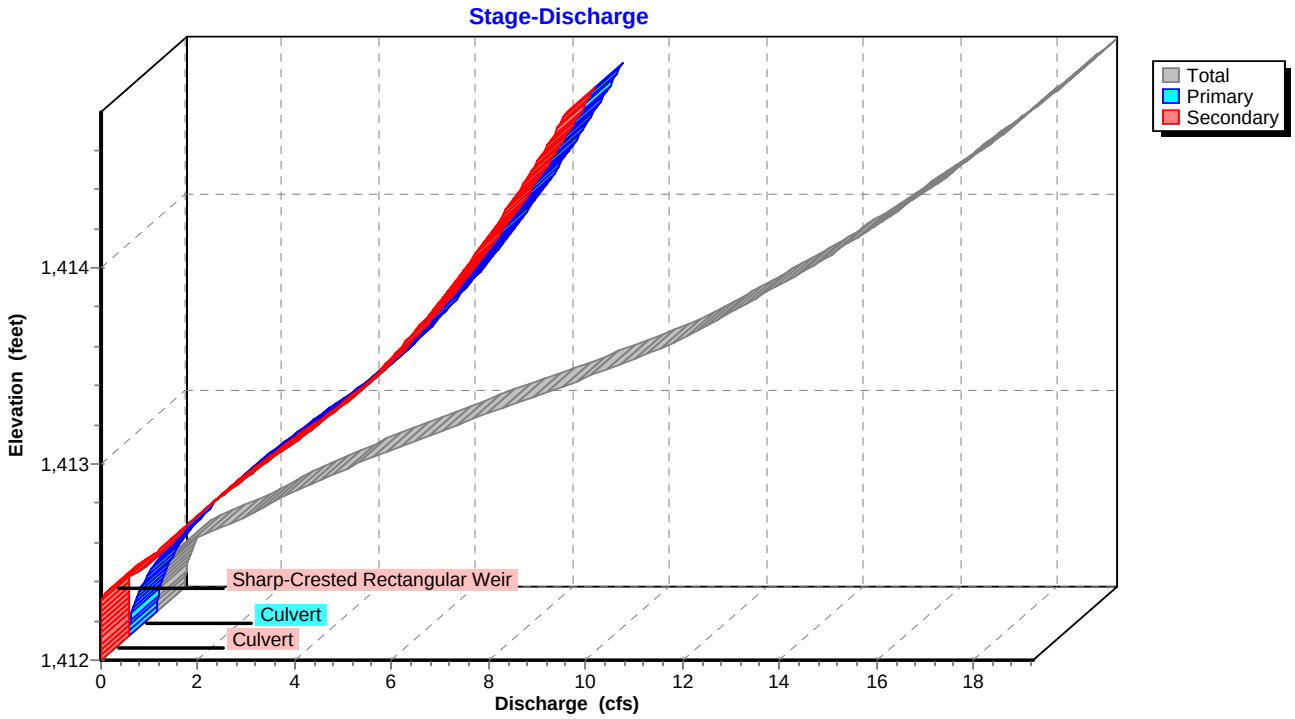
Primary OutFlow Max=1.03 cfs @ 12.03 hrs HW=1,412.51' TW=1,408.11' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.03 cfs @ 1.93 fps)

Secondary OutFlow Max=1.03 cfs @ 12.03 hrs HW=1,412.51' TW=1,375.77' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 1.03 cfs @ 1.93 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 1.03 cfs of 1.28 cfs potential flow)

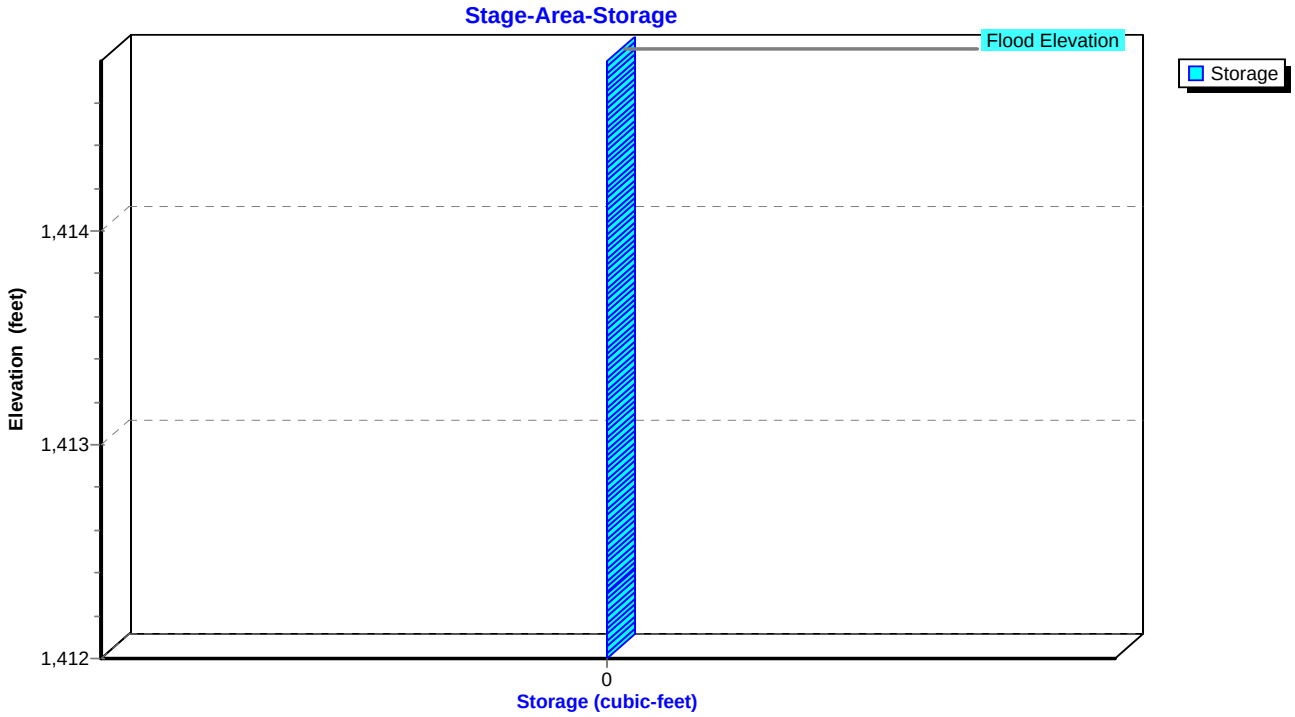
Pond SW28B-FS: Flow Splitter for SW28B



Pond SW28B-FS: Flow Splitter for SW28B



Pond SW28B-FS: Flow Splitter for SW28B



Summary for Pond SW28B-P: BRA-SW28B

Inflow Area = 0.506 ac, 52.17% Impervious, Inflow Depth = 3.99" for 10-YR, 24-HR Storm event
Inflow = 1.49 cfs @ 12.02 hrs, Volume= 0.168 af
Outflow = 0.24 cfs @ 12.91 hrs, Volume= 0.066 af, Atten= 84%, Lag= 52.9 min
Primary = 0.24 cfs @ 12.91 hrs, Volume= 0.066 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,409.04' @ 12.91 hrs Surf.Area= 2,580 sf Storage= 4,565 cf

Plug-Flow detention time= 371.6 min calculated for 0.066 af (39% of inflow)
Center-of-Mass det. time= 202.9 min (979.7 - 776.8)

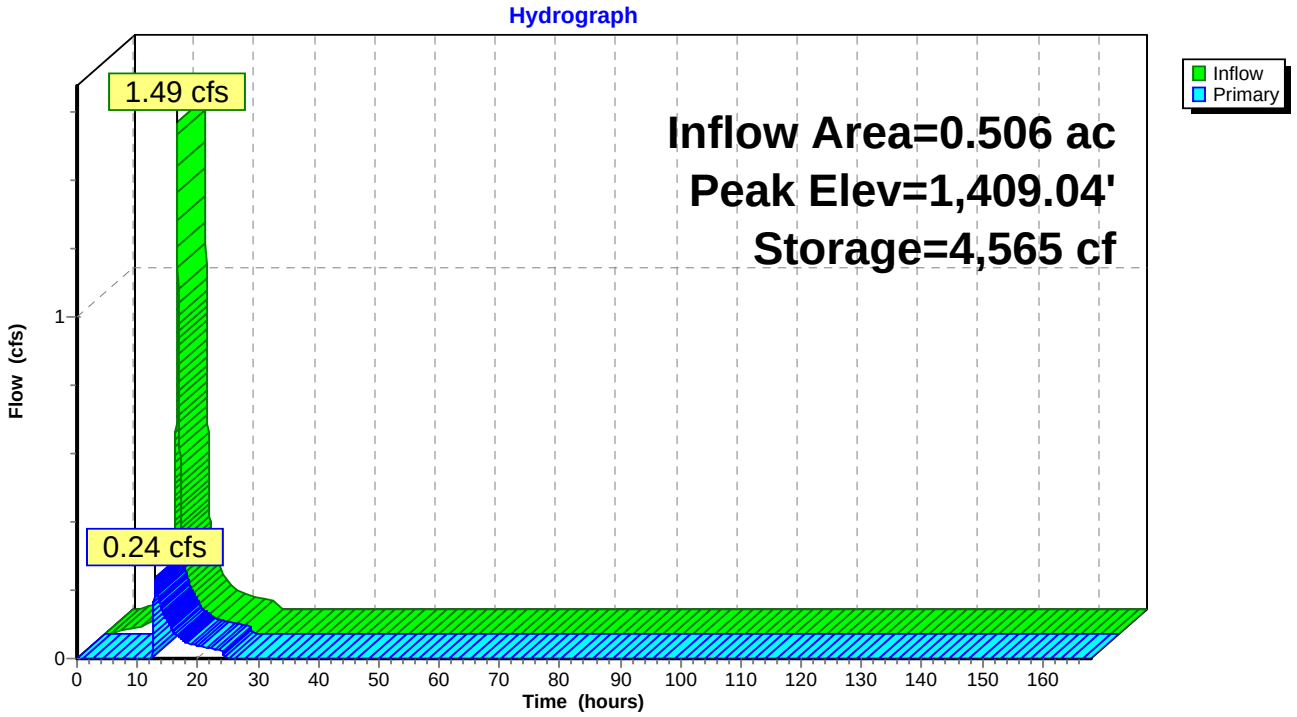
Volume	Invert	Avail.Storage	Storage Description
#1	1,403.50'	5,829 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,403.50	2,545	273.4	0.0	0	0	2,545
1,404.50	2,545	273.4	25.0	636	636	2,818
1,405.50	2,545	273.4	25.0	636	1,273	3,092
1,406.50	2,545	273.4	25.0	636	1,909	3,365
1,407.50	2,545	273.4	25.0	636	2,545	3,639
1,408.50	2,545	273.4	25.0	636	3,181	3,912
1,409.00	2,545	273.4	100.0	1,273	4,454	4,049
1,409.50	2,962	282.9	100.0	1,375	5,829	4,492

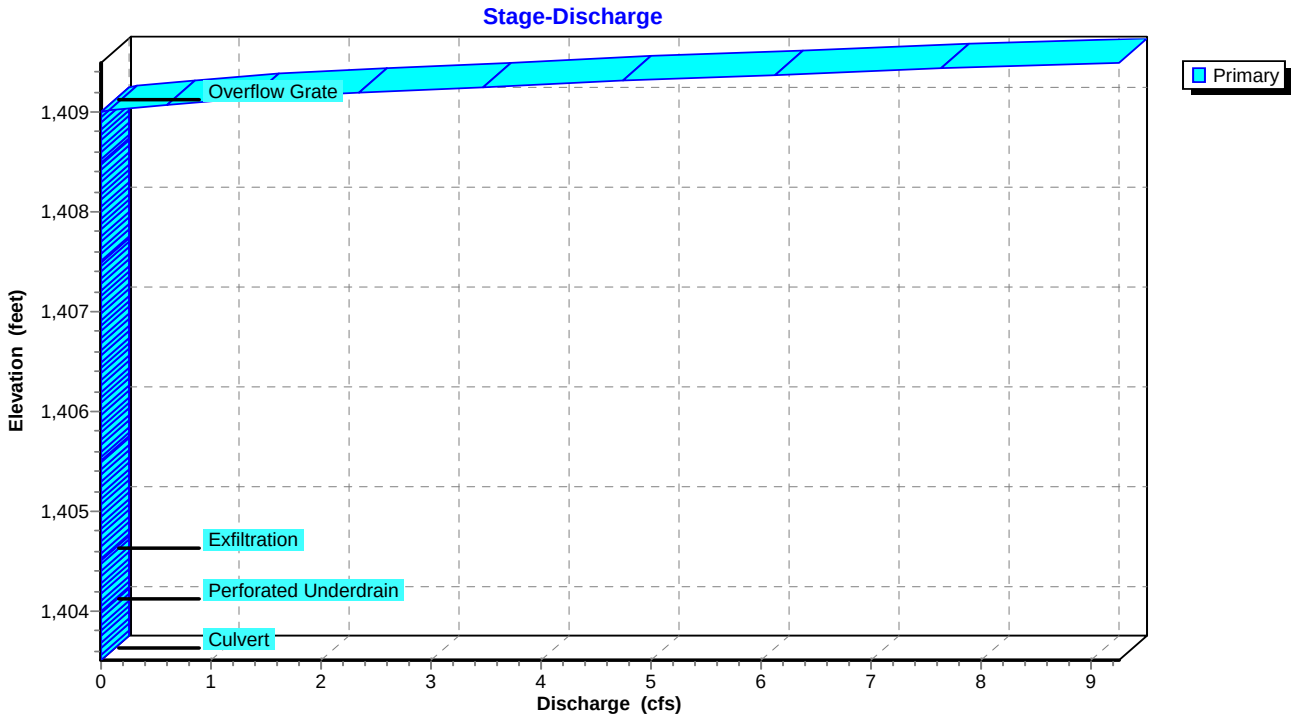
Device	Routing	Invert	Outlet Devices
#1	Primary	1,403.50'	**15.0" Round Culvert** L= 58.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,403.50' / 1,401.00' S= 0.0427 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,404.00'	**0.4" Horiz. Perforated Underdrain X 468.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,404.50'	**0.250 in/hr Exfiltration over Surface area above 1,404.50'** Conductivity to Groundwater Elevation = 1,403.50' Excluded Surface area = 2,545 sf
#4	Device 1	1,409.00'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.24 cfs @ 12.91 hrs HW=1,409.04' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.24 cfs of 10.35 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 17.66 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 0.24 cfs @ 0.68 fps)

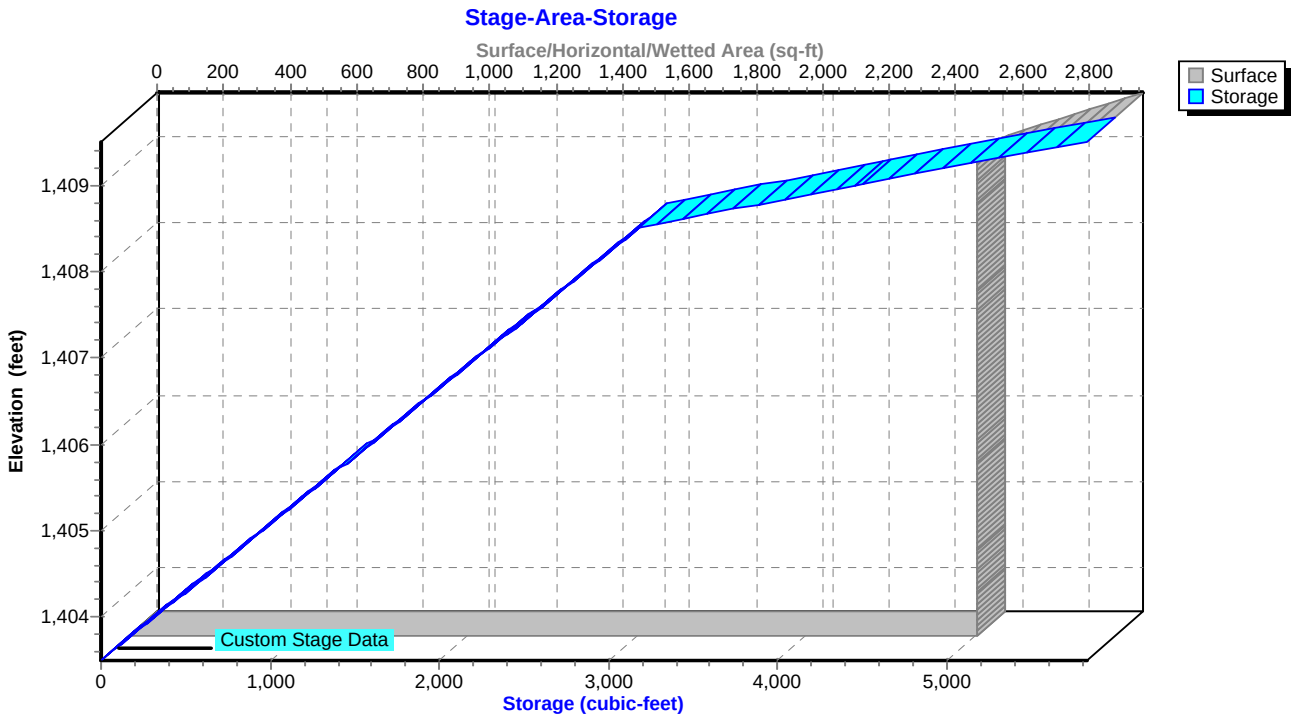
Pond SW28B-P: BRA-SW28B



Pond SW28B-P: BRA-SW28B



Pond SW28B-P: BRA-SW28B



Summary for Pond SW28C-FS: Flow Splitter for SW28C

Inflow Area = 0.666 ac,100.00% Impervious, Inflow Depth = 5.76" for 10-YR, 24-HR Storm event
Inflow = 4.54 cfs @ 12.03 hrs, Volume= 0.320 af
Outflow = 4.54 cfs @ 12.04 hrs, Volume= 0.320 af, Atten= 0%, Lag= 0.6 min
Primary = 2.34 cfs @ 12.04 hrs, Volume= 0.287 af
Secondary = 2.20 cfs @ 12.04 hrs, Volume= 0.033 af

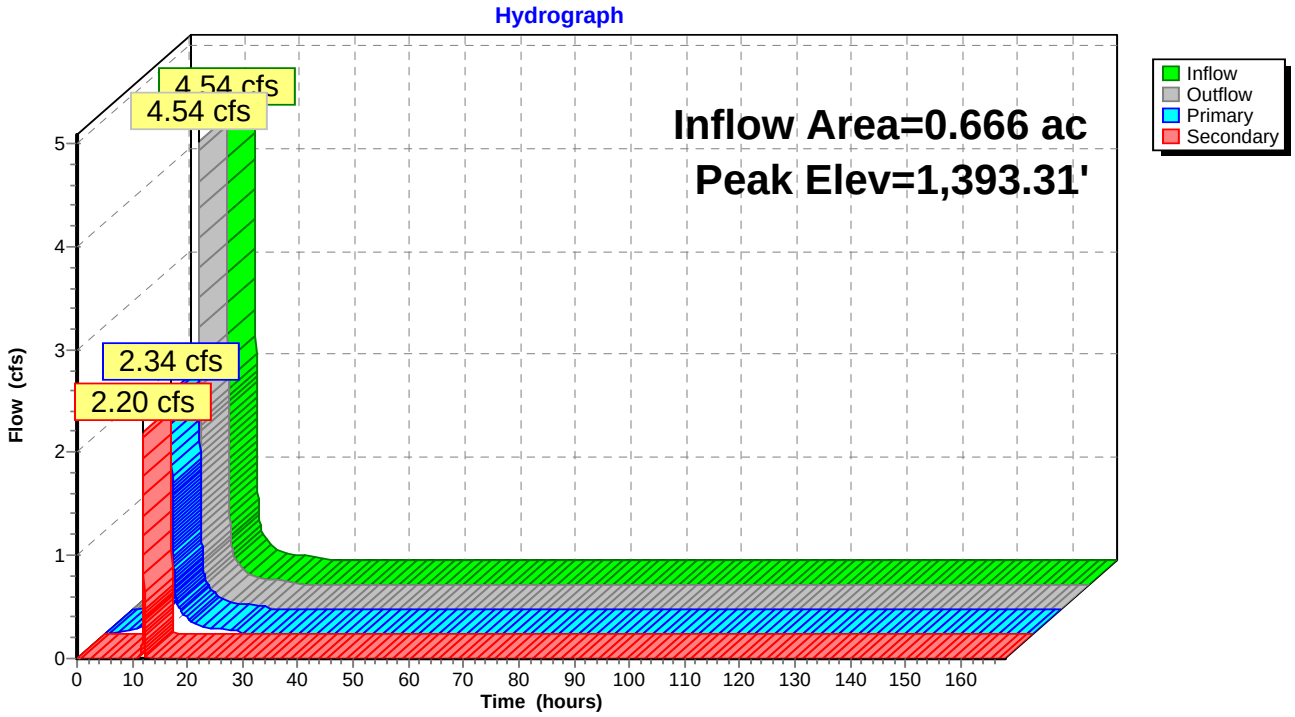
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,393.31' @ 12.04 hrs
Flood Elev= 1,396.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,392.50'	**18.0" Round Culvert to BRA-SW28A** L= 14.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,392.50' / 1,392.00' S= 0.0347 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,392.50'	**18.0" Round Culvert to Pond SW28D** L= 189.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,392.50' / 1,385.70' S= 0.0358 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,393.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

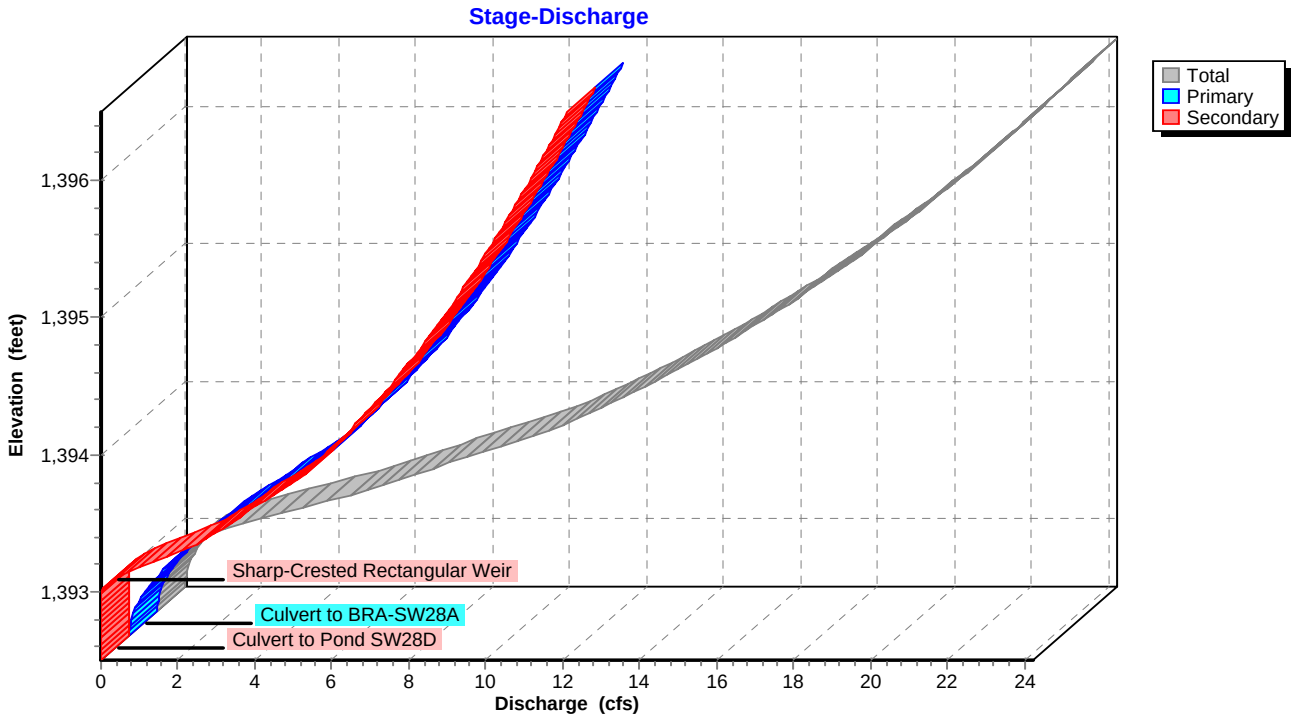
Primary OutFlow Max=2.34 cfs @ 12.04 hrs HW=1,393.31' TW=1,390.67' (Dynamic Tailwater)
└─**1=Culvert to BRA-SW28A** (Inlet Controls 2.34 cfs @ 2.41 fps)

Secondary OutFlow Max=2.18 cfs @ 12.04 hrs HW=1,393.31' TW=1,375.81' (Dynamic Tailwater)
└─**2=Culvert to Pond SW28D** (Passes 2.18 cfs of 2.34 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 2.18 cfs @ 1.81 fps)

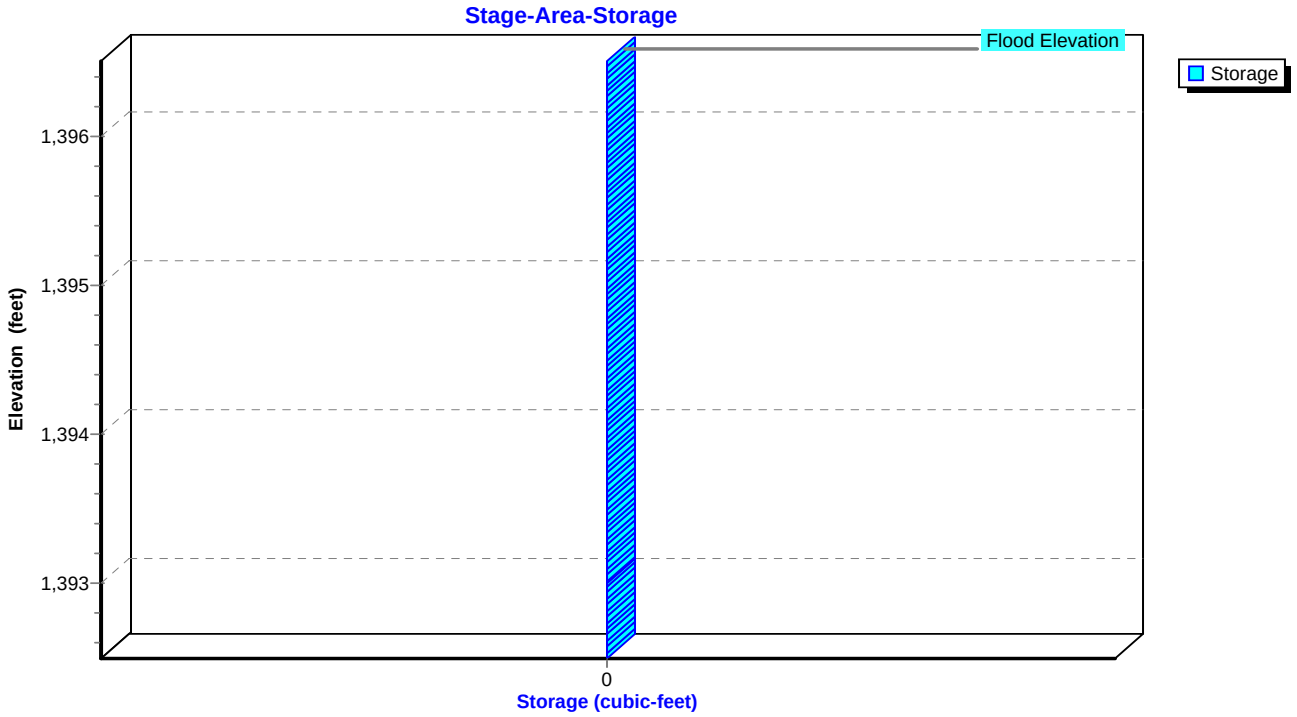
Pond SW28C-FS: Flow Splitter for SW28C



Pond SW28C-FS: Flow Splitter for SW28C



Pond SW28C-FS: Flow Splitter for SW28C



Summary for Pond SW28C-P: BRA-SW28C

Inflow Area = 0.763 ac, 87.29% Impervious, Inflow Depth = 4.92" for 10-YR, 24-HR Storm event
Inflow = 2.71 cfs @ 12.03 hrs, Volume= 0.313 af
Outflow = 2.34 cfs @ 12.08 hrs, Volume= 0.183 af, Atten= 14%, Lag= 2.9 min
Primary = 2.34 cfs @ 12.08 hrs, Volume= 0.183 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,390.70' @ 12.08 hrs Surf.Area= 2,516 sf Storage= 6,165 cf

Plug-Flow detention time= 251.4 min calculated for 0.183 af (58% of inflow)
Center-of-Mass det. time= 125.8 min (876.4 - 750.6)

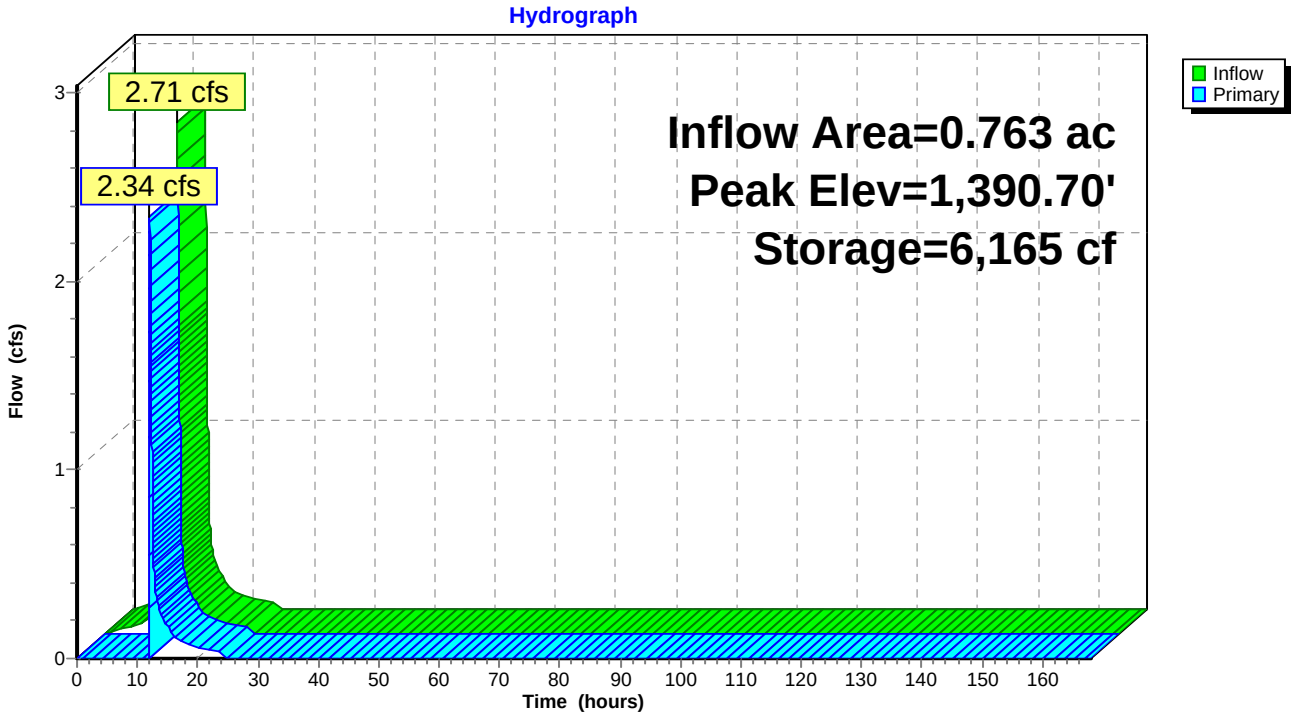
Volume	Invert	Avail.Storage	Storage Description
#1	1,384.50'	6,919 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,384.50	2,516	222.0	0.0	0	0	2,516
1,385.50	2,516	222.0	25.0	629	629	2,738
1,387.00	2,516	222.0	25.0	944	1,573	3,071
1,388.00	2,516	222.0	25.0	629	2,202	3,293
1,389.00	2,516	222.0	25.0	629	2,831	3,515
1,389.50	2,516	222.0	25.0	315	3,145	3,626
1,390.50	2,516	222.0	100.0	2,516	5,661	3,848
1,391.00	2,516	222.0	100.0	1,258	6,919	3,959

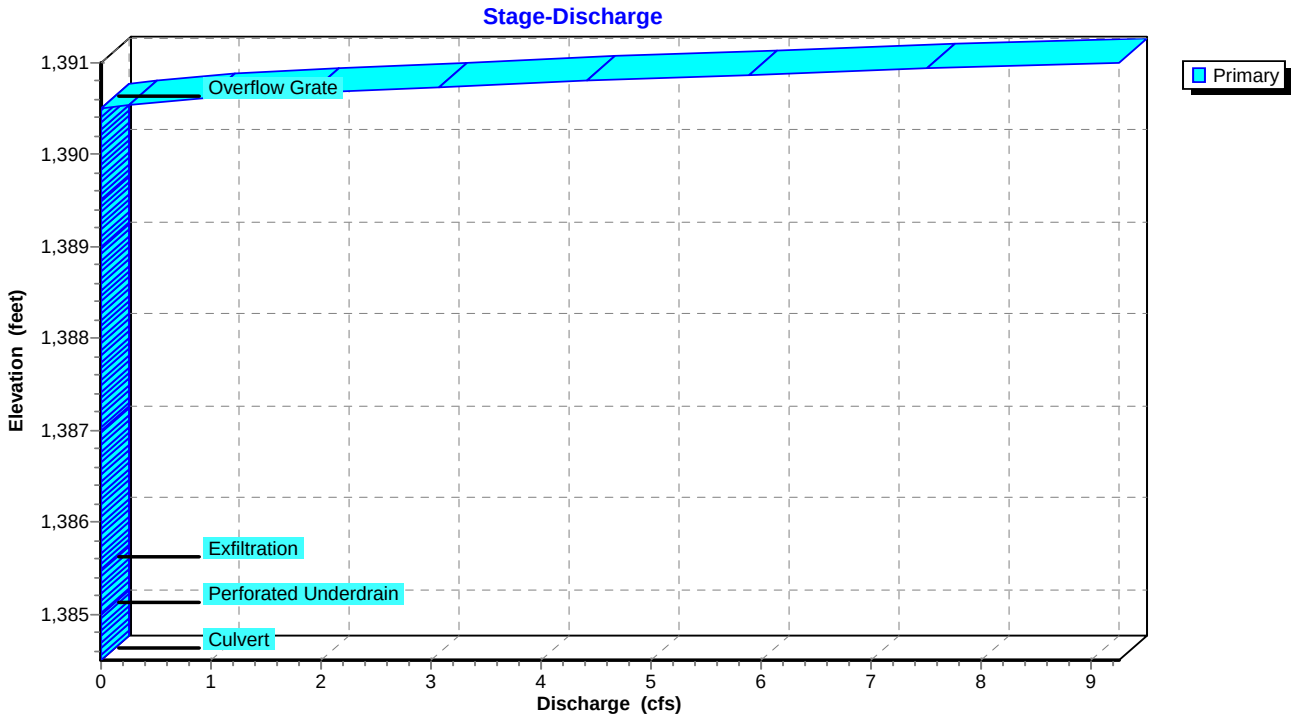
Device	Routing	Invert	Outlet Devices
#1	Primary	1,384.50'	**15.0" Round Culvert** L= 68.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,384.50' / 1,384.00' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,385.00'	**0.4" Horiz. Perforated Underdrain X 286.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,385.50'	**0.250 in/hr Exfiltration over Surface area above 1,385.50'** Conductivity to Groundwater Elevation = 1,385.00' Excluded Surface area = 2,516 sf
#4	Device 1	1,390.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.34 cfs @ 12.08 hrs HW=1,390.70' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.34 cfs of 11.01 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 11.48 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 2.34 cfs @ 1.46 fps)

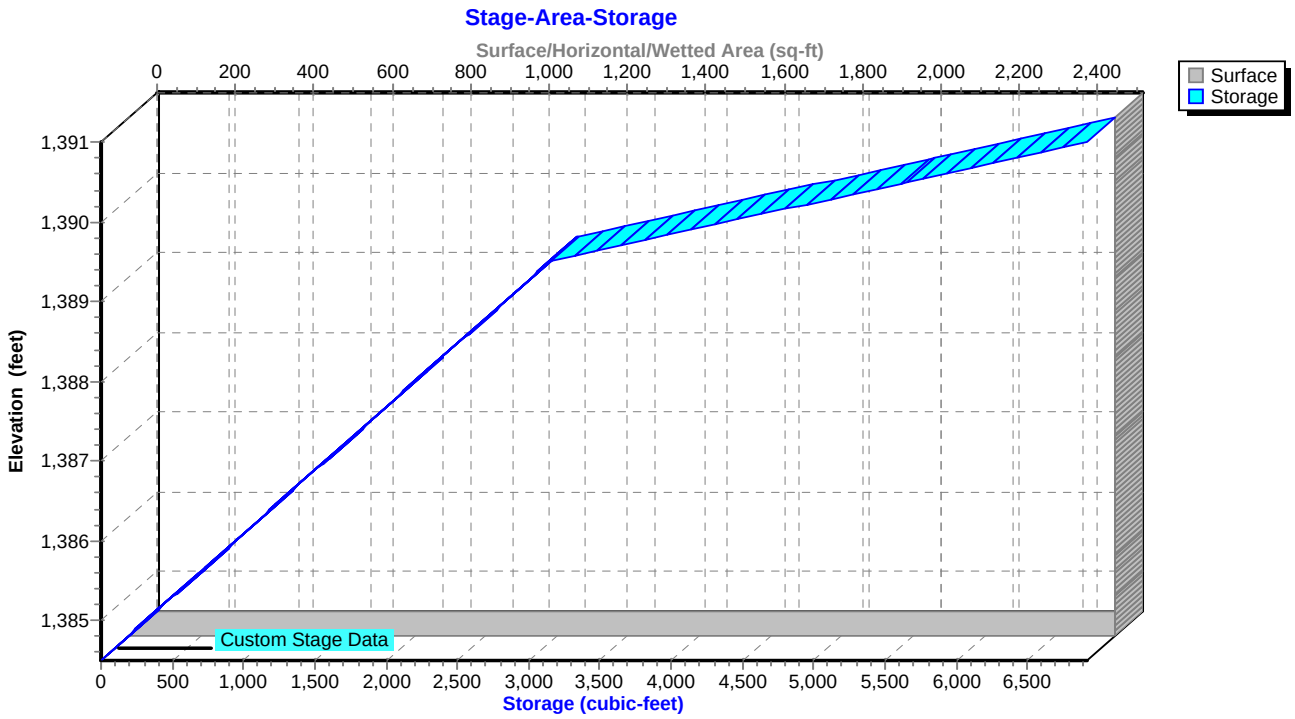
Pond SW28C-P: BRA-SW28C



Pond SW28C-P: BRA-SW28C



Pond SW28C-P: BRA-SW28C



Summary for Pond SW31-FS: Flow Splitter for SW31

Inflow Area = 0.537 ac, 58.47% Impervious, Inflow Depth = 4.63" for 10-YR, 24-HR Storm event
Inflow = 3.22 cfs @ 12.03 hrs, Volume= 0.207 af
Outflow = 3.22 cfs @ 12.04 hrs, Volume= 0.207 af, Atten= 0%, Lag= 0.6 min
Primary = 1.50 cfs @ 12.04 hrs, Volume= 0.165 af
Secondary = 1.72 cfs @ 12.04 hrs, Volume= 0.042 af

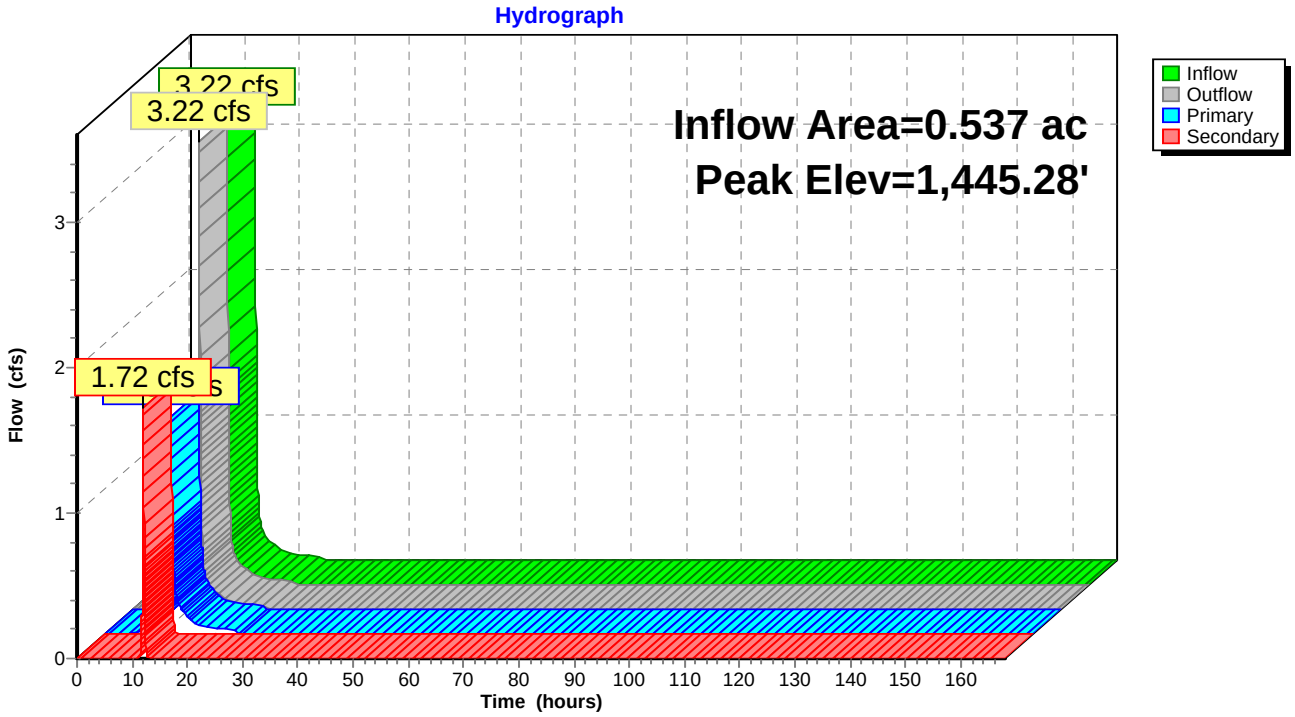
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,445.28' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,444.60'	**18.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,444.60' / 1,444.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,444.60'	**18.0" Round Culvert** L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,444.60' / 1,443.00' S= 0.0333 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,444.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

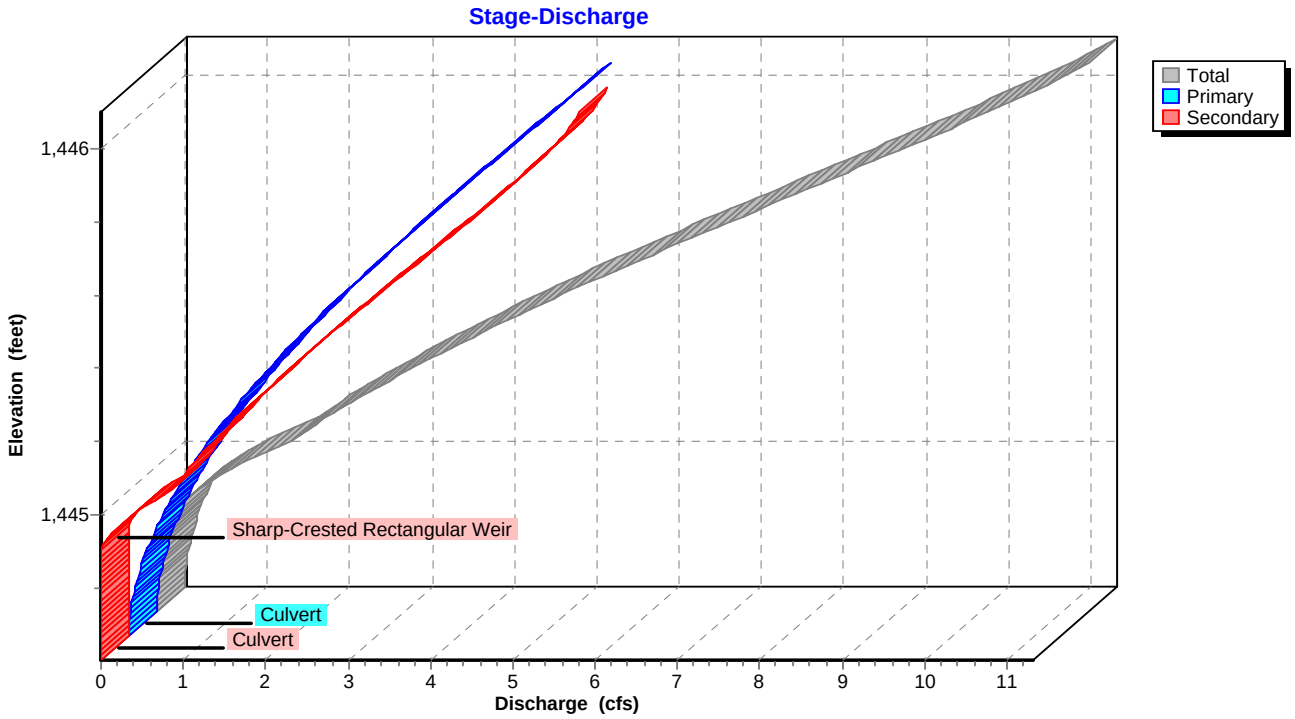
Primary OutFlow Max=1.49 cfs @ 12.04 hrs HW=1,445.28' TW=1,444.07' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 1.49 cfs @ 2.83 fps)

Secondary OutFlow Max=1.71 cfs @ 12.04 hrs HW=1,445.28' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 1.71 cfs @ 2.21 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 1.71 cfs of 2.97 cfs potential flow)

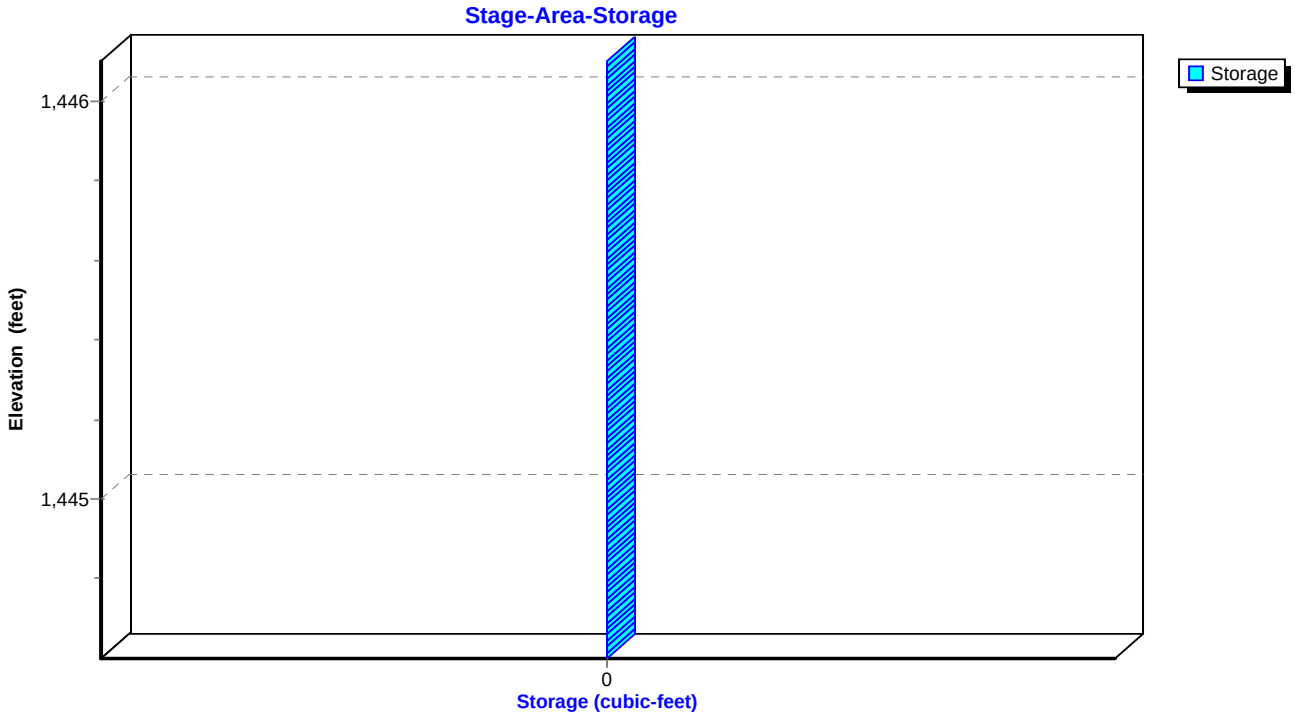
Pond SW31-FS: Flow Splitter for SW31



Pond SW31-FS: Flow Splitter for SW31



Pond SW31-FS: Flow Splitter for SW31



Summary for Pond SW31-P: BRA-SW31

Inflow Area = 0.597 ac, 52.60% Impervious, Inflow Depth = 3.65" for 10-YR, 24-HR Storm event
Inflow = 1.75 cfs @ 12.04 hrs, Volume= 0.181 af
Outflow = 0.86 cfs @ 12.15 hrs, Volume= 0.118 af, Atten= 51%, Lag= 6.5 min
Primary = 0.86 cfs @ 12.15 hrs, Volume= 0.118 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,444.26' @ 12.15 hrs Surf.Area= 1,567 sf Storage= 3,153 cf

Plug-Flow detention time= 214.6 min calculated for 0.118 af (65% of inflow)
Center-of-Mass det. time= 100.7 min (907.5 - 806.8)

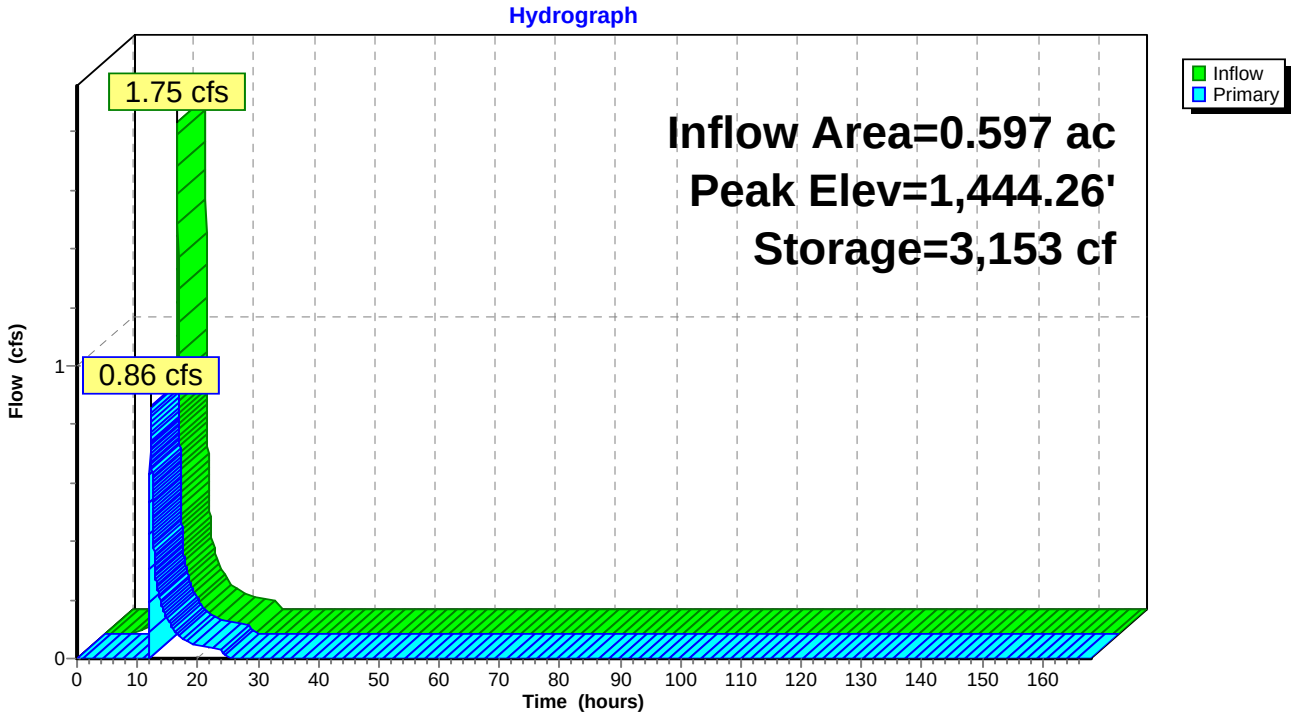
Volume	Invert	Avail.Storage	Storage Description
#1	1,438.50'	4,309 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,438.50	1,567	169.0	0.0	0	0	1,567
1,439.50	1,567	169.0	25.0	392	392	1,736
1,440.50	1,567	169.0	25.0	392	784	1,905
1,441.50	1,567	169.0	25.0	392	1,175	2,074
1,442.50	1,567	169.0	25.0	392	1,567	2,243
1,443.50	1,567	169.0	25.0	392	1,959	2,412
1,444.50	1,567	169.0	100.0	1,567	3,526	2,581
1,445.00	1,567	169.0	100.0	784	4,309	2,666

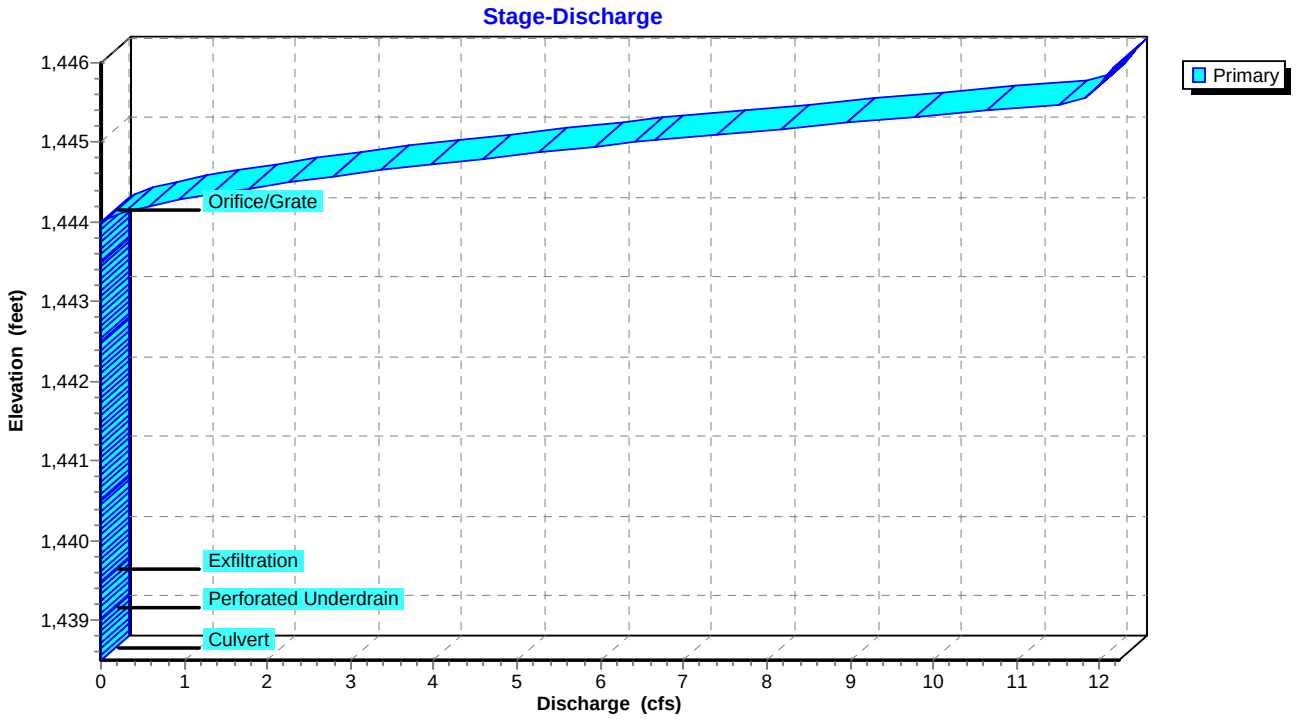
Device	Routing	Invert	Outlet Devices
#1	Primary	1,438.50'	**15.0" Round Culvert** L= 87.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,438.50' / 1,437.50' S= 0.0115 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,439.00'	**0.4" Horiz. Perforated Underdrain X 256.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,439.50'	**0.250 in/hr Exfiltration over Surface area above 1,439.50'** Conductivity to Groundwater Elevation = 1,438.00' Excluded Surface area = 1,567 sf
#4	Device 1	1,444.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.86 cfs @ 12.15 hrs HW=1,444.26' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.86 cfs of 10.57 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 9.87 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Orifice Controls 0.86 cfs @ 1.64 fps)

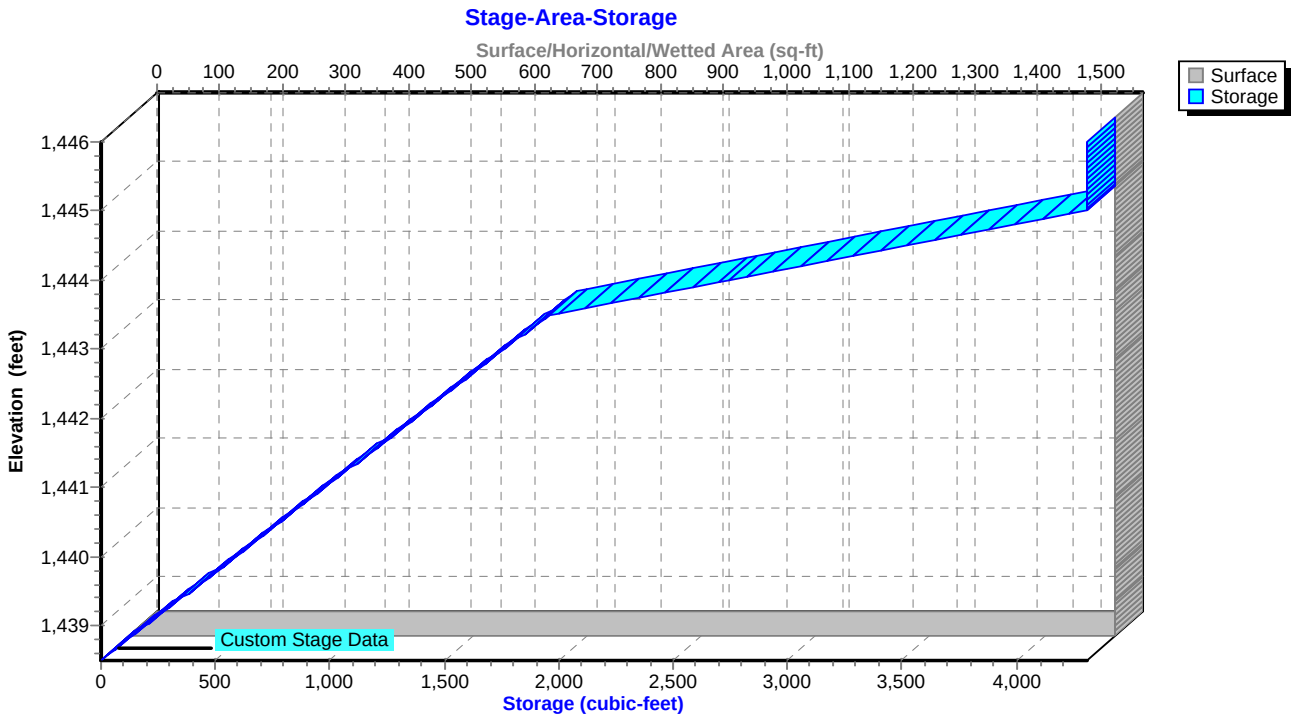
Pond SW31-P: BRA-SW31



Pond SW31-P: BRA-SW31



Pond SW31-P: BRA-SW31



Time span=0.00-168.00 hrs, dt=0.01 hrs, 16801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 21: PR DA 21 Runoff Area=30.406 ac 2.29% Impervious Runoff Depth=0.05"
Flow Length=2,809' Tc=46.3 min UI Adjusted CN=73 Runoff=0.22 cfs 0.129 af

Subcatchment 21A-1: PR DA 21A-1 Runoff Area=0.432 ac 37.27% Impervious Runoff Depth=0.25"
Flow Length=613' Tc=1.8 min CN=84 Runoff=0.12 cfs 0.009 af

Subcatchment 21A-2: PR DA 21A-2 Runoff Area=0.871 ac 35.25% Impervious Runoff Depth=0.31"
Flow Length=613' Tc=1.8 min CN=86 Runoff=0.32 cfs 0.022 af

Subcatchment 21B-1: PR DA 21B-1 Runoff Area=0.428 ac 38.79% Impervious Runoff Depth=0.25"
Flow Length=525' Tc=1.7 min CN=84 Runoff=0.12 cfs 0.009 af

Subcatchment 21B-2: PR DA 21B-2 Runoff Area=0.842 ac 36.34% Impervious Runoff Depth=0.31"
Flow Length=525' Tc=1.7 min CN=86 Runoff=0.31 cfs 0.021 af

Subcatchment 21C: PR DA 21C Runoff Area=39.300 ac 1.38% Impervious Runoff Depth=0.05"
Flow Length=3,341' Tc=68.5 min UI Adjusted CN=73 Runoff=0.28 cfs 0.167 af

Subcatchment 21D: PR DA 21D Runoff Area=7.632 ac 0.00% Impervious Runoff Depth=0.04"
Flow Length=1,018' Tc=42.4 min CN=72 Runoff=0.04 cfs 0.026 af

Subcatchment 21E-1: PR DA 21E-1 Runoff Area=0.450 ac 33.56% Impervious Runoff Depth=0.22"
Flow Length=632' Tc=2.5 min CN=83 Runoff=0.10 cfs 0.008 af

Subcatchment 21E-2: PR DA 21E-2 Runoff Area=0.334 ac 33.53% Impervious Runoff Depth=0.22"
Flow Length=632' Tc=2.5 min CN=83 Runoff=0.08 cfs 0.006 af

Subcatchment 21E-3: PR DA 21E-3 Runoff Area=0.446 ac 33.63% Impervious Runoff Depth=0.22"
Flow Length=632' Tc=2.5 min CN=83 Runoff=0.10 cfs 0.008 af

Subcatchment 21F-1: PR DA 21F-1 Runoff Area=0.384 ac 38.02% Impervious Runoff Depth=0.25"
Flow Length=632' Tc=2.5 min CN=84 Runoff=0.10 cfs 0.008 af

Subcatchment 21F-2: PR DA 21F-2 Runoff Area=0.284 ac 38.03% Impervious Runoff Depth=0.25"
Flow Length=632' Tc=2.5 min CN=84 Runoff=0.08 cfs 0.006 af

Subcatchment 21F-3: PR DA 21F-3 Runoff Area=0.380 ac 38.16% Impervious Runoff Depth=0.25"
Flow Length=632' Tc=2.5 min CN=84 Runoff=0.10 cfs 0.008 af

Subcatchment 21G: PR DA 21G Runoff Area=0.332 ac 43.67% Impervious Runoff Depth=0.25"
Flow Length=340' Tc=2.0 min CN=84 Runoff=0.09 cfs 0.007 af

Subcatchment 21H: PR DA 21H Runoff Area=0.256 ac 46.09% Impervious Runoff Depth=0.27"
Flow Length=434' Tc=2.2 min CN=85 Runoff=0.08 cfs 0.006 af

Subcatchment 23: PR DA 23 Runoff Area=6.968 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=800' Tc=30.3 min CN=70 Runoff=0.02 cfs 0.015 af

Subcatchment 23A-1: PR DA 23A-1 Runoff Area=0.806 ac 24.94% Impervious Runoff Depth=0.17"
Flow Length=424' Tc=1.8 min CN=81 Runoff=0.12 cfs 0.012 af

Subcatchment 23A-2: PR DA 23A-2 Runoff Area=0.696 ac 12.21% Impervious Runoff Depth=0.10"
Flow Length=424' Tc=1.8 min CN=77 Runoff=0.03 cfs 0.006 af

Subcatchment 23B-1: PR DA 23B-1 Runoff Area=0.572 ac 25.87% Impervious Runoff Depth=0.17"
Flow Length=334' Tc=1.5 min CN=81 Runoff=0.09 cfs 0.008 af

Subcatchment 23B-2: PR DA 23B-2 Runoff Area=0.629 ac 25.91% Impervious Runoff Depth=0.17"
Flow Length=334' Tc=1.5 min CN=81 Runoff=0.10 cfs 0.009 af

Subcatchment 23C: PR DA 23C Runoff Area=3.325 ac 0.00% Impervious Runoff Depth=0.10"
Flow Length=820' Tc=32.9 min CN=77 Runoff=0.10 cfs 0.028 af

Subcatchment 23F: PR DA 23F Runoff Area=0.206 ac 47.57% Impervious Runoff Depth=0.31"
Flow Length=384' Tc=1.7 min CN=86 Runoff=0.08 cfs 0.005 af

Subcatchment 23G: PR DA 23G Runoff Area=0.272 ac 39.34% Impervious Runoff Depth=0.25"
Flow Length=377' Tc=1.8 min CN=84 Runoff=0.07 cfs 0.006 af

Subcatchment 23H: PR DA 23H Runoff Area=0.307 ac 35.83% Impervious Runoff Depth=0.25"
Flow Length=458' Tc=2.2 min CN=84 Runoff=0.08 cfs 0.006 af

Subcatchment 23P: PR DA 23P Runoff Area=0.508 ac 0.00% Impervious Runoff Depth=0.06"
Tc=6.0 min CN=74 Runoff=0.01 cfs 0.003 af

Subcatchment 24: PR DA 24 Runoff Area=8.145 ac 0.00% Impervious Runoff Depth=0.05"
Flow Length=737' Tc=26.1 min CN=73 Runoff=0.06 cfs 0.035 af

Subcatchment 24A-1: PR DA 24A-1 Runoff Area=0.595 ac 25.71% Impervious Runoff Depth=0.17"
Flow Length=562' Tc=1.6 min CN=81 Runoff=0.09 cfs 0.009 af

Subcatchment 24A-2: PR DA 24A-2 Runoff Area=0.339 ac 28.02% Impervious Runoff Depth=0.34"
Flow Length=562' Tc=1.6 min CN=87 Runoff=0.14 cfs 0.010 af

Subcatchment 24A-3: PR DA 24A-3 Runoff Area=0.497 ac 27.36% Impervious Runoff Depth=0.67"
Flow Length=562' Tc=1.6 min CN=94 Runoff=0.46 cfs 0.028 af

Subcatchment 24A-4: PR DA 24A-4 Runoff Area=0.704 ac 18.75% Impervious Runoff Depth=0.20"
Flow Length=562' Tc=1.6 min CN=82 Runoff=0.13 cfs 0.011 af

Subcatchment 24B-1: PR DA 24B-1 Runoff Area=0.651 ac 25.35% Impervious Runoff Depth=0.17"
Flow Length=580' Tc=2.6 min CN=81 Runoff=0.10 cfs 0.009 af

Subcatchment 24B-2: PR DA 24B-2 Runoff Area=0.432 ac 22.92% Impervious Runoff Depth=0.27"
Flow Length=580' Tc=2.6 min CN=85 Runoff=0.13 cfs 0.010 af

Subcatchment 24B-3: PR DA 24B-3 Runoff Area=0.464 ac 22.63% Impervious Runoff Depth=0.50"
Flow Length=580' Tc=2.6 min CN=91 Runoff=0.31 cfs 0.020 af

Subcatchment 24B-4: PR DA 24B-4 Runoff Area=0.955 ac 19.79% Impervious Runoff Depth=0.17"
Flow Length=580' Tc=2.6 min CN=81 Runoff=0.14 cfs 0.014 af

Subcatchment 24C: PR DA 24C Runoff Area=6.956 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=700' Tc=32.6 min CN=71 Runoff=0.03 cfs 0.019 af

Subcatchment 24P: 24P Runoff Area=0.848 ac 0.00% Impervious Runoff Depth=0.10"
Tc=6.0 min CN=77 Runoff=0.04 cfs 0.007 af

Subcatchment 25: PR DA 25 Runoff Area=3.905 ac 0.00% Impervious Runoff Depth=0.05"
Flow Length=491' Tc=25.5 min CN=73 Runoff=0.03 cfs 0.017 af

Subcatchment 25A-1: PR DA 25A-1 Runoff Area=1.199 ac 23.44% Impervious Runoff Depth=0.13"
Flow Length=333' Tc=1.7 min CN=79 Runoff=0.11 cfs 0.013 af

Subcatchment 25A-2: PR DA 25A-2 Runoff Area=0.683 ac 32.06% Impervious Runoff Depth=0.17"
Flow Length=333' Tc=1.7 min CN=81 Runoff=0.11 cfs 0.010 af

Subcatchment 25B-1: PR DA 25B-1 Runoff Area=1.232 ac 21.27% Impervious Runoff Depth=0.15"
Flow Length=337' Tc=1.9 min CN=80 Runoff=0.15 cfs 0.016 af

Subcatchment 25B-2: PR DA 25B-2 Runoff Area=0.740 ac 23.11% Impervious Runoff Depth=0.15"
Flow Length=337' Tc=1.9 min CN=80 Runoff=0.09 cfs 0.009 af

Subcatchment 25C: PR DA 25C Runoff Area=3.283 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=200' Slope=0.0400 '/' Tc=16.7 min CN=70 Runoff=0.01 cfs 0.007 af

Subcatchment 25D: PR DA 25D Runoff Area=1.734 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=225' Tc=17.4 min CN=71 Runoff=0.01 cfs 0.005 af

Subcatchment 26: PR DA 26 Runoff Area=4.040 ac 0.00% Impervious Runoff Depth=0.05"
Flow Length=920' Tc=49.3 min CN=73 Runoff=0.03 cfs 0.017 af

Subcatchment 26A-1: PR DA 26A-1 Runoff Area=17,991 sf 27.15% Impervious Runoff Depth=0.15"
Flow Length=800' Tc=2.7 min CN=80 Runoff=0.05 cfs 0.005 af

Subcatchment 26A-2: PR DA 26A-2 Runoff Area=0.535 ac 26.17% Impervious Runoff Depth=0.15"
Flow Length=800' Tc=2.7 min CN=80 Runoff=0.06 cfs 0.007 af

Subcatchment 26A-3: PR DA 26A-3 Runoff Area=0.119 ac 93.28% Impervious Runoff Depth=0.89"
Flow Length=800' Tc=2.7 min CN=97 Runoff=0.14 cfs 0.009 af

Subcatchment 26B-1: PR DA 26B-1 Runoff Area=0.345 ac 28.41% Impervious Runoff Depth=0.20"
Flow Length=800' Tc=2.7 min CN=82 Runoff=0.06 cfs 0.006 af

Subcatchment 26B-2: PR DA 26B-2 Runoff Area=0.425 ac 28.47% Impervious Runoff Depth=0.20"
Flow Length=800' Tc=2.7 min CN=82 Runoff=0.08 cfs 0.007 af

Subcatchment 26B-3: PR DA 26B-3 Runoff Area=0.119 ac 93.28% Impervious Runoff Depth=0.89"
Flow Length=800' Tc=2.7 min CN=97 Runoff=0.14 cfs 0.009 af

Subcatchment 26C: PR DA 26C Runoff Area=0.445 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=236' Tc=17.4 min CN=70 Runoff=0.00 cfs 0.001 af

Subcatchment 26D: PR DA 26D Runoff Area=1.151 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=1,038' Tc=36.7 min CN=70 Runoff=0.00 cfs 0.002 af

Subcatchment 26E: PR DA 26E Runoff Area=2.170 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=735' Tc=46.1 min CN=74 Runoff=0.02 cfs 0.011 af

Subcatchment 26F: PR DA 26F Runoff Area=0.087 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=70' Slope=0.0800 '/' Tc=5.7 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment 26G: PR DA 26G Runoff Area=1.464 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=495' Tc=25.3 min CN=70 Runoff=0.00 cfs 0.003 af

Subcatchment 28A: PR DA 28A Runoff Area=1.501 ac 21.59% Impervious Runoff Depth=0.13"
Flow Length=1,280' Tc=13.4 min CN=79 Runoff=0.10 cfs 0.017 af

Subcatchment 28B: PR DA 28B Runoff Area=0.520 ac 47.88% Impervious Runoff Depth=0.27"
Flow Length=433' Tc=1.7 min CN=85 Runoff=0.17 cfs 0.012 af

Subcatchment 28C: PR DA 28C Runoff Area=0.435 ac 100.00% Impervious Runoff Depth=0.99"
Flow Length=525' Tc=1.9 min CN=98 Runoff=0.55 cfs 0.036 af

Subcatchment 28D: PR DA 28D Runoff Area=0.231 ac 100.00% Impervious Runoff Depth=0.99"
Flow Length=335' Tc=1.7 min CN=98 Runoff=0.30 cfs 0.019 af

Subcatchment 28E: PR DA 28E Runoff Area=0.127 ac 100.00% Impervious Runoff Depth=0.99"
Flow Length=390' Tc=1.6 min CN=98 Runoff=0.16 cfs 0.010 af

Subcatchment 28F: PR DA 28F Runoff Area=3.829 ac 1.57% Impervious Runoff Depth=0.03"
Flow Length=862' Tc=28.4 min CN=71 Runoff=0.02 cfs 0.010 af

Subcatchment 28G: PR DA 28G Runoff Area=0.127 ac 100.00% Impervious Runoff Depth=0.99"
Flow Length=339' Tc=1.3 min CN=98 Runoff=0.16 cfs 0.010 af

Subcatchment 28H: PR DA 28H Runoff Area=0.126 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=305' Tc=9.6 min CN=74 Runoff=0.00 cfs 0.001 af

Subcatchment 28I: PR DA 28I Runoff Area=0.137 ac 100.00% Impervious Runoff Depth=0.99"
Flow Length=283' Tc=1.2 min CN=98 Runoff=0.18 cfs 0.011 af

Subcatchment 31: PR DA 31 Runoff Area=2.152 ac 3.39% Impervious Runoff Depth=0.06"
Flow Length=708' Tc=51.5 min CN=74 Runoff=0.02 cfs 0.011 af

Subcatchment 31A: PR DA 31A Runoff Area=0.071 ac 100.00% Impervious Runoff Depth=0.99"
Flow Length=190' Tc=0.9 min CN=98 Runoff=0.09 cfs 0.006 af

Subcatchment 31B: PR DA 31B Runoff Area=0.069 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=186' Tc=10.8 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment 31C: PR DA 31C Runoff Area=0.080 ac 100.00% Impervious Runoff Depth=0.99"
Flow Length=150' Slope=0.0670 '/' Tc=1.0 min CN=98 Runoff=0.10 cfs 0.007 af

Subcatchment 31D: PR DA 31D Runoff Area=0.537 ac 58.47% Impervious Runoff Depth=0.38"
Flow Length=397' Tc=2.3 min CN=88 Runoff=0.25 cfs 0.017 af

Subcatchment SW21A: PR DA SW21A Runoff Area=0.814 ac 0.00% Impervious Runoff Depth=0.06"
Tc=6.0 min CN=74 Runoff=0.01 cfs 0.004 af

Subcatchment SW21B: PR DA SW21B Runoff Area=0.612 ac 0.00% Impervious Runoff Depth=0.06"
Tc=6.0 min CN=74 Runoff=0.01 cfs 0.003 af

Subcatchment SW21C: PR DA SW21C Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.06"
Tc=6.0 min CN=74 Runoff=0.00 cfs 0.001 af

Subcatchment SW23A: PR DA SW23A Runoff Area=0.056 ac 0.00% Impervious Runoff Depth=0.06"
Tc=6.0 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment SW23B: PR DA SW23B Runoff Area=0.093 ac 0.00% Impervious Runoff Depth=0.06"
Tc=6.0 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment SW28A: PR DA SW28A Runoff Area=0.081 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=64' Slope=0.1000 '/' Tc=4.8 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment SW28B: PR DA SW28B Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.00 cfs 0.001 af

Subcatchment SW28C: PR DA SW28C Runoff Area=0.097 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment SW28D: PR DA SW28D Runoff Area=0.378 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.01 cfs 0.002 af

Subcatchment SW31: PR DA SW31 Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=0.06"
Flow Length=20' Slope=0.0500 '/' Tc=2.5 min CN=74 Runoff=0.00 cfs 0.000 af

Reach 30R: DP-9 Inflow=0.02 cfs 0.011 af
Outflow=0.02 cfs 0.011 af

Reach 36R: DP-1 Inflow=0.03 cfs 0.051 af
Outflow=0.03 cfs 0.051 af

Reach 41R: DP-26 Inflow=0.04 cfs 0.072 af
Outflow=0.04 cfs 0.072 af

Reach 46R: DP-25 Inflow=0.02 cfs 0.012 af
Outflow=0.02 cfs 0.012 af

Reach 51R: DP-24 Inflow=0.09 cfs 0.310 af
Outflow=0.09 cfs 0.310 af

Reach 56R: DP-23 Inflow=0.03 cfs 0.033 af
Outflow=0.03 cfs 0.033 af

Reach 61R: DP-21 Inflow=0.56 cfs 0.409 af
Outflow=0.56 cfs 0.409 af

Pond 21A-P: Pond-21A Peak Elev=1,376.69' Storage=4,764 cf Inflow=0.56 cfs 0.048 af
Primary=0.01 cfs 0.046 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.046 af

Pond 21B-P: Pond-21B Peak Elev=1,378.14' Storage=12,291 cf Inflow=0.64 cfs 0.047 af
Primary=0.01 cfs 0.042 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.042 af

Pond 23-P: Pond-23 Peak Elev=1,381.09' Storage=9,622 cf Inflow=0.15 cfs 0.020 af
Outflow=0.01 cfs 0.018 af

Pond 24-P: Pond-24 Peak Elev=1,365.22' Storage=13,658 cf Inflow=1.29 cfs 0.118 af
Primary=0.03 cfs 0.275 af Secondary=0.00 cfs 0.000 af Outflow=0.03 cfs 0.275 af

Pond 26-P: Pond-26 Peak Elev=1,371.17' Storage=17,058 cf Inflow=0.51 cfs 0.056 af
Outflow=0.01 cfs 0.050 af

Pond 28-P: Pond-28 Peak Elev=1,373.95' Storage=5,495 cf Inflow=0.33 cfs 0.041 af
Outflow=0.01 cfs 0.041 af

Pond BRA-46: BRA-46 Peak Elev=1,368.30' Storage=785 cf Inflow=0.19 cfs 0.018 af
Outflow=0.00 cfs 0.000 af

Pond BRA-46-FS: Flow Splitter for BRA-46 Peak Elev=1,371.67' Inflow=0.19 cfs 0.018 af
Primary=0.19 cfs 0.018 af Secondary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.018 af

Pond BRA-59: BRA-59 Peak Elev=1,379.63' Storage=769 cf Inflow=0.24 cfs 0.018 af
Outflow=0.00 cfs 0.000 af

Pond BRA-59-FS: Flow Splitter for BRA-59 Peak Elev=1,382.00' Inflow=0.24 cfs 0.018 af
Primary=0.24 cfs 0.018 af Secondary=0.00 cfs 0.000 af Outflow=0.24 cfs 0.018 af

Pond BRA37-FS: Flow Splitter for BRA-37 Peak Elev=1,385.83' Inflow=0.21 cfs 0.040 af
Primary=0.21 cfs 0.040 af Secondary=0.00 cfs 0.000 af Outflow=0.21 cfs 0.040 af

Pond BRA37-P: BRA-37 Peak Elev=1,383.76' Storage=1,737 cf Inflow=0.21 cfs 0.040 af
Outflow=0.00 cfs 0.000 af

Pond BRA38-P: BRA-38 Peak Elev=1,382.70' Storage=1,096 cf Inflow=0.24 cfs 0.025 af
Primary=0.00 cfs 0.000 af Secondary=0.00 cfs 0.000 af Outflow=0.00 cfs 0.000 af

Pond BRA50-FS: Flow Splitter for BRA-50 Peak Elev=1,386.33' Inflow=0.19 cfs 0.045 af
Primary=0.19 cfs 0.045 af Secondary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.045 af

Pond BRA50-P: BRA-50 Peak Elev=1,385.21' Storage=1,978 cf Inflow=0.19 cfs 0.045 af
Outflow=0.00 cfs 0.000 af

Pond SW21C-FS: Flow Splitter for SW21C Peak Elev=1,404.70' Inflow=0.17 cfs 0.013 af
Primary=0.17 cfs 0.013 af Secondary=0.00 cfs 0.000 af Outflow=0.17 cfs 0.013 af

Pond SW21C-P: BRA-SW21C Peak Elev=1,399.09' Storage=578 cf Inflow=0.17 cfs 0.013 af
Outflow=0.00 cfs 0.000 af

Pond SW23A-FS: Flow Splitter for SW23A Peak Elev=1,383.90' Inflow=0.08 cfs 0.005 af
Primary=0.08 cfs 0.005 af Secondary=0.00 cfs 0.000 af Outflow=0.08 cfs 0.005 af

Pond SW23A-P: BRA-SW23A Peak Elev=1,379.30' Storage=241 cf Inflow=0.08 cfs 0.006 af
Outflow=0.00 cfs 0.000 af

Pond SW23B-FS: Flow Splitter for SW23B Peak Elev=1,388.69' Inflow=0.16 cfs 0.012 af
Primary=0.16 cfs 0.012 af Secondary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.012 af

Pond SW23B-P: BRA-SW23B Peak Elev=1,385.12' Storage=538 cf Inflow=0.16 cfs 0.012 af
Outflow=0.00 cfs 0.000 af

Pond SW28A-FS: Flow Splitter for SW28A Peak Elev=1,435.87' Inflow=0.20 cfs 0.013 af
Primary=0.20 cfs 0.013 af Secondary=0.00 cfs 0.000 af Outflow=0.20 cfs 0.013 af

Pond SW28A-P: BRA-SW28A Peak Elev=1,432.91' Storage=574 cf Inflow=0.20 cfs 0.013 af
Outflow=0.00 cfs 0.000 af

Pond SW28B-FS: Flow Splitter for SW28B Peak Elev=1,412.29' Inflow=0.34 cfs 0.022 af
Primary=0.34 cfs 0.022 af Secondary=0.00 cfs 0.000 af Outflow=0.34 cfs 0.022 af

Pond SW28B-P: BRA-SW28B Peak Elev=1,405.07' Storage=999 cf Inflow=0.34 cfs 0.023 af
Outflow=0.00 cfs 0.000 af

Pond SW28C-FS: Flow Splitter for SW28C Peak Elev=1,392.96' Inflow=0.85 cfs 0.055 af
Primary=0.85 cfs 0.055 af Secondary=0.00 cfs 0.000 af Outflow=0.85 cfs 0.055 af

Pond SW28C-P: BRA-SW28C Peak Elev=1,388.32' Storage=2,405 cf Inflow=0.85 cfs 0.055 af
Outflow=0.00 cfs 0.000 af

Pond SW31-FS: Flow Splitter for SW31 Peak Elev=1,444.85' Inflow=0.25 cfs 0.017 af
Primary=0.25 cfs 0.017 af Secondary=0.00 cfs 0.000 af Outflow=0.25 cfs 0.017 af

Pond SW31-P: BRA-SW31 Peak Elev=1,440.40' Storage=745 cf Inflow=0.25 cfs 0.017 af
Outflow=0.00 cfs 0.000 af

Total Runoff Area = 154.106 ac Runoff Volume = 1.043 af Average Runoff Depth = 0.08"
94.10% Pervious = 145.015 ac 5.90% Impervious = 9.091 ac

Summary for Subcatchment 21: PR DA 21

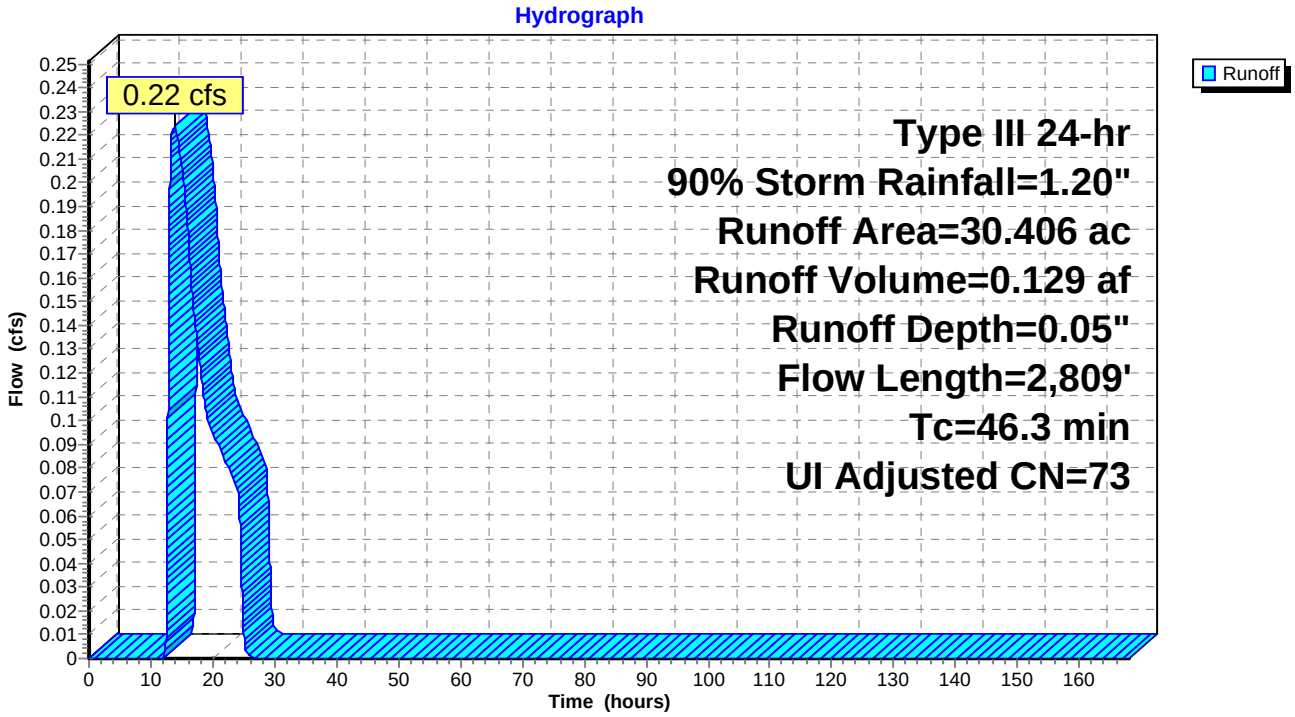
Runoff = 0.22 cfs @ 13.94 hrs, Volume= 0.129 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.695	98	Unconnected pavement, HSG C
10.838	74	>75% Grass cover, Good, HSG C
1.499	71	Meadow, non-grazed, HSG C
11.674	70	Woods, Good, HSG C
0.204	80	Pasture/grassland/range, Good, HSG D
1.601	78	Meadow, non-grazed, HSG D
3.895	77	Woods, Good, HSG D
30.406	74	Weighted Average, UI Adjusted CN = 73
29.711		97.71% Pervious Area
0.695		2.29% Impervious Area
0.695		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0467	0.28		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
31.3	1,500	0.0255	0.80		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
5.9	969	0.0114	2.75	4.13	**Channel Flow, Rivulet** Area= 1.5 sf Perim= 4.0' r= 0.38' n= 0.030
0.2	190	0.0239	12.74	64.94	**Pipe Channel, RCP_Elliptical 38x24** 38.0" x 24.0", R=31.2" Elliptical Area= 5.1 sf Perim= 8.3' r= 0.61' n= 0.013
46.3	2,809	Total			

Subcatchment 21: PR DA 21



Summary for Subcatchment 21A-1: PR DA 21A-1

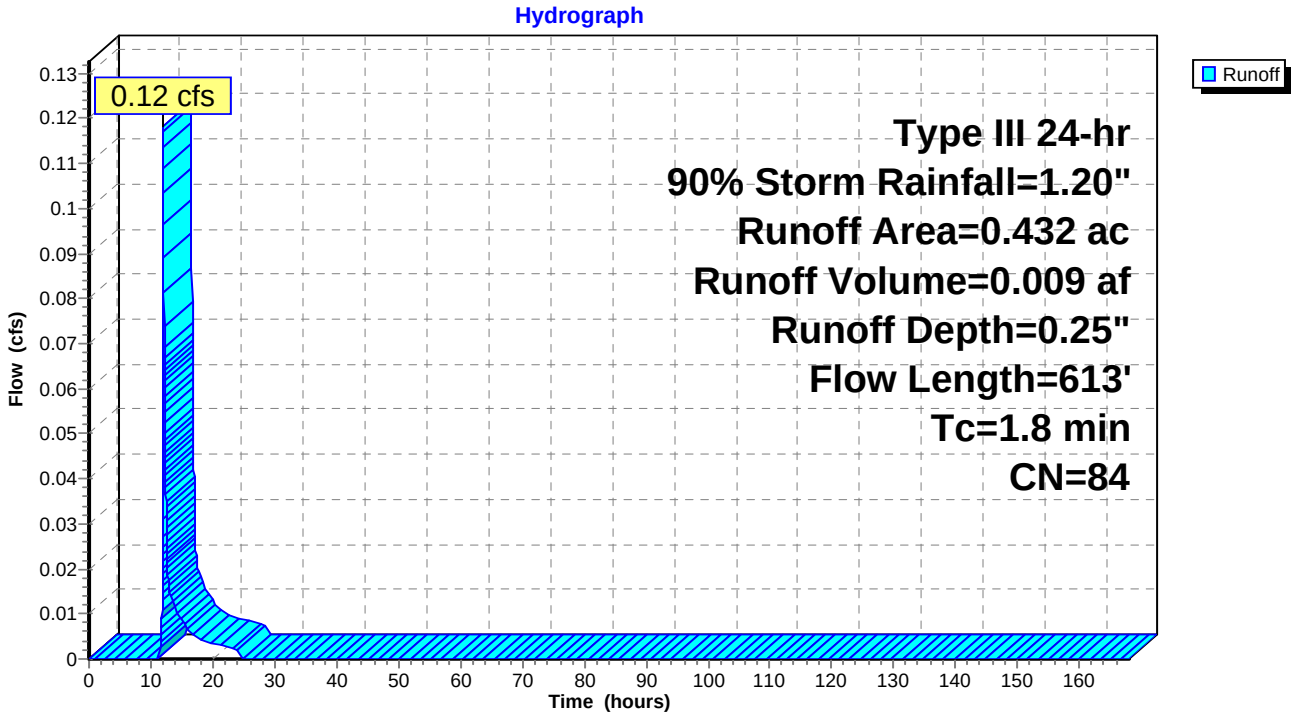
Runoff = 0.12 cfs @ 12.04 hrs, Volume= 0.009 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.242	74	>75% Grass cover, Good, HSG C
0.161	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.432	84	Weighted Average
0.271		62.73% Pervious Area
0.161		37.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.32		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	150	0.0360	7.97	65.36	**Channel Flow, SCF** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	408	0.0200	8.80	10.80	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.8	613	Total			

Subcatchment 21A-1: PR DA 21A-1



Summary for Subcatchment 21A-2: PR DA 21A-2

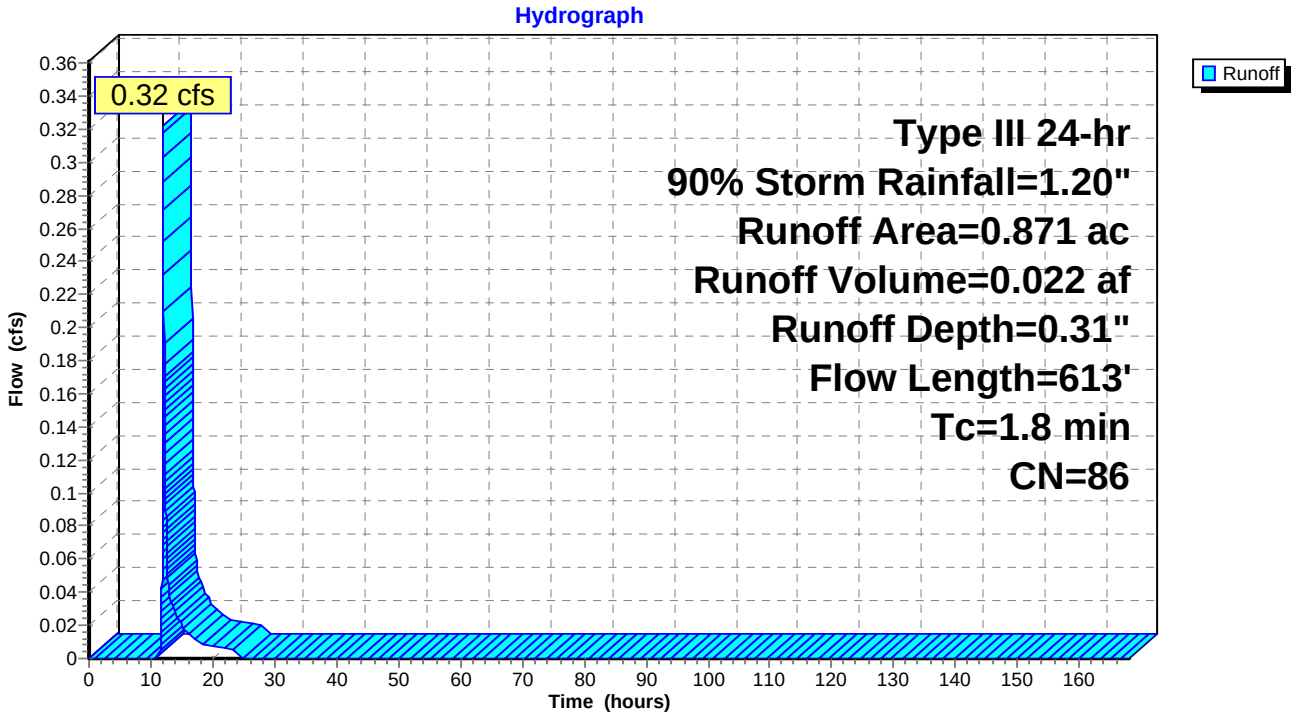
Runoff = 0.32 cfs @ 12.04 hrs, Volume= 0.022 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.134	74	>75% Grass cover, Good, HSG C
0.081	98	Paved roads w/curbs & sewers, HSG C
0.015	89	Gravel Shoulder, HSG C
0.374	80	>75% Grass cover, Good, HSG D
0.226	98	Paved roads w/curbs & sewers, HSG D
0.041	91	Gravel Shoulder, HSG D
0.871	86	Weighted Average
0.564		64.75% Pervious Area
0.307		35.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.32		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	150	0.0360	7.97	65.36	**Channel Flow, SCF** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	408	0.0200	8.80	10.80	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.8	613	Total			

Subcatchment 21A-2: PR DA 21A-2



Summary for Subcatchment 21B-1: PR DA 21B-1

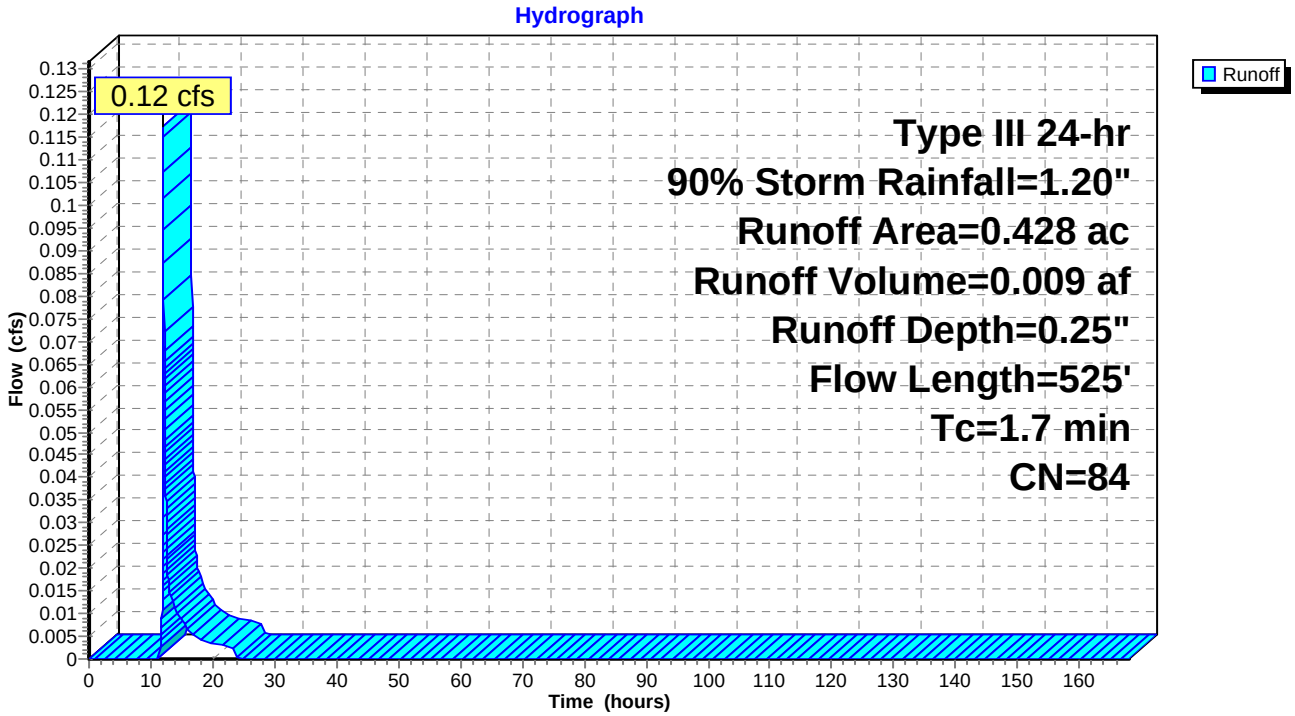
Runoff = 0.12 cfs @ 12.04 hrs, Volume= 0.009 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.232	74	>75% Grass cover, Good, HSG C
	0.166	98	Paved roads w/curbs & sewers, HSG C
*	0.030	89	Gravel Shoulder, HSG C
	0.428	84	Weighted Average
	0.262		61.21% Pervious Area
	0.166		38.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	45	0.0200	1.27		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	160	0.0300	7.28	59.66	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.7	320	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	525	Total			

Subcatchment 21B-1: PR DA 21B-1



Summary for Subcatchment 21B-2: PR DA 21B-2

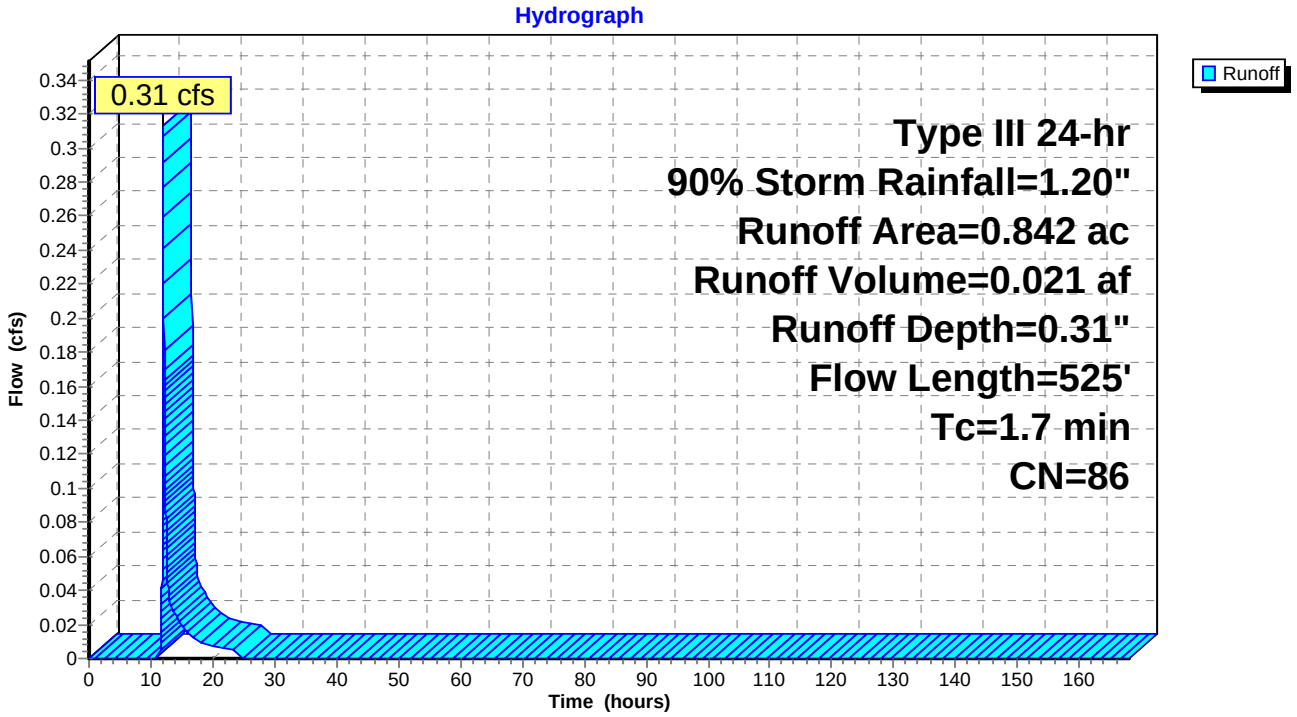
Runoff = 0.31 cfs @ 12.03 hrs, Volume= 0.021 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.011	70	Woods, Good, HSG C
	0.148	74	>75% Grass cover, Good, HSG C
	0.097	98	Paved roads w/curbs & sewers, HSG C
*	0.018	89	Gravel Shoulder, HSG C
	0.012	77	Woods, Good, HSG D
	0.309	80	>75% Grass cover, Good, HSG D
	0.209	98	Paved roads w/curbs & sewers, HSG D
	0.038	91	Gravel roads, HSG D
	0.842	86	Weighted Average
	0.536		63.66% Pervious Area
	0.306		36.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	45	0.0200	1.27		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	160	0.0300	7.28	59.66	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.7	320	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	525	Total			

Subcatchment 21B-2: PR DA 21B-2



Summary for Subcatchment 21C: PR DA 21C

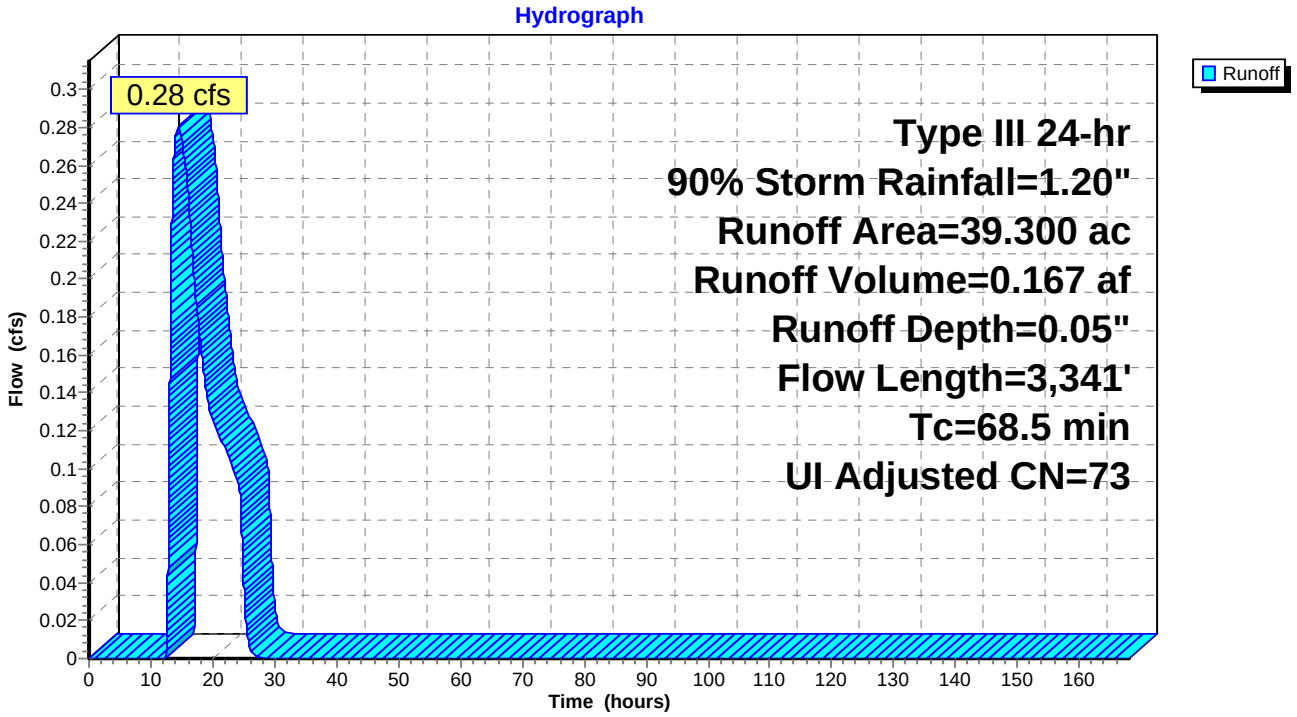
Runoff = 0.28 cfs @ 14.38 hrs, Volume= 0.167 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.541	98	Unconnected pavement, HSG C
31.045	74	>75% Grass cover, Good, HSG C
0.010	74	Pasture/grassland/range, Good, HSG C
0.136	71	Meadow, non-grazed, HSG C
7.568	70	Woods, Good, HSG C
39.300	74	Weighted Average, UI Adjusted CN = 73
38.759		98.62% Pervious Area
0.541		1.38% Impervious Area
0.541		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	150	0.0200	0.20		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
55.7	2,976	0.0317	0.89		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.3	215	0.0326	12.85	42.18	**Pipe Channel, RCP_Elliptical 30x19** 30.0" x 19.0", R=33.5" Elliptical Area= 3.3 sf Perim= 6.7' r= 0.49' n= 0.013
68.5	3,341	Total			

Subcatchment 21C: PR DA 21C



Summary for Subcatchment 21D: PR DA 21D

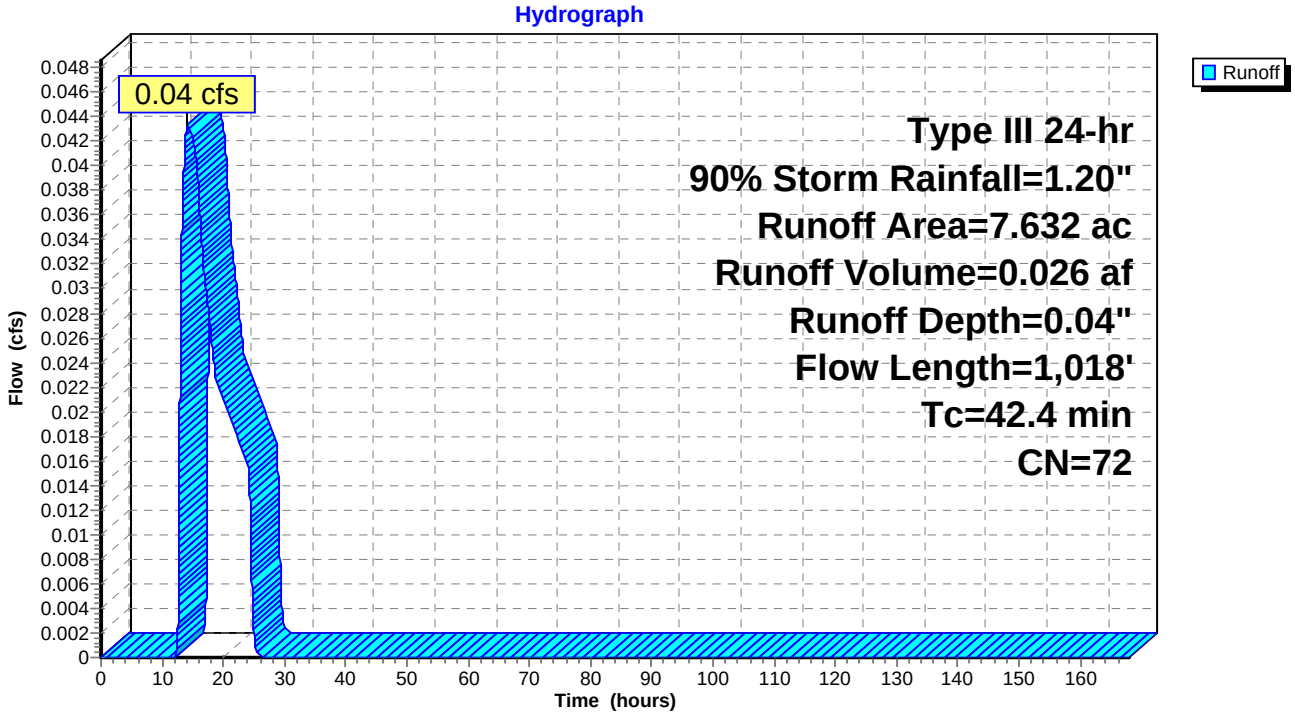
Runoff = 0.04 cfs @ 14.18 hrs, Volume= 0.026 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.065	65	Brush, Good, HSG C
0.260	74	>75% Grass cover, Good, HSG C
3.187	71	Meadow, non-grazed, HSG C
3.137	70	Woods, Good, HSG C
0.004	73	Brush, Good, HSG D
0.631	78	Meadow, non-grazed, HSG D
0.322	77	Woods, Good, HSG D
0.026	80	>75% Grass cover, Good, HSG D
7.632	72	Weighted Average
7.632		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	150	0.0300	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
19.1	868	0.0230	0.76		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
42.4	1,018	Total			

Subcatchment 21D: PR DA 21D



Summary for Subcatchment 21E-1: PR DA 21E-1

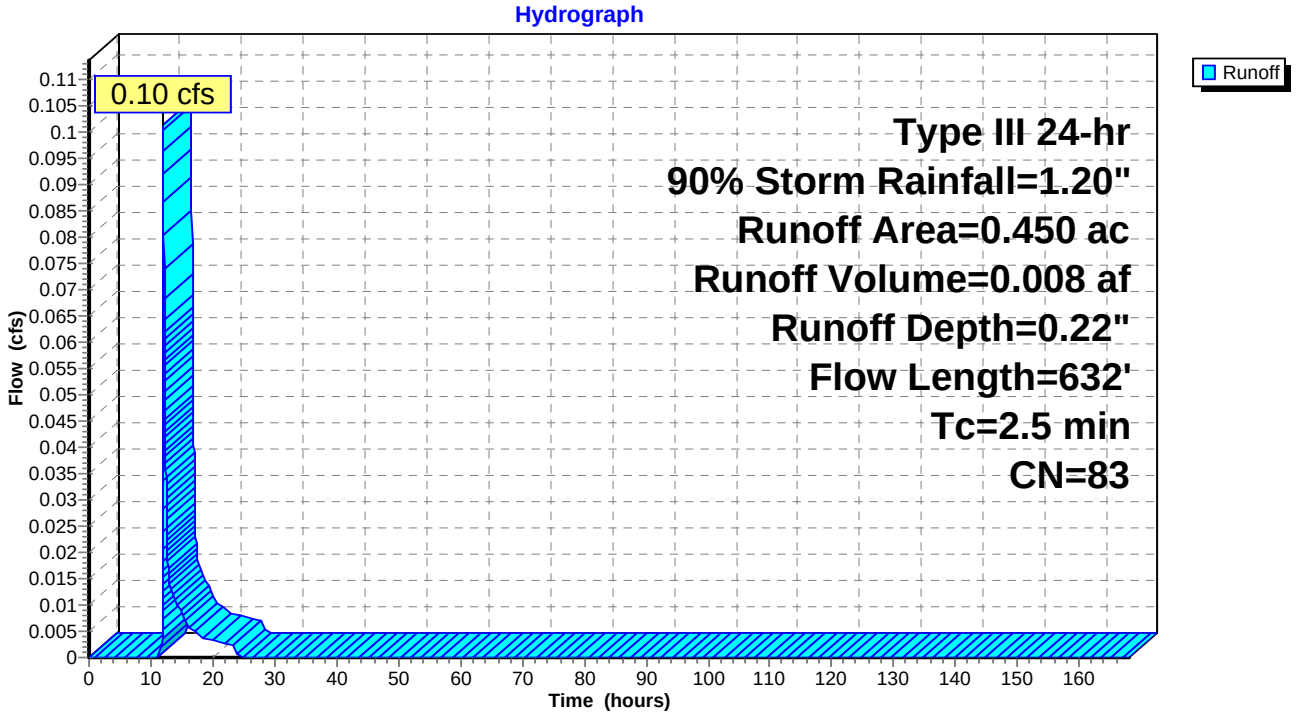
Runoff = 0.10 cfs @ 12.06 hrs, Volume= 0.008 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.007	70	Woods, Good, HSG C
	0.265	74	>75% Grass cover, Good, HSG C
	0.151	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.450	83	Weighted Average
	0.299		66.44% Pervious Area
	0.151		33.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-1: PR DA 21E-1



Summary for Subcatchment 21E-2: PR DA 21E-2

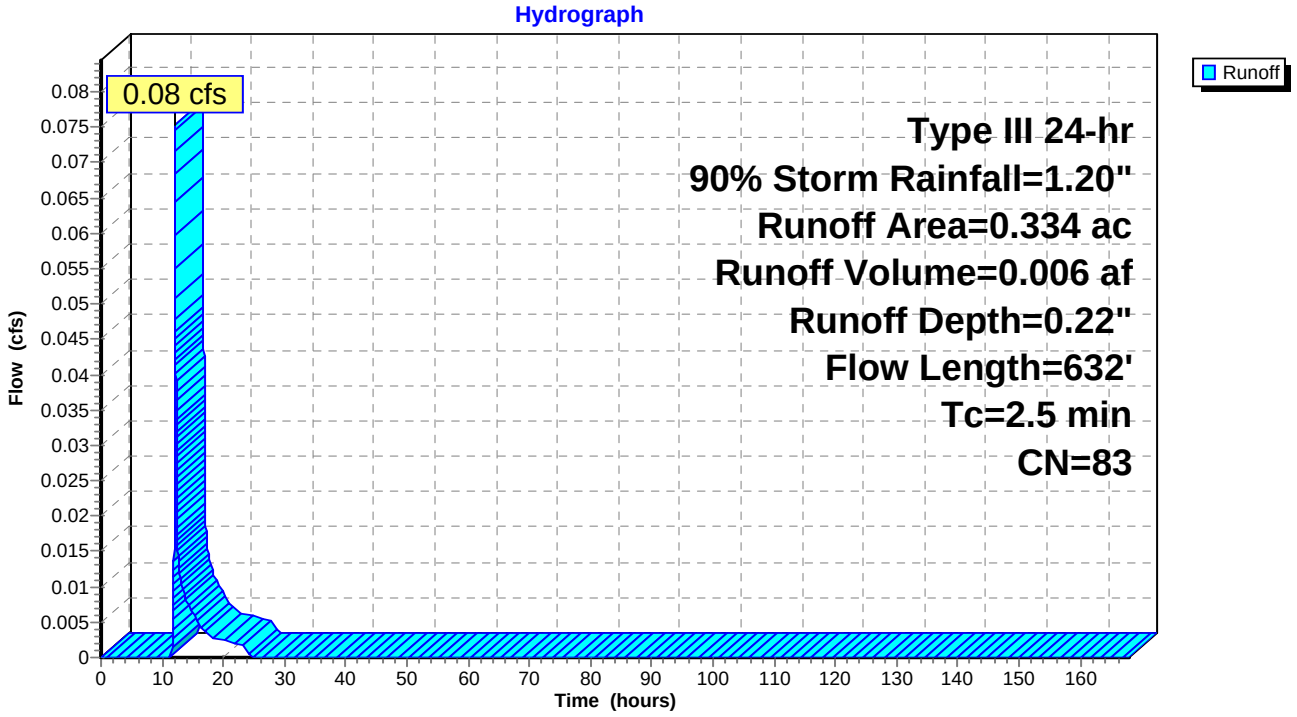
Runoff = 0.08 cfs @ 12.06 hrs, Volume= 0.006 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.005	70	Woods, Good, HSG C
	0.197	74	>75% Grass cover, Good, HSG C
	0.112	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.334	83	Weighted Average
	0.222		66.47% Pervious Area
	0.112		33.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-2: PR DA 21E-2



Summary for Subcatchment 21E-3: PR DA 21E-3

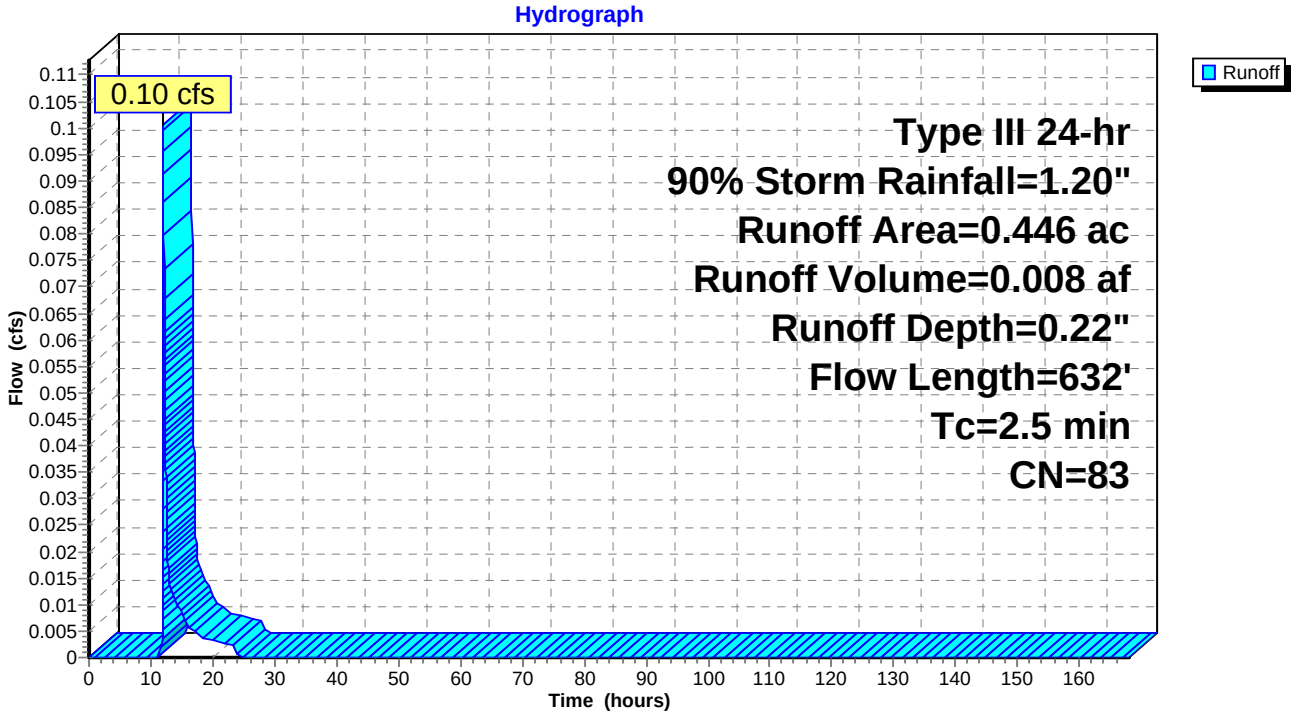
Runoff = 0.10 cfs @ 12.06 hrs, Volume= 0.008 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.006	70	Woods, Good, HSG C
	0.263	74	>75% Grass cover, Good, HSG C
	0.150	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.446	83	Weighted Average
	0.296		66.37% Pervious Area
	0.150		33.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-3: PR DA 21E-3



Summary for Subcatchment 21F-1: PR DA 21F-1

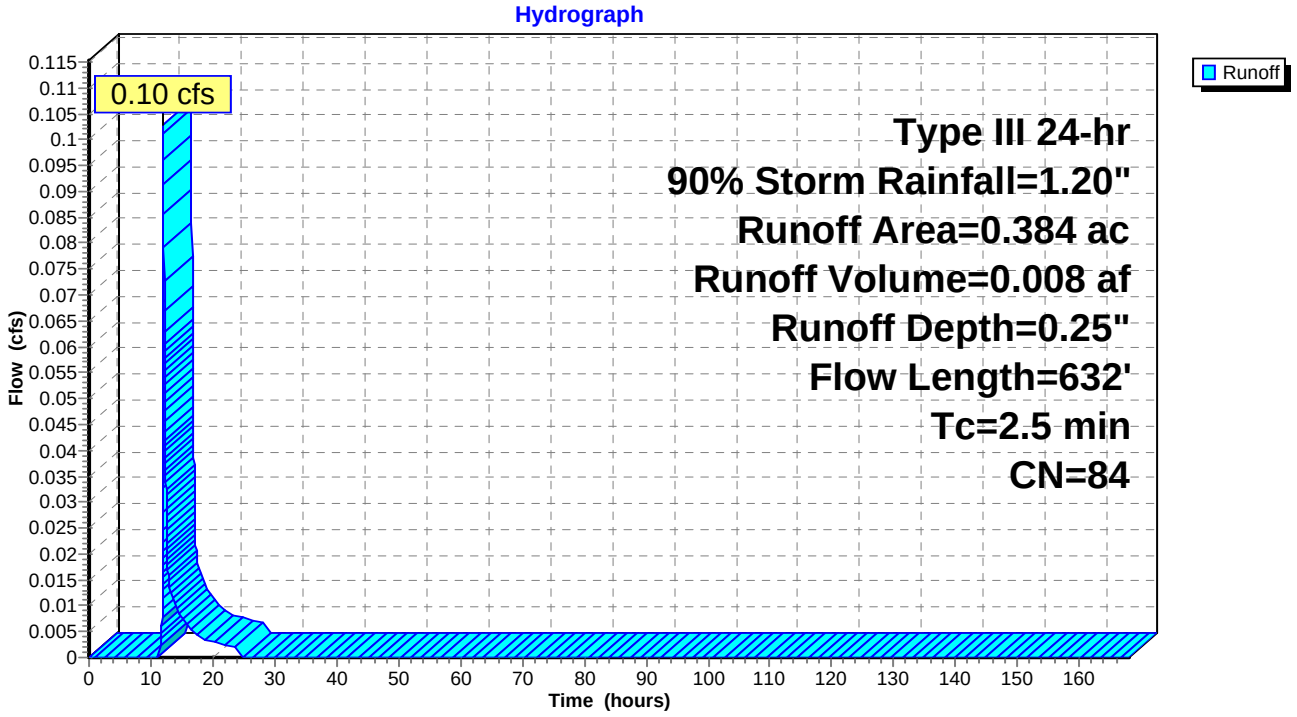
Runoff = 0.10 cfs @ 12.05 hrs, Volume= 0.008 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.004	70	Woods, Good, HSG C
	0.207	74	>75% Grass cover, Good, HSG C
	0.146	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.384	84	Weighted Average
	0.238		61.98% Pervious Area
	0.146		38.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-1: PR DA 21F-1



Summary for Subcatchment 21F-2: PR DA 21F-2

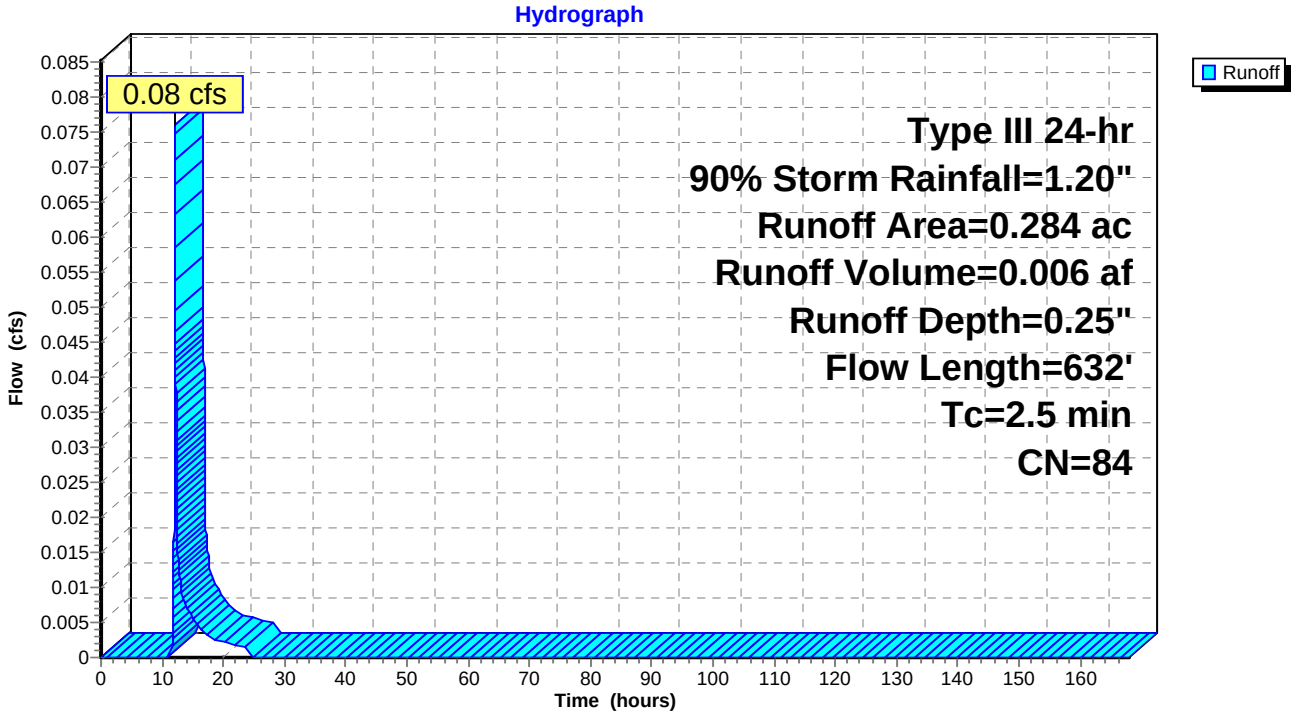
Runoff = 0.08 cfs @ 12.05 hrs, Volume= 0.006 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.003	70	Woods, Good, HSG C
	0.153	74	>75% Grass cover, Good, HSG C
	0.108	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.284	84	Weighted Average
	0.176		61.97% Pervious Area
	0.108		38.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-2: PR DA 21F-2



Summary for Subcatchment 21F-3: PR DA 21F-3

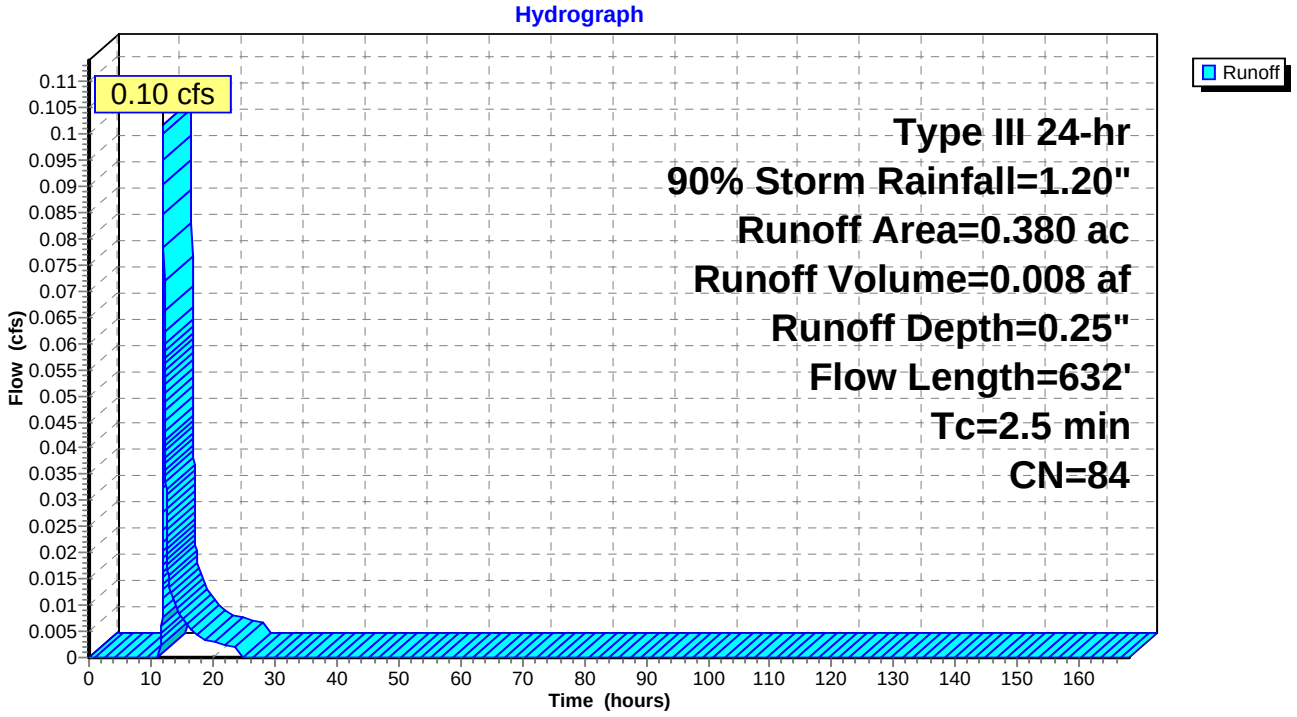
Runoff = 0.10 cfs @ 12.05 hrs, Volume= 0.008 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.004	70	Woods, Good, HSG C
	0.205	74	>75% Grass cover, Good, HSG C
	0.145	98	Paved roads w/curbs & sewers, HSG C
*	0.026	89	Gravel Shoulder, HSG C
	0.380	84	Weighted Average
	0.235		61.84% Pervious Area
	0.145		38.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-3: PR DA 21F-3



Summary for Subcatchment 21G: PR DA 21G

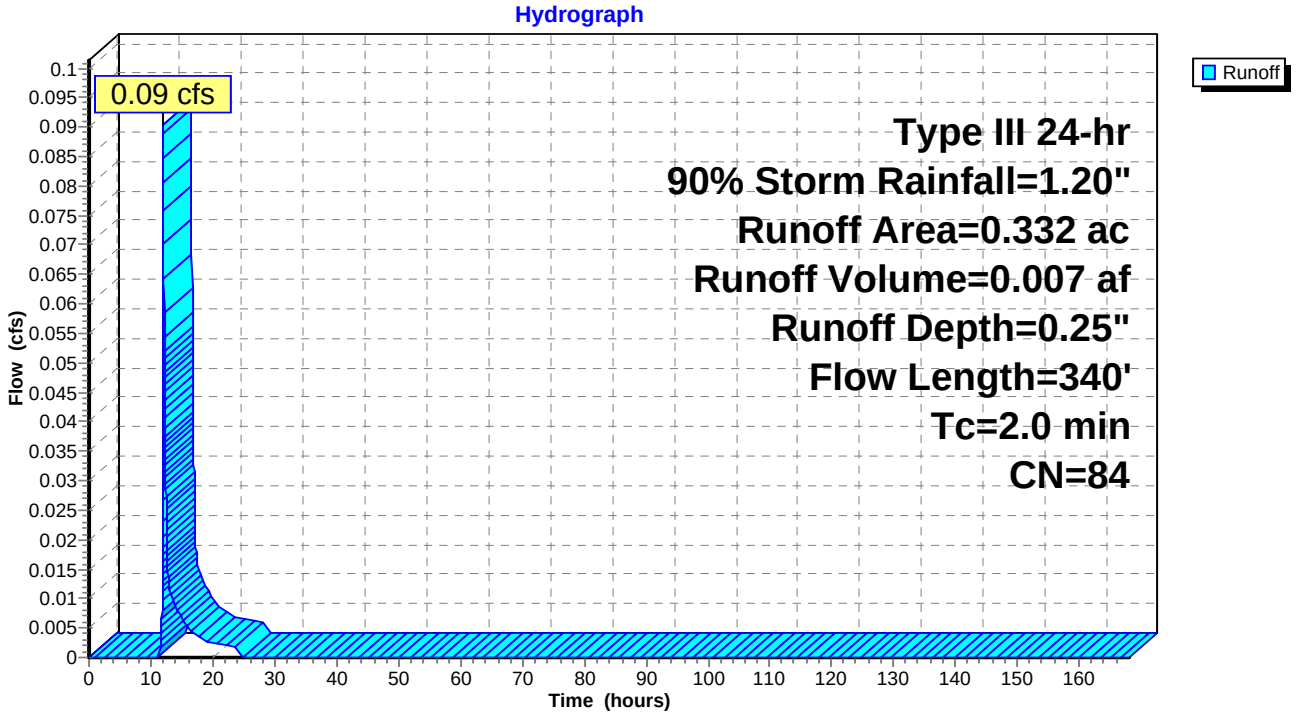
Runoff = 0.09 cfs @ 12.04 hrs, Volume= 0.007 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.187	74	>75% Grass cover, Good, HSG C
0.145	98	Paved roads w/curbs & sewers, HSG C
0.332	84	Weighted Average
0.187		56.33% Pervious Area
0.145		43.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	85	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	93	0.0500	4.54		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.2	62	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.2	100	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.0	340	Total			

Subcatchment 21G: PR DA 21G



Summary for Subcatchment 21H: PR DA 21H

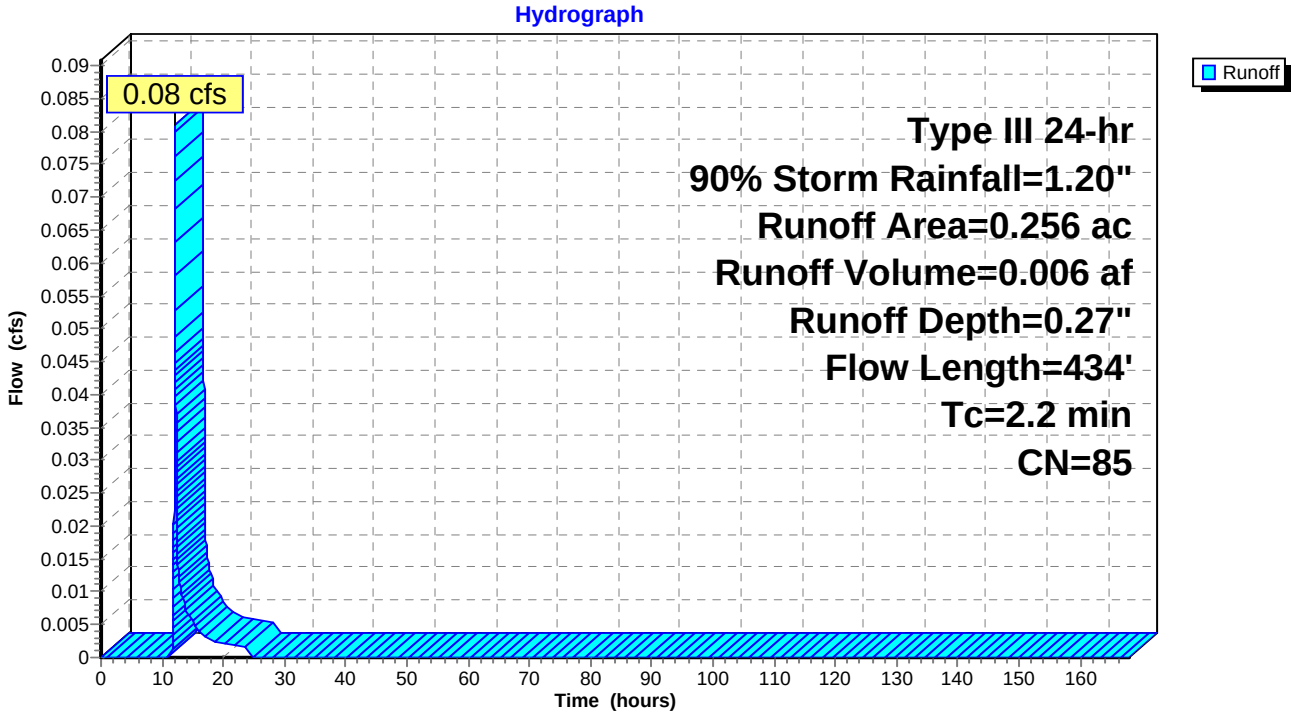
Runoff = 0.08 cfs @ 12.04 hrs, Volume= 0.006 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.138	74	>75% Grass cover, Good, HSG C
0.118	98	Paved roads w/curbs & sewers, HSG C
0.256	85	Weighted Average
0.138		53.91% Pervious Area
0.118		46.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	85	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	93	0.0500	4.54		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.2	62	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.4	194	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.2	434	Total			

Subcatchment 21H: PR DA 21H



Summary for Subcatchment 23: PR DA 23

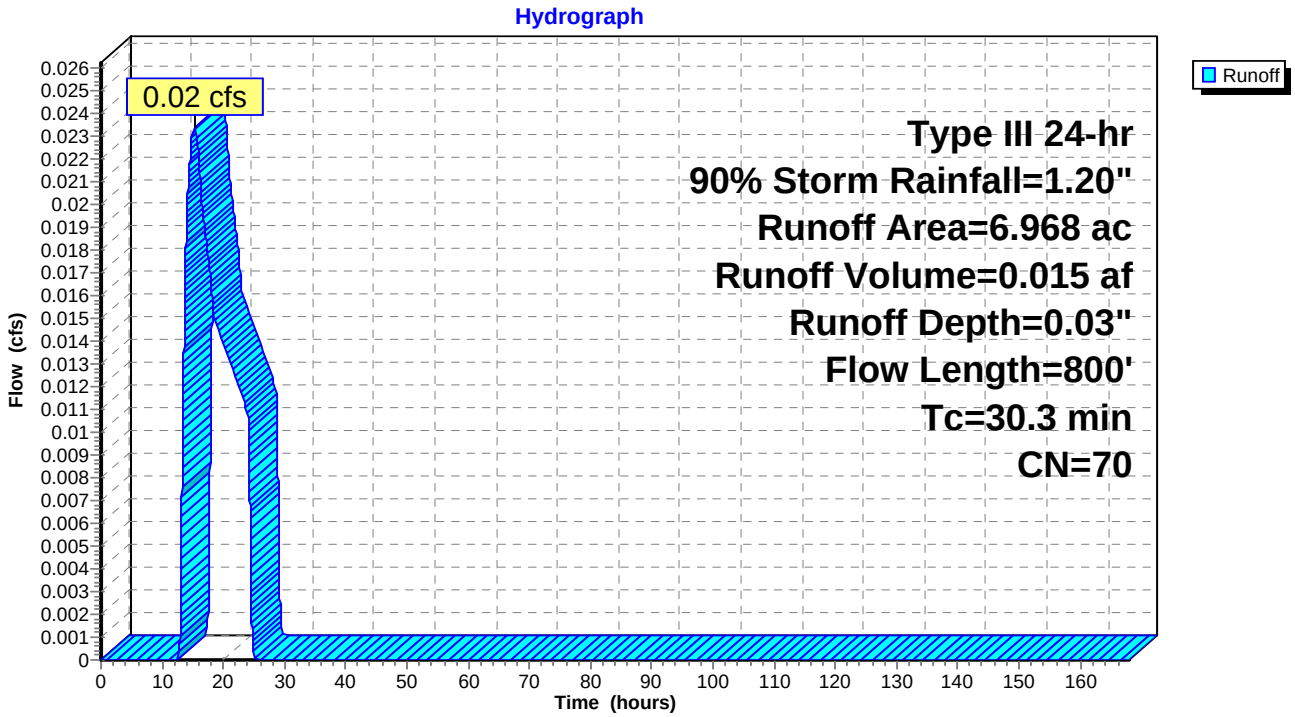
Runoff = 0.02 cfs @ 15.25 hrs, Volume= 0.015 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.415	65	Brush, Good, HSG C
0.170	74	>75% Grass cover, Good, HSG C
5.901	70	Woods, Good, HSG C
0.009	73	Brush, Good, HSG D
0.473	77	Woods, Good, HSG D
6.968	70	Weighted Average
6.968		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	150	0.0367	0.12		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
8.8	650	0.0600	1.22		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
30.3	800	Total			

Subcatchment 23: PR DA 23



Summary for Subcatchment 23A-1: PR DA 23A-1

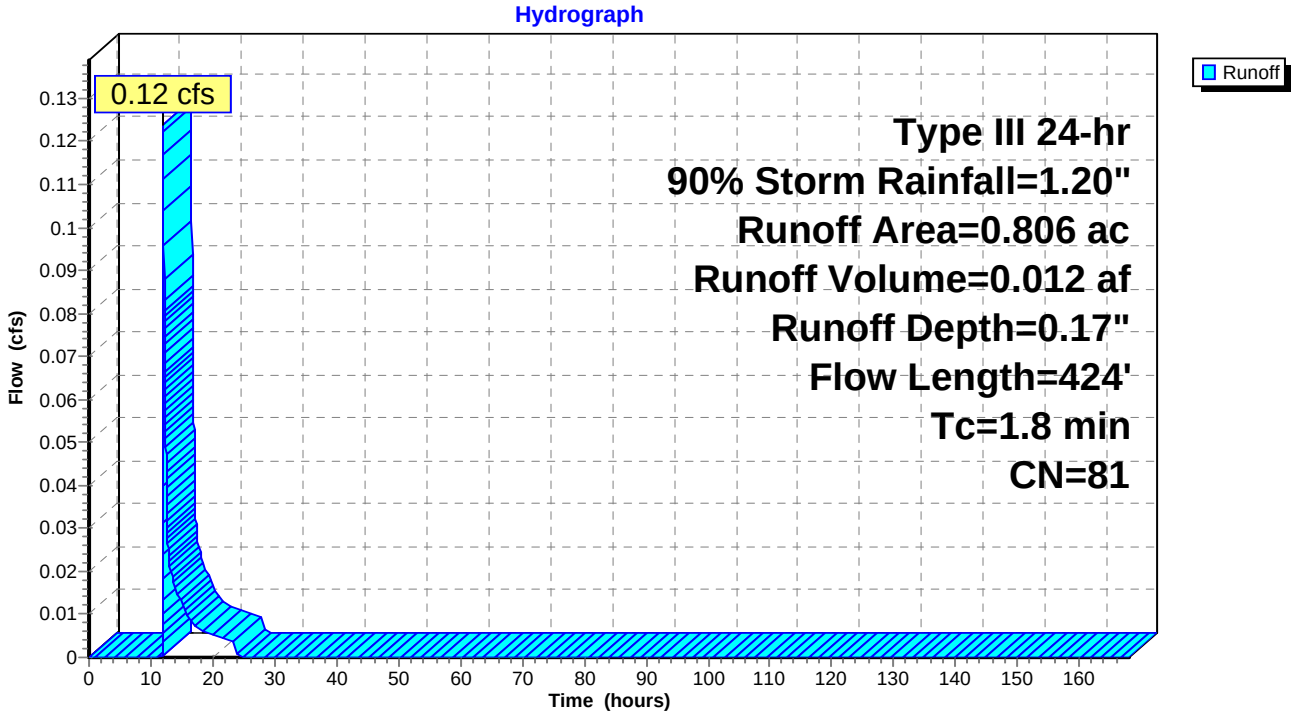
Runoff = 0.12 cfs @ 12.05 hrs, Volume= 0.012 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.562	74	>75% Grass cover, Good, HSG C
0.201	98	Paved roads w/curbs & sewers, HSG C
0.043	89	Gravel Shoulder, HSG C
0.806	81	Weighted Average
0.605		75.06% Pervious Area
0.201		24.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	62	0.0200	1.35		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
1.0	362	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.8	424	Total			

Subcatchment 23A-1: PR DA 23A-1



Summary for Subcatchment 23A-2: PR DA 23A-2

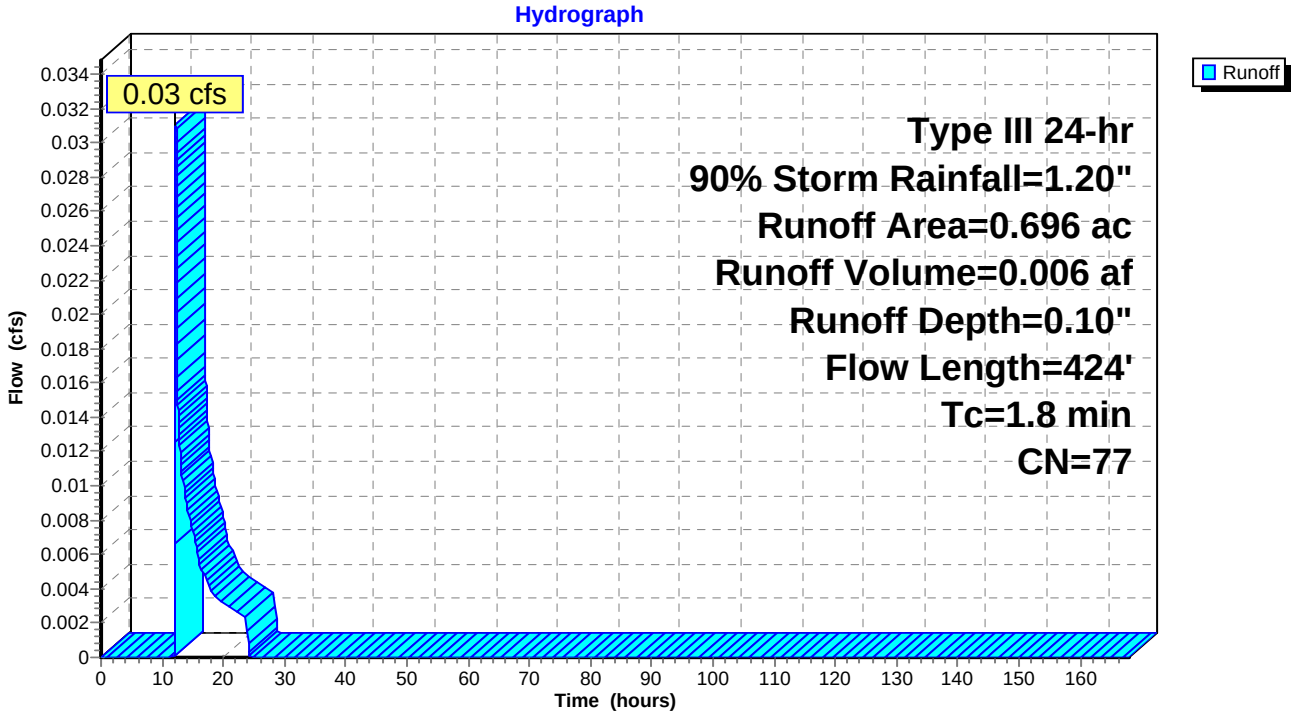
Runoff = 0.03 cfs @ 12.25 hrs, Volume= 0.006 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.593	74	>75% Grass cover, Good, HSG C
0.085	98	Paved roads w/curbs & sewers, HSG C
0.018	89	Gravel Shoulder, HSG C
0.696	77	Weighted Average
0.611		87.79% Pervious Area
0.085		12.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	62	0.0200	1.35		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
1.0	362	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.8	424	Total			

Subcatchment 23A-2: PR DA 23A-2



Summary for Subcatchment 23B-1: PR DA 23B-1

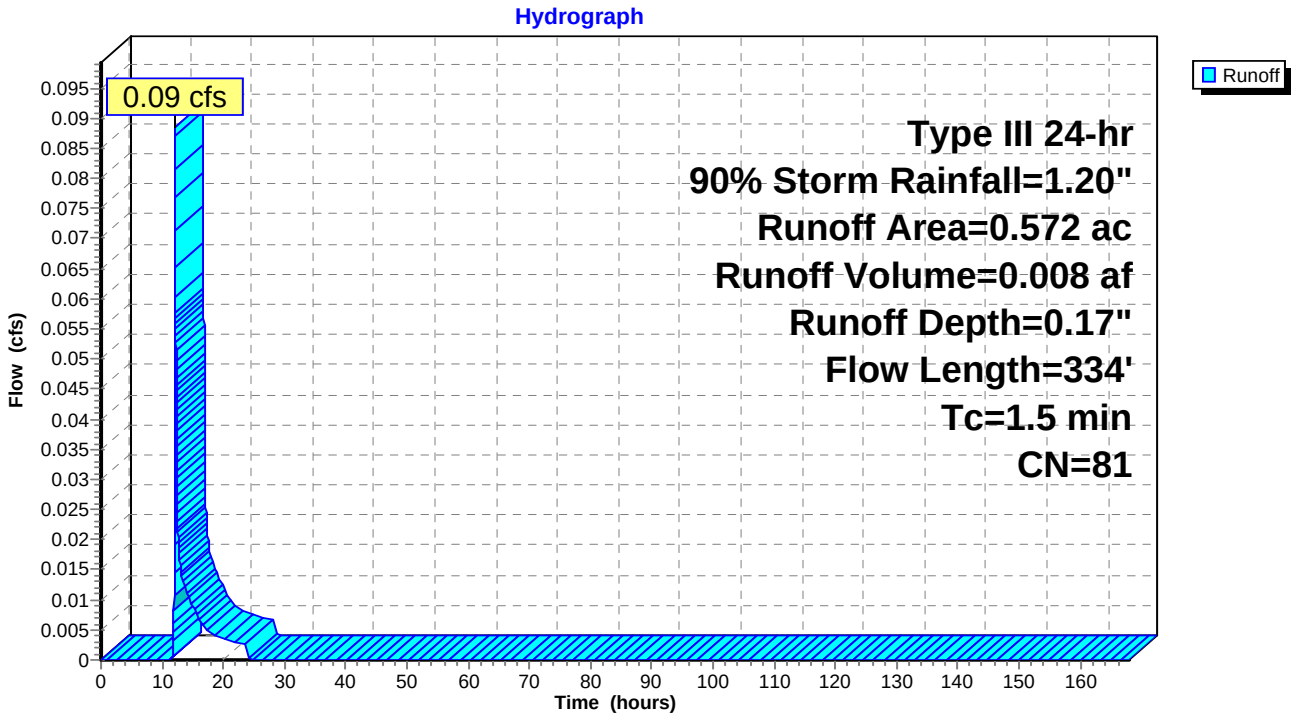
Runoff = 0.09 cfs @ 12.05 hrs, Volume= 0.008 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.005	70	Woods, Good, HSG C
0.392	74	>75% Grass cover, Good, HSG C
0.148	98	Paved roads w/curbs & sewers, HSG C
0.027	89	Gravel Shoulder, HSG C
0.572	81	Weighted Average
0.424		74.13% Pervious Area
0.148		25.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0200	1.34		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	274	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.5	334	Total			

Subcatchment 23B-1: PR DA 23B-1



Summary for Subcatchment 23B-2: PR DA 23B-2

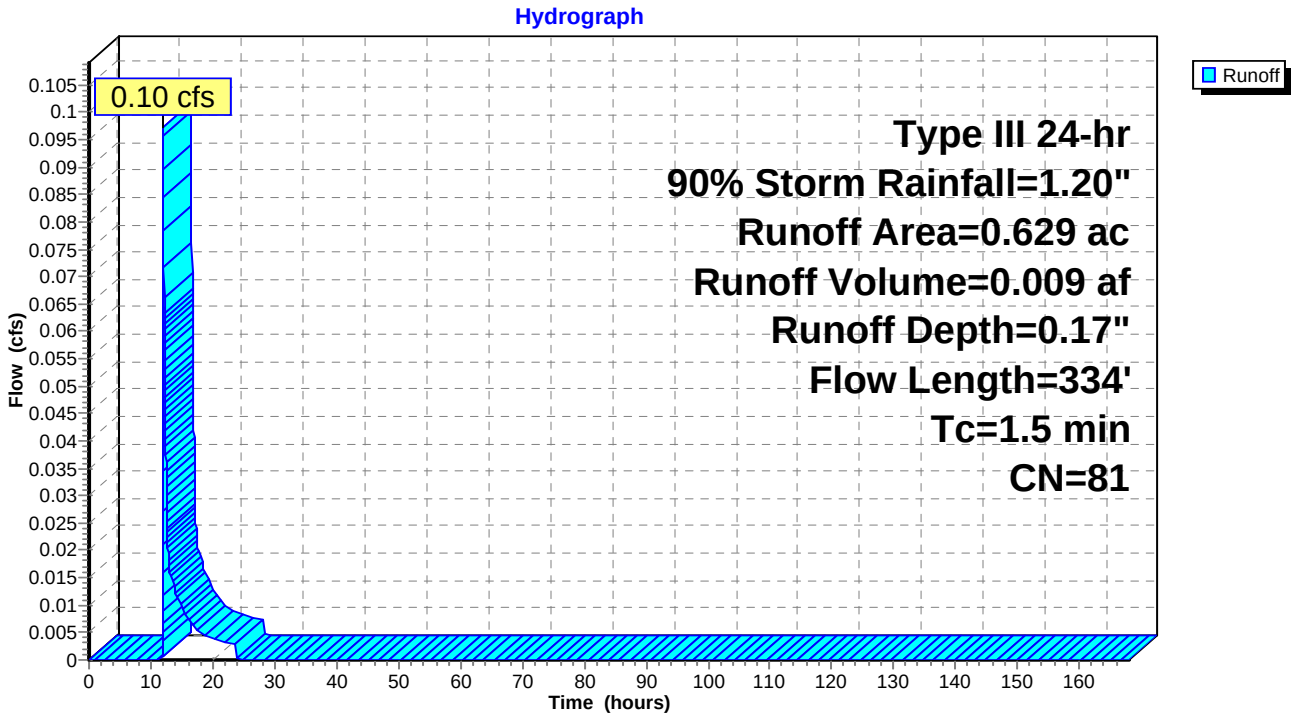
Runoff = 0.10 cfs @ 12.05 hrs, Volume= 0.009 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.005	70	Woods, Good, HSG C
0.432	74	>75% Grass cover, Good, HSG C
0.163	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.629	81	Weighted Average
0.466		74.09% Pervious Area
0.163		25.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0200	1.34		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	274	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.5	334	Total			

Subcatchment 23B-2: PR DA 23B-2



Summary for Subcatchment 23C: PR DA 23C

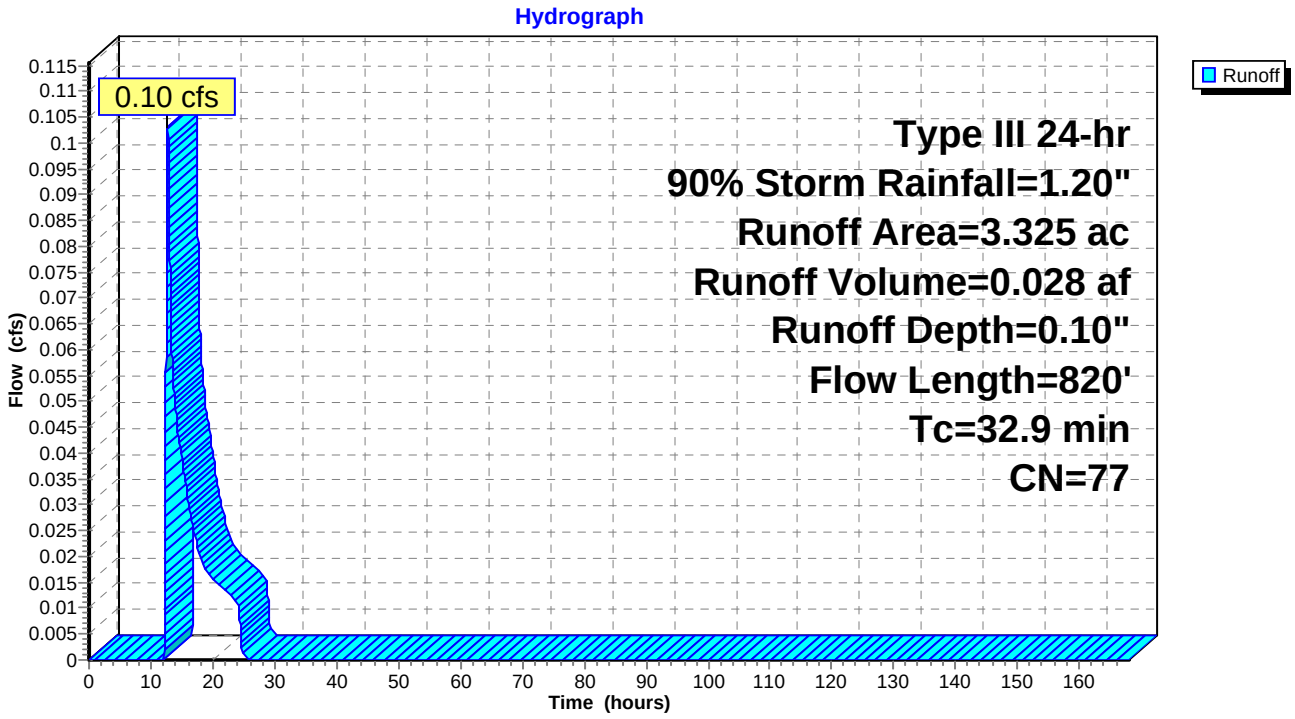
Runoff = 0.10 cfs @ 12.72 hrs, Volume= 0.028 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
3.325	77	Woods, Good, HSG D
3.325		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	150	0.0233	0.10		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
6.3	380	0.0400	1.00		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.5	165	0.0200	5.94	48.71	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	125	0.0200	7.44	9.14	**Pipe Channel, Pipe Crossing** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
32.9	820	Total			

Subcatchment 23C: PR DA 23C



Summary for Subcatchment 23F: PR DA 23F

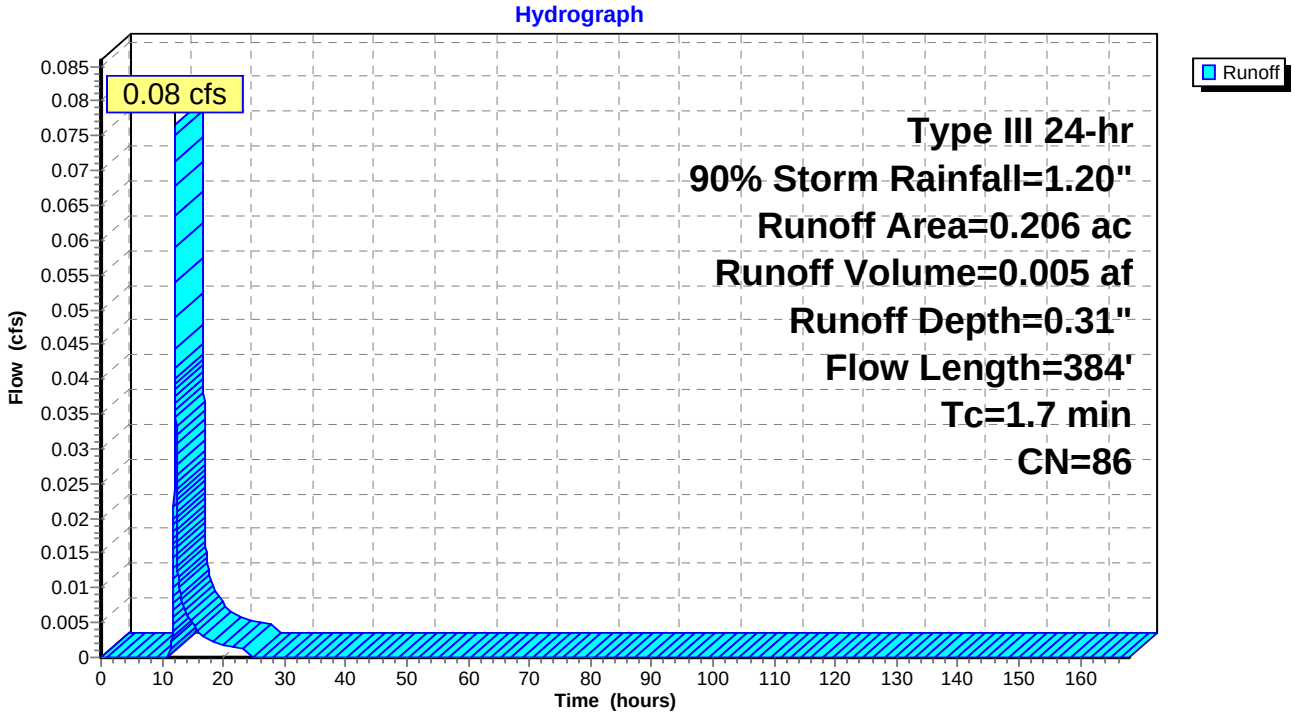
Runoff = 0.08 cfs @ 12.03 hrs, Volume= 0.005 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.099	74	>75% Grass cover, Good, HSG C
	0.098	98	Paved roads w/curbs & sewers, HSG C
*	0.009	89	Gravel Shoulder, HSG C
	0.206	86	Weighted Average
	0.108		52.43% Pervious Area
	0.098		47.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0100	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.75"
0.9	334	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	384	Total			

Subcatchment 23F: PR DA 23F



Summary for Subcatchment 23G: PR DA 23G

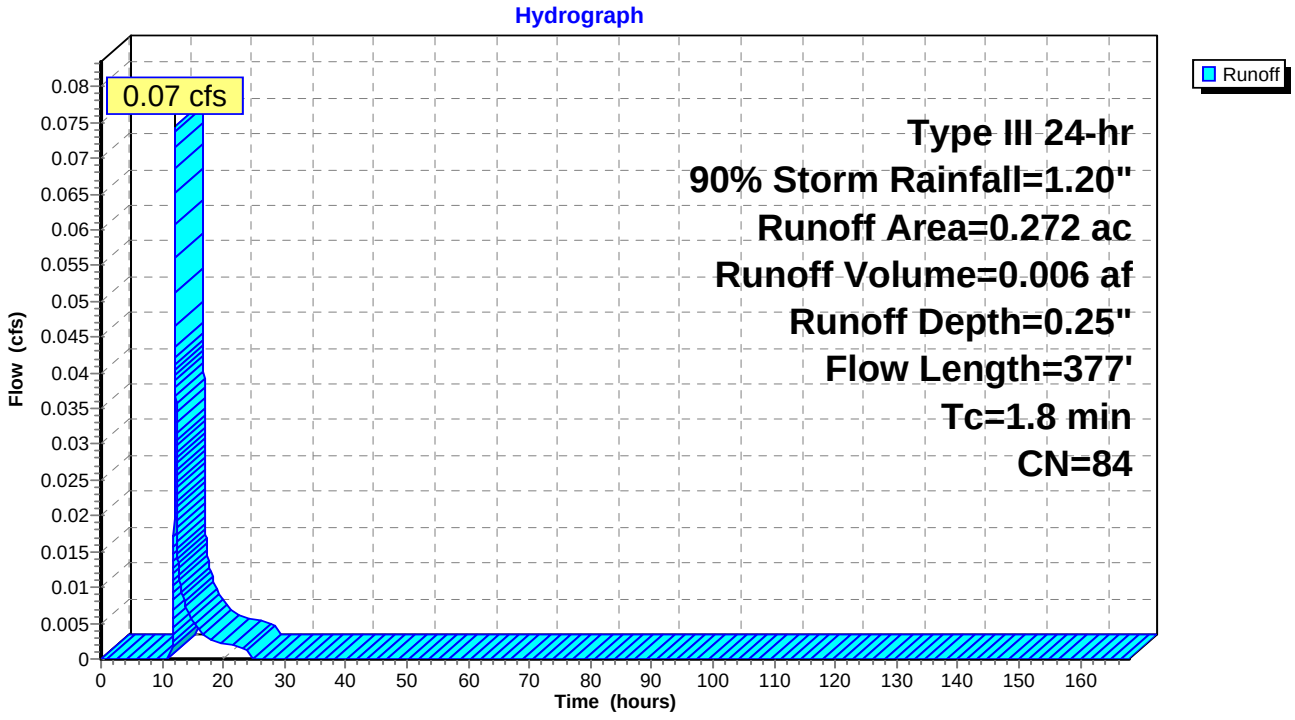
Runoff = 0.07 cfs @ 12.04 hrs, Volume= 0.006 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.146	74	>75% Grass cover, Good, HSG C
	0.107	98	Paved roads w/curbs & sewers, HSG C
*	0.019	89	Gravel Shoulder, HSG C
	0.272	84	Weighted Average
	0.165		60.66% Pervious Area
	0.107		39.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	64	0.0100	1.03		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.5	182	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	131	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	377	Total			

Subcatchment 23G: PR DA 23G



Summary for Subcatchment 23H: PR DA 23H

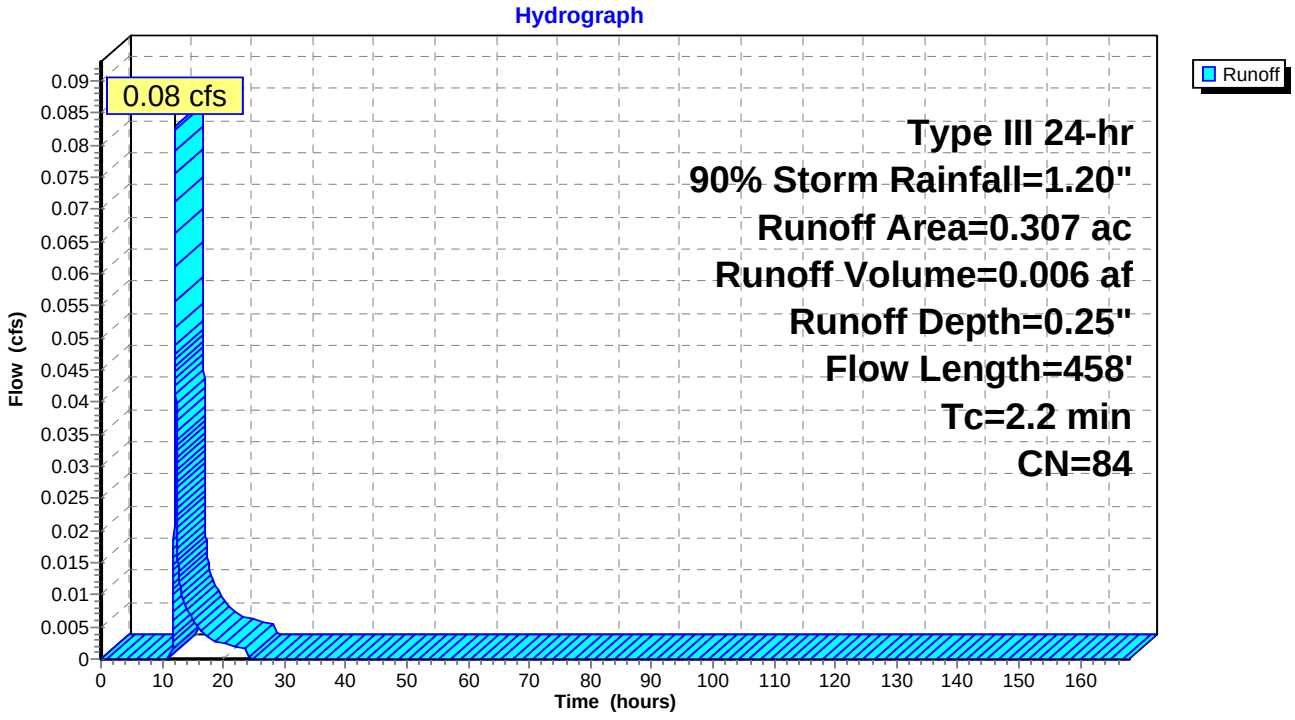
Runoff = 0.08 cfs @ 12.05 hrs, Volume= 0.006 af, Depth= 0.25"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.177	74	>75% Grass cover, Good, HSG C
	0.110	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.307	84	Weighted Average
	0.197		64.17% Pervious Area
	0.110		35.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	83	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	135	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.5	240	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.2	458	Total			

Subcatchment 23H: PR DA 23H



Summary for Subcatchment 23P: PR DA 23P

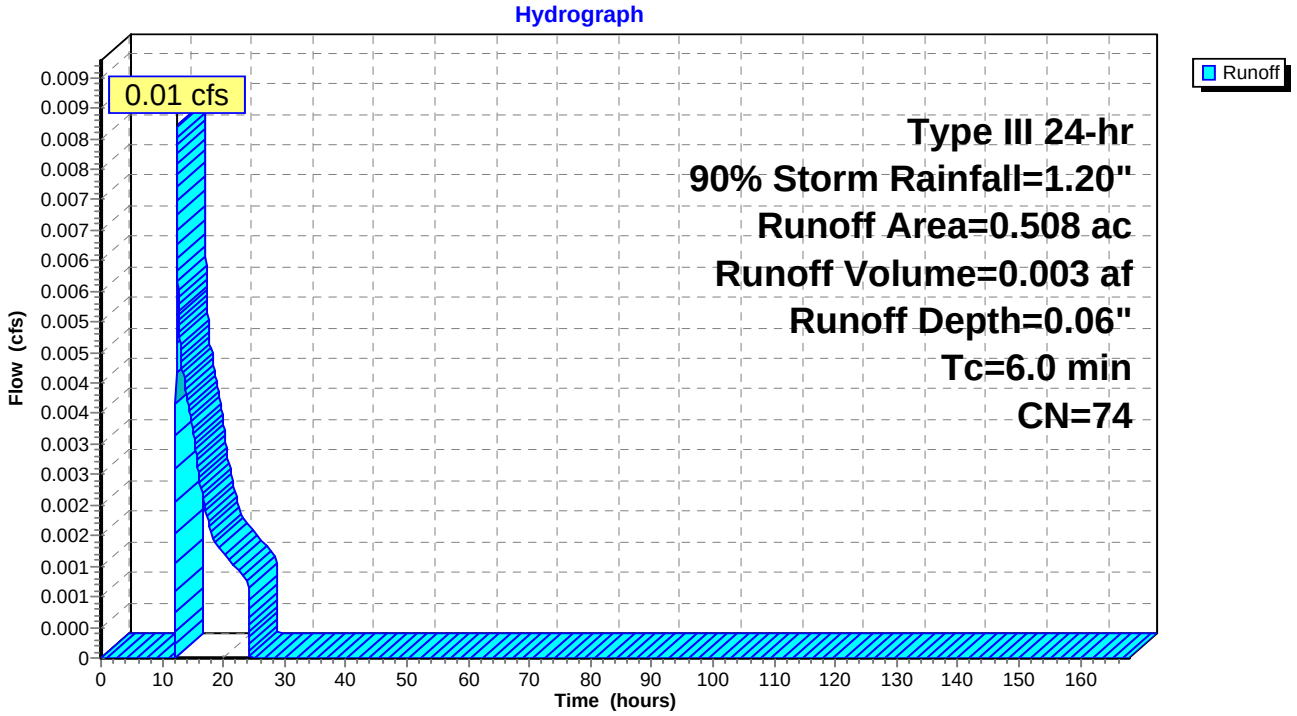
Runoff = 0.01 cfs @ 12.42 hrs, Volume= 0.003 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.508	74	>75% Grass cover, Good, HSG C
0.508		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 23P: PR DA 23P



Summary for Subcatchment 24: PR DA 24

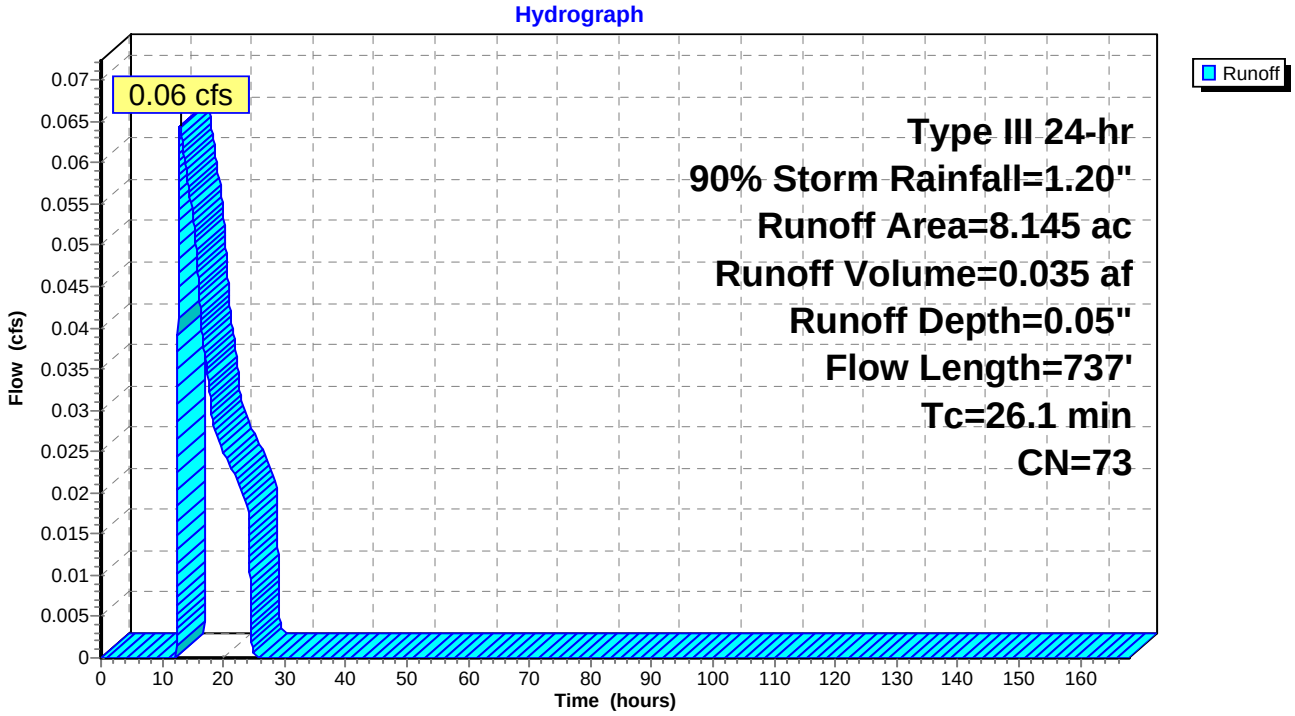
Runoff = 0.06 cfs @ 13.02 hrs, Volume= 0.035 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
4.719	70	Woods, Good, HSG C
0.090	96	Gravel surface, HSG D
3.336	77	Woods, Good, HSG D
8.145	73	Weighted Average
8.145		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	150	0.0533	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
7.6	587	0.0665	1.29		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
26.1	737	Total			

Subcatchment 24: PR DA 24



Summary for Subcatchment 24A-1: PR DA 24A-1

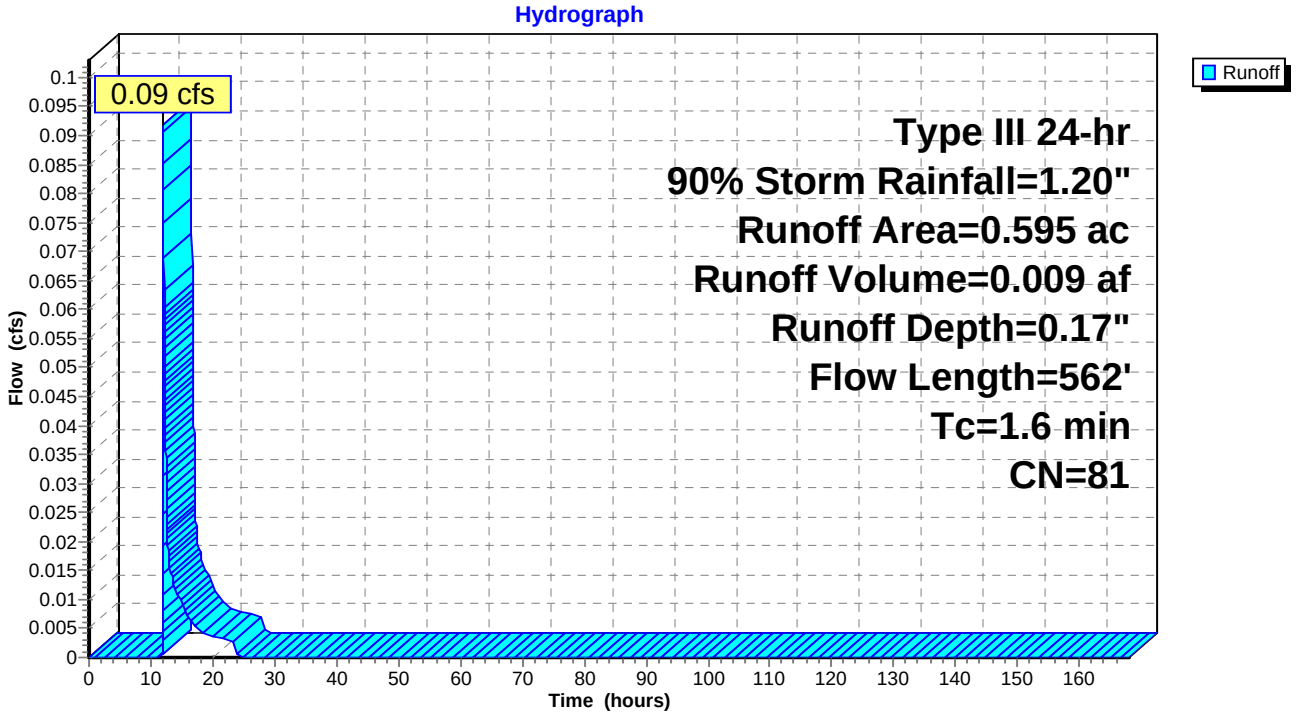
Runoff = 0.09 cfs @ 12.05 hrs, Volume= 0.009 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.003	70	Woods, Good, HSG C
0.411	74	>75% Grass cover, Good, HSG C
0.153	98	Paved roads w/curbs & sewers, HSG C
0.028	89	Gravel roads, HSG C
0.595	81	Weighted Average
0.442		74.29% Pervious Area
0.153		25.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-1: PR DA 24A-1



Summary for Subcatchment 24A-2: PR DA 24A-2

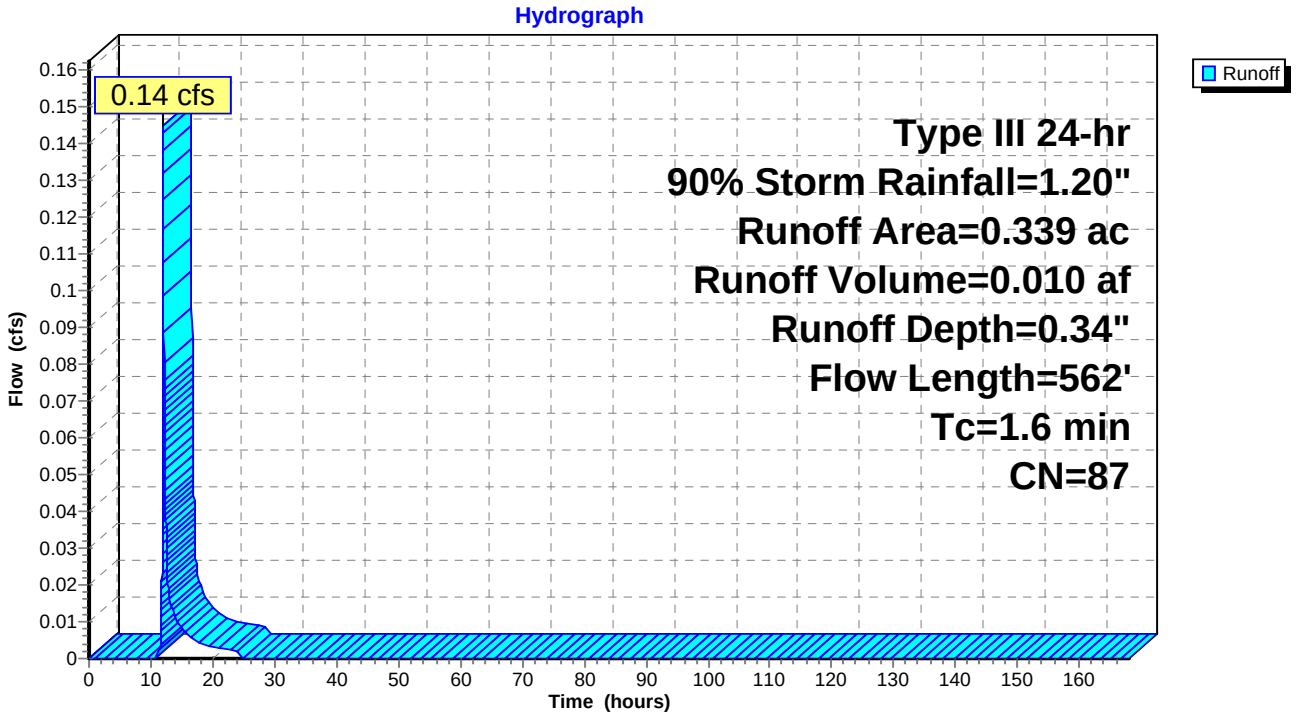
Runoff = 0.14 cfs @ 12.03 hrs, Volume= 0.010 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.053	74	>75% Grass cover, Good, HSG C
0.020	98	Paved roads w/curbs & sewers, HSG C
0.004	89	Gravel roads, HSG C
0.053	96	Gravel surface, HSG D
0.001	77	Woods, Good, HSG D
0.119	80	>75% Grass cover, Good, HSG D
0.075	98	Paved roads w/curbs & sewers, HSG D
0.014	91	Gravel Shoulder, HSG D
0.339	87	Weighted Average
0.244		71.98% Pervious Area
0.095		28.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-2: PR DA 24A-2



Summary for Subcatchment 24A-3: PR DA 24A-3

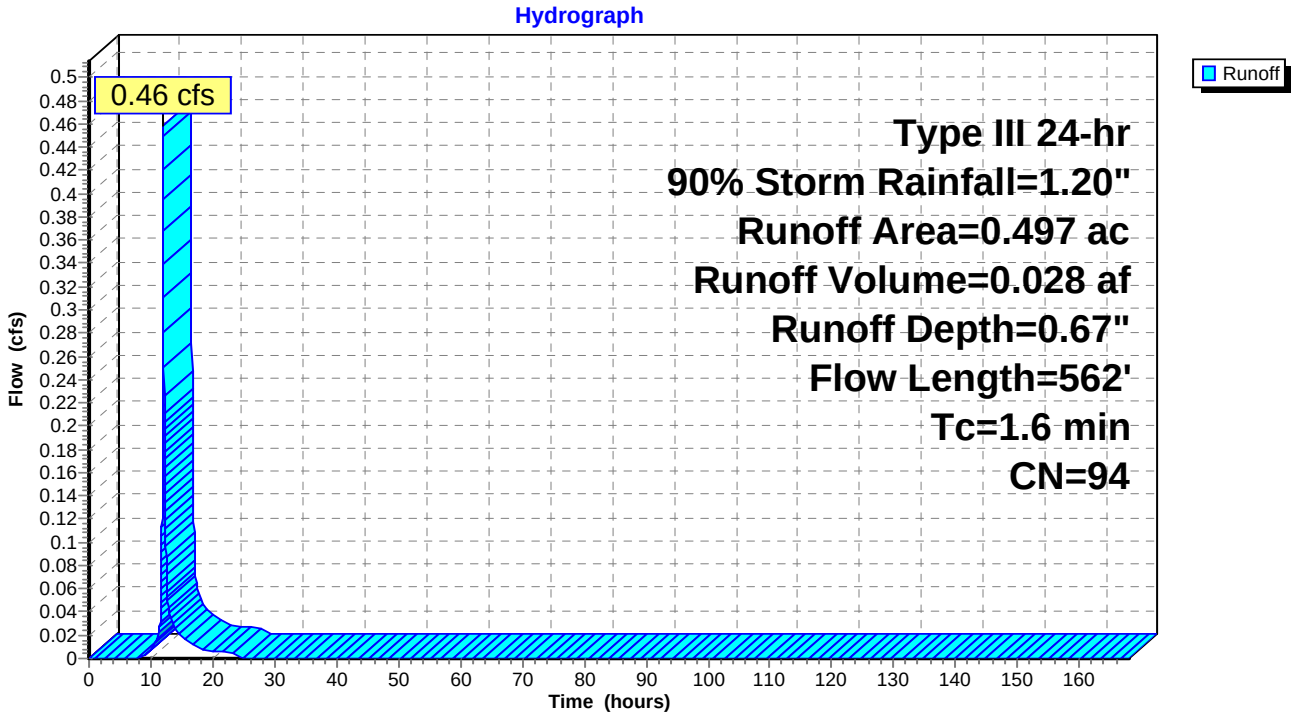
Runoff = 0.46 cfs @ 12.03 hrs, Volume= 0.028 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.282	96	Gravel surface, HSG D
0.028	77	Woods, Good, HSG D
0.026	80	>75% Grass cover, Good, HSG D
0.136	98	Paved roads w/curbs & sewers, HSG D
0.025	91	Gravel Shoulder, HSG D
0.497	94	Weighted Average
0.361		72.64% Pervious Area
0.136		27.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-3: PR DA 24A-3



Summary for Subcatchment 24A-4: PR DA 24A-4

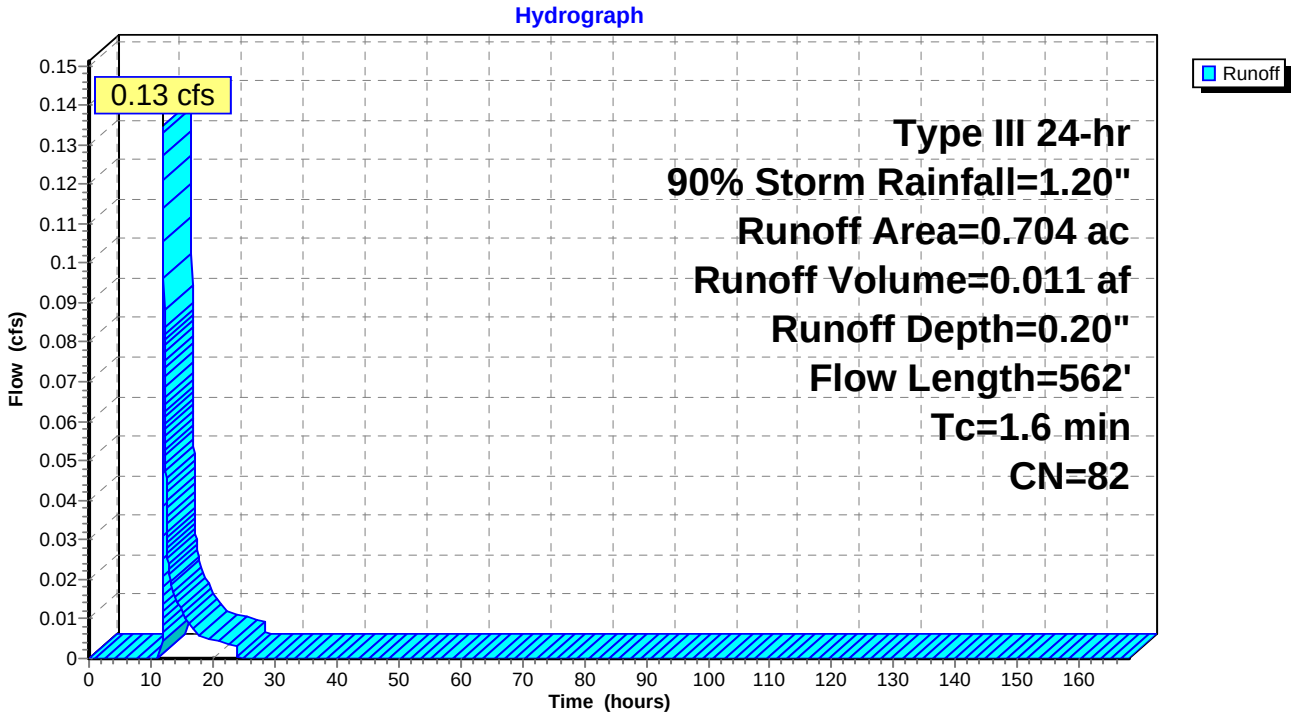
Runoff = 0.13 cfs @ 12.04 hrs, Volume= 0.011 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.127	74	>75% Grass cover, Good, HSG C
0.017	98	Paved roads w/curbs & sewers, HSG C
0.003	89	Gravel roads, HSG C
0.005	96	Gravel surface, HSG D
0.222	77	Woods, Good, HSG D
0.193	80	>75% Grass cover, Good, HSG D
0.115	98	Paved roads w/curbs & sewers, HSG D
0.021	91	Gravel Shoulder, HSG D
0.704	82	Weighted Average
0.572		81.25% Pervious Area
0.132		18.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-4: PR DA 24A-4



Summary for Subcatchment 24B-1: PR DA 24B-1

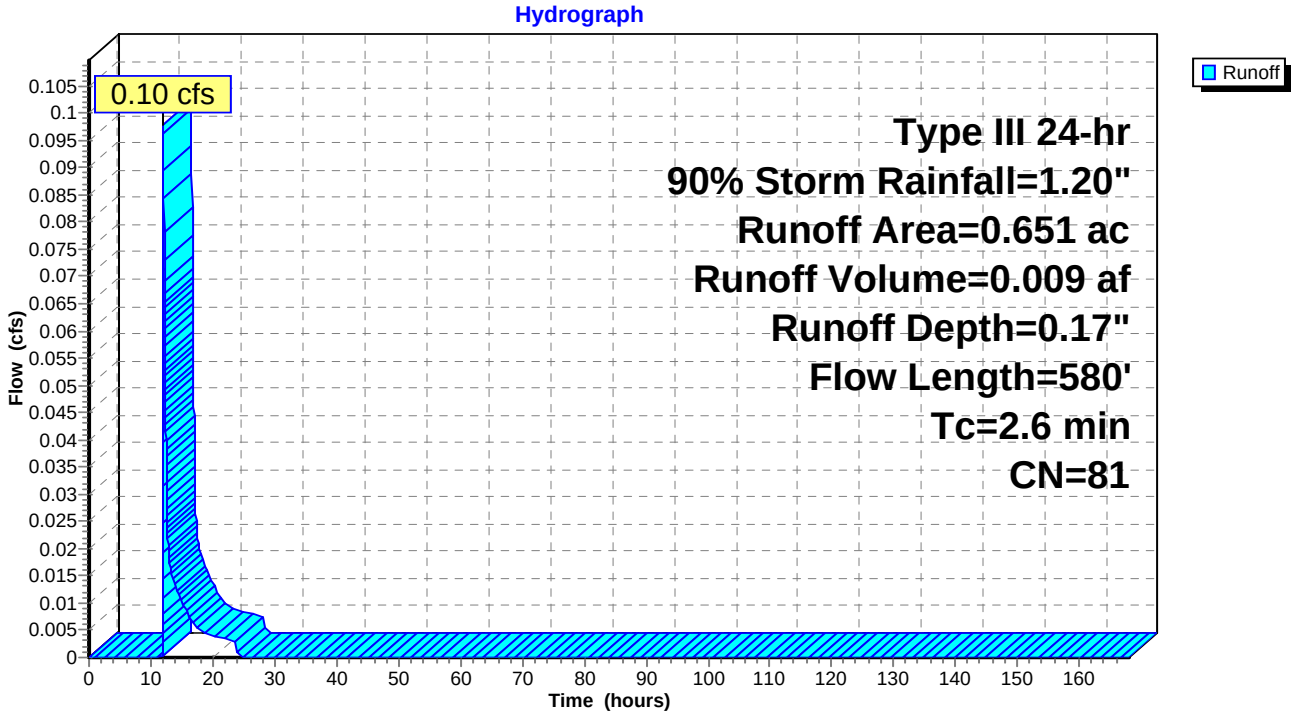
Runoff = 0.10 cfs @ 12.07 hrs, Volume= 0.009 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.455	74	>75% Grass cover, Good, HSG C
0.165	98	Paved roads w/curbs & sewers, HSG C
0.030	89	Gravel Shoulder, HSG C
0.651	81	Weighted Average
0.486		74.65% Pervious Area
0.165		25.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-1: PR DA 24B-1



Summary for Subcatchment 24B-2: PR DA 24B-2

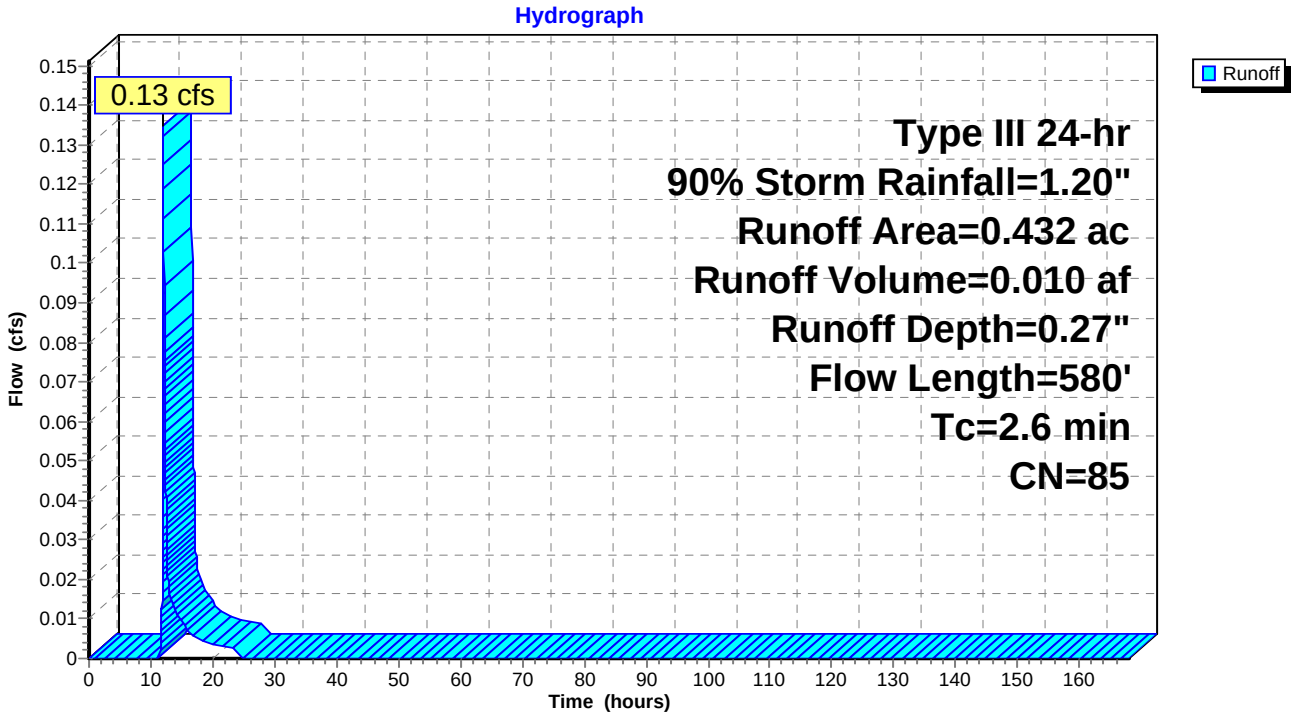
Runoff = 0.13 cfs @ 12.05 hrs, Volume= 0.010 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.114	74	>75% Grass cover, Good, HSG C
0.038	98	Paved roads w/curbs & sewers, HSG C
0.007	89	Gravel Shoulder, HSG C
0.065	96	Gravel surface, HSG D
0.006	77	Woods, Good, HSG D
0.129	80	>75% Grass cover, Good, HSG D
0.061	98	Paved roads w/curbs & sewers, HSG D
0.011	91	Gravel Shoulder, HSG D
0.432	85	Weighted Average
0.333		77.08% Pervious Area
0.099		22.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-2: PR DA 24B-2



Summary for Subcatchment 24B-3: PR DA 24B-3

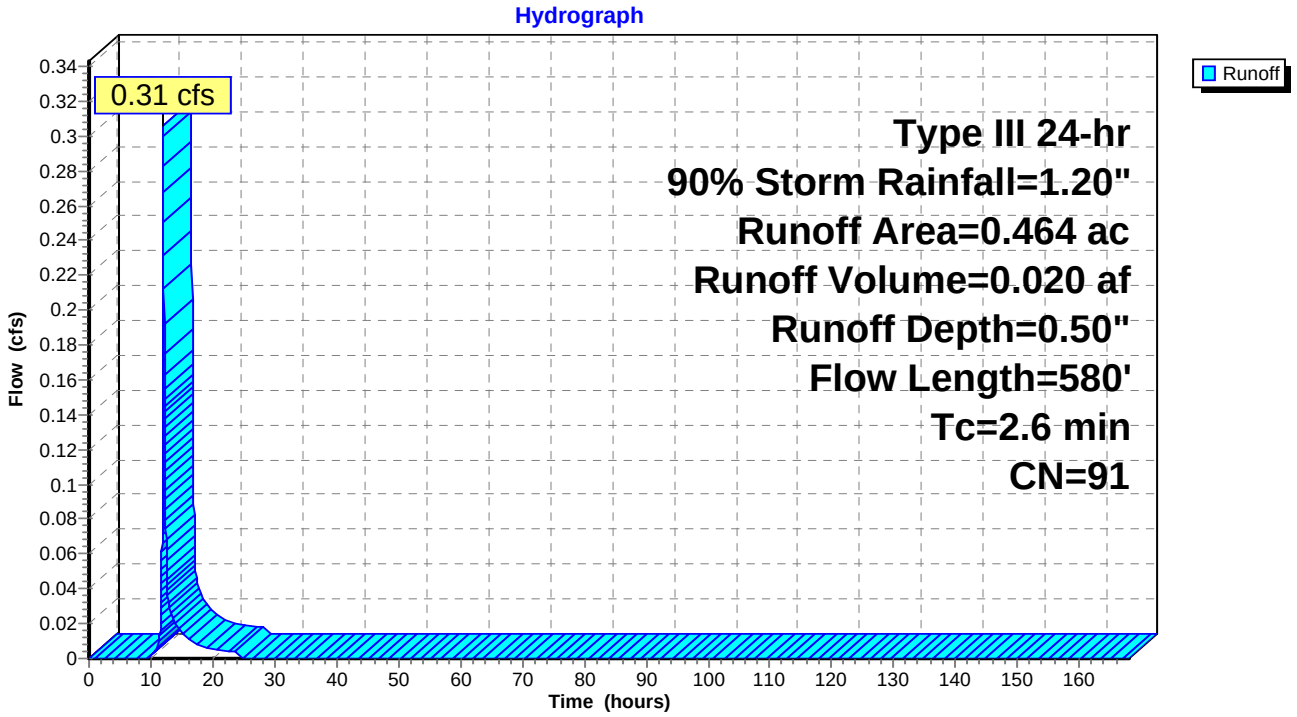
Runoff = 0.31 cfs @ 12.04 hrs, Volume= 0.020 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.003	70	Woods, Good, HSG C
0.106	74	>75% Grass cover, Good, HSG C
0.105	98	Paved roads w/curbs & sewers, HSG C
0.019	89	Gravel Shoulder, HSG C
0.231	96	Gravel surface, HSG D
0.464	91	Weighted Average
0.359		77.37% Pervious Area
0.105		22.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-3: PR DA 24B-3



Summary for Subcatchment 24B-4: PR DA 24B-4

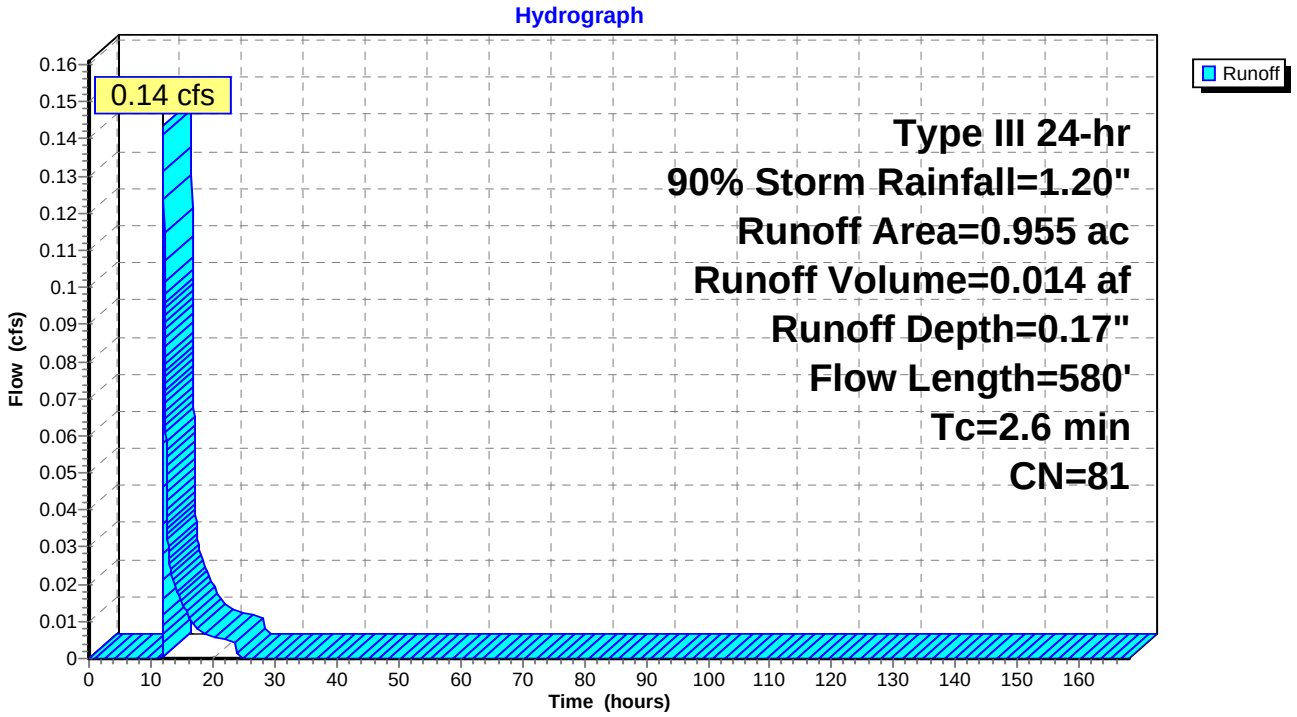
Runoff = 0.14 cfs @ 12.07 hrs, Volume= 0.014 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.007	70	Woods, Good, HSG C
0.480	74	>75% Grass cover, Good, HSG C
0.126	98	Paved roads w/curbs & sewers, HSG C
0.023	89	Gravel Shoulder, HSG C
0.011	96	Gravel surface, HSG D
0.003	77	Woods, Good, HSG D
0.231	80	>75% Grass cover, Good, HSG D
0.063	98	Paved roads w/curbs & sewers, HSG D
0.011	91	Gravel Shoulder, HSG D
0.955	81	Weighted Average
0.766		80.21% Pervious Area
0.189		19.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-4: PR DA 24B-4



Summary for Subcatchment 24C: PR DA 24C

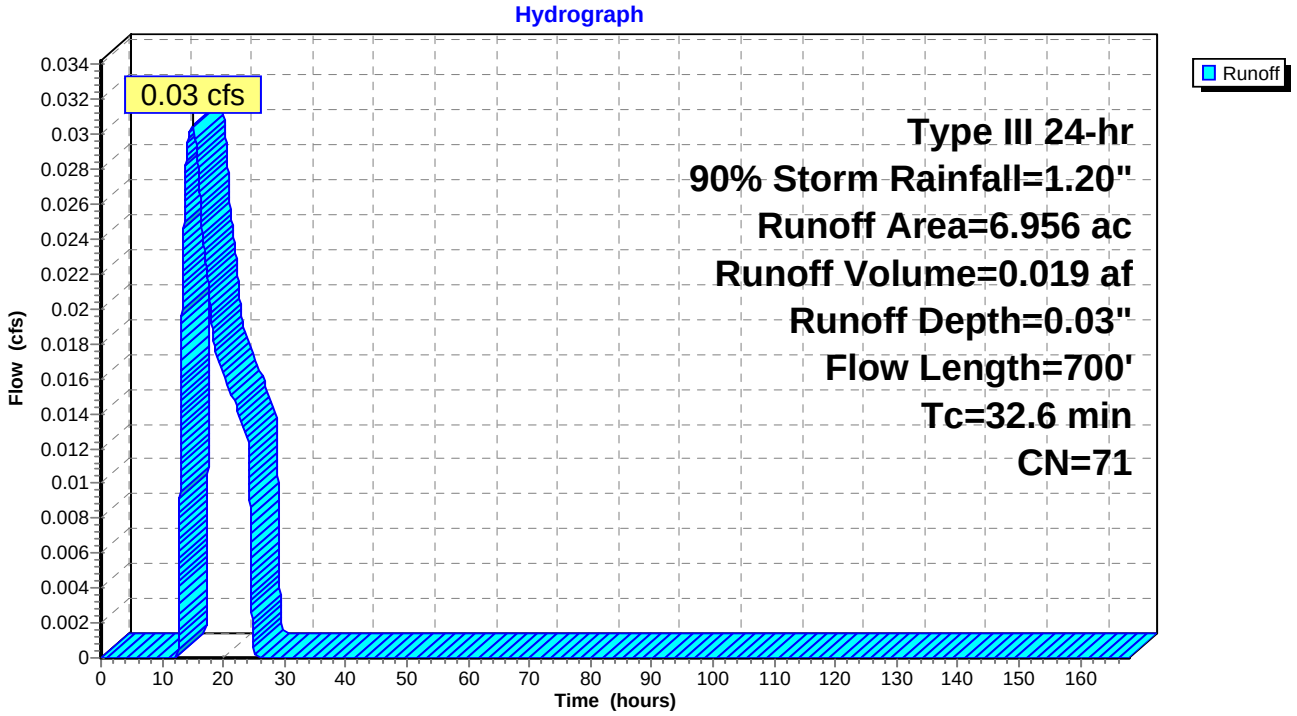
Runoff = 0.03 cfs @ 14.96 hrs, Volume= 0.019 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
6.012	70	Woods, Good, HSG C
0.002	96	Gravel surface, HSG D
0.942	77	Woods, Good, HSG D
6.956	71	Weighted Average
6.956		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	150	0.0270	0.10		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
8.3	550	0.0490	1.11		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
32.6	700	Total			

Subcatchment 24C: PR DA 24C



Summary for Subcatchment 24P: 24P

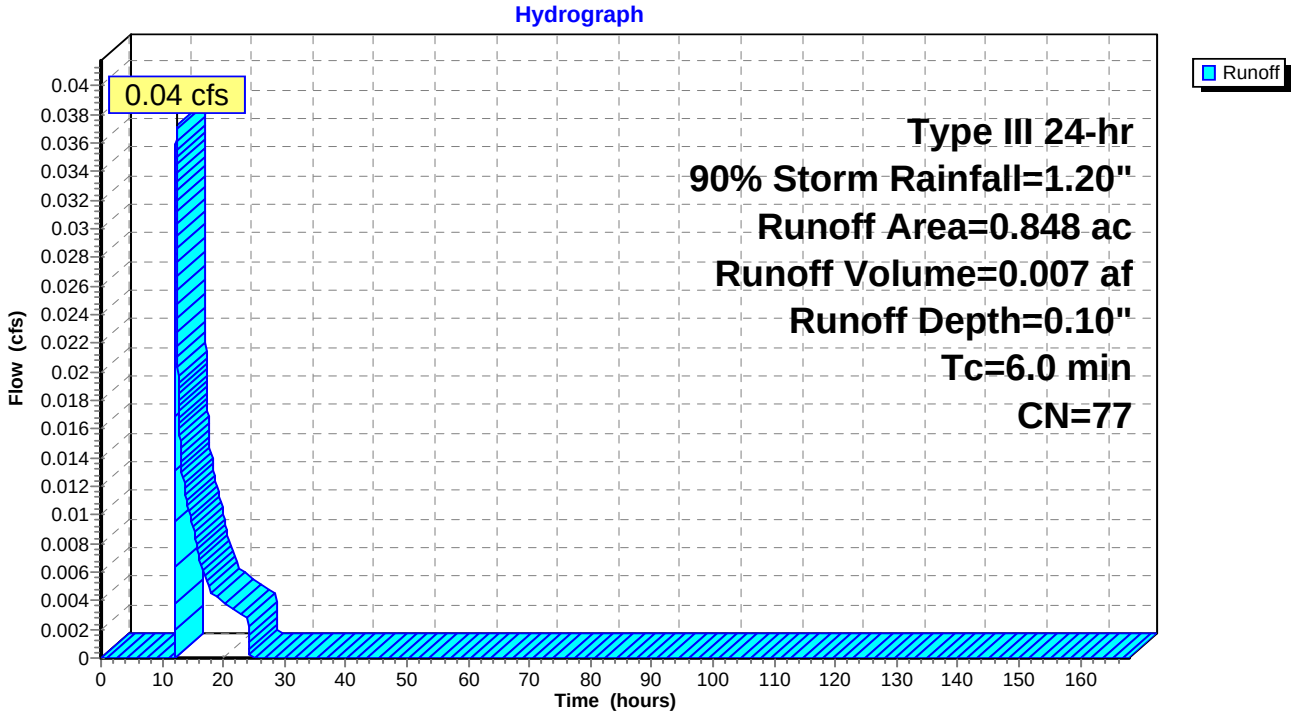
Runoff = 0.04 cfs @ 12.32 hrs, Volume= 0.007 af, Depth= 0.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.007	70	Woods, Good, HSG C
0.841	77	Woods, Good, HSG D
0.848	77	Weighted Average
0.848		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct**

Subcatchment 24P: 24P



Summary for Subcatchment 25: PR DA 25

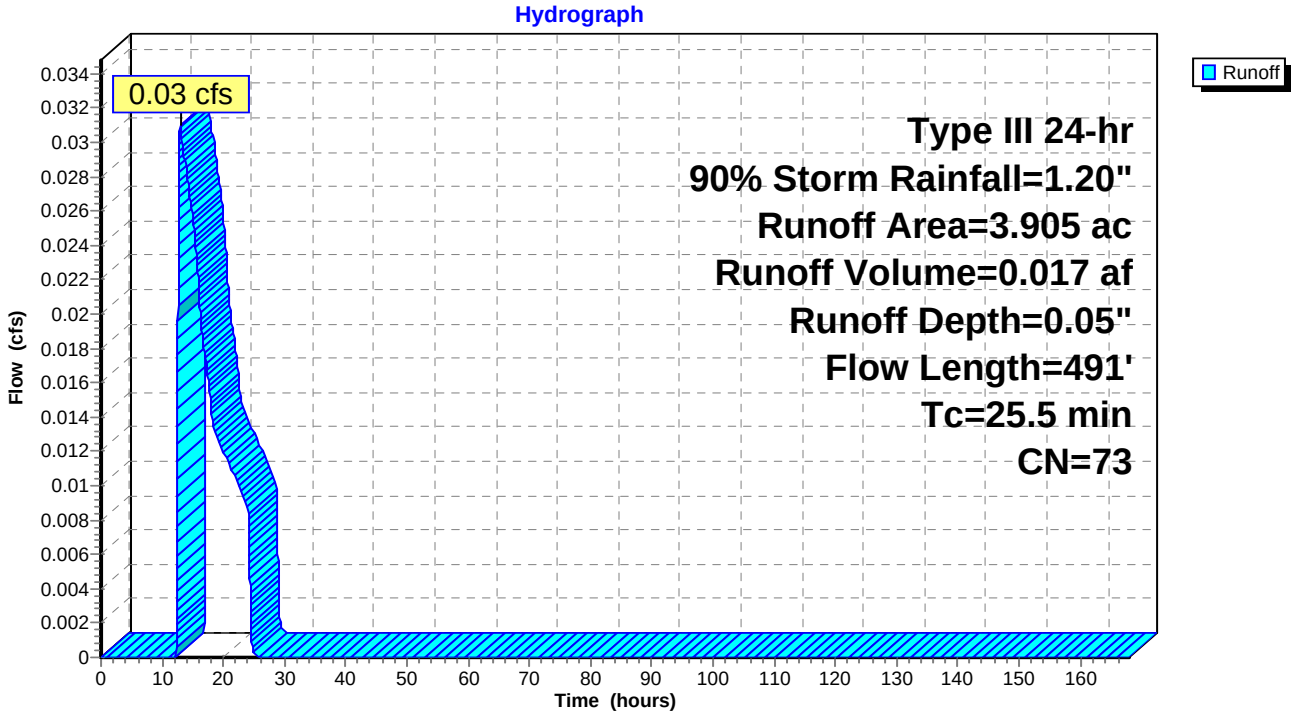
Runoff = 0.03 cfs @ 13.00 hrs, Volume= 0.017 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
2.432	70	Woods, Good, HSG C
1.473	77	Woods, Good, HSG D
3.905	73	Weighted Average
3.905		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.8	100	0.0200	0.08		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
5.2	246	0.0244	0.78		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.5	145	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
25.5	491	Total			

Subcatchment 25: PR DA 25



Summary for Subcatchment 25A-1: PR DA 25A-1

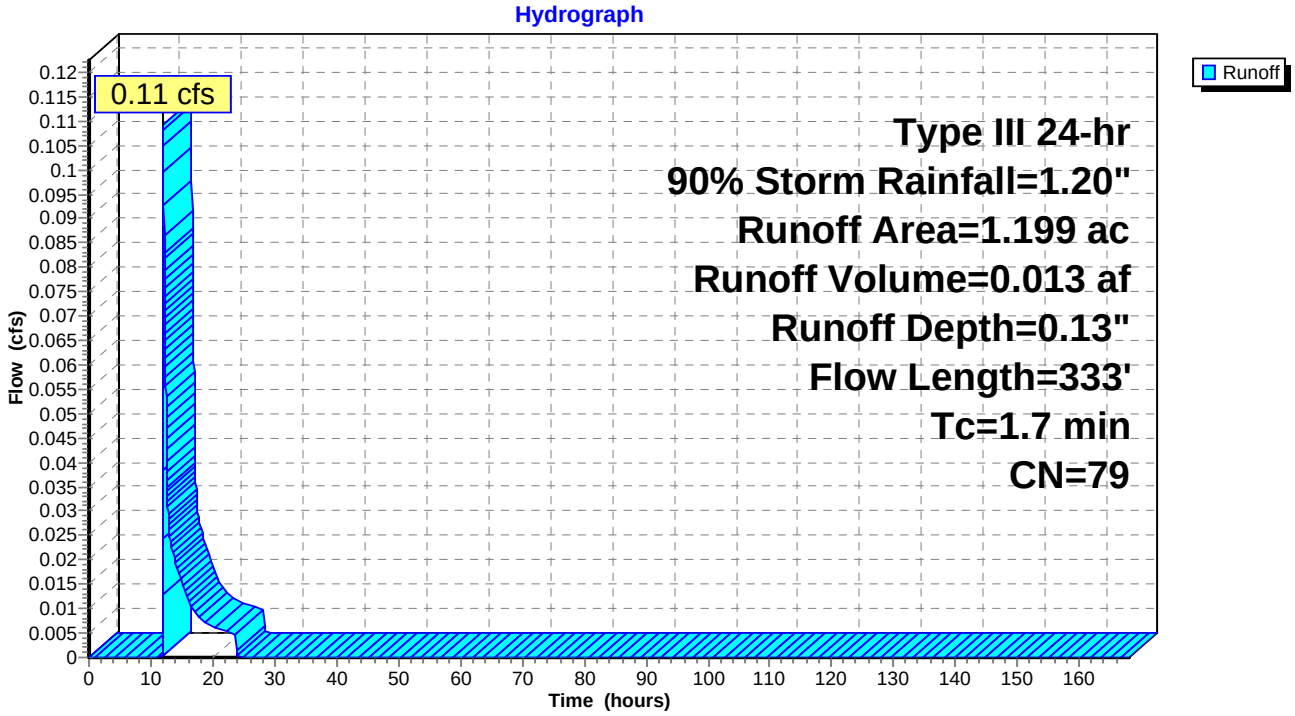
Runoff = 0.11 cfs @ 12.07 hrs, Volume= 0.013 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.303	70	Woods, Good, HSG C
0.562	74	>75% Grass cover, Good, HSG C
0.281	98	Paved roads w/curbs & sewers, HSG C
0.045	89	Gravel Shoulder, HSG C
0.008	77	Woods, Good, HSG D
1.199	79	Weighted Average
0.918		76.56% Pervious Area
0.281		23.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	65	0.0200	1.37		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.9	268	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	333	Total			

Subcatchment 25A-1: PR DA 25A-1



Summary for Subcatchment 25A-2: PR DA 25A-2

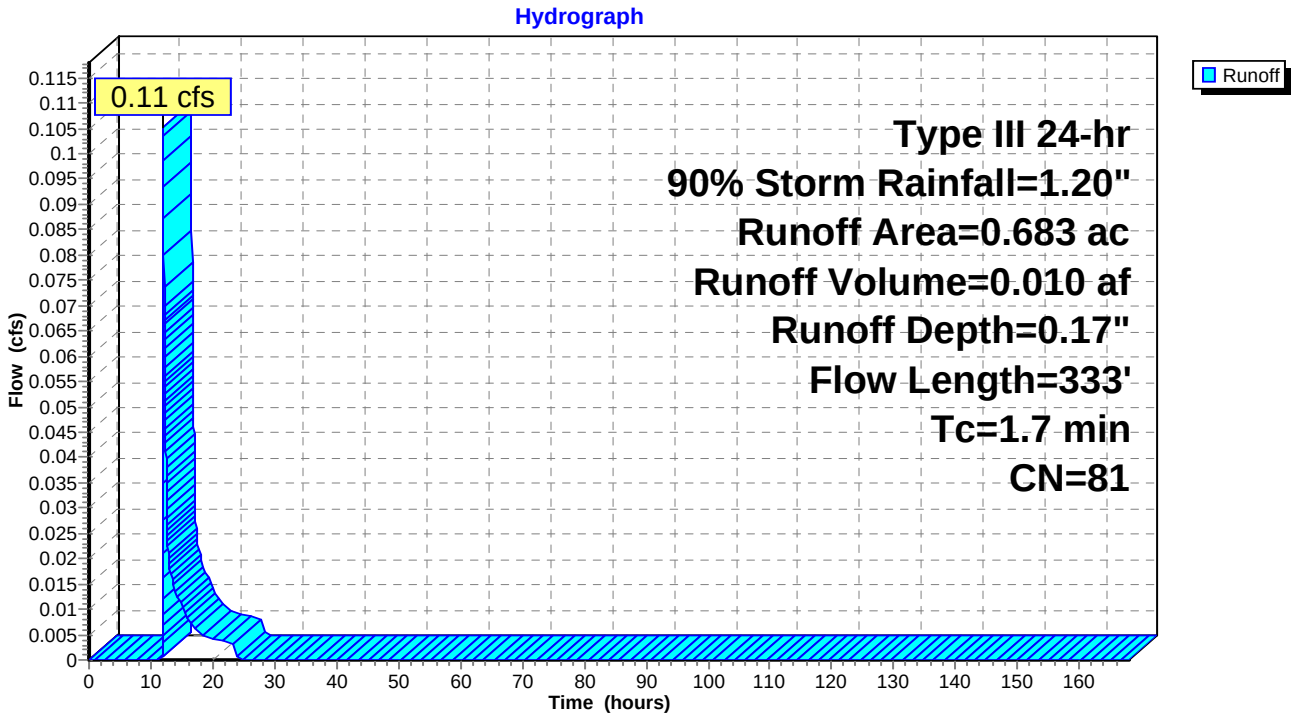
Runoff = 0.11 cfs @ 12.05 hrs, Volume= 0.010 af, Depth= 0.17"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.177	70	Woods, Good, HSG C
0.258	74	>75% Grass cover, Good, HSG C
0.219	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.683	81	Weighted Average
0.464		67.94% Pervious Area
0.219		32.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	65	0.0200	1.37		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.9	268	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	333	Total			

Subcatchment 25A-2: PR DA 25A-2



Summary for Subcatchment 25B-1: PR DA 25B-1

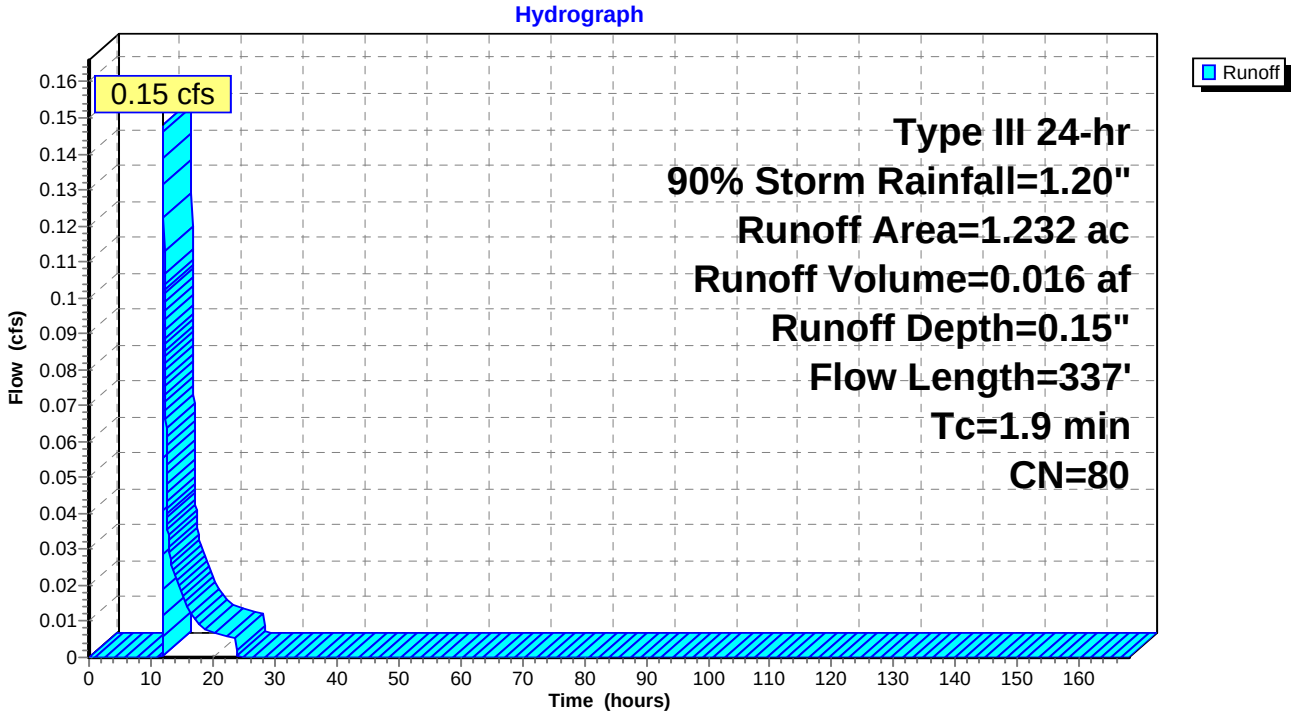
Runoff = 0.15 cfs @ 12.06 hrs, Volume= 0.016 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.922	74	>75% Grass cover, Good, HSG C
0.262	98	Paved roads w/curbs & sewers, HSG C
0.048	89	Gravel Shoulder, HSG C
1.232	80	Weighted Average
0.970		78.73% Pervious Area
0.262		21.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	237	0.0127	4.73	38.82	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.9	337	Total			

Subcatchment 25B-1: PR DA 25B-1



Summary for Subcatchment 25B-2: PR DA 25B-2

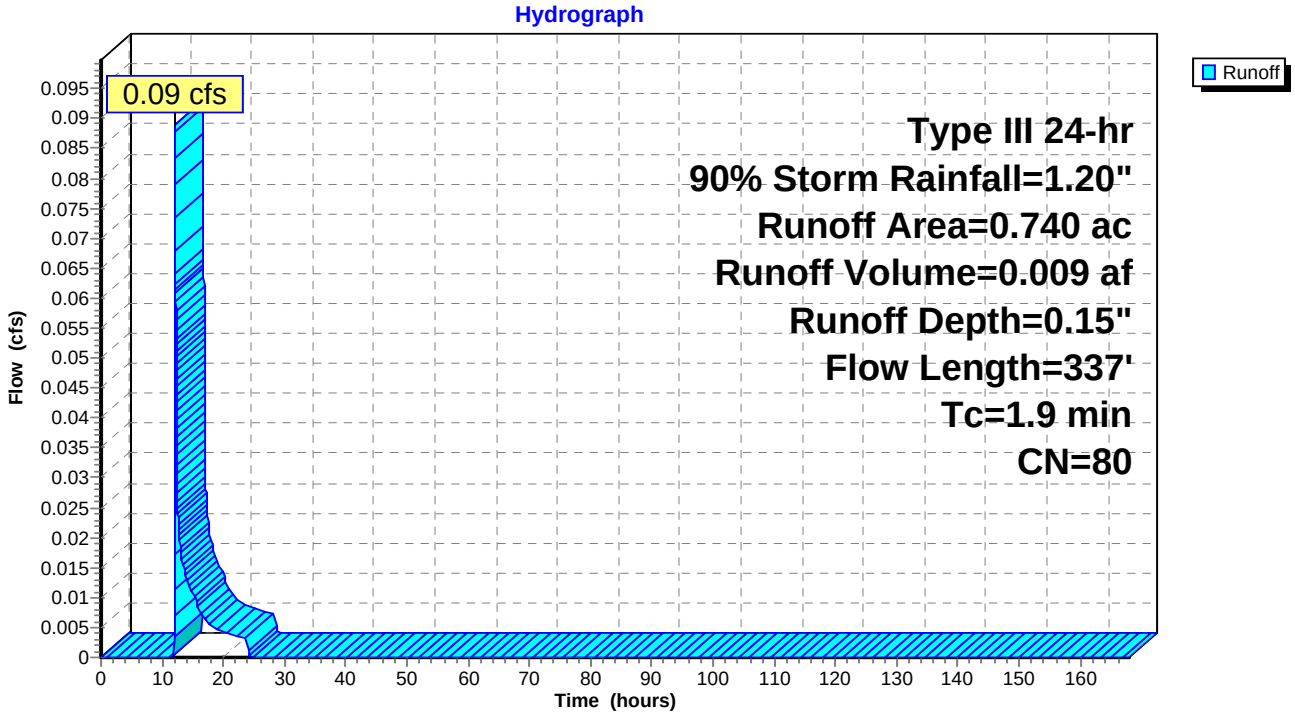
Runoff = 0.09 cfs @ 12.06 hrs, Volume= 0.009 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.538	74	>75% Grass cover, Good, HSG C
0.171	98	Paved roads w/curbs & sewers, HSG C
0.031	89	Gravel Shoulder, HSG C
0.740	80	Weighted Average
0.569		76.89% Pervious Area
0.171		23.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	237	0.0127	4.73	38.82	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.9	337	Total			

Subcatchment 25B-2: PR DA 25B-2



Summary for Subcatchment 25C: PR DA 25C

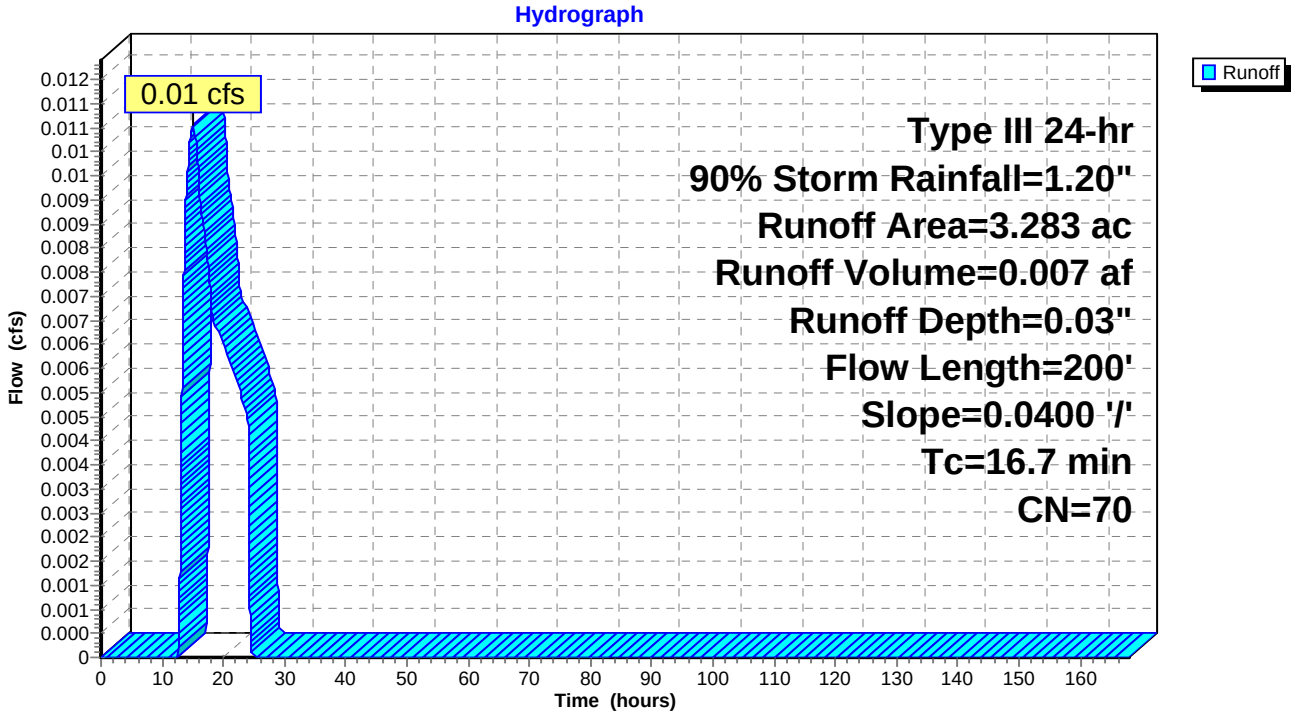
Runoff = 0.01 cfs @ 15.05 hrs, Volume= 0.007 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.023	71	Meadow, non-grazed, HSG C
3.126	70	Woods, Good, HSG C
0.013	78	Meadow, non-grazed, HSG D
0.121	77	Woods, Good, HSG D
3.283	70	Weighted Average
3.283		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0400	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
1.7	100	0.0400	1.00		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
16.7	200	Total			

Subcatchment 25C: PR DA 25C



Summary for Subcatchment 25D: PR DA 25D

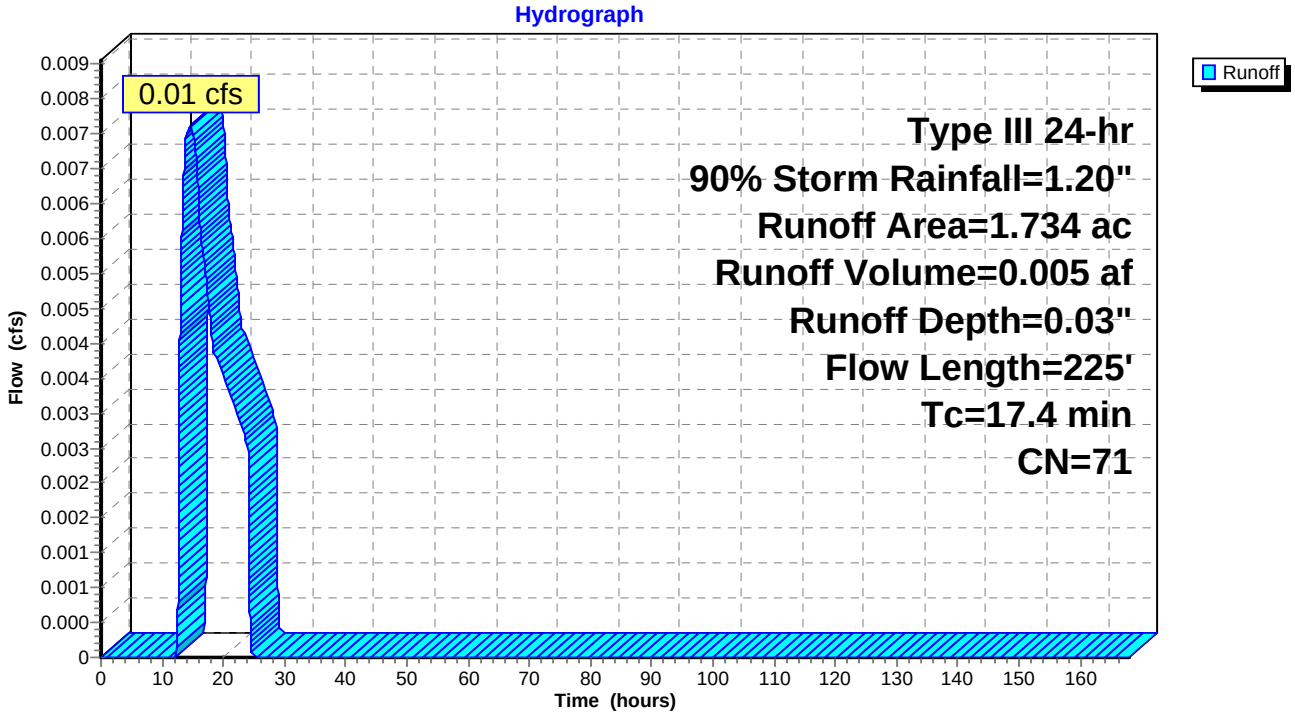
Runoff = 0.01 cfs @ 14.75 hrs, Volume= 0.005 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.543	71	Meadow, non-grazed, HSG C
1.095	70	Woods, Good, HSG C
0.093	78	Meadow, non-grazed, HSG D
0.003	77	Woods, Good, HSG D
1.734	71	Weighted Average
1.734		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0400	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
2.4	125	0.0300	0.87		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
17.4	225	Total			

Subcatchment 25D: PR DA 25D



Summary for Subcatchment 26: PR DA 26

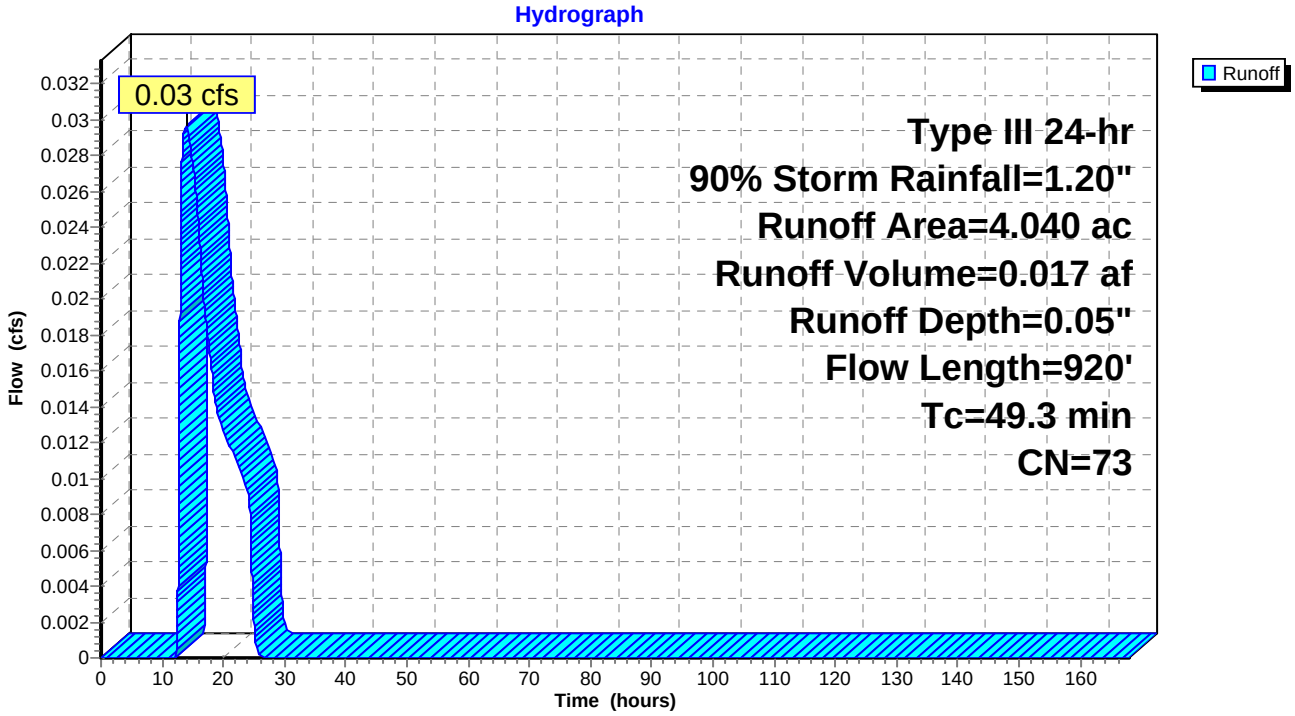
Runoff = 0.03 cfs @ 13.97 hrs, Volume= 0.017 af, Depth= 0.05"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.005	71	Meadow, non-grazed, HSG C
2.022	70	Woods, Good, HSG C
2.013	77	Woods, Good, HSG D
4.040	73	Weighted Average
4.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
13.1	770	0.0384	0.98		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
49.3	920	Total			

Subcatchment 26: PR DA 26



Summary for Subcatchment 26A-1: PR DA 26A-1

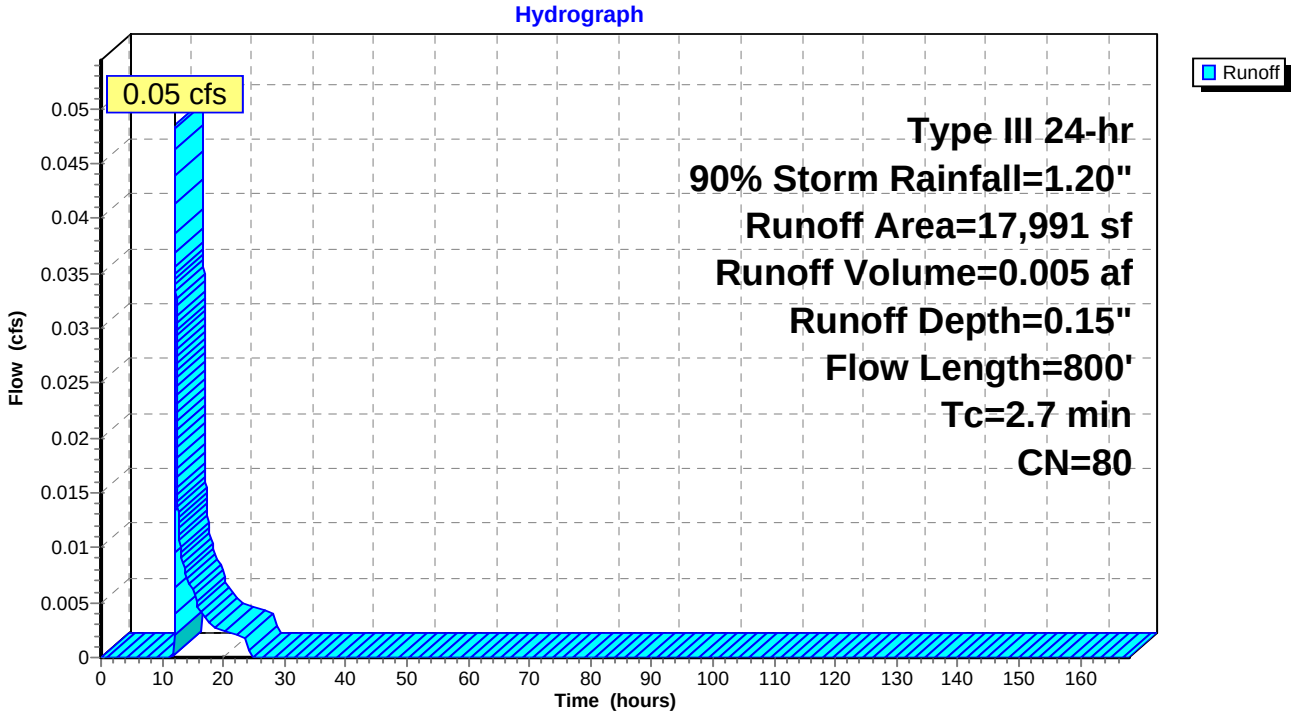
Runoff = 0.05 cfs @ 12.08 hrs, Volume= 0.005 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (sf)	CN	Description
	4,879	70	Woods, Good, HSG C
	7,312	74	>75% Grass cover, Good, HSG C
	4,885	98	Paved roads w/curbs & sewers, HSG C
*	915	89	Gravel Shoulder, HSG C
	17,991	80	Weighted Average
	13,106		72.85% Pervious Area
	4,885		27.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-1: PR DA 26A-1



Summary for Subcatchment 26A-2: PR DA 26A-2

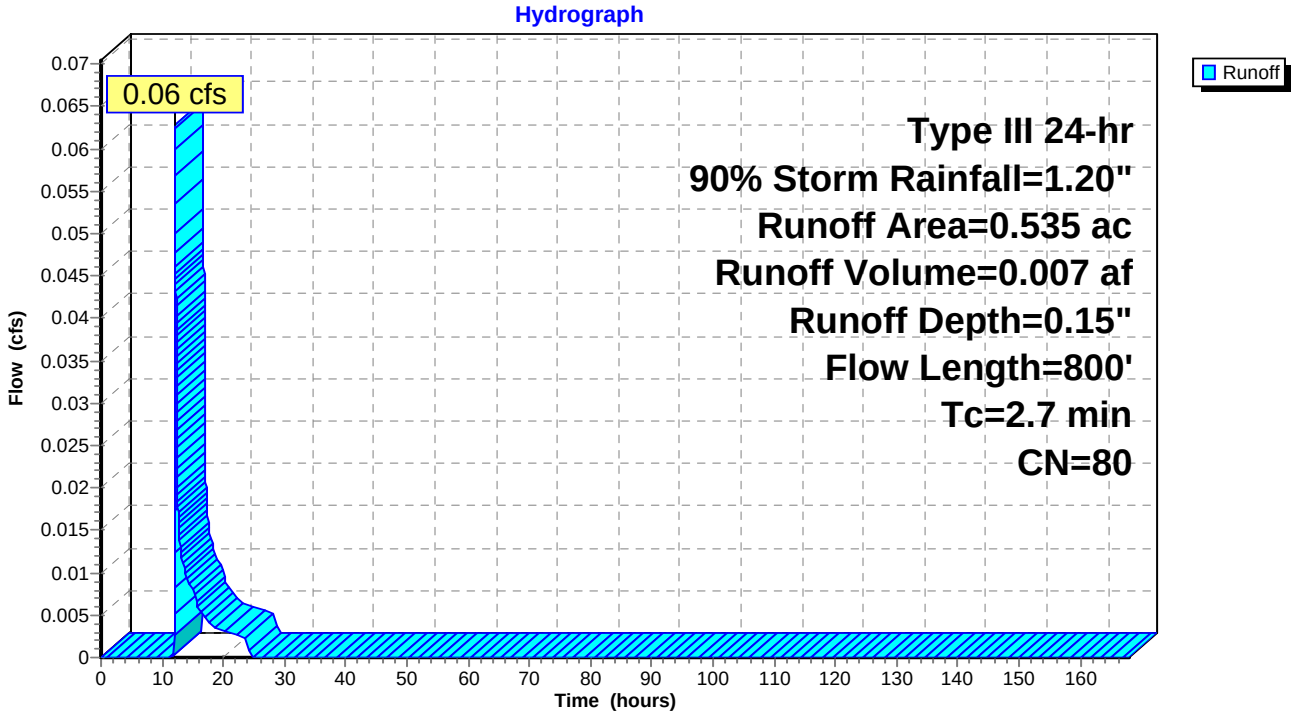
Runoff = 0.06 cfs @ 12.08 hrs, Volume= 0.007 af, Depth= 0.15"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.146	70	Woods, Good, HSG C
	0.222	74	>75% Grass cover, Good, HSG C
	0.140	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.535	80	Weighted Average
	0.395		73.83% Pervious Area
	0.140		26.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-2: PR DA 26A-2



Summary for Subcatchment 26A-3: PR DA 26A-3

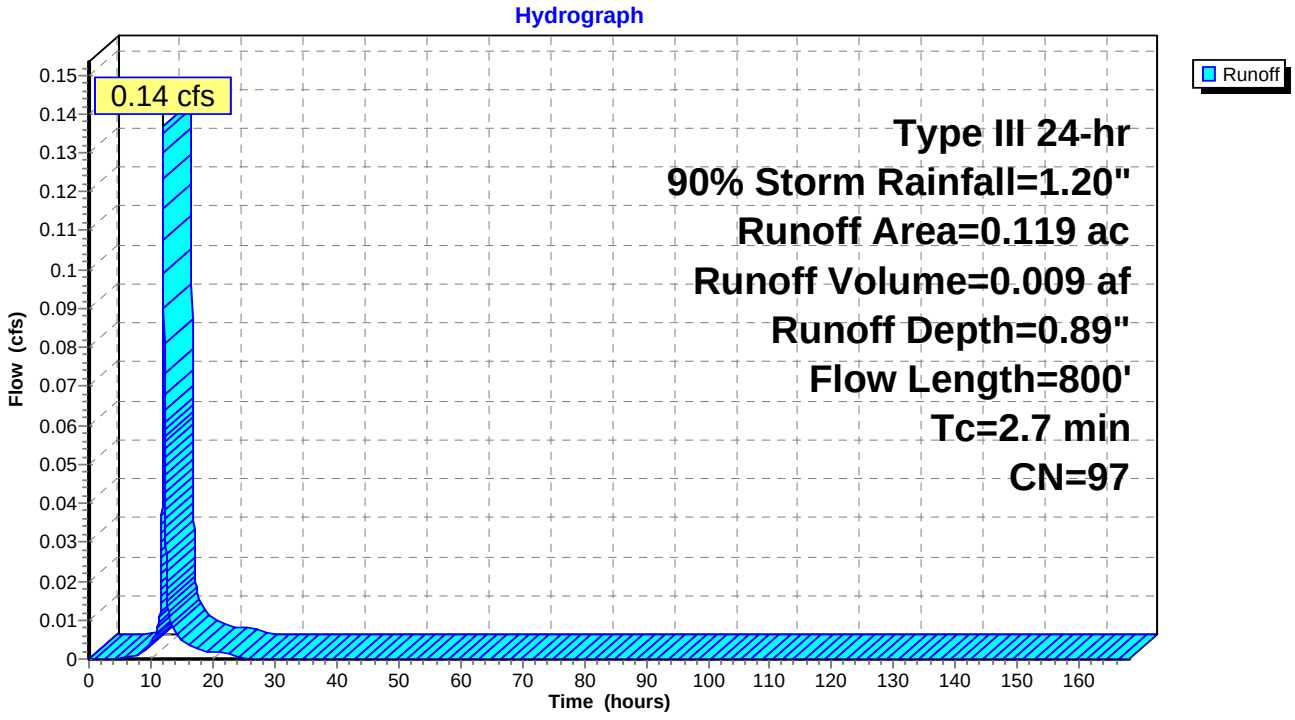
Runoff = 0.14 cfs @ 12.04 hrs, Volume= 0.009 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.005	74	>75% Grass cover, Good, HSG C
	0.111	98	Paved roads w/curbs & sewers, HSG C
*	0.003	89	Gravel Shoulder, HSG C
	0.119	97	Weighted Average
	0.008		6.72% Pervious Area
	0.111		93.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-3: PR DA 26A-3



Summary for Subcatchment 26B-1: PR DA 26B-1

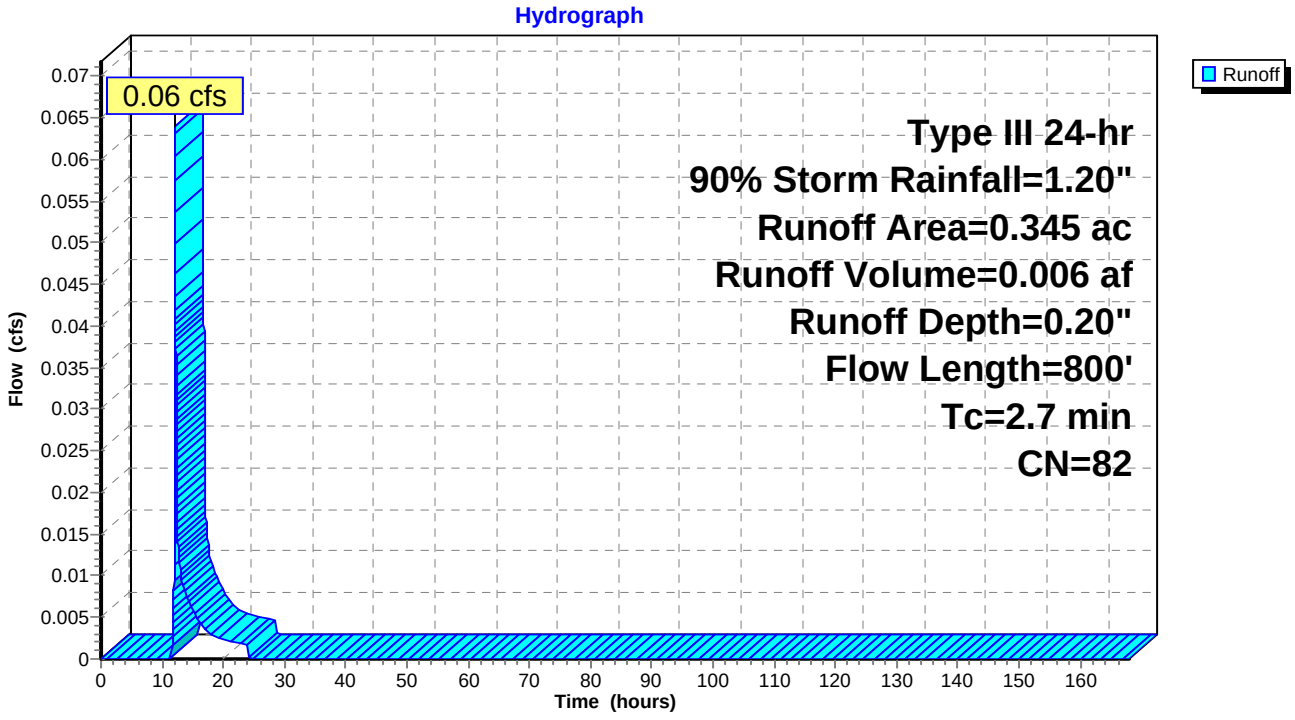
Runoff = 0.06 cfs @ 12.06 hrs, Volume= 0.006 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.228	74	>75% Grass cover, Good, HSG C
	0.098	98	Paved roads w/curbs & sewers, HSG C
*	0.019	89	Gravel Shoulder, HSG C
	0.345	82	Weighted Average
	0.247		71.59% Pervious Area
	0.098		28.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-1: PR DA 26B-1



Summary for Subcatchment 26B-2: PR DA 26B-2

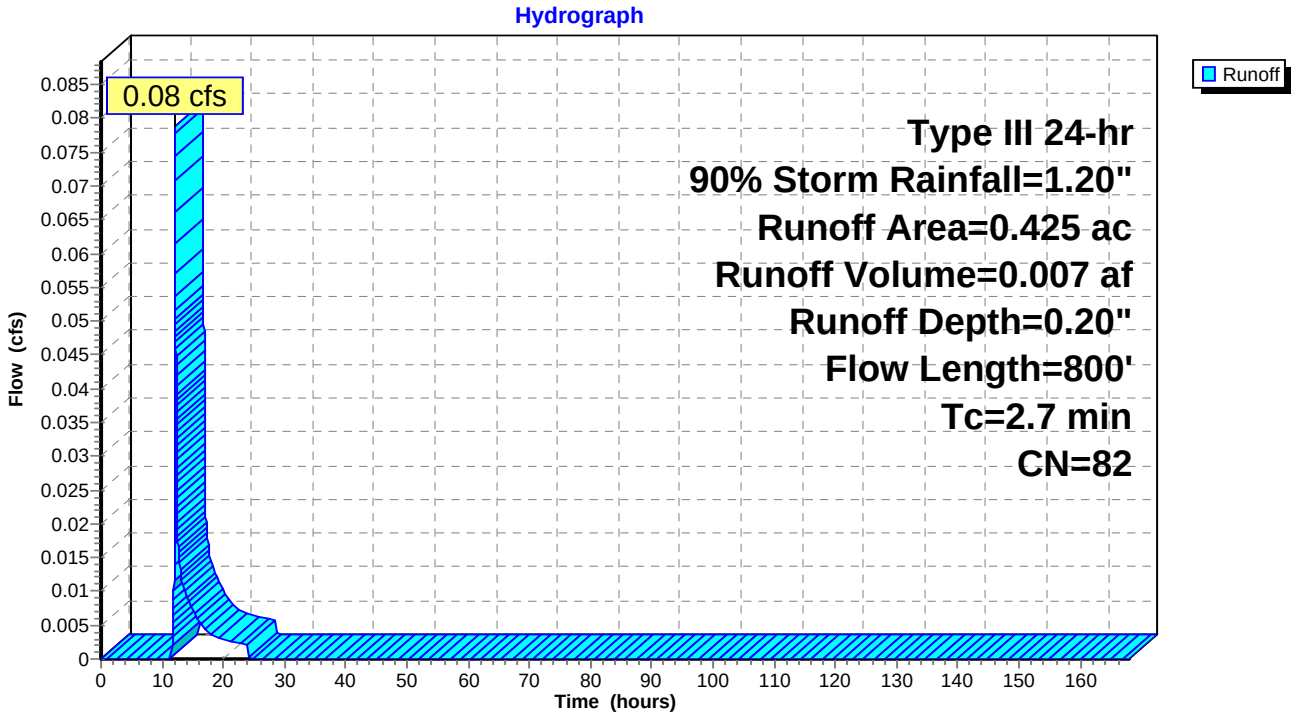
Runoff = 0.08 cfs @ 12.06 hrs, Volume= 0.007 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.281	74	>75% Grass cover, Good, HSG C
	0.121	98	Paved roads w/curbs & sewers, HSG C
*	0.023	89	Gravel Shoulder, HSG C
	0.425	82	Weighted Average
	0.304		71.53% Pervious Area
	0.121		28.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-2: PR DA 26B-2



Summary for Subcatchment 26B-3: PR DA 26B-3

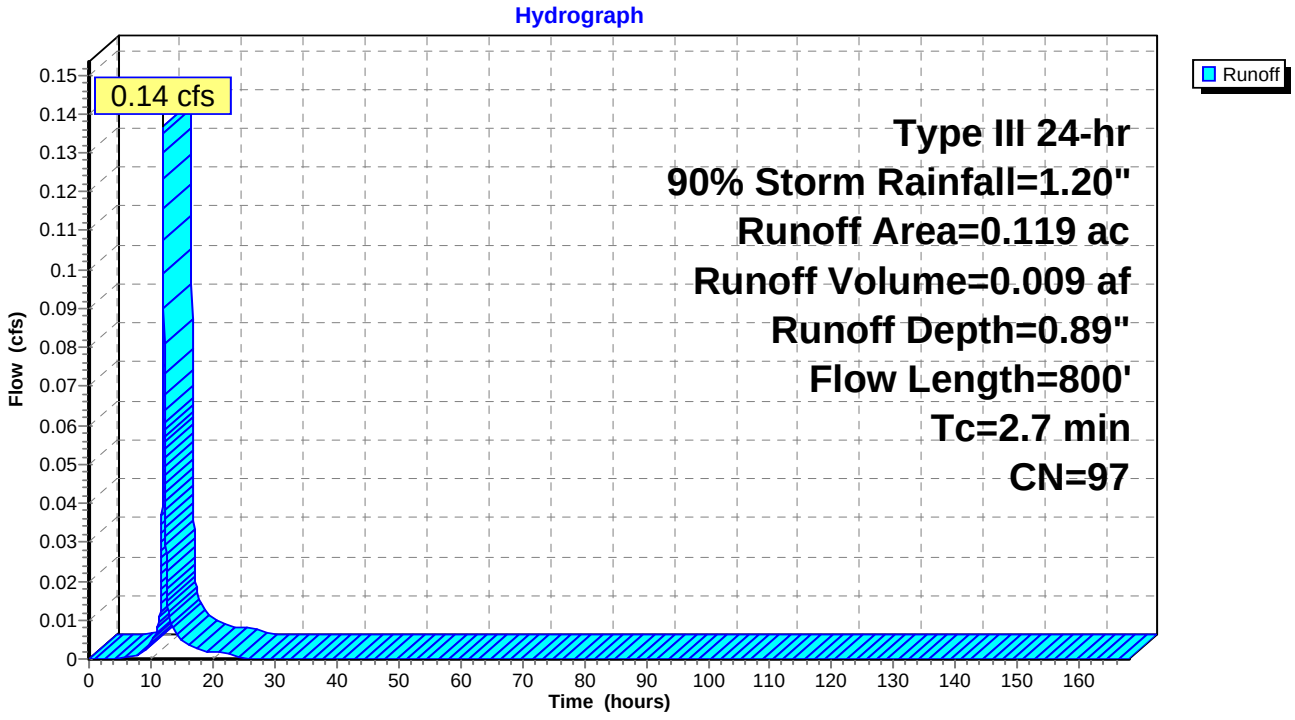
Runoff = 0.14 cfs @ 12.04 hrs, Volume= 0.009 af, Depth= 0.89"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.005	74	>75% Grass cover, Good, HSG C
	0.111	98	Paved roads w/curbs & sewers, HSG C
*	0.003	89	Gravel Shoulder, HSG C
	0.119	97	Weighted Average
	0.008		6.72% Pervious Area
	0.111		93.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-3: PR DA 26B-3



Summary for Subcatchment 26C: PR DA 26C

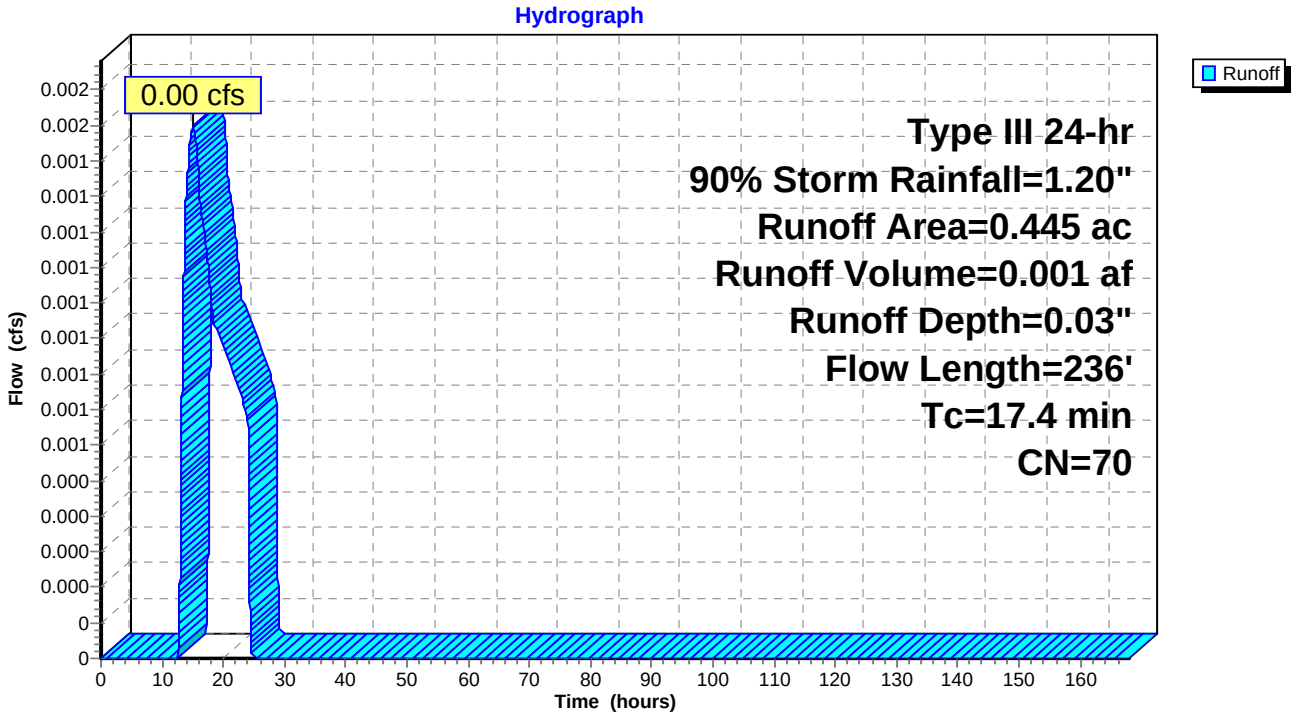
Runoff = 0.00 cfs @ 15.06 hrs, Volume= 0.001 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.176	71	Meadow, non-grazed, HSG C
0.269	70	Woods, Good, HSG C
0.445	70	Weighted Average
0.445		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	123	0.0569	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
2.0	113	0.0354	0.94		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
17.4	236	Total			

Subcatchment 26C: PR DA 26C



Summary for Subcatchment 26D: PR DA 26D

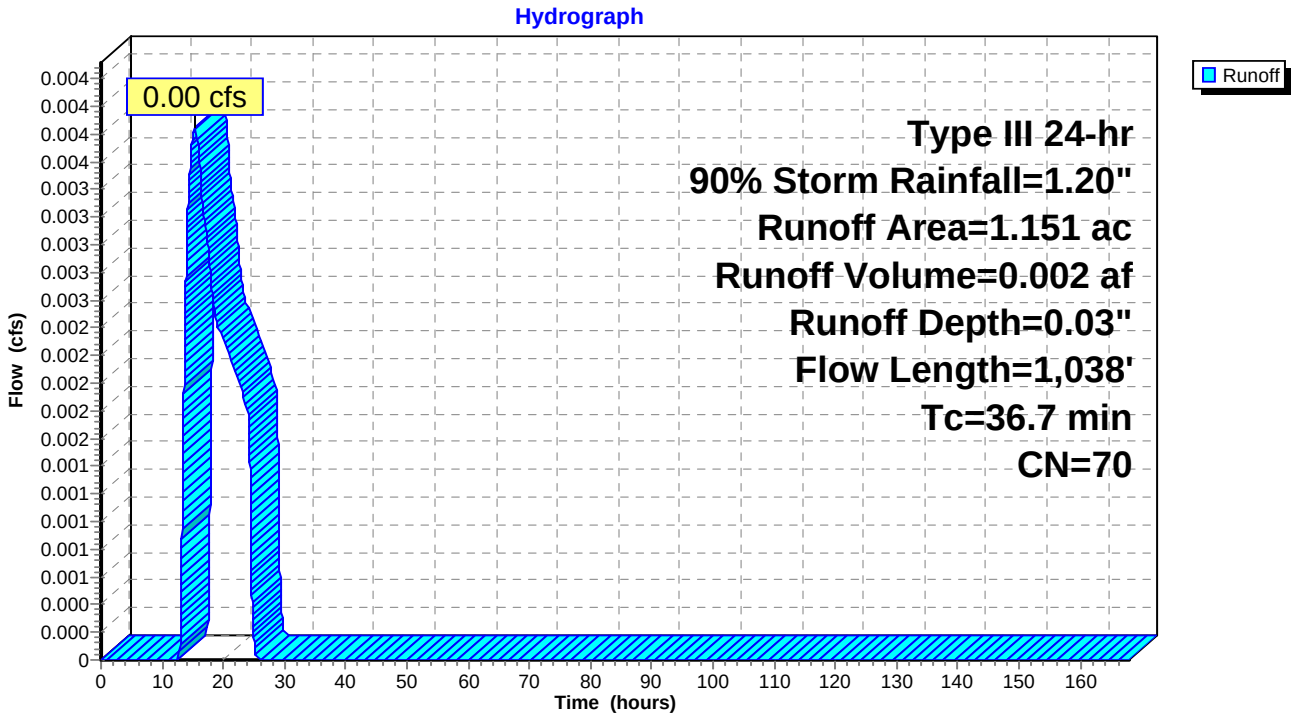
Runoff = 0.00 cfs @ 15.37 hrs, Volume= 0.002 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
1.146	70	Woods, Good, HSG C
0.005	77	Woods, Good, HSG D
1.151	70	Weighted Average
1.151		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.5	150	0.0167	0.08		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
5.9	315	0.0317	0.89		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.3	573	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
36.7	1,038	Total			

Subcatchment 26D: PR DA 26D



Summary for Subcatchment 26E: PR DA 26E

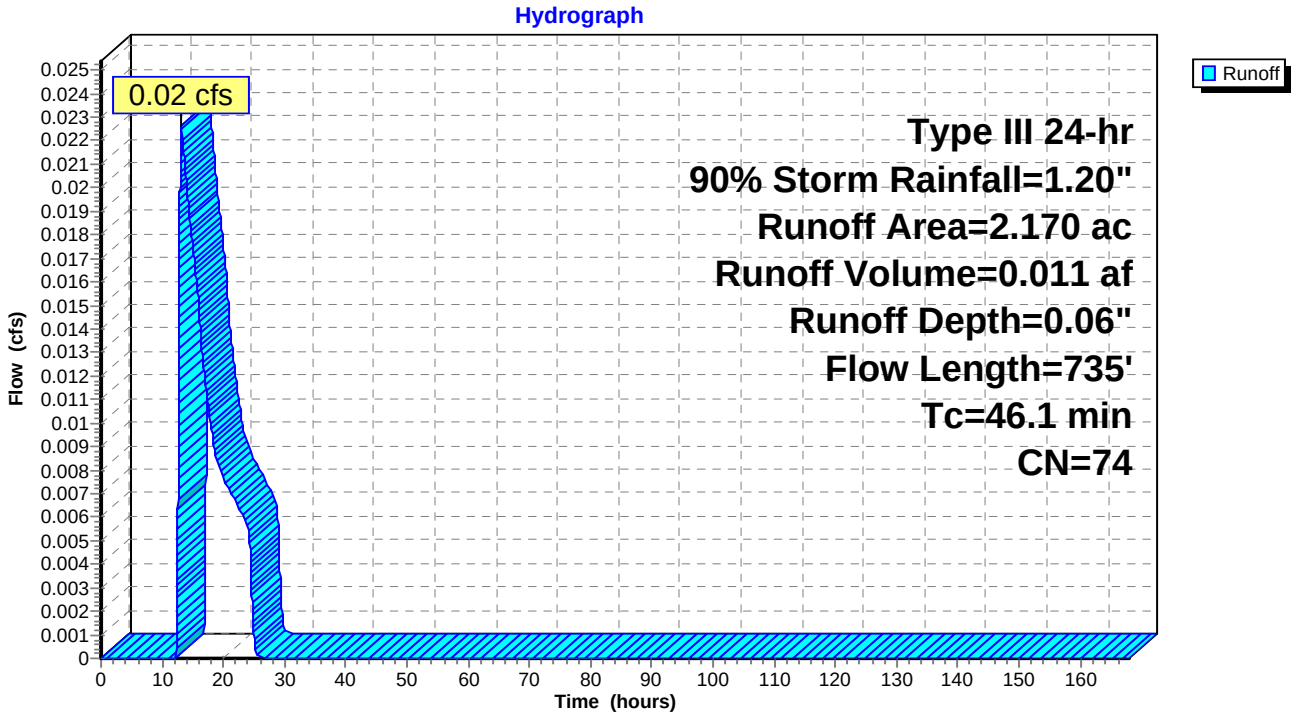
Runoff = 0.02 cfs @ 13.17 hrs, Volume= 0.011 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.900	70	Woods, Good, HSG C
1.270	77	Woods, Good, HSG D
2.170	74	Weighted Average
2.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
9.9	585	0.0387	0.98		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
46.1	735	Total			

Subcatchment 26E: PR DA 26E



Summary for Subcatchment 26F: PR DA 26F

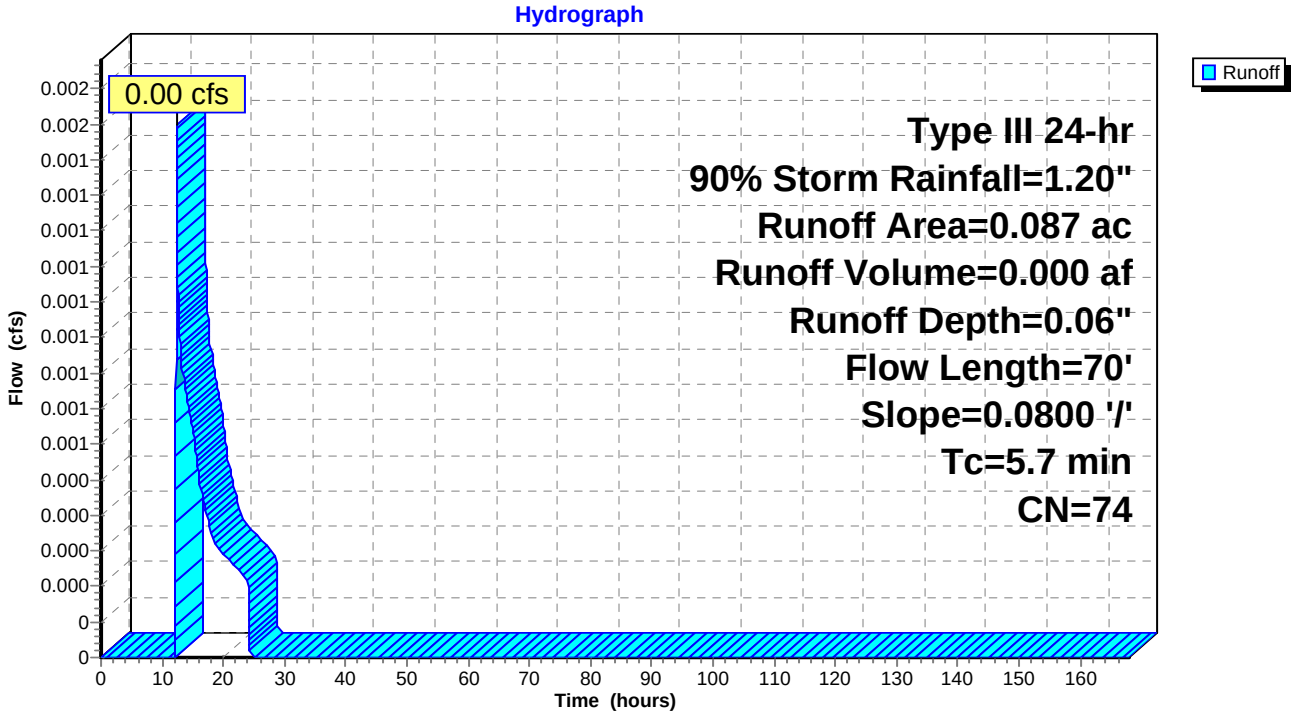
Runoff = 0.00 cfs @ 12.42 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.087	74	>75% Grass cover, Good, HSG C
0.087		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	70	0.0800	0.20		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment 26F: PR DA 26F



Summary for Subcatchment 26G: PR DA 26G

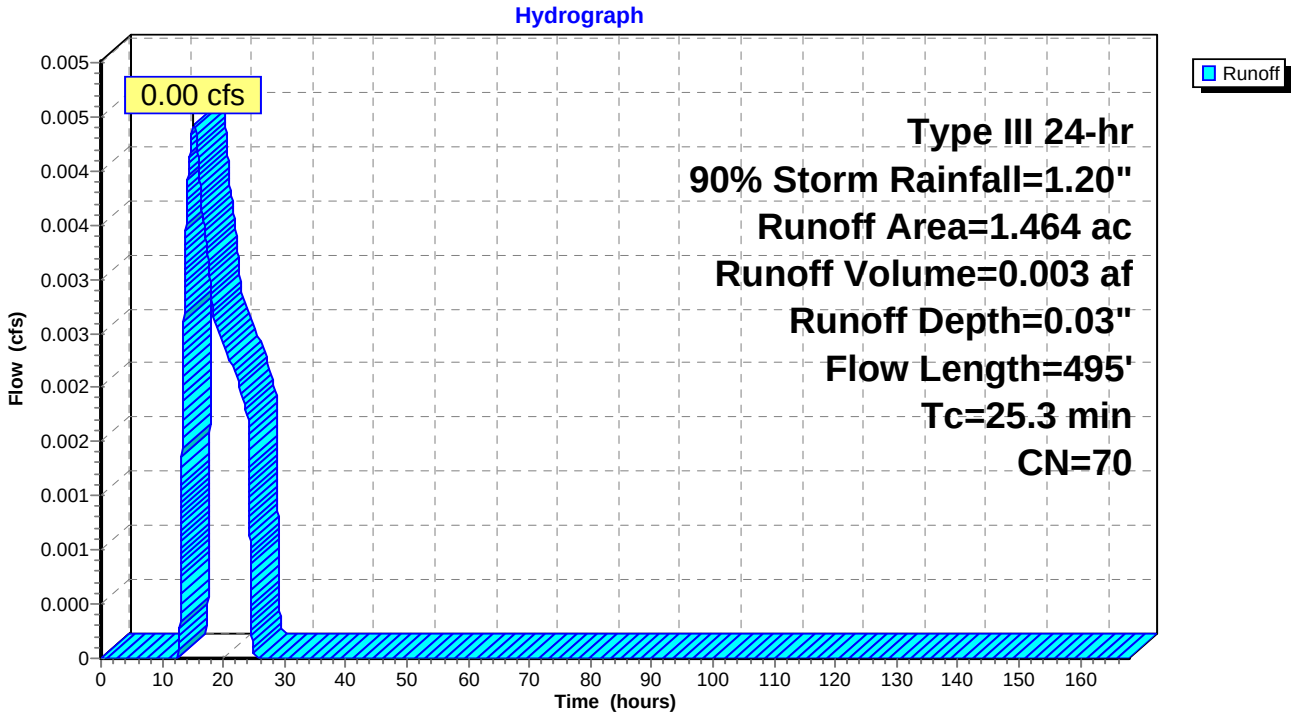
Runoff = 0.00 cfs @ 15.15 hrs, Volume= 0.003 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
1.464	70	Woods, Good, HSG C
1.464		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	150	0.0467	0.13		**Sheet Flow, 150** Woods: Light underbrush n= 0.400 P2= 3.75"
5.7	345	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
25.3	495	Total			

Subcatchment 26G: PR DA 26G



Summary for Subcatchment 28A: PR DA 28A

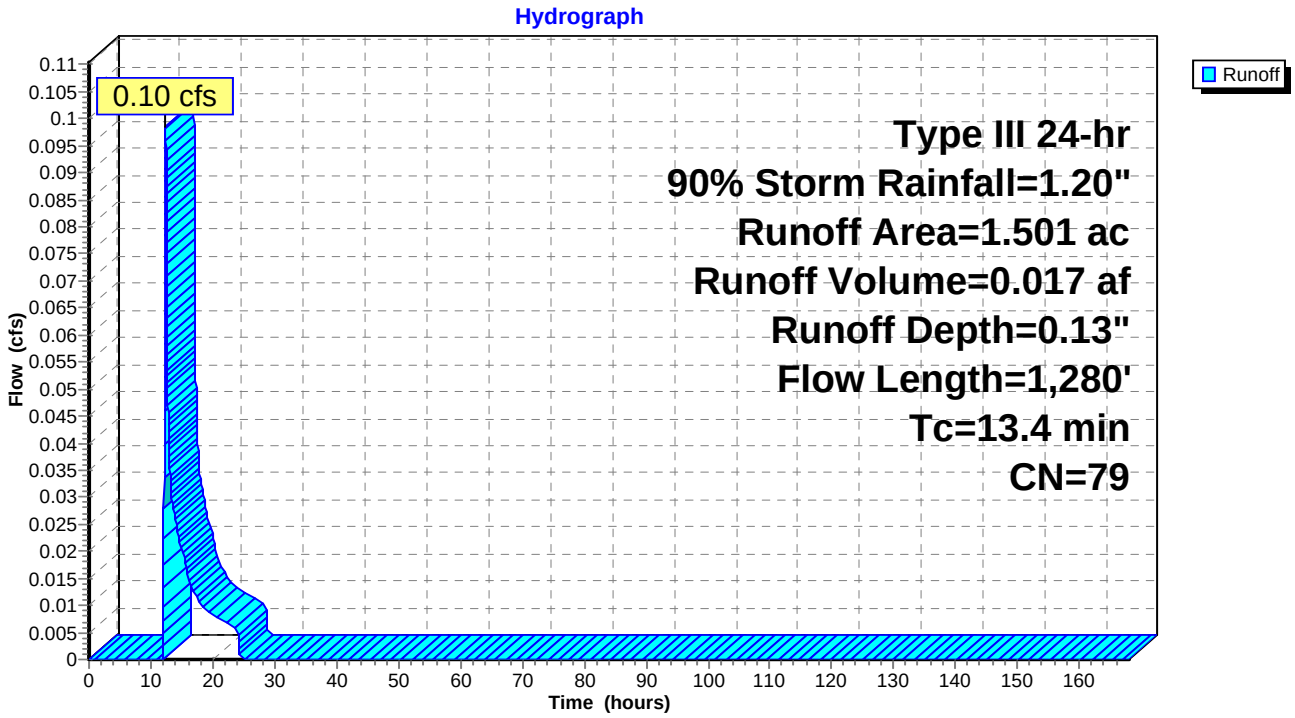
Runoff = 0.10 cfs @ 12.35 hrs, Volume= 0.017 af, Depth= 0.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
1.177	74	>75% Grass cover, Good, HSG C
0.324	98	Paved roads w/curbs & sewers, HSG C
1.501	79	Weighted Average
1.177		78.41% Pervious Area
0.324		21.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	150	0.0500	0.29		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
4.3	930	0.0500	3.60		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps
0.4	200	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
13.4	1,280	Total			

Subcatchment 28A: PR DA 28A



Summary for Subcatchment 28B: PR DA 28B

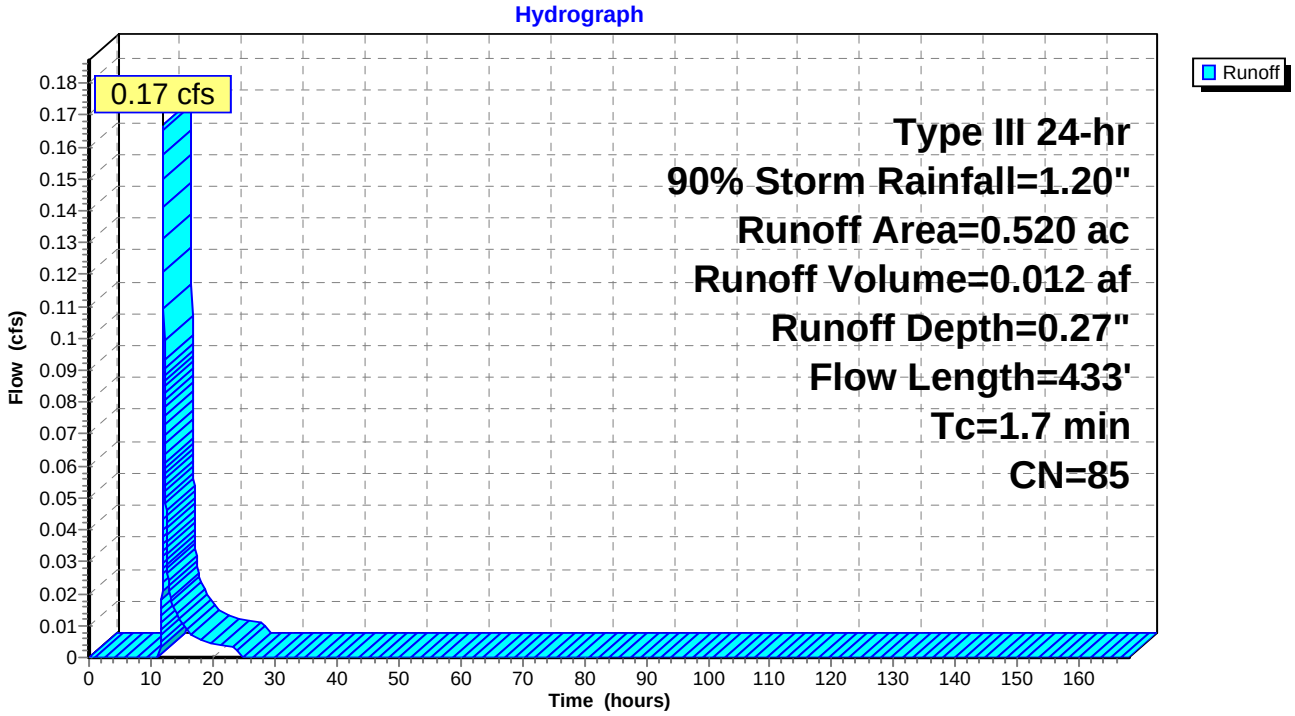
Runoff = 0.17 cfs @ 12.04 hrs, Volume= 0.012 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.271	74	>75% Grass cover, Good, HSG C
0.249	98	Paved roads w/curbs & sewers, HSG C
0.520	85	Weighted Average
0.271		52.12% Pervious Area
0.249		47.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.4	183	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	433	Total			

Subcatchment 28B: PR DA 28B



Summary for Subcatchment 28C: PR DA 28C

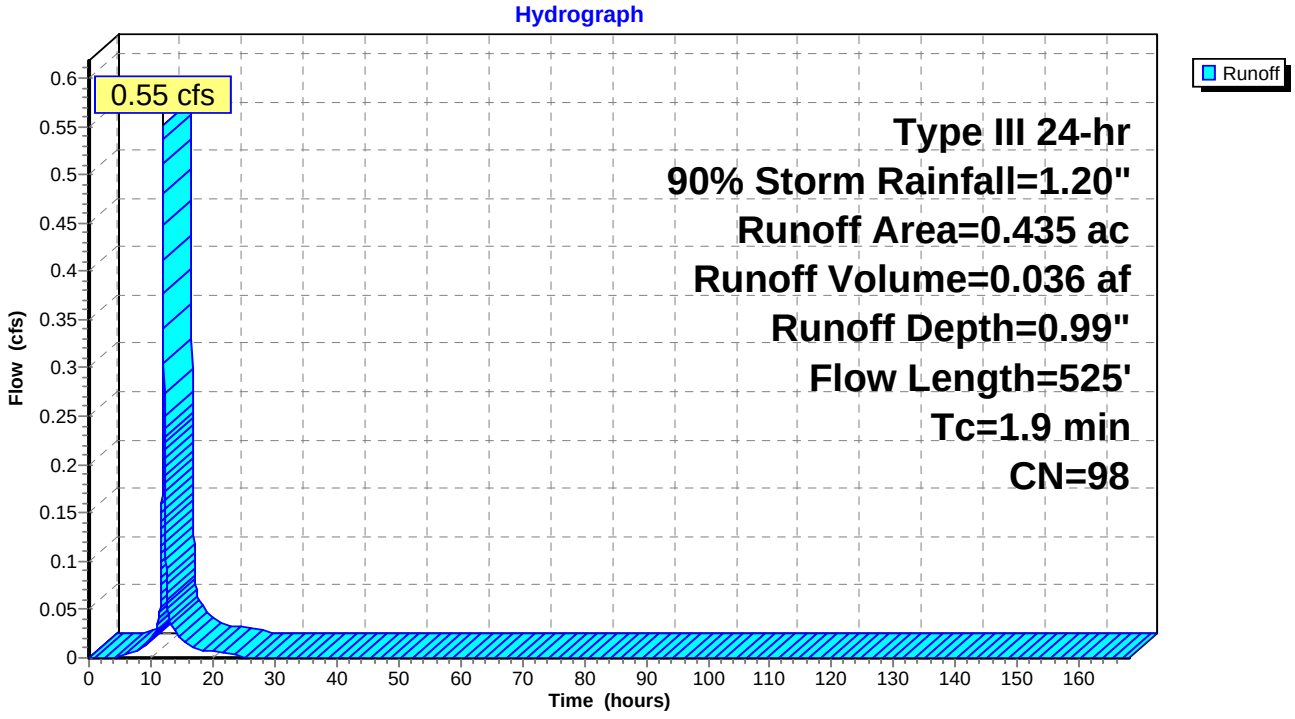
Runoff = 0.55 cfs @ 12.03 hrs, Volume= 0.036 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.435	98	Paved roads w/curbs & sewers, HSG C
0.435		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.6	275	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.9	525	Total			

Subcatchment 28C: PR DA 28C



Summary for Subcatchment 28D: PR DA 28D

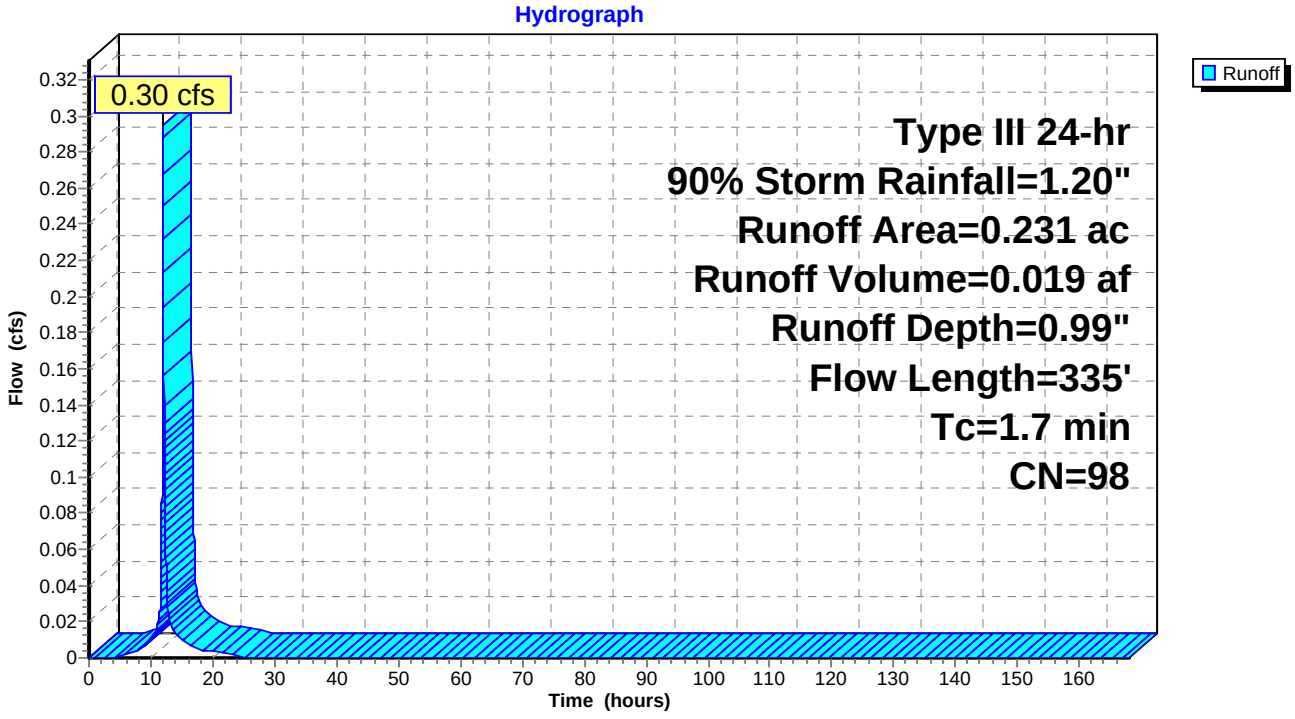
Runoff = 0.30 cfs @ 12.02 hrs, Volume= 0.019 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.231	98	Paved roads w/curbs & sewers, HSG C
0.231		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	150	0.0400	2.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	50	0.0400	4.06		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.3	135	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	335	Total			

Subcatchment 28D: PR DA 28D



Summary for Subcatchment 28E: PR DA 28E

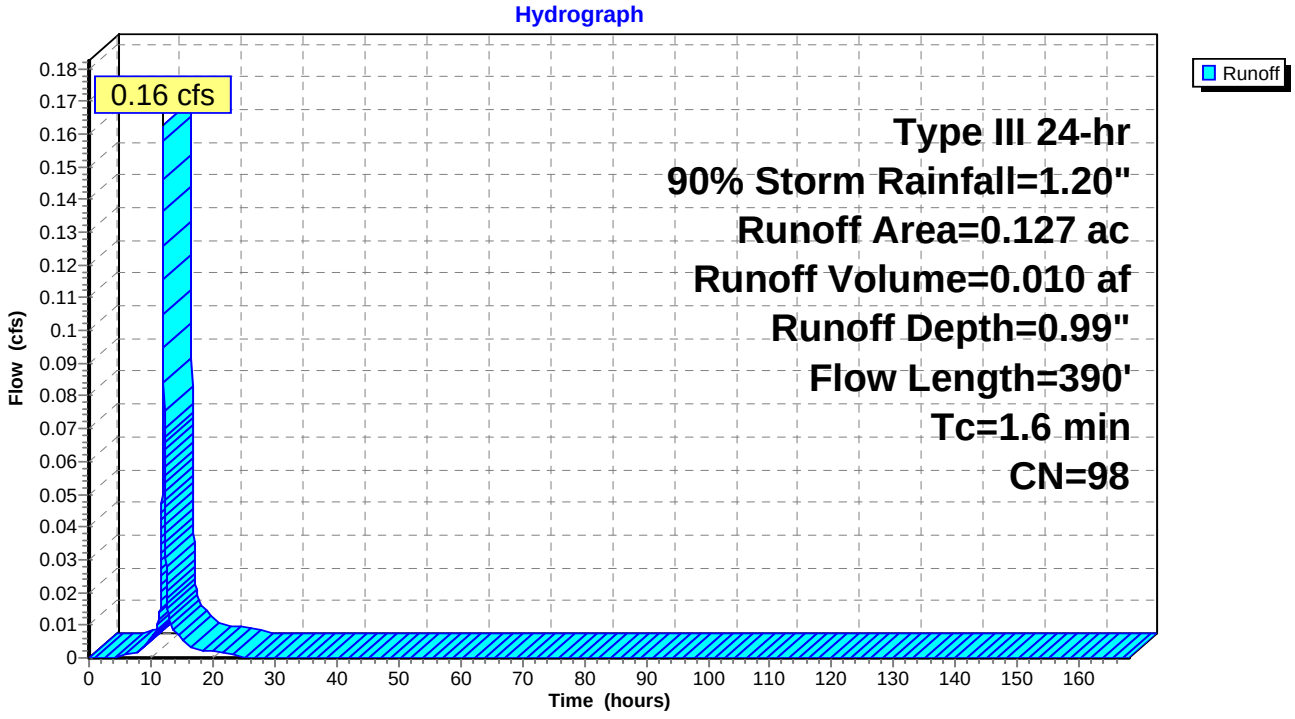
Runoff = 0.16 cfs @ 12.02 hrs, Volume= 0.010 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.127	98	Paved roads w/curbs & sewers, HSG C
0.127		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.3	140	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.6	390	Total			

Subcatchment 28E: PR DA 28E



Summary for Subcatchment 28F: PR DA 28F

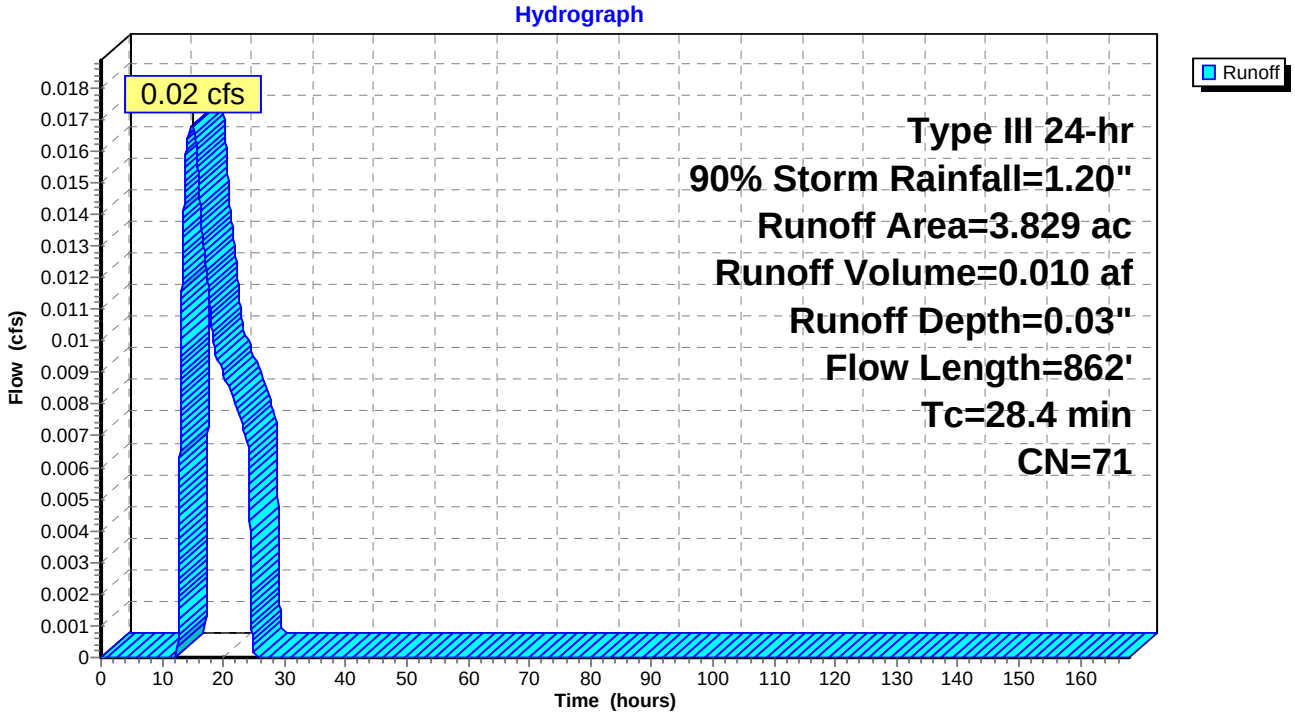
Runoff = 0.02 cfs @ 14.93 hrs, Volume= 0.010 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.011	71	Meadow, non-grazed, HSG C
0.060	98	Unconnected pavement, HSG C
0.571	74	>75% Grass cover, Good, HSG C
3.187	70	Woods, Good, HSG C
3.829	71	Weighted Average
3.769		98.43% Pervious Area
0.060		1.57% Impervious Area
0.060		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	150	0.0500	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
9.4	712	0.0640	1.26		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
28.4	862	Total			

Subcatchment 28F: PR DA 28F



Summary for Subcatchment 28G: PR DA 28G

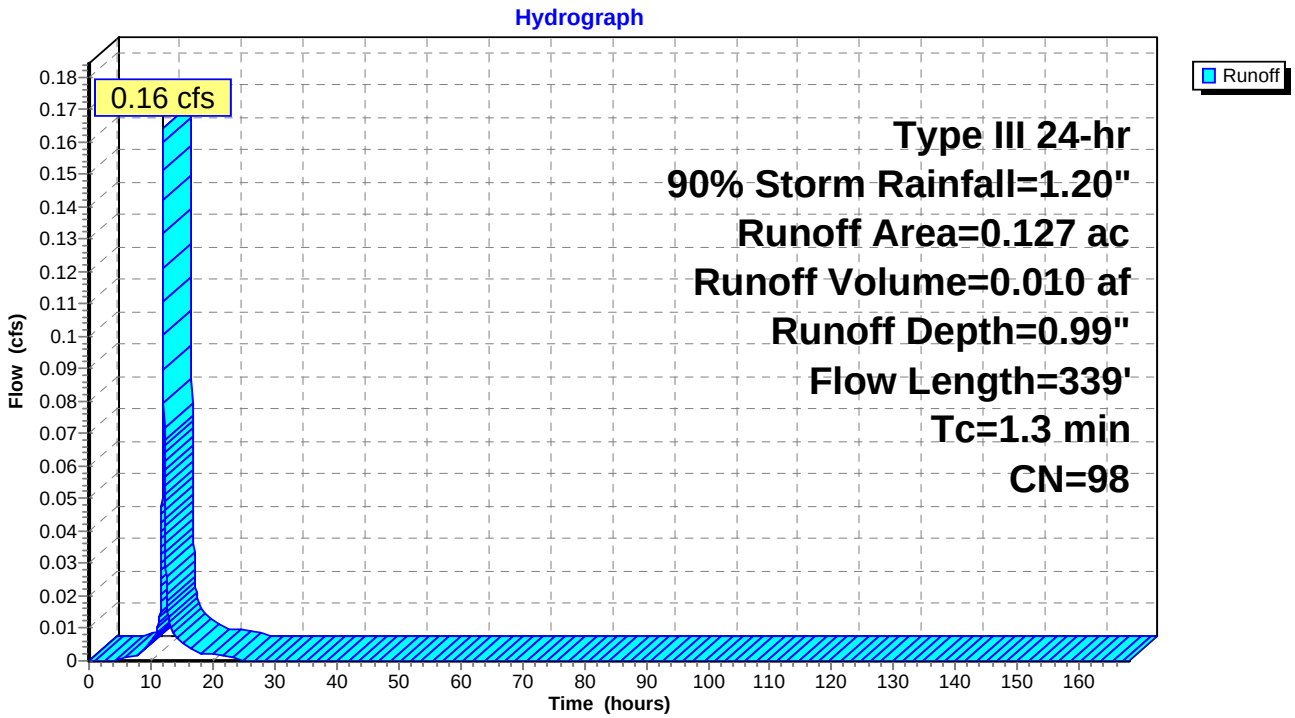
Runoff = 0.16 cfs @ 12.02 hrs, Volume= 0.010 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.127	98	Paved roads w/curbs & sewers, HSG C
0.127		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	113	0.0670	2.47		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.5	226	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.3	339	Total			

Subcatchment 28G: PR DA 28G



Summary for Subcatchment 28H: PR DA 28H

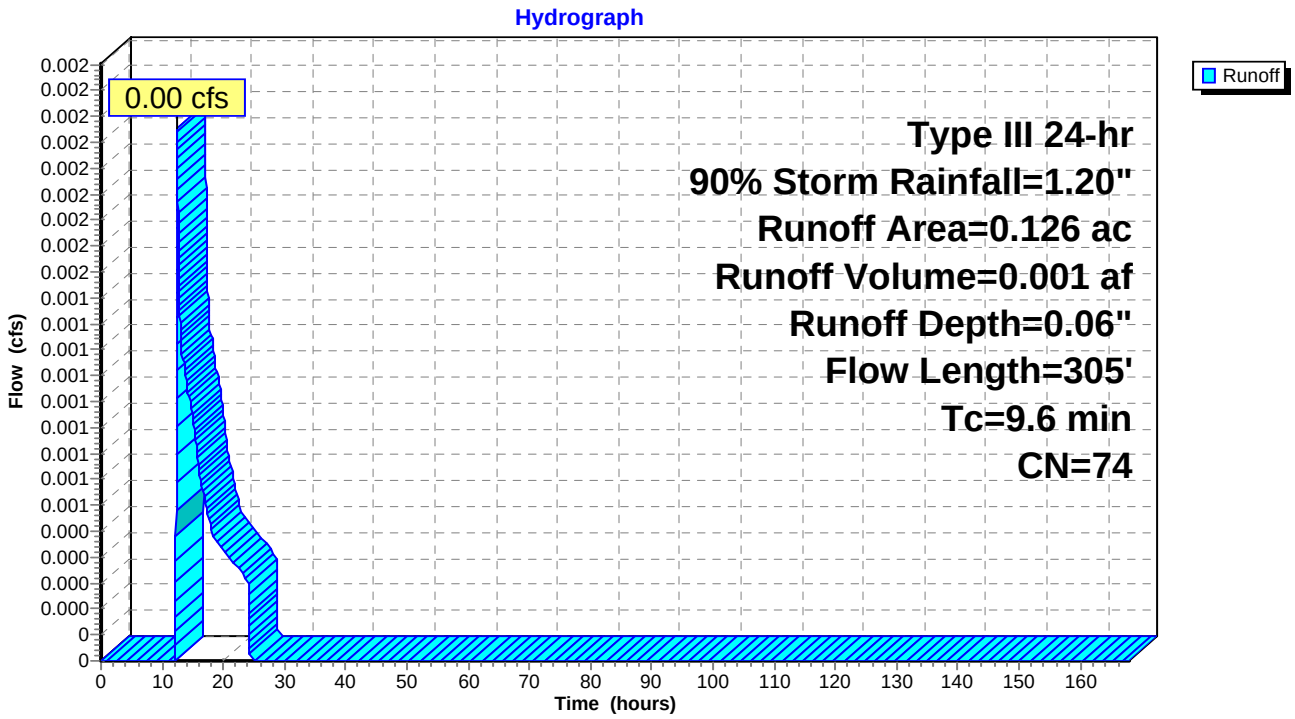
Runoff = 0.00 cfs @ 12.47 hrs, Volume= 0.001 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.126	74	>75% Grass cover, Good, HSG C
0.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	120	0.0700	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"
0.4	185	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
9.6	305	Total			

Subcatchment 28H: PR DA 28H



Summary for Subcatchment 28I: PR DA 28I

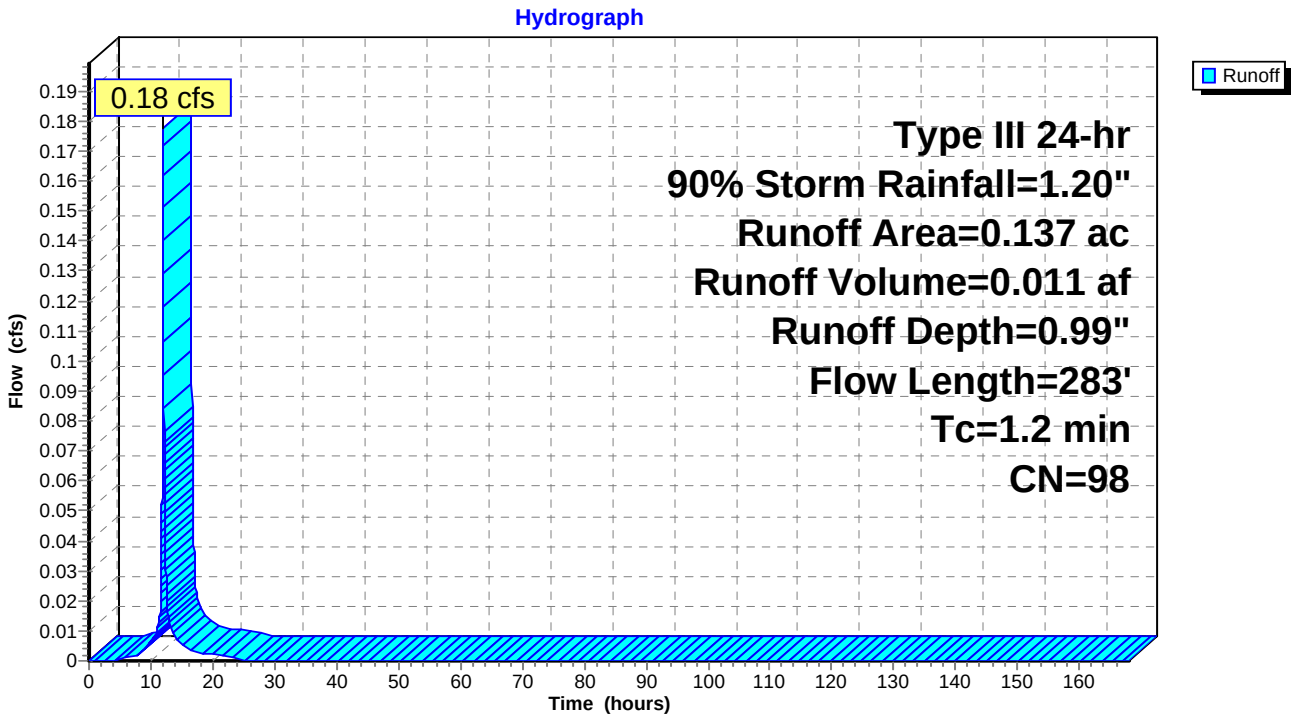
Runoff = 0.18 cfs @ 12.02 hrs, Volume= 0.011 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.137	98	Paved roads w/curbs & sewers, HSG C
0.137		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	118	0.0670	2.50		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	165	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.2	283	Total			

Subcatchment 28I: PR DA 28I



Summary for Subcatchment 31: PR DA 31

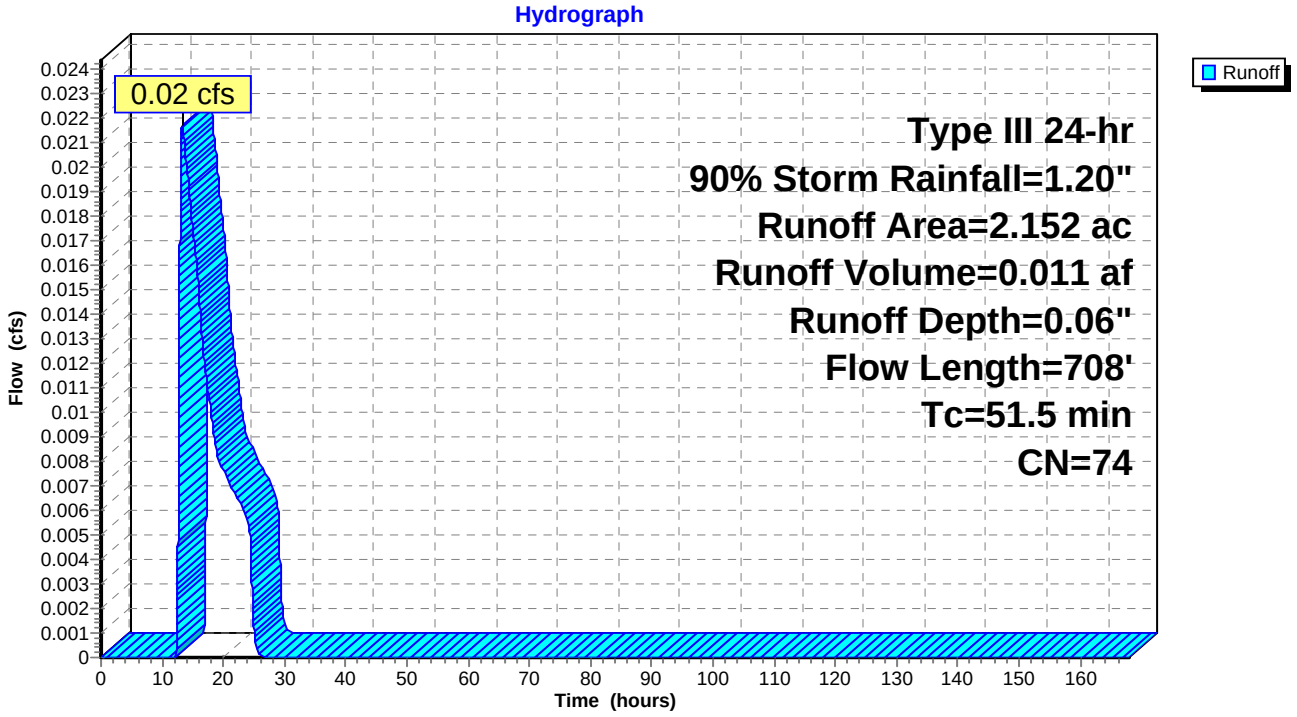
Runoff = 0.02 cfs @ 13.28 hrs, Volume= 0.011 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.064	98	Unconnected pavement, HSG C
1.699	74	>75% Grass cover, Good, HSG C
0.031	71	Meadow, non-grazed, HSG C
0.300	70	Woods, Good, HSG C
0.049	80	>75% Grass cover, Good, HSG D
0.009	98	Water Surface, HSG D
2.152	74	Weighted Average
2.079		96.61% Pervious Area
0.073		3.39% Impervious Area
0.064		87.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.5	150	0.0067	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
9.0	558	0.0430	1.04		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
51.5	708	Total			

Subcatchment 31: PR DA 31



Summary for Subcatchment 31A: PR DA 31A

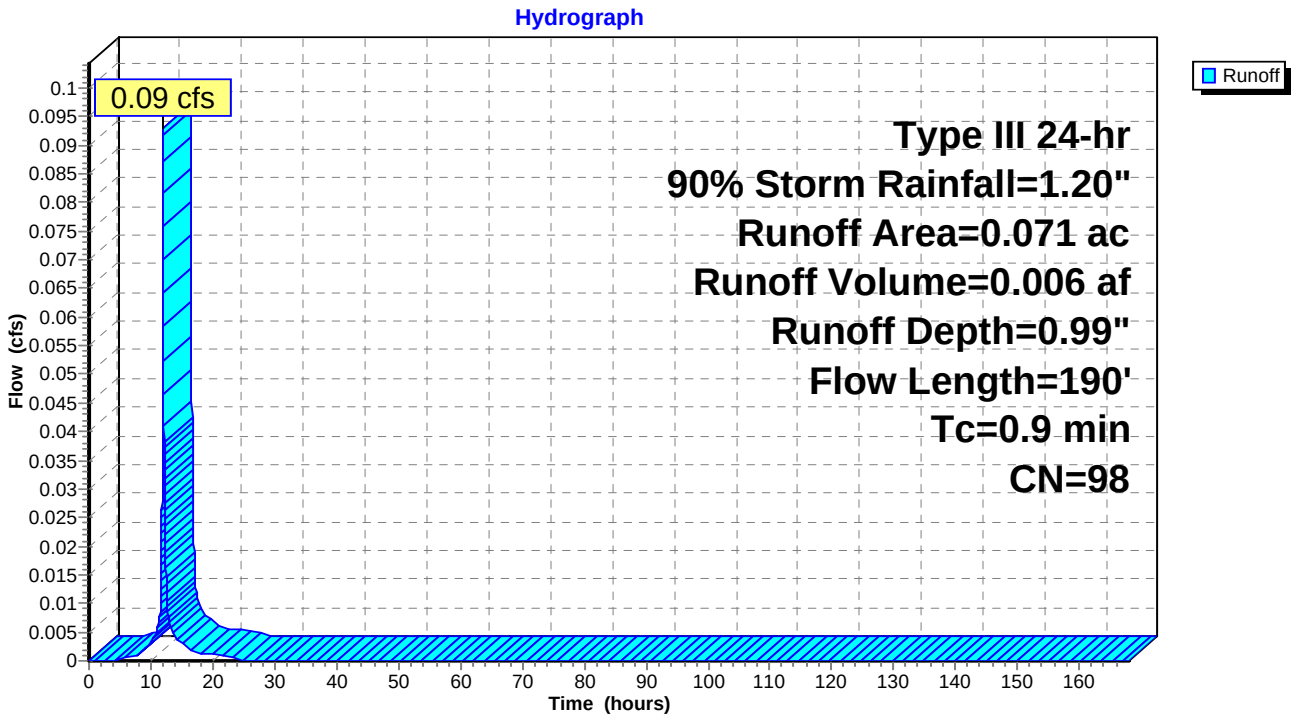
Runoff = 0.09 cfs @ 12.01 hrs, Volume= 0.006 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
*	0.071	98	Paved roads w/curbs & sewers, HSG C
	0.071		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	130	0.0690	2.58		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.1	60	0.0200	7.44	9.14	**Pipe Channel, Stormwater** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.9	190	Total			

Subcatchment 31A: PR DA 31A



Summary for Subcatchment 31B: PR DA 31B

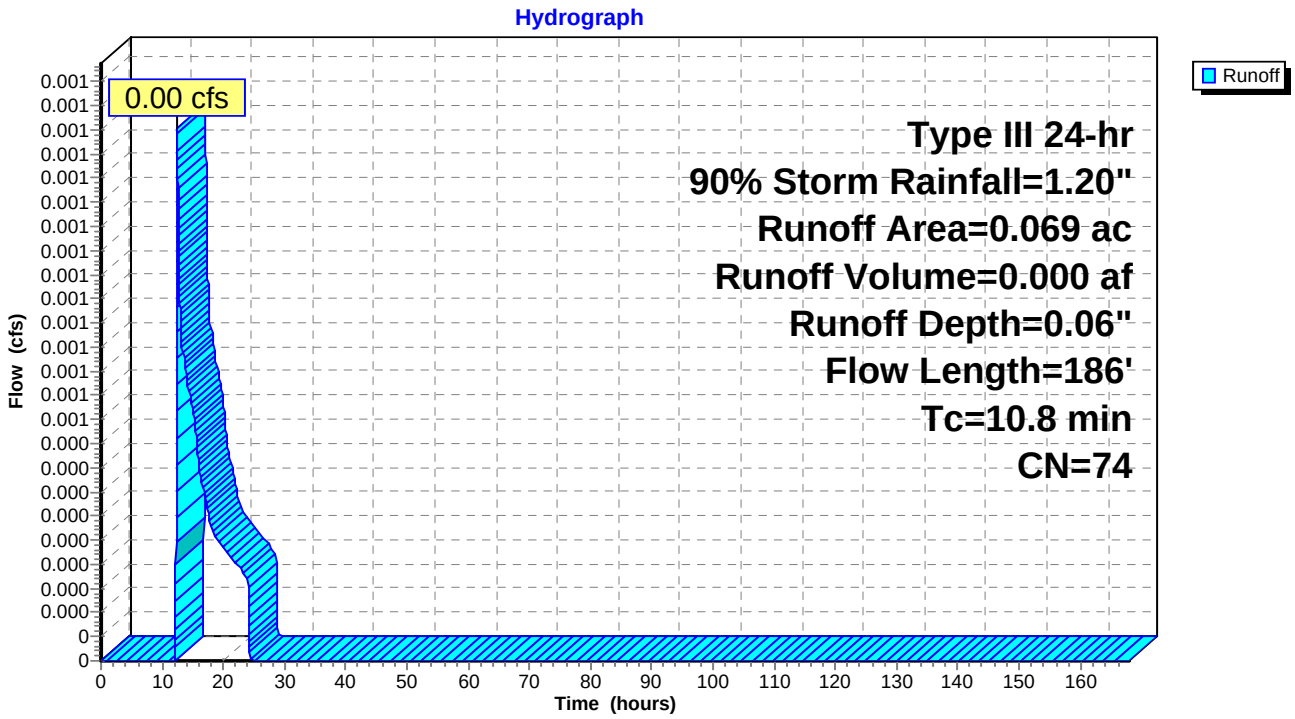
Runoff = 0.00 cfs @ 12.49 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.069	74	>75% Grass cover, Good, HSG C
0.069		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	144	0.0700	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"
0.1	42	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
10.8	186	Total			

Subcatchment 31B: PR DA 31B



Summary for Subcatchment 31C: PR DA 31C

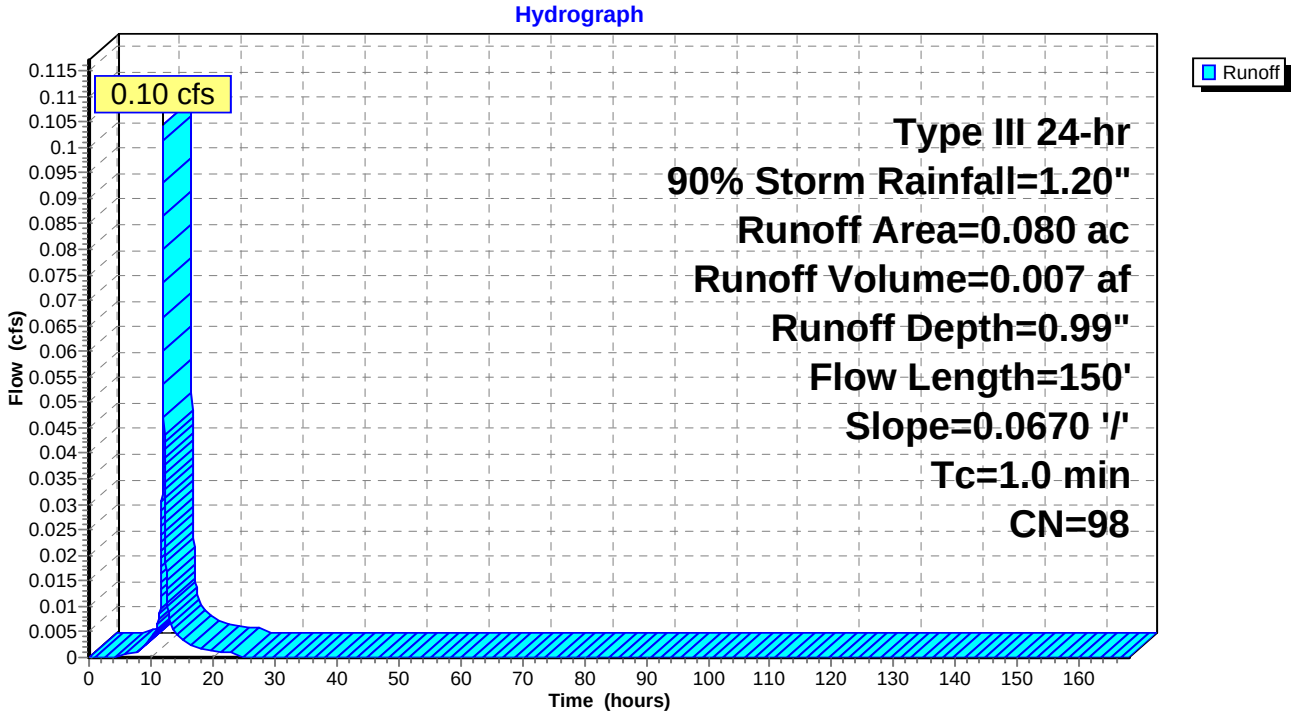
Runoff = 0.10 cfs @ 12.01 hrs, Volume= 0.007 af, Depth= 0.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.080	98	Paved roads w/curbs & sewers, HSG C
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0670	2.62		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"

Subcatchment 31C: PR DA 31C



Summary for Subcatchment 31D: PR DA 31D

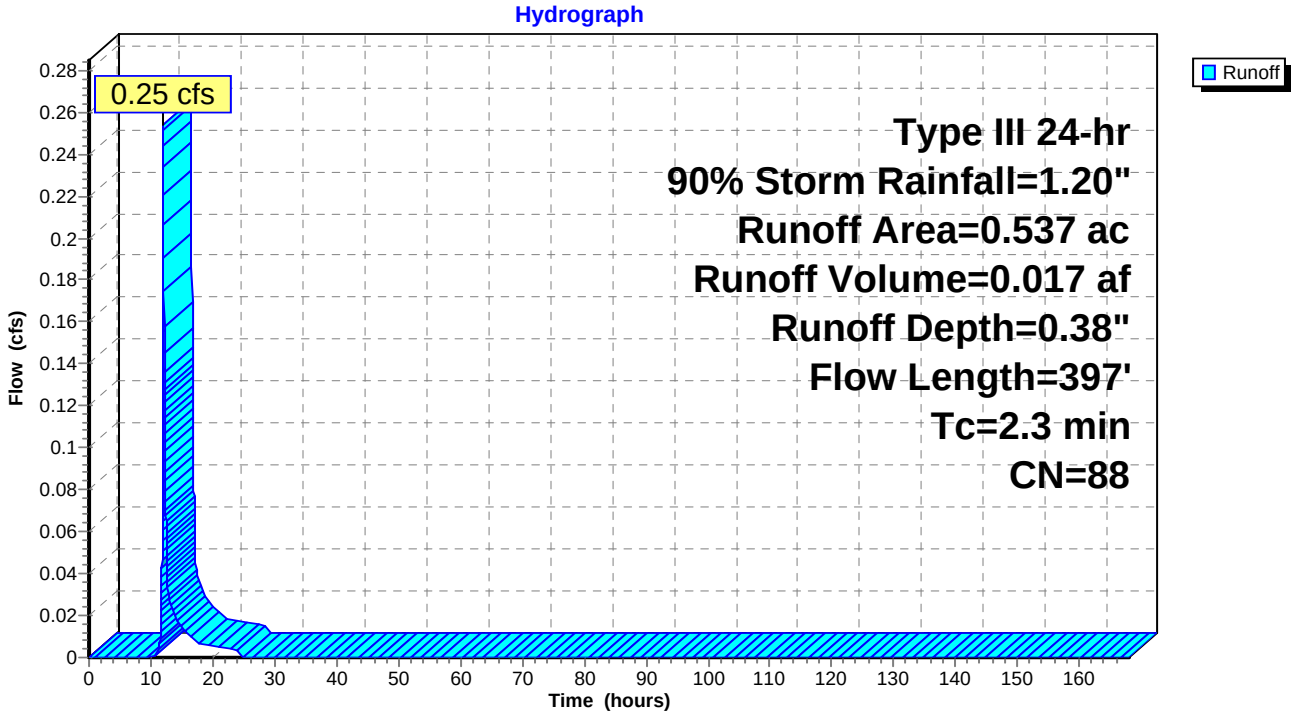
Runoff = 0.25 cfs @ 12.04 hrs, Volume= 0.017 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.223	74	>75% Grass cover, Good, HSG C
0.063	98	Unconnected pavement, HSG C
0.251	98	Paved roads w/curbs & sewers, HSG C
0.537	88	Weighted Average
0.223		41.53% Pervious Area
0.314		58.47% Impervious Area
0.063		20.06% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	150	0.0270	1.82		**Sheet Flow, Gutter** Smooth surfaces n= 0.011 P2= 3.75"
0.6	125	0.0270	3.34		**Shallow Concentrated Flow, Gutter** Paved Kv= 20.3 fps
0.3	122	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.3	397	Total			

Subcatchment 31D: PR DA 31D



Summary for Subcatchment SW21A: PR DA SW21A

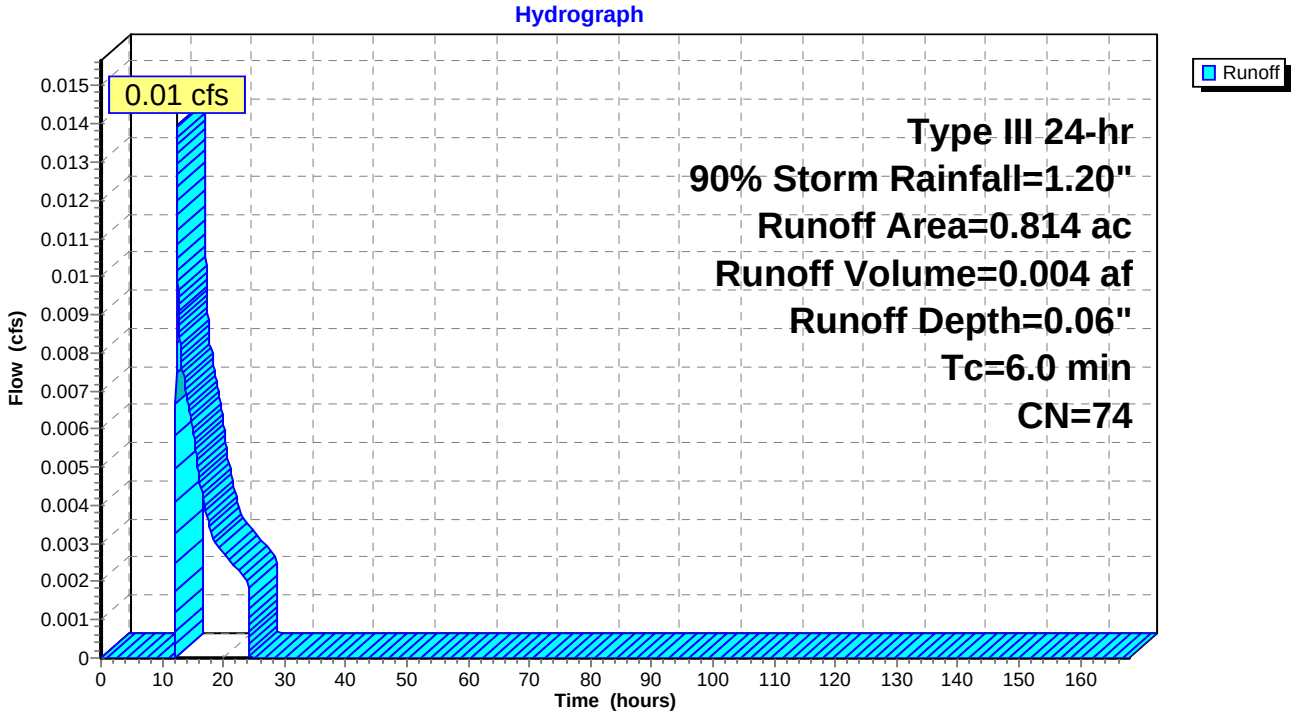
Runoff = 0.01 cfs @ 12.42 hrs, Volume= 0.004 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.814	74	>75% Grass cover, Good, HSG C
0.814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21A: PR DA SW21A



Summary for Subcatchment SW21B: PR DA SW21B

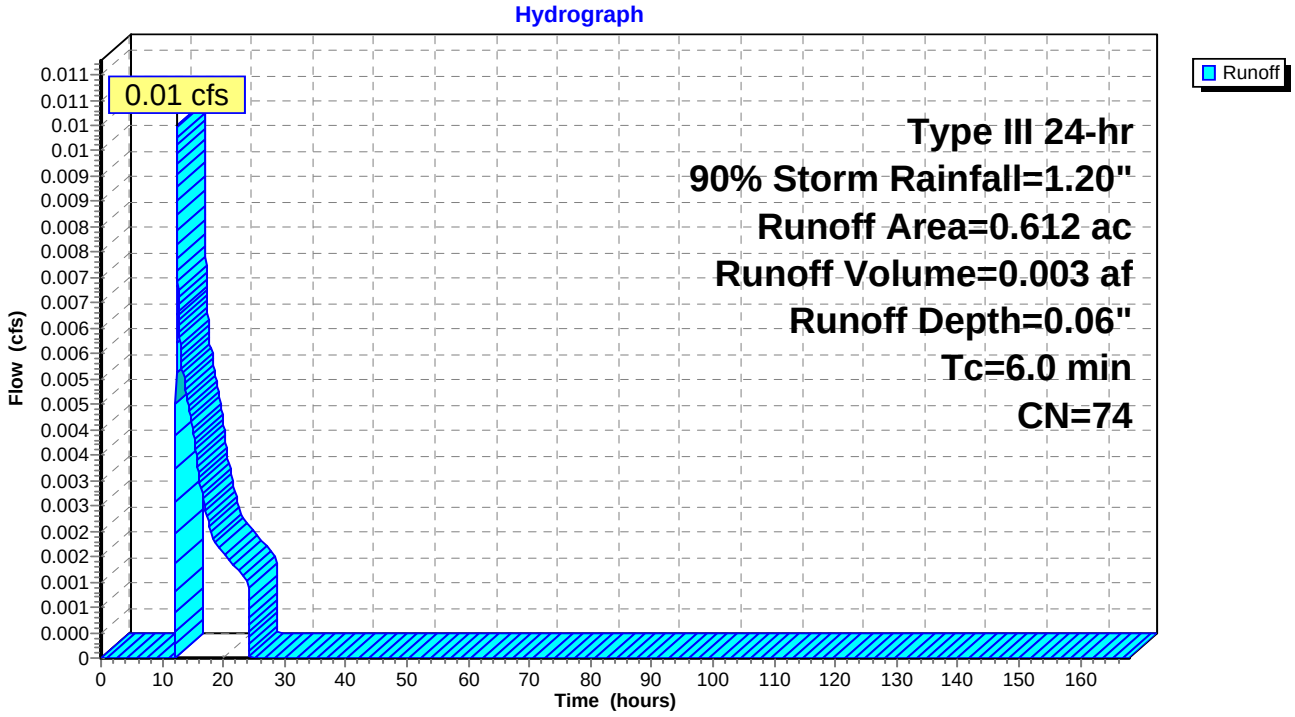
Runoff = 0.01 cfs @ 12.42 hrs, Volume= 0.003 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.433	74	>75% Grass cover, Good, HSG C
0.179	74	>75% Grass cover, Good, HSG C
0.612	74	Weighted Average
0.612		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21B: PR DA SW21B



Summary for Subcatchment SW21C: PR DA SW21C

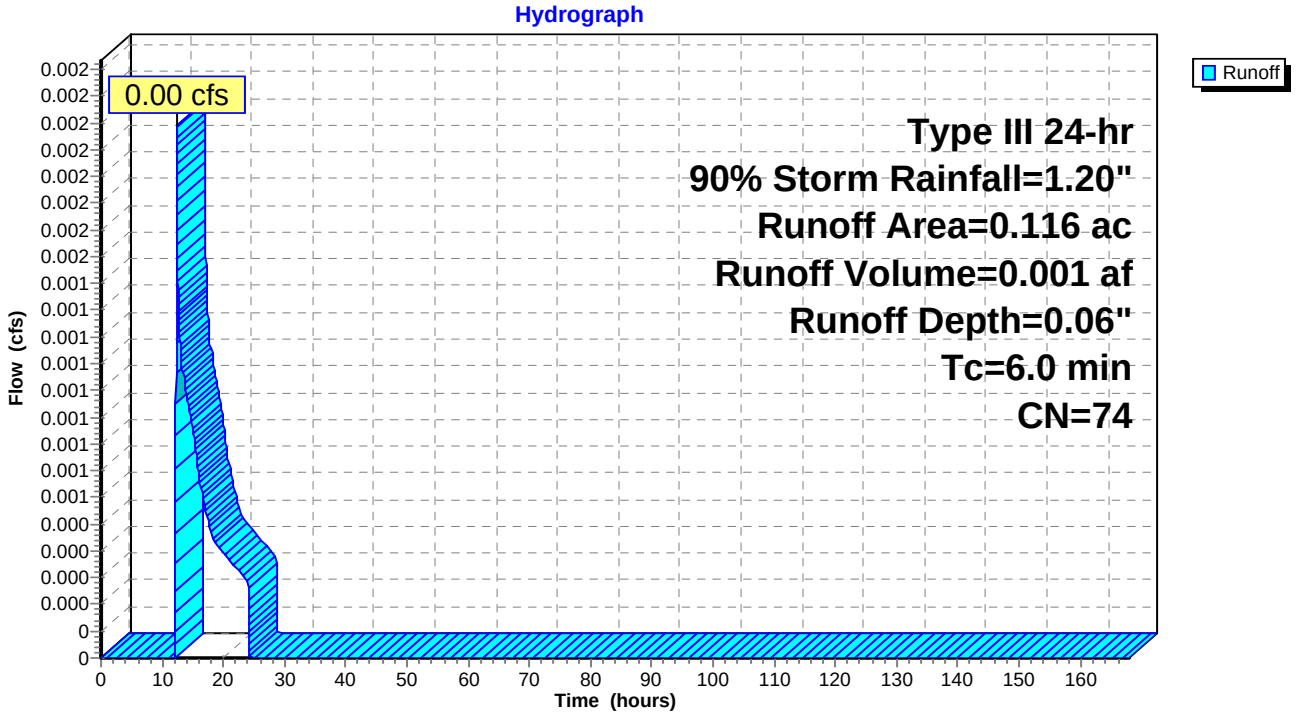
Runoff = 0.00 cfs @ 12.42 hrs, Volume= 0.001 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.116	74	>75% Grass cover, Good, HSG C
0.116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21C: PR DA SW21C



Summary for Subcatchment SW23A: PR DA SW23A

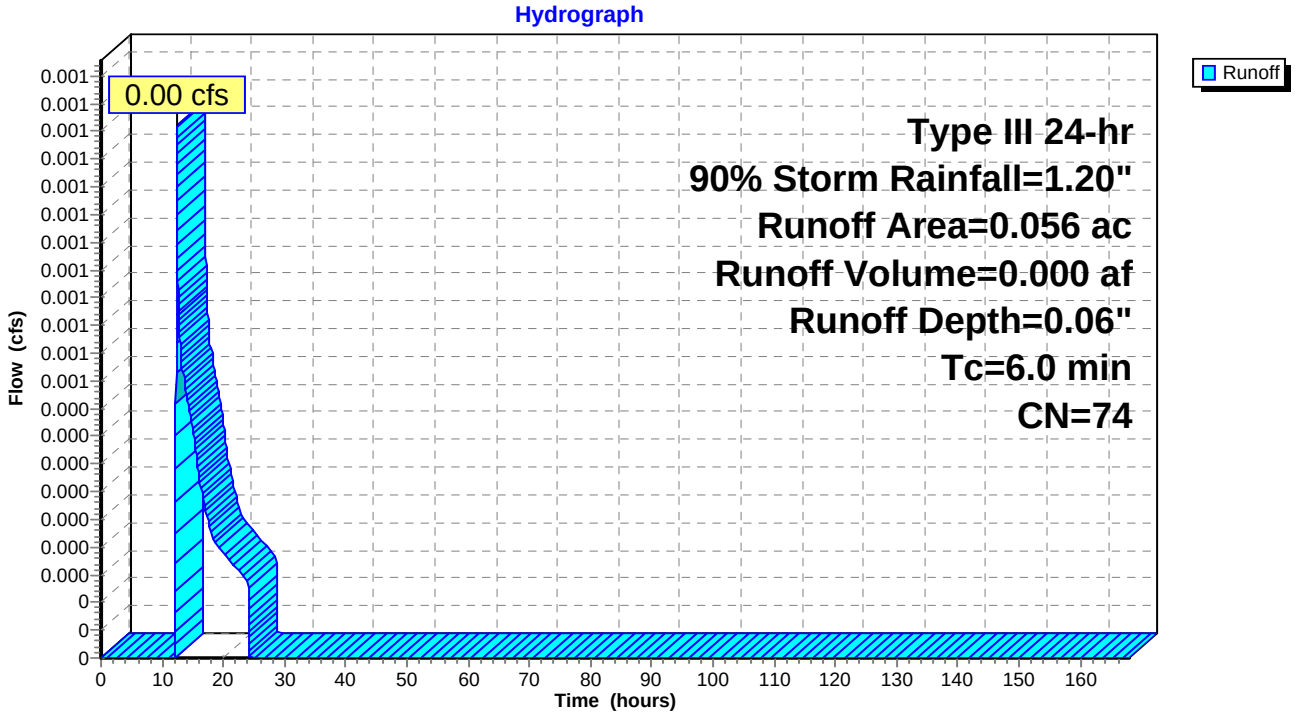
Runoff = 0.00 cfs @ 12.42 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.056	74	>75% Grass cover, Good, HSG C
0.056		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW23A: PR DA SW23A



Summary for Subcatchment SW23B: PR DA SW23B

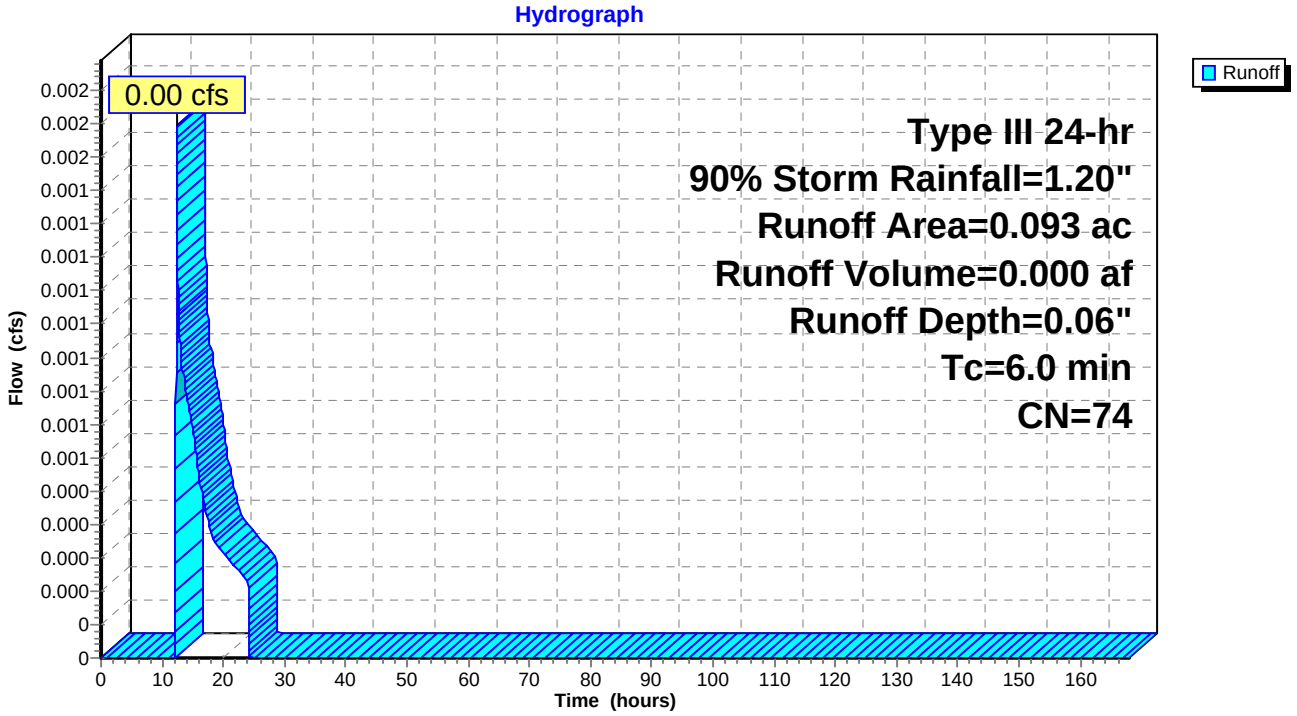
Runoff = 0.00 cfs @ 12.42 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.093	74	>75% Grass cover, Good, HSG C
0.093		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW23B: PR DA SW23B



Summary for Subcatchment SW28A: PR DA SW28A

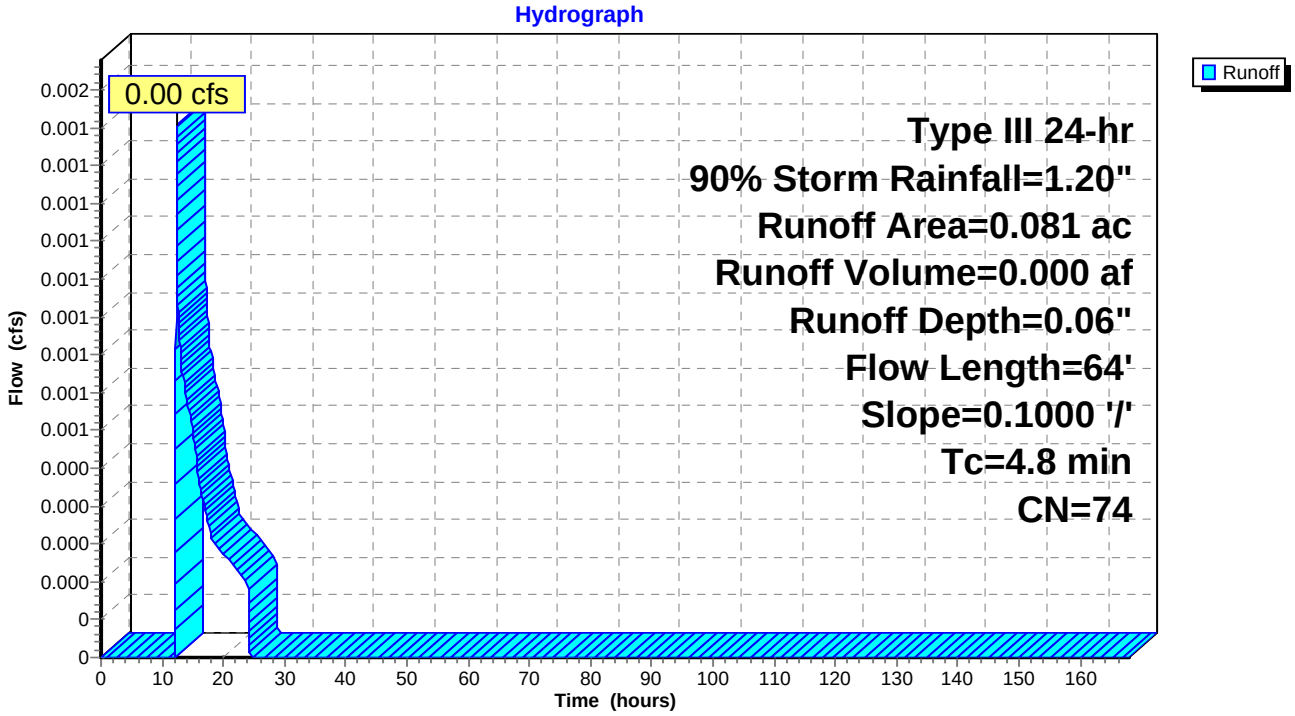
Runoff = 0.00 cfs @ 12.40 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.081	74	>75% Grass cover, Good, HSG C
0.081		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	64	0.1000	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment SW28A: PR DA SW28A



Summary for Subcatchment SW28B: PR DA SW28B

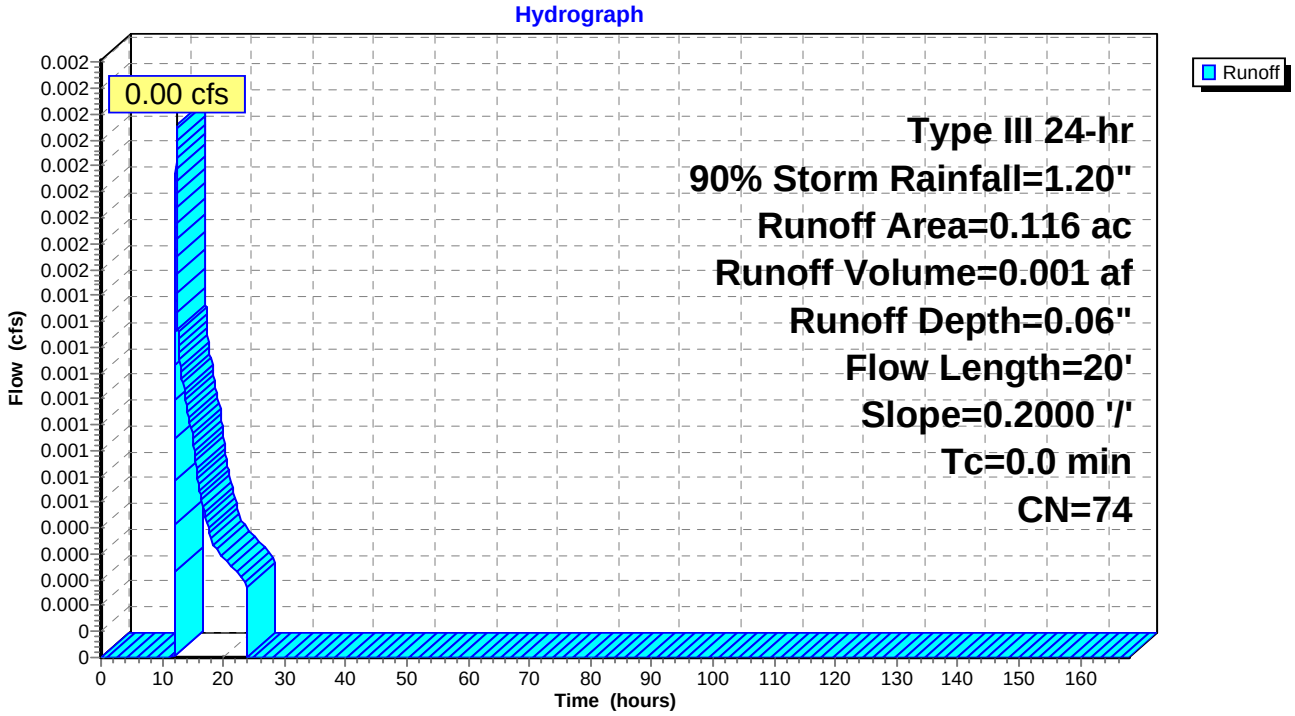
Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.001 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.116	74	>75% Grass cover, Good, HSG C
0.116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28B: PR DA SW28B



Summary for Subcatchment SW28C: PR DA SW28C

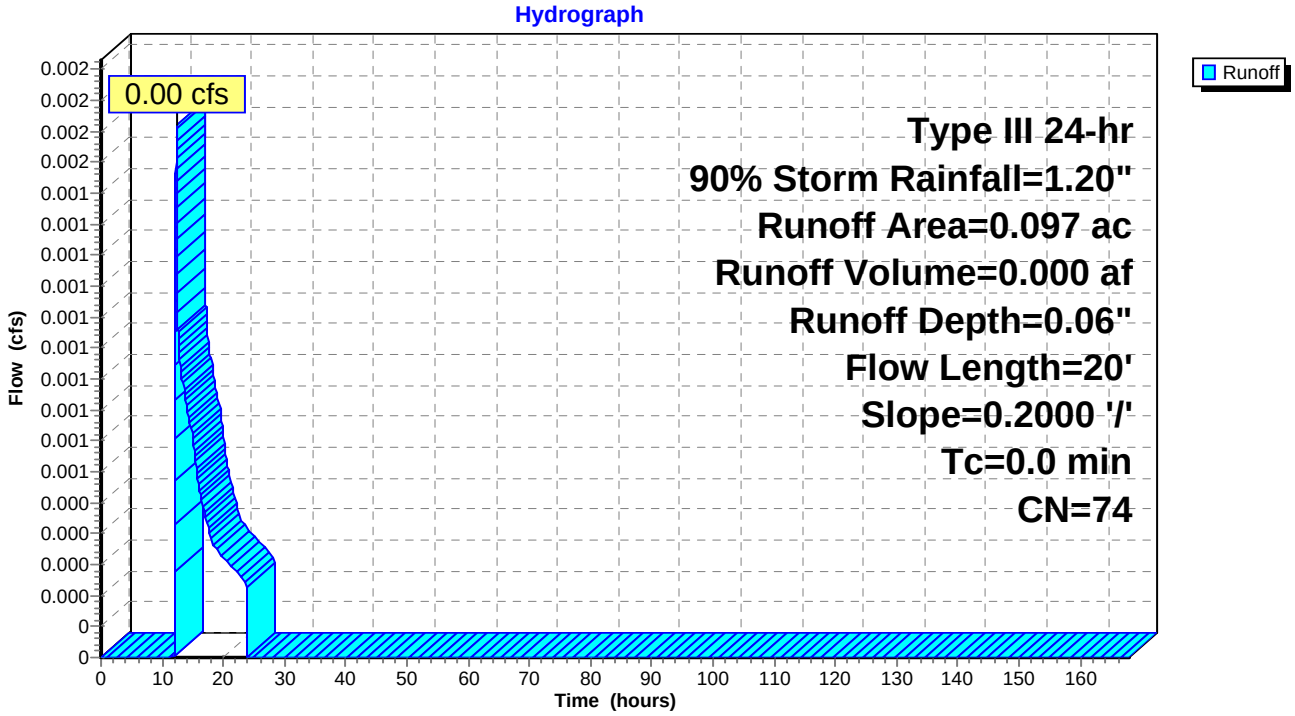
Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.097	74	>75% Grass cover, Good, HSG C
0.097		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28C: PR DA SW28C



Summary for Subcatchment SW28D: PR DA SW28D

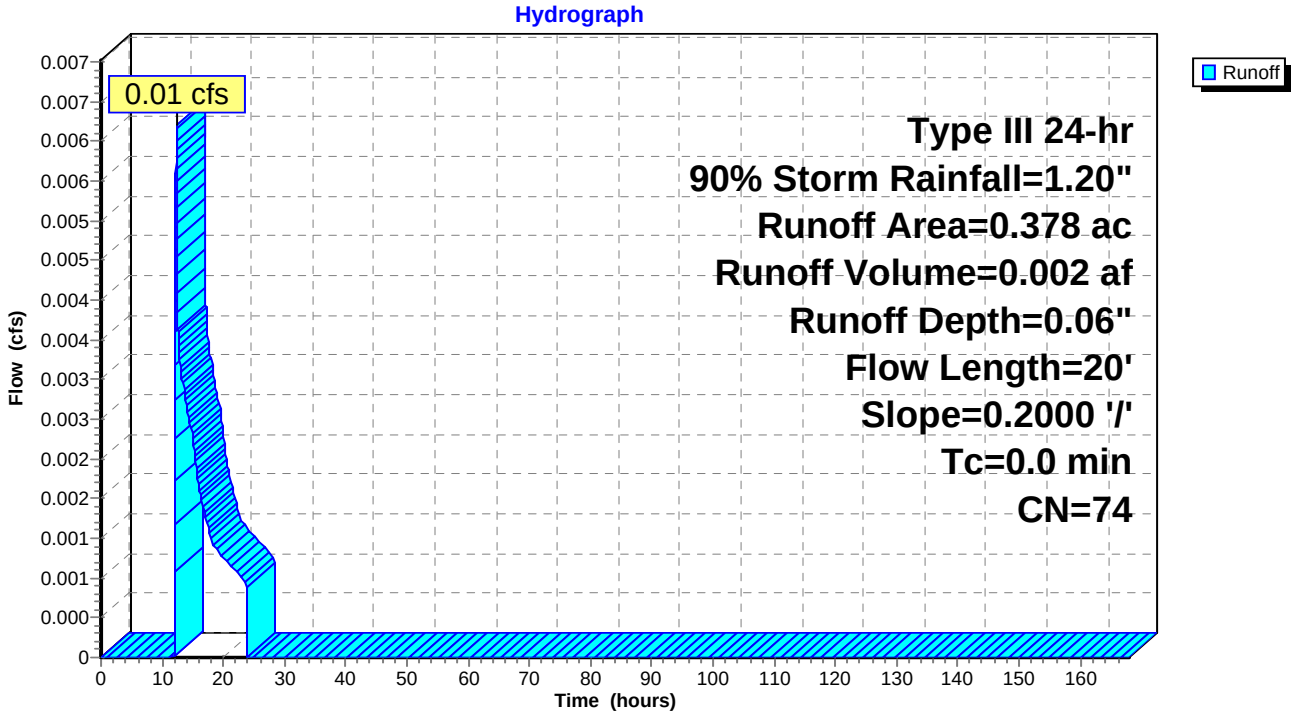
Runoff = 0.01 cfs @ 12.32 hrs, Volume= 0.002 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.378	74	>75% Grass cover, Good, HSG C
0.378		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28D: PR DA SW28D



Summary for Subcatchment SW31: PR DA SW31

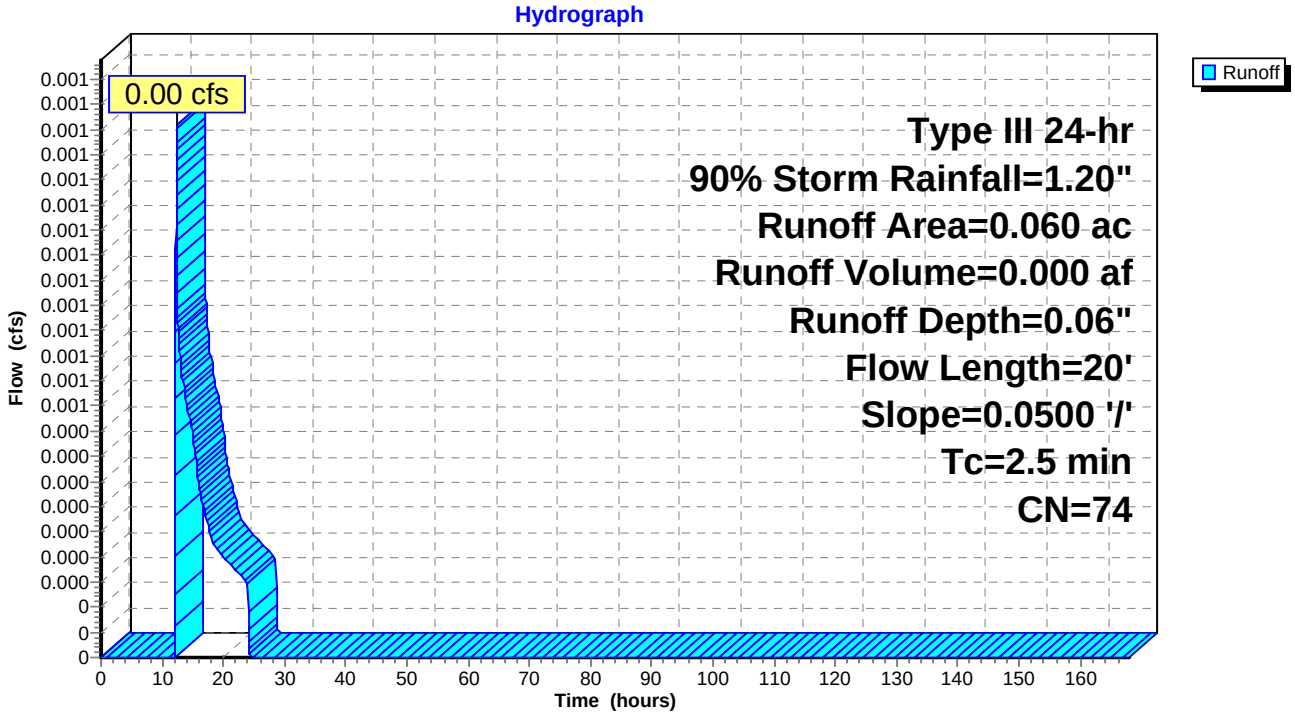
Runoff = 0.00 cfs @ 12.36 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.060	74	>75% Grass cover, Good, HSG C
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0500	0.13		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment SW31: PR DA SW31

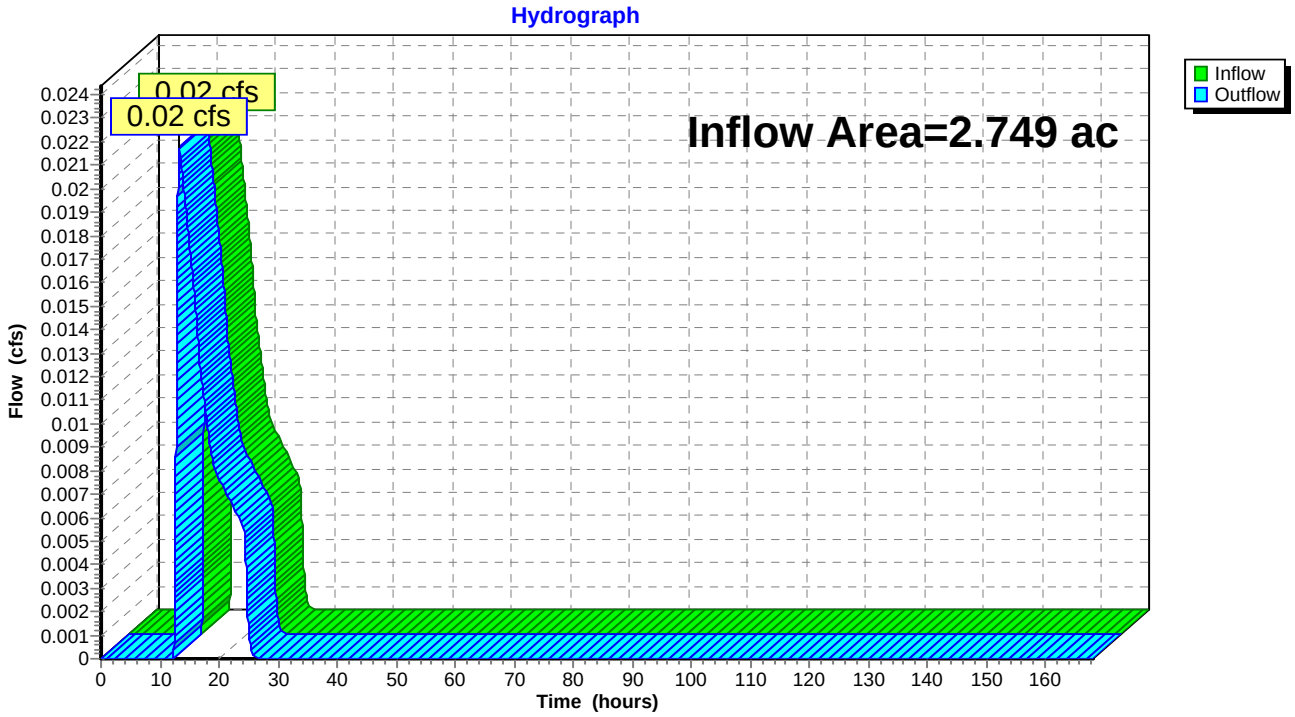


Summary for Reach 30R: DP-9

Inflow Area = 2.749 ac, 14.08% Impervious, Inflow Depth = 0.05" for 90% Storm event
Inflow = 0.02 cfs @ 13.28 hrs, Volume= 0.011 af
Outflow = 0.02 cfs @ 13.29 hrs, Volume= 0.011 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 30R: DP-9

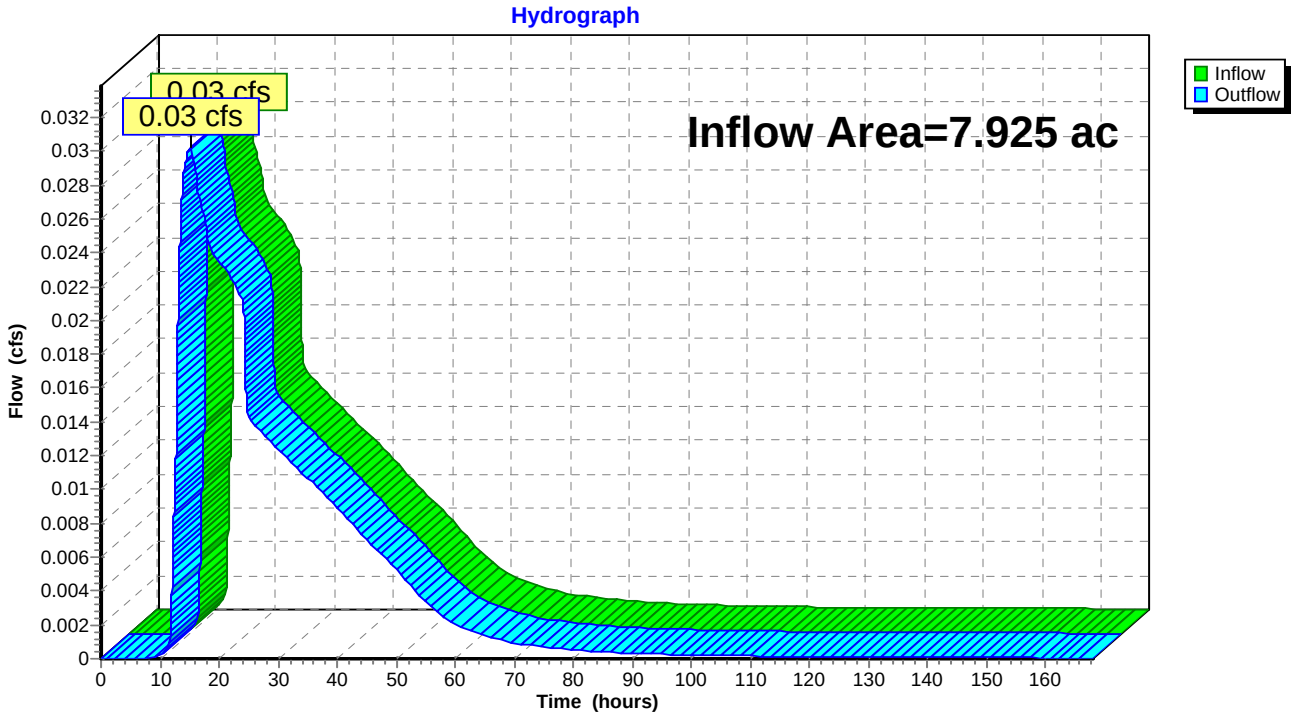


Summary for Reach 36R: DP-1

Inflow Area = 7.925 ac, 23.23% Impervious, Inflow Depth > 0.08" for 90% Storm event
Inflow = 0.03 cfs @ 15.11 hrs, Volume= 0.051 af
Outflow = 0.03 cfs @ 15.12 hrs, Volume= 0.051 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 36R: DP-1

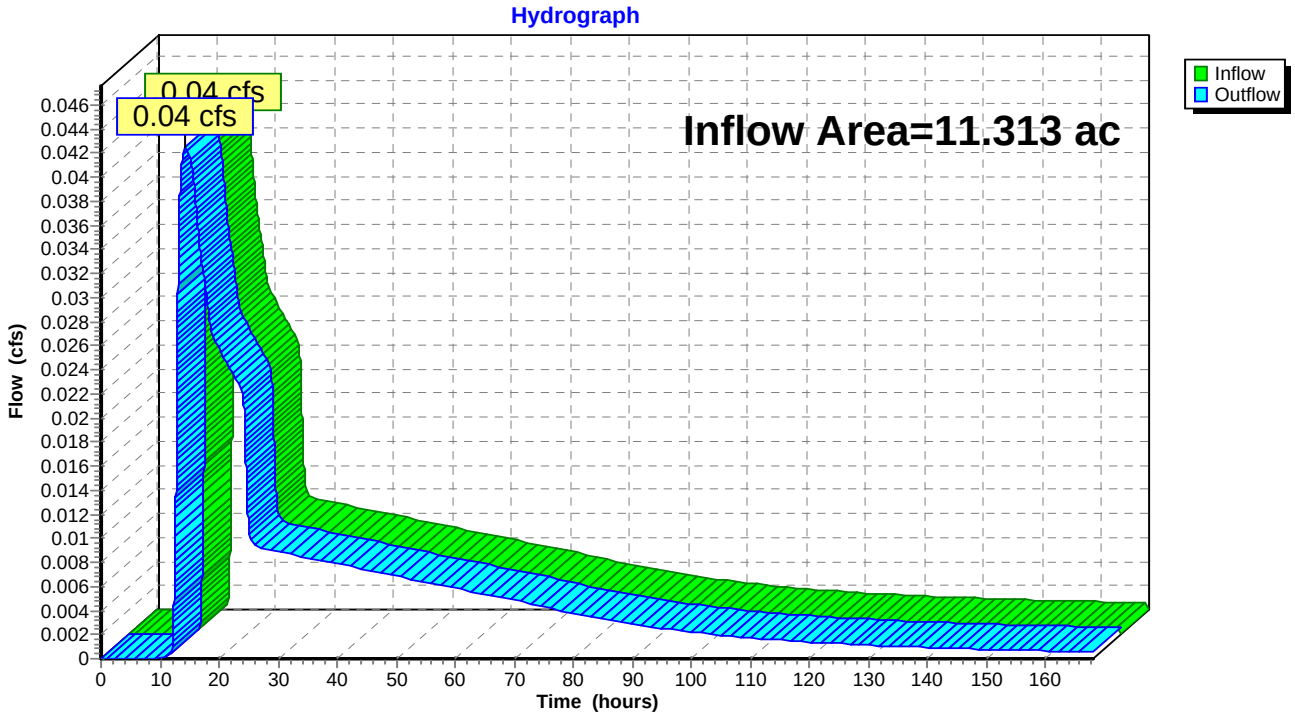


Summary for Reach 41R: DP-26

Inflow Area = 11.313 ac, 6.13% Impervious, Inflow Depth > 0.08" for 90% Storm event
Inflow = 0.04 cfs @ 14.19 hrs, Volume= 0.072 af
Outflow = 0.04 cfs @ 14.20 hrs, Volume= 0.072 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 41R: DP-26

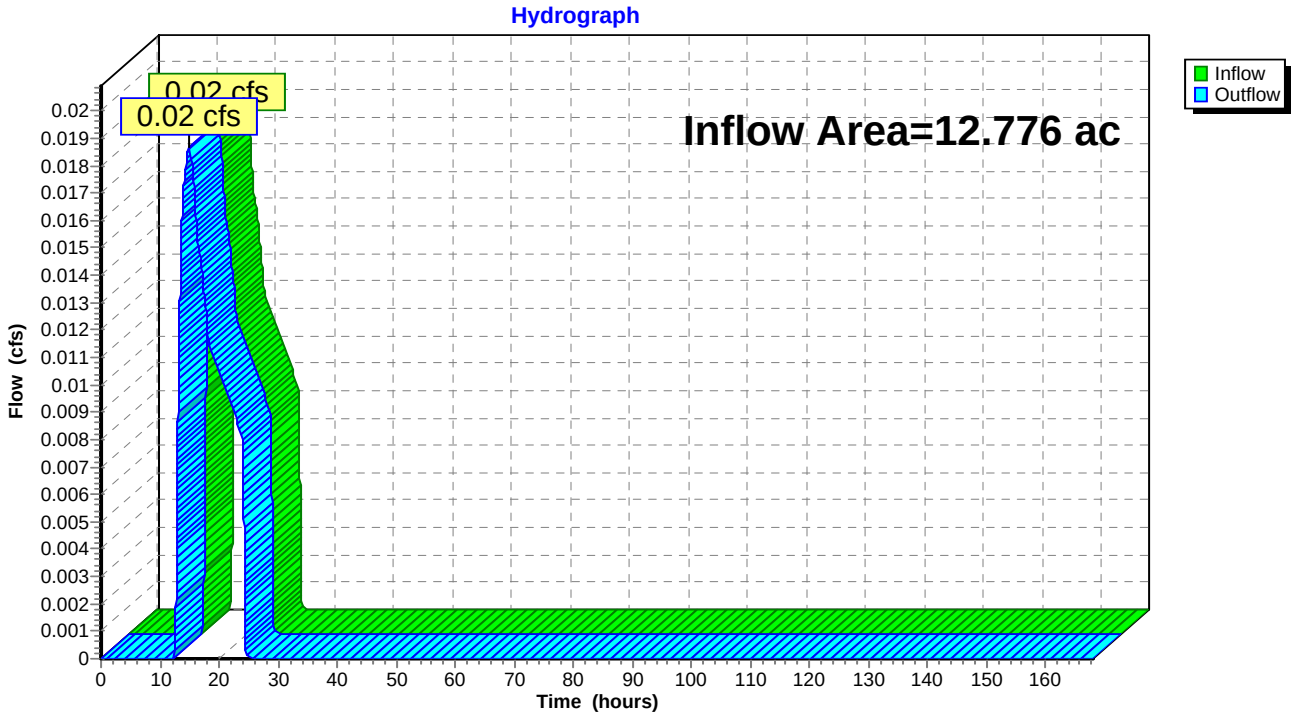


Summary for Reach 46R: DP-25

Inflow Area = 12.776 ac, 7.30% Impervious, Inflow Depth = 0.01" for 90% Storm event
Inflow = 0.02 cfs @ 14.94 hrs, Volume= 0.012 af
Outflow = 0.02 cfs @ 14.95 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 46R: DP-25

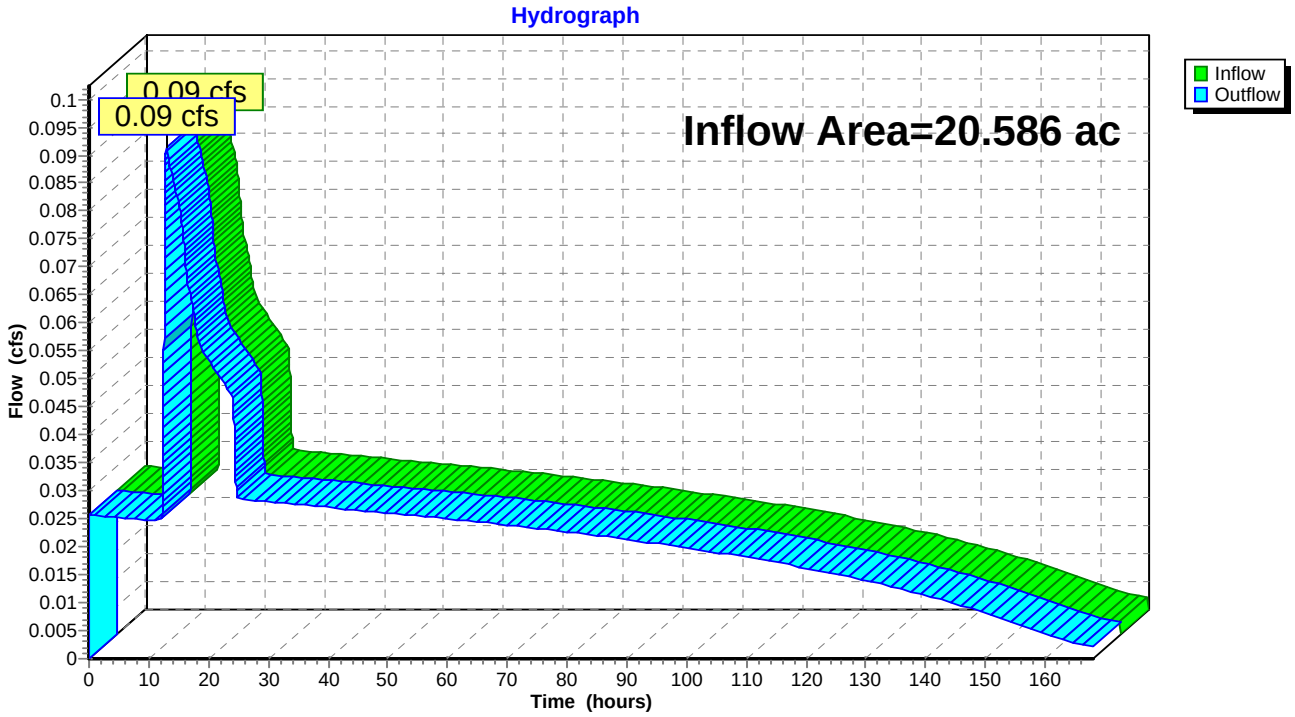


Summary for Reach 51R: DP-24

Inflow Area = 20.586 ac, 5.22% Impervious, Inflow Depth > 0.18" for 90% Storm event
Inflow = 0.09 cfs @ 13.02 hrs, Volume= 0.310 af
Outflow = 0.09 cfs @ 13.03 hrs, Volume= 0.310 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 51R: DP-24

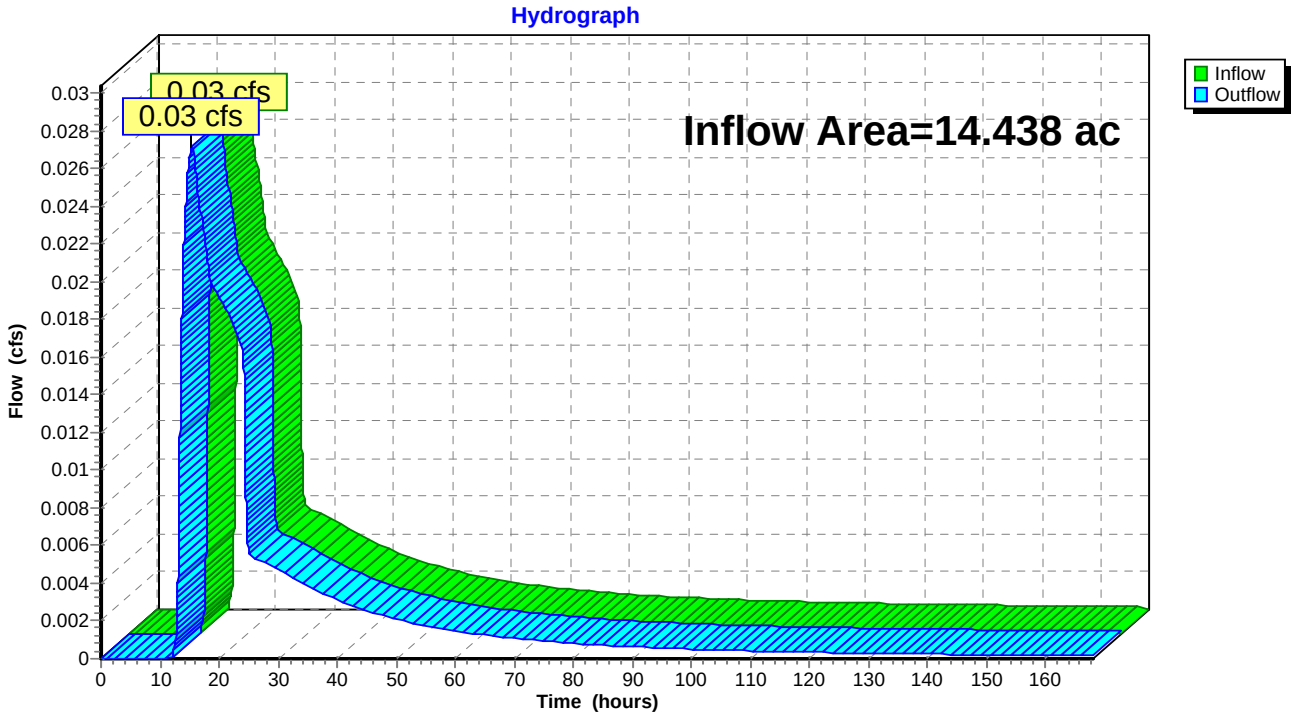


Summary for Reach 56R: DP-23

Inflow Area = 14.438 ac, 6.32% Impervious, Inflow Depth > 0.03" for 90% Storm event
Inflow = 0.03 cfs @ 15.39 hrs, Volume= 0.033 af
Outflow = 0.03 cfs @ 15.40 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 56R: DP-23

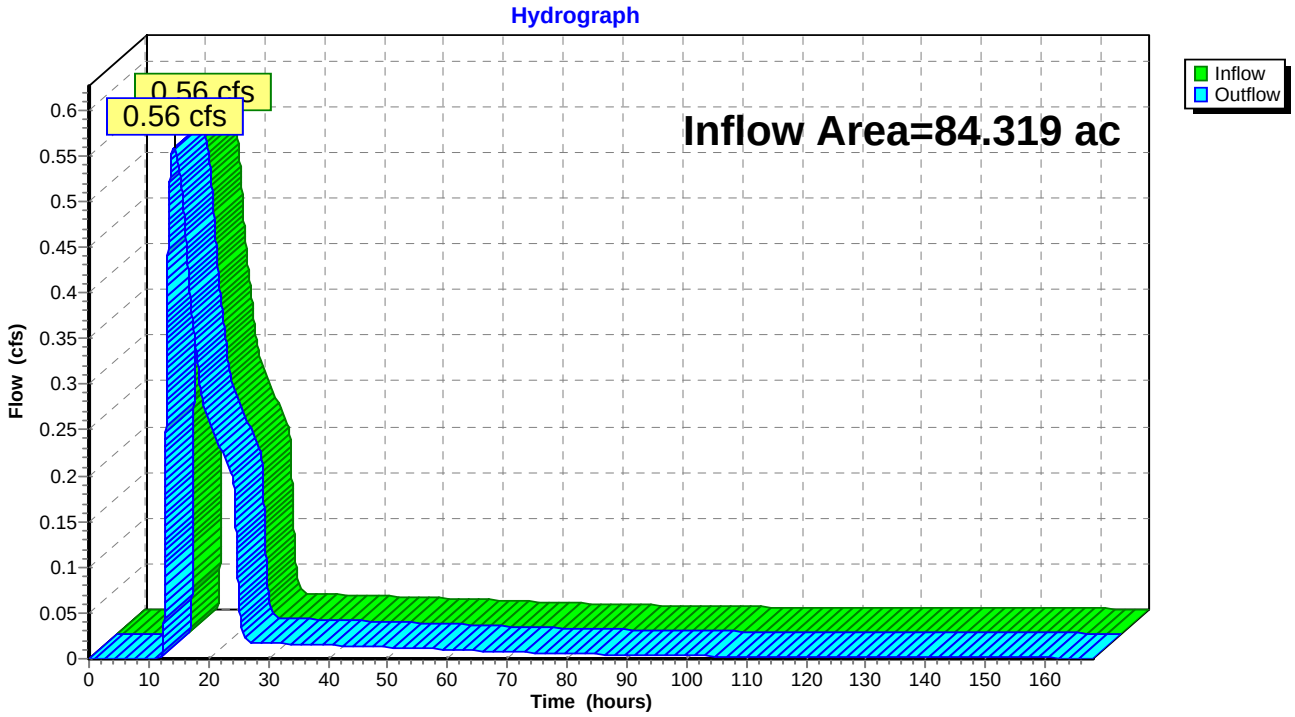


Summary for Reach 61R: DP-21

Inflow Area = 84.319 ac, 3.86% Impervious, Inflow Depth > 0.06" for 90% Storm event
Inflow = 0.56 cfs @ 14.23 hrs, Volume= 0.409 af
Outflow = 0.56 cfs @ 14.24 hrs, Volume= 0.409 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 61R: DP-21



Summary for Pond 21A-P: Pond-21A

Inflow Area = 3.092 ac, 26.26% Impervious, Inflow Depth = 0.19" for 90% Storm event
Inflow = 0.56 cfs @ 12.05 hrs, Volume= 0.048 af
Outflow = 0.01 cfs @ 24.03 hrs, Volume= 0.046 af, Atten= 98%, Lag= 718.7 min
Primary = 0.01 cfs @ 24.03 hrs, Volume= 0.046 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,376.50' Surf.Area= 2,567 sf Storage= 3,042 cf
Peak Elev= 1,376.69' @ 24.03 hrs Surf.Area= 9,423 sf Storage= 4,764 cf (1,722 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 2,178.1 min (3,076.8 - 898.7)

Volume	Invert	Avail.Storage	Storage Description
#1	1,374.00'	51,415 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

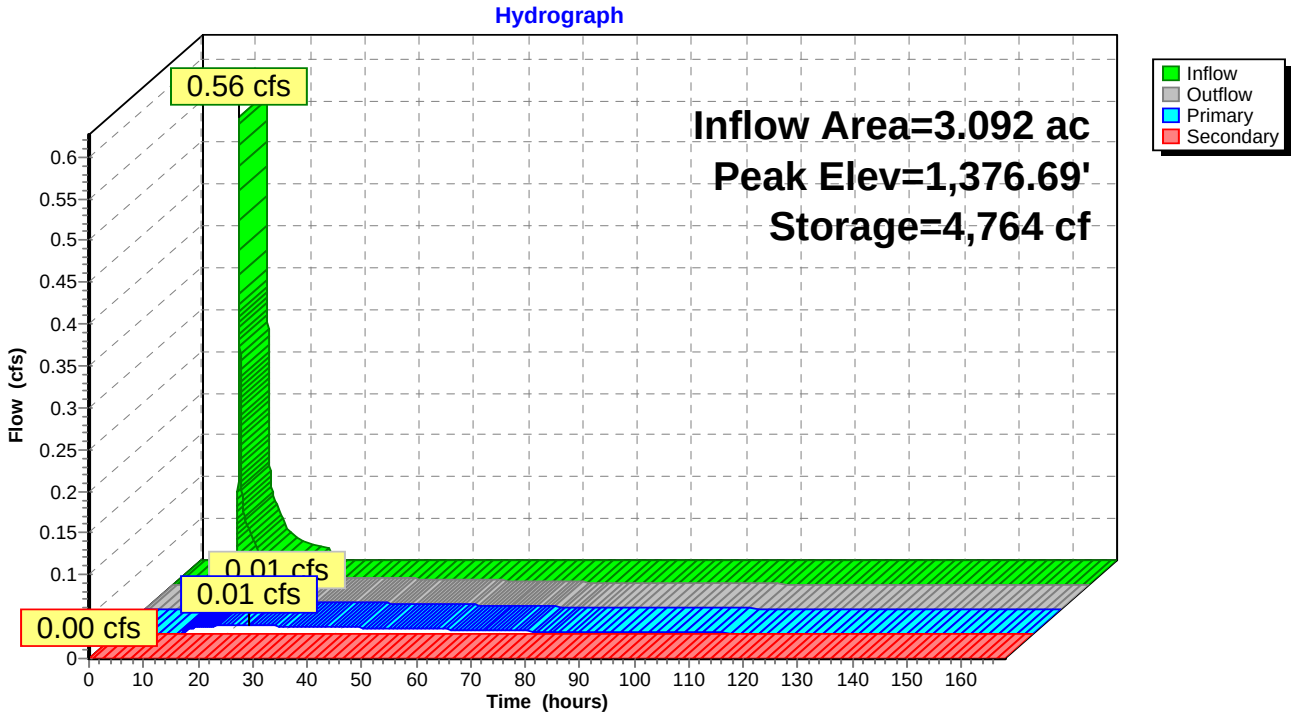
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,374.00	277	79.1	0	0	277
1,375.00	875	200.4	548	548	2,979
1,376.00	1,938	331.0	1,372	1,920	8,508
1,376.50	2,567	347.4	1,123	3,042	9,409
1,376.51	9,076	469.5	55	3,097	17,346
1,377.00	10,035	482.1	4,680	7,778	18,329
1,378.00	13,431	599.0	11,692	19,469	28,400
1,379.00	15,954	633.4	14,674	34,144	31,830
1,380.00	18,622	668.8	17,271	51,415	35,555

Device	Routing	Invert	Outlet Devices
#1	Primary	1,374.00'	**15.0" Round Culvert** L= 3.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,374.00' / 1,373.50' S= 0.1667 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,376.50'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,379.00'	**10.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

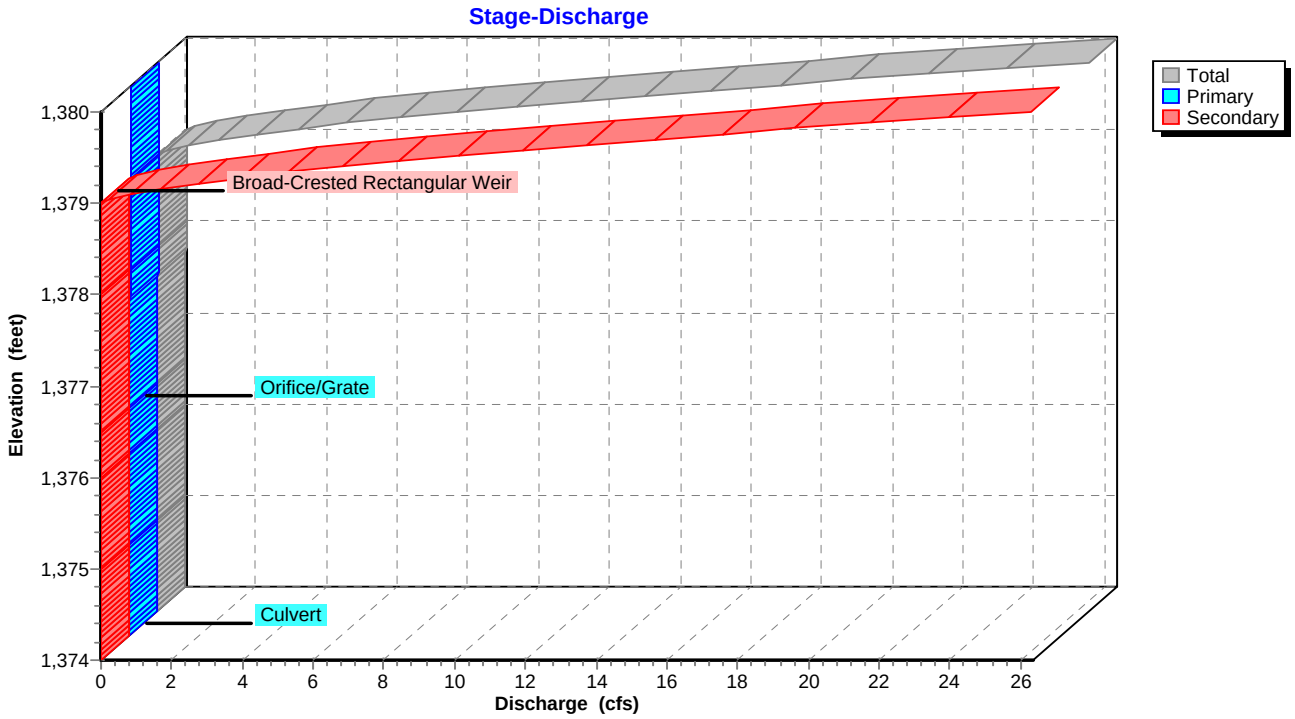
Primary OutFlow Max=0.01 cfs @ 24.03 hrs HW=1,376.69' TW=0.00' (Dynamic Tailwater)
↑—**1=Culvert** (Passes 0.01 cfs of 6.70 cfs potential flow)
↑—**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 1.86 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,376.50' TW=0.00' (Dynamic Tailwater)
↑—**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

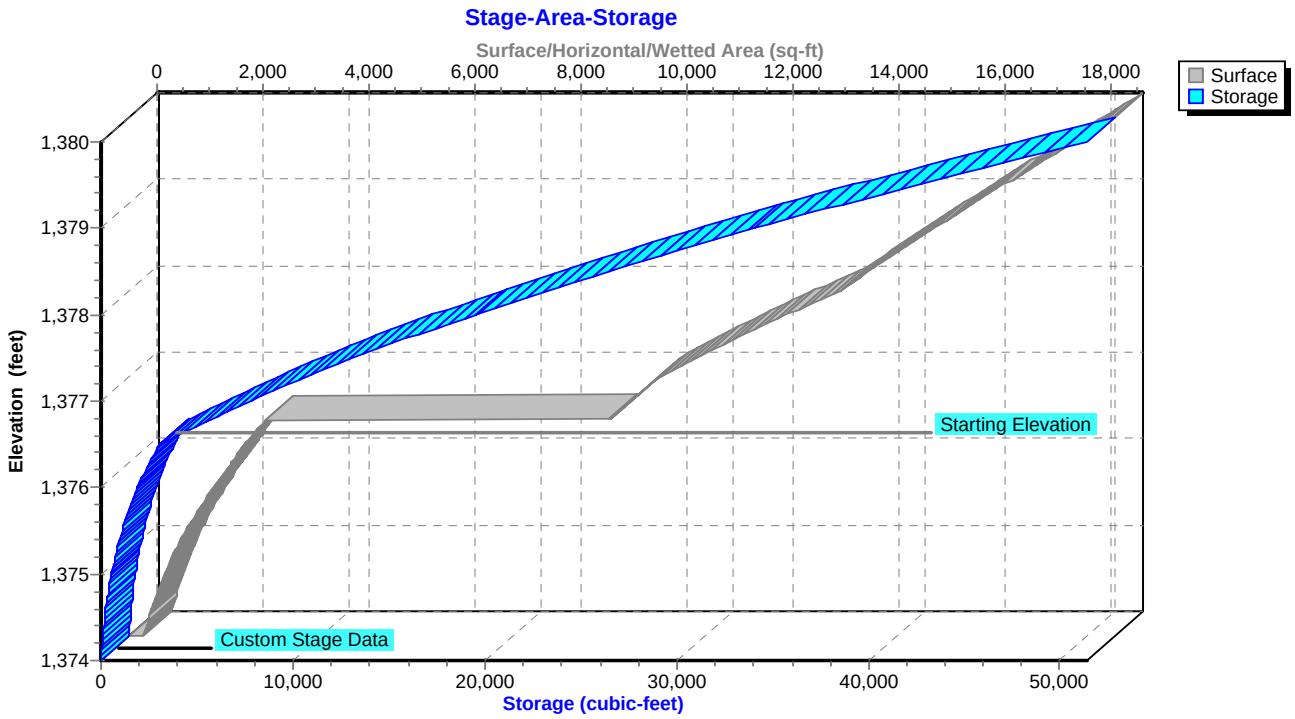
Pond 21A-P: Pond-21A



Pond 21A-P: Pond-21A



Pond 21A-P: Pond-21A



Summary for Pond 21B-P: Pond-21B

Inflow Area = 3.185 ac, 29.51% Impervious, Inflow Depth = 0.18" for 90% Storm event
Inflow = 0.64 cfs @ 12.03 hrs, Volume= 0.047 af
Outflow = 0.01 cfs @ 24.03 hrs, Volume= 0.042 af, Atten= 99%, Lag= 719.5 min
Primary = 0.01 cfs @ 24.03 hrs, Volume= 0.042 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,378.00' Surf.Area= 5,813 sf Storage= 10,561 cf
Peak Elev= 1,378.14' @ 24.03 hrs Surf.Area= 12,811 sf Storage= 12,291 cf (1,729 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 2,522.2 min (3,402.8 - 880.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,375.00'	58,169 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

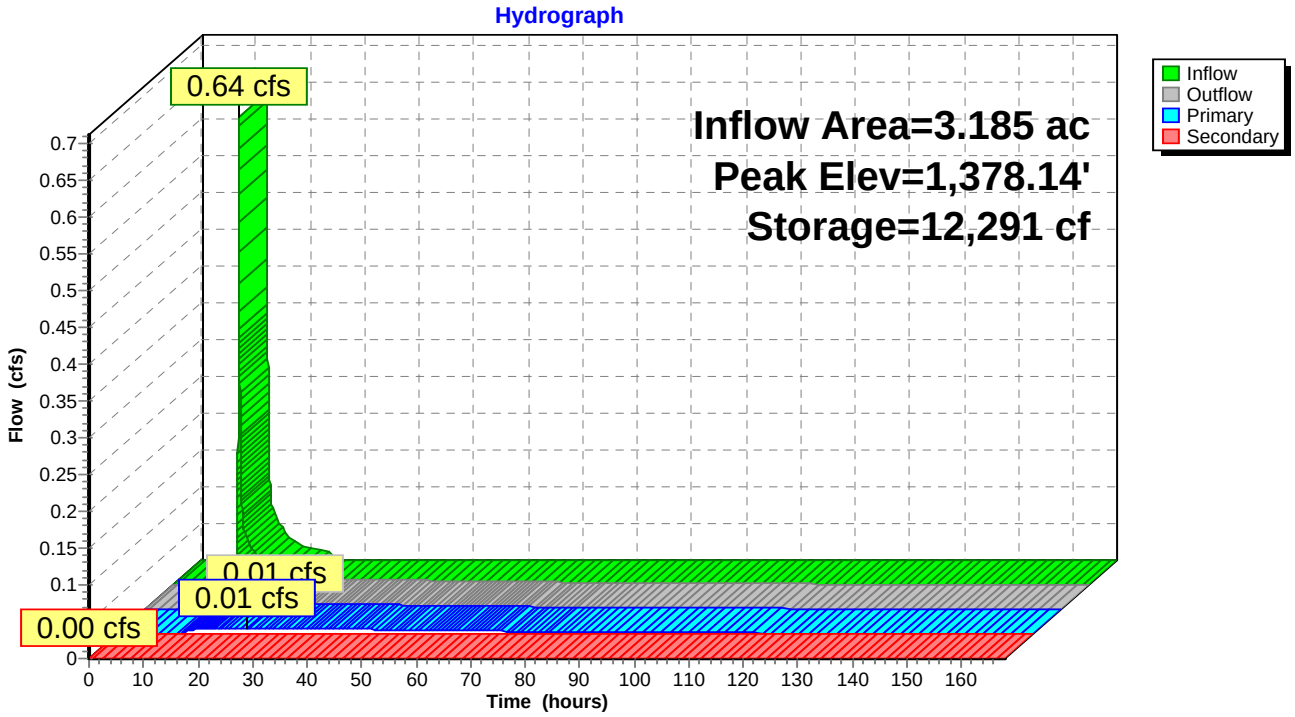
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,375.00	1,530	196.8	0	0	1,530
1,376.00	2,694	275.3	2,085	2,085	4,489
1,377.00	4,273	340.8	3,453	5,538	7,715
1,378.00	5,813	381.6	5,023	10,561	10,088
1,378.01	12,538	491.4	90	10,651	17,716
1,379.00	14,705	523.2	13,471	24,122	20,332
1,380.00	16,999	554.8	15,838	39,960	23,096
1,381.00	19,446	587.7	18,209	58,169	26,141

Device	Routing	Invert	Outlet Devices
#1	Primary	1,376.00'	**12.0" Round Culvert** L= 52.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,376.00' / 1,375.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,378.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,379.00'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Secondary	1,380.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

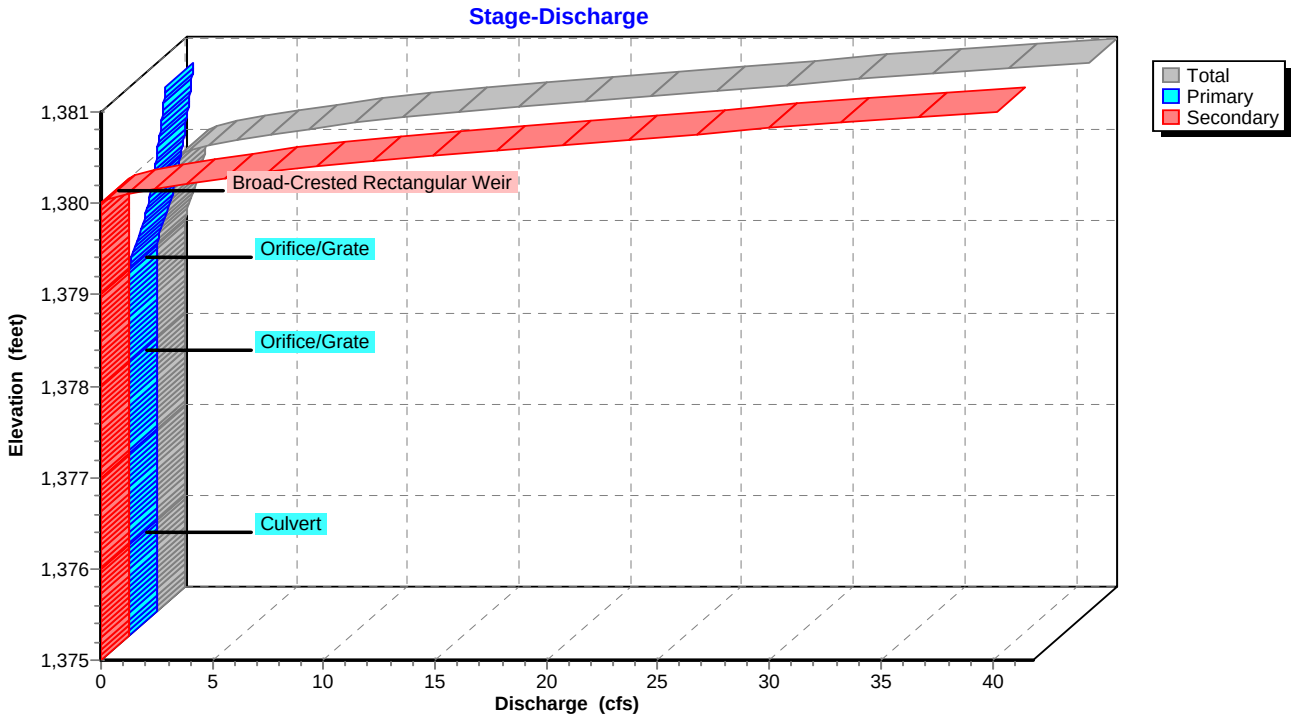
Primary OutFlow Max=0.01 cfs @ 24.03 hrs HW=1,378.14' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.01 cfs of 4.27 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 1.51 fps)
└**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,378.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

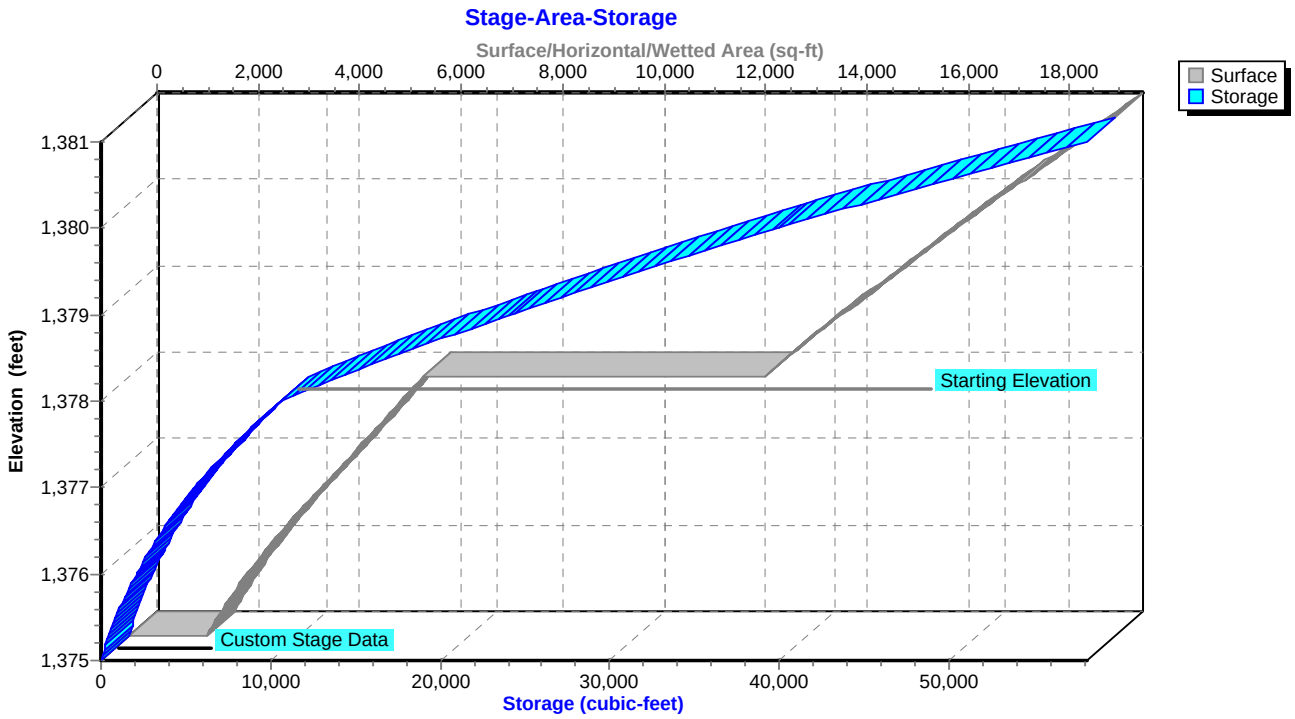
Pond 21B-P: Pond-21B



Pond 21B-P: Pond-21B



Pond 21B-P: Pond-21B



Summary for Pond 23-P: Pond-23

Inflow Area = 6.536 ac, 9.13% Impervious, Inflow Depth = 0.04" for 90% Storm event
Inflow = 0.15 cfs @ 12.07 hrs, Volume= 0.020 af
Outflow = 0.01 cfs @ 24.02 hrs, Volume= 0.018 af, Atten= 96%, Lag= 717.2 min
Primary = 0.01 cfs @ 24.02 hrs, Volume= 0.018 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,381.00' Surf.Area= 7,857 sf Storage= 8,931 cf
Peak Elev= 1,381.09' @ 24.02 hrs Surf.Area= 8,001 sf Storage= 9,622 cf (691 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 1,935.1 min (2,864.8 - 929.6)

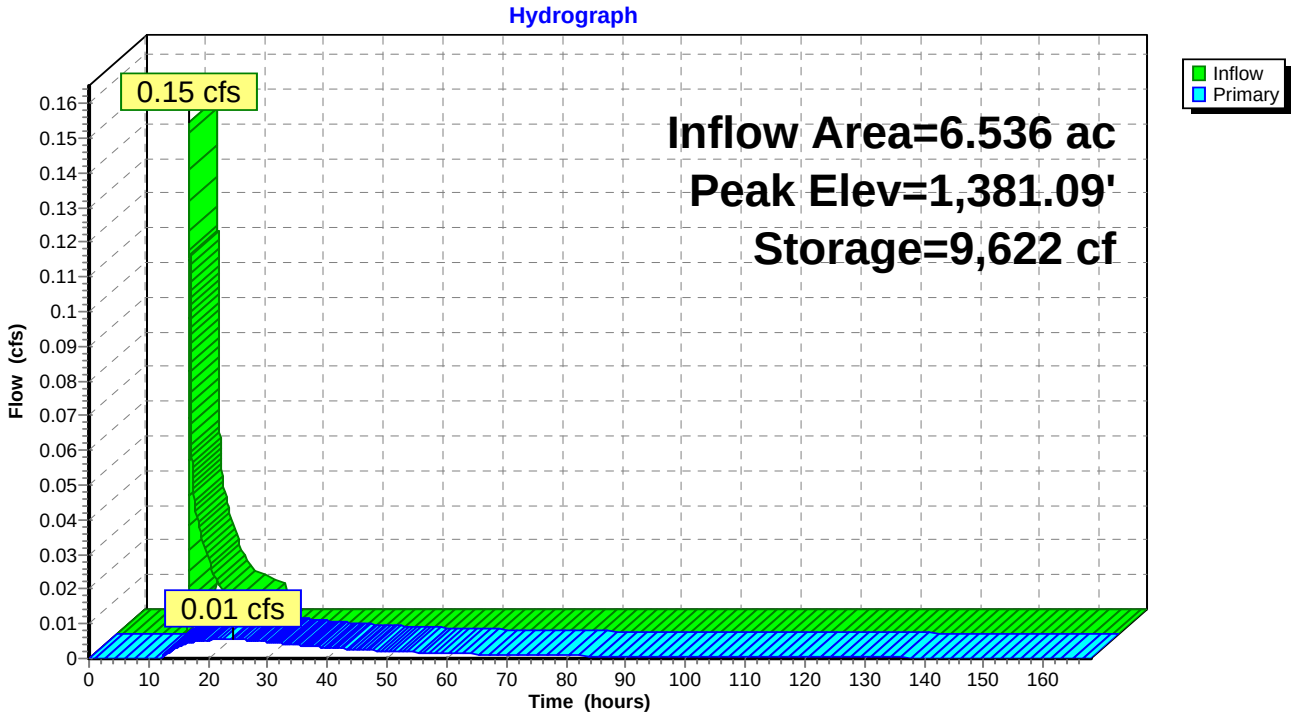
Volume	Invert	Avail.Storage	Storage Description
#1	1,377.00'	71,310 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,377.00	234	63.1	0	0	234
1,378.00	802	196.1	490	490	2,980
1,379.00	1,699	233.8	1,223	1,713	4,288
1,380.00	2,685	258.9	2,173	3,886	5,302
1,381.00	7,857	376.4	5,045	8,931	11,251
1,382.00	9,589	415.8	8,709	17,639	13,766
1,383.00	11,418	451.2	10,490	28,130	16,247
1,384.00	13,357	481.7	12,375	40,504	18,559
1,385.00	15,433	511.5	14,383	54,887	20,966
1,386.00	17,433	538.9	16,423	71,310	23,316

Device	Routing	Invert	Outlet Devices
#1	Primary	1,380.00'	**18.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,380.00' / 1,379.00' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,381.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,383.00'	**36.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,384.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=0.01 cfs @ 24.02 hrs HW=1,381.09' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.01 cfs of 3.84 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 1.03 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 23-P: Pond-23



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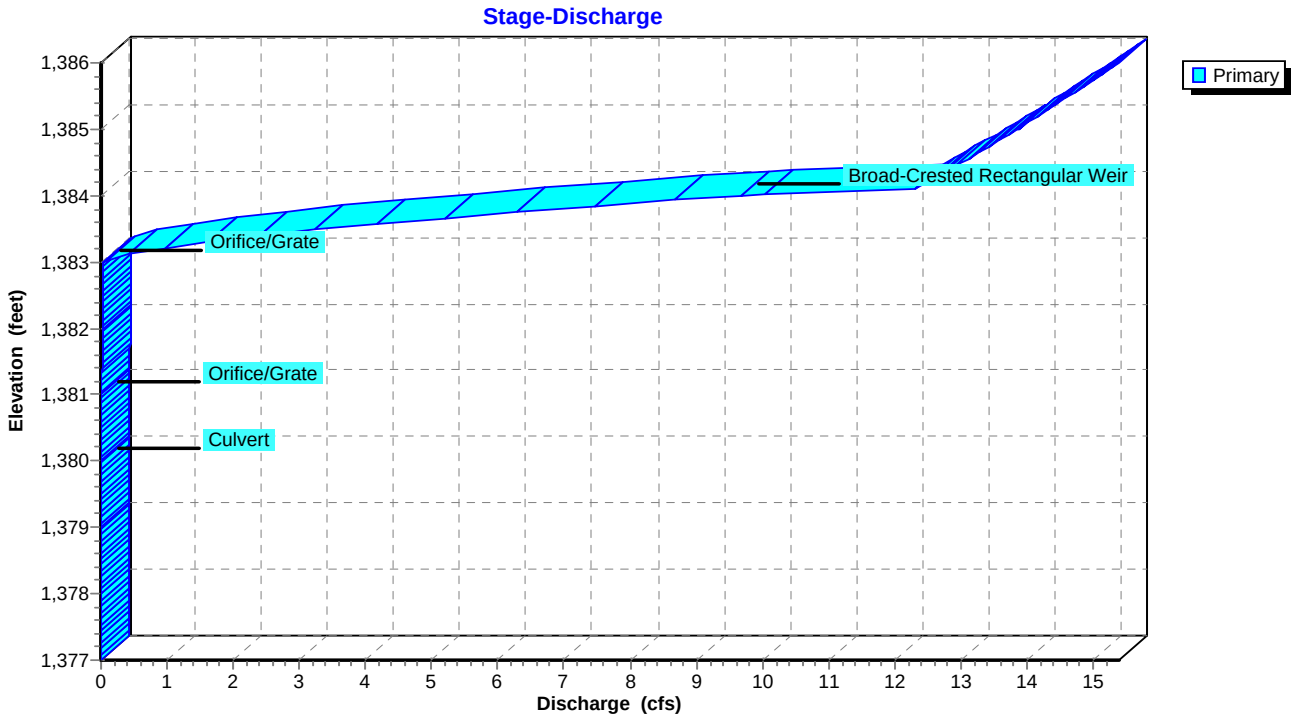

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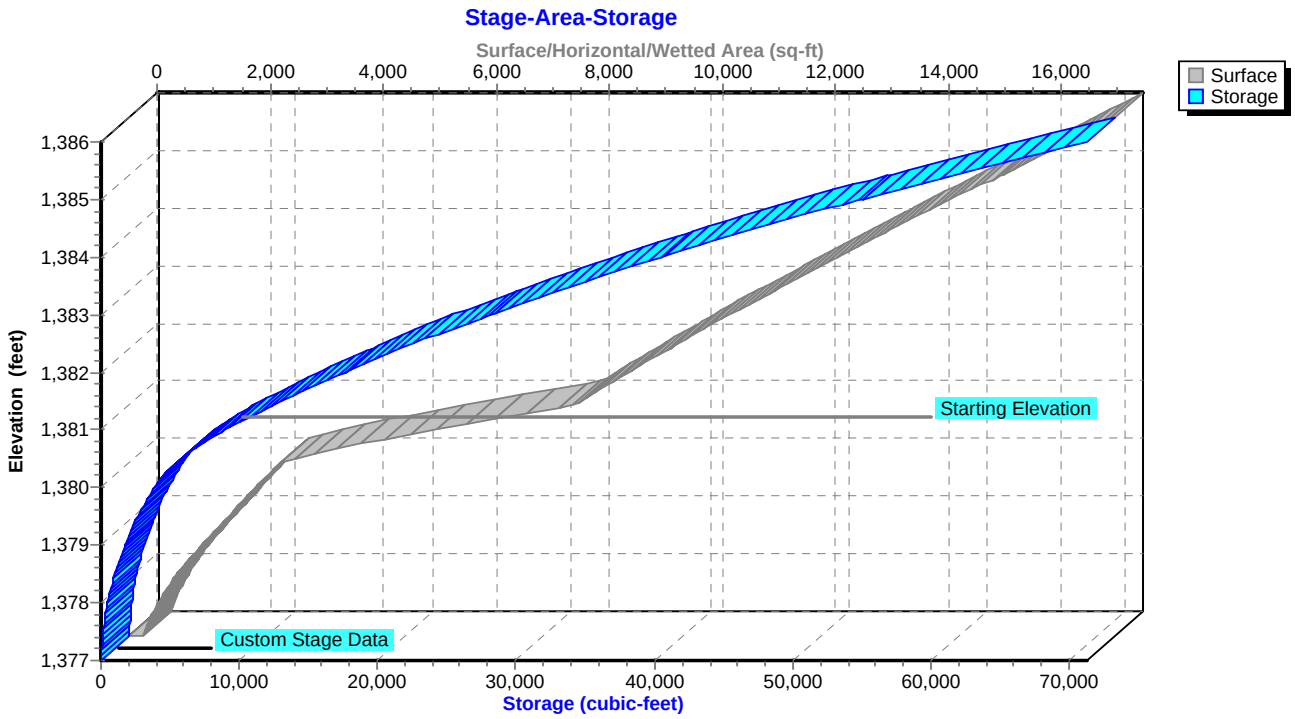


Summary for Pond 24-P: Pond-24

Inflow Area = 12.441 ac, 8.63% Impervious, Inflow Depth = 0.11" for 90% Storm event
Inflow = 1.29 cfs @ 12.04 hrs, Volume= 0.118 af
Outflow = 0.03 cfs @ 24.03 hrs, Volume= 0.275 af, Atten= 98%, Lag= 719.3 min
Primary = 0.03 cfs @ 24.03 hrs, Volume= 0.275 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,365.00' Surf.Area= 12,290 sf Storage= 10,821 cf
Peak Elev= 1,365.22' @ 24.03 hrs Surf.Area= 13,181 sf Storage= 13,658 cf (2,836 cf above start)

Plug-Flow detention time= 7,912.8 min calculated for 0.027 af (23% of inflow)
Center-of-Mass det. time= 3,121.6 min (4,020.2 - 898.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,361.00'	90,100 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

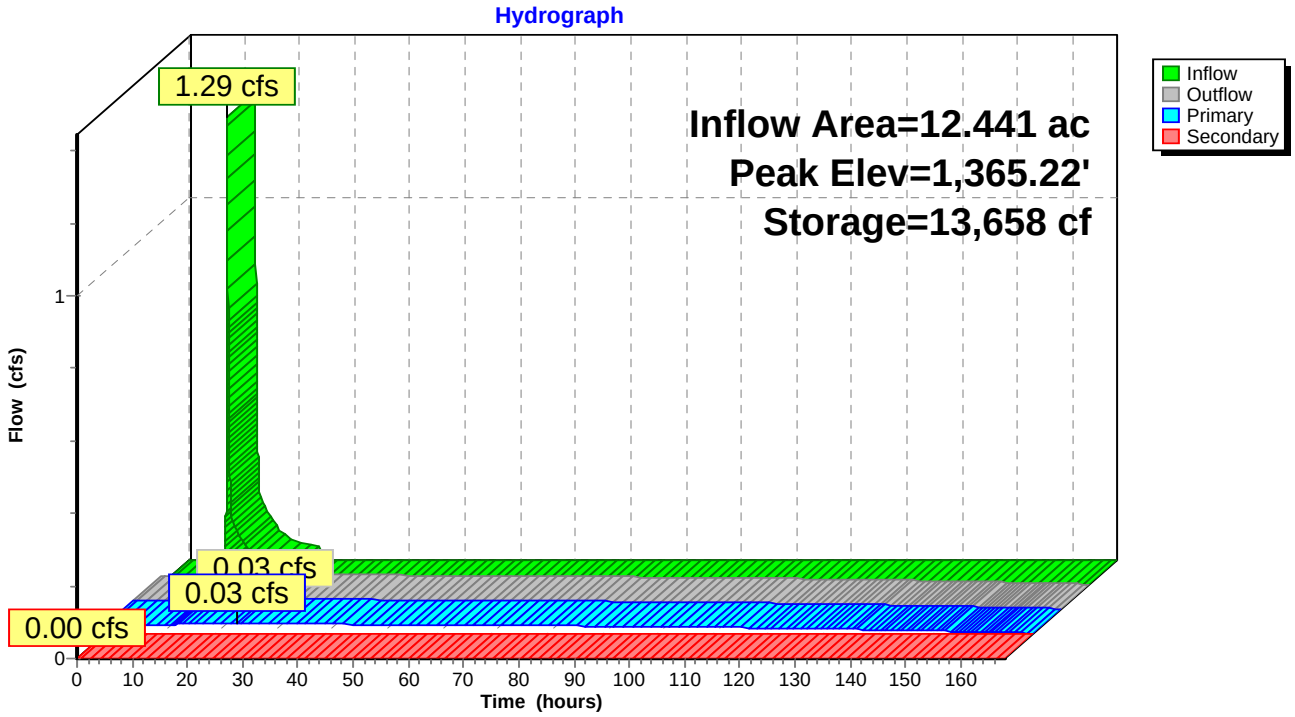
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,361.00	144	79.7	0	0	144
1,362.00	778	180.4	419	419	2,232
1,363.00	1,724	246.8	1,220	1,639	4,500
1,364.00	2,762	271.9	2,223	3,862	5,568
1,365.00	12,290	631.5	6,959	10,821	31,423
1,366.00	16,533	762.9	14,359	25,180	46,021
1,367.00	19,892	828.3	18,187	43,367	54,340
1,368.00	23,383	865.9	21,614	64,981	59,479
1,369.00	26,897	891.0	25,120	90,100	63,097

Device	Routing	Invert	Outlet Devices
#1	Primary	1,362.00'	**18.0" Round Culvert** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,362.00' / 1,358.00' S= 0.0267 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,364.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,365.80'	**12.5" W x 12.5" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,367.00'	**12.0" x 12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,368.00'	**20.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

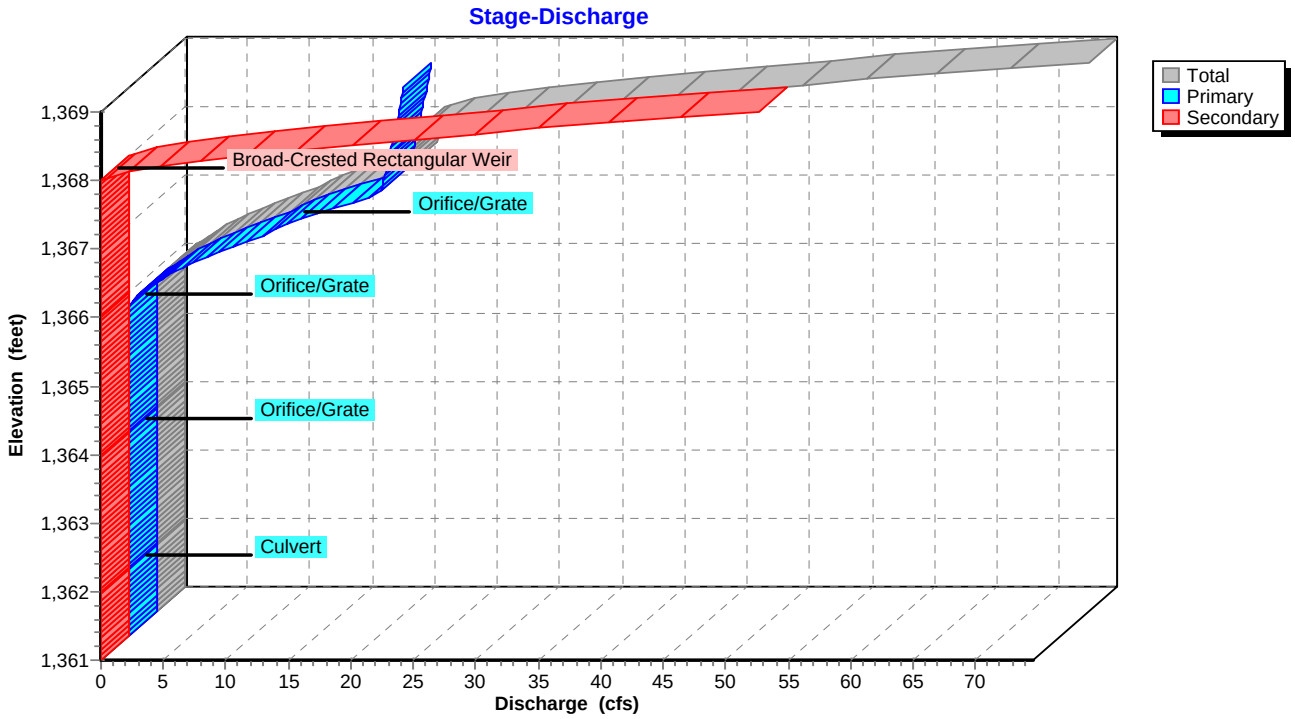
Primary OutFlow Max=0.03 cfs @ 24.03 hrs HW=1,365.22' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.03 cfs of 16.73 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 5.23 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,365.00' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

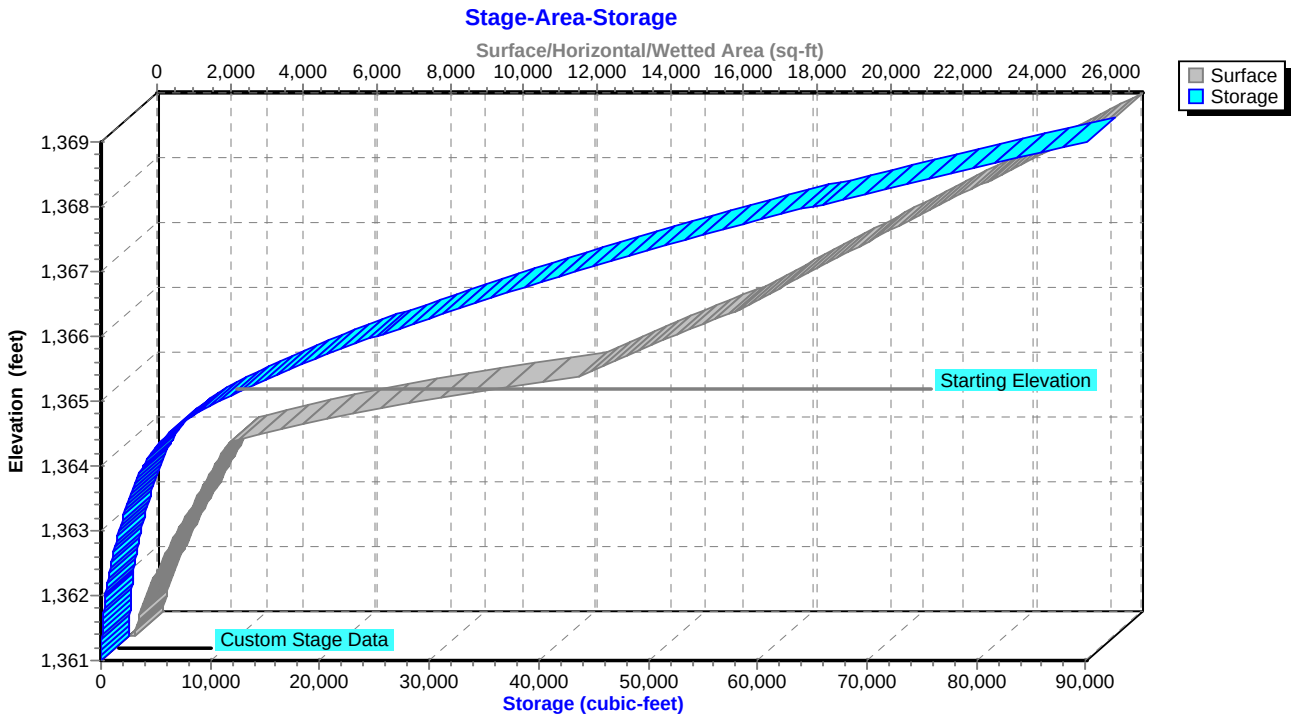
Pond 24-P: Pond-24



Pond 24-P: Pond-24



Pond 24-P: Pond-24



Summary for Pond 26-P: Pond-26

Inflow Area = 5.277 ac, 13.14% Impervious, Inflow Depth = 0.13" for 90% Storm event
Inflow = 0.51 cfs @ 12.05 hrs, Volume= 0.056 af
Outflow = 0.01 cfs @ 24.06 hrs, Volume= 0.050 af, Atten= 98%, Lag= 720.4 min
Primary = 0.01 cfs @ 24.06 hrs, Volume= 0.050 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,371.00' Surf.Area= 11,978 sf Storage= 14,978 cf
Peak Elev= 1,371.17' @ 24.06 hrs Surf.Area= 12,321 sf Storage= 17,058 cf (2,080 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 2,547.8 min (3,451.4 - 903.7)

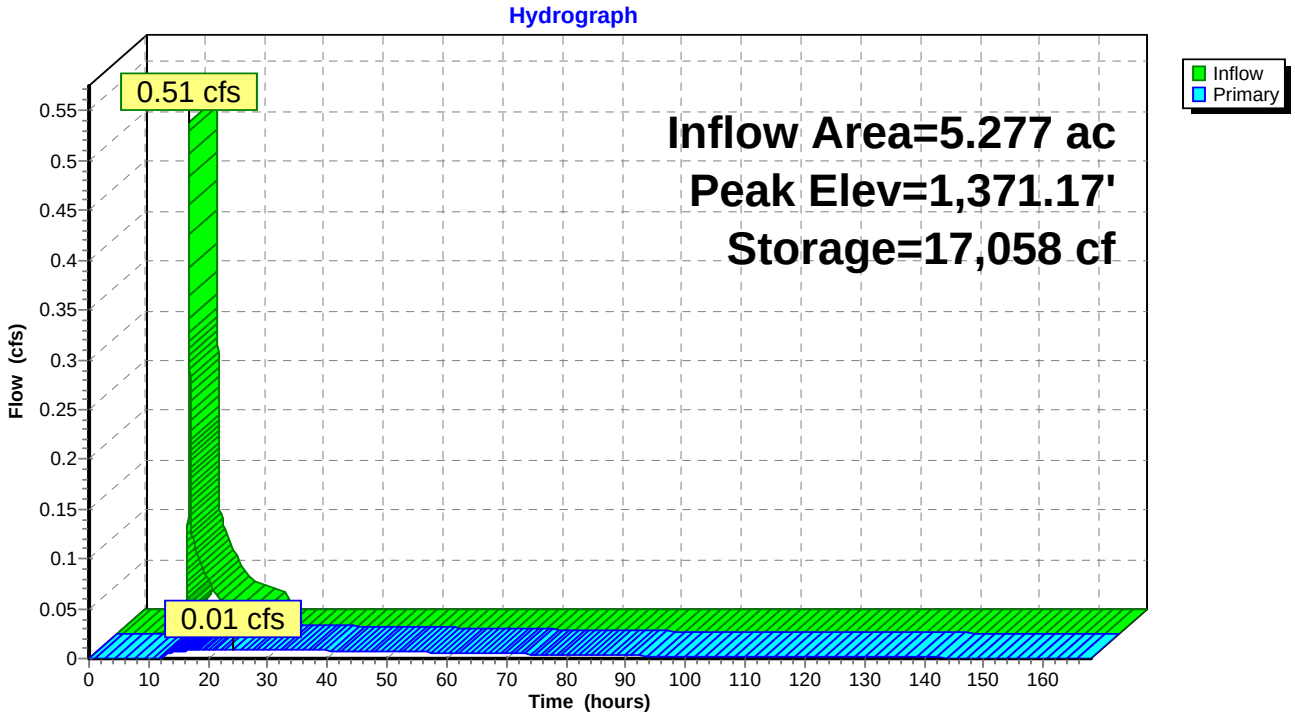
Volume	Invert	Avail.Storage	Storage Description
#1	1,367.00'	80,070 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,367.00	790	132.3	0	0	790
1,368.00	1,854	246.6	1,285	1,285	4,242
1,369.00	2,907	273.0	2,361	3,646	5,364
1,370.00	4,238	315.4	3,552	7,197	7,371
1,371.00	11,978	471.7	7,780	14,978	17,168
1,372.00	14,050	507.1	13,000	27,978	19,969
1,373.00	16,216	538.7	15,120	43,098	22,650
1,374.00	18,484	568.5	17,338	60,435	25,334
1,375.00	20,808	593.7	19,635	80,070	27,736

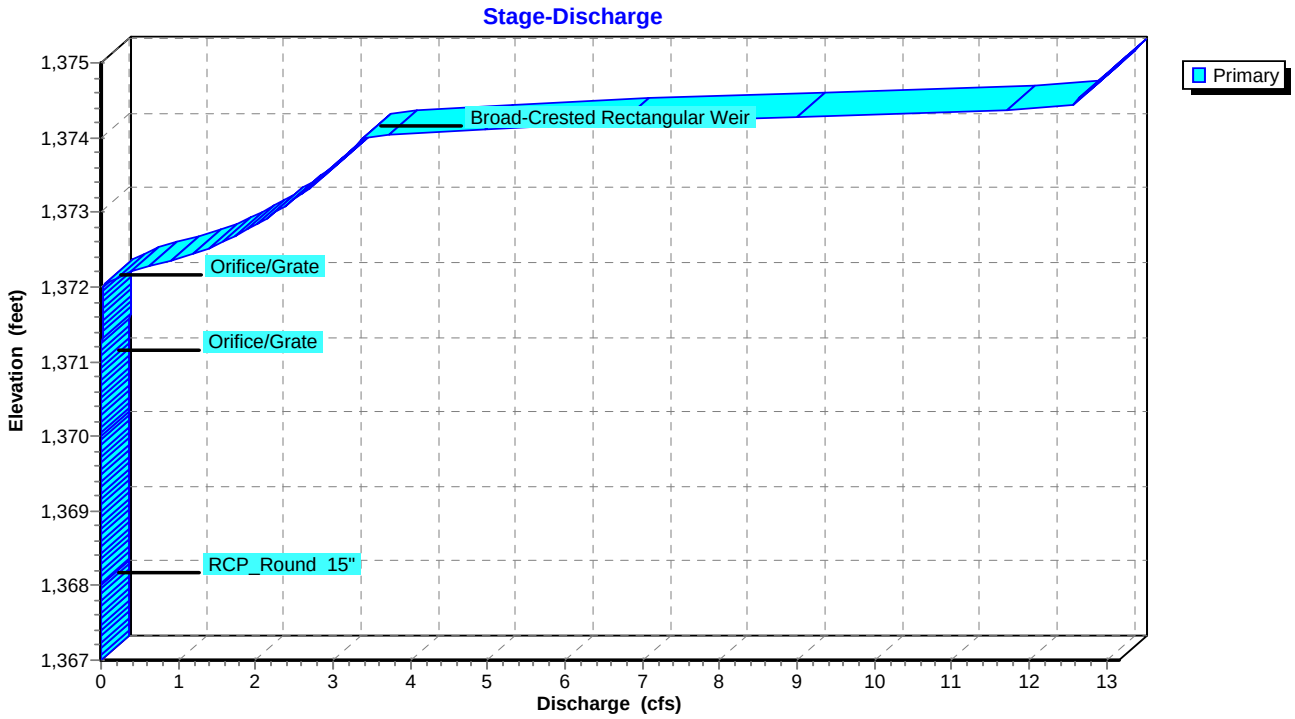
Device	Routing	Invert	Outlet Devices
#1	Primary	1,368.00'	**15.0" Round RCP_Round 15"** L= 60.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,368.00' / 1,367.00' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,371.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,372.00'	**5.0" W x 5.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,374.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=0.01 cfs @ 24.06 hrs HW=1,371.17' TW=0.00' (Dynamic Tailwater)
└─**1=RCP_Round 15"** (Passes 0.01 cfs of 8.32 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 1.73 fps)
  ├─**3=Orifice/Grate** (Controls 0.00 cfs)
  └─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

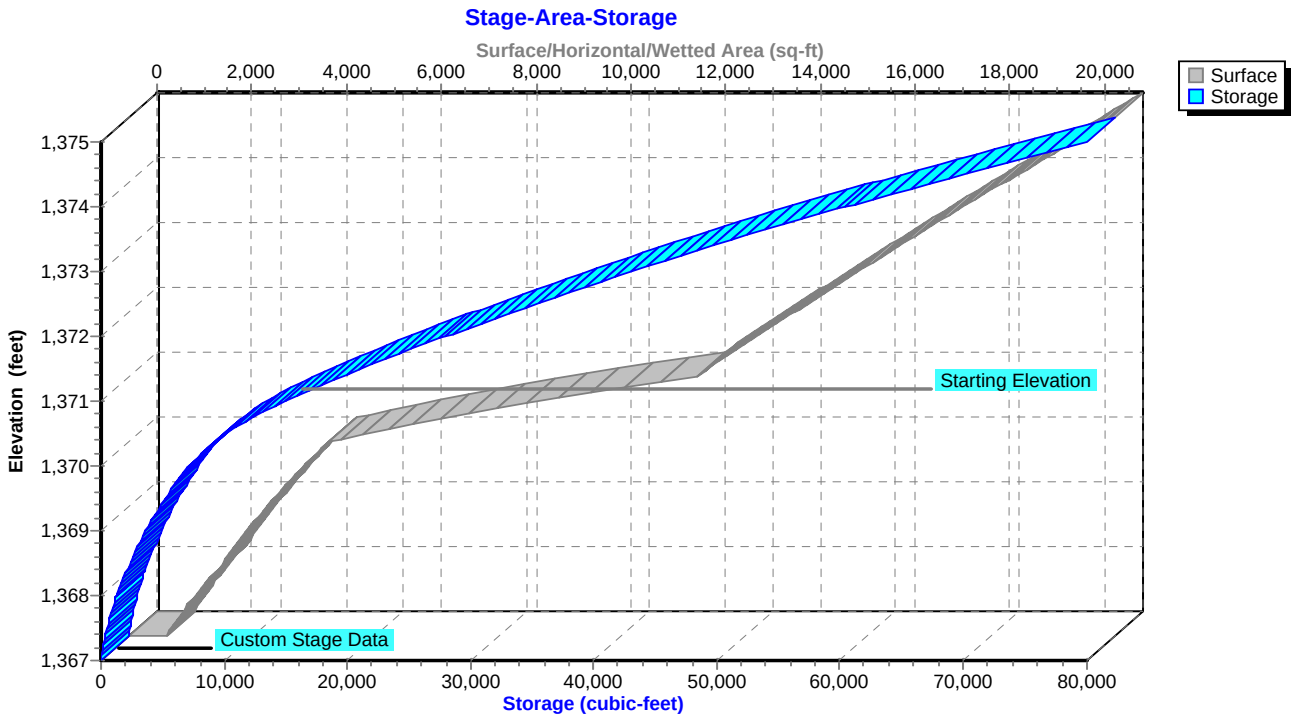
Pond 26-P: Pond-26



Pond 26-P: Pond-26



Pond 26-P: Pond-26



Summary for Pond 28-P: Pond-28

Inflow Area = 2.526 ac, 27.71% Impervious, Inflow Depth = 0.20" for 90% Storm event
Inflow = 0.33 cfs @ 12.03 hrs, Volume= 0.041 af
Outflow = 0.01 cfs @ 21.02 hrs, Volume= 0.041 af, Atten= 96%, Lag= 539.5 min
Primary = 0.01 cfs @ 21.02 hrs, Volume= 0.041 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,373.60' Surf.Area= 3,232 sf Storage= 4,285 cf
Peak Elev= 1,373.95' @ 21.02 hrs Surf.Area= 3,737 sf Storage= 5,495 cf (1,211 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 1,164.6 min (2,046.3 - 881.7)

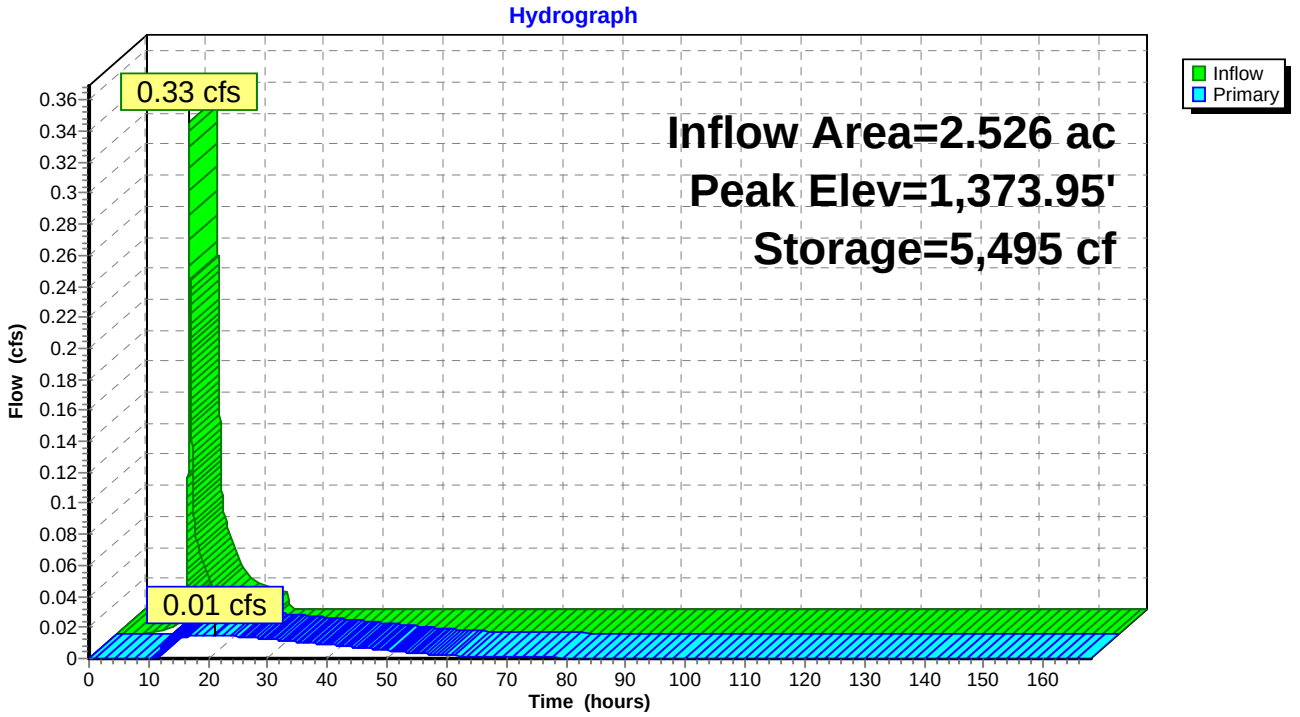
Volume	Invert	Avail.Storage	Storage Description
#1	1,371.50'	34,004 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,371.50	1,192	167.7	0	0	1,192
1,372.00	1,450	177.8	659	659	1,483
1,373.00	2,447	249.8	1,927	2,586	3,942
1,374.00	3,816	343.3	3,106	5,693	8,365
1,375.00	5,311	374.0	4,543	10,236	10,154
1,376.00	6,958	407.2	6,116	16,352	12,254
1,377.00	8,749	443.2	7,836	24,188	14,727
1,378.00	10,923	486.7	9,816	34,004	17,980

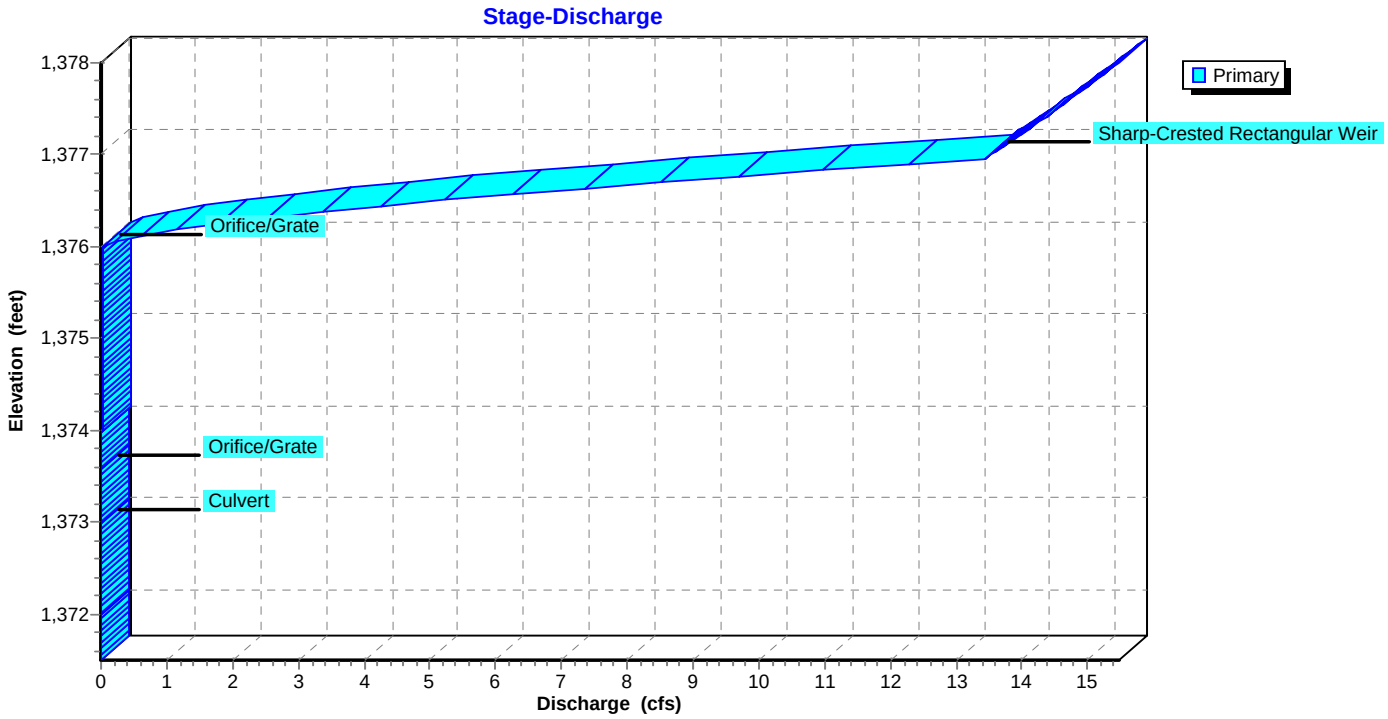
Device	Routing	Invert	Outlet Devices
#1	Primary	1,373.00'	**18.0" Round Culvert** L= 20.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,373.00' / 1,372.00' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,373.60'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,376.00'	**18.0" W x 12.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,377.00'	**16.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.01 cfs @ 21.02 hrs HW=1,373.95' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.01 cfs of 3.44 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 2.66 fps)
  - **3=Orifice/Grate** (Controls 0.00 cfs)
  - **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

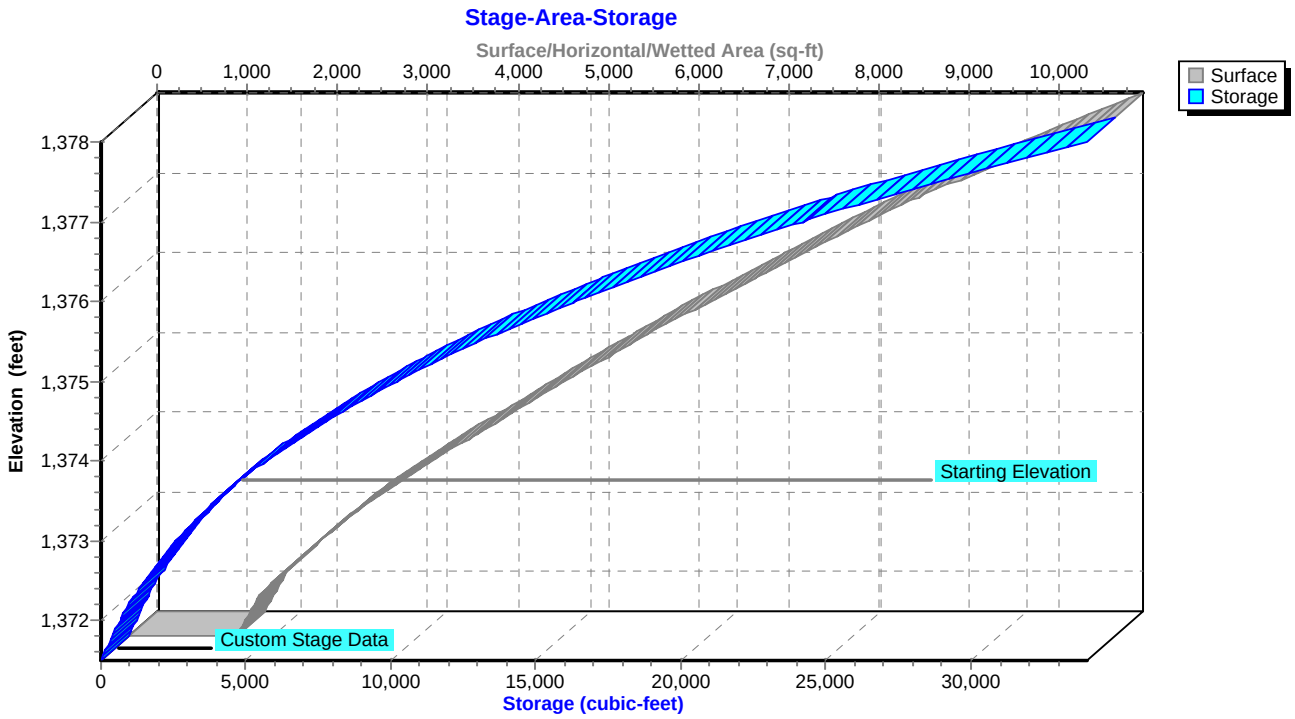
Pond 28-P: Pond-28



Pond 28-P: Pond-28



Pond 28-P: Pond-28



Summary for Pond BRA-46: BRA-46

Inflow Area = 1.246 ac, 25.52% Impervious, Inflow Depth = 0.17" for 90% Storm event
Inflow = 0.19 cfs @ 12.07 hrs, Volume= 0.018 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,368.30' @ 24.17 hrs Surf.Area= 1,368 sf Storage= 785 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

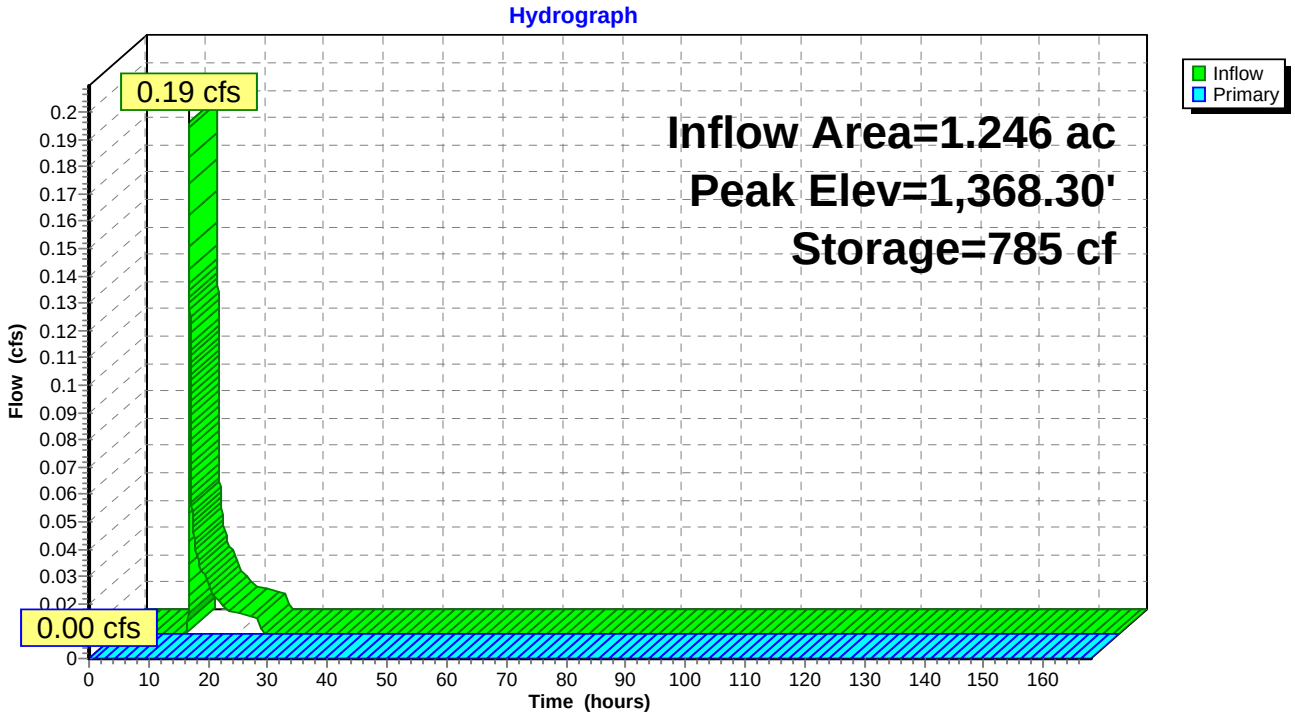
Volume	Invert	Avail.Storage	Storage Description
#1	1,366.00'	3,370 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,366.00	1,368	164.6	0.0	0	0	1,368
1,367.00	1,368	164.6	25.0	342	342	1,533
1,368.00	1,368	164.6	25.0	342	684	1,697
1,369.00	1,368	164.6	25.0	342	1,026	1,862
1,369.50	1,368	164.6	25.0	171	1,197	1,944
1,370.50	1,368	164.6	100.0	1,368	2,565	2,109
1,371.00	1,864	195.6	100.0	805	3,370	3,002

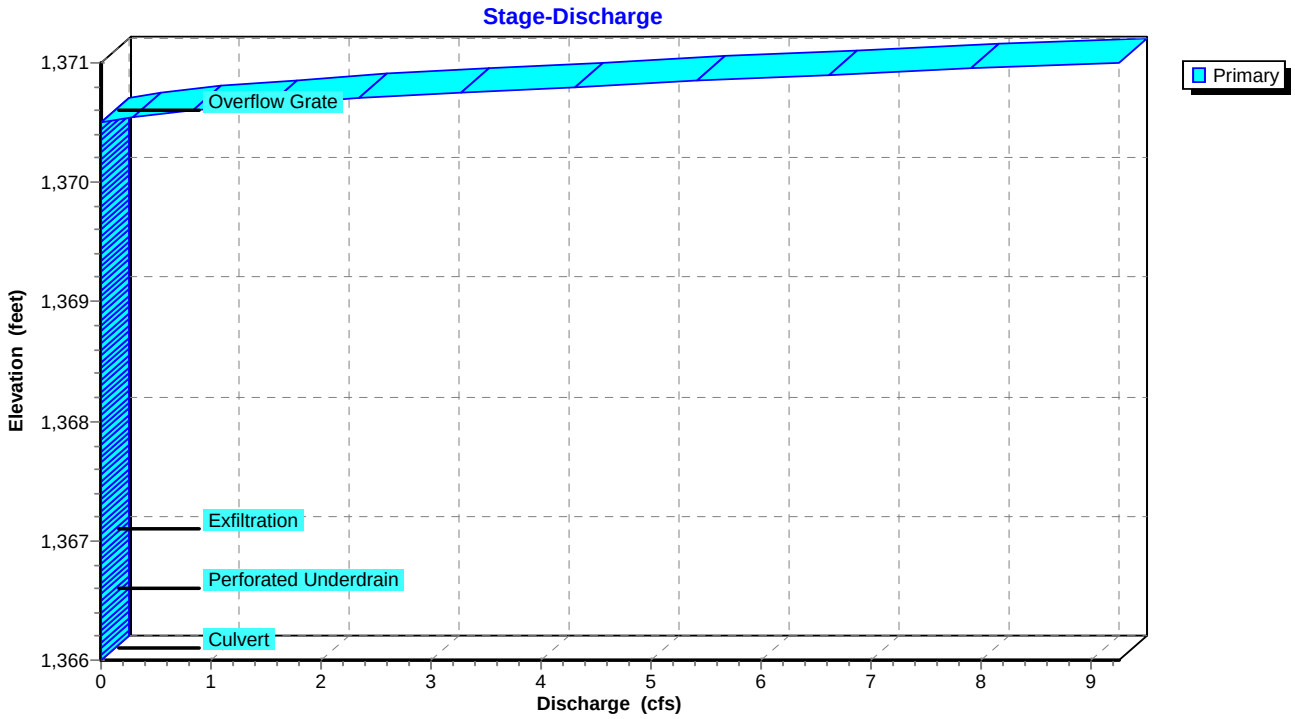
Device	Routing	Invert	Outlet Devices
#1	Primary	1,366.00'	**15.0" Round Culvert** L= 72.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,366.00' / 1,365.20' S= 0.0110 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,366.50'	**0.4" Horiz. Perforated Underdrain X 512.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,367.00'	**0.250 in/hr Exfiltration over Surface area above 1,367.00'** Conductivity to Groundwater Elevation = 1,366.00' Excluded Surface area = 1,368 sf
#4	Device 1	1,370.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,366.00' TW=1,365.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

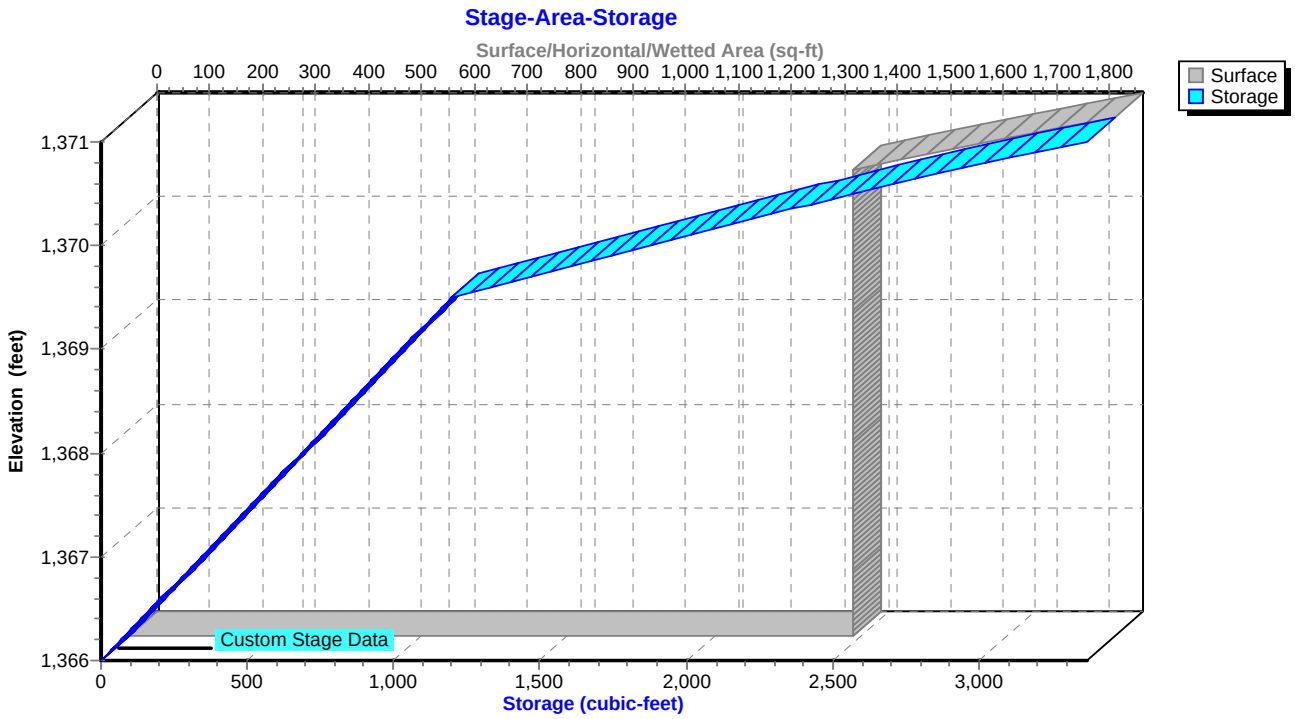
Pond BRA-46: BRA-46



Pond BRA-46: BRA-46



Pond BRA-46: BRA-46



Summary for Pond BRA-46-FS: Flow Splitter for BRA-46

Inflow Area = 1.246 ac, 25.52% Impervious, Inflow Depth = 0.17" for 90% Storm event
Inflow = 0.19 cfs @ 12.06 hrs, Volume= 0.018 af
Outflow = 0.19 cfs @ 12.07 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.6 min
Primary = 0.19 cfs @ 12.07 hrs, Volume= 0.018 af
Secondary = 0.00 cfs @ 12.07 hrs, Volume= 0.000 af

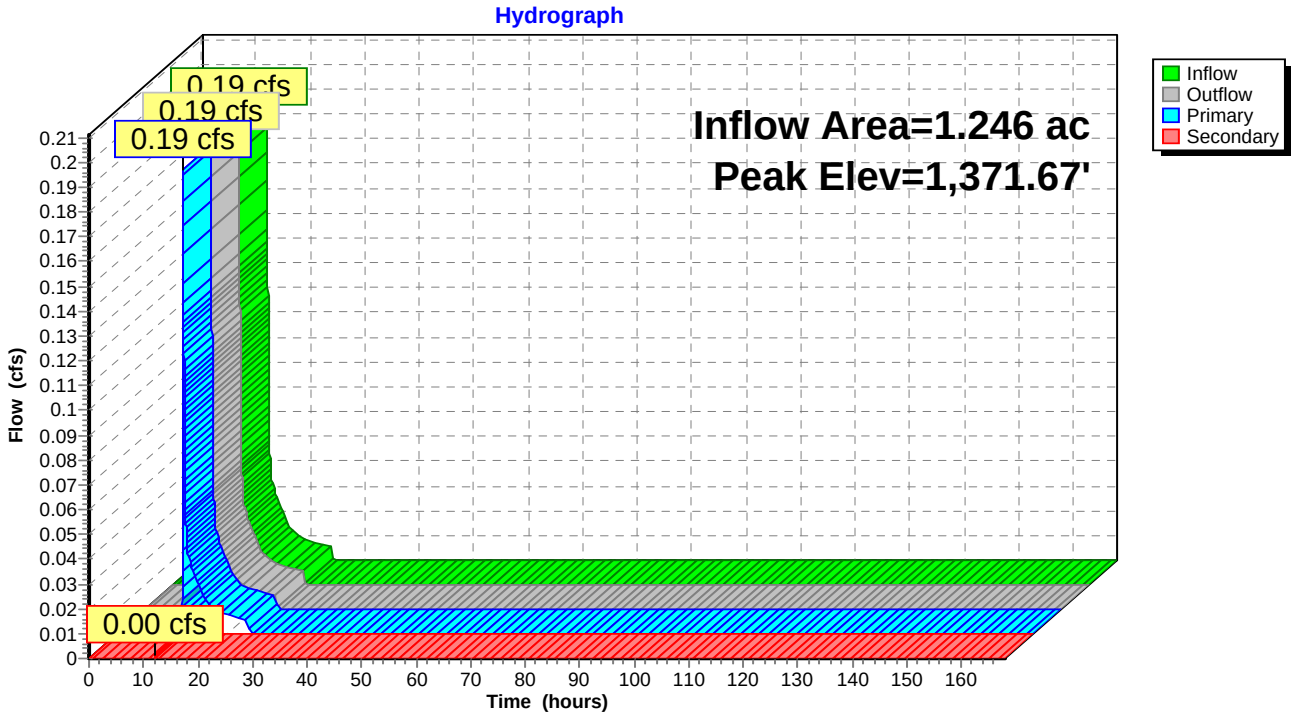
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,371.67' @ 12.07 hrs
Flood Elev= 1,375.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,371.45'	**15.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,371.45' / 1,371.00' S= 0.0118 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,371.45'	**15.0" Round Culvert** L= 195.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,371.45' / 1,365.12' S= 0.0325 '/' Cc= 0.900 n= 0.130, Flow Area= 1.23 sf
#3	Device 2	1,371.67'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

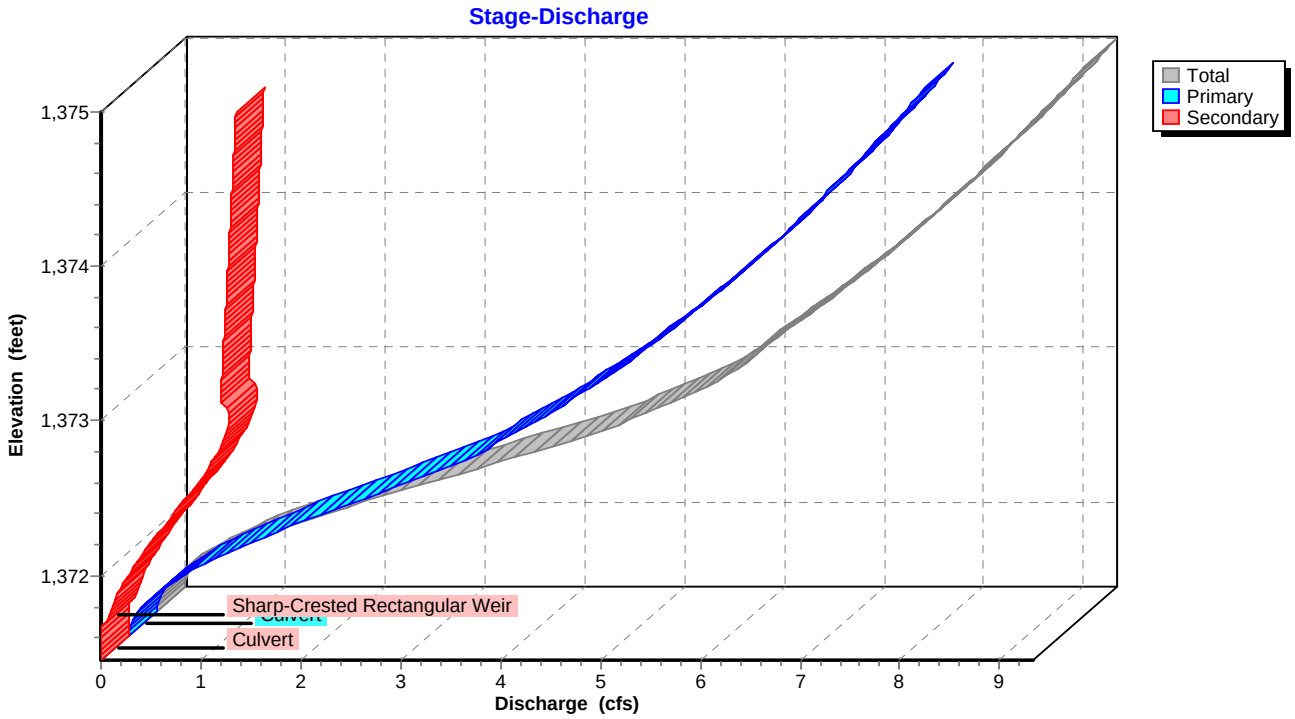
Primary OutFlow Max=0.19 cfs @ 12.07 hrs HW=1,371.67' TW=1,366.14' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.19 cfs @ 1.27 fps)

Secondary OutFlow Max=0.00 cfs @ 12.07 hrs HW=1,371.67' TW=1,364.98' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.00 cfs of 0.04 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.16 fps)

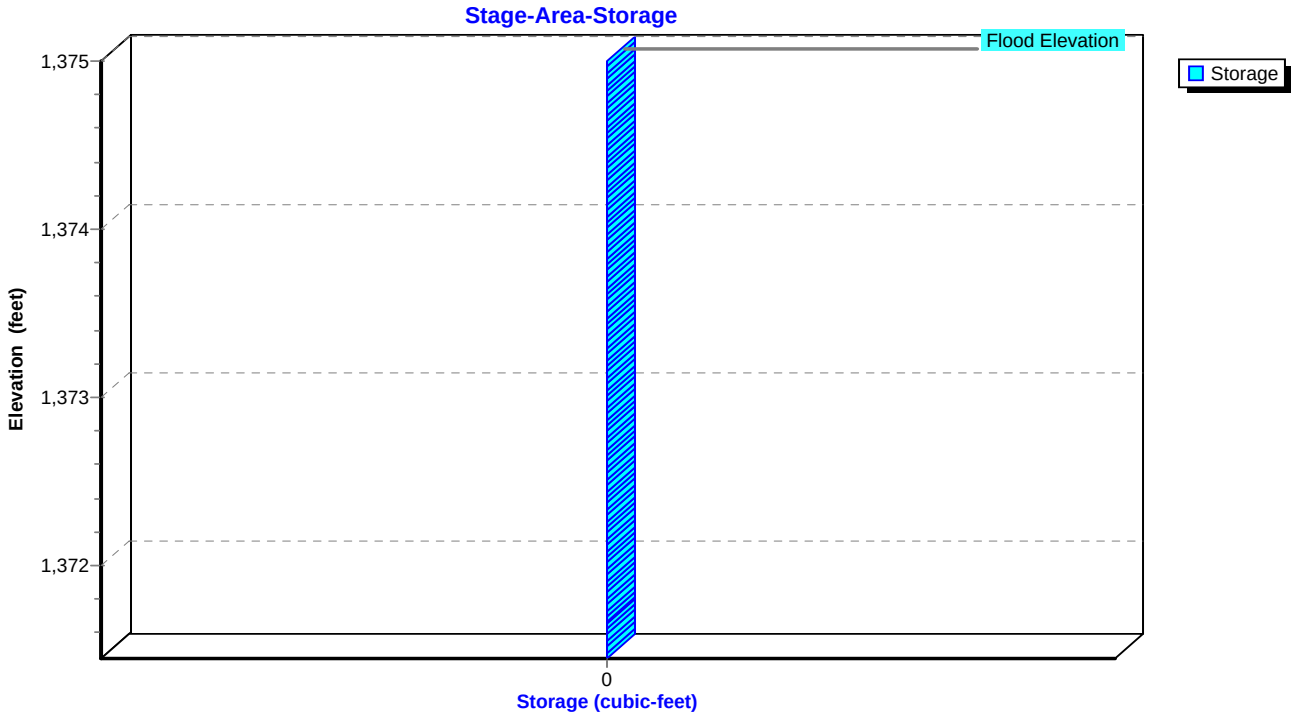
Pond BRA-46-FS: Flow Splitter for BRA-46



Pond BRA-46-FS: Flow Splitter for BRA-46



Pond BRA-46-FS: Flow Splitter for BRA-46



Summary for Pond BRA-59: BRA-59

Inflow Area = 0.860 ac, 38.02% Impervious, Inflow Depth = 0.25" for 90% Storm event
Inflow = 0.24 cfs @ 12.05 hrs, Volume= 0.018 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,379.63' @ 24.12 hrs Surf.Area= 2,733 sf Storage= 769 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

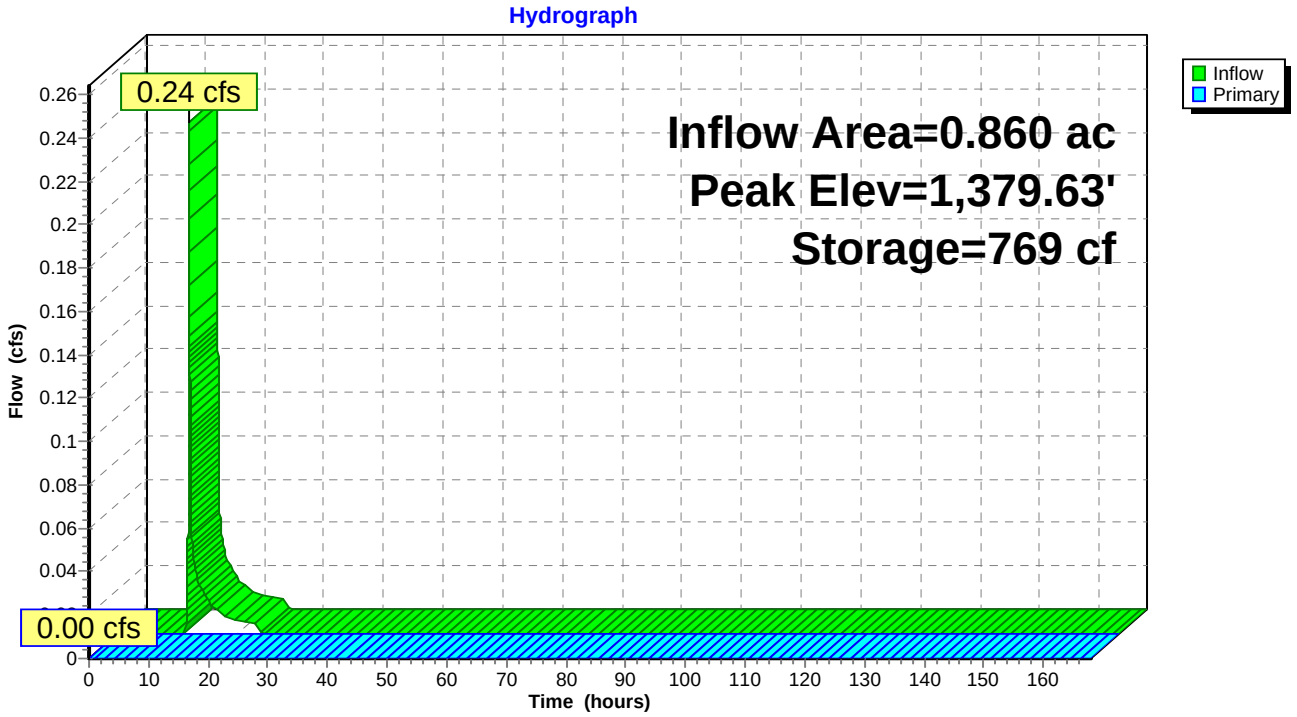
Volume	Invert	Avail.Storage	Storage Description
#1	1,378.50'	5,556 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,378.50	2,733	227.5	0.0	0	0	2,733
1,379.50	2,733	227.5	25.0	683	683	2,961
1,380.50	2,733	227.5	25.0	683	1,367	3,188
1,381.50	2,733	227.5	100.0	2,733	4,100	3,416
1,382.00	3,098	238.0	100.0	1,457	5,556	3,821

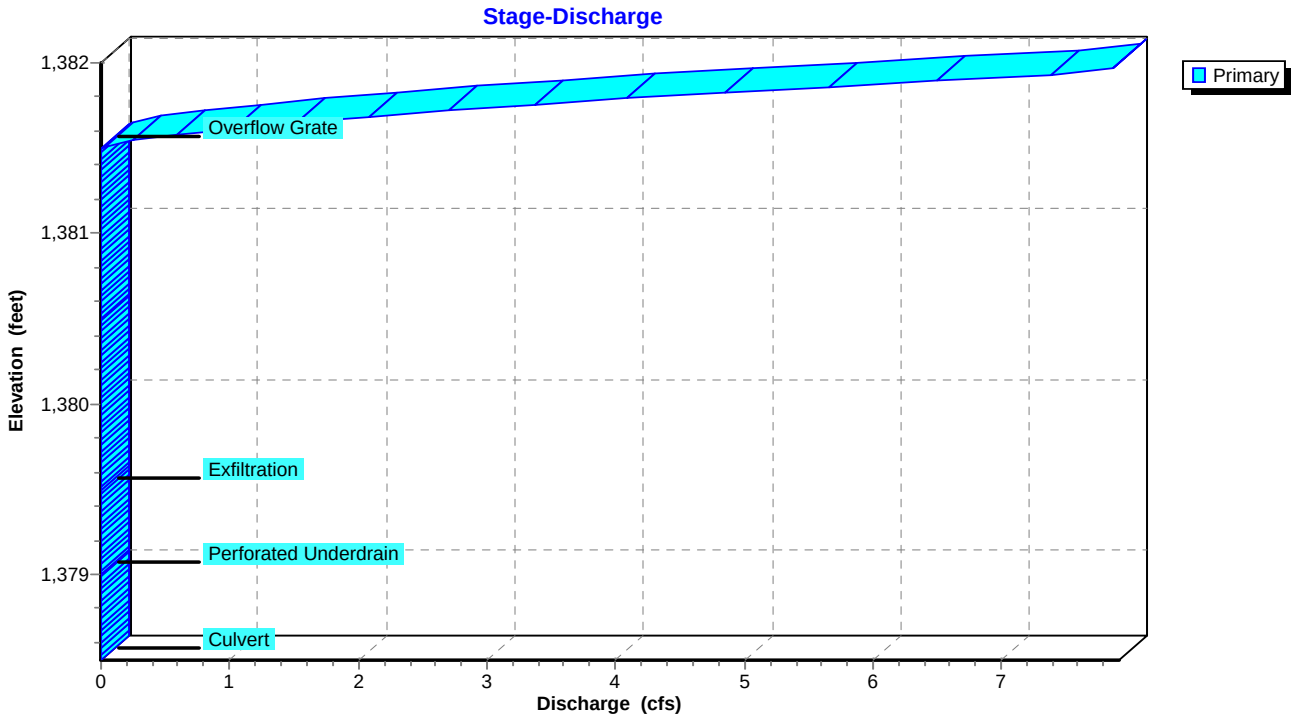
Device	Routing	Invert	Outlet Devices
#1	Primary	1,378.50'	**15.0" Round Culvert** L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,378.50' / 1,378.00' S= 0.0096 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,379.00'	**0.4" Horiz. Perforated Underdrain X 336.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,379.50'	**0.250 in/hr Exfiltration over Surface area above 1,379.50'** Conductivity to Groundwater Elevation = 1,378.50' Excluded Surface area = 2,733 sf
#4	Device 1	1,381.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,378.50' TW=1,378.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
- **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

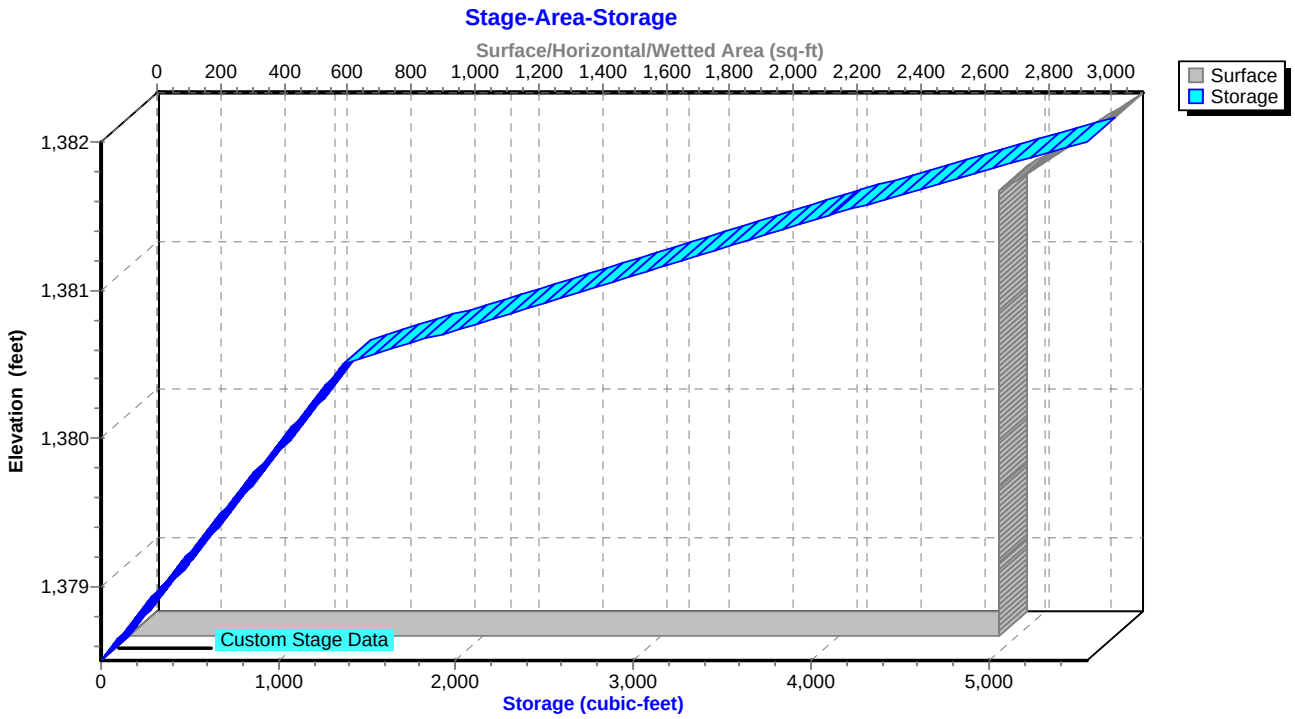
Pond BRA-59: BRA-59



Pond BRA-59: BRA-59



Pond BRA-59: BRA-59



Summary for Pond BRA-59-FS: Flow Splitter for BRA-59

Inflow Area = 0.860 ac, 38.02% Impervious, Inflow Depth = 0.25" for 90% Storm event
Inflow = 0.24 cfs @ 12.04 hrs, Volume= 0.018 af
Outflow = 0.24 cfs @ 12.05 hrs, Volume= 0.018 af, Atten= 0%, Lag= 0.6 min
Primary = 0.24 cfs @ 12.05 hrs, Volume= 0.018 af
Secondary = 0.00 cfs @ 12.05 hrs, Volume= 0.000 af

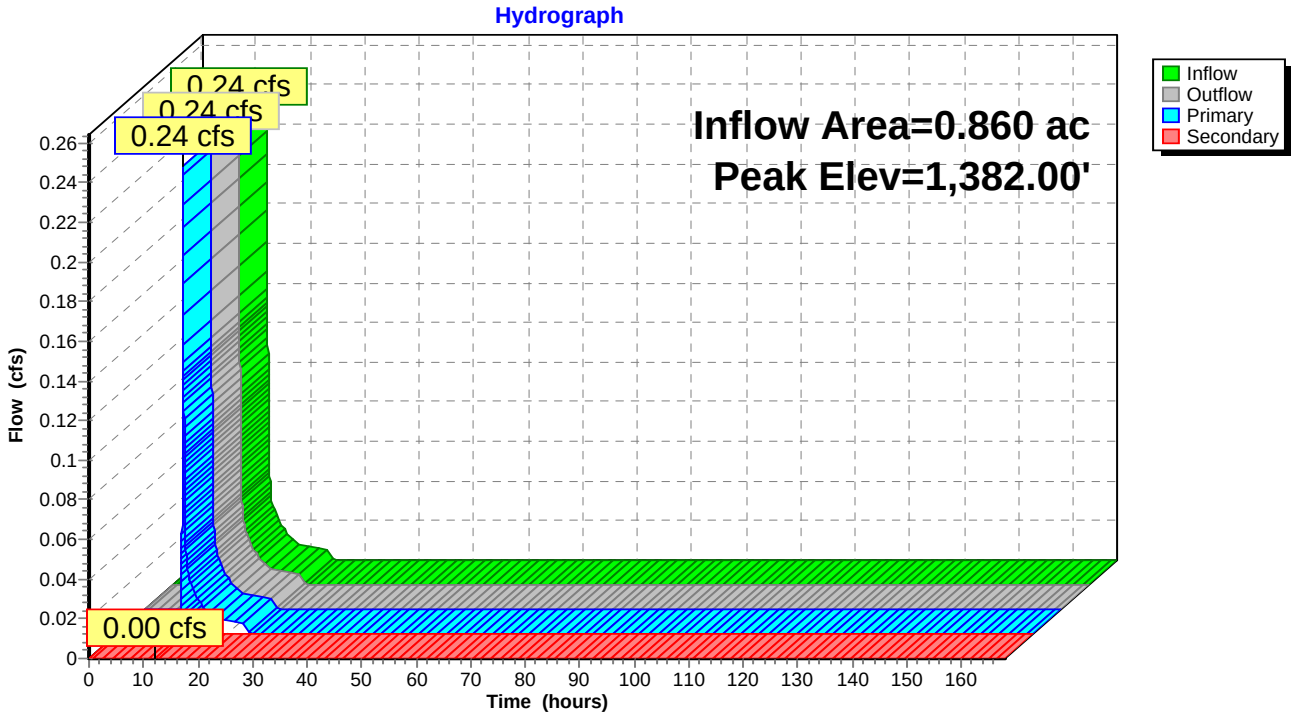
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,382.00' @ 12.05 hrs
Flood Elev= 1,385.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,381.75'	**15.0" Round Culvert to BRA** L= 66.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.75' / 1,381.25' S= 0.0076 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,381.50'	**15.0" Round Culvert to Pond** L= 86.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.50' / 1,380.50' S= 0.0116 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,382.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

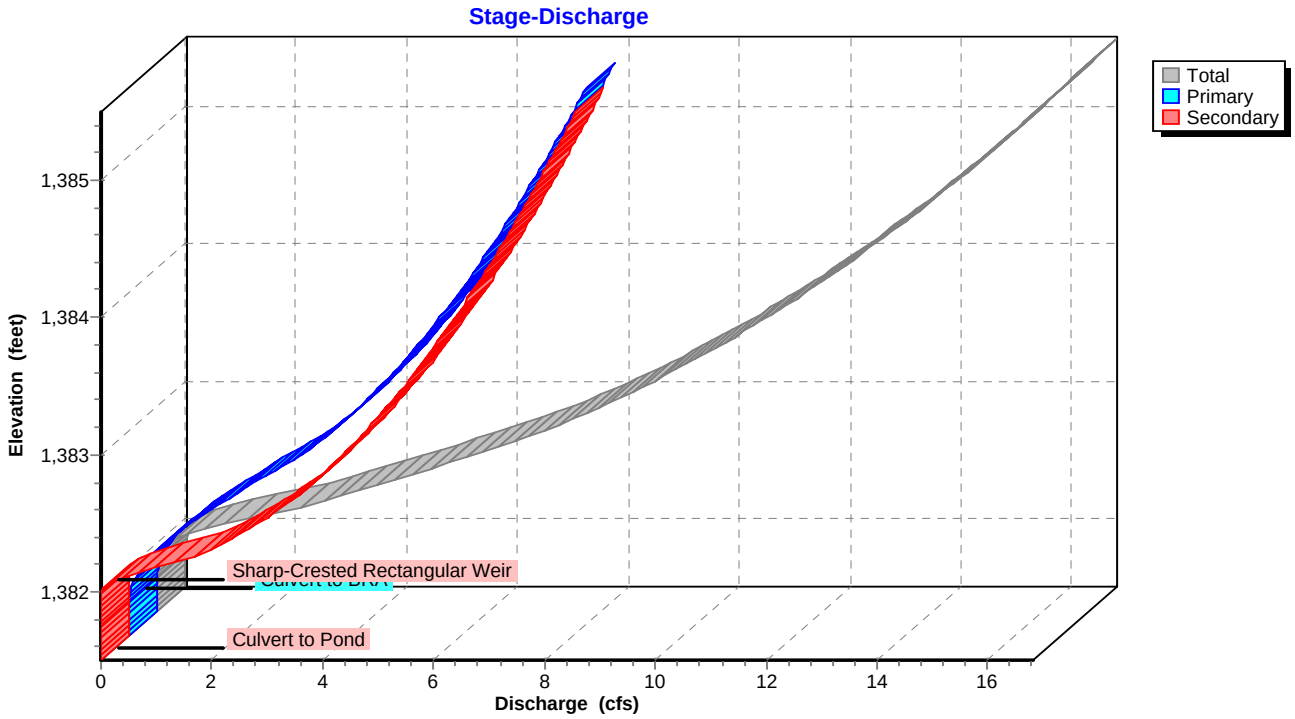
Primary OutFlow Max=0.24 cfs @ 12.05 hrs HW=1,382.00' TW=1,378.61' (Dynamic Tailwater)
└─**1=Culvert to BRA** (Inlet Controls 0.24 cfs @ 1.35 fps)

Secondary OutFlow Max=0.00 cfs @ 12.05 hrs HW=1,382.00' TW=1,378.03' (Dynamic Tailwater)
└─**2=Culvert to Pond** (Passes 0.00 cfs of 0.87 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.08 fps)

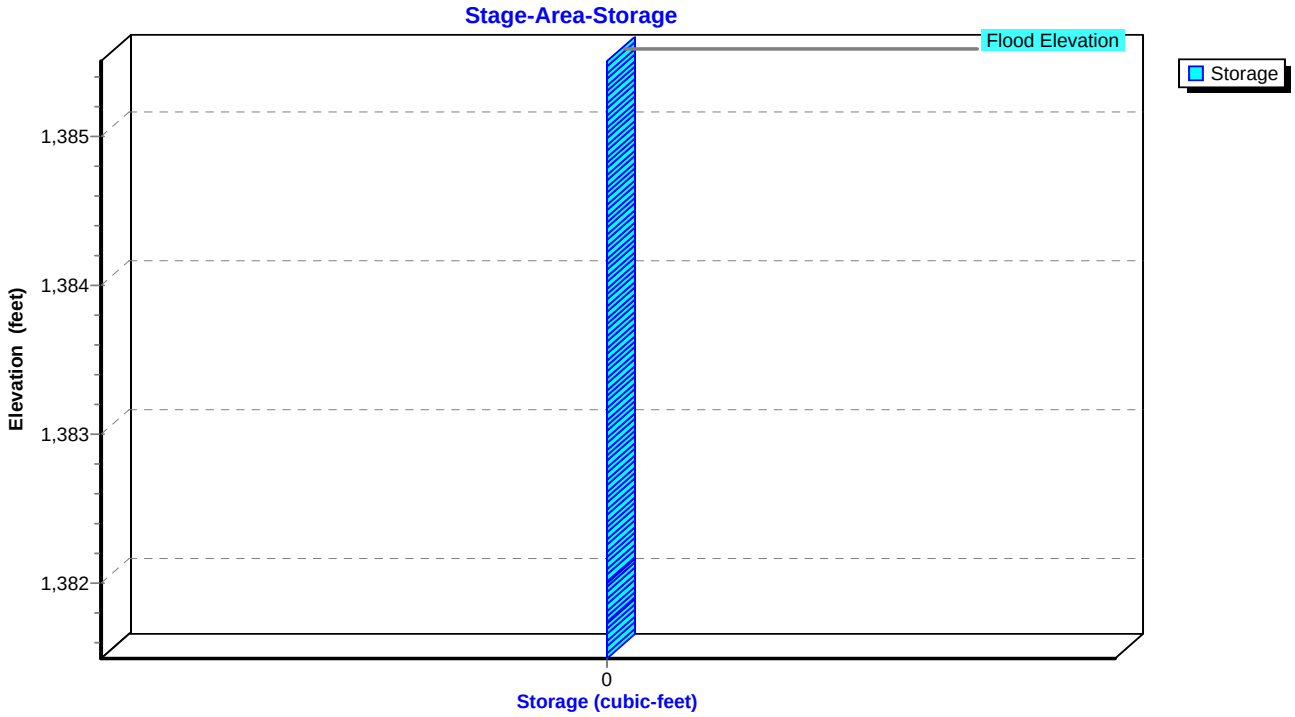
Pond BRA-59-FS: Flow Splitter for BRA-59



Pond BRA-59-FS: Flow Splitter for BRA-59



Pond BRA-59-FS: Flow Splitter for BRA-59



Summary for Pond BRA37-FS: Flow Splitter for BRA-37

Inflow Area = 5.787 ac, 8.64% Impervious, Inflow Depth = 0.08" for 90% Storm event
Inflow = 0.21 cfs @ 12.06 hrs, Volume= 0.040 af
Outflow = 0.21 cfs @ 12.07 hrs, Volume= 0.040 af, Atten= 0%, Lag= 0.6 min
Primary = 0.21 cfs @ 12.07 hrs, Volume= 0.040 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

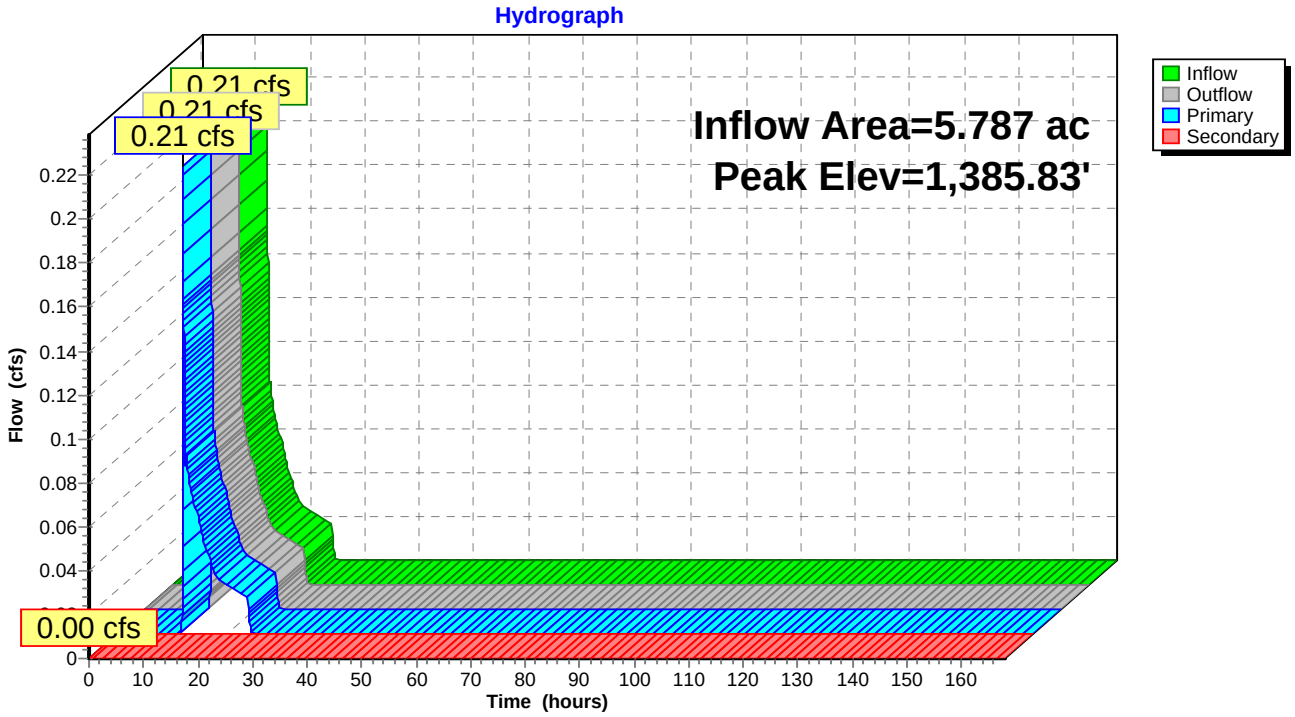
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,385.83' @ 12.07 hrs
Flood Elev= 1,390.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,385.60'	**18.0" Round Culvert to BRA-37** L= 7.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,385.60' / 1,385.50' S= 0.0127 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,385.60'	**18.0" Round Culvert** L= 89.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,385.60' / 1,383.00' S= 0.0292 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,385.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

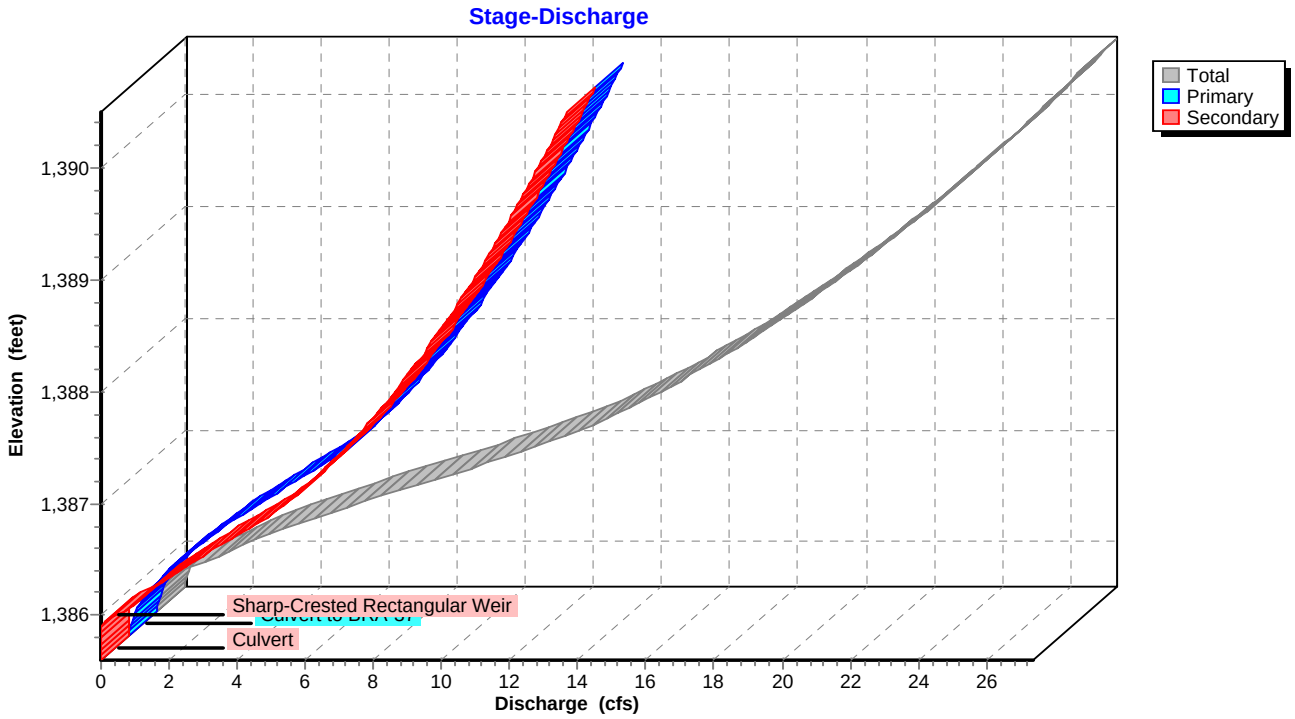
Primary OutFlow Max=0.21 cfs @ 12.07 hrs HW=1,385.83' TW=1,382.05' (Dynamic Tailwater)
└**1=Culvert to BRA-37** (Inlet Controls 0.21 cfs @ 1.28 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,385.60' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

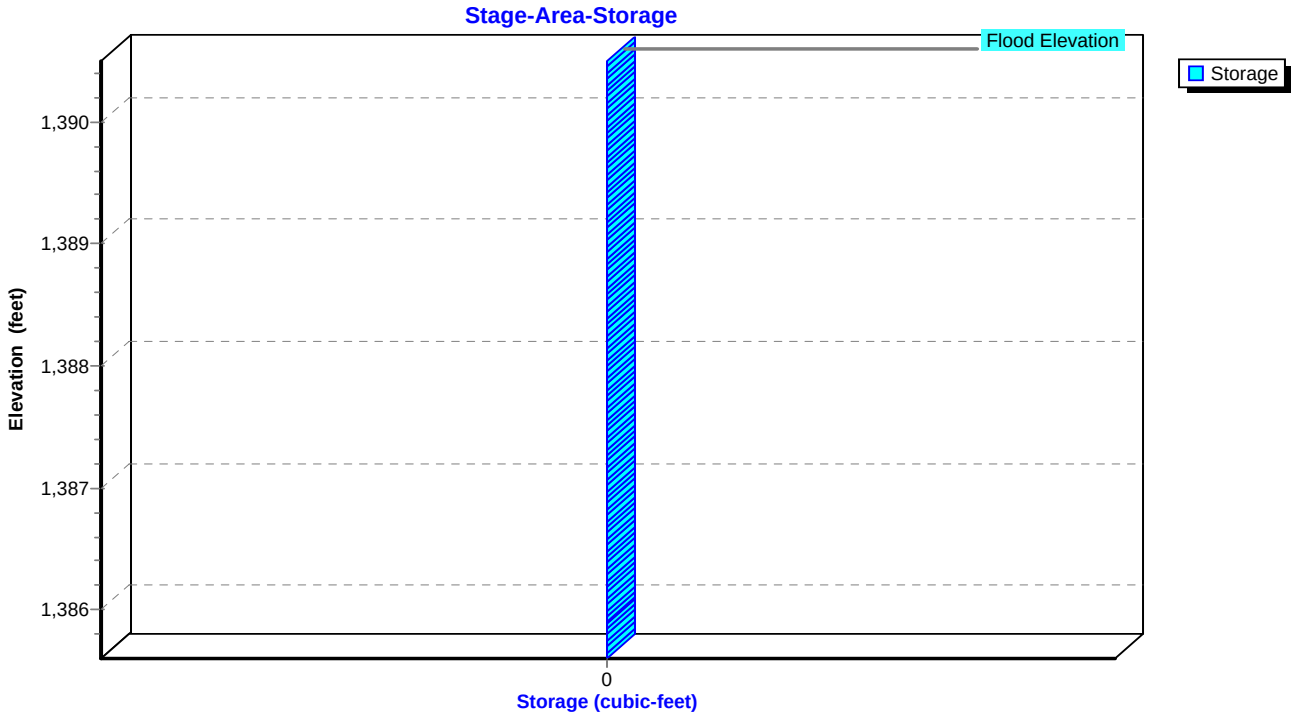
Pond BRA37-FS: Flow Splitter for BRA-37



Pond BRA37-FS: Flow Splitter for BRA-37



Pond BRA37-FS: Flow Splitter for BRA-37



Summary for Pond BRA37-P: BRA-37

Inflow Area = 5.787 ac, 8.64% Impervious, Inflow Depth = 0.08" for 90% Storm event
Inflow = 0.21 cfs @ 12.07 hrs, Volume= 0.040 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,383.76' @ 25.46 hrs Surf.Area= 3,939 sf Storage= 1,737 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

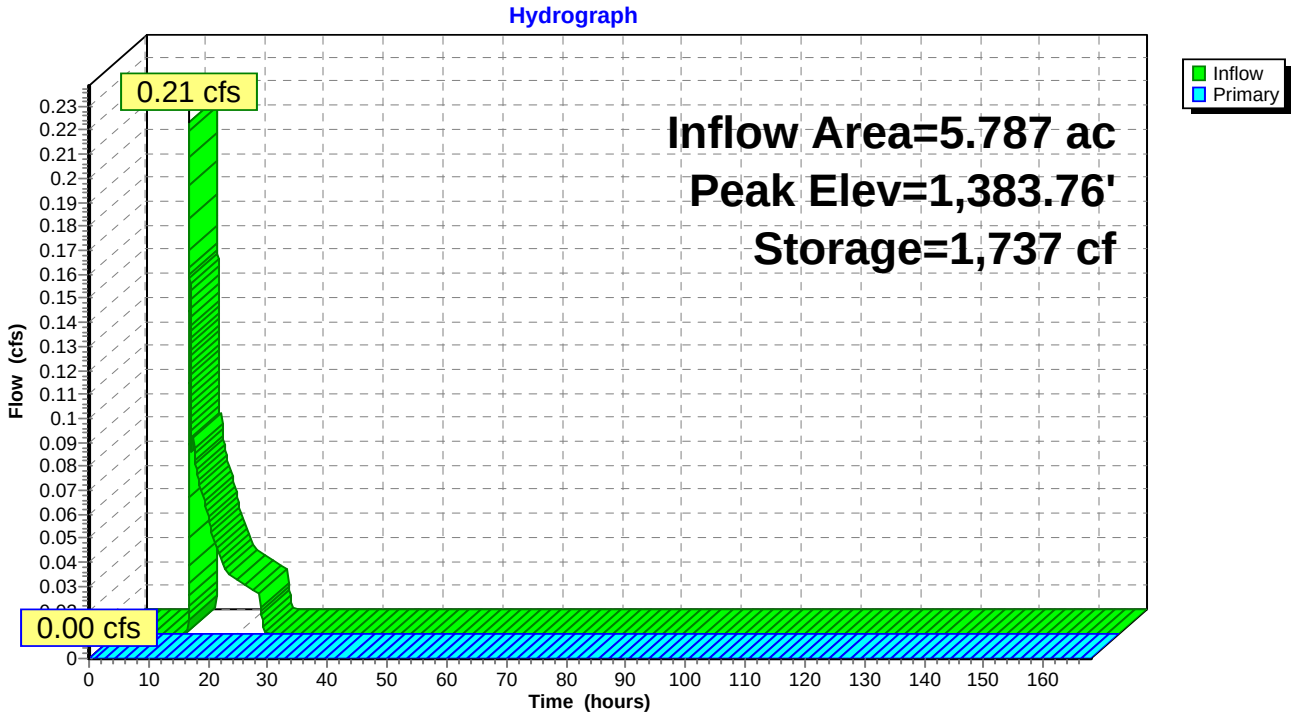
Volume	Invert	Avail.Storage	Storage Description
#1	1,382.00'	11,952 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,382.00	3,939	292.0	0.0	0	0	3,939
1,383.00	3,939	292.0	25.0	985	985	4,231
1,384.00	3,939	292.0	25.0	985	1,970	4,523
1,385.00	3,939	292.0	25.0	985	2,954	4,815
1,386.00	4,382	302.0	100.0	4,159	7,113	5,373
1,387.00	5,312	320.0	100.0	4,840	11,952	6,317

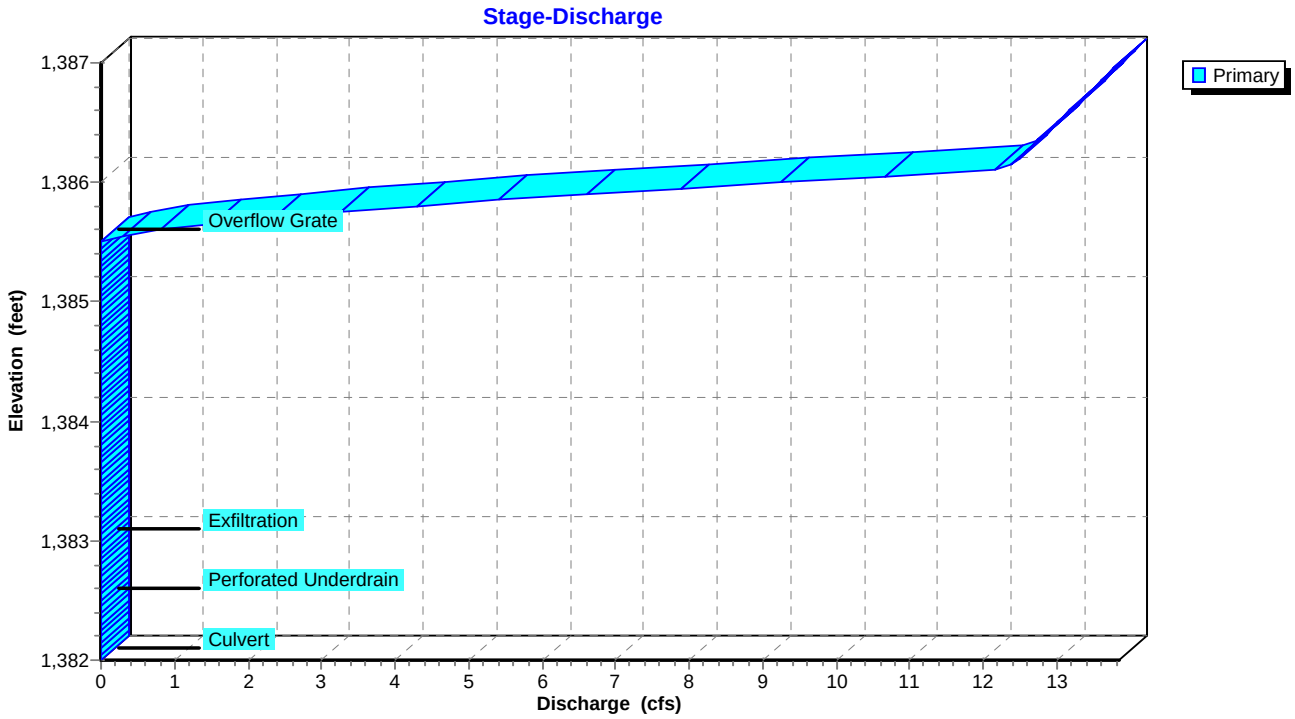
Device	Routing	Invert	Outlet Devices
#1	Primary	1,382.00'	**18.0" Round Culvert** L= 93.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,382.00' / 1,381.50' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.50'	**0.4" Horiz. Perforated Underdrain X 392.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,383.00'	**0.250 in/hr Exfiltration over Surface area above 1,383.00'** Conductivity to Groundwater Elevation = 1,382.00' Excluded Surface area = 3,939 sf
#4	Device 1	1,385.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,382.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

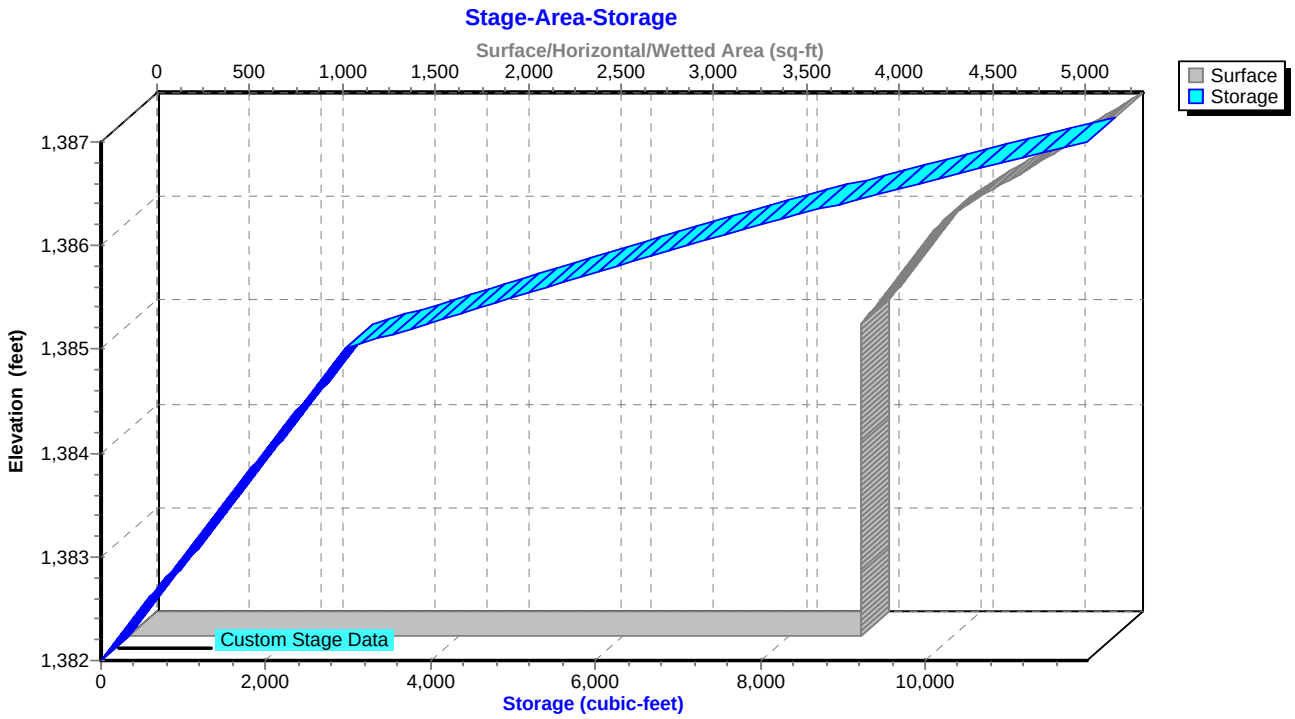
Pond BRA37-P: BRA-37



Pond BRA37-P: BRA-37



Pond BRA37-P: BRA-37



Summary for Pond BRA38-P: BRA-38

Inflow Area = 1.972 ac, 21.96% Impervious, Inflow Depth = 0.15" for 90% Storm event
Inflow = 0.24 cfs @ 12.06 hrs, Volume= 0.025 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,382.70' @ 24.12 hrs Surf.Area= 3,650 sf Storage= 1,096 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

Volume	Invert	Avail.Storage	Storage Description
#1	1,381.50'	6,388 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

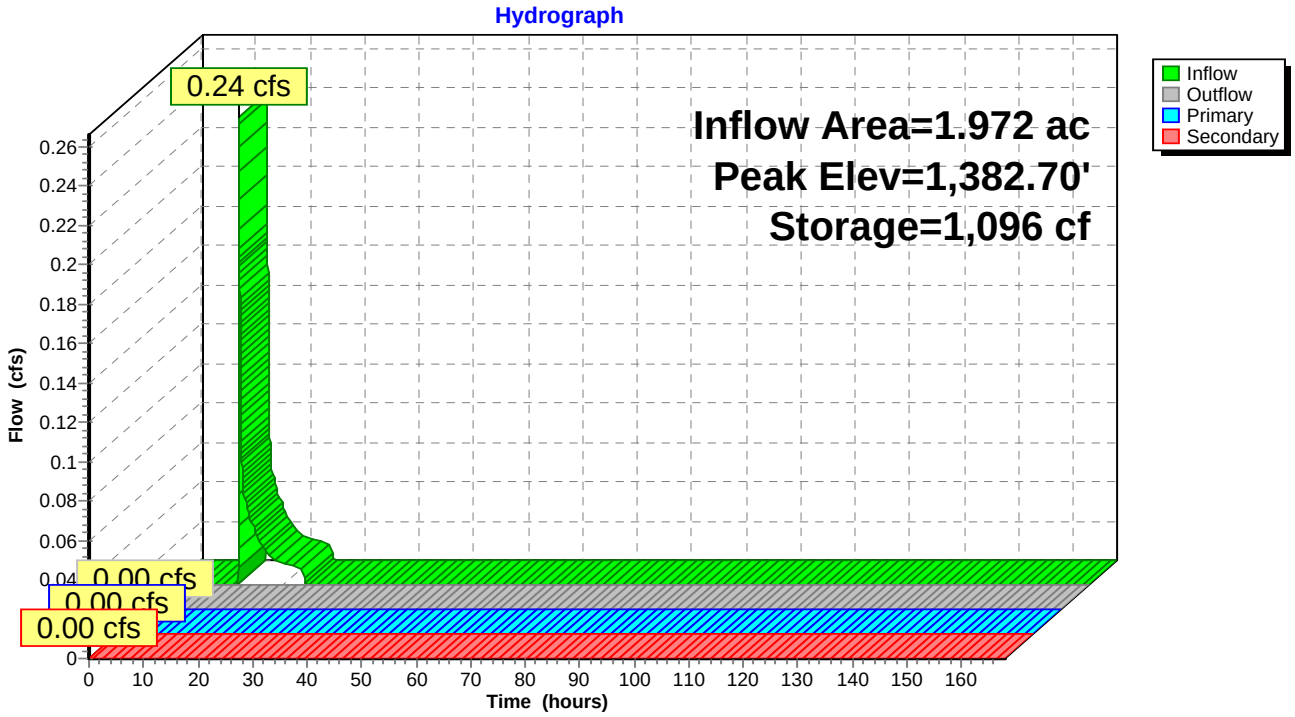
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,381.50	3,650	290.0	0.0	0	0	3,650
1,382.50	3,650	290.0	25.0	913	913	3,940
1,383.50	3,650	290.0	25.0	913	1,825	4,230
1,384.50	3,650	290.0	25.0	913	2,738	4,520
1,385.00	3,650	290.0	100.0	1,825	4,563	4,665
1,385.50	3,650	290.0	100.0	1,825	6,388	4,810

Device	Routing	Invert	Outlet Devices
#1	Primary	1,381.50'	**18.0" Round Culvert** L= 114.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.50' / 1,380.90' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.00'	**0.4" Horiz. Perforated Underdain X 452.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,382.50'	**0.250 in/hr Exfiltration over Surface area above 1,382.50'** Conductivity to Groundwater Elevation = 1,381.50' Excluded Surface area = 3,650 sf
#4	Device 1	1,385.00'	**36.0" x 36.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,385.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

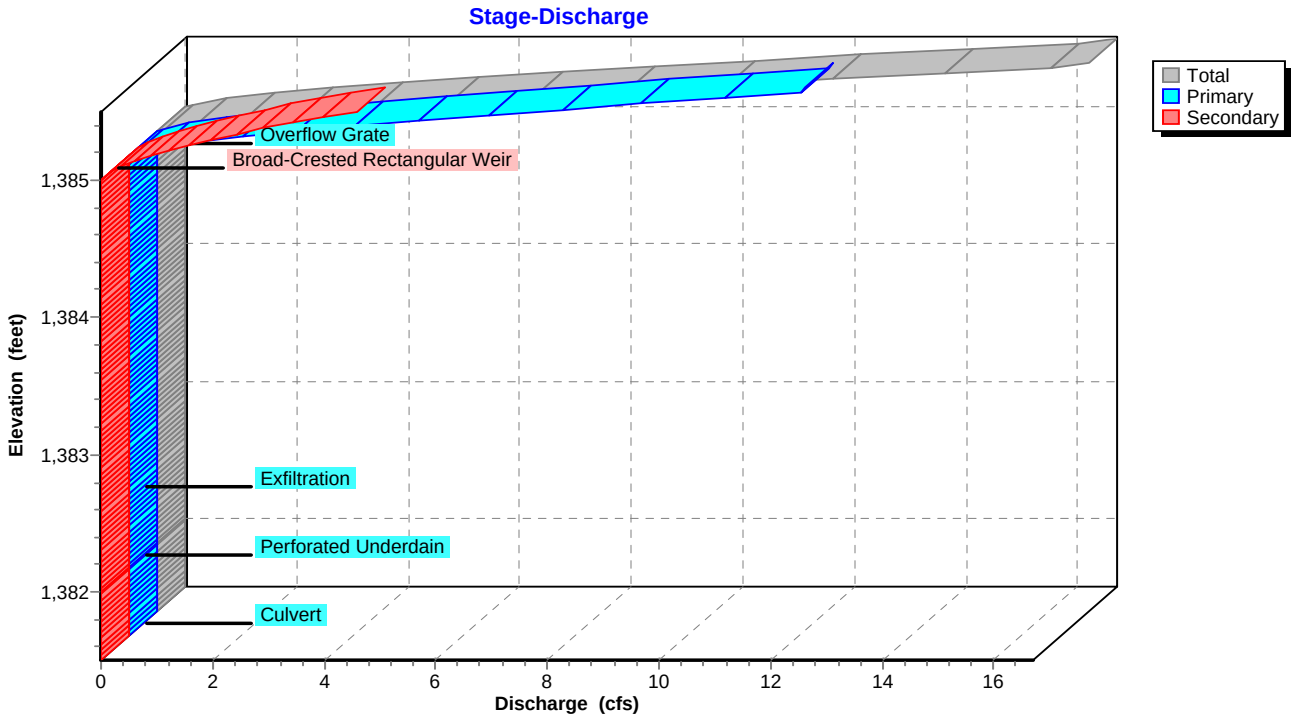
Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,381.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
  - **2=Perforated Underdain** (Controls 0.00 cfs)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,381.50' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

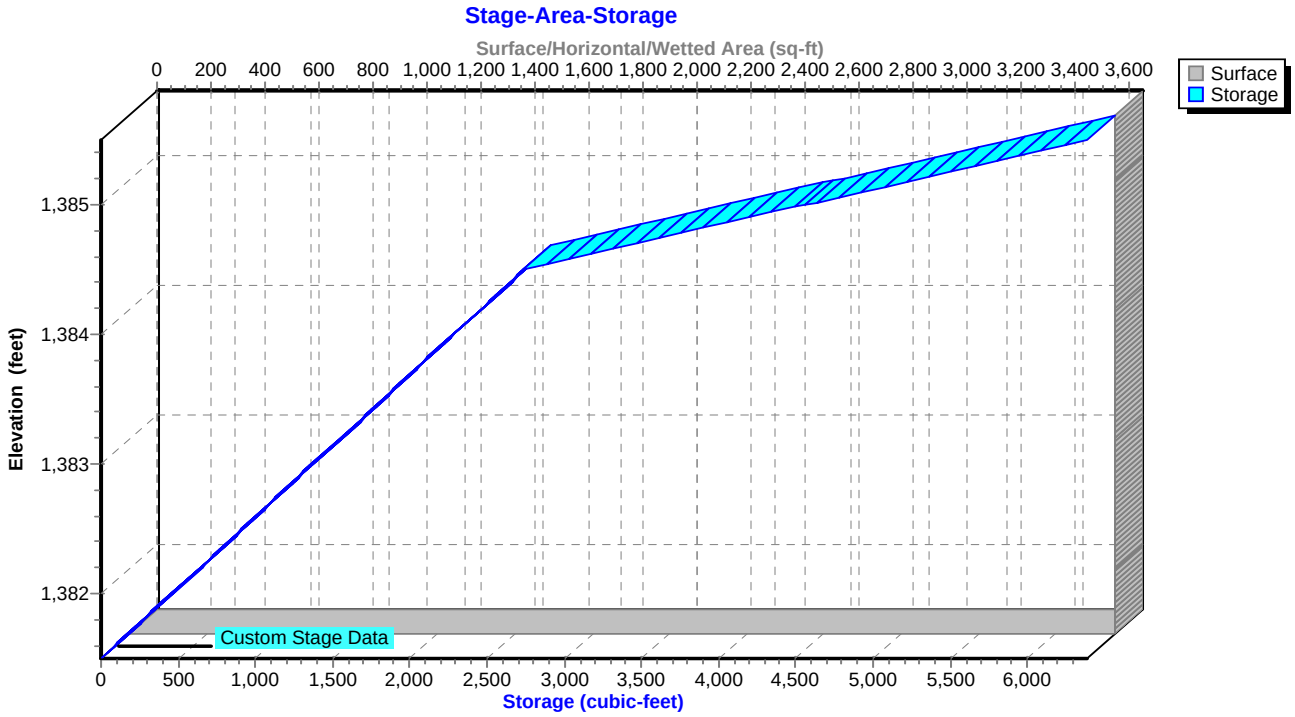
Pond BRA38-P: BRA-38



Pond BRA38-P: BRA-38



Pond BRA38-P: BRA-38



Summary for Pond BRA50-FS: Flow Splitter for BRA-50

Inflow Area = 4.526 ac, 6.87% Impervious, Inflow Depth = 0.12" for 90% Storm event
Inflow = 0.19 cfs @ 12.05 hrs, Volume= 0.045 af
Outflow = 0.19 cfs @ 12.06 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.6 min
Primary = 0.19 cfs @ 12.06 hrs, Volume= 0.045 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

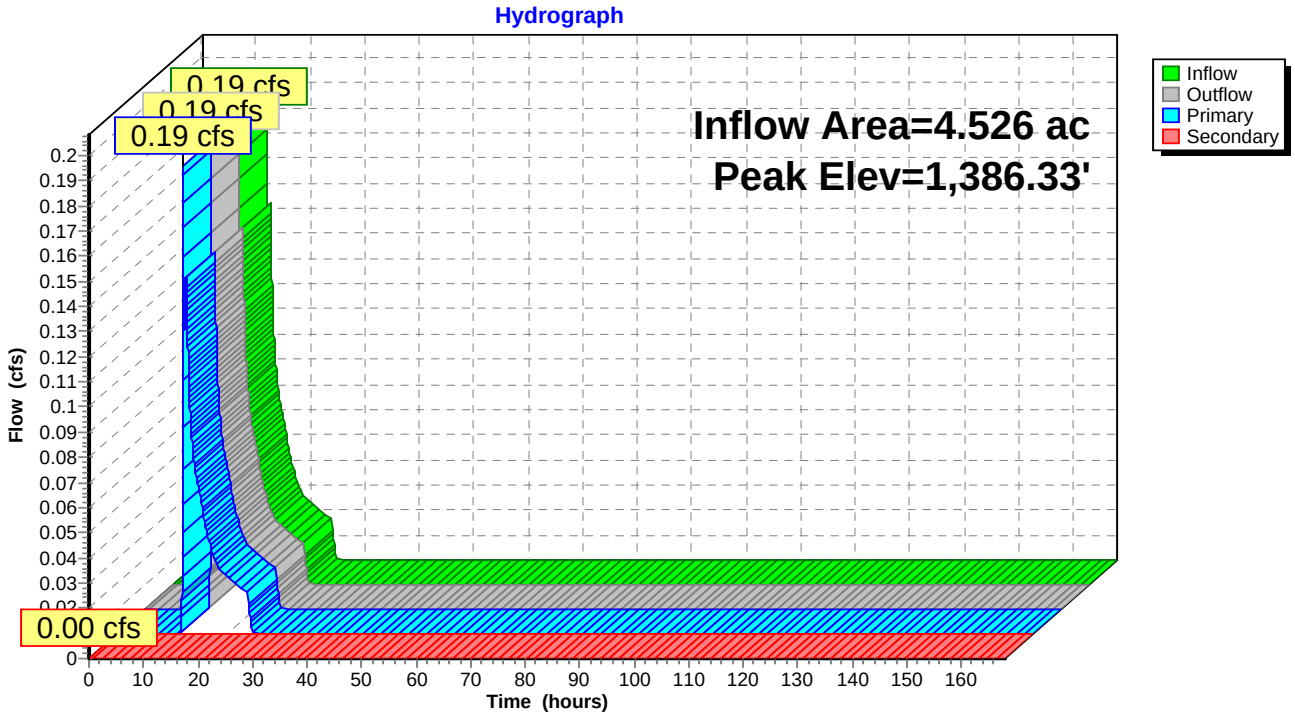
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,386.33' @ 12.06 hrs
Flood Elev= 1,390.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,386.10'	**18.0" Round Culvert to BRA-50** L= 17.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,386.10' / 1,386.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,386.10'	**18.0" Round Culvert to Pond 23** L= 71.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,386.10' / 1,383.70' S= 0.0334 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,386.40'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

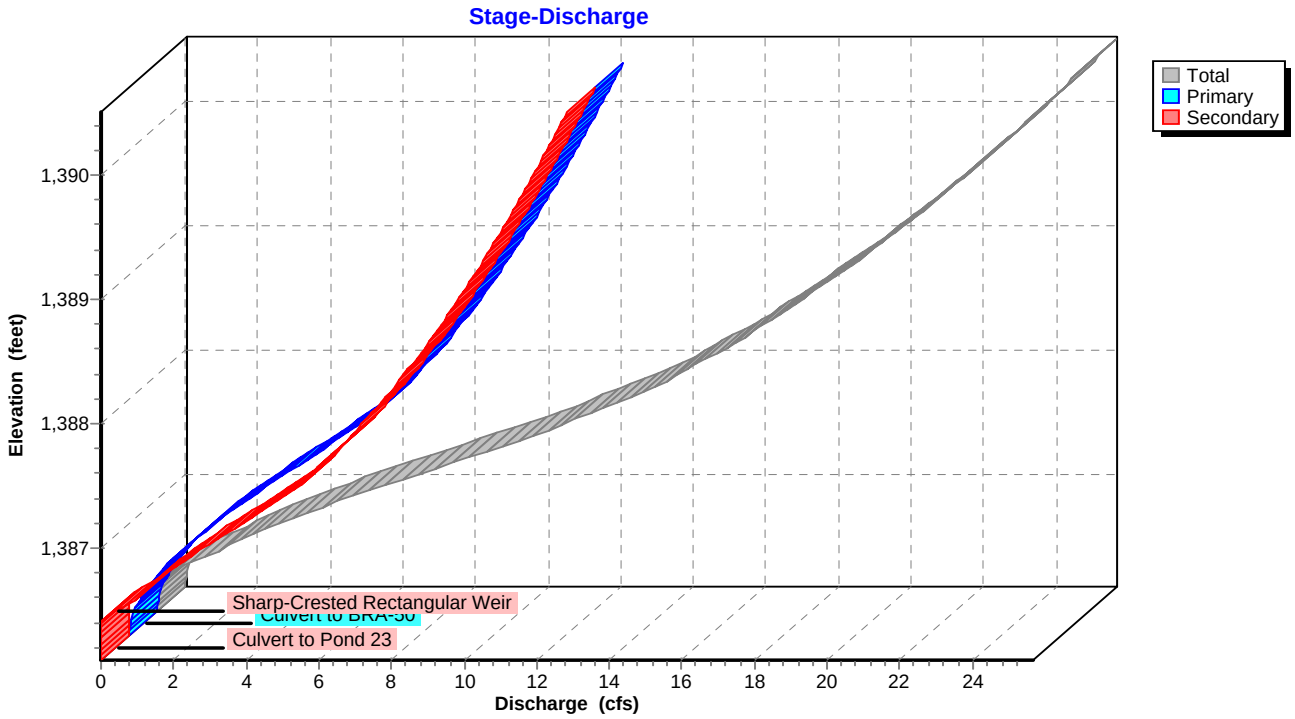
Primary OutFlow Max=0.19 cfs @ 12.06 hrs HW=1,386.33' TW=1,382.08' (Dynamic Tailwater)
└─**1=Culvert to BRA-50** (Barrel Controls 0.19 cfs @ 1.68 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,386.10' TW=1,381.00' (Dynamic Tailwater)
└─**2=Culvert to Pond 23** (Controls 0.00 cfs)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

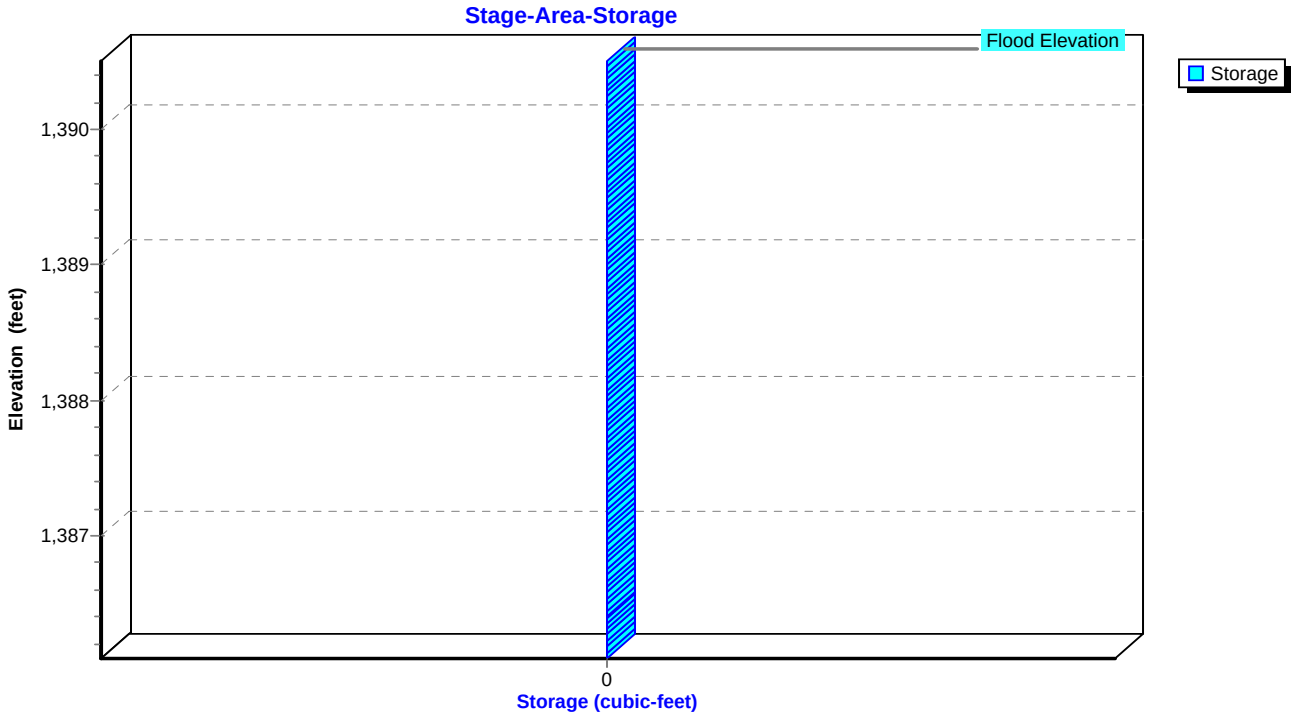
Pond BRA50-FS: Flow Splitter for BRA-50



Pond BRA50-FS: Flow Splitter for BRA-50



Pond BRA50-FS: Flow Splitter for BRA-50



Summary for Pond BRA50-P: BRA-50

Inflow Area = 4.526 ac, 6.87% Impervious, Inflow Depth = 0.12" for 90% Storm event
Inflow = 0.19 cfs @ 12.06 hrs, Volume= 0.045 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,385.21' @ 25.90 hrs Surf.Area= 2,068 sf Storage= 1,978 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

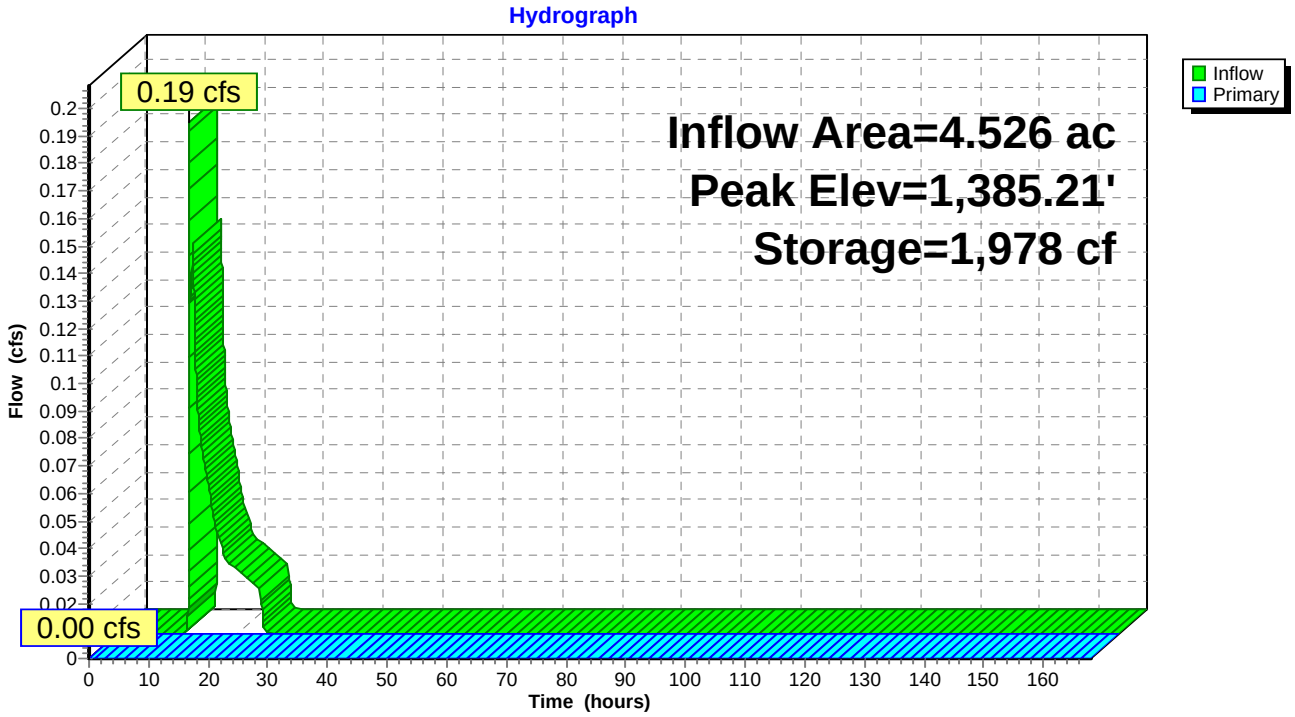
Volume	Invert	Avail.Storage	Storage Description
#1	1,382.00'	9,428 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,382.00	2,068	270.0	0.0	0	0	2,068
1,383.00	2,068	270.0	25.0	517	517	2,338
1,384.00	2,068	270.0	25.0	517	1,034	2,608
1,385.00	2,068	270.0	25.0	517	1,551	2,878
1,386.00	2,068	270.0	100.0	2,068	3,619	3,148
1,387.00	2,901	288.8	100.0	2,473	6,092	4,029
1,388.00	3,791	307.6	100.0	3,336	9,428	4,970

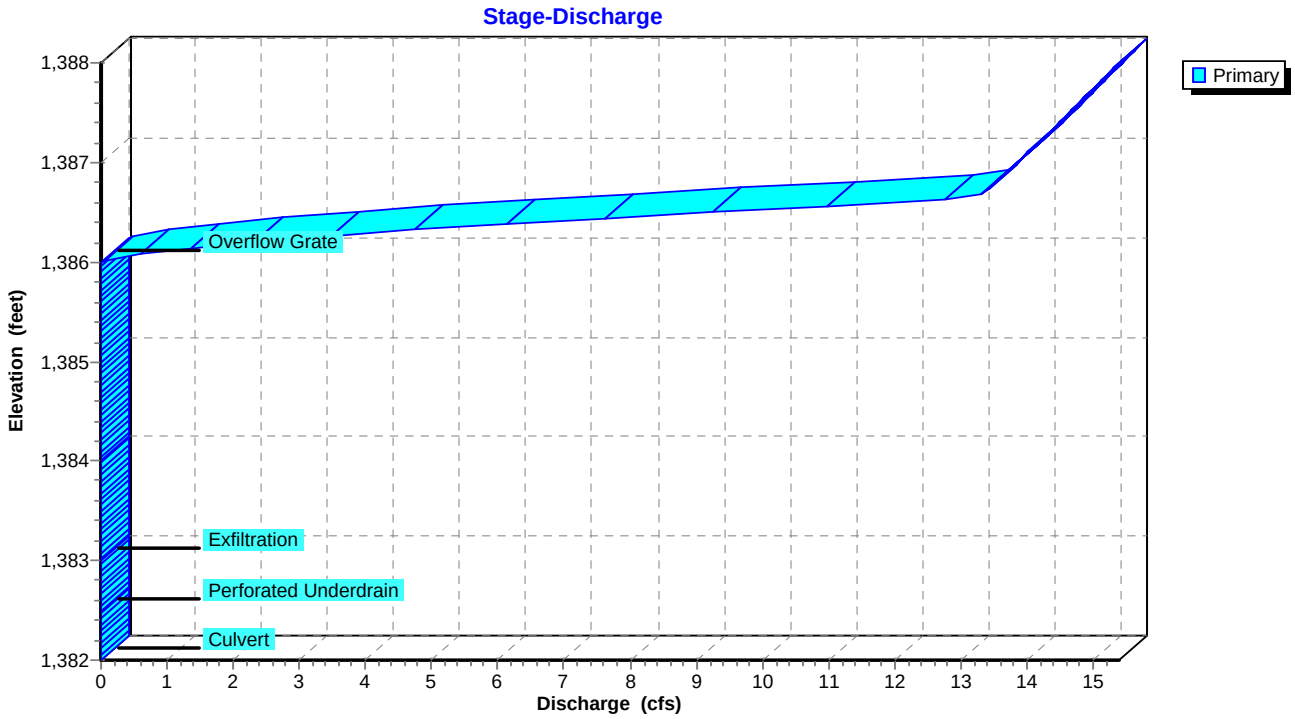
Device	Routing	Invert	Outlet Devices
#1	Primary	1,382.00'	**18.0" Round Culvert** L= 62.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,382.00' / 1,381.30' S= 0.0113 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.50'	**0.4" Horiz. Perforated Underdrain X 460.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,383.00'	**0.250 in/hr Exfiltration over Surface area above 1,383.00'** Conductivity to Groundwater Elevation = 1,382.00' Excluded Surface area = 2,068 sf
#4	Device 1	1,386.00'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,382.00' TW=1,381.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

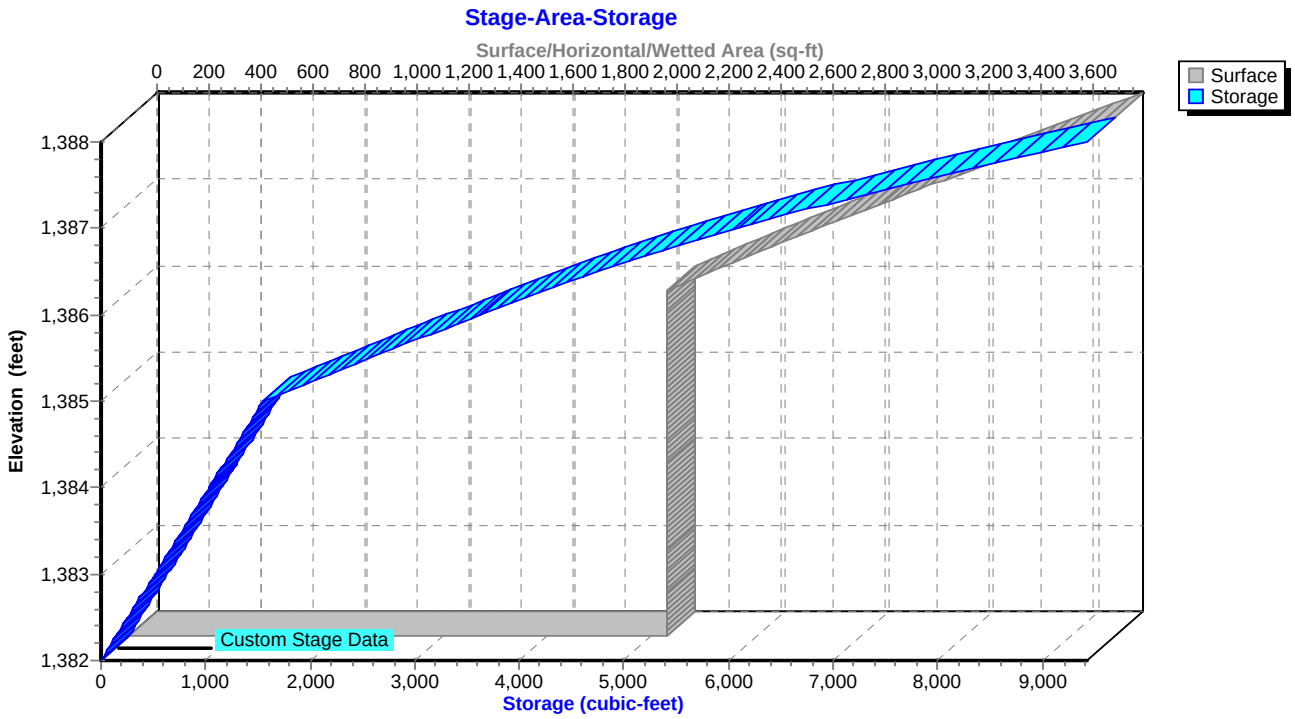
Pond BRA50-P: BRA-50



Pond BRA50-P: BRA-50



Pond BRA50-P: BRA-50



Summary for Pond SW21C-FS: Flow Splitter for SW21C

Inflow Area = 0.588 ac, 44.73% Impervious, Inflow Depth = 0.26" for 90% Storm event
Inflow = 0.17 cfs @ 12.04 hrs, Volume= 0.013 af
Outflow = 0.17 cfs @ 12.05 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.6 min
Primary = 0.17 cfs @ 12.05 hrs, Volume= 0.013 af
Secondary = 0.00 cfs @ 12.05 hrs, Volume= 0.000 af

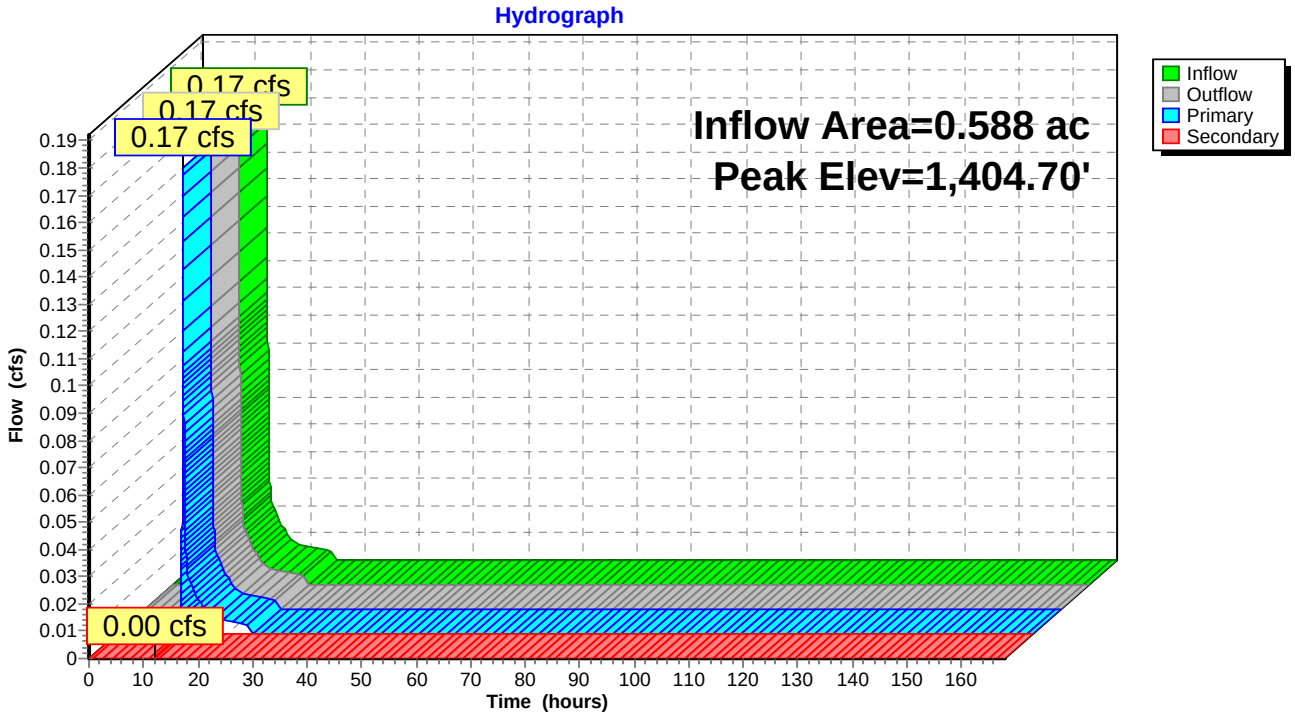
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,404.70' @ 12.05 hrs
Flood Elev= 1,408.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,404.50'	**18.0" Round Culvert to BRA-SW21C** L= 102.1' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,404.50' / 1,403.50' S= 0.0098 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,404.50'	**15.0" Round Culvert to Pond-SW21B** L= 293.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,404.50' / 1,377.20' S= 0.0932 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,404.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

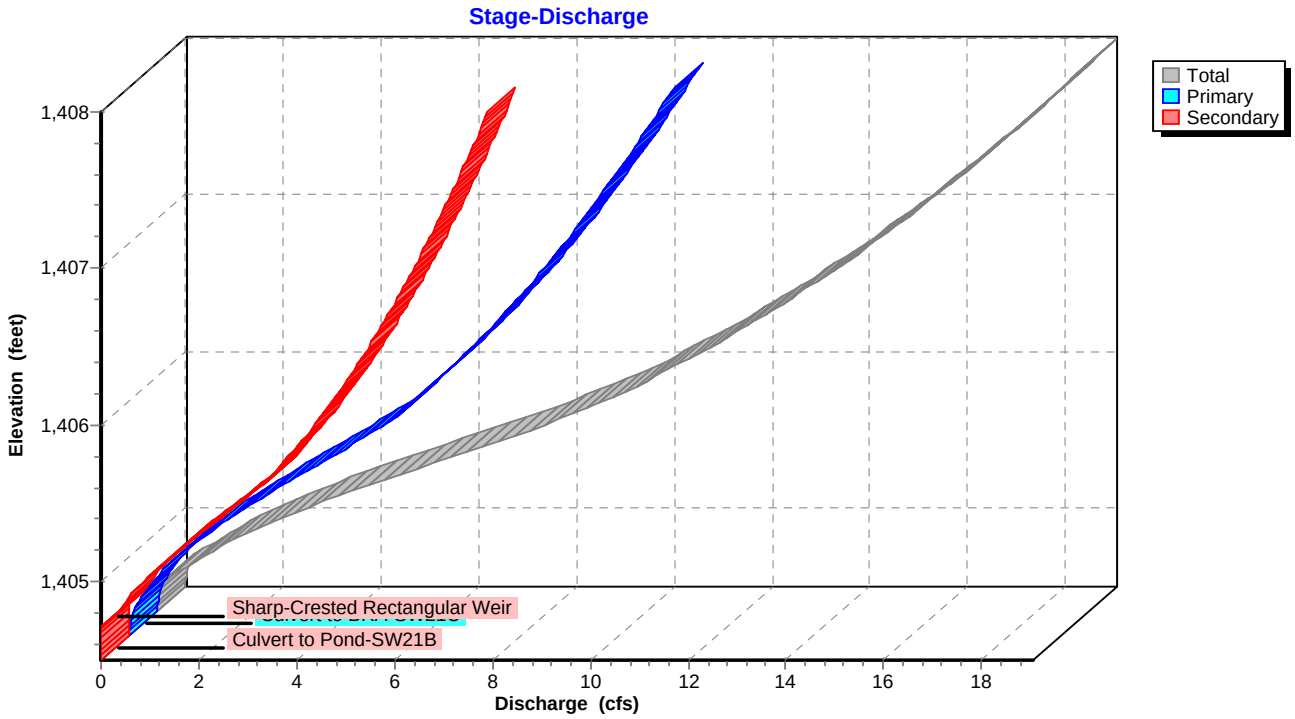
Primary OutFlow Max=0.17 cfs @ 12.05 hrs HW=1,404.70' TW=1,398.11' (Dynamic Tailwater)
└─**1=Culvert to BRA-SW21C** (Inlet Controls 0.17 cfs @ 1.21 fps)

Secondary OutFlow Max=0.00 cfs @ 12.05 hrs HW=1,404.70' TW=1,376.52' (Dynamic Tailwater)
└─**2=Culvert to Pond-SW21B** (Passes 0.00 cfs of 0.15 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.12 fps)

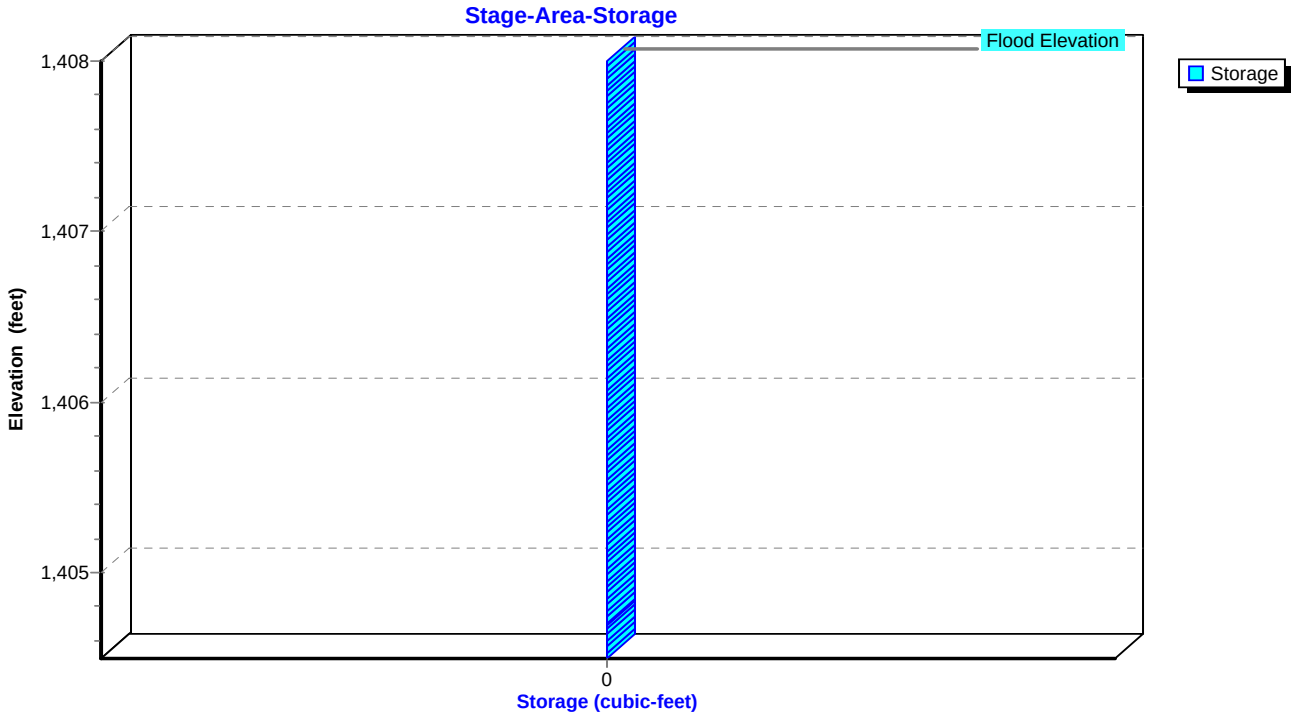
Pond SW21C-FS: Flow Splitter for SW21C



Pond SW21C-FS: Flow Splitter for SW21C



Pond SW21C-FS: Flow Splitter for SW21C



Summary for Pond SW21C-P: BRA-SW21C

Inflow Area = 0.704 ac, 37.36% Impervious, Inflow Depth = 0.23" for 90% Storm event
Inflow = 0.17 cfs @ 12.05 hrs, Volume= 0.013 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,399.09' @ 24.34 hrs Surf.Area= 2,129 sf Storage= 578 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

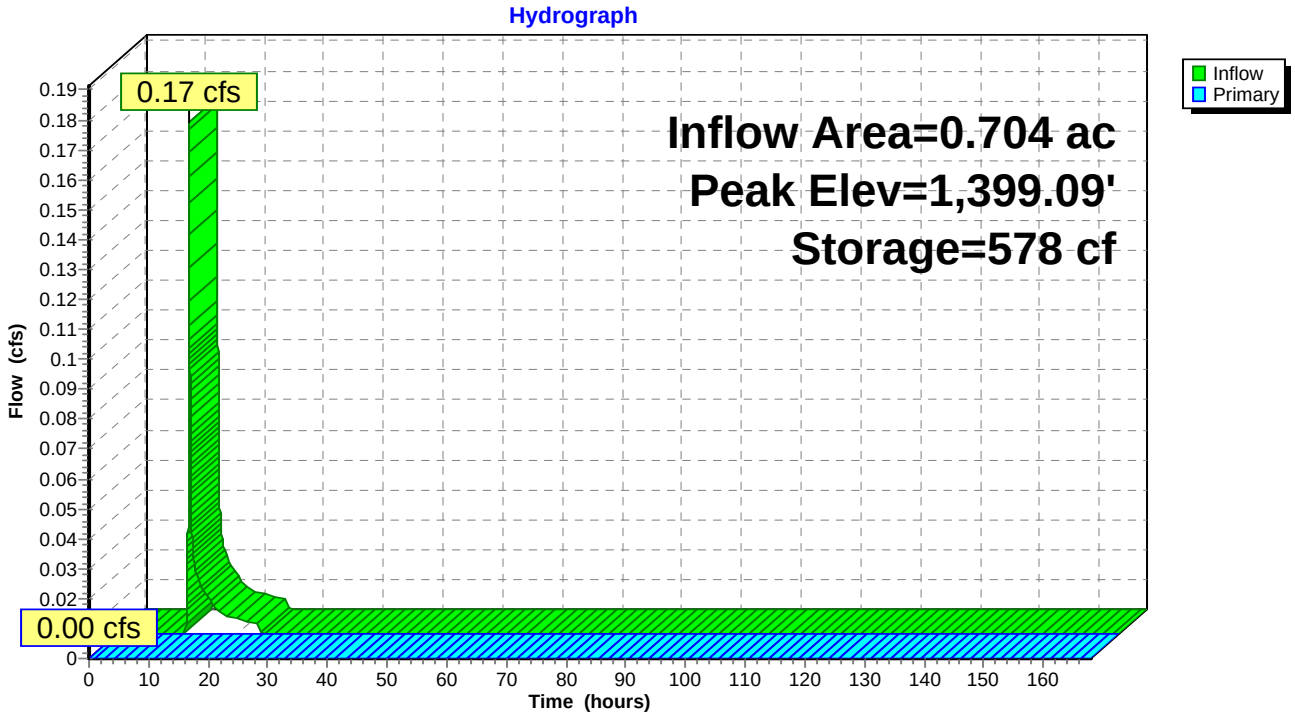
Volume	Invert	Avail.Storage	Storage Description
#1	1,398.00'	4,790 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,398.00	2,129	186.4	0.0	0	0	2,129
1,399.00	2,129	186.4	25.0	532	532	2,315
1,400.00	2,129	186.4	25.0	532	1,065	2,502
1,401.00	2,129	186.4	25.0	532	1,597	2,688
1,402.00	2,129	186.4	25.0	532	2,129	2,875
1,403.00	2,129	186.4	25.0	532	2,661	3,061
1,403.50	2,129	186.4	100.0	1,065	3,726	3,154
1,404.00	2,129	186.4	100.0	1,065	4,790	3,247

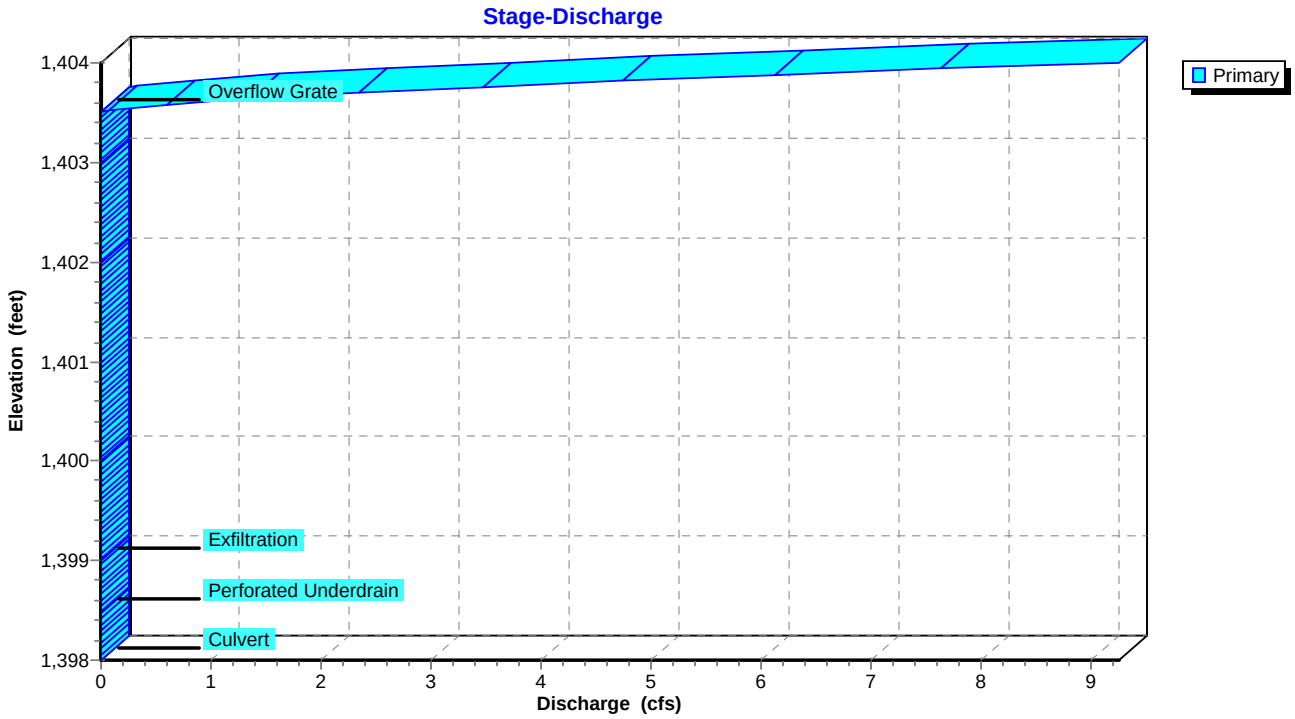
Device	Routing	Invert	Outlet Devices
#1	Primary	1,398.00'	**18.0" Round Culvert** L= 37.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,398.00' / 1,397.50' S= 0.0133 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,398.50'	**0.4" Horiz. Perforated Underdrain X 264.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,399.00'	**0.250 in/hr Exfiltration over Surface area above 1,399.00'** Conductivity to Groundwater Elevation = 1,398.00' Excluded Surface area = 2,129 sf
#4	Device 1	1,403.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,398.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

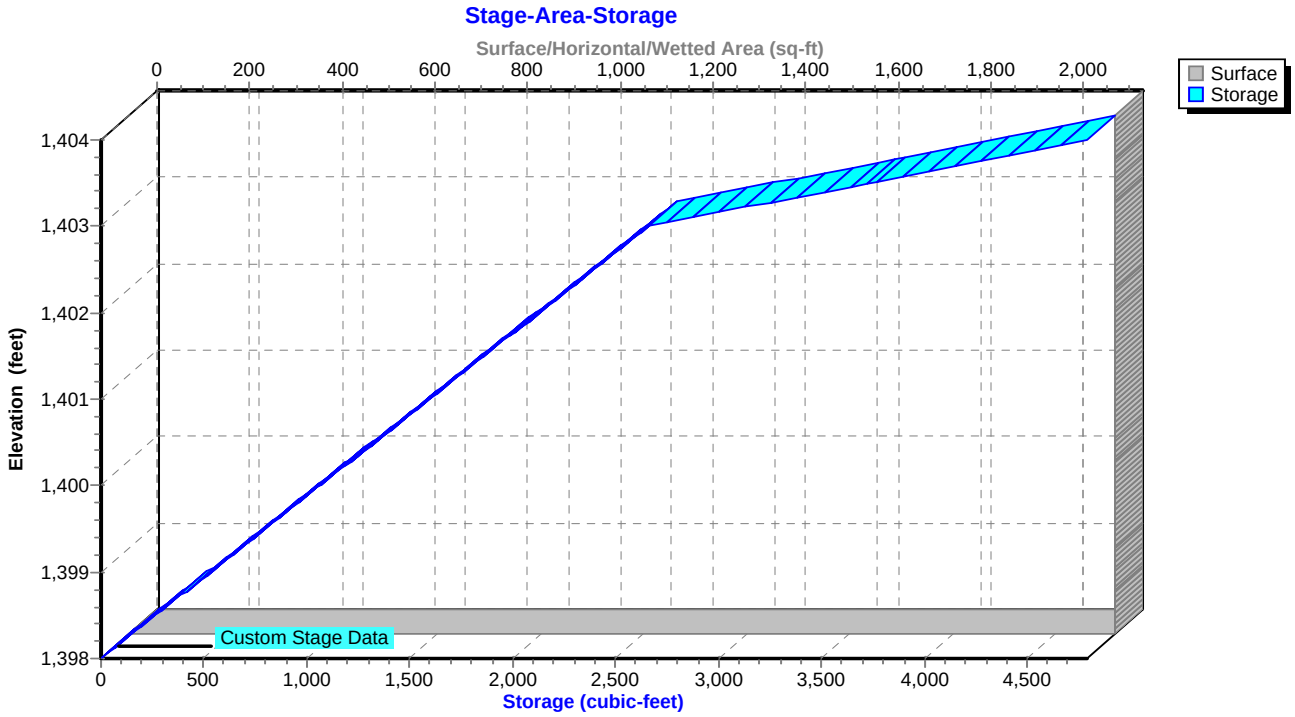
Pond SW21C-P: BRA-SW21C



Pond SW21C-P: BRA-SW21C



Pond SW21C-P: BRA-SW21C



Summary for Pond SW23A-FS: Flow Splitter for SW23A

Inflow Area = 0.206 ac, 47.57% Impervious, Inflow Depth = 0.31" for 90% Storm event
Inflow = 0.08 cfs @ 12.03 hrs, Volume= 0.005 af
Outflow = 0.08 cfs @ 12.04 hrs, Volume= 0.005 af, Atten= 0%, Lag= 0.6 min
Primary = 0.08 cfs @ 12.04 hrs, Volume= 0.005 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

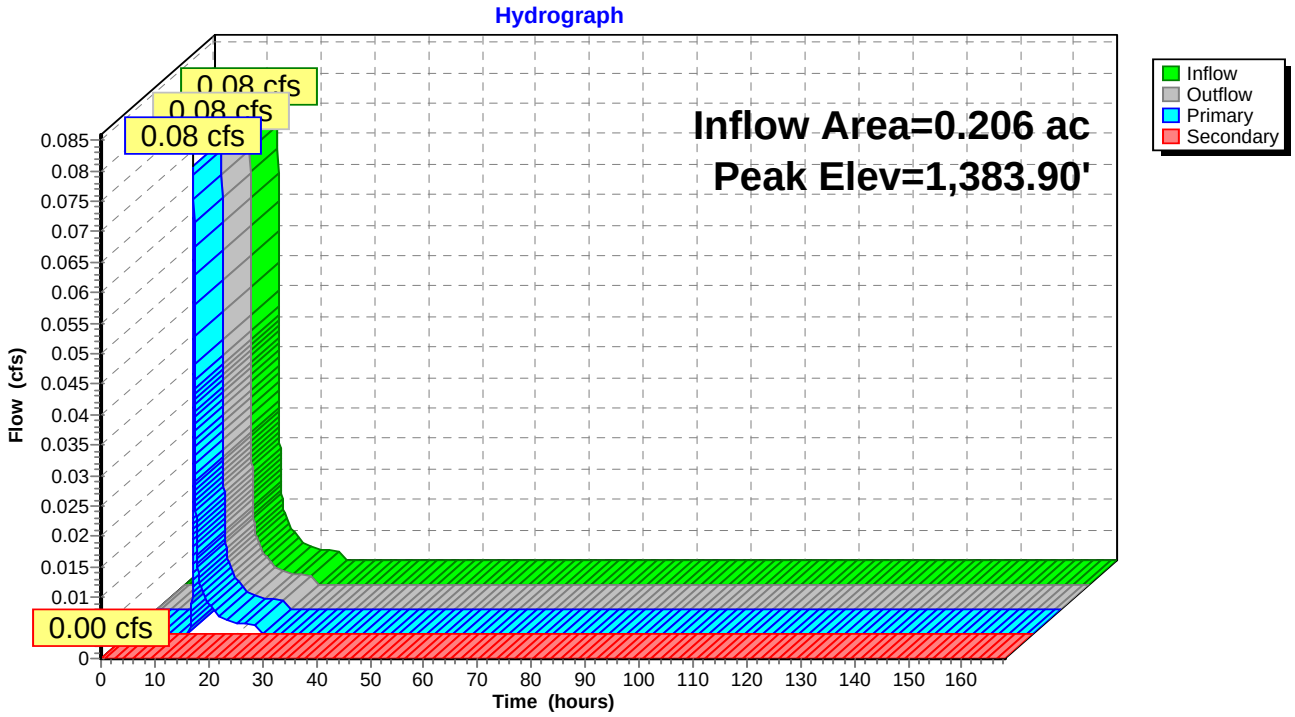
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,383.90' @ 12.04 hrs
Flood Elev= 1,387.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,383.75'	**15.0" Round Culvert to BRA-SW23A** L= 44.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,383.75' / 1,383.50' S= 0.0056 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,383.75'	**15.0" Round Culvert to Pond 23** L= 177.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,383.75' / 1,381.30' S= 0.0138 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,383.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

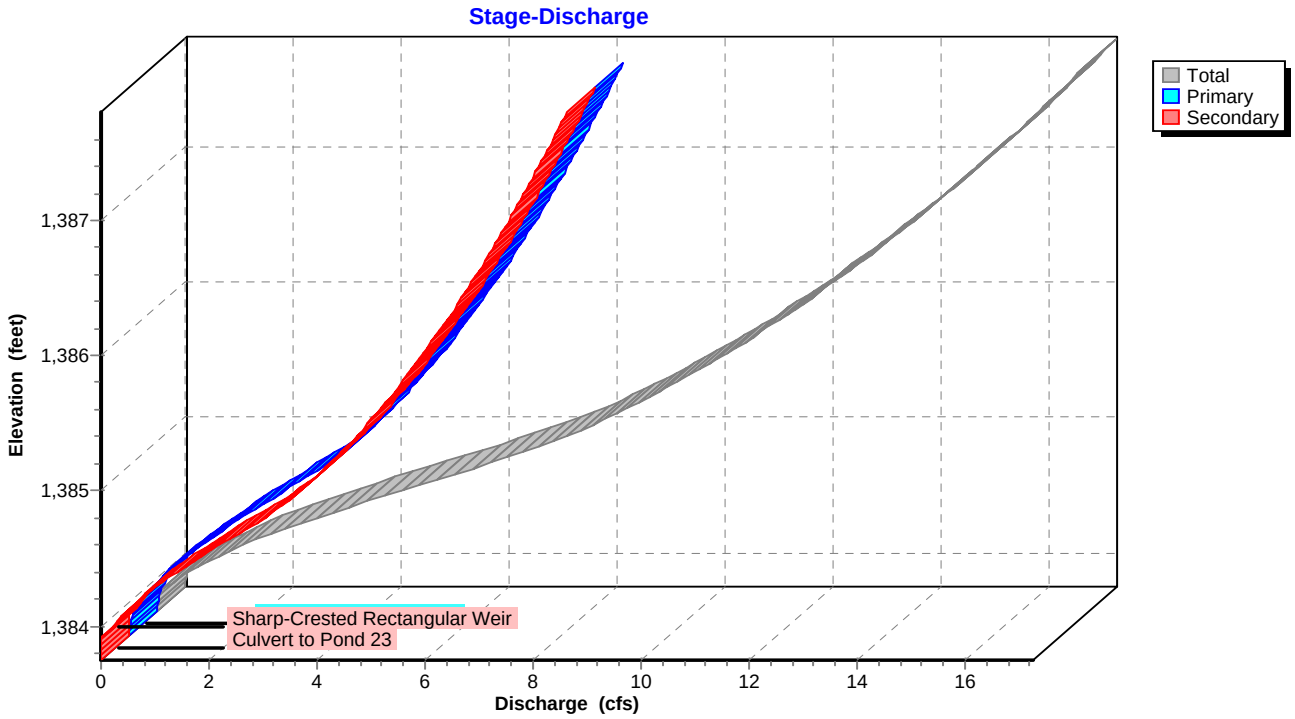
Primary OutFlow Max=0.08 cfs @ 12.04 hrs HW=1,383.90' TW=1,378.16' (Dynamic Tailwater)
└─**1=Culvert to BRA-SW23A** (Barrel Controls 0.08 cfs @ 1.40 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,383.75' TW=0.00' (Dynamic Tailwater)
└─**2=Culvert to Pond 23** (Controls 0.00 cfs)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

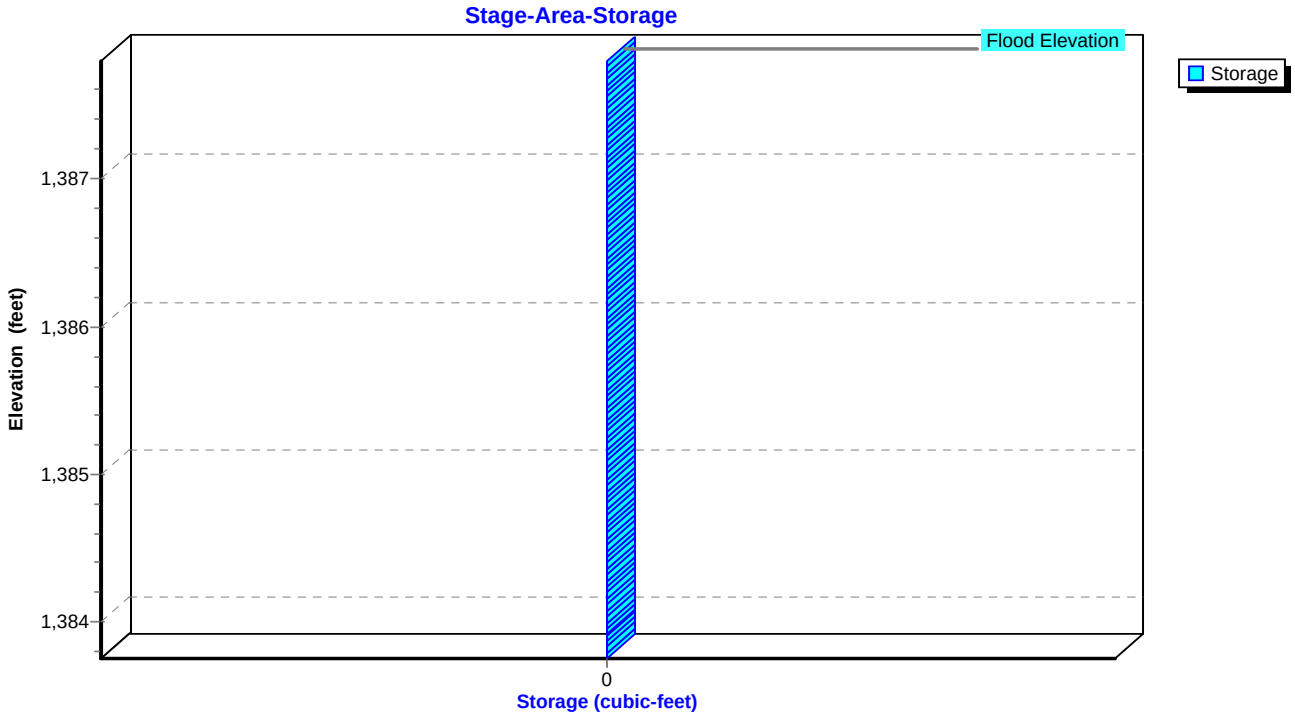
Pond SW23A-FS: Flow Splitter for SW23A



Pond SW23A-FS: Flow Splitter for SW23A



Pond SW23A-FS: Flow Splitter for SW23A



Summary for Pond SW23A-P: BRA-SW23A

Inflow Area = 0.262 ac, 37.40% Impervious, Inflow Depth = 0.25" for 90% Storm event
Inflow = 0.08 cfs @ 12.04 hrs, Volume= 0.006 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,379.30' @ 24.34 hrs Surf.Area= 743 sf Storage= 241 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

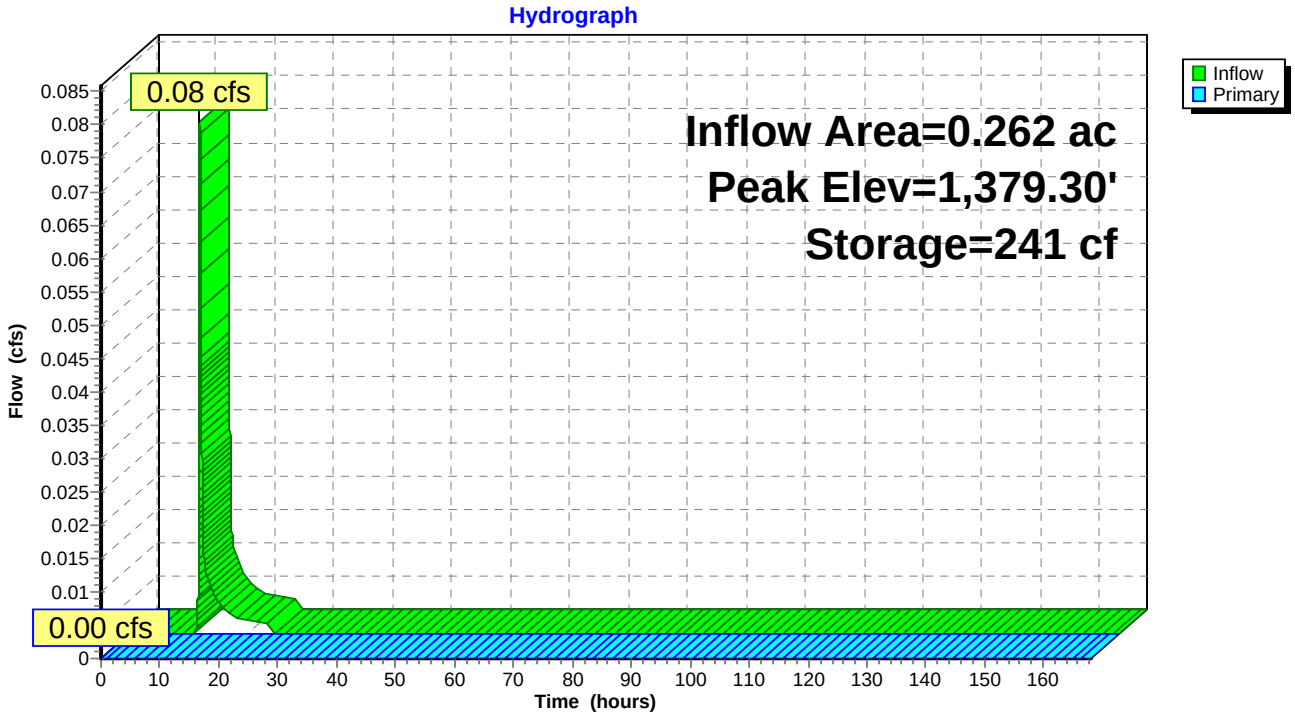
Volume	Invert	Avail.Storage	Storage Description
#1	1,378.00'	1,718 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,378.00	743	120.0	0.0	0	0	743
1,379.00	743	120.0	25.0	186	186	863
1,380.00	743	120.0	25.0	186	372	983
1,381.00	743	120.0	25.0	186	557	1,103
1,382.00	743	120.0	25.0	186	743	1,223
1,383.00	743	120.0	25.0	186	929	1,343
1,383.50	743	120.0	100.0	372	1,300	1,403
1,384.00	930	120.0	100.0	417	1,718	1,463

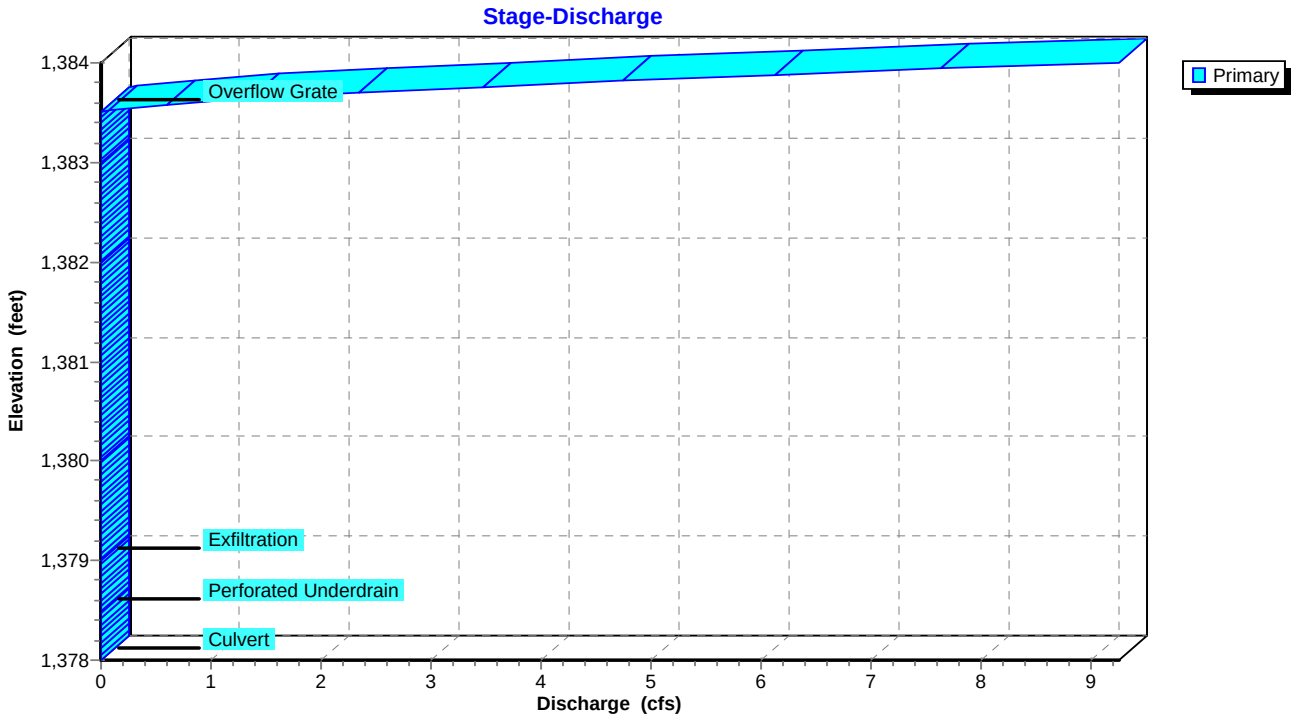
Device	Routing	Invert	Outlet Devices
#1	Primary	1,378.00'	**15.0" Round Culvert** L= 97.1' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,378.00' / 1,376.50' S= 0.0154 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,378.50'	**0.4" Horiz. Perforated Underdrain X 608.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,379.00'	**0.250 in/hr Exfiltration over Surface area above 1,379.00'** Conductivity to Groundwater Elevation = 1,378.00' Excluded Surface area = 743 sf
#4	Device 1	1,383.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,378.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

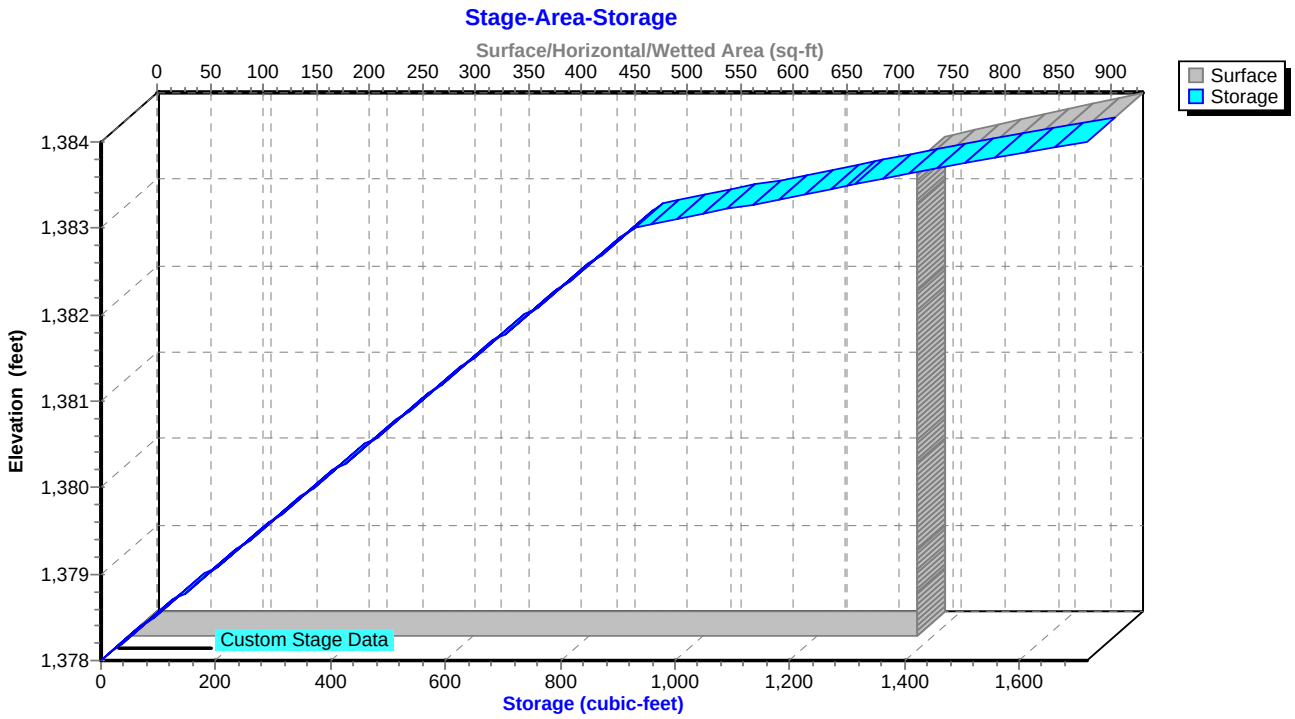
Pond SW23A-P: BRA-SW23A



Pond SW23A-P: BRA-SW23A



Pond SW23A-P: BRA-SW23A



Summary for Pond SW23B-FS: Flow Splitter for SW23B

Inflow Area = 0.579 ac, 37.48% Impervious, Inflow Depth = 0.25" for 90% Storm event
Inflow = 0.16 cfs @ 12.04 hrs, Volume= 0.012 af
Outflow = 0.16 cfs @ 12.05 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.6 min
Primary = 0.16 cfs @ 12.05 hrs, Volume= 0.012 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

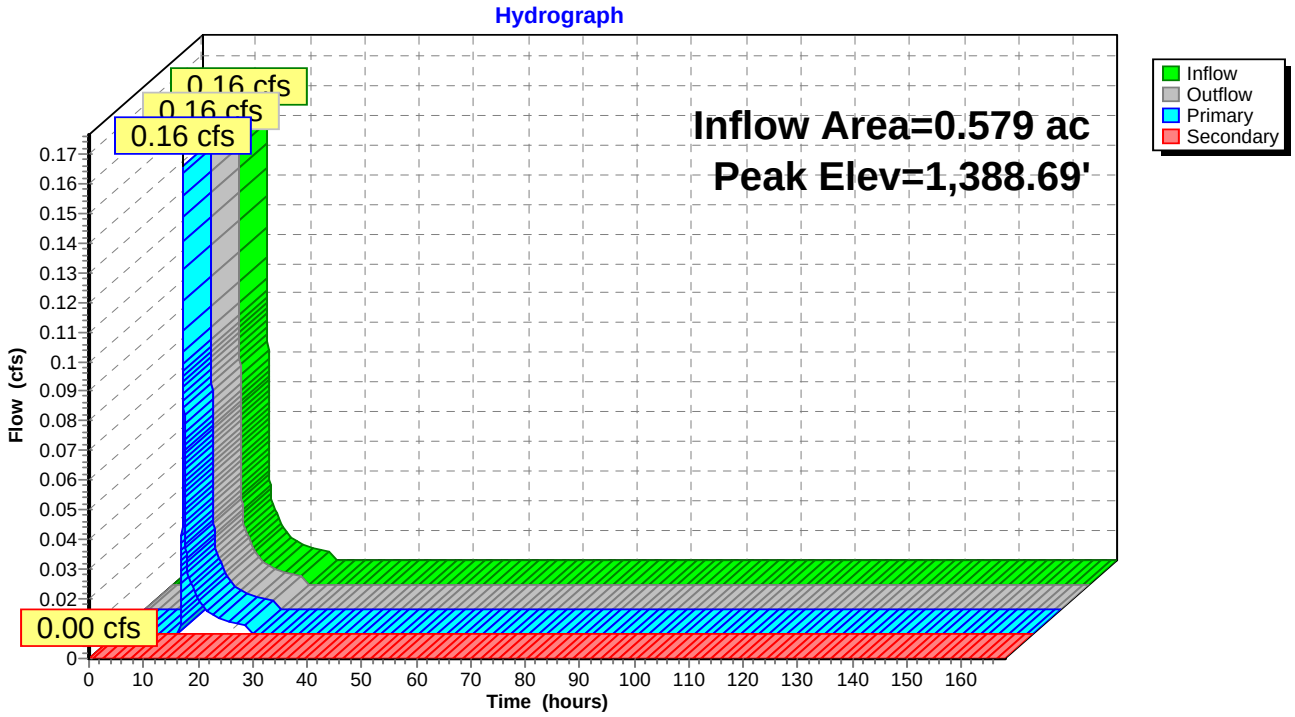
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,388.69' @ 12.05 hrs
Flood Elev= 1,391.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,388.50'	**18.0" Round Culvert to SW23B** L= 132.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,388.50' / 1,387.50' S= 0.0075 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,388.50'	**15.0" Round Culvert to Pond 23** L= 268.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,388.50' / 1,384.00' S= 0.0168 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,388.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

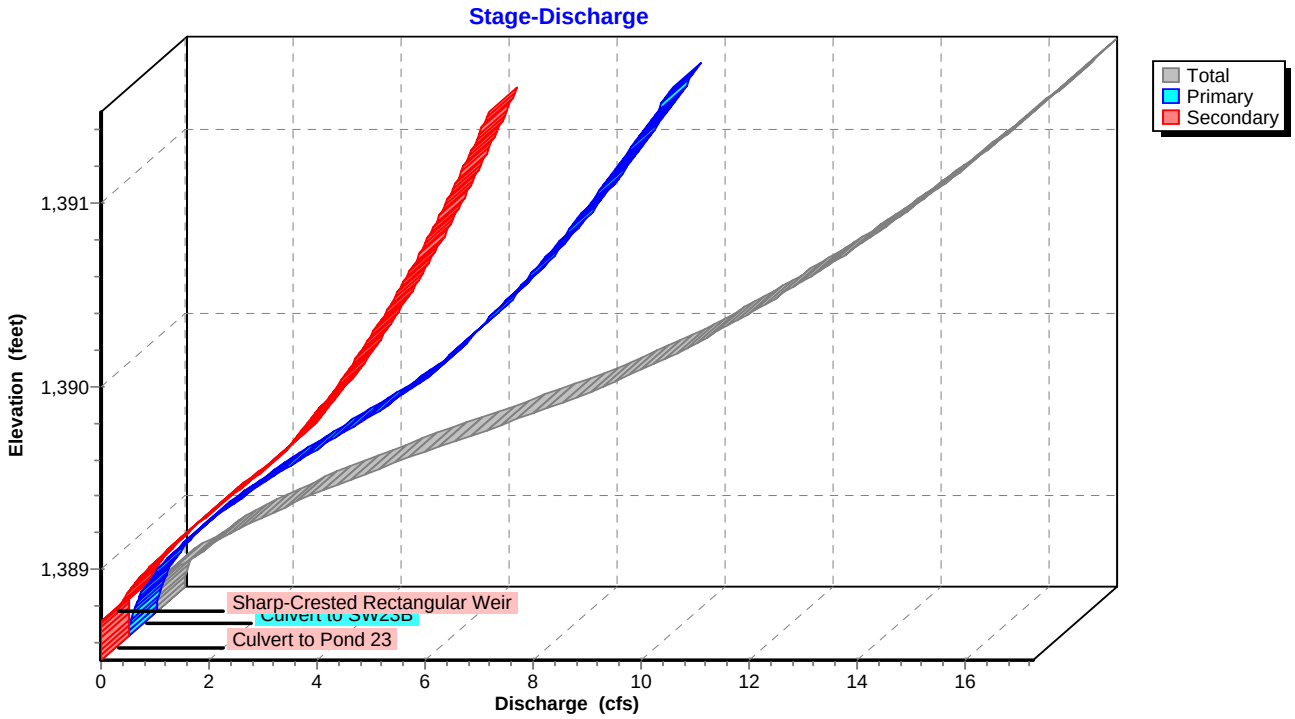
Primary OutFlow Max=0.16 cfs @ 12.05 hrs HW=1,388.69' TW=1,384.11' (Dynamic Tailwater)
└**1=Culvert to SW23B** (Inlet Controls 0.16 cfs @ 1.18 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,388.50' TW=1,381.00' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

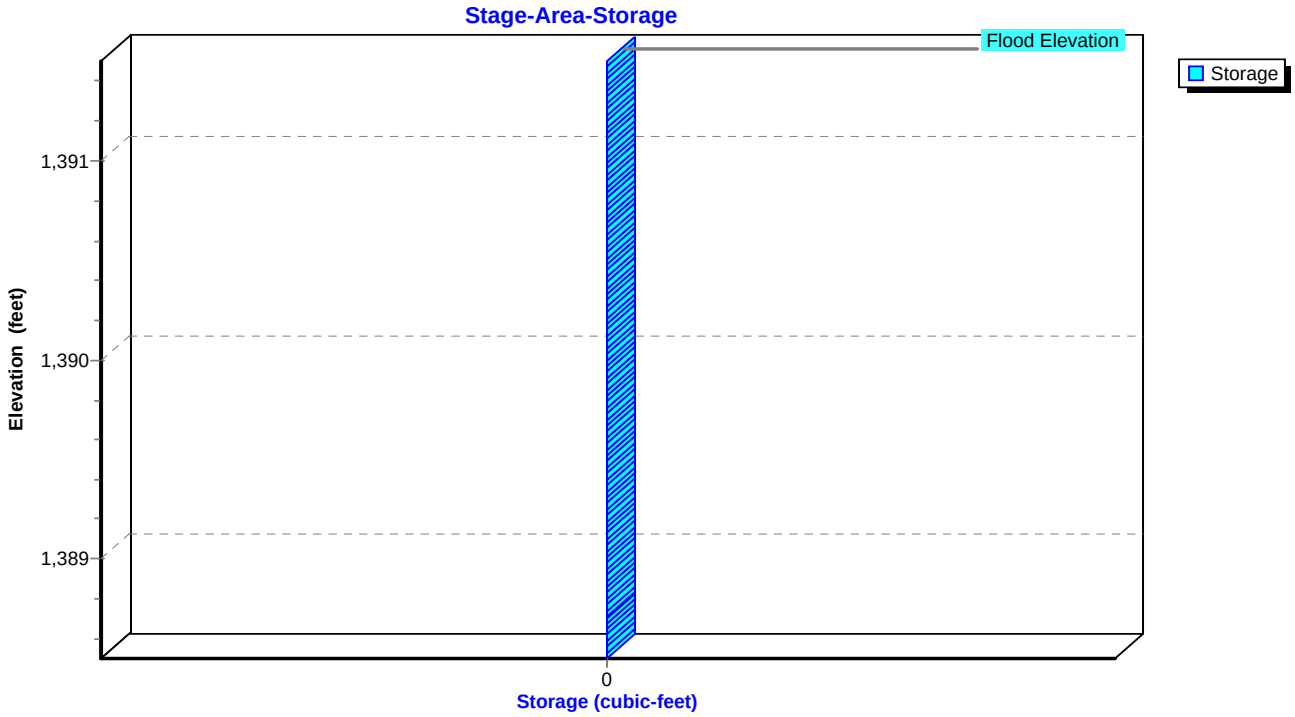
Pond SW23B-FS: Flow Splitter for SW23B



Pond SW23B-FS: Flow Splitter for SW23B



Pond SW23B-FS: Flow Splitter for SW23B



Summary for Pond SW23B-P: BRA-SW23B

Inflow Area = 0.672 ac, 32.29% Impervious, Inflow Depth = 0.22" for 90% Storm event
Inflow = 0.16 cfs @ 12.05 hrs, Volume= 0.012 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,385.12' @ 24.34 hrs Surf.Area= 1,923 sf Storage= 538 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

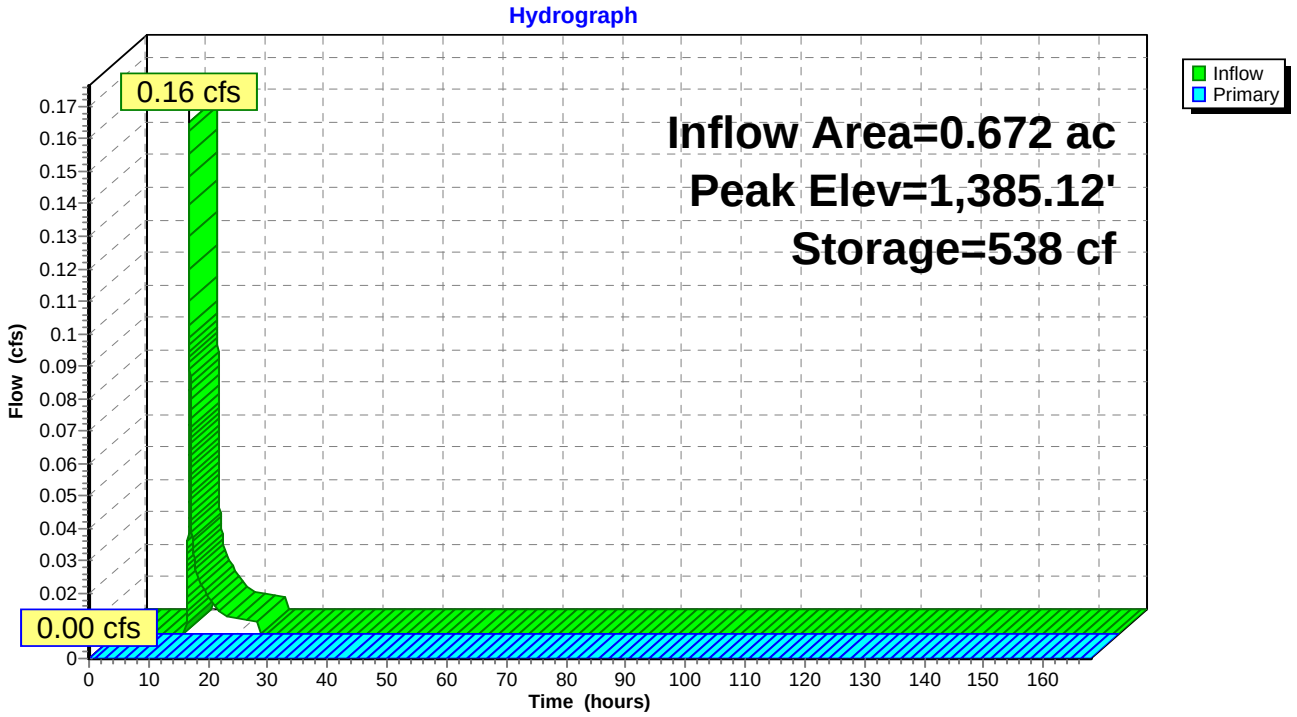
Volume	Invert	Avail.Storage	Storage Description
#1	1,384.00'	3,450 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,384.00	1,923	225.0	0.0	0	0	1,923
1,385.00	1,923	225.0	25.0	481	481	2,148
1,386.00	1,923	225.0	25.0	481	962	2,373
1,387.00	1,923	225.0	25.0	481	1,442	2,598
1,387.50	1,923	225.0	100.0	962	2,404	2,711
1,388.00	2,268	234.4	100.0	1,047	3,450	3,073

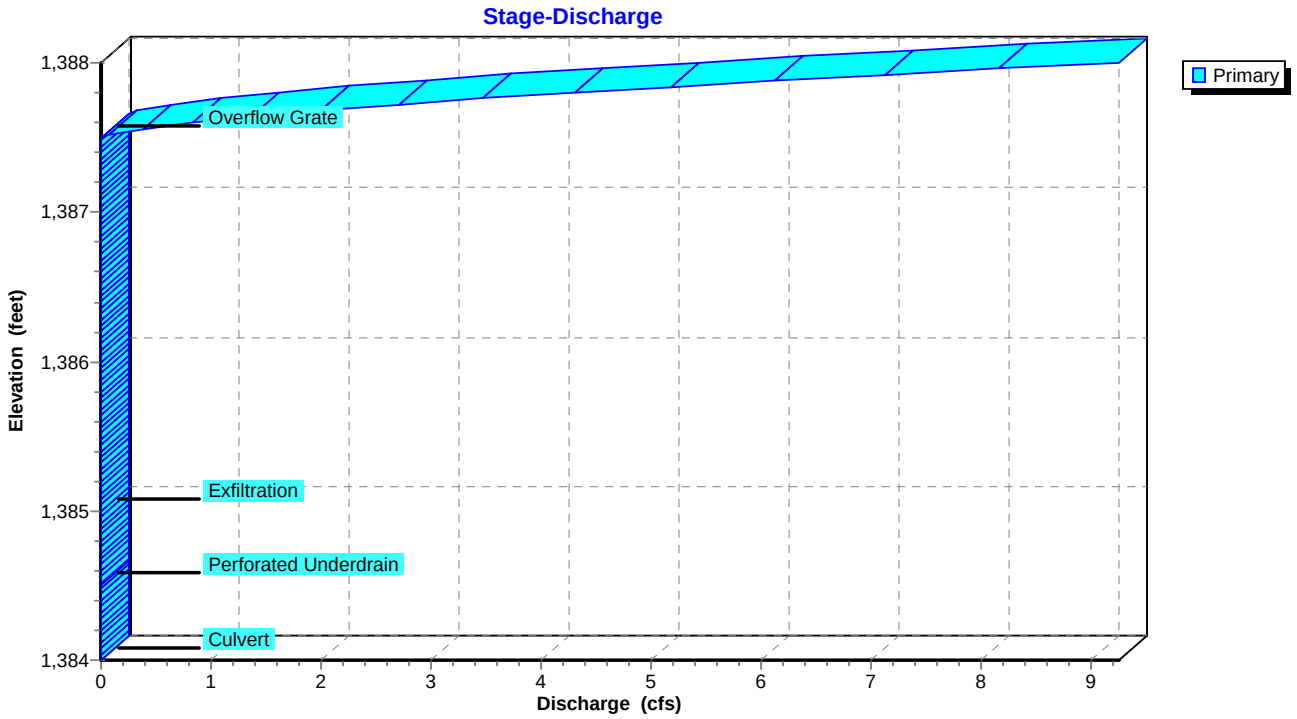
Device	Routing	Invert	Outlet Devices
#1	Primary	1,384.00'	**18.0" Round Culvert** L= 80.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,384.00' / 1,383.00' S= 0.0124 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,384.50'	**0.4" Horiz. Perforated Underdrain X 324.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,385.00'	**0.250 in/hr Exfiltration over Surface area above 1,385.00'** Conductivity to Groundwater Elevation = 1,384.00' Excluded Surface area = 1,923 sf
#4	Device 1	1,387.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,384.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

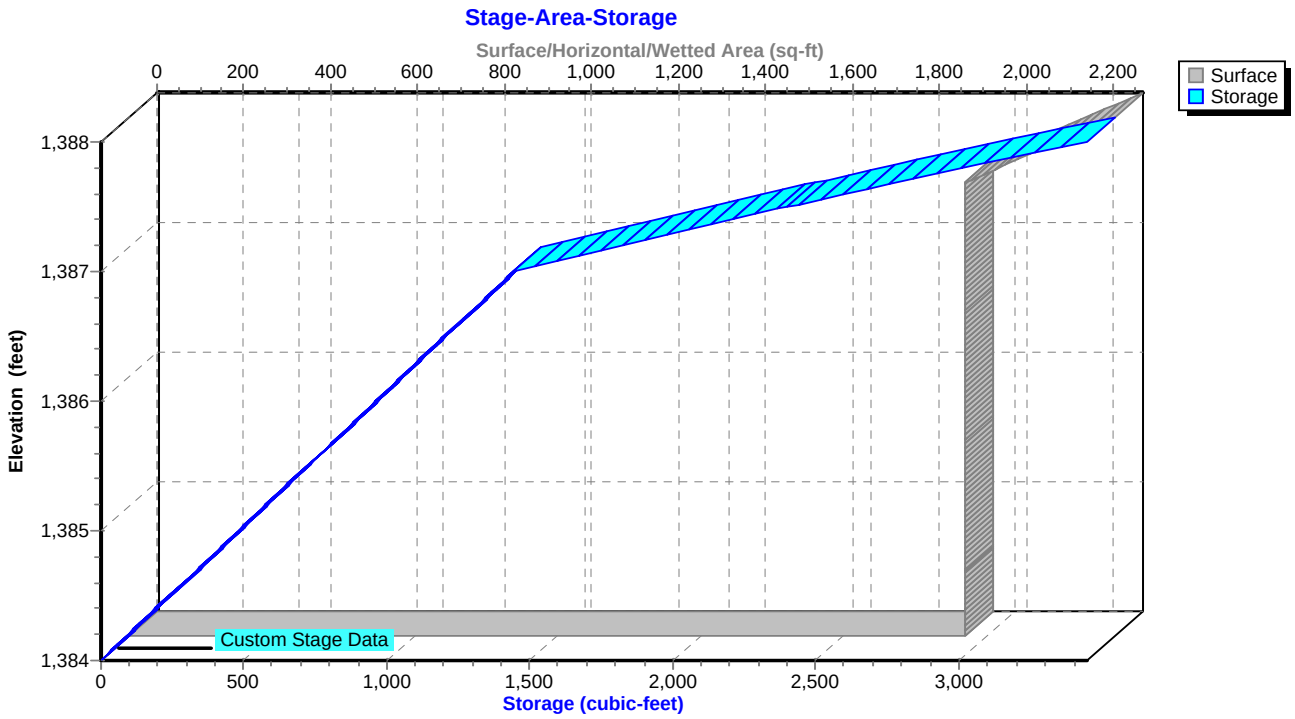
Pond SW23B-P: BRA-SW23B



Pond SW23B-P: BRA-SW23B



Pond SW23B-P: BRA-SW23B



Summary for Pond SW28A-FS: Flow Splitter for SW28A

Inflow Area = 0.220 ac, 68.64% Impervious, Inflow Depth = 0.70" for 90% Storm event
Inflow = 0.20 cfs @ 12.01 hrs, Volume= 0.013 af
Outflow = 0.20 cfs @ 12.02 hrs, Volume= 0.013 af, Atten= 0%, Lag= 0.6 min
Primary = 0.20 cfs @ 12.02 hrs, Volume= 0.013 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

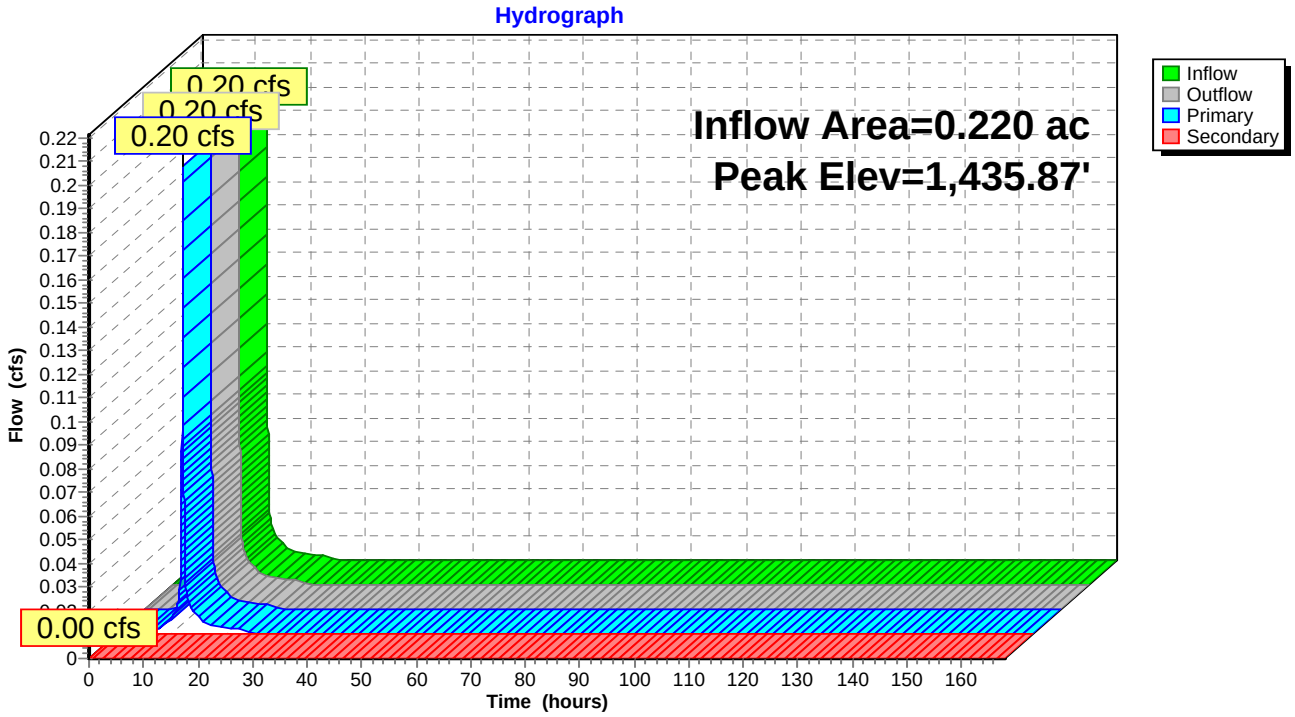
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,435.87' @ 12.02 hrs
Flood Elev= 1,439.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,435.64'	**15.0" Round Outlet to BRA-SW28A** L= 7.3' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,435.64' / 1,435.50' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,435.64'	**15.0" Round Culvert to Pond SW28D** L= 149.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,435.64' / 1,427.30' S= 0.0558 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,435.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

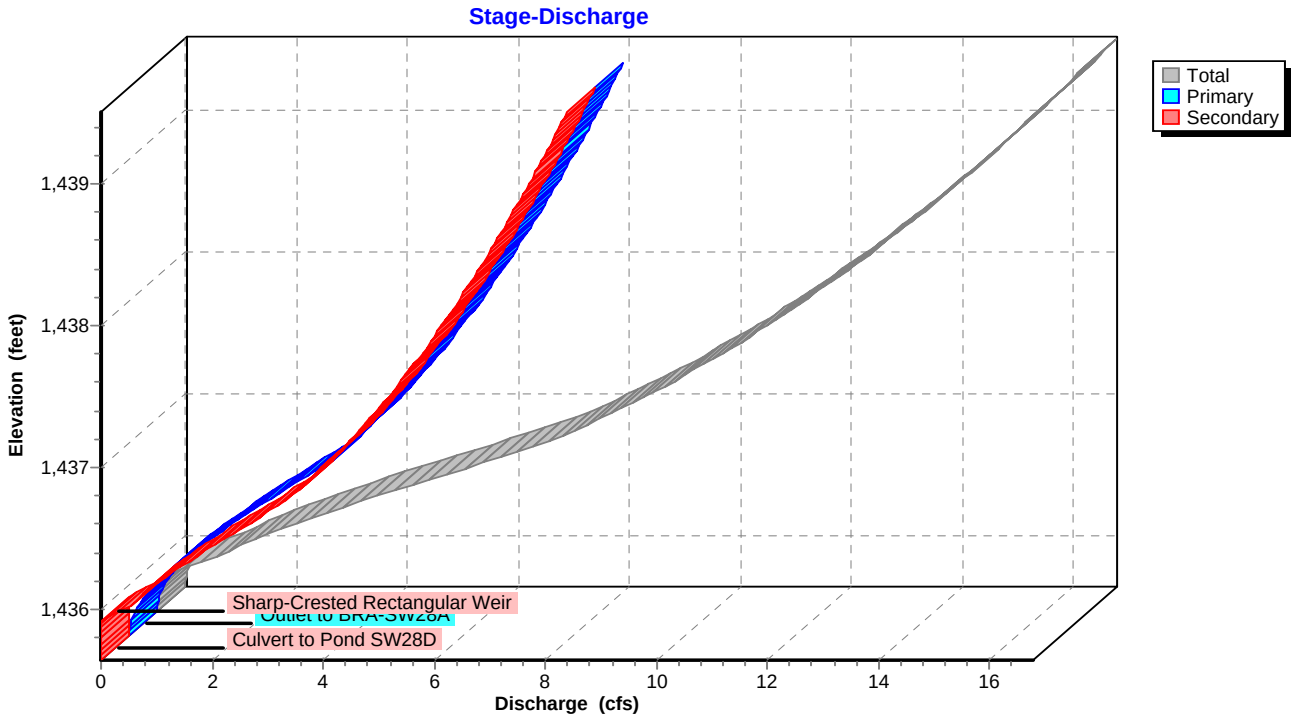
Primary OutFlow Max=0.20 cfs @ 12.02 hrs HW=1,435.87' TW=1,430.81' (Dynamic Tailwater)
└─**1=Outlet to BRA-SW28A** (Inlet Controls 0.20 cfs @ 1.28 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,435.64' TW=1,373.60' (Dynamic Tailwater)
└─**2=Culvert to Pond SW28D** (Controls 0.00 cfs)
└─**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

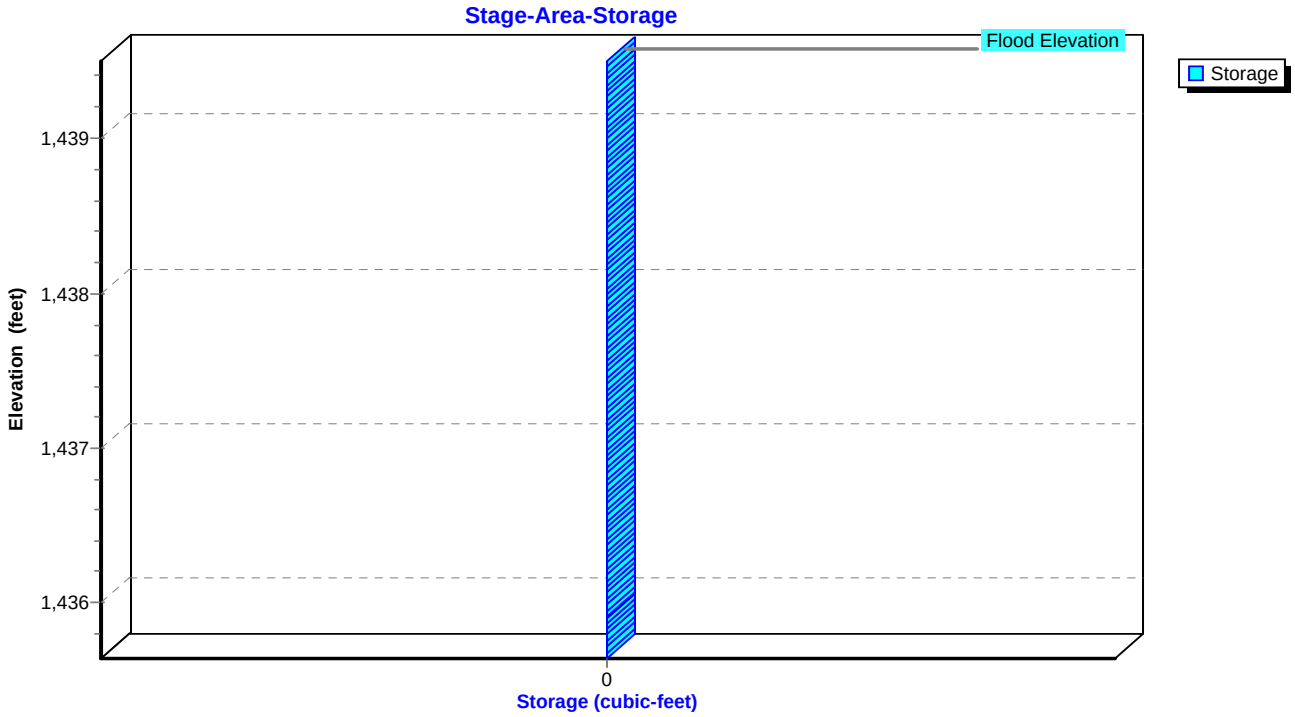
Pond SW28A-FS: Flow Splitter for SW28A



Pond SW28A-FS: Flow Splitter for SW28A



Pond SW28A-FS: Flow Splitter for SW28A



Summary for Pond SW28A-P: BRA-SW28A

Inflow Area = 0.301 ac, 50.17% Impervious, Inflow Depth = 0.53" for 90% Storm event
Inflow = 0.20 cfs @ 12.02 hrs, Volume= 0.013 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,432.91' @ 24.62 hrs Surf.Area= 674 sf Storage= 574 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

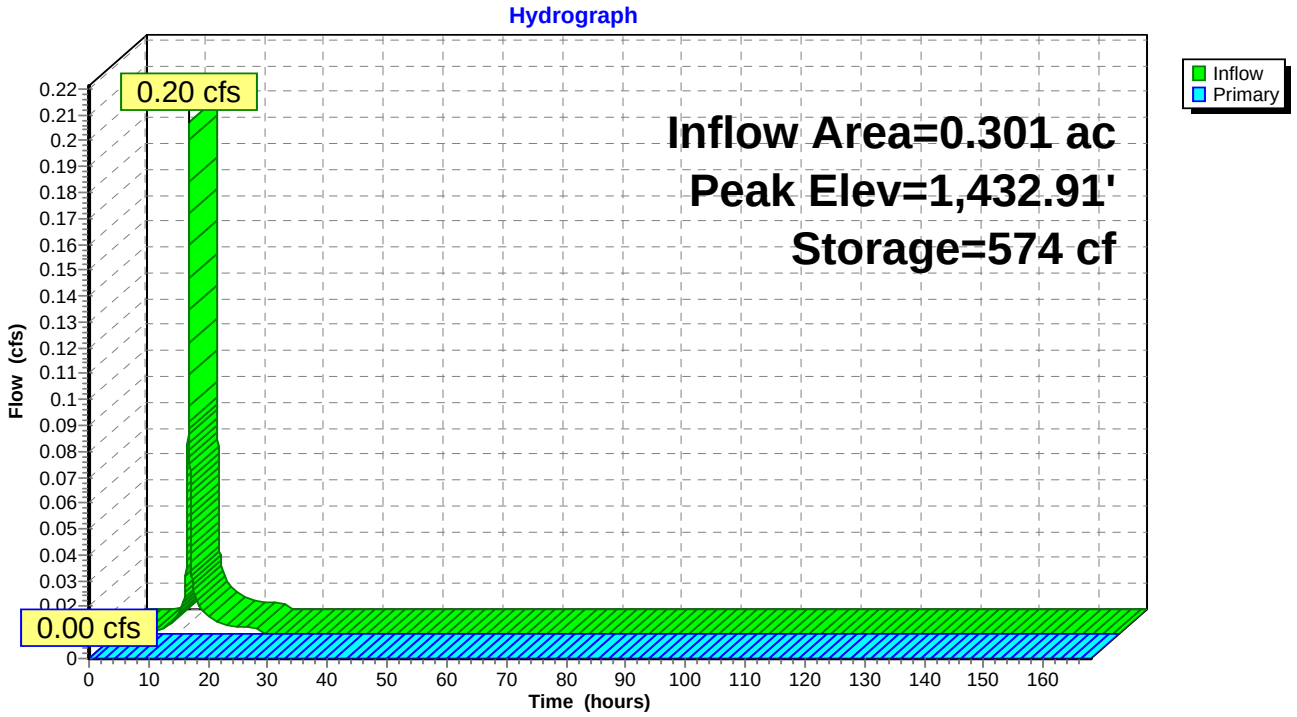
Volume	Invert	Avail.Storage	Storage Description
#1	1,429.50'	1,854 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,429.50	674	100.6	0.0	0	0	674
1,430.50	674	100.6	25.0	169	169	775
1,432.00	674	100.6	25.0	253	421	926
1,433.00	674	100.6	25.0	169	590	1,026
1,434.00	674	100.6	25.0	169	758	1,127
1,434.50	674	100.6	25.0	84	843	1,177
1,435.50	674	100.6	100.0	674	1,517	1,278
1,436.00	674	100.6	100.0	337	1,854	1,328

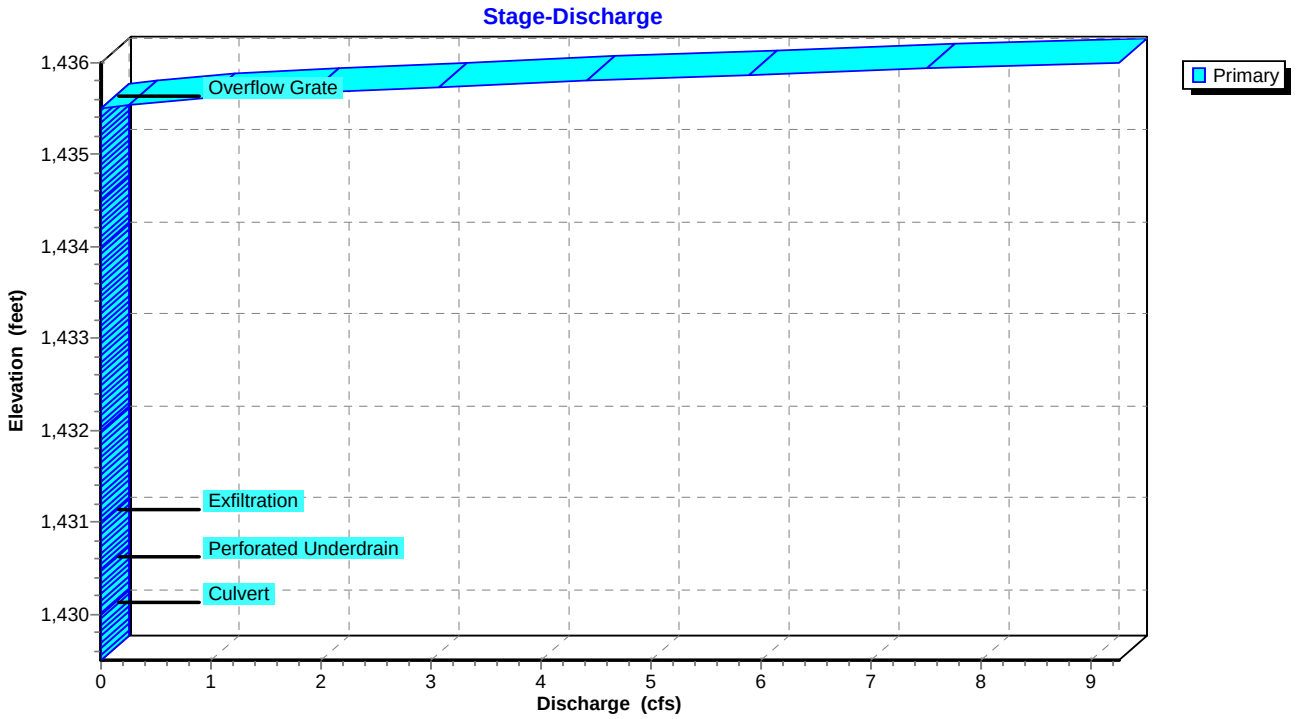
Device	Routing	Invert	Outlet Devices
#1	Primary	1,430.00'	**15.0" Round Culvert** L= 77.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,430.00' / 1,429.00' S= 0.0130 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,430.50'	**0.4" Horiz. Perforated Underdrain** X 512 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,431.00'	**0.250 in/hr Exfiltration over Surface area above 1,431.00'** Conductivity to Groundwater Elevation = 1,430.00' Excluded Surface area = 674 sf
#4	Device 1	1,435.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,429.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

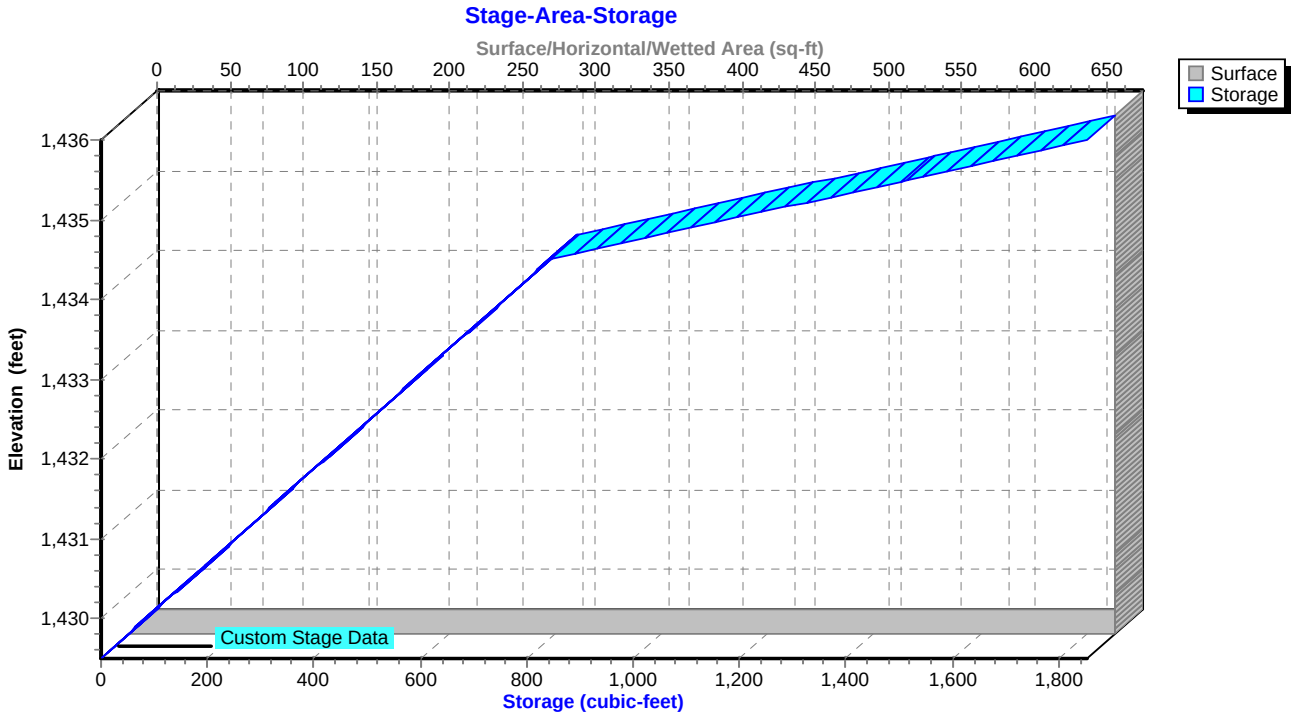
Pond SW28A-P: BRA-SW28A



Pond SW28A-P: BRA-SW28A



Pond SW28A-P: BRA-SW28A



Summary for Pond SW28B-FS: Flow Splitter for SW28B

Inflow Area = 0.390 ac, 67.69% Impervious, Inflow Depth = 0.69" for 90% Storm event
Inflow = 0.34 cfs @ 12.02 hrs, Volume= 0.022 af
Outflow = 0.34 cfs @ 12.03 hrs, Volume= 0.022 af, Atten= 0%, Lag= 0.6 min
Primary = 0.34 cfs @ 12.03 hrs, Volume= 0.022 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

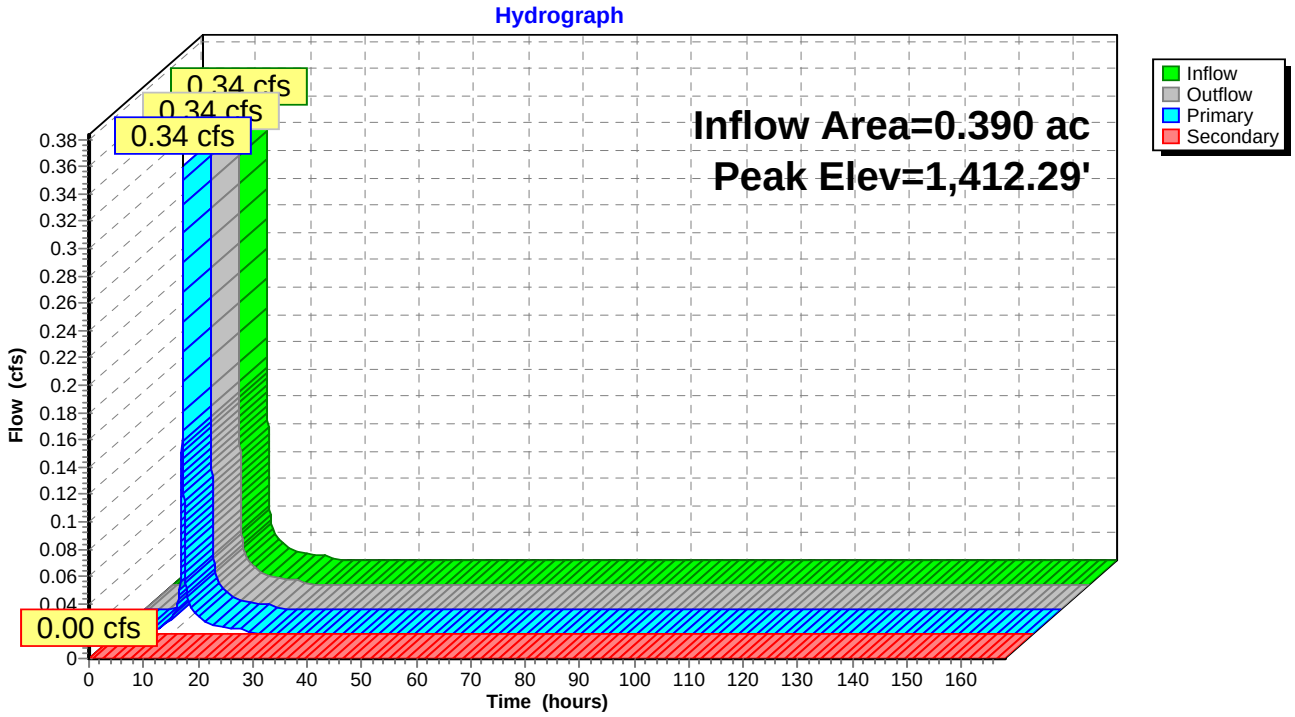
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,412.29' @ 12.03 hrs
Flood Elev= 1,414.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,412.00'	**18.0" Round Culvert** L= 21.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,412.00' / 1,410.50' S= 0.0714 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,412.00'	**18.0" Round Culvert** L= 117.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,412.00' / 1,406.00' S= 0.0513 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,412.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

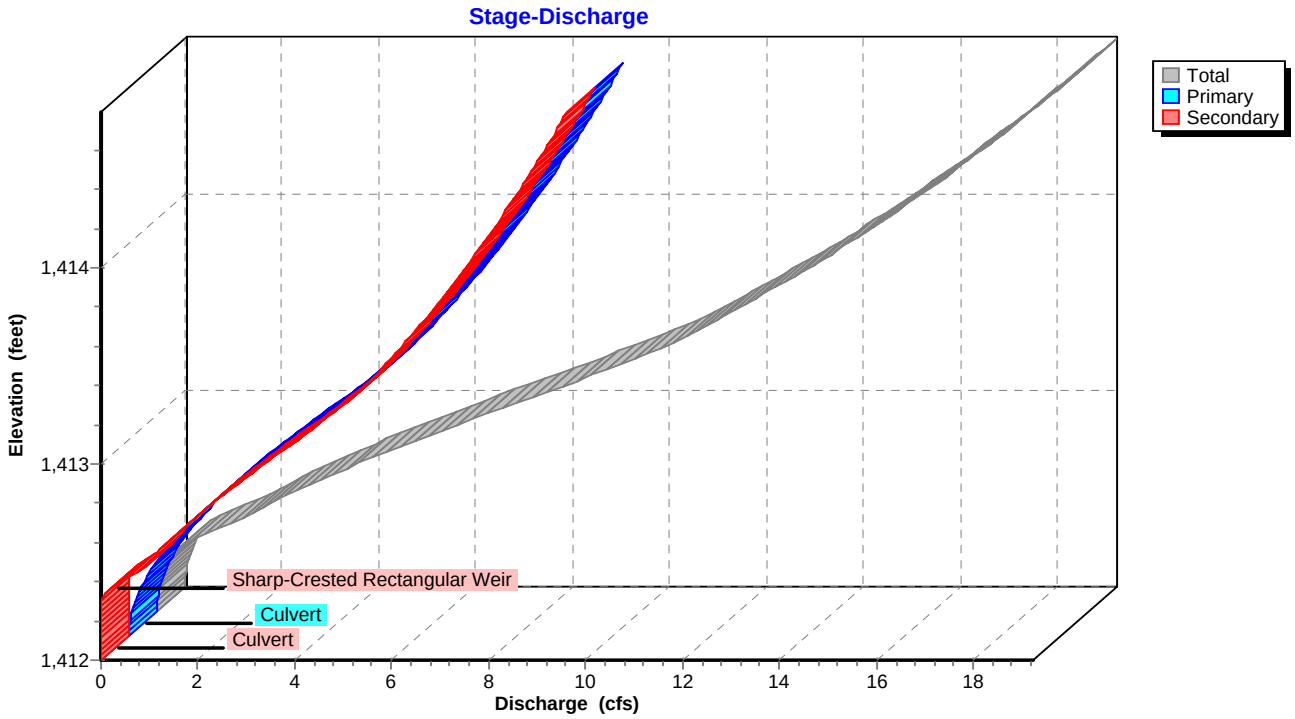
Primary OutFlow Max=0.34 cfs @ 12.03 hrs HW=1,412.29' TW=1,404.11' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.34 cfs @ 1.44 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,412.00' TW=1,373.60' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

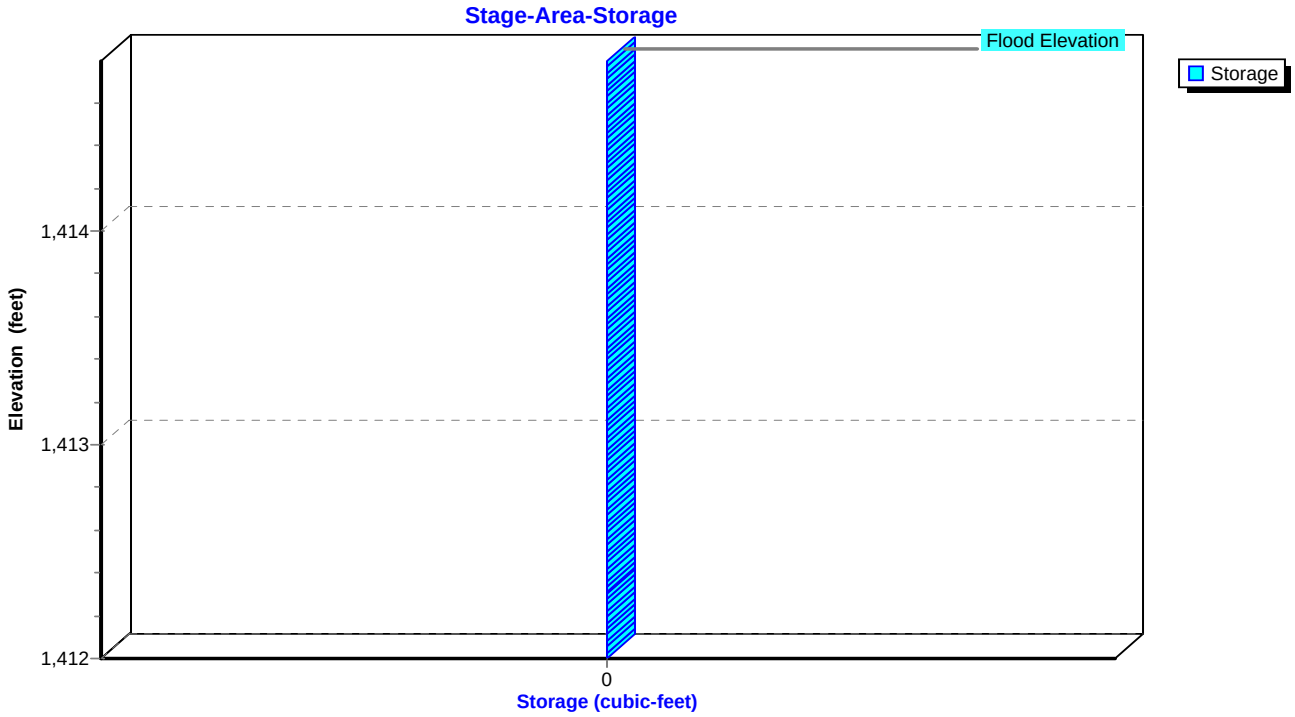
Pond SW28B-FS: Flow Splitter for SW28B



Pond SW28B-FS: Flow Splitter for SW28B



Pond SW28B-FS: Flow Splitter for SW28B



Summary for Pond SW28B-P: BRA-SW28B

Inflow Area = 0.506 ac, 52.17% Impervious, Inflow Depth = 0.54" for 90% Storm event
Inflow = 0.34 cfs @ 12.03 hrs, Volume= 0.023 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,405.07' @ 24.55 hrs Surf.Area= 2,545 sf Storage= 999 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

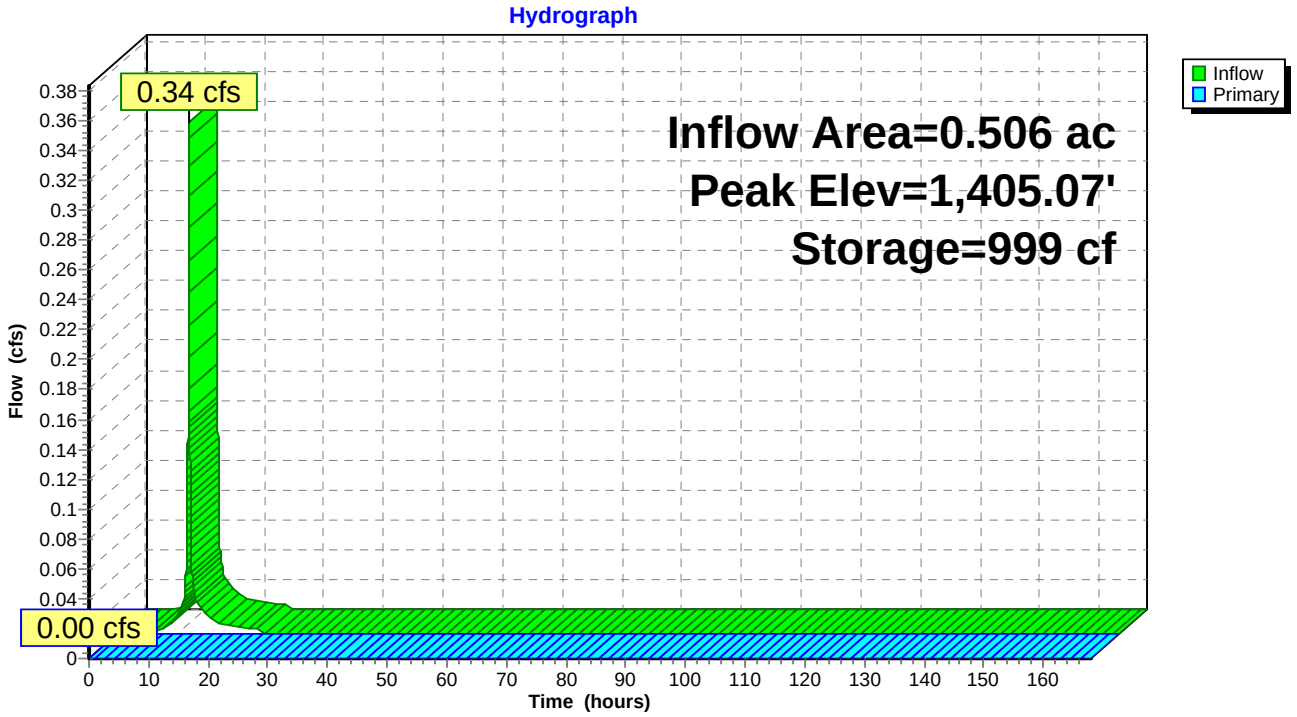
Volume	Invert	Avail.Storage	Storage Description
#1	1,403.50'	5,829 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,403.50	2,545	273.4	0.0	0	0	2,545
1,404.50	2,545	273.4	25.0	636	636	2,818
1,405.50	2,545	273.4	25.0	636	1,273	3,092
1,406.50	2,545	273.4	25.0	636	1,909	3,365
1,407.50	2,545	273.4	25.0	636	2,545	3,639
1,408.50	2,545	273.4	25.0	636	3,181	3,912
1,409.00	2,545	273.4	100.0	1,273	4,454	4,049
1,409.50	2,962	282.9	100.0	1,375	5,829	4,492

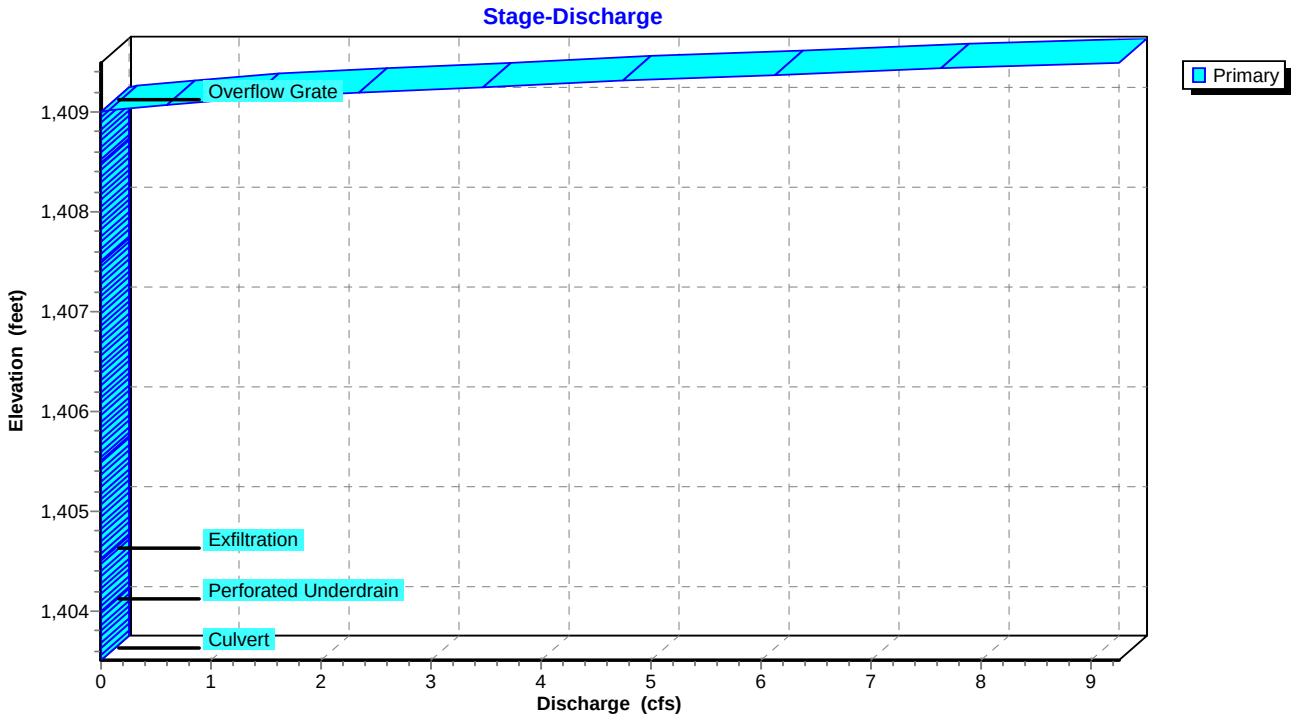
Device	Routing	Invert	Outlet Devices
#1	Primary	1,403.50'	**15.0" Round Culvert** L= 58.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,403.50' / 1,401.00' S= 0.0427 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,404.00'	**0.4" Horiz. Perforated Underdrain X 468.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,404.50'	**0.250 in/hr Exfiltration over Surface area above 1,404.50'** Conductivity to Groundwater Elevation = 1,403.50' Excluded Surface area = 2,545 sf
#4	Device 1	1,409.00'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,403.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

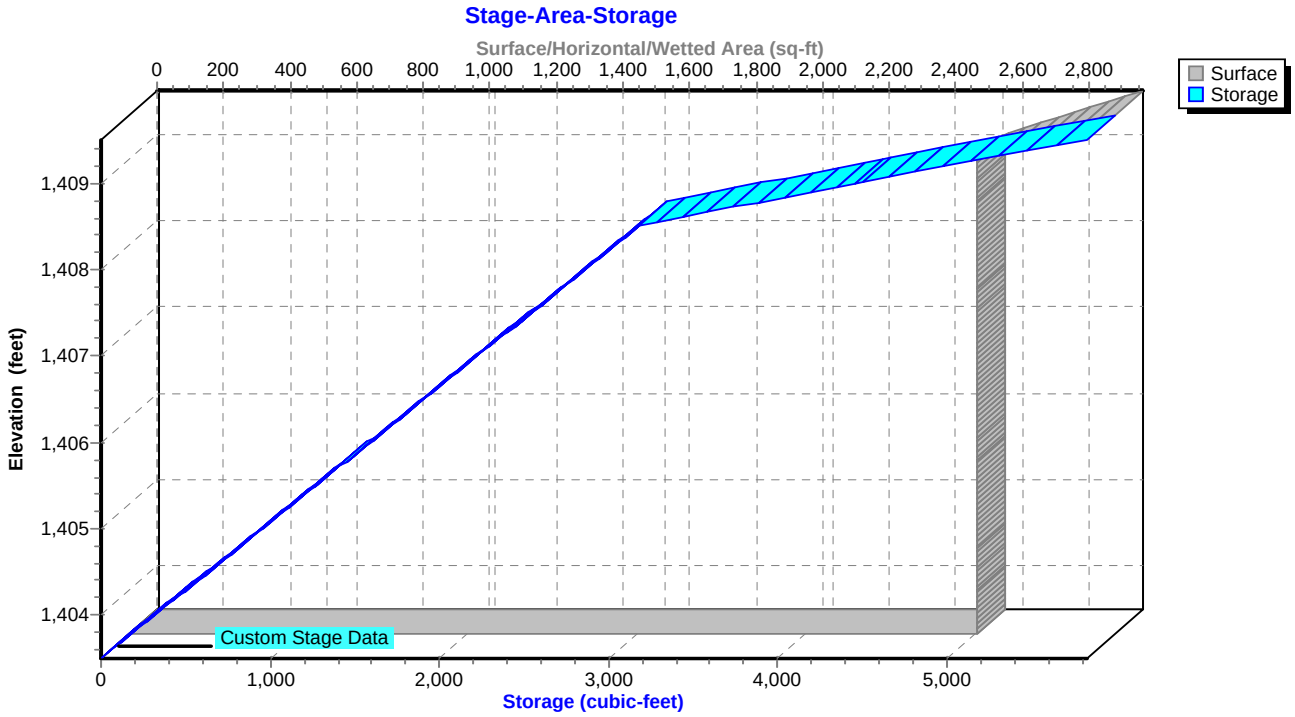
Pond SW28B-P: BRA-SW28B



Pond SW28B-P: BRA-SW28B



Pond SW28B-P: BRA-SW28B



Summary for Pond SW28C-FS: Flow Splitter for SW28C

Inflow Area = 0.666 ac,100.00% Impervious, Inflow Depth = 0.99" for 90% Storm event
Inflow = 0.85 cfs @ 12.03 hrs, Volume= 0.055 af
Outflow = 0.85 cfs @ 12.04 hrs, Volume= 0.055 af, Atten= 0%, Lag= 0.6 min
Primary = 0.85 cfs @ 12.04 hrs, Volume= 0.055 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

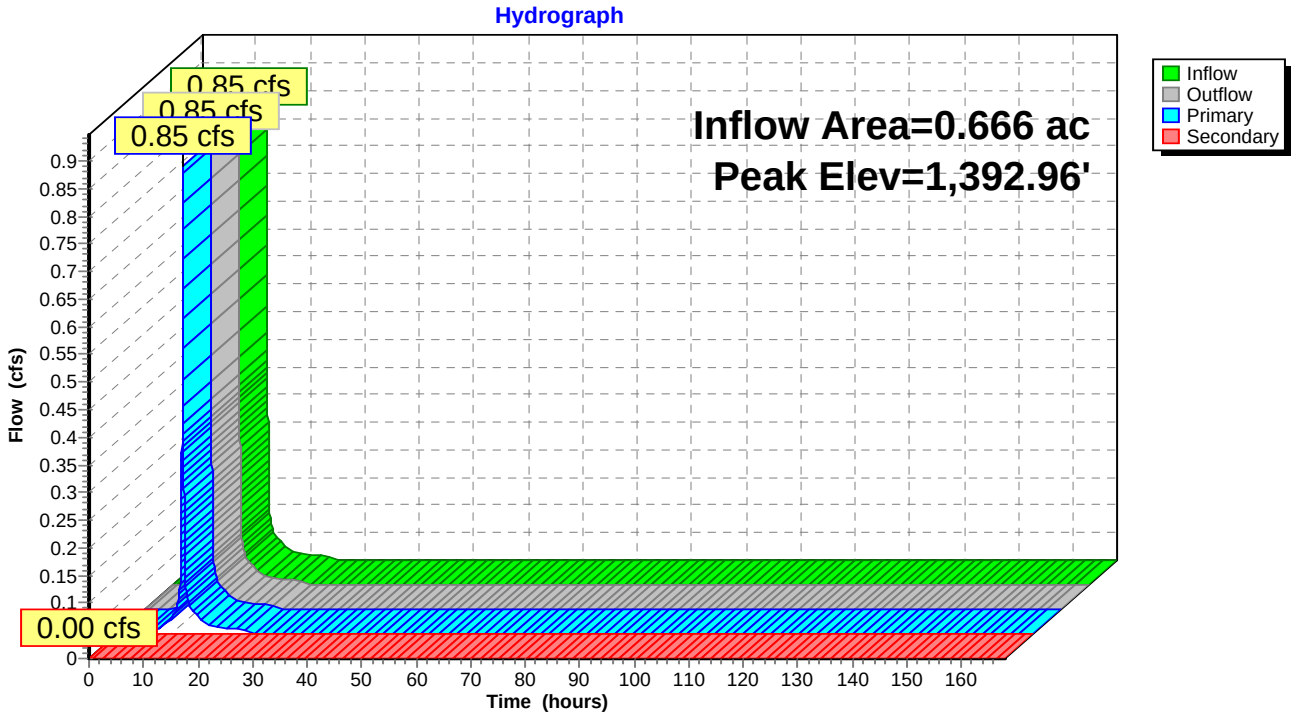
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,392.96' @ 12.04 hrs
Flood Elev= 1,396.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,392.50'	**18.0" Round Culvert to BRA-SW28A** L= 14.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,392.50' / 1,392.00' S= 0.0347 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,392.50'	**18.0" Round Culvert to Pond SW28D** L= 189.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,392.50' / 1,385.70' S= 0.0358 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,393.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

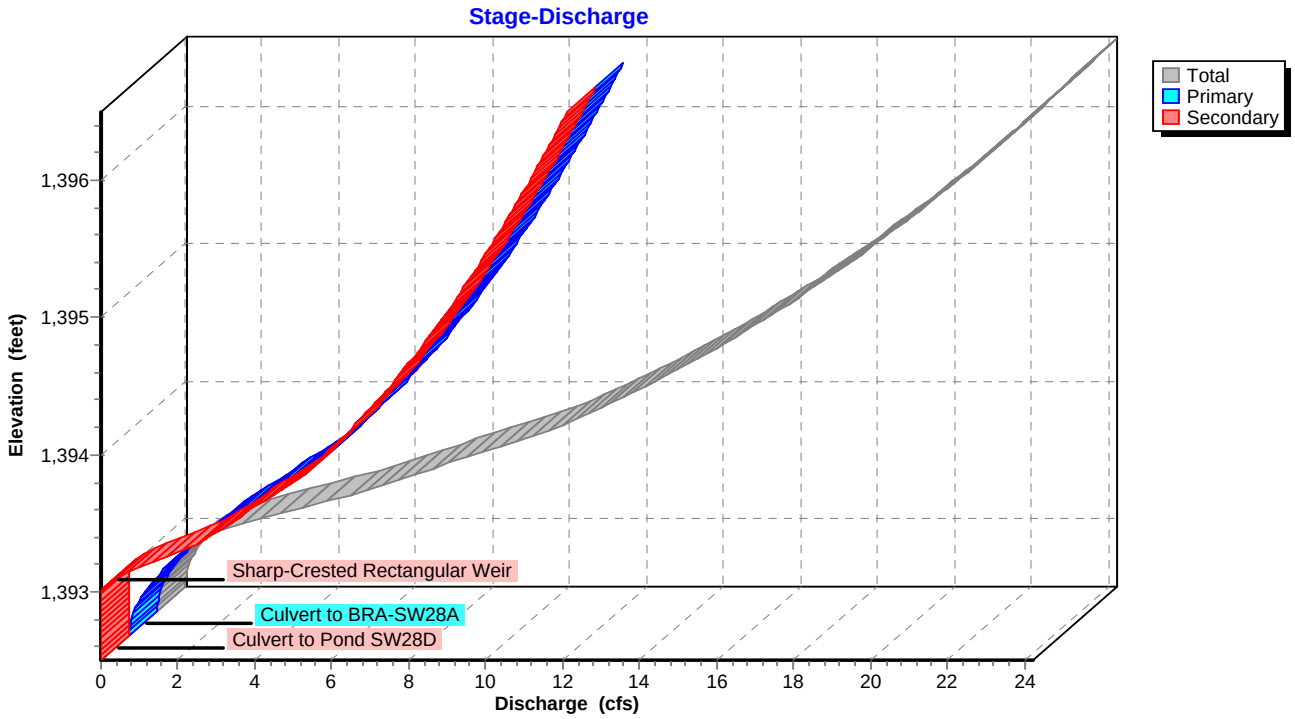
Primary OutFlow Max=0.84 cfs @ 12.04 hrs HW=1,392.96' TW=1,386.05' (Dynamic Tailwater)
└**1=Culvert to BRA-SW28A** (Inlet Controls 0.84 cfs @ 1.83 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,392.50' TW=1,373.60' (Dynamic Tailwater)
└**2=Culvert to Pond SW28D** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

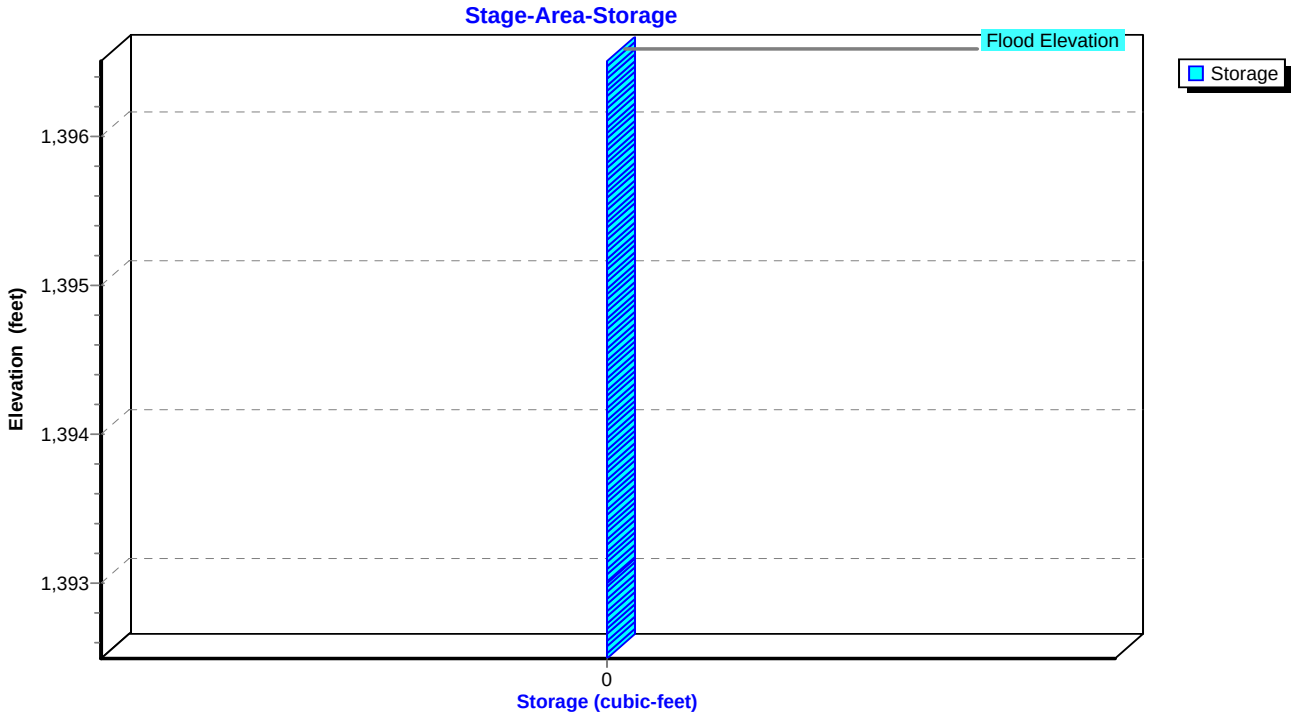
Pond SW28C-FS: Flow Splitter for SW28C



Pond SW28C-FS: Flow Splitter for SW28C



Pond SW28C-FS: Flow Splitter for SW28C



Summary for Pond SW28C-P: BRA-SW28C

Inflow Area = 0.763 ac, 87.29% Impervious, Inflow Depth = 0.87" for 90% Storm event
Inflow = 0.85 cfs @ 12.04 hrs, Volume= 0.055 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,388.32' @ 24.13 hrs Surf.Area= 2,516 sf Storage= 2,405 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

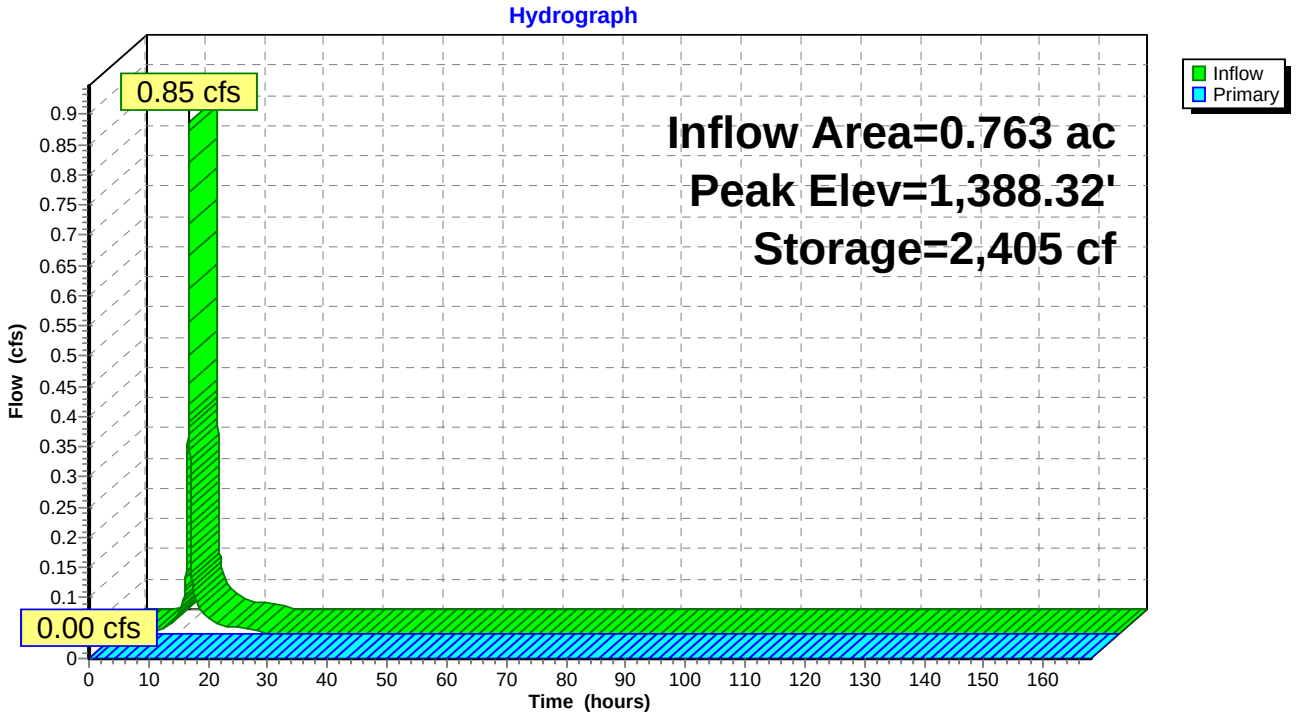
Volume	Invert	Avail.Storage	Storage Description
#1	1,384.50'	6,919 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,384.50	2,516	222.0	0.0	0	0	2,516
1,385.50	2,516	222.0	25.0	629	629	2,738
1,387.00	2,516	222.0	25.0	944	1,573	3,071
1,388.00	2,516	222.0	25.0	629	2,202	3,293
1,389.00	2,516	222.0	25.0	629	2,831	3,515
1,389.50	2,516	222.0	25.0	315	3,145	3,626
1,390.50	2,516	222.0	100.0	2,516	5,661	3,848
1,391.00	2,516	222.0	100.0	1,258	6,919	3,959

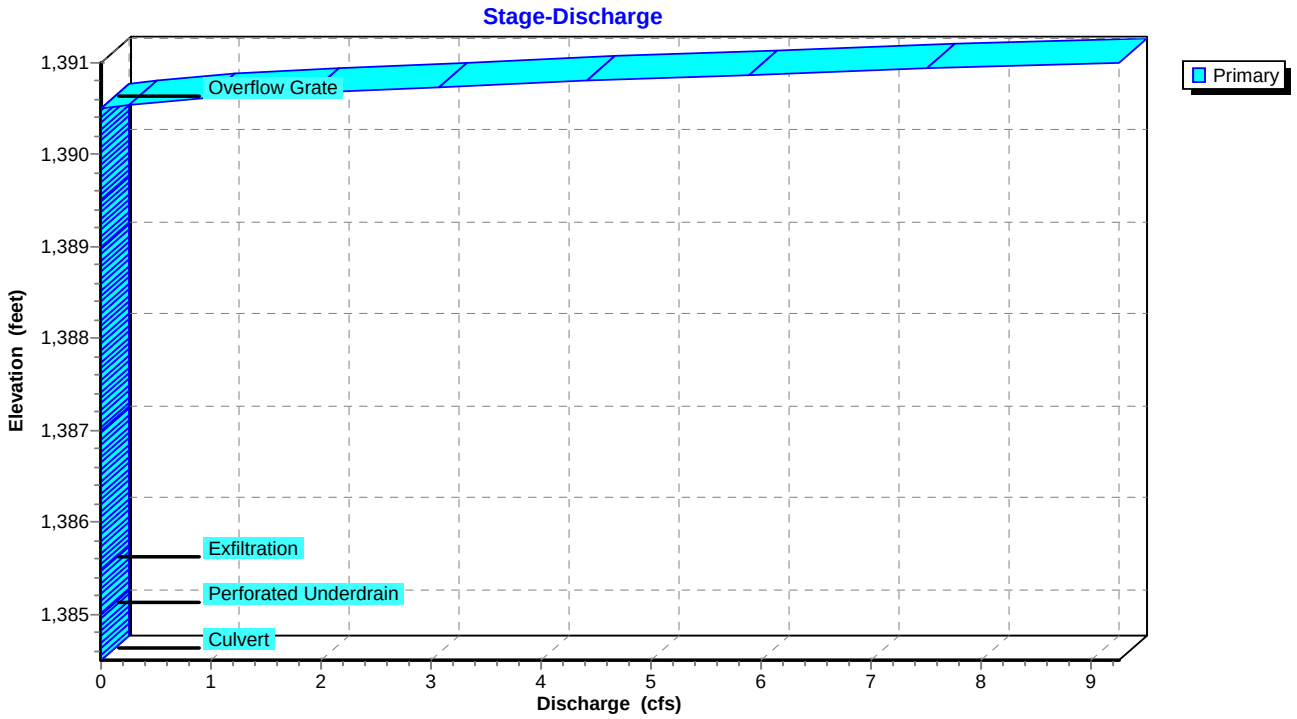
Device	Routing	Invert	Outlet Devices
#1	Primary	1,384.50'	**15.0" Round Culvert** L= 68.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,384.50' / 1,384.00' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,385.00'	**0.4" Horiz. Perforated Underdrain X 286.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,385.50'	**0.250 in/hr Exfiltration over Surface area above 1,385.50'** Conductivity to Groundwater Elevation = 1,385.00' Excluded Surface area = 2,516 sf
#4	Device 1	1,390.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,384.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Controls 0.00 cfs)

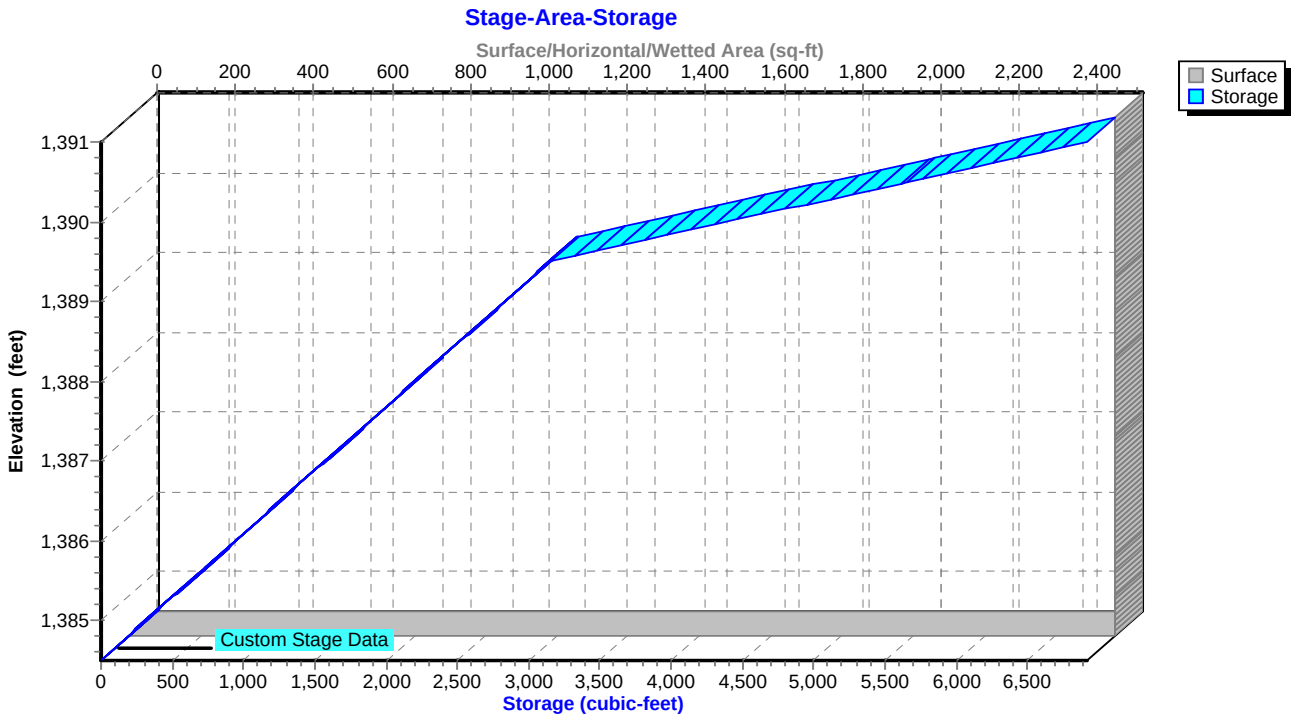
Pond SW28C-P: BRA-SW28C



Pond SW28C-P: BRA-SW28C



Pond SW28C-P: BRA-SW28C



Summary for Pond SW31-FS: Flow Splitter for SW31

Inflow Area = 0.537 ac, 58.47% Impervious, Inflow Depth = 0.38" for 90% Storm event
Inflow = 0.25 cfs @ 12.04 hrs, Volume= 0.017 af
Outflow = 0.25 cfs @ 12.05 hrs, Volume= 0.017 af, Atten= 0%, Lag= 0.6 min
Primary = 0.25 cfs @ 12.05 hrs, Volume= 0.017 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

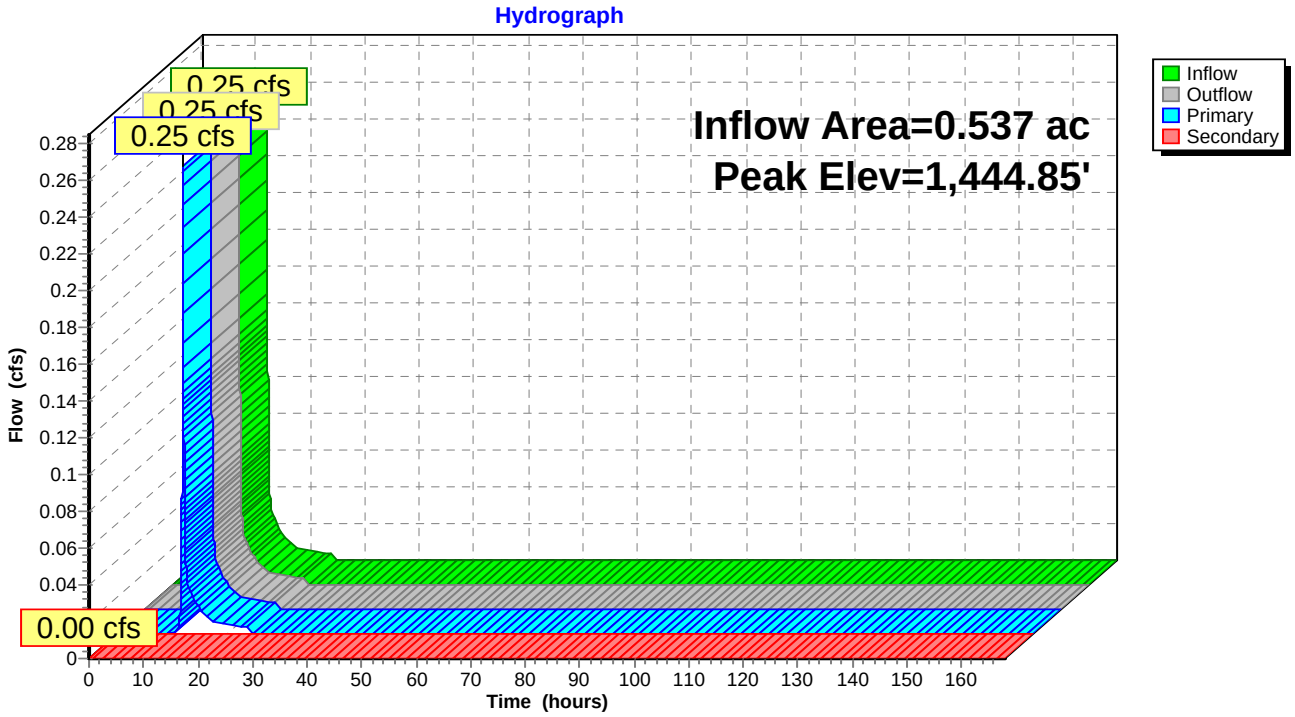
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,444.85' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,444.60'	**18.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,444.60' / 1,444.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,444.60'	**18.0" Round Culvert** L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,444.60' / 1,443.00' S= 0.0333 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,444.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

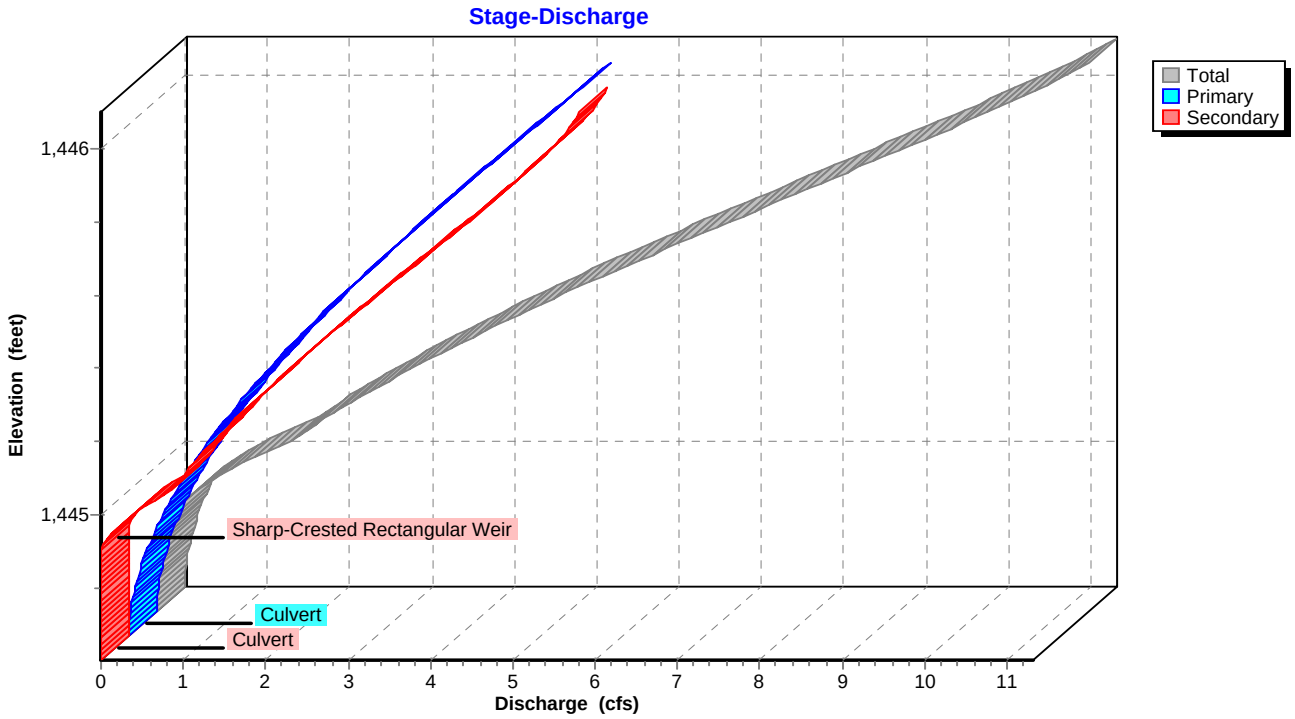
Primary OutFlow Max=0.25 cfs @ 12.05 hrs HW=1,444.85' TW=1,438.82' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 0.25 cfs @ 1.96 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,444.60' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

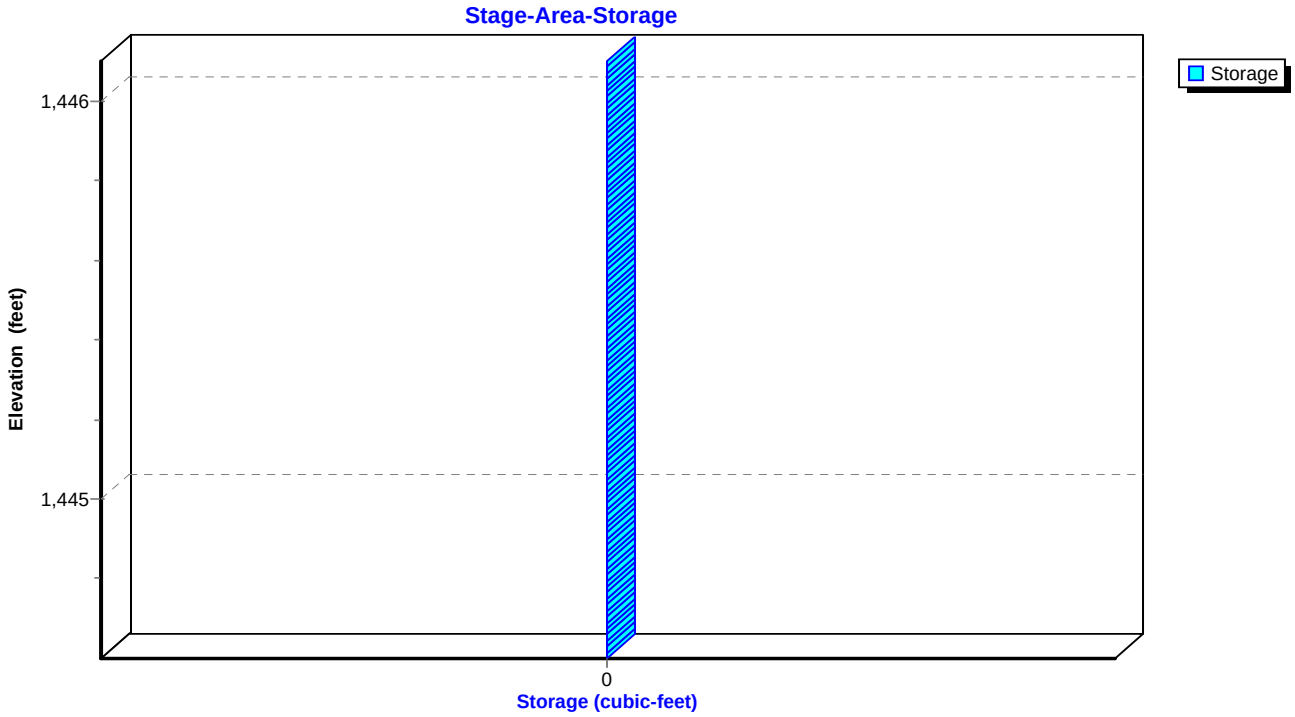
Pond SW31-FS: Flow Splitter for SW31



Pond SW31-FS: Flow Splitter for SW31



Pond SW31-FS: Flow Splitter for SW31



Summary for Pond SW31-P: BRA-SW31

Inflow Area = 0.597 ac, 52.60% Impervious, Inflow Depth = 0.34" for 90% Storm event
Inflow = 0.25 cfs @ 12.05 hrs, Volume= 0.017 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,440.40' @ 24.15 hrs Surf.Area= 1,567 sf Storage= 745 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

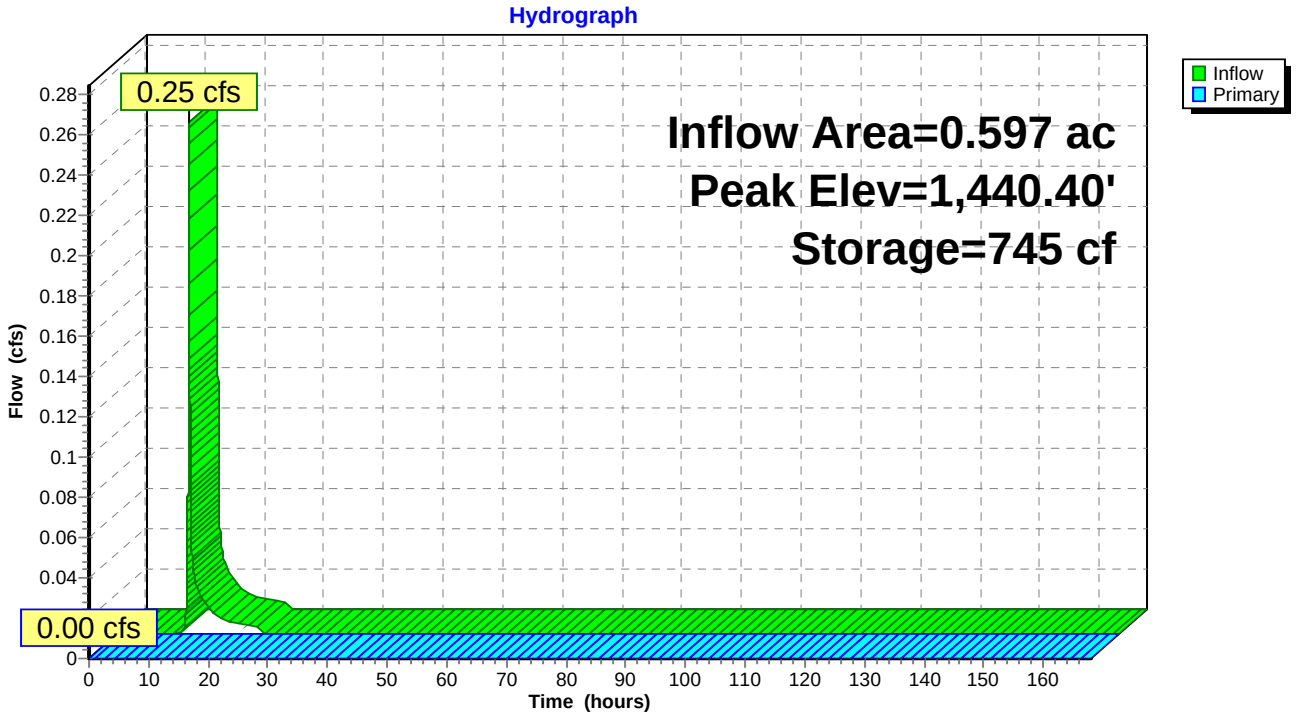
Volume	Invert	Avail.Storage	Storage Description
#1	1,438.50'	4,309 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,438.50	1,567	169.0	0.0	0	0	1,567
1,439.50	1,567	169.0	25.0	392	392	1,736
1,440.50	1,567	169.0	25.0	392	784	1,905
1,441.50	1,567	169.0	25.0	392	1,175	2,074
1,442.50	1,567	169.0	25.0	392	1,567	2,243
1,443.50	1,567	169.0	25.0	392	1,959	2,412
1,444.50	1,567	169.0	100.0	1,567	3,526	2,581
1,445.00	1,567	169.0	100.0	784	4,309	2,666

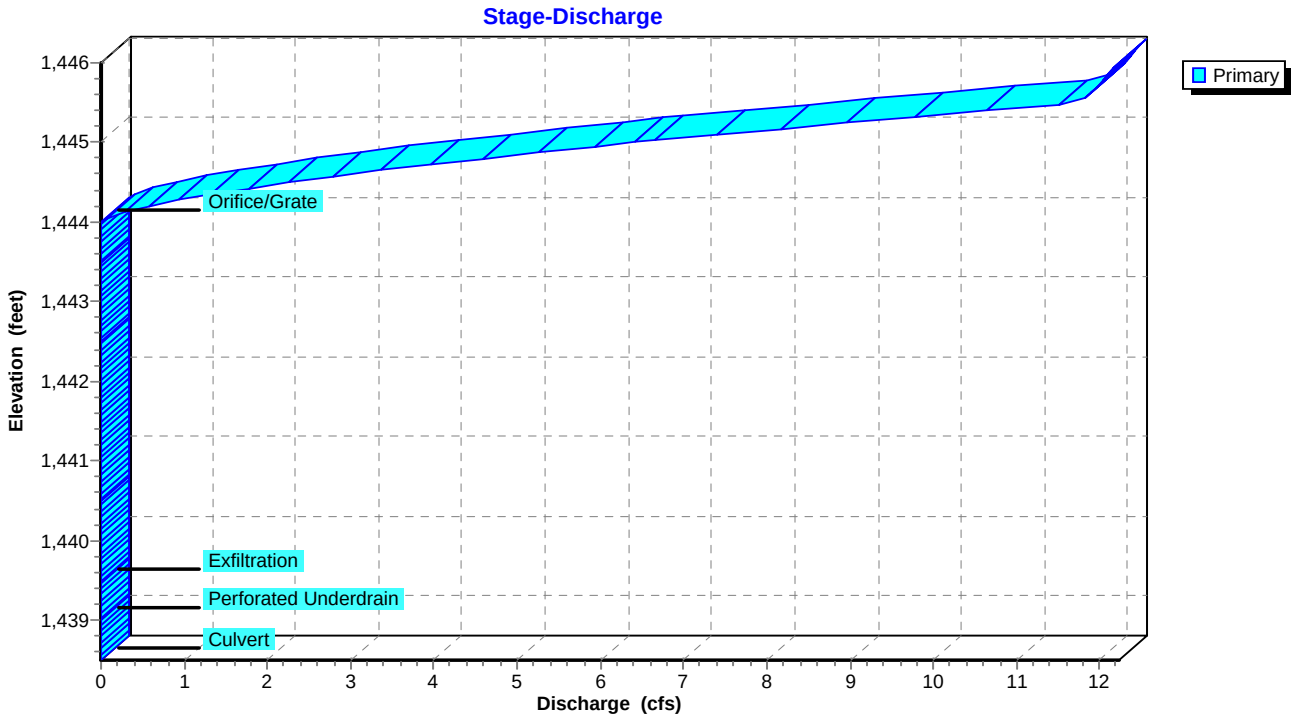
Device	Routing	Invert	Outlet Devices
#1	Primary	1,438.50'	**15.0" Round Culvert** L= 87.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,438.50' / 1,437.50' S= 0.0115 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,439.00'	**0.4" Horiz. Perforated Underdrain X 256.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,439.50'	**0.250 in/hr Exfiltration over Surface area above 1,439.50'** Conductivity to Groundwater Elevation = 1,438.00' Excluded Surface area = 1,567 sf
#4	Device 1	1,444.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,438.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)

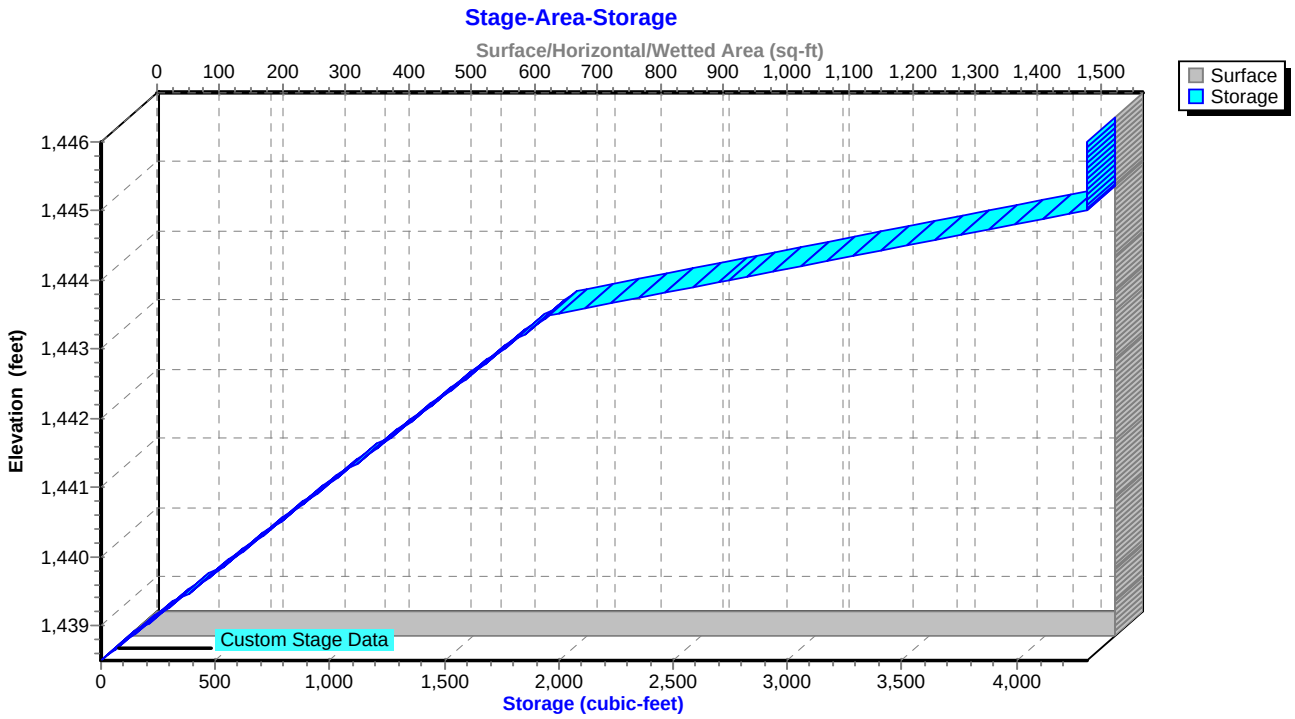
Pond SW31-P: BRA-SW31



Pond SW31-P: BRA-SW31



Pond SW31-P: BRA-SW31



Time span=0.00-168.00 hrs, dt=0.01 hrs, 16801 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment21: PR DA 21 Runoff Area=30.406 ac 2.29% Impervious Runoff Depth=4.81"
Flow Length=2,809' Tc=46.3 min UI Adjusted CN=73 Runoff=78.21 cfs 12.188 af

Subcatchment21A-1: PR DA 21A-1 Runoff Area=0.432 ac 37.27% Impervious Runoff Depth=6.10"
Flow Length=613' Tc=1.8 min CN=84 Runoff=3.48 cfs 0.219 af

Subcatchment21A-2: PR DA 21A-2 Runoff Area=0.871 ac 35.25% Impervious Runoff Depth=6.33"
Flow Length=613' Tc=1.8 min CN=86 Runoff=7.21 cfs 0.460 af

Subcatchment21B-1: PR DA 21B-1 Runoff Area=0.428 ac 38.79% Impervious Runoff Depth=6.10"
Flow Length=525' Tc=1.7 min CN=84 Runoff=3.46 cfs 0.217 af

Subcatchment21B-2: PR DA 21B-2 Runoff Area=0.842 ac 36.34% Impervious Runoff Depth=6.33"
Flow Length=525' Tc=1.7 min CN=86 Runoff=6.99 cfs 0.444 af

Subcatchment21C: PR DA 21C Runoff Area=39.300 ac 1.38% Impervious Runoff Depth=4.81"
Flow Length=3,341' Tc=68.5 min UI Adjusted CN=73 Runoff=80.22 cfs 15.753 af

Subcatchment21D: PR DA 21D Runoff Area=7.632 ac 0.00% Impervious Runoff Depth=4.69"
Flow Length=1,018' Tc=42.4 min CN=72 Runoff=20.13 cfs 2.986 af

Subcatchment21E-1: PR DA 21E-1 Runoff Area=0.450 ac 33.56% Impervious Runoff Depth=5.98"
Flow Length=632' Tc=2.5 min CN=83 Runoff=3.48 cfs 0.224 af

Subcatchment21E-2: PR DA 21E-2 Runoff Area=0.334 ac 33.53% Impervious Runoff Depth=5.98"
Flow Length=632' Tc=2.5 min CN=83 Runoff=2.58 cfs 0.166 af

Subcatchment21E-3: PR DA 21E-3 Runoff Area=0.446 ac 33.63% Impervious Runoff Depth=5.98"
Flow Length=632' Tc=2.5 min CN=83 Runoff=3.45 cfs 0.222 af

Subcatchment21F-1: PR DA 21F-1 Runoff Area=0.384 ac 38.02% Impervious Runoff Depth=6.10"
Flow Length=632' Tc=2.5 min CN=84 Runoff=3.02 cfs 0.195 af

Subcatchment21F-2: PR DA 21F-2 Runoff Area=0.284 ac 38.03% Impervious Runoff Depth=6.10"
Flow Length=632' Tc=2.5 min CN=84 Runoff=2.23 cfs 0.144 af

Subcatchment21F-3: PR DA 21F-3 Runoff Area=0.380 ac 38.16% Impervious Runoff Depth=6.10"
Flow Length=632' Tc=2.5 min CN=84 Runoff=2.98 cfs 0.193 af

Subcatchment21G: PR DA 21G Runoff Area=0.332 ac 43.67% Impervious Runoff Depth=6.10"
Flow Length=340' Tc=2.0 min CN=84 Runoff=2.66 cfs 0.169 af

Subcatchment21H: PR DA 21H Runoff Area=0.256 ac 46.09% Impervious Runoff Depth=6.21"
Flow Length=434' Tc=2.2 min CN=85 Runoff=2.06 cfs 0.133 af

Subcatchment23: PR DA 23 Runoff Area=6.968 ac 0.00% Impervious Runoff Depth=4.46"
Flow Length=800' Tc=30.3 min CN=70 Runoff=20.57 cfs 2.592 af

Subcatchment 23A-1: PR DA 23A-1 Runoff Area=0.806 ac 24.94% Impervious Runoff Depth=5.74"
Flow Length=424' Tc=1.8 min CN=81 Runoff=6.19 cfs 0.386 af

Subcatchment 23A-2: PR DA 23A-2 Runoff Area=0.696 ac 12.21% Impervious Runoff Depth=5.27"
Flow Length=424' Tc=1.8 min CN=77 Runoff=4.97 cfs 0.306 af

Subcatchment 23B-1: PR DA 23B-1 Runoff Area=0.572 ac 25.87% Impervious Runoff Depth=5.74"
Flow Length=334' Tc=1.5 min CN=81 Runoff=4.44 cfs 0.274 af

Subcatchment 23B-2: PR DA 23B-2 Runoff Area=0.629 ac 25.91% Impervious Runoff Depth=5.74"
Flow Length=334' Tc=1.5 min CN=81 Runoff=4.89 cfs 0.301 af

Subcatchment 23C: PR DA 23C Runoff Area=3.325 ac 0.00% Impervious Runoff Depth=5.27"
Flow Length=820' Tc=32.9 min CN=77 Runoff=11.09 cfs 1.461 af

Subcatchment 23F: PR DA 23F Runoff Area=0.206 ac 47.57% Impervious Runoff Depth=6.33"
Flow Length=384' Tc=1.7 min CN=86 Runoff=1.71 cfs 0.109 af

Subcatchment 23G: PR DA 23G Runoff Area=0.272 ac 39.34% Impervious Runoff Depth=6.10"
Flow Length=377' Tc=1.8 min CN=84 Runoff=2.19 cfs 0.138 af

Subcatchment 23H: PR DA 23H Runoff Area=0.307 ac 35.83% Impervious Runoff Depth=6.10"
Flow Length=458' Tc=2.2 min CN=84 Runoff=2.44 cfs 0.156 af

Subcatchment 23P: PR DA 23P Runoff Area=0.508 ac 0.00% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=74 Runoff=2.93 cfs 0.209 af

Subcatchment 24: PR DA 24 Runoff Area=8.145 ac 0.00% Impervious Runoff Depth=4.81"
Flow Length=737' Tc=26.1 min CN=73 Runoff=27.59 cfs 3.265 af

Subcatchment 24A-1: PR DA 24A-1 Runoff Area=0.595 ac 25.71% Impervious Runoff Depth=5.74"
Flow Length=562' Tc=1.6 min CN=81 Runoff=4.60 cfs 0.285 af

Subcatchment 24A-2: PR DA 24A-2 Runoff Area=0.339 ac 28.02% Impervious Runoff Depth=6.45"
Flow Length=562' Tc=1.6 min CN=87 Runoff=2.86 cfs 0.182 af

Subcatchment 24A-3: PR DA 24A-3 Runoff Area=0.497 ac 27.36% Impervious Runoff Depth=7.28"
Flow Length=562' Tc=1.6 min CN=94 Runoff=4.49 cfs 0.302 af

Subcatchment 24A-4: PR DA 24A-4 Runoff Area=0.704 ac 18.75% Impervious Runoff Depth=5.86"
Flow Length=562' Tc=1.6 min CN=82 Runoff=5.54 cfs 0.344 af

Subcatchment 24B-1: PR DA 24B-1 Runoff Area=0.651 ac 25.35% Impervious Runoff Depth=5.74"
Flow Length=580' Tc=2.6 min CN=81 Runoff=4.86 cfs 0.312 af

Subcatchment 24B-2: PR DA 24B-2 Runoff Area=0.432 ac 22.92% Impervious Runoff Depth=6.21"
Flow Length=580' Tc=2.6 min CN=85 Runoff=3.43 cfs 0.224 af

Subcatchment 24B-3: PR DA 24B-3 Runoff Area=0.464 ac 22.63% Impervious Runoff Depth=6.92"
Flow Length=580' Tc=2.6 min CN=91 Runoff=3.95 cfs 0.268 af

Subcatchment 24B-4: PR DA 24B-4 Runoff Area=0.955 ac 19.79% Impervious Runoff Depth=5.74"
Flow Length=580' Tc=2.6 min CN=81 Runoff=7.13 cfs 0.457 af

Subcatchment 24C: PR DA 24C Runoff Area=6.956 ac 0.00% Impervious Runoff Depth=4.58"
Flow Length=700' Tc=32.6 min CN=71 Runoff=20.30 cfs 2.654 af

Subcatchment 24P: 24P Runoff Area=0.848 ac 0.00% Impervious Runoff Depth=5.27"
Tc=6.0 min CN=77 Runoff=5.20 cfs 0.373 af

Subcatchment 25: PR DA 25 Runoff Area=3.905 ac 0.00% Impervious Runoff Depth=4.81"
Flow Length=491' Tc=25.5 min CN=73 Runoff=13.37 cfs 1.565 af

Subcatchment 25A-1: PR DA 25A-1 Runoff Area=1.199 ac 23.44% Impervious Runoff Depth=5.51"
Flow Length=333' Tc=1.7 min CN=79 Runoff=8.92 cfs 0.550 af

Subcatchment 25A-2: PR DA 25A-2 Runoff Area=0.683 ac 32.06% Impervious Runoff Depth=5.74"
Flow Length=333' Tc=1.7 min CN=81 Runoff=5.26 cfs 0.327 af

Subcatchment 25B-1: PR DA 25B-1 Runoff Area=1.232 ac 21.27% Impervious Runoff Depth=5.62"
Flow Length=337' Tc=1.9 min CN=80 Runoff=9.27 cfs 0.577 af

Subcatchment 25B-2: PR DA 25B-2 Runoff Area=0.740 ac 23.11% Impervious Runoff Depth=5.62"
Flow Length=337' Tc=1.9 min CN=80 Runoff=5.57 cfs 0.347 af

Subcatchment 25C: PR DA 25C Runoff Area=3.283 ac 0.00% Impervious Runoff Depth=4.46"
Flow Length=200' Slope=0.0400 '/' Tc=16.7 min CN=70 Runoff=12.49 cfs 1.221 af

Subcatchment 25D: PR DA 25D Runoff Area=1.734 ac 0.00% Impervious Runoff Depth=4.58"
Flow Length=225' Tc=17.4 min CN=71 Runoff=6.66 cfs 0.662 af

Subcatchment 26: PR DA 26 Runoff Area=4.040 ac 0.00% Impervious Runoff Depth=4.81"
Flow Length=920' Tc=49.3 min CN=73 Runoff=10.06 cfs 1.619 af

Subcatchment 26A-1: PR DA 26A-1 Runoff Area=17,991 sf 27.15% Impervious Runoff Depth=5.62"
Flow Length=800' Tc=2.7 min CN=80 Runoff=3.02 cfs 0.194 af

Subcatchment 26A-2: PR DA 26A-2 Runoff Area=0.535 ac 26.17% Impervious Runoff Depth=5.63"
Flow Length=800' Tc=2.7 min CN=80 Runoff=3.91 cfs 0.251 af

Subcatchment 26A-3: PR DA 26A-3 Runoff Area=0.119 ac 93.28% Impervious Runoff Depth=7.64"
Flow Length=800' Tc=2.7 min CN=97 Runoff=1.05 cfs 0.076 af

Subcatchment 26B-1: PR DA 26B-1 Runoff Area=0.345 ac 28.41% Impervious Runoff Depth=5.86"
Flow Length=800' Tc=2.7 min CN=82 Runoff=2.61 cfs 0.168 af

Subcatchment 26B-2: PR DA 26B-2 Runoff Area=0.425 ac 28.47% Impervious Runoff Depth=5.86"
Flow Length=800' Tc=2.7 min CN=82 Runoff=3.21 cfs 0.208 af

Subcatchment 26B-3: PR DA 26B-3 Runoff Area=0.119 ac 93.28% Impervious Runoff Depth=7.64"
Flow Length=800' Tc=2.7 min CN=97 Runoff=1.05 cfs 0.076 af

Subcatchment 26C: PR DA 26C Runoff Area=0.445 ac 0.00% Impervious Runoff Depth=4.46"
Flow Length=236' Tc=17.4 min CN=70 Runoff=1.66 cfs 0.166 af

Subcatchment 26D: PR DA 26D Runoff Area=1.151 ac 0.00% Impervious Runoff Depth=4.46"
Flow Length=1,038' Tc=36.7 min CN=70 Runoff=3.10 cfs 0.428 af

Subcatchment 26E: PR DA 26E Runoff Area=2.170 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=735' Tc=46.1 min CN=74 Runoff=5.73 cfs 0.891 af

Subcatchment 26F: PR DA 26F Runoff Area=0.087 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=70' Slope=0.0800 '/' Tc=5.7 min CN=74 Runoff=0.51 cfs 0.036 af

Subcatchment 26G: PR DA 26G Runoff Area=1.464 ac 0.00% Impervious Runoff Depth=4.46"
Flow Length=495' Tc=25.3 min CN=70 Runoff=4.68 cfs 0.545 af

Subcatchment 28A: PR DA 28A Runoff Area=1.501 ac 21.59% Impervious Runoff Depth=5.51"
Flow Length=1,280' Tc=13.4 min CN=79 Runoff=7.58 cfs 0.689 af

Subcatchment 28B: PR DA 28B Runoff Area=0.520 ac 47.88% Impervious Runoff Depth=6.21"
Flow Length=433' Tc=1.7 min CN=85 Runoff=4.26 cfs 0.269 af

Subcatchment 28C: PR DA 28C Runoff Area=0.435 ac 100.00% Impervious Runoff Depth=7.76"
Flow Length=525' Tc=1.9 min CN=98 Runoff=3.95 cfs 0.281 af

Subcatchment 28D: PR DA 28D Runoff Area=0.231 ac 100.00% Impervious Runoff Depth=7.76"
Flow Length=335' Tc=1.7 min CN=98 Runoff=2.12 cfs 0.149 af

Subcatchment 28E: PR DA 28E Runoff Area=0.127 ac 100.00% Impervious Runoff Depth=7.76"
Flow Length=390' Tc=1.6 min CN=98 Runoff=1.17 cfs 0.082 af

Subcatchment 28F: PR DA 28F Runoff Area=3.829 ac 1.57% Impervious Runoff Depth=4.58"
Flow Length=862' Tc=28.4 min CN=71 Runoff=11.94 cfs 1.461 af

Subcatchment 28G: PR DA 28G Runoff Area=0.127 ac 100.00% Impervious Runoff Depth=7.76"
Flow Length=339' Tc=1.3 min CN=98 Runoff=1.18 cfs 0.082 af

Subcatchment 28H: PR DA 28H Runoff Area=0.126 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=305' Tc=9.6 min CN=74 Runoff=0.64 cfs 0.052 af

Subcatchment 28I: PR DA 28I Runoff Area=0.137 ac 100.00% Impervious Runoff Depth=7.76"
Flow Length=283' Tc=1.2 min CN=98 Runoff=1.27 cfs 0.089 af

Subcatchment 31: PR DA 31 Runoff Area=2.152 ac 3.39% Impervious Runoff Depth=4.93"
Flow Length=708' Tc=51.5 min CN=74 Runoff=5.33 cfs 0.883 af

Subcatchment 31A: PR DA 31A Runoff Area=0.071 ac 100.00% Impervious Runoff Depth=7.76"
Flow Length=190' Tc=0.9 min CN=98 Runoff=0.67 cfs 0.046 af

Subcatchment 31B: PR DA 31B Runoff Area=0.069 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=186' Tc=10.8 min CN=74 Runoff=0.34 cfs 0.028 af

Subcatchment 31C: PR DA 31C Runoff Area=0.080 ac 100.00% Impervious Runoff Depth=7.76"
Flow Length=150' Slope=0.0670 '/' Tc=1.0 min CN=98 Runoff=0.75 cfs 0.052 af

Subcatchment 31D: PR DA 31D Runoff Area=0.537 ac 58.47% Impervious Runoff Depth=6.57"
Flow Length=397' Tc=2.3 min CN=88 Runoff=4.48 cfs 0.294 af

Subcatchment SW21A: PR DA SW21A Runoff Area=0.814 ac 0.00% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=74 Runoff=4.69 cfs 0.334 af

Subcatchment SW21B: PR DA SW21B Runoff Area=0.612 ac 0.00% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=74 Runoff=3.53 cfs 0.251 af

Subcatchment SW21C: PR DA SW21C Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=74 Runoff=0.67 cfs 0.048 af

Subcatchment SW23A: PR DA SW23A Runoff Area=0.056 ac 0.00% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=74 Runoff=0.32 cfs 0.023 af

Subcatchment SW23B: PR DA SW23B Runoff Area=0.093 ac 0.00% Impervious Runoff Depth=4.93"
Tc=6.0 min CN=74 Runoff=0.54 cfs 0.038 af

Subcatchment SW28A: PR DA SW28A Runoff Area=0.081 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=64' Slope=0.1000 '/' Tc=4.8 min CN=74 Runoff=0.49 cfs 0.033 af

Subcatchment SW28B: PR DA SW28B Runoff Area=0.116 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.82 cfs 0.048 af

Subcatchment SW28C: PR DA SW28C Runoff Area=0.097 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=0.68 cfs 0.040 af

Subcatchment SW28D: PR DA SW28D Runoff Area=0.378 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=20' Slope=0.2000 '/' Tc=0.0 min CN=74 Runoff=2.67 cfs 0.155 af

Subcatchment SW31: PR DA SW31 Runoff Area=0.060 ac 0.00% Impervious Runoff Depth=4.93"
Flow Length=20' Slope=0.0500 '/' Tc=2.5 min CN=74 Runoff=0.39 cfs 0.025 af

Reach 30R: DP-9 Inflow=5.88 cfs 1.139 af
Outflow=5.88 cfs 1.139 af

Reach 36R: DP-1 Inflow=25.37 cfs 3.286 af
Outflow=25.37 cfs 3.286 af

Reach 41R: DP-26 Inflow=17.08 cfs 4.575 af
Outflow=17.08 cfs 4.575 af

Reach 46R: DP-25 Inflow=41.82 cfs 5.031 af
Outflow=41.82 cfs 5.031 af

Reach 51R: DP-24 Inflow=48.33 cfs 8.677 af
Outflow=48.33 cfs 8.677 af

Reach 56R: DP-23 Inflow=34.71 cfs 5.713 af
Outflow=34.71 cfs 5.713 af

Reach 61R: DP-21 Inflow=176.45 cfs 33.767 af
Outflow=176.45 cfs 33.767 af

Pond 21A-P: Pond-21A Peak Elev=1,379.35' Storage=39,880 cf Inflow=23.83 cfs 1.562 af
Primary=0.04 cfs 0.467 af Secondary=5.57 cfs 0.794 af Outflow=5.62 cfs 1.262 af

Pond 21B-P: Pond-21B Peak Elev=1,380.23' Storage=43,893 cf Inflow=21.65 cfs 1.498 af
Primary=1.23 cfs 1.158 af Secondary=4.08 cfs 0.241 af Outflow=5.30 cfs 1.399 af

Pond 23-P: Pond-23 Peak Elev=1,384.52' Storage=47,664 cf Inflow=27.52 cfs 2.933 af
Outflow=13.04 cfs 2.822 af

Pond 24-P: Pond-24 Peak Elev=1,368.13' Storage=67,947 cf Inflow=46.25 cfs 5.340 af
Primary=20.97 cfs 5.362 af Secondary=2.39 cfs 0.051 af Outflow=23.36 cfs 5.413 af

Pond 26-P: Pond-26 Peak Elev=1,374.11' Storage=62,455 cf Inflow=17.14 cfs 2.291 af
Outflow=4.76 cfs 2.210 af

Pond 28-P: Pond-28 Peak Elev=1,376.87' Storage=23,104 cf Inflow=16.93 cfs 1.311 af
Outflow=11.86 cfs 1.308 af

Pond BRA-46: BRA-46 Peak Elev=1,370.95' Storage=3,275 cf Inflow=8.08 cfs 0.507 af
Outflow=7.86 cfs 0.449 af

Pond BRA-46-FS: Flow Splitter for BRA-46 Peak Elev=1,375.07' Inflow=9.37 cfs 0.596 af
Primary=8.08 cfs 0.507 af Secondary=1.30 cfs 0.089 af Outflow=9.37 cfs 0.596 af

Pond BRA-59: BRA-59 Peak Elev=1,381.69' Storage=4,625 cf Inflow=3.07 cfs 0.287 af
Outflow=2.13 cfs 0.192 af

Pond BRA-59-FS: Flow Splitter for BRA-59 Peak Elev=1,382.81' Inflow=6.93 cfs 0.437 af
Primary=3.07 cfs 0.287 af Secondary=3.86 cfs 0.150 af Outflow=6.93 cfs 0.437 af

Pond BRA37-FS: Flow Splitter for BRA-37 Peak Elev=1,388.38' Inflow=19.12 cfs 2.442 af
Primary=9.56 cfs 1.337 af Secondary=9.56 cfs 1.105 af Outflow=19.12 cfs 2.442 af

Pond BRA37-P: BRA-37 Peak Elev=1,385.98' Storage=7,006 cf Inflow=9.56 cfs 1.337 af
Outflow=8.58 cfs 1.223 af

Pond BRA38-P: BRA-38 Peak Elev=1,385.43' Storage=6,114 cf Inflow=14.84 cfs 0.924 af
Primary=10.88 cfs 0.629 af Secondary=3.50 cfs 0.190 af Outflow=14.38 cfs 0.820 af

Pond BRA50-FS: Flow Splitter for BRA-50 Peak Elev=1,387.80' Inflow=12.92 cfs 2.036 af
Primary=6.37 cfs 1.107 af Secondary=6.56 cfs 0.929 af Outflow=12.92 cfs 2.036 af

Pond BRA50-P: BRA-50 Peak Elev=1,386.39' Storage=4,481 cf Inflow=6.37 cfs 1.107 af
Outflow=6.33 cfs 1.024 af

Pond SW21C-FS: Flow Splitter for SW21C Peak Elev=1,405.35' Inflow=4.72 cfs 0.301 af
Primary=2.53 cfs 0.218 af Secondary=2.18 cfs 0.083 af Outflow=4.72 cfs 0.301 af

Pond SW21C-P: BRA-SW21C Peak Elev=1,403.72' Storage=4,184 cf Inflow=3.10 cfs 0.266 af
Outflow=2.61 cfs 0.181 af

Pond SW23A-FS: Flow Splitter for SW23A Peak Elev=1,384.26' Inflow=1.71 cfs 0.109 af
Primary=0.82 cfs 0.079 af Secondary=0.89 cfs 0.030 af Outflow=1.71 cfs 0.109 af

Pond SW23A-P: BRA-SW23A Peak Elev=1,383.62' Storage=1,391 cf Inflow=1.08 cfs 0.102 af
Outflow=1.07 cfs 0.072 af

Pond SW23B-FS: Flow Splitter for SW23B Peak Elev=1,389.33' Inflow=4.62 cfs 0.294 af
Primary=2.48 cfs 0.214 af Secondary=2.14 cfs 0.080 af Outflow=4.62 cfs 0.294 af

Pond SW23B-P: BRA-SW23B Peak Elev=1,387.72' Storage=2,847 cf Inflow=2.93 cfs 0.252 af
Outflow=2.74 cfs 0.197 af

Pond SW28A-FS: Flow Splitter for SW28A Peak Elev=1,436.12' Inflow=1.59 cfs 0.126 af
Primary=0.80 cfs 0.106 af Secondary=0.80 cfs 0.020 af Outflow=1.59 cfs 0.126 af

Pond SW28A-P: BRA-SW28A Peak Elev=1,435.63' Storage=1,603 cf Inflow=1.21 cfs 0.139 af
Outflow=1.20 cfs 0.104 af

Pond SW28B-FS: Flow Splitter for SW28B Peak Elev=1,412.61' Inflow=2.81 cfs 0.222 af
Primary=1.41 cfs 0.184 af Secondary=1.41 cfs 0.038 af Outflow=2.81 cfs 0.222 af

Pond SW28B-P: BRA-SW28B Peak Elev=1,409.11' Storage=4,750 cf Inflow=2.12 cfs 0.232 af
Outflow=1.01 cfs 0.130 af

Pond SW28C-FS: Flow Splitter for SW28C Peak Elev=1,393.44' Inflow=6.06 cfs 0.431 af
Primary=3.03 cfs 0.374 af Secondary=3.03 cfs 0.057 af Outflow=6.06 cfs 0.431 af

Pond SW28C-P: BRA-SW28C Peak Elev=1,390.75' Storage=6,299 cf Inflow=3.60 cfs 0.414 af
Outflow=3.34 cfs 0.284 af

Pond SW31-FS: Flow Splitter for SW31 Peak Elev=1,445.42' Inflow=4.48 cfs 0.294 af
Primary=2.08 cfs 0.227 af Secondary=2.40 cfs 0.067 af Outflow=4.48 cfs 0.294 af

Pond SW31-P: BRA-SW31 Peak Elev=1,444.46' Storage=3,458 cf Inflow=2.47 cfs 0.252 af
Outflow=1.98 cfs 0.189 af

Total Runoff Area = 154.106 ac Runoff Volume = 63.666 af Average Runoff Depth = 4.96"
94.10% Pervious = 145.015 ac 5.90% Impervious = 9.091 ac

Summary for Subcatchment 21: PR DA 21

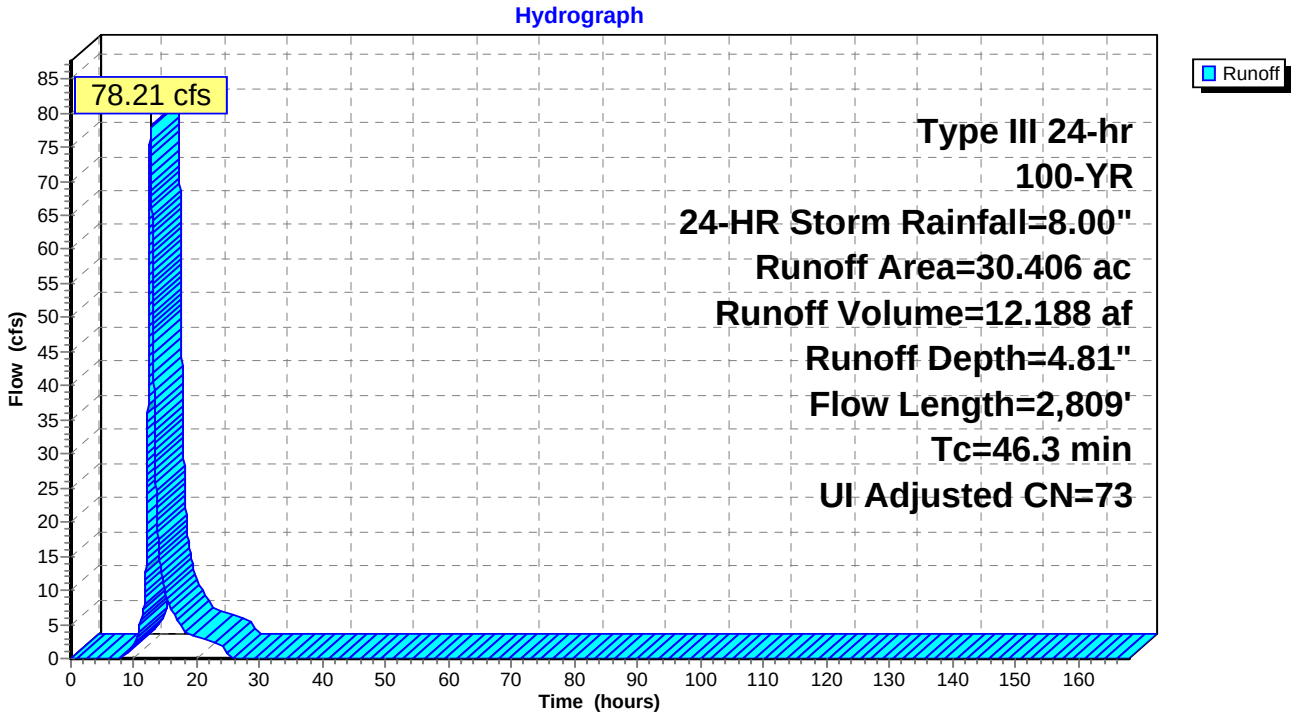
Runoff = 78.21 cfs @ 12.61 hrs, Volume= 12.188 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.695	98	Unconnected pavement, HSG C
10.838	74	>75% Grass cover, Good, HSG C
1.499	71	Meadow, non-grazed, HSG C
11.674	70	Woods, Good, HSG C
0.204	80	Pasture/grassland/range, Good, HSG D
1.601	78	Meadow, non-grazed, HSG D
3.895	77	Woods, Good, HSG D
30.406	74	Weighted Average, UI Adjusted CN = 73
29.711		97.71% Pervious Area
0.695		2.29% Impervious Area
0.695		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.9	150	0.0467	0.28		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
31.3	1,500	0.0255	0.80		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
5.9	969	0.0114	2.75	4.13	**Channel Flow, Rivulet** Area= 1.5 sf Perim= 4.0' r= 0.38' n= 0.030
0.2	190	0.0239	12.74	64.94	**Pipe Channel, RCP_Elliptical 38x24** 38.0" x 24.0", R=31.2" Elliptical Area= 5.1 sf Perim= 8.3' r= 0.61' n= 0.013
46.3	2,809	Total			

Subcatchment 21: PR DA 21



Summary for Subcatchment 21A-1: PR DA 21A-1

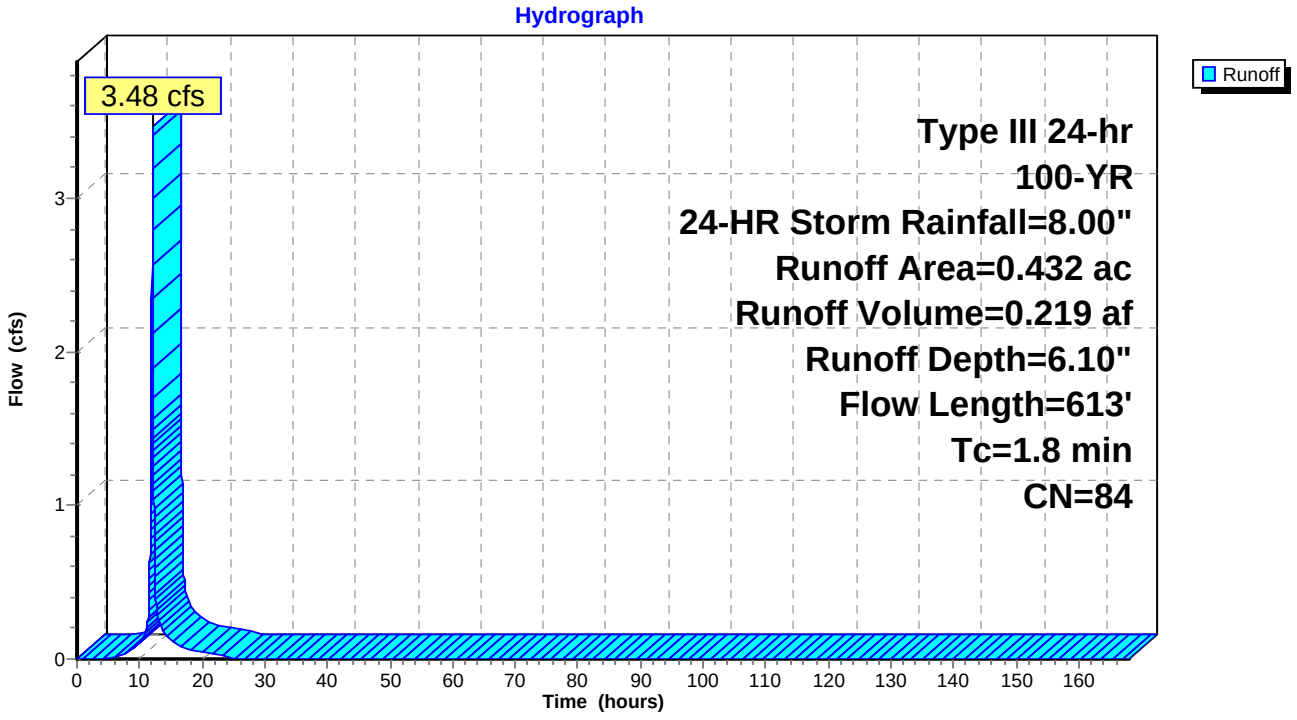
Runoff = 3.48 cfs @ 12.03 hrs, Volume= 0.219 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.242	74	>75% Grass cover, Good, HSG C
0.161	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.432	84	Weighted Average
0.271		62.73% Pervious Area
0.161		37.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.32		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	150	0.0360	7.97	65.36	**Channel Flow, SCF** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	408	0.0200	8.80	10.80	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.8	613	Total			

Subcatchment 21A-1: PR DA 21A-1



Summary for Subcatchment 21A-2: PR DA 21A-2

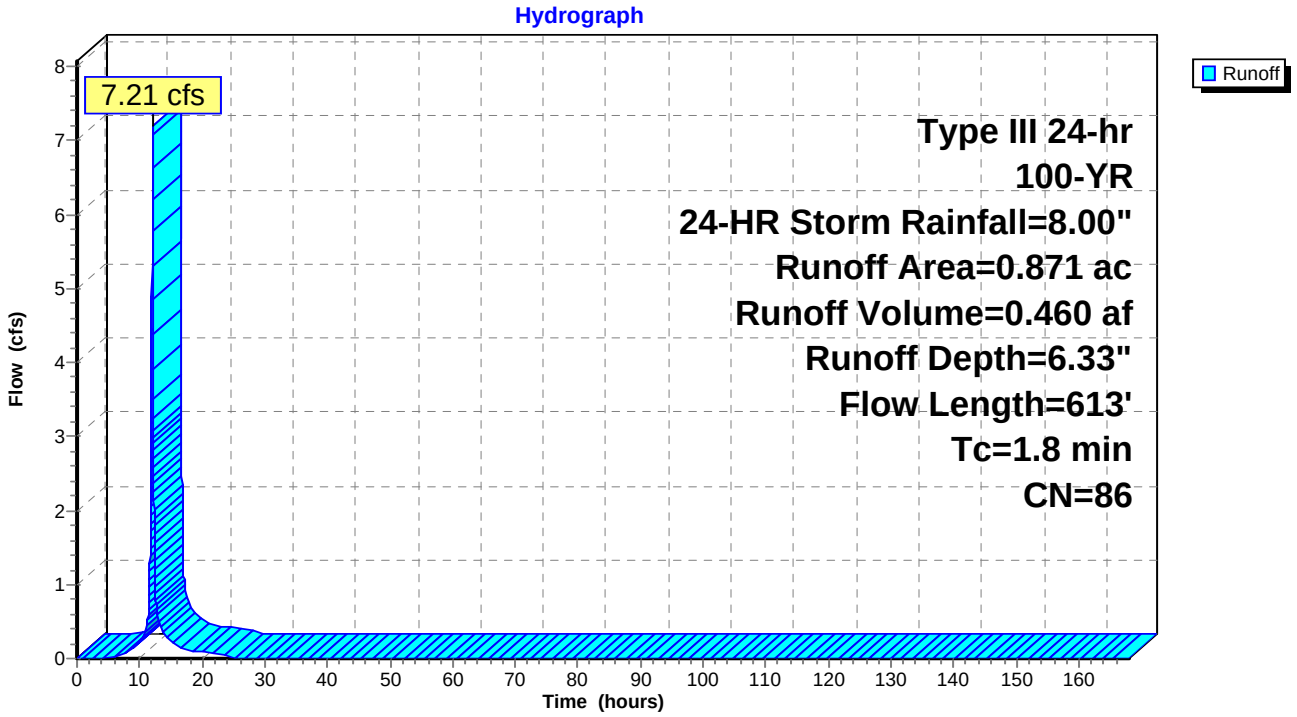
Runoff = 7.21 cfs @ 12.03 hrs, Volume= 0.460 af, Depth= 6.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.134	74	>75% Grass cover, Good, HSG C
0.081	98	Paved roads w/curbs & sewers, HSG C
0.015	89	Gravel Shoulder, HSG C
0.374	80	>75% Grass cover, Good, HSG D
0.226	98	Paved roads w/curbs & sewers, HSG D
0.041	91	Gravel Shoulder, HSG D
0.871	86	Weighted Average
0.564		64.75% Pervious Area
0.307		35.25% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	55	0.0200	1.32		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	150	0.0360	7.97	65.36	**Channel Flow, SCF** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	408	0.0200	8.80	10.80	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.011
1.8	613	Total			

Subcatchment 21A-2: PR DA 21A-2



Summary for Subcatchment 21B-1: PR DA 21B-1

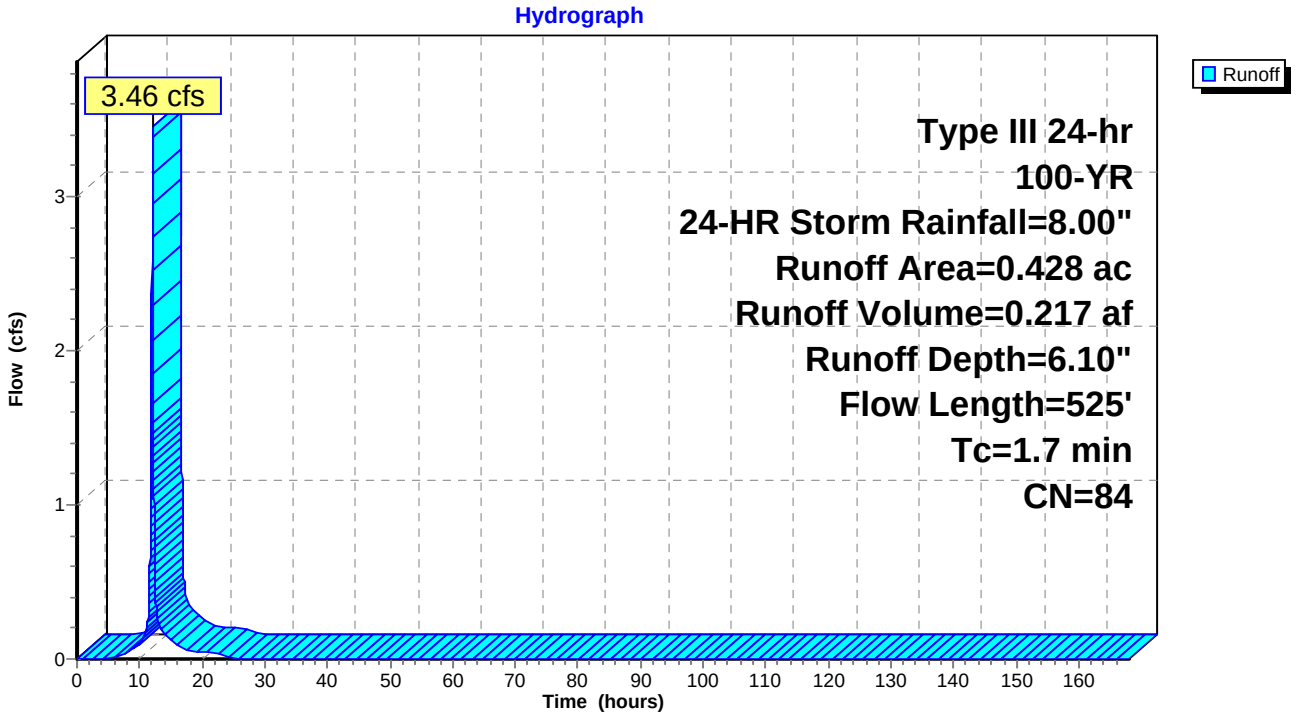
Runoff = 3.46 cfs @ 12.03 hrs, Volume= 0.217 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.232	74	>75% Grass cover, Good, HSG C
	0.166	98	Paved roads w/curbs & sewers, HSG C
*	0.030	89	Gravel Shoulder, HSG C
	0.428	84	Weighted Average
	0.262		61.21% Pervious Area
	0.166		38.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	45	0.0200	1.27		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	160	0.0300	7.28	59.66	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.7	320	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	525	Total			

Subcatchment 21B-1: PR DA 21B-1



Summary for Subcatchment 21B-2: PR DA 21B-2

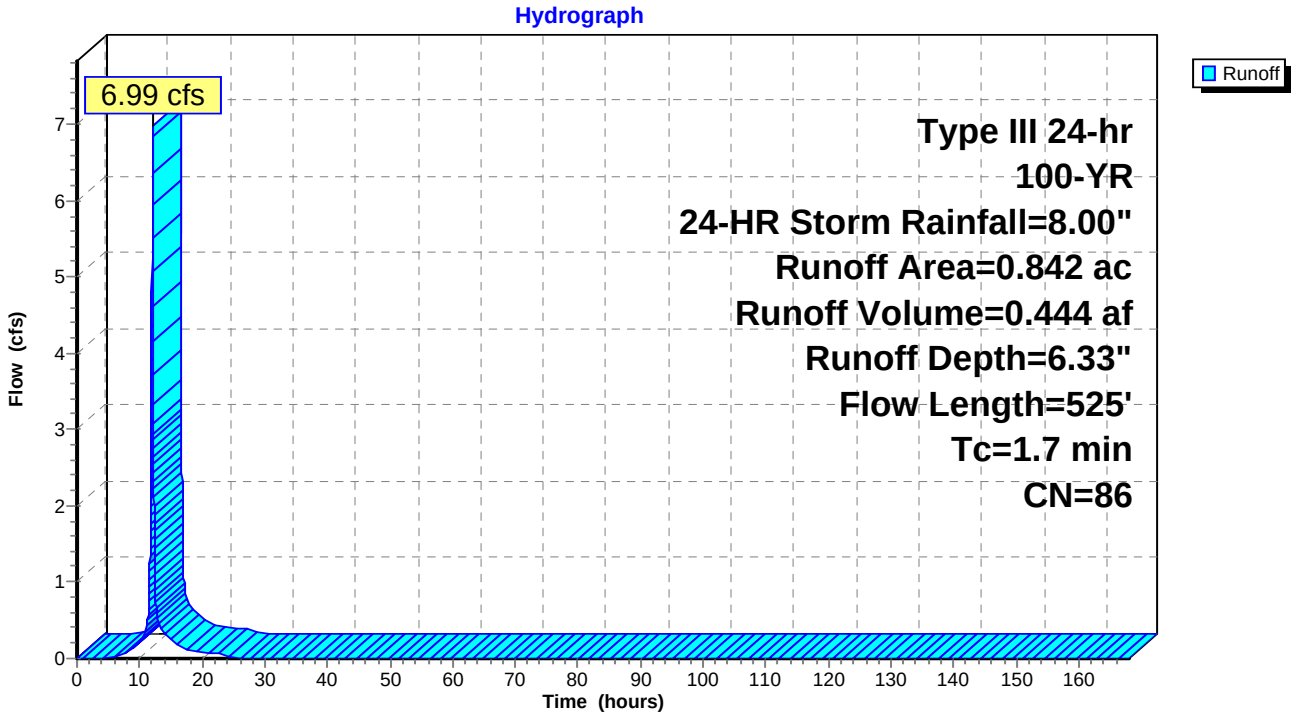
Runoff = 6.99 cfs @ 12.03 hrs, Volume= 0.444 af, Depth= 6.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.011	70	Woods, Good, HSG C
	0.148	74	>75% Grass cover, Good, HSG C
	0.097	98	Paved roads w/curbs & sewers, HSG C
*	0.018	89	Gravel Shoulder, HSG C
	0.012	77	Woods, Good, HSG D
	0.309	80	>75% Grass cover, Good, HSG D
	0.209	98	Paved roads w/curbs & sewers, HSG D
	0.038	91	Gravel roads, HSG D
	0.842	86	Weighted Average
	0.536		63.66% Pervious Area
	0.306		36.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	45	0.0200	1.27		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	160	0.0300	7.28	59.66	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.7	320	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	525	Total			

Subcatchment 21B-2: PR DA 21B-2



Summary for Subcatchment 21C: PR DA 21C

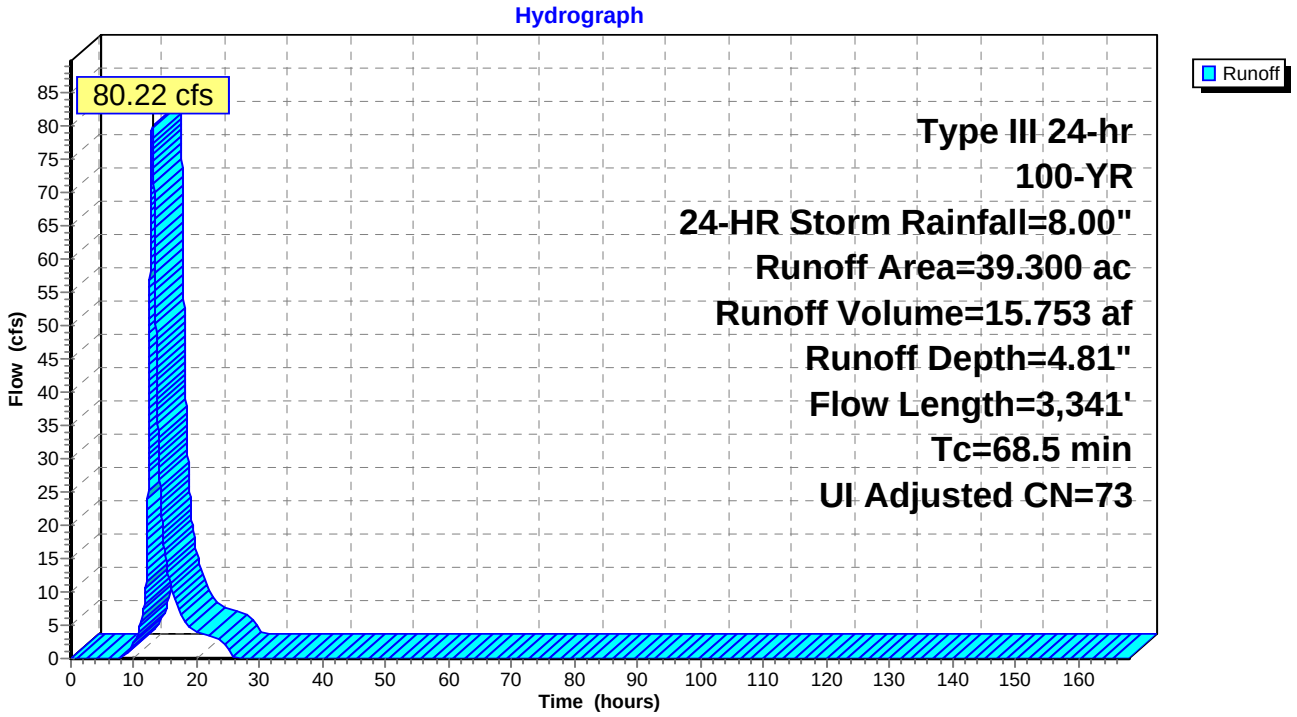
Runoff = 80.22 cfs @ 12.93 hrs, Volume= 15.753 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.541	98	Unconnected pavement, HSG C
31.045	74	>75% Grass cover, Good, HSG C
0.010	74	Pasture/grassland/range, Good, HSG C
0.136	71	Meadow, non-grazed, HSG C
7.568	70	Woods, Good, HSG C
39.300	74	Weighted Average, UI Adjusted CN = 73
38.759		98.62% Pervious Area
0.541		1.38% Impervious Area
0.541		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
12.5	150	0.0200	0.20		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
55.7	2,976	0.0317	0.89		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.3	215	0.0326	12.85	42.18	**Pipe Channel, RCP_Elliptical 30x19** 30.0" x 19.0", R=33.5" Elliptical Area= 3.3 sf Perim= 6.7' r= 0.49' n= 0.013
68.5	3,341	Total			

Subcatchment 21C: PR DA 21C



Summary for Subcatchment 21D: PR DA 21D

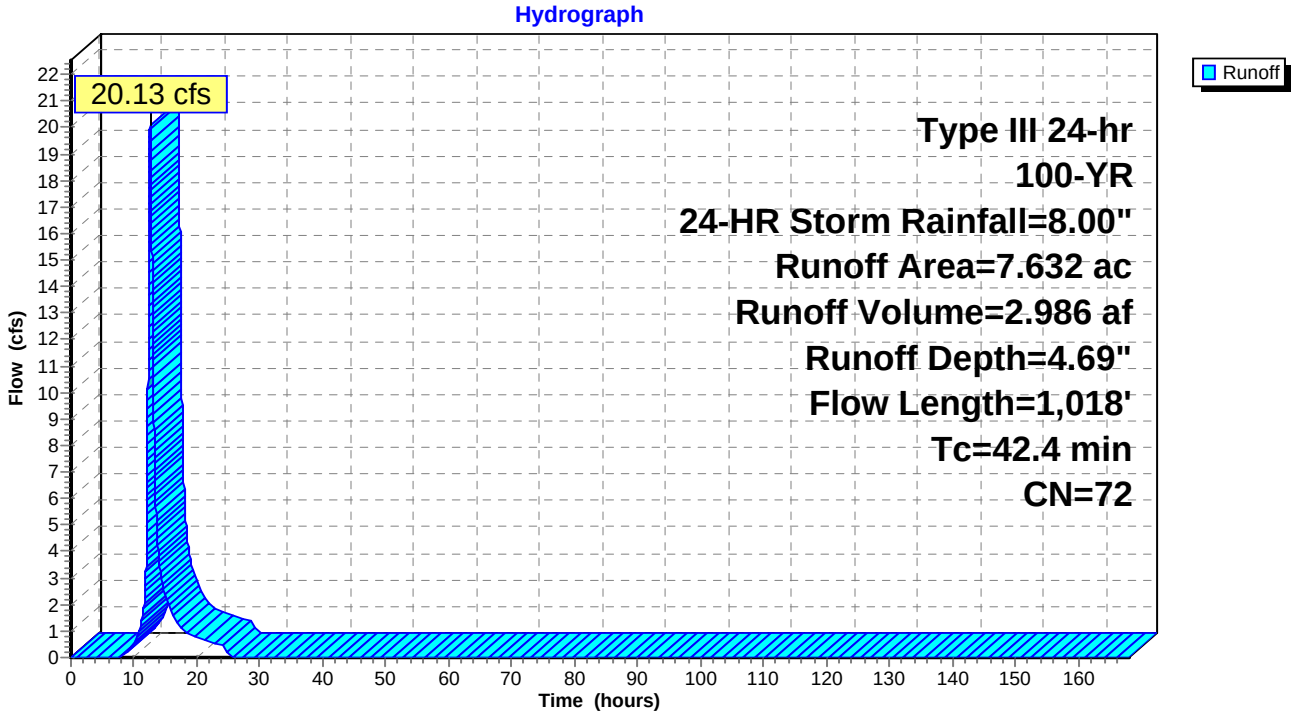
Runoff = 20.13 cfs @ 12.58 hrs, Volume= 2.986 af, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.065	65	Brush, Good, HSG C
0.260	74	>75% Grass cover, Good, HSG C
3.187	71	Meadow, non-grazed, HSG C
3.137	70	Woods, Good, HSG C
0.004	73	Brush, Good, HSG D
0.631	78	Meadow, non-grazed, HSG D
0.322	77	Woods, Good, HSG D
0.026	80	>75% Grass cover, Good, HSG D
7.632	72	Weighted Average
7.632		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
23.3	150	0.0300	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
19.1	868	0.0230	0.76		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
42.4	1,018	Total			

Subcatchment 21D: PR DA 21D



Summary for Subcatchment 21E-1: PR DA 21E-1

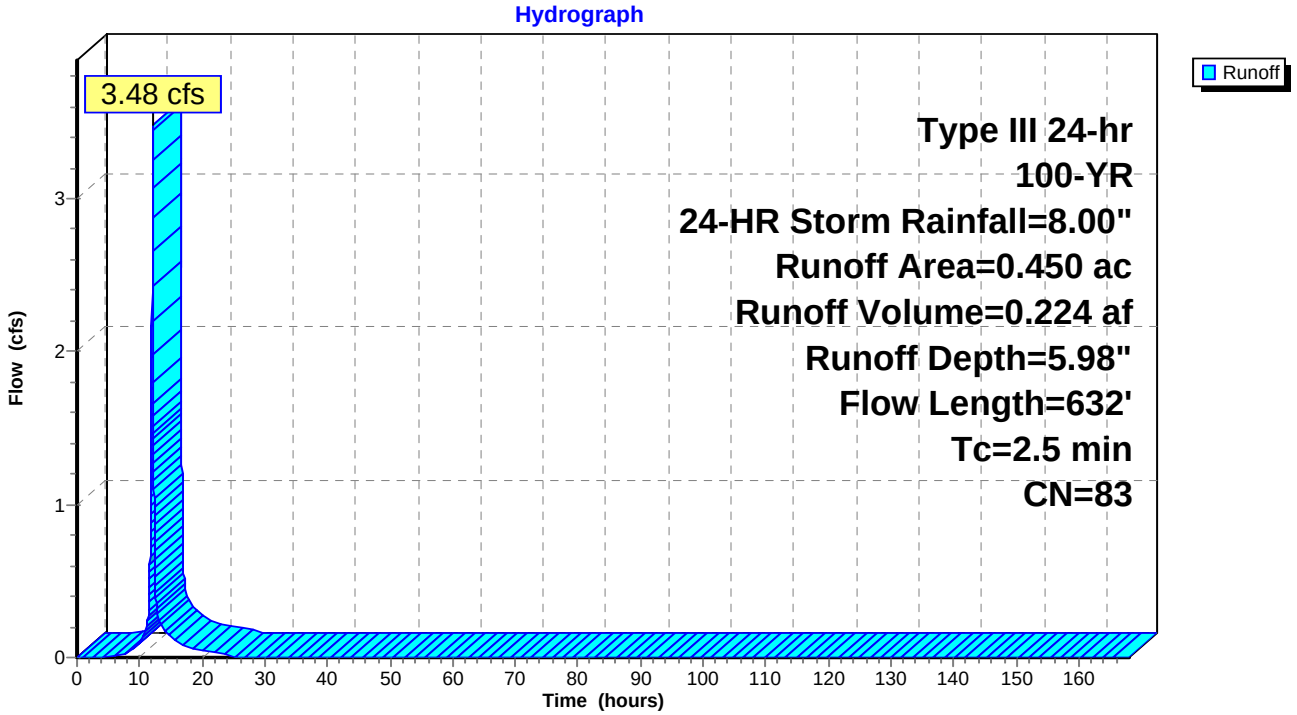
Runoff = 3.48 cfs @ 12.04 hrs, Volume= 0.224 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.007	70	Woods, Good, HSG C
	0.265	74	>75% Grass cover, Good, HSG C
	0.151	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.450	83	Weighted Average
	0.299		66.44% Pervious Area
	0.151		33.56% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-1: PR DA 21E-1



Summary for Subcatchment 21E-2: PR DA 21E-2

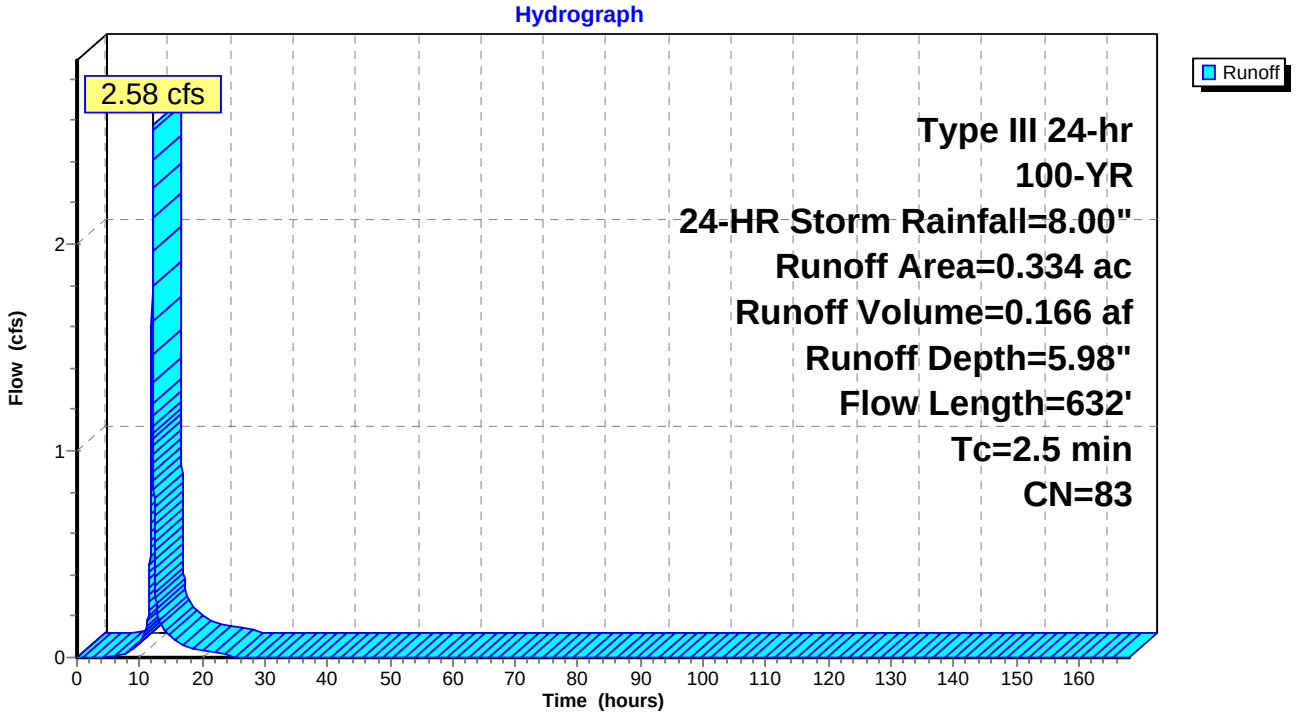
Runoff = 2.58 cfs @ 12.04 hrs, Volume= 0.166 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.005	70	Woods, Good, HSG C
	0.197	74	>75% Grass cover, Good, HSG C
	0.112	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.334	83	Weighted Average
	0.222		66.47% Pervious Area
	0.112		33.53% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-2: PR DA 21E-2



Summary for Subcatchment 21E-3: PR DA 21E-3

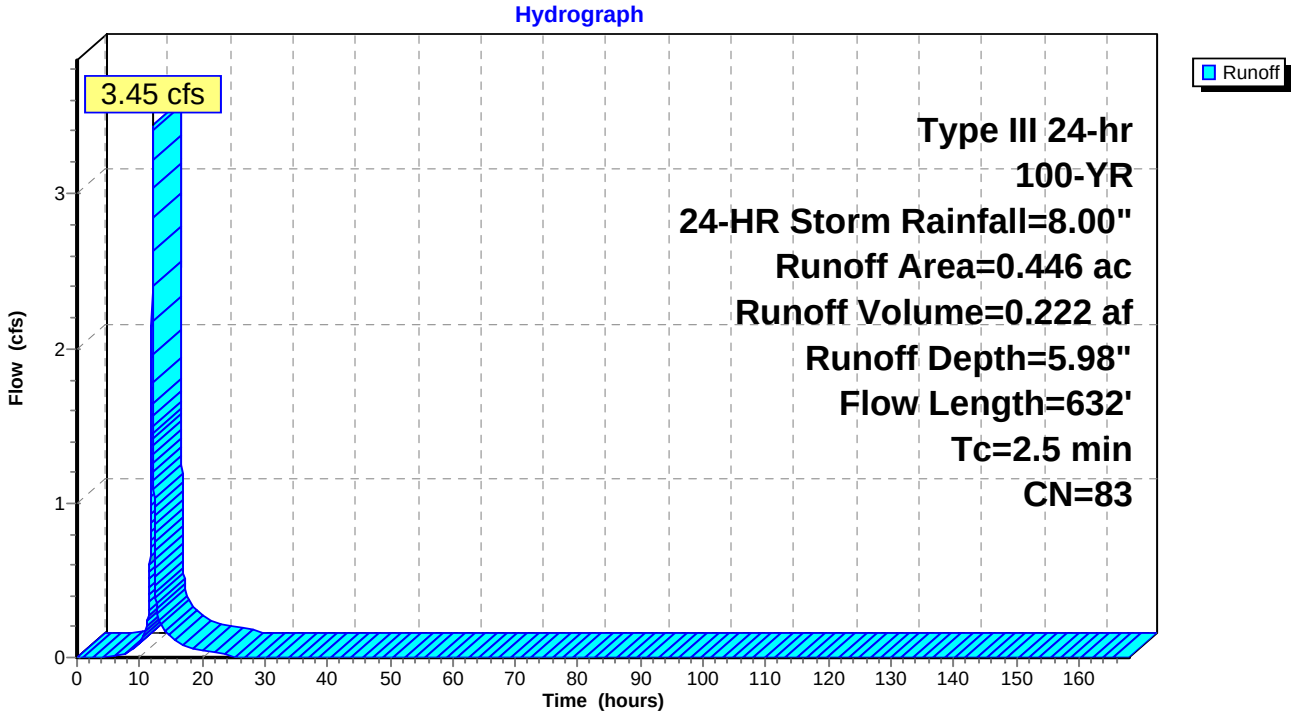
Runoff = 3.45 cfs @ 12.04 hrs, Volume= 0.222 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.006	70	Woods, Good, HSG C
	0.263	74	>75% Grass cover, Good, HSG C
	0.150	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.446	83	Weighted Average
	0.296		66.37% Pervious Area
	0.150		33.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21E-3: PR DA 21E-3



Summary for Subcatchment 21F-1: PR DA 21F-1

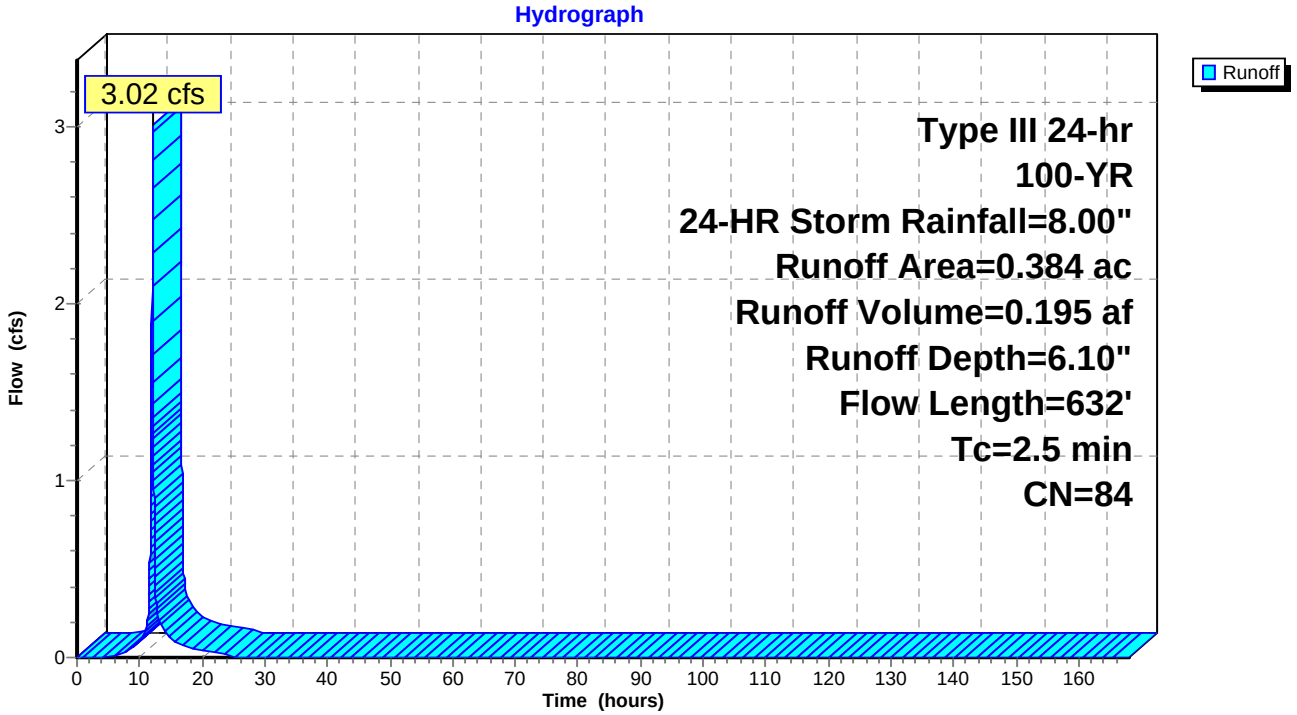
Runoff = 3.02 cfs @ 12.04 hrs, Volume= 0.195 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.004	70	Woods, Good, HSG C
	0.207	74	>75% Grass cover, Good, HSG C
	0.146	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.384	84	Weighted Average
	0.238		61.98% Pervious Area
	0.146		38.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-1: PR DA 21F-1



Summary for Subcatchment 21F-2: PR DA 21F-2

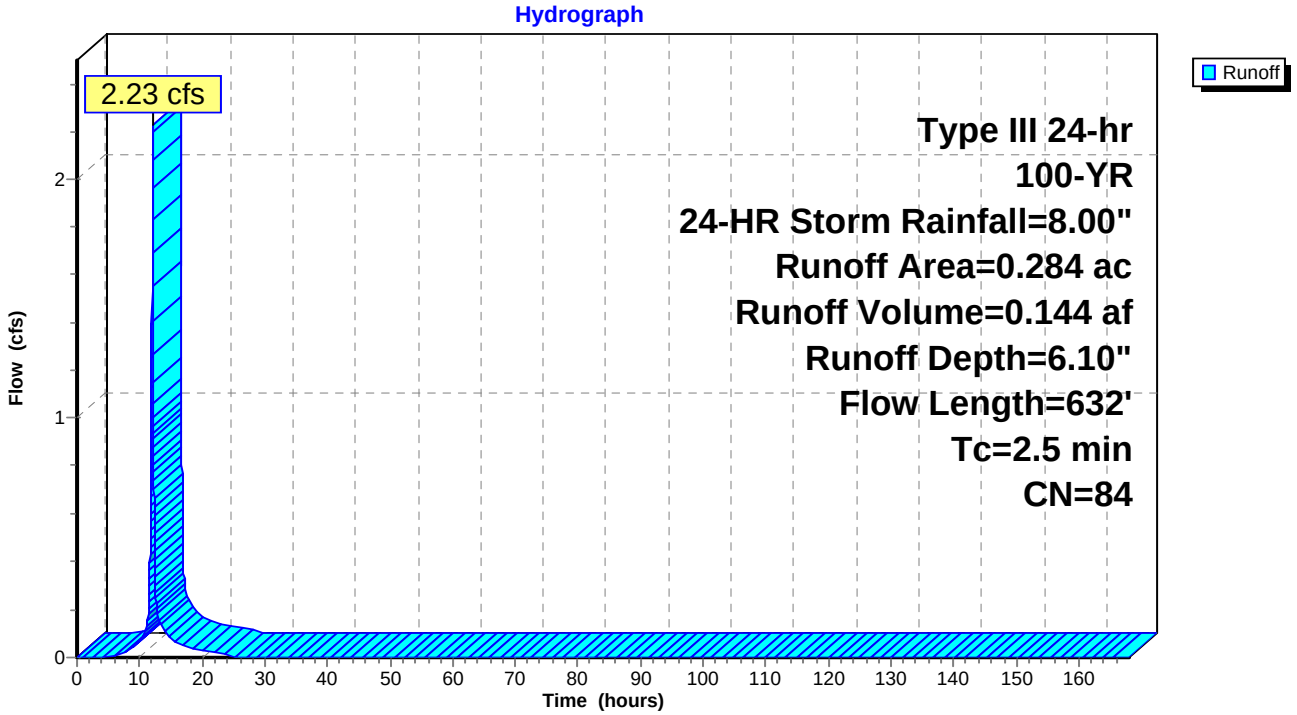
Runoff = 2.23 cfs @ 12.04 hrs, Volume= 0.144 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.003	70	Woods, Good, HSG C
	0.153	74	>75% Grass cover, Good, HSG C
	0.108	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.284	84	Weighted Average
	0.176		61.97% Pervious Area
	0.108		38.03% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-2: PR DA 21F-2



Summary for Subcatchment 21F-3: PR DA 21F-3

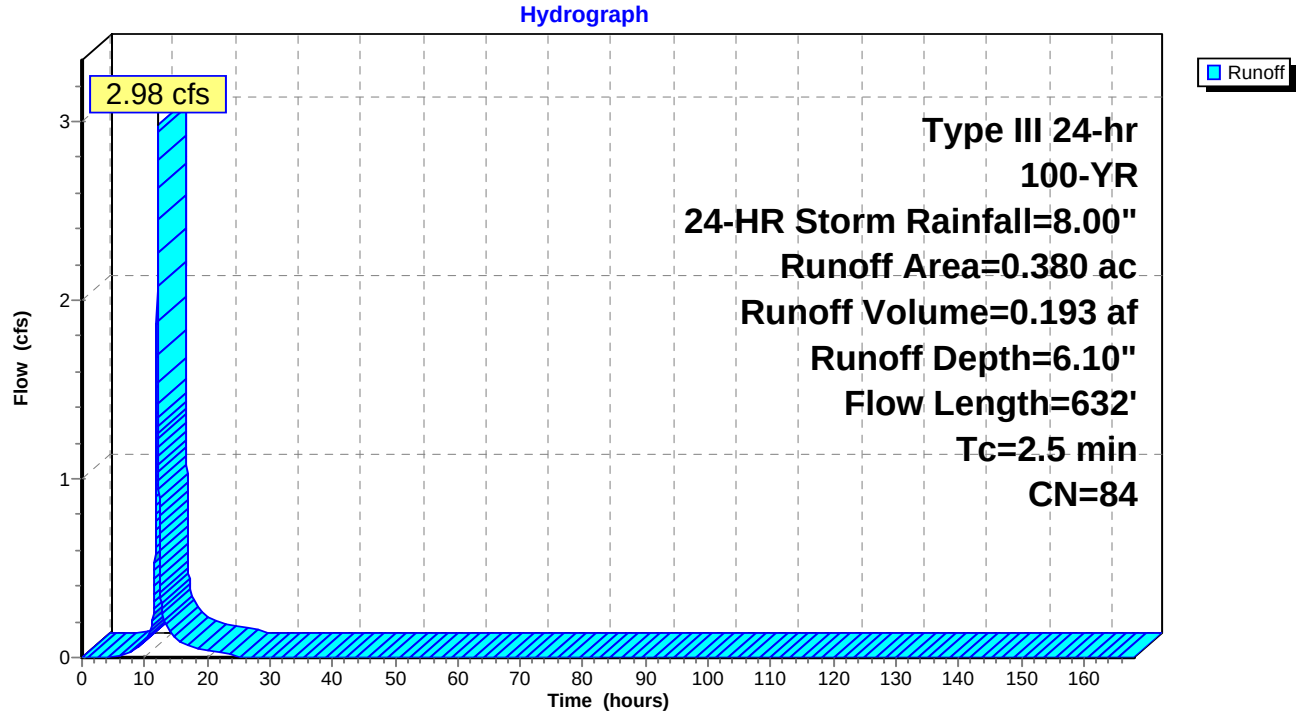
Runoff = 2.98 cfs @ 12.04 hrs, Volume= 0.193 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.004	70	Woods, Good, HSG C
	0.205	74	>75% Grass cover, Good, HSG C
	0.145	98	Paved roads w/curbs & sewers, HSG C
*	0.026	89	Gravel Shoulder, HSG C
	0.380	84	Weighted Average
	0.235		61.84% Pervious Area
	0.145		38.16% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	150	0.0200	1.61		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	142	0.0600	10.29	84.37	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	340	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.5	632	Total			

Subcatchment 21F-3: PR DA 21F-3



Summary for Subcatchment 21G: PR DA 21G

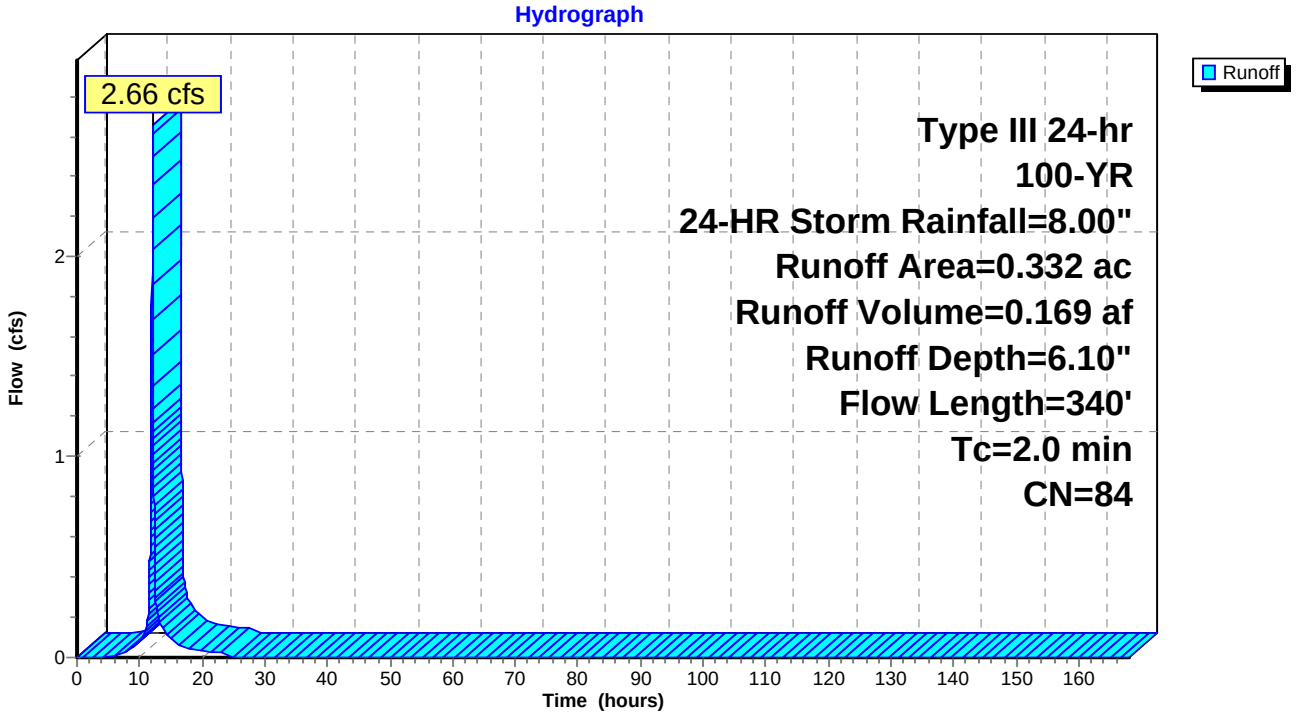
Runoff = 2.66 cfs @ 12.03 hrs, Volume= 0.169 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.187	74	>75% Grass cover, Good, HSG C
0.145	98	Paved roads w/curbs & sewers, HSG C
0.332	84	Weighted Average
0.187		56.33% Pervious Area
0.145		43.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	85	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	93	0.0500	4.54		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.2	62	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.2	100	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.0	340	Total			

Subcatchment 21G: PR DA 21G



Summary for Subcatchment 21H: PR DA 21H

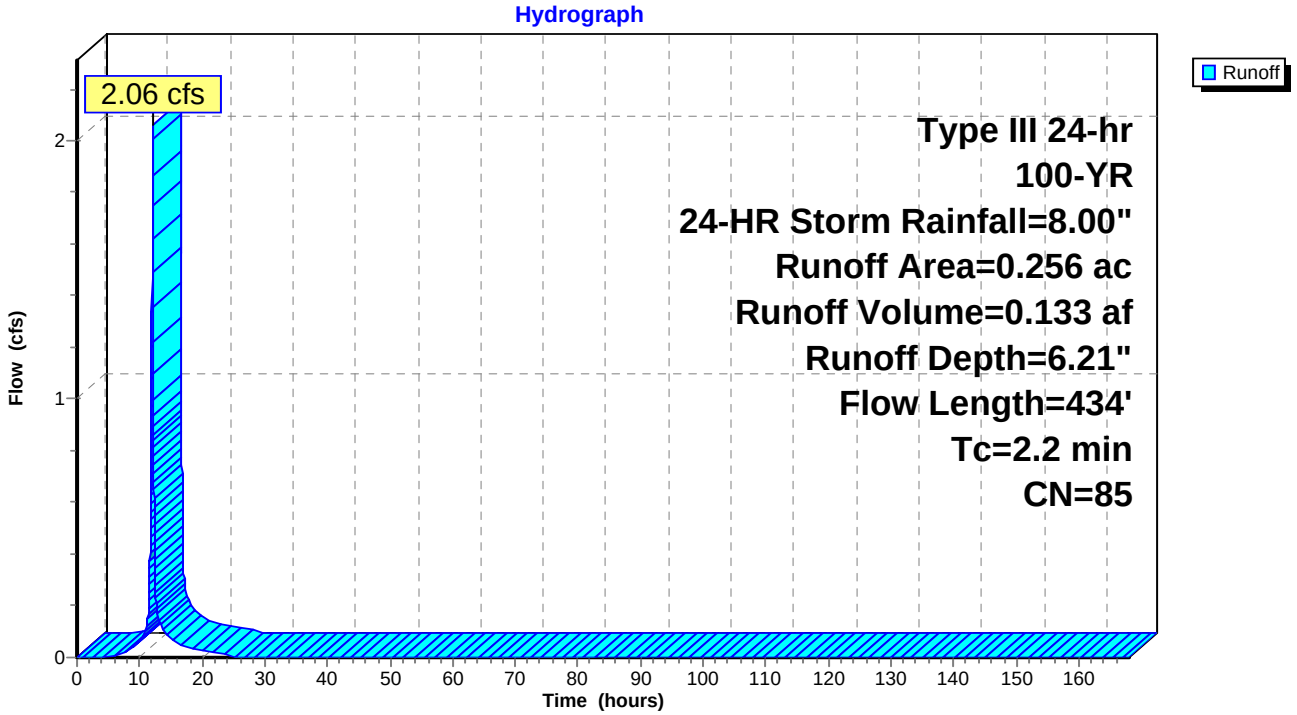
Runoff = 2.06 cfs @ 12.03 hrs, Volume= 0.133 af, Depth= 6.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.138	74	>75% Grass cover, Good, HSG C
0.118	98	Paved roads w/curbs & sewers, HSG C
0.256	85	Weighted Average
0.138		53.91% Pervious Area
0.118		46.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	85	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	93	0.0500	4.54		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.2	62	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.4	194	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.2	434	Total			

Subcatchment 21H: PR DA 21H



Summary for Subcatchment 23: PR DA 23

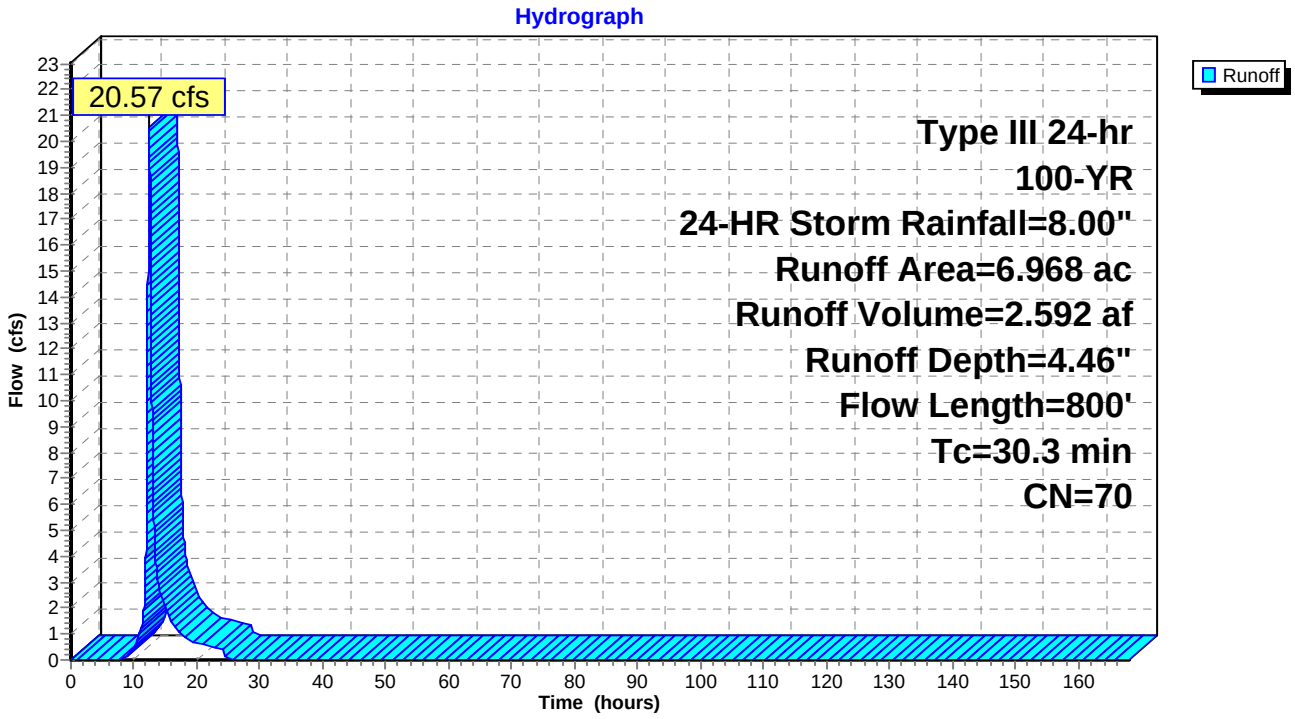
Runoff = 20.57 cfs @ 12.42 hrs, Volume= 2.592 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.415	65	Brush, Good, HSG C
0.170	74	>75% Grass cover, Good, HSG C
5.901	70	Woods, Good, HSG C
0.009	73	Brush, Good, HSG D
0.473	77	Woods, Good, HSG D
6.968	70	Weighted Average
6.968		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
21.5	150	0.0367	0.12		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
8.8	650	0.0600	1.22		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
30.3	800	Total			

Subcatchment 23: PR DA 23



Summary for Subcatchment 23A-1: PR DA 23A-1

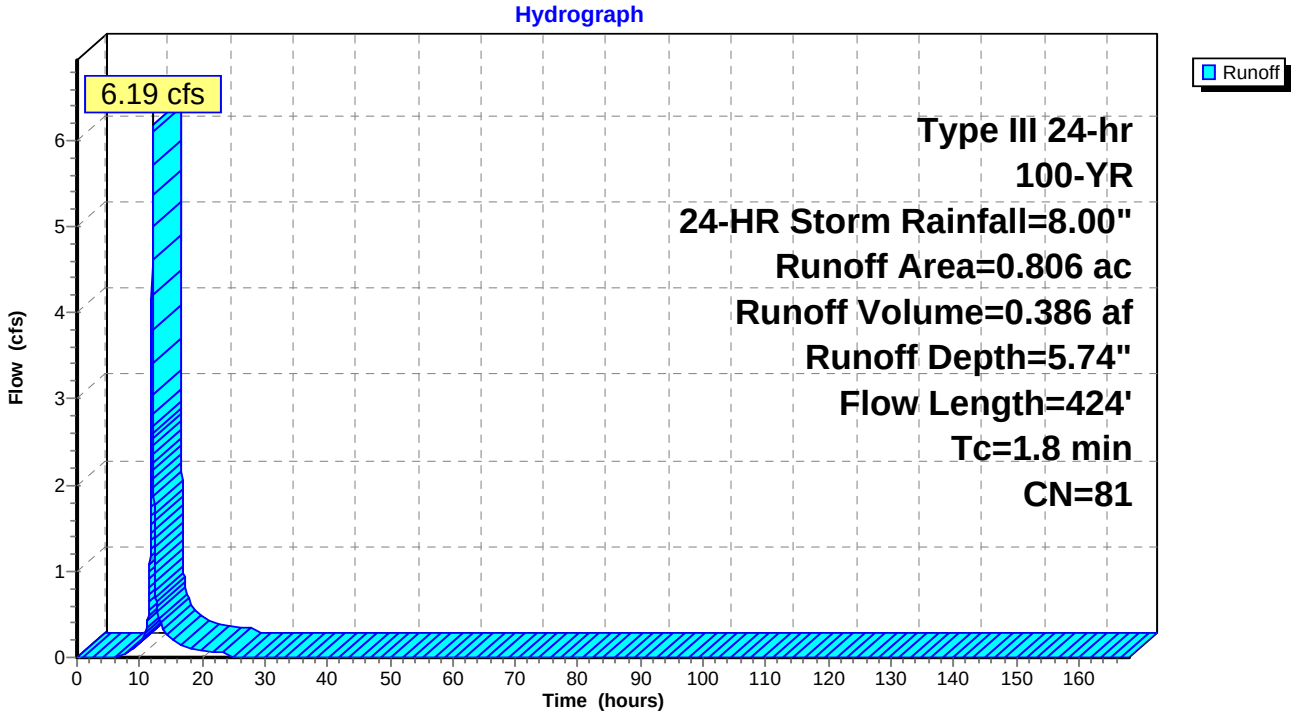
Runoff = 6.19 cfs @ 12.03 hrs, Volume= 0.386 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.562	74	>75% Grass cover, Good, HSG C
0.201	98	Paved roads w/curbs & sewers, HSG C
0.043	89	Gravel Shoulder, HSG C
0.806	81	Weighted Average
0.605		75.06% Pervious Area
0.201		24.94% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	62	0.0200	1.35		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
1.0	362	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.8	424	Total			

Subcatchment 23A-1: PR DA 23A-1



Summary for Subcatchment 23A-2: PR DA 23A-2

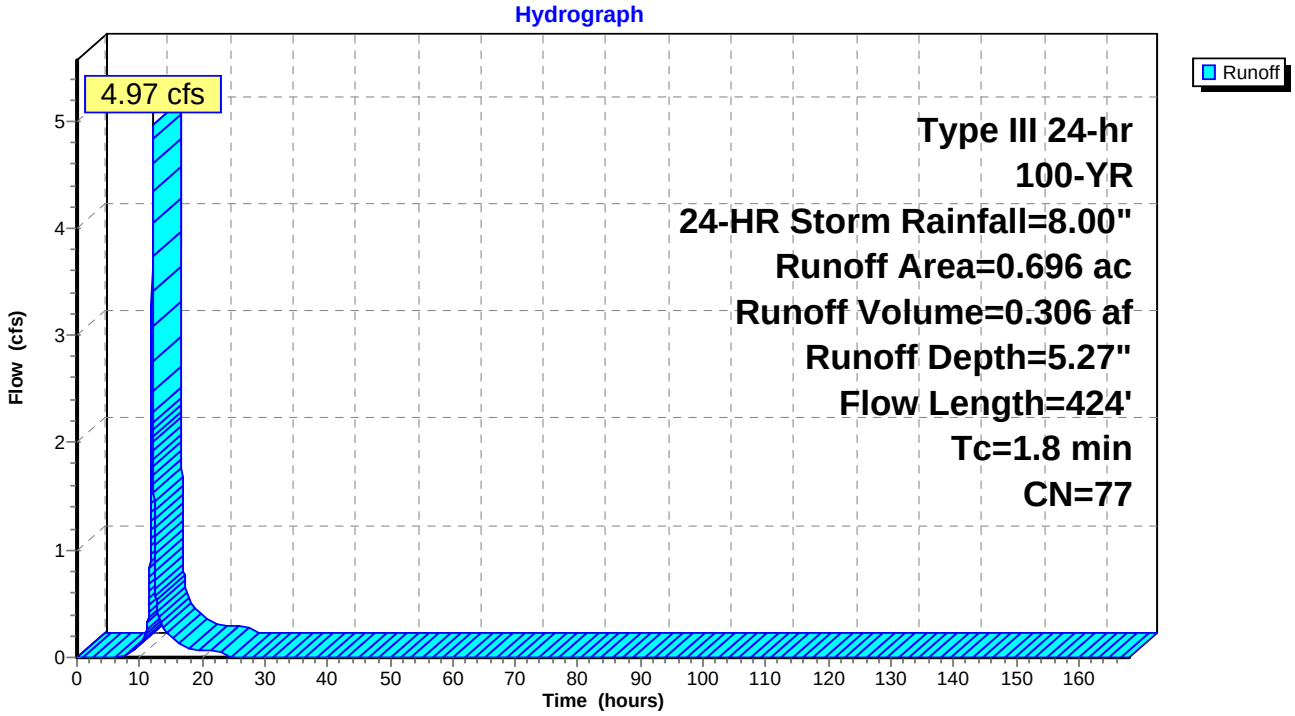
Runoff = 4.97 cfs @ 12.03 hrs, Volume= 0.306 af, Depth= 5.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.593	74	>75% Grass cover, Good, HSG C
0.085	98	Paved roads w/curbs & sewers, HSG C
0.018	89	Gravel Shoulder, HSG C
0.696	77	Weighted Average
0.611		87.79% Pervious Area
0.085		12.21% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	62	0.0200	1.35		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
1.0	362	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.8	424	Total			

Subcatchment 23A-2: PR DA 23A-2



Summary for Subcatchment 23B-1: PR DA 23B-1

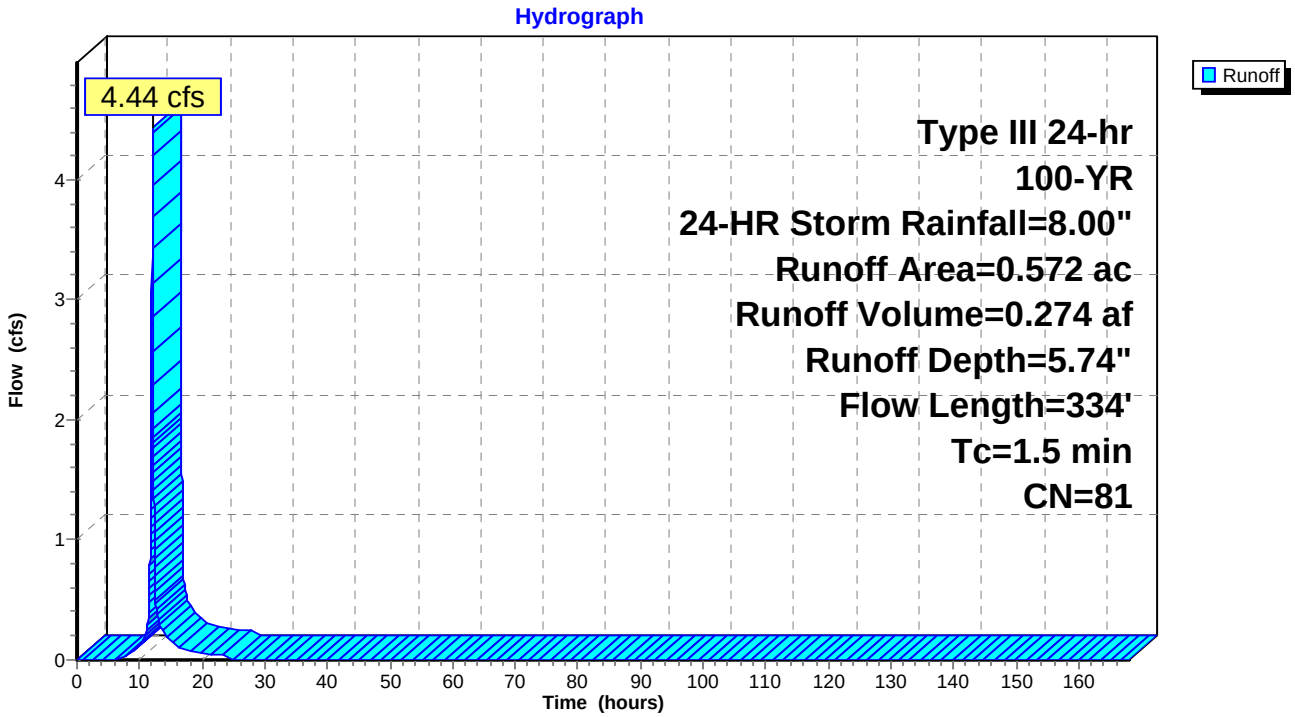
Runoff = 4.44 cfs @ 12.02 hrs, Volume= 0.274 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.005	70	Woods, Good, HSG C
0.392	74	>75% Grass cover, Good, HSG C
0.148	98	Paved roads w/curbs & sewers, HSG C
0.027	89	Gravel Shoulder, HSG C
0.572	81	Weighted Average
0.424		74.13% Pervious Area
0.148		25.87% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0200	1.34		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	274	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.5	334	Total			

Subcatchment 23B-1: PR DA 23B-1



Summary for Subcatchment 23B-2: PR DA 23B-2

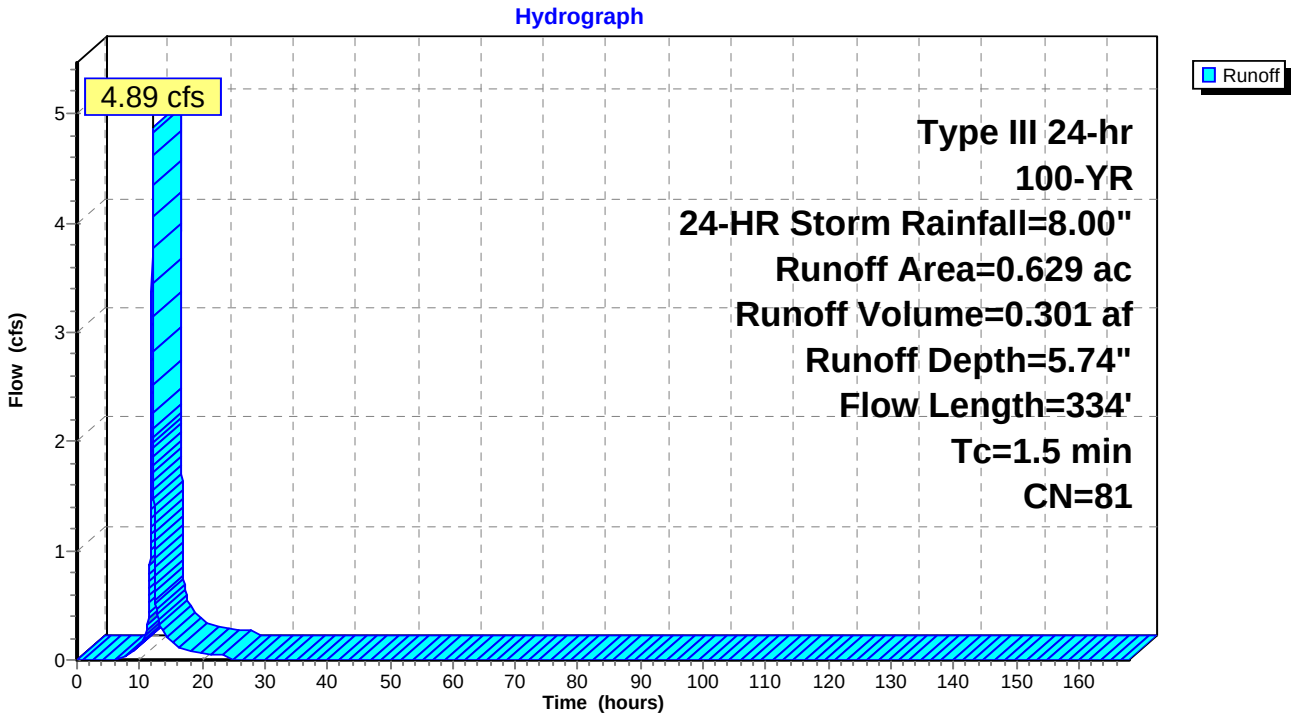
Runoff = 4.89 cfs @ 12.02 hrs, Volume= 0.301 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.005	70	Woods, Good, HSG C
0.432	74	>75% Grass cover, Good, HSG C
0.163	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.629	81	Weighted Average
0.466		74.09% Pervious Area
0.163		25.91% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	60	0.0200	1.34		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	274	0.0190	5.79	47.48	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.5	334	Total			

Subcatchment 23B-2: PR DA 23B-2



Summary for Subcatchment 23C: PR DA 23C

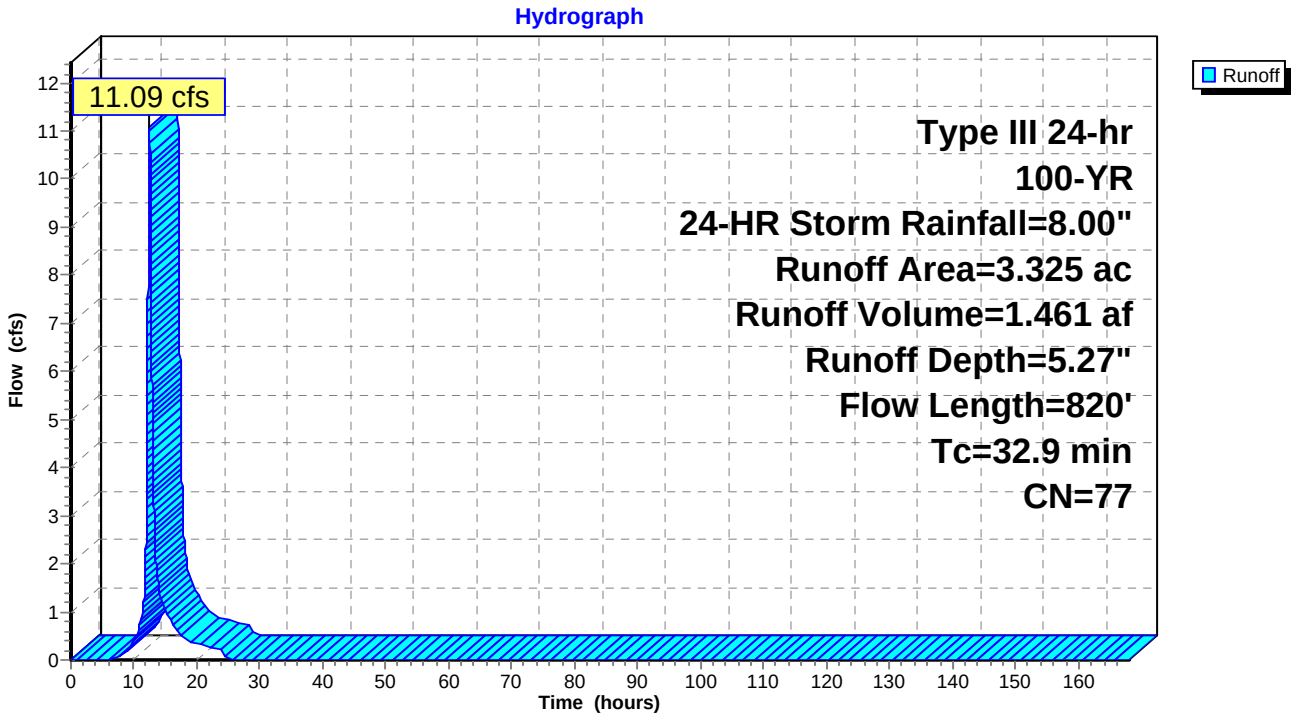
Runoff = 11.09 cfs @ 12.46 hrs, Volume= 1.461 af, Depth= 5.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
3.325	77	Woods, Good, HSG D
3.325		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
25.8	150	0.0233	0.10		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
6.3	380	0.0400	1.00		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.5	165	0.0200	5.94	48.71	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	125	0.0200	7.44	9.14	**Pipe Channel, Pipe Crossing** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
32.9	820	Total			

Subcatchment 23C: PR DA 23C



Summary for Subcatchment 23F: PR DA 23F

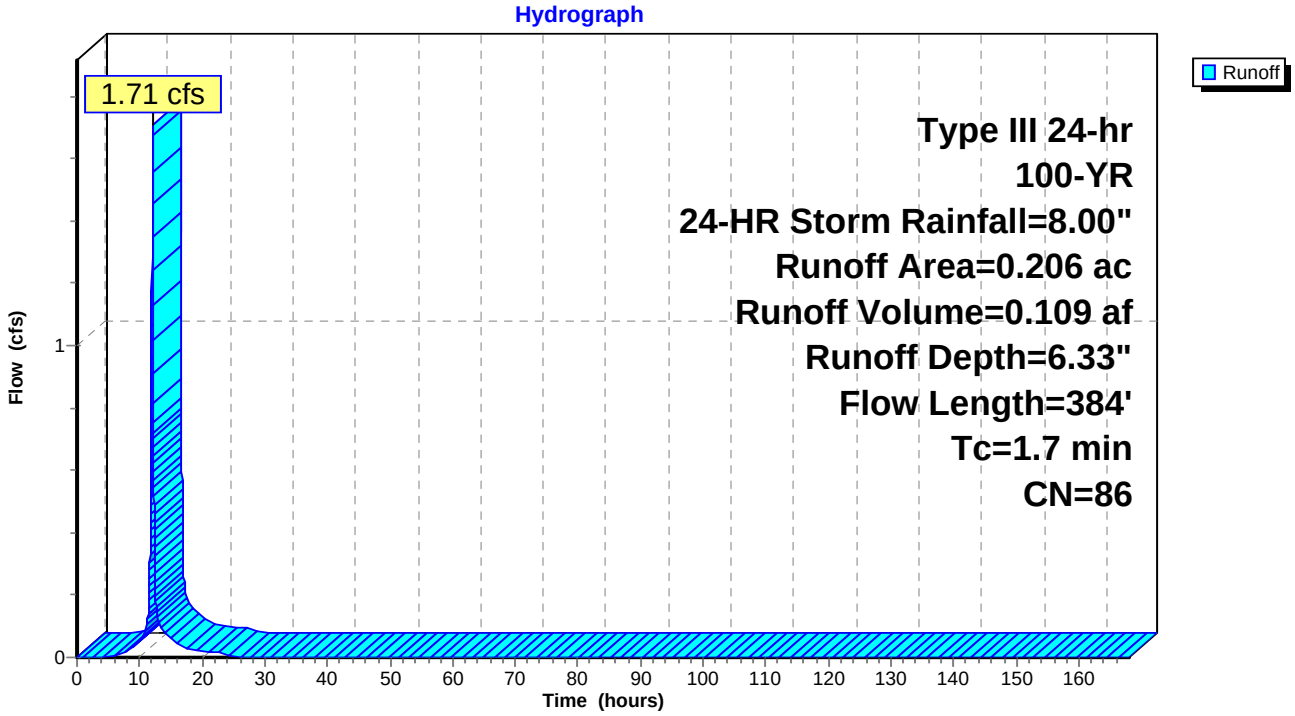
Runoff = 1.71 cfs @ 12.03 hrs, Volume= 0.109 af, Depth= 6.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.099	74	>75% Grass cover, Good, HSG C
	0.098	98	Paved roads w/curbs & sewers, HSG C
*	0.009	89	Gravel Shoulder, HSG C
	0.206	86	Weighted Average
	0.108		52.43% Pervious Area
	0.098		47.57% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0100	0.98		**Sheet Flow,** Smooth surfaces n= 0.011 P2= 3.75"
0.9	334	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	384	Total			

Subcatchment 23F: PR DA 23F



Summary for Subcatchment 23G: PR DA 23G

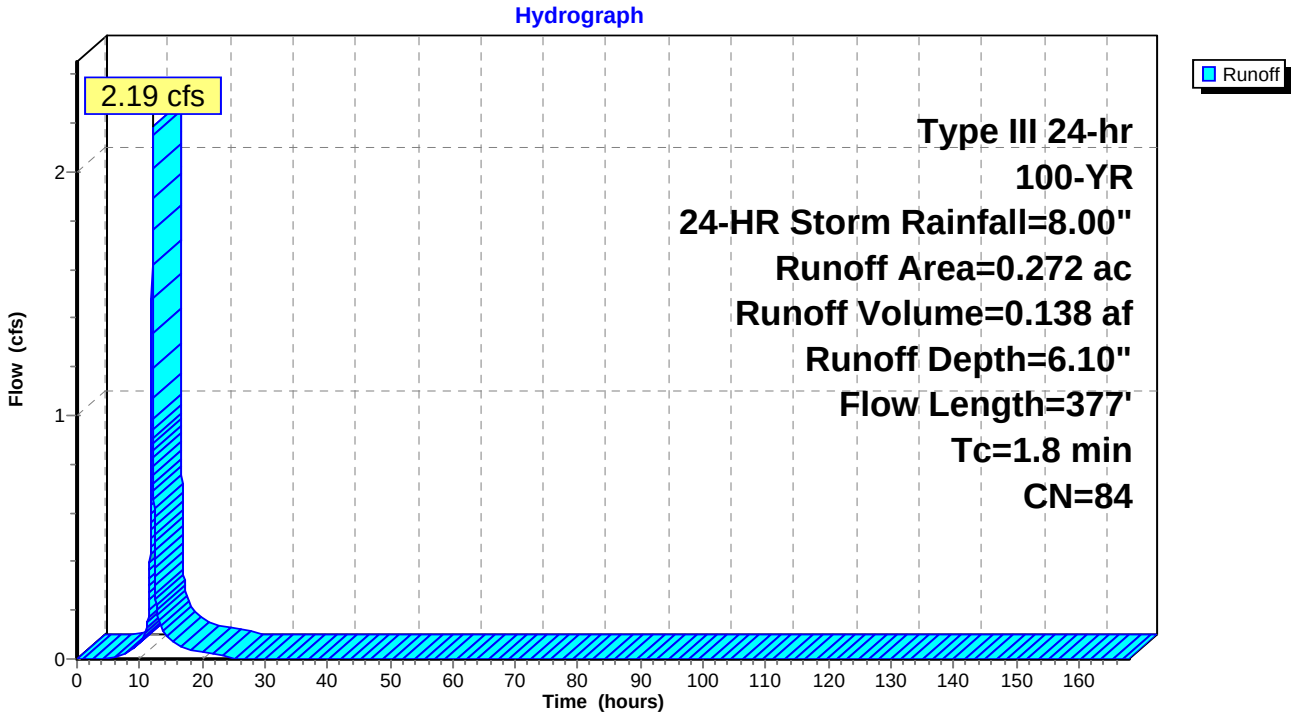
Runoff = 2.19 cfs @ 12.03 hrs, Volume= 0.138 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.146	74	>75% Grass cover, Good, HSG C
	0.107	98	Paved roads w/curbs & sewers, HSG C
*	0.019	89	Gravel Shoulder, HSG C
	0.272	84	Weighted Average
	0.165		60.66% Pervious Area
	0.107		39.34% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	64	0.0100	1.03		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.5	182	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	131	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	377	Total			

Subcatchment 23G: PR DA 23G



Summary for Subcatchment 23H: PR DA 23H

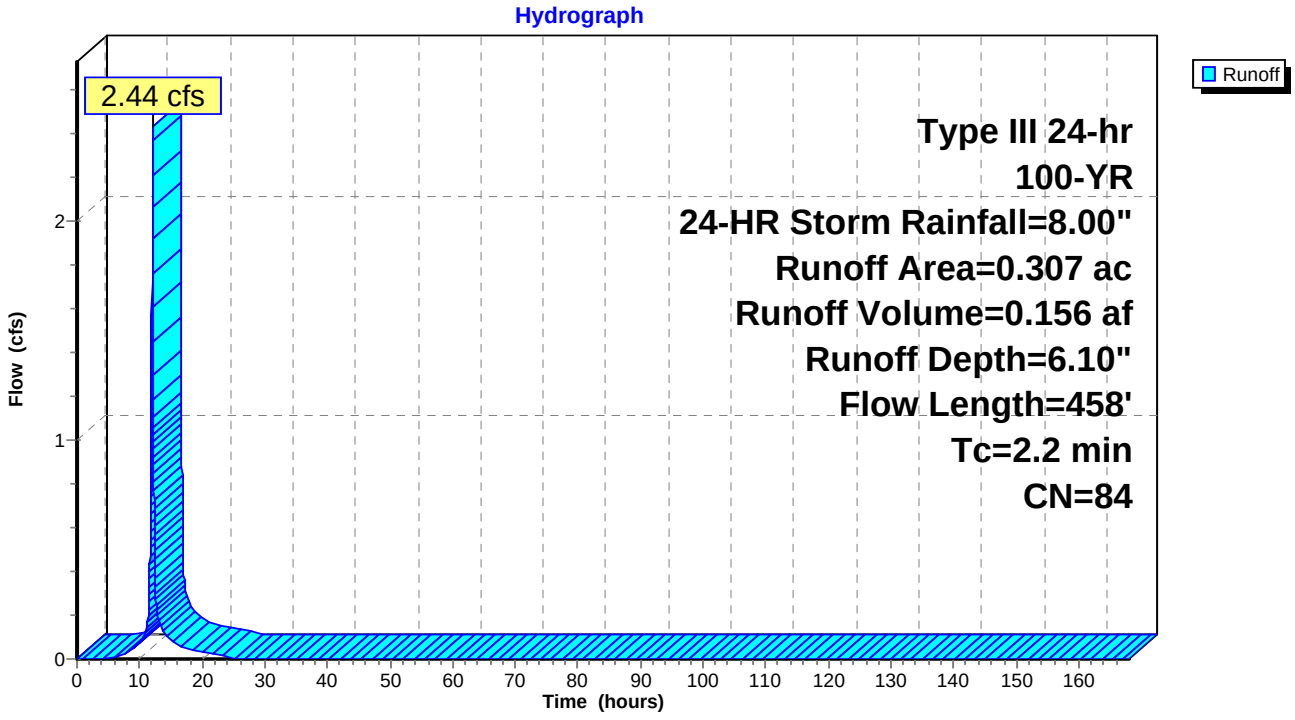
Runoff = 2.44 cfs @ 12.03 hrs, Volume= 0.156 af, Depth= 6.10"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.177	74	>75% Grass cover, Good, HSG C
	0.110	98	Paved roads w/curbs & sewers, HSG C
*	0.020	89	Gravel Shoulder, HSG C
	0.307	84	Weighted Average
	0.197		64.17% Pervious Area
	0.110		35.83% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.3	83	0.0100	1.09		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	135	0.0200	5.94	48.71	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.5	240	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.2	458	Total			

Subcatchment 23H: PR DA 23H



Summary for Subcatchment 23P: PR DA 23P

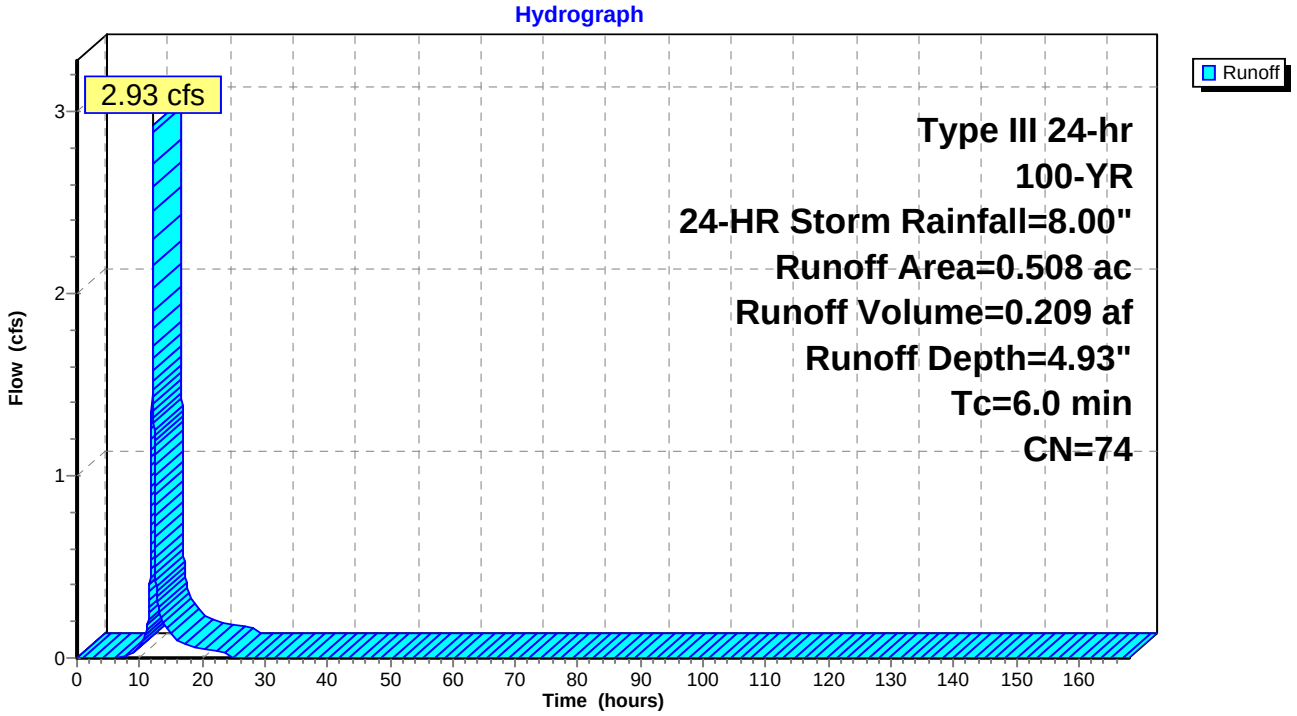
Runoff = 2.93 cfs @ 12.09 hrs, Volume= 0.209 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.508	74	>75% Grass cover, Good, HSG C
0.508		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment 23P: PR DA 23P



Summary for Subcatchment 24: PR DA 24

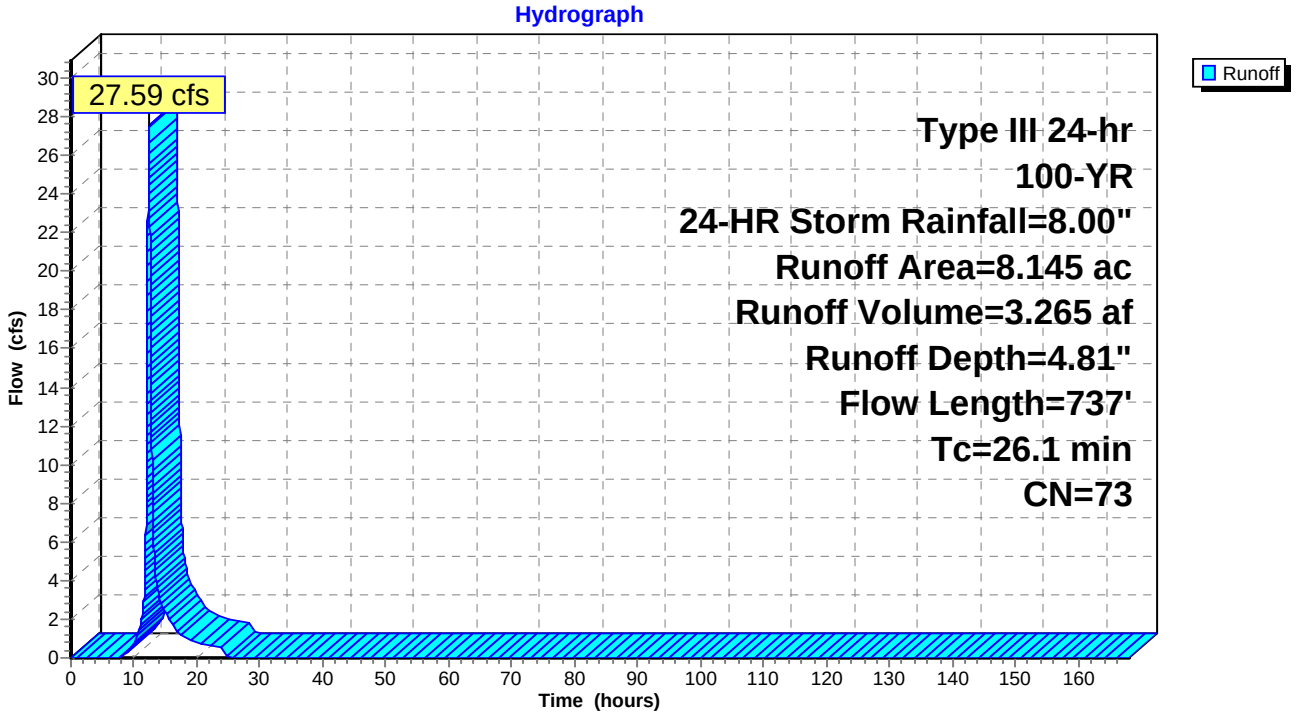
Runoff = 27.59 cfs @ 12.36 hrs, Volume= 3.265 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
4.719	70	Woods, Good, HSG C
0.090	96	Gravel surface, HSG D
3.336	77	Woods, Good, HSG D
8.145	73	Weighted Average
8.145		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
18.5	150	0.0533	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
7.6	587	0.0665	1.29		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
26.1	737	Total			

Subcatchment 24: PR DA 24



Summary for Subcatchment 24A-1: PR DA 24A-1

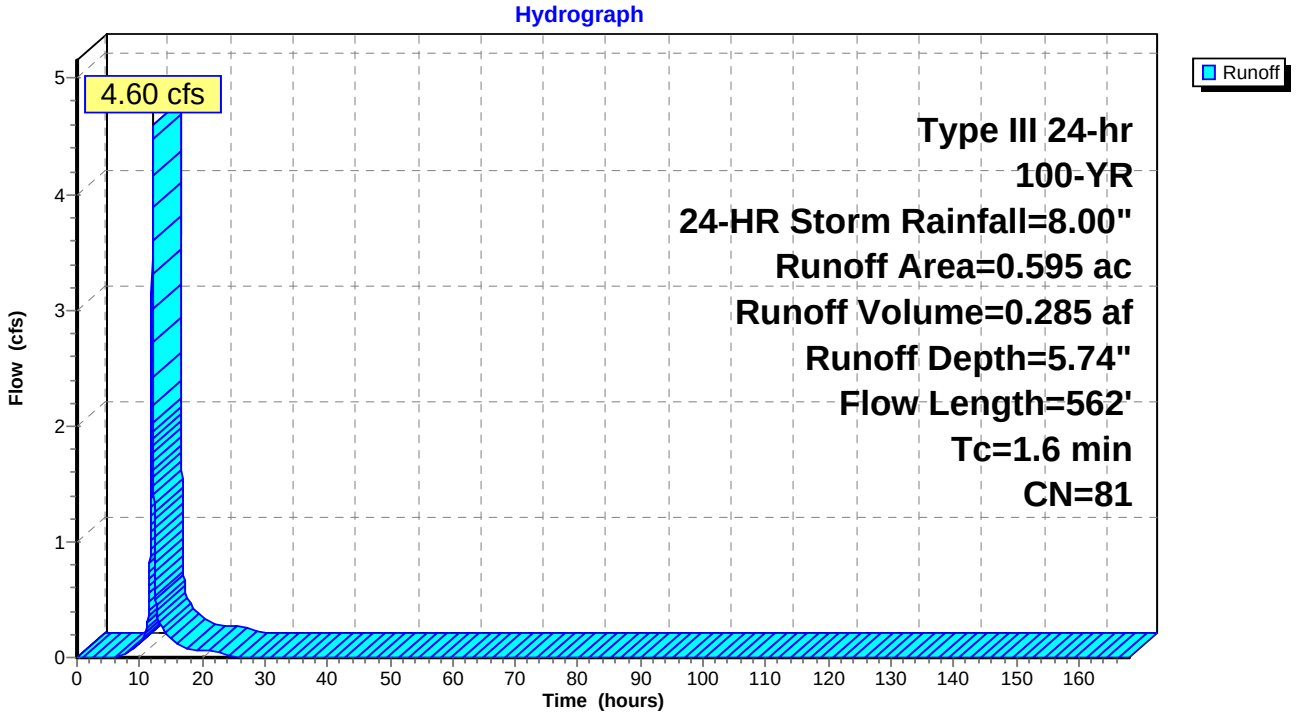
Runoff = 4.60 cfs @ 12.02 hrs, Volume= 0.285 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.003	70	Woods, Good, HSG C
0.411	74	>75% Grass cover, Good, HSG C
0.153	98	Paved roads w/curbs & sewers, HSG C
0.028	89	Gravel roads, HSG C
0.595	81	Weighted Average
0.442		74.29% Pervious Area
0.153		25.71% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-1: PR DA 24A-1



Summary for Subcatchment 24A-2: PR DA 24A-2

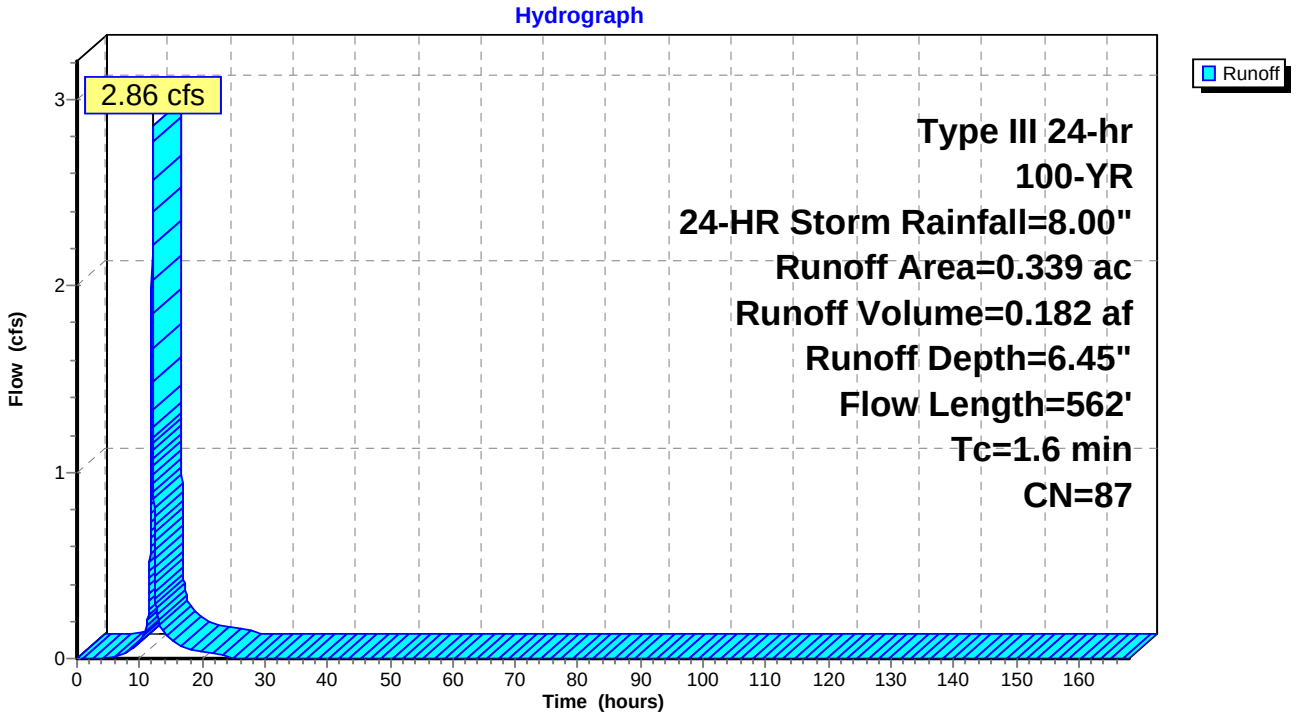
Runoff = 2.86 cfs @ 12.02 hrs, Volume= 0.182 af, Depth= 6.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.053	74	>75% Grass cover, Good, HSG C
0.020	98	Paved roads w/curbs & sewers, HSG C
0.004	89	Gravel roads, HSG C
0.053	96	Gravel surface, HSG D
0.001	77	Woods, Good, HSG D
0.119	80	>75% Grass cover, Good, HSG D
0.075	98	Paved roads w/curbs & sewers, HSG D
0.014	91	Gravel Shoulder, HSG D
0.339	87	Weighted Average
0.244		71.98% Pervious Area
0.095		28.02% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-2: PR DA 24A-2



Summary for Subcatchment 24A-3: PR DA 24A-3

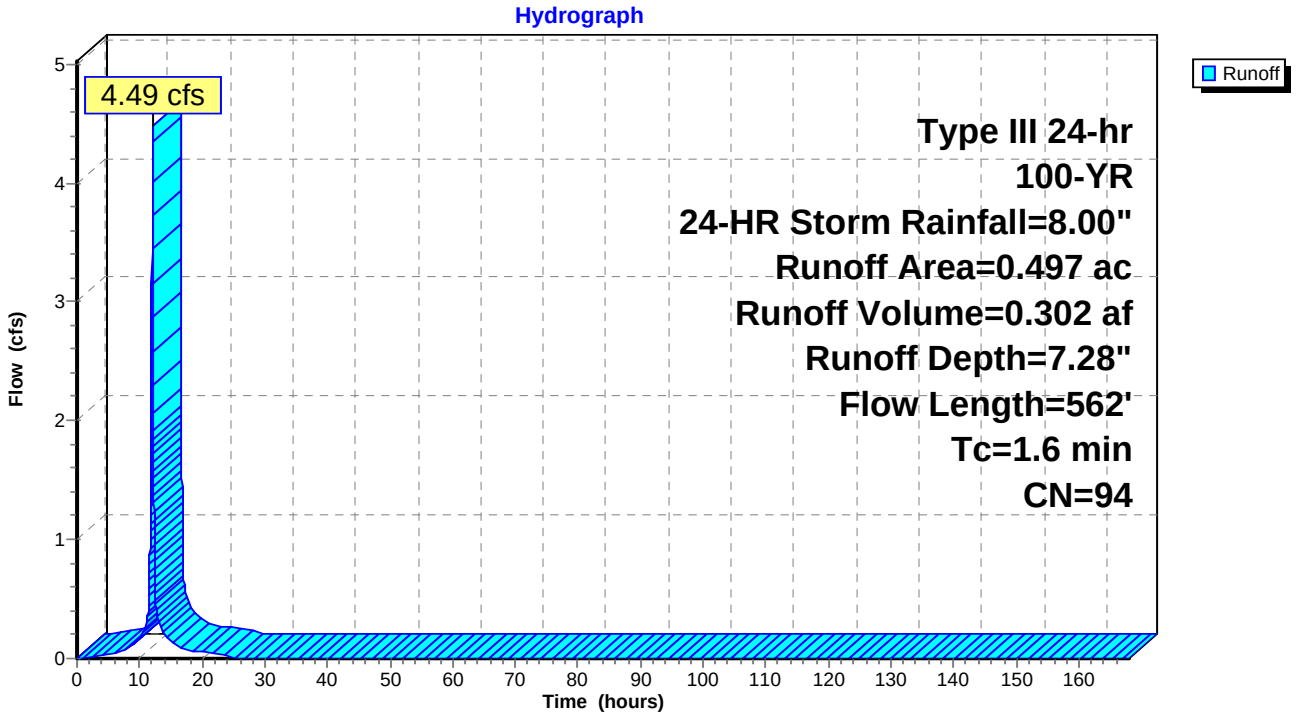
Runoff = 4.49 cfs @ 12.02 hrs, Volume= 0.302 af, Depth= 7.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.282	96	Gravel surface, HSG D
0.028	77	Woods, Good, HSG D
0.026	80	>75% Grass cover, Good, HSG D
0.136	98	Paved roads w/curbs & sewers, HSG D
0.025	91	Gravel Shoulder, HSG D
0.497	94	Weighted Average
0.361		72.64% Pervious Area
0.136		27.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-3: PR DA 24A-3



Summary for Subcatchment 24A-4: PR DA 24A-4

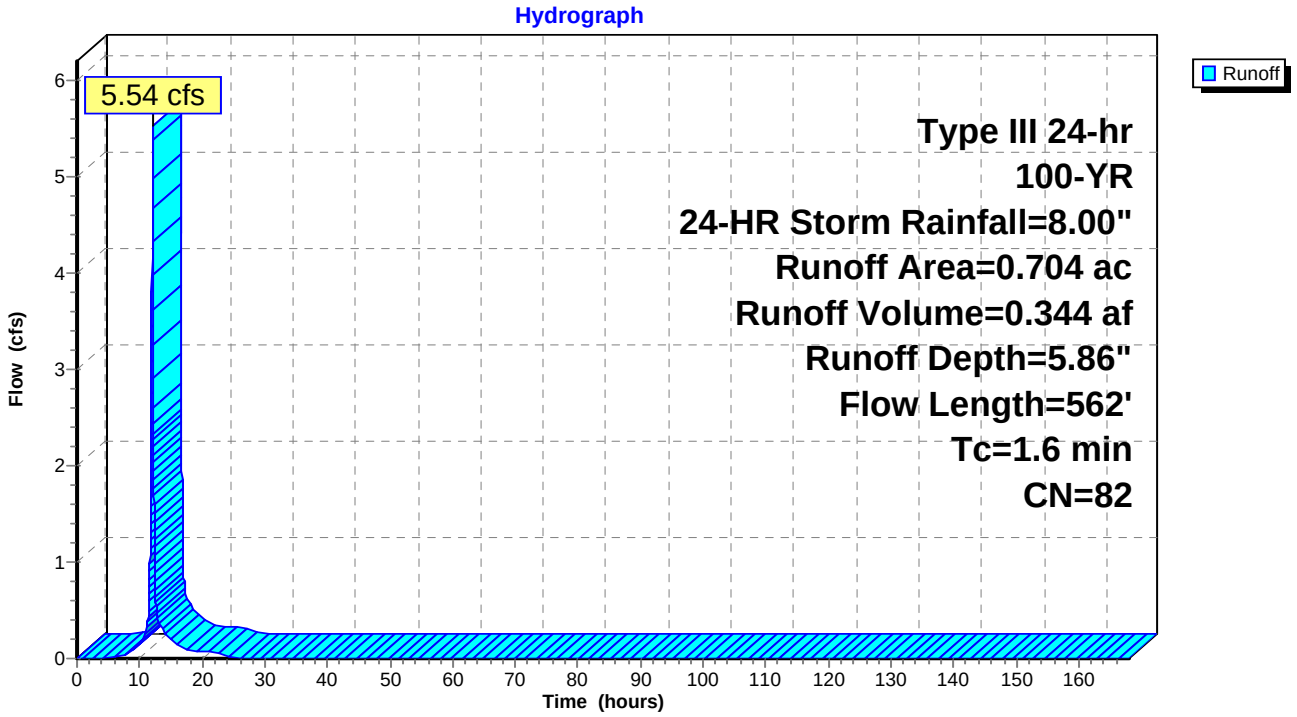
Runoff = 5.54 cfs @ 12.02 hrs, Volume= 0.344 af, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.127	74	>75% Grass cover, Good, HSG C
0.017	98	Paved roads w/curbs & sewers, HSG C
0.003	89	Gravel roads, HSG C
0.005	96	Gravel surface, HSG D
0.222	77	Woods, Good, HSG D
0.193	80	>75% Grass cover, Good, HSG D
0.115	98	Paved roads w/curbs & sewers, HSG D
0.021	91	Gravel Shoulder, HSG D
0.704	82	Weighted Average
0.572		81.25% Pervious Area
0.132		18.75% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	164	0.0525	9.62	78.92	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.3	312	0.0200	16.83	238.79	**Pipe Channel, SW** 51.0" Round Area= 14.2 sf Perim= 13.4' r= 1.06' n= 0.013
1.6	562	Total			

Subcatchment 24A-4: PR DA 24A-4



Summary for Subcatchment 24B-1: PR DA 24B-1

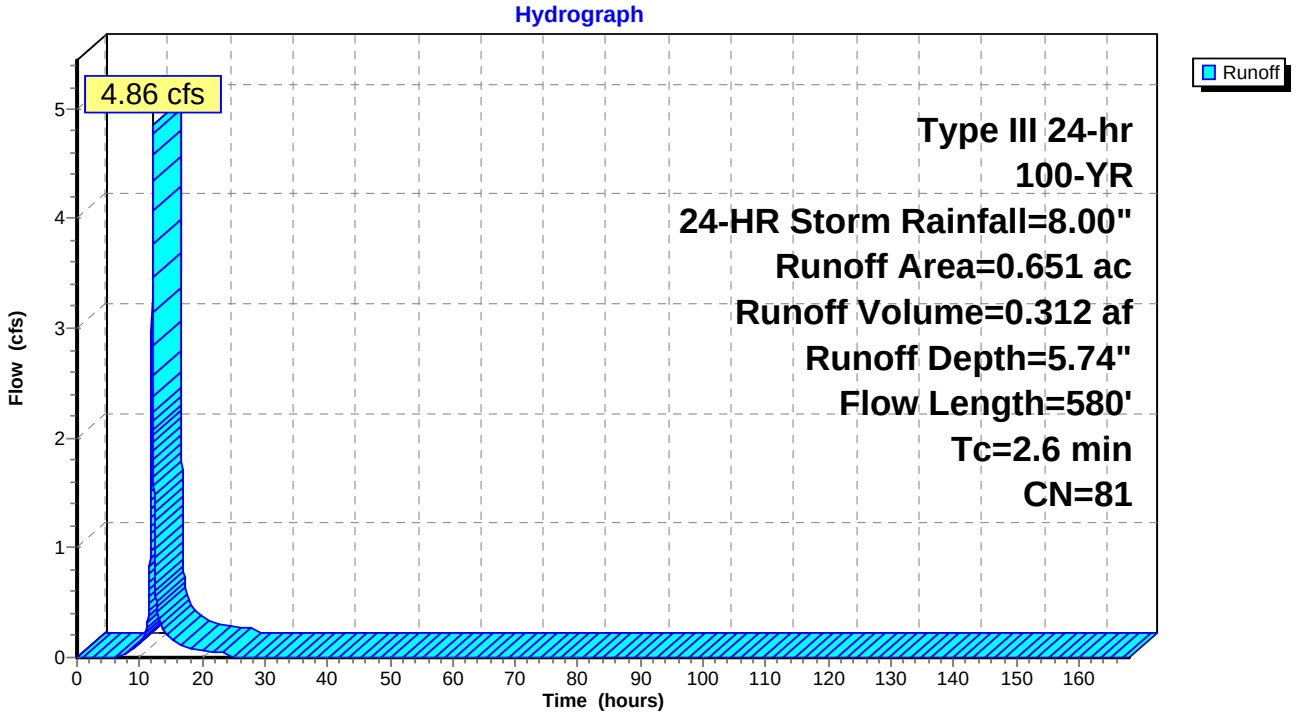
Runoff = 4.86 cfs @ 12.04 hrs, Volume= 0.312 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.455	74	>75% Grass cover, Good, HSG C
0.165	98	Paved roads w/curbs & sewers, HSG C
0.030	89	Gravel Shoulder, HSG C
0.651	81	Weighted Average
0.486		74.65% Pervious Area
0.165		25.35% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-1: PR DA 24B-1



Summary for Subcatchment 24B-2: PR DA 24B-2

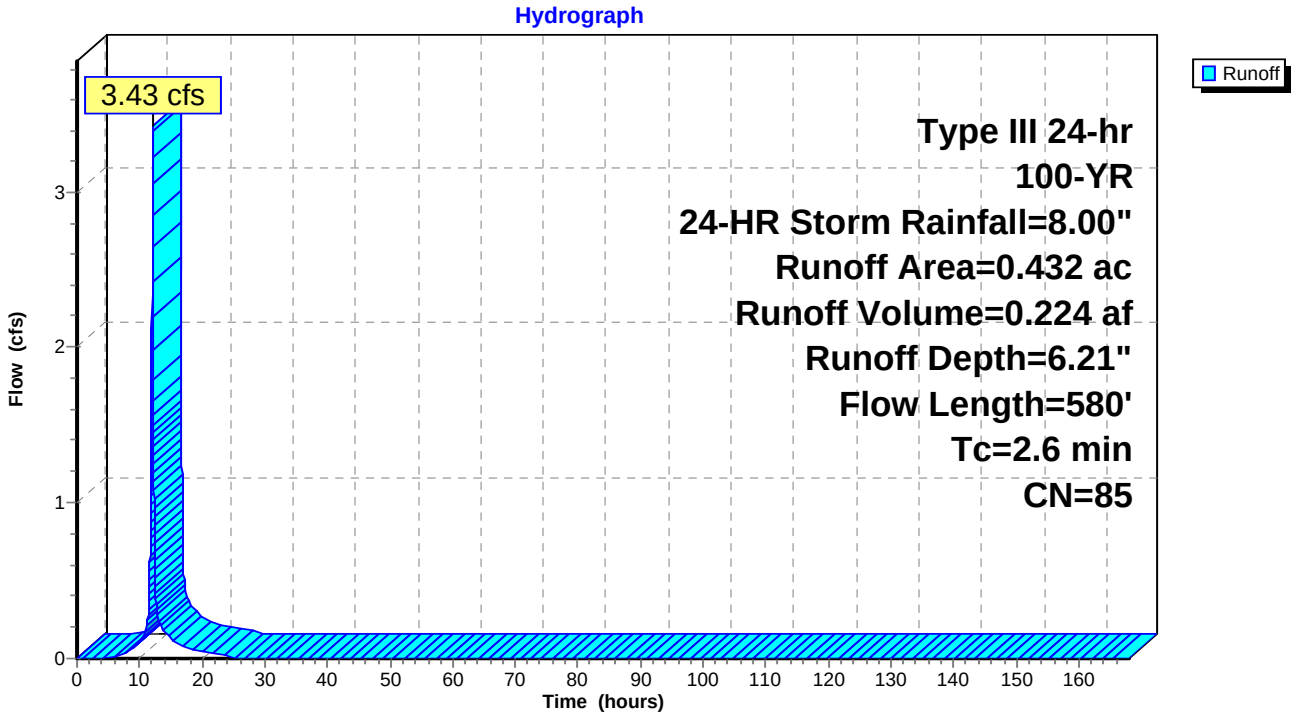
Runoff = 3.43 cfs @ 12.04 hrs, Volume= 0.224 af, Depth= 6.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.001	70	Woods, Good, HSG C
0.114	74	>75% Grass cover, Good, HSG C
0.038	98	Paved roads w/curbs & sewers, HSG C
0.007	89	Gravel Shoulder, HSG C
0.065	96	Gravel surface, HSG D
0.006	77	Woods, Good, HSG D
0.129	80	>75% Grass cover, Good, HSG D
0.061	98	Paved roads w/curbs & sewers, HSG D
0.011	91	Gravel Shoulder, HSG D
0.432	85	Weighted Average
0.333		77.08% Pervious Area
0.099		22.92% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-2: PR DA 24B-2



Summary for Subcatchment 24B-3: PR DA 24B-3

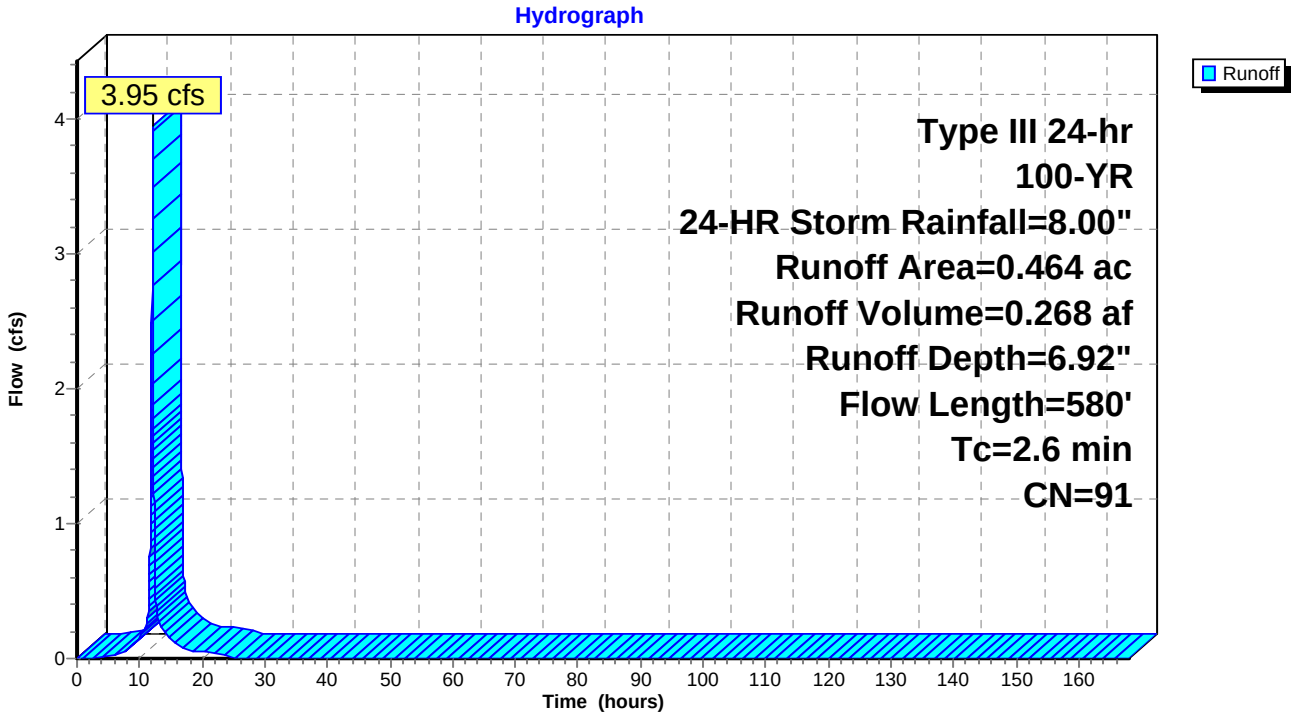
Runoff = 3.95 cfs @ 12.04 hrs, Volume= 0.268 af, Depth= 6.92"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.003	70	Woods, Good, HSG C
0.106	74	>75% Grass cover, Good, HSG C
0.105	98	Paved roads w/curbs & sewers, HSG C
0.019	89	Gravel Shoulder, HSG C
0.231	96	Gravel surface, HSG D
0.464	91	Weighted Average
0.359		77.37% Pervious Area
0.105		22.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-3: PR DA 24B-3



Summary for Subcatchment 24B-4: PR DA 24B-4

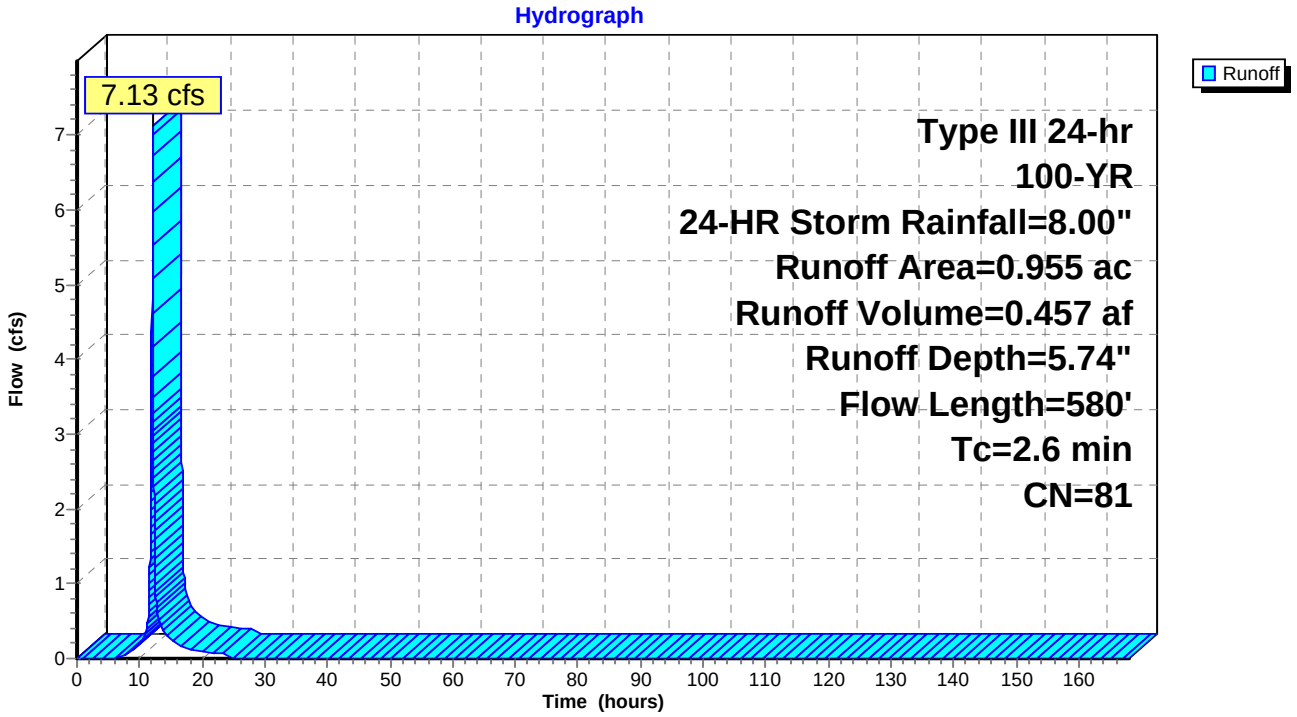
Runoff = 7.13 cfs @ 12.04 hrs, Volume= 0.457 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.007	70	Woods, Good, HSG C
0.480	74	>75% Grass cover, Good, HSG C
0.126	98	Paved roads w/curbs & sewers, HSG C
0.023	89	Gravel Shoulder, HSG C
0.011	96	Gravel surface, HSG D
0.003	77	Woods, Good, HSG D
0.231	80	>75% Grass cover, Good, HSG D
0.063	98	Paved roads w/curbs & sewers, HSG D
0.011	91	Gravel Shoulder, HSG D
0.955	81	Weighted Average
0.766		80.21% Pervious Area
0.189		19.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.5	100	0.0100	1.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	137	0.0384	8.23	67.50	**Channel Flow, DITVH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
0.8	343	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.6	580	Total			

Subcatchment 24B-4: PR DA 24B-4



Summary for Subcatchment 24C: PR DA 24C

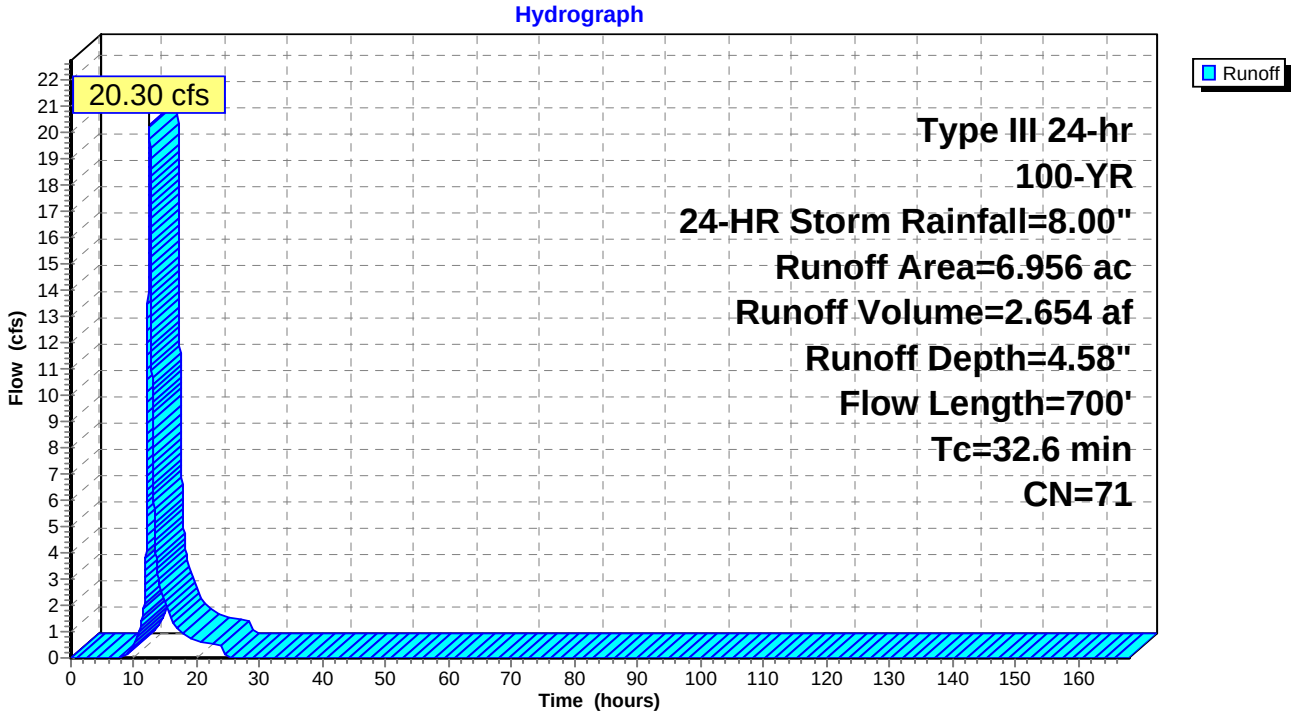
Runoff = 20.30 cfs @ 12.46 hrs, Volume= 2.654 af, Depth= 4.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
6.012	70	Woods, Good, HSG C
0.002	96	Gravel surface, HSG D
0.942	77	Woods, Good, HSG D
6.956	71	Weighted Average
6.956		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.3	150	0.0270	0.10		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
8.3	550	0.0490	1.11		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
32.6	700	Total			

Subcatchment 24C: PR DA 24C



Summary for Subcatchment 24P: 24P

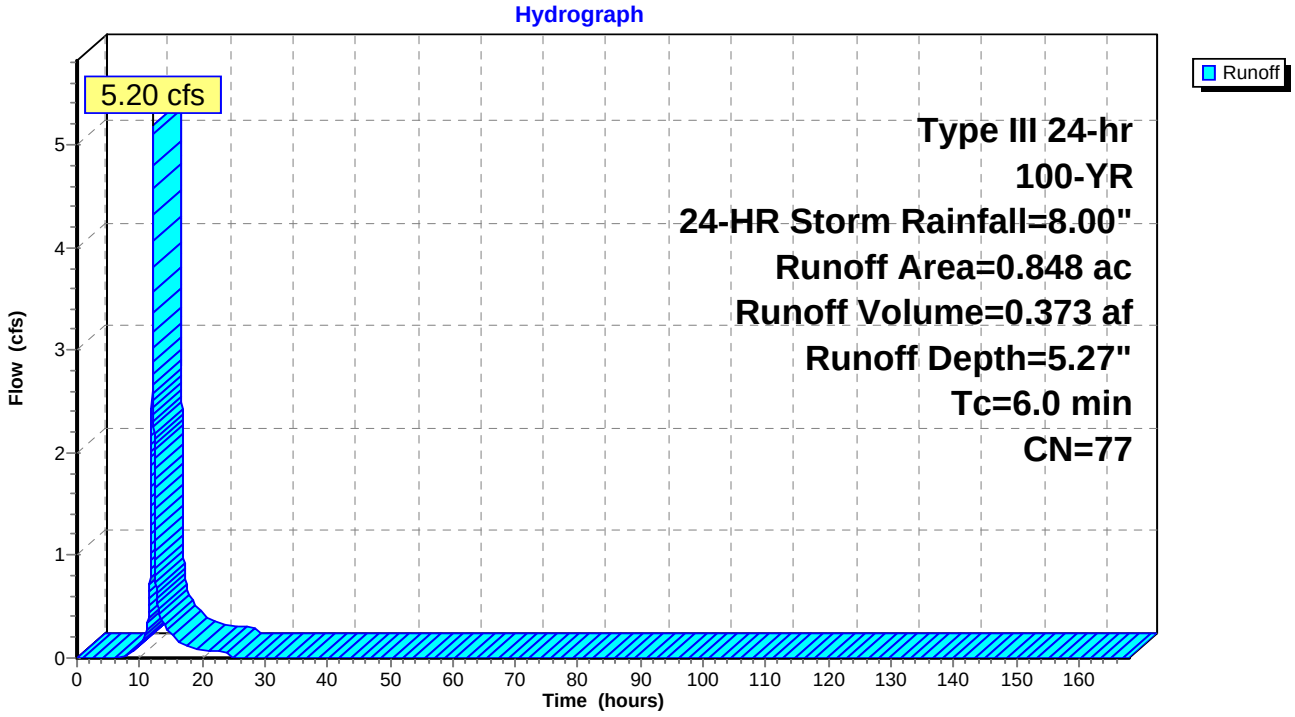
Runoff = 5.20 cfs @ 12.09 hrs, Volume= 0.373 af, Depth= 5.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.007	70	Woods, Good, HSG C
0.841	77	Woods, Good, HSG D
0.848	77	Weighted Average
0.848		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry, Direct**

Subcatchment 24P: 24P



Summary for Subcatchment 25: PR DA 25

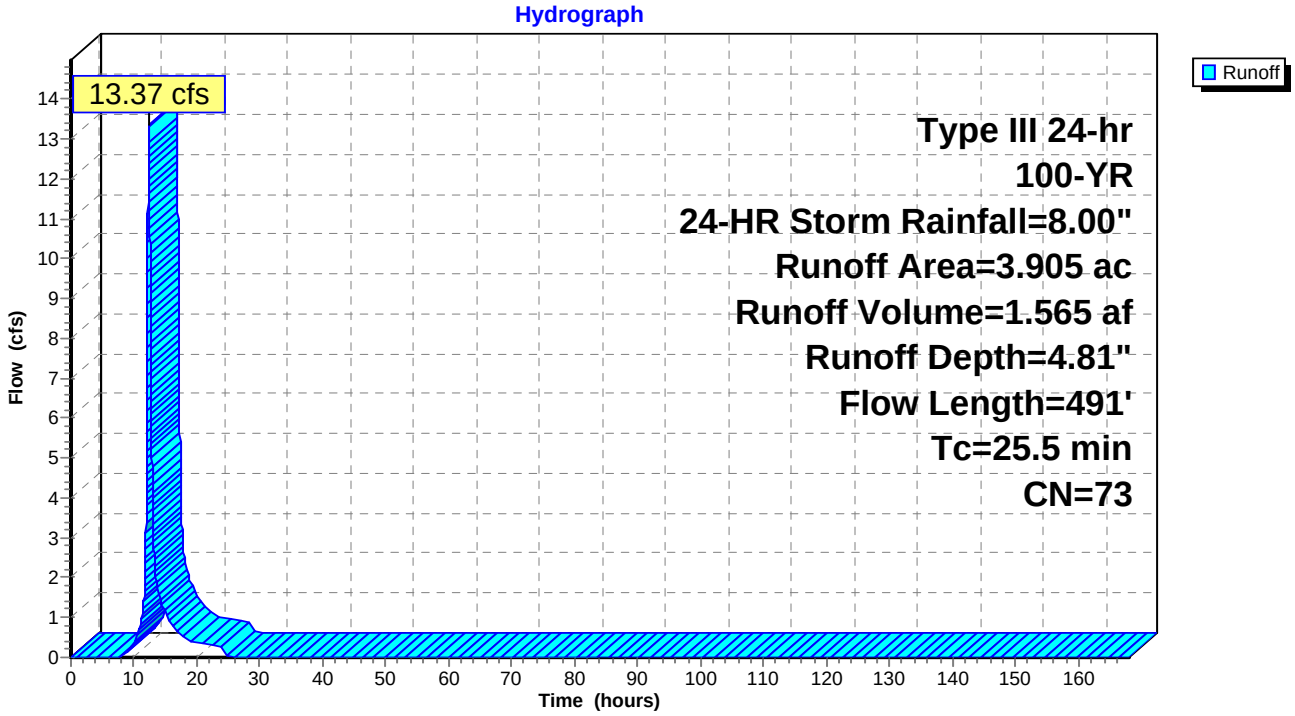
Runoff = 13.37 cfs @ 12.35 hrs, Volume= 1.565 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
2.432	70	Woods, Good, HSG C
1.473	77	Woods, Good, HSG D
3.905	73	Weighted Average
3.905		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.8	100	0.0200	0.08		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
5.2	246	0.0244	0.78		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
0.5	145	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
25.5	491	Total			

Subcatchment 25: PR DA 25



Summary for Subcatchment 25A-1: PR DA 25A-1

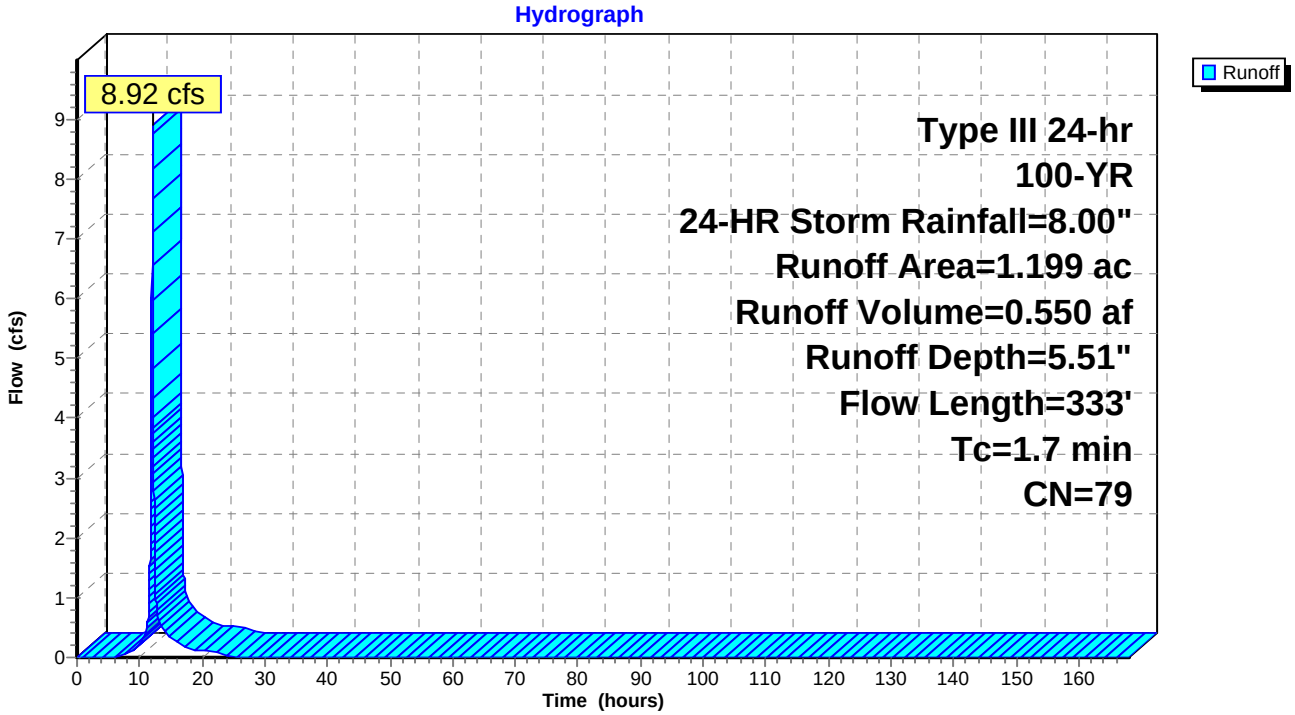
Runoff = 8.92 cfs @ 12.03 hrs, Volume= 0.550 af, Depth= 5.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.303	70	Woods, Good, HSG C
0.562	74	>75% Grass cover, Good, HSG C
0.281	98	Paved roads w/curbs & sewers, HSG C
0.045	89	Gravel Shoulder, HSG C
0.008	77	Woods, Good, HSG D
1.199	79	Weighted Average
0.918		76.56% Pervious Area
0.281		23.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	65	0.0200	1.37		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.9	268	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	333	Total			

Subcatchment 25A-1: PR DA 25A-1



Summary for Subcatchment 25A-2: PR DA 25A-2

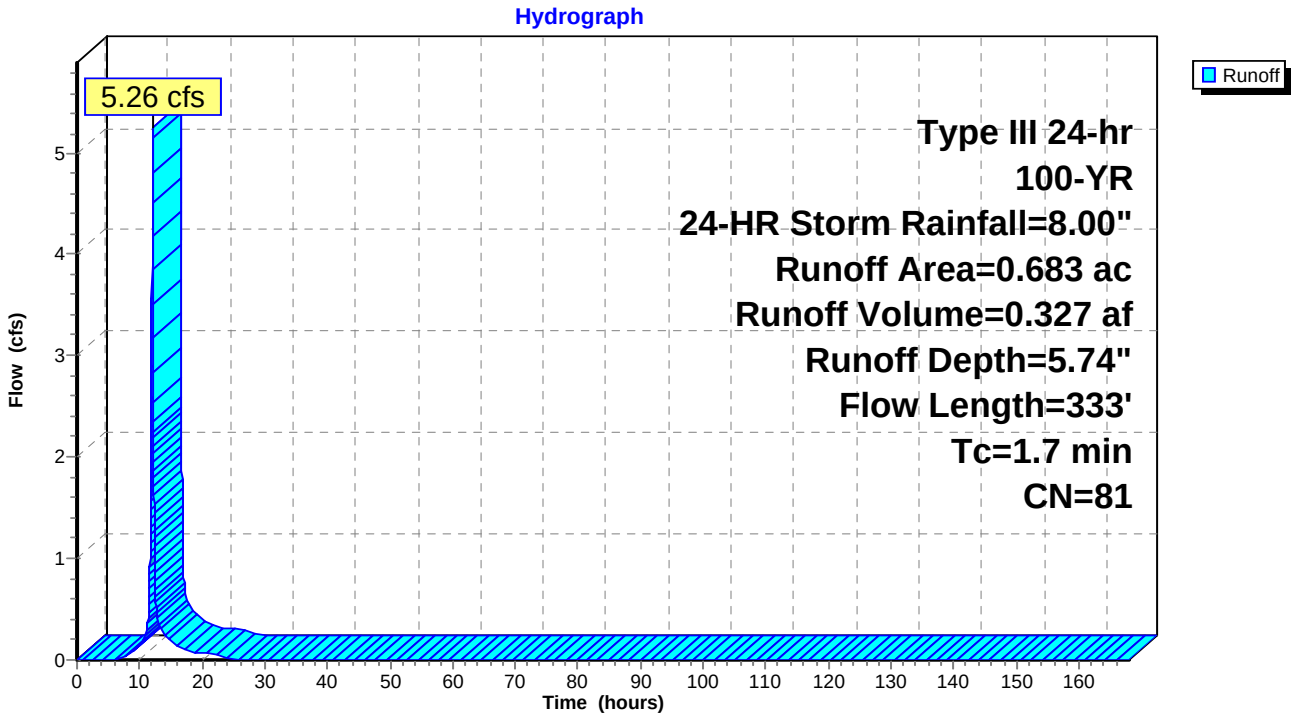
Runoff = 5.26 cfs @ 12.03 hrs, Volume= 0.327 af, Depth= 5.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.177	70	Woods, Good, HSG C
0.258	74	>75% Grass cover, Good, HSG C
0.219	98	Paved roads w/curbs & sewers, HSG C
0.029	89	Gravel Shoulder, HSG C
0.683	81	Weighted Average
0.464		67.94% Pervious Area
0.219		32.06% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	65	0.0200	1.37		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.9	268	0.0140	4.97	40.76	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.7	333	Total			

Subcatchment 25A-2: PR DA 25A-2



Summary for Subcatchment 25B-1: PR DA 25B-1

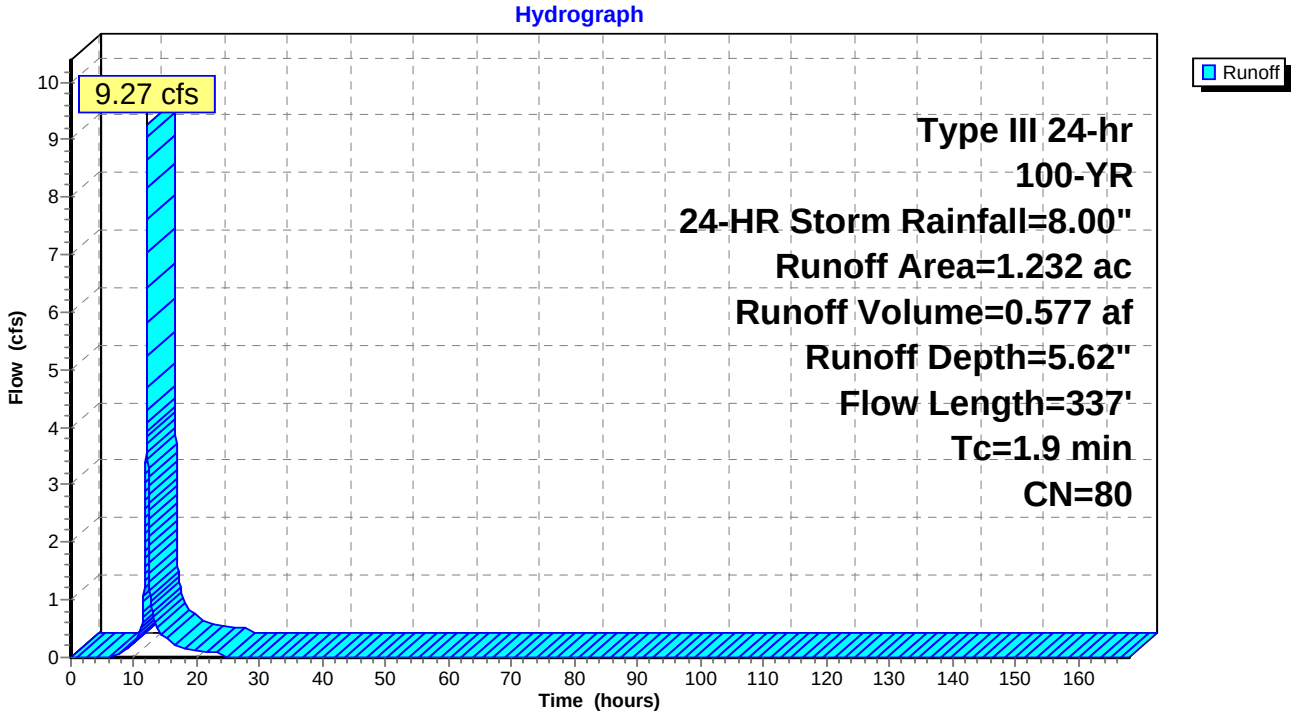
Runoff = 9.27 cfs @ 12.03 hrs, Volume= 0.577 af, Depth= 5.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.922	74	>75% Grass cover, Good, HSG C
0.262	98	Paved roads w/curbs & sewers, HSG C
0.048	89	Gravel Shoulder, HSG C
1.232	80	Weighted Average
0.970		78.73% Pervious Area
0.262		21.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	237	0.0127	4.73	38.82	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.9	337	Total			

Subcatchment 25B-1: PR DA 25B-1



Summary for Subcatchment 25B-2: PR DA 25B-2

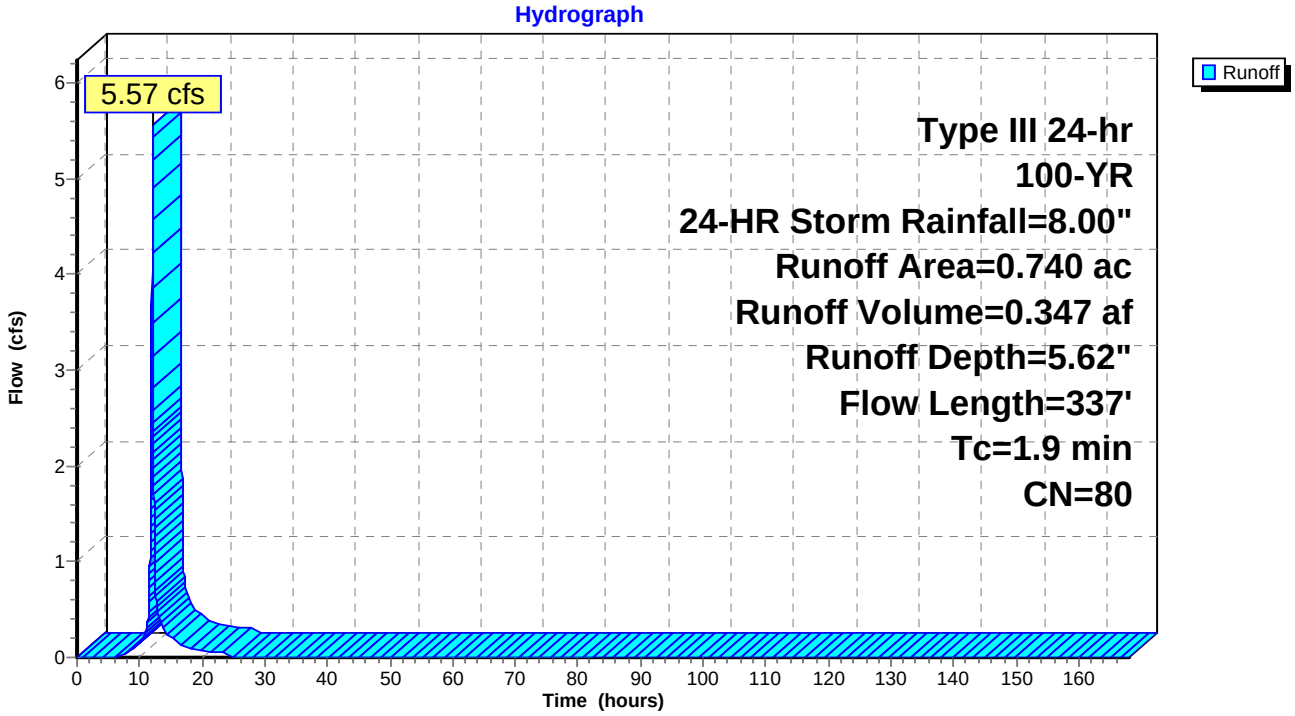
Runoff = 5.57 cfs @ 12.03 hrs, Volume= 0.347 af, Depth= 5.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.538	74	>75% Grass cover, Good, HSG C
0.171	98	Paved roads w/curbs & sewers, HSG C
0.031	89	Gravel Shoulder, HSG C
0.740	80	Weighted Average
0.569		76.89% Pervious Area
0.171		23.11% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.8	237	0.0127	4.73	38.82	**Channel Flow, DITCH** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.9	337	Total			

Subcatchment 25B-2: PR DA 25B-2



Summary for Subcatchment 25C: PR DA 25C

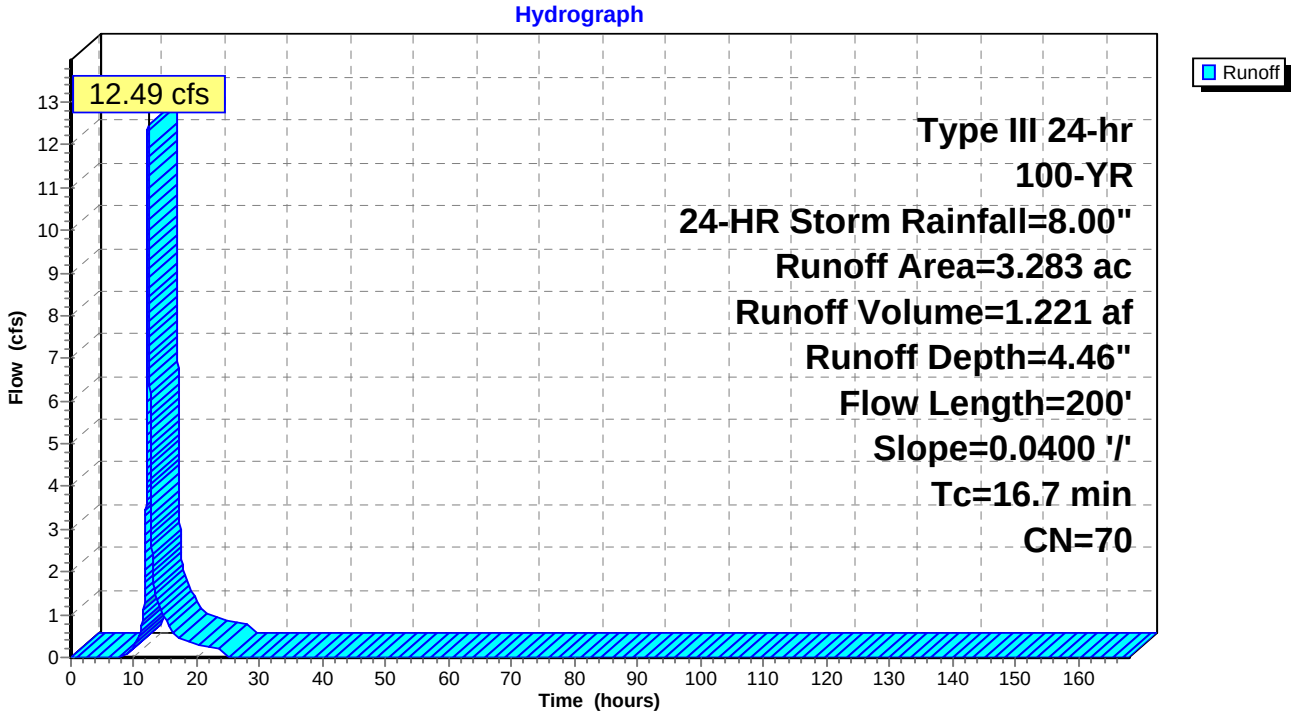
Runoff = 12.49 cfs @ 12.23 hrs, Volume= 1.221 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.023	71	Meadow, non-grazed, HSG C
3.126	70	Woods, Good, HSG C
0.013	78	Meadow, non-grazed, HSG D
0.121	77	Woods, Good, HSG D
3.283	70	Weighted Average
3.283		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0400	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
1.7	100	0.0400	1.00		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
16.7	200	Total			

Subcatchment 25C: PR DA 25C



Summary for Subcatchment 25D: PR DA 25D

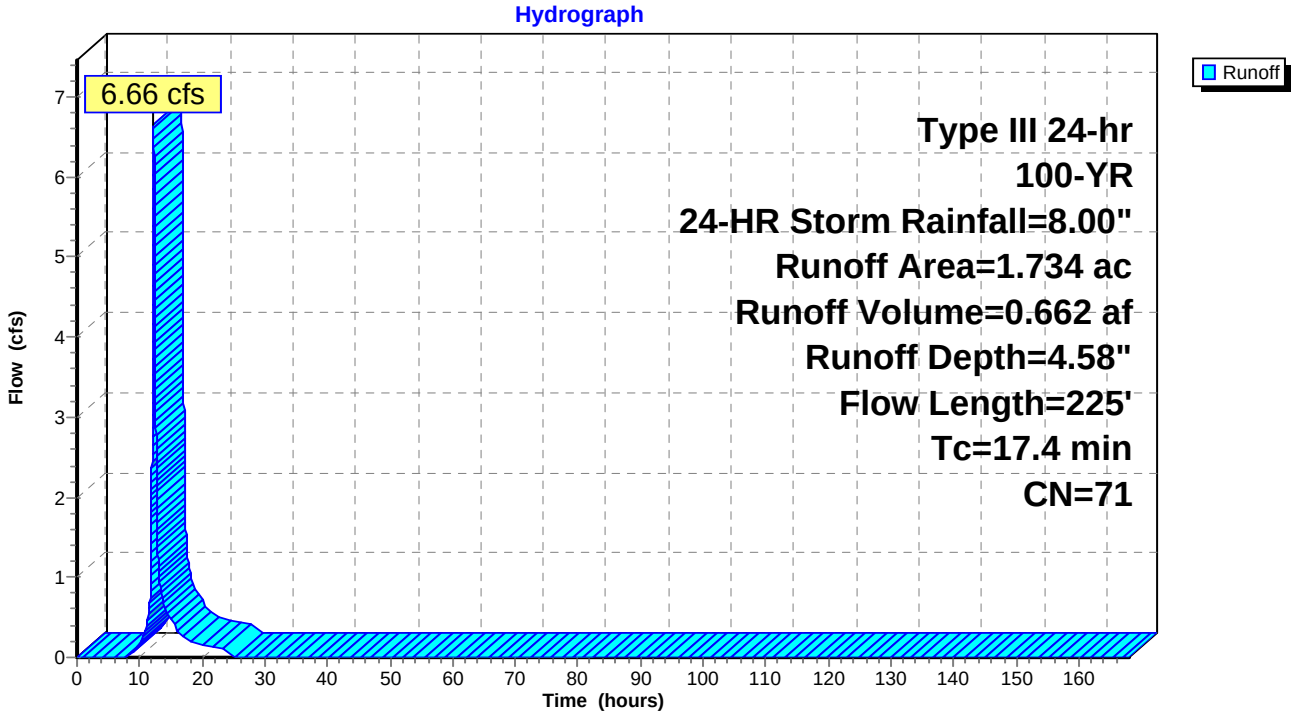
Runoff = 6.66 cfs @ 12.24 hrs, Volume= 0.662 af, Depth= 4.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.543	71	Meadow, non-grazed, HSG C
1.095	70	Woods, Good, HSG C
0.093	78	Meadow, non-grazed, HSG D
0.003	77	Woods, Good, HSG D
1.734	71	Weighted Average
1.734		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.0	100	0.0400	0.11		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
2.4	125	0.0300	0.87		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
17.4	225	Total			

Subcatchment 25D: PR DA 25D



Summary for Subcatchment 26: PR DA 26

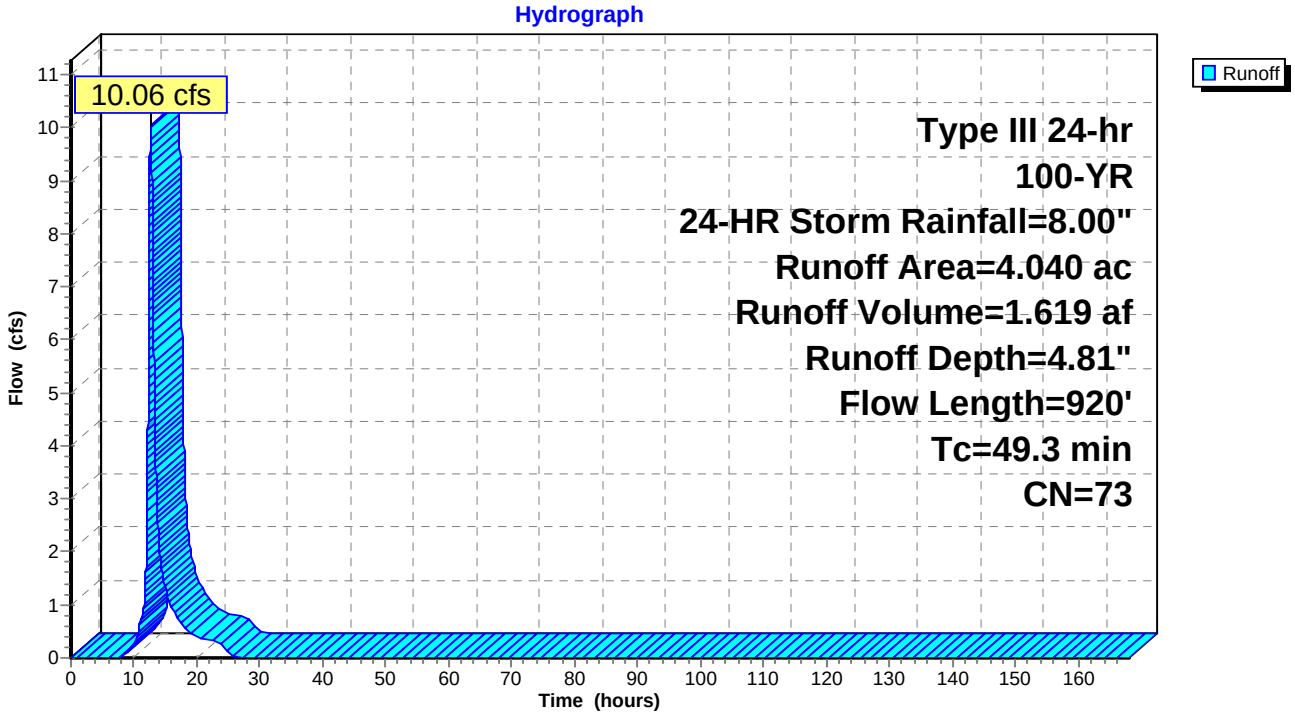
Runoff = 10.06 cfs @ 12.66 hrs, Volume= 1.619 af, Depth= 4.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.005	71	Meadow, non-grazed, HSG C
2.022	70	Woods, Good, HSG C
2.013	77	Woods, Good, HSG D
4.040	73	Weighted Average
4.040		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
13.1	770	0.0384	0.98		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
49.3	920	Total			

Subcatchment 26: PR DA 26



Summary for Subcatchment 26A-1: PR DA 26A-1

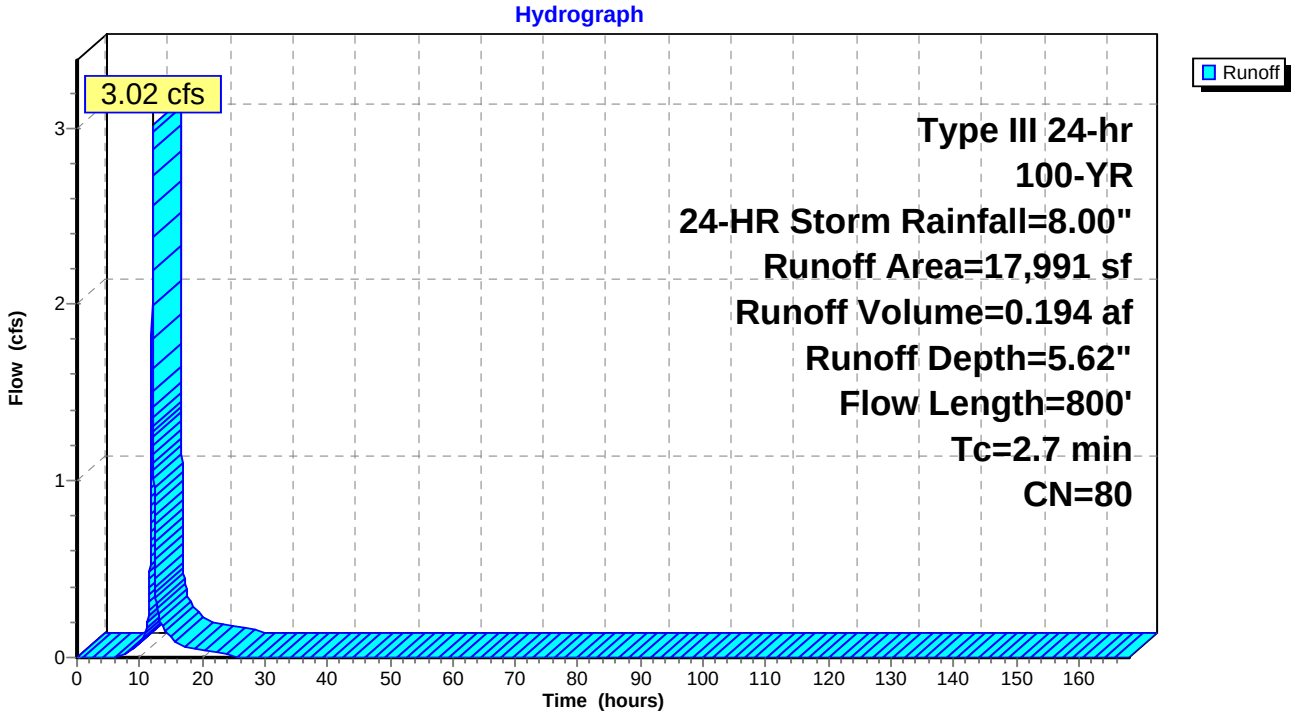
Runoff = 3.02 cfs @ 12.04 hrs, Volume= 0.194 af, Depth= 5.62"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (sf)	CN	Description
	4,879	70	Woods, Good, HSG C
	7,312	74	>75% Grass cover, Good, HSG C
	4,885	98	Paved roads w/curbs & sewers, HSG C
*	915	89	Gravel Shoulder, HSG C
	17,991	80	Weighted Average
	13,106		72.85% Pervious Area
	4,885		27.15% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-1: PR DA 26A-1



Summary for Subcatchment 26A-2: PR DA 26A-2

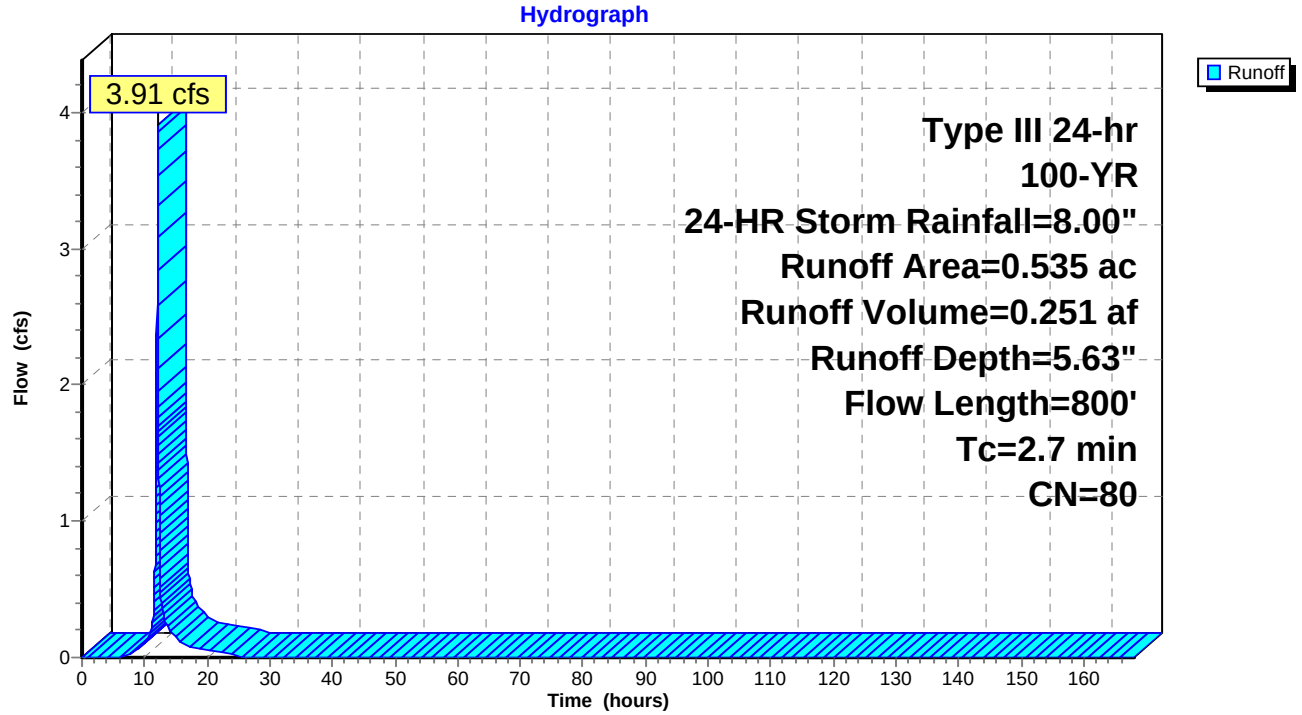
Runoff = 3.91 cfs @ 12.04 hrs, Volume= 0.251 af, Depth= 5.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.146	70	Woods, Good, HSG C
	0.222	74	>75% Grass cover, Good, HSG C
	0.140	98	Paved roads w/curbs & sewers, HSG C
*	0.027	89	Gravel Shoulder, HSG C
	0.535	80	Weighted Average
	0.395		73.83% Pervious Area
	0.140		26.17% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-2: PR DA 26A-2



Summary for Subcatchment 26A-3: PR DA 26A-3

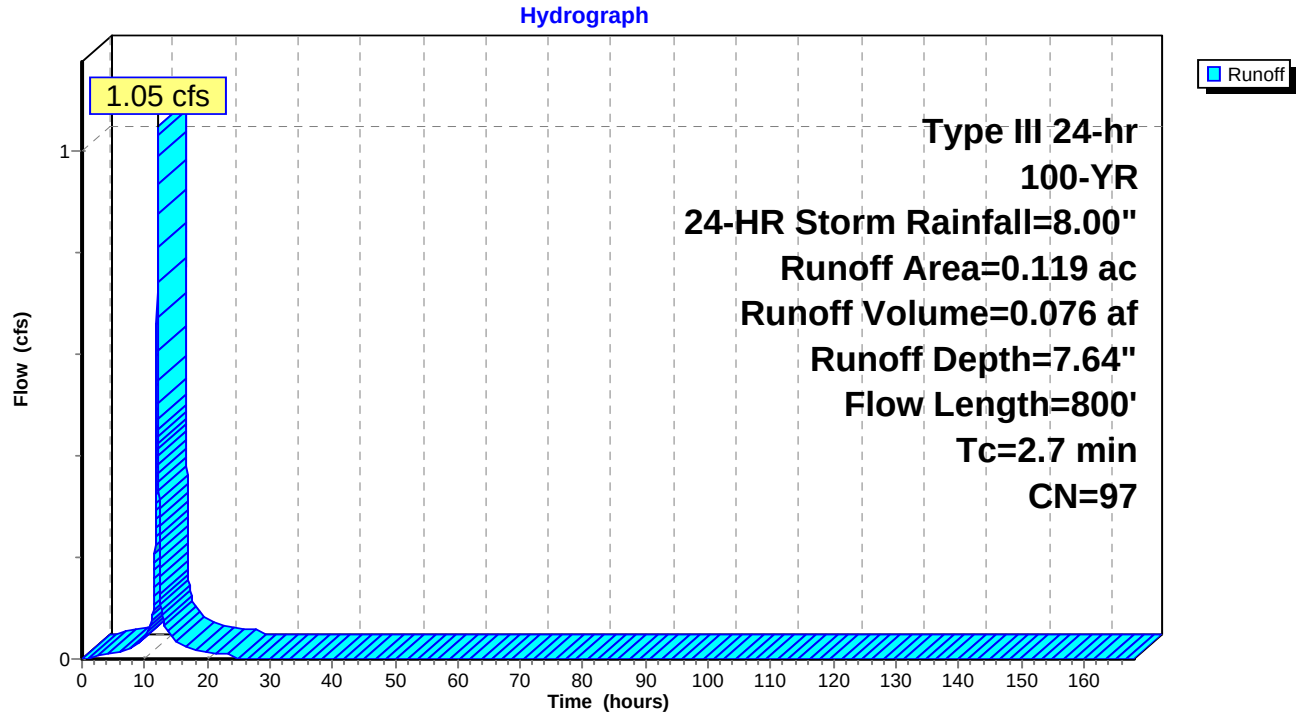
Runoff = 1.05 cfs @ 12.04 hrs, Volume= 0.076 af, Depth= 7.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.005	74	>75% Grass cover, Good, HSG C
	0.111	98	Paved roads w/curbs & sewers, HSG C
*	0.003	89	Gravel Shoulder, HSG C
	0.119	97	Weighted Average
	0.008		6.72% Pervious Area
	0.111		93.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26A-3: PR DA 26A-3



Summary for Subcatchment 26B-1: PR DA 26B-1

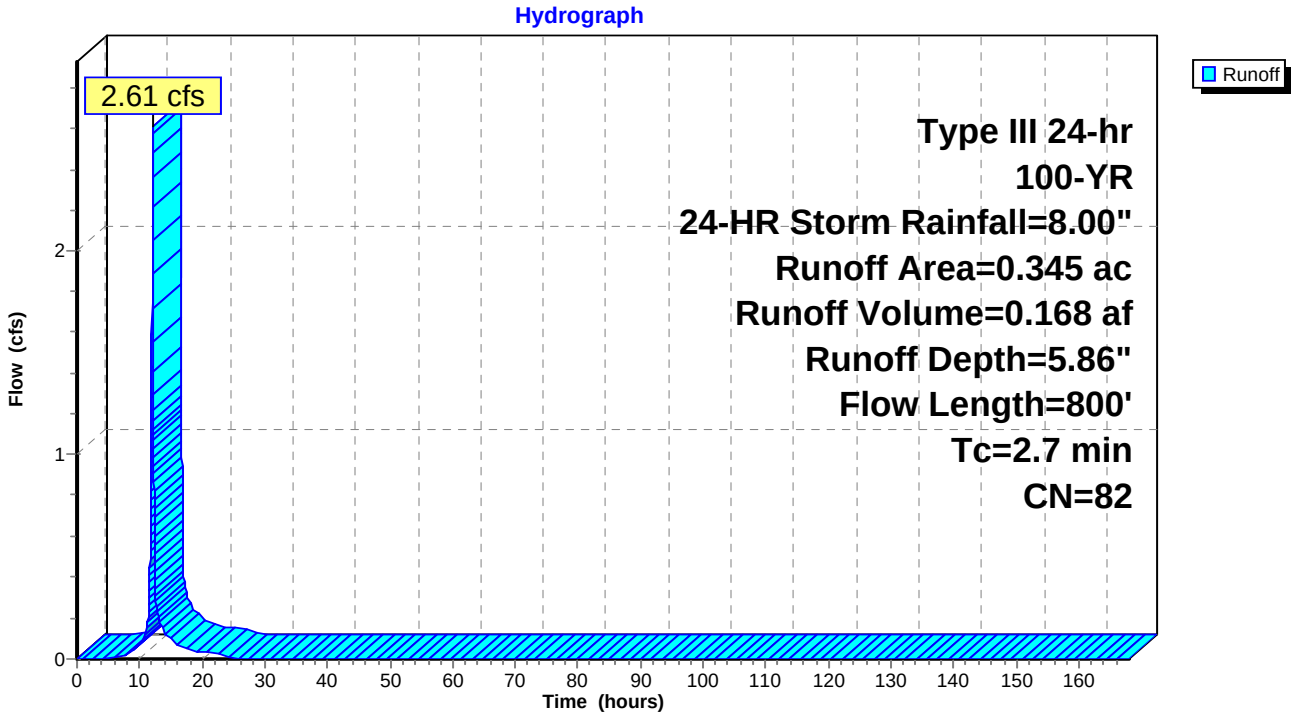
Runoff = 2.61 cfs @ 12.04 hrs, Volume= 0.168 af, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.228	74	>75% Grass cover, Good, HSG C
	0.098	98	Paved roads w/curbs & sewers, HSG C
*	0.019	89	Gravel Shoulder, HSG C
	0.345	82	Weighted Average
	0.247		71.59% Pervious Area
	0.098		28.41% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-1: PR DA 26B-1



Summary for Subcatchment 26B-2: PR DA 26B-2

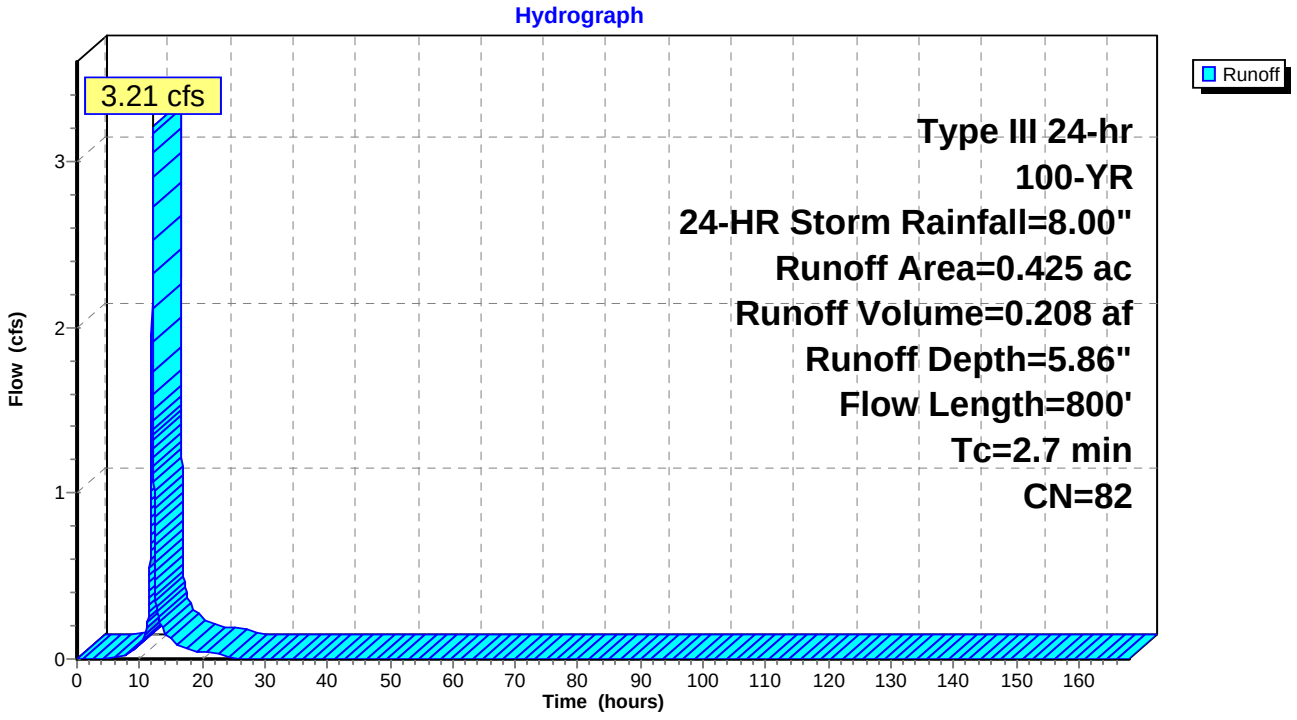
Runoff = 3.21 cfs @ 12.04 hrs, Volume= 0.208 af, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.281	74	>75% Grass cover, Good, HSG C
	0.121	98	Paved roads w/curbs & sewers, HSG C
*	0.023	89	Gravel Shoulder, HSG C
	0.425	82	Weighted Average
	0.304		71.53% Pervious Area
	0.121		28.47% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-2: PR DA 26B-2



Summary for Subcatchment 26B-3: PR DA 26B-3

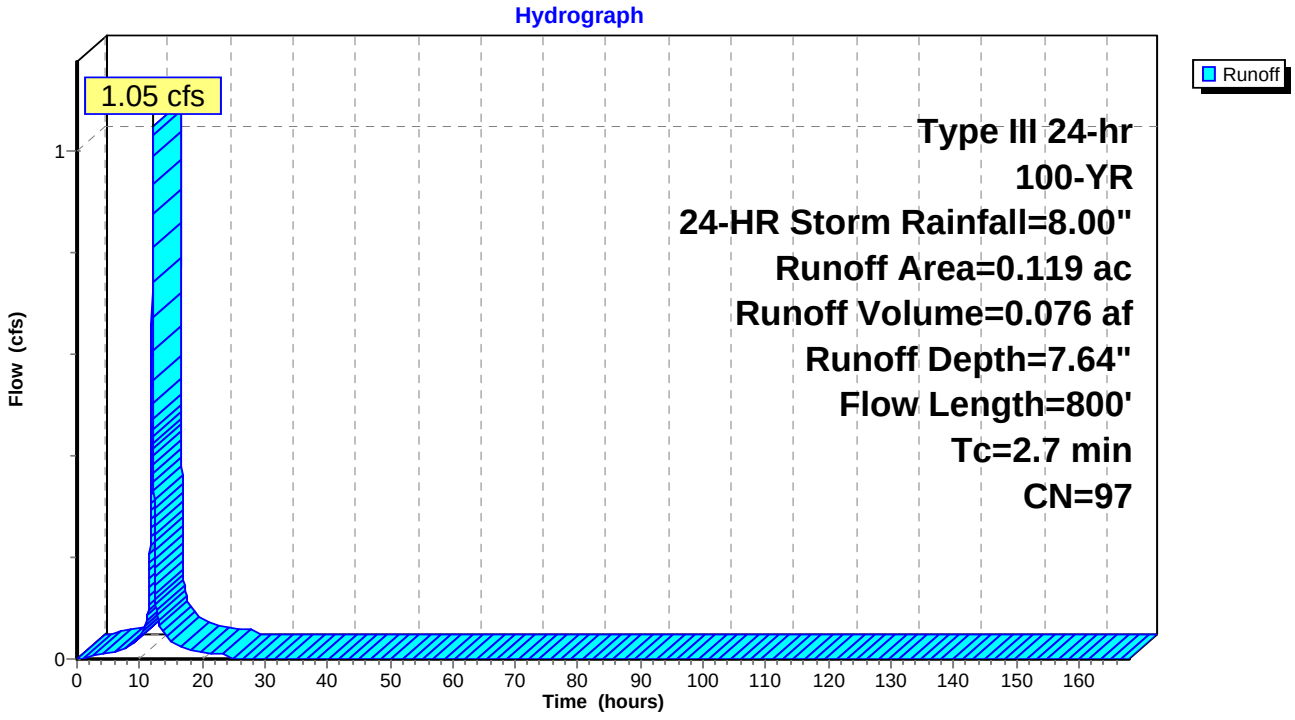
Runoff = 1.05 cfs @ 12.04 hrs, Volume= 0.076 af, Depth= 7.64"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.005	74	>75% Grass cover, Good, HSG C
	0.111	98	Paved roads w/curbs & sewers, HSG C
*	0.003	89	Gravel Shoulder, HSG C
	0.119	97	Weighted Average
	0.008		6.72% Pervious Area
	0.111		93.28% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	128	0.0345	7.80	63.98	**Channel Flow, Ditch** Area= 8.2 sf Perim= 10.5' r= 0.78' n= 0.030
1.3	572	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.7	800	Total			

Subcatchment 26B-3: PR DA 26B-3



Summary for Subcatchment 26C: PR DA 26C

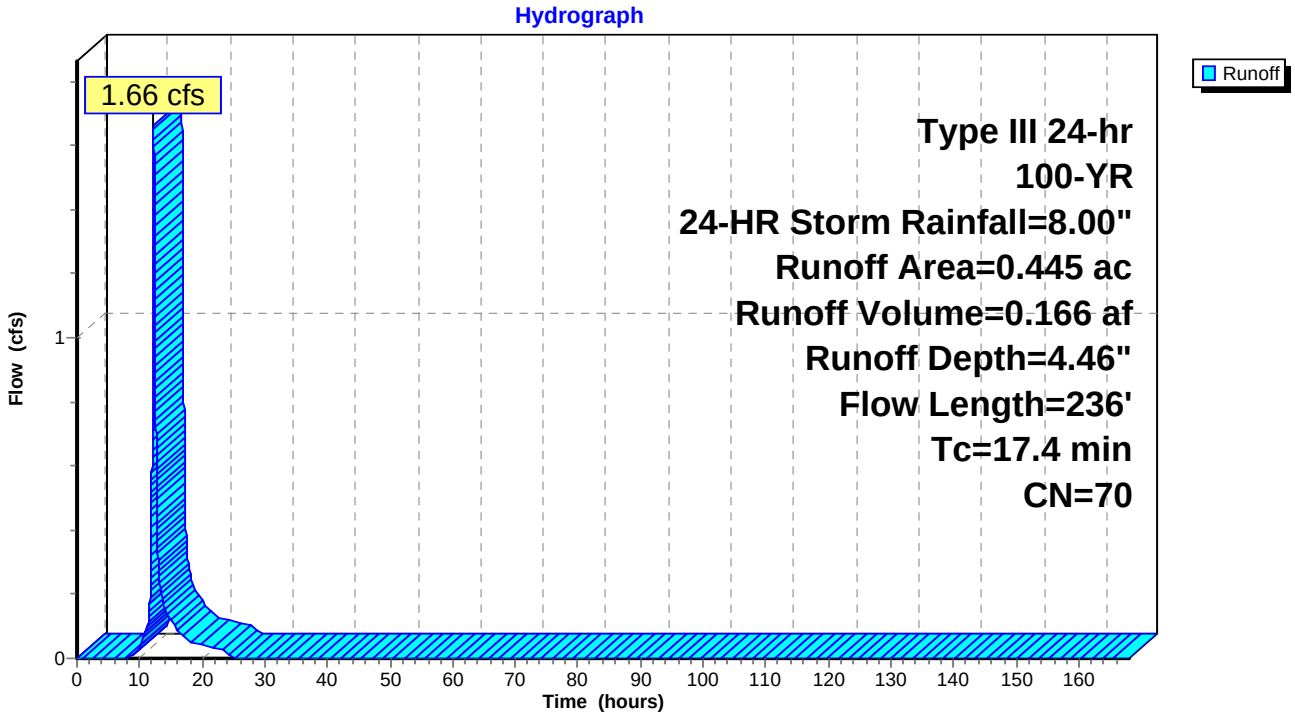
Runoff = 1.66 cfs @ 12.24 hrs, Volume= 0.166 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.176	71	Meadow, non-grazed, HSG C
0.269	70	Woods, Good, HSG C
0.445	70	Weighted Average
0.445		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
15.4	123	0.0569	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
2.0	113	0.0354	0.94		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
17.4	236	Total			

Subcatchment 26C: PR DA 26C



Summary for Subcatchment 26D: PR DA 26D

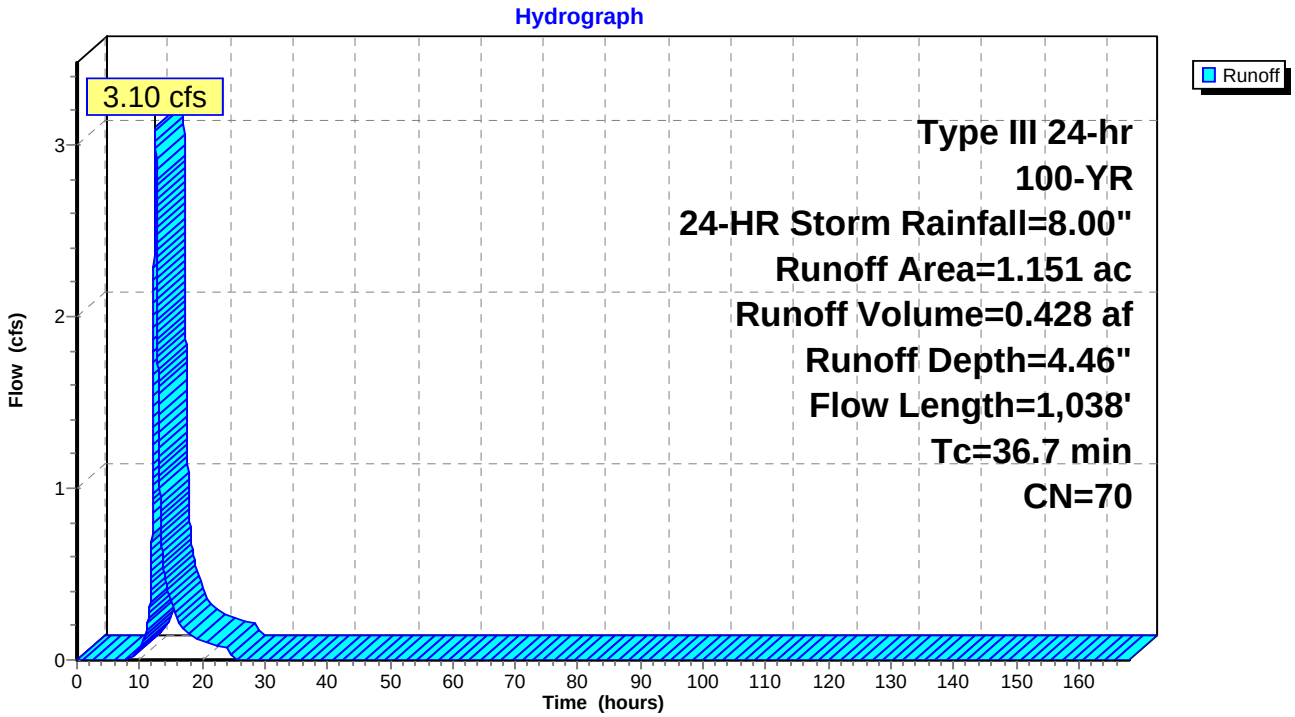
Runoff = 3.10 cfs @ 12.52 hrs, Volume= 0.428 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
1.146	70	Woods, Good, HSG C
0.005	77	Woods, Good, HSG D
1.151	70	Weighted Average
1.151		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
29.5	150	0.0167	0.08		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
5.9	315	0.0317	0.89		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
1.3	573	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
36.7	1,038	Total			

Subcatchment 26D: PR DA 26D



Summary for Subcatchment 26E: PR DA 26E

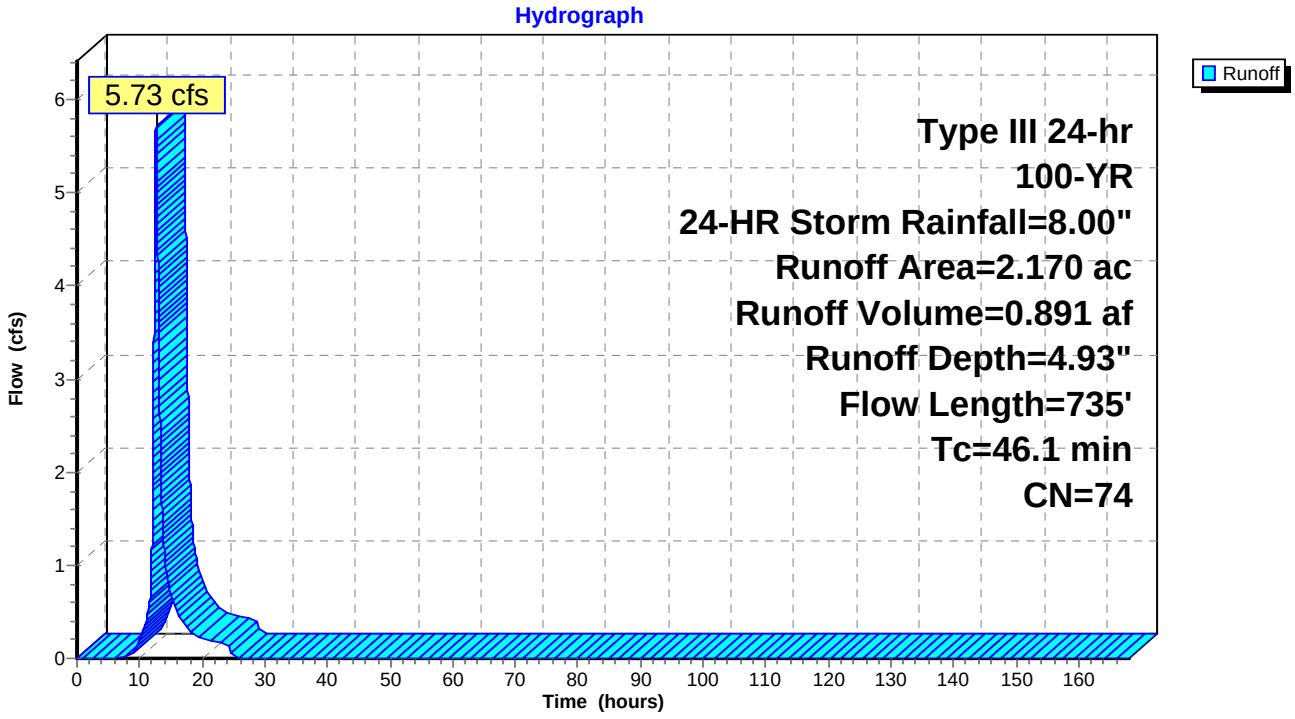
Runoff = 5.73 cfs @ 12.65 hrs, Volume= 0.891 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.900	70	Woods, Good, HSG C
1.270	77	Woods, Good, HSG D
2.170	74	Weighted Average
2.170		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
36.2	150	0.0100	0.07		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
9.9	585	0.0387	0.98		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
46.1	735	Total			

Subcatchment 26E: PR DA 26E



Summary for Subcatchment 26F: PR DA 26F

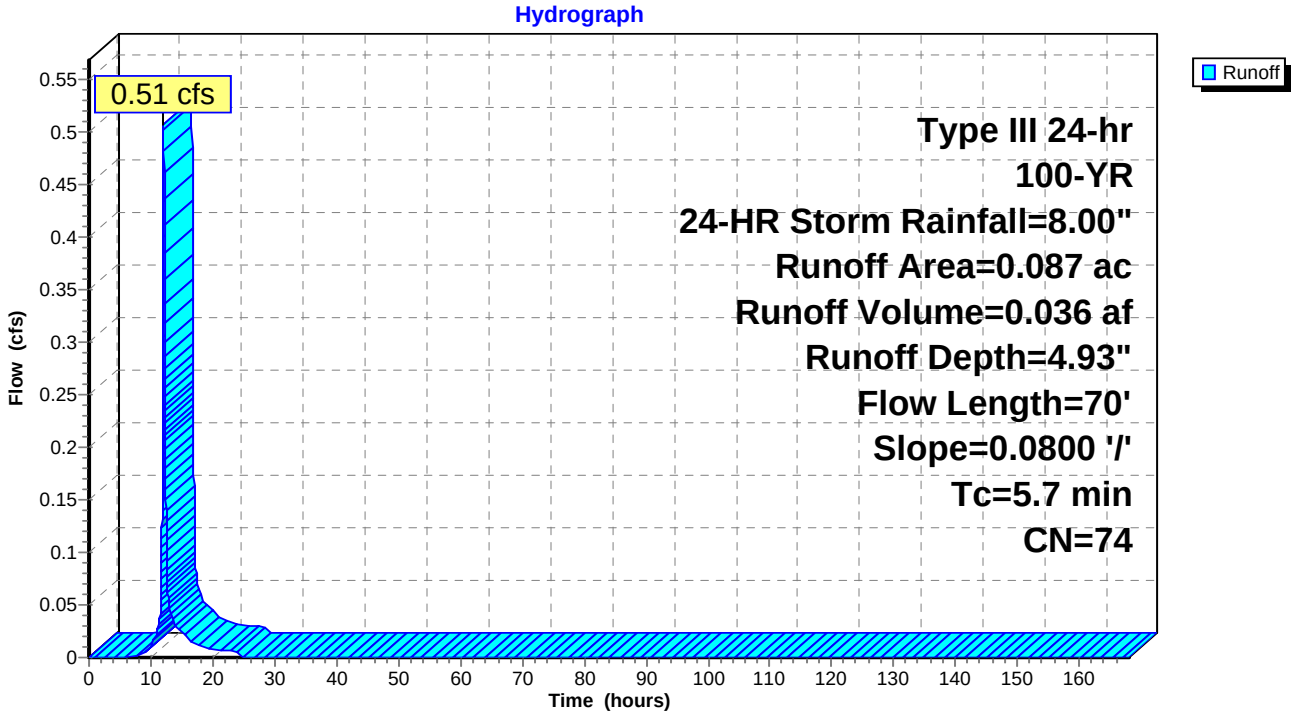
Runoff = 0.51 cfs @ 12.08 hrs, Volume= 0.036 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.087	74	>75% Grass cover, Good, HSG C
0.087		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.7	70	0.0800	0.20		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment 26F: PR DA 26F



Summary for Subcatchment 26G: PR DA 26G

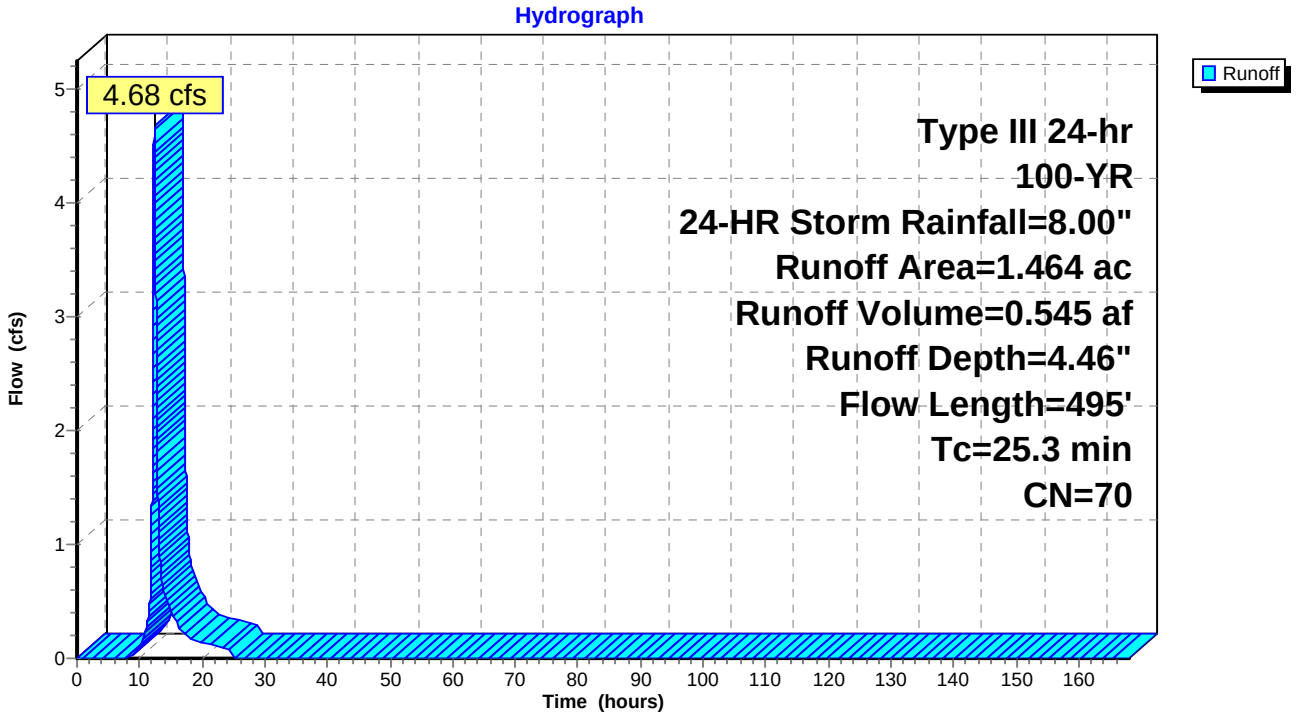
Runoff = 4.68 cfs @ 12.34 hrs, Volume= 0.545 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
1.464	70	Woods, Good, HSG C
1.464		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.5	150	0.0467	0.13		**Sheet Flow, 150** Woods: Light underbrush n= 0.400 P2= 3.75"
5.7	345	0.0400	1.00		**Shallow Concentrated Flow, Shallow Concentrated** Woodland Kv= 5.0 fps
25.3	495	Total			

Subcatchment 26G: PR DA 26G



Summary for Subcatchment 28A: PR DA 28A

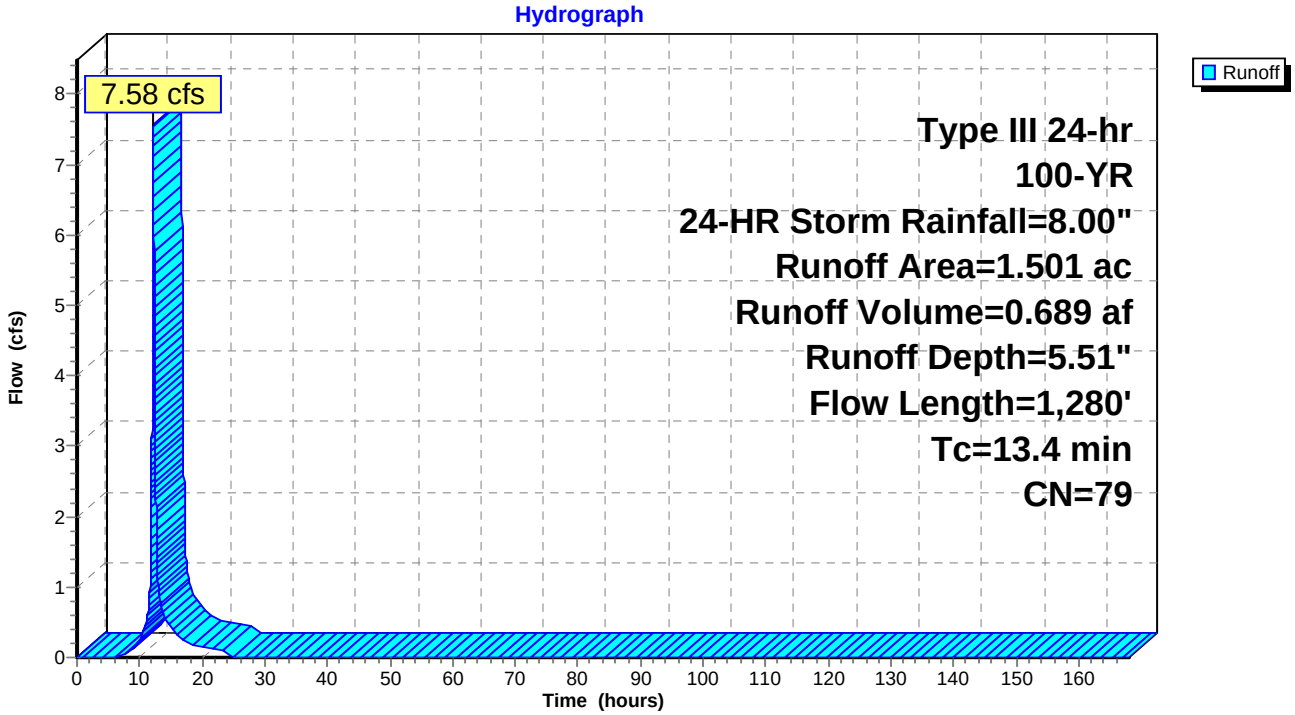
Runoff = 7.58 cfs @ 12.18 hrs, Volume= 0.689 af, Depth= 5.51"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
1.177	74	>75% Grass cover, Good, HSG C
0.324	98	Paved roads w/curbs & sewers, HSG C
1.501	79	Weighted Average
1.177		78.41% Pervious Area
0.324		21.59% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
8.7	150	0.0500	0.29		**Sheet Flow, SF** Grass: Short n= 0.150 P2= 3.75"
4.3	930	0.0500	3.60		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps
0.4	200	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
13.4	1,280	Total			

Subcatchment 28A: PR DA 28A



Summary for Subcatchment 28B: PR DA 28B

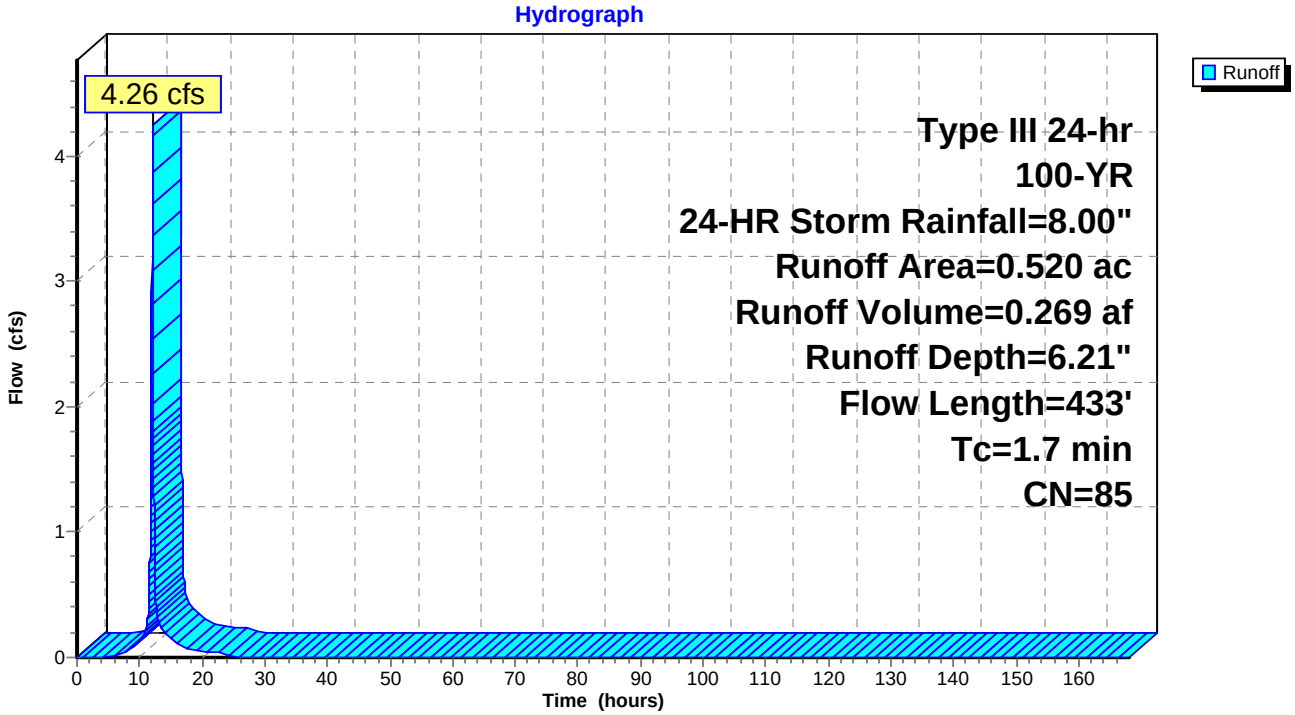
Runoff = 4.26 cfs @ 12.03 hrs, Volume= 0.269 af, Depth= 6.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.271	74	>75% Grass cover, Good, HSG C
0.249	98	Paved roads w/curbs & sewers, HSG C
0.520	85	Weighted Average
0.271		52.12% Pervious Area
0.249		47.88% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.4	183	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	433	Total			

Subcatchment 28B: PR DA 28B



Summary for Subcatchment 28C: PR DA 28C

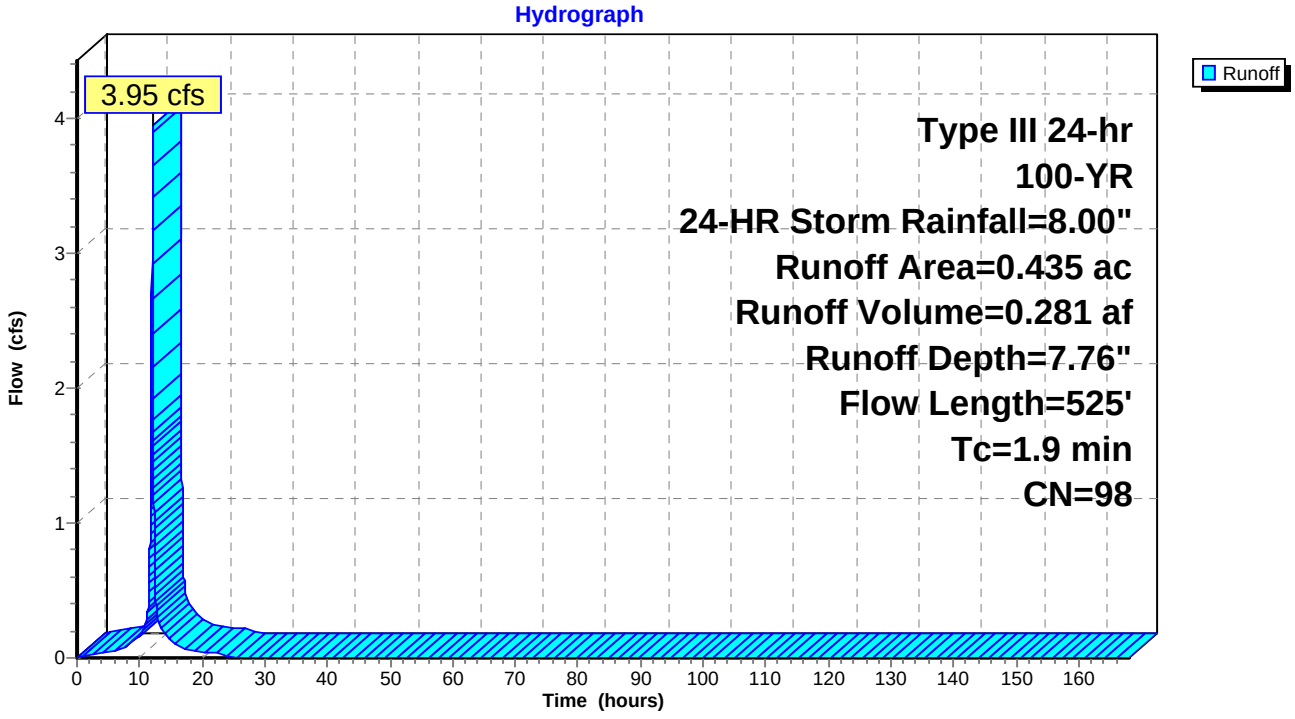
Runoff = 3.95 cfs @ 12.03 hrs, Volume= 0.281 af, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.435	98	Paved roads w/curbs & sewers, HSG C
0.435		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.6	275	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.9	525	Total			

Subcatchment 28C: PR DA 28C



Summary for Subcatchment 28D: PR DA 28D

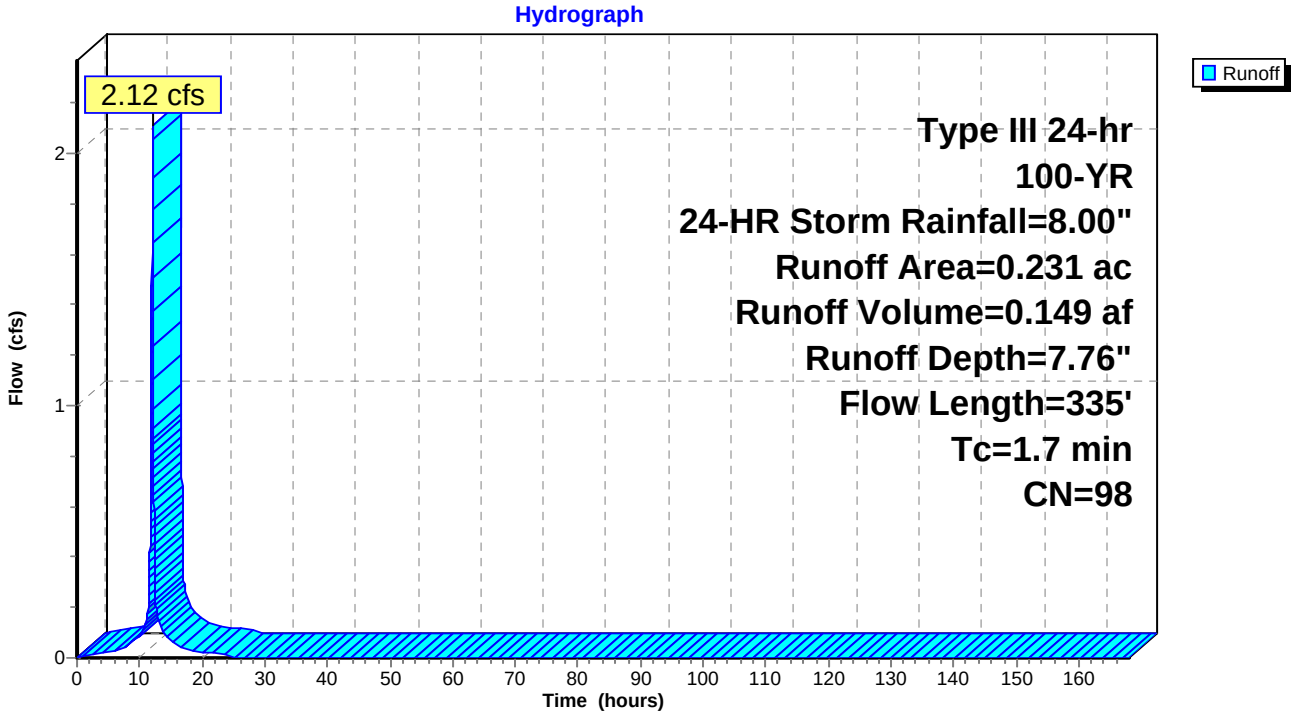
Runoff = 2.12 cfs @ 12.02 hrs, Volume= 0.149 af, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.231	98	Paved roads w/curbs & sewers, HSG C
0.231		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	150	0.0400	2.13		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.2	50	0.0400	4.06		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.3	135	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.7	335	Total			

Subcatchment 28D: PR DA 28D



Summary for Subcatchment 28E: PR DA 28E

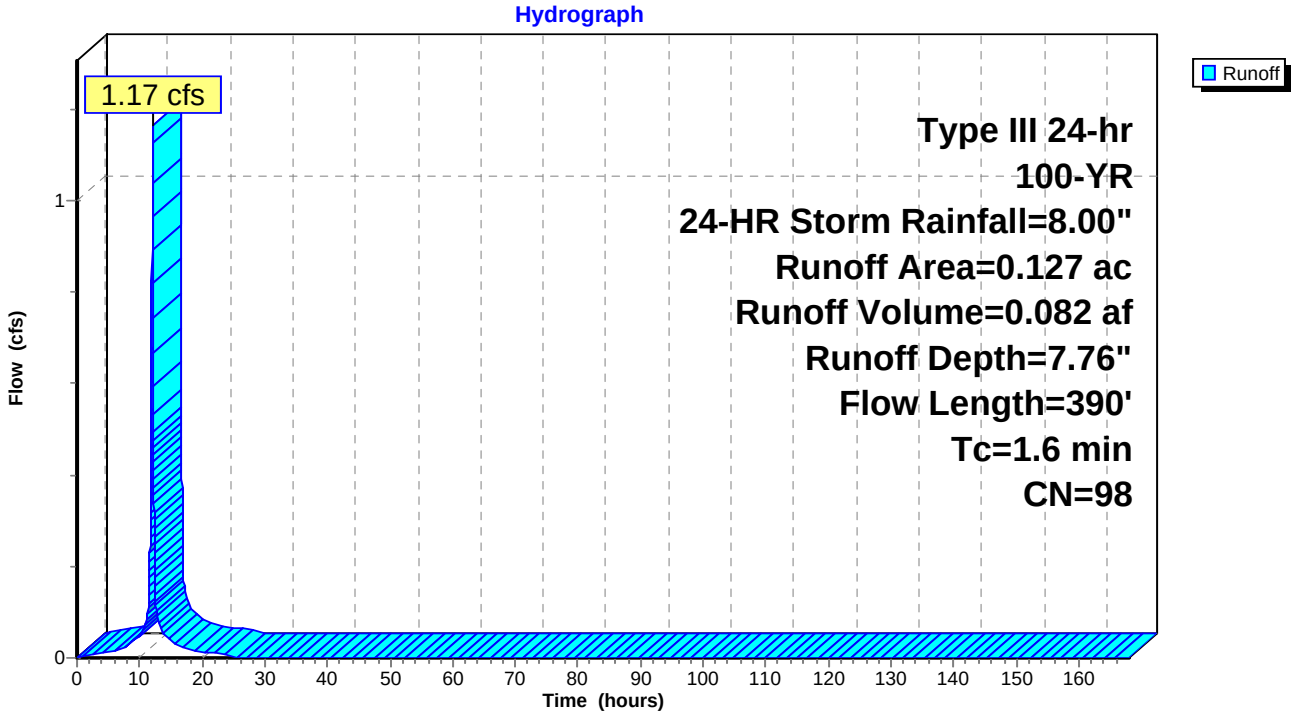
Runoff = 1.17 cfs @ 12.02 hrs, Volume= 0.082 af, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.127	98	Paved roads w/curbs & sewers, HSG C
0.127		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0600	2.51		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.3	100	0.0600	4.97		**Shallow Concentrated Flow, SC** Paved Kv= 20.3 fps
0.3	140	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.6	390	Total			

Subcatchment 28E: PR DA 28E



Summary for Subcatchment 28F: PR DA 28F

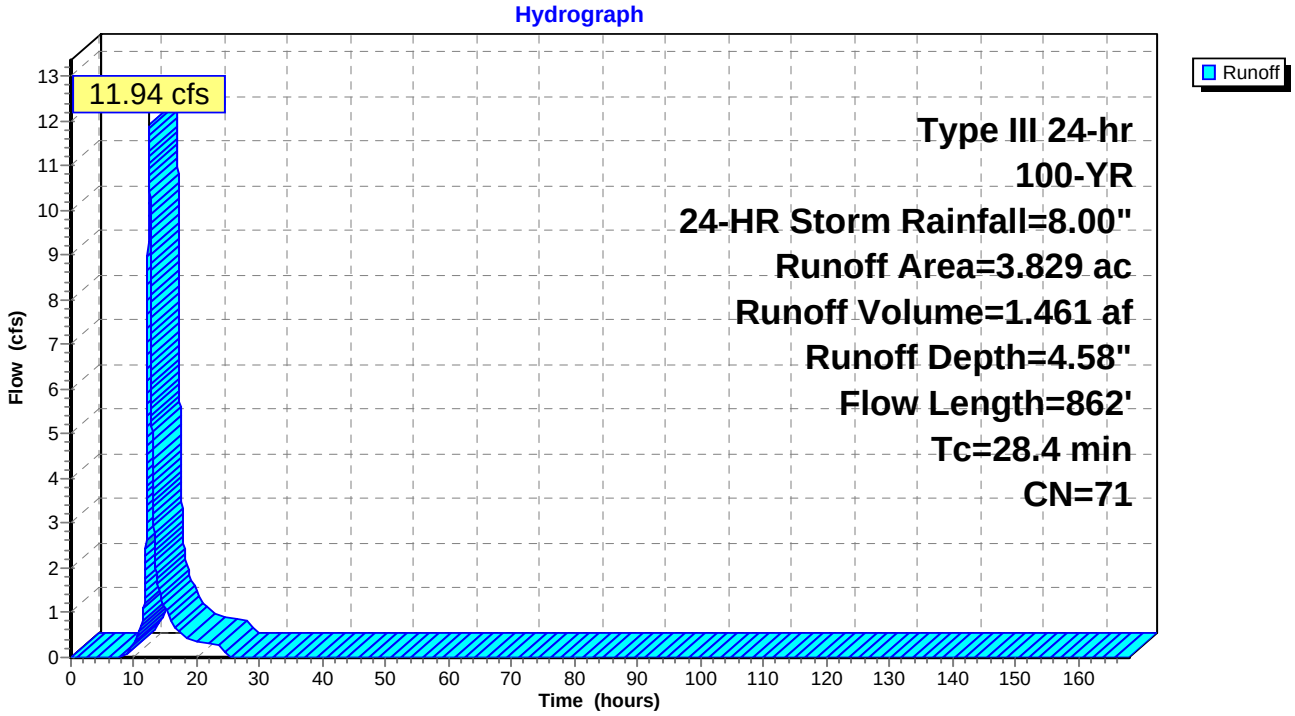
Runoff = 11.94 cfs @ 12.40 hrs, Volume= 1.461 af, Depth= 4.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.011	71	Meadow, non-grazed, HSG C
0.060	98	Unconnected pavement, HSG C
0.571	74	>75% Grass cover, Good, HSG C
3.187	70	Woods, Good, HSG C
3.829	71	Weighted Average
3.769		98.43% Pervious Area
0.060		1.57% Impervious Area
0.060		100.00% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
19.0	150	0.0500	0.13		**Sheet Flow, SF** Woods: Light underbrush n= 0.400 P2= 3.75"
9.4	712	0.0640	1.26		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
28.4	862	Total			

Subcatchment 28F: PR DA 28F



Summary for Subcatchment 28G: PR DA 28G

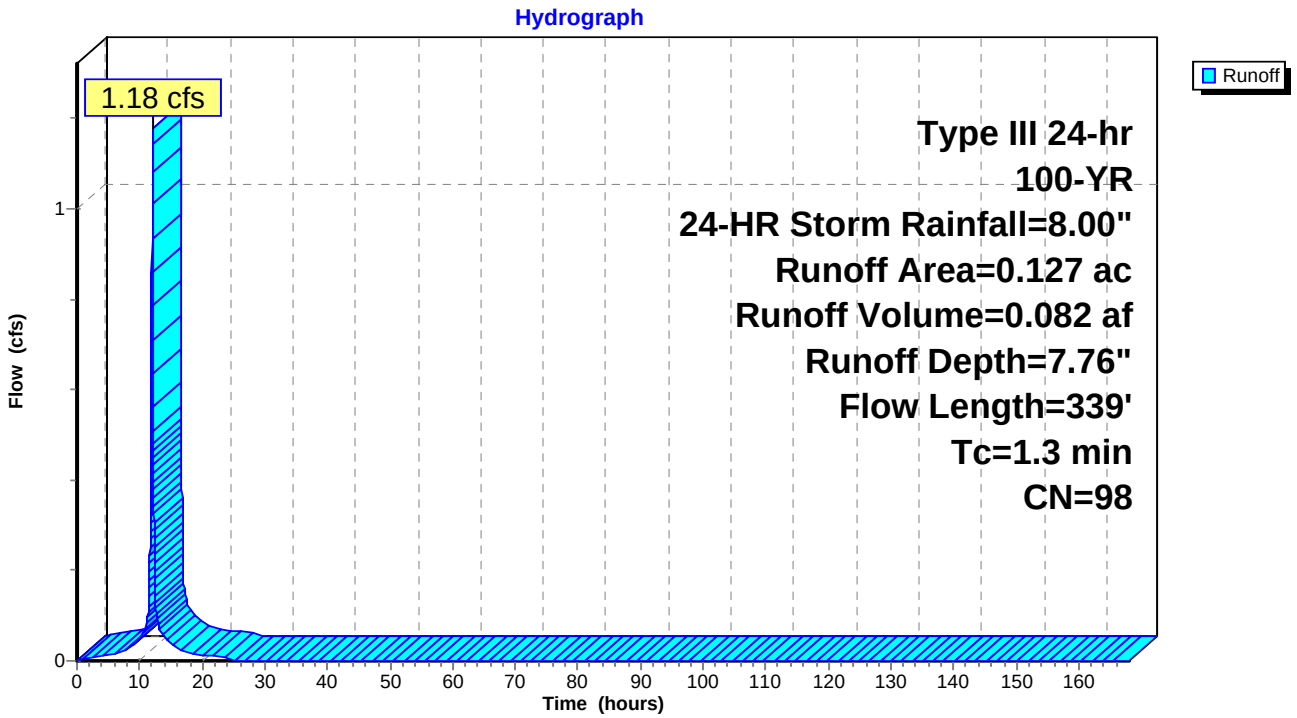
Runoff = 1.18 cfs @ 12.02 hrs, Volume= 0.082 af, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.127	98	Paved roads w/curbs & sewers, HSG C
0.127		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	113	0.0670	2.47		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.5	226	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.3	339	Total			

Subcatchment 28G: PR DA 28G



Summary for Subcatchment 28H: PR DA 28H

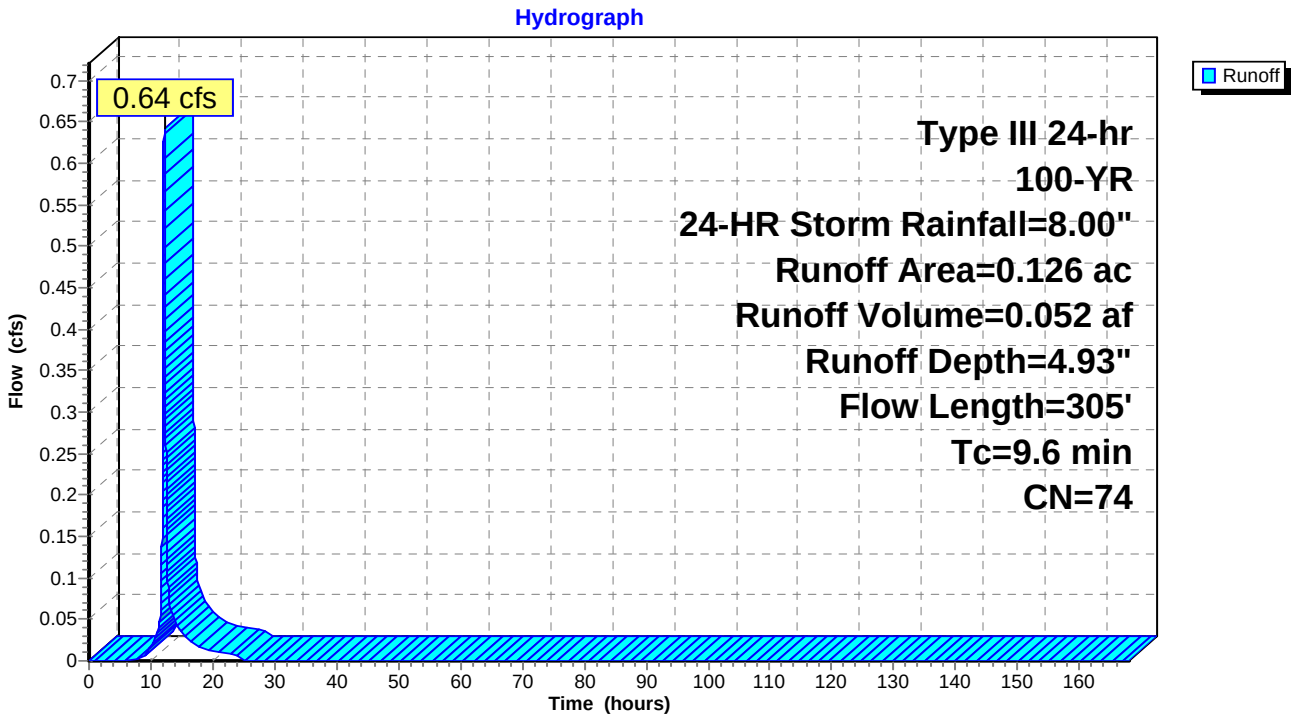
Runoff = 0.64 cfs @ 12.13 hrs, Volume= 0.052 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.126	74	>75% Grass cover, Good, HSG C
0.126		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
9.2	120	0.0700	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"
0.4	185	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
9.6	305	Total			

Subcatchment 28H: PR DA 28H



Summary for Subcatchment 28I: PR DA 28I

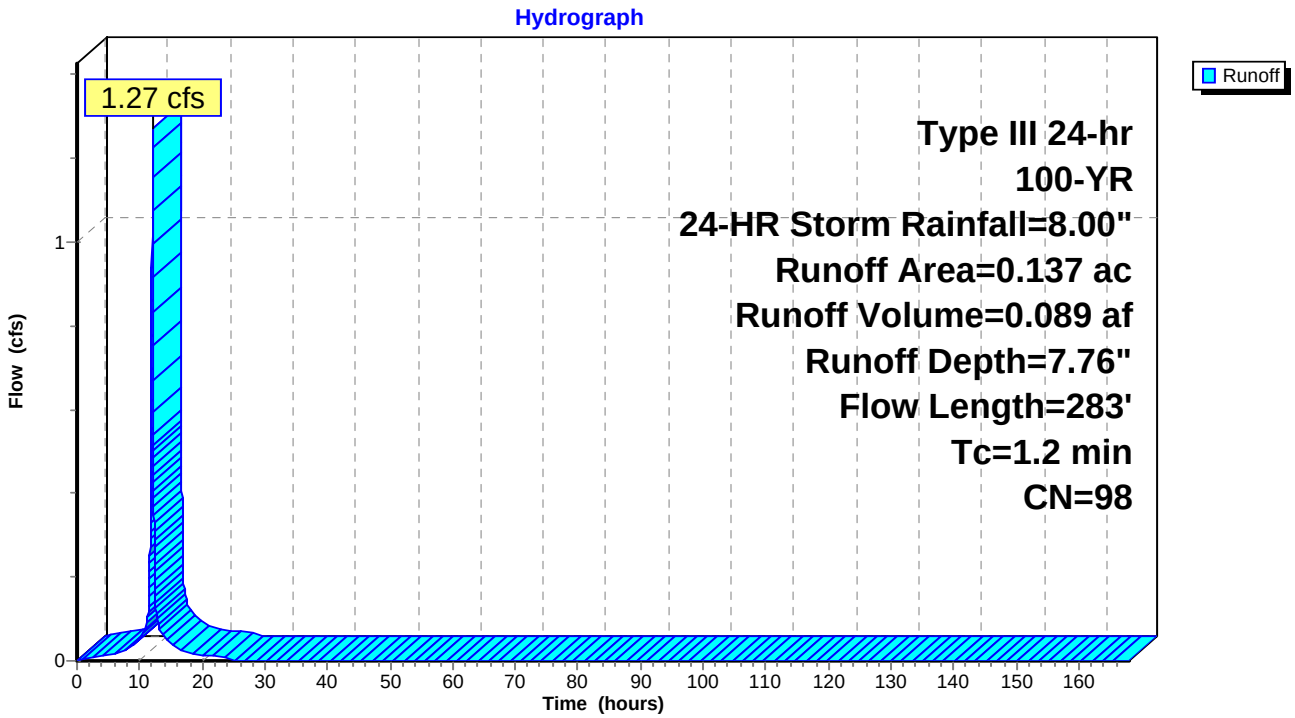
Runoff = 1.27 cfs @ 12.02 hrs, Volume= 0.089 af, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.137	98	Paved roads w/curbs & sewers, HSG C
0.137		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	118	0.0670	2.50		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.4	165	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.2	283	Total			

Subcatchment 28I: PR DA 28I



Summary for Subcatchment 31: PR DA 31

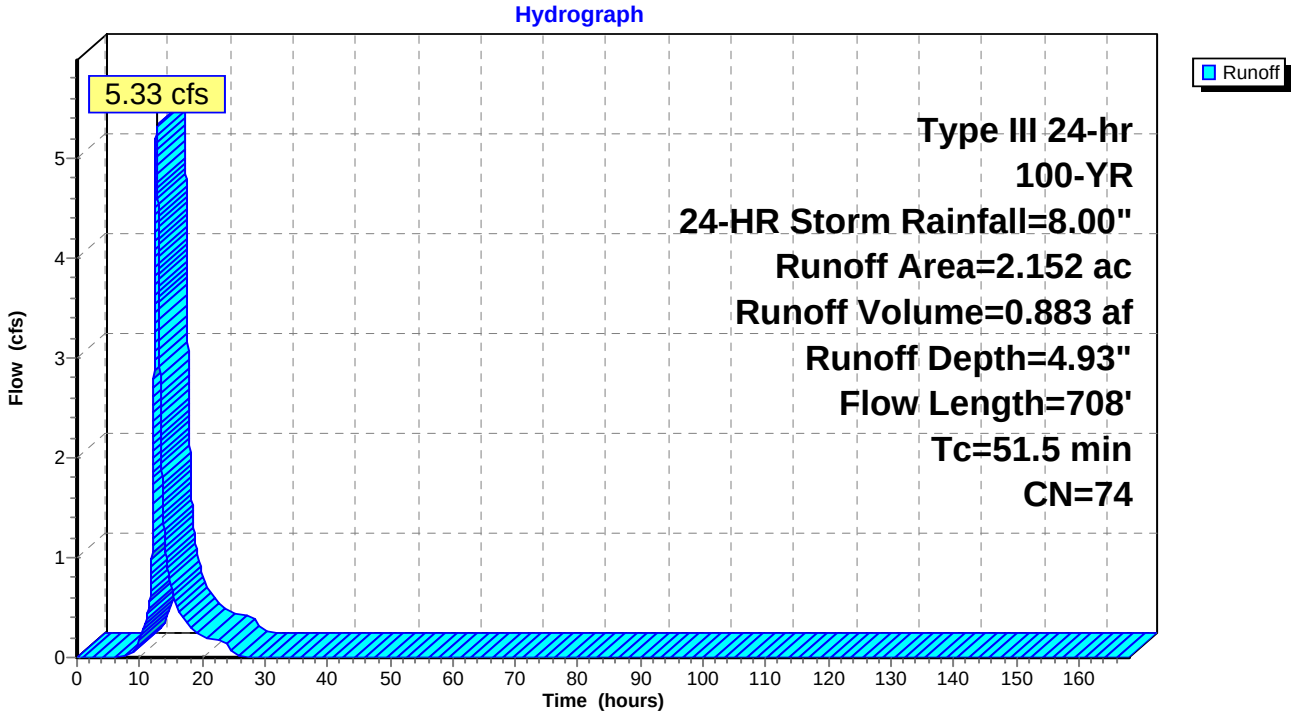
Runoff = 5.33 cfs @ 12.70 hrs, Volume= 0.883 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.064	98	Unconnected pavement, HSG C
1.699	74	>75% Grass cover, Good, HSG C
0.031	71	Meadow, non-grazed, HSG C
0.300	70	Woods, Good, HSG C
0.049	80	>75% Grass cover, Good, HSG D
0.009	98	Water Surface, HSG D
2.152	74	Weighted Average
2.079		96.61% Pervious Area
0.073		3.39% Impervious Area
0.064		87.67% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
42.5	150	0.0067	0.06		**Sheet Flow, Sheet Flow** Woods: Light underbrush n= 0.400 P2= 3.75"
9.0	558	0.0430	1.04		**Shallow Concentrated Flow, SCF** Woodland Kv= 5.0 fps
51.5	708	Total			

Subcatchment 31: PR DA 31



Summary for Subcatchment 31A: PR DA 31A

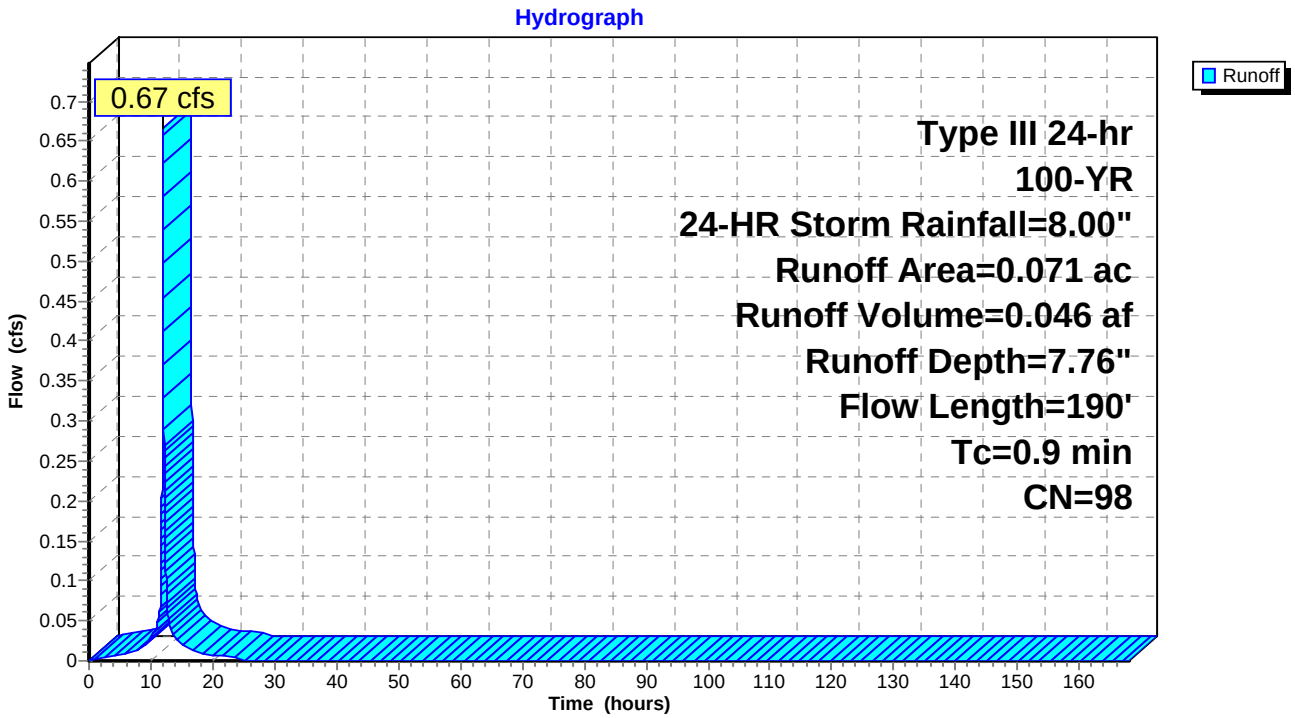
Runoff = 0.67 cfs @ 12.01 hrs, Volume= 0.046 af, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
*	0.071	98	Paved roads w/curbs & sewers, HSG C
	0.071		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	130	0.0690	2.58		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"
0.1	60	0.0200	7.44	9.14	**Pipe Channel, Stormwater** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
0.9	190	Total			

Subcatchment 31A: PR DA 31A



Summary for Subcatchment 31B: PR DA 31B

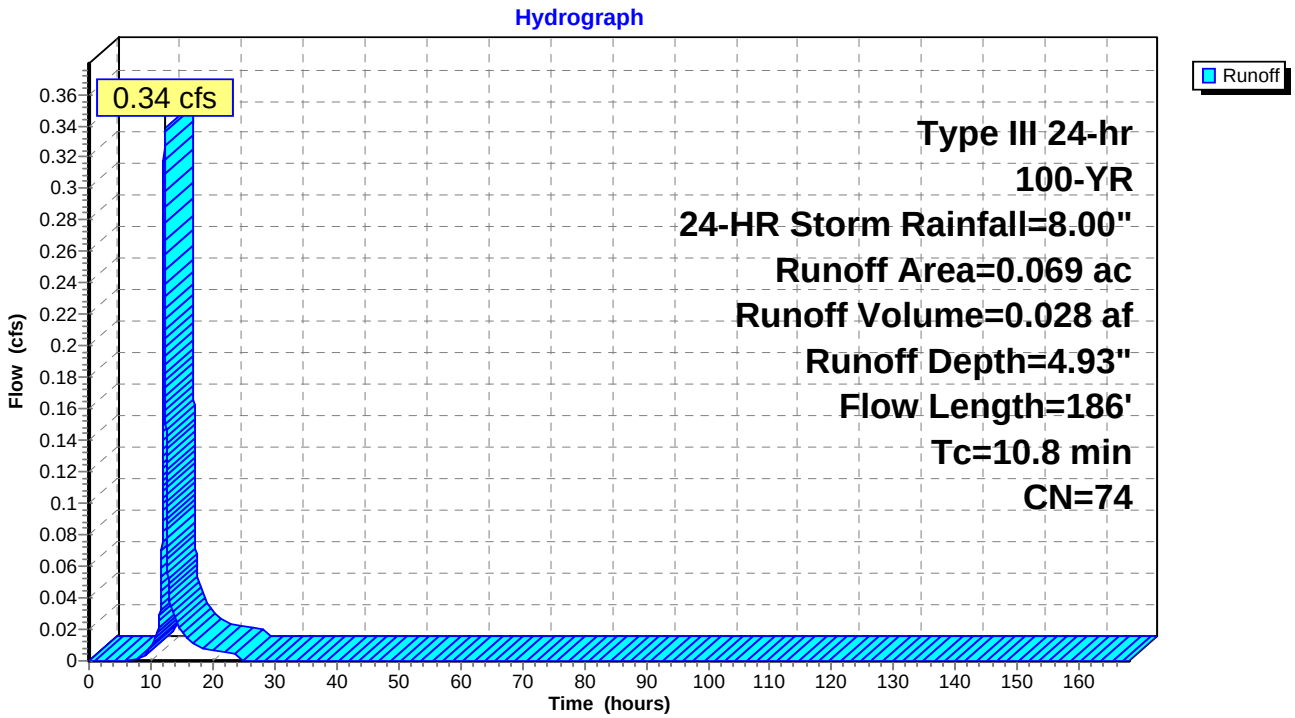
Runoff = 0.34 cfs @ 12.15 hrs, Volume= 0.028 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.069	74	>75% Grass cover, Good, HSG C
0.069		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.7	144	0.0700	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"
0.1	42	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
10.8	186	Total			

Subcatchment 31B: PR DA 31B



Summary for Subcatchment 31C: PR DA 31C

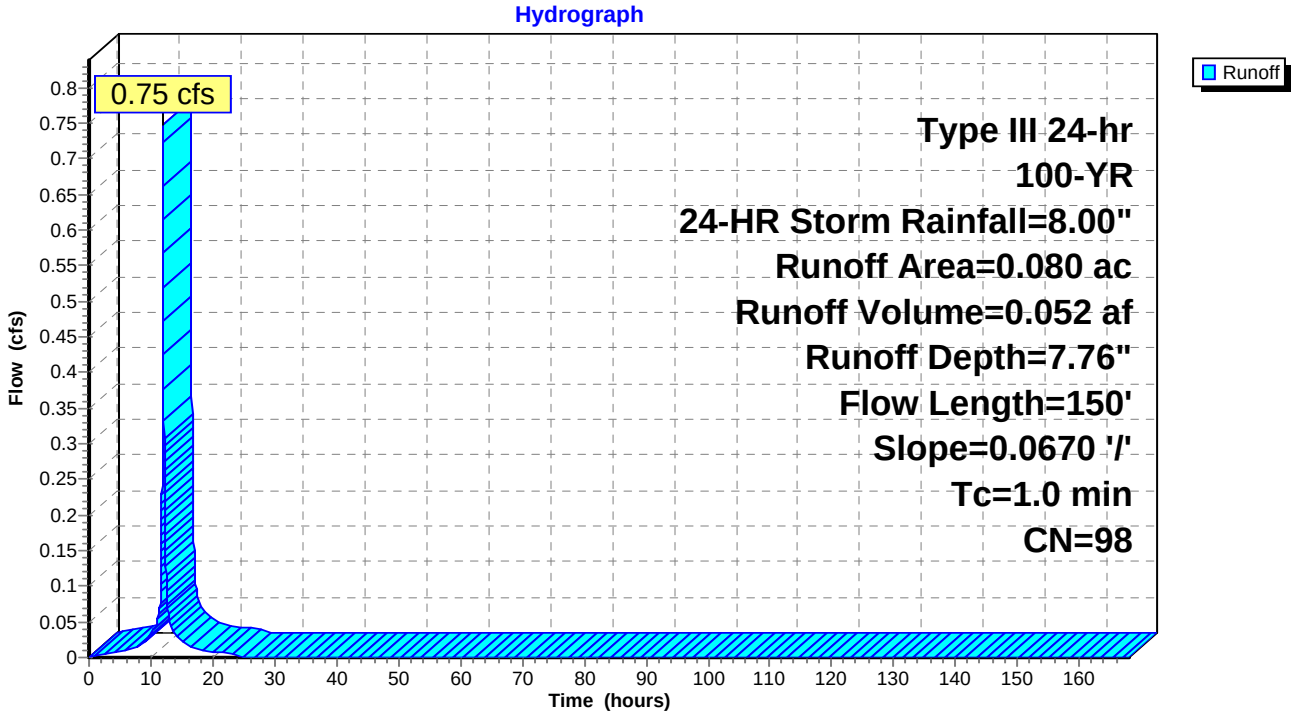
Runoff = 0.75 cfs @ 12.01 hrs, Volume= 0.052 af, Depth= 7.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.080	98	Paved roads w/curbs & sewers, HSG C
0.080		100.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	150	0.0670	2.62		**Sheet Flow, SF** Smooth surfaces n= 0.011 P2= 3.75"

Subcatchment 31C: PR DA 31C



Summary for Subcatchment 31D: PR DA 31D

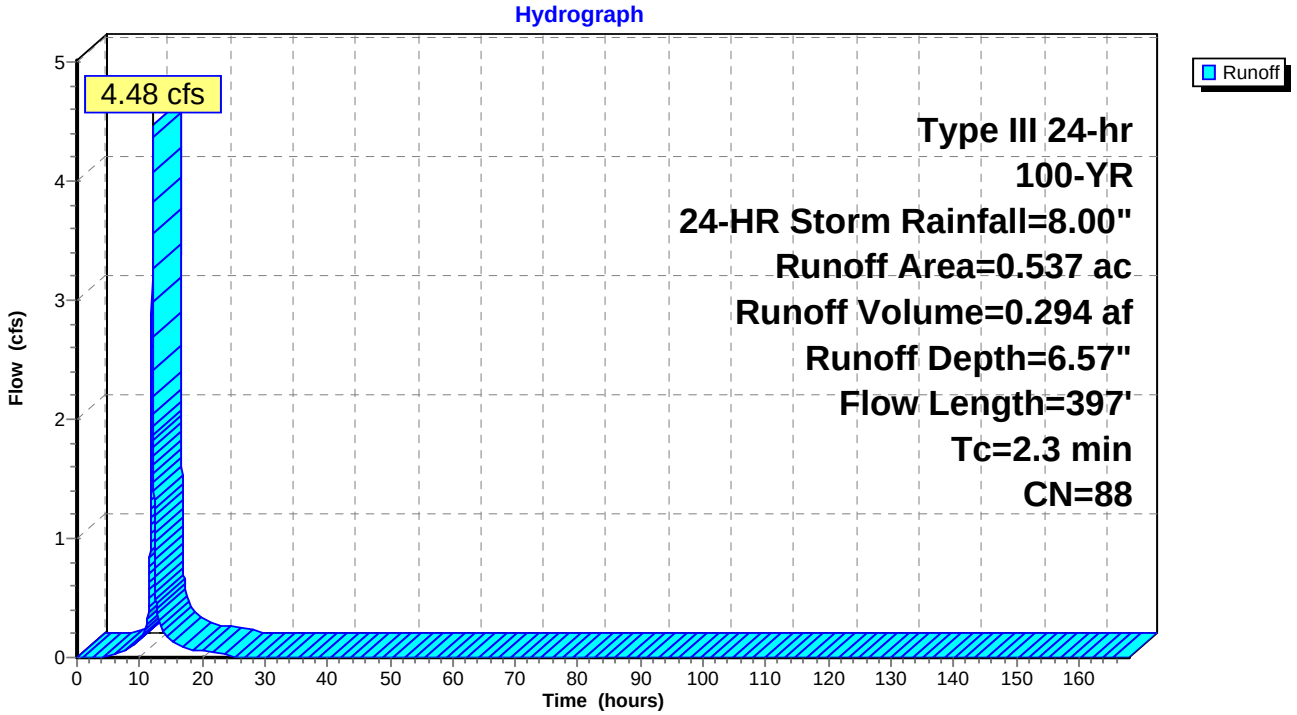
Runoff = 4.48 cfs @ 12.03 hrs, Volume= 0.294 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.223	74	>75% Grass cover, Good, HSG C
0.063	98	Unconnected pavement, HSG C
0.251	98	Paved roads w/curbs & sewers, HSG C
0.537	88	Weighted Average
0.223		41.53% Pervious Area
0.314		58.47% Impervious Area
0.063		20.06% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.4	150	0.0270	1.82		**Sheet Flow, Gutter** Smooth surfaces n= 0.011 P2= 3.75"
0.6	125	0.0270	3.34		**Shallow Concentrated Flow, Gutter** Paved Kv= 20.3 fps
0.3	122	0.0200	7.44	9.14	**Pipe Channel, SW** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
2.3	397	Total			

Subcatchment 31D: PR DA 31D



Summary for Subcatchment SW21A: PR DA SW21A

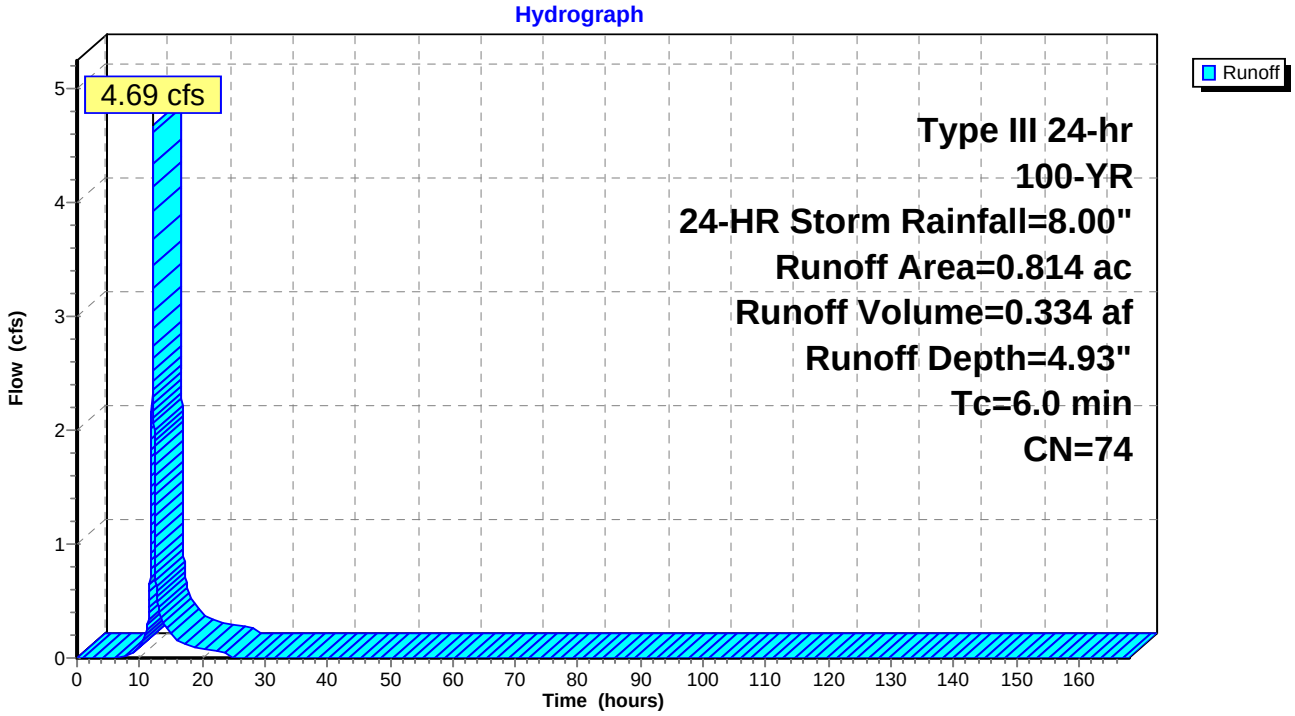
Runoff = 4.69 cfs @ 12.09 hrs, Volume= 0.334 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.814	74	>75% Grass cover, Good, HSG C
0.814		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21A: PR DA SW21A



Summary for Subcatchment SW21B: PR DA SW21B

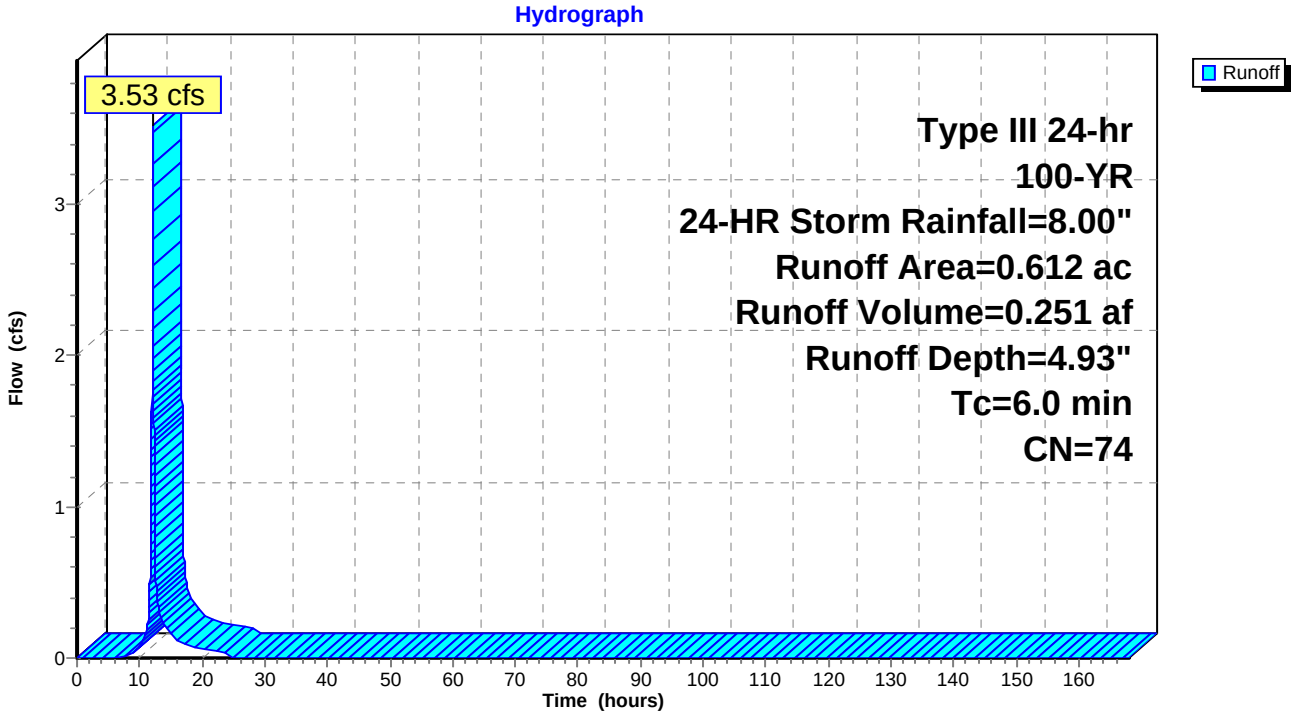
Runoff = 3.53 cfs @ 12.09 hrs, Volume= 0.251 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.433	74	>75% Grass cover, Good, HSG C
0.179	74	>75% Grass cover, Good, HSG C
0.612	74	Weighted Average
0.612		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21B: PR DA SW21B



Summary for Subcatchment SW21C: PR DA SW21C

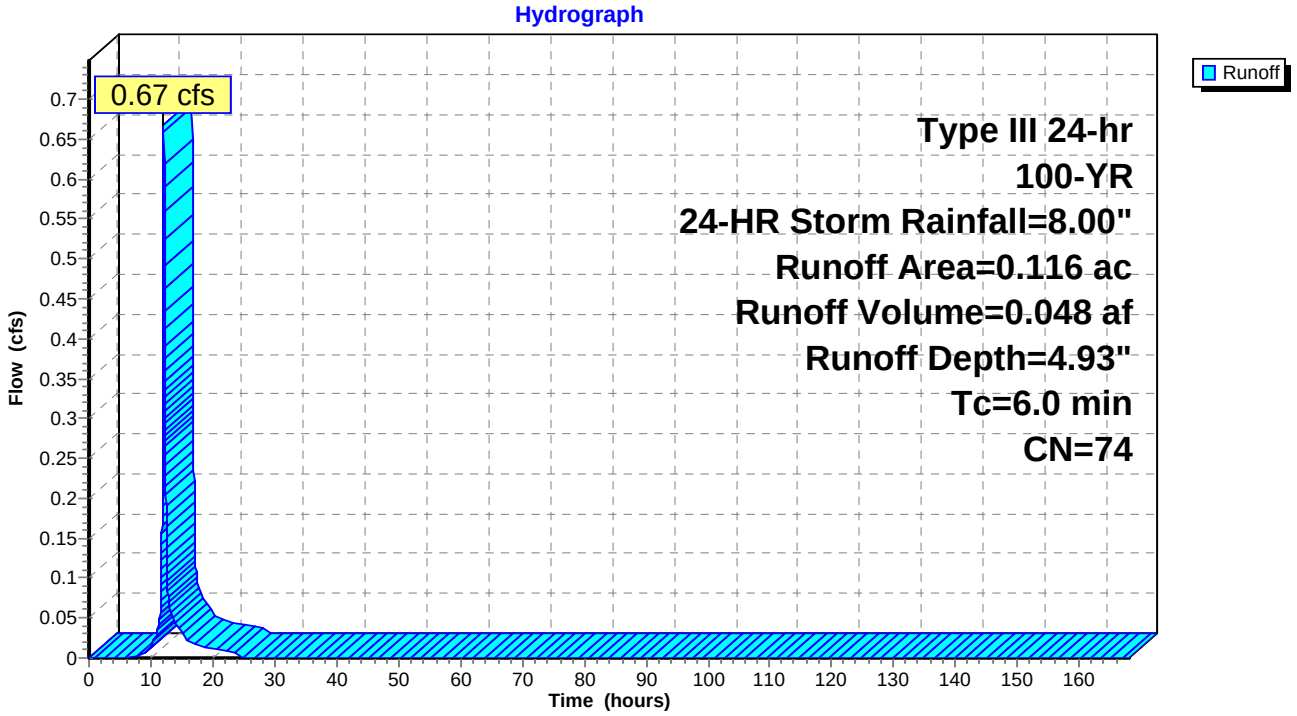
Runoff = 0.67 cfs @ 12.09 hrs, Volume= 0.048 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.116	74	>75% Grass cover, Good, HSG C
0.116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW21C: PR DA SW21C



Summary for Subcatchment SW23A: PR DA SW23A

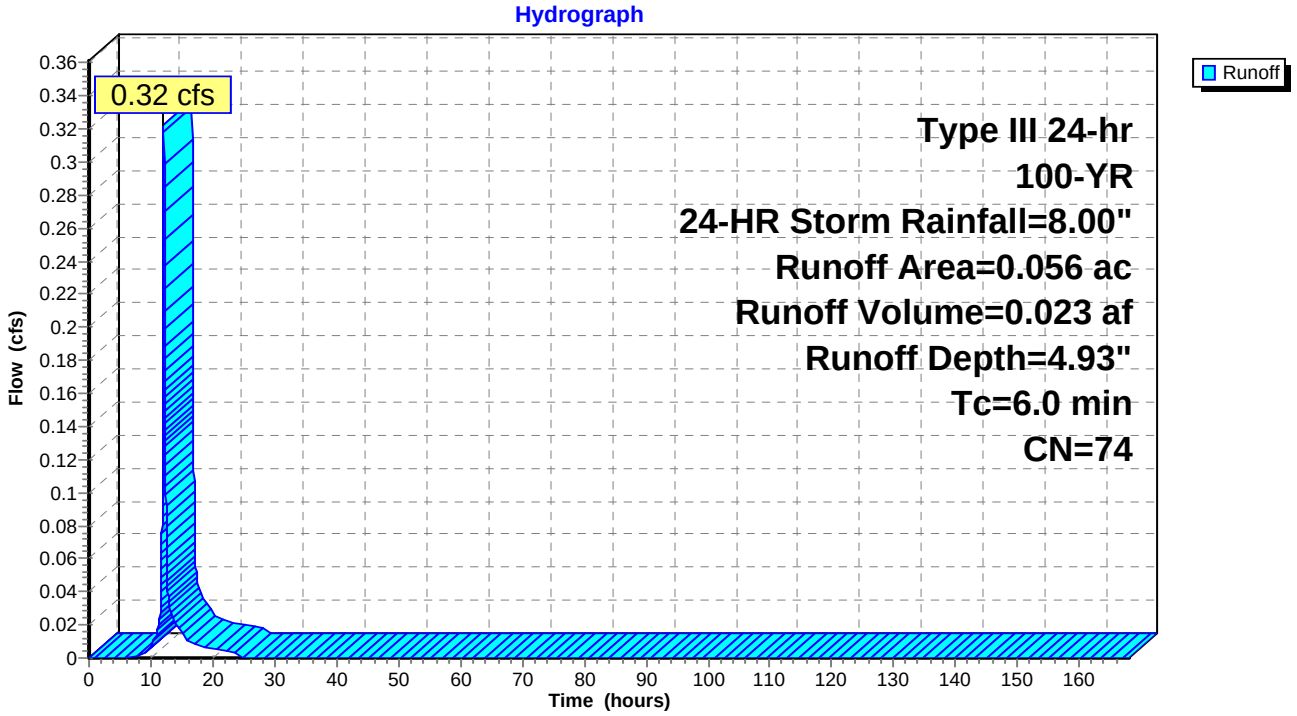
Runoff = 0.32 cfs @ 12.09 hrs, Volume= 0.023 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.056	74	>75% Grass cover, Good, HSG C
0.056		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW23A: PR DA SW23A



Summary for Subcatchment SW23B: PR DA SW23B

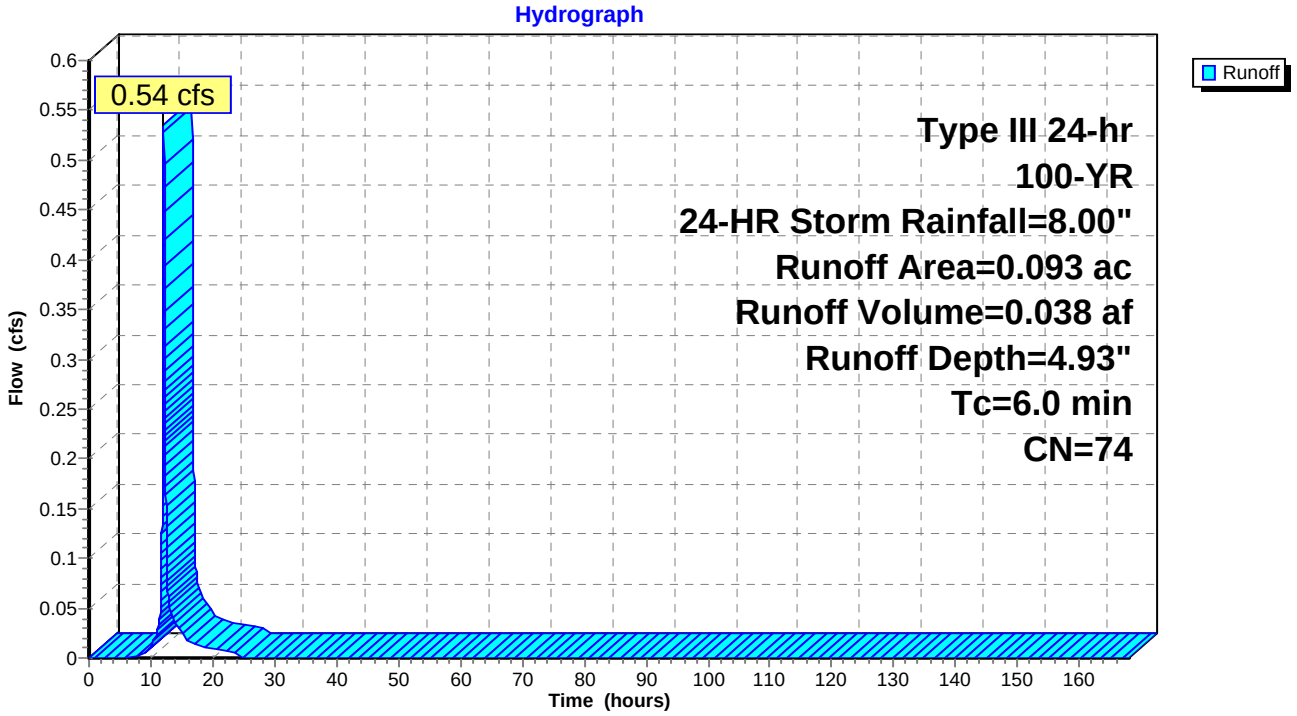
Runoff = 0.54 cfs @ 12.09 hrs, Volume= 0.038 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.093	74	>75% Grass cover, Good, HSG C
0.093		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					**Direct Entry,**

Subcatchment SW23B: PR DA SW23B



Summary for Subcatchment SW28A: PR DA SW28A

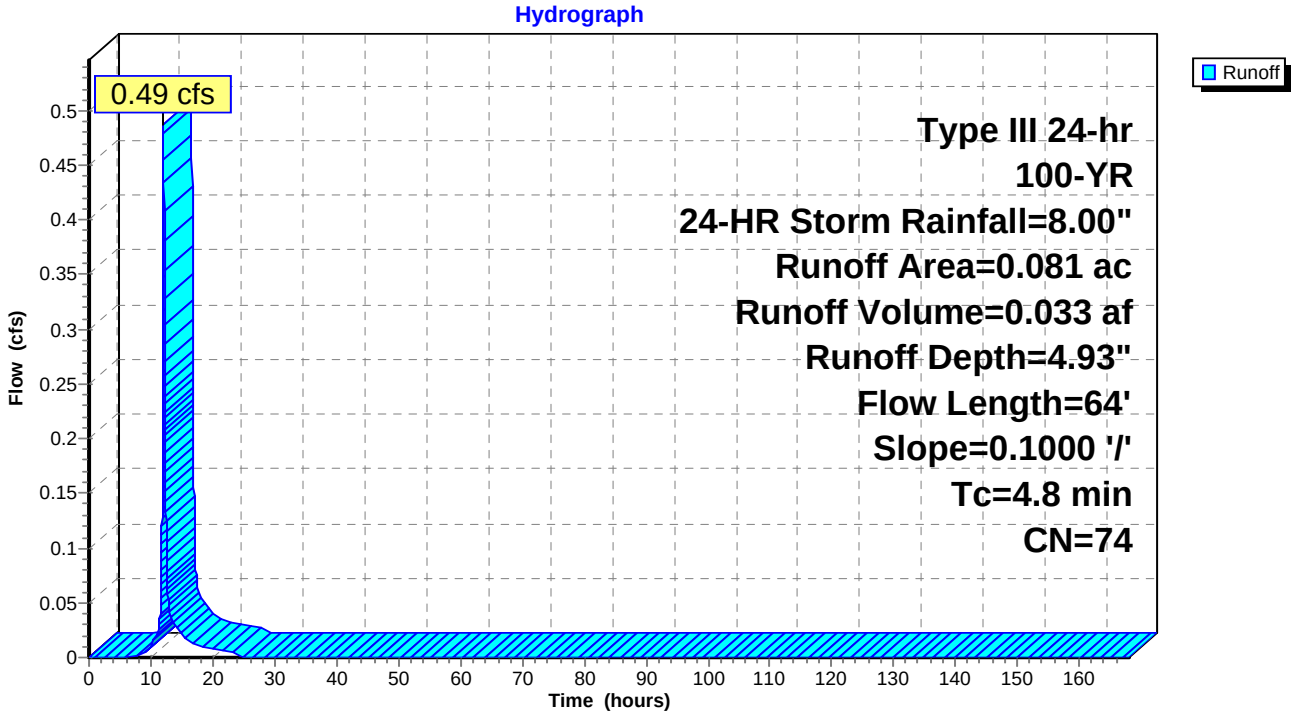
Runoff = 0.49 cfs @ 12.07 hrs, Volume= 0.033 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.081	74	>75% Grass cover, Good, HSG C
0.081		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
4.8	64	0.1000	0.22		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment SW28A: PR DA SW28A



Summary for Subcatchment SW28B: PR DA SW28B

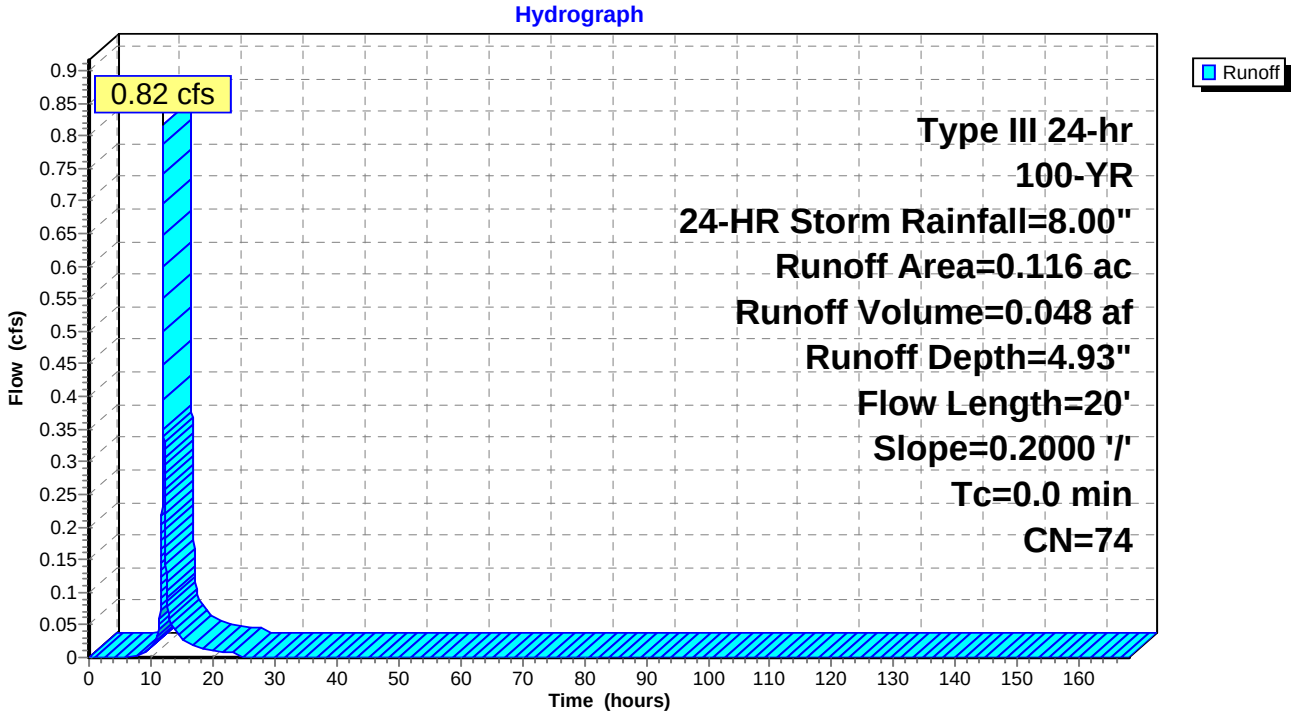
Runoff = 0.82 cfs @ 12.00 hrs, Volume= 0.048 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.116	74	>75% Grass cover, Good, HSG C
0.116		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28B: PR DA SW28B



Summary for Subcatchment SW28C: PR DA SW28C

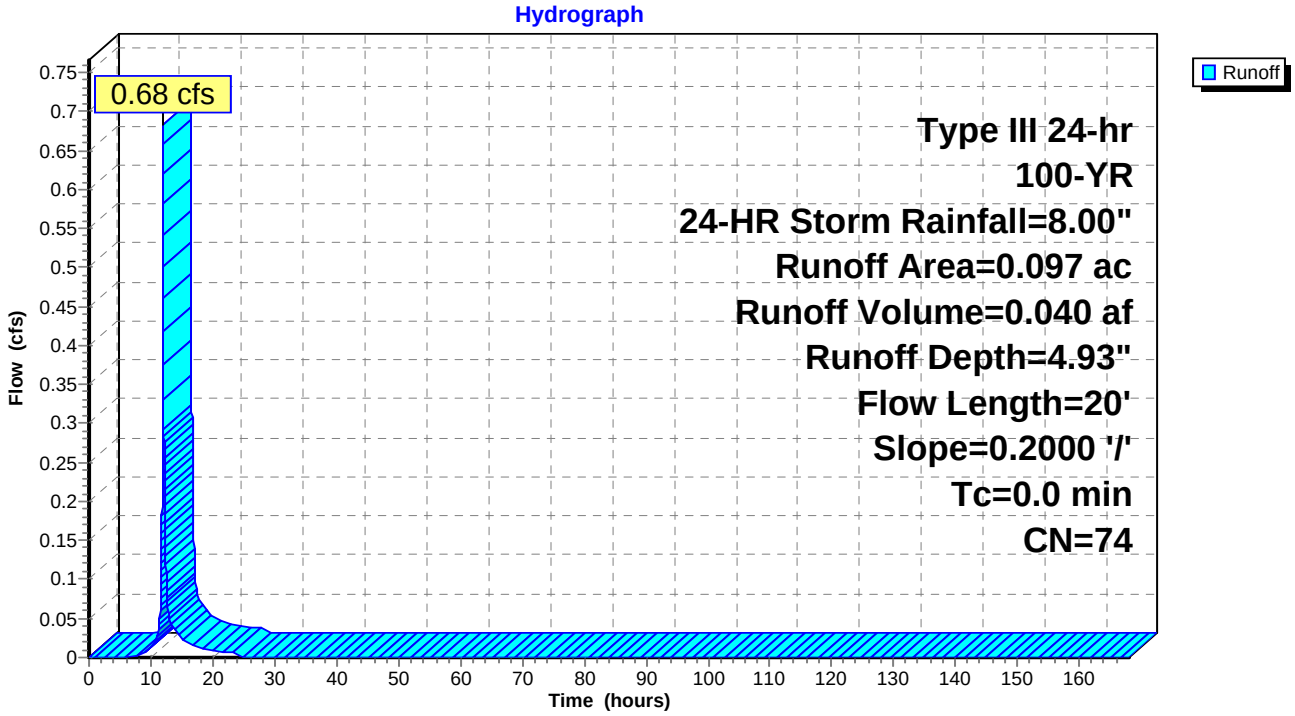
Runoff = 0.68 cfs @ 12.00 hrs, Volume= 0.040 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.097	74	>75% Grass cover, Good, HSG C
0.097		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28C: PR DA SW28C



Summary for Subcatchment SW28D: PR DA SW28D

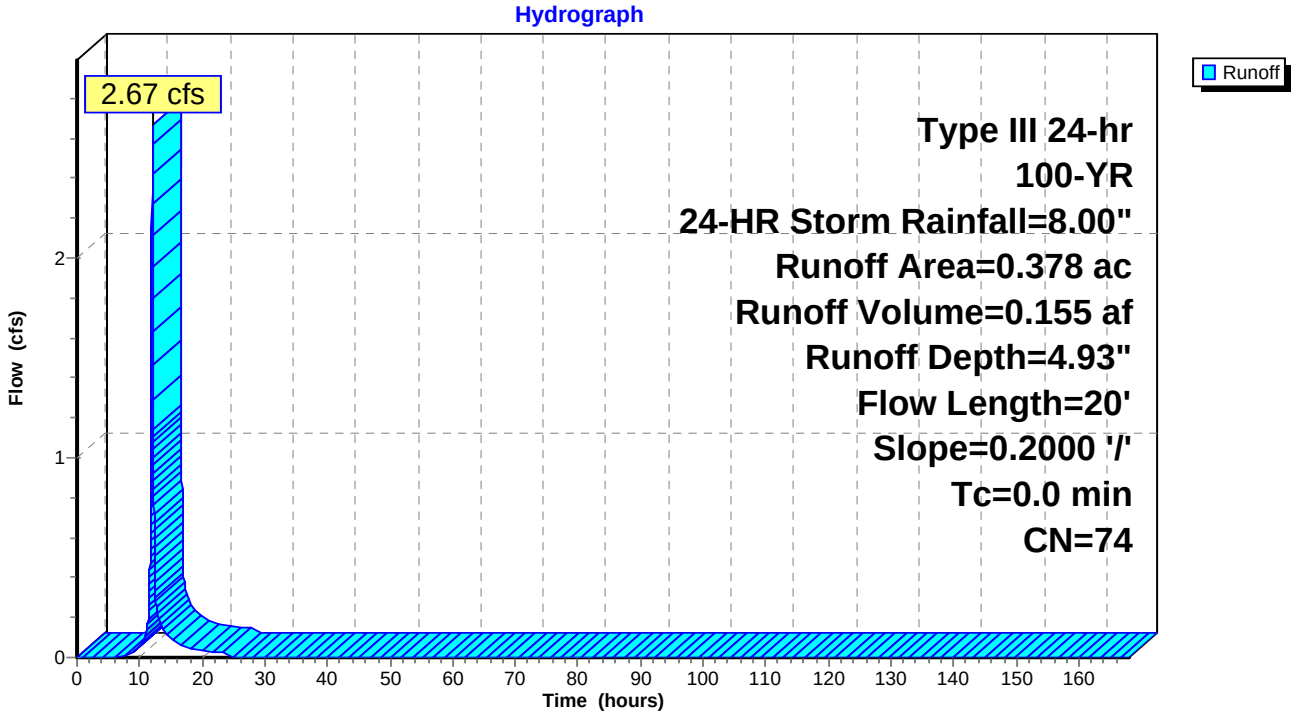
Runoff = 2.67 cfs @ 12.00 hrs, Volume= 0.155 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.378	74	>75% Grass cover, Good, HSG C
0.378		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.0	20	0.2000	7.20		**Shallow Concentrated Flow, SC** Unpaved Kv= 16.1 fps

Subcatchment SW28D: PR DA SW28D



Summary for Subcatchment SW31: PR DA SW31

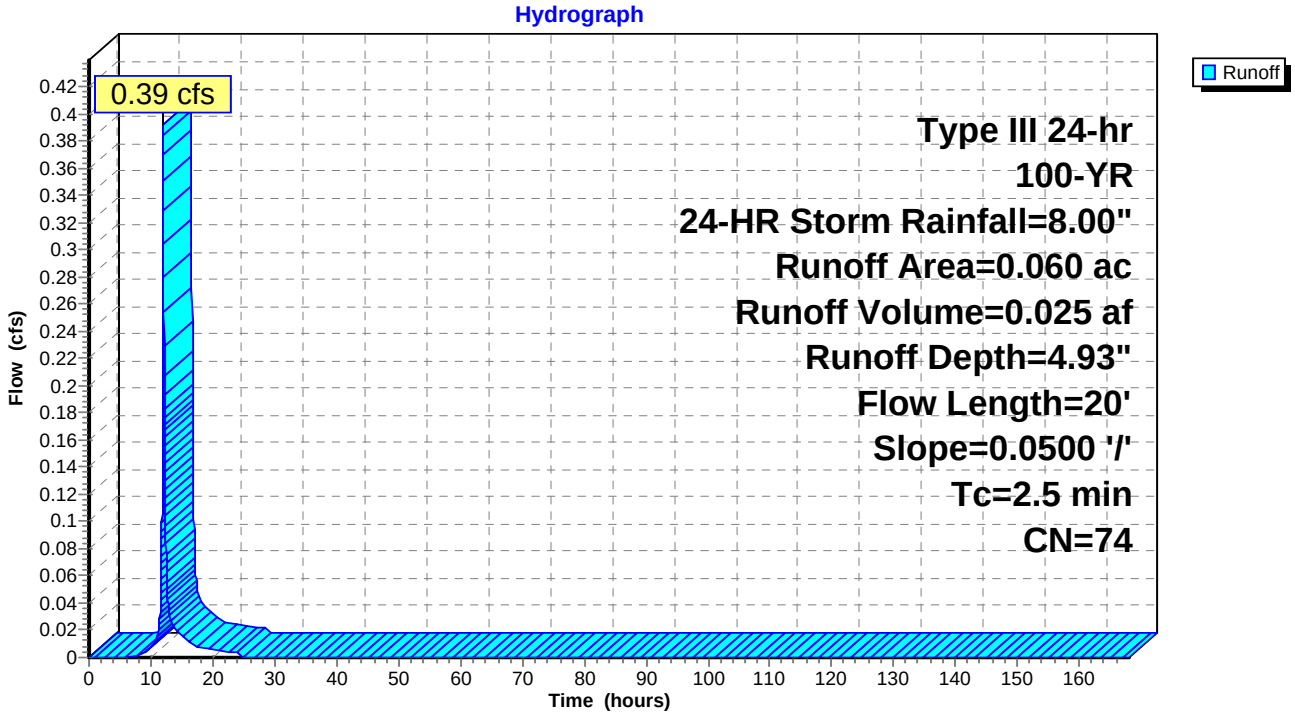
Runoff = 0.39 cfs @ 12.04 hrs, Volume= 0.025 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.060	74	>75% Grass cover, Good, HSG C
0.060		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
2.5	20	0.0500	0.13		**Sheet Flow, SF** Grass: Dense n= 0.240 P2= 3.75"

Subcatchment SW31: PR DA SW31

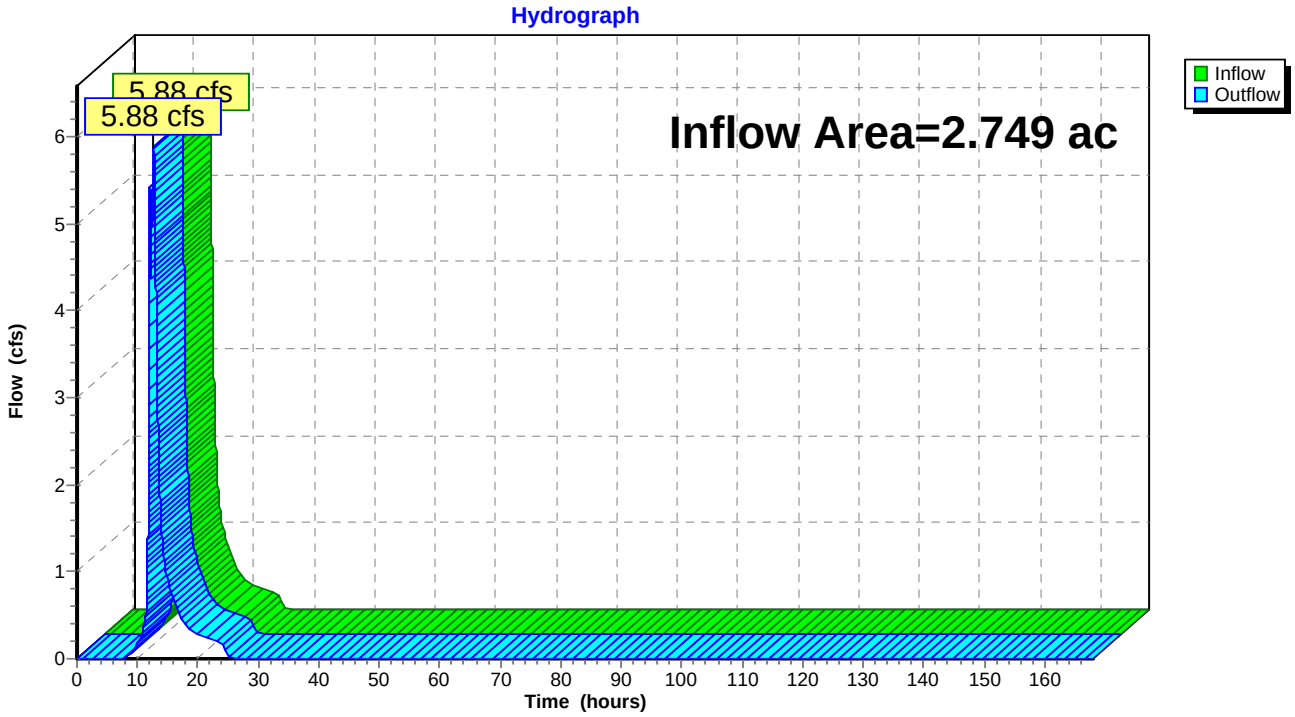


Summary for Reach 30R: DP-9

Inflow Area = 2.749 ac, 14.08% Impervious, Inflow Depth = 4.97" for 100-YR, 24-HR Storm event
Inflow = 5.88 cfs @ 12.65 hrs, Volume= 1.139 af
Outflow = 5.88 cfs @ 12.66 hrs, Volume= 1.139 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 30R: DP-9

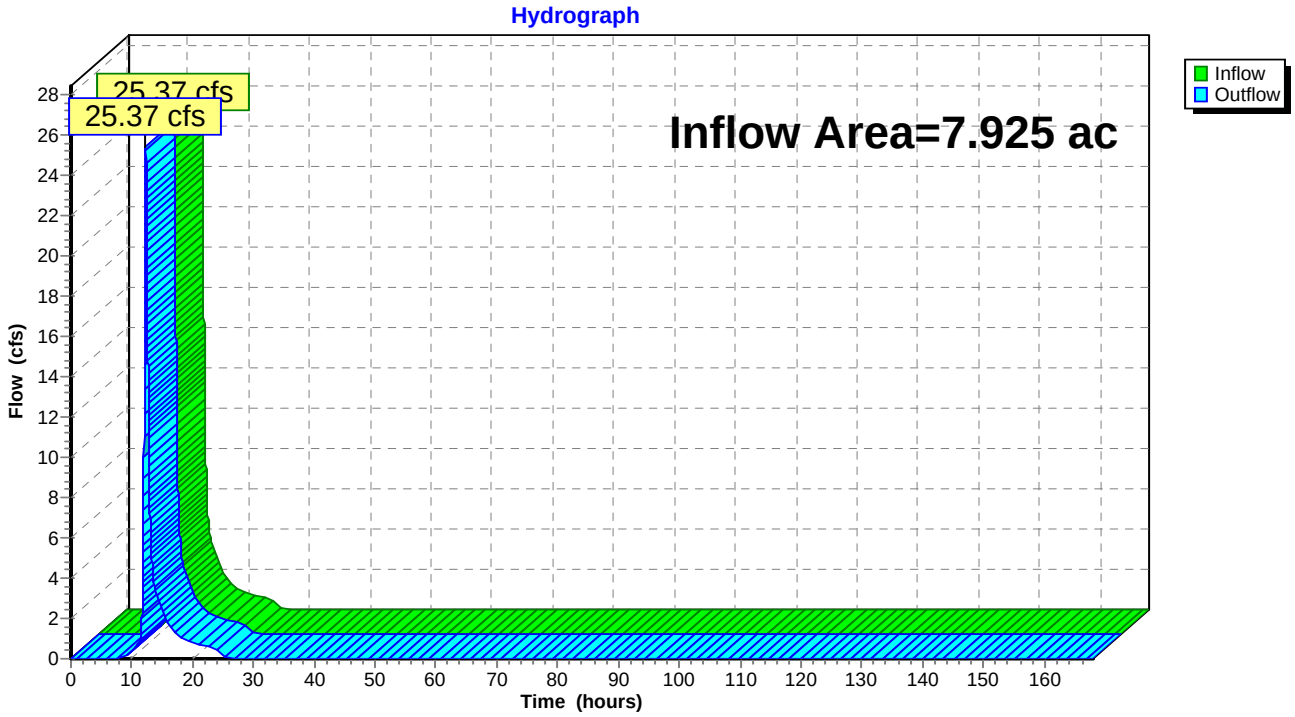


Summary for Reach 36R: DP-1

Inflow Area = 7.925 ac, 23.23% Impervious, Inflow Depth = 4.98" for 100-YR, 24-HR Storm event
Inflow = 25.37 cfs @ 12.29 hrs, Volume= 3.286 af
Outflow = 25.37 cfs @ 12.30 hrs, Volume= 3.286 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 36R: DP-1

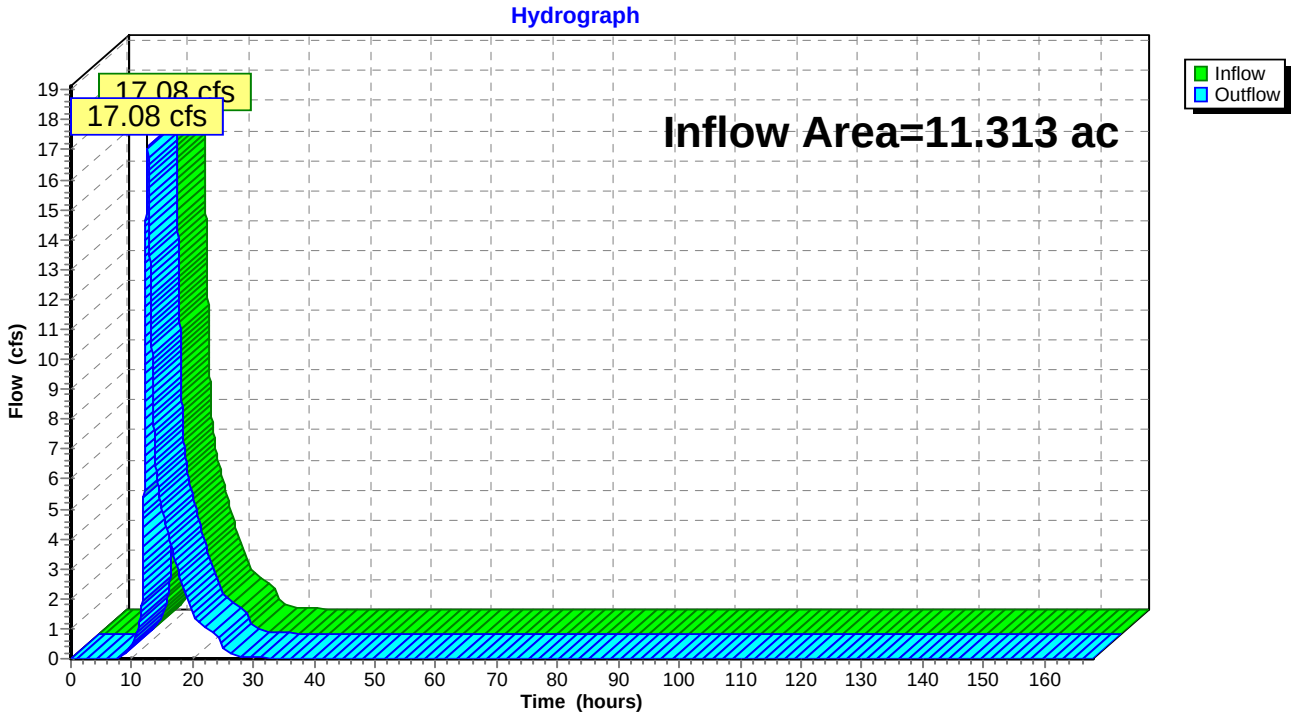


Summary for Reach 41R: DP-26

Inflow Area = 11.313 ac, 6.13% Impervious, Inflow Depth > 4.85" for 100-YR, 24-HR Storm event
Inflow = 17.08 cfs @ 12.55 hrs, Volume= 4.575 af
Outflow = 17.08 cfs @ 12.56 hrs, Volume= 4.575 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 41R: DP-26

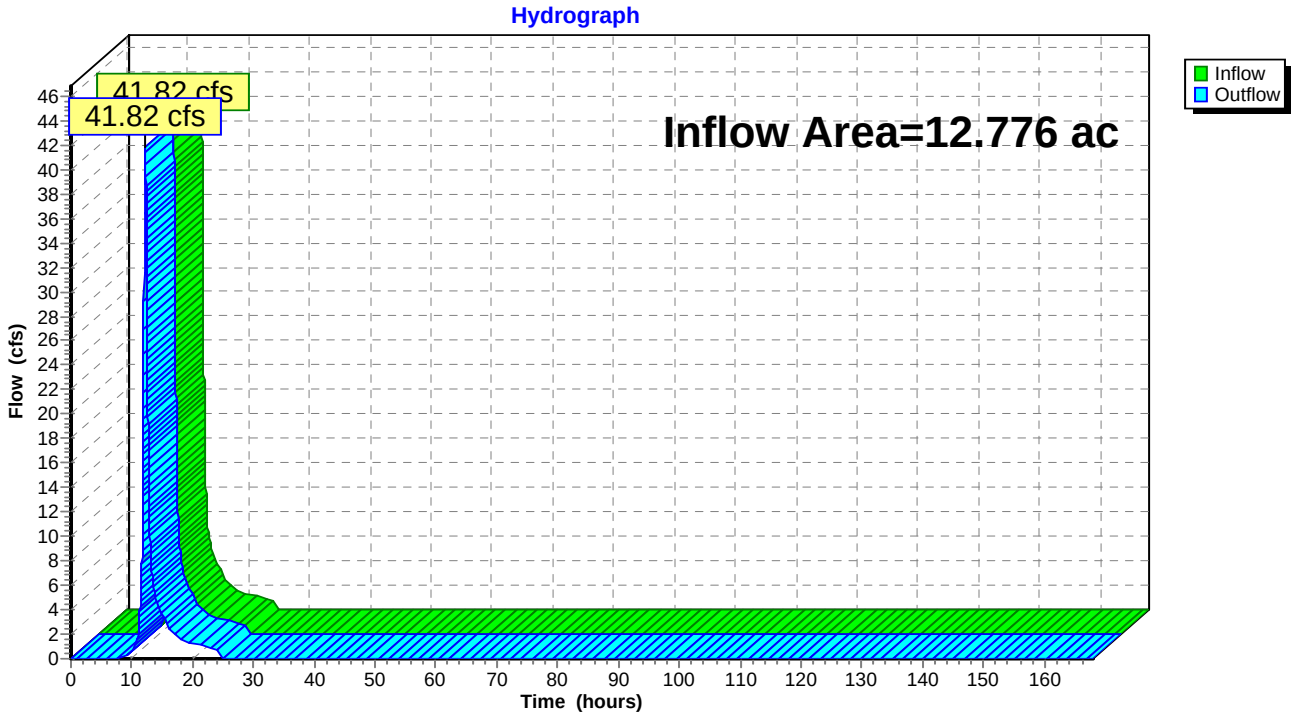


Summary for Reach 46R: DP-25

Inflow Area = 12.776 ac, 7.30% Impervious, Inflow Depth = 4.73" for 100-YR, 24-HR Storm event
Inflow = 41.82 cfs @ 12.06 hrs, Volume= 5.031 af
Outflow = 41.82 cfs @ 12.07 hrs, Volume= 5.031 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 46R: DP-25

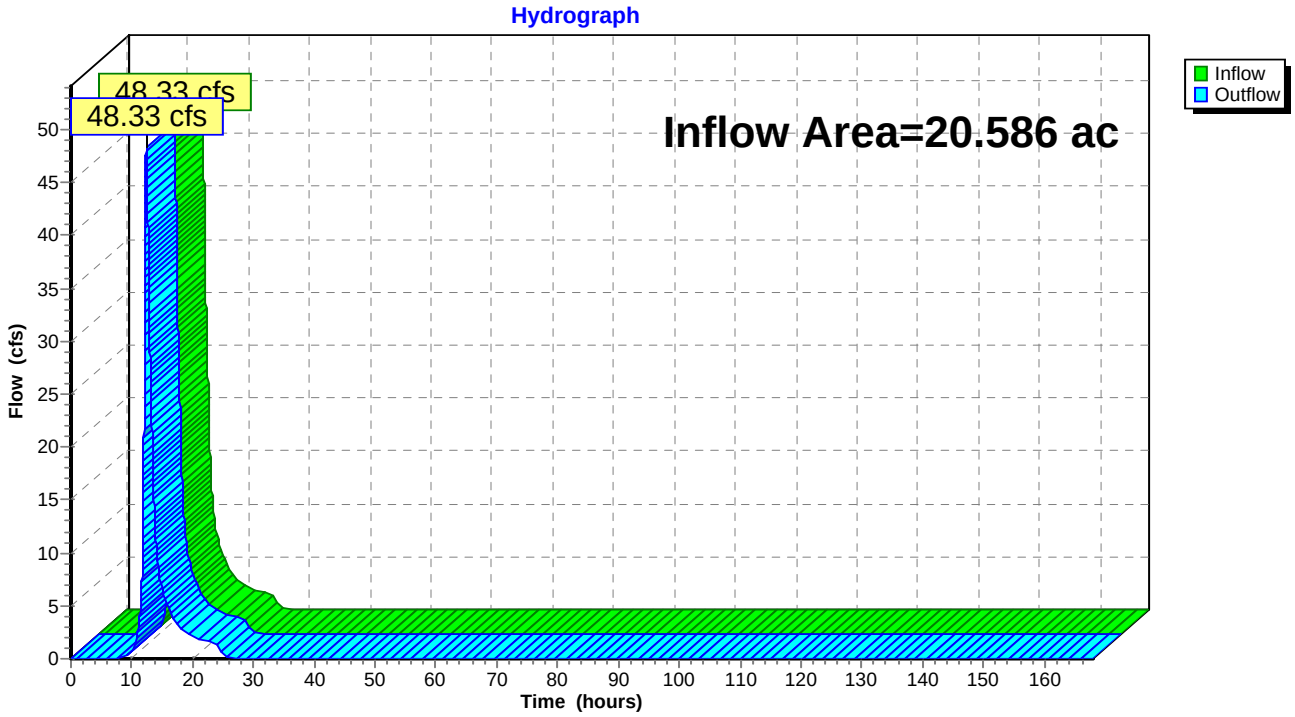


Summary for Reach 51R: DP-24

Inflow Area = 20.586 ac, 5.22% Impervious, Inflow Depth > 5.06" for 100-YR, 24-HR Storm event
Inflow = 48.33 cfs @ 12.37 hrs, Volume= 8.677 af
Outflow = 48.33 cfs @ 12.38 hrs, Volume= 8.677 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 51R: DP-24

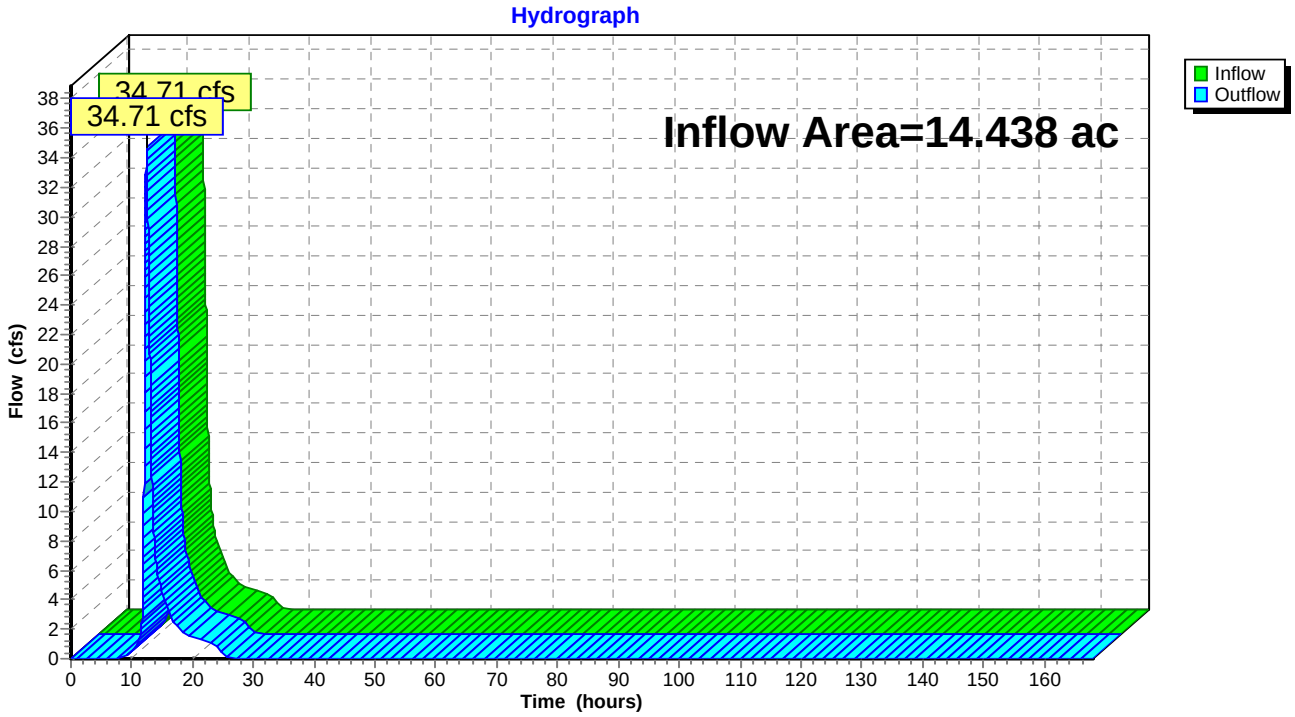


Summary for Reach 56R: DP-23

Inflow Area = 14.438 ac, 6.32% Impervious, Inflow Depth > 4.75" for 100-YR, 24-HR Storm event
Inflow = 34.71 cfs @ 12.42 hrs, Volume= 5.713 af
Outflow = 34.71 cfs @ 12.43 hrs, Volume= 5.713 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 56R: DP-23

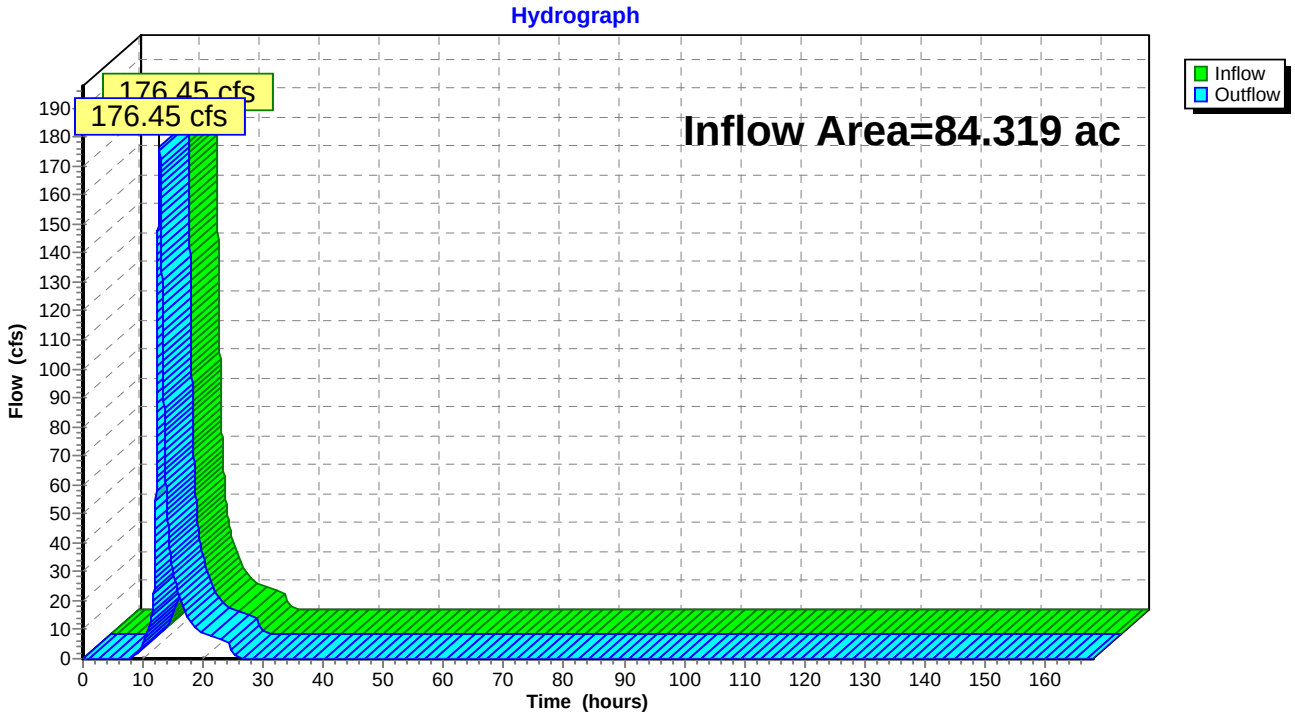


Summary for Reach 61R: DP-21

Inflow Area = 84.319 ac, 3.86% Impervious, Inflow Depth > 4.81" for 100-YR, 24-HR Storm event
Inflow = 176.45 cfs @ 12.71 hrs, Volume= 33.767 af
Outflow = 176.45 cfs @ 12.72 hrs, Volume= 33.767 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs

Reach 61R: DP-21



Summary for Pond 21A-P: Pond-21A

Inflow Area = 3.092 ac, 26.26% Impervious, Inflow Depth = 6.06" for 100-YR, 24-HR Storm event
Inflow = 23.83 cfs @ 12.04 hrs, Volume= 1.562 af
Outflow = 5.62 cfs @ 12.43 hrs, Volume= 1.262 af, Atten= 76%, Lag= 23.2 min
Primary = 0.04 cfs @ 12.43 hrs, Volume= 0.467 af
Secondary = 5.57 cfs @ 12.43 hrs, Volume= 0.794 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,376.50' Surf.Area= 2,567 sf Storage= 3,042 cf
Peak Elev= 1,379.35' @ 12.43 hrs Surf.Area= 16,863 sf Storage= 39,880 cf (36,838 cf above start)

Plug-Flow detention time= 1,827.3 min calculated for 1.192 af (76% of inflow)
Center-of-Mass det. time= 1,646.7 min (2,440.0 - 793.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,374.00'	51,415 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

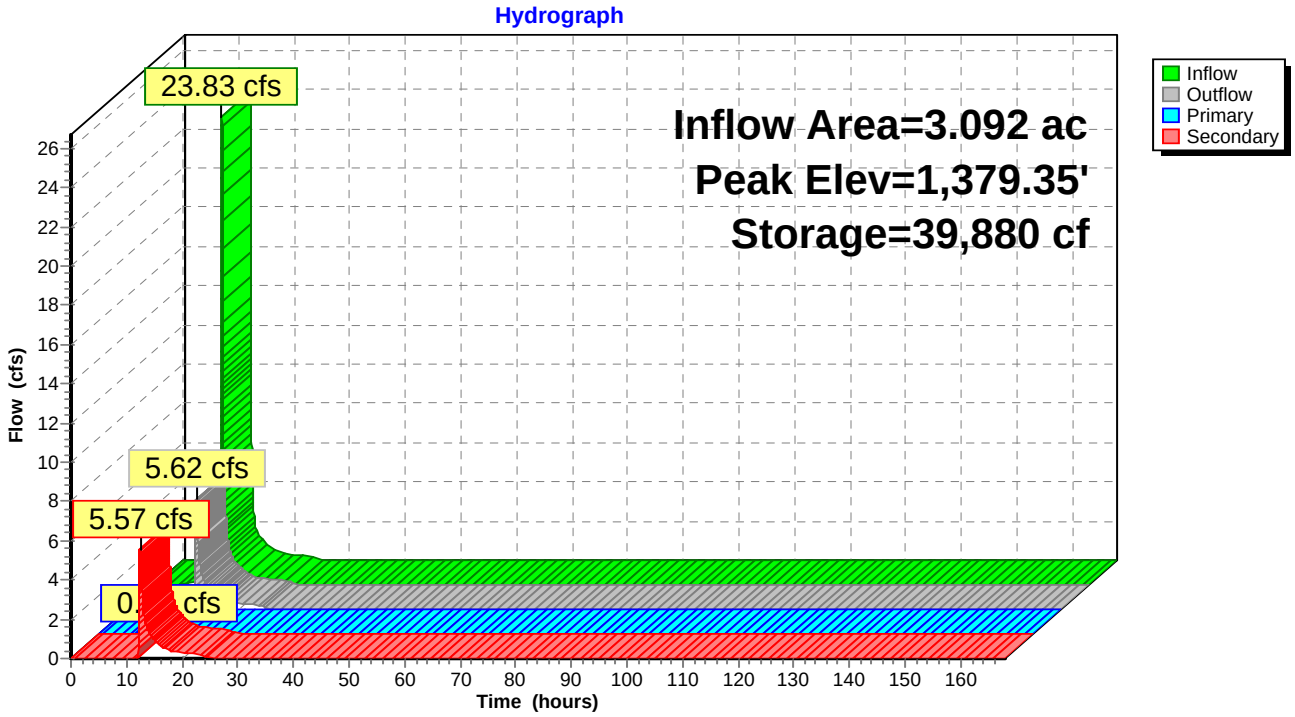
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,374.00	277	79.1	0	0	277
1,375.00	875	200.4	548	548	2,979
1,376.00	1,938	331.0	1,372	1,920	8,508
1,376.50	2,567	347.4	1,123	3,042	9,409
1,376.51	9,076	469.5	55	3,097	17,346
1,377.00	10,035	482.1	4,680	7,778	18,329
1,378.00	13,431	599.0	11,692	19,469	28,400
1,379.00	15,954	633.4	14,674	34,144	31,830
1,380.00	18,622	668.8	17,271	51,415	35,555

Device	Routing	Invert	Outlet Devices
#1	Primary	1,374.00'	**15.0" Round Culvert** L= 3.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,374.00' / 1,373.50' S= 0.1667 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,376.50'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Secondary	1,379.00'	**10.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

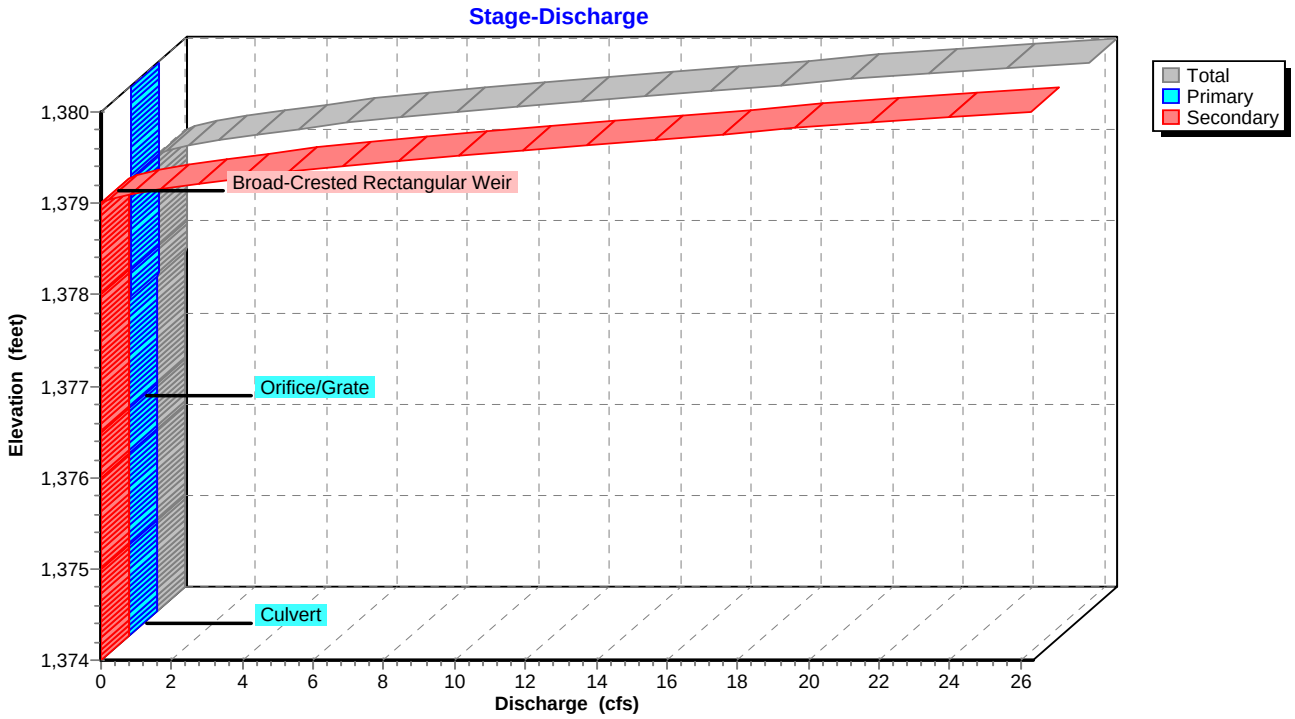
Primary OutFlow Max=0.04 cfs @ 12.43 hrs HW=1,379.35' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.04 cfs of 10.14 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 8.07 fps)

Secondary OutFlow Max=5.57 cfs @ 12.43 hrs HW=1,379.35' TW=0.00' (Dynamic Tailwater)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 5.57 cfs @ 1.59 fps)

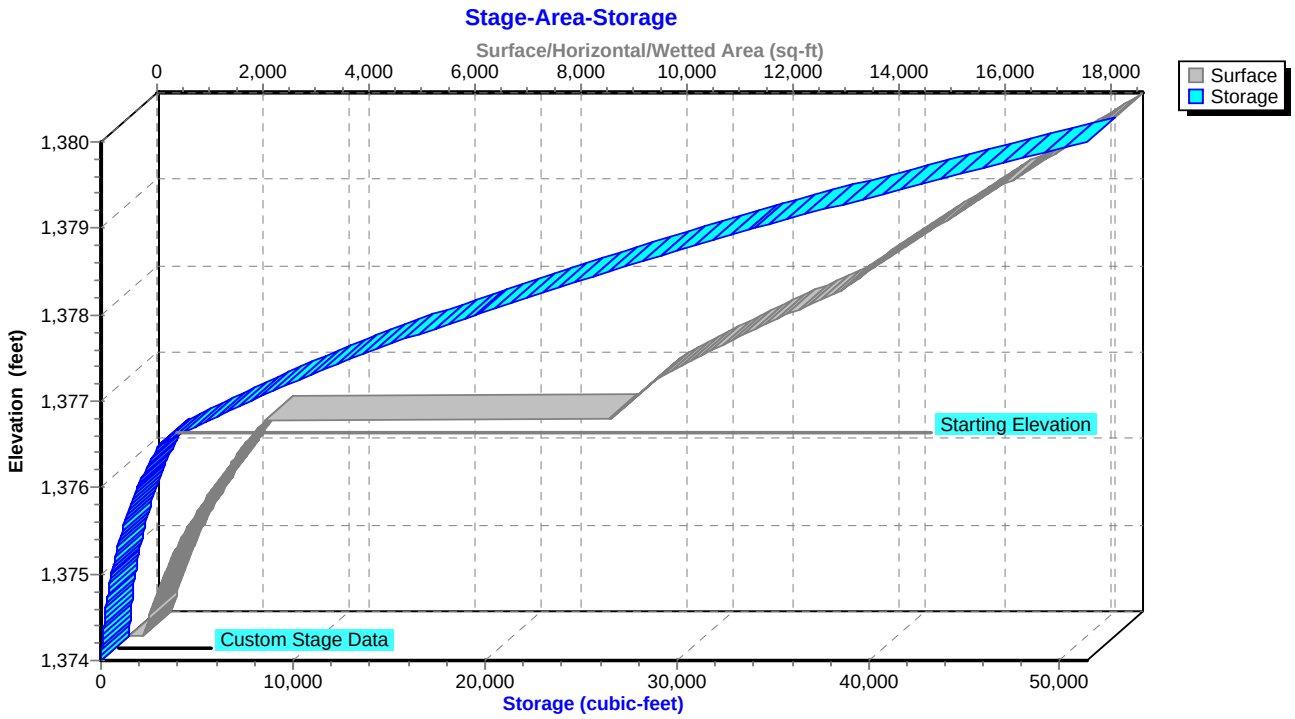
Pond 21A-P: Pond-21A



Pond 21A-P: Pond-21A



Pond 21A-P: Pond-21A



Summary for Pond 21B-P: Pond-21B

Inflow Area = 3.185 ac, 29.51% Impervious, Inflow Depth = 5.64" for 100-YR, 24-HR Storm event
Inflow = 21.65 cfs @ 12.04 hrs, Volume= 1.498 af
Outflow = 5.30 cfs @ 12.43 hrs, Volume= 1.399 af, Atten= 76%, Lag= 23.4 min
Primary = 1.23 cfs @ 12.43 hrs, Volume= 1.158 af
Secondary = 4.08 cfs @ 12.43 hrs, Volume= 0.241 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,378.00' Surf.Area= 5,813 sf Storage= 10,561 cf
Peak Elev= 1,380.23' @ 12.43 hrs Surf.Area= 17,542 sf Storage= 43,893 cf (33,332 cf above start)

Plug-Flow detention time= 1,266.3 min calculated for 1.156 af (77% of inflow)
Center-of-Mass det. time= 969.0 min (1,771.0 - 802.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,375.00'	58,169 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

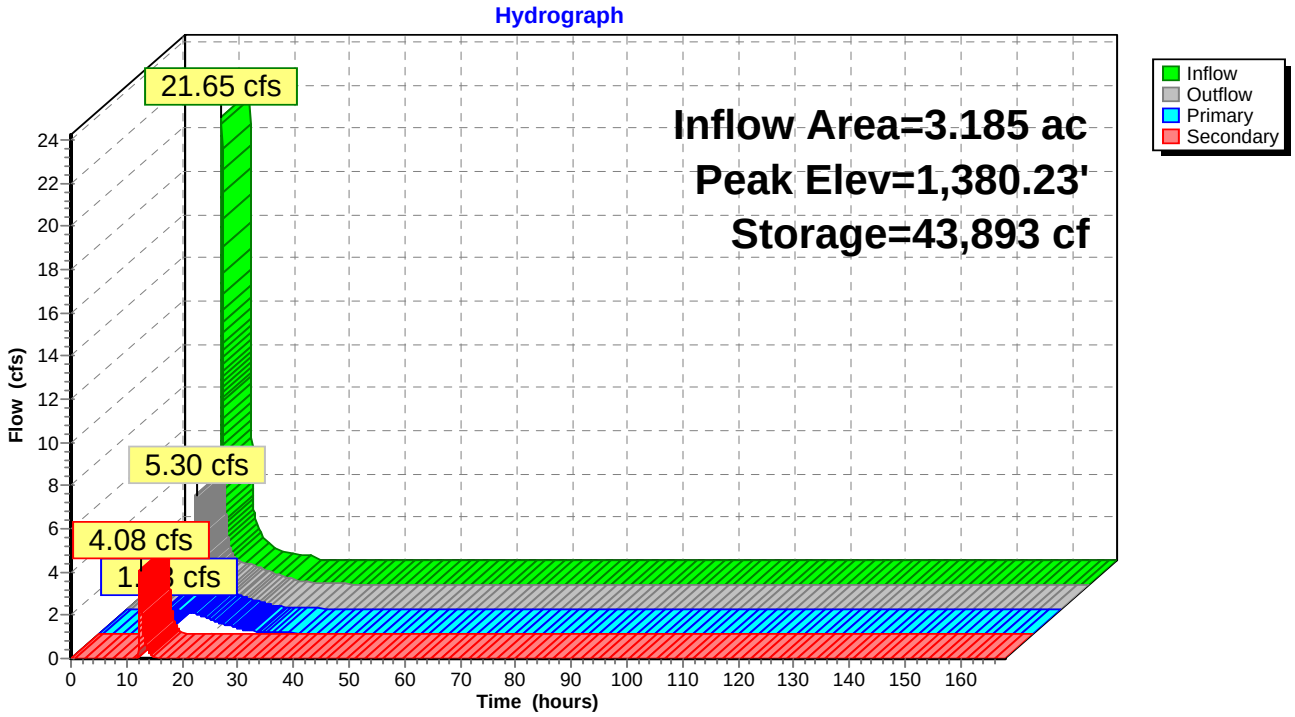
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,375.00	1,530	196.8	0	0	1,530
1,376.00	2,694	275.3	2,085	2,085	4,489
1,377.00	4,273	340.8	3,453	5,538	7,715
1,378.00	5,813	381.6	5,023	10,561	10,088
1,378.01	12,538	491.4	90	10,651	17,716
1,379.00	14,705	523.2	13,471	24,122	20,332
1,380.00	16,999	554.8	15,838	39,960	23,096
1,381.00	19,446	587.7	18,209	58,169	26,141

Device	Routing	Invert	Outlet Devices
#1	Primary	1,376.00'	**12.0" Round Culvert** L= 52.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,376.00' / 1,375.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,378.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,379.00'	**6.0" W x 6.0" H Vert. Orifice/Grate** C= 0.600
#4	Secondary	1,380.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

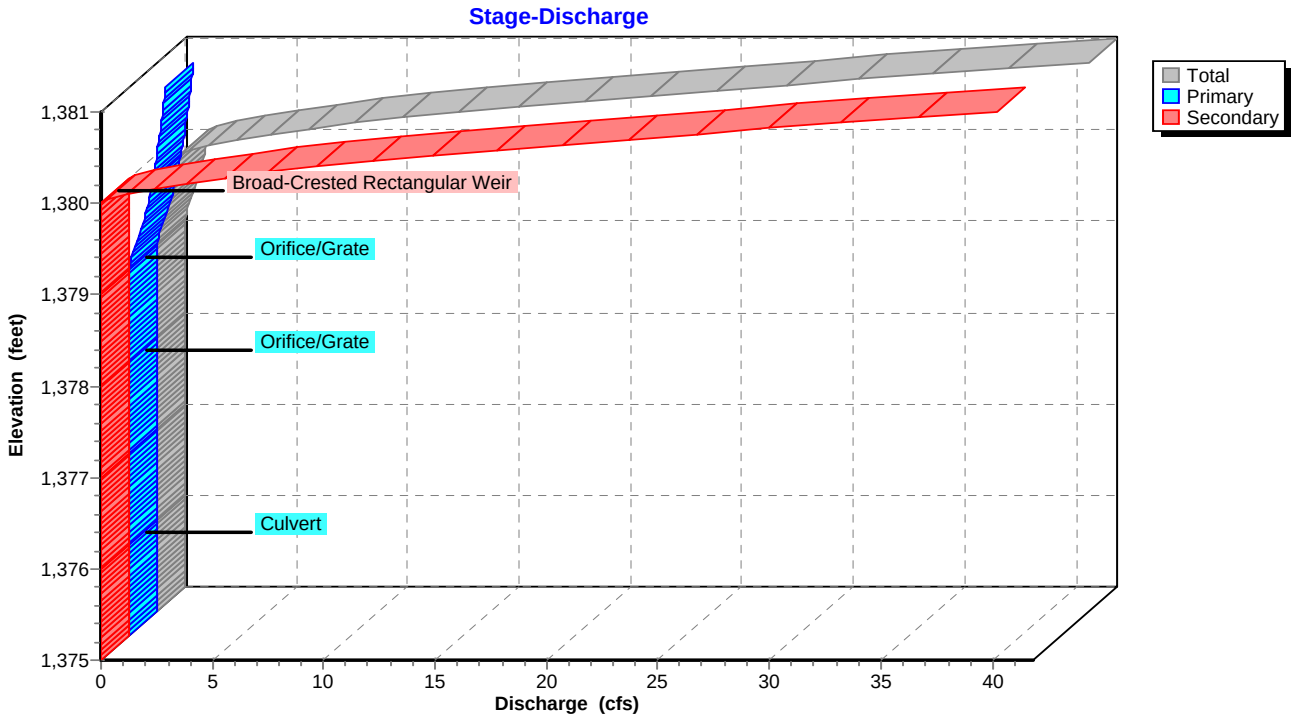
Primary OutFlow Max=1.23 cfs @ 12.43 hrs HW=1,380.23' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 1.23 cfs of 6.44 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 7.12 fps)
└**3=Orifice/Grate** (Orifice Controls 1.19 cfs @ 4.75 fps)

Secondary OutFlow Max=4.08 cfs @ 12.43 hrs HW=1,380.23' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 4.08 cfs @ 1.19 fps)

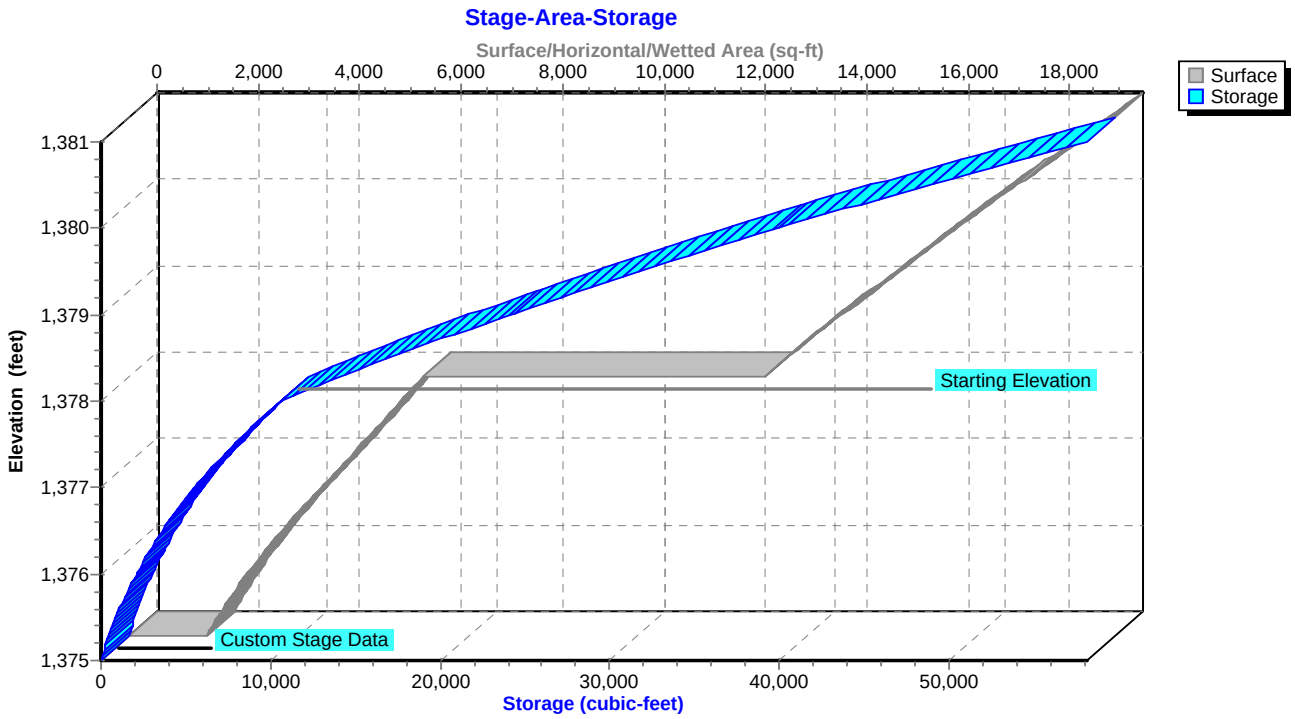
Pond 21B-P: Pond-21B



Pond 21B-P: Pond-21B



Pond 21B-P: Pond-21B



Summary for Pond 23-P: Pond-23

Inflow Area = 6.536 ac, 9.13% Impervious, Inflow Depth = 5.39" for 100-YR, 24-HR Storm event
Inflow = 27.52 cfs @ 12.04 hrs, Volume= 2.933 af
Outflow = 13.04 cfs @ 12.61 hrs, Volume= 2.822 af, Atten= 53%, Lag= 33.9 min
Primary = 13.04 cfs @ 12.61 hrs, Volume= 2.822 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,381.00' Surf.Area= 7,857 sf Storage= 8,931 cf
Peak Elev= 1,384.52' @ 12.61 hrs Surf.Area= 14,409 sf Storage= 47,664 cf (38,734 cf above start)

Plug-Flow detention time= 693.9 min calculated for 2.617 af (89% of inflow)
Center-of-Mass det. time= 589.4 min (1,414.1 - 824.8)

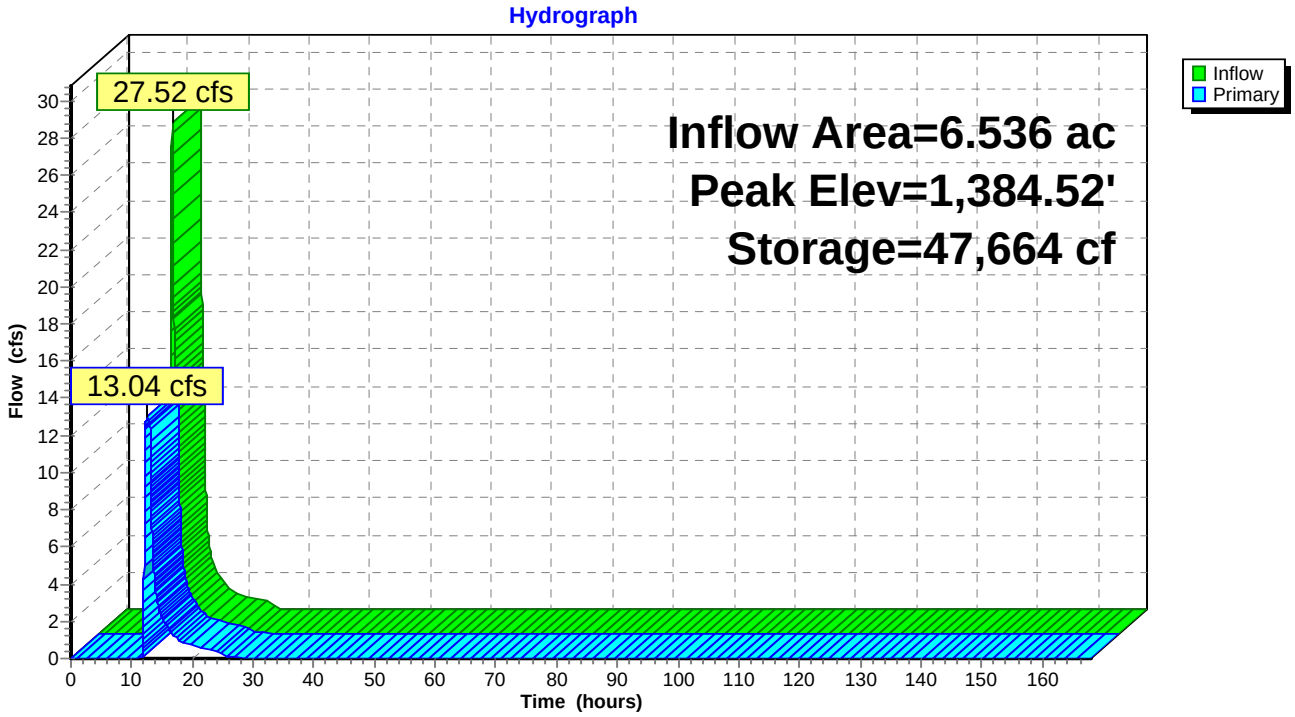
Volume	Invert	Avail.Storage	Storage Description
#1	1,377.00'	71,310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,377.00	234	63.1	0	0	234
1,378.00	802	196.1	490	490	2,980
1,379.00	1,699	233.8	1,223	1,713	4,288
1,380.00	2,685	258.9	2,173	3,886	5,302
1,381.00	7,857	376.4	5,045	8,931	11,251
1,382.00	9,589	415.8	8,709	17,639	13,766
1,383.00	11,418	451.2	10,490	28,130	16,247
1,384.00	13,357	481.7	12,375	40,504	18,559
1,385.00	15,433	511.5	14,383	54,887	20,966
1,386.00	17,433	538.9	16,423	71,310	23,316

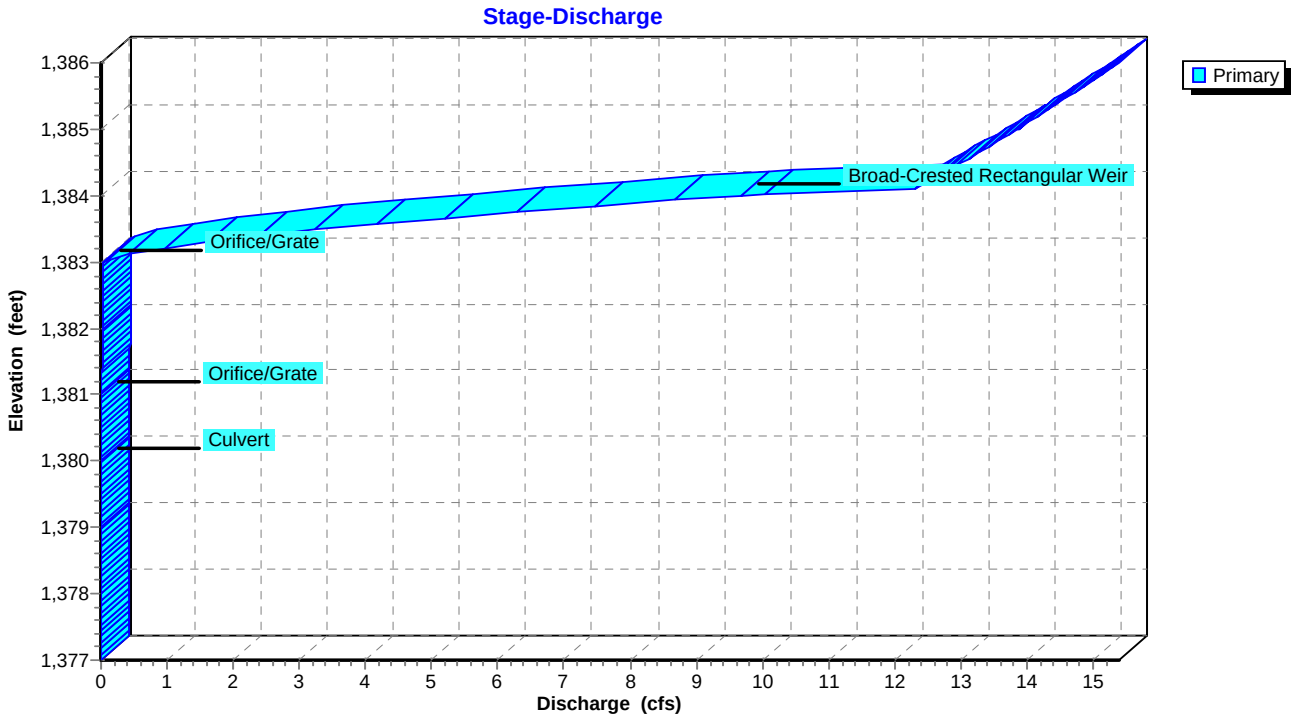
Device	Routing	Invert	Outlet Devices
#1	Primary	1,380.00'	**18.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,380.00' / 1,379.00' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,381.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,383.00'	**36.0" W x 12.0" H Vert. Orifice/Grate** C= 0.600
#4	Device 1	1,384.00'	**15.0' long x 10.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64

Primary OutFlow Max=13.04 cfs @ 12.61 hrs HW=1,384.52' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 13.04 cfs @ 7.38 fps)
  ├**2=Orifice/Grate** (Passes < 0.05 cfs potential flow)
  ├**3=Orifice/Grate** (Passes < 14.40 cfs potential flow)
  └**4=Broad-Crested Rectangular Weir** (Passes < 14.68 cfs potential flow)

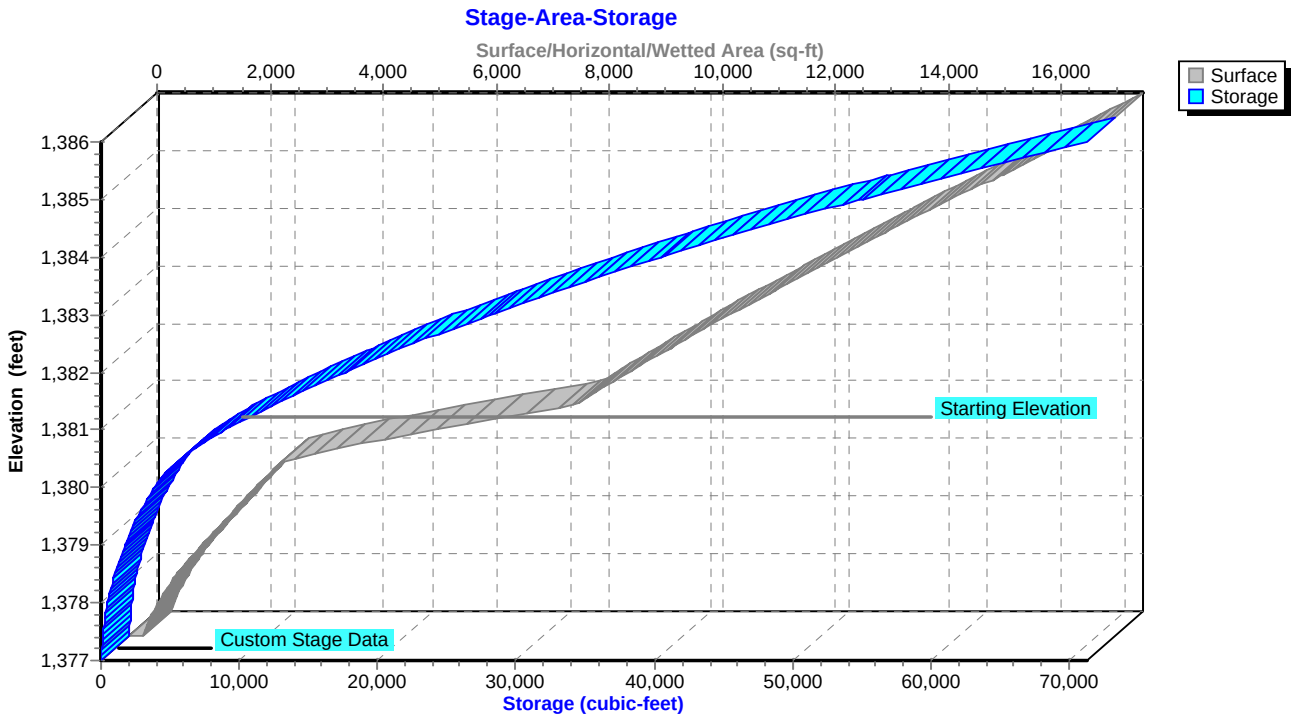
Pond 23-P: Pond-23



Pond 23-P: Pond-23



Pond 23-P: Pond-23



Summary for Pond 24-P: Pond-24

Inflow Area = 12.441 ac, 8.63% Impervious, Inflow Depth = 5.15" for 100-YR, 24-HR Storm event
Inflow = 46.25 cfs @ 12.04 hrs, Volume= 5.340 af
Outflow = 23.36 cfs @ 12.59 hrs, Volume= 5.413 af, Atten= 49%, Lag= 32.7 min
Primary = 20.97 cfs @ 12.59 hrs, Volume= 5.362 af
Secondary = 2.39 cfs @ 12.59 hrs, Volume= 0.051 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,365.00' Surf.Area= 12,290 sf Storage= 10,821 cf
Peak Elev= 1,368.13' @ 12.59 hrs Surf.Area= 23,811 sf Storage= 67,947 cf (57,126 cf above start)

Plug-Flow detention time= 378.9 min calculated for 5.164 af (97% of inflow)
Center-of-Mass det. time= 335.6 min (1,156.6 - 820.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,361.00'	90,100 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

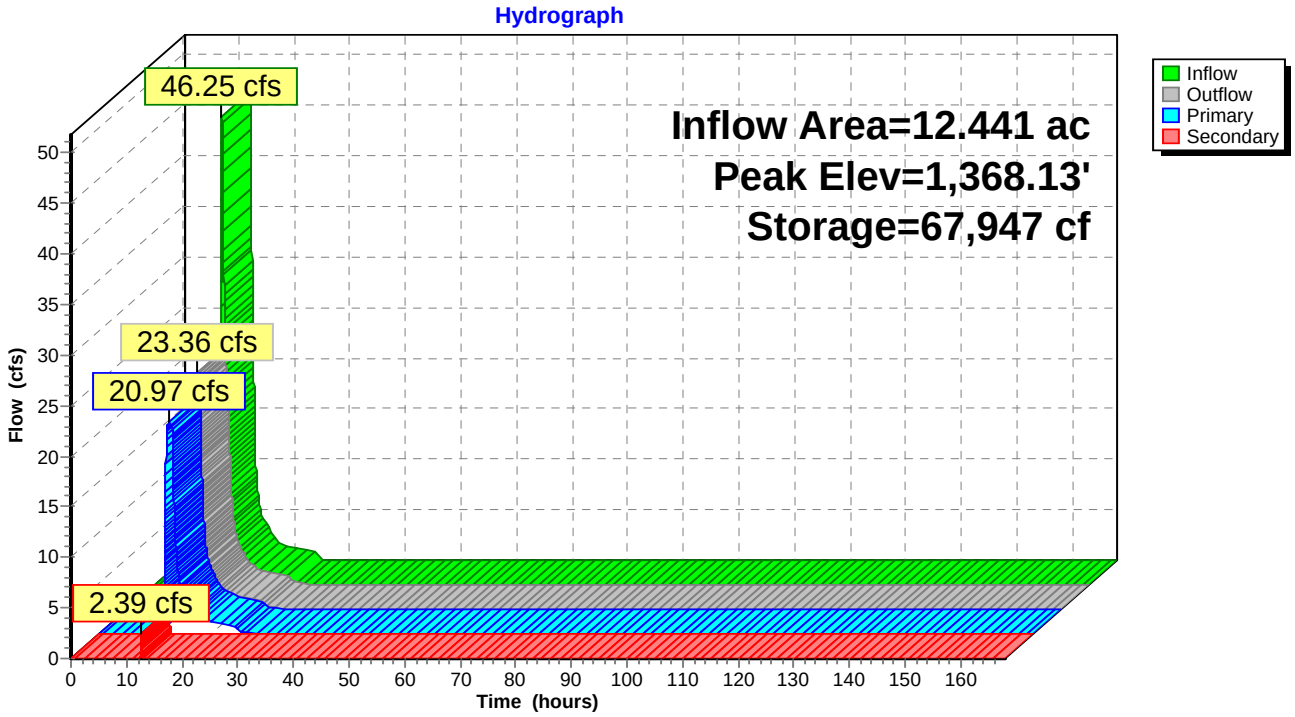
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,361.00	144	79.7	0	0	144
1,362.00	778	180.4	419	419	2,232
1,363.00	1,724	246.8	1,220	1,639	4,500
1,364.00	2,762	271.9	2,223	3,862	5,568
1,365.00	12,290	631.5	6,959	10,821	31,423
1,366.00	16,533	762.9	14,359	25,180	46,021
1,367.00	19,892	828.3	18,187	43,367	54,340
1,368.00	23,383	865.9	21,614	64,981	59,479
1,369.00	26,897	891.0	25,120	90,100	63,097

Device	Routing	Invert	Outlet Devices
#1	Primary	1,362.00'	**18.0" Round Culvert** L= 150.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,362.00' / 1,358.00' S= 0.0267 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,364.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,365.80'	**12.5" W x 12.5" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,367.00'	**12.0" x 12.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,368.00'	**20.0' long x 15.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.68 2.70 2.70 2.64 2.63 2.64 2.64 2.63

Primary OutFlow Max=20.97 cfs @ 12.59 hrs HW=1,368.13' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Barrel Controls 20.97 cfs @ 11.87 fps)
  - **2=Orifice/Grate** (Passes < 0.05 cfs potential flow)
  - **3=Orifice/Grate** (Passes < 20.98 cfs potential flow)
  - **4=Orifice/Grate** (Passes < 5.11 cfs potential flow)

Secondary OutFlow Max=2.39 cfs @ 12.59 hrs HW=1,368.13' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 2.39 cfs @ 0.95 fps)

Pond 24-P: Pond-24



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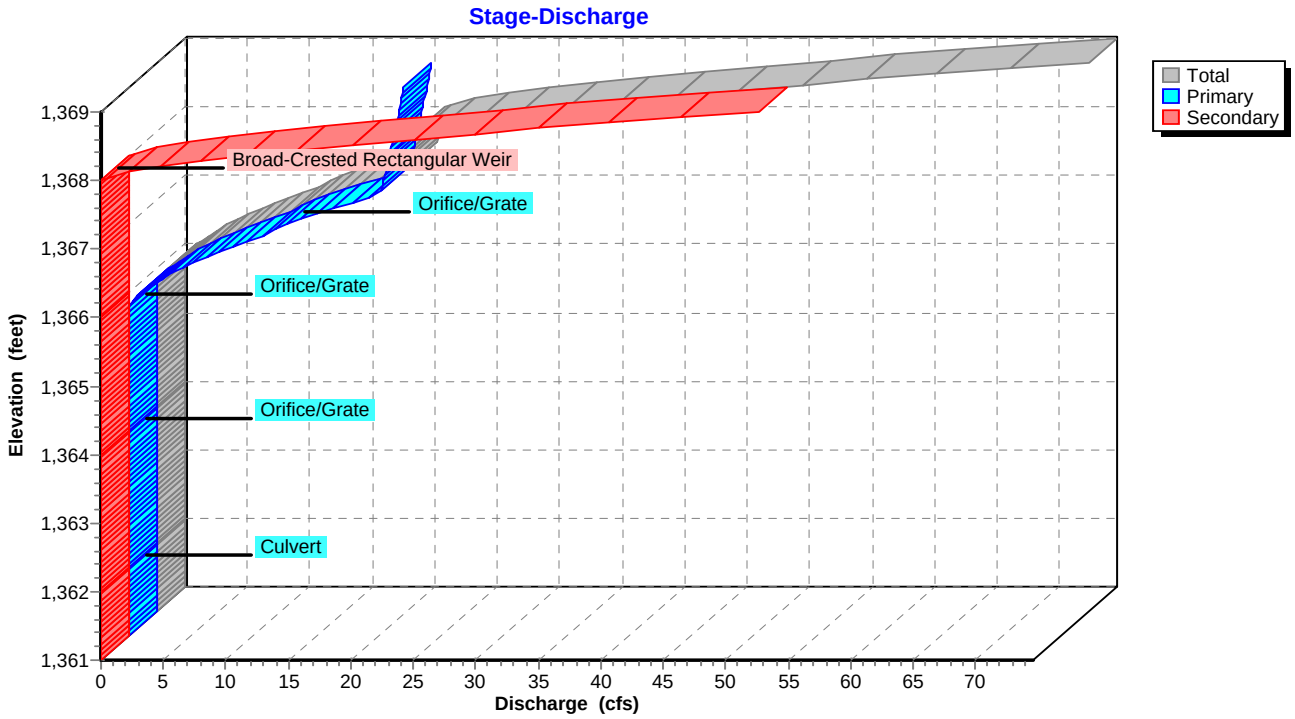

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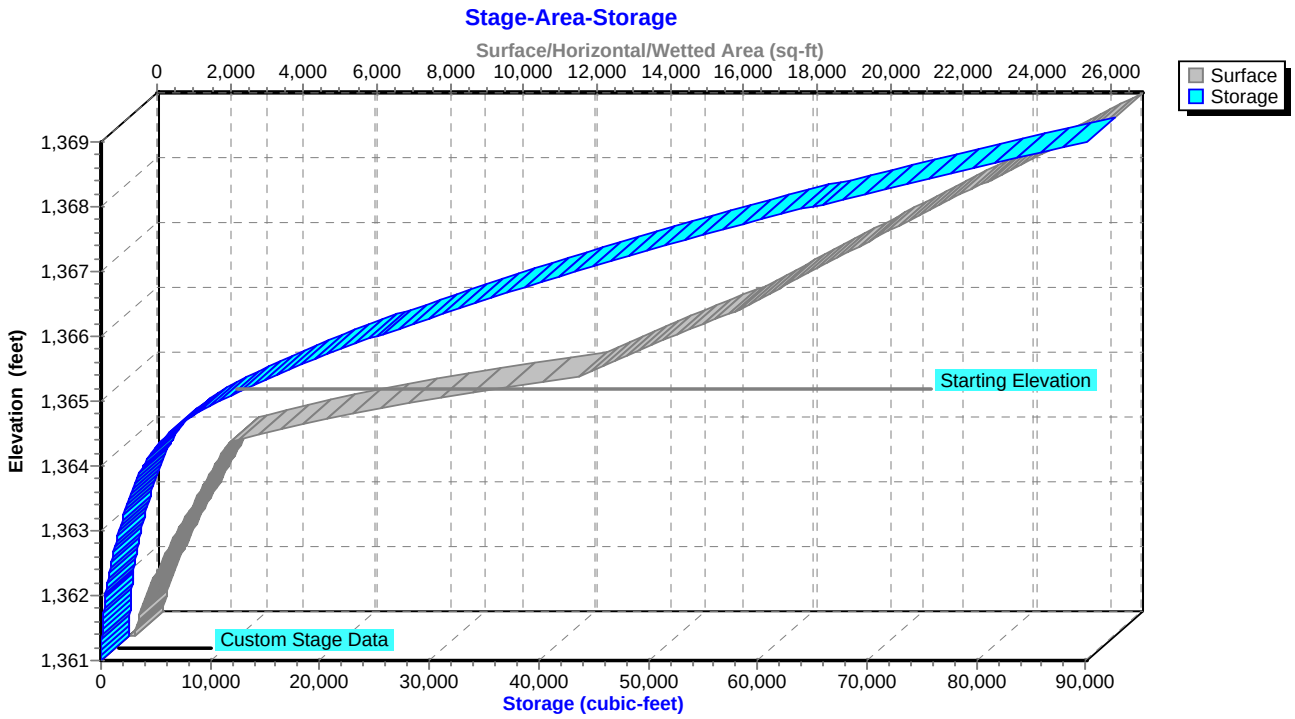


Summary for Pond 26-P: Pond-26

Inflow Area = 5.277 ac, 13.14% Impervious, Inflow Depth = 5.21" for 100-YR, 24-HR Storm event
Inflow = 17.14 cfs @ 12.04 hrs, Volume= 2.291 af
Outflow = 4.76 cfs @ 13.21 hrs, Volume= 2.210 af, Atten= 72%, Lag= 70.4 min
Primary = 4.76 cfs @ 13.21 hrs, Volume= 2.210 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,371.00' Surf.Area= 11,978 sf Storage= 14,978 cf
Peak Elev= 1,374.11' @ 13.21 hrs Surf.Area= 18,730 sf Storage= 62,455 cf (47,477 cf above start)

Plug-Flow detention time= 808.1 min calculated for 1.866 af (81% of inflow)
Center-of-Mass det. time= 610.1 min (1,436.3 - 826.2)

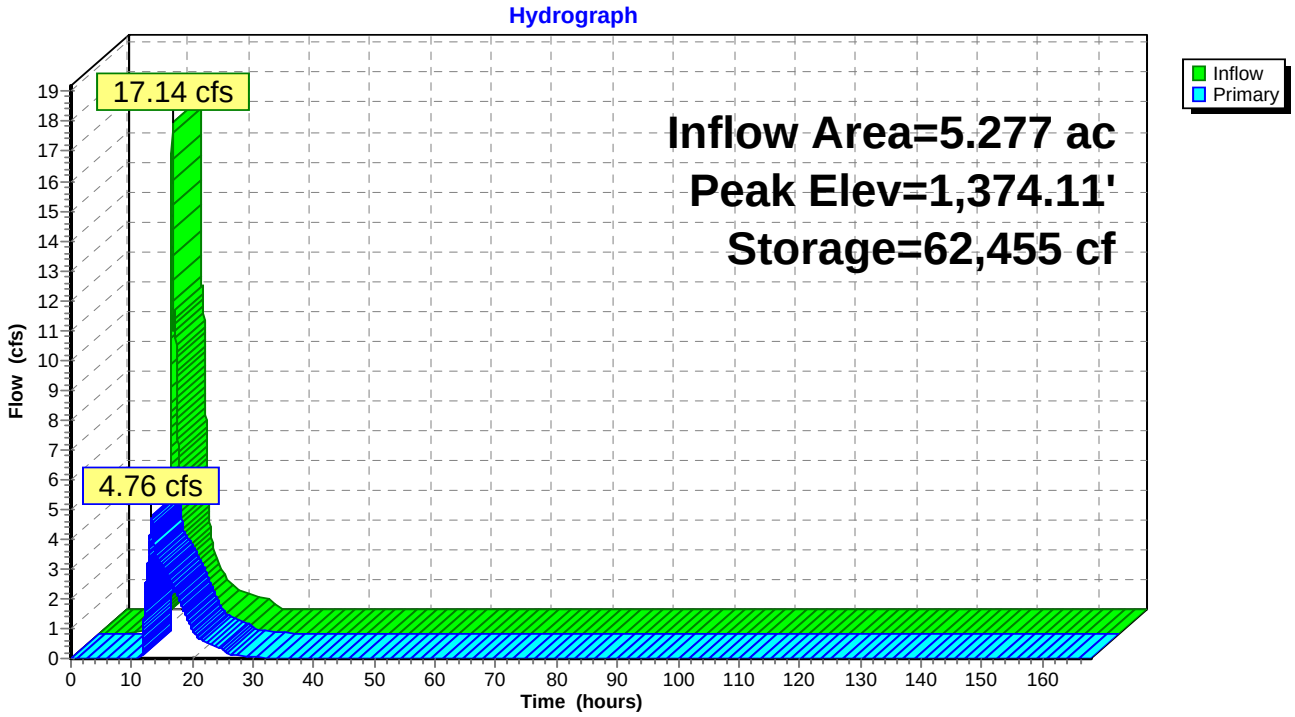
Volume	Invert	Avail.Storage	Storage Description
#1	1,367.00'	80,070 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,367.00	790	132.3	0	0	790
1,368.00	1,854	246.6	1,285	1,285	4,242
1,369.00	2,907	273.0	2,361	3,646	5,364
1,370.00	4,238	315.4	3,552	7,197	7,371
1,371.00	11,978	471.7	7,780	14,978	17,168
1,372.00	14,050	507.1	13,000	27,978	19,969
1,373.00	16,216	538.7	15,120	43,098	22,650
1,374.00	18,484	568.5	17,338	60,435	25,334
1,375.00	20,808	593.7	19,635	80,070	27,736

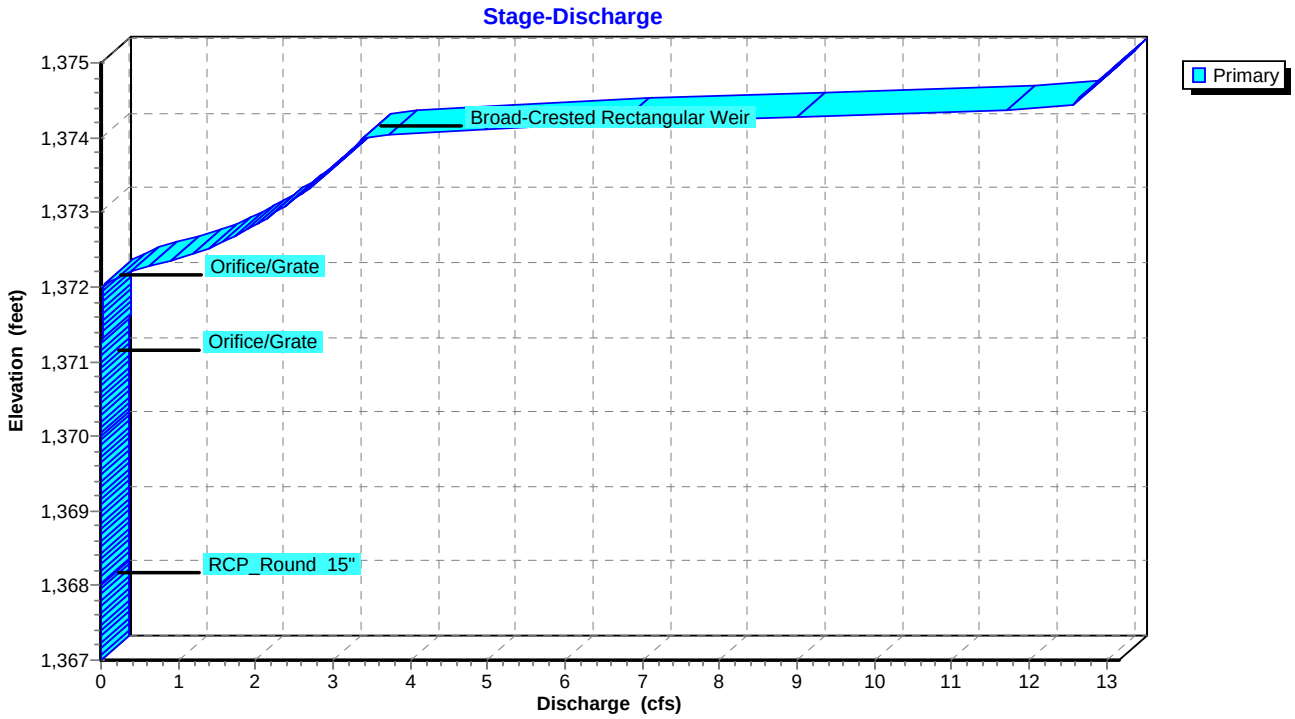
Device	Routing	Invert	Outlet Devices
#1	Primary	1,368.00'	**15.0" Round RCP_Round 15"** L= 60.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,368.00' / 1,367.00' S= 0.0167 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,371.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,372.00'	**5.0" W x 5.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,374.00'	**15.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

Primary OutFlow Max=4.76 cfs @ 13.21 hrs HW=1,374.11' TW=0.00' (Dynamic Tailwater)
└─**1=RCP_Round 15"** (Passes 4.76 cfs of 12.21 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.43 fps)
  ├─**3=Orifice/Grate** (Orifice Controls 3.46 cfs @ 6.63 fps)
  └─**4=Broad-Crested Rectangular Weir** (Weir Controls 1.25 cfs @ 0.77 fps)

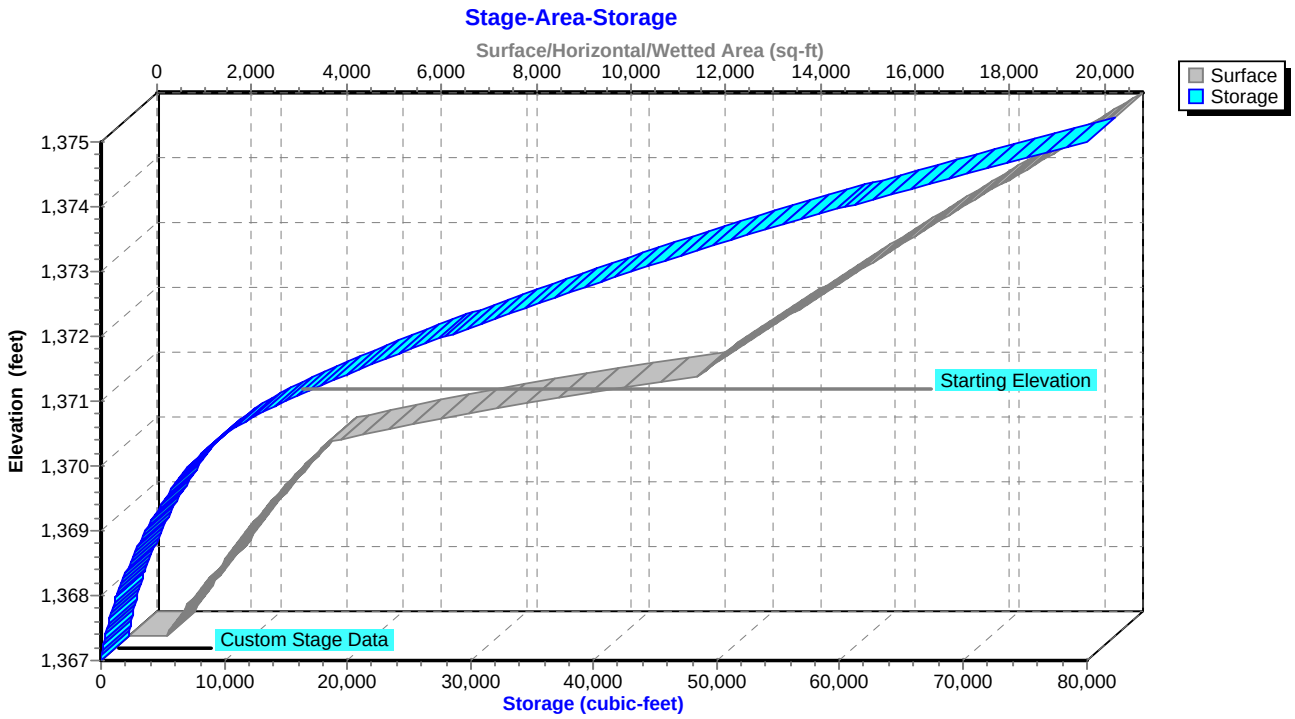
Pond 26-P: Pond-26



Pond 26-P: Pond-26



Pond 26-P: Pond-26



Summary for Pond 28-P: Pond-28

Inflow Area = 2.526 ac, 27.71% Impervious, Inflow Depth = 6.23" for 100-YR, 24-HR Storm event
Inflow = 16.93 cfs @ 12.03 hrs, Volume= 1.311 af
Outflow = 11.86 cfs @ 12.22 hrs, Volume= 1.308 af, Atten= 30%, Lag= 11.1 min
Primary = 11.86 cfs @ 12.22 hrs, Volume= 1.308 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Starting Elev= 1,373.60' Surf.Area= 3,232 sf Storage= 4,285 cf
Peak Elev= 1,376.87' @ 12.22 hrs Surf.Area= 8,513 sf Storage= 23,104 cf (18,820 cf above start)

Plug-Flow detention time= 954.8 min calculated for 1.209 af (92% of inflow)
Center-of-Mass det. time= 840.5 min (1,634.7 - 794.2)

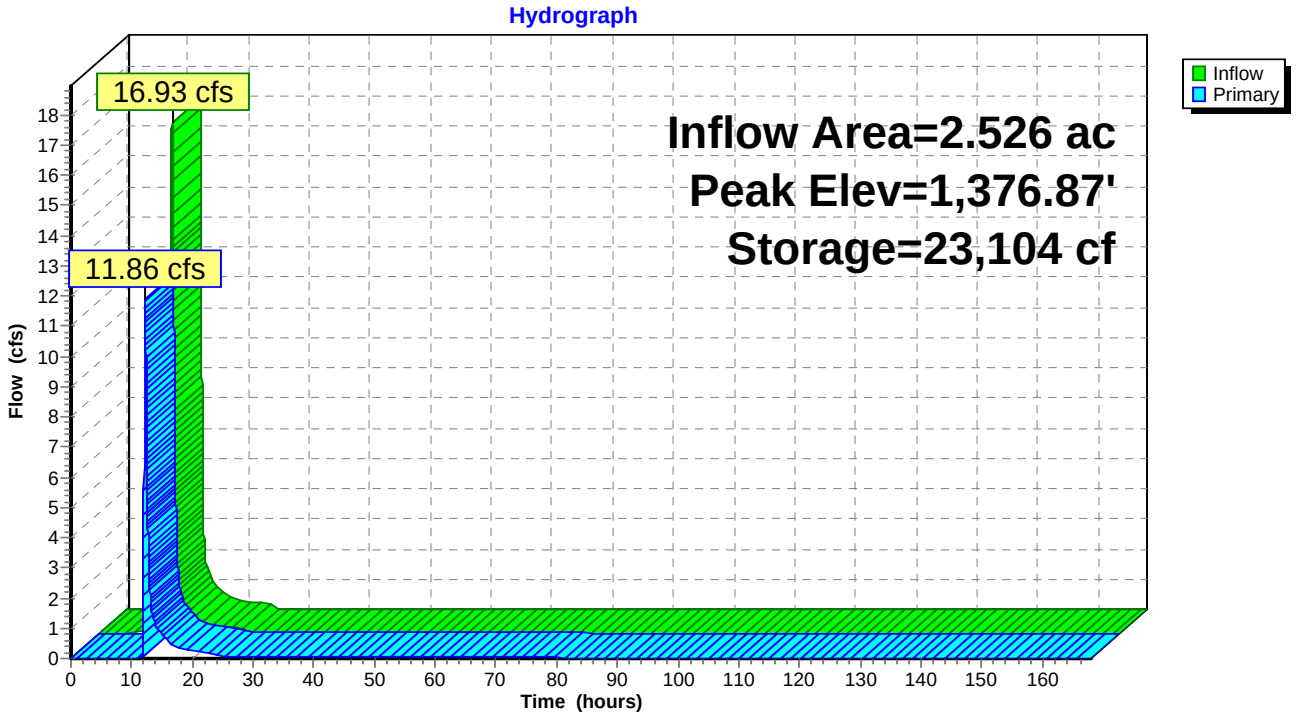
Volume	Invert	Avail.Storage	Storage Description
#1	1,371.50'	34,004 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,371.50	1,192	167.7	0	0	1,192
1,372.00	1,450	177.8	659	659	1,483
1,373.00	2,447	249.8	1,927	2,586	3,942
1,374.00	3,816	343.3	3,106	5,693	8,365
1,375.00	5,311	374.0	4,543	10,236	10,154
1,376.00	6,958	407.2	6,116	16,352	12,254
1,377.00	8,749	443.2	7,836	24,188	14,727
1,378.00	10,923	486.7	9,816	34,004	17,980

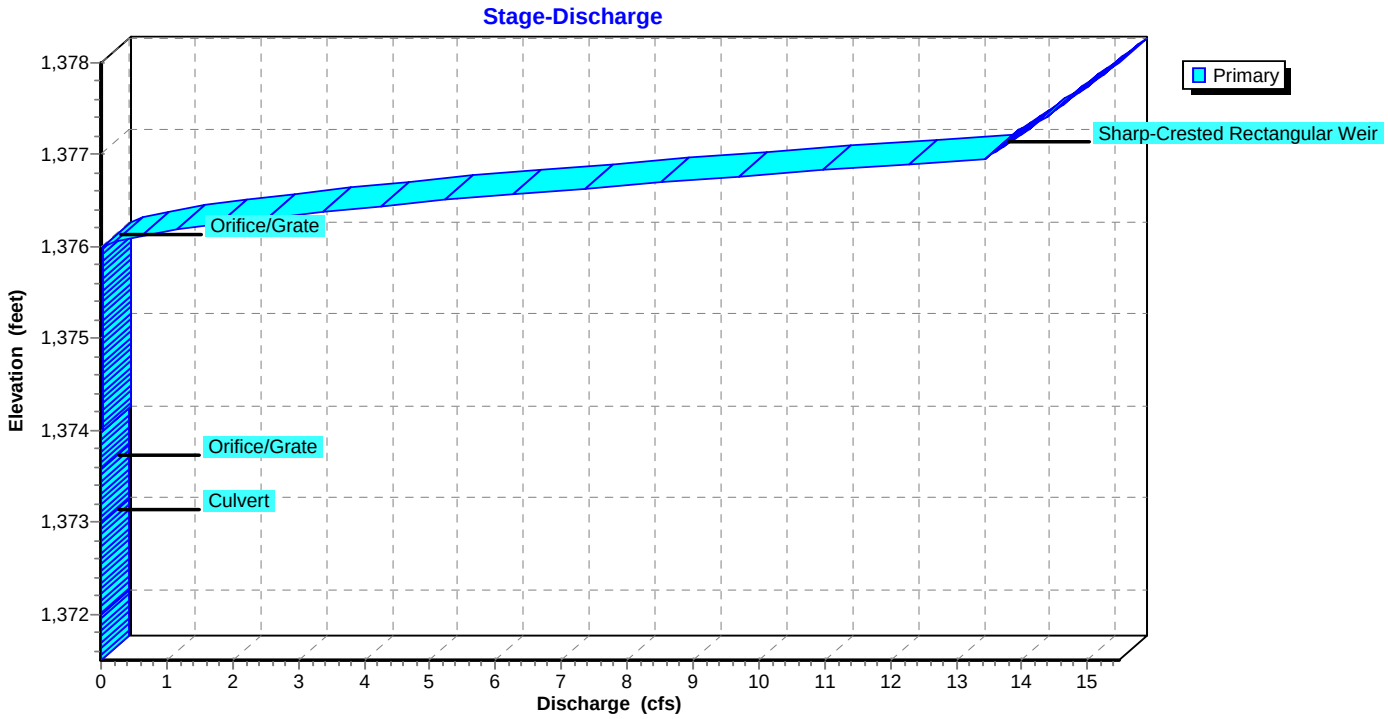
Device	Routing	Invert	Outlet Devices
#1	Primary	1,373.00'	**18.0" Round Culvert** L= 20.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,373.00' / 1,372.00' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,373.60'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,376.00'	**18.0" W x 12.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#4	Device 1	1,377.00'	**16.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=11.86 cfs @ 12.22 hrs HW=1,376.87' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 11.86 cfs of 13.27 cfs potential flow)
  - **2=Orifice/Grate** (Orifice Controls 0.05 cfs @ 8.66 fps)
  - **3=Orifice/Grate** (Orifice Controls 11.81 cfs @ 3.00 fps)
  - **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

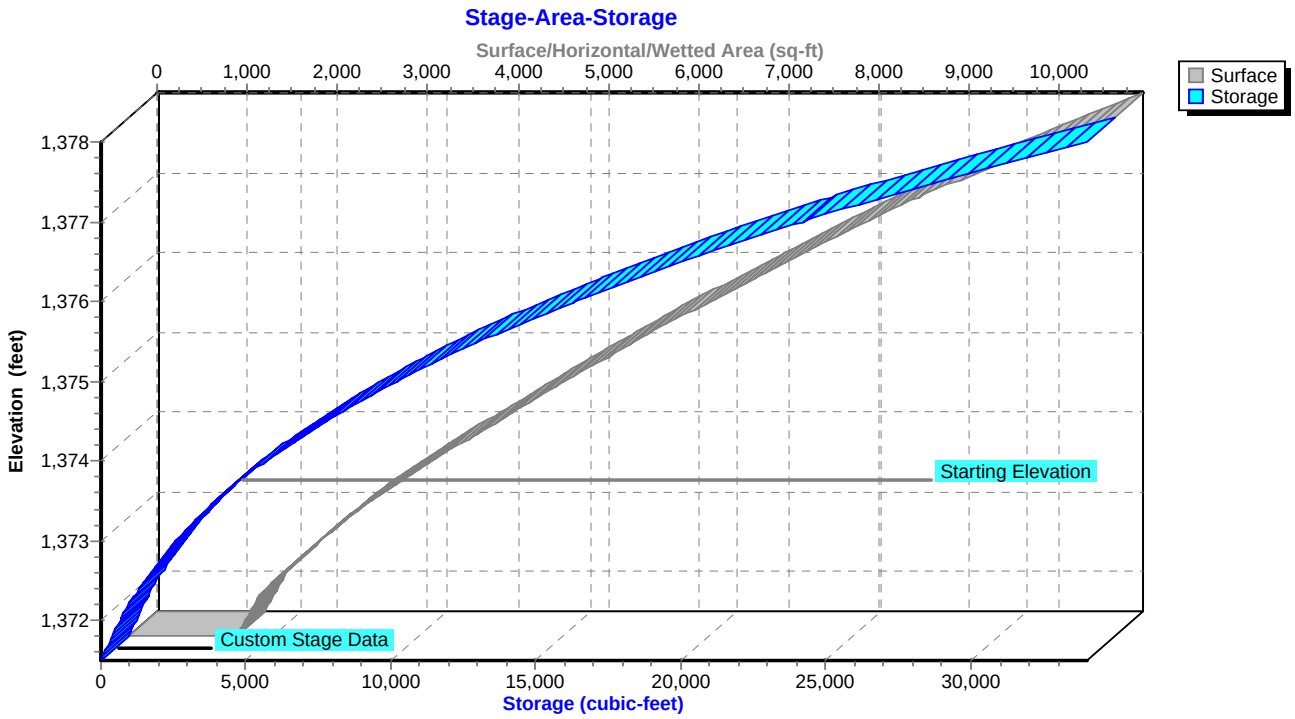
Pond 28-P: Pond-28



Pond 28-P: Pond-28



Pond 28-P: Pond-28



Summary for Pond BRA-46: BRA-46

Inflow Area = 1.246 ac, 25.52% Impervious, Inflow Depth = 4.89" for 100-YR, 24-HR Storm event
Inflow = 8.08 cfs @ 12.04 hrs, Volume= 0.507 af
Outflow = 7.86 cfs @ 12.06 hrs, Volume= 0.449 af, Atten= 3%, Lag= 1.1 min
Primary = 7.86 cfs @ 12.06 hrs, Volume= 0.449 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,370.95' @ 12.06 hrs Surf.Area= 1,809 sf Storage= 3,275 cf

Plug-Flow detention time= 89.7 min calculated for 0.448 af (88% of inflow)
Center-of-Mass det. time= 33.2 min (839.2 - 806.0)

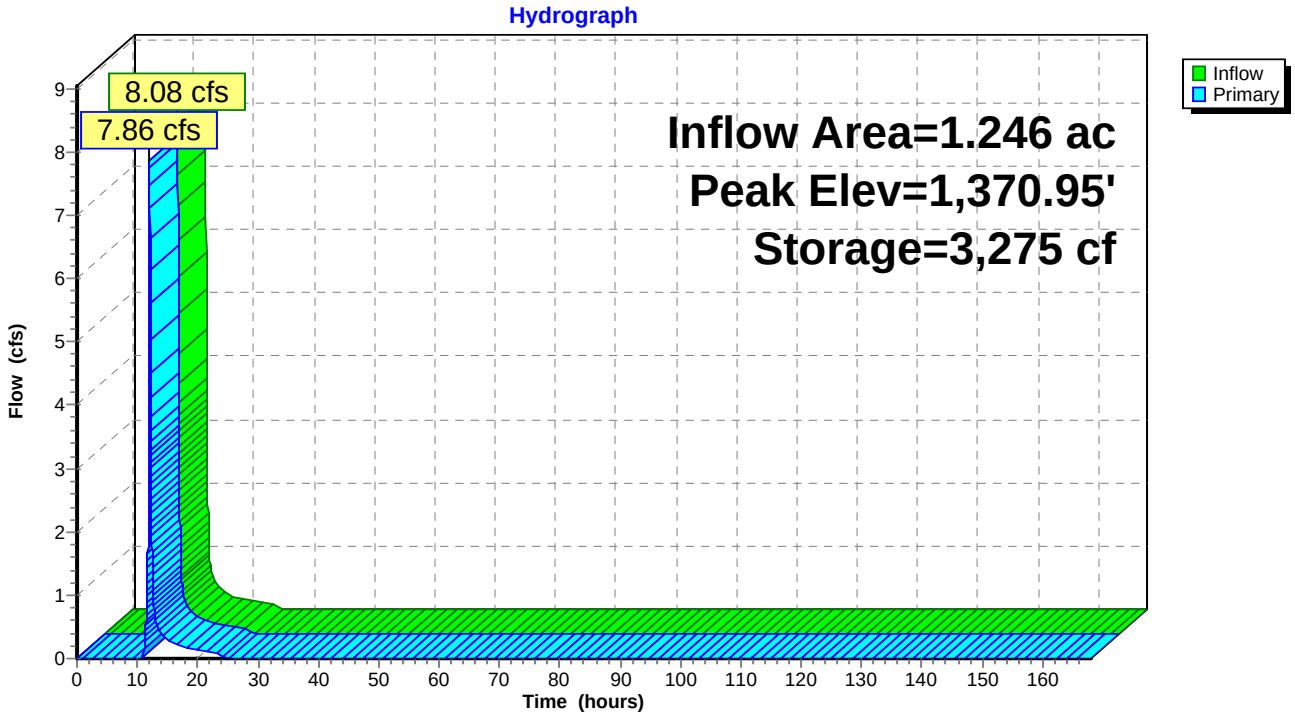
Volume	Invert	Avail.Storage	Storage Description
#1	1,366.00'	3,370 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,366.00	1,368	164.6	0.0	0	0	1,368
1,367.00	1,368	164.6	25.0	342	342	1,533
1,368.00	1,368	164.6	25.0	342	684	1,697
1,369.00	1,368	164.6	25.0	342	1,026	1,862
1,369.50	1,368	164.6	25.0	171	1,197	1,944
1,370.50	1,368	164.6	100.0	1,368	2,565	2,109
1,371.00	1,864	195.6	100.0	805	3,370	3,002

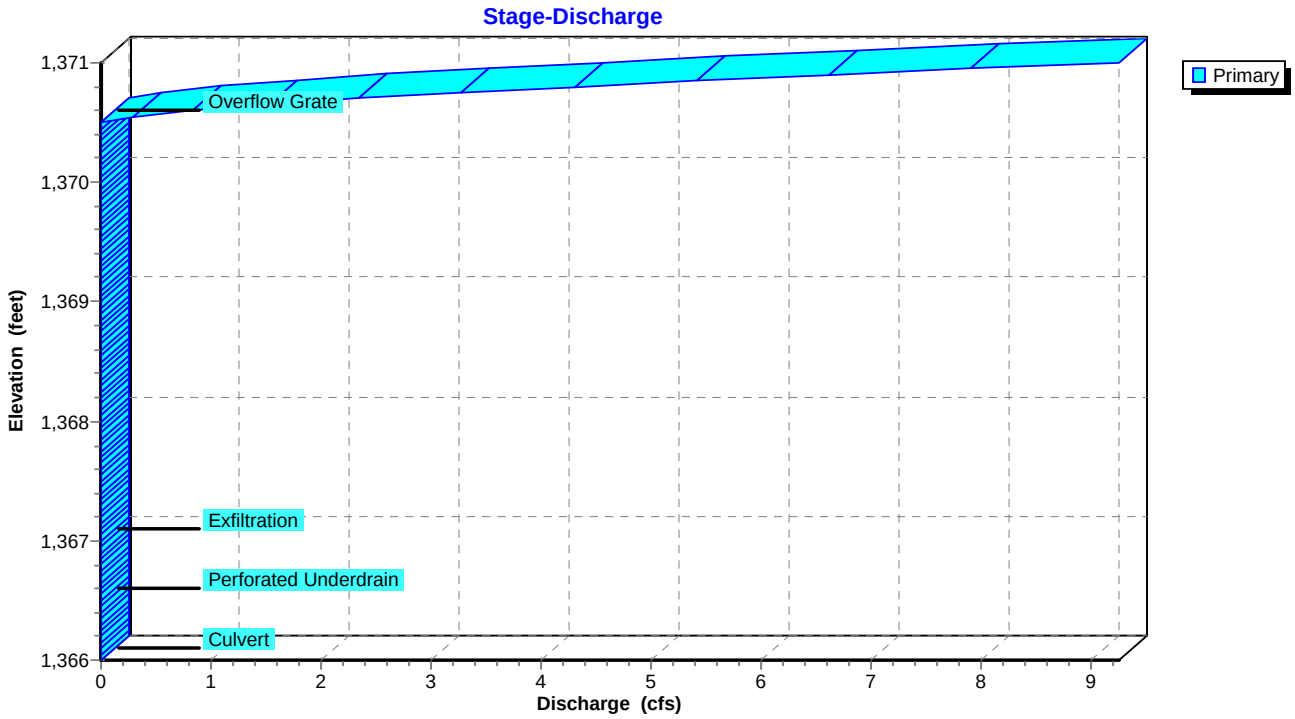
Device	Routing	Invert	Outlet Devices
#1	Primary	1,366.00'	**15.0" Round Culvert** L= 72.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,366.00' / 1,365.20' S= 0.0110 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,366.50'	**0.4" Horiz. Perforated Underdrain X 512.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,367.00'	**0.250 in/hr Exfiltration over Surface area above 1,367.00'** Conductivity to Groundwater Elevation = 1,366.00' Excluded Surface area = 1,368 sf
#4	Device 1	1,370.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=7.85 cfs @ 12.06 hrs HW=1,370.95' TW=1,367.31' (Dynamic Tailwater)
- **1=Culvert** (Passes 7.85 cfs of 8.90 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 4.10 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 7.85 cfs @ 2.19 fps)

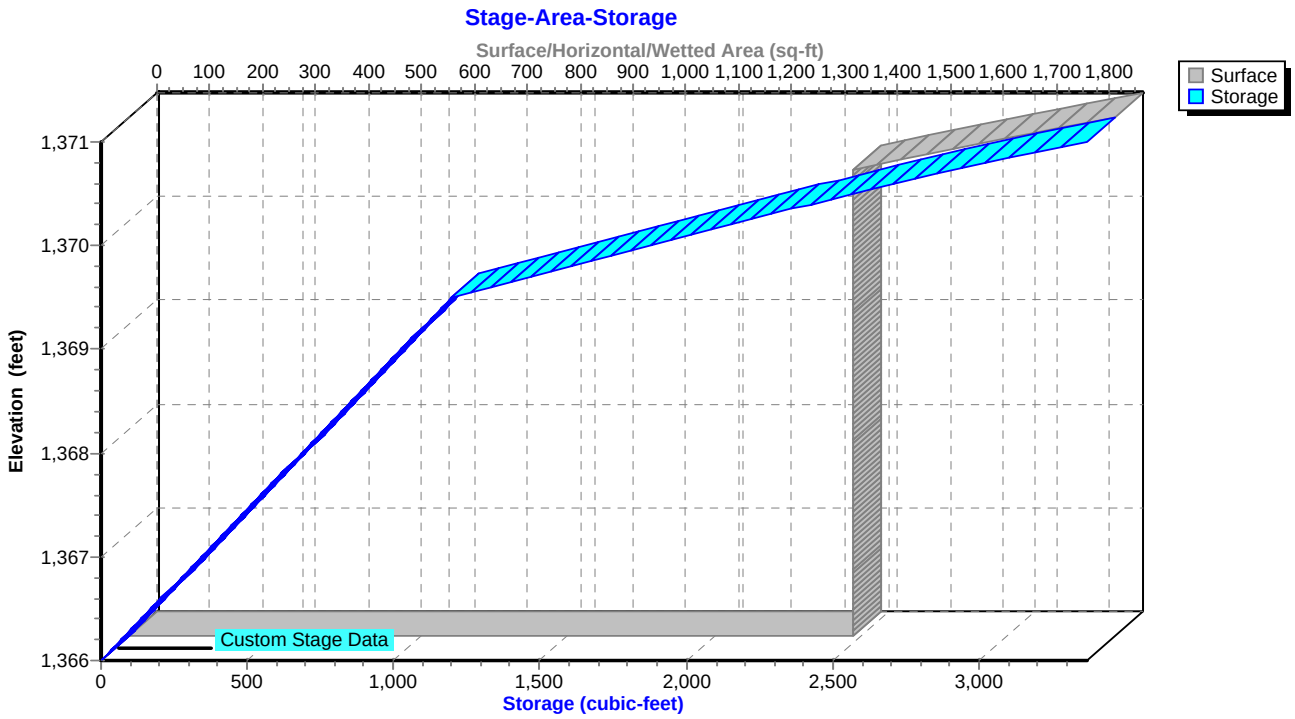
Pond BRA-46: BRA-46



Pond BRA-46: BRA-46



Pond BRA-46: BRA-46



Summary for Pond BRA-46-FS: Flow Splitter for BRA-46

Inflow Area = 1.246 ac, 25.52% Impervious, Inflow Depth = 5.74" for 100-YR, 24-HR Storm event
Inflow = 9.37 cfs @ 12.03 hrs, Volume= 0.596 af
Outflow = 9.37 cfs @ 12.04 hrs, Volume= 0.596 af, Atten= 0%, Lag= 0.6 min
Primary = 8.08 cfs @ 12.04 hrs, Volume= 0.507 af
Secondary = 1.30 cfs @ 12.04 hrs, Volume= 0.089 af

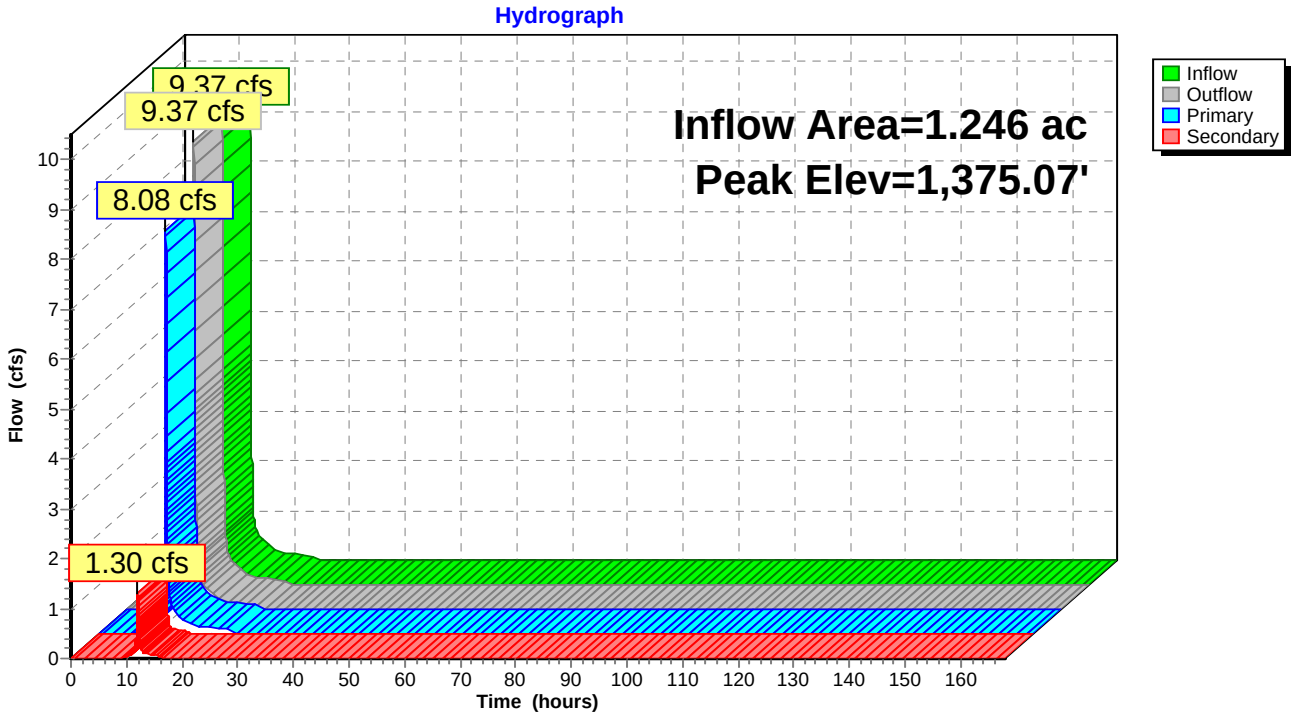
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,375.07' @ 12.04 hrs
Flood Elev= 1,375.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,371.45'	**15.0" Round Culvert** L= 38.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,371.45' / 1,371.00' S= 0.0118 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,371.45'	**15.0" Round Culvert** L= 195.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,371.45' / 1,365.12' S= 0.0325 '/' Cc= 0.900 n= 0.130, Flow Area= 1.23 sf
#3	Device 2	1,371.67'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

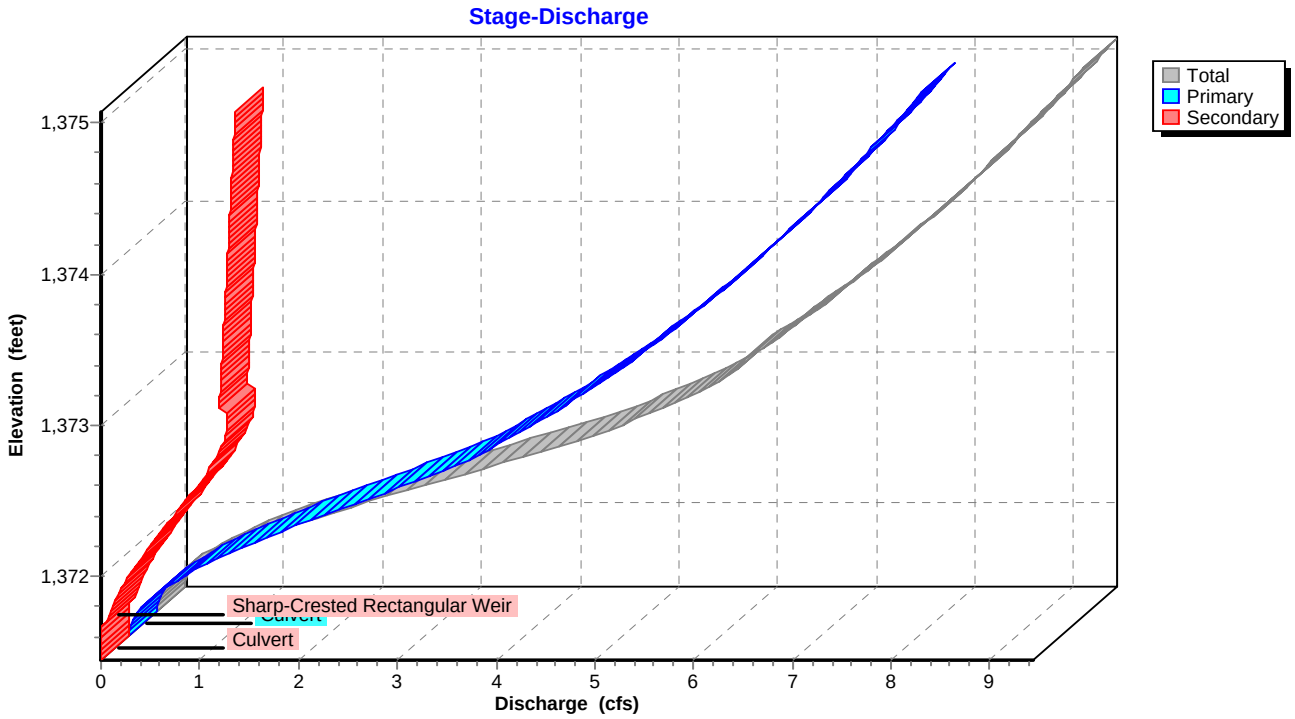
Primary OutFlow Max=8.06 cfs @ 12.04 hrs HW=1,375.06' TW=1,370.93' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 8.06 cfs @ 6.57 fps)

Secondary OutFlow Max=1.29 cfs @ 12.04 hrs HW=1,375.06' TW=1,367.20' (Dynamic Tailwater)
└**2=Culvert** (Outlet Controls 1.29 cfs @ 1.05 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 1.29 cfs of 67.69 cfs potential flow)

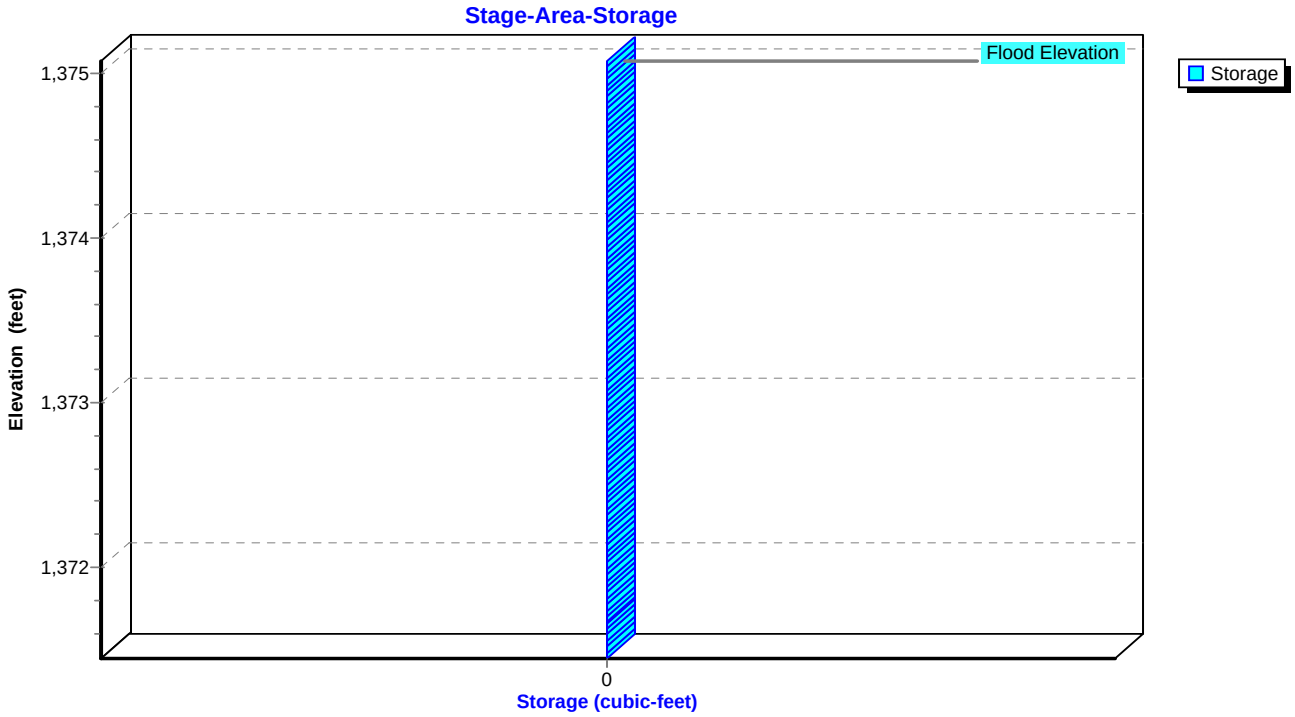
Pond BRA-46-FS: Flow Splitter for BRA-46



Pond BRA-46-FS: Flow Splitter for BRA-46



Pond BRA-46-FS: Flow Splitter for BRA-46



Summary for Pond BRA-59: BRA-59

Inflow Area = 0.860 ac, 38.02% Impervious, Inflow Depth = 4.00" for 100-YR, 24-HR Storm event
Inflow = 3.07 cfs @ 12.04 hrs, Volume= 0.287 af
Outflow = 2.13 cfs @ 12.09 hrs, Volume= 0.192 af, Atten= 31%, Lag= 3.3 min
Primary = 2.13 cfs @ 12.09 hrs, Volume= 0.192 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,381.69' @ 12.09 hrs Surf.Area= 2,867 sf Storage= 4,625 cf

Plug-Flow detention time= 228.9 min calculated for 0.192 af (67% of inflow)
Center-of-Mass det. time= 104.2 min (925.5 - 821.3)

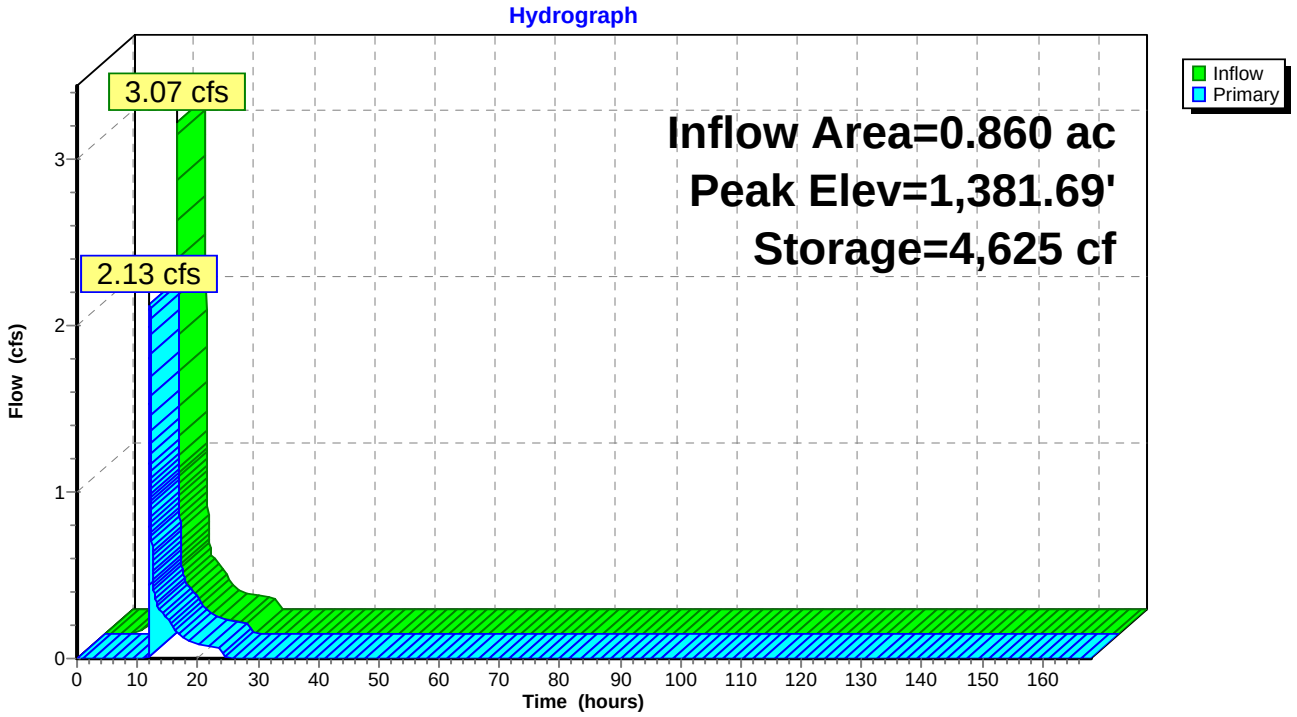
Volume	Invert	Avail.Storage	Storage Description
#1	1,378.50'	5,556 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,378.50	2,733	227.5	0.0	0	0	2,733
1,379.50	2,733	227.5	25.0	683	683	2,961
1,380.50	2,733	227.5	25.0	683	1,367	3,188
1,381.50	2,733	227.5	100.0	2,733	4,100	3,416
1,382.00	3,098	238.0	100.0	1,457	5,556	3,821

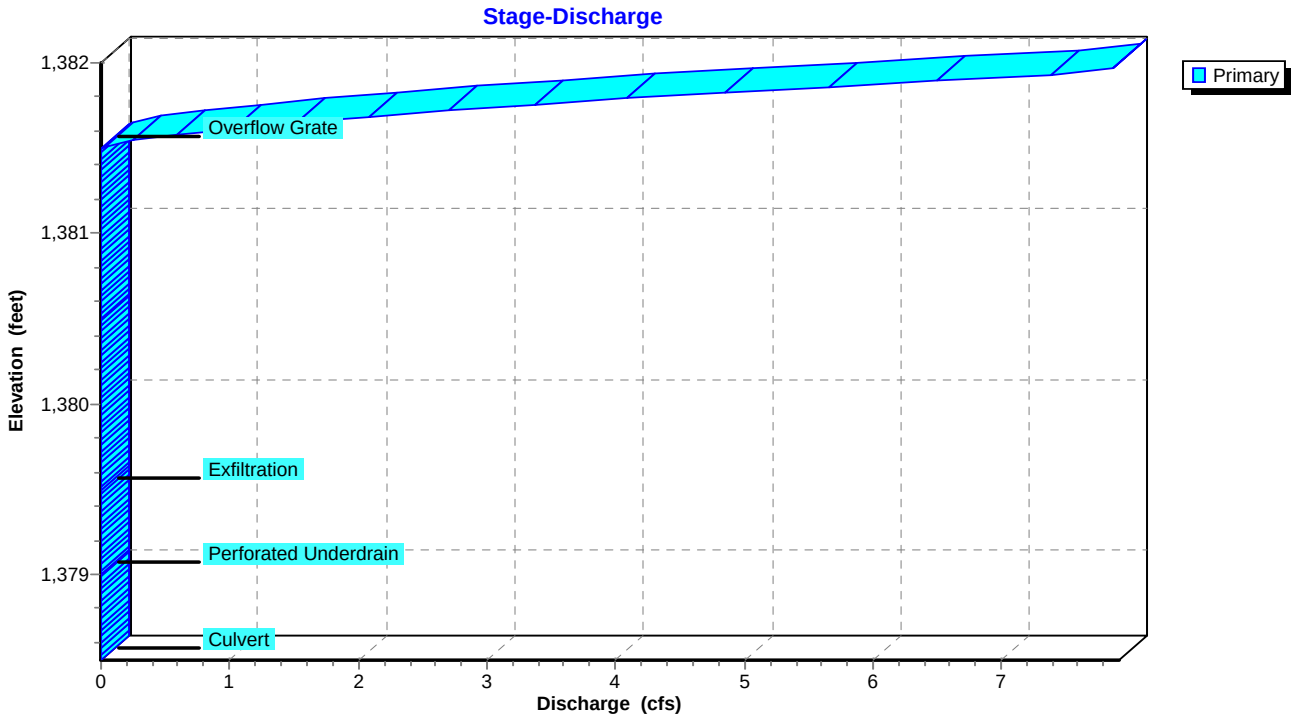
Device	Routing	Invert	Outlet Devices
#1	Primary	1,378.50'	**15.0" Round Culvert** L= 52.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,378.50' / 1,378.00' S= 0.0096 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,379.00'	**0.4" Horiz. Perforated Underdrain X 336.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,379.50'	**0.250 in/hr Exfiltration over Surface area above 1,379.50'** Conductivity to Groundwater Elevation = 1,378.50' Excluded Surface area = 2,733 sf
#4	Device 1	1,381.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.13 cfs @ 12.09 hrs HW=1,381.69' TW=1,379.76' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.13 cfs of 6.48 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 7.84 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 2.13 cfs @ 1.42 fps)

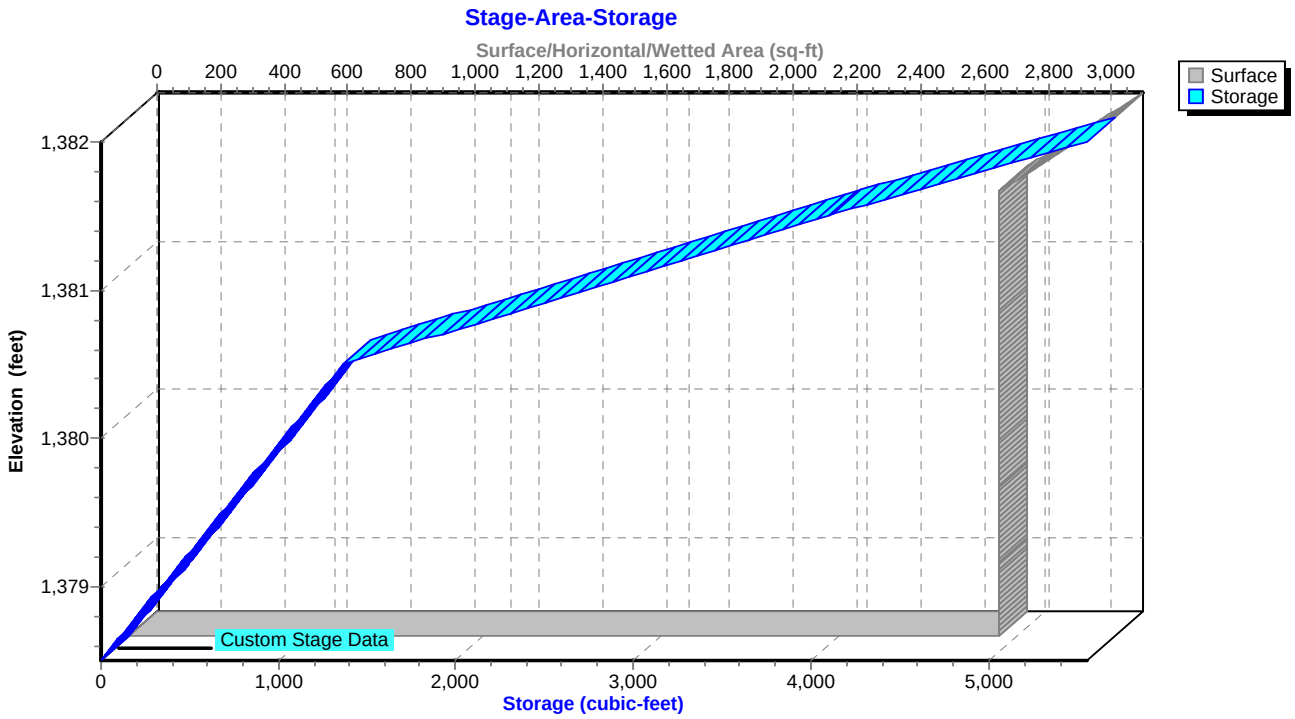
Pond BRA-59: BRA-59



Pond BRA-59: BRA-59



Pond BRA-59: BRA-59



Summary for Pond BRA-59-FS: Flow Splitter for BRA-59

Inflow Area = 0.860 ac, 38.02% Impervious, Inflow Depth = 6.10" for 100-YR, 24-HR Storm event
Inflow = 6.93 cfs @ 12.03 hrs, Volume= 0.437 af
Outflow = 6.93 cfs @ 12.04 hrs, Volume= 0.437 af, Atten= 0%, Lag= 0.6 min
Primary = 3.07 cfs @ 12.04 hrs, Volume= 0.287 af
Secondary = 3.86 cfs @ 12.04 hrs, Volume= 0.150 af

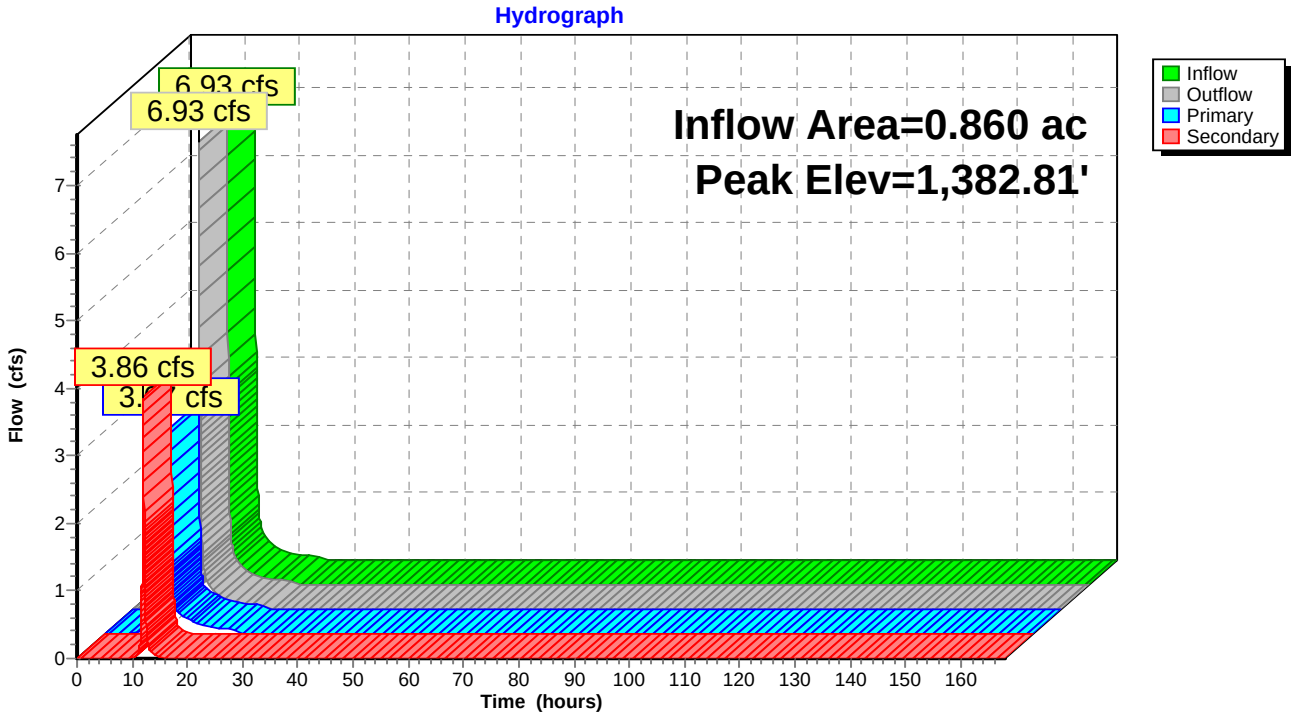
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,382.81' @ 12.04 hrs
Flood Elev= 1,385.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,381.75'	**15.0" Round Culvert to BRA** L= 66.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.75' / 1,381.25' S= 0.0076 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,381.50'	**15.0" Round Culvert to Pond** L= 86.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.50' / 1,380.50' S= 0.0116 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,382.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

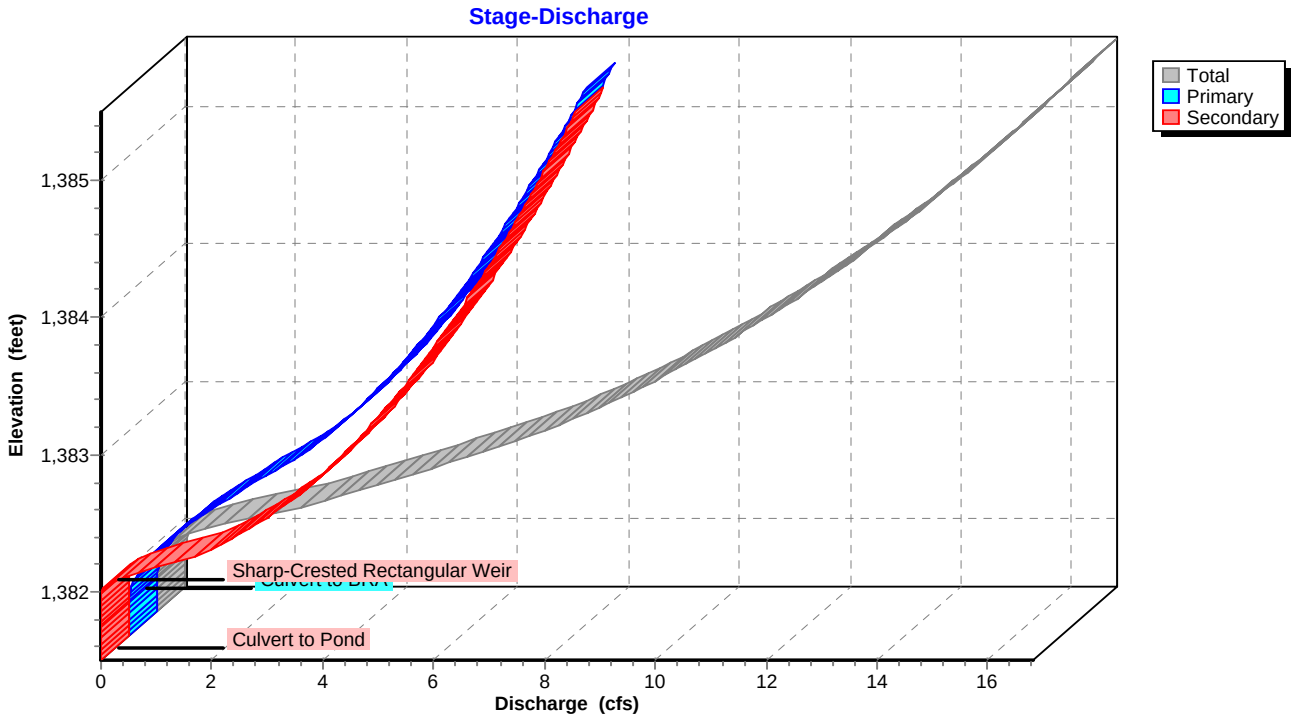
Primary OutFlow Max=3.05 cfs @ 12.04 hrs HW=1,382.81' TW=1,381.61' (Dynamic Tailwater)
└**1=Culvert to BRA** (Inlet Controls 3.05 cfs @ 2.76 fps)

Secondary OutFlow Max=3.85 cfs @ 12.04 hrs HW=1,382.81' TW=1,379.51' (Dynamic Tailwater)
└**2=Culvert to Pond** (Inlet Controls 3.85 cfs @ 3.14 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 3.85 cfs of 9.08 cfs potential flow)

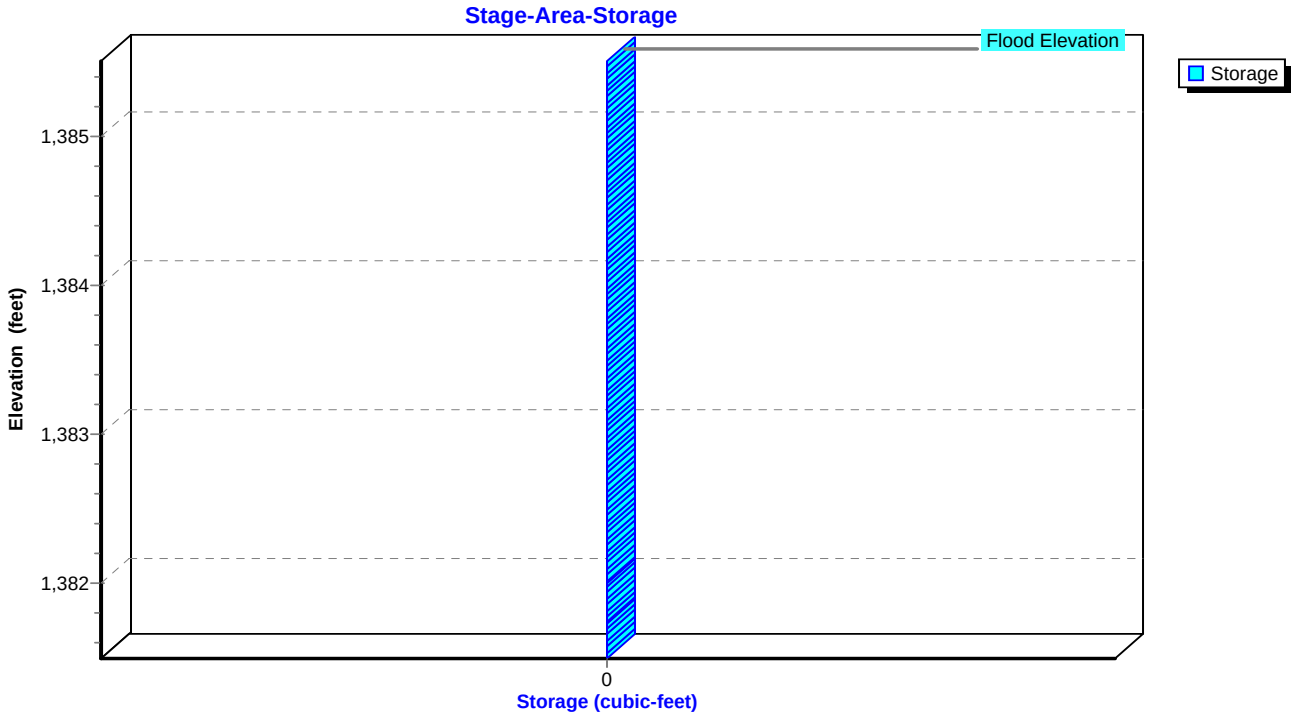
Pond BRA-59-FS: Flow Splitter for BRA-59



Pond BRA-59-FS: Flow Splitter for BRA-59



Pond BRA-59-FS: Flow Splitter for BRA-59



Summary for Pond BRA37-FS: Flow Splitter for BRA-37

Inflow Area = 5.787 ac, 8.64% Impervious, Inflow Depth = 5.06" for 100-YR, 24-HR Storm event
Inflow = 19.12 cfs @ 12.03 hrs, Volume= 2.442 af
Outflow = 19.12 cfs @ 12.04 hrs, Volume= 2.442 af, Atten= 0%, Lag= 0.6 min
Primary = 9.56 cfs @ 12.04 hrs, Volume= 1.337 af
Secondary = 9.56 cfs @ 12.04 hrs, Volume= 1.105 af

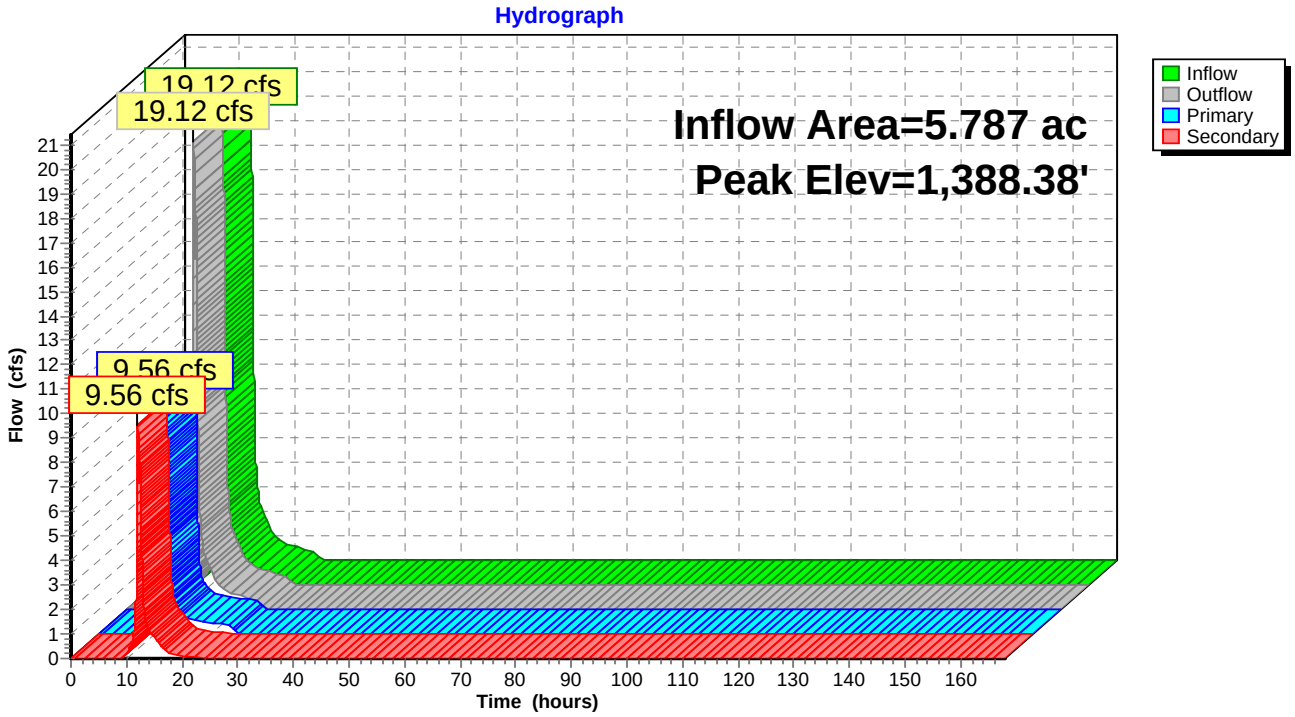
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,388.38' @ 12.04 hrs
Flood Elev= 1,390.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,385.60'	**18.0" Round Culvert to BRA-37** L= 7.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,385.60' / 1,385.50' S= 0.0127 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,385.60'	**18.0" Round Culvert** L= 89.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,385.60' / 1,383.00' S= 0.0292 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,385.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

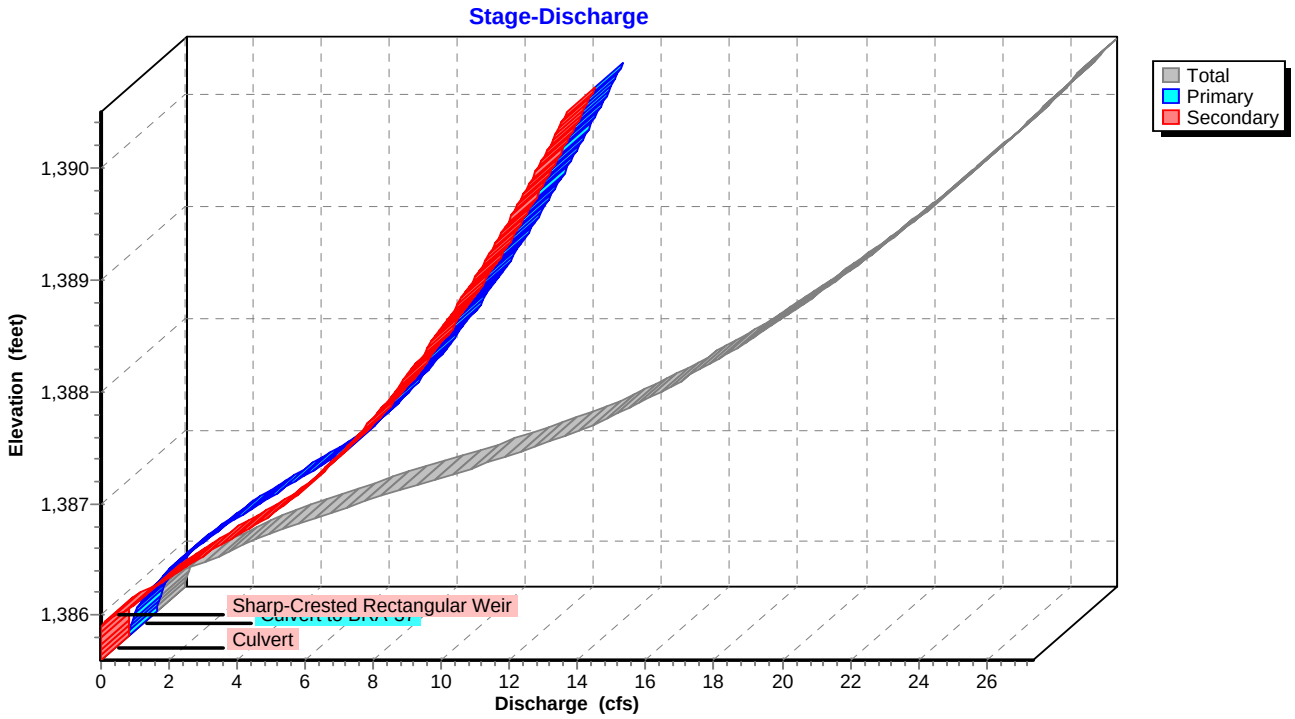
Primary OutFlow Max=9.56 cfs @ 12.04 hrs HW=1,388.37' TW=1,385.93' (Dynamic Tailwater)
└**1=Culvert to BRA-37** (Inlet Controls 9.56 cfs @ 5.41 fps)

Secondary OutFlow Max=9.56 cfs @ 12.04 hrs HW=1,388.37' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 9.56 cfs @ 5.41 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 9.56 cfs of 44.62 cfs potential flow)

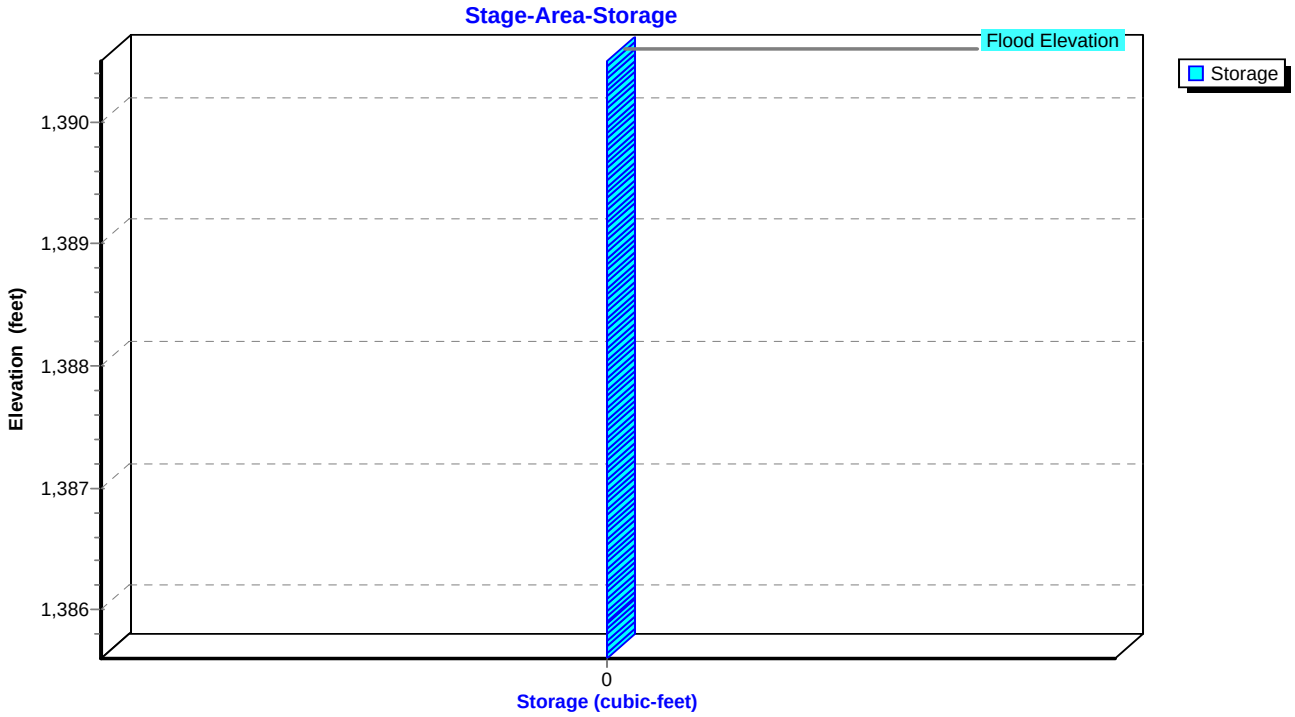
Pond BRA37-FS: Flow Splitter for BRA-37



Pond BRA37-FS: Flow Splitter for BRA-37



Pond BRA37-FS: Flow Splitter for BRA-37



Summary for Pond BRA37-P: BRA-37

Inflow Area = 5.787 ac, 8.64% Impervious, Inflow Depth = 2.77" for 100-YR, 24-HR Storm event
Inflow = 9.56 cfs @ 12.04 hrs, Volume= 1.337 af
Outflow = 8.58 cfs @ 12.09 hrs, Volume= 1.223 af, Atten= 10%, Lag= 2.8 min
Primary = 8.58 cfs @ 12.09 hrs, Volume= 1.223 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,385.98' @ 12.09 hrs Surf.Area= 4,371 sf Storage= 7,006 cf

Plug-Flow detention time= 79.4 min calculated for 1.223 af (91% of inflow)
Center-of-Mass det. time= 32.5 min (883.1 - 850.7)

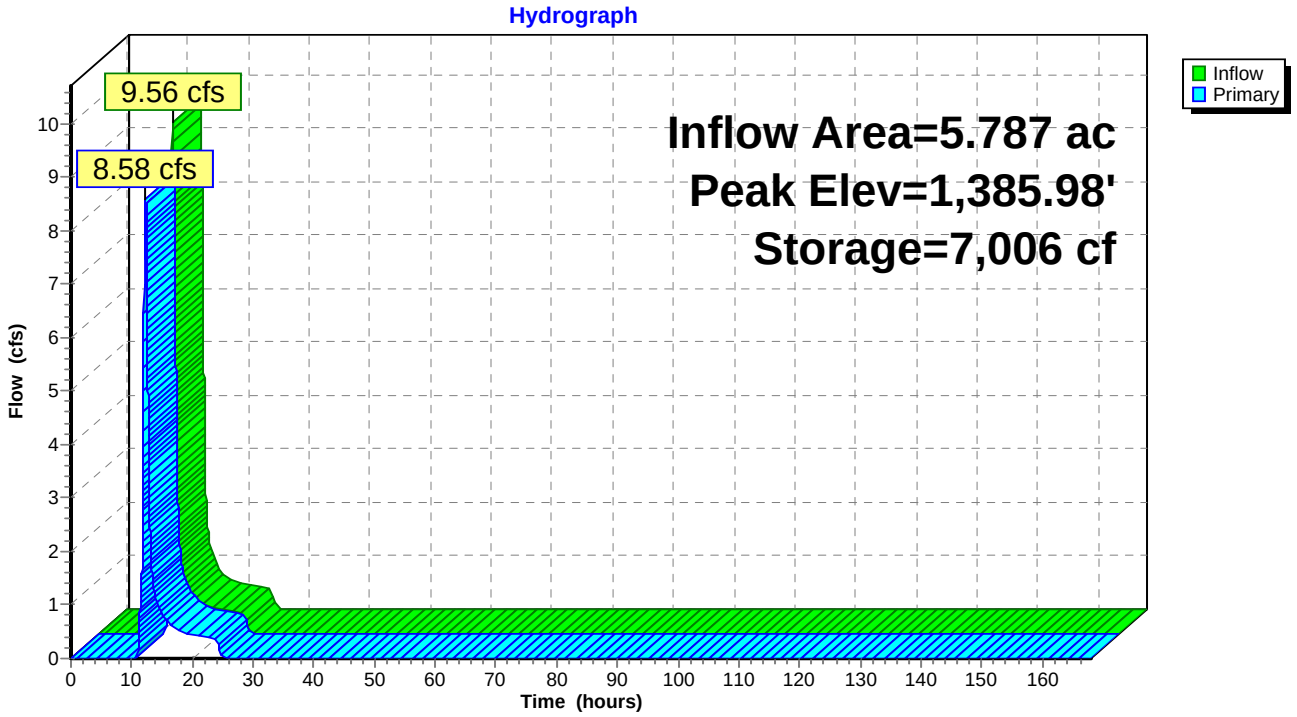
Volume	Invert	Avail.Storage	Storage Description
#1	1,382.00'	11,952 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,382.00	3,939	292.0	0.0	0	0	3,939
1,383.00	3,939	292.0	25.0	985	985	4,231
1,384.00	3,939	292.0	25.0	985	1,970	4,523
1,385.00	3,939	292.0	25.0	985	2,954	4,815
1,386.00	4,382	302.0	100.0	4,159	7,113	5,373
1,387.00	5,312	320.0	100.0	4,840	11,952	6,317

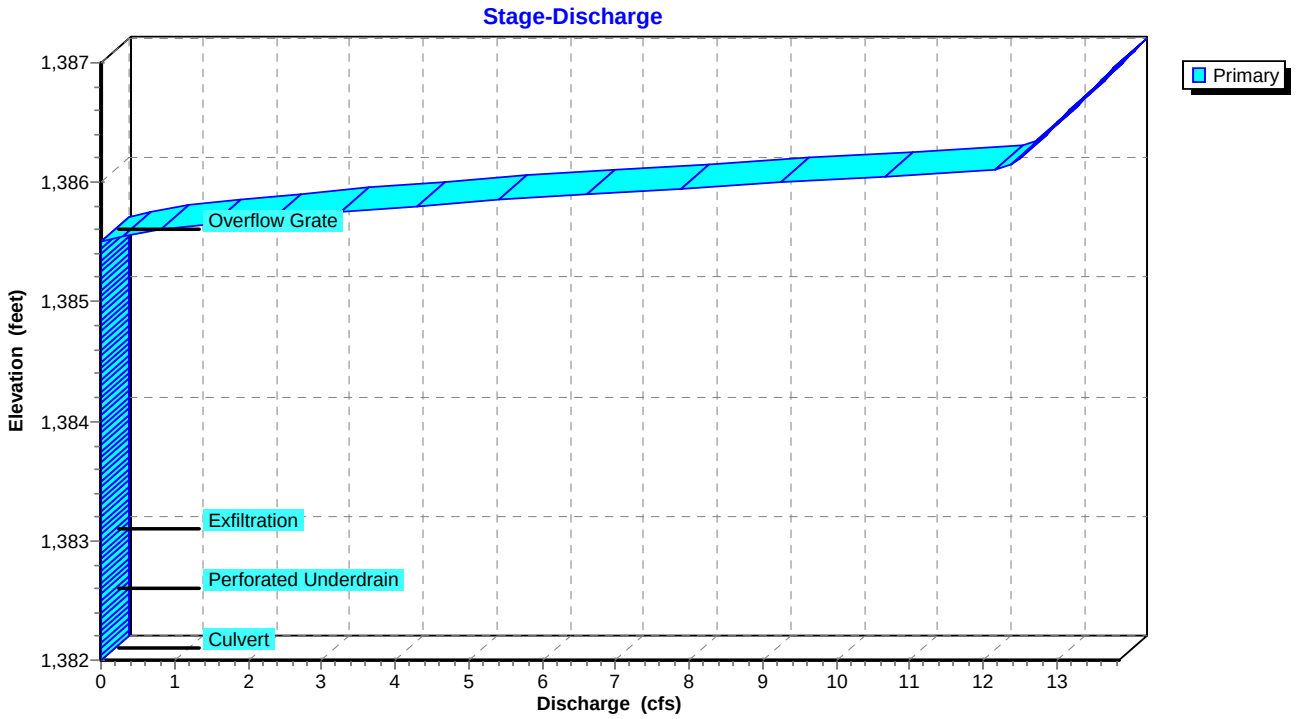
Device	Routing	Invert	Outlet Devices
#1	Primary	1,382.00'	**18.0" Round Culvert** L= 93.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,382.00' / 1,381.50' S= 0.0054 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.50'	**0.4" Horiz. Perforated Underdrain X 392.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,383.00'	**0.250 in/hr Exfiltration over Surface area above 1,383.00'** Conductivity to Groundwater Elevation = 1,382.00' Excluded Surface area = 3,939 sf
#4	Device 1	1,385.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=8.57 cfs @ 12.09 hrs HW=1,385.98' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 8.57 cfs of 12.06 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 12.28 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 8.57 cfs @ 2.25 fps)

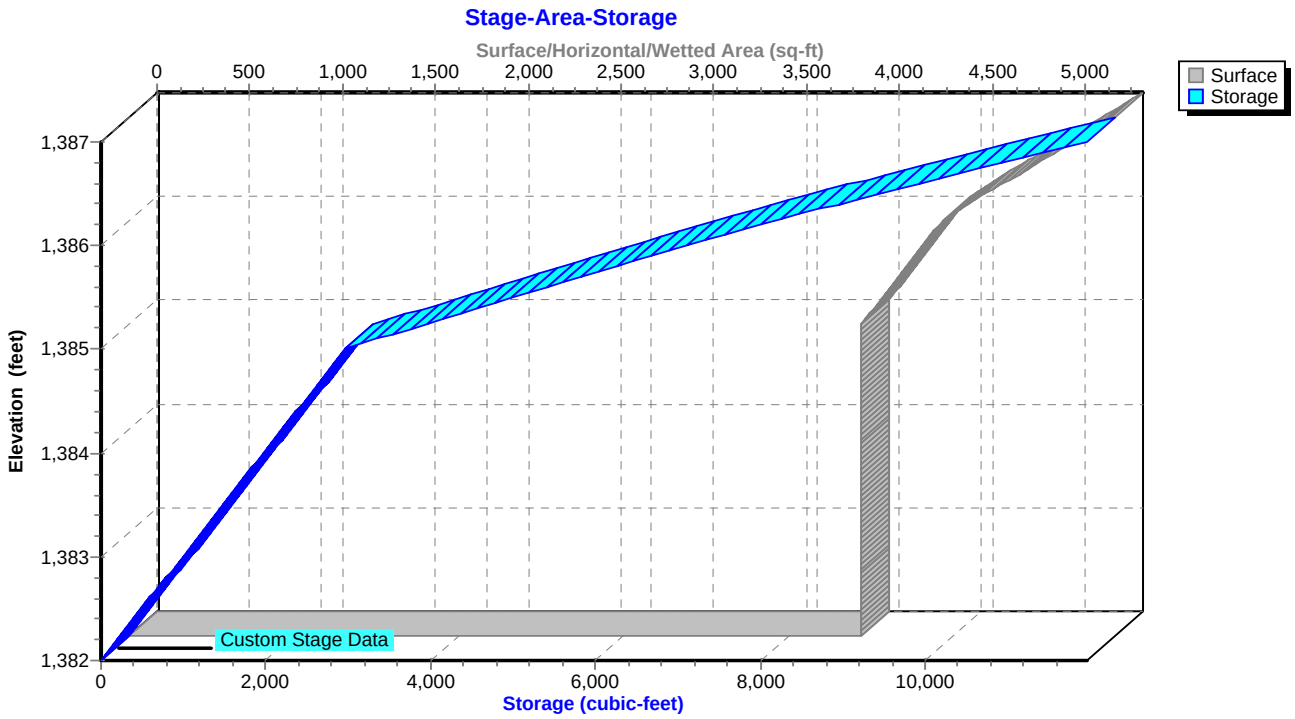
Pond BRA37-P: BRA-37



Pond BRA37-P: BRA-37



Pond BRA37-P: BRA-37



Summary for Pond BRA38-P: BRA-38

Inflow Area = 1.972 ac, 21.96% Impervious, Inflow Depth = 5.62" for 100-YR, 24-HR Storm event
Inflow = 14.84 cfs @ 12.03 hrs, Volume= 0.924 af
Outflow = 14.38 cfs @ 12.05 hrs, Volume= 0.820 af, Atten= 3%, Lag= 1.2 min
Primary = 10.88 cfs @ 12.05 hrs, Volume= 0.629 af
Secondary = 3.50 cfs @ 12.05 hrs, Volume= 0.190 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,385.43' @ 12.05 hrs Surf.Area= 3,650 sf Storage= 6,114 cf

Plug-Flow detention time= 83.7 min calculated for 0.820 af (89% of inflow)
Center-of-Mass det. time= 30.6 min (829.7 - 799.1)

Volume	Invert	Avail.Storage	Storage Description
#1	1,381.50'	6,388 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

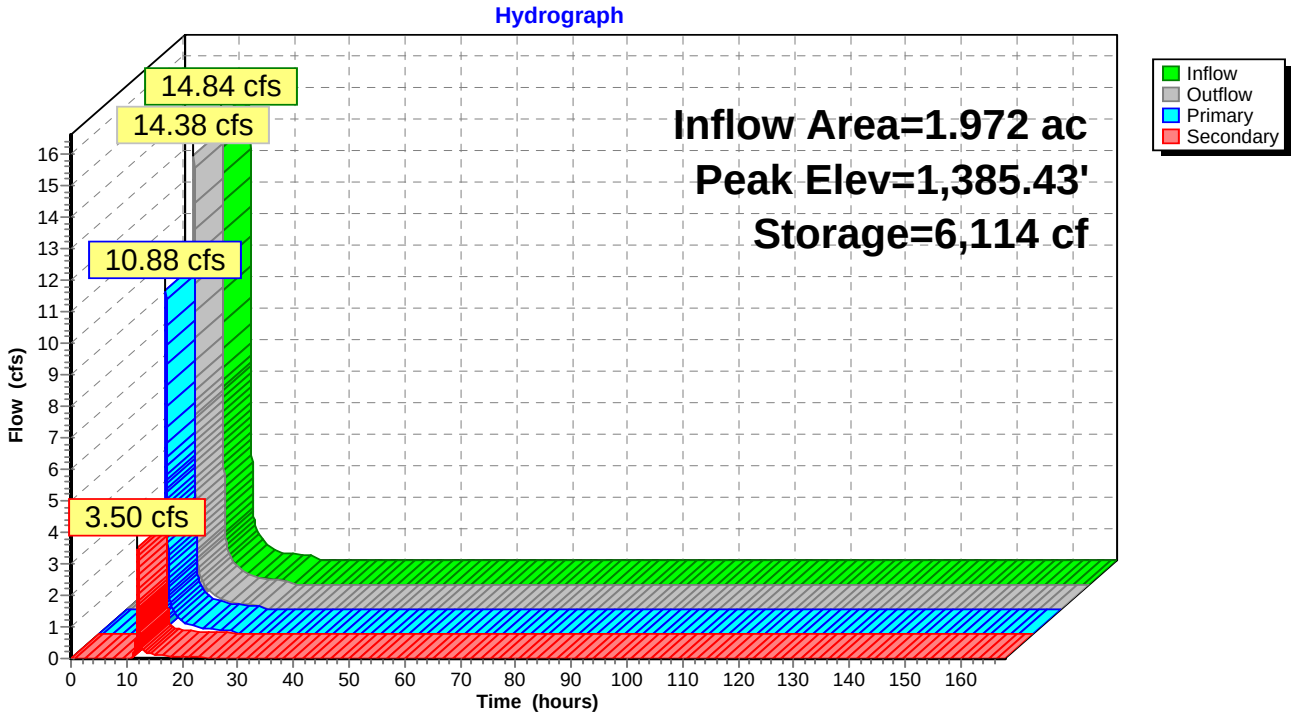
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,381.50	3,650	290.0	0.0	0	0	3,650
1,382.50	3,650	290.0	25.0	913	913	3,940
1,383.50	3,650	290.0	25.0	913	1,825	4,230
1,384.50	3,650	290.0	25.0	913	2,738	4,520
1,385.00	3,650	290.0	100.0	1,825	4,563	4,665
1,385.50	3,650	290.0	100.0	1,825	6,388	4,810

Device	Routing	Invert	Outlet Devices
#1	Primary	1,381.50'	**18.0" Round Culvert** L= 114.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,381.50' / 1,380.90' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.00'	**0.4" Horiz. Perforated Underdain X 452.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,382.50'	**0.250 in/hr Exfiltration over Surface area above 1,382.50'** Conductivity to Groundwater Elevation = 1,381.50' Excluded Surface area = 3,650 sf
#4	Device 1	1,385.00'	**36.0" x 36.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads
#5	Secondary	1,385.00'	**5.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

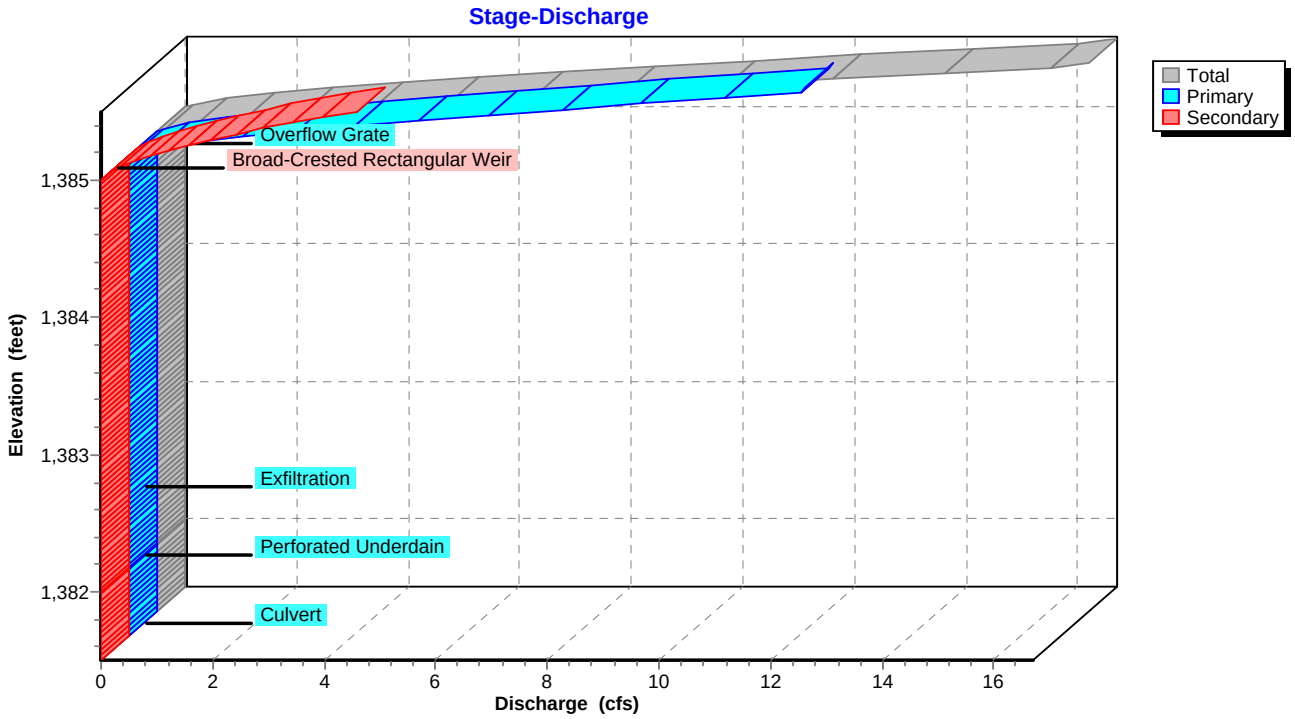
Primary OutFlow Max=10.86 cfs @ 12.05 hrs HW=1,385.42' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 10.86 cfs of 11.97 cfs potential flow)
  - **2=Perforated Underdain** (Passes 0.00 cfs of 14.06 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 10.86 cfs @ 2.13 fps)

Secondary OutFlow Max=3.49 cfs @ 12.05 hrs HW=1,385.42' TW=0.00' (Dynamic Tailwater)
- **5=Broad-Crested Rectangular Weir** (Weir Controls 3.49 cfs @ 1.65 fps)

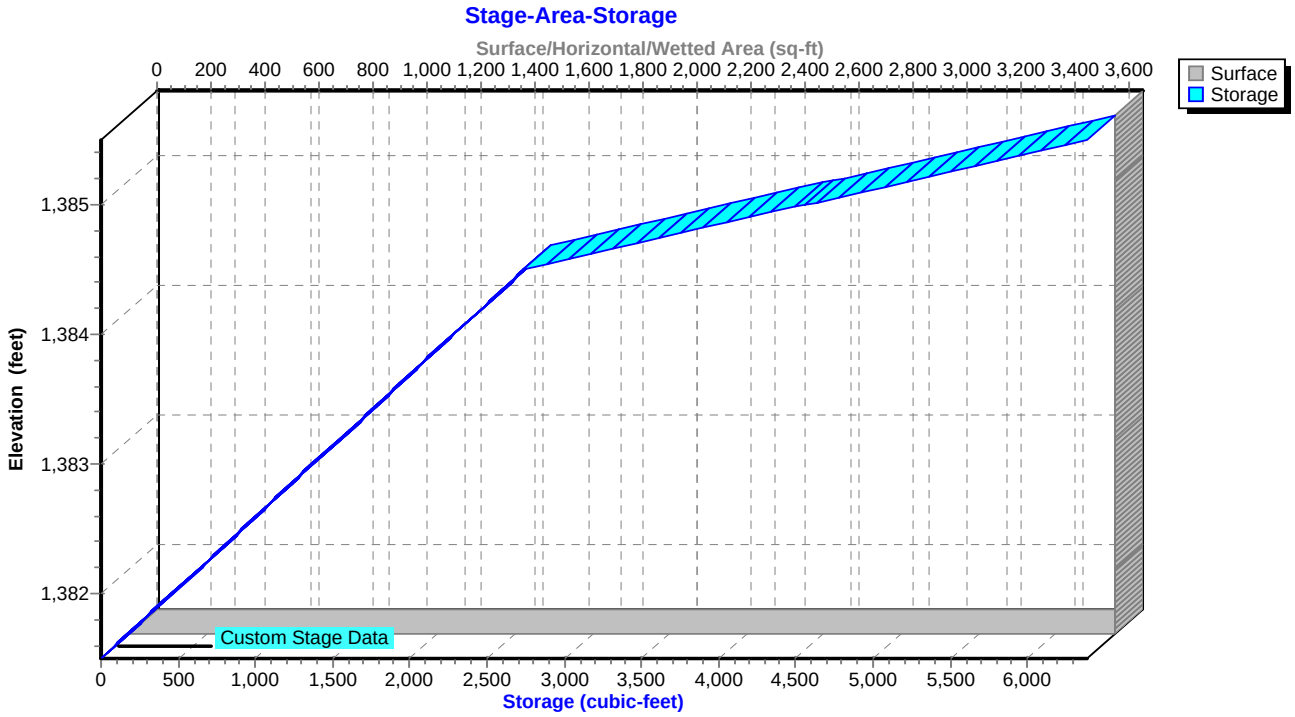
Pond BRA38-P: BRA-38



Pond BRA38-P: BRA-38



Pond BRA38-P: BRA-38



Summary for Pond BRA50-FS: Flow Splitter for BRA-50

Inflow Area = 4.526 ac, 6.87% Impervious, Inflow Depth = 5.40" for 100-YR, 24-HR Storm event
Inflow = 12.92 cfs @ 12.39 hrs, Volume= 2.036 af
Outflow = 12.92 cfs @ 12.40 hrs, Volume= 2.036 af, Atten= 0%, Lag= 0.6 min
Primary = 6.37 cfs @ 12.40 hrs, Volume= 1.107 af
Secondary = 6.56 cfs @ 12.40 hrs, Volume= 0.929 af

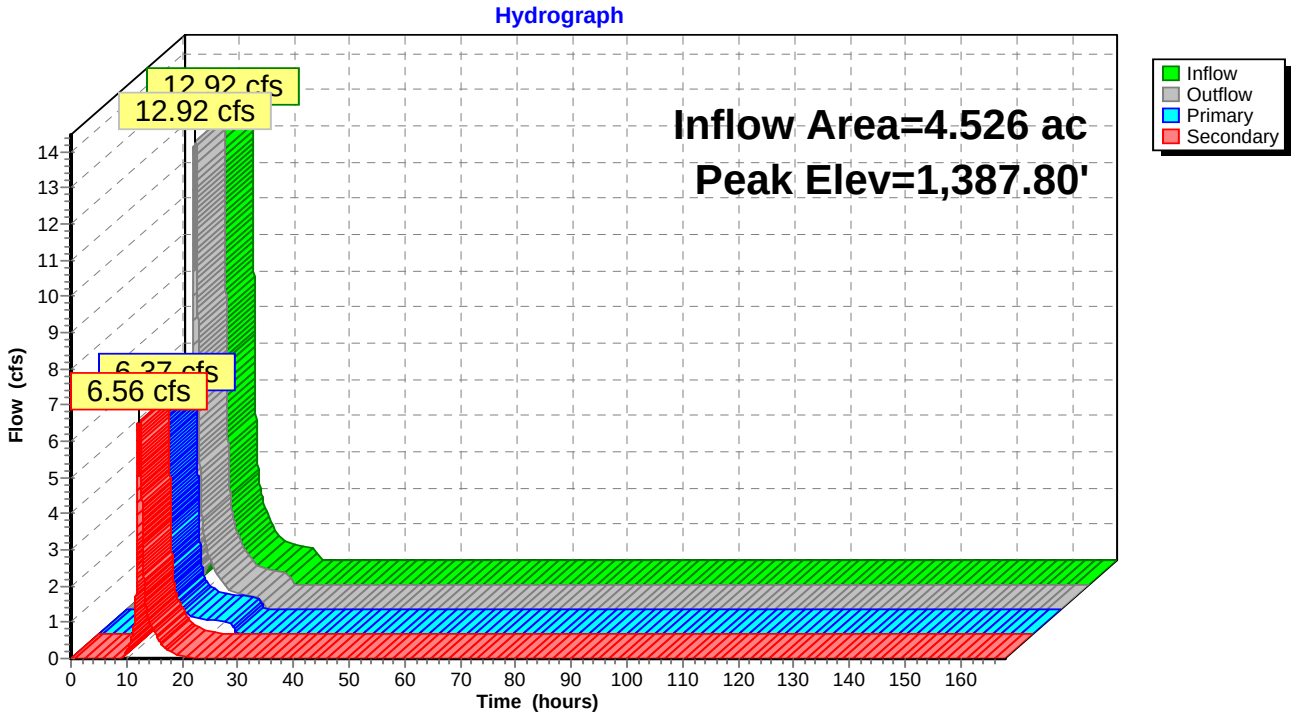
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,387.80' @ 12.40 hrs
Flood Elev= 1,390.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,386.10'	**18.0" Round Culvert to BRA-50** L= 17.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,386.10' / 1,386.00' S= 0.0057 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,386.10'	**18.0" Round Culvert to Pond 23** L= 71.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,386.10' / 1,383.70' S= 0.0334 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,386.40'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

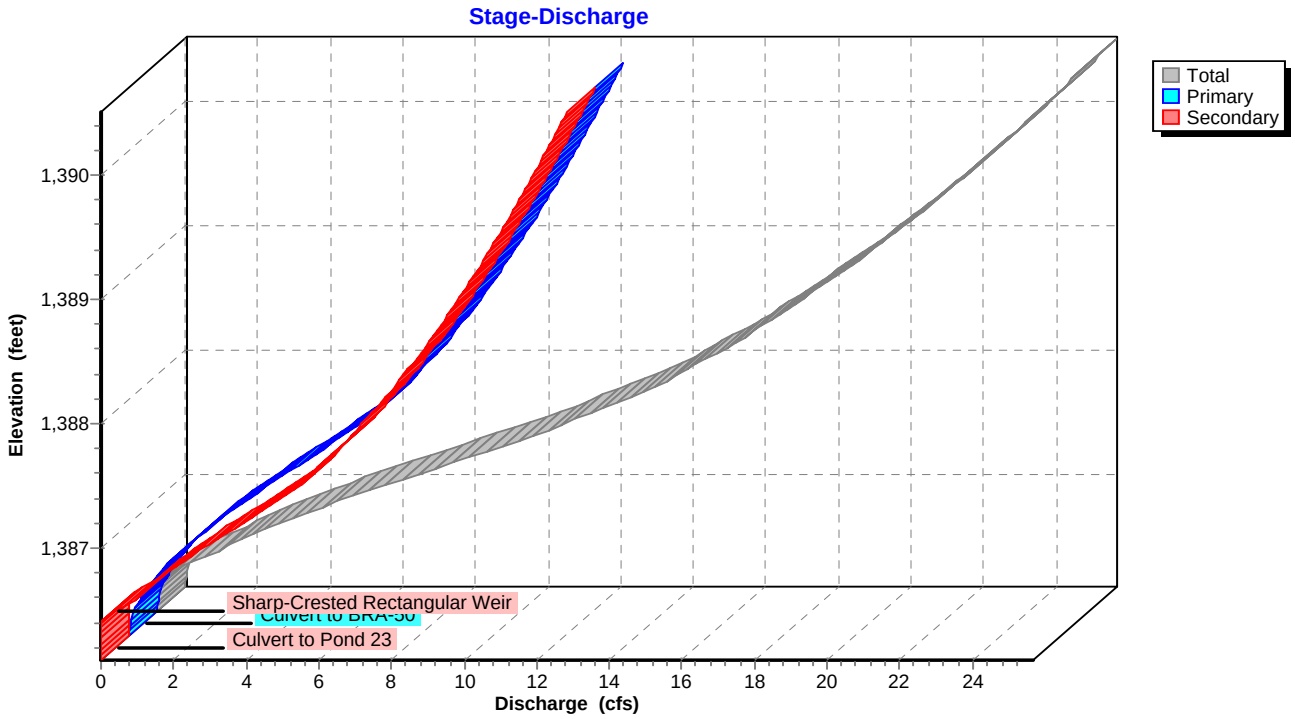
Primary OutFlow Max=6.36 cfs @ 12.40 hrs HW=1,387.80' TW=1,386.39' (Dynamic Tailwater)
└**1=Culvert to BRA-50** (Barrel Controls 6.36 cfs @ 3.97 fps)

Secondary OutFlow Max=6.56 cfs @ 12.40 hrs HW=1,387.80' TW=1,384.41' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Inlet Controls 6.56 cfs @ 3.71 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 6.56 cfs of 20.20 cfs potential flow)

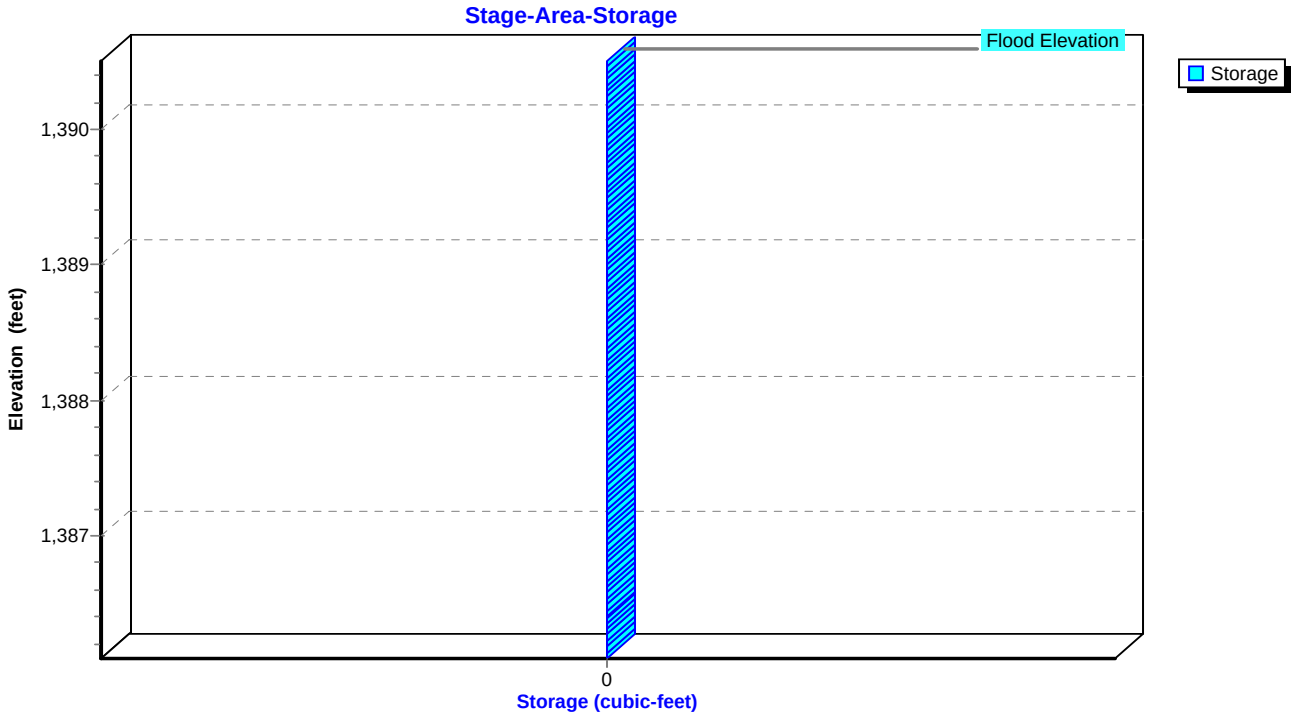
Pond BRA50-FS: Flow Splitter for BRA-50



Pond BRA50-FS: Flow Splitter for BRA-50



Pond BRA50-FS: Flow Splitter for BRA-50



Summary for Pond BRA50-P: BRA-50

Inflow Area = 4.526 ac, 6.87% Impervious, Inflow Depth = 2.94" for 100-YR, 24-HR Storm event
Inflow = 6.37 cfs @ 12.40 hrs, Volume= 1.107 af
Outflow = 6.33 cfs @ 12.43 hrs, Volume= 1.024 af, Atten= 1%, Lag= 1.6 min
Primary = 6.33 cfs @ 12.43 hrs, Volume= 1.024 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,386.39' @ 12.43 hrs Surf.Area= 2,375 sf Storage= 4,481 cf

Plug-Flow detention time= 70.5 min calculated for 1.024 af (92% of inflow)
Center-of-Mass det. time= 28.4 min (883.1 - 854.7)

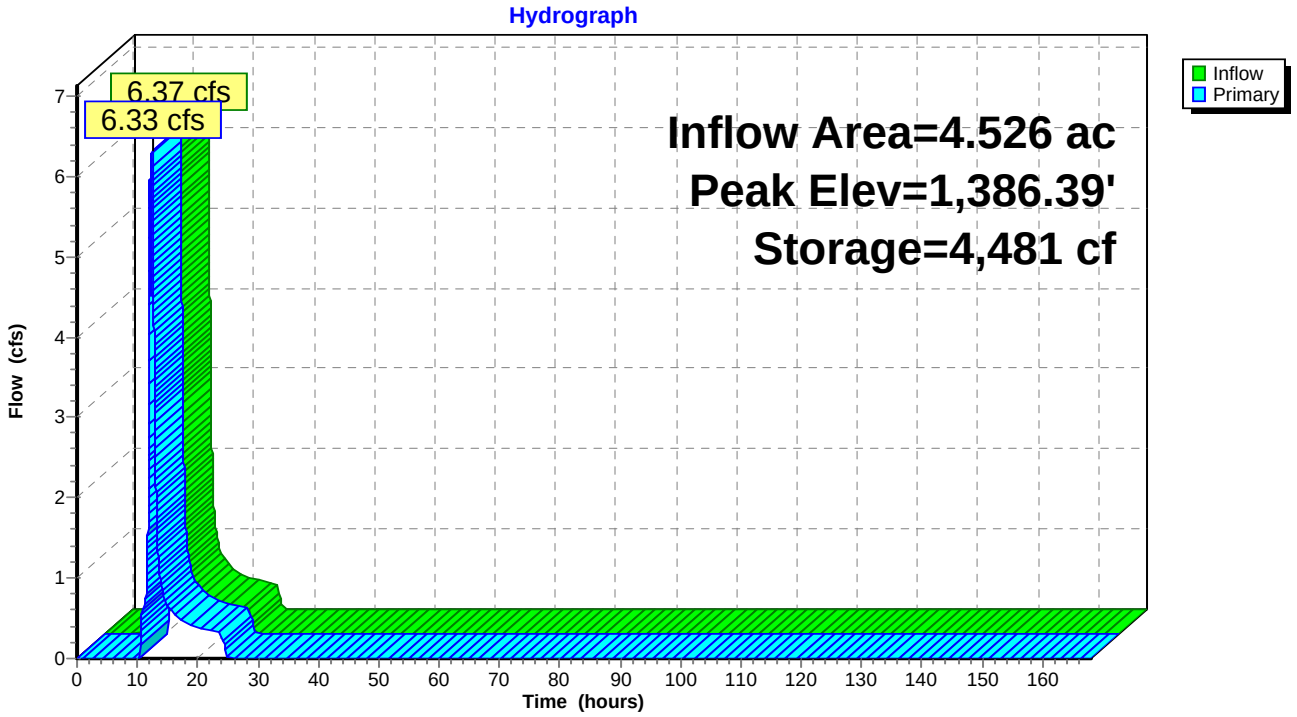
Volume	Invert	Avail.Storage	Storage Description
#1	1,382.00'	9,428 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,382.00	2,068	270.0	0.0	0	0	2,068
1,383.00	2,068	270.0	25.0	517	517	2,338
1,384.00	2,068	270.0	25.0	517	1,034	2,608
1,385.00	2,068	270.0	25.0	517	1,551	2,878
1,386.00	2,068	270.0	100.0	2,068	3,619	3,148
1,387.00	2,901	288.8	100.0	2,473	6,092	4,029
1,388.00	3,791	307.6	100.0	3,336	9,428	4,970

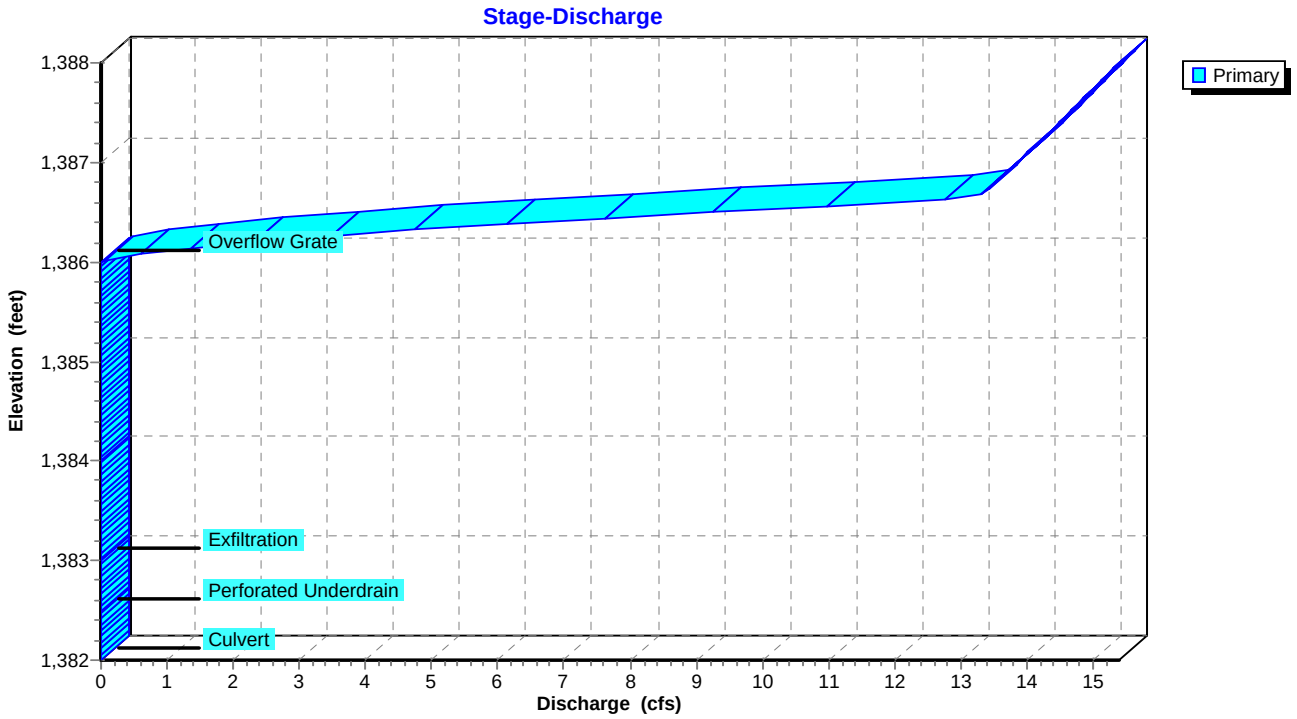
Device	Routing	Invert	Outlet Devices
#1	Primary	1,382.00'	**18.0" Round Culvert** L= 62.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,382.00' / 1,381.30' S= 0.0113 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,382.50'	**0.4" Horiz. Perforated Underdrain X 460.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,383.00'	**0.250 in/hr Exfiltration over Surface area above 1,383.00'** Conductivity to Groundwater Elevation = 1,382.00' Excluded Surface area = 2,068 sf
#4	Device 1	1,386.00'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.33 cfs @ 12.43 hrs HW=1,386.39' TW=1,384.44' (Dynamic Tailwater)
- **1=Culvert** (Passes 6.33 cfs of 9.38 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 10.79 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 6.33 cfs @ 2.04 fps)

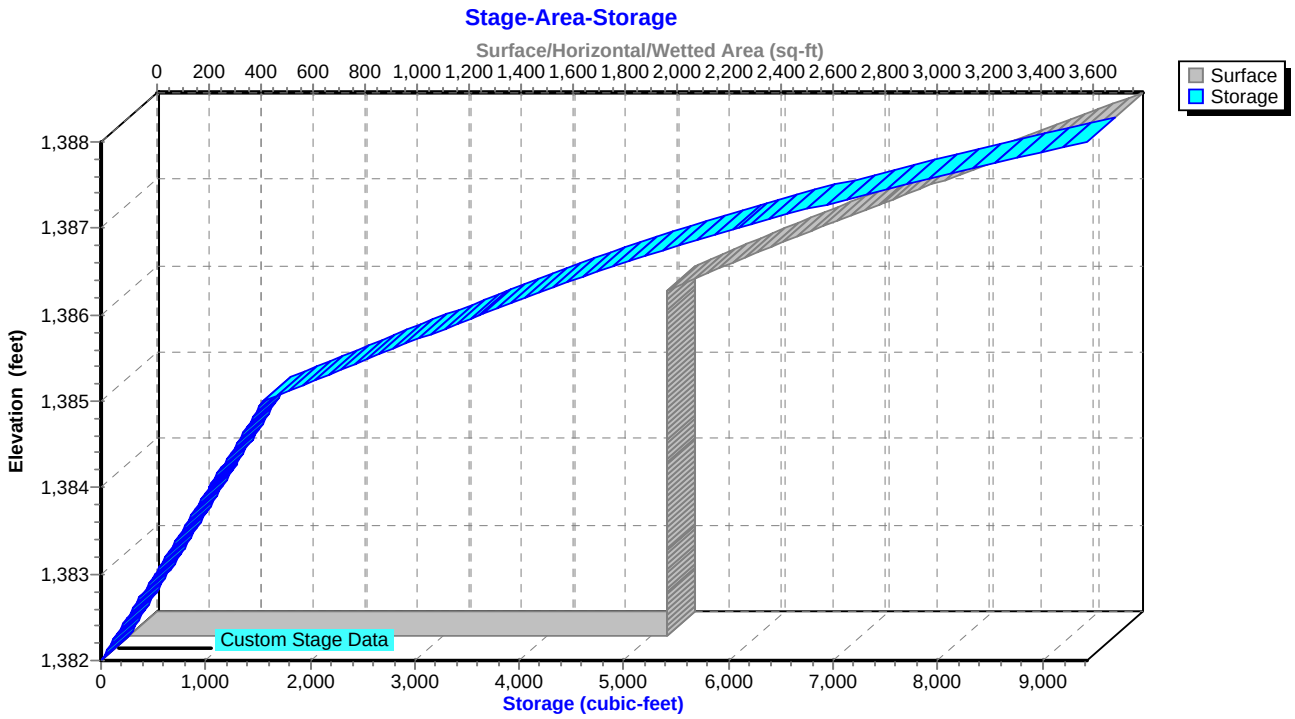
Pond BRA50-P: BRA-50



Pond BRA50-P: BRA-50



Pond BRA50-P: BRA-50



Summary for Pond SW21C-FS: Flow Splitter for SW21C

Inflow Area = 0.588 ac, 44.73% Impervious, Inflow Depth = 6.15" for 100-YR, 24-HR Storm event
Inflow = 4.72 cfs @ 12.03 hrs, Volume= 0.301 af
Outflow = 4.72 cfs @ 12.04 hrs, Volume= 0.301 af, Atten= 0%, Lag= 0.6 min
Primary = 2.53 cfs @ 12.04 hrs, Volume= 0.218 af
Secondary = 2.18 cfs @ 12.04 hrs, Volume= 0.083 af

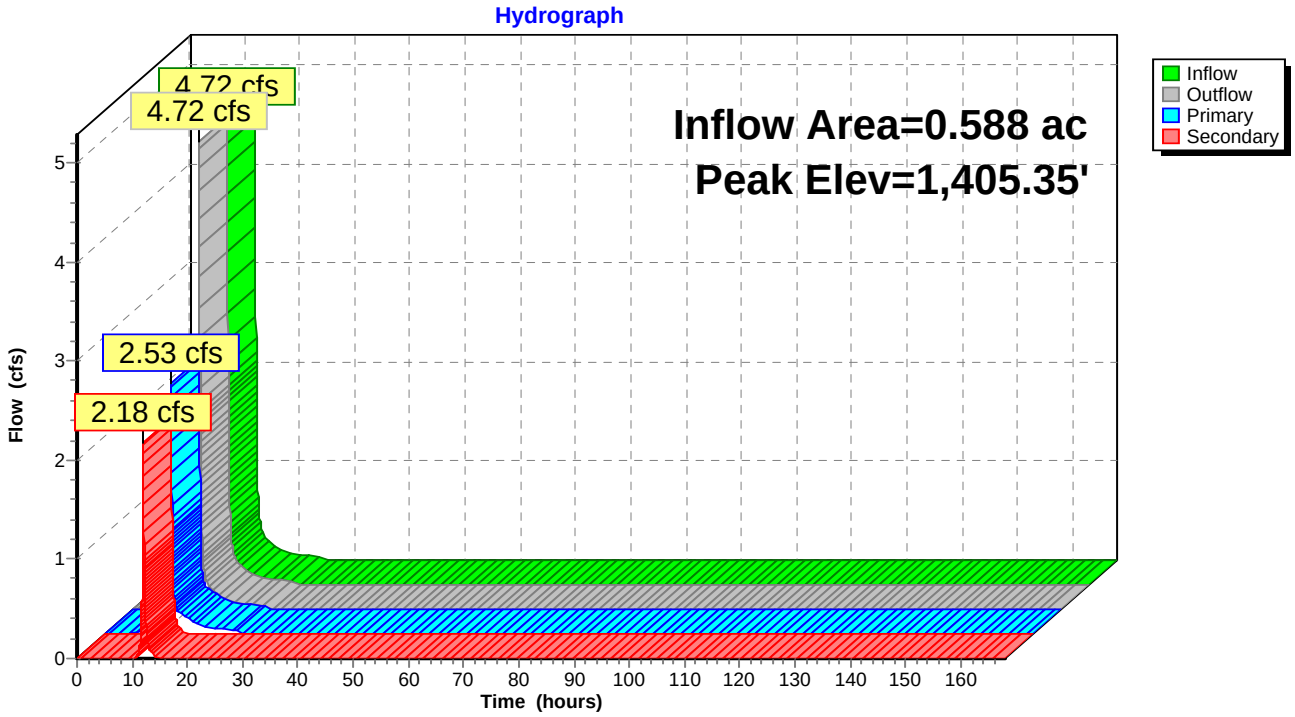
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,405.35' @ 12.04 hrs
Flood Elev= 1,408.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,404.50'	**18.0" Round Culvert to BRA-SW21C** L= 102.1' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,404.50' / 1,403.50' S= 0.0098 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,404.50'	**15.0" Round Culvert to Pond-SW21B** L= 293.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,404.50' / 1,377.20' S= 0.0932 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,404.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

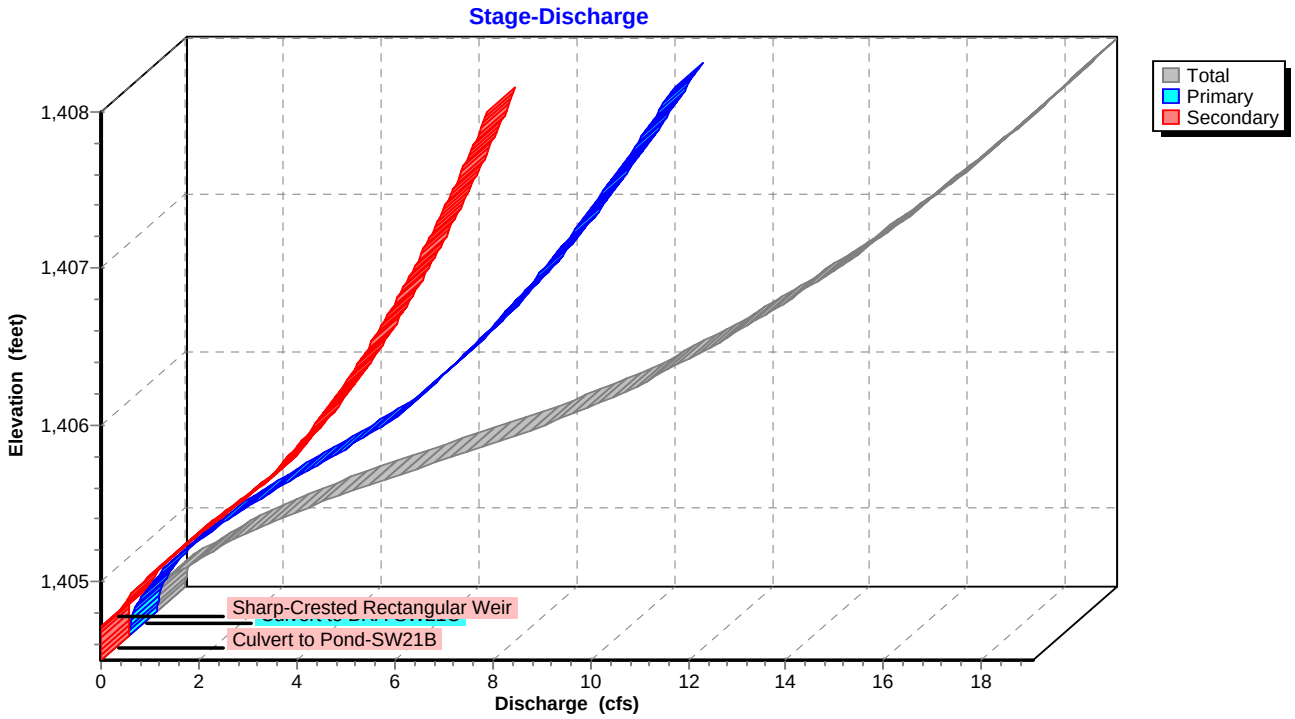
Primary OutFlow Max=2.53 cfs @ 12.04 hrs HW=1,405.34' TW=1,403.63' (Dynamic Tailwater)
└**1=Culvert to BRA-SW21C** (Inlet Controls 2.53 cfs @ 2.47 fps)

Secondary OutFlow Max=2.18 cfs @ 12.04 hrs HW=1,405.34' TW=1,378.55' (Dynamic Tailwater)
└**2=Culvert to Pond-SW21B** (Inlet Controls 2.18 cfs @ 2.47 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 2.18 cfs of 6.55 cfs potential flow)

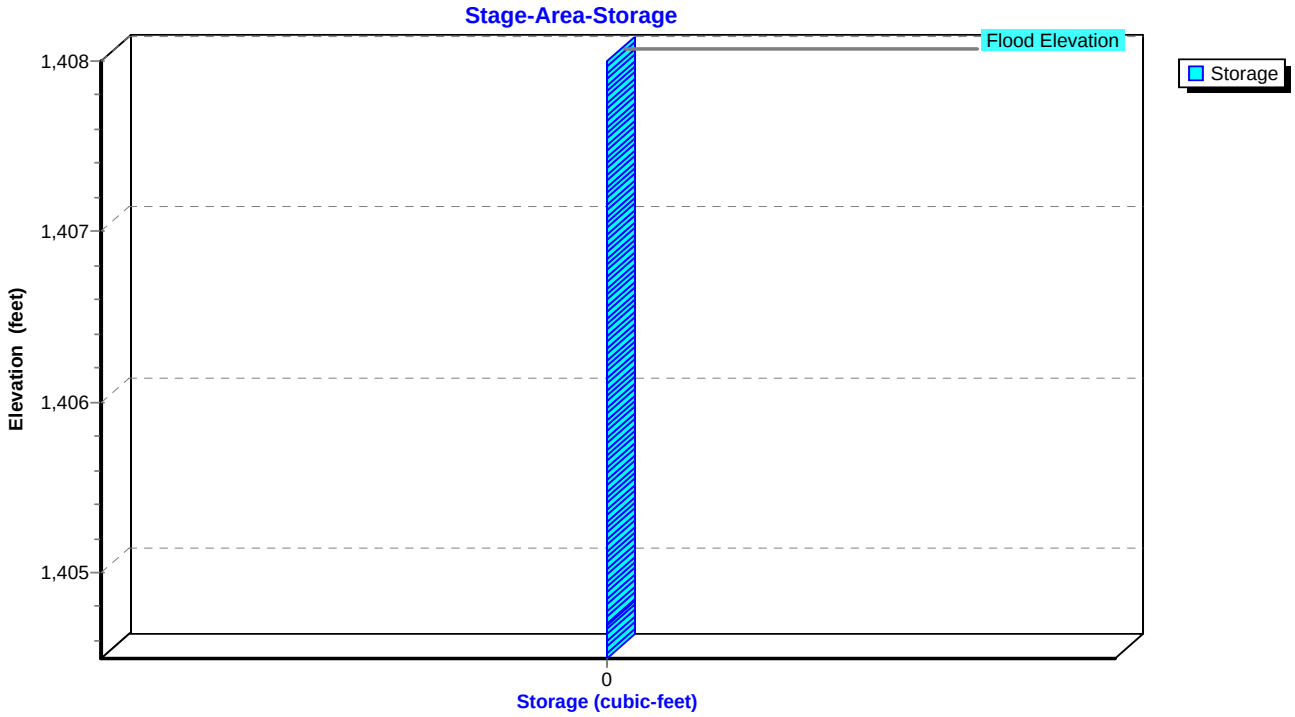
Pond SW21C-FS: Flow Splitter for SW21C



Pond SW21C-FS: Flow Splitter for SW21C



Pond SW21C-FS: Flow Splitter for SW21C



Summary for Pond SW21C-P: BRA-SW21C

Inflow Area = 0.704 ac, 37.36% Impervious, Inflow Depth = 4.54" for 100-YR, 24-HR Storm event
Inflow = 3.10 cfs @ 12.04 hrs, Volume= 0.266 af
Outflow = 2.61 cfs @ 12.10 hrs, Volume= 0.181 af, Atten= 16%, Lag= 3.1 min
Primary = 2.61 cfs @ 12.10 hrs, Volume= 0.181 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,403.72' @ 12.10 hrs Surf.Area= 2,129 sf Storage= 4,184 cf

Plug-Flow detention time= 201.9 min calculated for 0.181 af (68% of inflow)
Center-of-Mass det. time= 88.3 min (900.5 - 812.2)

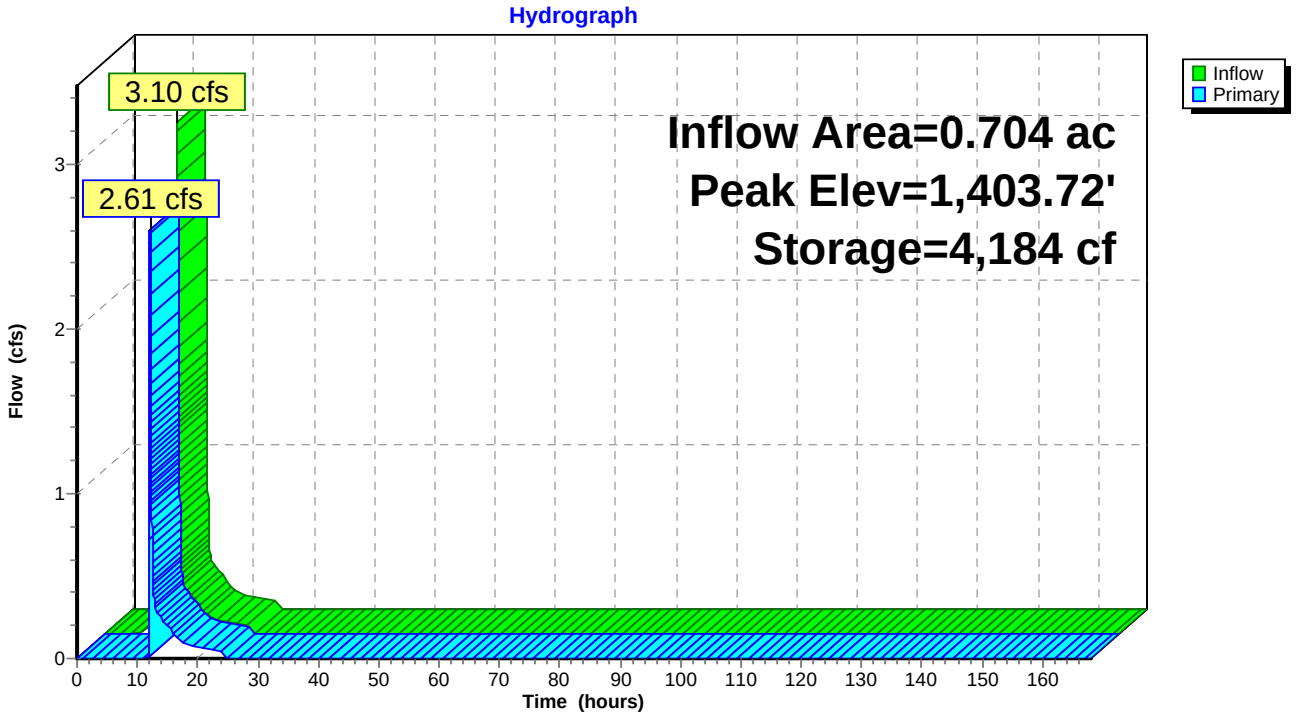
Volume	Invert	Avail.Storage	Storage Description
#1	1,398.00'	4,790 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,398.00	2,129	186.4	0.0	0	0	2,129
1,399.00	2,129	186.4	25.0	532	532	2,315
1,400.00	2,129	186.4	25.0	532	1,065	2,502
1,401.00	2,129	186.4	25.0	532	1,597	2,688
1,402.00	2,129	186.4	25.0	532	2,129	2,875
1,403.00	2,129	186.4	25.0	532	2,661	3,061
1,403.50	2,129	186.4	100.0	1,065	3,726	3,154
1,404.00	2,129	186.4	100.0	1,065	4,790	3,247

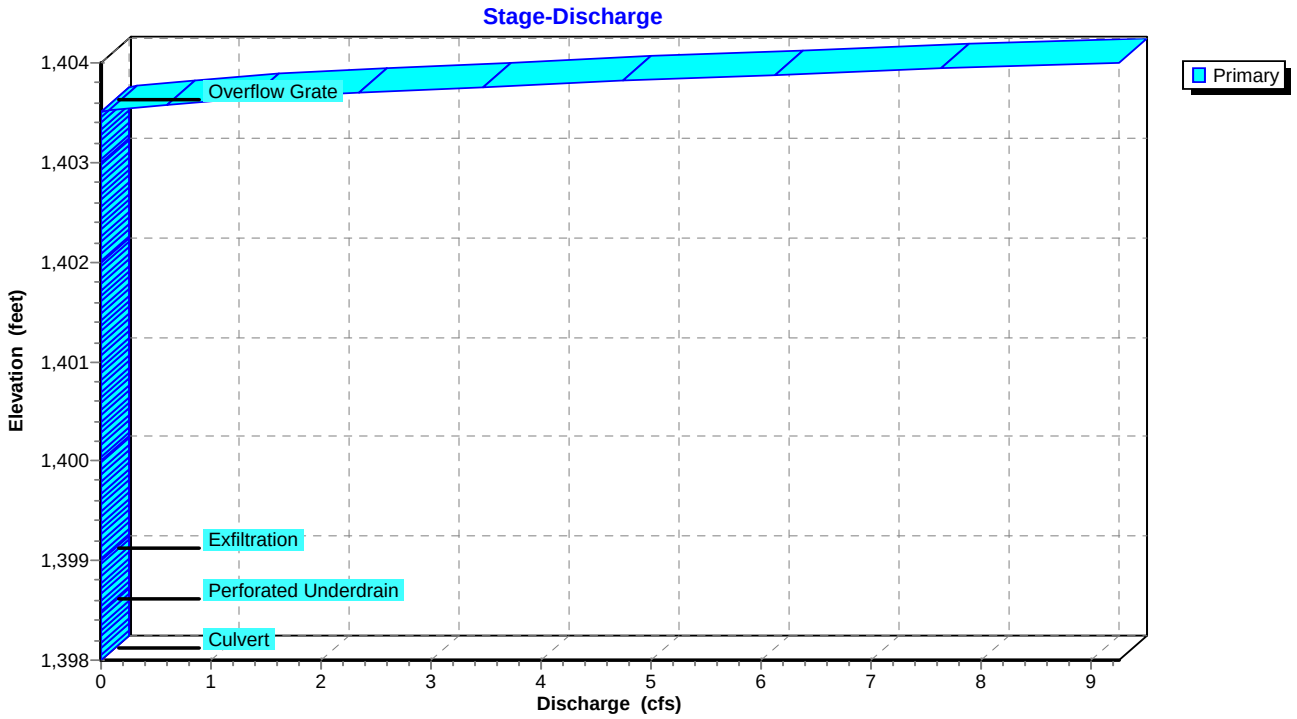
Device	Routing	Invert	Outlet Devices
#1	Primary	1,398.00'	**18.0" Round Culvert** L= 37.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,398.00' / 1,397.50' S= 0.0133 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,398.50'	**0.4" Horiz. Perforated Underdrain X 264.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,399.00'	**0.250 in/hr Exfiltration over Surface area above 1,399.00'** Conductivity to Groundwater Elevation = 1,398.00' Excluded Surface area = 2,129 sf
#4	Device 1	1,403.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.60 cfs @ 12.10 hrs HW=1,403.71' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.60 cfs of 14.97 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 10.13 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 2.60 cfs @ 1.52 fps)

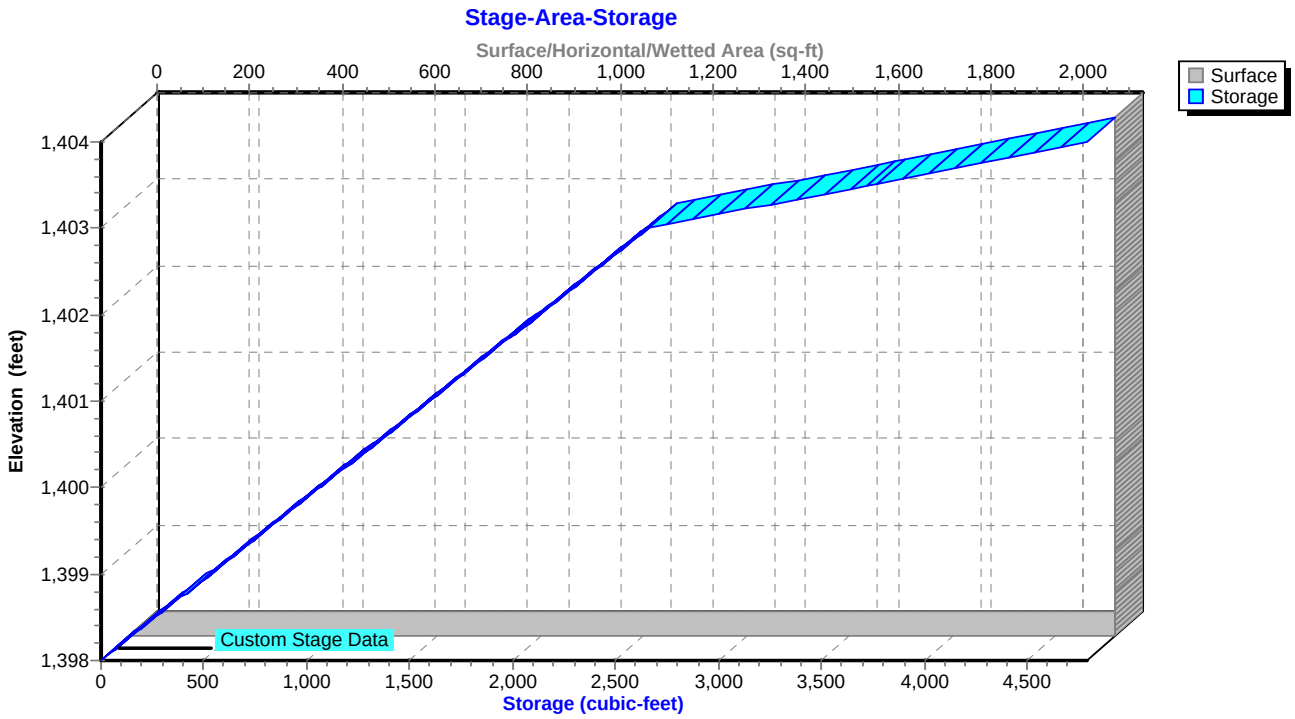
Pond SW21C-P: BRA-SW21C



Pond SW21C-P: BRA-SW21C



Pond SW21C-P: BRA-SW21C



Summary for Pond SW23A-FS: Flow Splitter for SW23A

Inflow Area = 0.206 ac, 47.57% Impervious, Inflow Depth = 6.33" for 100-YR, 24-HR Storm event
Inflow = 1.71 cfs @ 12.03 hrs, Volume= 0.109 af
Outflow = 1.71 cfs @ 12.04 hrs, Volume= 0.109 af, Atten= 0%, Lag= 0.6 min
Primary = 0.82 cfs @ 12.04 hrs, Volume= 0.079 af
Secondary = 0.89 cfs @ 12.04 hrs, Volume= 0.030 af

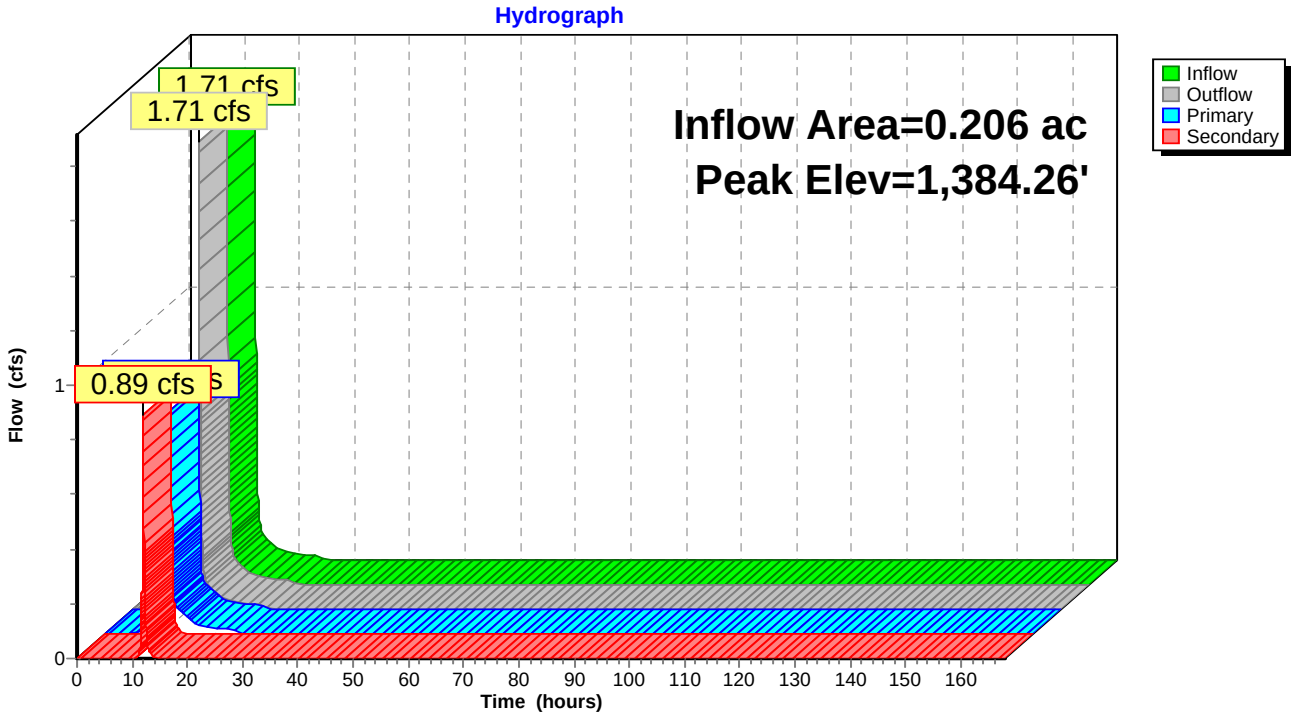
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,384.26' @ 12.04 hrs
Flood Elev= 1,387.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,383.75'	**15.0" Round Culvert to BRA-SW23A** L= 44.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,383.75' / 1,383.50' S= 0.0056 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,383.75'	**15.0" Round Culvert to Pond 23** L= 177.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,383.75' / 1,381.30' S= 0.0138 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,383.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

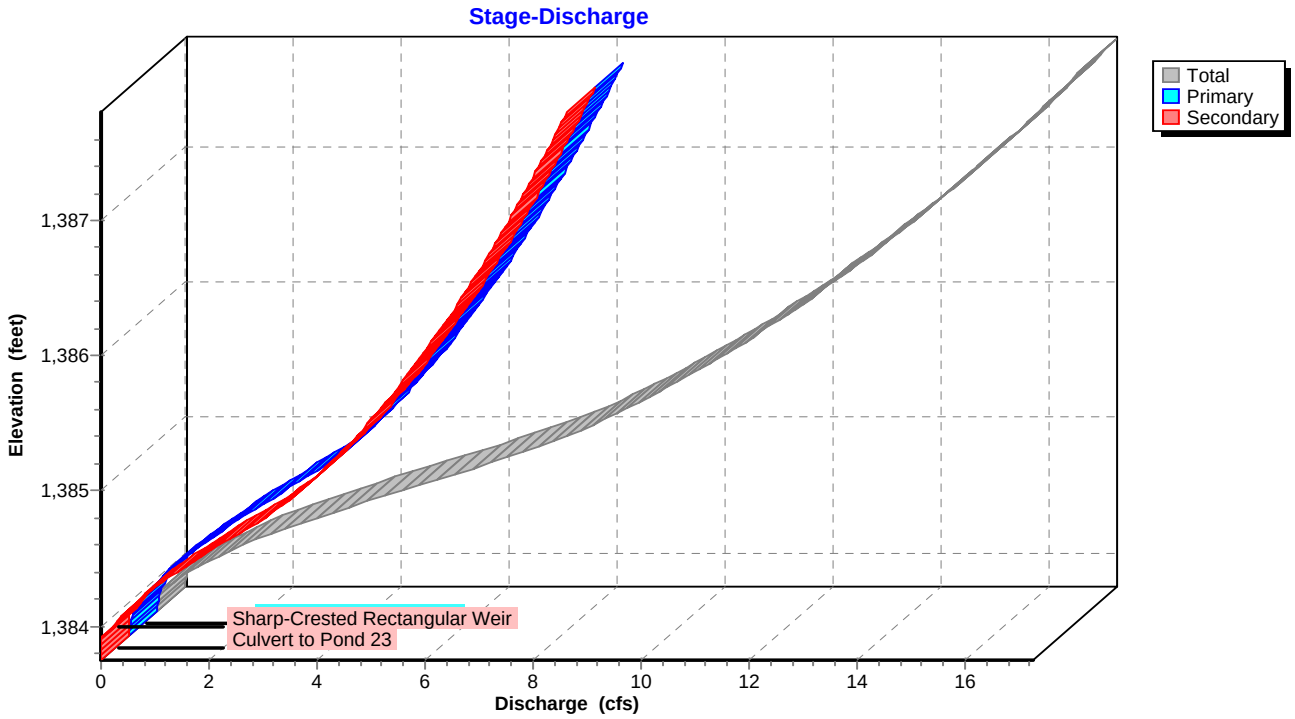
Primary OutFlow Max=0.81 cfs @ 12.04 hrs HW=1,384.26' TW=1,383.61' (Dynamic Tailwater)
└**1=Culvert to BRA-SW23A** (Barrel Controls 0.81 cfs @ 2.59 fps)

Secondary OutFlow Max=0.89 cfs @ 12.04 hrs HW=1,384.26' TW=0.00' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Inlet Controls 0.89 cfs @ 1.91 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 0.89 cfs of 2.72 cfs potential flow)

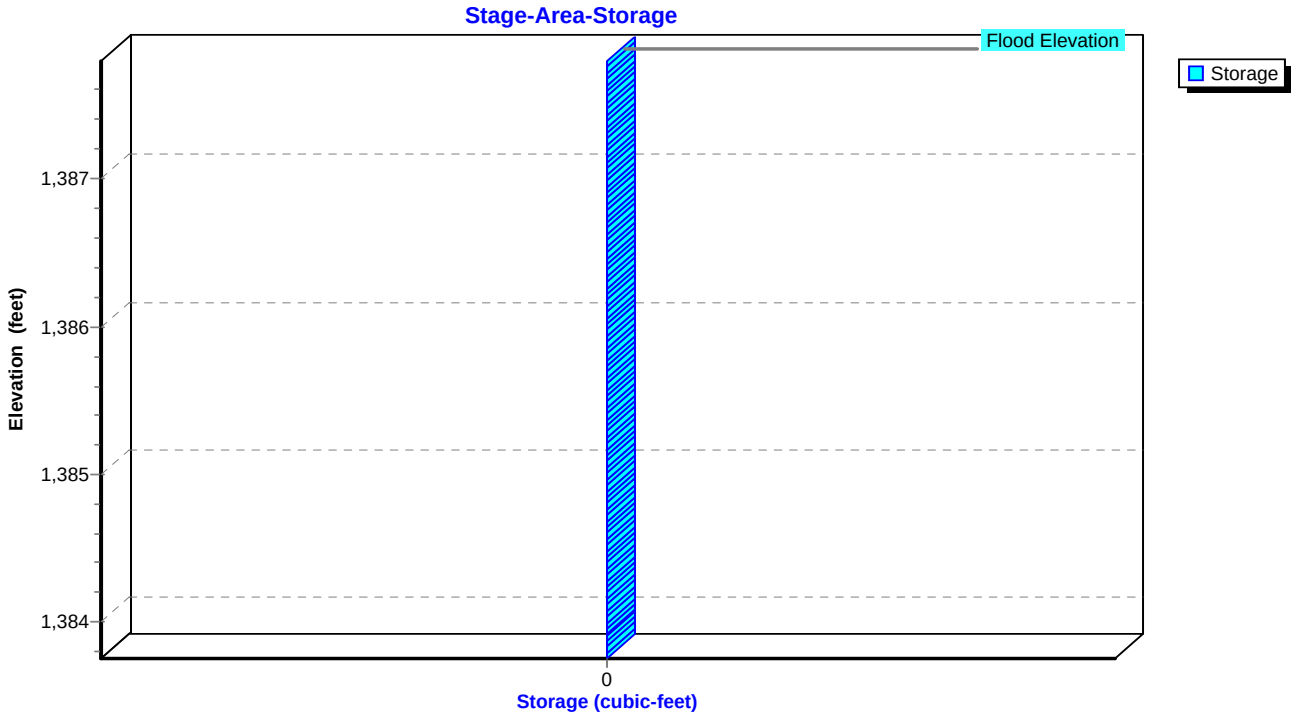
Pond SW23A-FS: Flow Splitter for SW23A



Pond SW23A-FS: Flow Splitter for SW23A



Pond SW23A-FS: Flow Splitter for SW23A



Summary for Pond SW23A-P: BRA-SW23A

Inflow Area = 0.262 ac, 37.40% Impervious, Inflow Depth = 4.66" for 100-YR, 24-HR Storm event
Inflow = 1.08 cfs @ 12.04 hrs, Volume= 0.102 af
Outflow = 1.07 cfs @ 12.06 hrs, Volume= 0.072 af, Atten= 1%, Lag= 1.1 min
Primary = 1.07 cfs @ 12.06 hrs, Volume= 0.072 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,383.62' @ 12.06 hrs Surf.Area= 785 sf Storage= 1,391 cf

Plug-Flow detention time= 186.5 min calculated for 0.072 af (71% of inflow)
Center-of-Mass det. time= 79.3 min (888.1 - 808.8)

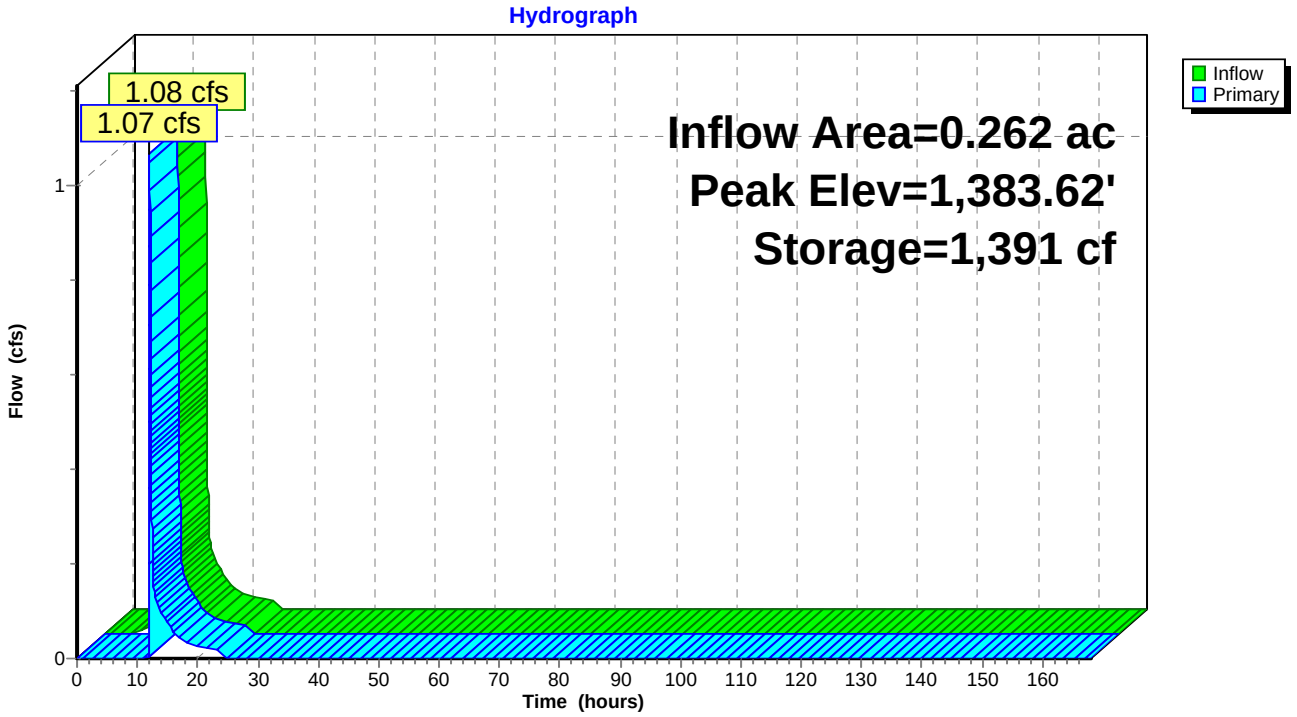
Volume	Invert	Avail.Storage	Storage Description
#1	1,378.00'	1,718 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,378.00	743	120.0	0.0	0	0	743
1,379.00	743	120.0	25.0	186	186	863
1,380.00	743	120.0	25.0	186	372	983
1,381.00	743	120.0	25.0	186	557	1,103
1,382.00	743	120.0	25.0	186	743	1,223
1,383.00	743	120.0	25.0	186	929	1,343
1,383.50	743	120.0	100.0	372	1,300	1,403
1,384.00	930	120.0	100.0	417	1,718	1,463

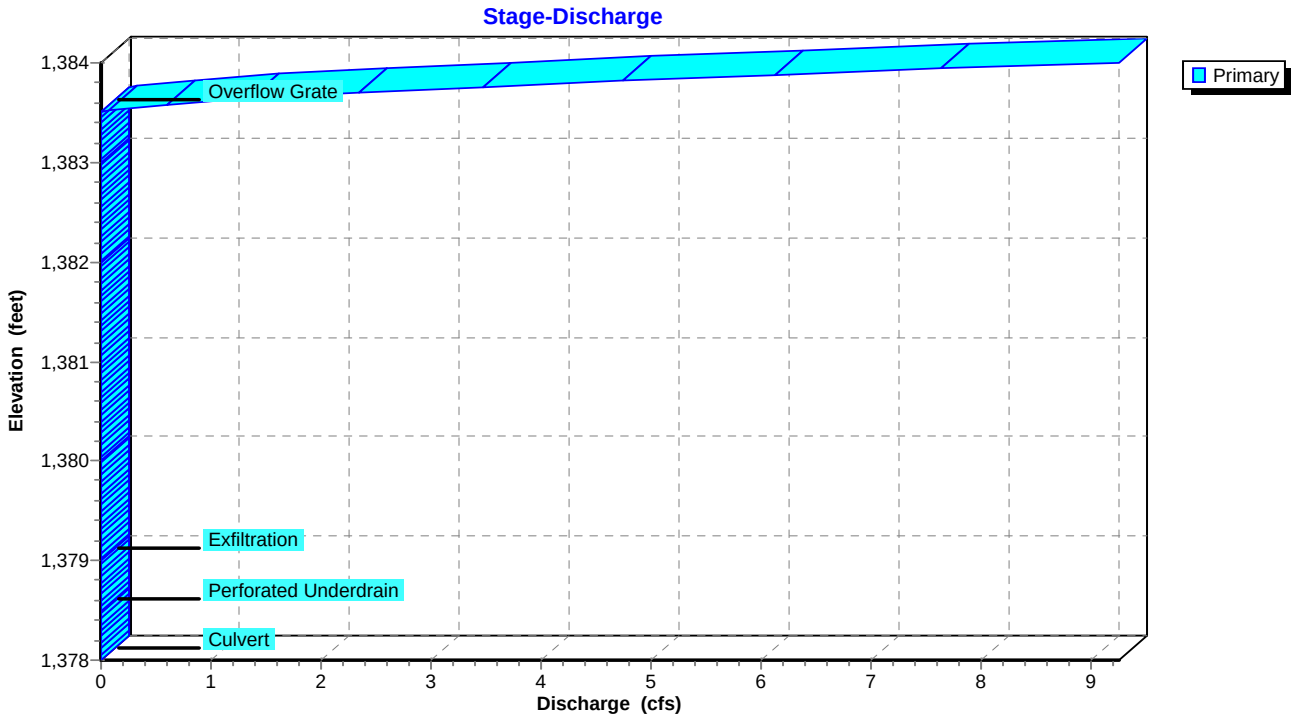
Device	Routing	Invert	Outlet Devices
#1	Primary	1,378.00'	**15.0" Round Culvert** L= 97.1' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,378.00' / 1,376.50' S= 0.0154 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,378.50'	**0.4" Horiz. Perforated Underdrain X 608.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,379.00'	**0.250 in/hr Exfiltration over Surface area above 1,379.00'** Conductivity to Groundwater Elevation = 1,378.00' Excluded Surface area = 743 sf
#4	Device 1	1,383.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.07 cfs @ 12.06 hrs HW=1,383.62' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.07 cfs of 10.42 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 5.78 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 1.07 cfs @ 1.13 fps)

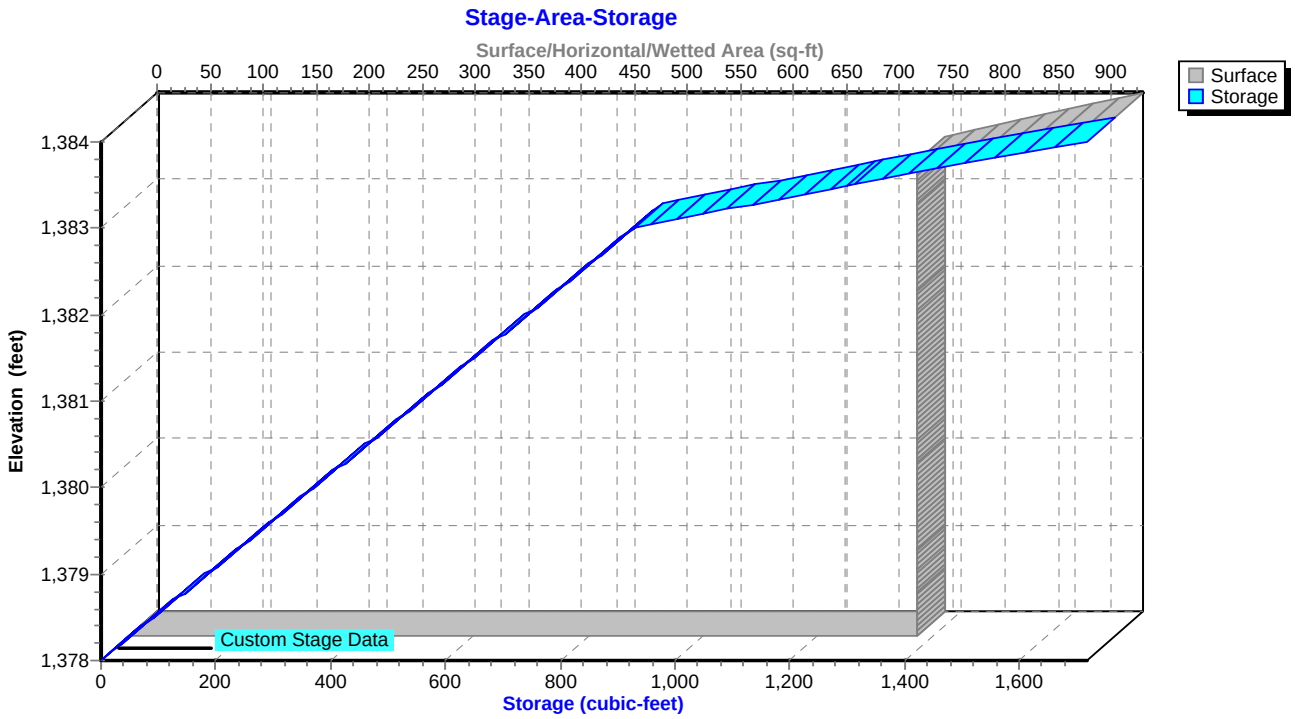
Pond SW23A-P: BRA-SW23A



Pond SW23A-P: BRA-SW23A



Pond SW23A-P: BRA-SW23A



Summary for Pond SW23B-FS: Flow Splitter for SW23B

Inflow Area = 0.579 ac, 37.48% Impervious, Inflow Depth = 6.10" for 100-YR, 24-HR Storm event
Inflow = 4.62 cfs @ 12.03 hrs, Volume= 0.294 af
Outflow = 4.62 cfs @ 12.04 hrs, Volume= 0.294 af, Atten= 0%, Lag= 0.6 min
Primary = 2.48 cfs @ 12.04 hrs, Volume= 0.214 af
Secondary = 2.14 cfs @ 12.04 hrs, Volume= 0.080 af

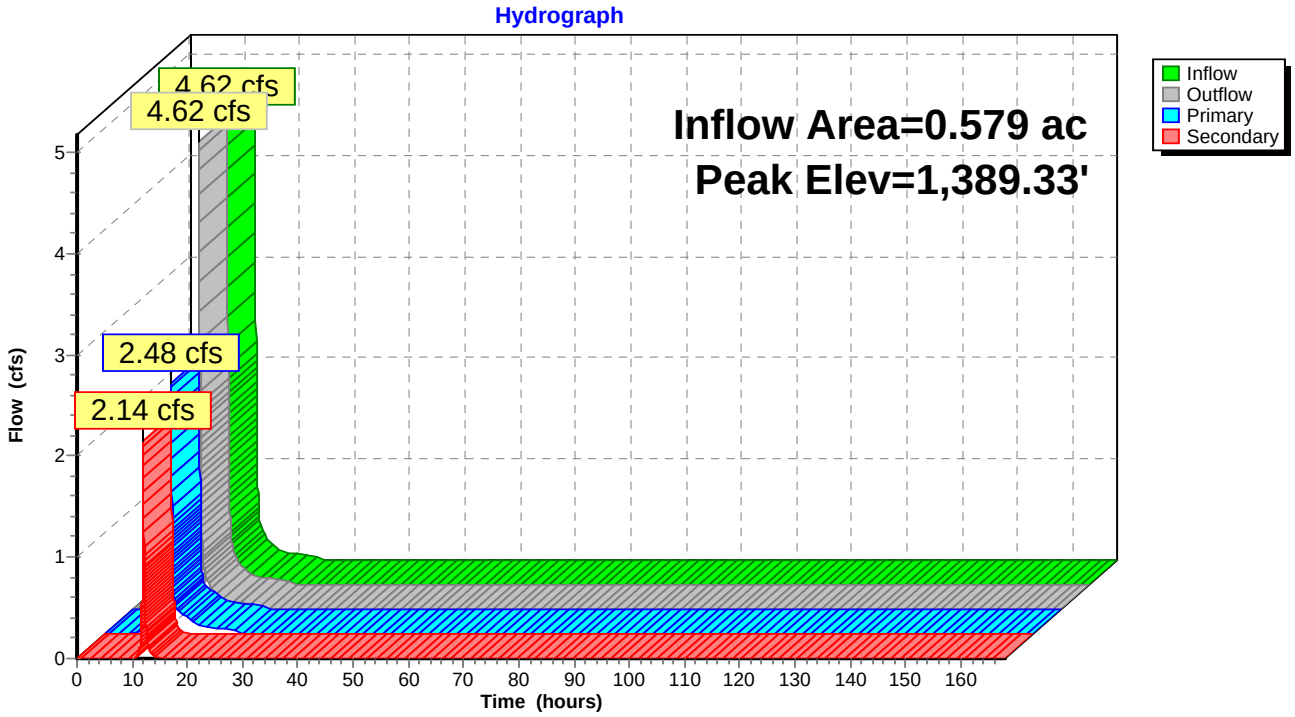
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,389.33' @ 12.04 hrs
Flood Elev= 1,391.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,388.50'	**18.0" Round Culvert to SW23B** L= 132.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,388.50' / 1,387.50' S= 0.0075 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,388.50'	**15.0" Round Culvert to Pond 23** L= 268.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,388.50' / 1,384.00' S= 0.0168 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,388.70'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

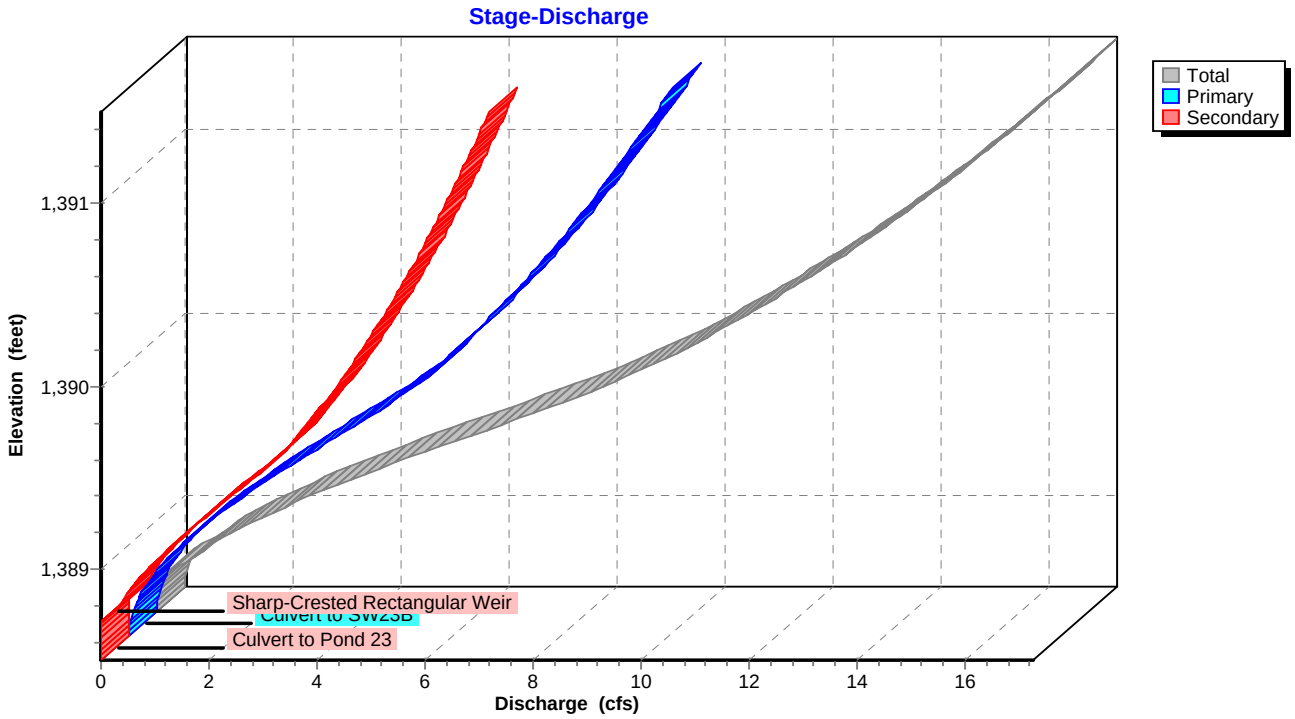
Primary OutFlow Max=2.48 cfs @ 12.04 hrs HW=1,389.33' TW=1,387.70' (Dynamic Tailwater)
└**1=Culvert to SW23B** (Inlet Controls 2.48 cfs @ 2.46 fps)

Secondary OutFlow Max=2.14 cfs @ 12.04 hrs HW=1,389.33' TW=1,383.70' (Dynamic Tailwater)
└**2=Culvert to Pond 23** (Inlet Controls 2.14 cfs @ 2.46 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 2.14 cfs of 6.41 cfs potential flow)

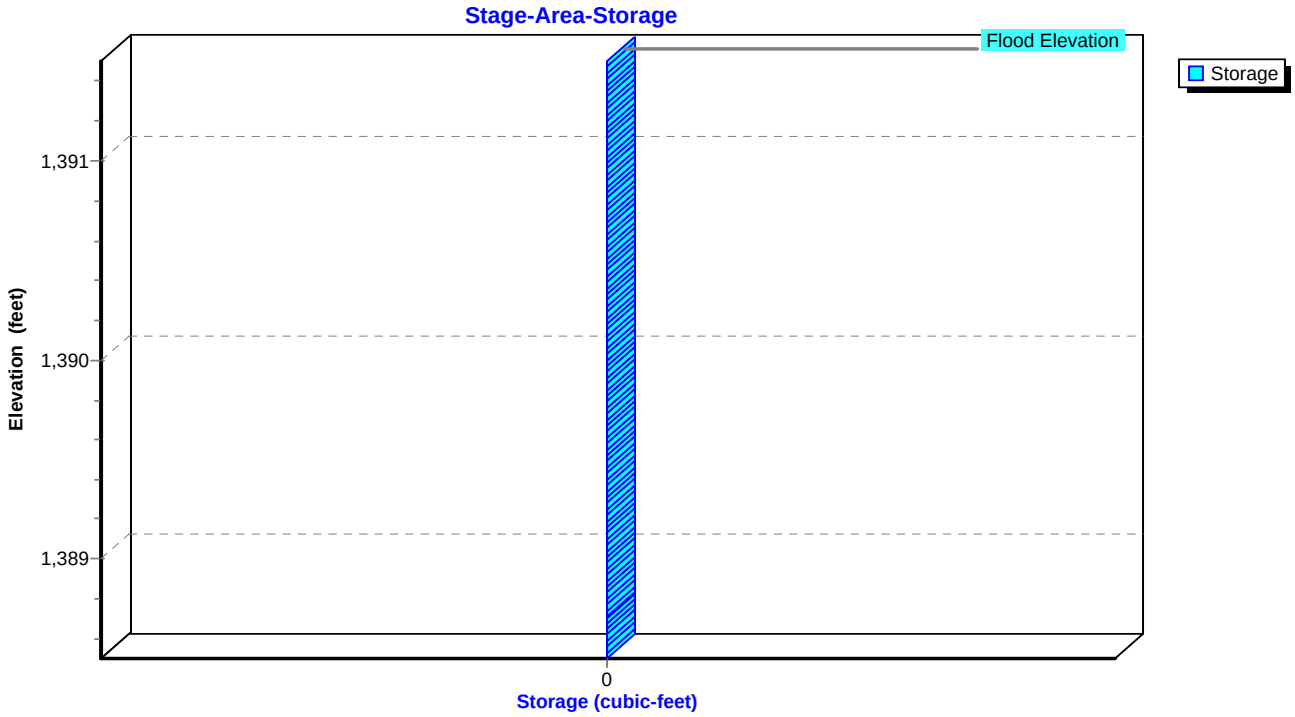
Pond SW23B-FS: Flow Splitter for SW23B



Pond SW23B-FS: Flow Splitter for SW23B



Pond SW23B-FS: Flow Splitter for SW23B



Summary for Pond SW23B-P: BRA-SW23B

Inflow Area = 0.672 ac, 32.29% Impervious, Inflow Depth = 4.50" for 100-YR, 24-HR Storm event
Inflow = 2.93 cfs @ 12.04 hrs, Volume= 0.252 af
Outflow = 2.74 cfs @ 12.07 hrs, Volume= 0.197 af, Atten= 7%, Lag= 1.9 min
Primary = 2.74 cfs @ 12.07 hrs, Volume= 0.197 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,387.72' @ 12.07 hrs Surf.Area= 2,073 sf Storage= 2,847 cf

Plug-Flow detention time= 153.9 min calculated for 0.197 af (78% of inflow)
Center-of-Mass det. time= 63.8 min (877.0 - 813.2)

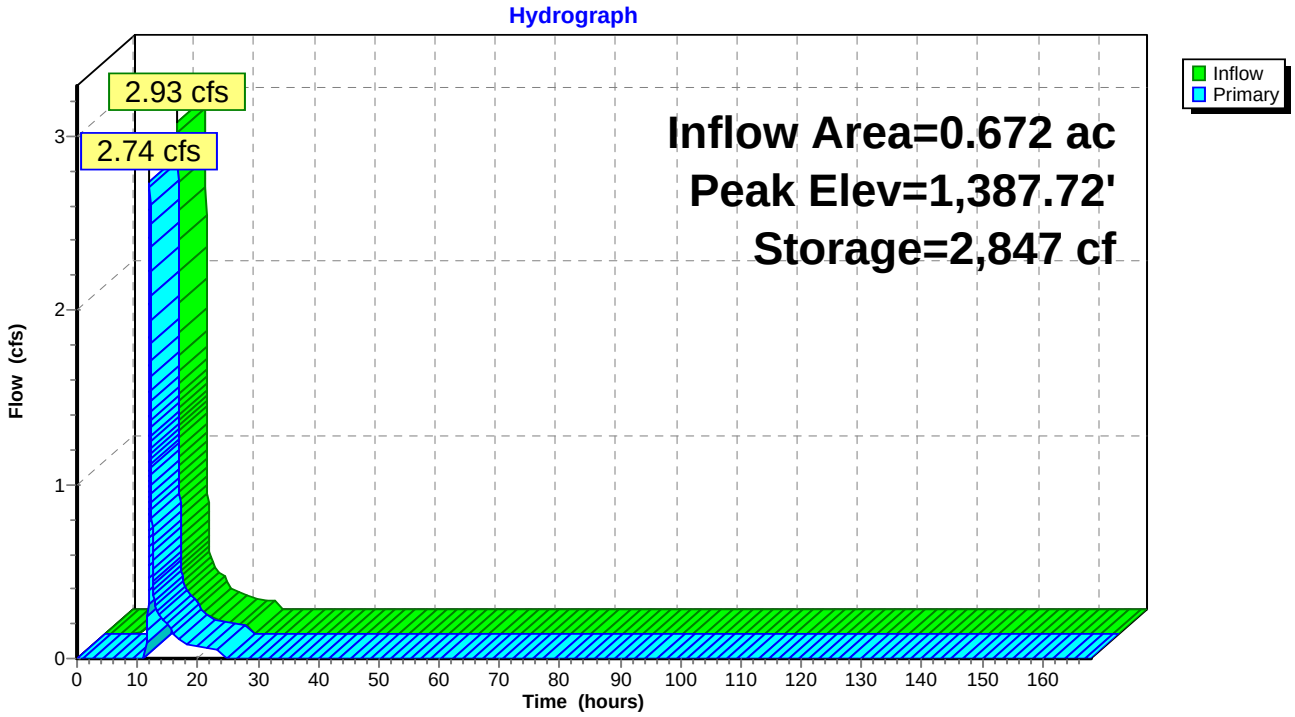
Volume	Invert	Avail.Storage	Storage Description
#1	1,384.00'	3,450 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,384.00	1,923	225.0	0.0	0	0	1,923
1,385.00	1,923	225.0	25.0	481	481	2,148
1,386.00	1,923	225.0	25.0	481	962	2,373
1,387.00	1,923	225.0	25.0	481	1,442	2,598
1,387.50	1,923	225.0	100.0	962	2,404	2,711
1,388.00	2,268	234.4	100.0	1,047	3,450	3,073

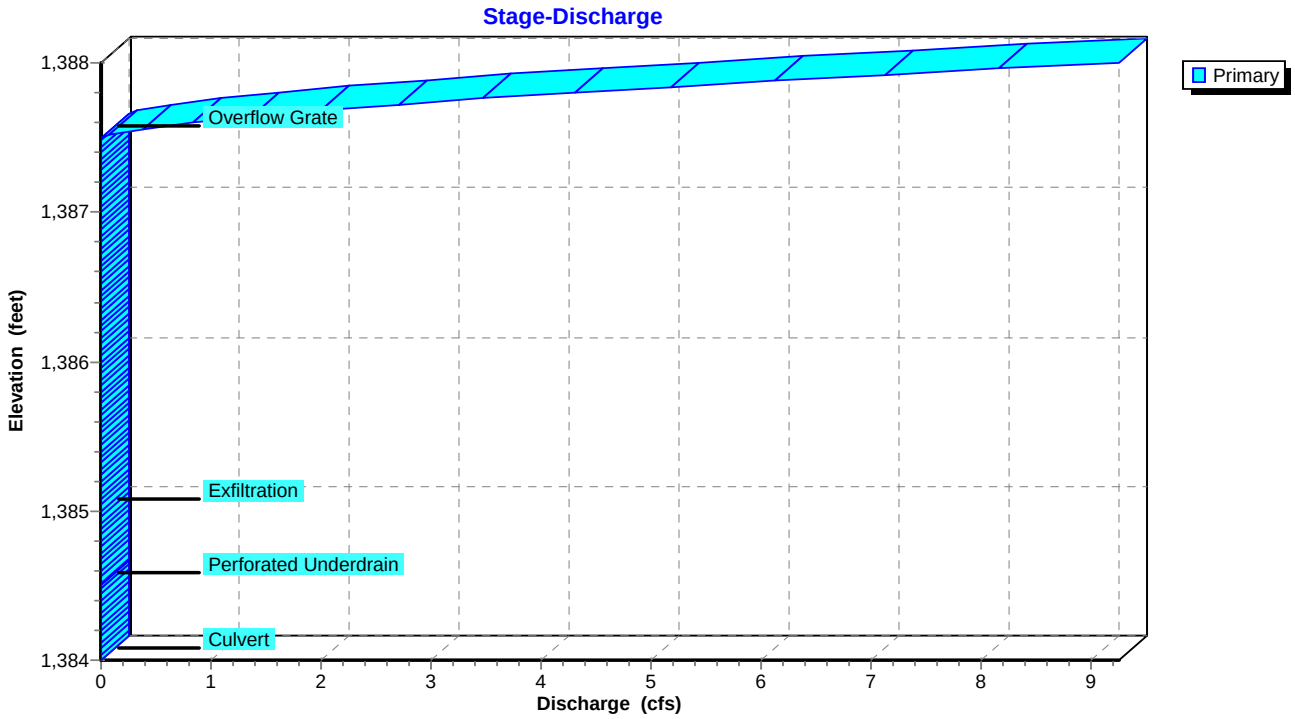
Device	Routing	Invert	Outlet Devices
#1	Primary	1,384.00'	**18.0" Round Culvert** L= 80.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,384.00' / 1,383.00' S= 0.0124 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,384.50'	**0.4" Horiz. Perforated Underdrain X 324.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,385.00'	**0.250 in/hr Exfiltration over Surface area above 1,385.00'** Conductivity to Groundwater Elevation = 1,384.00' Excluded Surface area = 1,923 sf
#4	Device 1	1,387.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=2.73 cfs @ 12.07 hrs HW=1,387.72' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 2.73 cfs of 11.58 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 9.77 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 2.73 cfs @ 1.54 fps)

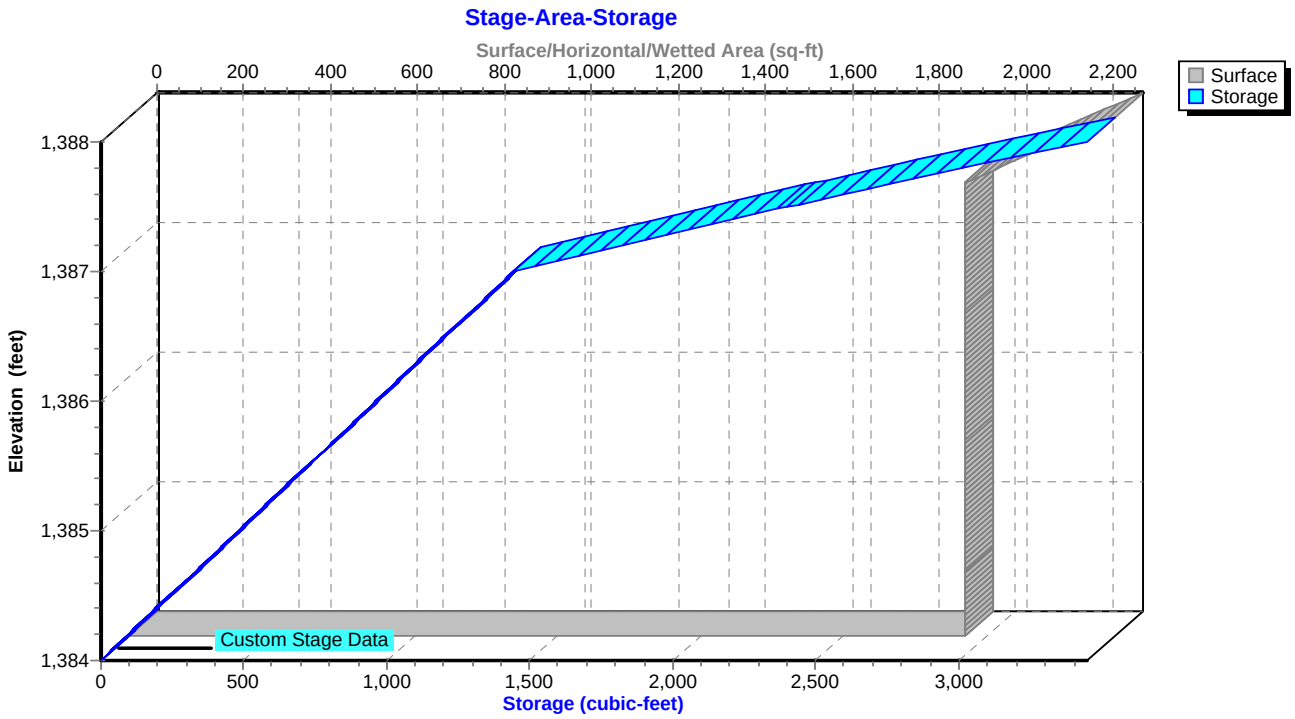
Pond SW23B-P: BRA-SW23B



Pond SW23B-P: BRA-SW23B



Pond SW23B-P: BRA-SW23B



Summary for Pond SW28A-FS: Flow Splitter for SW28A

Inflow Area = 0.220 ac, 68.64% Impervious, Inflow Depth = 6.87" for 100-YR, 24-HR Storm event
Inflow = 1.59 cfs @ 12.01 hrs, Volume= 0.126 af
Outflow = 1.59 cfs @ 12.02 hrs, Volume= 0.126 af, Atten= 0%, Lag= 0.6 min
Primary = 0.80 cfs @ 12.02 hrs, Volume= 0.106 af
Secondary = 0.80 cfs @ 12.02 hrs, Volume= 0.020 af

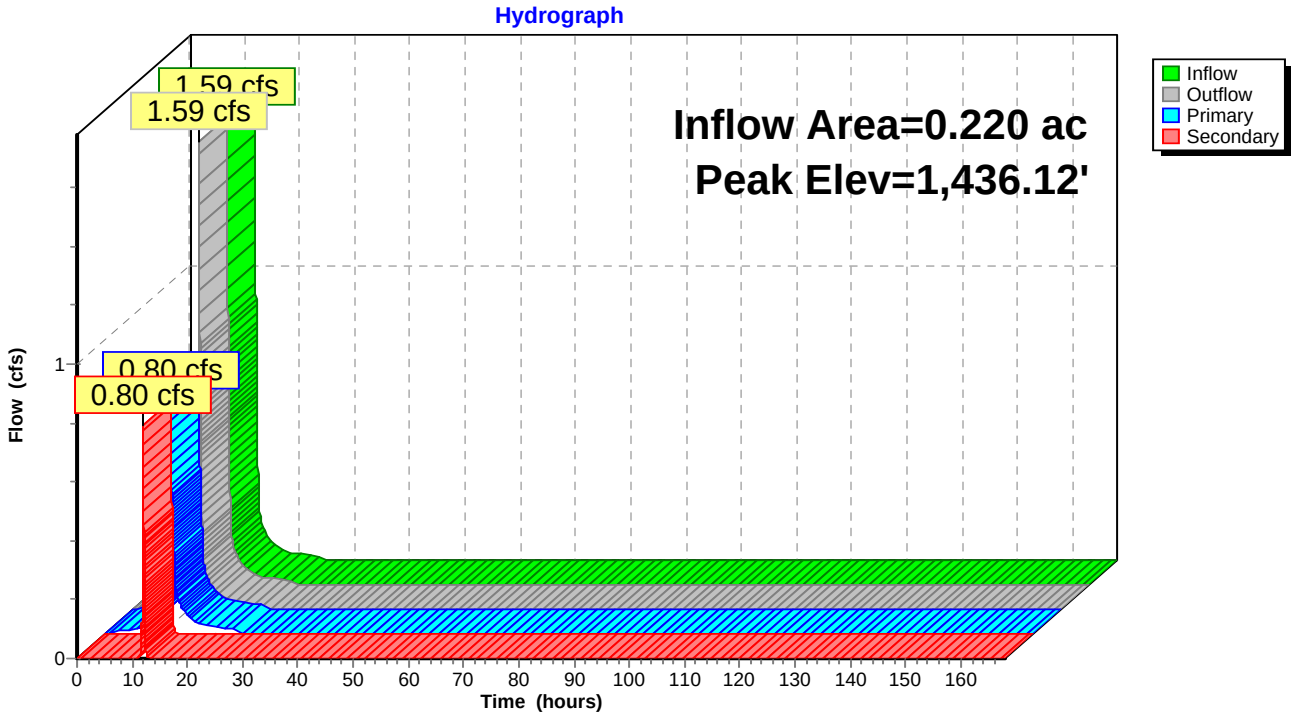
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,436.12' @ 12.02 hrs
Flood Elev= 1,439.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,435.64'	**15.0" Round Outlet to BRA-SW28A** L= 7.3' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,435.64' / 1,435.50' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,435.64'	**15.0" Round Culvert to Pond SW28D** L= 149.5' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,435.64' / 1,427.30' S= 0.0558 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,435.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

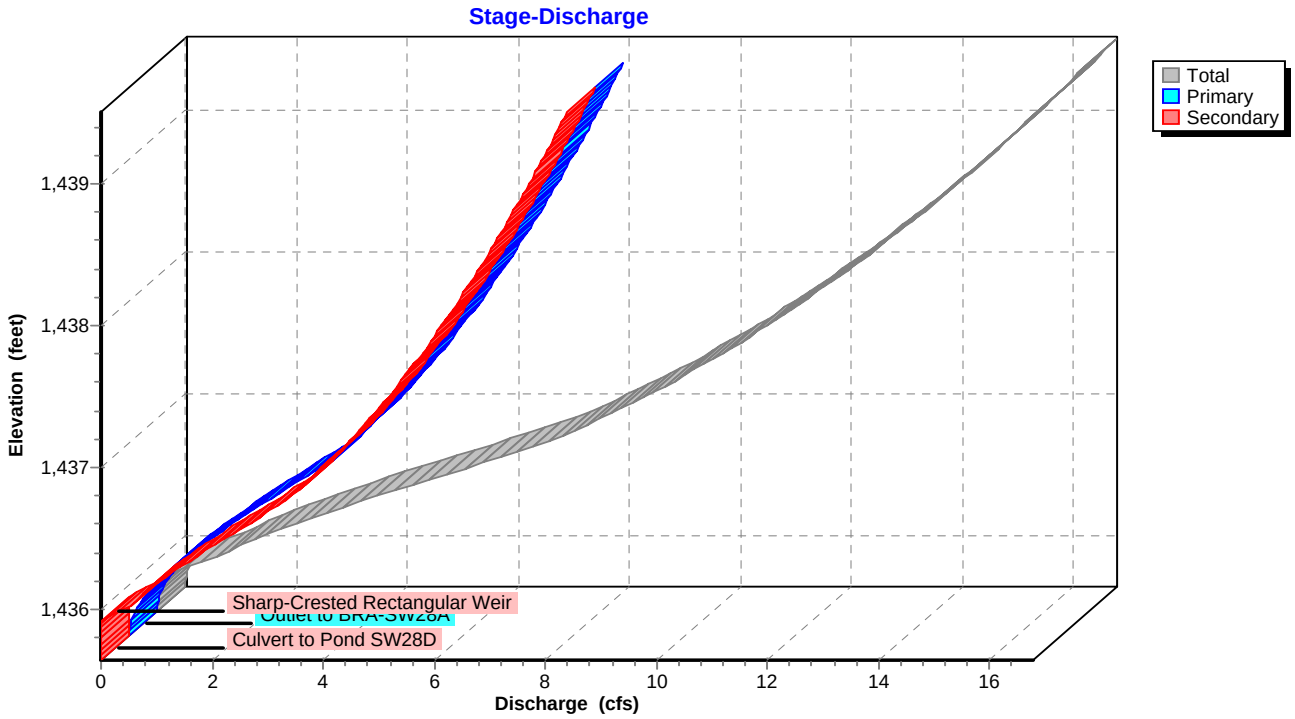
Primary OutFlow Max=0.79 cfs @ 12.02 hrs HW=1,436.11' TW=1,435.62' (Dynamic Tailwater)
└─**1=Outlet to BRA-SW28A** (Inlet Controls 0.79 cfs @ 1.85 fps)

Secondary OutFlow Max=0.79 cfs @ 12.02 hrs HW=1,436.11' TW=1,376.55' (Dynamic Tailwater)
└─**2=Culvert to Pond SW28D** (Inlet Controls 0.79 cfs @ 1.85 fps)
└─**3=Sharp-Crested Rectangular Weir** (Passes 0.79 cfs of 1.28 cfs potential flow)

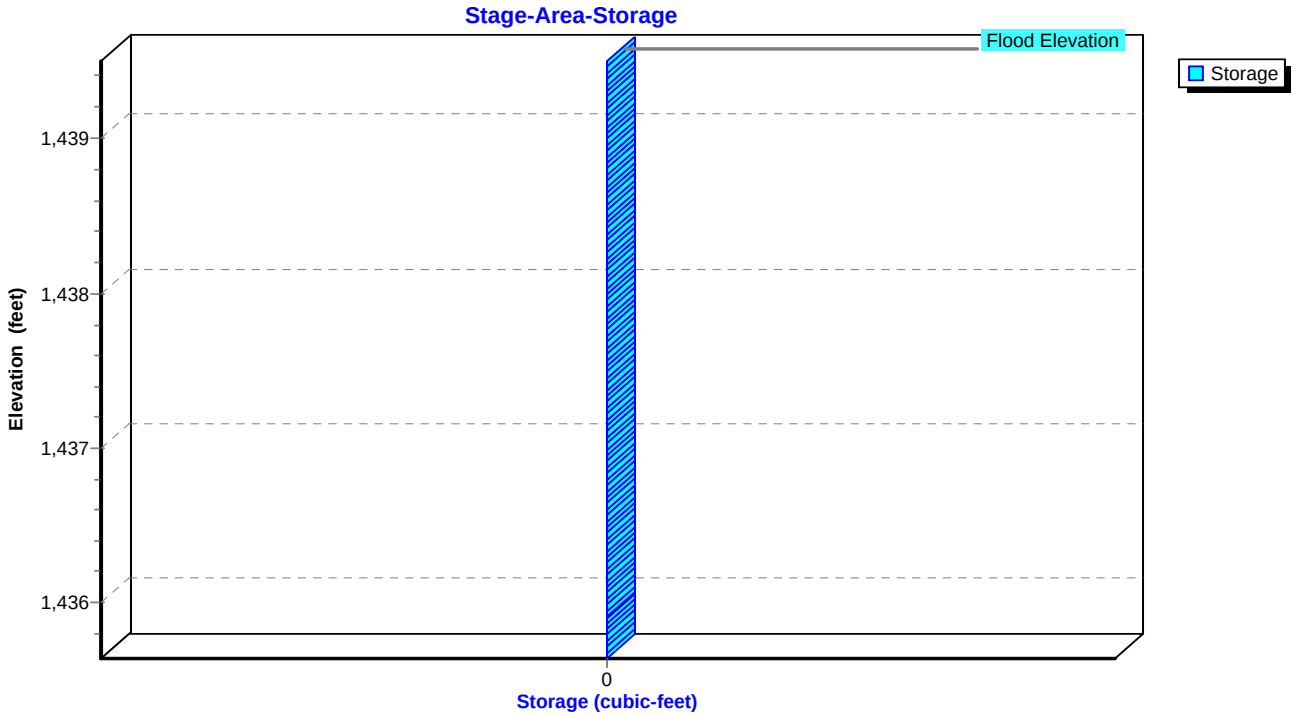
Pond SW28A-FS: Flow Splitter for SW28A



Pond SW28A-FS: Flow Splitter for SW28A



Pond SW28A-FS: Flow Splitter for SW28A



Summary for Pond SW28A-P: BRA-SW28A

Inflow Area = 0.301 ac, 50.17% Impervious, Inflow Depth = 5.55" for 100-YR, 24-HR Storm event
Inflow = 1.21 cfs @ 12.04 hrs, Volume= 0.139 af
Outflow = 1.20 cfs @ 12.05 hrs, Volume= 0.104 af, Atten= 0%, Lag= 1.0 min
Primary = 1.20 cfs @ 12.05 hrs, Volume= 0.104 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,435.63' @ 12.05 hrs Surf.Area= 674 sf Storage= 1,603 cf

Plug-Flow detention time= 175.9 min calculated for 0.104 af (75% of inflow)
Center-of-Mass det. time= 79.5 min (854.3 - 774.8)

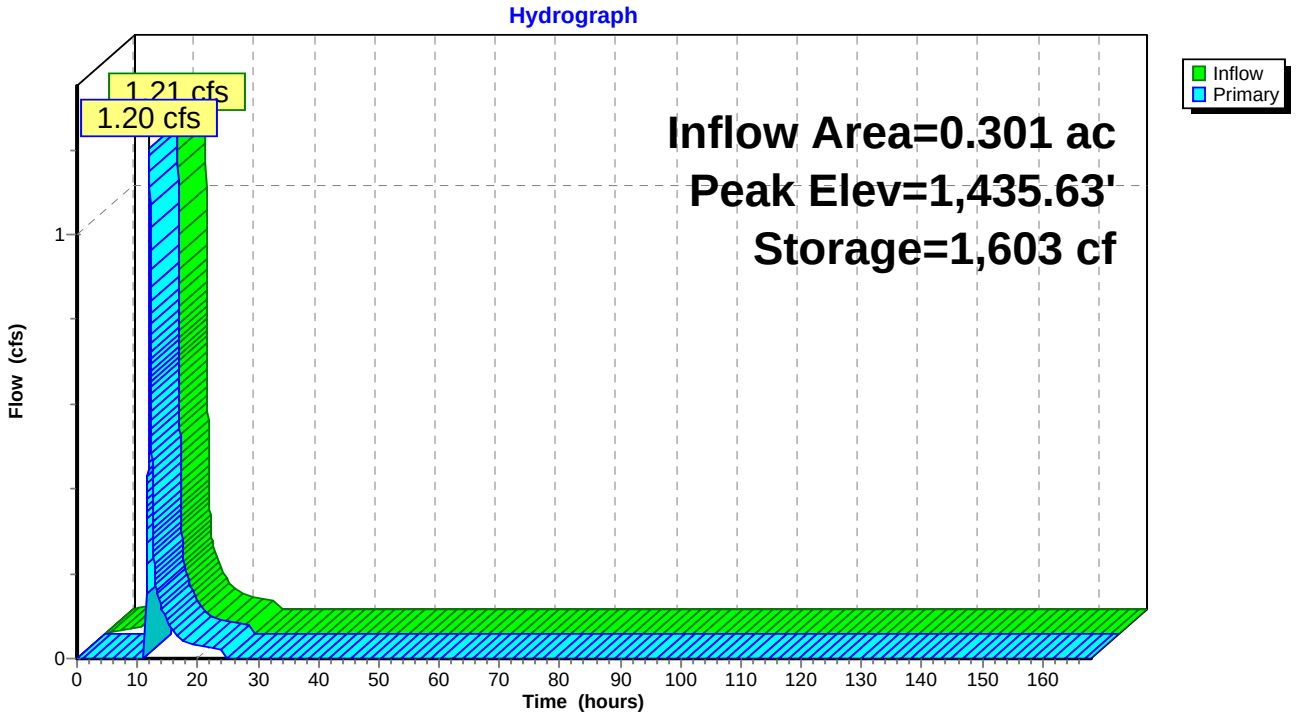
Volume	Invert	Avail.Storage	Storage Description
#1	1,429.50'	1,854 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,429.50	674	100.6	0.0	0	0	674
1,430.50	674	100.6	25.0	169	169	775
1,432.00	674	100.6	25.0	253	421	926
1,433.00	674	100.6	25.0	169	590	1,026
1,434.00	674	100.6	25.0	169	758	1,127
1,434.50	674	100.6	25.0	84	843	1,177
1,435.50	674	100.6	100.0	674	1,517	1,278
1,436.00	674	100.6	100.0	337	1,854	1,328

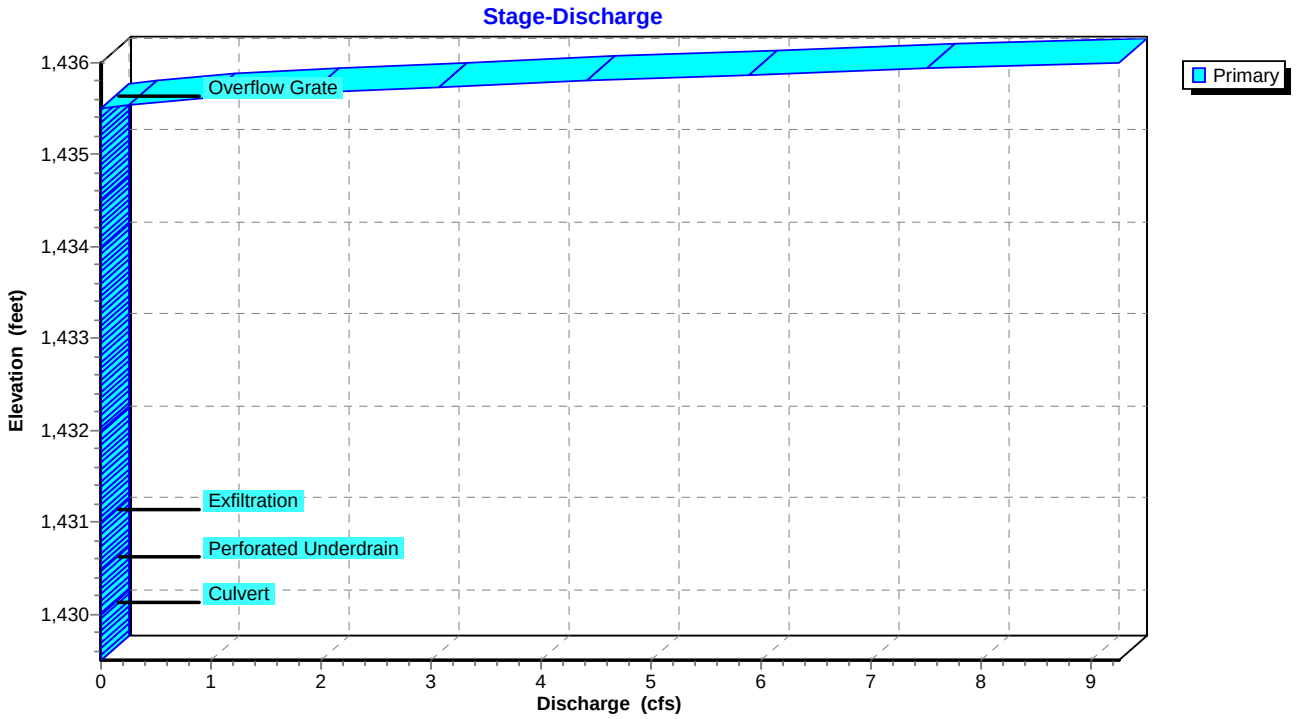
Device	Routing	Invert	Outlet Devices
#1	Primary	1,430.00'	**15.0" Round Culvert** L= 77.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,430.00' / 1,429.00' S= 0.0130 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,430.50'	**0.4" Horiz. Perforated Underdrain** X 512 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,431.00'	**0.250 in/hr Exfiltration over Surface area above 1,431.00'** Conductivity to Groundwater Elevation = 1,430.00' Excluded Surface area = 674 sf
#4	Device 1	1,435.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.20 cfs @ 12.05 hrs HW=1,435.63' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.20 cfs of 10.43 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 4.87 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 1.20 cfs @ 1.17 fps)

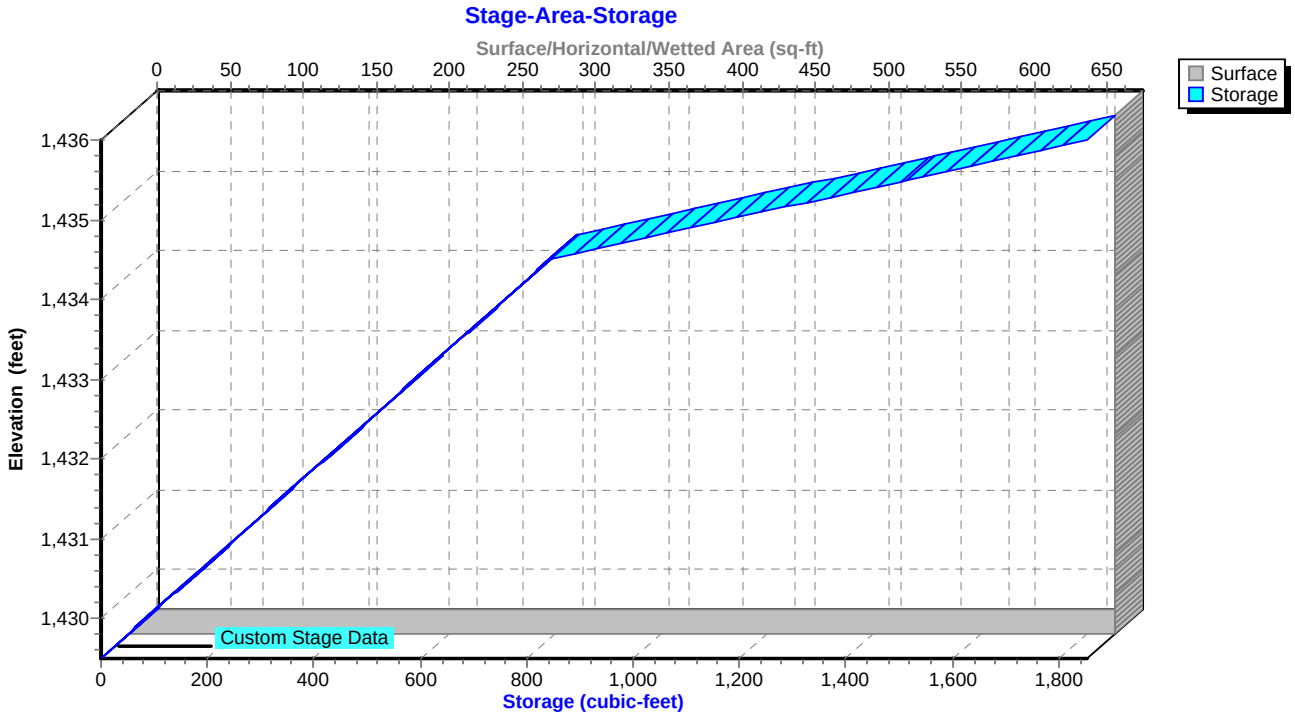
Pond SW28A-P: BRA-SW28A



Pond SW28A-P: BRA-SW28A



Pond SW28A-P: BRA-SW28A



Summary for Pond SW28B-FS: Flow Splitter for SW28B

Inflow Area = 0.390 ac, 67.69% Impervious, Inflow Depth = 6.84" for 100-YR, 24-HR Storm event
Inflow = 2.81 cfs @ 12.02 hrs, Volume= 0.222 af
Outflow = 2.81 cfs @ 12.03 hrs, Volume= 0.222 af, Atten= 0%, Lag= 0.6 min
Primary = 1.41 cfs @ 12.03 hrs, Volume= 0.184 af
Secondary = 1.41 cfs @ 12.03 hrs, Volume= 0.038 af

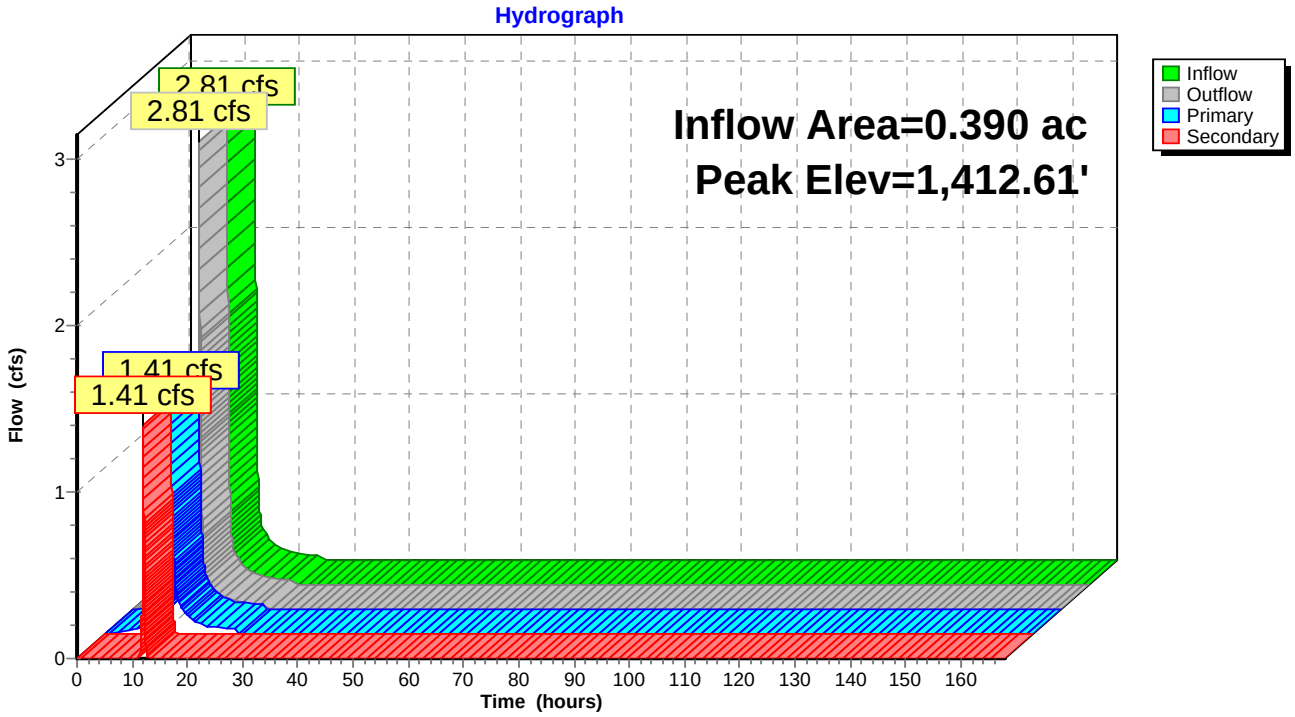
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,412.61' @ 12.03 hrs
Flood Elev= 1,414.80'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,412.00'	**18.0" Round Culvert** L= 21.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,412.00' / 1,410.50' S= 0.0714 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,412.00'	**18.0" Round Culvert** L= 117.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,412.00' / 1,406.00' S= 0.0513 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,412.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

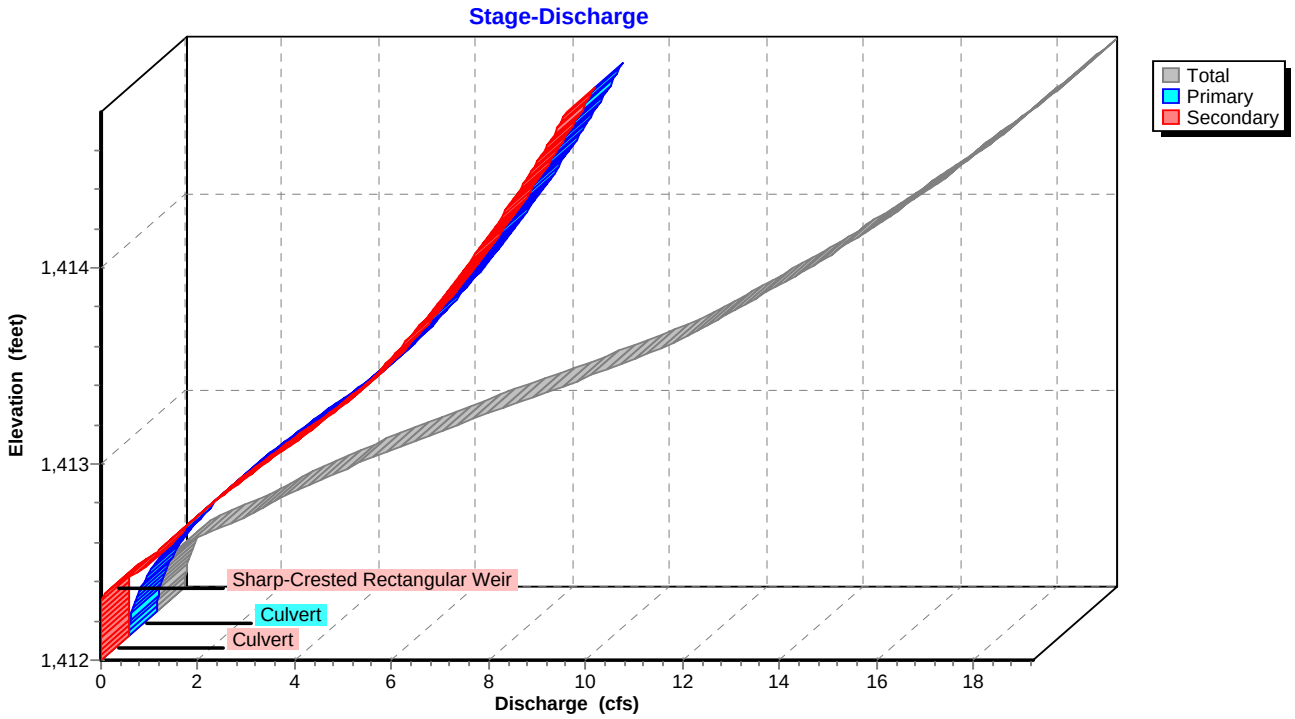
Primary OutFlow Max=1.41 cfs @ 12.03 hrs HW=1,412.61' TW=1,408.88' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.41 cfs @ 2.09 fps)

Secondary OutFlow Max=1.41 cfs @ 12.03 hrs HW=1,412.61' TW=1,376.58' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 1.41 cfs @ 2.09 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 1.41 cfs of 2.19 cfs potential flow)

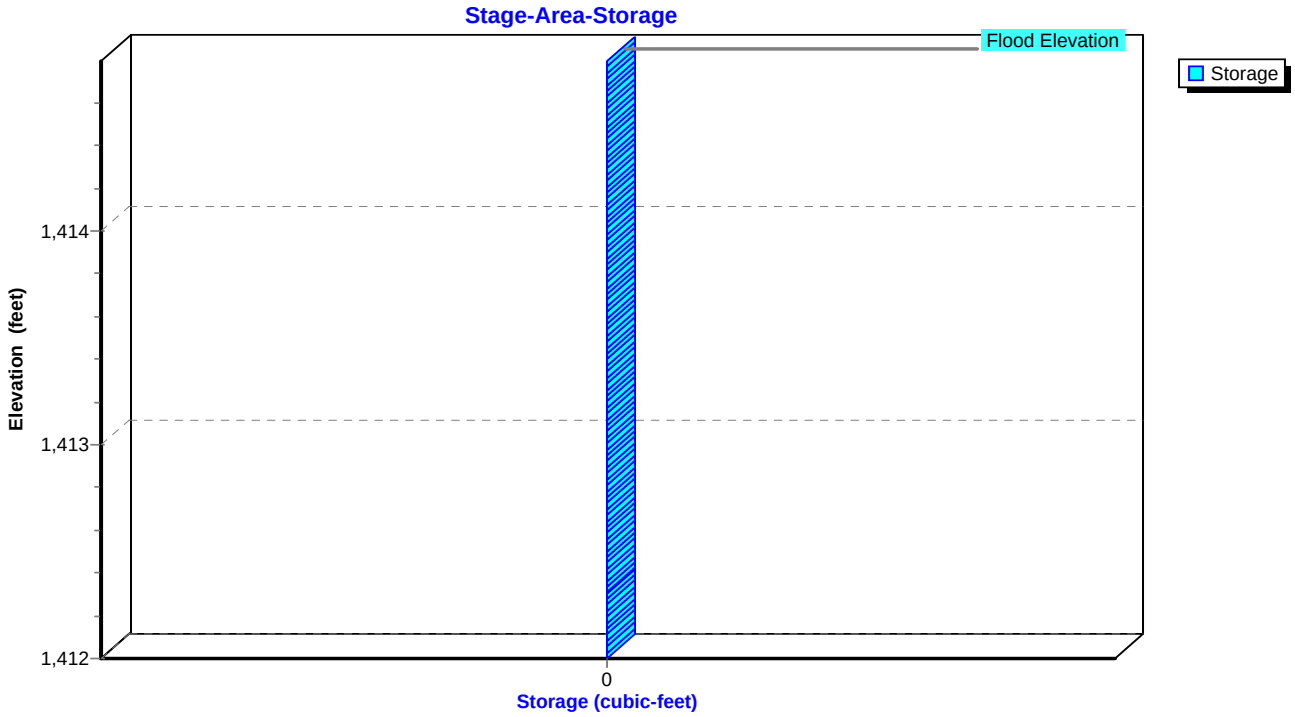
Pond SW28B-FS: Flow Splitter for SW28B



Pond SW28B-FS: Flow Splitter for SW28B



Pond SW28B-FS: Flow Splitter for SW28B



Summary for Pond SW28B-P: BRA-SW28B

Inflow Area = 0.506 ac, 52.17% Impervious, Inflow Depth = 5.50" for 100-YR, 24-HR Storm event
Inflow = 2.12 cfs @ 12.02 hrs, Volume= 0.232 af
Outflow = 1.01 cfs @ 12.23 hrs, Volume= 0.130 af, Atten= 52%, Lag= 12.3 min
Primary = 1.01 cfs @ 12.23 hrs, Volume= 0.130 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,409.11' @ 12.23 hrs Surf.Area= 2,637 sf Storage= 4,750 cf

Plug-Flow detention time= 270.2 min calculated for 0.130 af (56% of inflow)
Center-of-Mass det. time= 135.1 min (908.2 - 773.1)

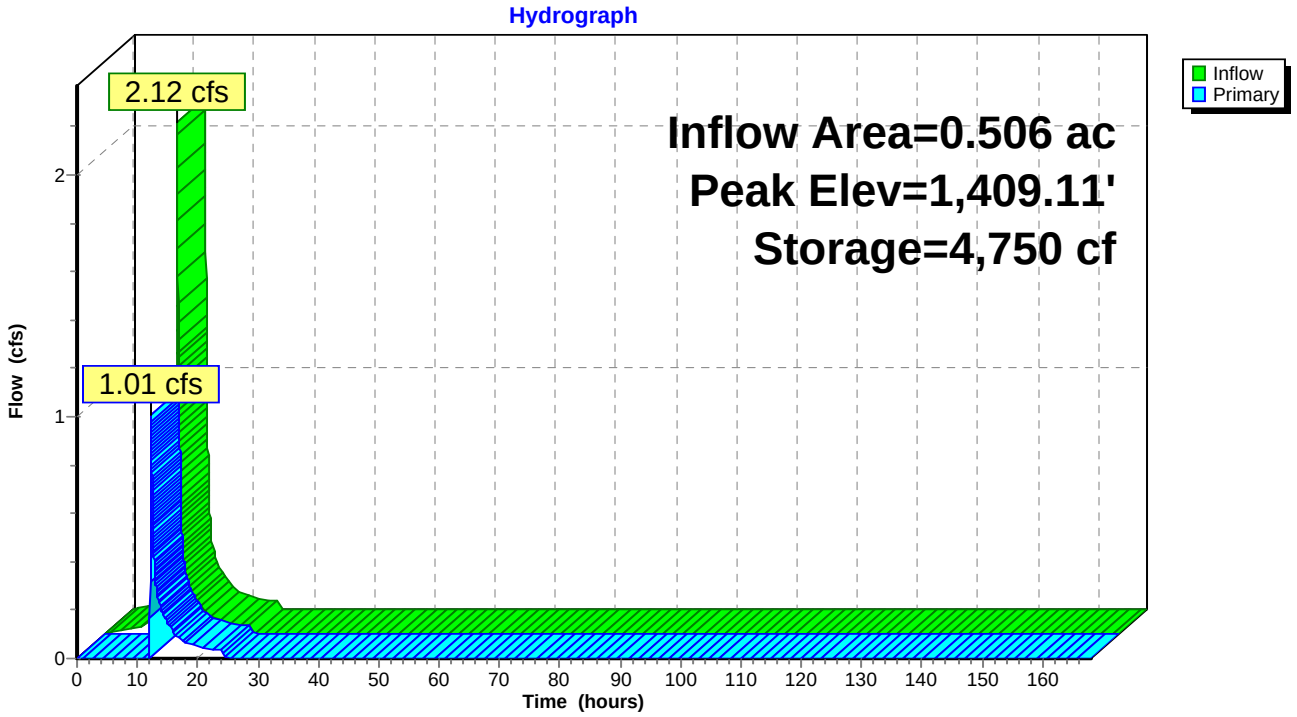
Volume	Invert	Avail.Storage	Storage Description
#1	1,403.50'	5,829 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,403.50	2,545	273.4	0.0	0	0	2,545
1,404.50	2,545	273.4	25.0	636	636	2,818
1,405.50	2,545	273.4	25.0	636	1,273	3,092
1,406.50	2,545	273.4	25.0	636	1,909	3,365
1,407.50	2,545	273.4	25.0	636	2,545	3,639
1,408.50	2,545	273.4	25.0	636	3,181	3,912
1,409.00	2,545	273.4	100.0	1,273	4,454	4,049
1,409.50	2,962	282.9	100.0	1,375	5,829	4,492

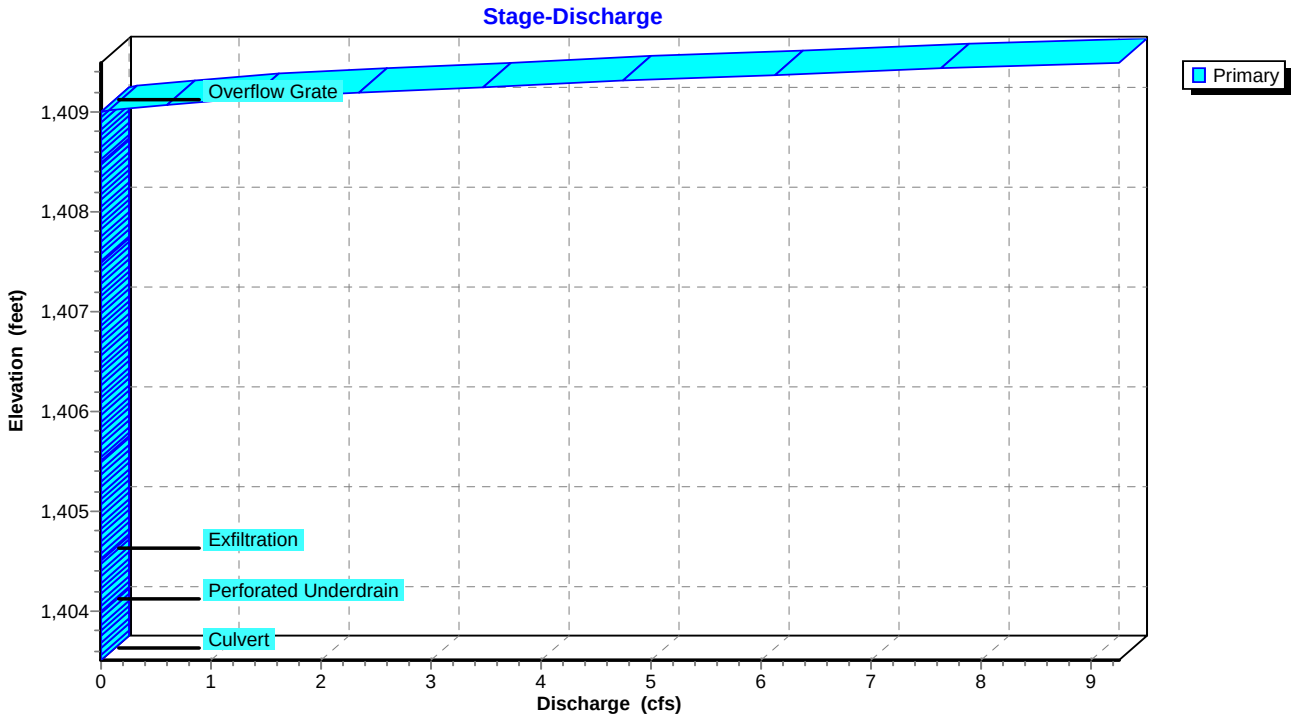
Device	Routing	Invert	Outlet Devices
#1	Primary	1,403.50'	**15.0" Round Culvert** L= 58.6' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,403.50' / 1,401.00' S= 0.0427 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,404.00'	**0.4" Horiz. Perforated Underdrain X 468.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,404.50'	**0.250 in/hr Exfiltration over Surface area above 1,404.50'** Conductivity to Groundwater Elevation = 1,403.50' Excluded Surface area = 2,545 sf
#4	Device 1	1,409.00'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.01 cfs @ 12.23 hrs HW=1,409.11' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.01 cfs of 10.42 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 17.79 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Overflow Grate** (Weir Controls 1.01 cfs @ 1.11 fps)

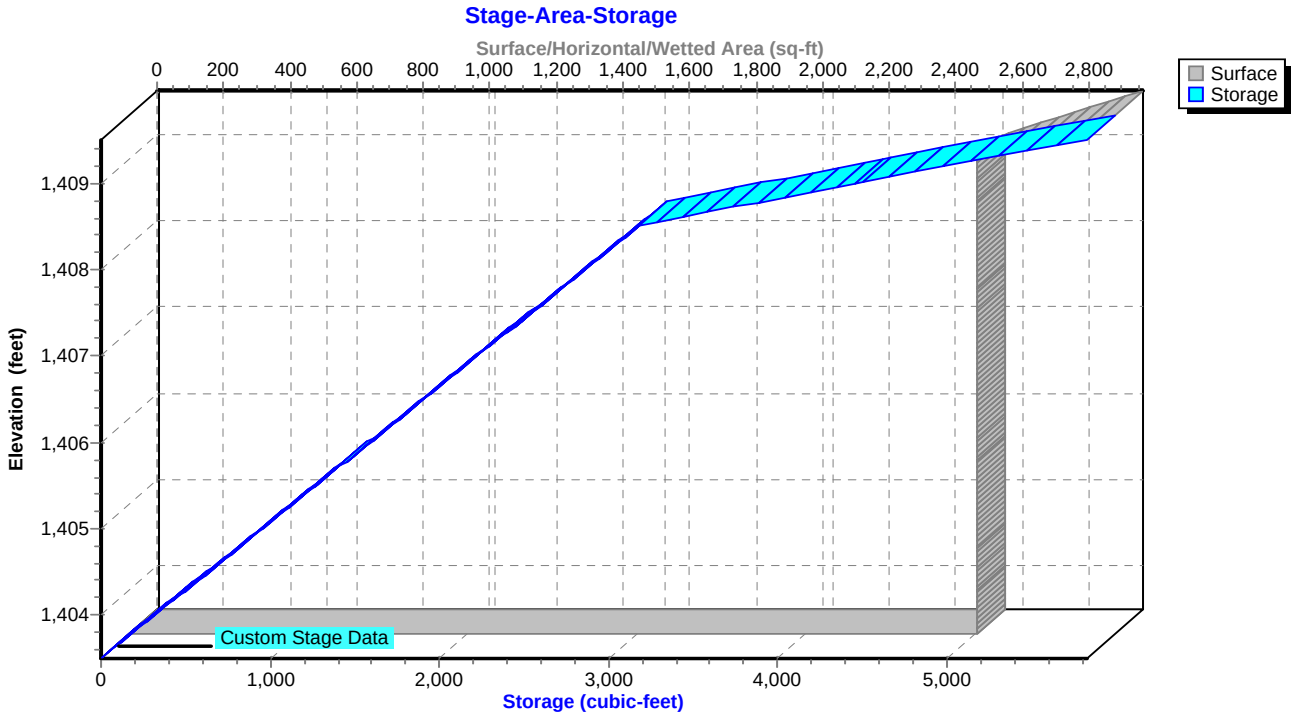
Pond SW28B-P: BRA-SW28B



Pond SW28B-P: BRA-SW28B



Pond SW28B-P: BRA-SW28B



Summary for Pond SW28C-FS: Flow Splitter for SW28C

Inflow Area = 0.666 ac,100.00% Impervious, Inflow Depth = 7.76" for 100-YR, 24-HR Storm event
Inflow = 6.06 cfs @ 12.03 hrs, Volume= 0.431 af
Outflow = 6.06 cfs @ 12.04 hrs, Volume= 0.431 af, Atten= 0%, Lag= 0.6 min
Primary = 3.03 cfs @ 12.04 hrs, Volume= 0.374 af
Secondary = 3.03 cfs @ 12.04 hrs, Volume= 0.057 af

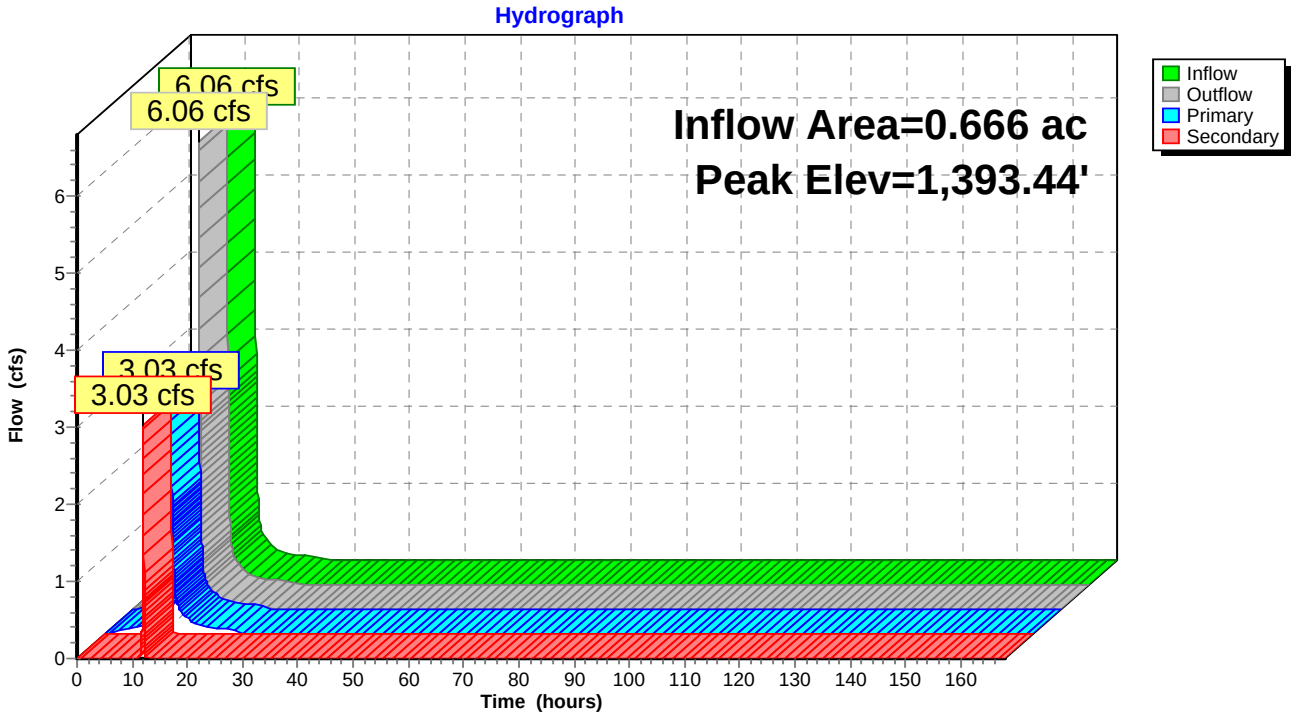
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,393.44' @ 12.04 hrs
Flood Elev= 1,396.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,392.50'	**18.0" Round Culvert to BRA-SW28A** L= 14.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,392.50' / 1,392.00' S= 0.0347 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,392.50'	**18.0" Round Culvert to Pond SW28D** L= 189.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,392.50' / 1,385.70' S= 0.0358 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,393.00'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

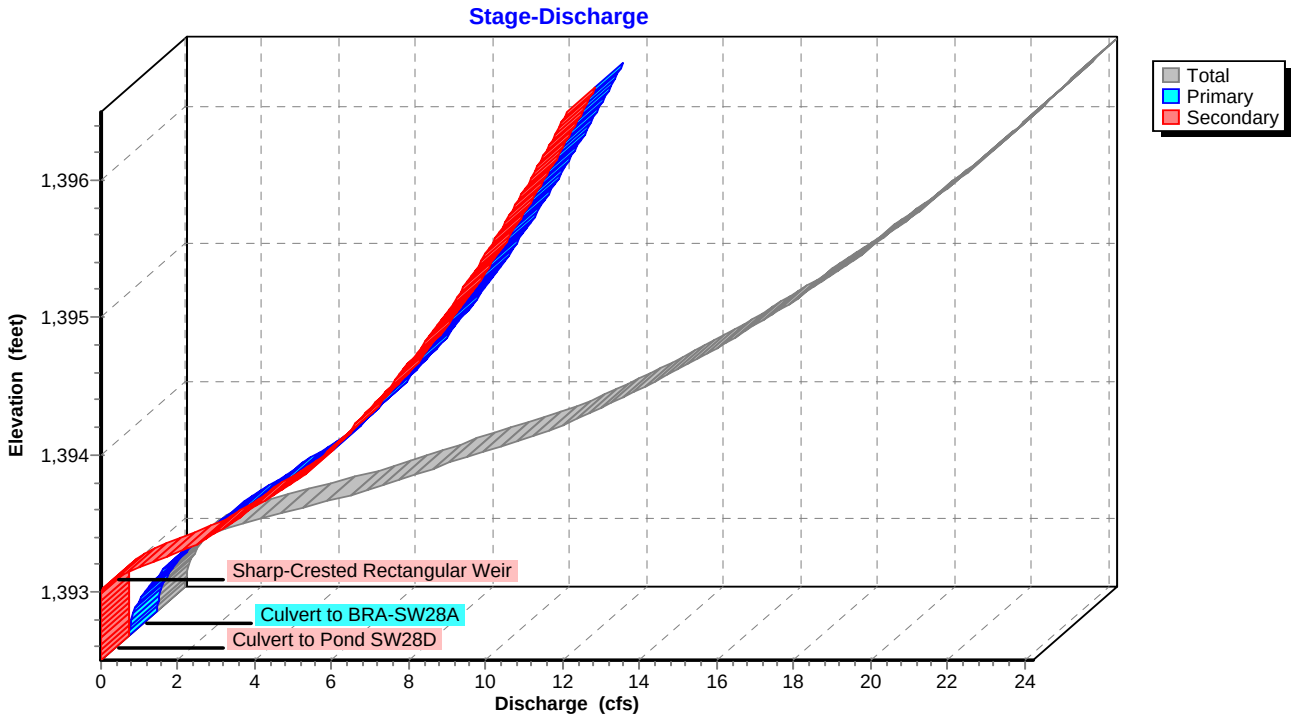
Primary OutFlow Max=3.02 cfs @ 12.04 hrs HW=1,393.44' TW=1,390.74' (Dynamic Tailwater)
└**1=Culvert to BRA-SW28A** (Inlet Controls 3.02 cfs @ 2.60 fps)

Secondary OutFlow Max=3.02 cfs @ 12.04 hrs HW=1,393.44' TW=1,376.61' (Dynamic Tailwater)
└**2=Culvert to Pond SW28D** (Inlet Controls 3.02 cfs @ 2.60 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 3.02 cfs of 3.69 cfs potential flow)

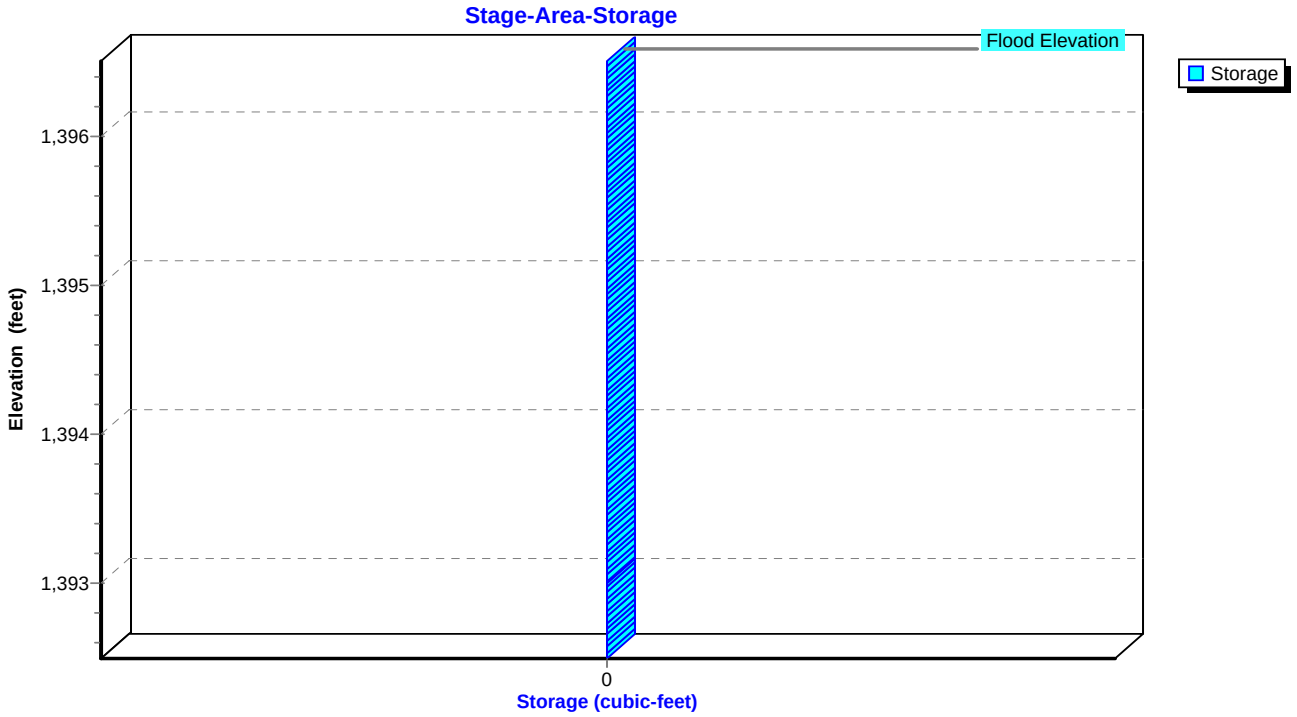
Pond SW28C-FS: Flow Splitter for SW28C



Pond SW28C-FS: Flow Splitter for SW28C



Pond SW28C-FS: Flow Splitter for SW28C



Summary for Pond SW28C-P: BRA-SW28C

Inflow Area = 0.763 ac, 87.29% Impervious, Inflow Depth = 6.50" for 100-YR, 24-HR Storm event
Inflow = 3.60 cfs @ 12.03 hrs, Volume= 0.414 af
Outflow = 3.34 cfs @ 12.06 hrs, Volume= 0.284 af, Atten= 7%, Lag= 1.7 min
Primary = 3.34 cfs @ 12.06 hrs, Volume= 0.284 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,390.75' @ 12.06 hrs Surf.Area= 2,516 sf Storage= 6,299 cf

Plug-Flow detention time= 216.6 min calculated for 0.284 af (69% of inflow)
Center-of-Mass det. time= 106.2 min (853.3 - 747.1)

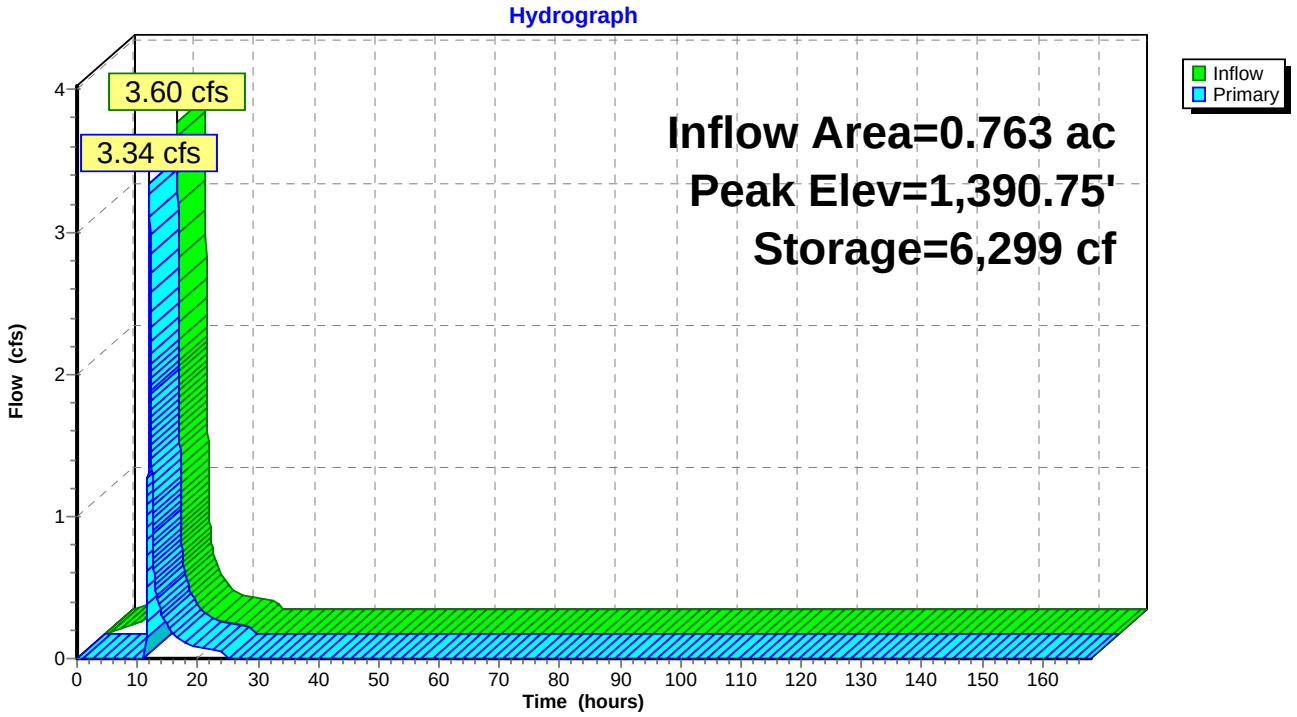
Volume	Invert	Avail.Storage	Storage Description
#1	1,384.50'	6,919 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,384.50	2,516	222.0	0.0	0	0	2,516
1,385.50	2,516	222.0	25.0	629	629	2,738
1,387.00	2,516	222.0	25.0	944	1,573	3,071
1,388.00	2,516	222.0	25.0	629	2,202	3,293
1,389.00	2,516	222.0	25.0	629	2,831	3,515
1,389.50	2,516	222.0	25.0	315	3,145	3,626
1,390.50	2,516	222.0	100.0	2,516	5,661	3,848
1,391.00	2,516	222.0	100.0	1,258	6,919	3,959

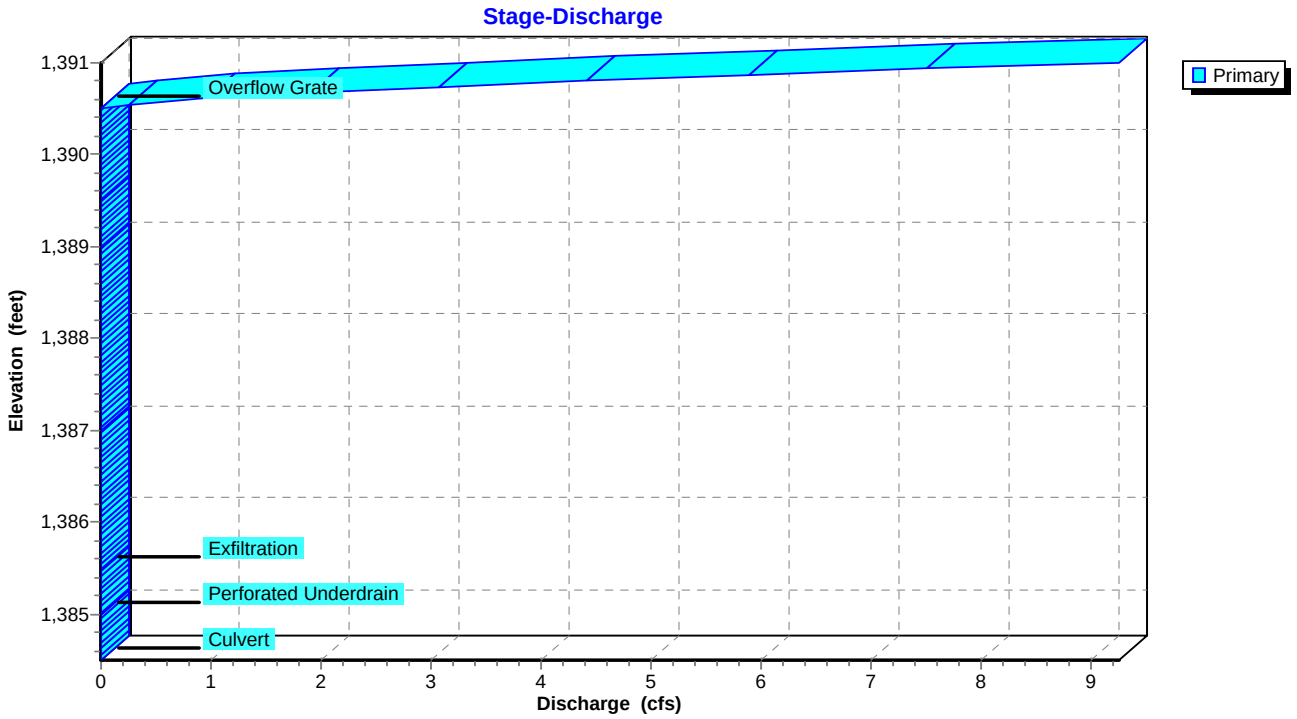
Device	Routing	Invert	Outlet Devices
#1	Primary	1,384.50'	**15.0" Round Culvert** L= 68.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,384.50' / 1,384.00' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,385.00'	**0.4" Horiz. Perforated Underdrain X 286.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,385.50'	**0.250 in/hr Exfiltration over Surface area above 1,385.50'** Conductivity to Groundwater Elevation = 1,385.00' Excluded Surface area = 2,516 sf
#4	Device 1	1,390.50'	**24.0" x 24.0" Horiz. Overflow Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.34 cfs @ 12.06 hrs HW=1,390.75' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 3.34 cfs of 11.07 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 11.53 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Overflow Grate** (Weir Controls 3.34 cfs @ 1.65 fps)

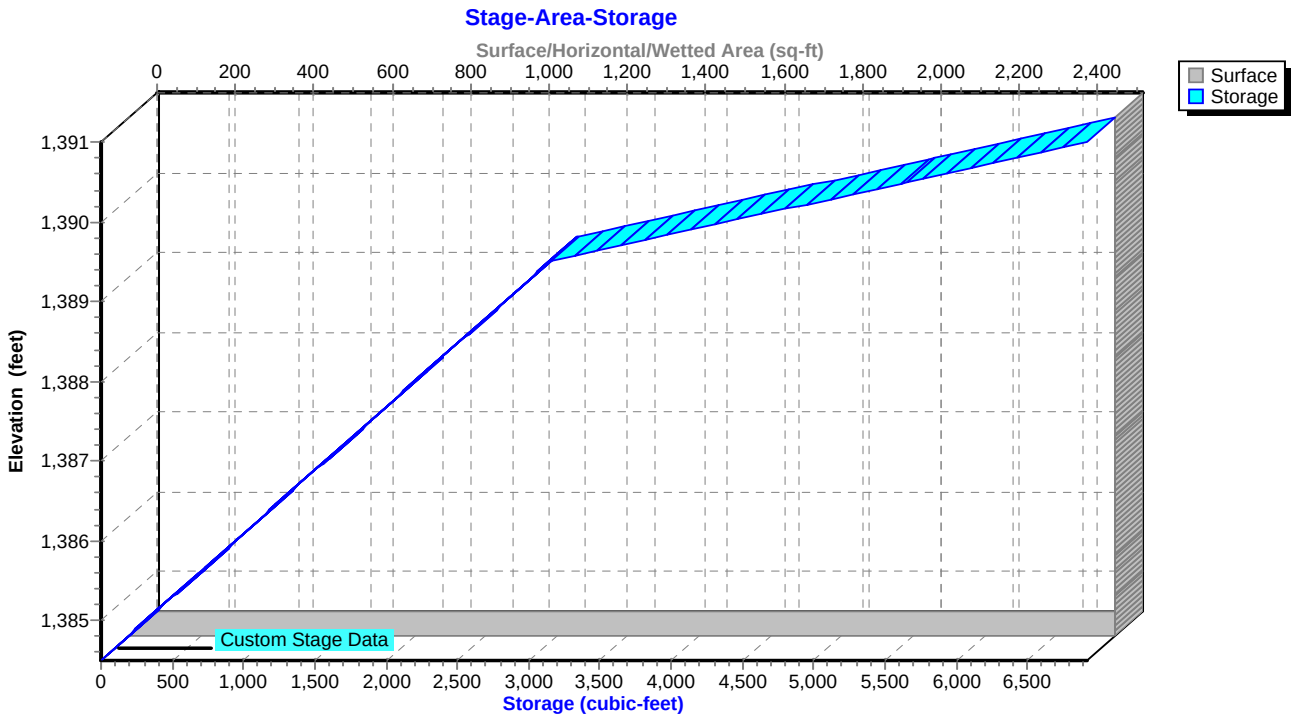
Pond SW28C-P: BRA-SW28C



Pond SW28C-P: BRA-SW28C



Pond SW28C-P: BRA-SW28C



Summary for Pond SW31-FS: Flow Splitter for SW31

Inflow Area = 0.537 ac, 58.47% Impervious, Inflow Depth = 6.57" for 100-YR, 24-HR Storm event
Inflow = 4.48 cfs @ 12.03 hrs, Volume= 0.294 af
Outflow = 4.48 cfs @ 12.04 hrs, Volume= 0.294 af, Atten= 0%, Lag= 0.6 min
Primary = 2.08 cfs @ 12.04 hrs, Volume= 0.227 af
Secondary = 2.40 cfs @ 12.04 hrs, Volume= 0.067 af

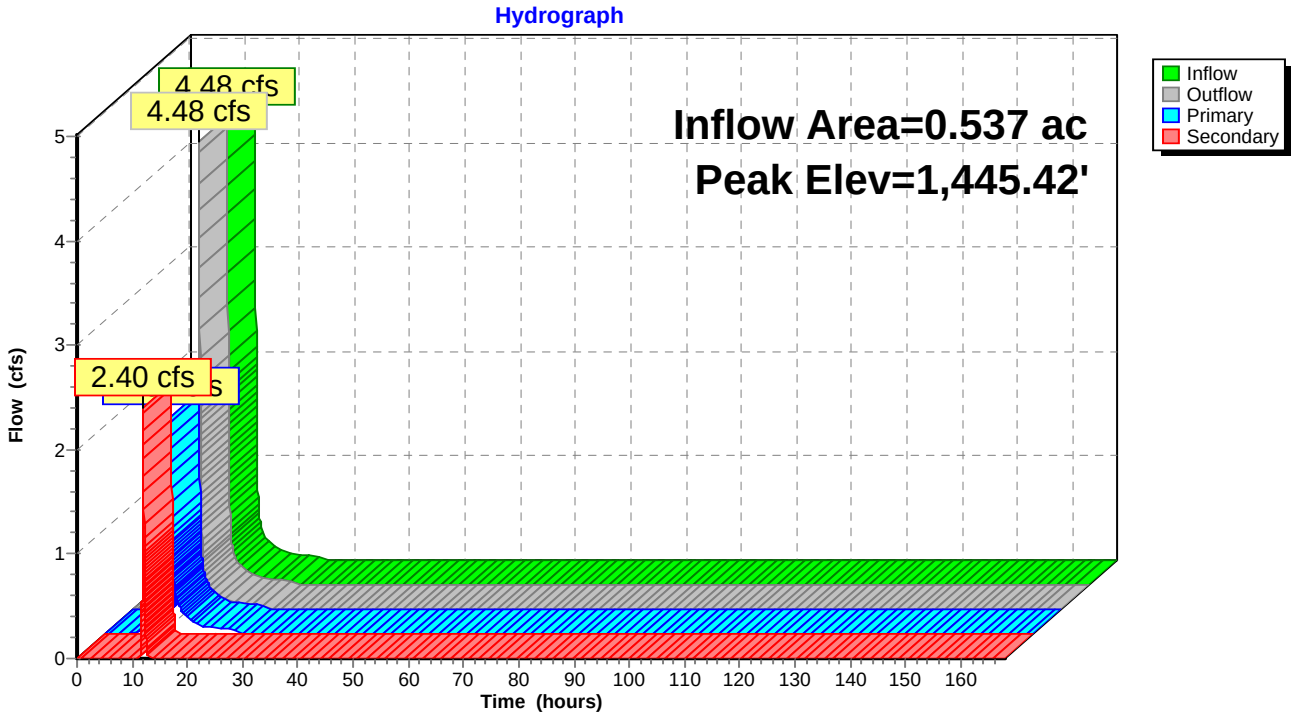
Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,445.42' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,444.60'	**18.0" Round Culvert** L= 10.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,444.60' / 1,444.50' S= 0.0100 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Secondary	1,444.60'	**18.0" Round Culvert** L= 48.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,444.60' / 1,443.00' S= 0.0333 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#3	Device 2	1,444.90'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

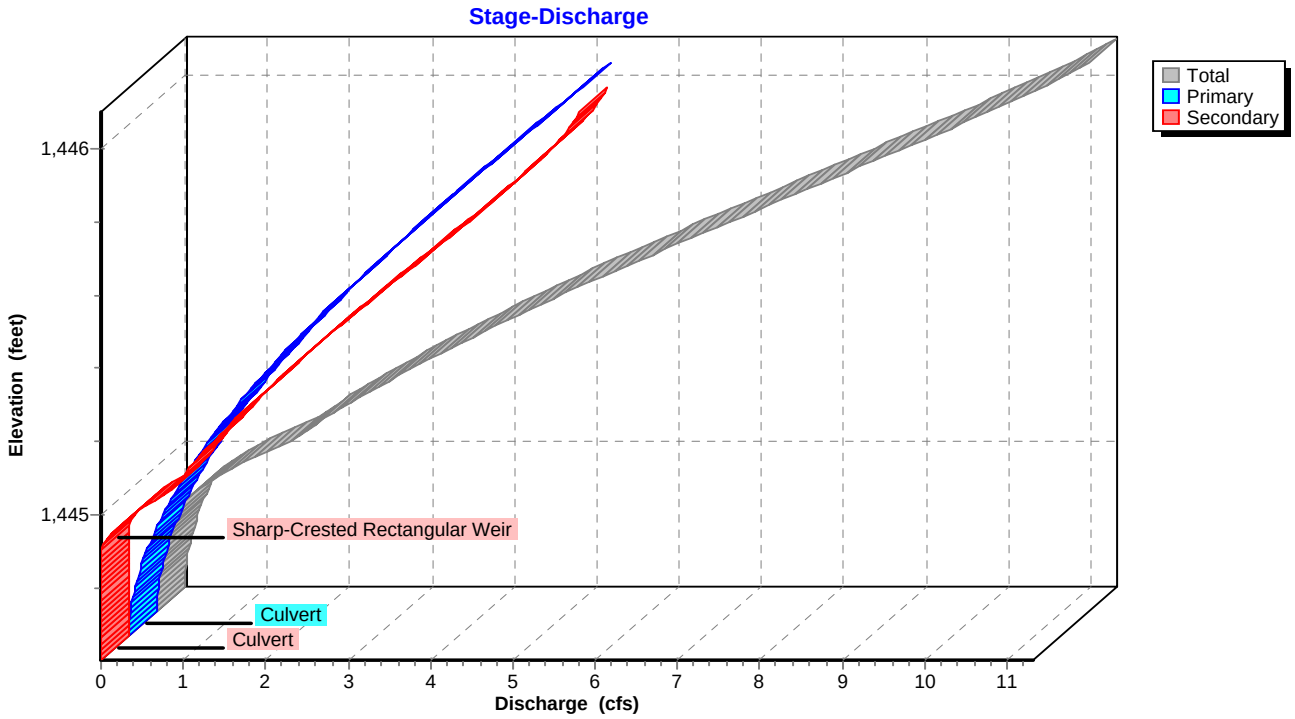
Primary OutFlow Max=2.07 cfs @ 12.04 hrs HW=1,445.42' TW=1,444.40' (Dynamic Tailwater)
└**1=Culvert** (Barrel Controls 2.07 cfs @ 3.04 fps)

Secondary OutFlow Max=2.39 cfs @ 12.04 hrs HW=1,445.42' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 2.39 cfs @ 2.43 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 2.39 cfs of 4.75 cfs potential flow)

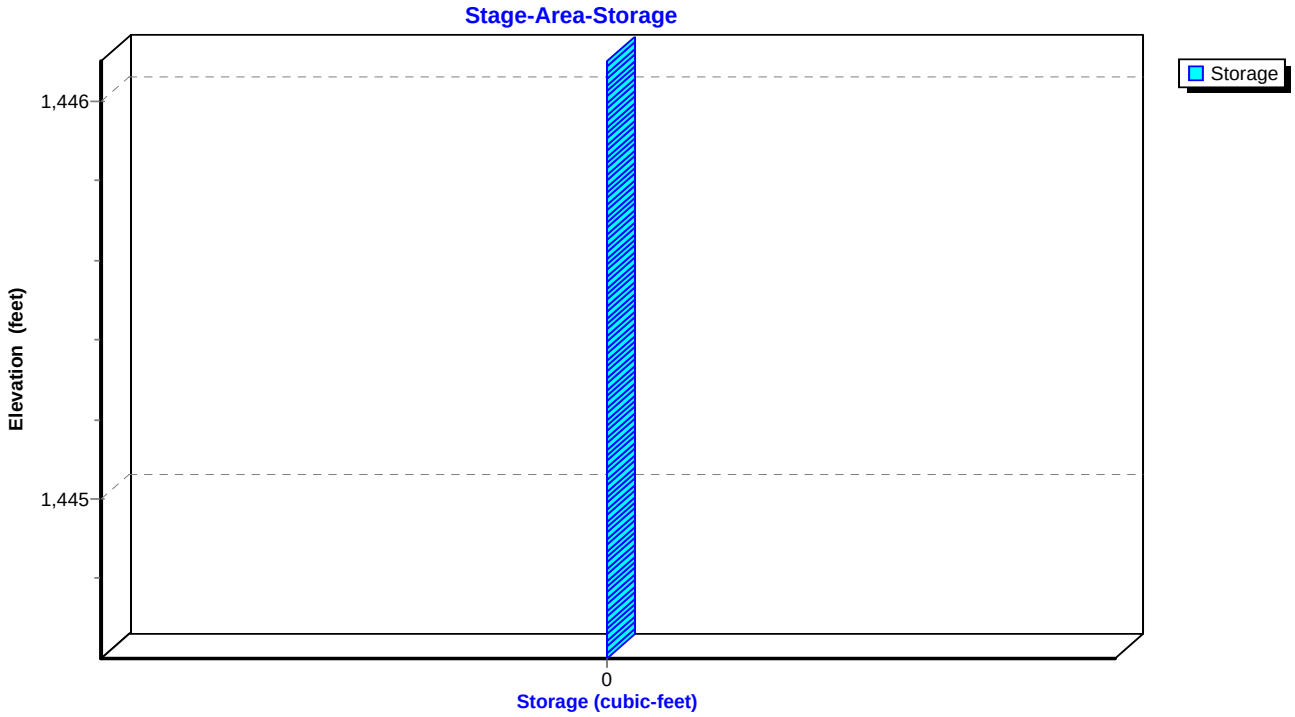
Pond SW31-FS: Flow Splitter for SW31



Pond SW31-FS: Flow Splitter for SW31



Pond SW31-FS: Flow Splitter for SW31



Summary for Pond SW31-P: BRA-SW31

Inflow Area = 0.597 ac, 52.60% Impervious, Inflow Depth = 5.06" for 100-YR, 24-HR Storm event
Inflow = 2.47 cfs @ 12.04 hrs, Volume= 0.252 af
Outflow = 1.98 cfs @ 12.09 hrs, Volume= 0.189 af, Atten= 20%, Lag= 3.0 min
Primary = 1.98 cfs @ 12.09 hrs, Volume= 0.189 af

Routing by Sim-Route method, Time Span= 0.00-168.00 hrs, dt= 0.01 hrs
Peak Elev= 1,444.46' @ 12.09 hrs Surf.Area= 1,567 sf Storage= 3,458 cf

Plug-Flow detention time= 177.4 min calculated for 0.189 af (75% of inflow)
Center-of-Mass det. time= 80.9 min (878.1 - 797.2)

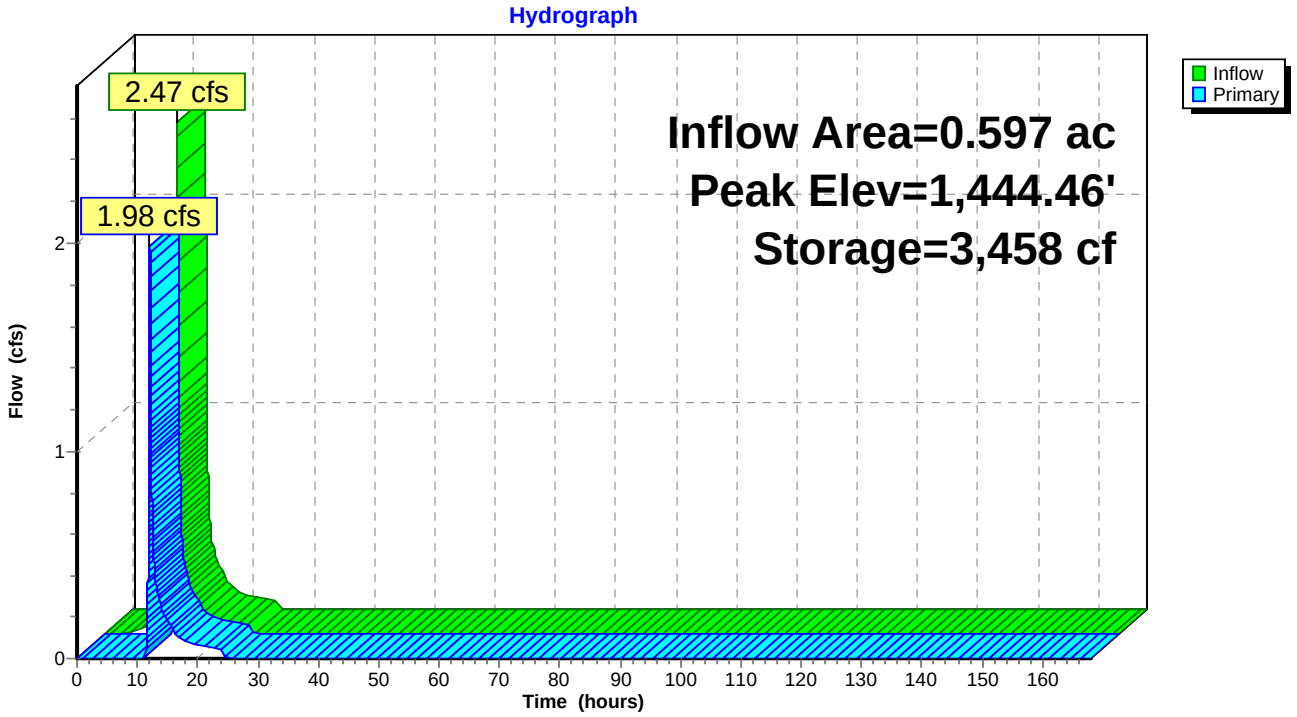
Volume	Invert	Avail.Storage	Storage Description
#1	1,438.50'	4,309 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,438.50	1,567	169.0	0.0	0	0	1,567
1,439.50	1,567	169.0	25.0	392	392	1,736
1,440.50	1,567	169.0	25.0	392	784	1,905
1,441.50	1,567	169.0	25.0	392	1,175	2,074
1,442.50	1,567	169.0	25.0	392	1,567	2,243
1,443.50	1,567	169.0	25.0	392	1,959	2,412
1,444.50	1,567	169.0	100.0	1,567	3,526	2,581
1,445.00	1,567	169.0	100.0	784	4,309	2,666

Device	Routing	Invert	Outlet Devices
#1	Primary	1,438.50'	**15.0" Round Culvert** L= 87.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,438.50' / 1,437.50' S= 0.0115 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,439.00'	**0.4" Horiz. Perforated Underdrain X 256.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,439.50'	**0.250 in/hr Exfiltration over Surface area above 1,439.50'** Conductivity to Groundwater Elevation = 1,438.00' Excluded Surface area = 1,567 sf
#4	Device 1	1,444.00'	**24.0" W x 24.0" H Vert. Orifice/Grate** C= 0.600

Primary OutFlow Max=1.98 cfs @ 12.09 hrs HW=1,444.46' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 1.98 cfs of 10.77 cfs potential flow)
  - **2=Perforated Underdrain** (Passes 0.00 cfs of 10.05 cfs potential flow)
    - **3=Exfiltration** (Controls 0.00 cfs)
  - **4=Orifice/Grate** (Orifice Controls 1.98 cfs @ 2.17 fps)

Pond SW31-P: BRA-SW31



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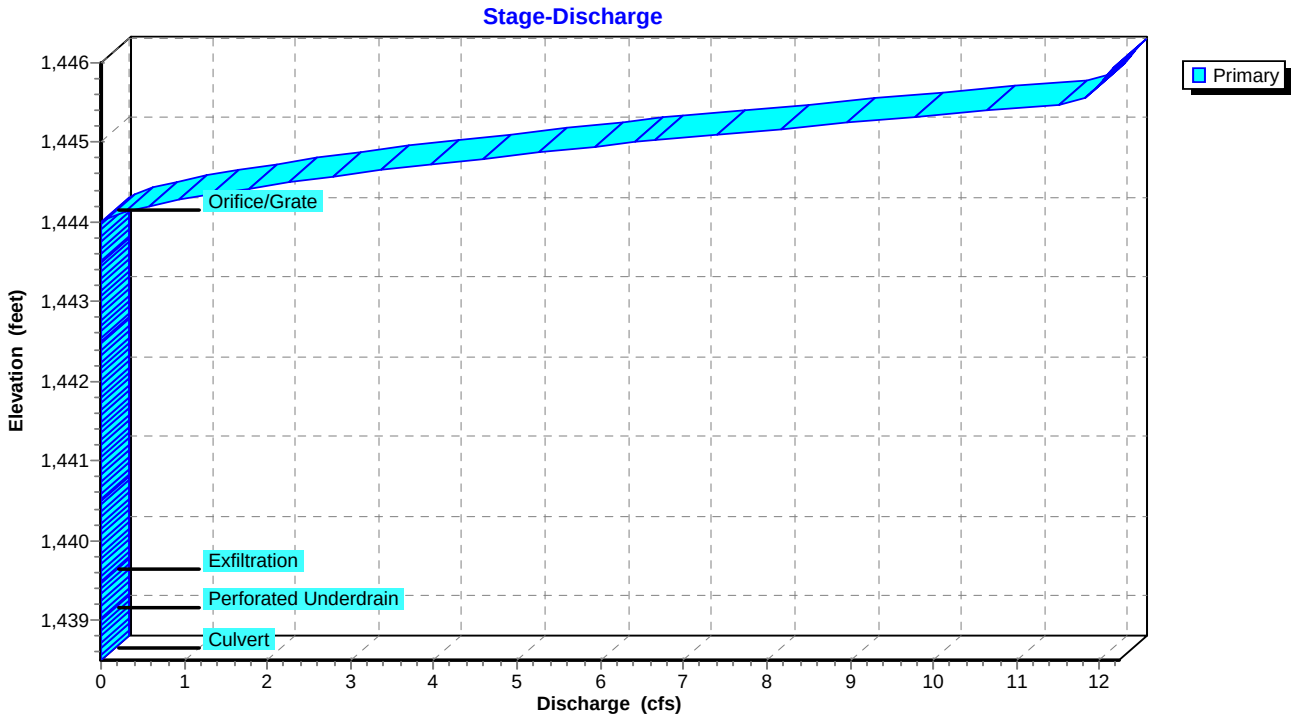

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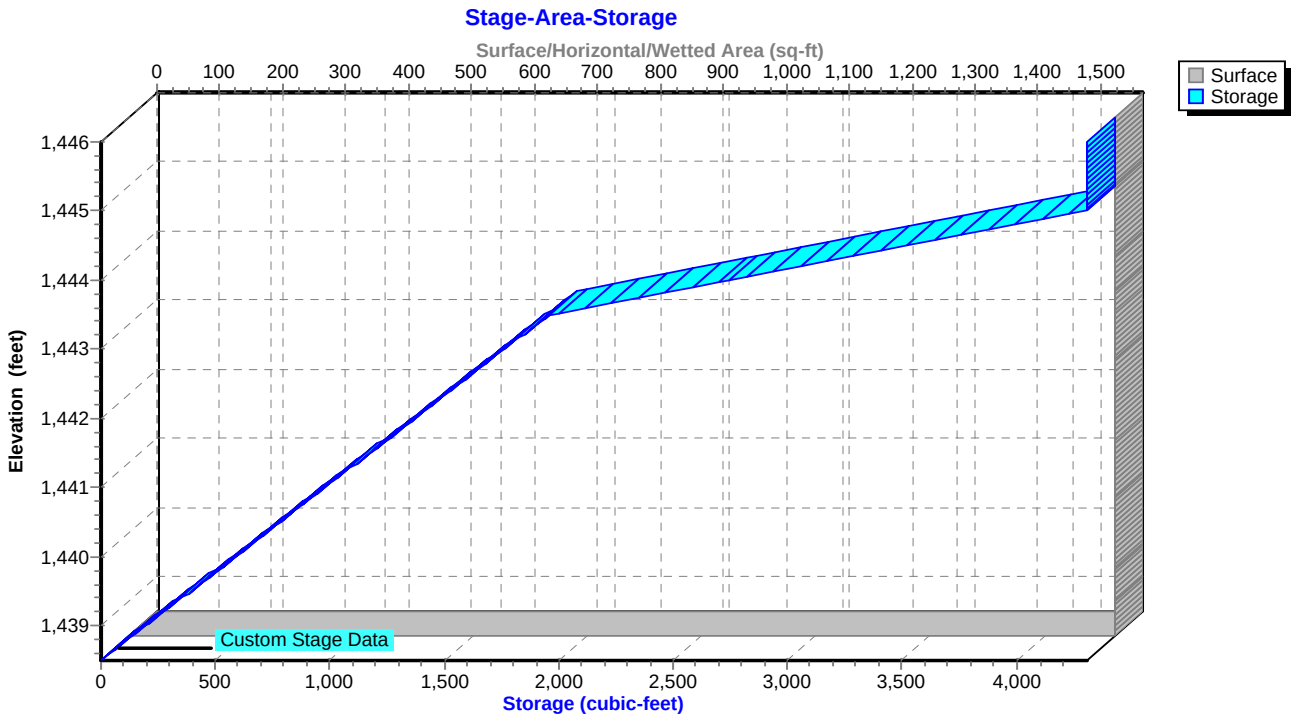

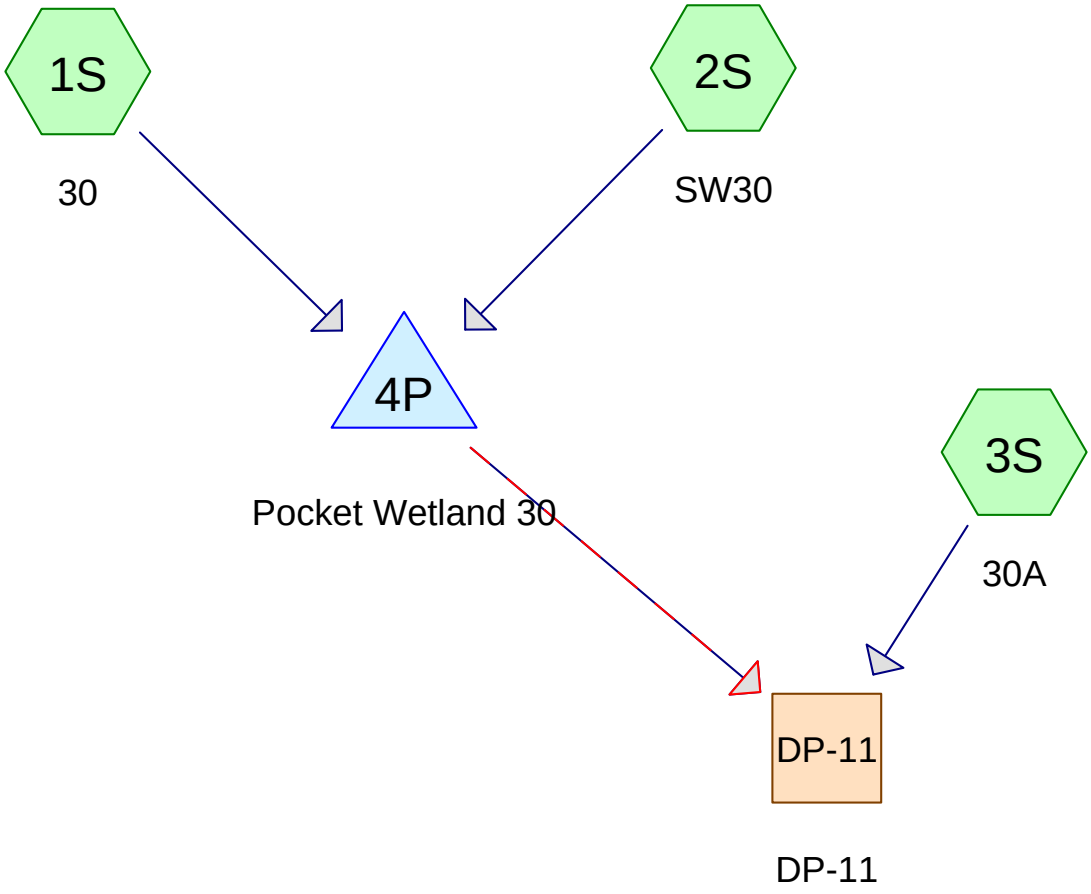

Subcat Reach Pond Link

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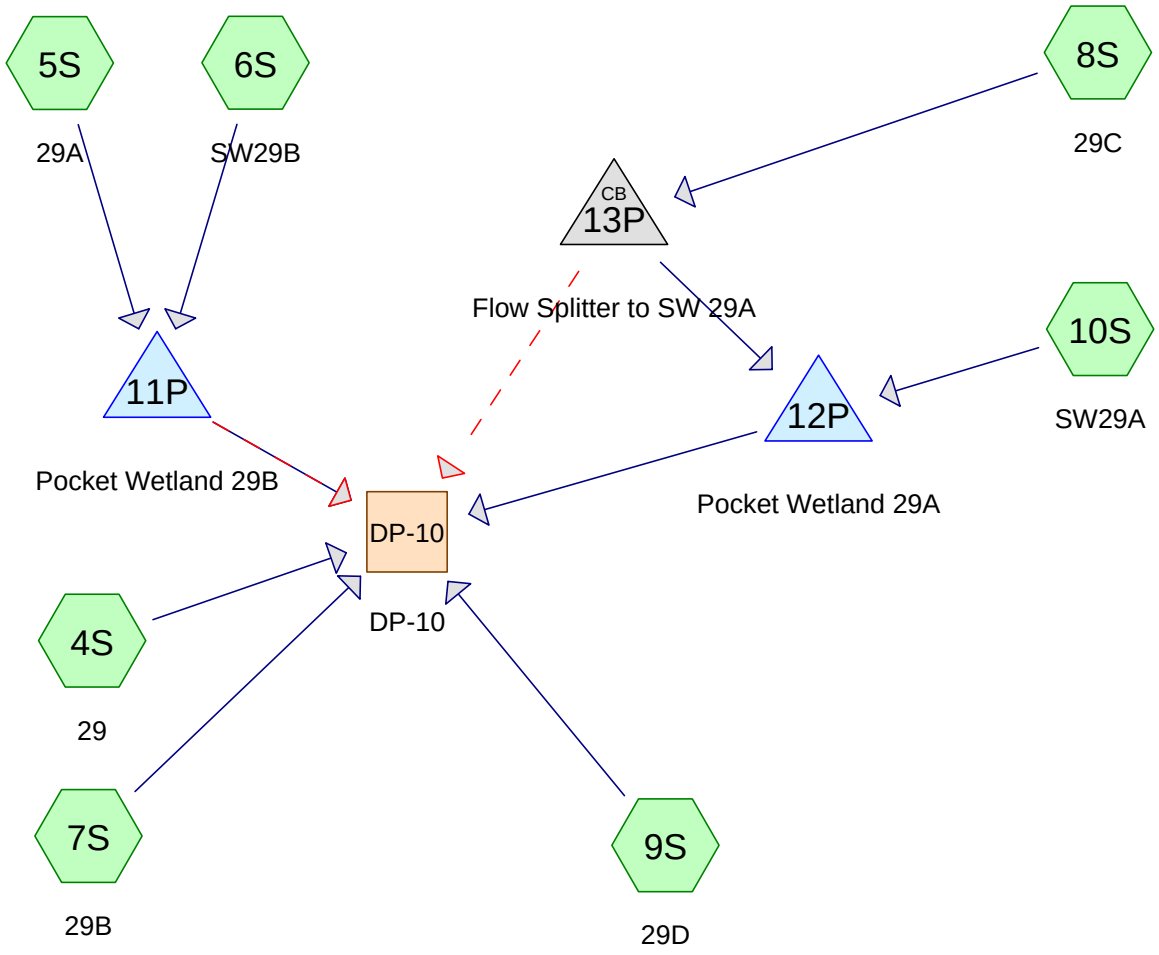

Subcat Reach Pond Link

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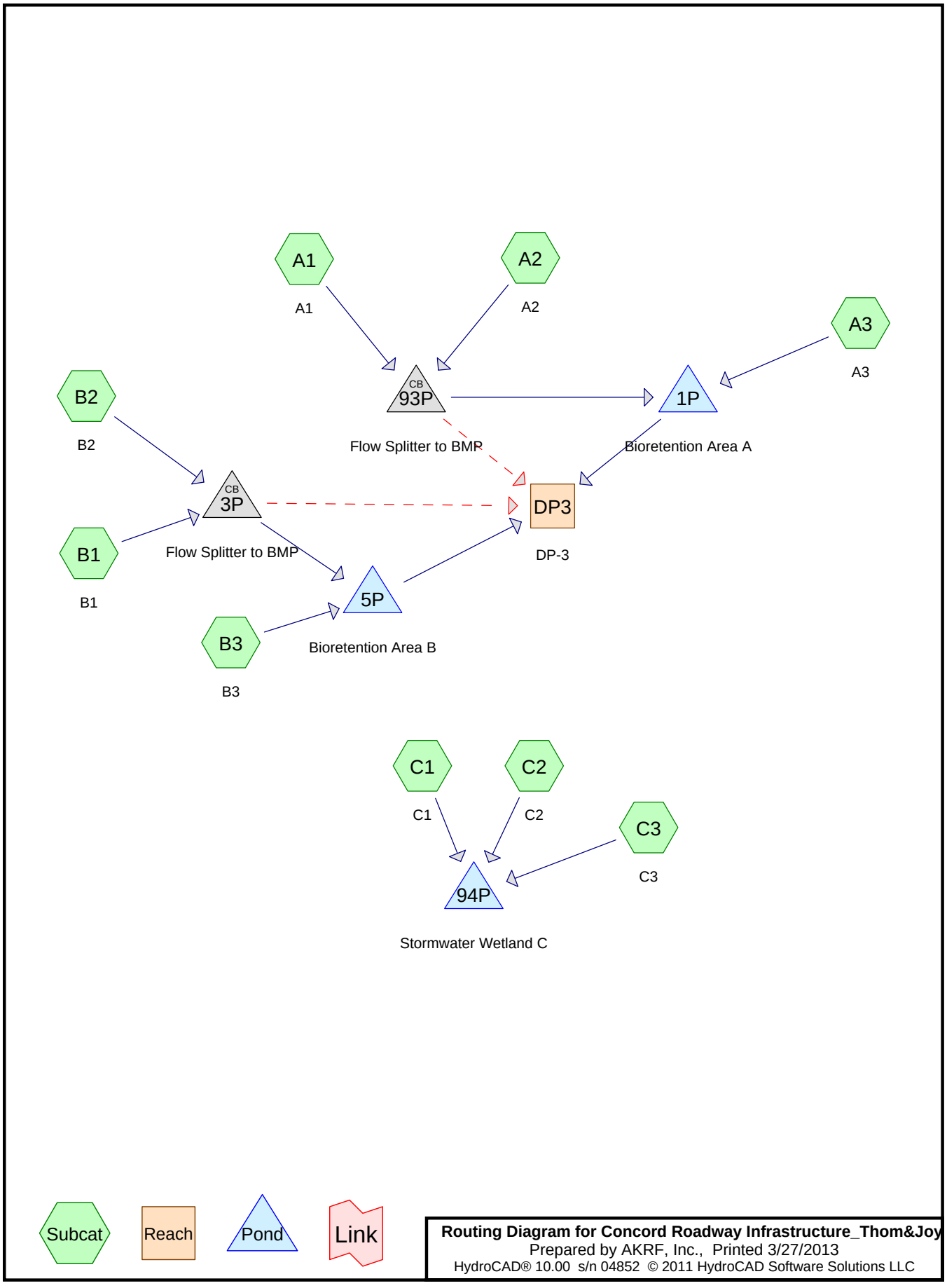

Routing Diagram for Concord Roadway Infrastructure_Thom&Joy
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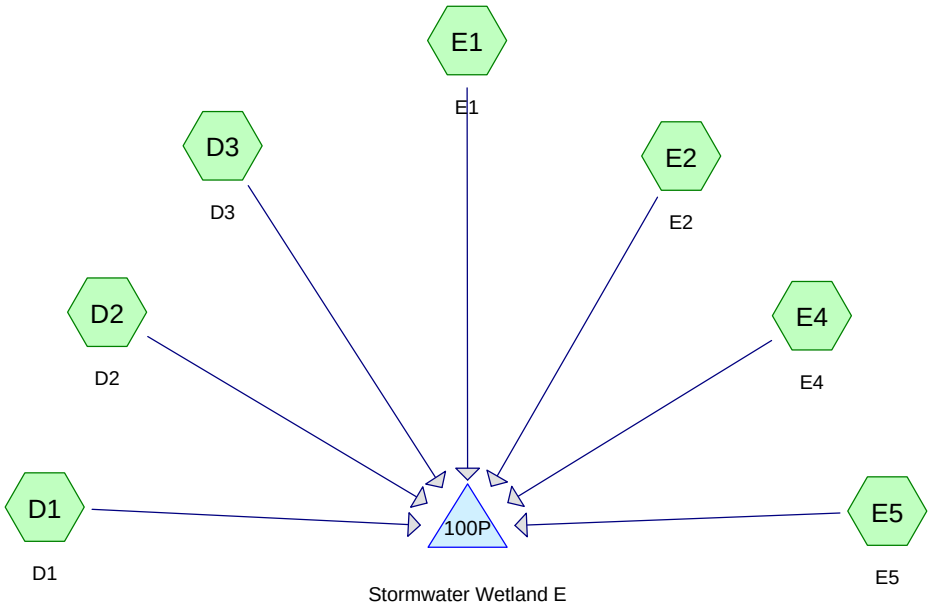

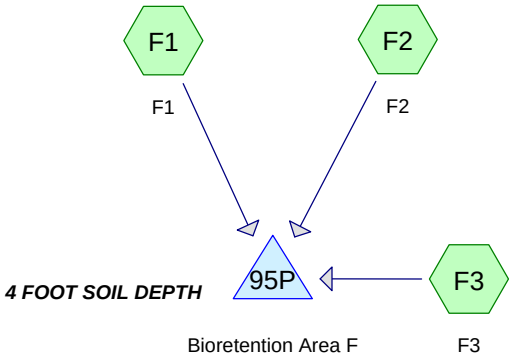

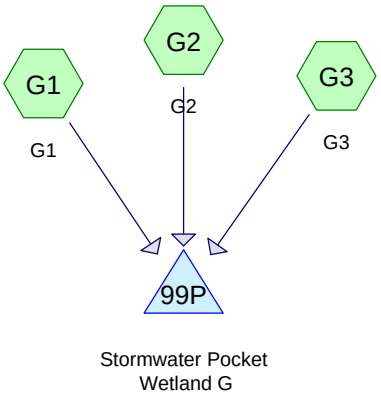

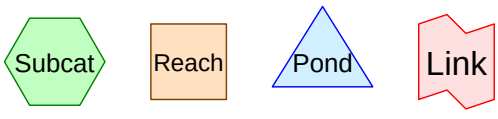

Routing Diagram for Concord Roadway Infrastructure_Thom&Joy
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Area Listing (selected nodes)

Area (acres)	CN	Description (subcatchment-numbers)
2.637	70	Woods, Good, HSG C (3S, 4S, 7S, 9S)
0.003	71	Meadow, non-grazed, HSG C (5S)
7.886	74	>75% Grass cover, Good, HSG C (1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 10S, A1, A2, A3, B1, B2, B3, C1, C2, C3, D1, D2, D3, E1, E2, E4, E5, F1, F2, F3, G1, G2, G3)
0.184	80	>75% Grass cover, Good, HSG D (C1, C2, G1, G2)
0.098	89	Gravel roads, HSG C (A1, A2, A3, B3, D2, E2)
0.215	89	Porous Pavement (Gravel roads), HSG C (5S, 8S)
0.101	89	Porous Pavement Walkway (Gravel roads), HSG C (1S)
0.105	98	Paved parking, HSG C (4S, 5S)
3.622	98	Paved roads w/curbs & sewers, HSG C (1S, 3S, 5S, 8S, A1, A2, B1, B2, C1, C2, D1, D2, E1, E2, E4, F1, F2, G1, G2)
0.228	98	Paved roads w/curbs & sewers, HSG D (C1, C2, G1, G2)
0.122	98	Roofs, HSG C (4S)
0.002	98	Unconnected pavement, HSG C (5S)
0.182	98	Water Surface, HSG C (2S, 6S, 10S)
15.385	**80**	**TOTAL AREA**

Soil Listing (selected nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.000	HSG B	
14.973	HSG C	1S, 2S, 3S, 4S, 5S, 6S, 7S, 8S, 9S, 10S, A1, A2, A3, B1, B2, B3, C1, C2, C3, D1, D2, D3, E1, E2, E4, E5, F1, F2, F3, G1, G2, G3
0.412	HSG D	C1, C2, G1, G2
0.000	Other	
15.385		**TOTAL AREA**

Ground Covers (selected nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subca Numb
0.000	0.000	7.886	0.184	0.000	8.070	>75% Grass cover, Good	
0.000	0.000	0.215	0.000	0.000	0.215	Porous Pavement (Gravel roads)	
0.000	0.000	0.101	0.000	0.000	0.101	Porous Pavement Walkway (Gravel roads)	
0.000	0.000	0.105	0.000	0.000	0.105	Paved parking	
0.000	0.000	0.002	0.000	0.000	0.002	Unconnected pavement	
0.000	0.000	0.122	0.000	0.000	0.122	Roofs	
0.000	0.000	3.622	0.228	0.000	3.850	Paved roads w/curbs & sewers	
0.000	0.000	0.098	0.000	0.000	0.098	Gravel roads	
0.000	0.000	0.003	0.000	0.000	0.003	Meadow, non-grazed	
0.000	0.000	2.637	0.000	0.000	2.637	Woods, Good	
0.000	0.000	0.182	0.000	0.000	0.182	Water Surface	
0.000	**0.000**	**14.973**	**0.412**	**0.000**	**15.385**	**TOTAL AREA**	

Pipe Listing (selected nodes)

Line#	Node Number	In-Invert (feet)	Out-Invert (feet)	Length (feet)	Slope (ft/ft)	n	Diam/Width (inches)	Height (inches)	Inside-Fill (inches)
1	1S	0.00	0.00	361.0	0.0224	0.013	18.0	0.0	0.0
2	4S	0.00	0.00	91.0	0.0055	0.013	24.0	0.0	0.0
3	5S	0.00	0.00	387.0	0.0238	0.013	24.0	0.0	0.0
4	8S	0.00	0.00	80.0	0.0100	0.013	15.0	0.0	0.0
5	A1	0.00	0.00	35.0	0.0145	0.013	12.0	0.0	0.0
6	A2	0.00	0.00	22.0	0.0577	0.013	15.0	0.0	0.0
7	B1	0.00	0.00	35.0	0.0145	0.013	12.0	0.0	0.0
8	B2	0.00	0.00	26.0	0.0338	0.013	12.0	0.0	0.0
9	C1	0.00	0.00	36.0	0.0118	0.013	12.0	0.0	0.0
10	D1	0.00	0.00	30.0	0.0118	0.013	12.0	0.0	0.0
11	E1	0.00	0.00	31.0	0.0128	0.013	12.0	0.0	0.0
12	F1	0.00	0.00	32.0	0.0078	0.013	15.0	0.0	0.0
13	G1	0.00	0.00	33.0	0.0920	0.013	12.0	0.0	0.0
14	1P	1,360.50	1,360.00	20.9	0.0239	0.013	12.0	0.0	0.0
15	3P	1,349.49	1,348.85	18.9	0.0339	0.013	12.0	0.0	0.0
16	3P	1,349.49	1,348.00	119.4	0.0125	0.013	15.0	0.0	0.0
17	4P	1,434.00	1,432.00	20.0	0.1000	0.013	15.0	0.0	0.0
18	5P	1,348.10	1,348.00	19.0	0.0053	0.013	12.0	0.0	0.0
19	13P	1,443.30	1,443.00	41.2	0.0073	0.013	15.0	0.0	0.0
20	13P	1,443.30	1,443.00	46.0	0.0065	0.013	15.0	0.0	0.0
21	93P	1,367.76	1,366.50	21.8	0.0578	0.013	15.0	0.0	0.0
22	93P	1,367.76	1,363.37	93.7	0.0469	0.013	15.0	0.0	0.0
23	95P	1,345.00	1,344.20	78.0	0.0103	0.013	15.0	0.0	0.0
24	100P	1,346.20	1,346.00	50.0	0.0040	0.013	6.0	0.0	0.0

Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 1S: 30 Runoff Area=0.901 ac 52.39% Impervious Runoff Depth=1.47"
Flow Length=585' Tc=2.3 min CN=88 Runoff=1.77 cfs 0.110 af

Subcatchment 2S: SW30 Runoff Area=0.247 ac 34.82% Impervious Runoff Depth=1.07"
Tc=0.0 min CN=82 Runoff=0.37 cfs 0.022 af

Subcatchment 3S: 30A Runoff Area=0.277 ac 13.00% Impervious Runoff Depth=0.71"
Flow Length=197' Tc=24.8 min CN=75 Runoff=0.13 cfs 0.016 af

Subcatchment 4S: 29 Runoff Area=3.109 ac 7.14% Impervious Runoff Depth=0.71"
Flow Length=636' Tc=20.5 min CN=75 Runoff=1.56 cfs 0.184 af

Subcatchment 5S: 29A Runoff Area=1.558 ac 53.02% Impervious Runoff Depth=1.47"
Flow Length=600' Tc=2.3 min CN=88 Runoff=3.07 cfs 0.191 af

Subcatchment 6S: SW29B Runoff Area=0.230 ac 38.26% Impervious Runoff Depth=1.13"
Tc=0.0 min CN=83 Runoff=0.37 cfs 0.022 af

Subcatchment 7S: 29B Runoff Area=2.391 ac 0.00% Impervious Runoff Depth=0.58"
Flow Length=423' Tc=24.5 min CN=72 Runoff=0.86 cfs 0.116 af

Subcatchment 8S: 29C Runoff Area=0.369 ac 50.68% Impervious Runoff Depth=1.47"
Flow Length=271' Tc=1.8 min CN=88 Runoff=0.74 cfs 0.045 af

Subcatchment 9S: 29D Runoff Area=0.798 ac 0.00% Impervious Runoff Depth=0.50"
Flow Length=264' Tc=36.1 min CN=70 Runoff=0.20 cfs 0.034 af

Subcatchment 10S: SW29A Runoff Area=0.079 ac 10.13% Impervious Runoff Depth=0.76"
Tc=0.0 min CN=76 Runoff=0.08 cfs 0.005 af

Subcatchment A1: A1 Runoff Area=0.734 ac 36.10% Impervious Runoff Depth=1.13"
Flow Length=790' Tc=1.7 min CN=83 Runoff=1.13 cfs 0.069 af

Subcatchment A2: A2 Runoff Area=0.505 ac 55.84% Impervious Runoff Depth=1.47"
Flow Length=780' Tc=1.8 min CN=88 Runoff=1.01 cfs 0.062 af

Subcatchment A3: A3 Runoff Area=0.096 ac 0.00% Impervious Runoff Depth=0.76"
Tc=0.0 min CN=76 Runoff=0.10 cfs 0.006 af

Subcatchment B1: B1 Runoff Area=0.238 ac 36.97% Impervious Runoff Depth=1.13"
Flow Length=324' Tc=1.0 min CN=83 Runoff=0.37 cfs 0.022 af

Subcatchment B2: B2 Runoff Area=0.169 ac 60.36% Impervious Runoff Depth=1.47"
Flow Length=389' Tc=1.1 min CN=88 Runoff=0.35 cfs 0.021 af

Subcatchment B3: B3 Runoff Area=0.062 ac 0.00% Impervious Runoff Depth=0.76"
Tc=0.0 min CN=76 Runoff=0.06 cfs 0.004 af

Subcatchment C1: C1 Runoff Area=0.415 ac 53.98% Impervious Runoff Depth=1.47"
Flow Length=584' Tc=2.1 min CN=88 Runoff=0.82 cfs 0.051 af

Subcatchment C2: C2 Runoff Area=0.439 ac 58.31% Impervious Runoff Depth=1.54"
Flow Length=548' Tc=1.9 min CN=89 Runoff=0.92 cfs 0.056 af

Subcatchment C3: C3 Runoff Area=0.105 ac 0.00% Impervious Runoff Depth=0.67"
Tc=0.0 min CN=74 Runoff=0.09 cfs 0.006 af

Subcatchment D1: D1 Runoff Area=0.371 ac 38.54% Impervious Runoff Depth=1.13"
Flow Length=293' Tc=1.6 min CN=83 Runoff=0.57 cfs 0.035 af

Subcatchment D2: D2 Runoff Area=0.321 ac 51.09% Impervious Runoff Depth=1.40"
Flow Length=449' Tc=1.9 min CN=87 Runoff=0.61 cfs 0.037 af

Subcatchment D3: D3 Runoff Area=0.086 ac 0.00% Impervious Runoff Depth=0.67"
Tc=0.0 min CN=74 Runoff=0.07 cfs 0.005 af

Subcatchment E1: E1 Runoff Area=0.264 ac 45.08% Impervious Runoff Depth=1.26"
Flow Length=335' Tc=1.8 min CN=85 Runoff=0.45 cfs 0.028 af

Subcatchment E2: E2 Runoff Area=0.221 ac 43.44% Impervious Runoff Depth=1.40"
Flow Length=246' Tc=1.3 min CN=87 Runoff=0.43 cfs 0.026 af

Subcatchment E4: E4 Runoff Area=0.081 ac 56.79% Impervious Runoff Depth=1.47"
Flow Length=225' Tc=1.3 min CN=88 Runoff=0.17 cfs 0.010 af

Subcatchment E5: E5 Runoff Area=0.078 ac 0.00% Impervious Runoff Depth=0.67"
Tc=0.0 min CN=74 Runoff=0.07 cfs 0.004 af

Subcatchment F1: F1 Runoff Area=0.291 ac 39.18% Impervious Runoff Depth=1.13"
Flow Length=268' Tc=1.5 min CN=83 Runoff=0.45 cfs 0.027 af

Subcatchment F2: F2 Runoff Area=0.230 ac 60.00% Impervious Runoff Depth=1.47"
Flow Length=184' Tc=1.3 min CN=88 Runoff=0.47 cfs 0.028 af

Subcatchment F3: F3 Runoff Area=0.043 ac 0.00% Impervious Runoff Depth=0.67"
Tc=0.0 min CN=74 Runoff=0.04 cfs 0.002 af

Subcatchment G1: G1 Runoff Area=0.320 ac 44.69% Impervious Runoff Depth=1.33"
Flow Length=454' Tc=1.3 min CN=86 Runoff=0.59 cfs 0.035 af

Subcatchment G2: G2 Runoff Area=0.274 ac 56.93% Impervious Runoff Depth=1.54"
Flow Length=409' Tc=1.2 min CN=89 Runoff=0.59 cfs 0.035 af

Subcatchment G3: G3 Runoff Area=0.083 ac 0.00% Impervious Runoff Depth=0.67"
Tc=0.0 min CN=74 Runoff=0.07 cfs 0.005 af

Reach DP-10: DP-10 Inflow=3.48 cfs 0.592 af
Outflow=3.48 cfs 0.592 af

Reach DP-11: DP-11 Inflow=0.15 cfs 0.147 af
Outflow=0.15 cfs 0.147 af

Reach DP3: DP-3 Inflow=1.35 cfs 0.096 af
Outflow=1.35 cfs 0.096 af

Pond 1P: Bioretention Area A Peak Elev=1,366.03' Storage=3,750 cf Inflow=1.58 cfs 0.132 af
Outflow=0.13 cfs 0.055 af

Pond 3P: Flow Splitter to BMP Peak Elev=1,350.00' Inflow=0.72 cfs 0.043 af
Primary=0.30 cfs 0.009 af Secondary=0.72 cfs 0.035 af Outflow=0.72 cfs 0.043 af

Pond 4P: Pocket Wetland 30 Peak Elev=1,437.89' Storage=8,969 cf Inflow=2.09 cfs 0.132 af
Primary=0.09 cfs 0.130 af Secondary=0.00 cfs 0.000 af Outflow=0.09 cfs 0.130 af

Pond 5P: Bioretention Area B Peak Elev=1,350.56' Storage=539 cf Inflow=0.33 cfs 0.012 af
Outflow=0.00 cfs 0.001 af

Pond 11P: Pocket Wetland 29B Peak Elev=1,442.86' Storage=9,075 cf Inflow=3.38 cfs 0.212 af
Primary=0.73 cfs 0.209 af Secondary=0.00 cfs 0.000 af Outflow=0.73 cfs 0.209 af

Pond 12P: Pocket Wetland 29A Peak Elev=1,443.60' Storage=1,700 cf Inflow=0.81 cfs 0.050 af
Outflow=0.74 cfs 0.050 af

Pond 13P: Flow Splitter to SW 29A Peak Elev=1,443.84' Inflow=0.74 cfs 0.045 af
Primary=0.74 cfs 0.045 af Secondary=0.00 cfs 0.000 af Outflow=0.74 cfs 0.045 af

Pond 93P: Flow Splitter to BMP Peak Elev=1,368.44' Inflow=2.14 cfs 0.131 af
Primary=1.49 cfs 0.126 af Secondary=0.64 cfs 0.005 af Outflow=2.14 cfs 0.131 af

Pond 94P: Stormwater Wetland C Peak Elev=1,348.22' Storage=4,429 cf Inflow=1.82 cfs 0.113 af
Primary=0.31 cfs 0.110 af Secondary=0.07 cfs 0.001 af Outflow=0.38 cfs 0.111 af

Pond 95P: Bioretention Area F Peak Elev=1,349.51' Storage=1,651 cf Inflow=0.95 cfs 0.058 af
Outflow=0.06 cfs 0.033 af

Pond 99P: Stormwater Pocket Wetland G Peak Elev=1,339.11' Storage=5,559 cf Inflow=1.24 cfs 0.075 af
Outflow=0.89 cfs 0.075 af

Pond 100P: Stormwater Wetland E Peak Elev=1,347.13' Storage=3,479 cf Inflow=2.35 cfs 0.145 af
Primary=0.52 cfs 0.123 af Secondary=1.07 cfs 0.022 af Outflow=1.59 cfs 0.145 af

Total Runoff Area = 15.385 ac Runoff Volume = 1.319 af Average Runoff Depth = 1.03"
72.30% Pervious = 11.124 ac 27.70% Impervious = 4.261 ac

Summary for Subcatchment 1S: 30

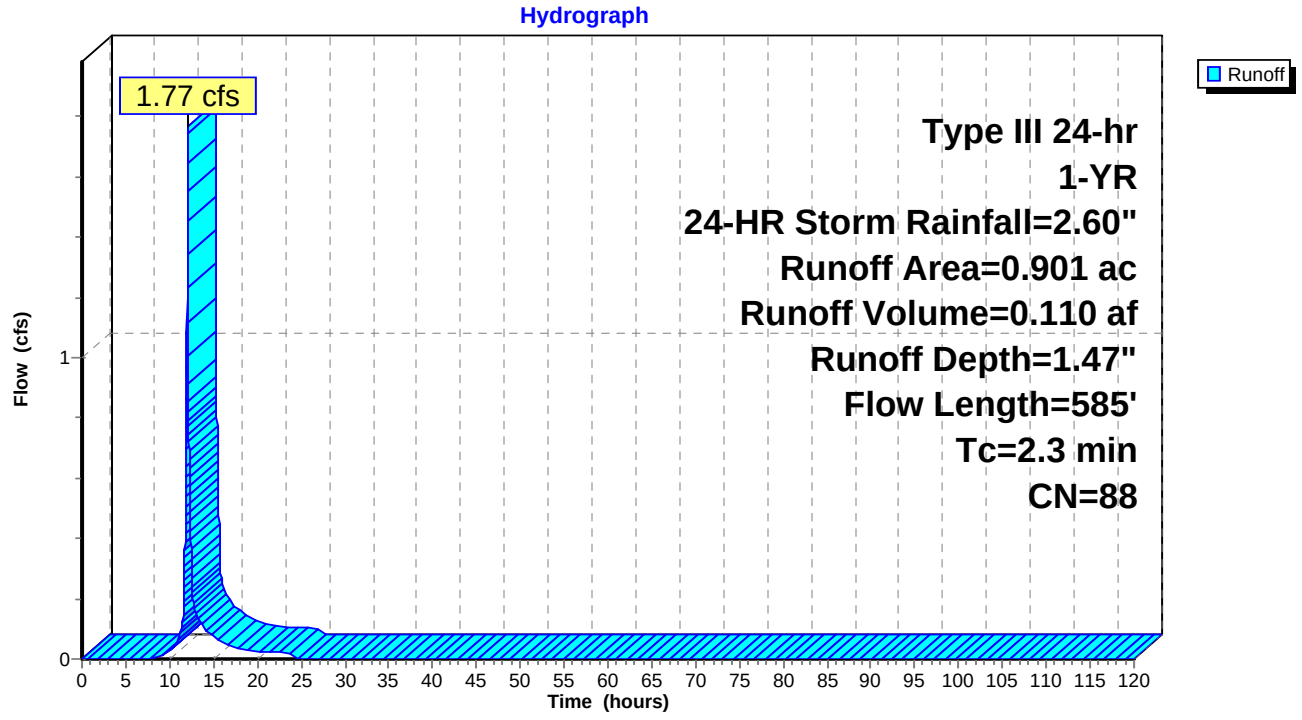
Runoff = 1.77 cfs @ 12.04 hrs, Volume= 0.110 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.328	74	>75% Grass cover, Good, HSG C
*	0.101	89	Porous Pavement Walkway (Gravel roads), HSG C
	0.472	98	Paved roads w/curbs & sewers, HSG C
	0.901	88	Weighted Average
	0.429		47.61% Pervious Area
	0.472		52.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	46	0.0200	1.27		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
1.0	178	0.0225	3.04		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.7	361	0.0224	8.90	15.72	**Pipe Channel, Storm Network** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.3	585	Total			

Subcatchment 1S: 30



Summary for Subcatchment 2S: SW30

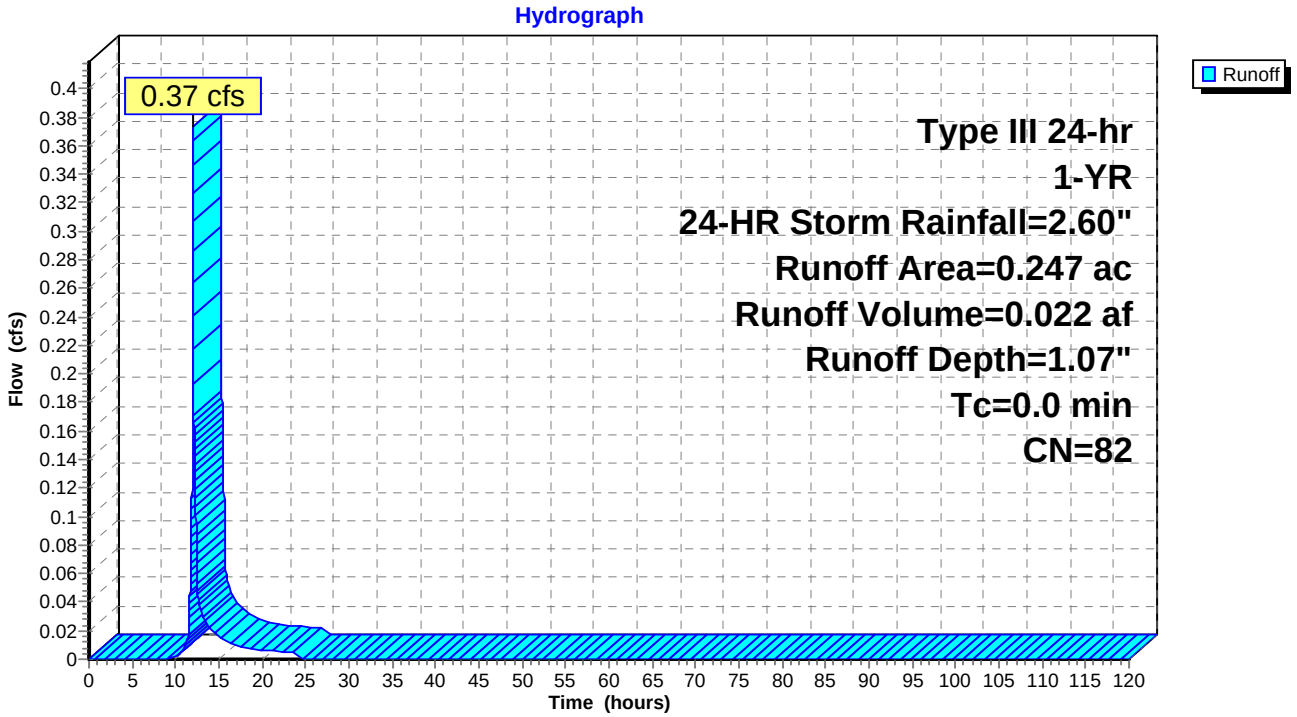
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.37 cfs @ 12.00 hrs, Volume= 0.022 af, Depth= 1.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.161	74	>75% Grass cover, Good, HSG C
0.086	98	Water Surface, HSG C
0.247	82	Weighted Average
0.161		65.18% Pervious Area
0.086		34.82% Impervious Area

Subcatchment 2S: SW30



Summary for Subcatchment 3S: 30A

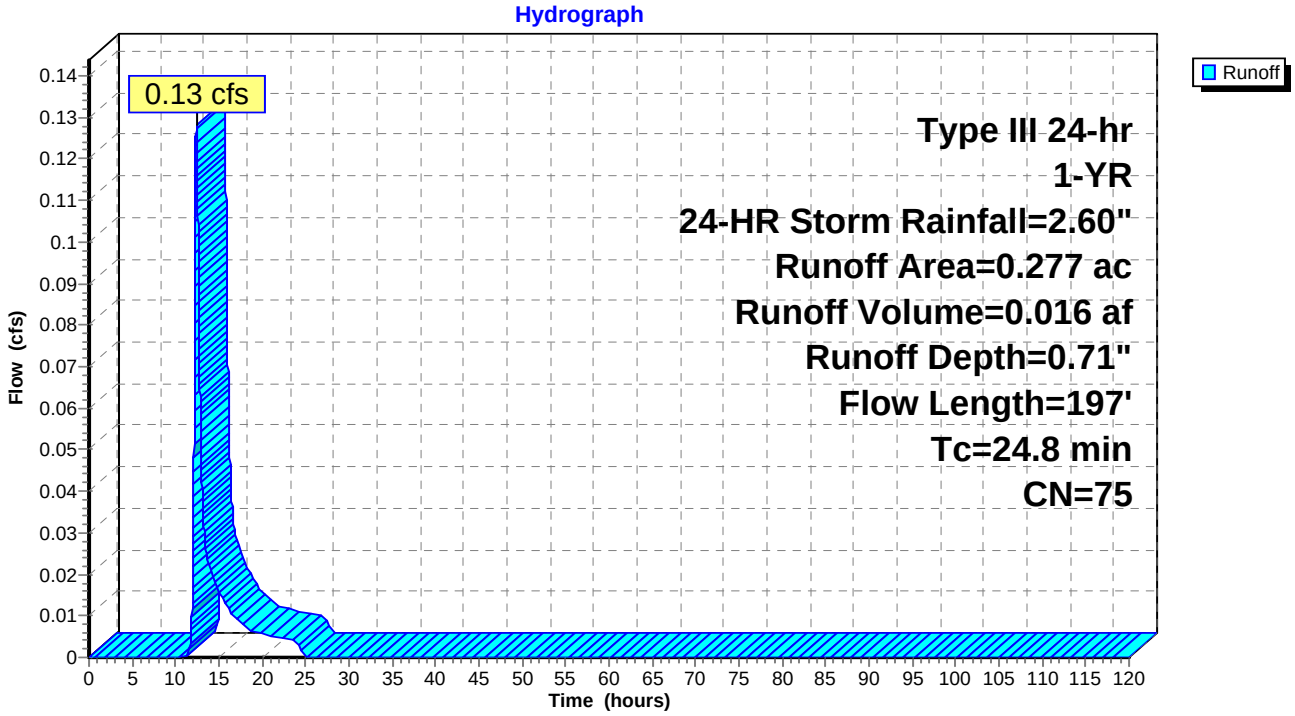
Runoff = 0.13 cfs @ 12.38 hrs, Volume= 0.016 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.097	74	>75% Grass cover, Good, HSG C
0.144	70	Woods, Good, HSG C
0.036	98	Paved roads w/curbs & sewers, HSG C
0.277	75	Weighted Average
0.241		87.00% Pervious Area
0.036		13.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	120	0.0170	0.08		**Sheet Flow, Overland** Woods: Light underbrush n= 0.400 P2= 3.75"
0.3	77	0.0250	5.13	18.45	**Channel Flow, Ditch** Area= 3.6 sf Perim= 6.8' r= 0.53' n= 0.030
24.8	197	Total			

Subcatchment 3S: 30A



Summary for Subcatchment 4S: 29

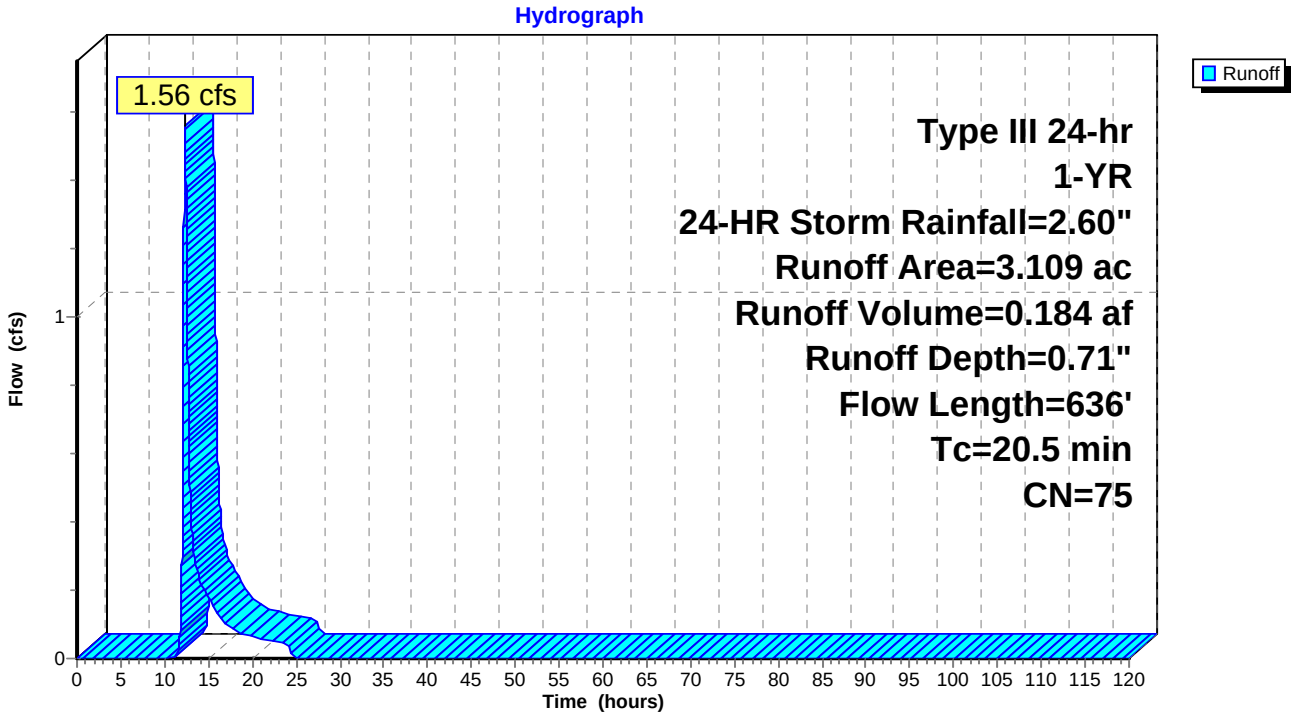
Runoff = 1.56 cfs @ 12.32 hrs, Volume= 0.184 af, Depth= 0.71"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.122	98	Roofs, HSG C
2.605	74	>75% Grass cover, Good, HSG C
0.100	98	Paved parking, HSG C
0.261	70	Woods, Good, HSG C
0.021	74	>75% Grass cover, Good, HSG C
3.109	75	Weighted Average
2.887		92.86% Pervious Area
0.222		7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	150	0.0133	0.17		**Sheet Flow, Overland** Grass: Short n= 0.150 P2= 3.75"
4.4	239	0.0167	0.90		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
1.1	156	0.0060	2.42	7.25	**Channel Flow, Roadside Ditch** Area= 3.0 sf Perim= 6.0' r= 0.50' n= 0.030
0.3	91	0.0055	5.34	16.78	**Pipe Channel, Proposed Roadside Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
20.5	636	Total			

Subcatchment 4S: 29



Summary for Subcatchment 5S: 29A

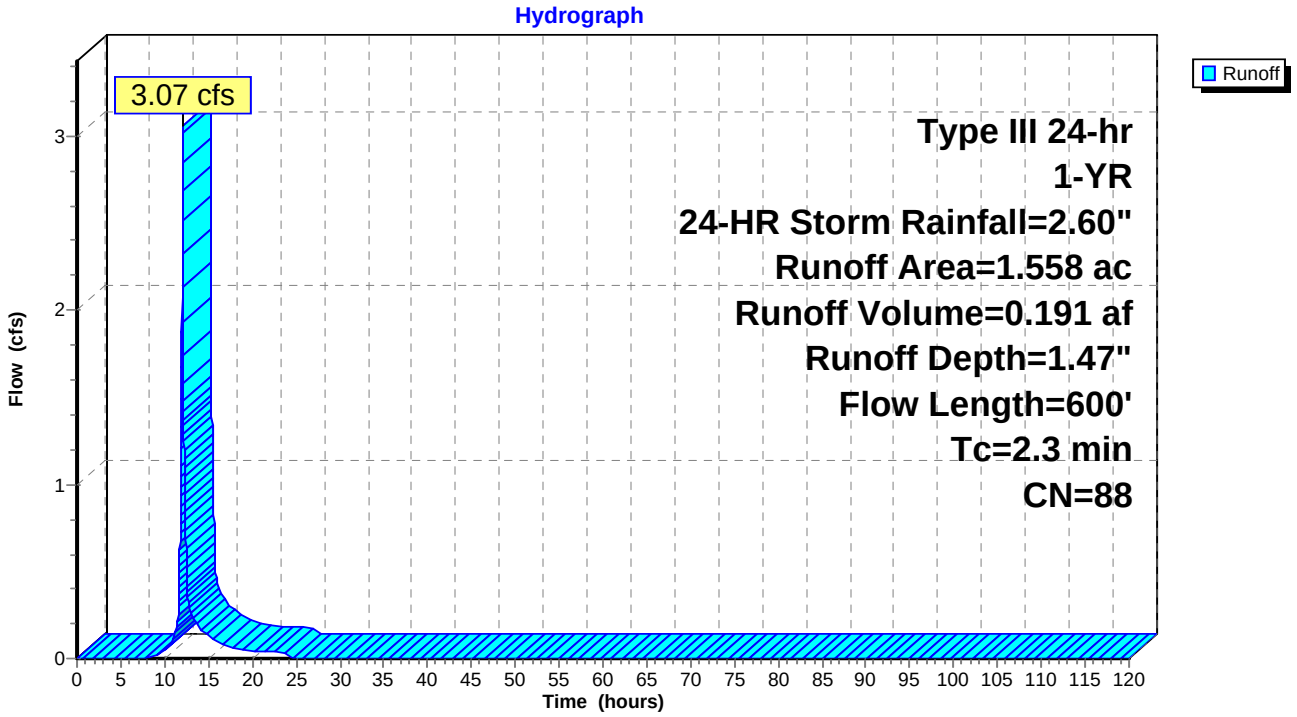
Runoff = 3.07 cfs @ 12.04 hrs, Volume= 0.191 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.005	98	Paved parking, HSG C
	0.003	71	Meadow, non-grazed, HSG C
	0.002	98	Unconnected pavement, HSG C
	0.560	74	>75% Grass cover, Good, HSG C
*	0.169	89	Porous Pavement (Gravel roads), HSG C
	0.819	98	Paved roads w/curbs & sewers, HSG C
	1.558	88	Weighted Average
	0.732		46.98% Pervious Area
	0.826		53.02% Impervious Area
	0.002		0.24% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	61	0.0200	1.35		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
0.9	152	0.0200	2.87		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.6	387	0.0238	11.11	34.90	**Pipe Channel, Storm Network** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
2.3	600	Total			

Subcatchment 5S: 29A



Summary for Subcatchment 6S: SW29B

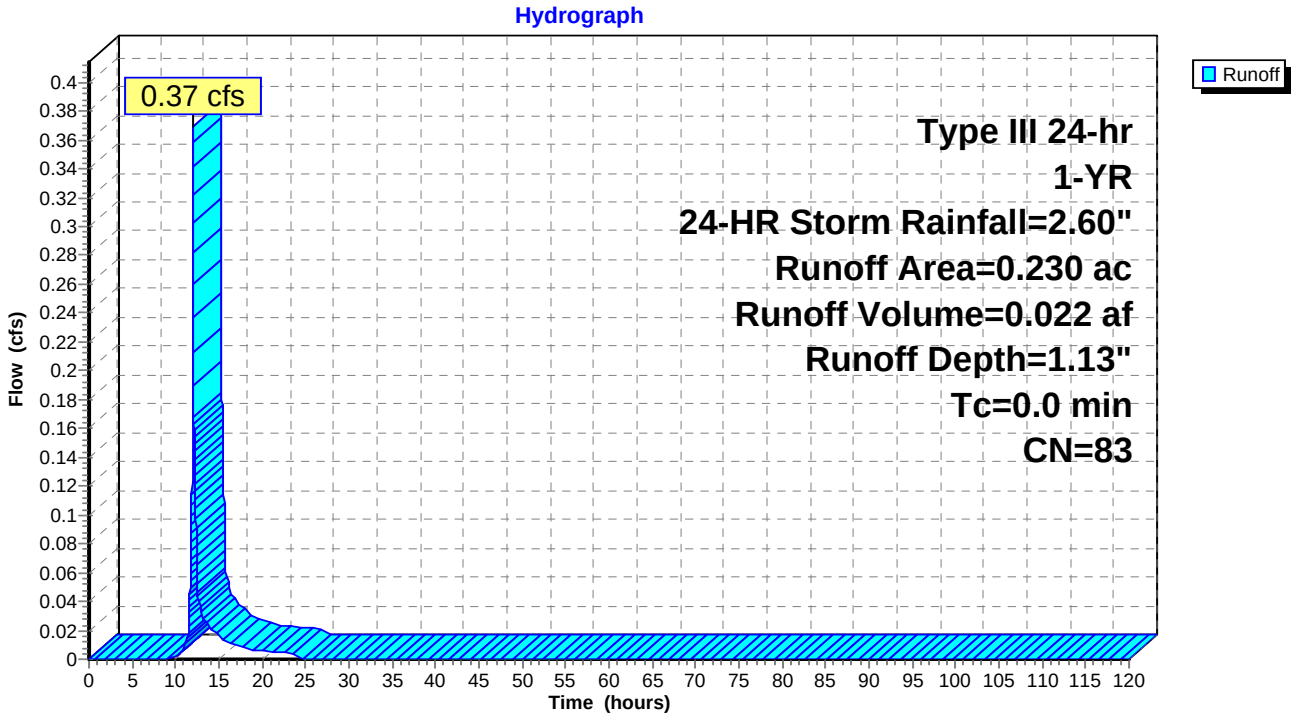
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.37 cfs @ 12.00 hrs, Volume= 0.022 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.088	98	Water Surface, HSG C
0.142	74	>75% Grass cover, Good, HSG C
0.230	83	Weighted Average
0.142		61.74% Pervious Area
0.088		38.26% Impervious Area

Subcatchment 6S: SW29B



Summary for Subcatchment 7S: 29B

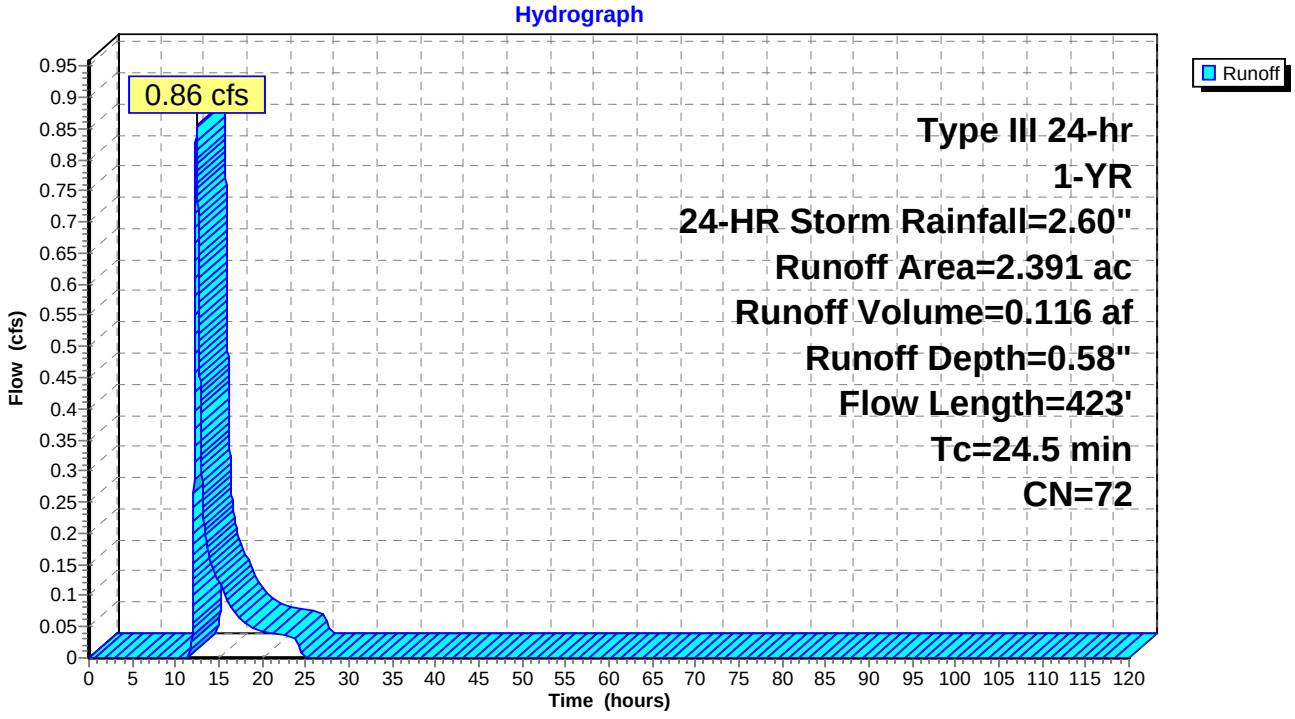
Runoff = 0.86 cfs @ 12.39 hrs, Volume= 0.116 af, Depth= 0.58"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.008	74	>75% Grass cover, Good, HSG C
0.949	74	>75% Grass cover, Good, HSG C
1.434	70	Woods, Good, HSG C
2.391	72	Weighted Average
2.391		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	150	0.0100	0.15		**Sheet Flow, Overland** Grass: Short n= 0.150 P2= 3.75"
8.0	273	0.0128	0.57		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
24.5	423	Total			

Subcatchment 7S: 29B



Summary for Subcatchment 8S: 29C

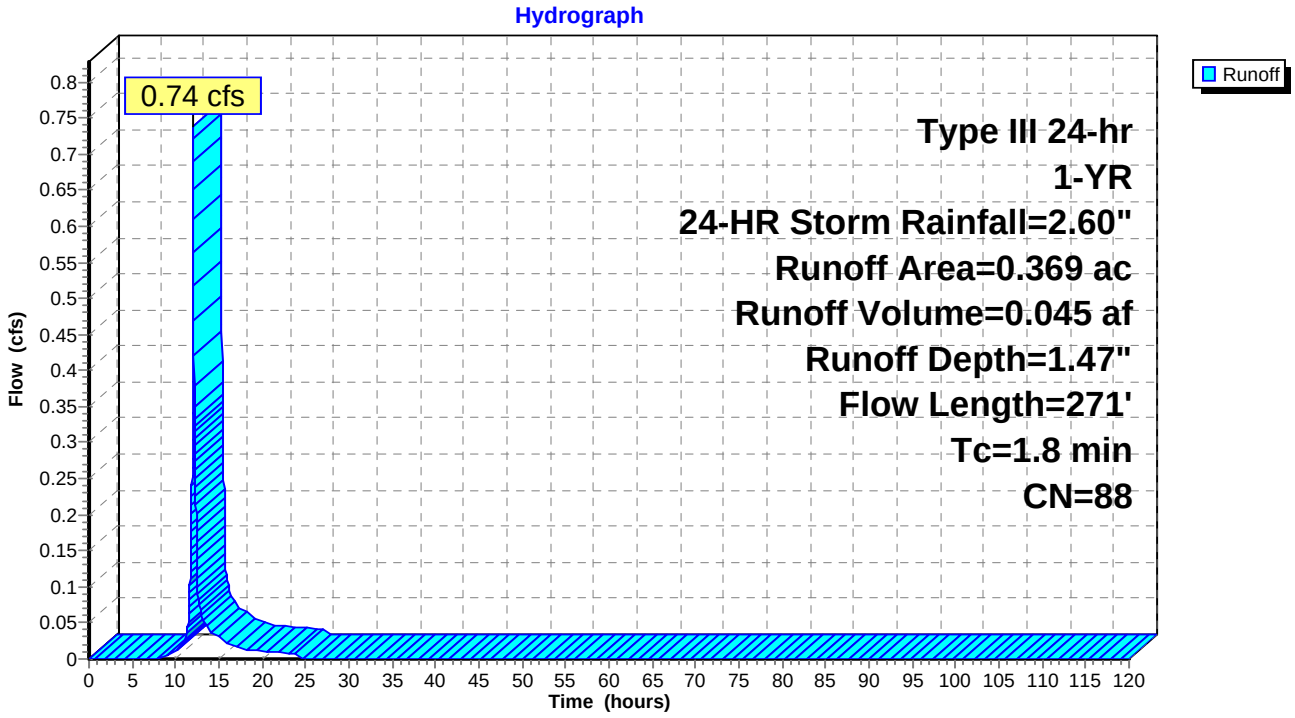
Runoff = 0.74 cfs @ 12.03 hrs, Volume= 0.045 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

	Area (ac)	CN	Description
	0.136	74	>75% Grass cover, Good, HSG C
*	0.046	89	Porous Pavement (Gravel roads), HSG C
	0.187	98	Paved roads w/curbs & sewers, HSG C
	0.369	88	Weighted Average
	0.182		49.32% Pervious Area
	0.187		50.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	64	0.0200	1.36		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
0.7	127	0.0200	2.87		**Shallow Concentrated Flow, Gutter** Paved Kv= 20.3 fps
0.3	80	0.0100	5.26	6.46	**Pipe Channel, Storm Network** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	271	Total			

Subcatchment 8S: 29C



Summary for Subcatchment 9S: 29D

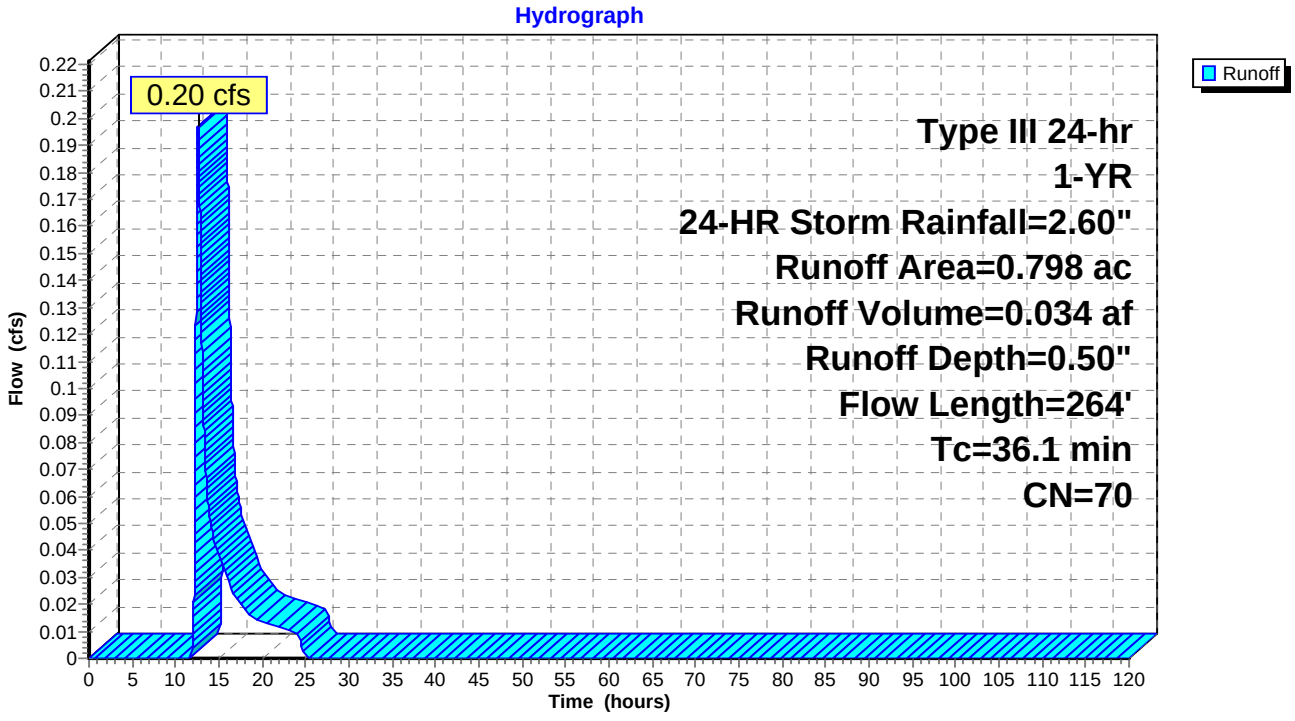
Runoff = 0.20 cfs @ 12.60 hrs, Volume= 0.034 af, Depth= 0.50"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.798	70	Woods, Good, HSG C
0.798		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.3	150	0.0133	0.08		**Sheet Flow, Overland** Woods: Light underbrush n= 0.400 P2= 3.75"
3.8	114	0.0100	0.50		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
36.1	264	Total			

Subcatchment 9S: 29D



Summary for Subcatchment 10S: SW29A

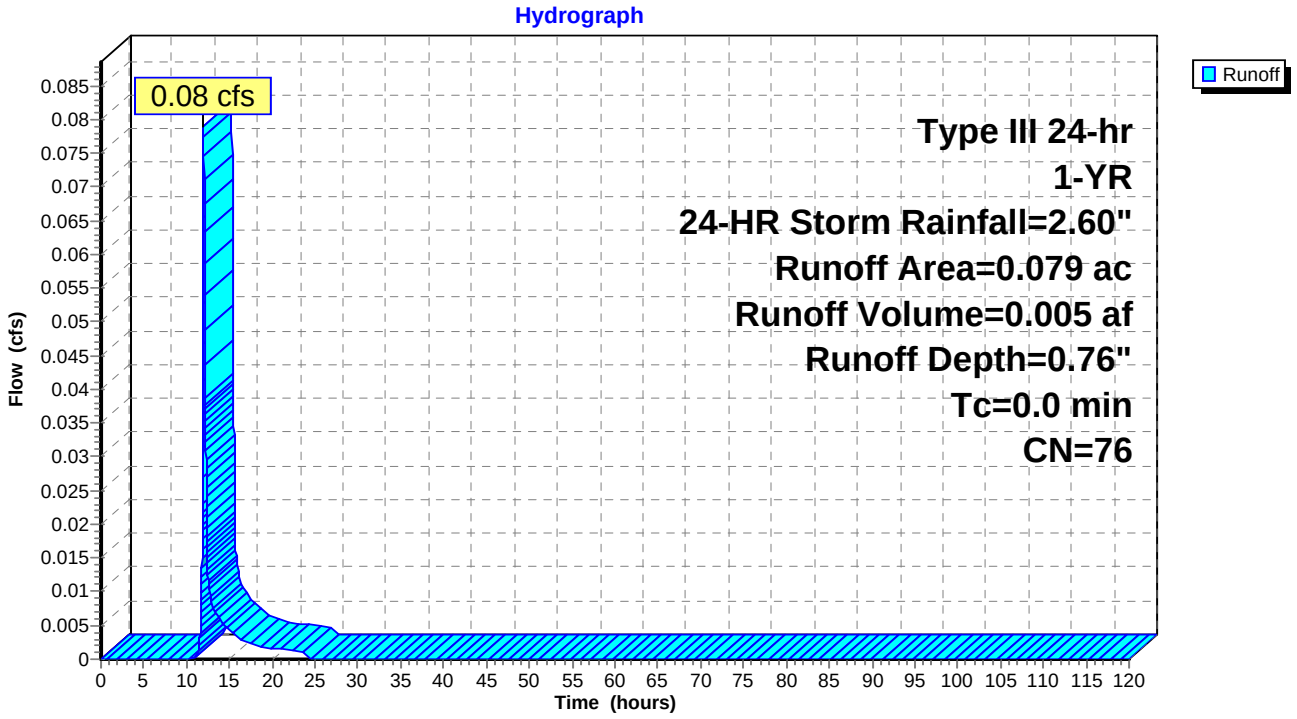
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.08 cfs @ 12.00 hrs, Volume= 0.005 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.008	98	Water Surface, HSG C
0.071	74	>75% Grass cover, Good, HSG C
0.079	76	Weighted Average
0.071		89.87% Pervious Area
0.008		10.13% Impervious Area

Subcatchment 10S: SW29A



Summary for Subcatchment A1: A1

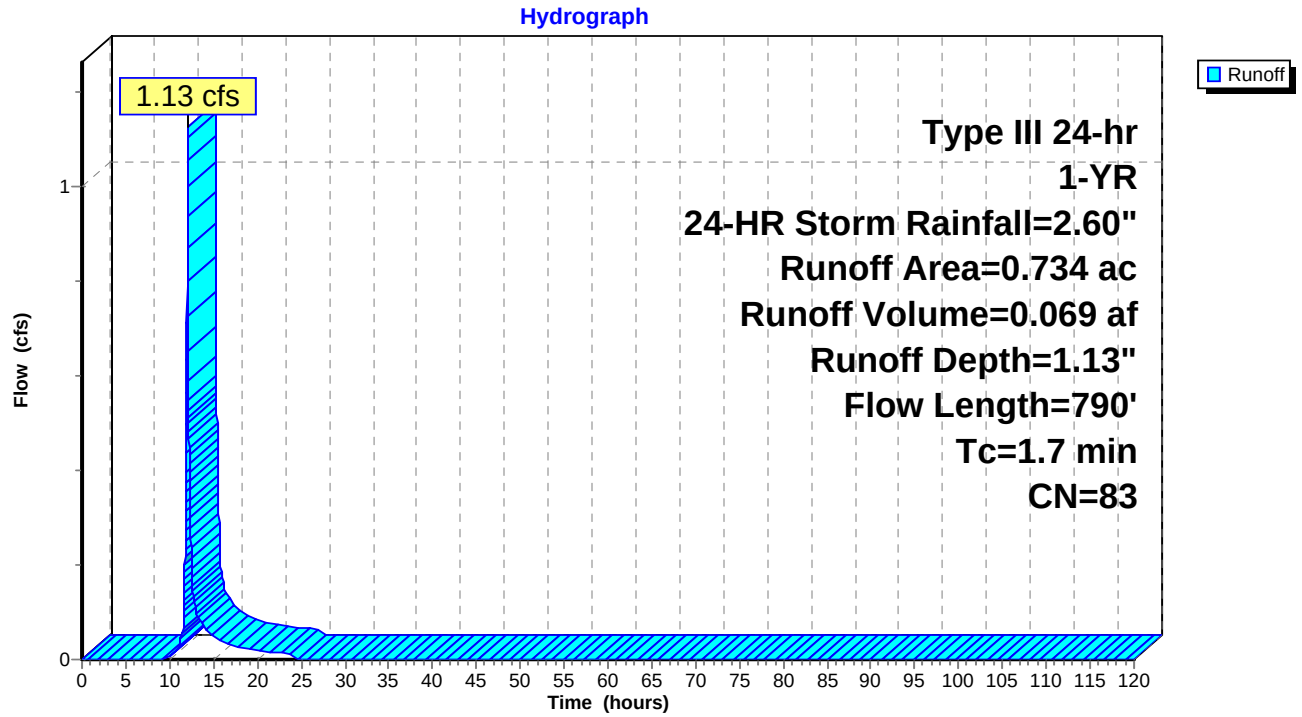
Runoff = 1.13 cfs @ 12.03 hrs, Volume= 0.069 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.004	74	>75% Grass cover, Good, HSG C
0.458	74	>75% Grass cover, Good, HSG C
0.007	89	Gravel roads, HSG C
0.265	98	Paved roads w/curbs & sewers, HSG C
0.734	83	Weighted Average
0.469		63.90% Pervious Area
0.265		36.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	81	0.0200	1.43		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	674	0.0846	15.82	193.04	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	35	0.0145	5.46	4.29	**Pipe Channel, Culvert Crossing** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.7	790	Total			

Subcatchment A1: A1



Summary for Subcatchment A2: A2

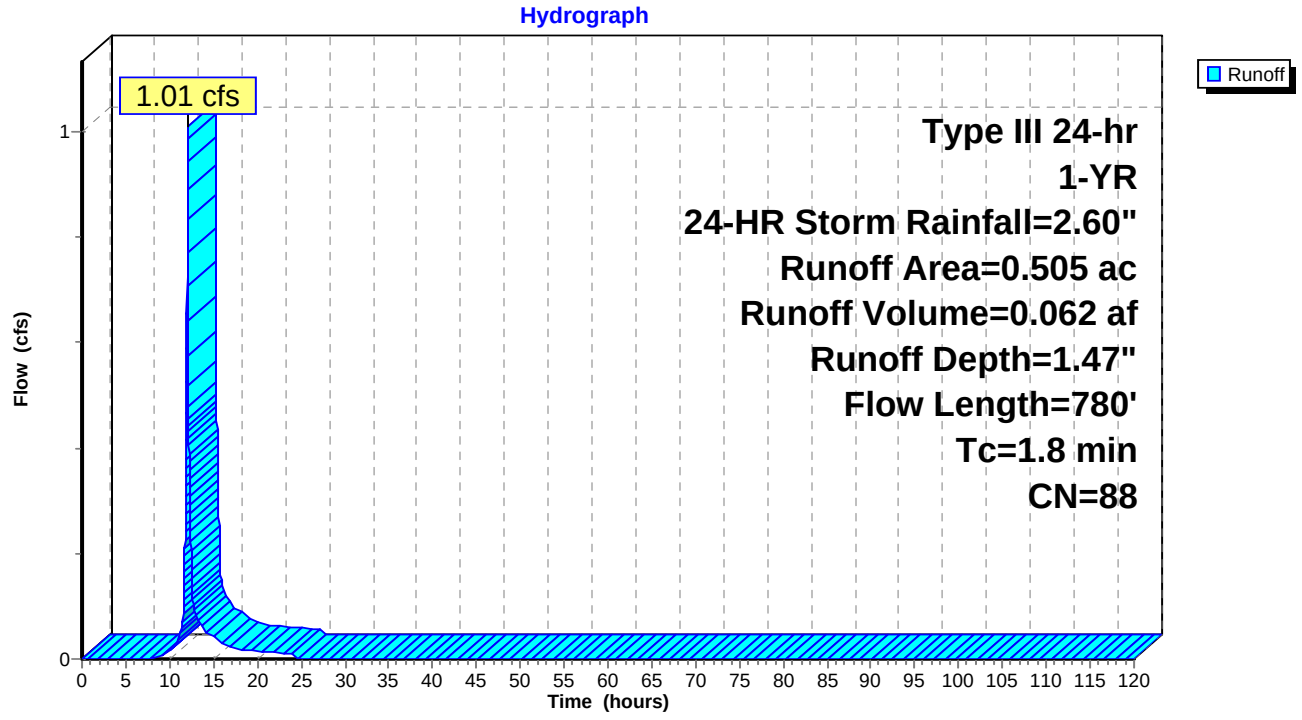
Runoff = 1.01 cfs @ 12.03 hrs, Volume= 0.062 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.200	74	>75% Grass cover, Good, HSG C
0.023	89	Gravel roads, HSG C
0.282	98	Paved roads w/curbs & sewers, HSG C
0.505	88	Weighted Average
0.223		44.16% Pervious Area
0.282		55.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	658	0.0836	15.73	191.89	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.0	22	0.0577	12.64	15.52	**Pipe Channel, Pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	780	Total			

Subcatchment A2: A2



Summary for Subcatchment A3: A3

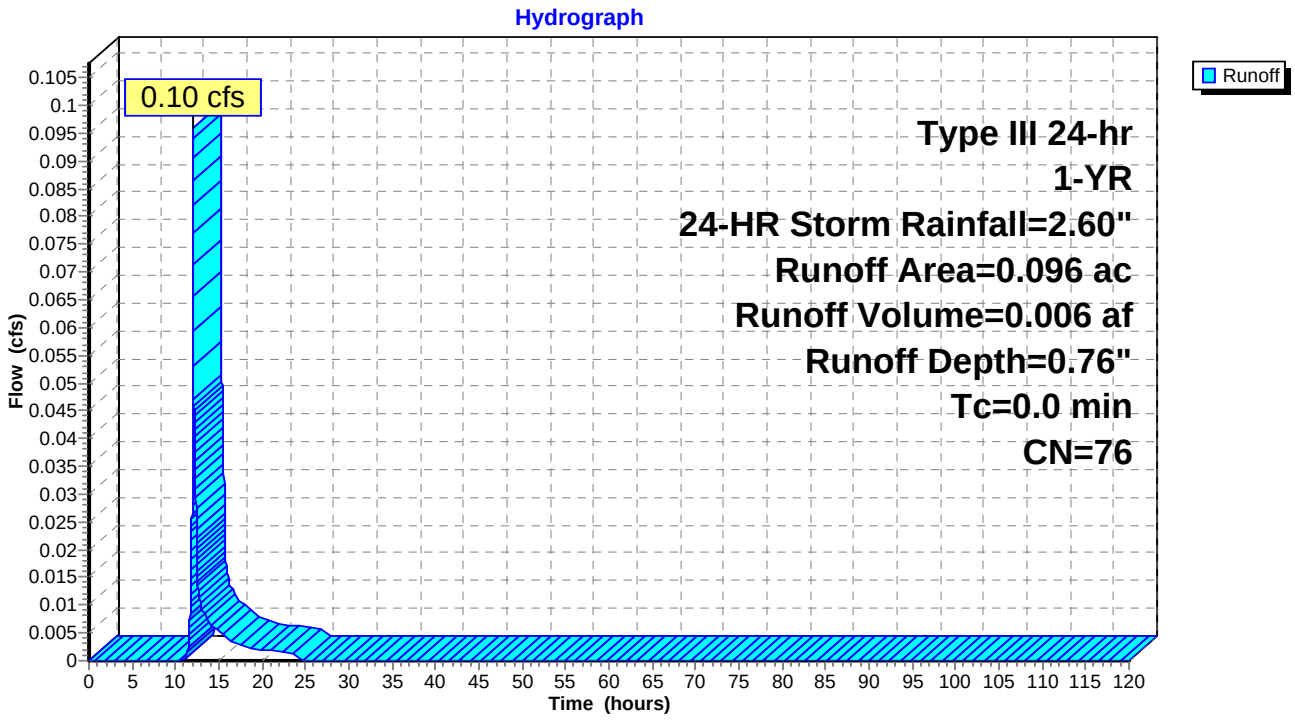
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.10 cfs @ 12.00 hrs, Volume= 0.006 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.085	74	>75% Grass cover, Good, HSG C
0.011	89	Gravel roads, HSG C
0.096	76	Weighted Average
0.096		100.00% Pervious Area

Subcatchment A3: A3



Summary for Subcatchment B1: B1

[49] Hint: Tc<2dt may require smaller dt

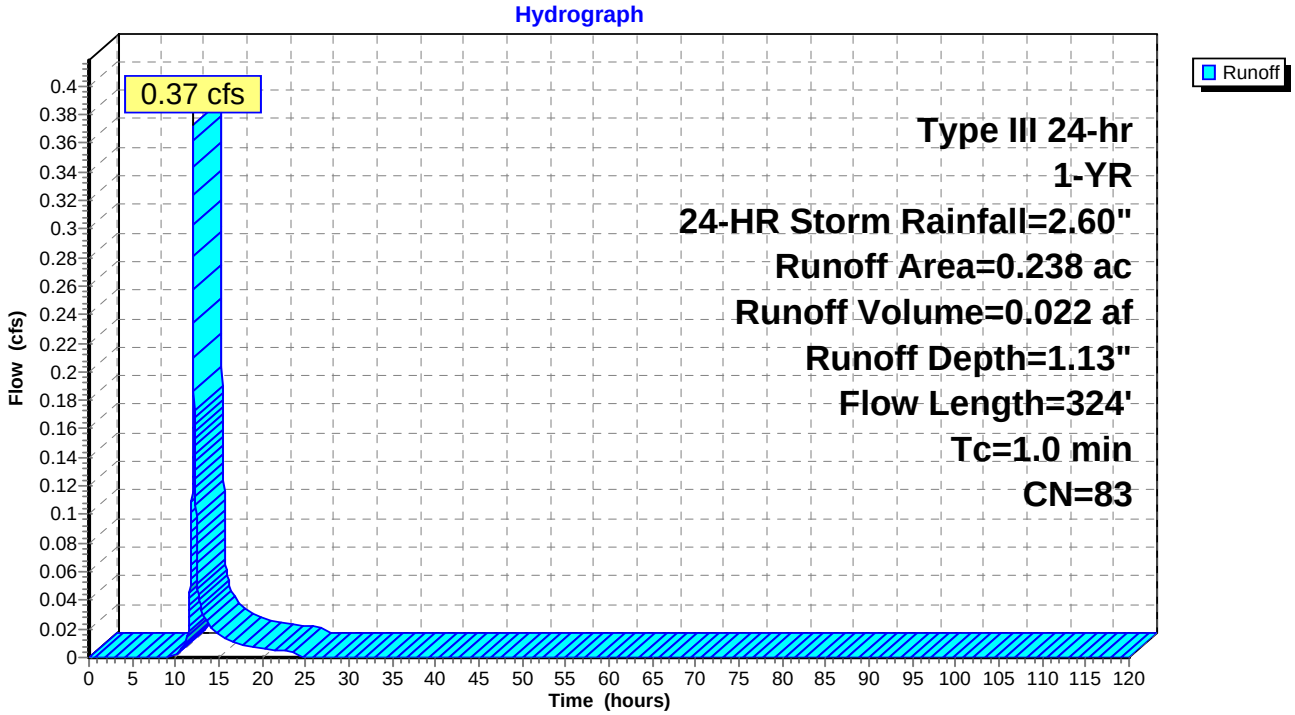
Runoff = 0.37 cfs @ 12.02 hrs, Volume= 0.022 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.150	74	>75% Grass cover, Good, HSG C
0.088	98	Paved roads w/curbs & sewers, HSG C
0.238	83	Weighted Average
0.150		63.03% Pervious Area
0.088		36.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0800	2.59		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	189	0.0476	11.87	144.80	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	35	0.0145	5.46	4.29	**Pipe Channel, Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.0	324	Total			

Subcatchment B1: B1



Summary for Subcatchment B2: B2

[49] Hint: Tc<2dt may require smaller dt

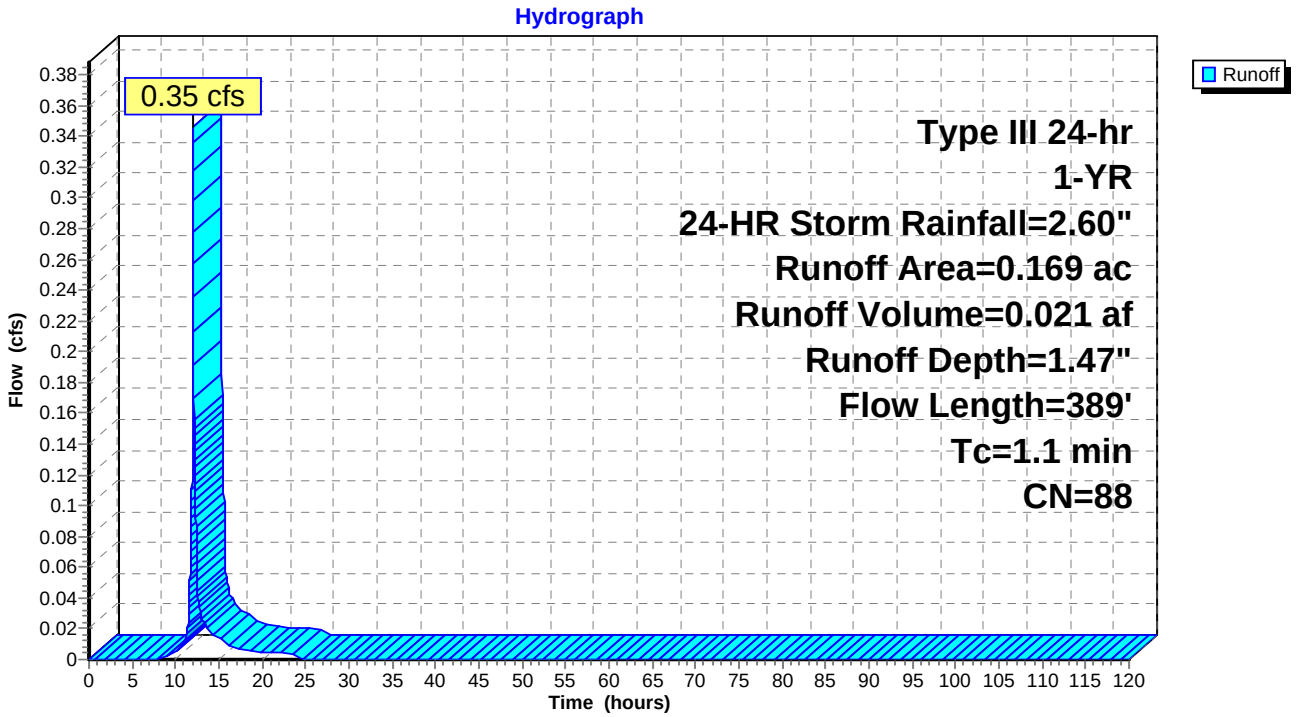
Runoff = 0.35 cfs @ 12.02 hrs, Volume= 0.021 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.067	74	>75% Grass cover, Good, HSG C
0.102	98	Paved roads w/curbs & sewers, HSG C
0.169	88	Weighted Average
0.067		39.64% Pervious Area
0.102		60.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0830	2.63		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.4	263	0.0380	10.60	129.38	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	26	0.0338	8.34	6.55	**Pipe Channel, Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.1	389	Total			

Subcatchment B2: B2



Summary for Subcatchment B3: B3

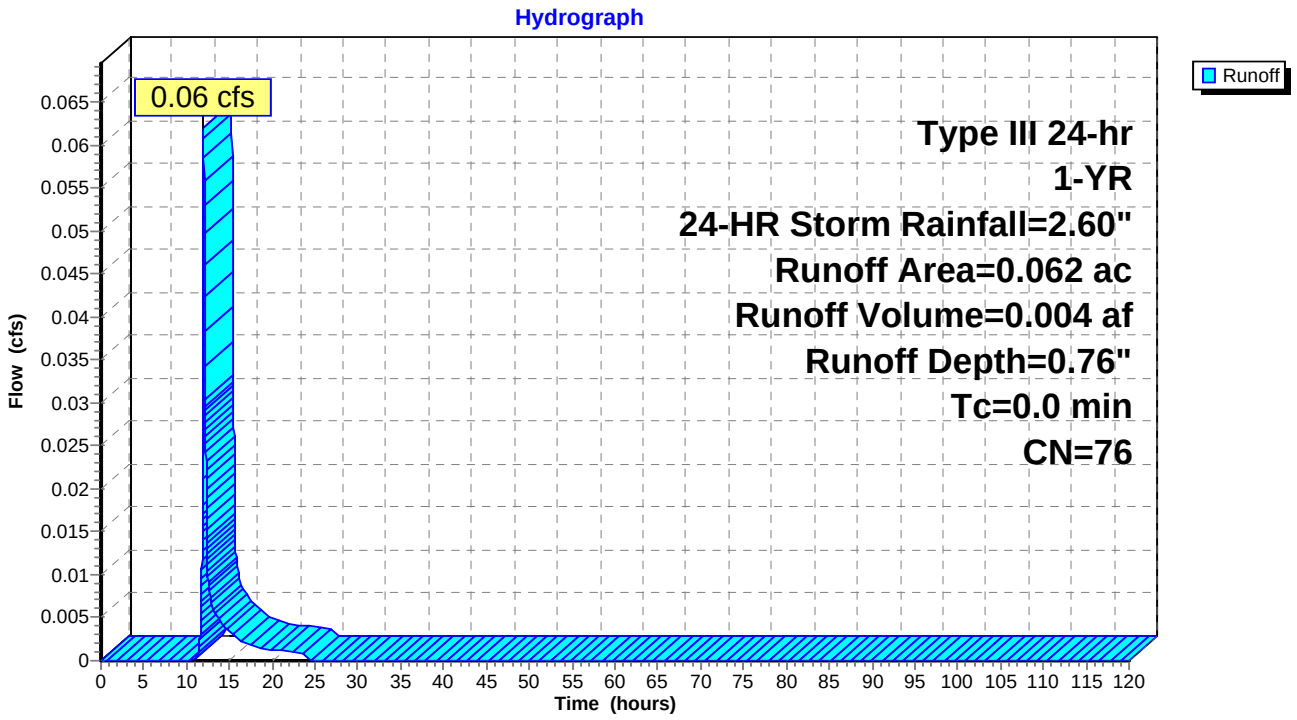
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.06 cfs @ 12.00 hrs, Volume= 0.004 af, Depth= 0.76"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.054	74	>75% Grass cover, Good, HSG C
0.008	89	Gravel roads, HSG C
0.062	76	Weighted Average
0.062		100.00% Pervious Area

Subcatchment B3: B3



Summary for Subcatchment C1: C1

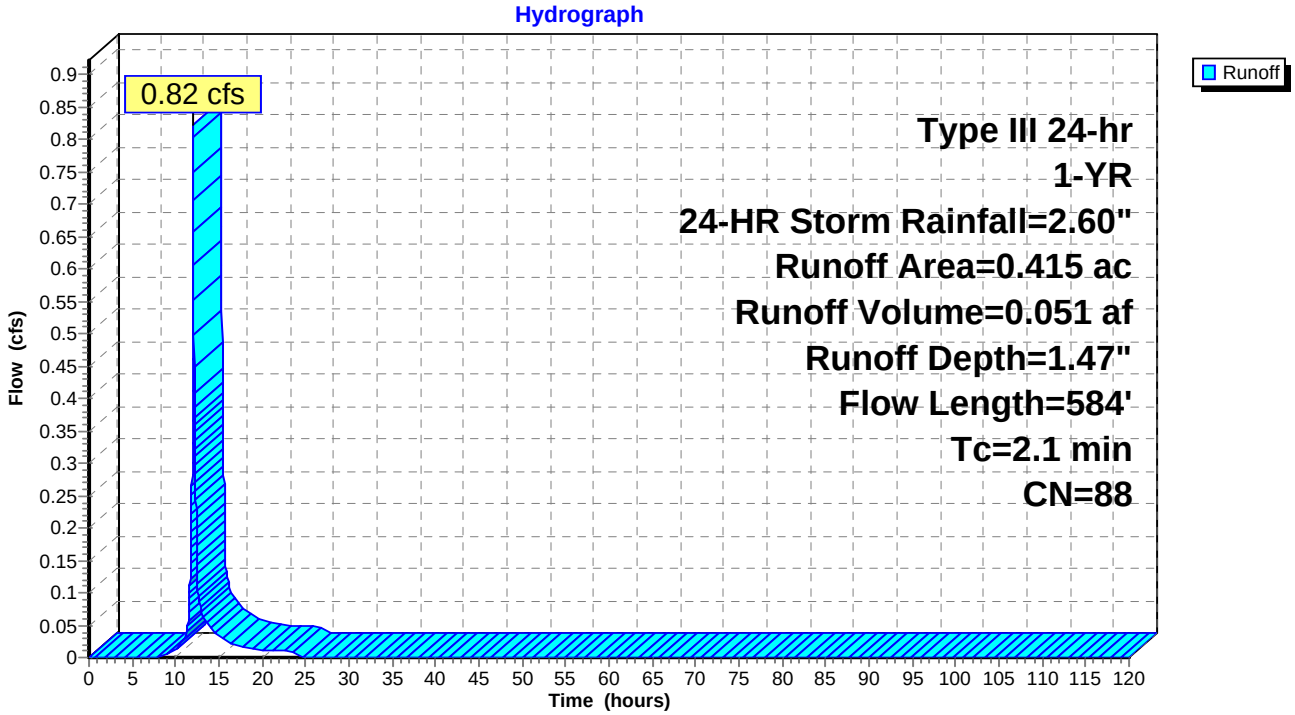
Runoff = 0.82 cfs @ 12.03 hrs, Volume= 0.051 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.143	74	>75% Grass cover, Good, HSG C
0.166	98	Paved roads w/curbs & sewers, HSG C
0.048	80	>75% Grass cover, Good, HSG D
0.058	98	Paved roads w/curbs & sewers, HSG D
0.415	88	Weighted Average
0.191		46.02% Pervious Area
0.224		53.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
1.0	462	0.0216	8.00	97.54	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	36	0.0118	4.93	3.87	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.1	584	Total			

Subcatchment C1: C1



Summary for Subcatchment C2: C2

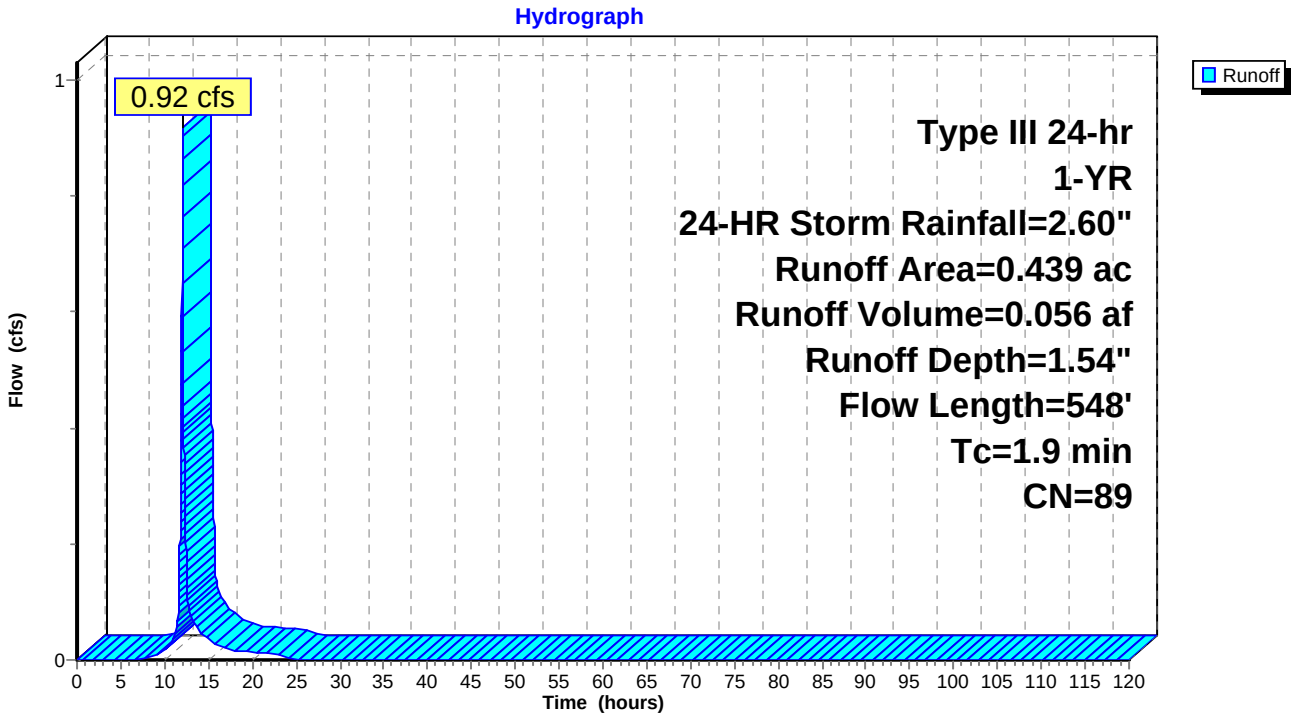
Runoff = 0.92 cfs @ 12.03 hrs, Volume= 0.056 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.140	74	>75% Grass cover, Good, HSG C
0.189	98	Paved roads w/curbs & sewers, HSG C
0.043	80	>75% Grass cover, Good, HSG D
0.067	98	Paved roads w/curbs & sewers, HSG D
0.439	89	Weighted Average
0.183		41.69% Pervious Area
0.256		58.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	77	0.0200	1.41		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
1.0	471	0.0191	7.52	91.72	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.9	548	Total			

Subcatchment C2: C2



Summary for Subcatchment C3: C3

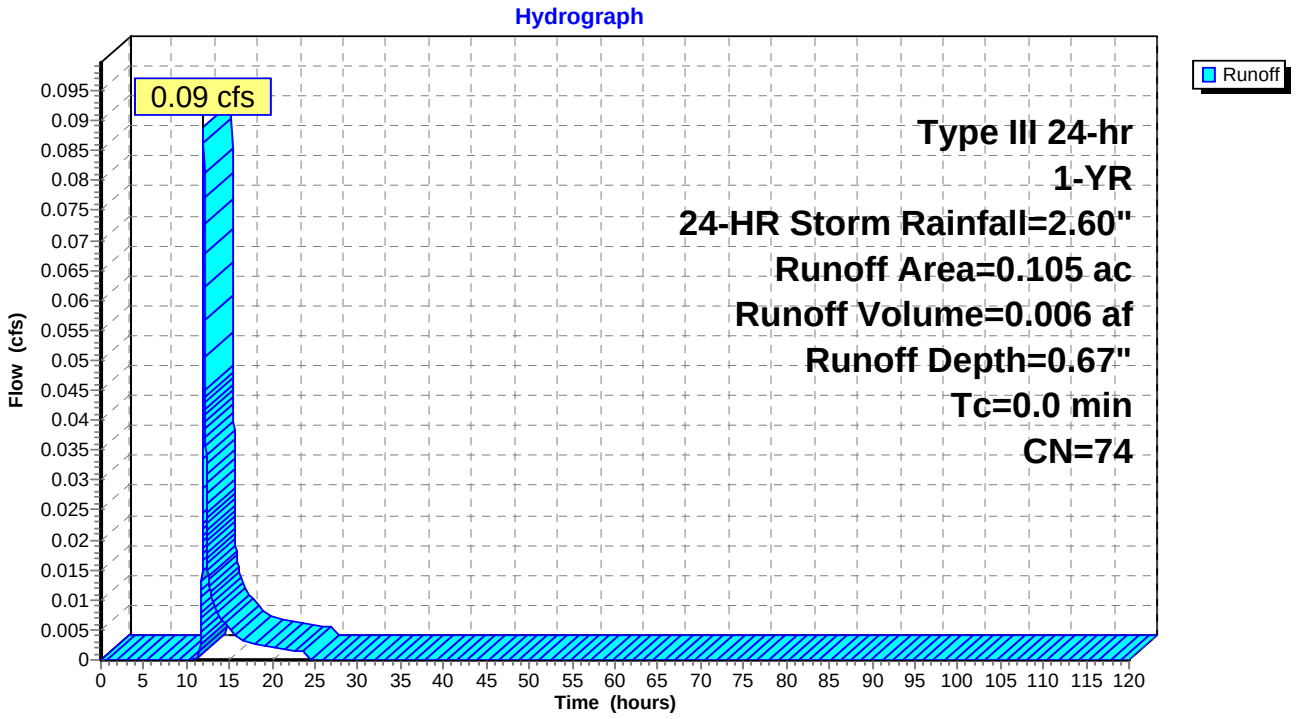
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.09 cfs @ 12.00 hrs, Volume= 0.006 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.105	74	>75% Grass cover, Good, HSG C
0.105		100.00% Pervious Area

Subcatchment C3: C3



Summary for Subcatchment D1: D1

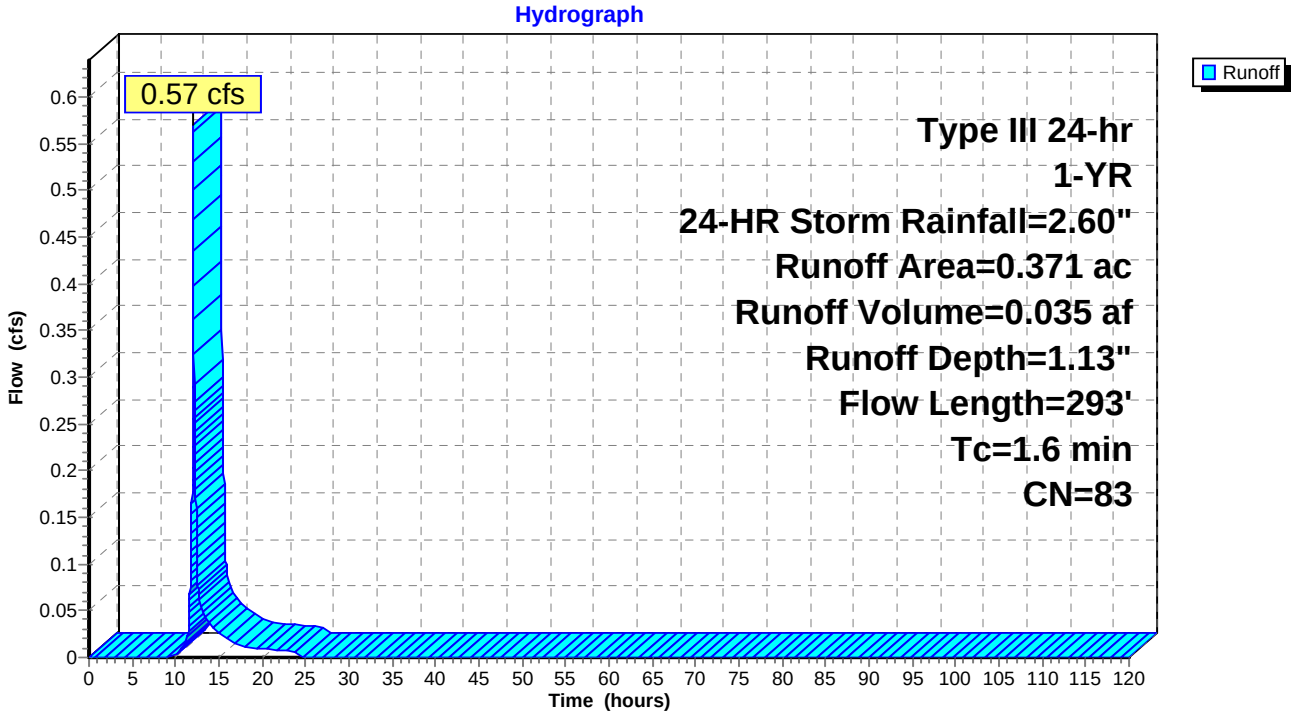
Runoff = 0.57 cfs @ 12.03 hrs, Volume= 0.035 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.228	74	>75% Grass cover, Good, HSG C
0.143	98	Paved roads w/curbs & sewers, HSG C
0.371	83	Weighted Average
0.228		61.46% Pervious Area
0.143		38.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	80	0.0100	1.08		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	183	0.0436	11.36	138.58	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	30	0.0118	4.93	3.87	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.6	293	Total			

Subcatchment D1: D1



Summary for Subcatchment D2: D2

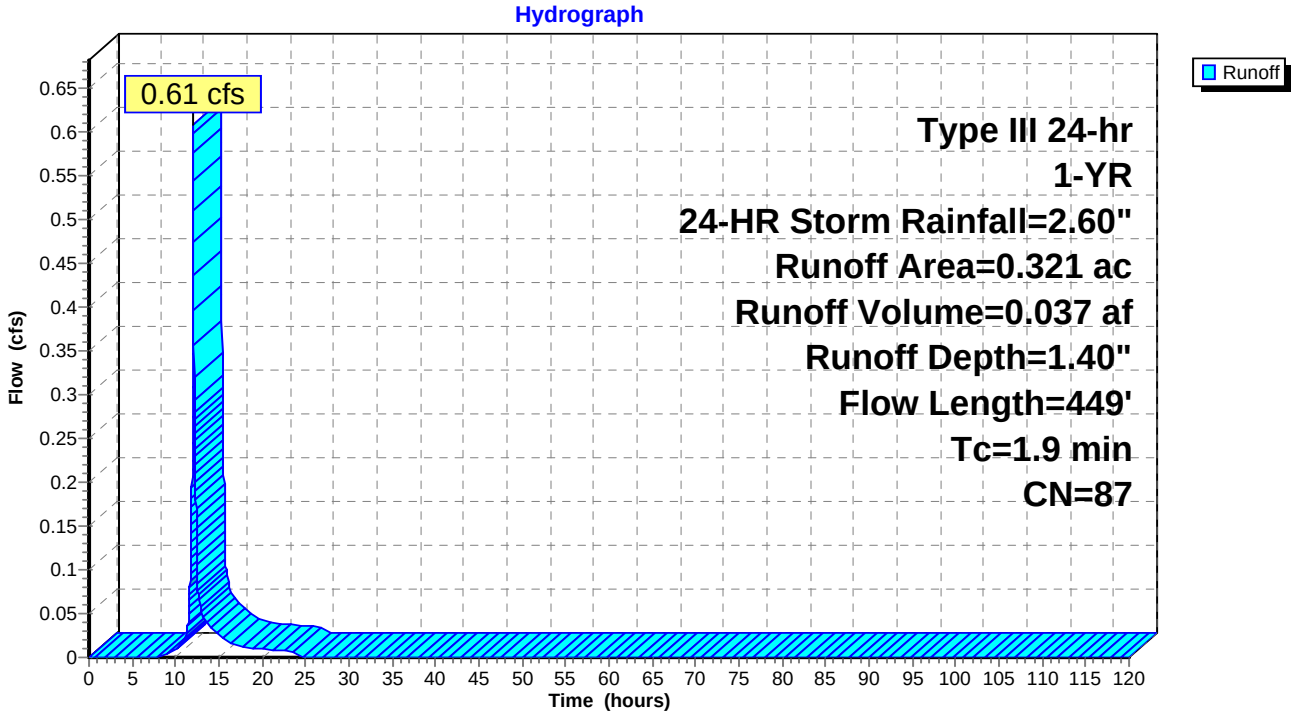
Runoff = 0.61 cfs @ 12.03 hrs, Volume= 0.037 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.140	74	>75% Grass cover, Good, HSG C
0.017	89	Gravel roads, HSG C
0.164	98	Paved roads w/curbs & sewers, HSG C
0.321	87	Weighted Average
0.157		48.91% Pervious Area
0.164		51.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	78	0.0100	1.07		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	371	0.0256	8.70	106.19	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.9	449	Total			

Subcatchment D2: D2



Summary for Subcatchment D3: D3

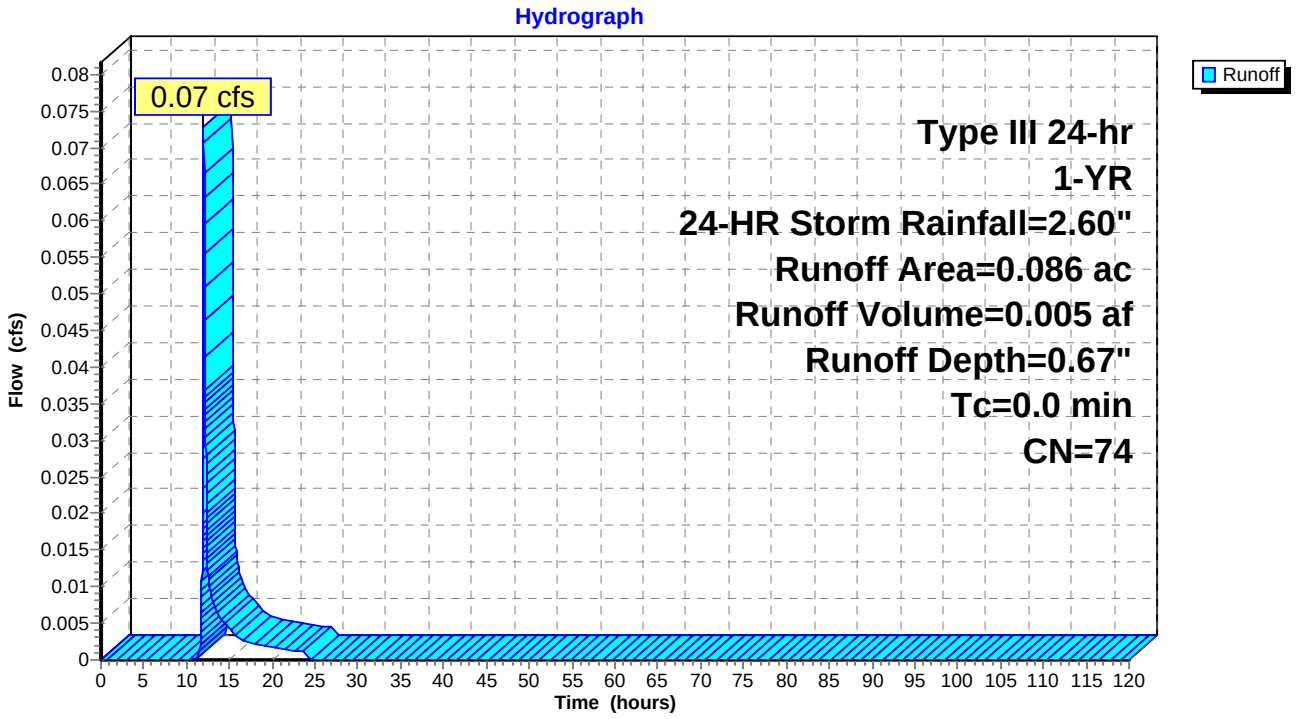
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.07 cfs @ 12.00 hrs, Volume= 0.005 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.086	74	>75% Grass cover, Good, HSG C
0.086		100.00% Pervious Area

Subcatchment D3: D3



Summary for Subcatchment E1: E1

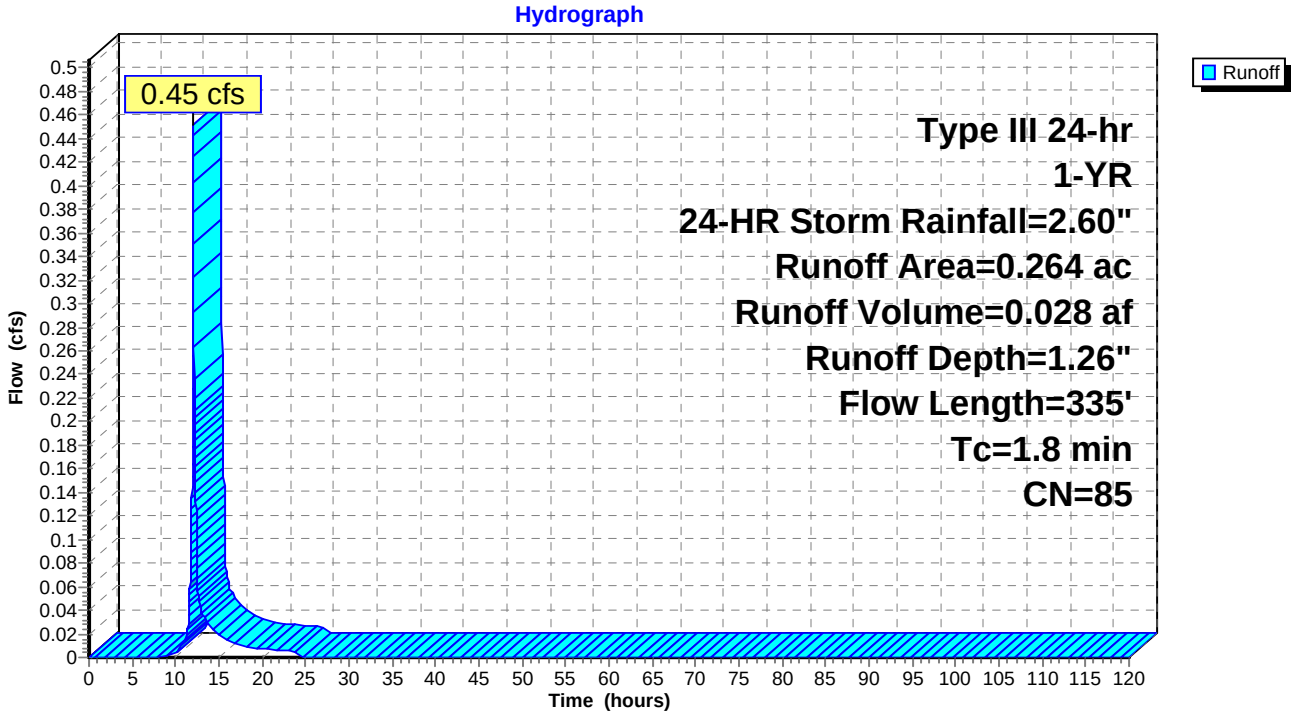
Runoff = 0.45 cfs @ 12.03 hrs, Volume= 0.028 af, Depth= 1.26"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.145	74	>75% Grass cover, Good, HSG C
0.119	98	Paved roads w/curbs & sewers, HSG C
0.264	85	Weighted Average
0.145		54.92% Pervious Area
0.119		45.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	81	0.0100	1.08		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	223	0.0179	7.28	88.79	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	31	0.0128	5.13	4.03	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.8	335	Total			

Subcatchment E1: E1



Summary for Subcatchment E2: E2

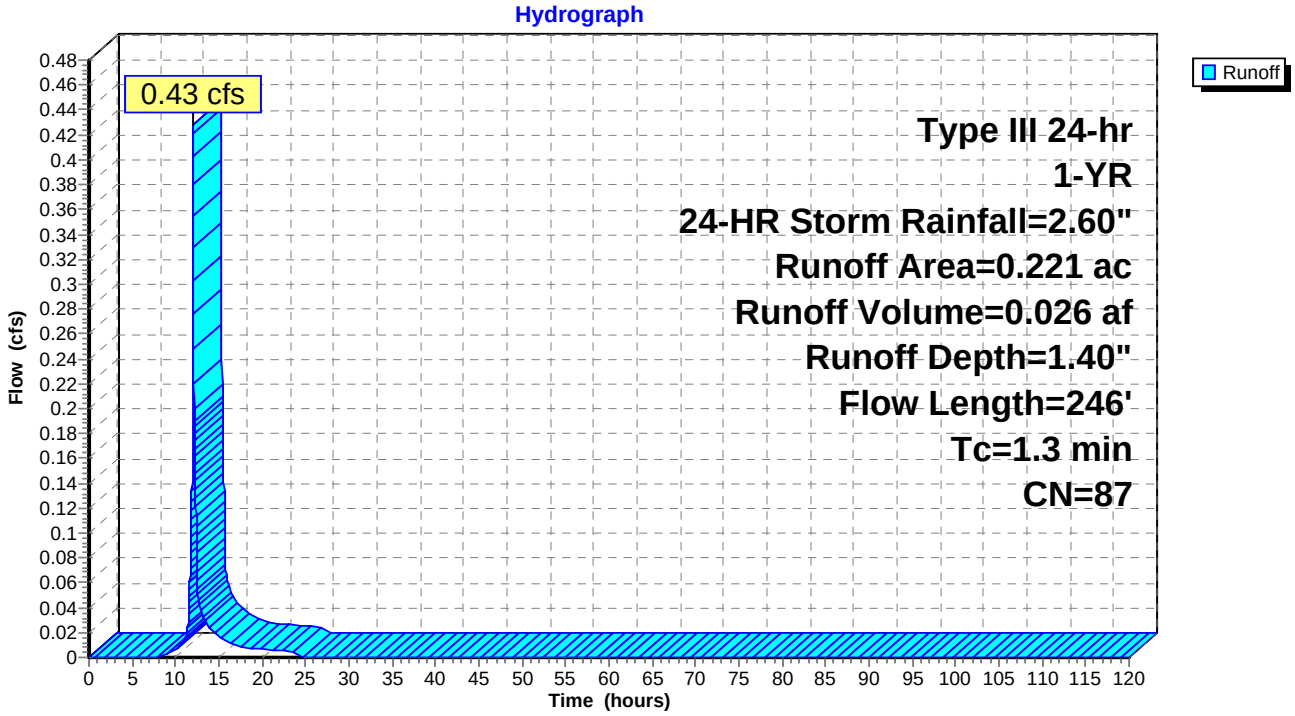
Runoff = 0.43 cfs @ 12.02 hrs, Volume= 0.026 af, Depth= 1.40"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.093	74	>75% Grass cover, Good, HSG C
0.032	89	Gravel roads, HSG C
0.096	98	Paved roads w/curbs & sewers, HSG C
0.221	87	Weighted Average
0.125		56.56% Pervious Area
0.096		43.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0100	0.98		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	196	0.0153	6.73	82.09	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	246	Total			

Subcatchment E2: E2



Summary for Subcatchment E4: E4

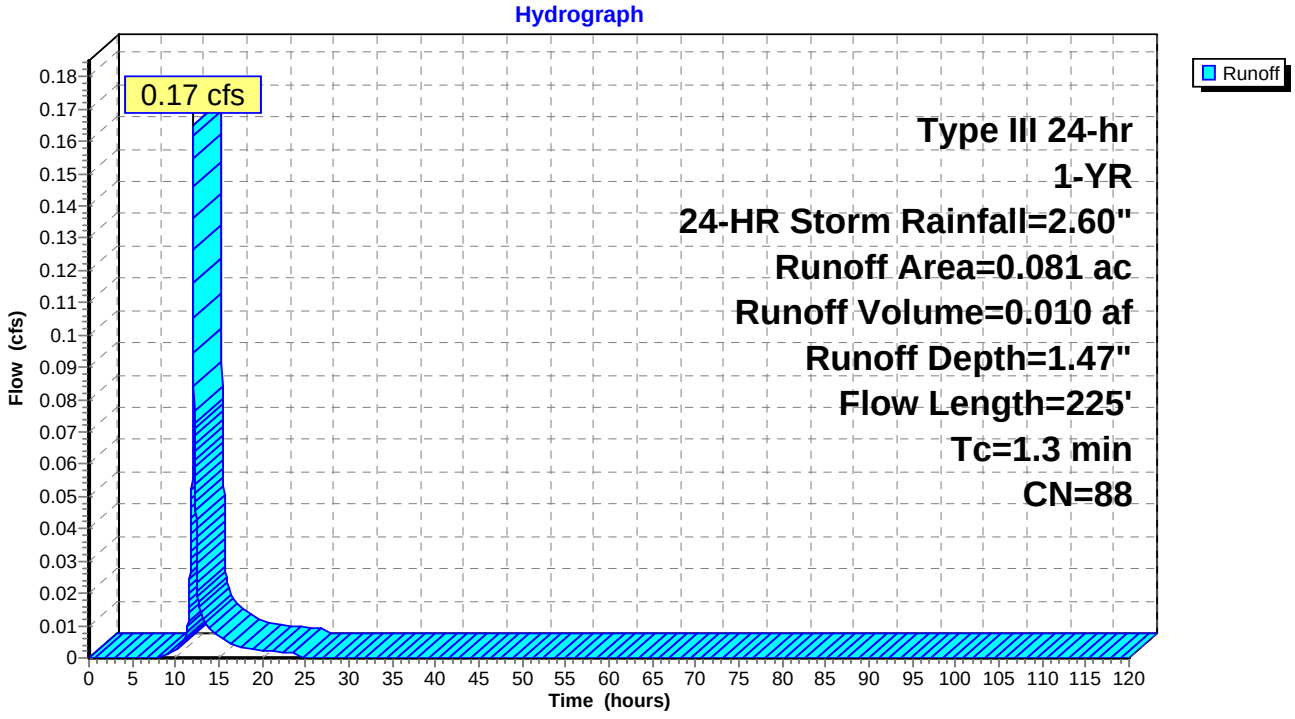
Runoff = 0.17 cfs @ 12.02 hrs, Volume= 0.010 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.046	98	Paved roads w/curbs & sewers, HSG C
0.035	74	>75% Grass cover, Good, HSG C
0.081	88	Weighted Average
0.035		43.21% Pervious Area
0.046		56.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	46	0.0100	0.97		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	179	0.0117	5.88	71.79	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	225	Total			

Subcatchment E4: E4



Summary for Subcatchment E5: E5

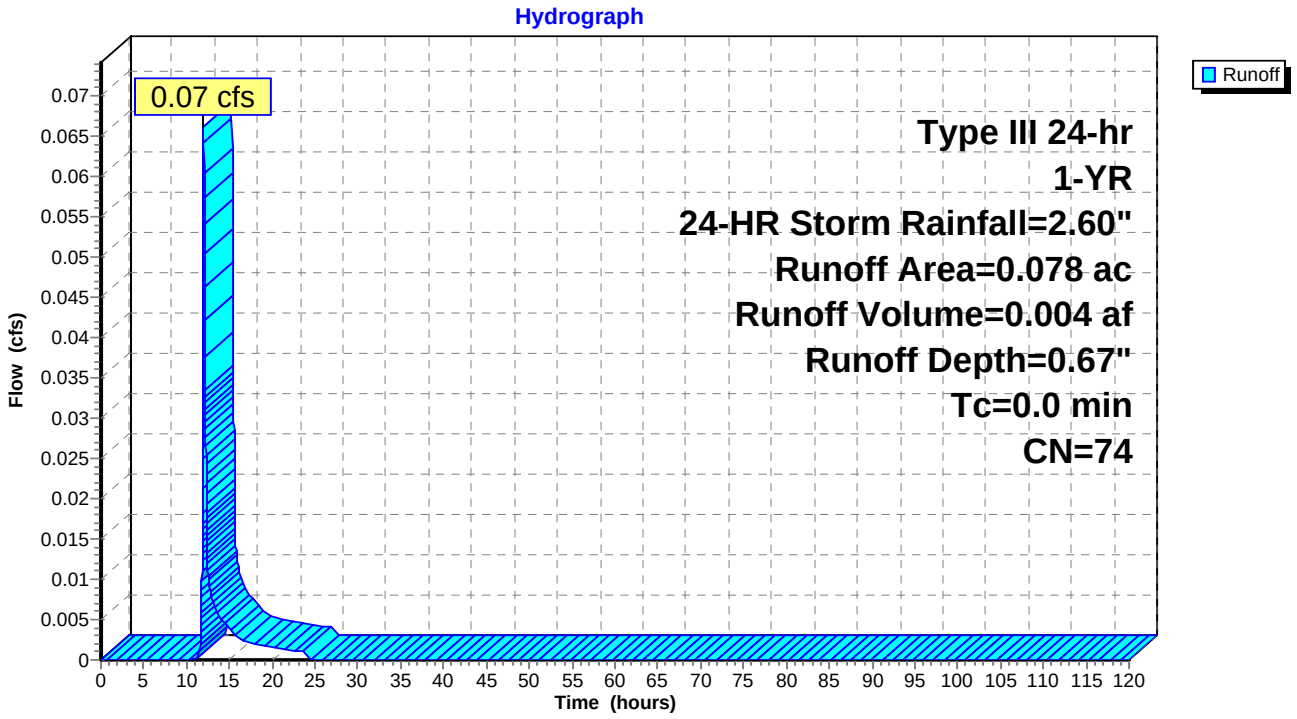
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.07 cfs @ 12.00 hrs, Volume= 0.004 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.078	74	>75% Grass cover, Good, HSG C
0.078		100.00% Pervious Area

Subcatchment E5: E5



Summary for Subcatchment F1: F1

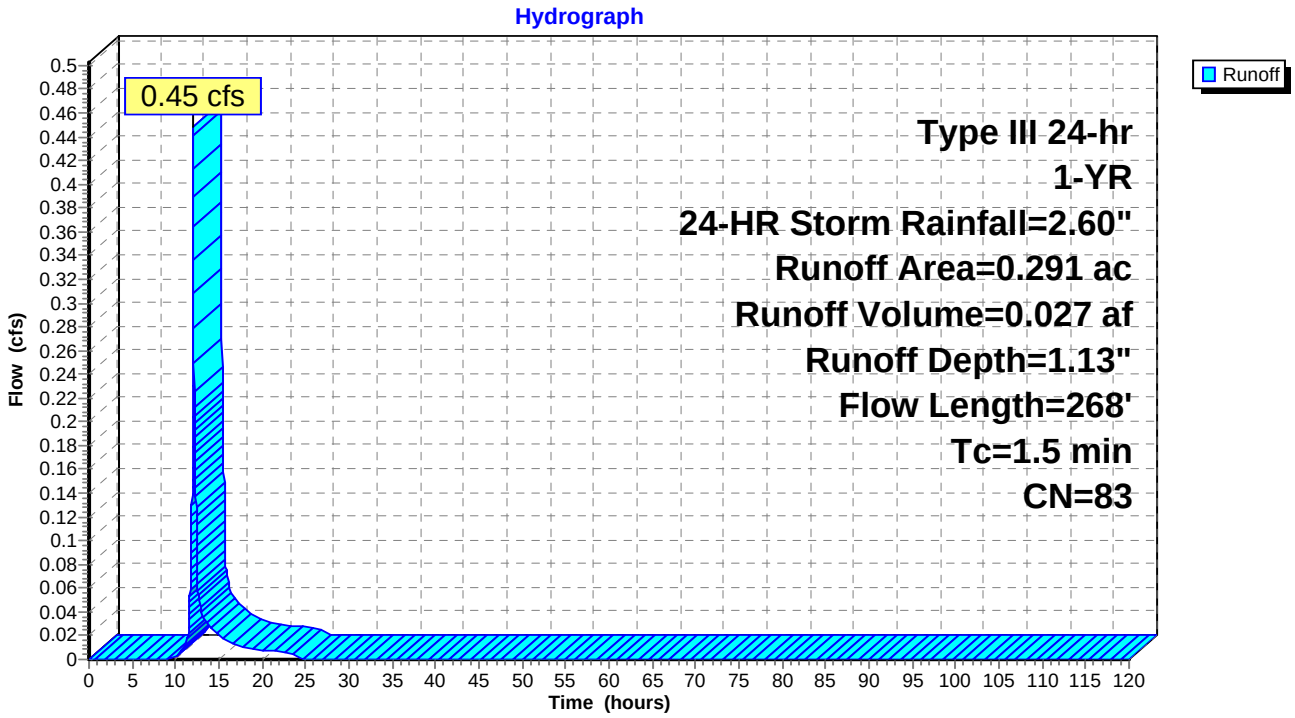
Runoff = 0.45 cfs @ 12.03 hrs, Volume= 0.027 af, Depth= 1.13"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.177	74	>75% Grass cover, Good, HSG C
0.114	98	Paved roads w/curbs & sewers, HSG C
0.291	83	Weighted Average
0.177		60.82% Pervious Area
0.114		39.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	54	0.0100	1.00		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	182	0.0110	5.71	69.61	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	32	0.0078	4.65	5.71	**Pipe Channel, Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.5	268	Total			

Subcatchment F1: F1



Summary for Subcatchment F2: F2

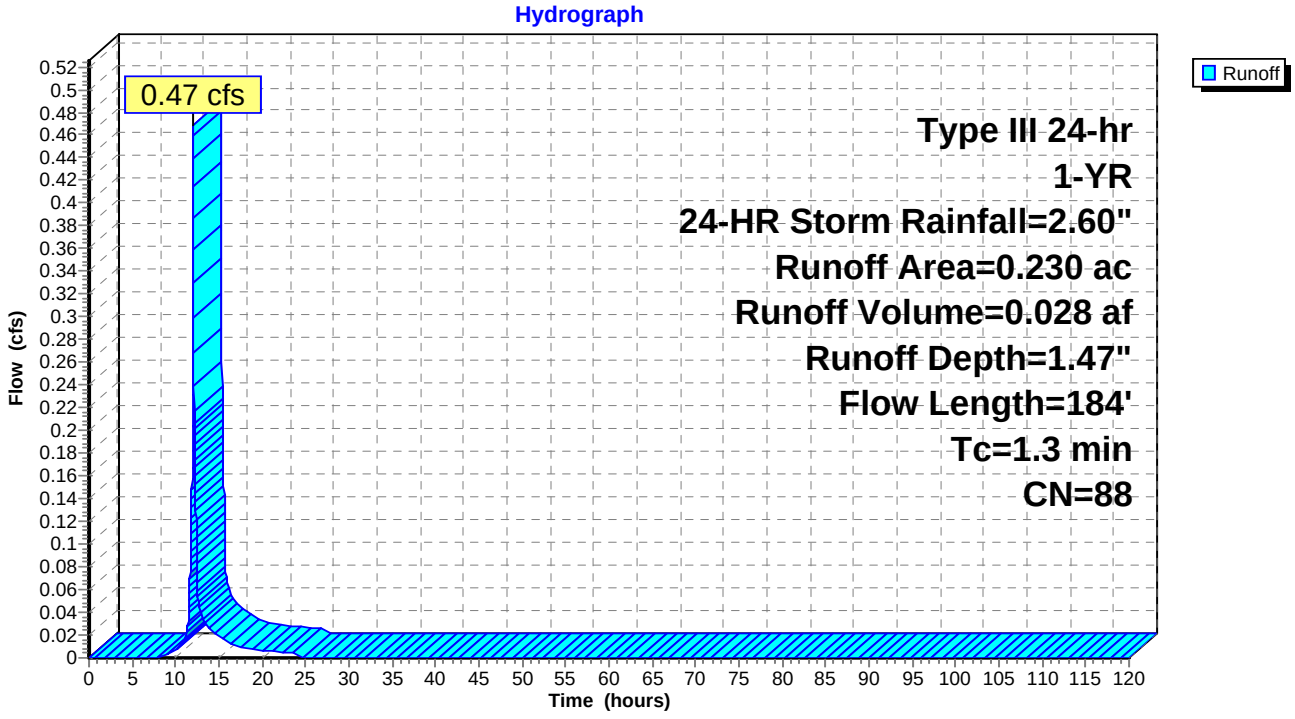
Runoff = 0.47 cfs @ 12.02 hrs, Volume= 0.028 af, Depth= 1.47"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.092	74	>75% Grass cover, Good, HSG C
0.138	98	Paved roads w/curbs & sewers, HSG C
0.230	88	Weighted Average
0.092		40.00% Pervious Area
0.138		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	58	0.0100	1.01		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	126	0.0160	6.88	83.95	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	184	Total			

Subcatchment F2: F2



Summary for Subcatchment F3: F3

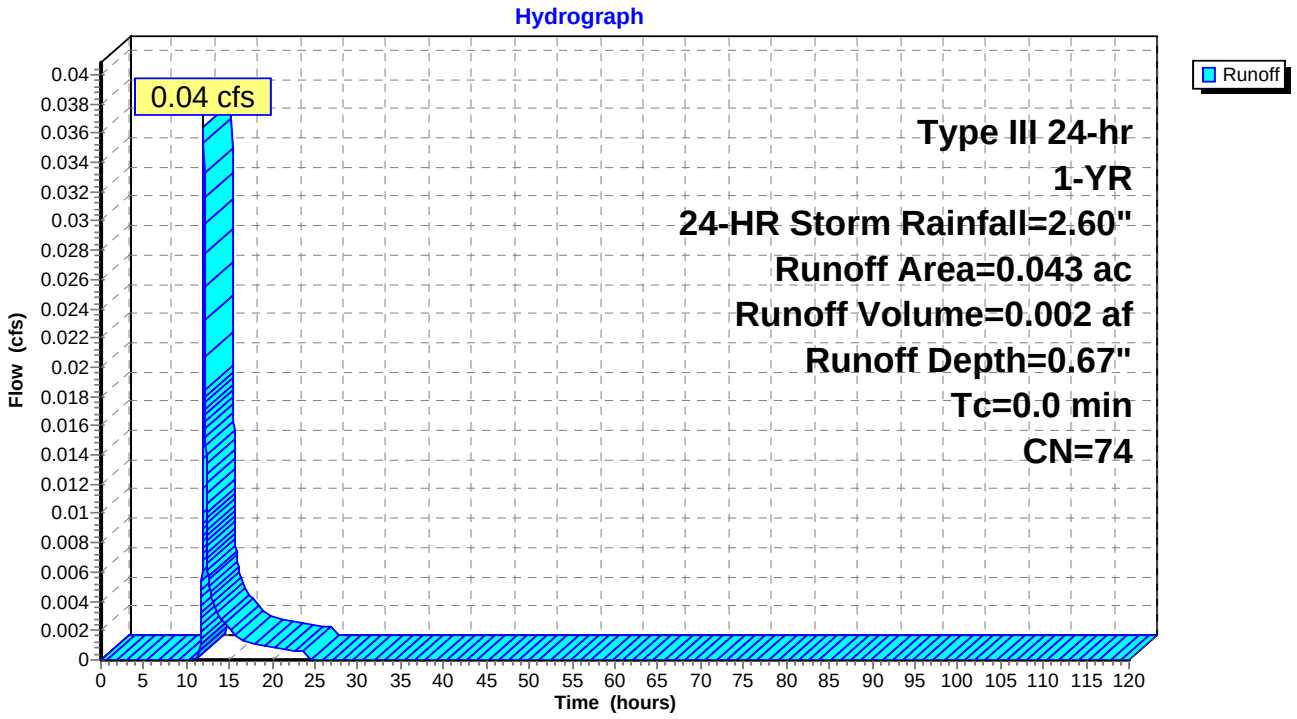
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.04 cfs @ 12.00 hrs, Volume= 0.002 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.043	74	>75% Grass cover, Good, HSG C
0.043		100.00% Pervious Area

Subcatchment F3: F3



Summary for Subcatchment G1: G1

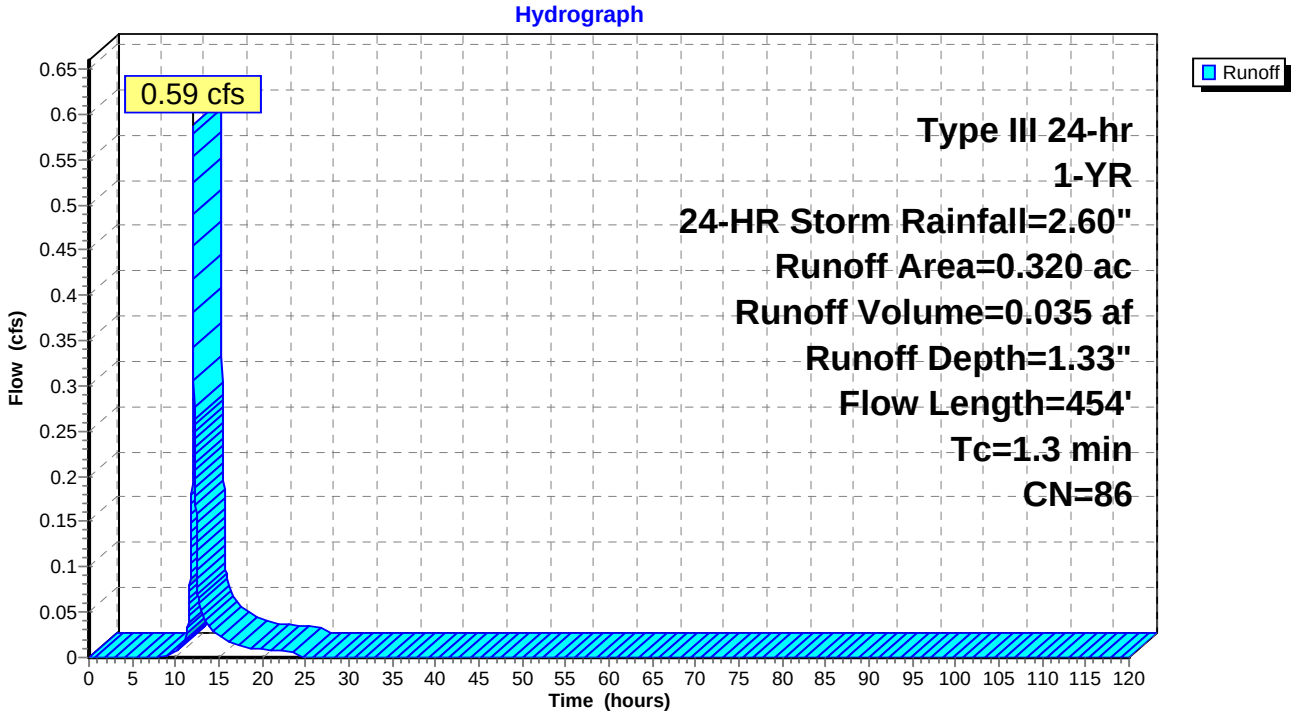
Runoff = 0.59 cfs @ 12.02 hrs, Volume= 0.035 af, Depth= 1.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.130	74	>75% Grass cover, Good, HSG C
0.095	98	Paved roads w/curbs & sewers, HSG C
0.047	80	>75% Grass cover, Good, HSG D
0.048	98	Paved roads w/curbs & sewers, HSG D
0.320	86	Weighted Average
0.177		55.31% Pervious Area
0.143		44.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	57	0.0200	1.33		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.6	364	0.0329	9.87	120.38	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.0	33	0.0920	13.76	10.81	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.3	454	Total			

Subcatchment G1: G1



Summary for Subcatchment G2: G2

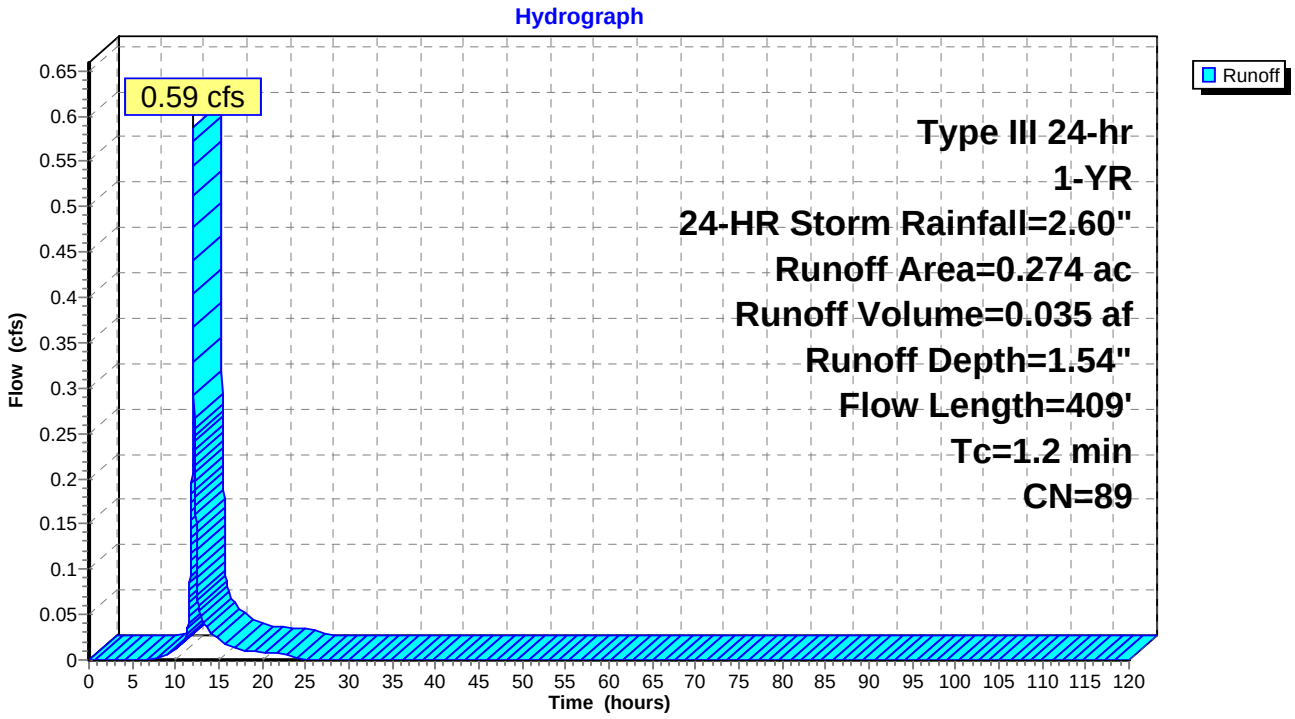
Runoff = 0.59 cfs @ 12.02 hrs, Volume= 0.035 af, Depth= 1.54"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.072	74	>75% Grass cover, Good, HSG C
0.101	98	Paved roads w/curbs & sewers, HSG C
0.046	80	>75% Grass cover, Good, HSG D
0.055	98	Paved roads w/curbs & sewers, HSG D
0.274	89	Weighted Average
0.118		43.07% Pervious Area
0.156		56.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	49	0.0200	1.29		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.6	360	0.0360	10.32	125.92	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.2	409	Total			

Subcatchment G2: G2



Summary for Subcatchment G3: G3

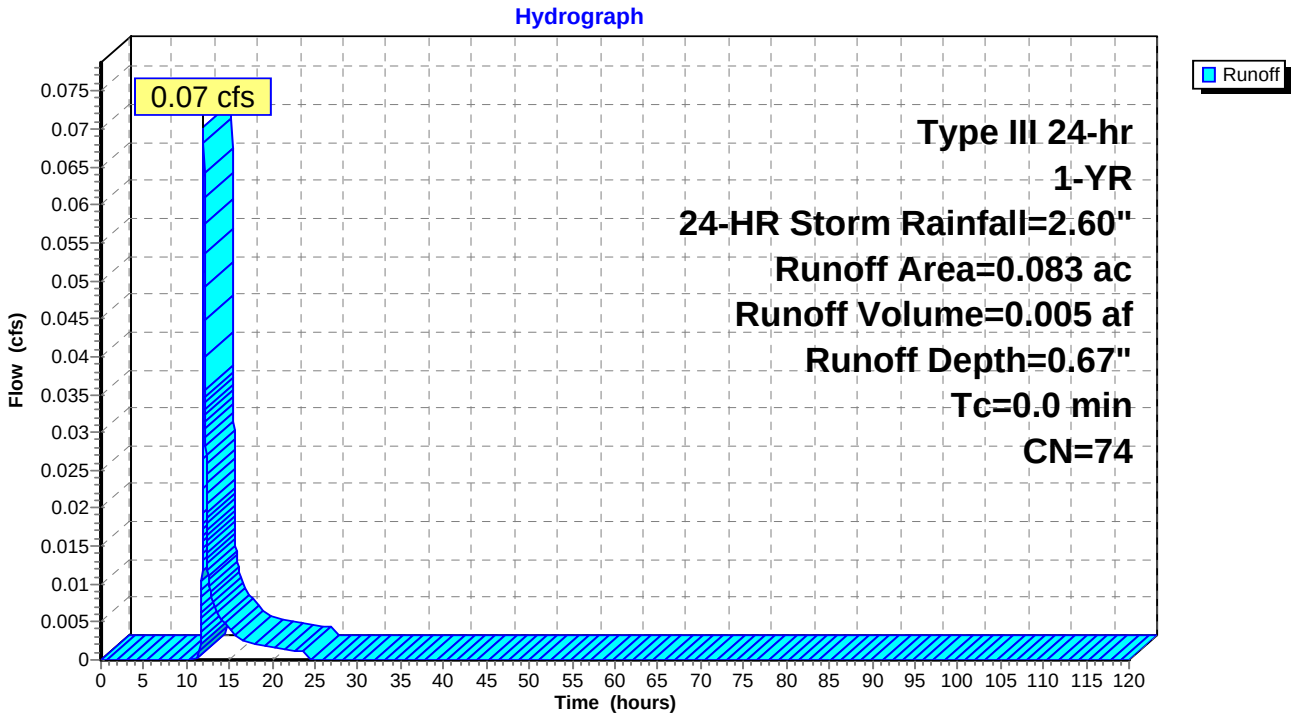
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.07 cfs @ 12.00 hrs, Volume= 0.005 af, Depth= 0.67"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 1-YR, 24-HR Storm Rainfall=2.60"

Area (ac)	CN	Description
0.083	74	>75% Grass cover, Good, HSG C
0.083		100.00% Pervious Area

Subcatchment G3: G3



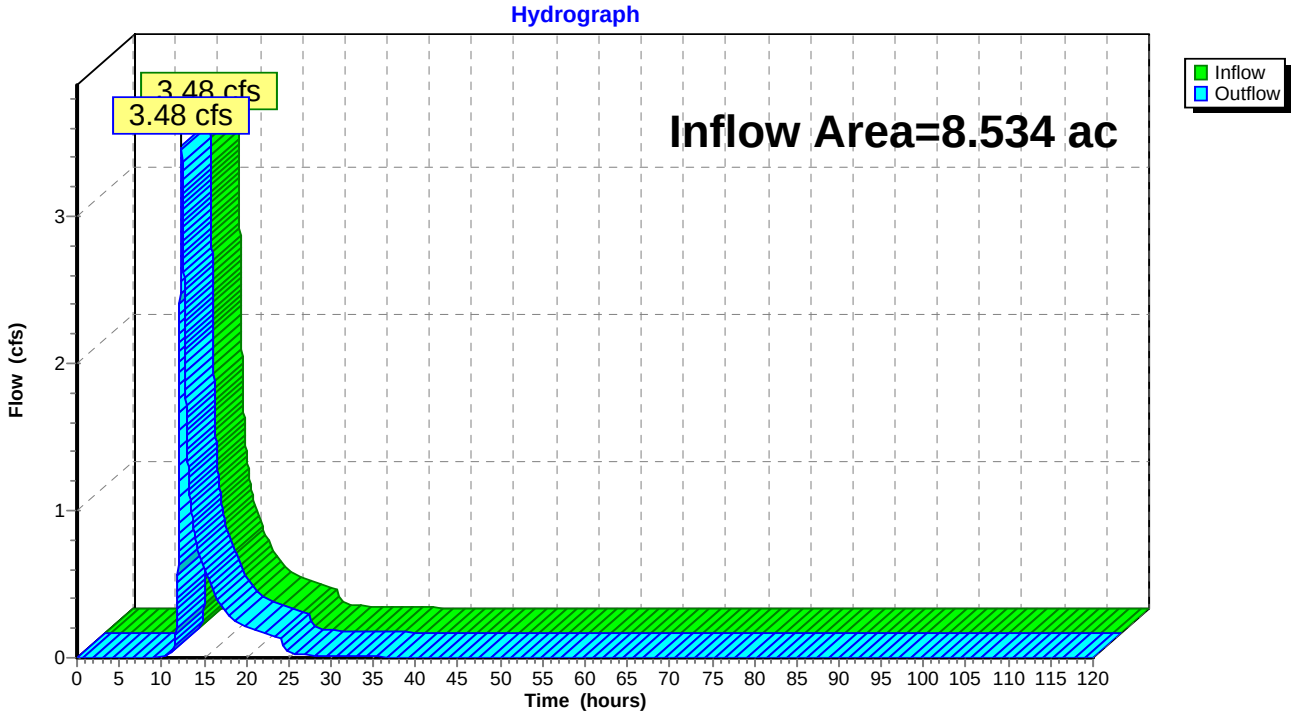
Summary for Reach DP-10: DP-10

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.534 ac, 15.60% Impervious, Inflow Depth = 0.83" for 1-YR, 24-HR Storm event
Inflow = 3.48 cfs @ 12.35 hrs, Volume= 0.592 af
Outflow = 3.48 cfs @ 12.36 hrs, Volume= 0.592 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP-10: DP-10



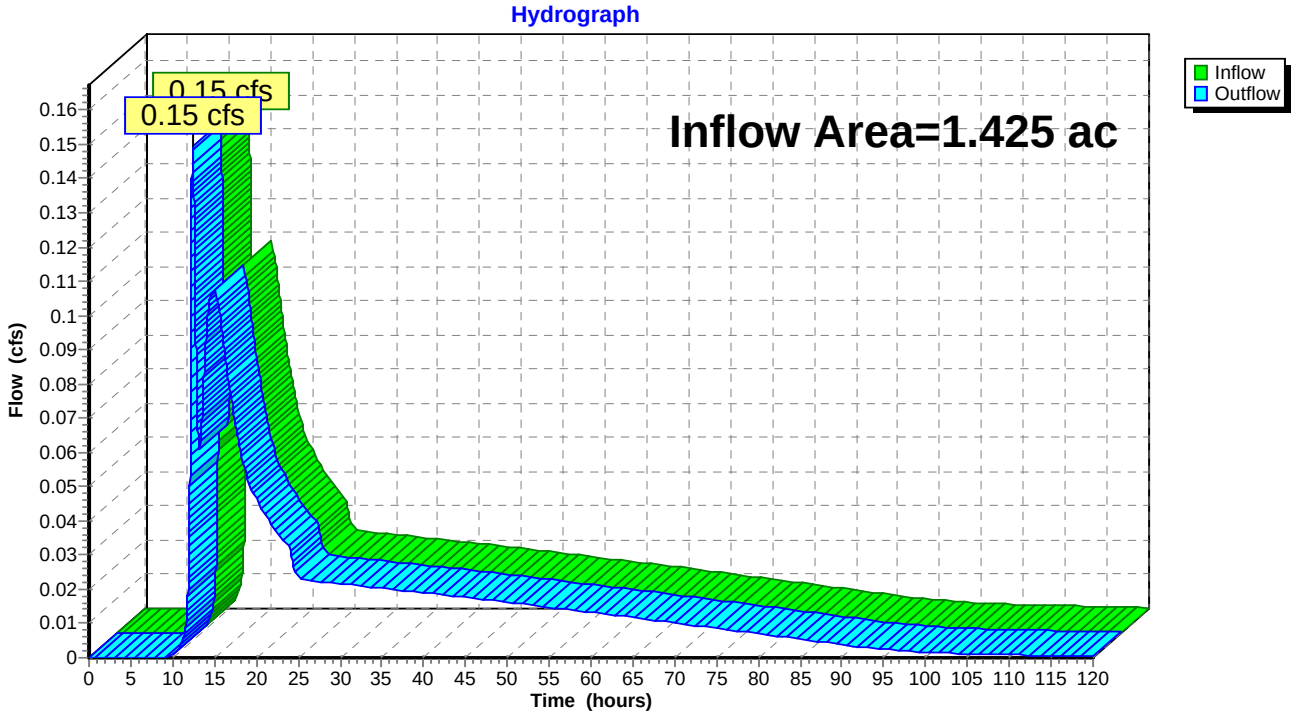
Summary for Reach DP-11: DP-11

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.425 ac, 41.68% Impervious, Inflow Depth > 1.24" for 1-YR, 24-HR Storm event
Inflow = 0.15 cfs @ 12.38 hrs, Volume= 0.147 af
Outflow = 0.15 cfs @ 12.39 hrs, Volume= 0.147 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP-11: DP-11



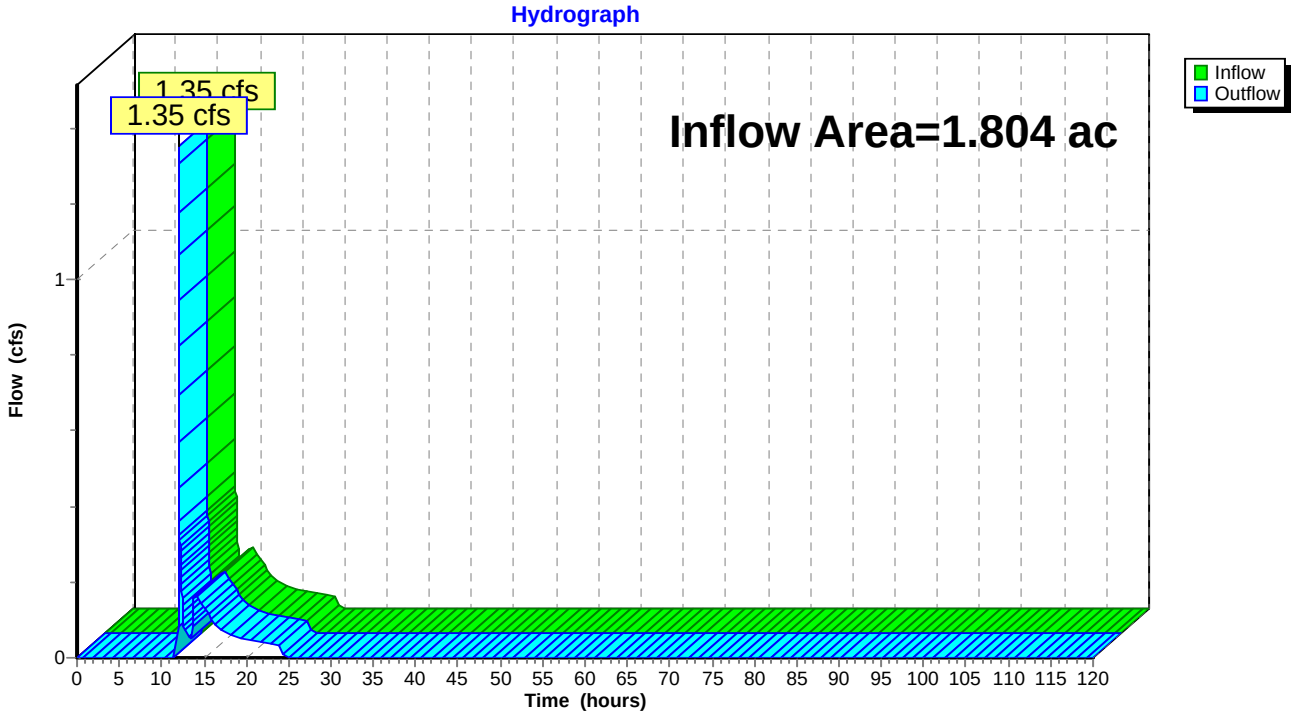
Summary for Reach DP3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.804 ac, 40.85% Impervious, Inflow Depth > 0.64" for 1-YR, 24-HR Storm event
Inflow = 1.35 cfs @ 12.03 hrs, Volume= 0.096 af
Outflow = 1.35 cfs @ 12.04 hrs, Volume= 0.096 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP3: DP-3



Summary for Pond 1P: Bioretention Area A

Inflow Area = 1.335 ac, 40.97% Impervious, Inflow Depth = 1.19" for 1-YR, 24-HR Storm event
Inflow = 1.58 cfs @ 12.04 hrs, Volume= 0.132 af
Outflow = 0.13 cfs @ 13.92 hrs, Volume= 0.055 af, Atten= 92%, Lag= 113.0 min
Primary = 0.13 cfs @ 13.92 hrs, Volume= 0.055 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,366.03' @ 13.92 hrs Surf.Area= 2,293 sf Storage= 3,750 cf

Plug-Flow detention time= 769.7 min calculated for 0.055 af (42% of inflow)
Center-of-Mass det. time= 641.0 min (1,477.4 - 836.4)

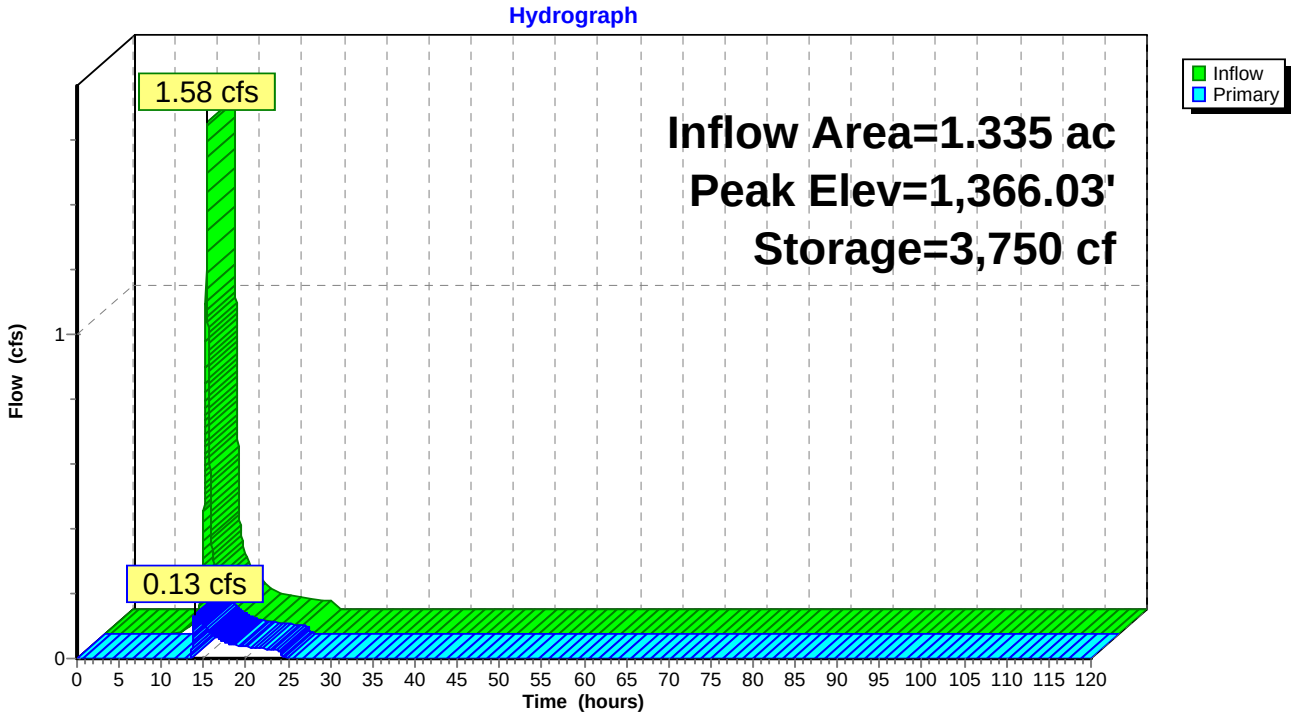
Volume	Invert	Avail.Storage	Storage Description
#1	1,360.50'	4,917 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,360.50	2,077	185.3	0.0	0	0	2,077
1,361.50	2,077	185.3	25.0	519	519	2,262
1,362.50	2,077	185.3	25.0	519	1,039	2,448
1,363.50	2,077	185.3	25.0	519	1,558	2,633
1,364.50	2,077	185.3	25.0	519	2,077	2,818
1,365.50	2,077	185.3	25.0	519	2,596	3,004
1,366.00	2,271	192.5	100.0	1,087	3,683	3,240
1,366.50	2,669	204.6	100.0	1,234	4,917	3,635

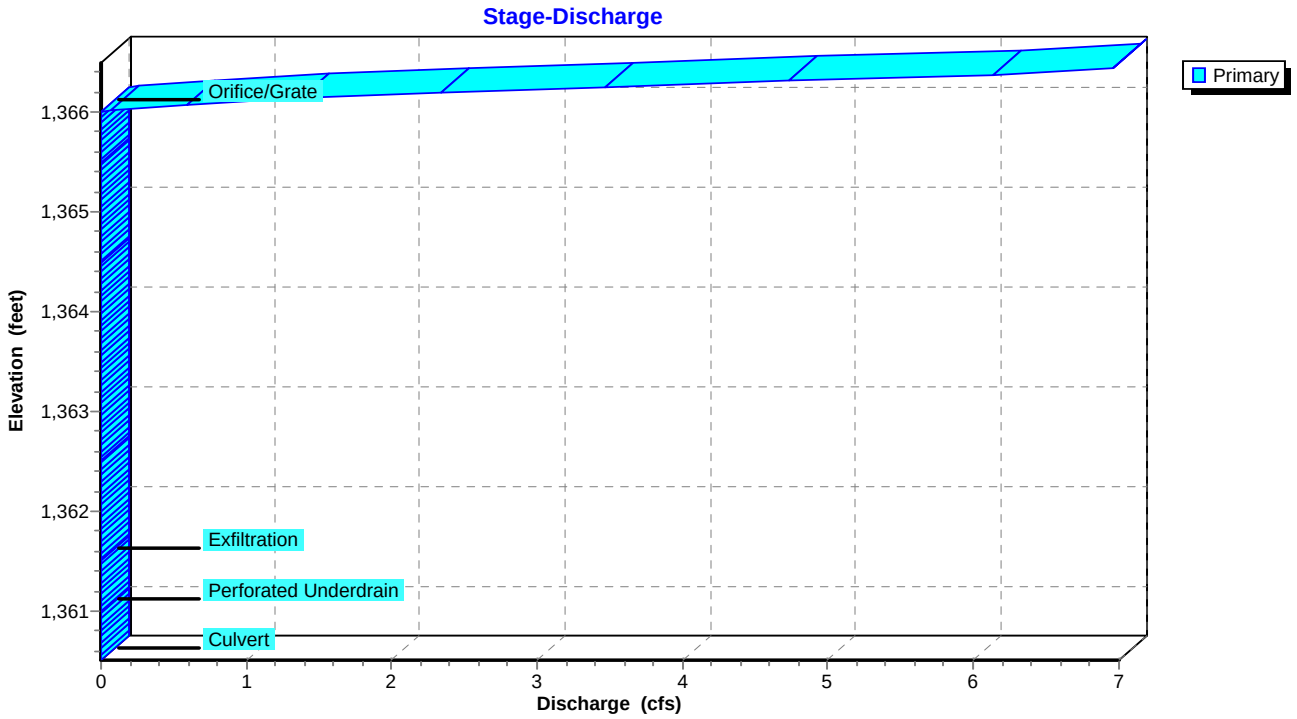
Device	Routing	Invert	Outlet Devices
#1	Primary	1,360.50'	**12.0" Round Culvert** L= 20.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,360.50' / 1,360.00' S= 0.0239 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,361.00'	**0.4" Horiz. Perforated Underdrain X 272.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,361.50'	**0.250 in/hr Exfiltration over Surface area above 1,361.50'** Conductivity to Groundwater Elevation = 1,360.00' Excluded Surface area = 2,077 sf
#4	Device 1	1,366.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.13 cfs @ 13.92 hrs HW=1,366.03' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.13 cfs of 6.70 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 10.25 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Weir Controls 0.13 cfs @ 0.56 fps)

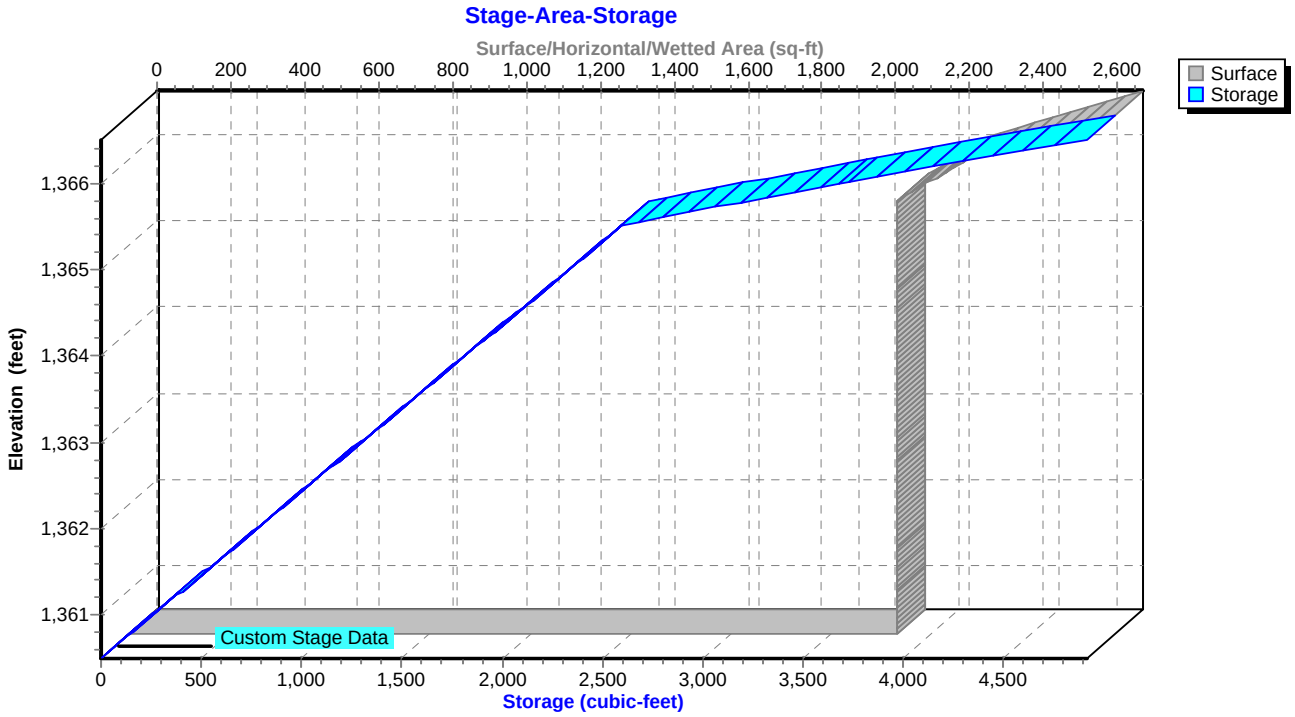
Pond 1P: Bioretention Area A



Pond 1P: Bioretention Area A



Pond 1P: Bioretention Area A



Summary for Pond 3P: Flow Splitter to BMP

Inflow Area = 0.407 ac, 46.68% Impervious, Inflow Depth = 1.27" for 1-YR, 24-HR Storm event
Inflow = 0.72 cfs @ 12.02 hrs, Volume= 0.043 af
Outflow = 0.72 cfs @ 12.03 hrs, Volume= 0.043 af, Atten= 0%, Lag= 0.6 min
Primary = 0.30 cfs @ 11.94 hrs, Volume= 0.009 af
Secondary = 0.72 cfs @ 12.03 hrs, Volume= 0.035 af

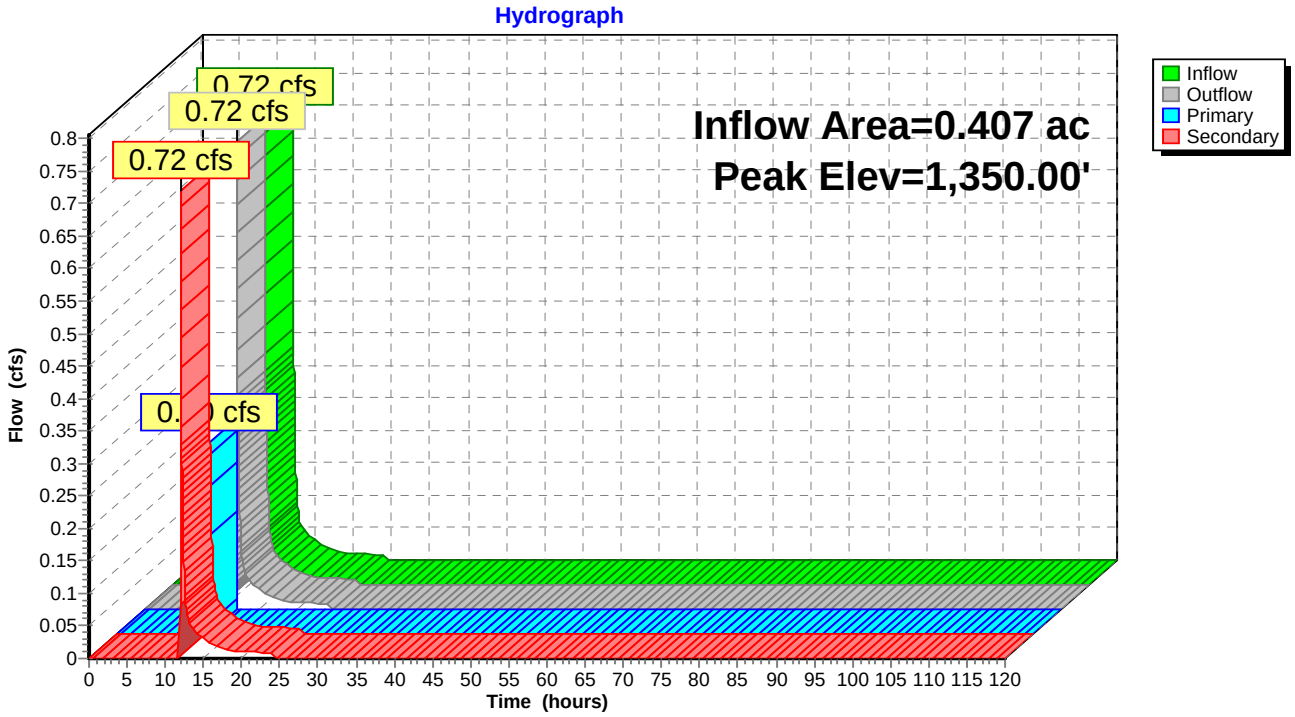
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,350.00' @ 12.03 hrs
Flood Elev= 1,350.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,349.49'	**12.0" Round Culvert** L= 18.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,349.49' / 1,348.85' S= 0.0339 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	1,349.49'	**15.0" Round Bypass Culvert** L= 119.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,349.49' / 1,348.00' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,349.85'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

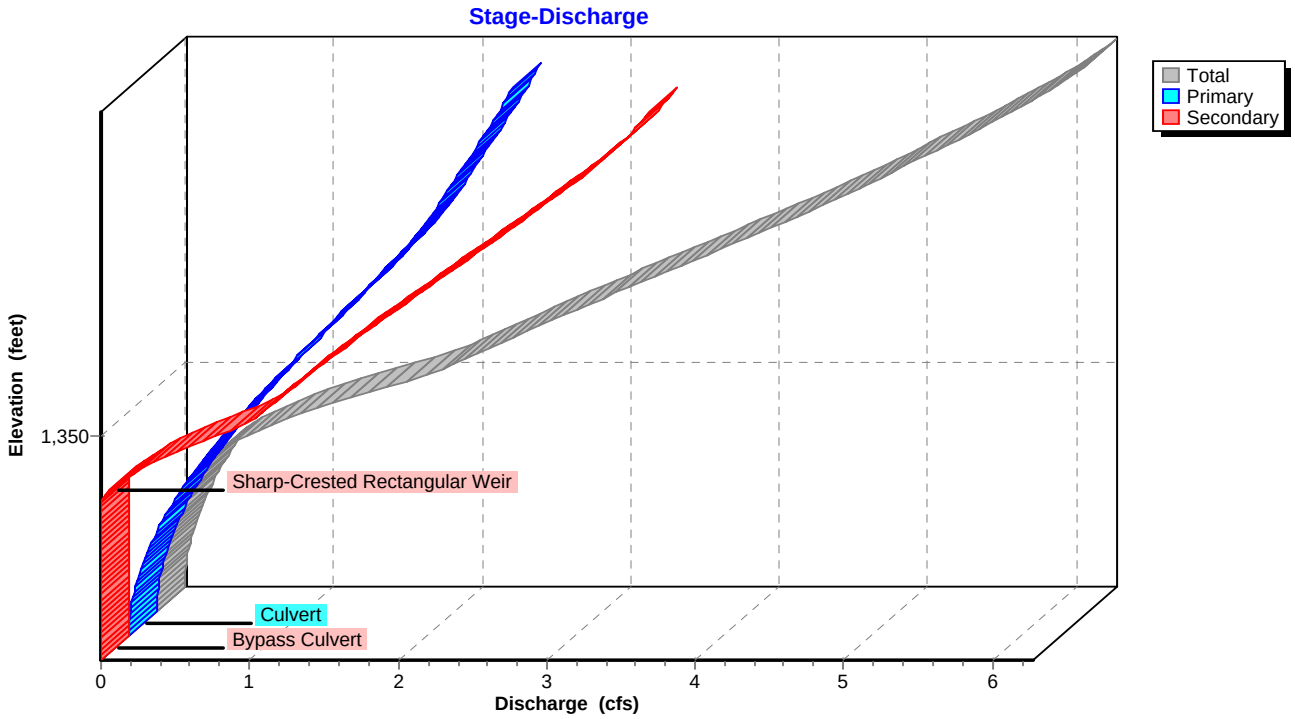
Primary OutFlow Max=0.22 cfs @ 11.94 hrs HW=1,349.86' TW=1,349.79' (Dynamic Tailwater)
└─**1=Culvert** (Outlet Controls 0.22 cfs @ 1.22 fps)

Secondary OutFlow Max=0.72 cfs @ 12.03 hrs HW=1,350.00' TW=0.00' (Dynamic Tailwater)
└─**2=Bypass Culvert** (Passes 0.72 cfs of 0.89 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.72 cfs @ 1.25 fps)

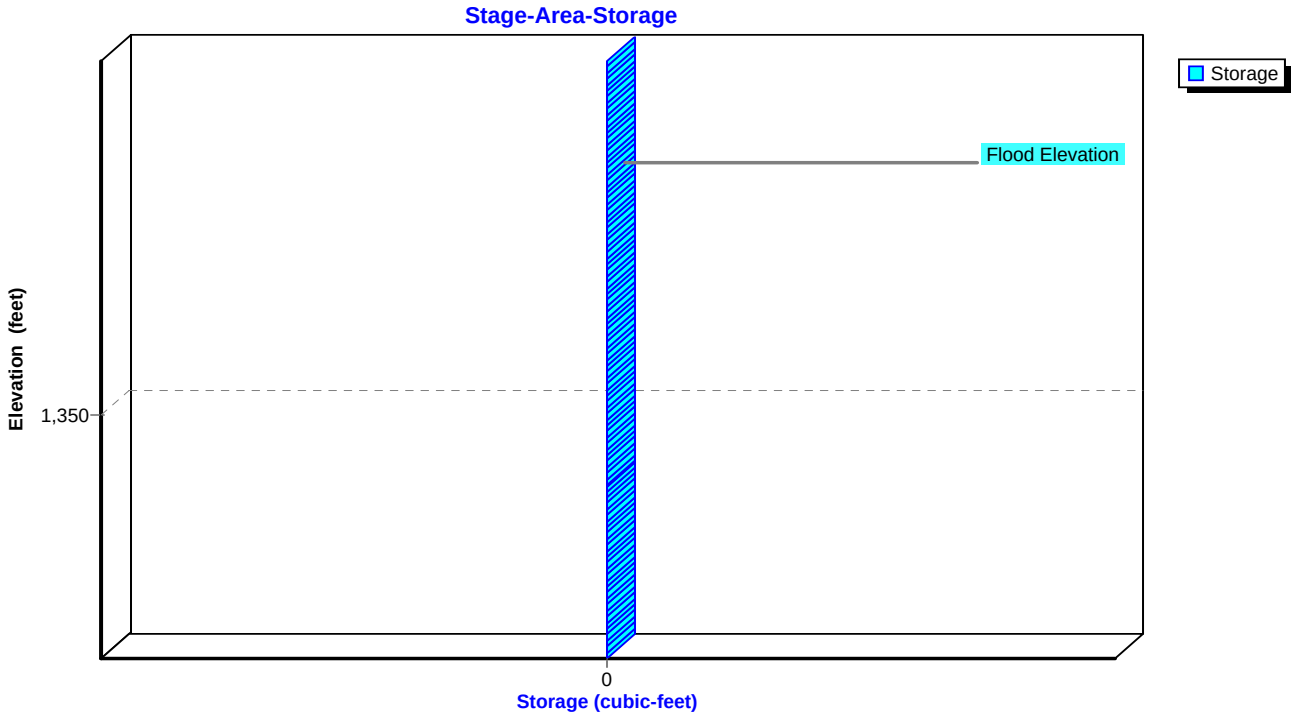
Pond 3P: Flow Splitter to BMP



Pond 3P: Flow Splitter to BMP



Pond 3P: Flow Splitter to BMP



Summary for Pond 4P: Pocket Wetland 30

Inflow Area = 1.148 ac, 48.61% Impervious, Inflow Depth = 1.38" for 1-YR, 24-HR Storm event
Inflow = 2.09 cfs @ 12.03 hrs, Volume= 0.132 af
Outflow = 0.09 cfs @ 14.98 hrs, Volume= 0.130 af, Atten= 96%, Lag= 177.1 min
Primary = 0.09 cfs @ 14.98 hrs, Volume= 0.130 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,437.00' Surf.Area= 3,744 sf Storage= 5,097 cf
Peak Elev= 1,437.89' @ 14.98 hrs Surf.Area= 5,025 sf Storage= 8,969 cf (3,871 cf above start)

Plug-Flow detention time= 4,483.1 min calculated for 0.013 af (10% of inflow)
Center-of-Mass det. time= 1,476.3 min (2,300.2 - 823.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,434.00'	22,580 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

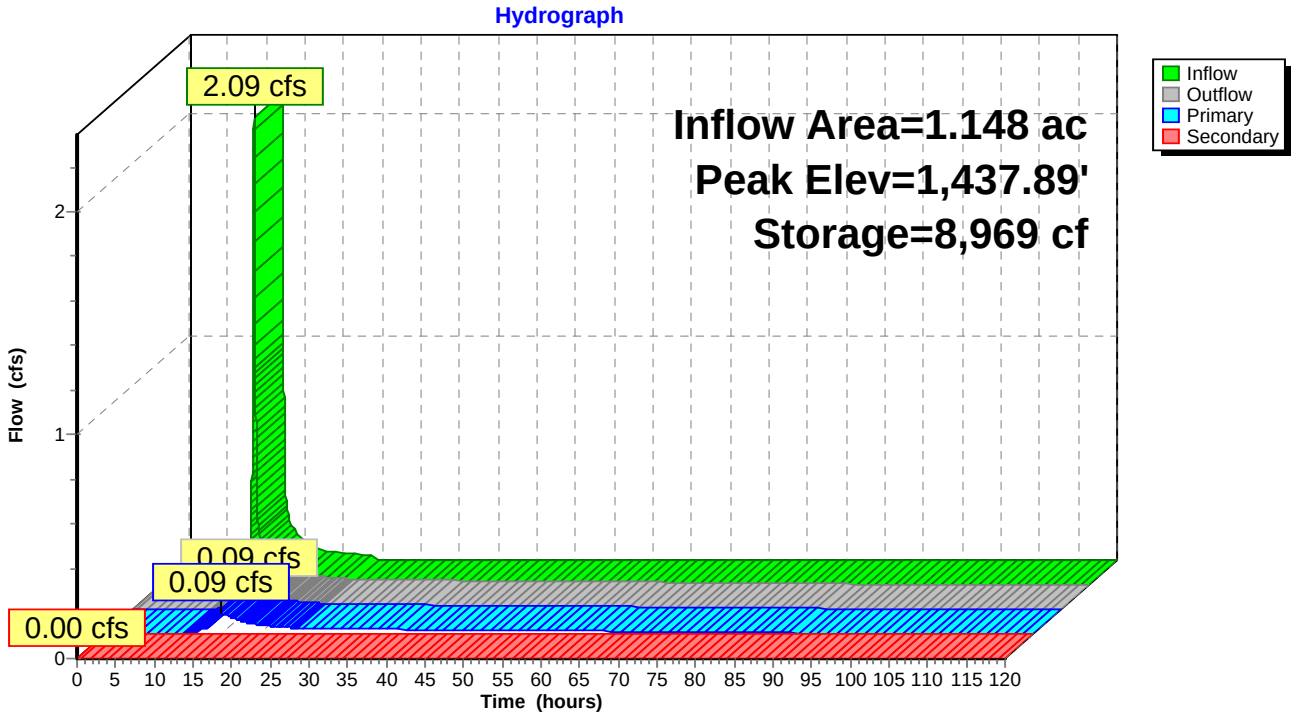
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,434.00	524	152.8	0	0	524
1,435.00	1,039	190.5	767	767	1,568
1,436.00	2,010	281.1	1,498	2,265	4,976
1,437.00	3,744	344.1	2,832	5,097	8,126
1,438.00	5,203	334.4	4,454	9,551	8,750
1,439.00	6,601	346.2	5,888	15,439	9,474
1,440.00	7,695	367.2	7,141	22,580	10,719

Device	Routing	Invert	Outlet Devices
#1	Primary	1,434.00'	**15.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,434.00' / 1,432.00' S= 0.1000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,437.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,437.80'	**6.0" Vert. Orifice/Grate X 3.00** C= 0.600
#4	Secondary	1,439.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

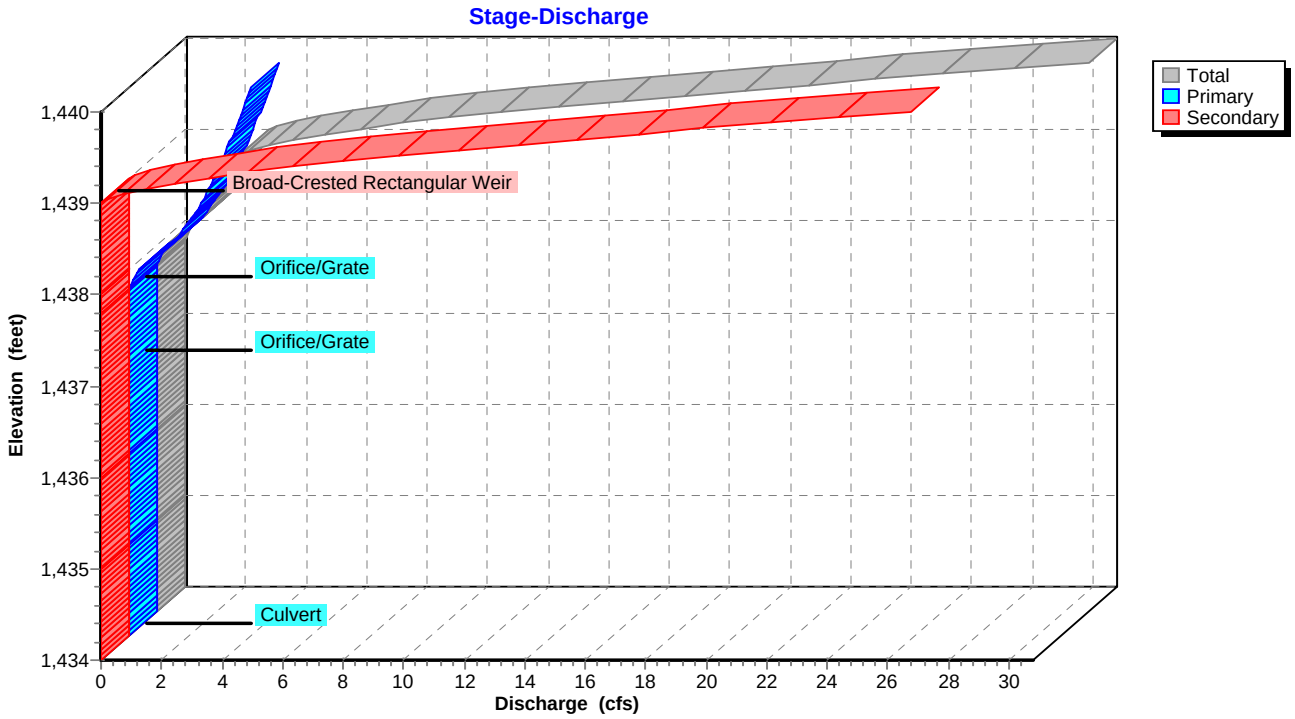
Primary OutFlow Max=0.09 cfs @ 14.98 hrs HW=1,437.89' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.09 cfs of 8.42 cfs potential flow)
  ├─**2=Orifice/Grate** (Orifice Controls 0.02 cfs @ 4.42 fps)
  └─**3=Orifice/Grate** (Orifice Controls 0.07 cfs @ 1.00 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,437.00' TW=0.00' (Dynamic Tailwater)
└─**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

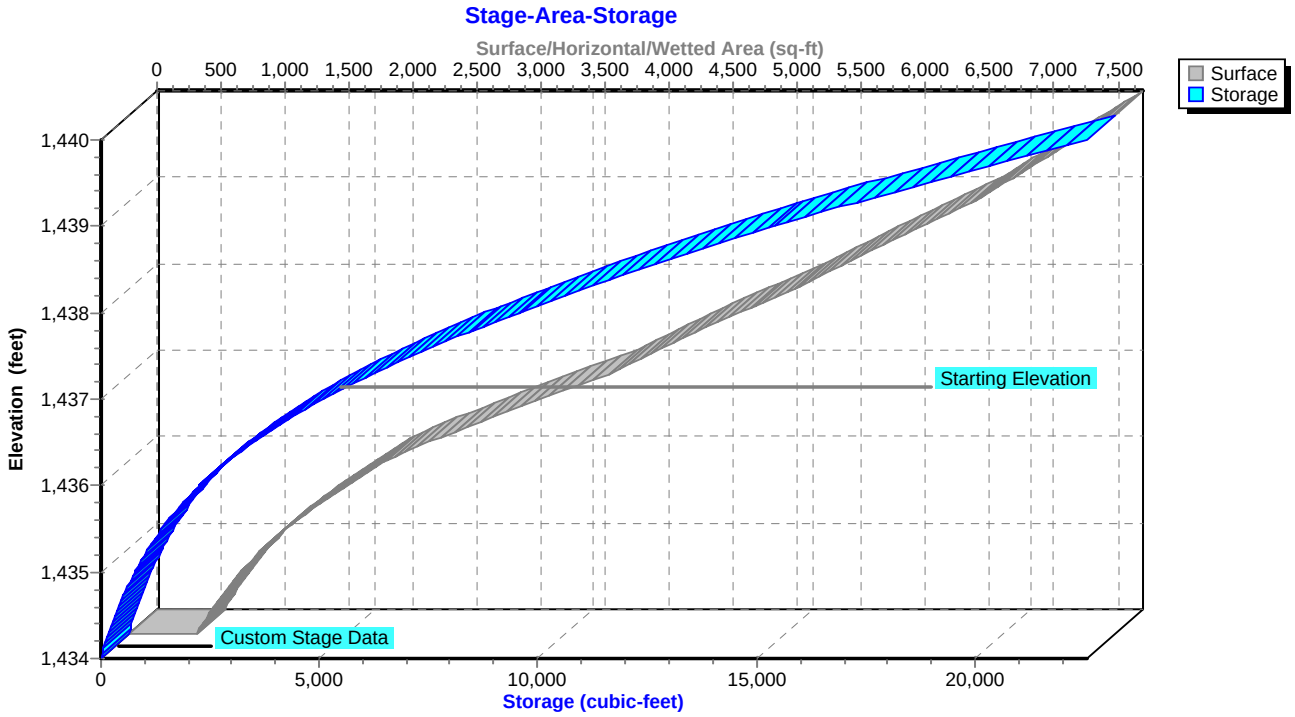
Pond 4P: Pocket Wetland 30



Pond 4P: Pocket Wetland 30



Pond 4P: Pocket Wetland 30



Summary for Pond 5P: Bioretention Area B

[80] Warning: Exceeded Pond 3P by 0.71' @ 24.09 hrs (2.25 cfs 19.576 af)

Inflow Area = 0.469 ac, 40.51% Impervious, Inflow Depth = 0.32" for 1-YR, 24-HR Storm event
Inflow = 0.33 cfs @ 11.94 hrs, Volume= 0.012 af
Outflow = 0.00 cfs @ 24.01 hrs, Volume= 0.001 af, Atten= 100%, Lag= 724.2 min
Primary = 0.00 cfs @ 24.01 hrs, Volume= 0.001 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,350.56' @ 24.01 hrs Surf.Area= 813 sf Storage= 539 cf

Plug-Flow detention time= 2,975.9 min calculated for 0.001 af (7% of inflow)
Center-of-Mass det. time= 2,818.7 min (3,560.1 - 741.4)

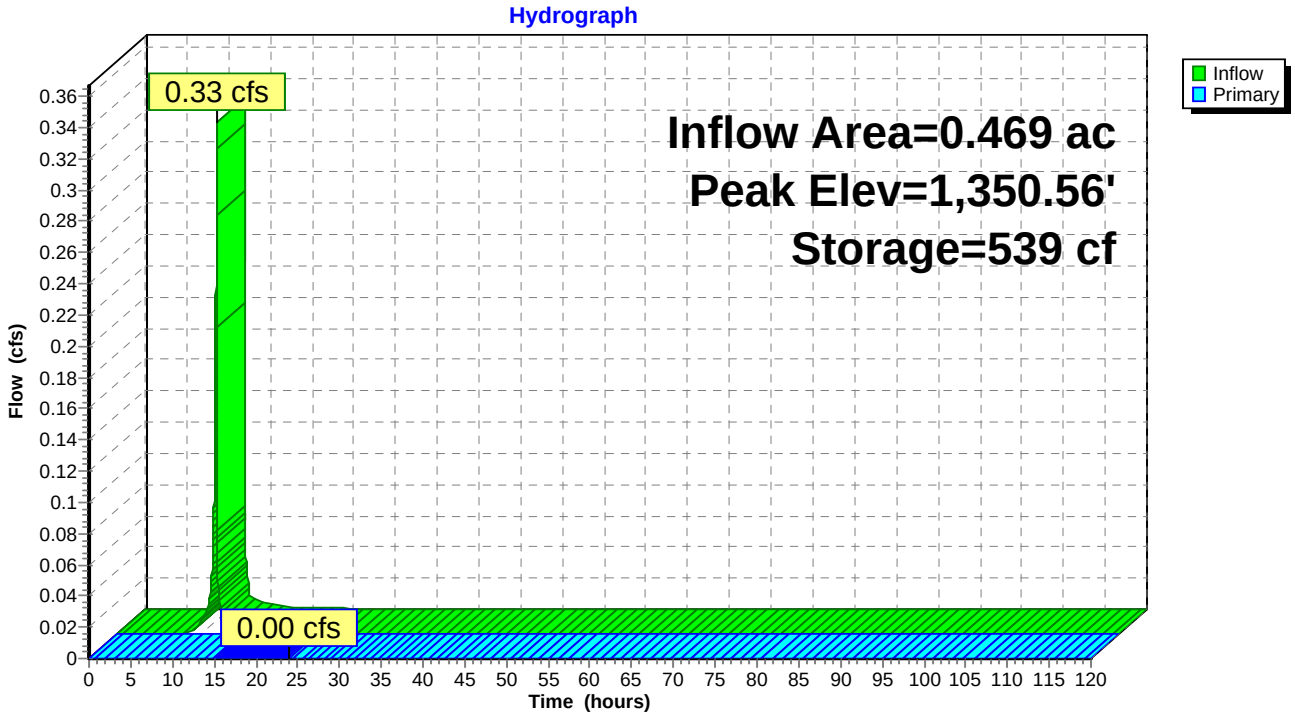
Volume	Invert	Avail.Storage	Storage Description
#1	1,348.00'	2,214 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,348.00	786	136.5	0.0	0	0	786
1,349.00	786	136.5	25.0	197	197	923
1,349.50	786	136.5	25.0	98	295	991
1,350.00	786	136.5	25.0	98	393	1,059
1,350.50	786	136.5	25.0	98	491	1,127
1,351.00	1,026	151.0	100.0	452	943	1,467
1,352.00	1,534	174.5	100.0	1,272	2,214	2,097

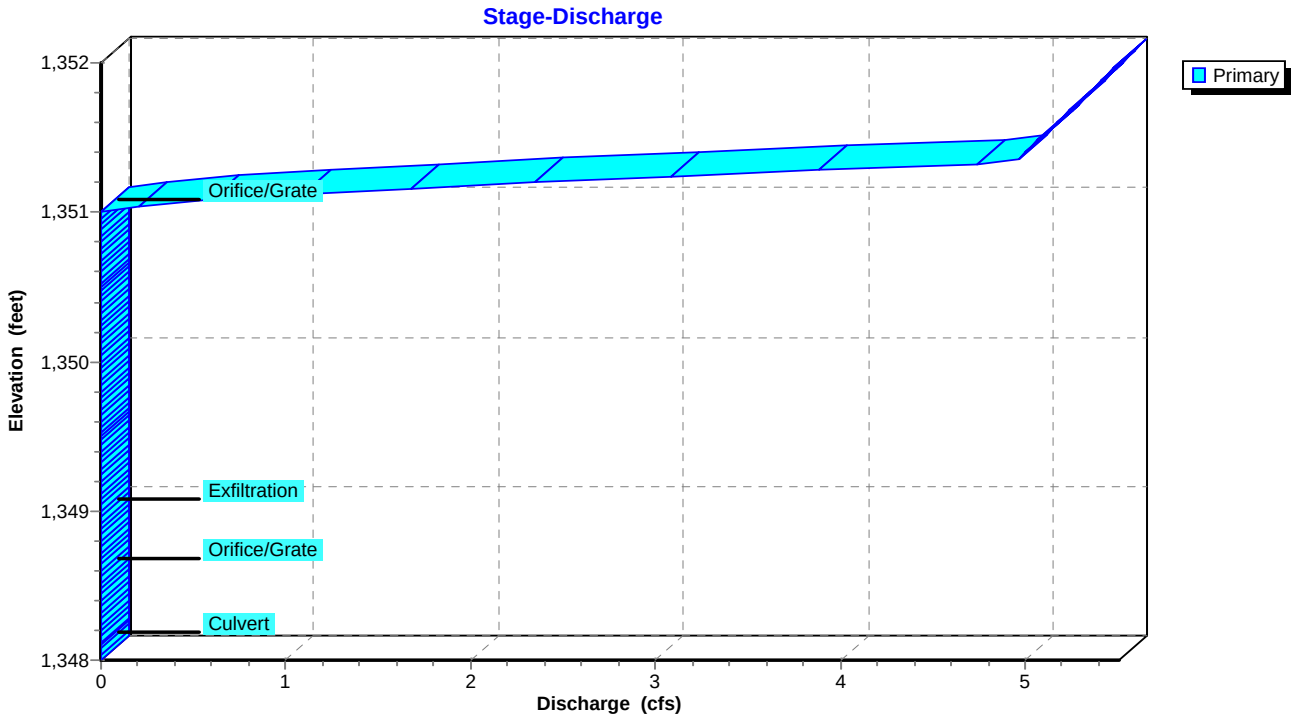
Device	Routing	Invert	Outlet Devices
#1	Primary	1,348.10'	**12.0" Round Culvert** L= 19.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,348.10' / 1,348.00' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,348.60'	**0.4" Horiz. Orifice/Grate X 960.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,349.00'	**0.250 in/hr Exfiltration over Surface area above 1,349.00'** Conductivity to Groundwater Elevation = 1,347.50' Excluded Surface area = 786 sf
#4	Device 1	1,351.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 24.01 hrs HW=1,350.56' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.00 cfs of 4.18 cfs potential flow)
- **2=Orifice/Grate** (Passes 0.00 cfs of 5.65 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)

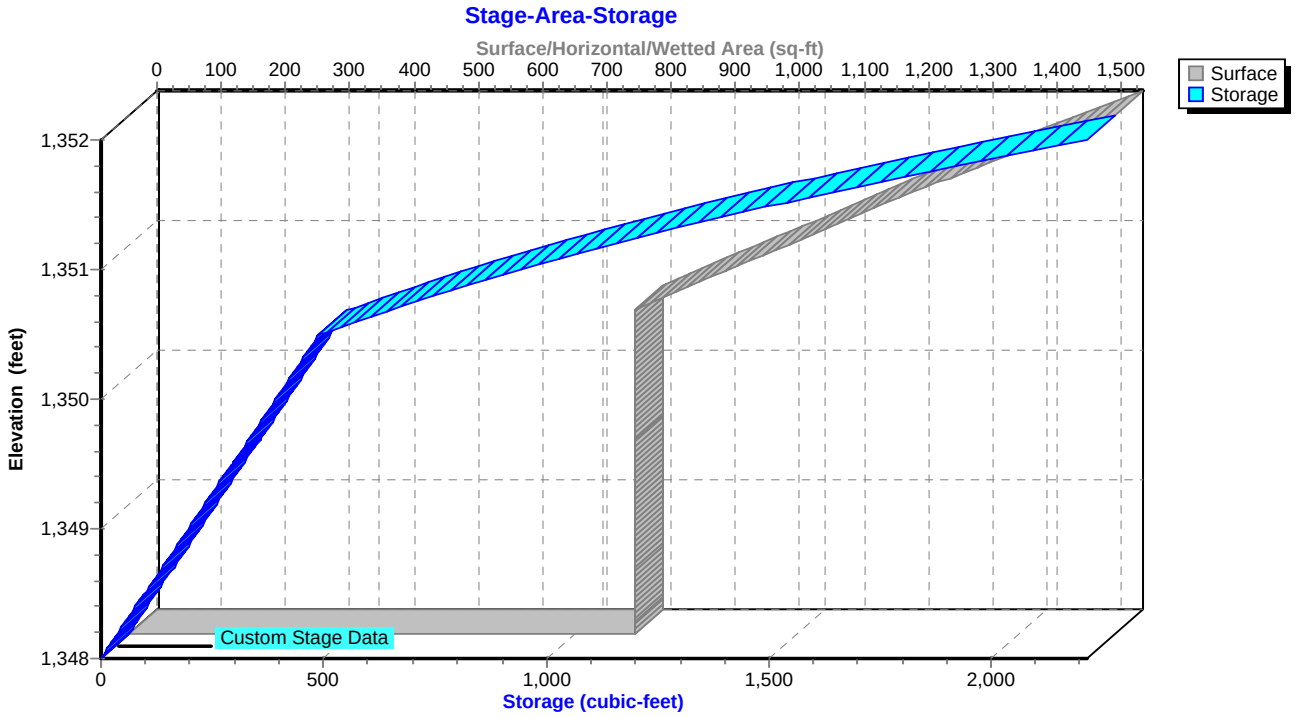
Pond 5P: Bioretention Area B



Pond 5P: Bioretention Area B



Pond 5P: Bioretention Area B



Summary for Pond 11P: Pocket Wetland 29B

Inflow Area = 1.788 ac, 51.12% Impervious, Inflow Depth = 1.42" for 1-YR, 24-HR Storm event
Inflow = 3.38 cfs @ 12.03 hrs, Volume= 0.212 af
Outflow = 0.73 cfs @ 12.44 hrs, Volume= 0.209 af, Atten= 78%, Lag= 24.2 min
Primary = 0.73 cfs @ 12.44 hrs, Volume= 0.209 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,442.00' Surf.Area= 3,817 sf Storage= 5,150 cf
Peak Elev= 1,442.86' @ 12.44 hrs Surf.Area= 5,330 sf Storage= 9,075 cf (3,925 cf above start)

Plug-Flow detention time= 722.2 min calculated for 0.091 af (43% of inflow)
Center-of-Mass det. time= 247.7 min (1,069.9 - 822.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,438.00'	20,412 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

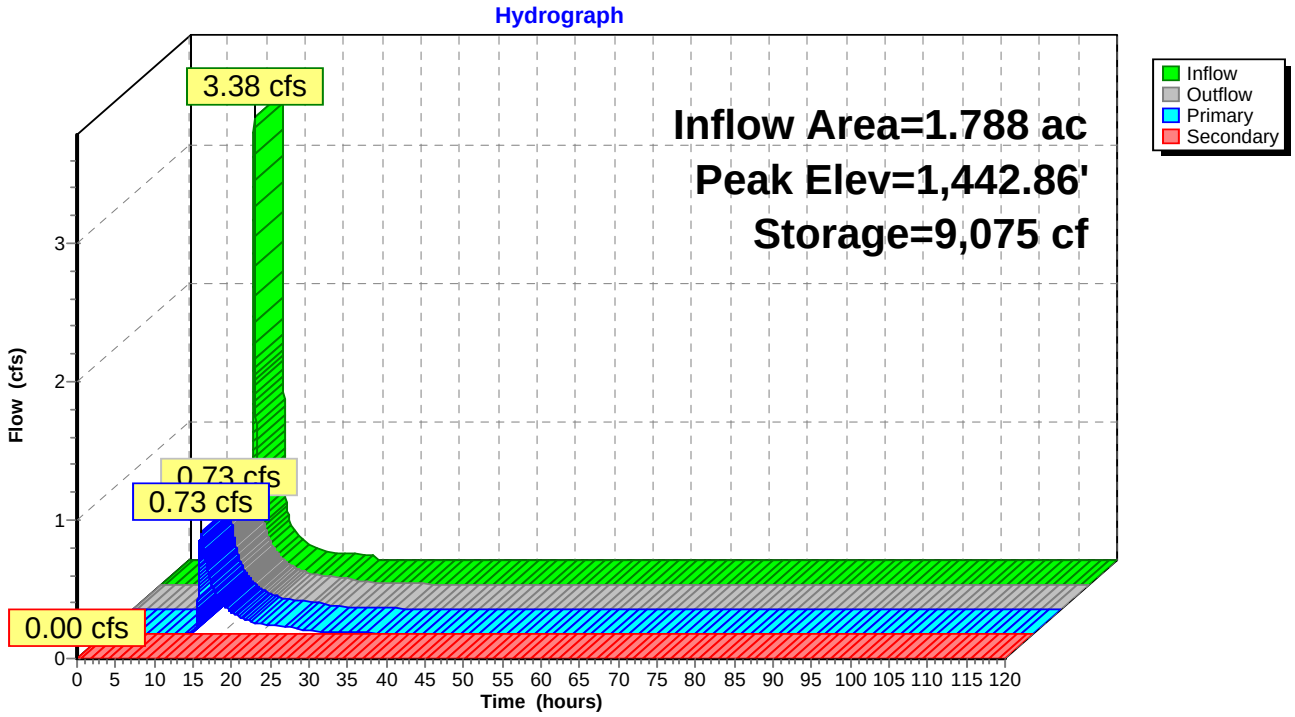
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,438.00	74	30.7	0	0	74
1,439.00	207	53.8	135	135	235
1,440.00	720	190.6	438	573	2,898
1,441.00	2,419	328.2	1,486	2,059	8,585
1,442.00	3,817	444.2	3,092	5,150	15,726
1,443.00	5,595	534.5	4,678	9,828	22,775
1,444.00	7,680	353.3	6,610	16,438	35,585
1,444.50	8,217	362.0	3,973	20,412	36,111

Device	Routing	Invert	Outlet Devices
#1	Primary	1,442.00'	**45.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)
#2	Secondary	1,443.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

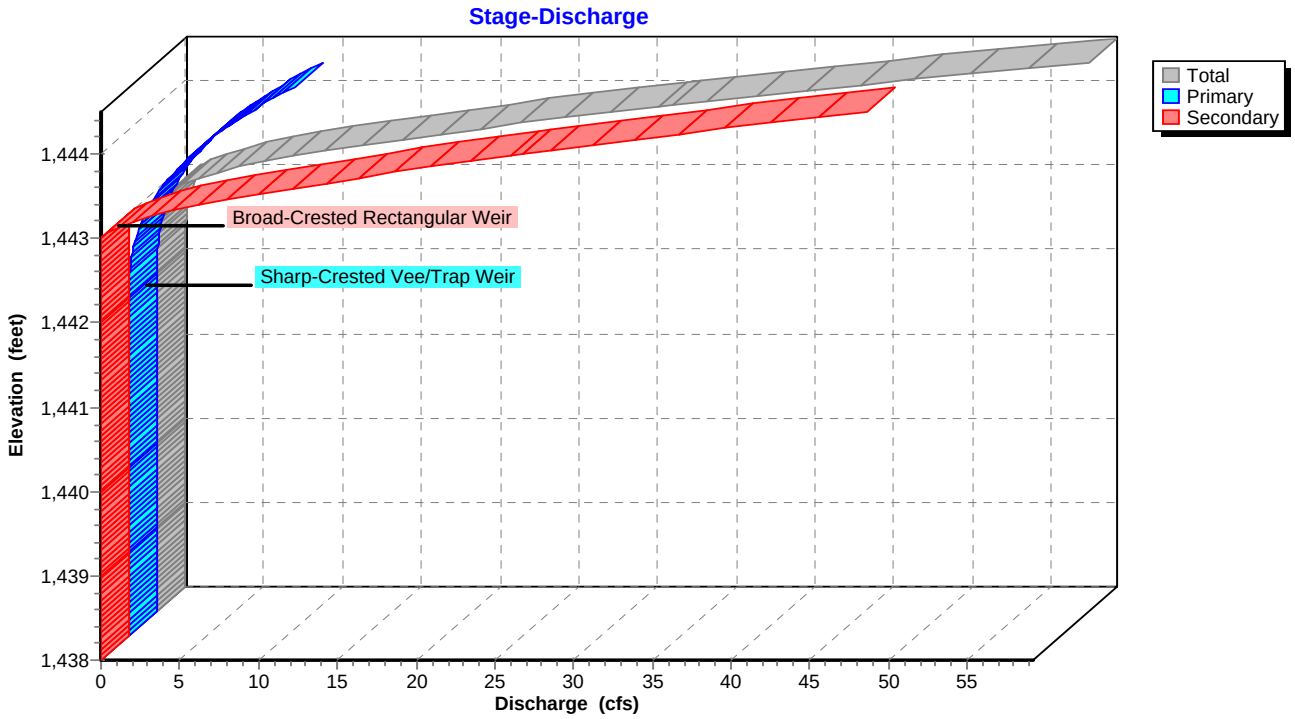
Primary OutFlow Max=0.73 cfs @ 12.44 hrs HW=1,442.86' TW=0.00' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.73 cfs @ 2.38 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,442.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

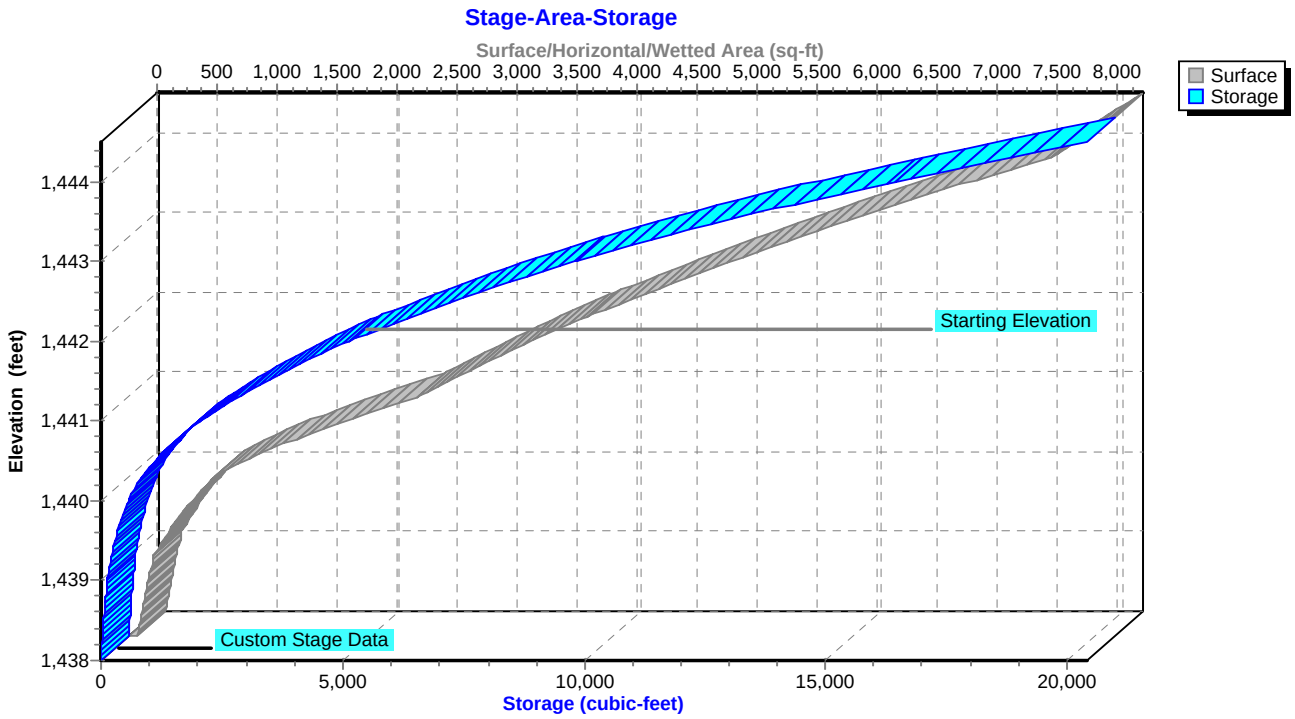
Pond 11P: Pocket Wetland 29B



Pond 11P: Pocket Wetland 29B



Pond 11P: Pocket Wetland 29B



Summary for Pond 12P: Pocket Wetland 29A

Inflow Area = 0.448 ac, 43.53% Impervious, Inflow Depth = 1.34" for 1-YR, 24-HR Storm event
Inflow = 0.81 cfs @ 12.04 hrs, Volume= 0.050 af
Outflow = 0.74 cfs @ 12.07 hrs, Volume= 0.050 af, Atten= 9%, Lag= 1.9 min
Primary = 0.74 cfs @ 12.07 hrs, Volume= 0.050 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,443.50' Surf.Area= 1,339 sf Storage= 1,565 cf
Peak Elev= 1,443.60' @ 12.07 hrs Surf.Area= 1,390 sf Storage= 1,700 cf (134 cf above start)

Plug-Flow detention time= 385.2 min calculated for 0.014 af (28% of inflow)
Center-of-Mass det. time= 6.8 min (831.6 - 824.8)

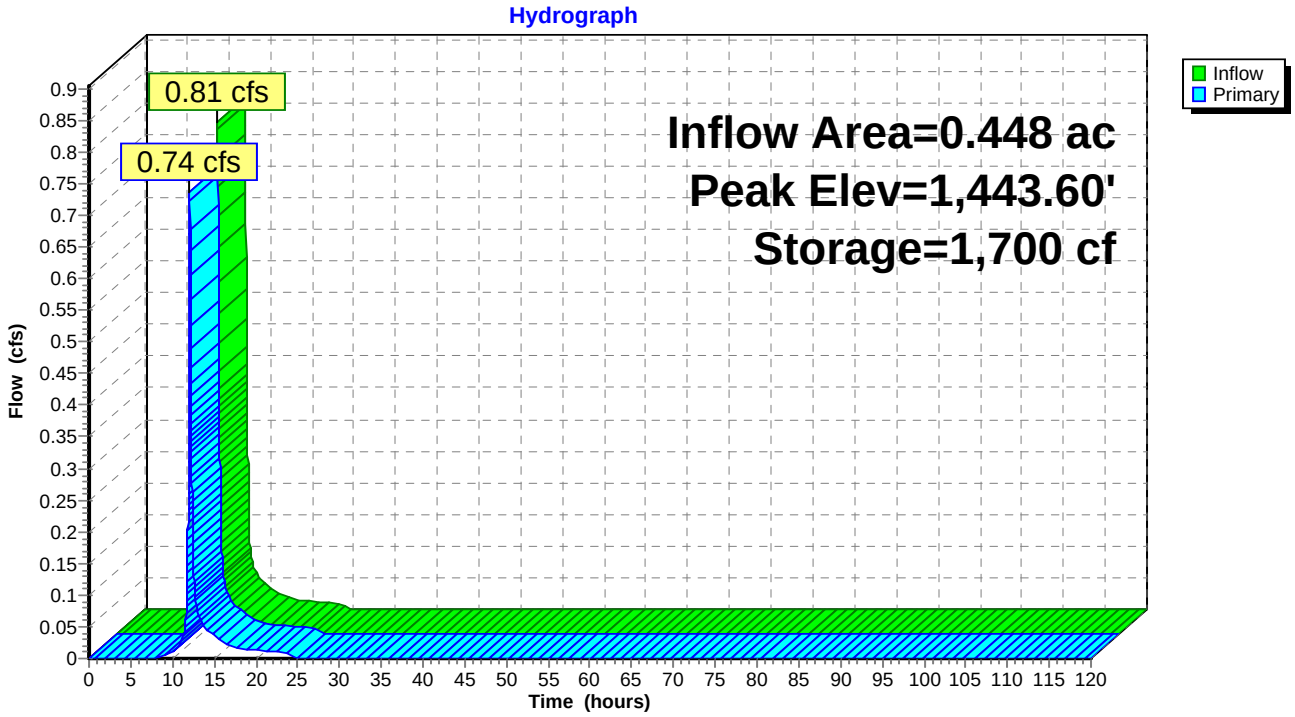
Volume	Invert	Avail.Storage	Storage Description
#1	1,441.00'	4,185 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,441.00	166	50.3	0	0	166
1,442.00	367	74.7	260	260	417
1,443.00	1,094	161.8	698	958	2,060
1,444.00	1,608	180.7	1,343	2,301	2,603
1,445.00	2,175	199.2	1,884	4,185	3,194

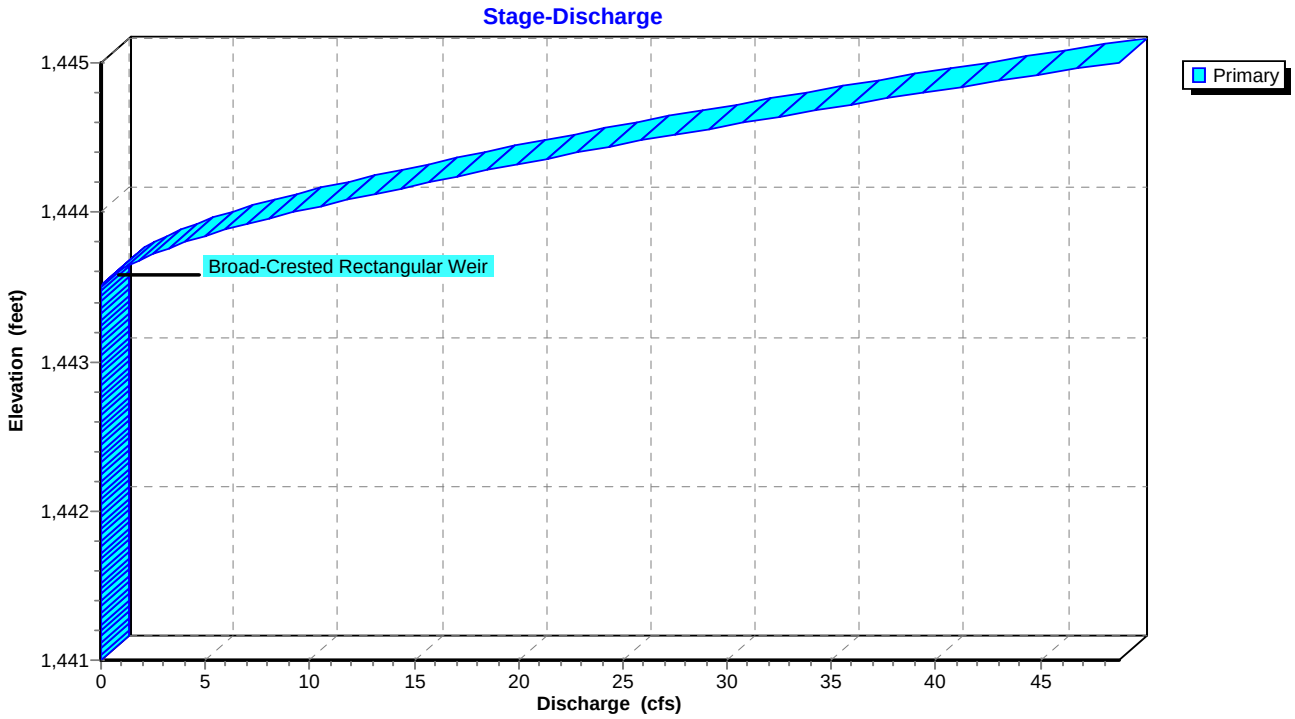
Device	Routing	Invert	Outlet Devices
#1	Primary	1,443.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.74 cfs @ 12.07 hrs HW=1,443.60' TW=0.00' (Dynamic Tailwater)
↑—**1=Broad-Crested Rectangular Weir** (Weir Controls 0.74 cfs @ 0.75 fps)

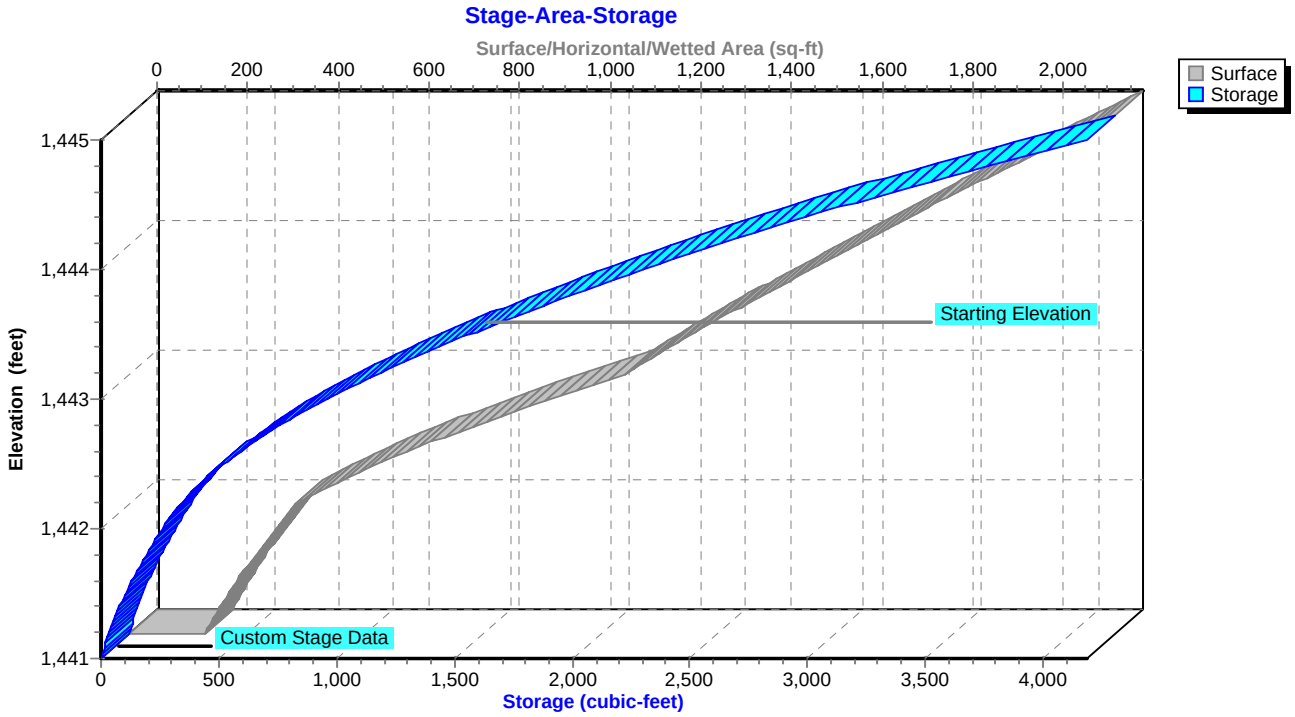
Pond 12P: Pocket Wetland 29A



Pond 12P: Pocket Wetland 29A



Pond 12P: Pocket Wetland 29A



Summary for Pond 13P: Flow Splitter to SW 29A

[57] Hint: Peaked at 1,443.84' (Flood elevation advised)

Inflow Area = 0.369 ac, 50.68% Impervious, Inflow Depth = 1.47" for 1-YR, 24-HR Storm event
Inflow = 0.74 cfs @ 12.03 hrs, Volume= 0.045 af
Outflow = 0.74 cfs @ 12.04 hrs, Volume= 0.045 af, Atten= 0%, Lag= 0.6 min
Primary = 0.74 cfs @ 12.04 hrs, Volume= 0.045 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

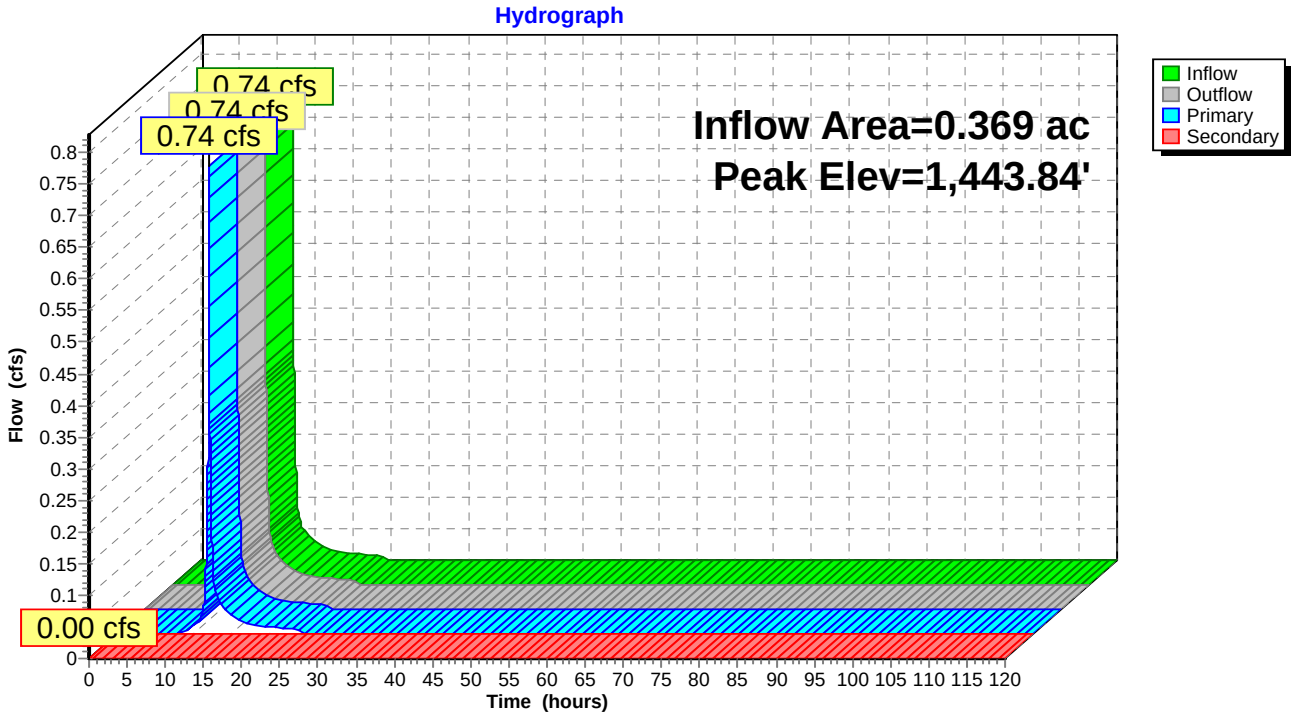
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,443.84' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,443.30'	**15.0" Round CMP_Round 15"** L= 41.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,443.30' / 1,443.00' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,443.30'	**15.0" Round Bypass Culvert** L= 46.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,443.30' / 1,443.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,444.10'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

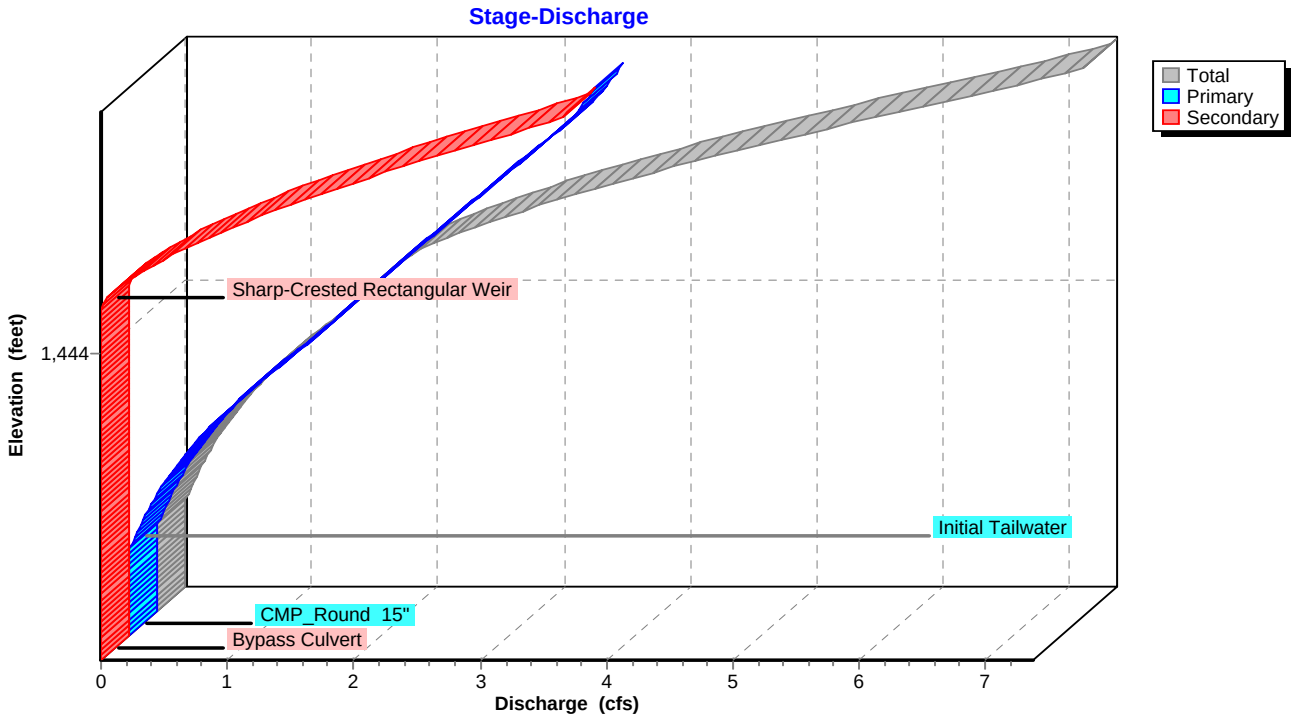
Primary OutFlow Max=0.73 cfs @ 12.04 hrs HW=1,443.83' TW=1,443.59' (Dynamic Tailwater)
↑—**1=CMP_Round 15"** (Outlet Controls 0.73 cfs @ 2.15 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,443.50' TW=0.00' (Dynamic Tailwater)
↑—**2=Bypass Culvert** (Passes 0.00 cfs of 0.15 cfs potential flow)
↑—**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

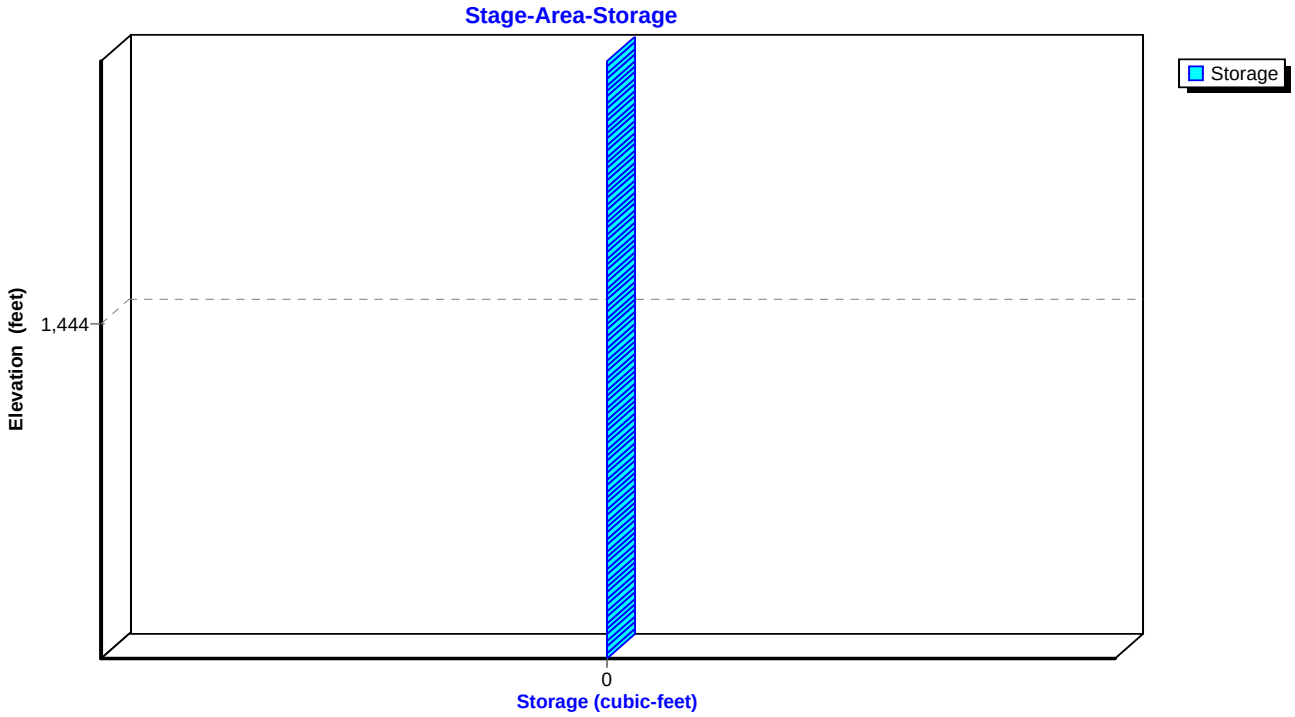
Pond 13P: Flow Splitter to SW 29A



Pond 13P: Flow Splitter to SW 29A



Pond 13P: Flow Splitter to SW 29A



Summary for Pond 93P: Flow Splitter to BMP

Inflow Area = 1.239 ac, 44.15% Impervious, Inflow Depth = 1.27" for 1-YR, 24-HR Storm event
Inflow = 2.14 cfs @ 12.03 hrs, Volume= 0.131 af
Outflow = 2.14 cfs @ 12.04 hrs, Volume= 0.131 af, Atten= 0%, Lag= 0.6 min
Primary = 1.49 cfs @ 12.04 hrs, Volume= 0.126 af
Secondary = 0.64 cfs @ 12.04 hrs, Volume= 0.005 af

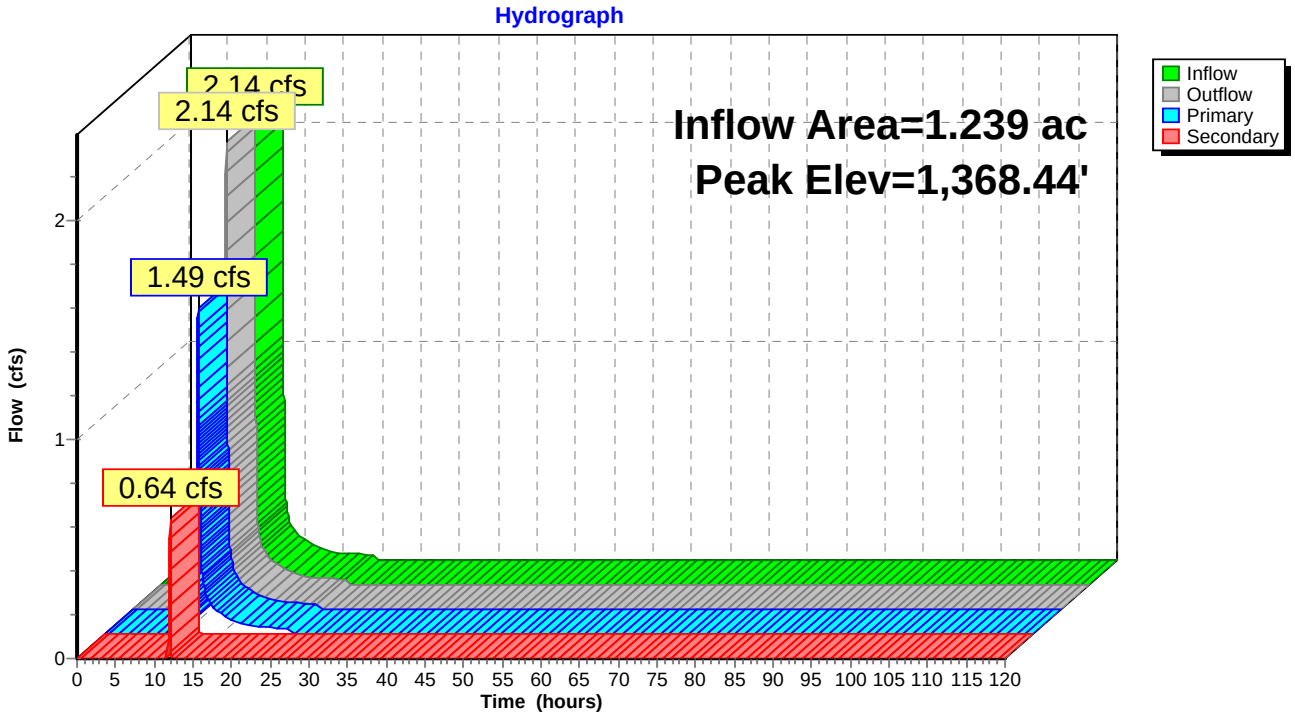
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,368.44' @ 12.04 hrs
Flood Elev= 1,369.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,367.76'	**15.0" Round Culvert** L= 21.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,367.76' / 1,366.50' S= 0.0578 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,367.76'	**15.0" Round Culvert** L= 93.7' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,367.76' / 1,363.37' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,368.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

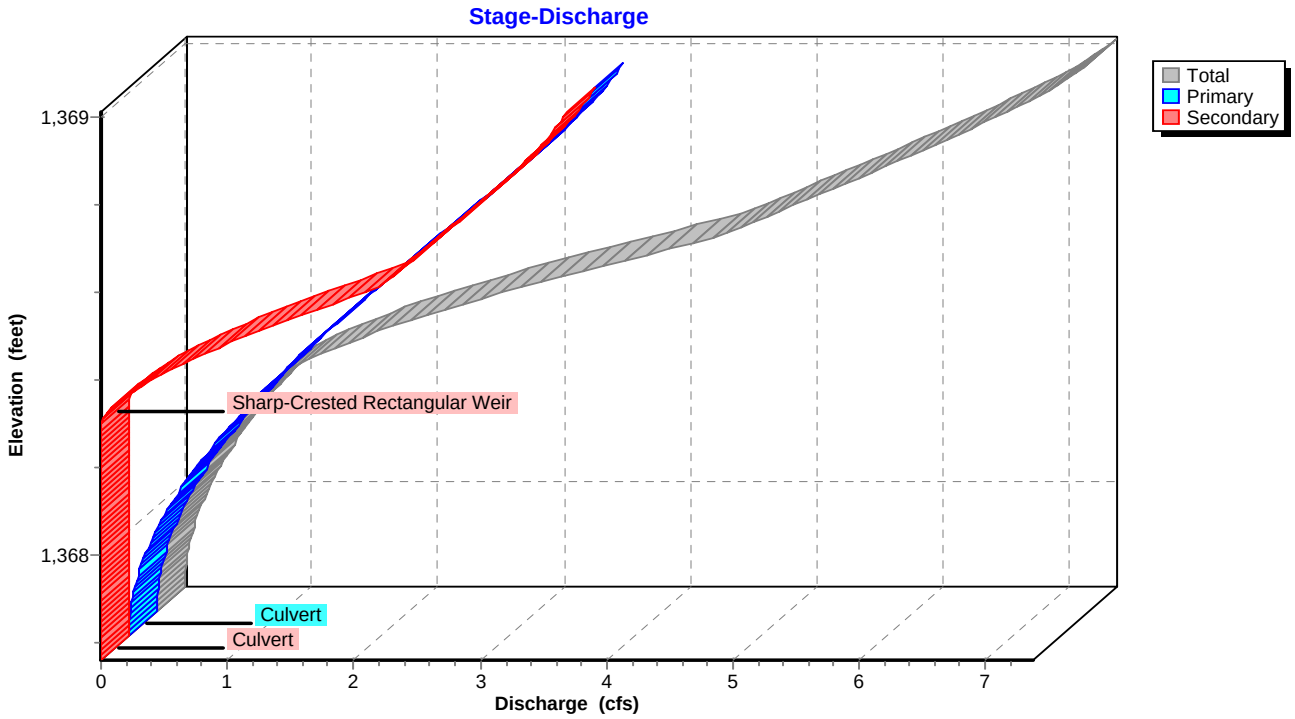
Primary OutFlow Max=1.49 cfs @ 12.04 hrs HW=1,368.43' TW=1,363.33' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 1.49 cfs @ 2.21 fps)

Secondary OutFlow Max=0.64 cfs @ 12.04 hrs HW=1,368.43' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Passes 0.64 cfs of 1.49 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.64 cfs @ 1.20 fps)

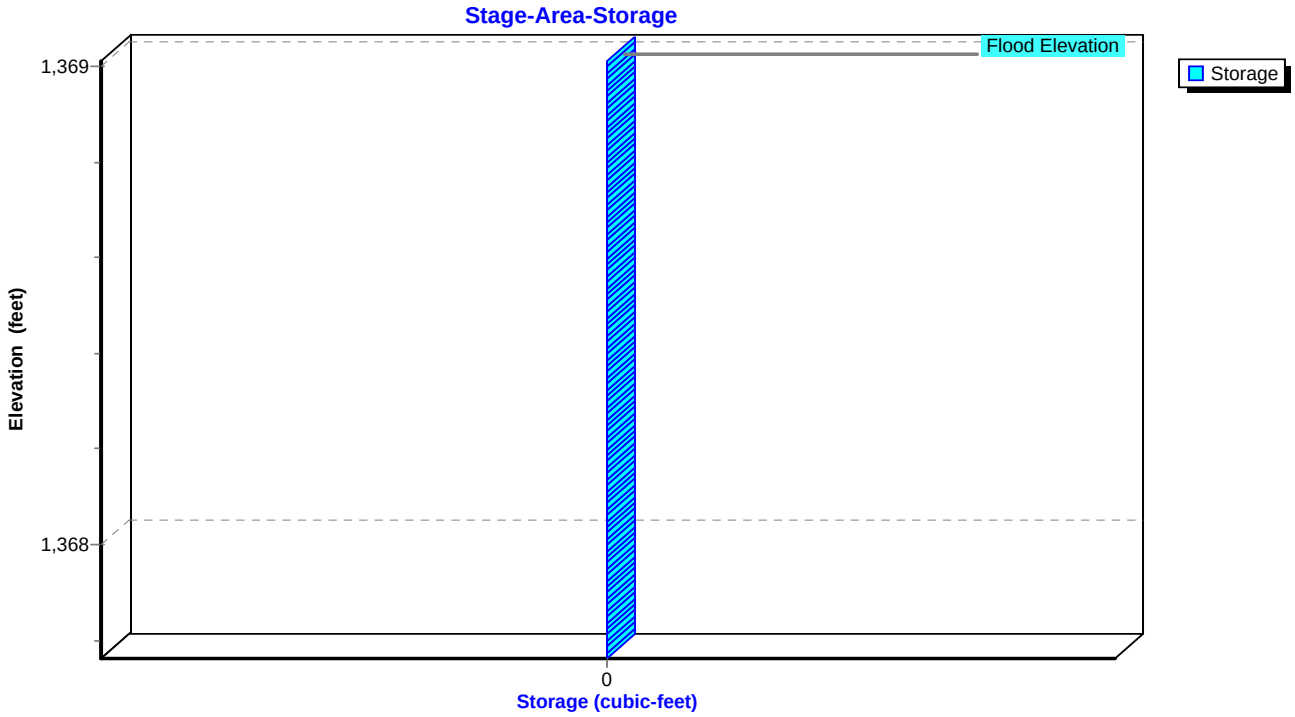
Pond 93P: Flow Splitter to BMP



Pond 93P: Flow Splitter to BMP



Pond 93P: Flow Splitter to BMP



Summary for Pond 94P: Stormwater Wetland C

Inflow Area = 0.959 ac, 50.05% Impervious, Inflow Depth = 1.41" for 1-YR, 24-HR Storm event
Inflow = 1.82 cfs @ 12.03 hrs, Volume= 0.113 af
Outflow = 0.38 cfs @ 12.44 hrs, Volume= 0.111 af, Atten= 79%, Lag= 24.7 min
Primary = 0.31 cfs @ 12.44 hrs, Volume= 0.110 af
Secondary = 0.07 cfs @ 12.44 hrs, Volume= 0.001 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,347.50' Surf.Area= 2,565 sf Storage= 2,214 cf
Peak Elev= 1,348.22' @ 12.44 hrs Surf.Area= 3,495 sf Storage= 4,429 cf (2,215 cf above start)

Plug-Flow detention time= 692.7 min calculated for 0.060 af (53% of inflow)
Center-of-Mass det. time= 299.2 min (1,119.8 - 820.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,345.00'	7,418 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

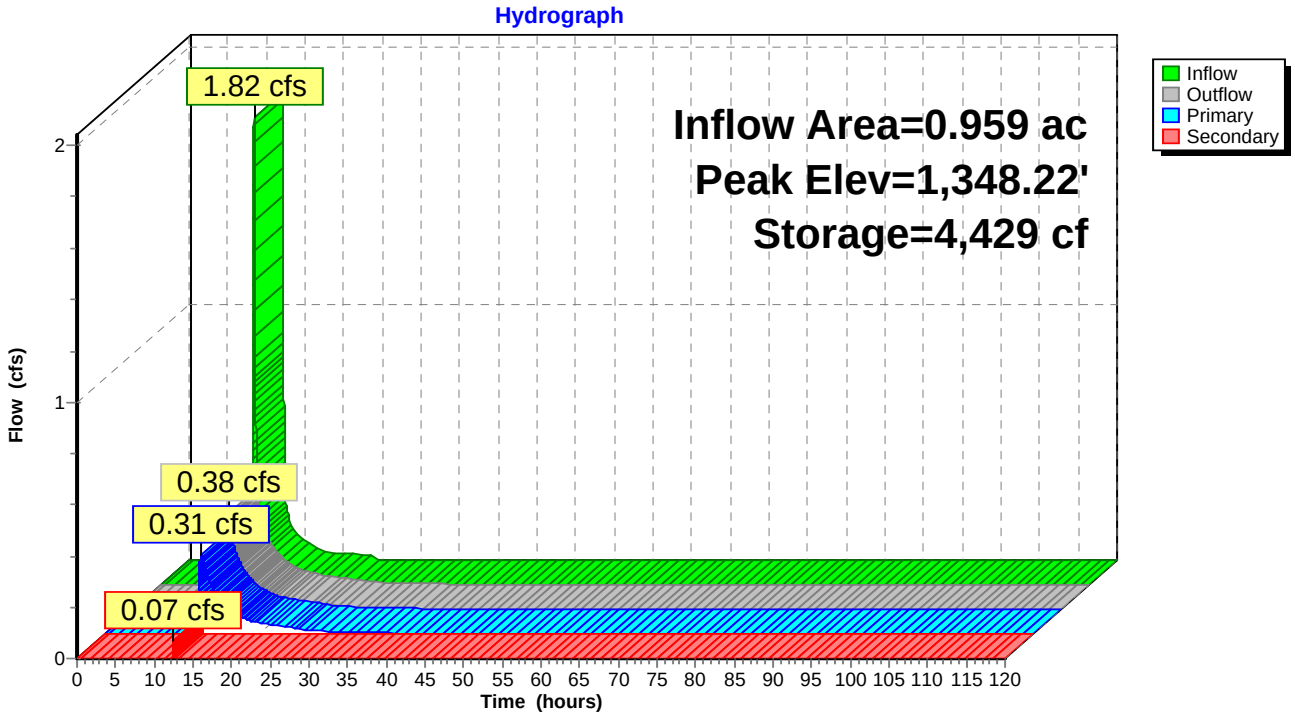
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,345.00	25	39.0	0	0	25
1,346.00	323	286.8	146	146	6,452
1,347.00	1,831	404.5	974	1,120	12,936
1,347.50	2,565	404.6	1,094	2,214	13,138
1,348.00	3,311	405.0	1,465	3,679	13,342
1,349.00	4,184	299.4	3,739	7,418	19,272

Device	Routing	Invert	Outlet Devices
#1	Primary	1,347.50'	**30.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.61 (C= 3.26)
#2	Secondary	1,348.20'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

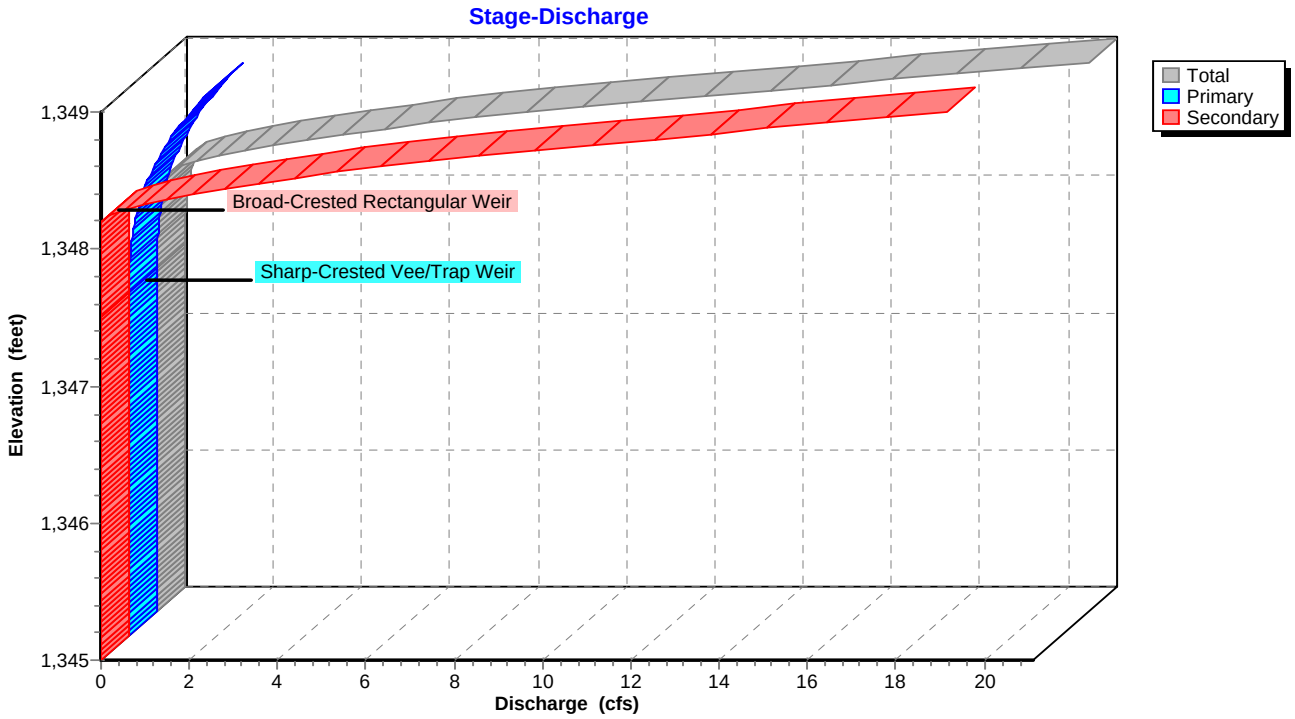
Primary OutFlow Max=0.31 cfs @ 12.44 hrs HW=1,348.22' (Free Discharge)
1=Sharp-Crested Vee/Trap Weir (Weir Controls 0.31 cfs @ 2.22 fps)

Secondary OutFlow Max=0.07 cfs @ 12.44 hrs HW=1,348.22' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 0.07 cfs @ 0.33 fps)

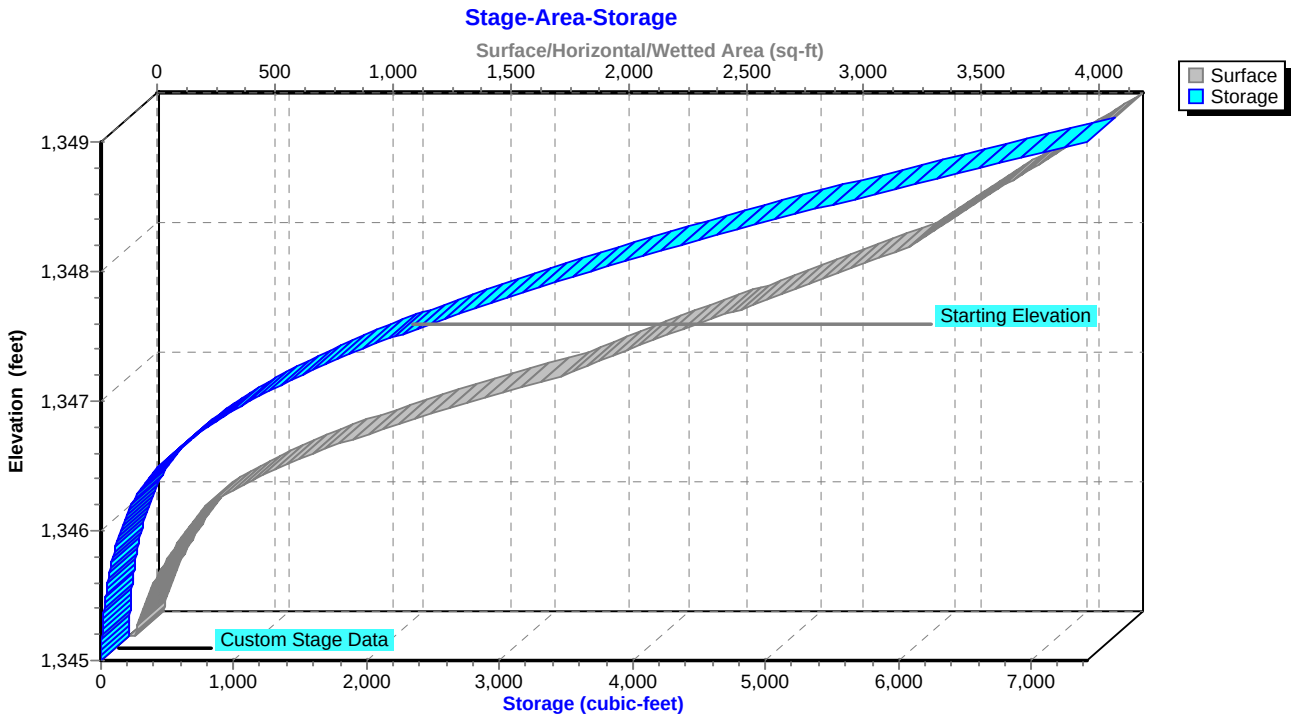
Pond 94P: Stormwater Wetland C



Pond 94P: Stormwater Wetland C



Pond 94P: Stormwater Wetland C



Summary for Pond 95P: Bioretention Area F

Inflow Area = 0.564 ac, 44.68% Impervious, Inflow Depth = 1.23" for 1-YR, 24-HR Storm event
Inflow = 0.95 cfs @ 12.02 hrs, Volume= 0.058 af
Outflow = 0.06 cfs @ 13.77 hrs, Volume= 0.033 af, Atten= 94%, Lag= 104.8 min
Primary = 0.06 cfs @ 13.77 hrs, Volume= 0.033 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,349.51' @ 13.77 hrs Surf.Area= 1,582 sf Storage= 1,651 cf

Plug-Flow detention time= 1,241.4 min calculated for 0.033 af (57% of inflow)
Center-of-Mass det. time= 1,127.2 min (1,958.0 - 830.9)

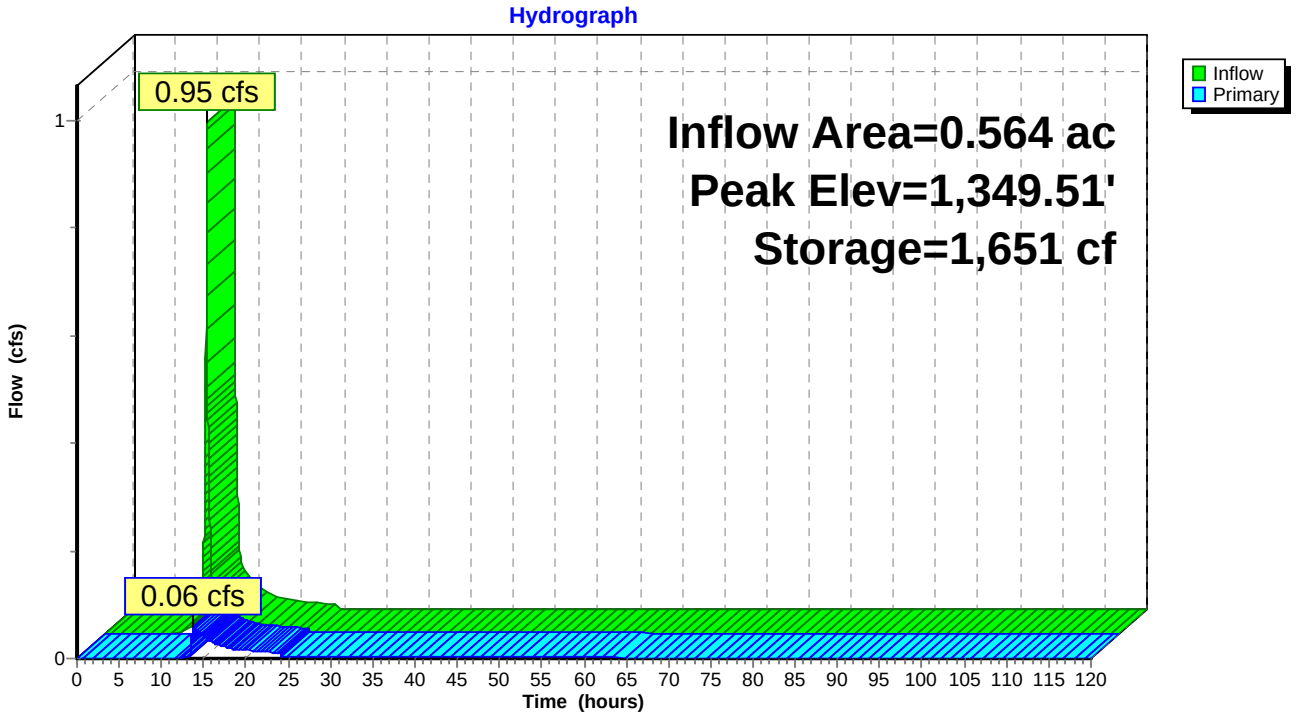
Volume	Invert	Avail.Storage	Storage Description
#1	1,345.00'	6,415 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,345.00	996	183.4	0.0	0	0	996
1,345.50	996	183.4	25.0	125	125	1,088
1,346.00	996	183.4	25.0	125	249	1,179
1,347.00	996	183.4	25.0	249	498	1,363
1,348.00	996	183.4	25.0	249	747	1,546
1,349.00	996	183.4	25.0	249	996	1,730
1,350.00	2,264	464.7	100.0	1,587	2,583	16,241
1,351.00	5,654	1,195.0	100.0	3,832	6,415	112,699

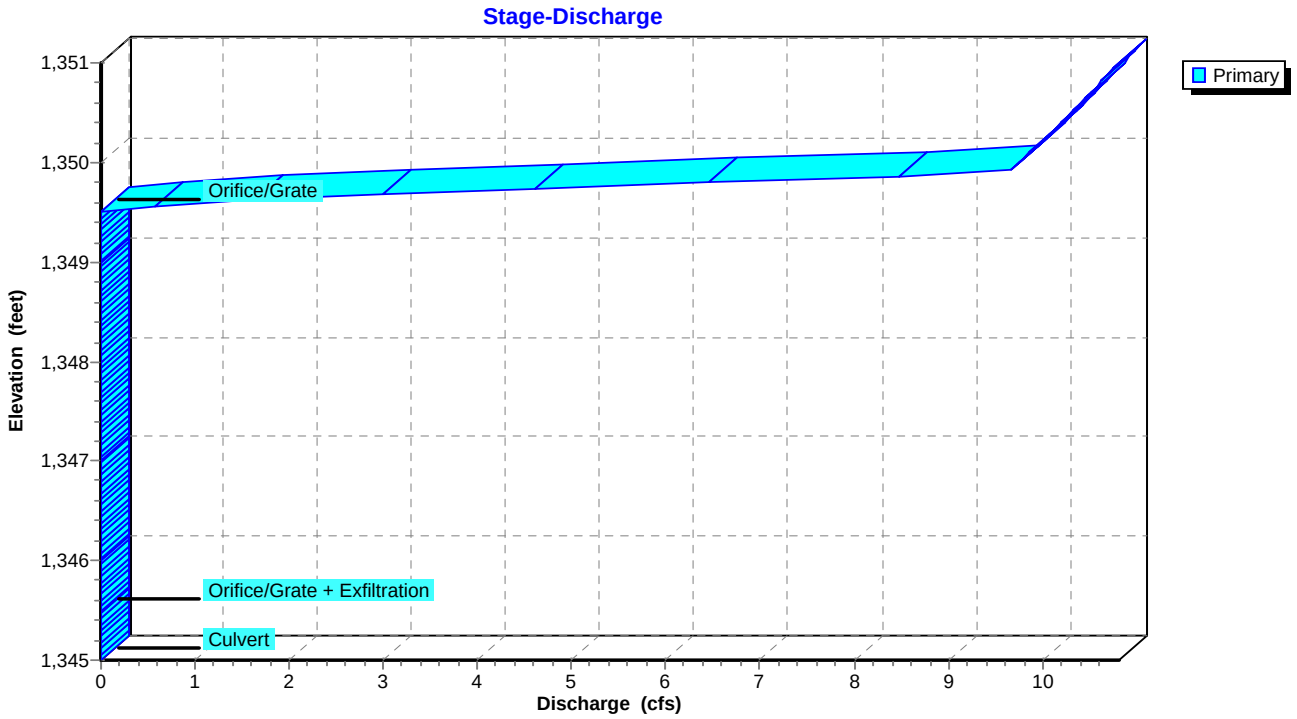
Device	Routing	Invert	Outlet Devices
#1	Primary	1,345.00'	**15.0" Round Culvert** L= 78.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,345.00' / 1,344.20' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,345.50'	**0.4" Horiz. Orifice/Grate X 340.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,345.50'	**0.250 in/hr Exfiltration over Surface area above 1,345.50'** Conductivity to Groundwater Elevation = 1,344.50' Excluded Surface area = 996 sf
#4	Device 1	1,349.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.06 cfs @ 13.77 hrs HW=1,349.51' (Free Discharge)
└**1=Culvert** (Passes 0.06 cfs of 9.20 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.00 cfs of 11.45 cfs potential flow)
└**3=Exfiltration** (Controls 0.00 cfs)
└**4=Orifice/Grate** (Weir Controls 0.06 cfs @ 0.37 fps)

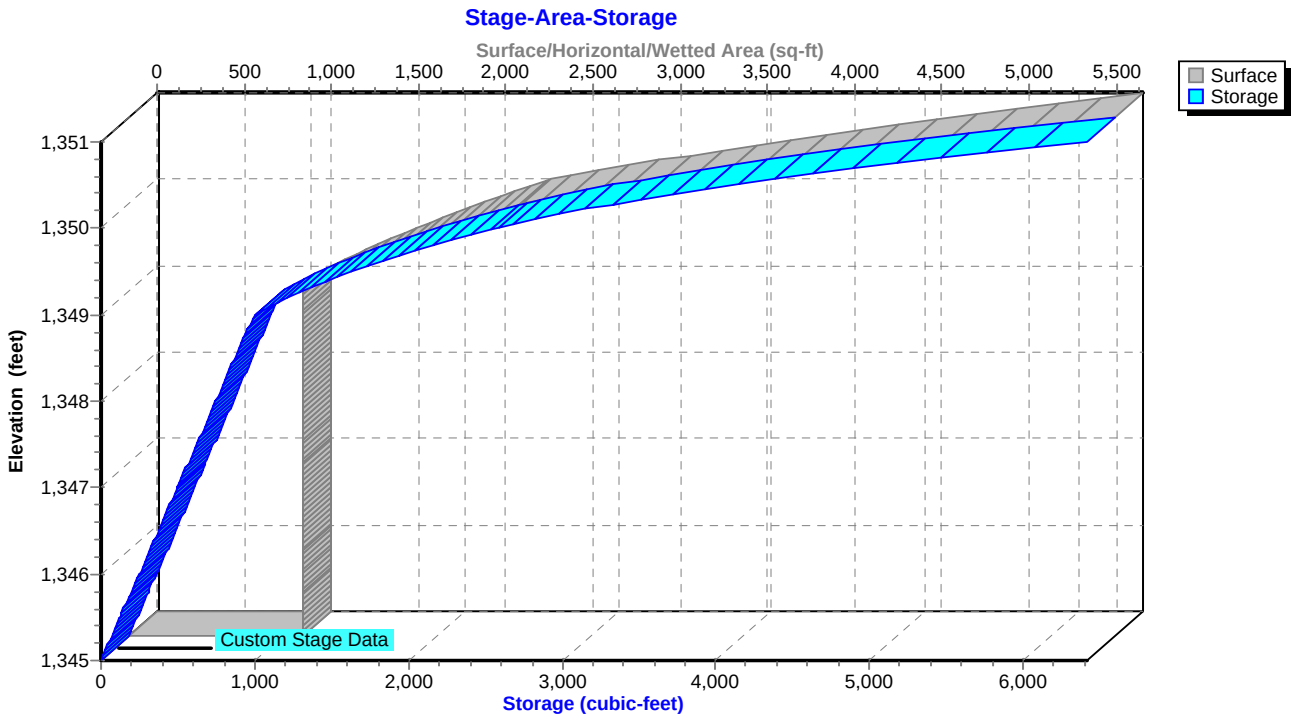
Pond 95P: Bioretention Area F



Pond 95P: Bioretention Area F



Pond 95P: Bioretention Area F



Summary for Pond 99P: Stormwater Pocket Wetland G

Inflow Area = 0.677 ac, 44.17% Impervious, Inflow Depth = 1.33" for 1-YR, 24-HR Storm event
Inflow = 1.24 cfs @ 12.02 hrs, Volume= 0.075 af
Outflow = 0.89 cfs @ 12.08 hrs, Volume= 0.075 af, Atten= 28%, Lag= 3.7 min
Primary = 0.89 cfs @ 12.08 hrs, Volume= 0.075 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,339.00' Surf.Area= 3,682 sf Storage= 5,147 cf
Peak Elev= 1,339.11' @ 12.08 hrs Surf.Area= 3,801 sf Storage= 5,559 cf (412 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 16.3 min (840.7 - 824.4)

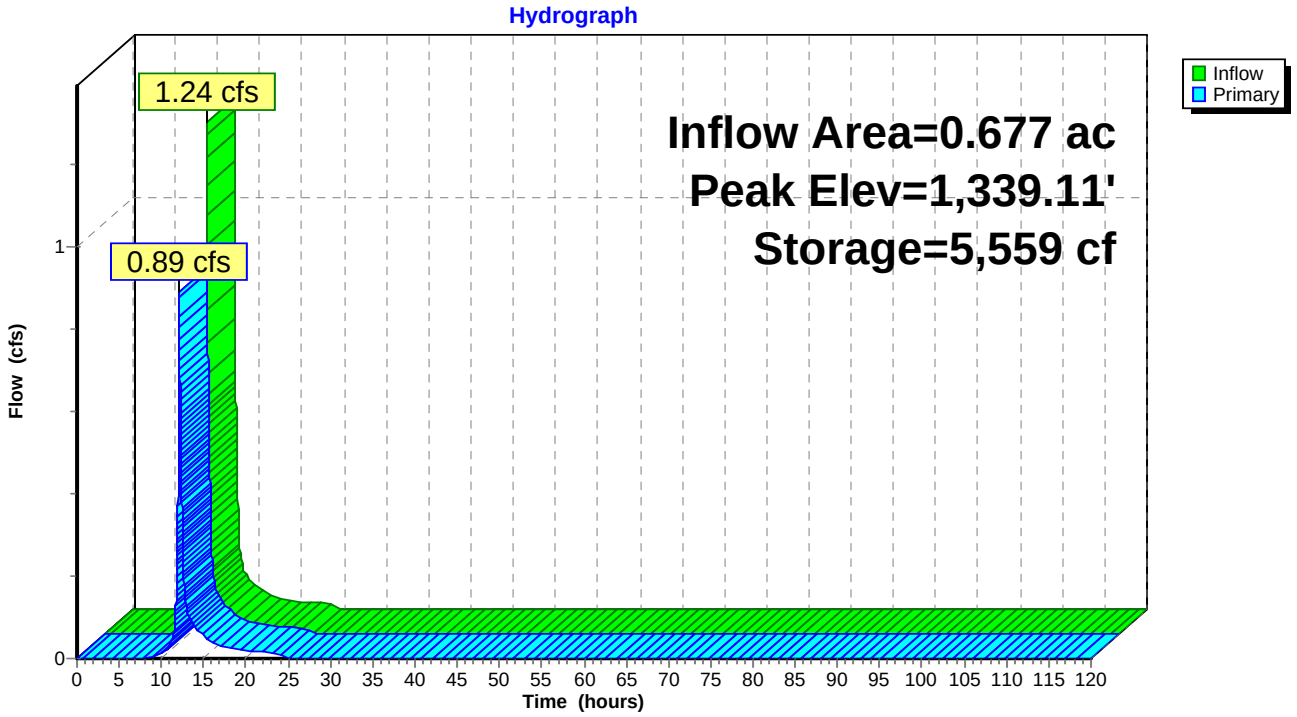
Volume	Invert	Avail.Storage	Storage Description
#1	1,335.00'	9,394 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,335.00	93	80.5	0	0	93
1,336.00	416	130.2	235	235	933
1,337.00	1,024	220.2	698	933	3,449
1,338.00	1,932	236.2	1,454	2,387	4,073
1,339.00	3,682	404.5	2,760	5,147	12,660
1,340.00	4,837	491.2	4,246	9,394	18,856

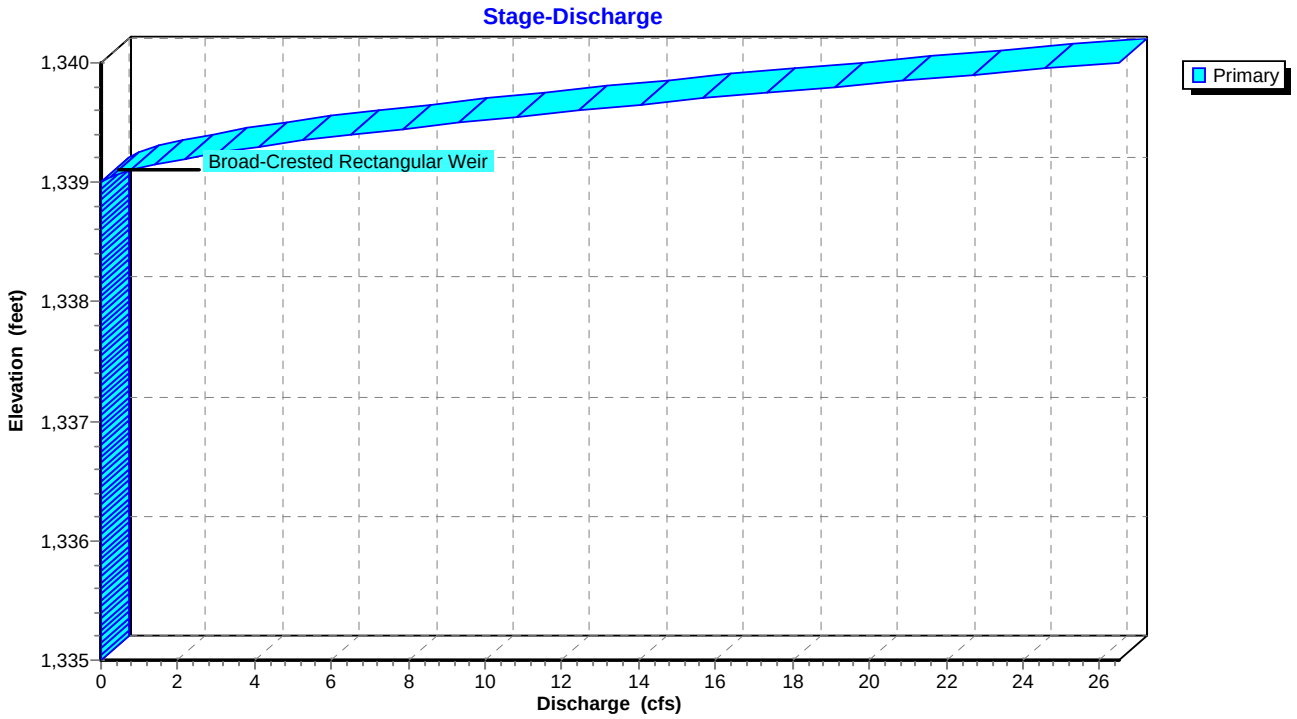
Device	Routing	Invert	Outlet Devices
#1	Primary	1,339.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.89 cfs @ 12.08 hrs HW=1,339.11' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.89 cfs @ 0.81 fps)

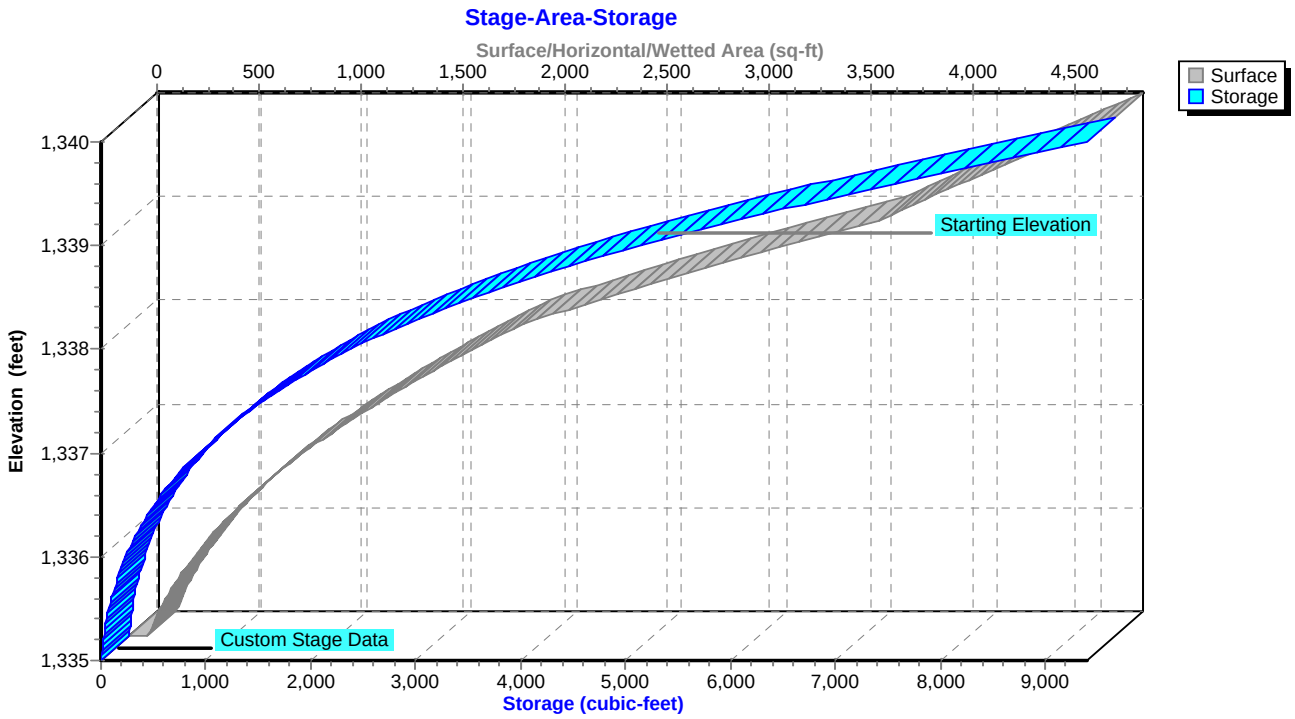
Pond 99P: Stormwater Pocket Wetland G



Pond 99P: Stormwater Pocket Wetland G



Pond 99P: Stormwater Pocket Wetland G



Summary for Pond 100P: Stormwater Wetland E

Inflow Area = 1.422 ac, 39.94% Impervious, Inflow Depth = 1.22" for 1-YR, 24-HR Storm event
Inflow = 2.35 cfs @ 12.03 hrs, Volume= 0.145 af
Outflow = 1.59 cfs @ 12.10 hrs, Volume= 0.145 af, Atten= 32%, Lag= 4.2 min
Primary = 0.52 cfs @ 12.10 hrs, Volume= 0.123 af
Secondary = 1.07 cfs @ 12.10 hrs, Volume= 0.022 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,346.80' Surf.Area= 2,420 sf Storage= 2,588 cf
Peak Elev= 1,347.13' @ 12.10 hrs Surf.Area= 3,014 sf Storage= 3,479 cf (891 cf above start)

Plug-Flow detention time= 214.2 min calculated for 0.085 af (59% of inflow)
Center-of-Mass det. time= 11.9 min (843.6 - 831.8)

Volume	Invert	Avail.Storage	Storage Description
#1	1,343.00'	13,221 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

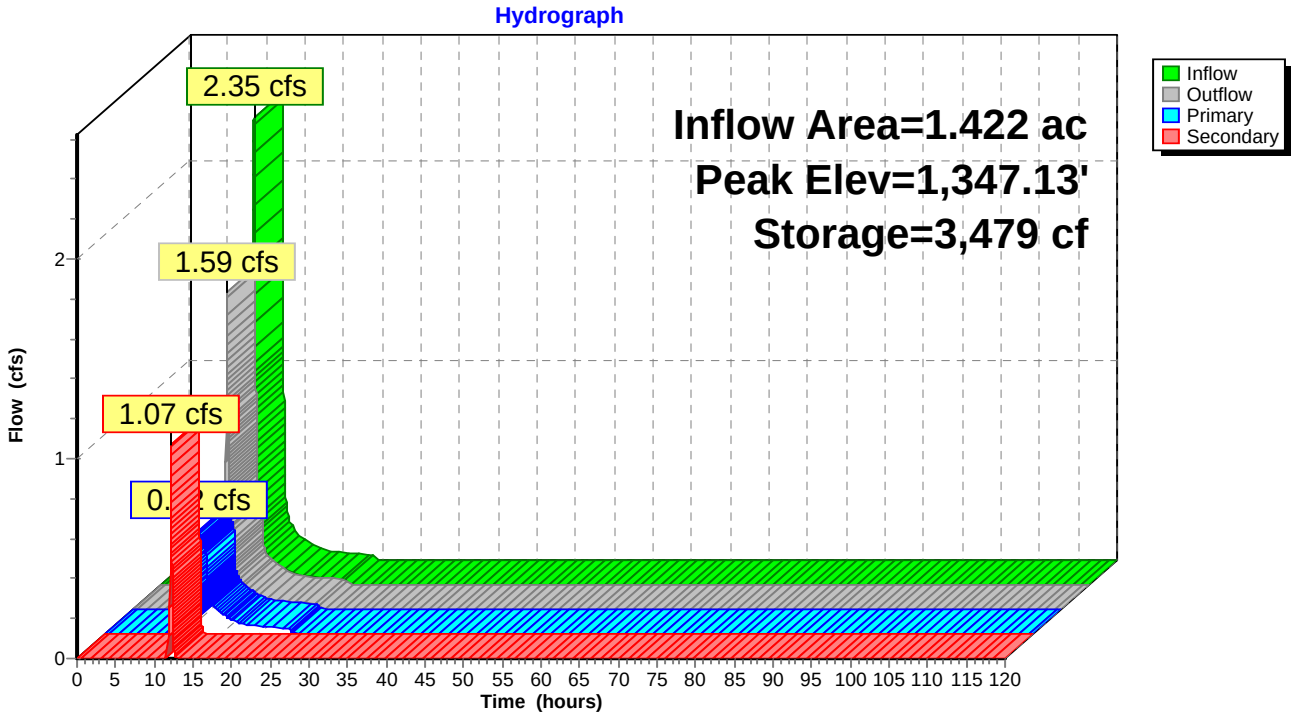
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,343.00	13	14.7	0	0	13
1,344.00	114	57.6	55	55	262
1,345.00	474	130.7	273	329	1,362
1,346.00	1,234	286.1	824	1,153	6,520
1,347.00	2,778	454.7	1,954	3,107	16,466
1,348.00	4,871	736.2	3,776	6,883	43,150
1,349.00	7,928	1,003.3	6,338	13,221	80,134

Device	Routing	Invert	Outlet Devices
#1	Primary	1,346.20'	**6.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,346.20' / 1,346.00' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Device 1	1,346.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	1,347.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

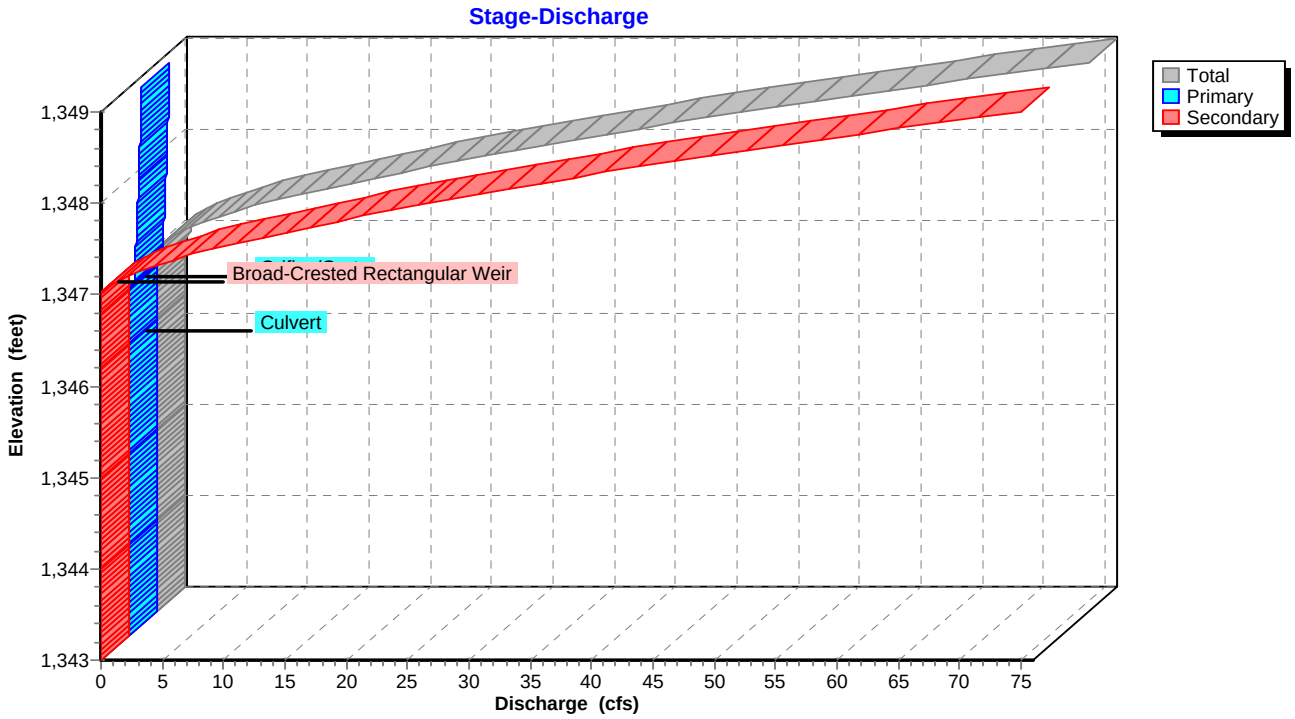
Primary OutFlow Max=0.52 cfs @ 12.10 hrs HW=1,347.13' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.52 cfs @ 2.63 fps)
└**2=Orifice/Grate** (Passes 0.52 cfs of 4.92 cfs potential flow)

Secondary OutFlow Max=1.07 cfs @ 12.10 hrs HW=1,347.13' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 1.07 cfs @ 0.84 fps)

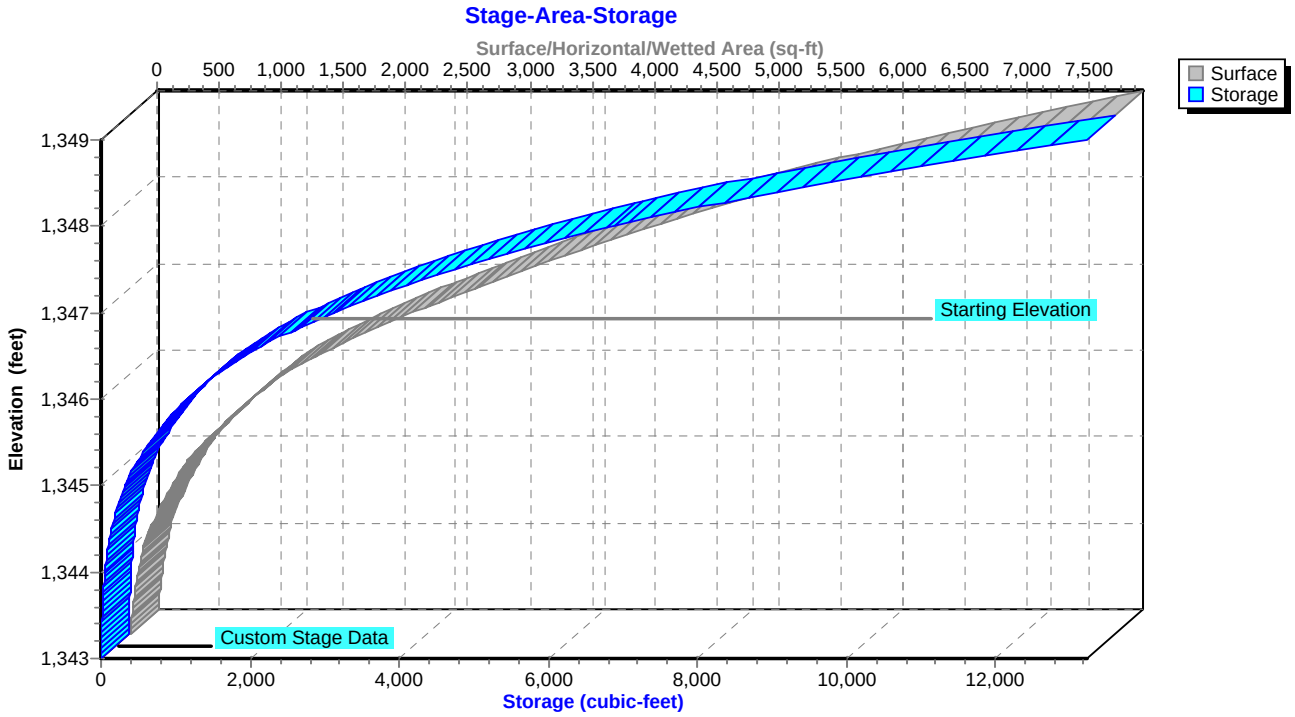
Pond 100P: Stormwater Wetland E



Pond 100P: Stormwater Wetland E



Pond 100P: Stormwater Wetland E



Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 1S: 30 Runoff Area=0.901 ac 52.39% Impervious Runoff Depth=4.63"
Flow Length=585' Tc=2.3 min CN=88 Runoff=5.40 cfs 0.347 af

Subcatchment 2S: SW30 Runoff Area=0.247 ac 34.82% Impervious Runoff Depth=3.99"
Tc=0.0 min CN=82 Runoff=1.40 cfs 0.082 af

Subcatchment 3S: 30A Runoff Area=0.277 ac 13.00% Impervious Runoff Depth=3.28"
Flow Length=197' Tc=24.8 min CN=75 Runoff=0.66 cfs 0.076 af

Subcatchment 4S: 29 Runoff Area=3.109 ac 7.14% Impervious Runoff Depth=3.28"
Flow Length=636' Tc=20.5 min CN=75 Runoff=7.99 cfs 0.850 af

Subcatchment 5S: 29A Runoff Area=1.558 ac 53.02% Impervious Runoff Depth=4.63"
Flow Length=600' Tc=2.3 min CN=88 Runoff=9.33 cfs 0.601 af

Subcatchment 6S: SW29B Runoff Area=0.230 ac 38.26% Impervious Runoff Depth=4.09"
Tc=0.0 min CN=83 Runoff=1.33 cfs 0.078 af

Subcatchment 7S: 29B Runoff Area=2.391 ac 0.00% Impervious Runoff Depth=2.99"
Flow Length=423' Tc=24.5 min CN=72 Runoff=5.17 cfs 0.596 af

Subcatchment 8S: 29C Runoff Area=0.369 ac 50.68% Impervious Runoff Depth=4.63"
Flow Length=271' Tc=1.8 min CN=88 Runoff=2.25 cfs 0.142 af

Subcatchment 9S: 29D Runoff Area=0.798 ac 0.00% Impervious Runoff Depth=2.81"
Flow Length=264' Tc=36.1 min CN=70 Runoff=1.35 cfs 0.187 af

Subcatchment 10S: SW29A Runoff Area=0.079 ac 10.13% Impervious Runoff Depth=3.38"
Tc=0.0 min CN=76 Runoff=0.38 cfs 0.022 af

Subcatchment A1: A1 Runoff Area=0.734 ac 36.10% Impervious Runoff Depth=4.09"
Flow Length=790' Tc=1.7 min CN=83 Runoff=4.06 cfs 0.250 af

Subcatchment A2: A2 Runoff Area=0.505 ac 55.84% Impervious Runoff Depth=4.63"
Flow Length=780' Tc=1.8 min CN=88 Runoff=3.08 cfs 0.195 af

Subcatchment A3: A3 Runoff Area=0.096 ac 0.00% Impervious Runoff Depth=3.38"
Tc=0.0 min CN=76 Runoff=0.47 cfs 0.027 af

Subcatchment B1: B1 Runoff Area=0.238 ac 36.97% Impervious Runoff Depth=4.09"
Flow Length=324' Tc=1.0 min CN=83 Runoff=1.35 cfs 0.081 af

Subcatchment B2: B2 Runoff Area=0.169 ac 60.36% Impervious Runoff Depth=4.63"
Flow Length=389' Tc=1.1 min CN=88 Runoff=1.05 cfs 0.065 af

Subcatchment B3: B3 Runoff Area=0.062 ac 0.00% Impervious Runoff Depth=3.38"
Tc=0.0 min CN=76 Runoff=0.30 cfs 0.017 af

Subcatchment C1: C1 Runoff Area=0.415 ac 53.98% Impervious Runoff Depth=4.63"
Flow Length=584' Tc=2.1 min CN=88 Runoff=2.50 cfs 0.160 af

Subcatchment C2: C2 Runoff Area=0.439 ac 58.31% Impervious Runoff Depth=4.74"
Flow Length=548' Tc=1.9 min CN=89 Runoff=2.71 cfs 0.173 af

Subcatchment C3: C3 Runoff Area=0.105 ac 0.00% Impervious Runoff Depth=3.18"
Tc=0.0 min CN=74 Runoff=0.48 cfs 0.028 af

Subcatchment D1: D1 Runoff Area=0.371 ac 38.54% Impervious Runoff Depth=4.09"
Flow Length=293' Tc=1.6 min CN=83 Runoff=2.06 cfs 0.126 af

Subcatchment D2: D2 Runoff Area=0.321 ac 51.09% Impervious Runoff Depth=4.52"
Flow Length=449' Tc=1.9 min CN=87 Runoff=1.91 cfs 0.121 af

Subcatchment D3: D3 Runoff Area=0.086 ac 0.00% Impervious Runoff Depth=3.18"
Tc=0.0 min CN=74 Runoff=0.39 cfs 0.023 af

Subcatchment E1: E1 Runoff Area=0.264 ac 45.08% Impervious Runoff Depth=4.30"
Flow Length=335' Tc=1.8 min CN=85 Runoff=1.52 cfs 0.095 af

Subcatchment E2: E2 Runoff Area=0.221 ac 43.44% Impervious Runoff Depth=4.52"
Flow Length=246' Tc=1.3 min CN=87 Runoff=1.35 cfs 0.083 af

Subcatchment E4: E4 Runoff Area=0.081 ac 56.79% Impervious Runoff Depth=4.63"
Flow Length=225' Tc=1.3 min CN=88 Runoff=0.50 cfs 0.031 af

Subcatchment E5: E5 Runoff Area=0.078 ac 0.00% Impervious Runoff Depth=3.18"
Tc=0.0 min CN=74 Runoff=0.36 cfs 0.021 af

Subcatchment F1: F1 Runoff Area=0.291 ac 39.18% Impervious Runoff Depth=4.09"
Flow Length=268' Tc=1.5 min CN=83 Runoff=1.62 cfs 0.099 af

Subcatchment F2: F2 Runoff Area=0.230 ac 60.00% Impervious Runoff Depth=4.63"
Flow Length=184' Tc=1.3 min CN=88 Runoff=1.43 cfs 0.089 af

Subcatchment F3: F3 Runoff Area=0.043 ac 0.00% Impervious Runoff Depth=3.18"
Tc=0.0 min CN=74 Runoff=0.20 cfs 0.011 af

Subcatchment G1: G1 Runoff Area=0.320 ac 44.69% Impervious Runoff Depth=4.41"
Flow Length=454' Tc=1.3 min CN=86 Runoff=1.91 cfs 0.118 af

Subcatchment G2: G2 Runoff Area=0.274 ac 56.93% Impervious Runoff Depth=4.74"
Flow Length=409' Tc=1.2 min CN=89 Runoff=1.73 cfs 0.108 af

Subcatchment G3: G3 Runoff Area=0.083 ac 0.00% Impervious Runoff Depth=3.18"
Tc=0.0 min CN=74 Runoff=0.38 cfs 0.022 af

Reach DP-10: DP-10 Inflow=19.03 cfs 2.474 af
Outflow=19.03 cfs 2.474 af

Reach DP-11: DP-11 Inflow=2.78 cfs 0.503 af
Outflow=2.78 cfs 0.503 af

Reach DP3: DP-3 Inflow=9.28 cfs 0.544 af
Outflow=9.28 cfs 0.544 af

Pond 1P: Bioretention Area A Peak Elev=1,366.27' Storage=4,321 cf Inflow=3.96 cfs 0.398 af
Outflow=3.64 cfs 0.321 af

Pond 3P: Flow Splitter to BMP Peak Elev=1,350.39' Inflow=2.40 cfs 0.146 af
Primary=0.06 cfs 0.008 af Secondary=2.40 cfs 0.138 af Outflow=2.40 cfs 0.146 af

Pond 4P: Pocket Wetland 30 Peak Elev=1,438.60' Storage=12,893 cf Inflow=6.57 cfs 0.429 af
Primary=2.13 cfs 0.428 af Secondary=0.00 cfs 0.000 af Outflow=2.13 cfs 0.428 af

Pond 5P: Bioretention Area B Peak Elev=1,351.00' Storage=948 cf Inflow=0.30 cfs 0.026 af
Outflow=0.01 cfs 0.011 af

Pond 11P: Pocket Wetland 29B Peak Elev=1,443.39' Storage=12,163 cf Inflow=10.44 cfs 0.679 af
Primary=2.42 cfs 0.519 af Secondary=6.08 cfs 0.157 af Outflow=8.50 cfs 0.676 af

Pond 12P: Pocket Wetland 29A Peak Elev=1,443.71' Storage=1,859 cf Inflow=2.38 cfs 0.164 af
Outflow=2.31 cfs 0.164 af

Pond 13P: Flow Splitter to SW 29A Peak Elev=1,444.16' Inflow=2.25 cfs 0.142 af
Primary=2.06 cfs 0.142 af Secondary=0.19 cfs 0.001 af Outflow=2.25 cfs 0.142 af

Pond 93P: Flow Splitter to BMP Peak Elev=1,368.96' Inflow=7.14 cfs 0.445 af
Primary=3.57 cfs 0.371 af Secondary=3.57 cfs 0.074 af Outflow=7.14 cfs 0.445 af

Pond 94P: Stormwater Wetland C Peak Elev=1,348.51' Storage=5,477 cf Inflow=5.63 cfs 0.361 af
Primary=0.72 cfs 0.227 af Secondary=4.19 cfs 0.132 af Outflow=4.91 cfs 0.359 af

Pond 95P: Bioretention Area F Peak Elev=1,349.68' Storage=1,942 cf Inflow=3.23 cfs 0.199 af
Outflow=3.12 cfs 0.174 af

Pond 99P: Stormwater Pocket Wetland G Peak Elev=1,339.26' Storage=6,138 cf Inflow=3.99 cfs 0.248 af
Outflow=3.27 cfs 0.248 af

Pond 100P: Stormwater Wetland E Peak Elev=1,347.41' Storage=4,400 cf Inflow=8.00 cfs 0.500 af
Primary=0.62 cfs 0.303 af Secondary=6.56 cfs 0.197 af Outflow=7.18 cfs 0.500 af

Total Runoff Area = 15.385 ac Runoff Volume = 4.926 af Average Runoff Depth = 3.84"
72.30% Pervious = 11.124 ac 27.70% Impervious = 4.261 ac

Summary for Subcatchment 1S: 30

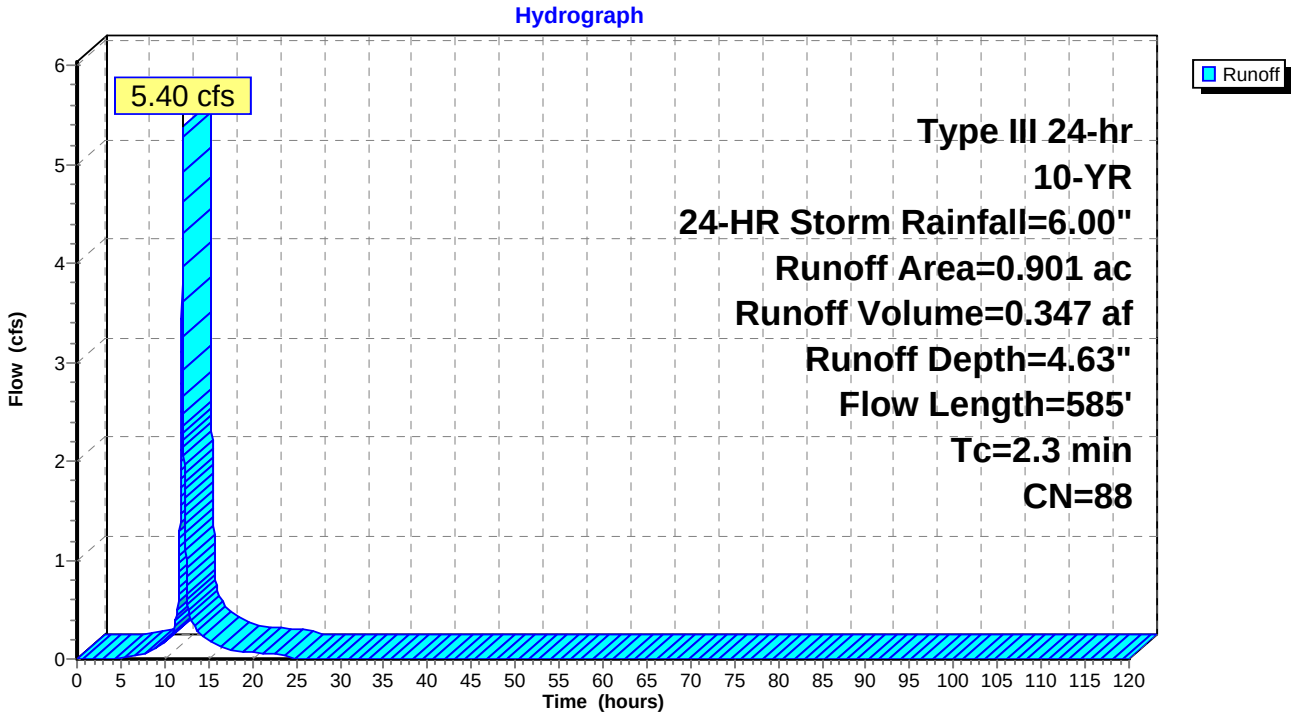
Runoff = 5.40 cfs @ 12.03 hrs, Volume= 0.347 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.328	74	>75% Grass cover, Good, HSG C
*	0.101	89	Porous Pavement Walkway (Gravel roads), HSG C
	0.472	98	Paved roads w/curbs & sewers, HSG C
	0.901	88	Weighted Average
	0.429		47.61% Pervious Area
	0.472		52.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	46	0.0200	1.27		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
1.0	178	0.0225	3.04		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.7	361	0.0224	8.90	15.72	**Pipe Channel, Storm Network** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.3	585	Total			

Subcatchment 1S: 30



Summary for Subcatchment 2S: SW30

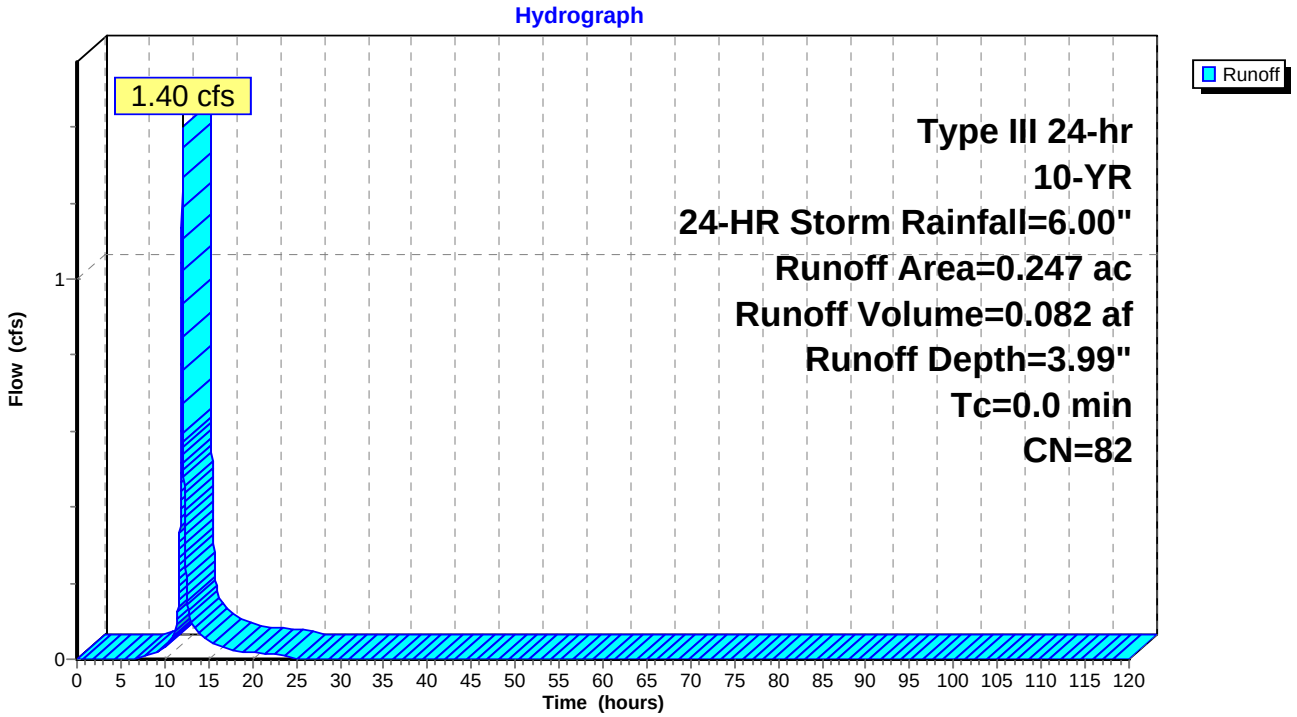
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.40 cfs @ 12.00 hrs, Volume= 0.082 af, Depth= 3.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.161	74	>75% Grass cover, Good, HSG C
0.086	98	Water Surface, HSG C
0.247	82	Weighted Average
0.161		65.18% Pervious Area
0.086		34.82% Impervious Area

Subcatchment 2S: SW30



Summary for Subcatchment 3S: 30A

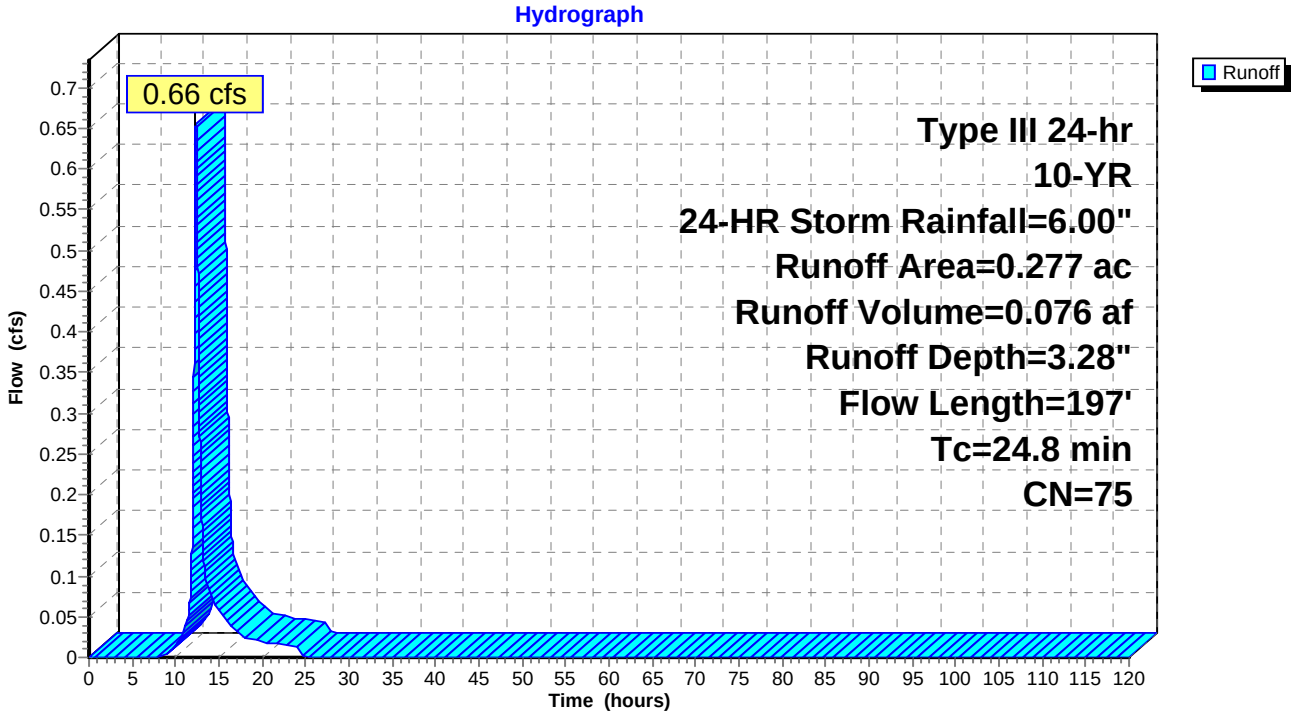
Runoff = 0.66 cfs @ 12.34 hrs, Volume= 0.076 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.097	74	>75% Grass cover, Good, HSG C
0.144	70	Woods, Good, HSG C
0.036	98	Paved roads w/curbs & sewers, HSG C
0.277	75	Weighted Average
0.241		87.00% Pervious Area
0.036		13.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	120	0.0170	0.08		**Sheet Flow, Overland** Woods: Light underbrush n= 0.400 P2= 3.75"
0.3	77	0.0250	5.13	18.45	**Channel Flow, Ditch** Area= 3.6 sf Perim= 6.8' r= 0.53' n= 0.030
24.8	197	Total			

Subcatchment 3S: 30A



Summary for Subcatchment 4S: 29

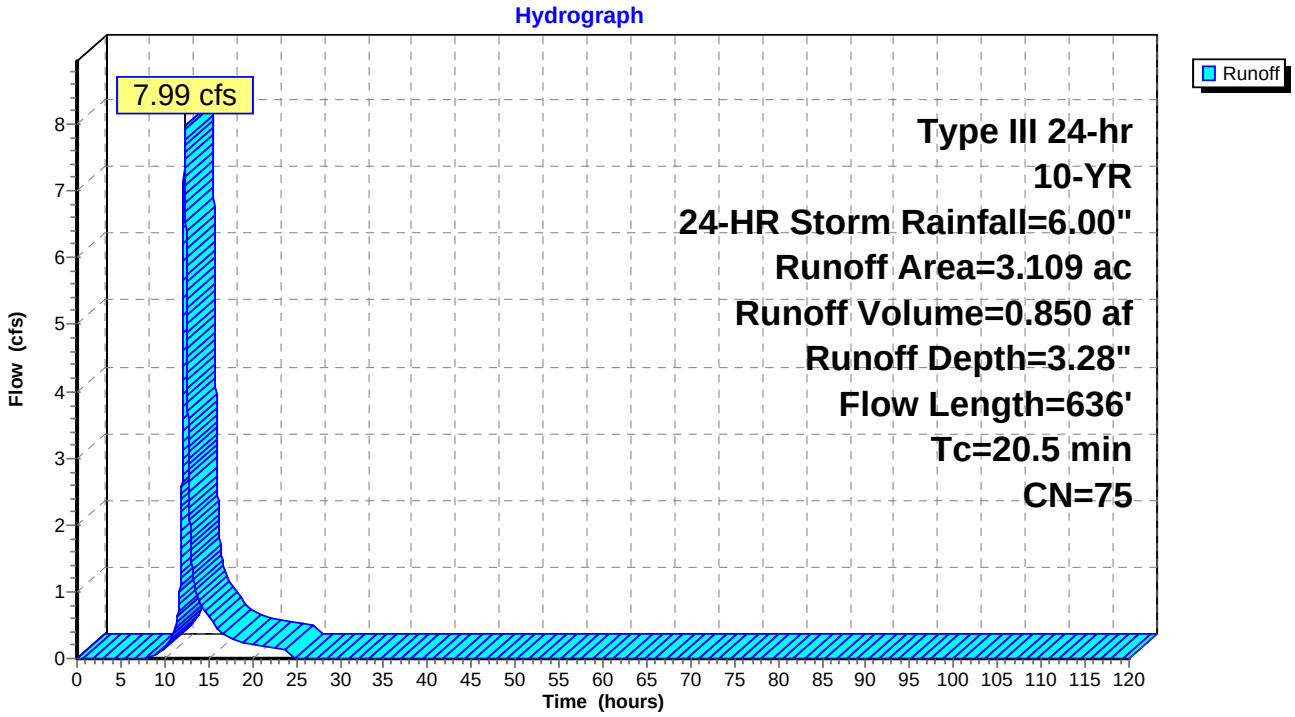
Runoff = 7.99 cfs @ 12.28 hrs, Volume= 0.850 af, Depth= 3.28"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.122	98	Roofs, HSG C
2.605	74	>75% Grass cover, Good, HSG C
0.100	98	Paved parking, HSG C
0.261	70	Woods, Good, HSG C
0.021	74	>75% Grass cover, Good, HSG C
3.109	75	Weighted Average
2.887		92.86% Pervious Area
0.222		7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	150	0.0133	0.17		**Sheet Flow, Overland** Grass: Short n= 0.150 P2= 3.75"
4.4	239	0.0167	0.90		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
1.1	156	0.0060	2.42	7.25	**Channel Flow, Roadside Ditch** Area= 3.0 sf Perim= 6.0' r= 0.50' n= 0.030
0.3	91	0.0055	5.34	16.78	**Pipe Channel, Proposed Roadside Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
20.5	636	Total			

Subcatchment 4S: 29



Summary for Subcatchment 5S: 29A

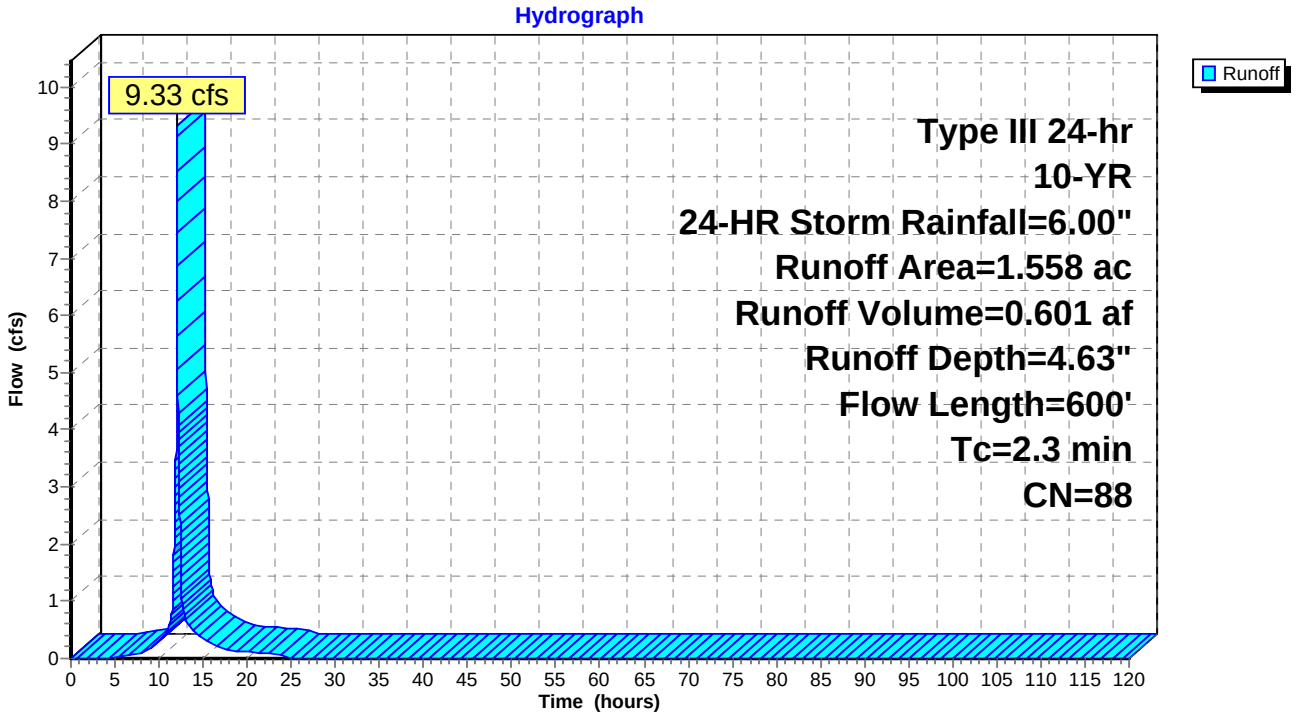
Runoff = 9.33 cfs @ 12.03 hrs, Volume= 0.601 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.005	98	Paved parking, HSG C
	0.003	71	Meadow, non-grazed, HSG C
	0.002	98	Unconnected pavement, HSG C
	0.560	74	>75% Grass cover, Good, HSG C
*	0.169	89	Porous Pavement (Gravel roads), HSG C
	0.819	98	Paved roads w/curbs & sewers, HSG C
	1.558	88	Weighted Average
	0.732		46.98% Pervious Area
	0.826		53.02% Impervious Area
	0.002		0.24% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	61	0.0200	1.35		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
0.9	152	0.0200	2.87		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.6	387	0.0238	11.11	34.90	**Pipe Channel, Storm Network** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
2.3	600	Total			

Subcatchment 5S: 29A



Summary for Subcatchment 6S: SW29B

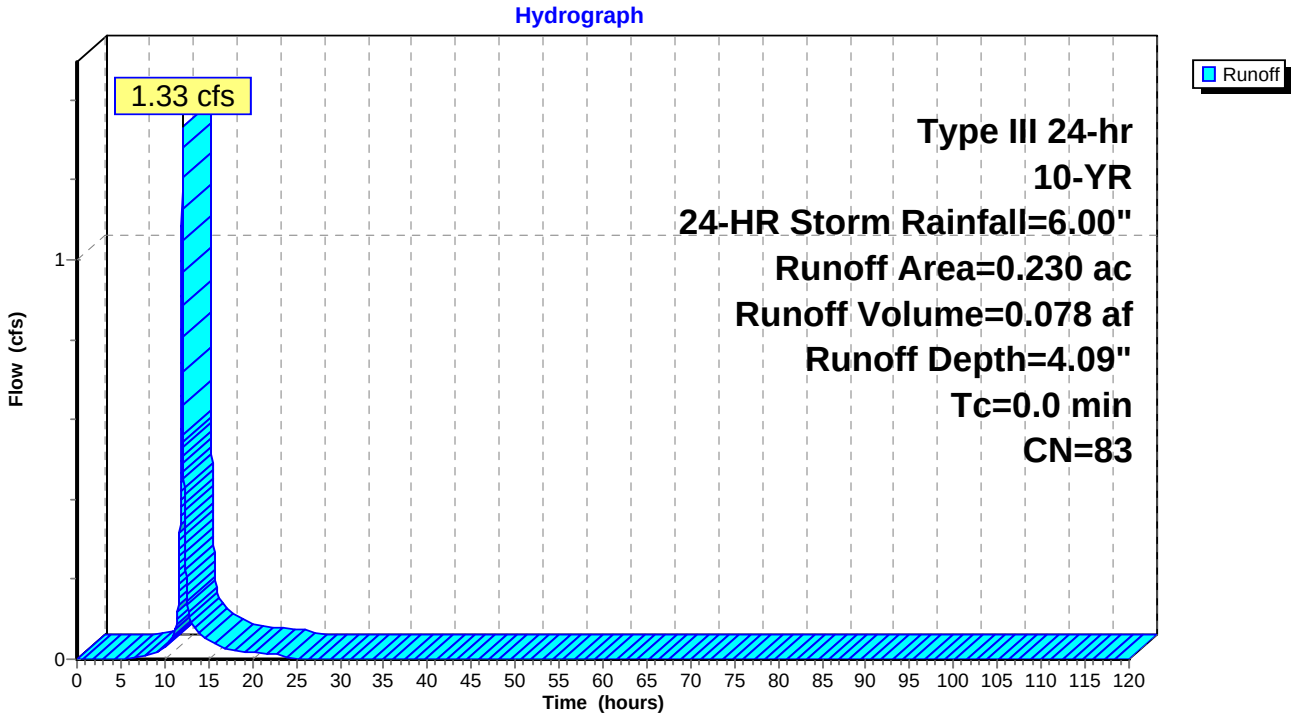
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.33 cfs @ 12.00 hrs, Volume= 0.078 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.088	98	Water Surface, HSG C
0.142	74	>75% Grass cover, Good, HSG C
0.230	83	Weighted Average
0.142		61.74% Pervious Area
0.088		38.26% Impervious Area

Subcatchment 6S: SW29B



Summary for Subcatchment 7S: 29B

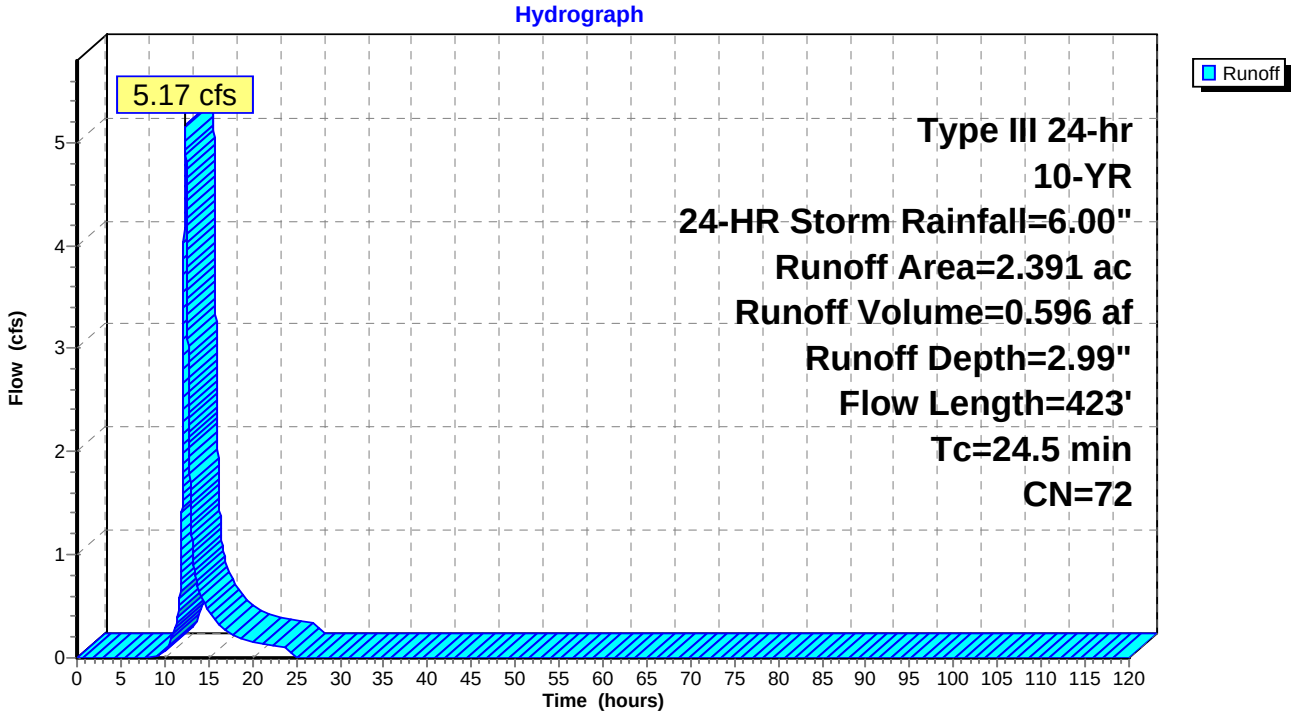
Runoff = 5.17 cfs @ 12.34 hrs, Volume= 0.596 af, Depth= 2.99"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.008	74	>75% Grass cover, Good, HSG C
0.949	74	>75% Grass cover, Good, HSG C
1.434	70	Woods, Good, HSG C
2.391	72	Weighted Average
2.391		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	150	0.0100	0.15		**Sheet Flow, Overland** Grass: Short n= 0.150 P2= 3.75"
8.0	273	0.0128	0.57		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
24.5	423	Total			

Subcatchment 7S: 29B



Summary for Subcatchment 8S: 29C

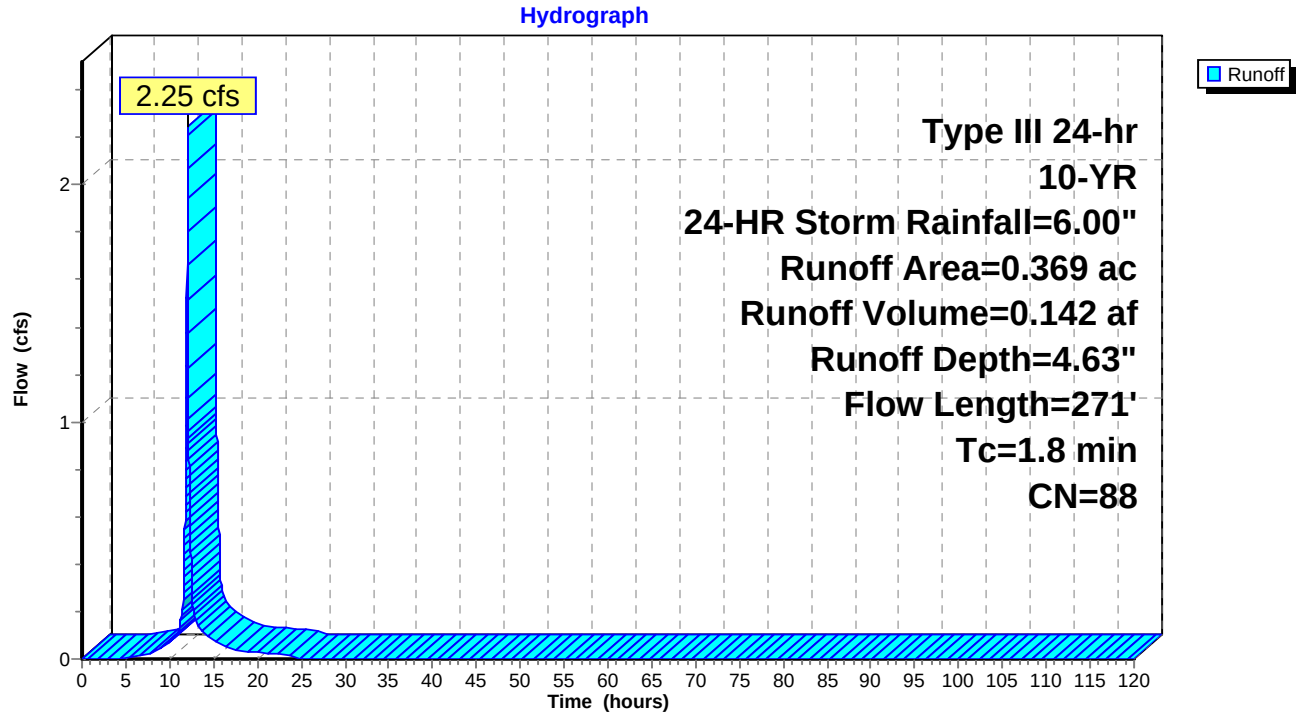
Runoff = 2.25 cfs @ 12.03 hrs, Volume= 0.142 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

	Area (ac)	CN	Description
	0.136	74	>75% Grass cover, Good, HSG C
*	0.046	89	Porous Pavement (Gravel roads), HSG C
	0.187	98	Paved roads w/curbs & sewers, HSG C
	0.369	88	Weighted Average
	0.182		49.32% Pervious Area
	0.187		50.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	64	0.0200	1.36		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
0.7	127	0.0200	2.87		**Shallow Concentrated Flow, Gutter** Paved Kv= 20.3 fps
0.3	80	0.0100	5.26	6.46	**Pipe Channel, Storm Network** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	271	Total			

Subcatchment 8S: 29C



Summary for Subcatchment 9S: 29D

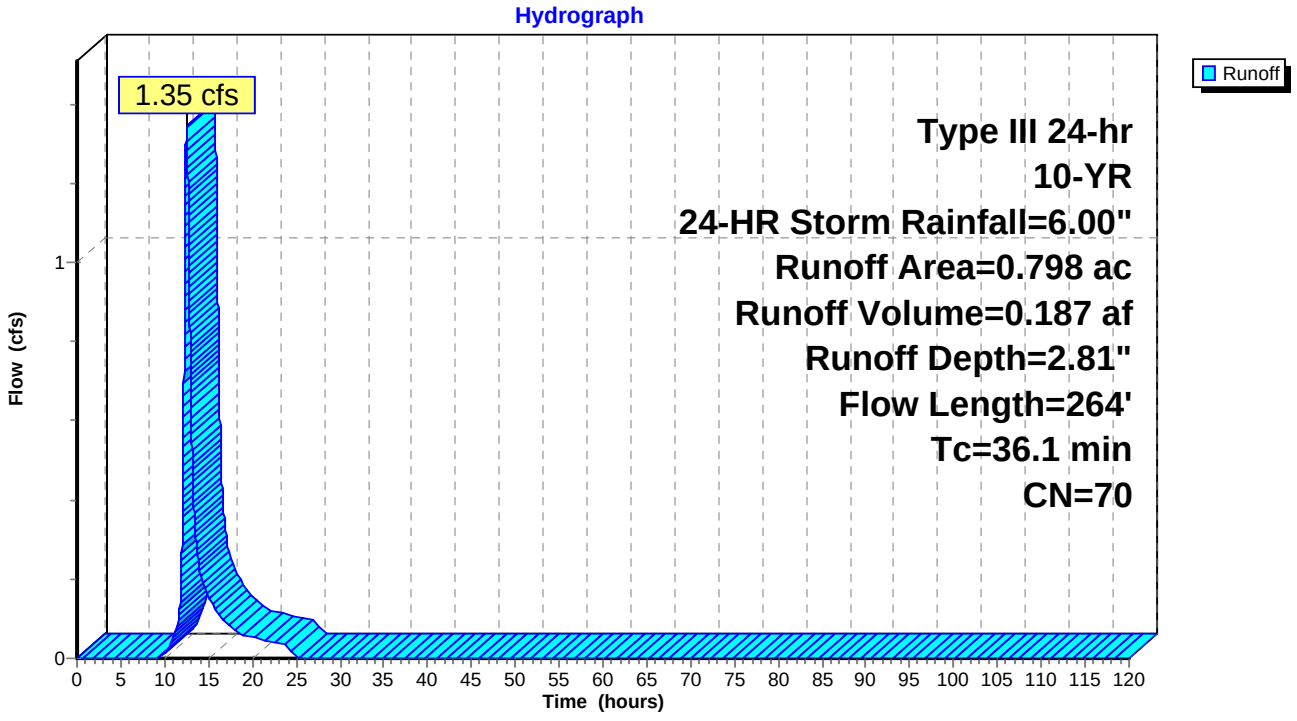
Runoff = 1.35 cfs @ 12.51 hrs, Volume= 0.187 af, Depth= 2.81"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.798	70	Woods, Good, HSG C
0.798		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.3	150	0.0133	0.08		**Sheet Flow, Overland** Woods: Light underbrush n= 0.400 P2= 3.75"
3.8	114	0.0100	0.50		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
36.1	264	Total			

Subcatchment 9S: 29D



Summary for Subcatchment 10S: SW29A

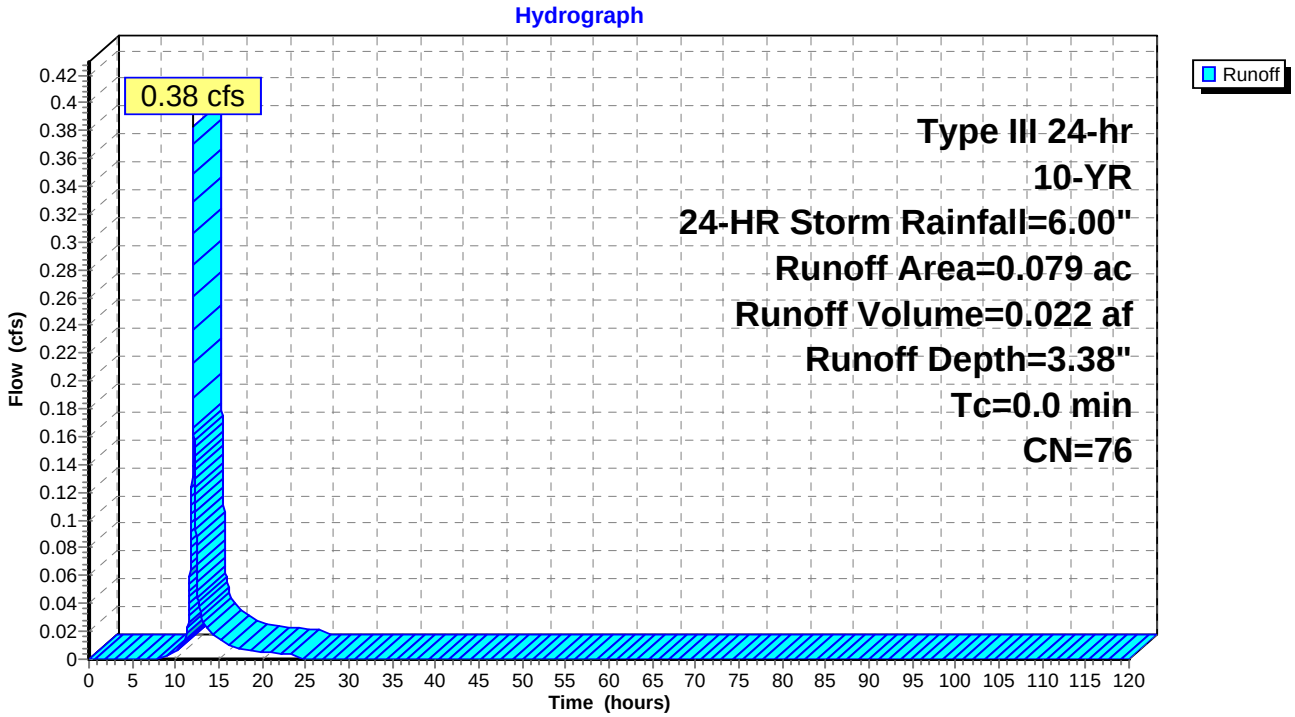
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.38 cfs @ 12.00 hrs, Volume= 0.022 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.008	98	Water Surface, HSG C
0.071	74	>75% Grass cover, Good, HSG C
0.079	76	Weighted Average
0.071		89.87% Pervious Area
0.008		10.13% Impervious Area

Subcatchment 10S: SW29A



Summary for Subcatchment A1: A1

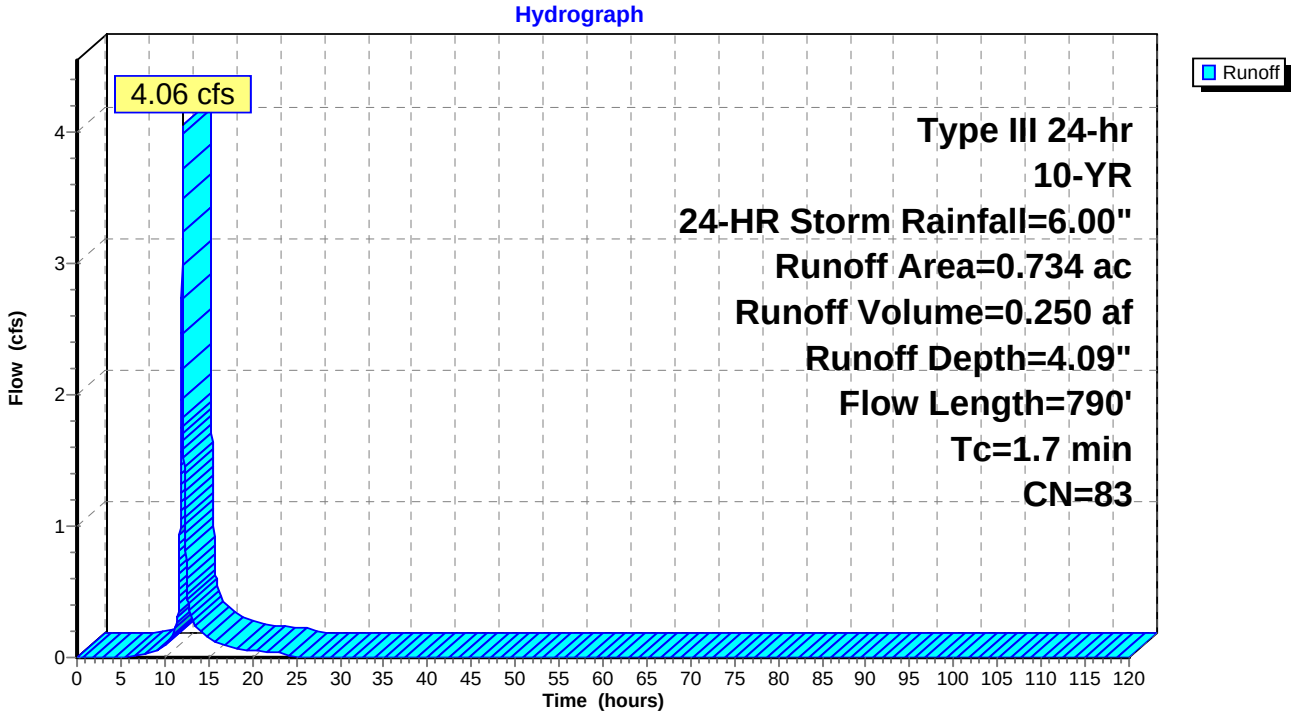
Runoff = 4.06 cfs @ 12.03 hrs, Volume= 0.250 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.004	74	>75% Grass cover, Good, HSG C
0.458	74	>75% Grass cover, Good, HSG C
0.007	89	Gravel roads, HSG C
0.265	98	Paved roads w/curbs & sewers, HSG C
0.734	83	Weighted Average
0.469		63.90% Pervious Area
0.265		36.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	81	0.0200	1.43		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	674	0.0846	15.82	193.04	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	35	0.0145	5.46	4.29	**Pipe Channel, Culvert Crossing** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.7	790	Total			

Subcatchment A1: A1



Summary for Subcatchment A2: A2

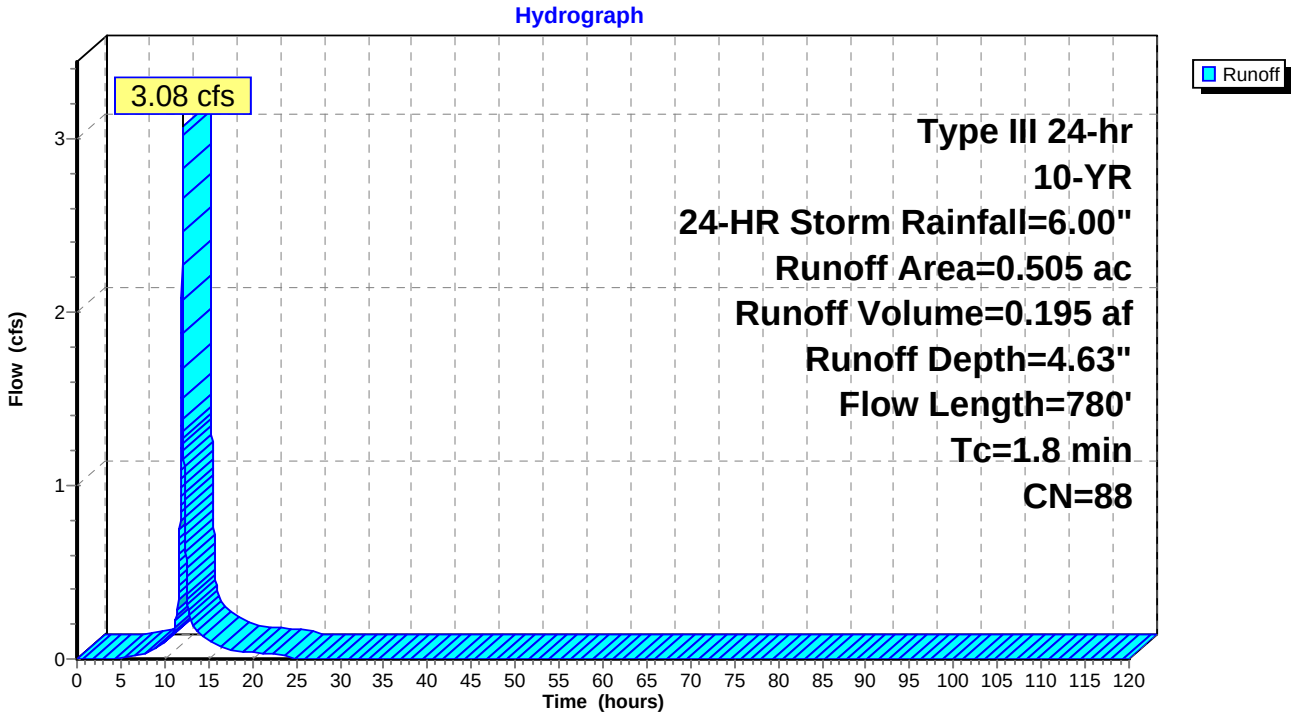
Runoff = 3.08 cfs @ 12.03 hrs, Volume= 0.195 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.200	74	>75% Grass cover, Good, HSG C
0.023	89	Gravel roads, HSG C
0.282	98	Paved roads w/curbs & sewers, HSG C
0.505	88	Weighted Average
0.223		44.16% Pervious Area
0.282		55.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	658	0.0836	15.73	191.89	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.0	22	0.0577	12.64	15.52	**Pipe Channel, Pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	780	Total			

Subcatchment A2: A2



Summary for Subcatchment A3: A3

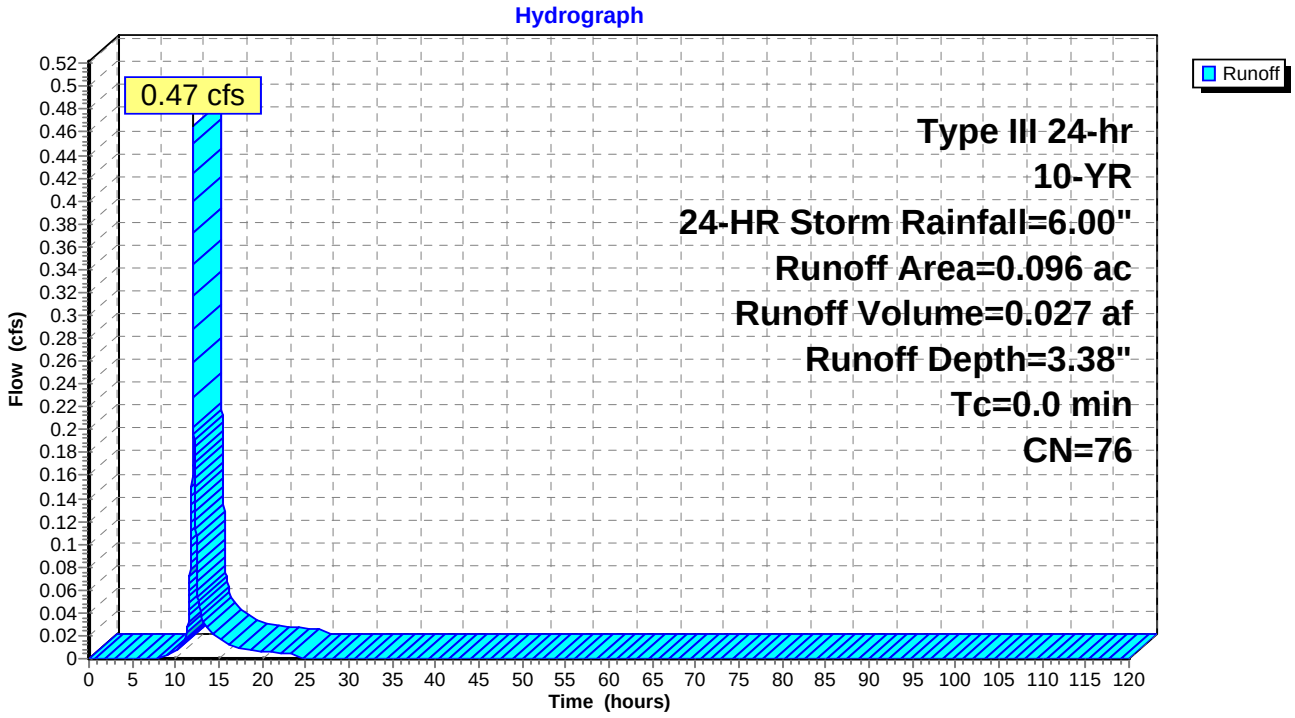
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.47 cfs @ 12.00 hrs, Volume= 0.027 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.085	74	>75% Grass cover, Good, HSG C
0.011	89	Gravel roads, HSG C
0.096	76	Weighted Average
0.096		100.00% Pervious Area

Subcatchment A3: A3



Summary for Subcatchment B1: B1

[49] Hint: Tc<2dt may require smaller dt

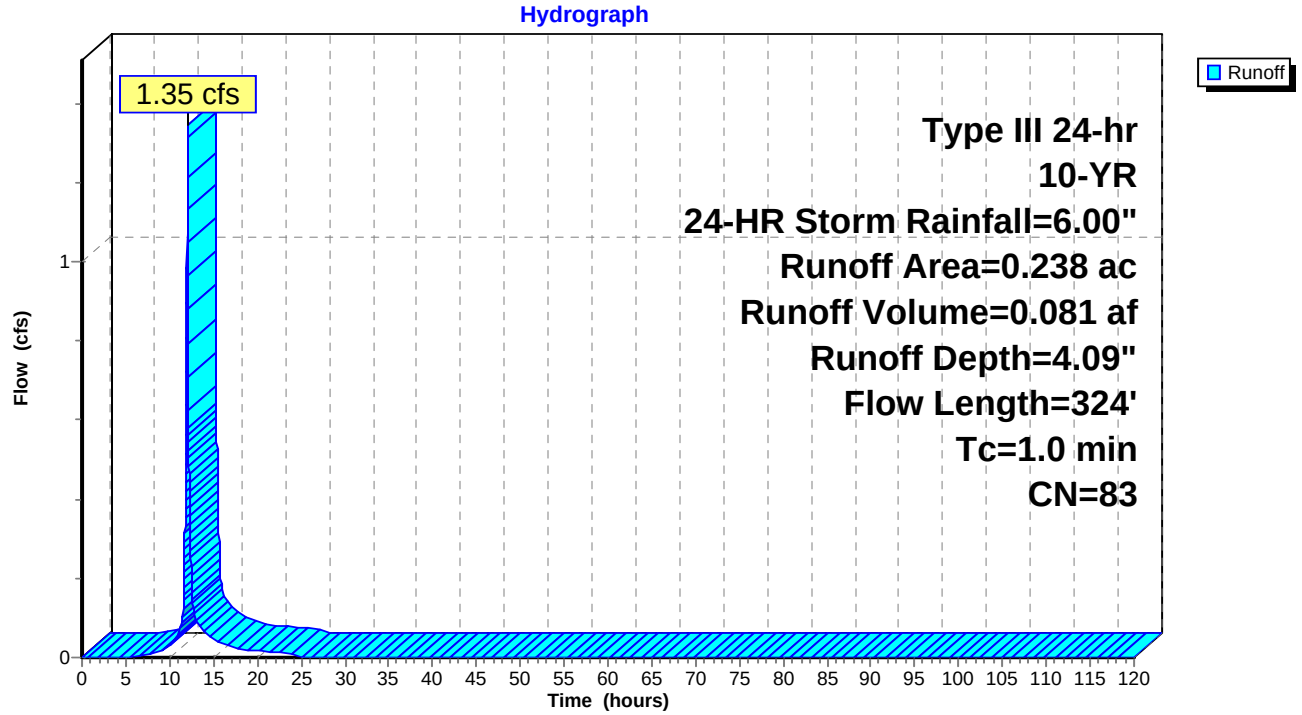
Runoff = 1.35 cfs @ 12.02 hrs, Volume= 0.081 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.150	74	>75% Grass cover, Good, HSG C
0.088	98	Paved roads w/curbs & sewers, HSG C
0.238	83	Weighted Average
0.150		63.03% Pervious Area
0.088		36.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0800	2.59		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	189	0.0476	11.87	144.80	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	35	0.0145	5.46	4.29	**Pipe Channel, Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.0	324	Total			

Subcatchment B1: B1



Summary for Subcatchment B2: B2

[49] Hint: Tc<2dt may require smaller dt

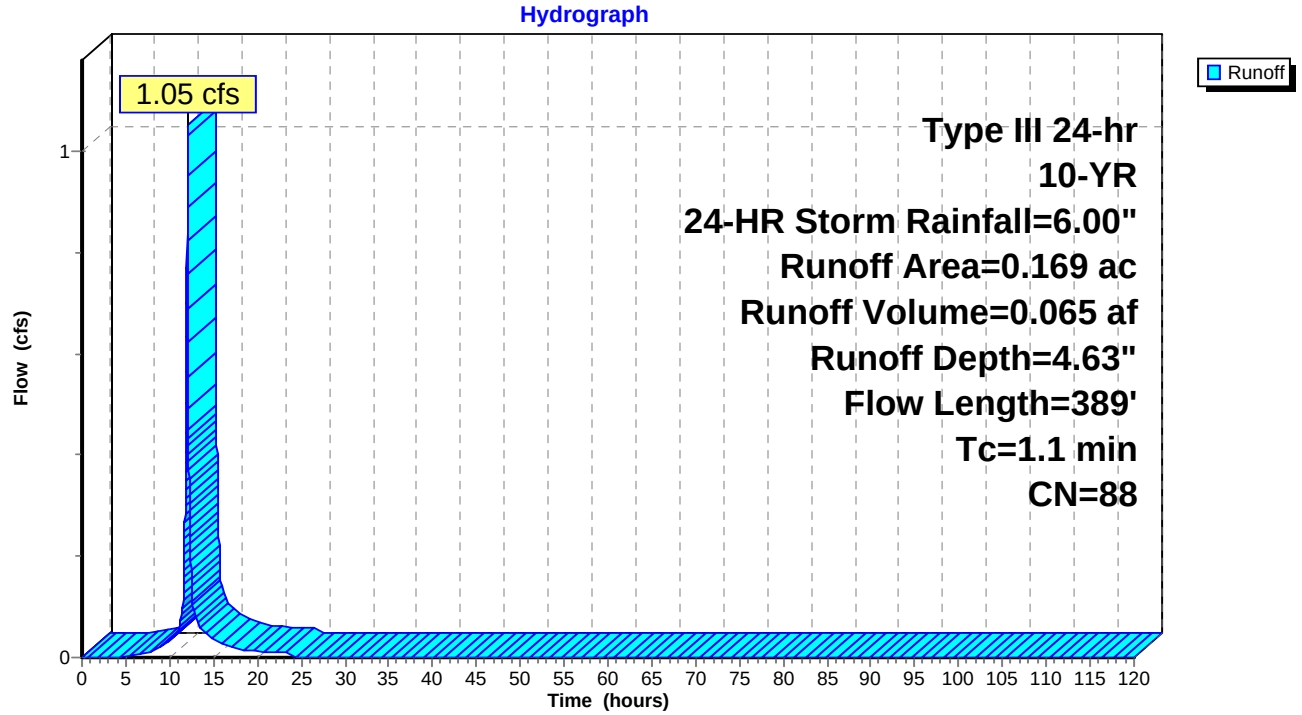
Runoff = 1.05 cfs @ 12.02 hrs, Volume= 0.065 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.067	74	>75% Grass cover, Good, HSG C
0.102	98	Paved roads w/curbs & sewers, HSG C
0.169	88	Weighted Average
0.067		39.64% Pervious Area
0.102		60.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0830	2.63		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.4	263	0.0380	10.60	129.38	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	26	0.0338	8.34	6.55	**Pipe Channel, Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.1	389	Total			

Subcatchment B2: B2



Summary for Subcatchment B3: B3

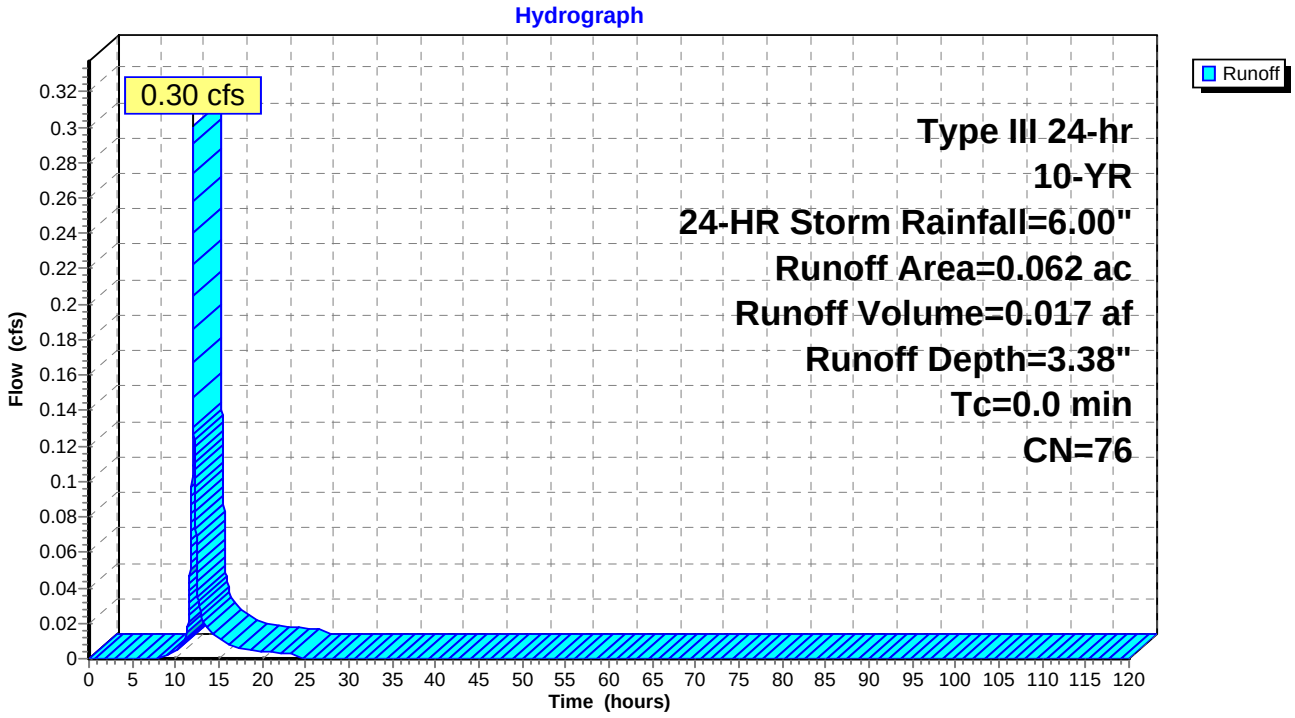
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.30 cfs @ 12.00 hrs, Volume= 0.017 af, Depth= 3.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.054	74	>75% Grass cover, Good, HSG C
0.008	89	Gravel roads, HSG C
0.062	76	Weighted Average
0.062		100.00% Pervious Area

Subcatchment B3: B3



Summary for Subcatchment C1: C1

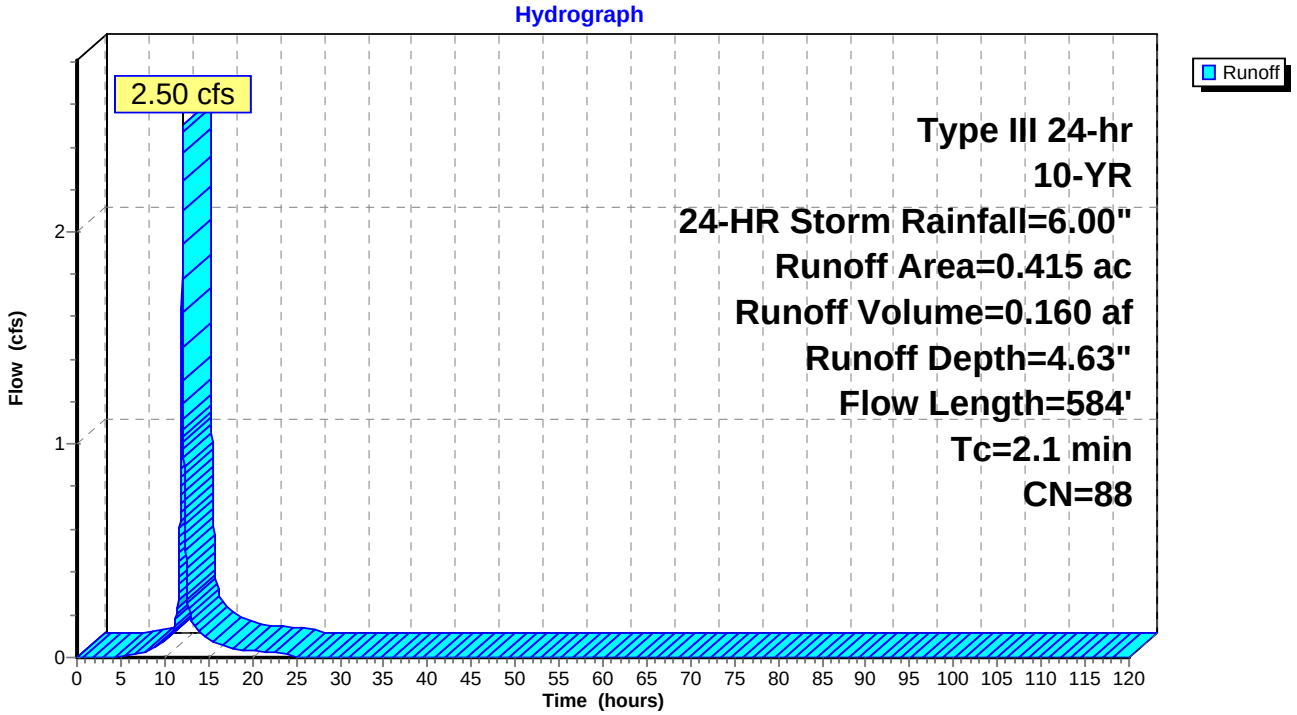
Runoff = 2.50 cfs @ 12.03 hrs, Volume= 0.160 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.143	74	>75% Grass cover, Good, HSG C
0.166	98	Paved roads w/curbs & sewers, HSG C
0.048	80	>75% Grass cover, Good, HSG D
0.058	98	Paved roads w/curbs & sewers, HSG D
0.415	88	Weighted Average
0.191		46.02% Pervious Area
0.224		53.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
1.0	462	0.0216	8.00	97.54	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	36	0.0118	4.93	3.87	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.1	584	Total			

Subcatchment C1: C1



Summary for Subcatchment C2: C2

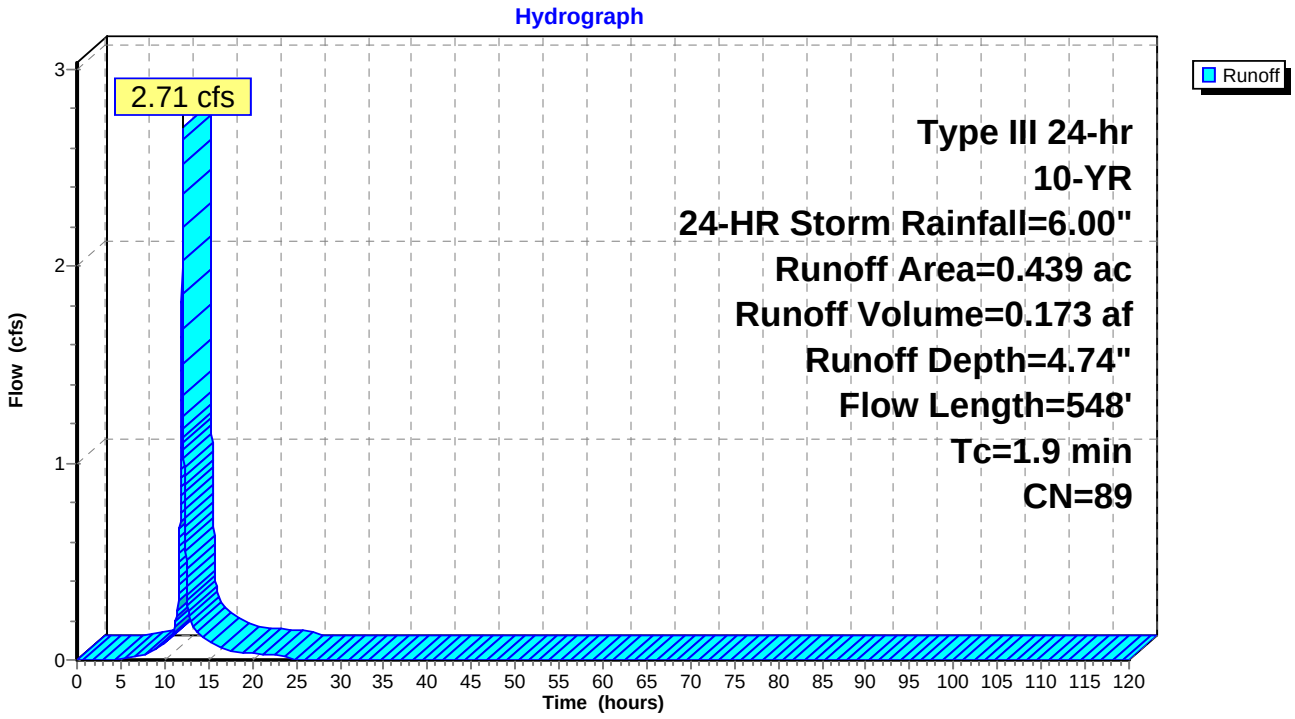
Runoff = 2.71 cfs @ 12.03 hrs, Volume= 0.173 af, Depth= 4.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.140	74	>75% Grass cover, Good, HSG C
0.189	98	Paved roads w/curbs & sewers, HSG C
0.043	80	>75% Grass cover, Good, HSG D
0.067	98	Paved roads w/curbs & sewers, HSG D
0.439	89	Weighted Average
0.183		41.69% Pervious Area
0.256		58.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	77	0.0200	1.41		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
1.0	471	0.0191	7.52	91.72	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.9	548	Total			

Subcatchment C2: C2



Summary for Subcatchment C3: C3

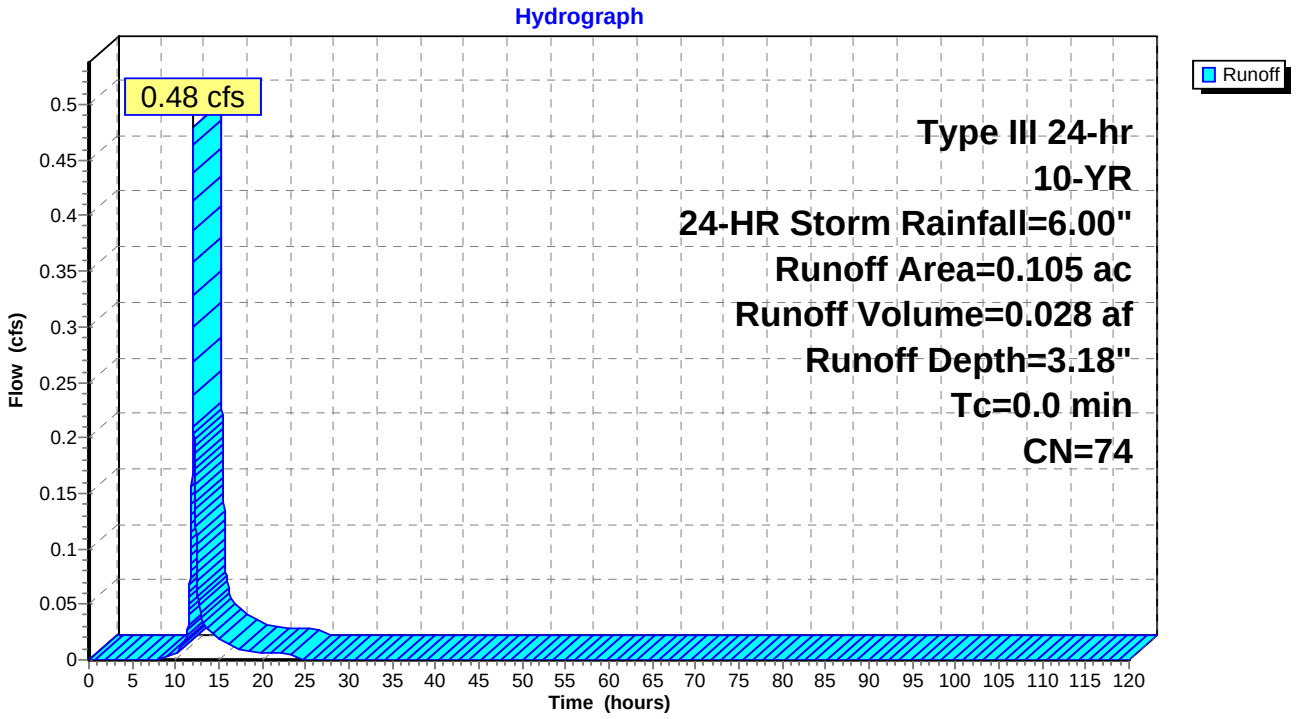
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.48 cfs @ 12.00 hrs, Volume= 0.028 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.105	74	>75% Grass cover, Good, HSG C
0.105		100.00% Pervious Area

Subcatchment C3: C3



Summary for Subcatchment D1: D1

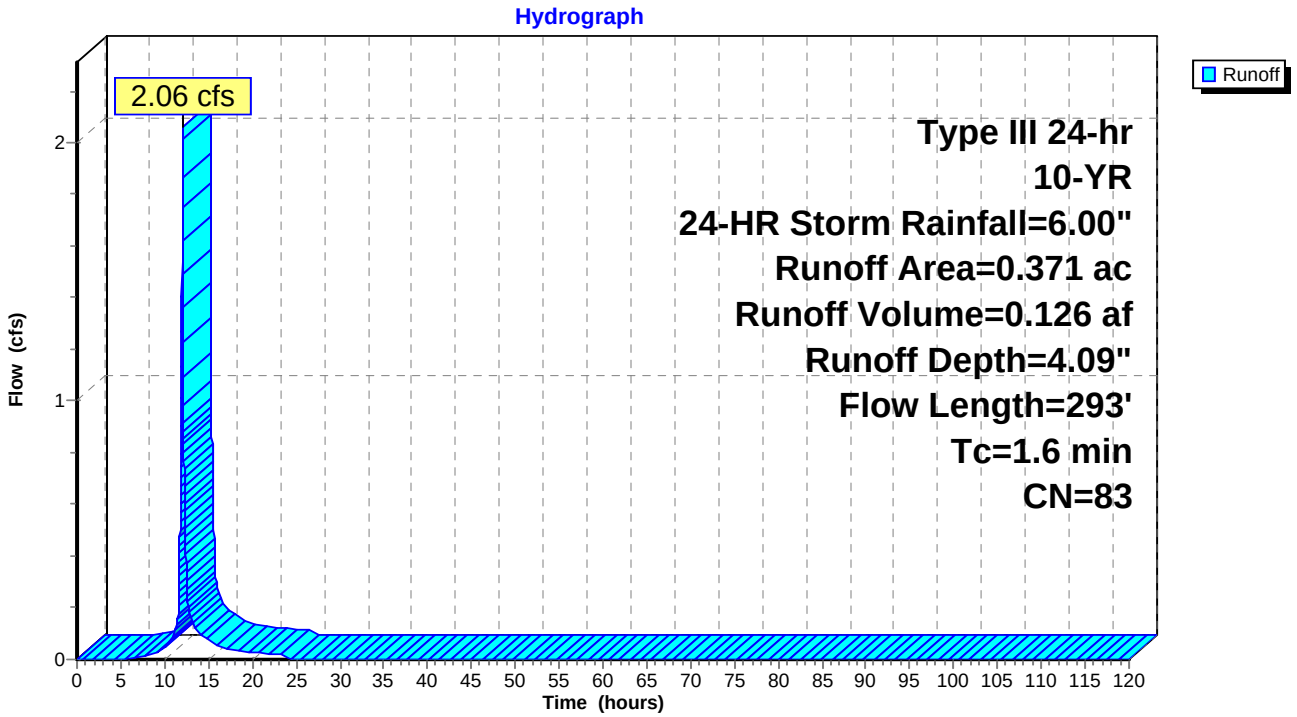
Runoff = 2.06 cfs @ 12.02 hrs, Volume= 0.126 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.228	74	>75% Grass cover, Good, HSG C
0.143	98	Paved roads w/curbs & sewers, HSG C
0.371	83	Weighted Average
0.228		61.46% Pervious Area
0.143		38.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	80	0.0100	1.08		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	183	0.0436	11.36	138.58	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	30	0.0118	4.93	3.87	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.6	293	Total			

Subcatchment D1: D1



Summary for Subcatchment D2: D2

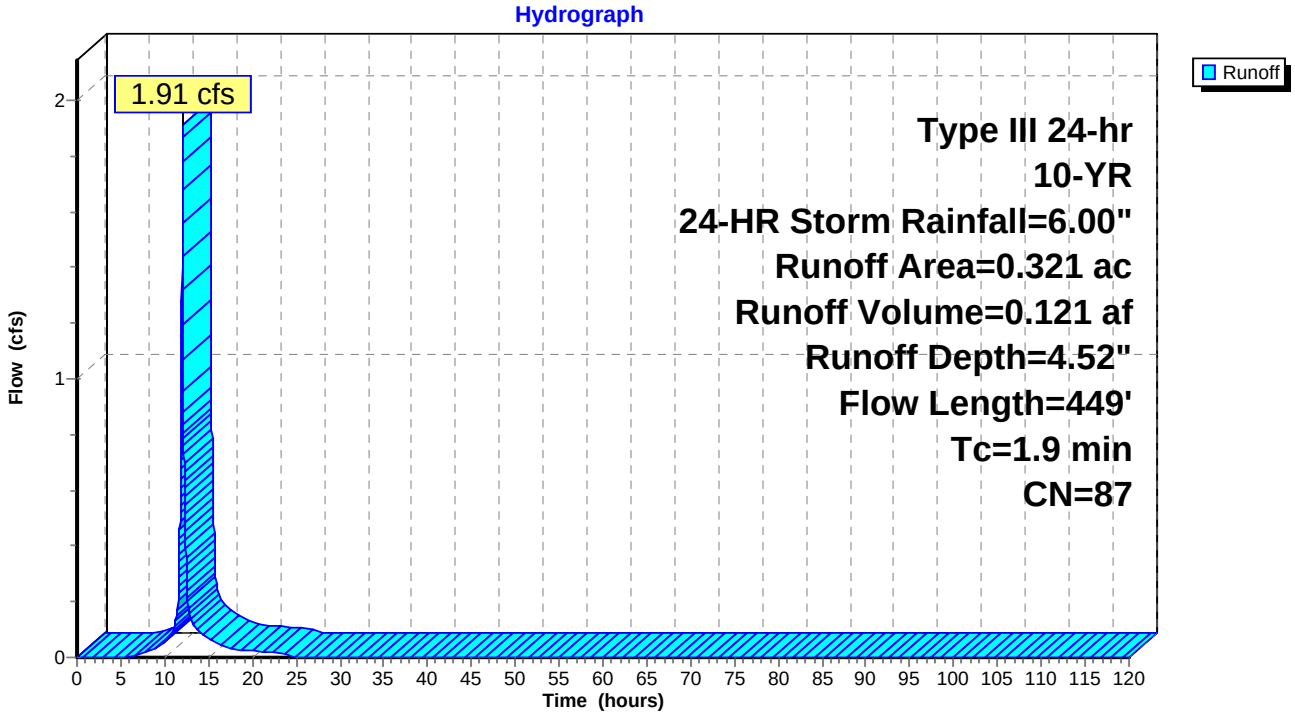
Runoff = 1.91 cfs @ 12.03 hrs, Volume= 0.121 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.140	74	>75% Grass cover, Good, HSG C
0.017	89	Gravel roads, HSG C
0.164	98	Paved roads w/curbs & sewers, HSG C
0.321	87	Weighted Average
0.157		48.91% Pervious Area
0.164		51.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	78	0.0100	1.07		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	371	0.0256	8.70	106.19	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.9	449	Total			

Subcatchment D2: D2



Summary for Subcatchment D3: D3

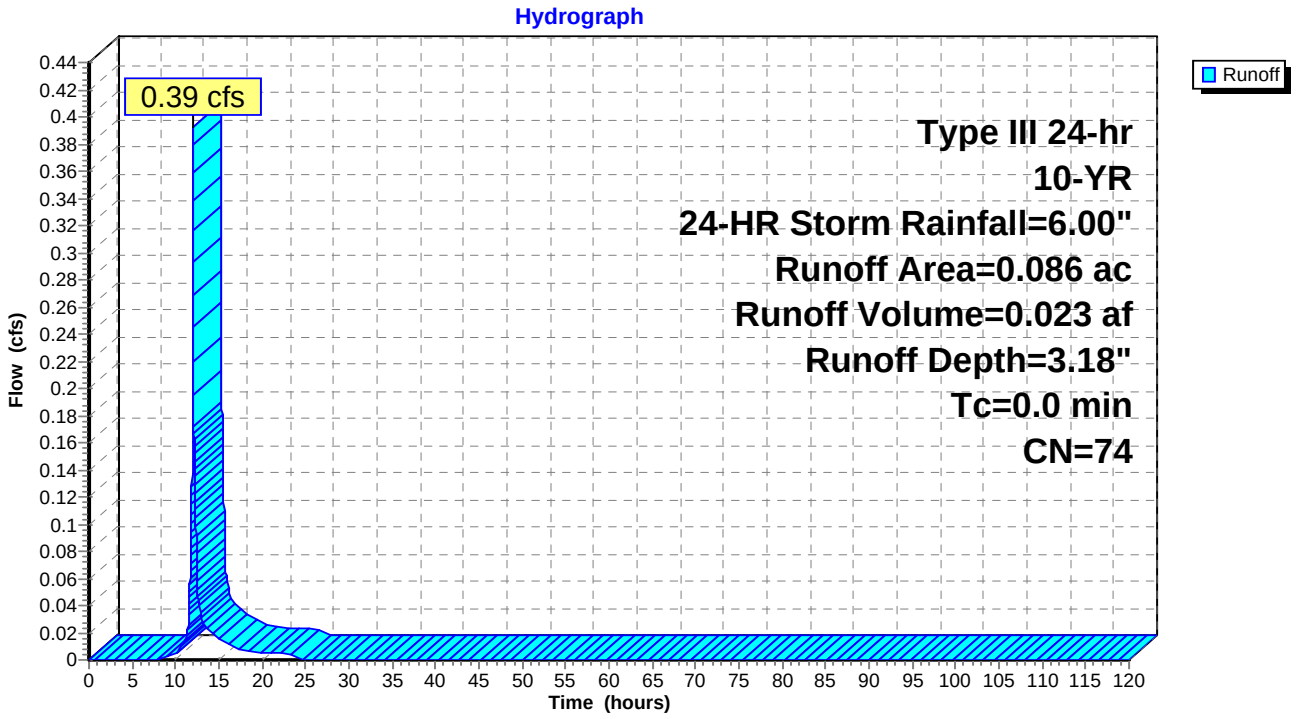
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.39 cfs @ 12.00 hrs, Volume= 0.023 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.086	74	>75% Grass cover, Good, HSG C
0.086		100.00% Pervious Area

Subcatchment D3: D3



Summary for Subcatchment E1: E1

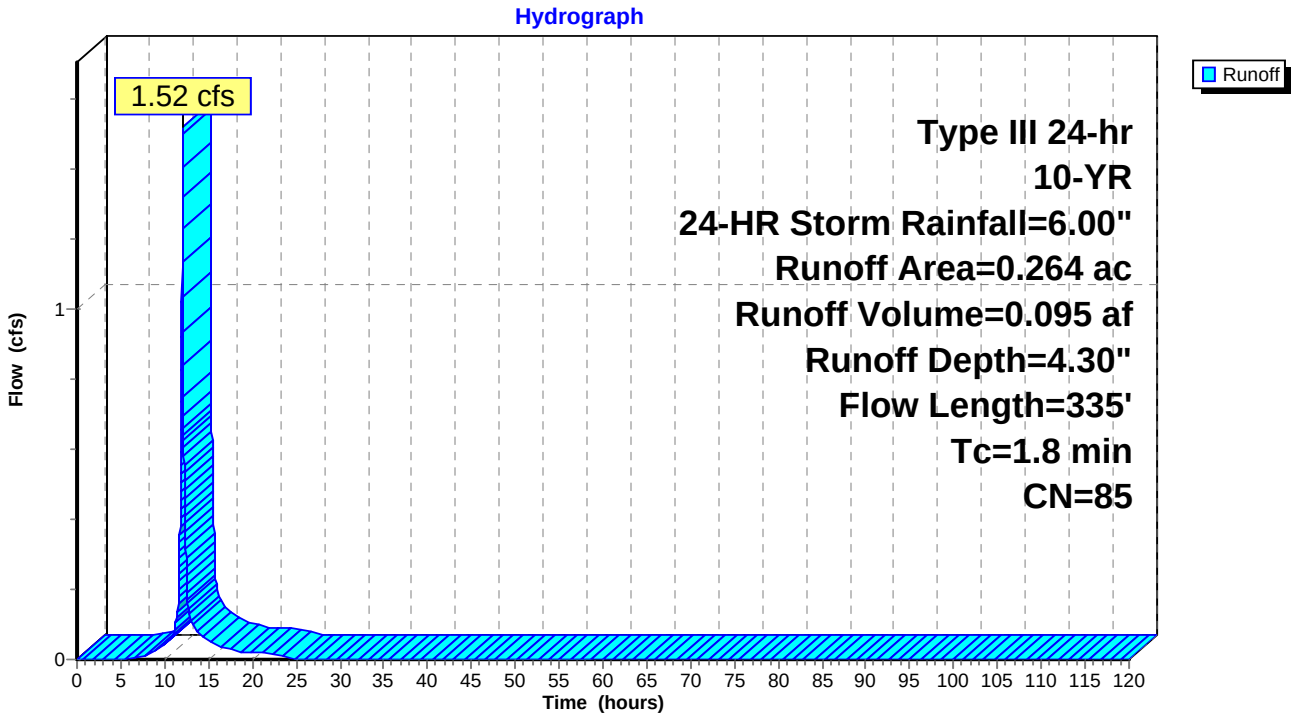
Runoff = 1.52 cfs @ 12.03 hrs, Volume= 0.095 af, Depth= 4.30"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.145	74	>75% Grass cover, Good, HSG C
0.119	98	Paved roads w/curbs & sewers, HSG C
0.264	85	Weighted Average
0.145		54.92% Pervious Area
0.119		45.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	81	0.0100	1.08		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	223	0.0179	7.28	88.79	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	31	0.0128	5.13	4.03	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.8	335	Total			

Subcatchment E1: E1



Summary for Subcatchment E2: E2

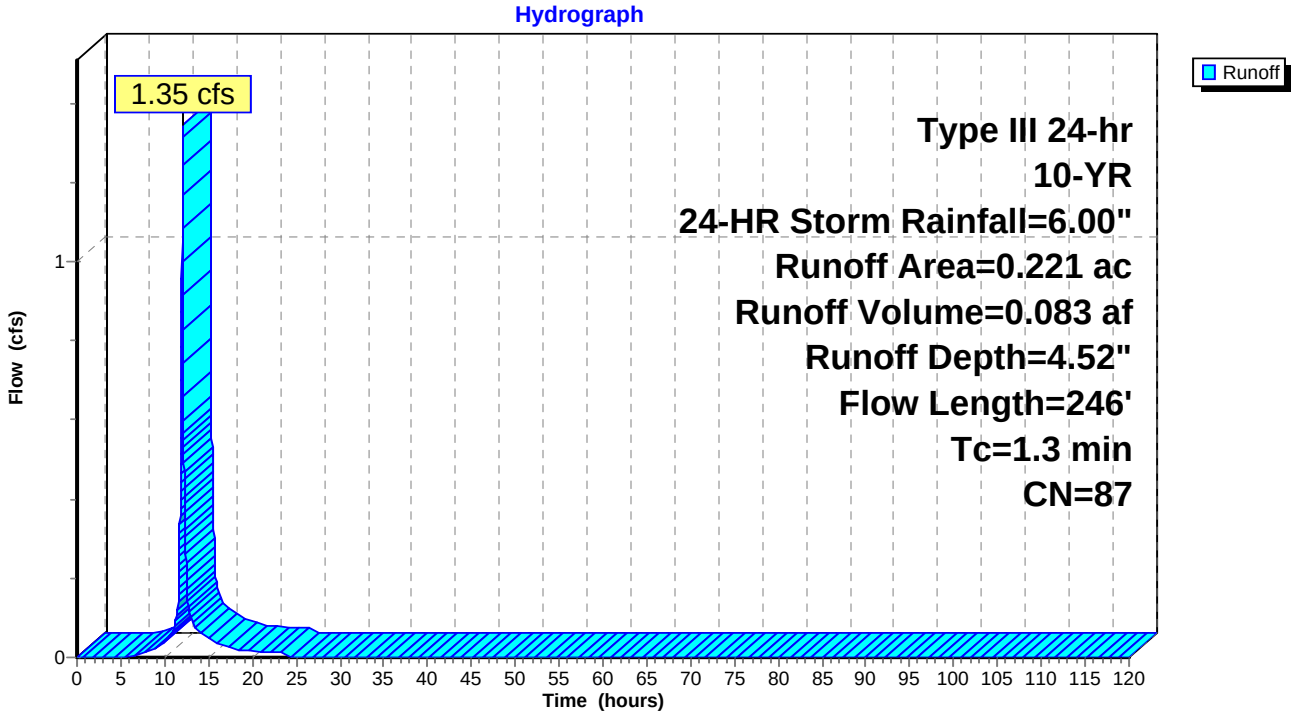
Runoff = 1.35 cfs @ 12.02 hrs, Volume= 0.083 af, Depth= 4.52"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.093	74	>75% Grass cover, Good, HSG C
0.032	89	Gravel roads, HSG C
0.096	98	Paved roads w/curbs & sewers, HSG C
0.221	87	Weighted Average
0.125		56.56% Pervious Area
0.096		43.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0100	0.98		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	196	0.0153	6.73	82.09	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	246	Total			

Subcatchment E2: E2



Summary for Subcatchment E4: E4

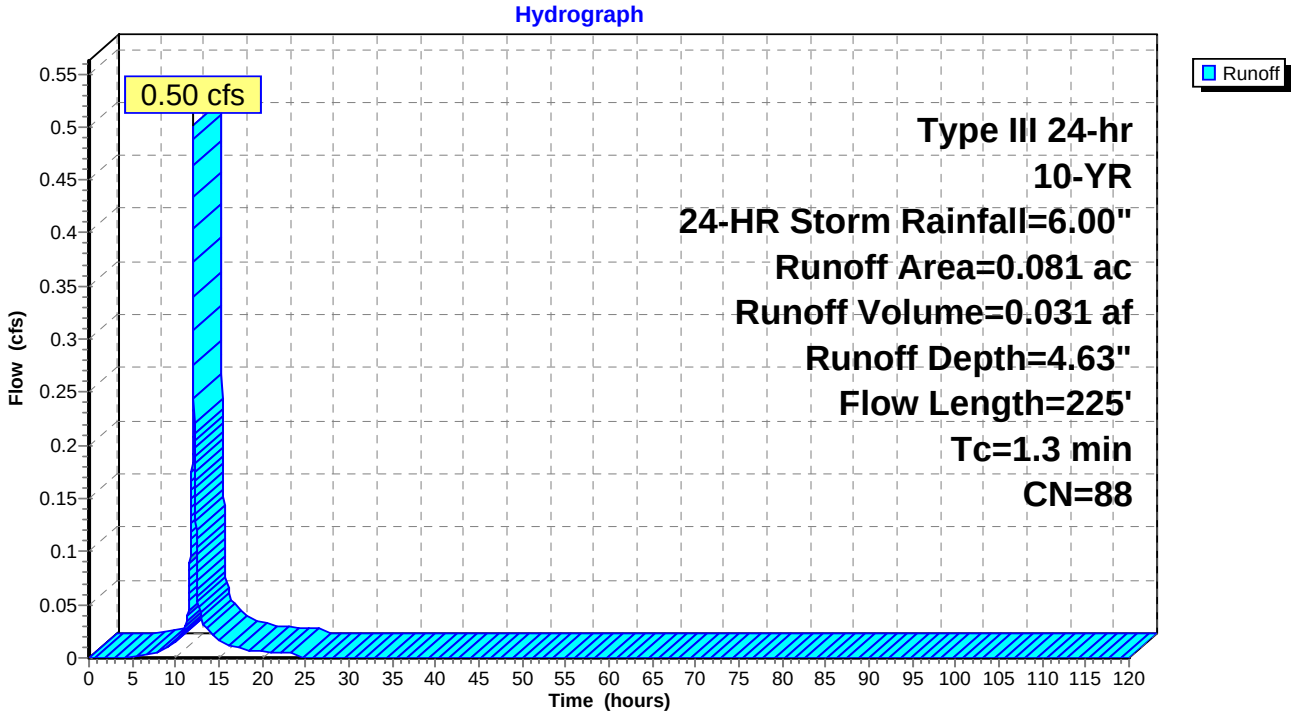
Runoff = 0.50 cfs @ 12.02 hrs, Volume= 0.031 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.046	98	Paved roads w/curbs & sewers, HSG C
0.035	74	>75% Grass cover, Good, HSG C
0.081	88	Weighted Average
0.035		43.21% Pervious Area
0.046		56.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	46	0.0100	0.97		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	179	0.0117	5.88	71.79	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	225	Total			

Subcatchment E4: E4



Summary for Subcatchment E5: E5

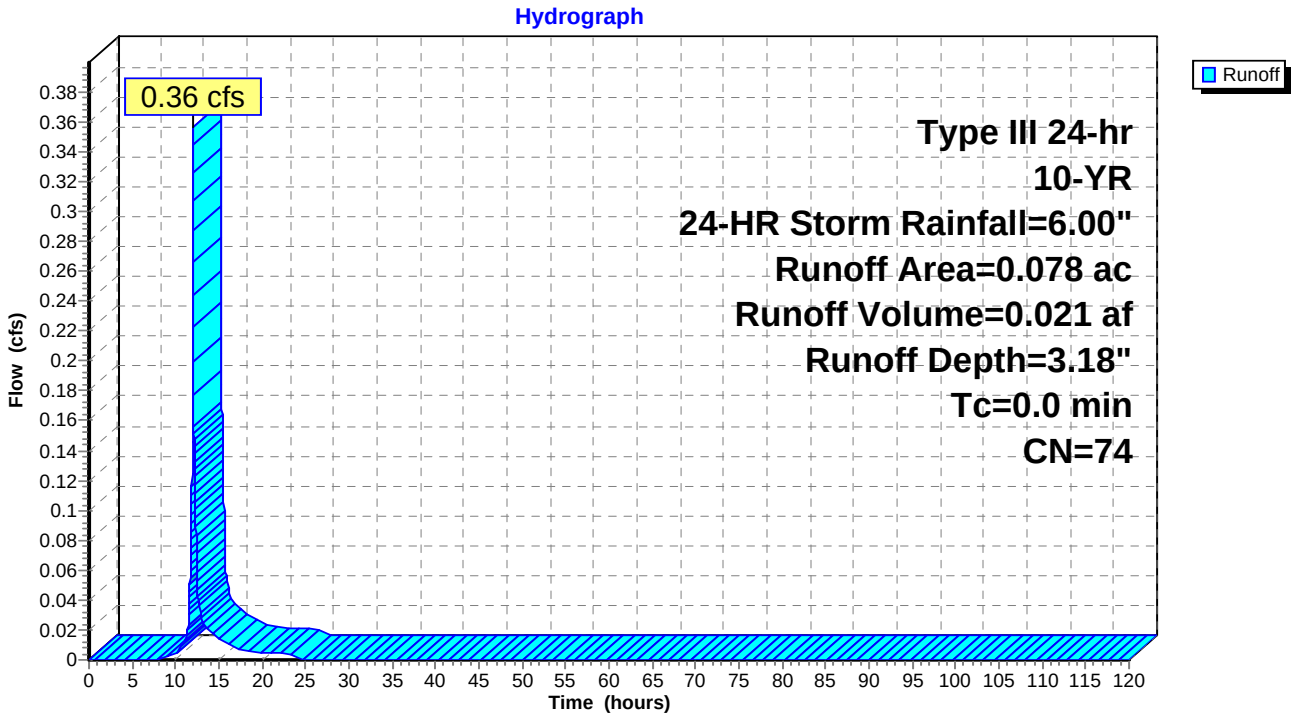
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.36 cfs @ 12.00 hrs, Volume= 0.021 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.078	74	>75% Grass cover, Good, HSG C
0.078		100.00% Pervious Area

Subcatchment E5: E5



Summary for Subcatchment F1: F1

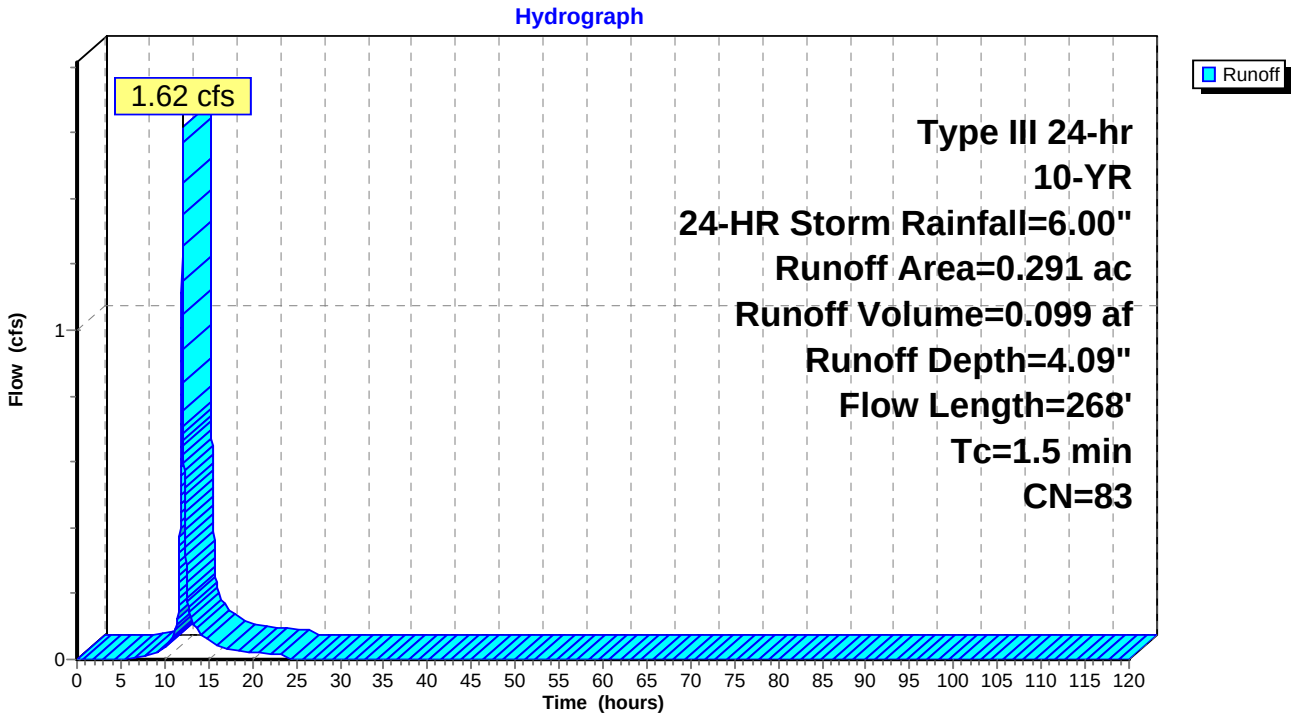
Runoff = 1.62 cfs @ 12.02 hrs, Volume= 0.099 af, Depth= 4.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.177	74	>75% Grass cover, Good, HSG C
0.114	98	Paved roads w/curbs & sewers, HSG C
0.291	83	Weighted Average
0.177		60.82% Pervious Area
0.114		39.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	54	0.0100	1.00		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	182	0.0110	5.71	69.61	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	32	0.0078	4.65	5.71	**Pipe Channel, Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.5	268	Total			

Subcatchment F1: F1



Summary for Subcatchment F2: F2

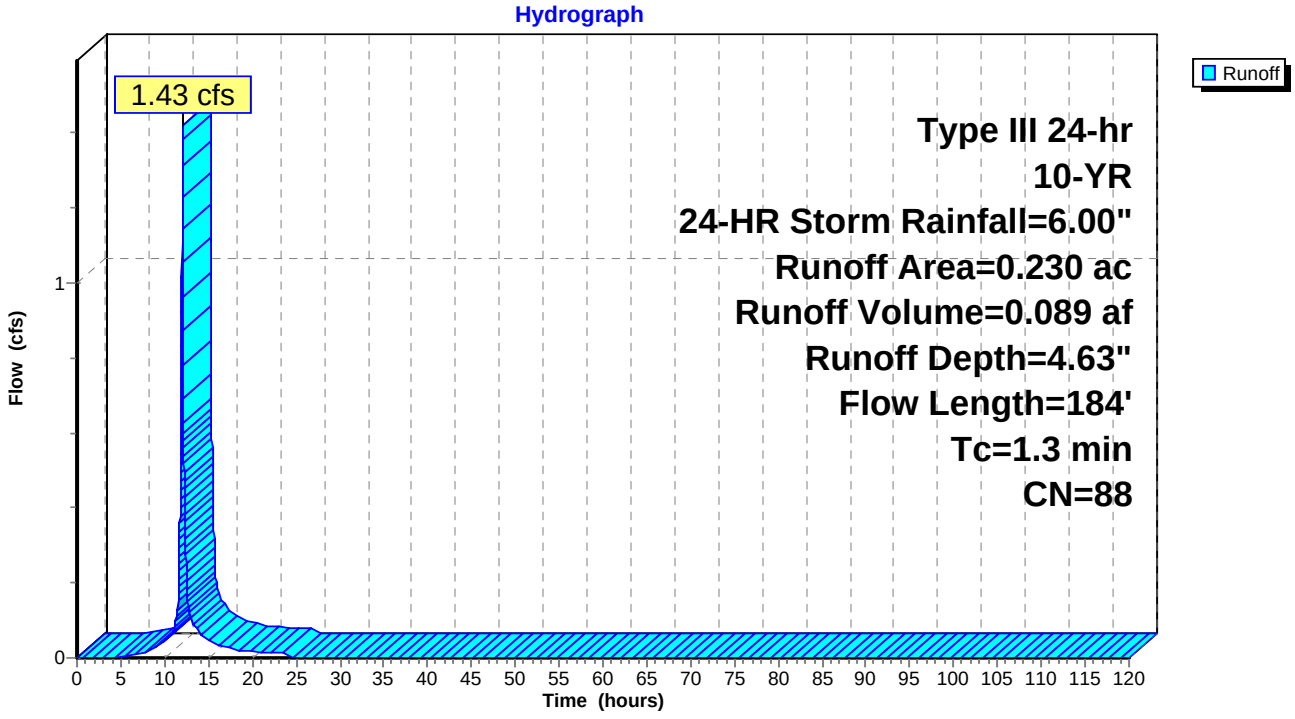
Runoff = 1.43 cfs @ 12.02 hrs, Volume= 0.089 af, Depth= 4.63"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.092	74	>75% Grass cover, Good, HSG C
0.138	98	Paved roads w/curbs & sewers, HSG C
0.230	88	Weighted Average
0.092		40.00% Pervious Area
0.138		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	58	0.0100	1.01		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	126	0.0160	6.88	83.95	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	184	Total			

Subcatchment F2: F2



Summary for Subcatchment F3: F3

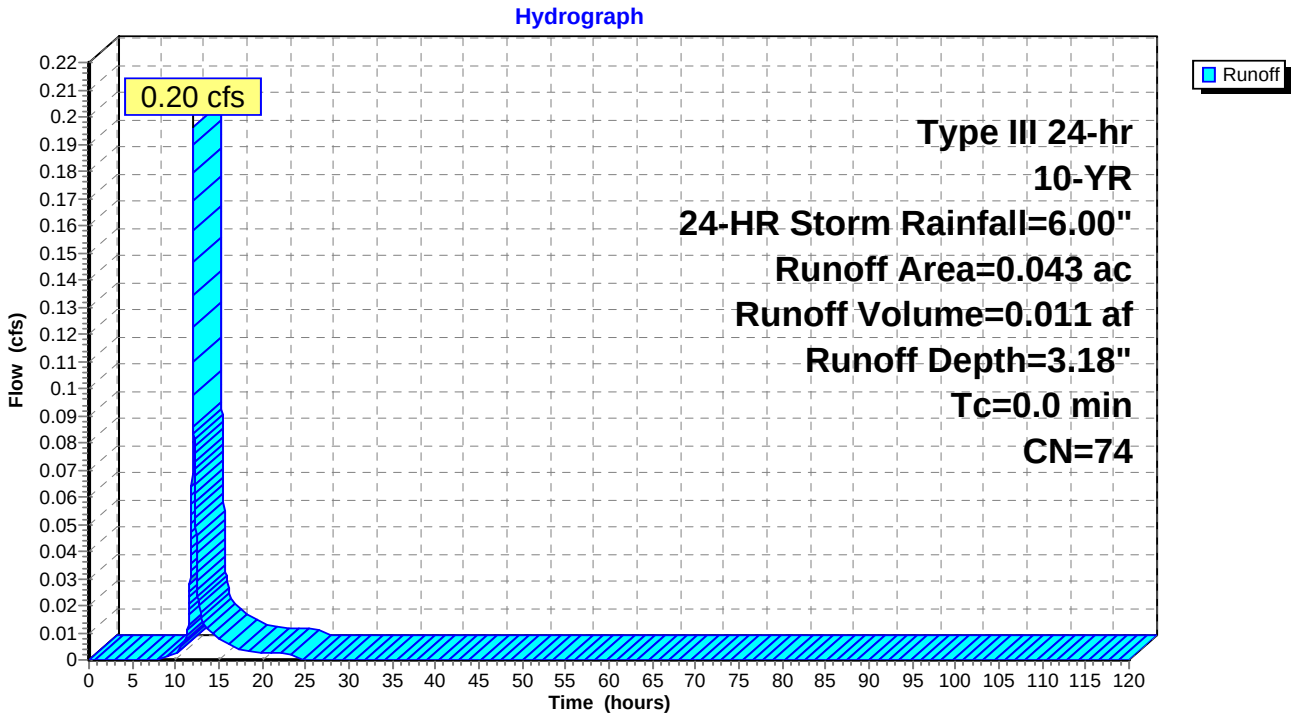
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.20 cfs @ 12.00 hrs, Volume= 0.011 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.043	74	>75% Grass cover, Good, HSG C
0.043		100.00% Pervious Area

Subcatchment F3: F3



Summary for Subcatchment G1: G1

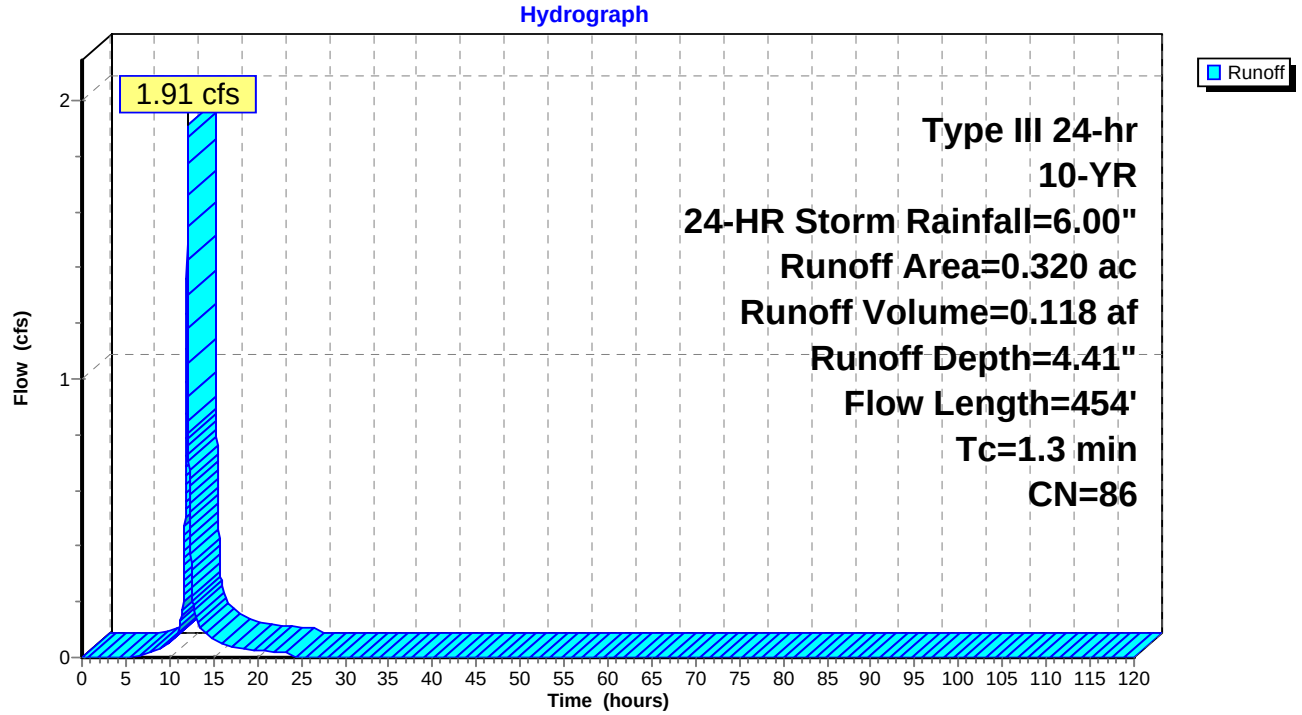
Runoff = 1.91 cfs @ 12.02 hrs, Volume= 0.118 af, Depth= 4.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.130	74	>75% Grass cover, Good, HSG C
0.095	98	Paved roads w/curbs & sewers, HSG C
0.047	80	>75% Grass cover, Good, HSG D
0.048	98	Paved roads w/curbs & sewers, HSG D
0.320	86	Weighted Average
0.177		55.31% Pervious Area
0.143		44.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	57	0.0200	1.33		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.6	364	0.0329	9.87	120.38	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.0	33	0.0920	13.76	10.81	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.3	454	Total			

Subcatchment G1: G1



Summary for Subcatchment G2: G2

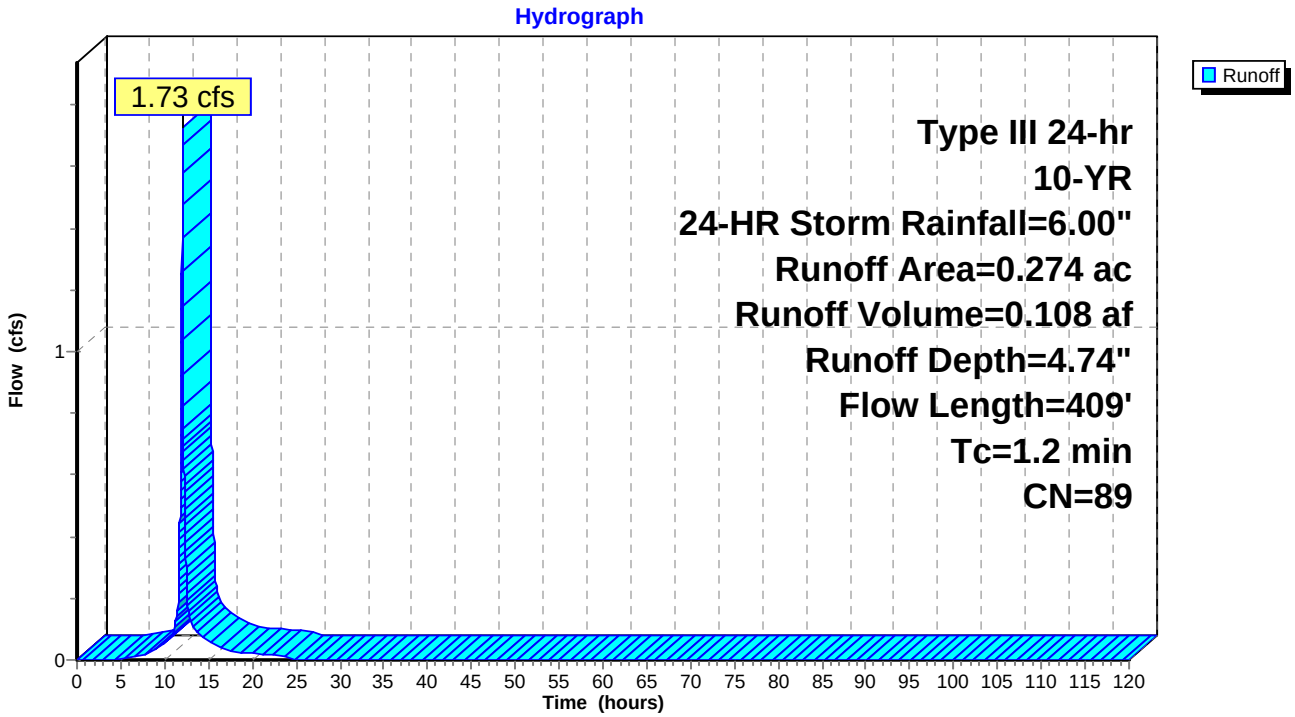
Runoff = 1.73 cfs @ 12.02 hrs, Volume= 0.108 af, Depth= 4.74"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.072	74	>75% Grass cover, Good, HSG C
0.101	98	Paved roads w/curbs & sewers, HSG C
0.046	80	>75% Grass cover, Good, HSG D
0.055	98	Paved roads w/curbs & sewers, HSG D
0.274	89	Weighted Average
0.118		43.07% Pervious Area
0.156		56.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	49	0.0200	1.29		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.6	360	0.0360	10.32	125.92	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.2	409	Total			

Subcatchment G2: G2



Summary for Subcatchment G3: G3

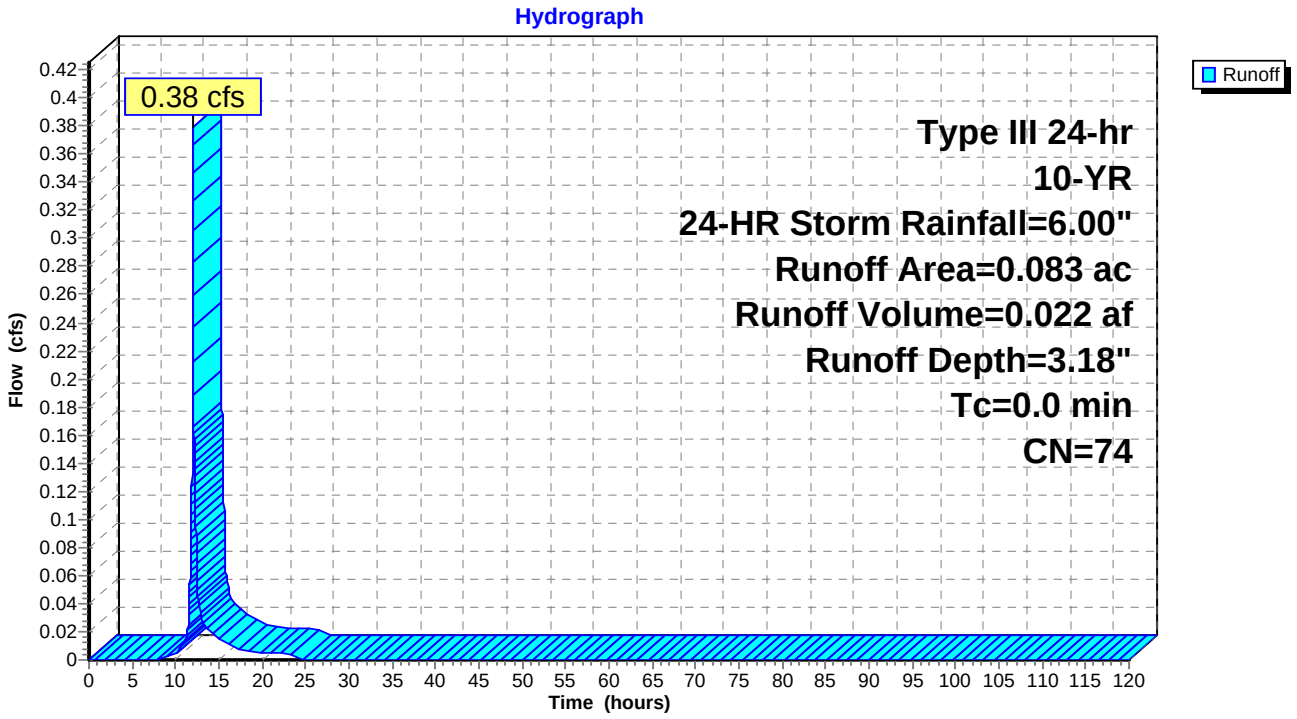
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.38 cfs @ 12.00 hrs, Volume= 0.022 af, Depth= 3.18"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 10-YR, 24-HR Storm Rainfall=6.00"

Area (ac)	CN	Description
0.083	74	>75% Grass cover, Good, HSG C
0.083		100.00% Pervious Area

Subcatchment G3: G3



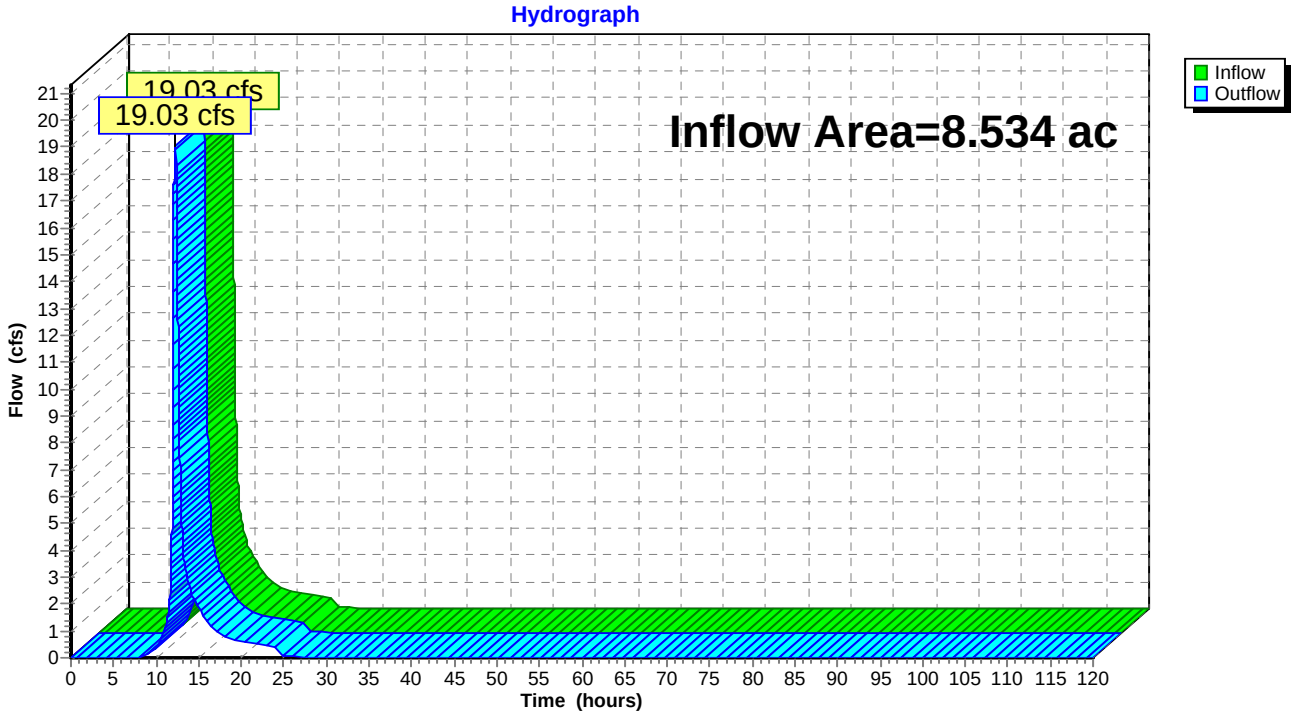
Summary for Reach DP-10: DP-10

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.534 ac, 15.60% Impervious, Inflow Depth = 3.48" for 10-YR, 24-HR Storm event
Inflow = 19.03 cfs @ 12.28 hrs, Volume= 2.474 af
Outflow = 19.03 cfs @ 12.29 hrs, Volume= 2.474 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP-10: DP-10



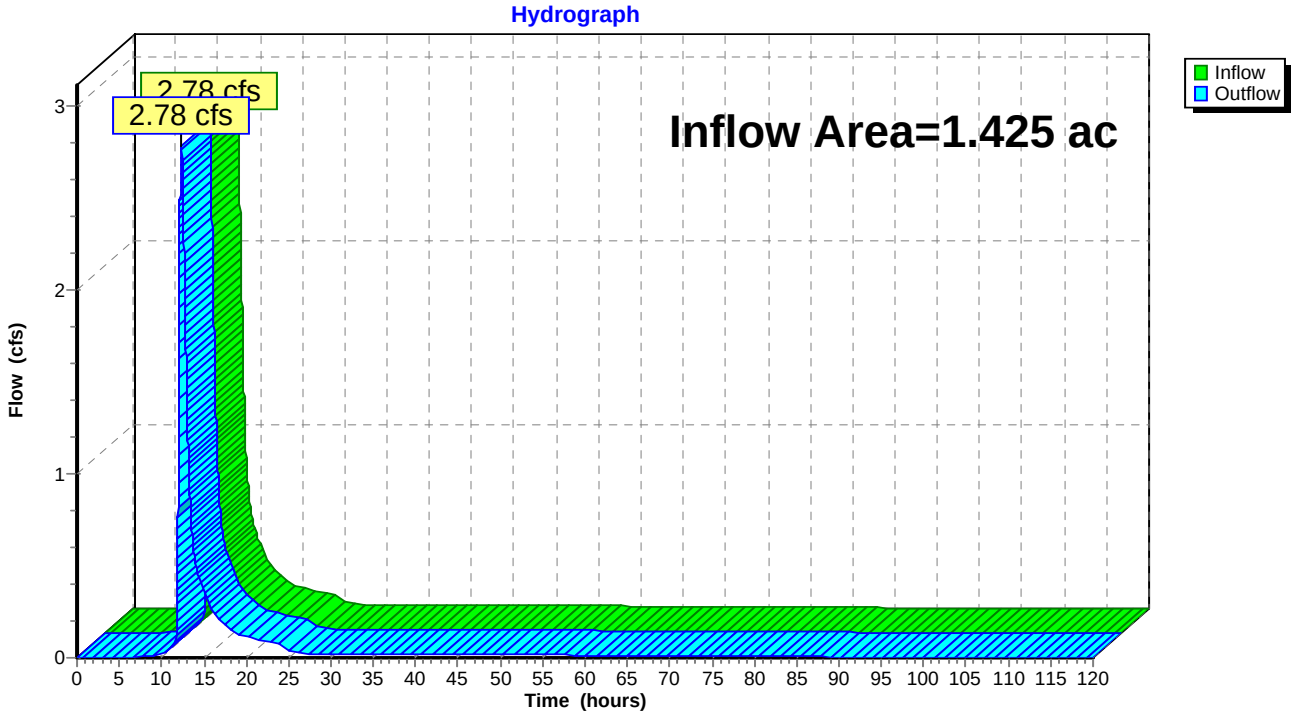
Summary for Reach DP-11: DP-11

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.425 ac, 41.68% Impervious, Inflow Depth > 4.24" for 10-YR, 24-HR Storm event
Inflow = 2.78 cfs @ 12.32 hrs, Volume= 0.503 af
Outflow = 2.78 cfs @ 12.33 hrs, Volume= 0.503 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP-11: DP-11



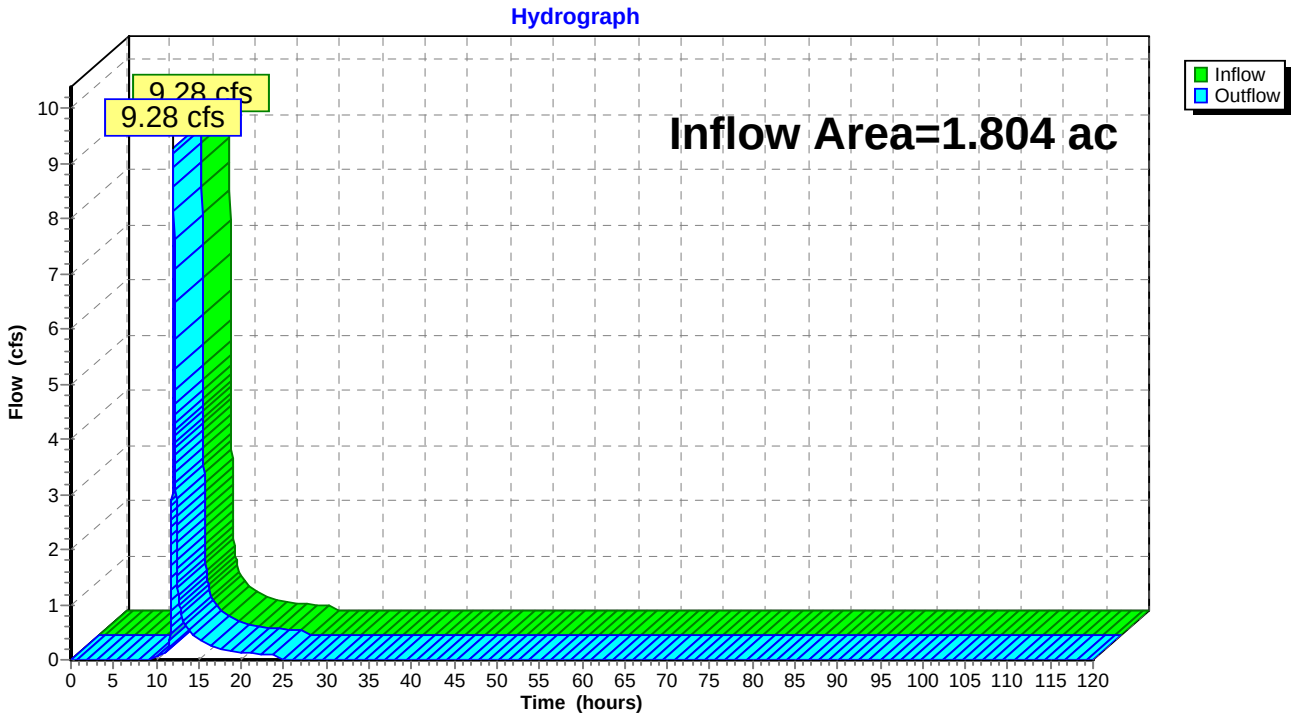
Summary for Reach DP3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.804 ac, 40.85% Impervious, Inflow Depth > 3.62" for 10-YR, 24-HR Storm event
Inflow = 9.28 cfs @ 12.04 hrs, Volume= 0.544 af
Outflow = 9.28 cfs @ 12.05 hrs, Volume= 0.544 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP3: DP-3



Summary for Pond 1P: Bioretention Area A

Inflow Area = 1.335 ac, 40.97% Impervious, Inflow Depth = 3.58" for 10-YR, 24-HR Storm event
Inflow = 3.96 cfs @ 12.03 hrs, Volume= 0.398 af
Outflow = 3.64 cfs @ 12.06 hrs, Volume= 0.321 af, Atten= 8%, Lag= 1.7 min
Primary = 3.64 cfs @ 12.06 hrs, Volume= 0.321 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,366.27' @ 12.06 hrs Surf.Area= 2,481 sf Storage= 4,321 cf

Plug-Flow detention time= 215.3 min calculated for 0.321 af (81% of inflow)
Center-of-Mass det. time= 135.6 min (947.1 - 811.6)

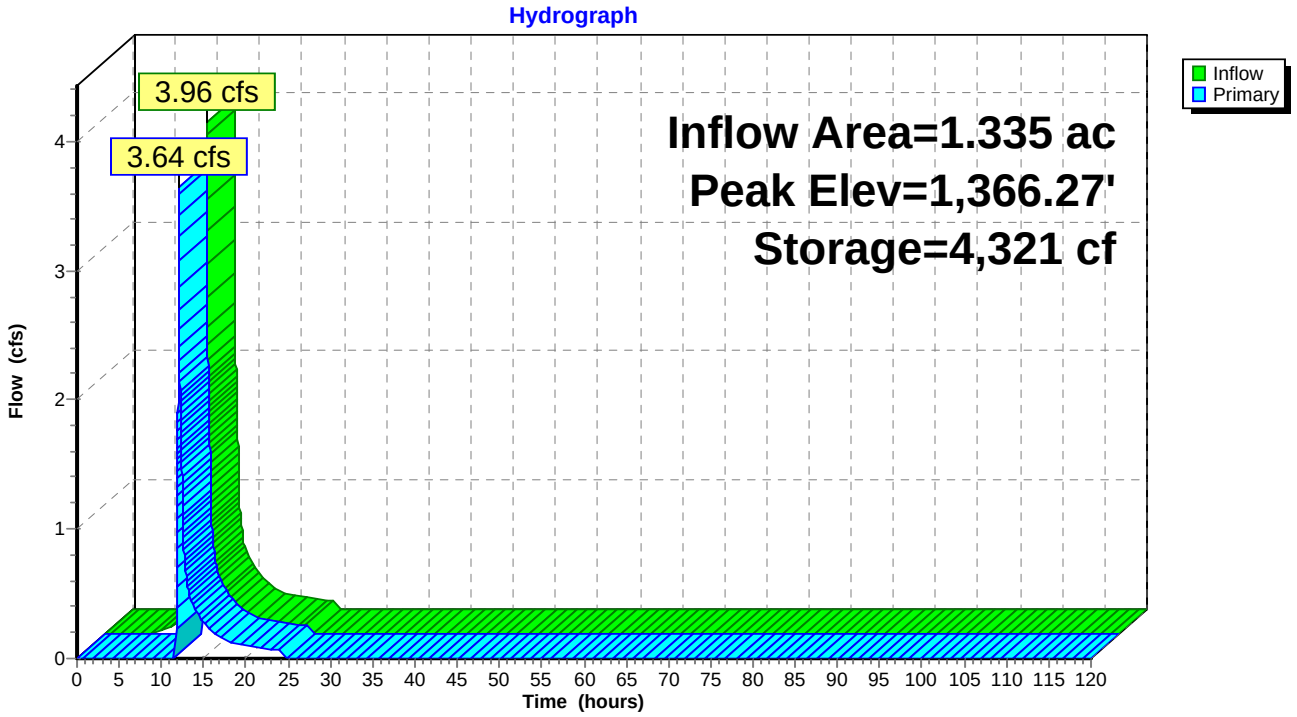
Volume	Invert	Avail.Storage	Storage Description
#1	1,360.50'	4,917 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,360.50	2,077	185.3	0.0	0	0	2,077
1,361.50	2,077	185.3	25.0	519	519	2,262
1,362.50	2,077	185.3	25.0	519	1,039	2,448
1,363.50	2,077	185.3	25.0	519	1,558	2,633
1,364.50	2,077	185.3	25.0	519	2,077	2,818
1,365.50	2,077	185.3	25.0	519	2,596	3,004
1,366.00	2,271	192.5	100.0	1,087	3,683	3,240
1,366.50	2,669	204.6	100.0	1,234	4,917	3,635

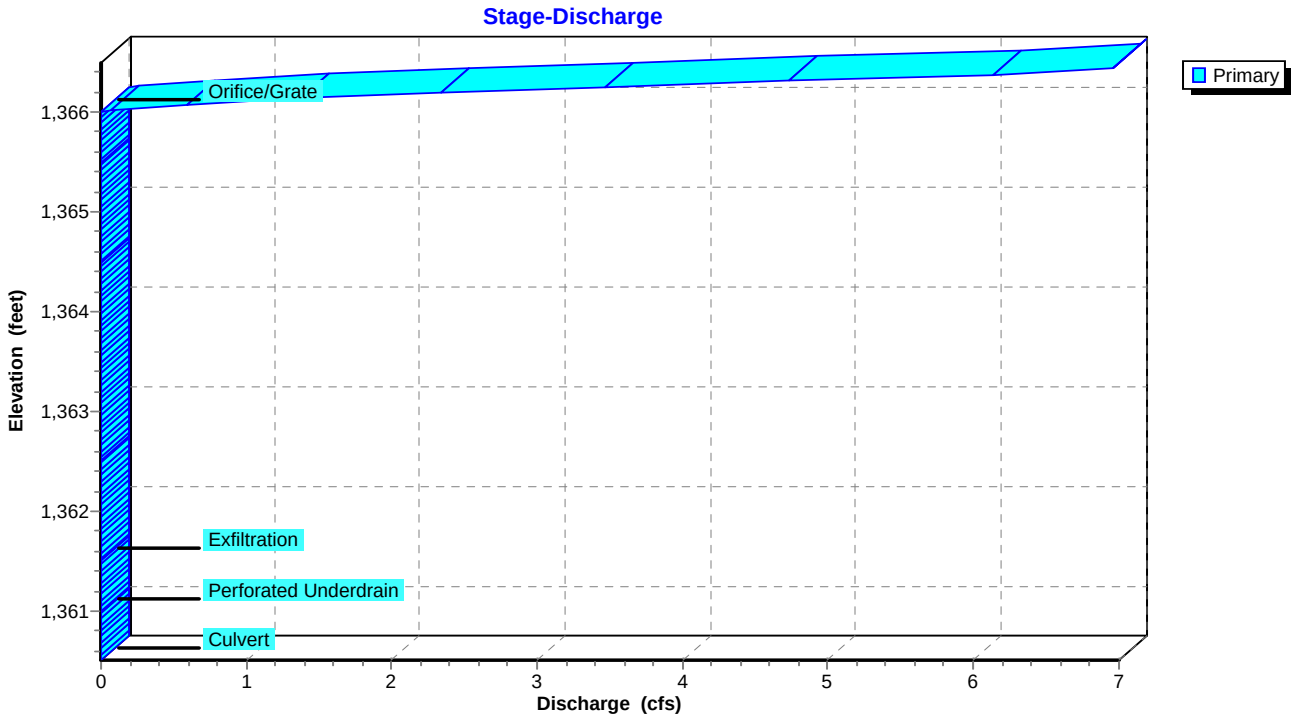
Device	Routing	Invert	Outlet Devices
#1	Primary	1,360.50'	**12.0" Round Culvert** L= 20.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,360.50' / 1,360.00' S= 0.0239 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,361.00'	**0.4" Horiz. Perforated Underdrain X 272.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,361.50'	**0.250 in/hr Exfiltration over Surface area above 1,361.50'** Conductivity to Groundwater Elevation = 1,360.00' Excluded Surface area = 2,077 sf
#4	Device 1	1,366.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.63 cfs @ 12.06 hrs HW=1,366.27' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 3.63 cfs of 6.85 cfs potential flow)
└─**2=Perforated Underdrain** (Passes 0.00 cfs of 10.49 cfs potential flow)
└─**3=Exfiltration** (Controls 0.00 cfs)
└─**4=Orifice/Grate** (Weir Controls 3.63 cfs @ 1.69 fps)

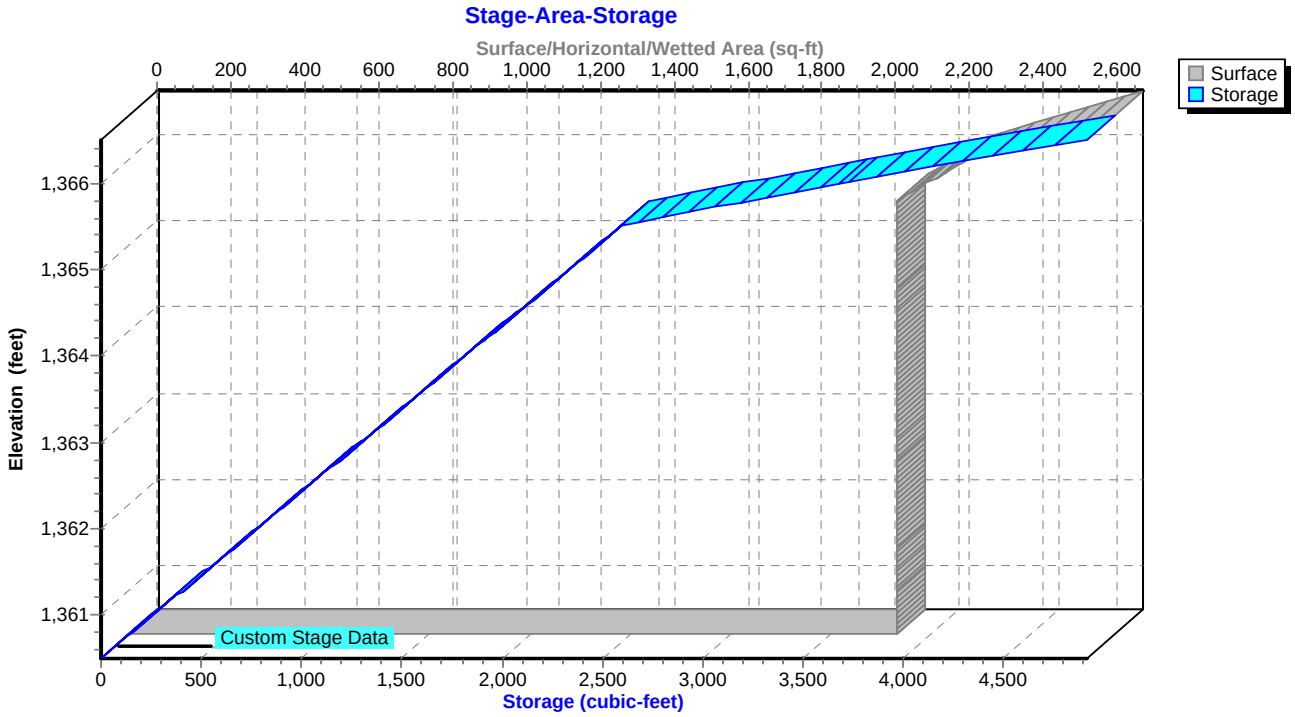
Pond 1P: Bioretention Area A



Pond 1P: Bioretention Area A



Pond 1P: Bioretention Area A



Summary for Pond 3P: Flow Splitter to BMP

Inflow Area = 0.407 ac, 46.68% Impervious, Inflow Depth = 4.31" for 10-YR, 24-HR Storm event
Inflow = 2.40 cfs @ 12.02 hrs, Volume= 0.146 af
Outflow = 2.40 cfs @ 12.03 hrs, Volume= 0.146 af, Atten= 0%, Lag= 0.6 min
Primary = 0.06 cfs @ 9.95 hrs, Volume= 0.008 af
Secondary = 2.40 cfs @ 12.03 hrs, Volume= 0.138 af

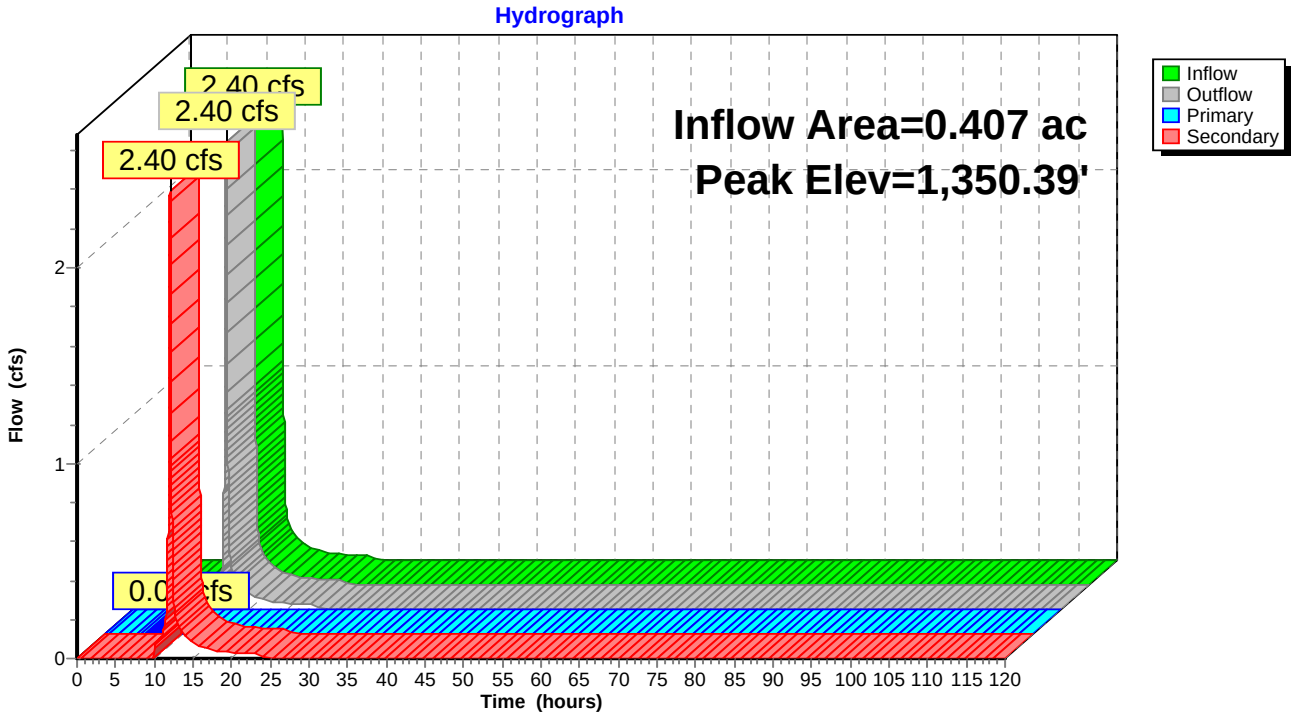
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,350.39' @ 12.03 hrs
Flood Elev= 1,350.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,349.49'	**12.0" Round Culvert** L= 18.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,349.49' / 1,348.85' S= 0.0339 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	1,349.49'	**15.0" Round Bypass Culvert** L= 119.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,349.49' / 1,348.00' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,349.85'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

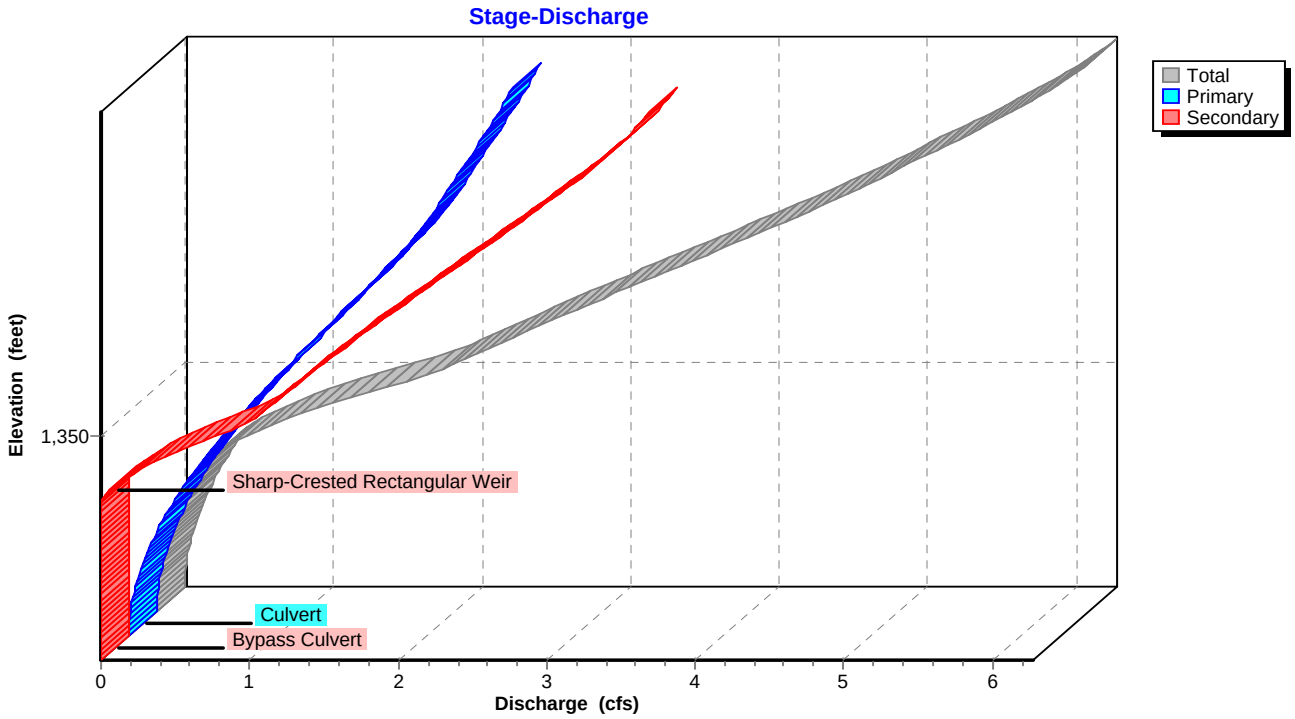
Primary OutFlow Max=0.00 cfs @ 9.95 hrs HW=1,349.85' TW=1,349.85' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=2.39 cfs @ 12.03 hrs HW=1,350.38' TW=0.00' (Dynamic Tailwater)
└**2=Bypass Culvert** (Inlet Controls 2.39 cfs @ 2.54 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 2.39 cfs of 4.96 cfs potential flow)

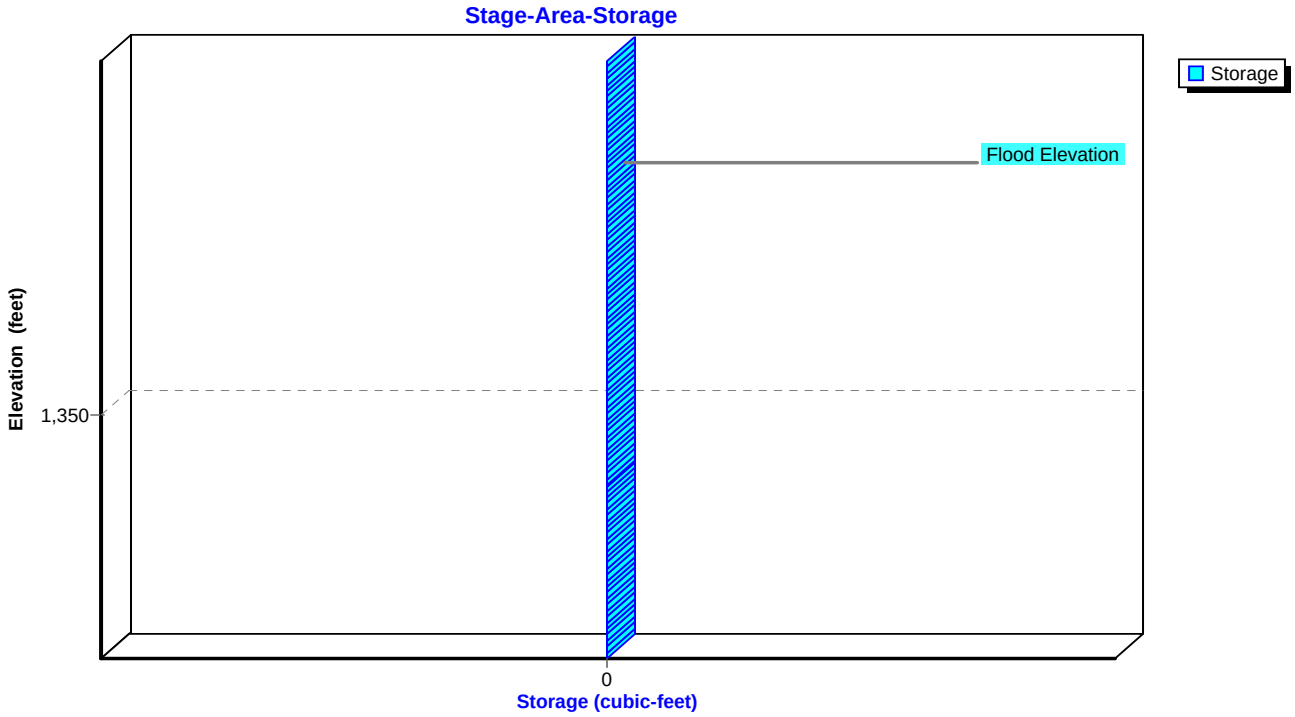
Pond 3P: Flow Splitter to BMP



Pond 3P: Flow Splitter to BMP



Pond 3P: Flow Splitter to BMP



Summary for Pond 4P: Pocket Wetland 30

Inflow Area = 1.148 ac, 48.61% Impervious, Inflow Depth = 4.49" for 10-YR, 24-HR Storm event
Inflow = 6.57 cfs @ 12.03 hrs, Volume= 0.429 af
Outflow = 2.13 cfs @ 12.29 hrs, Volume= 0.428 af, Atten= 68%, Lag= 15.3 min
Primary = 2.13 cfs @ 12.29 hrs, Volume= 0.428 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,437.00' Surf.Area= 3,744 sf Storage= 5,097 cf
Peak Elev= 1,438.60' @ 12.29 hrs Surf.Area= 6,017 sf Storage= 12,893 cf (7,795 cf above start)

Plug-Flow detention time= 814.5 min calculated for 0.310 af (72% of inflow)
Center-of-Mass det. time= 510.5 min (1,301.5 - 791.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,434.00'	22,580 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

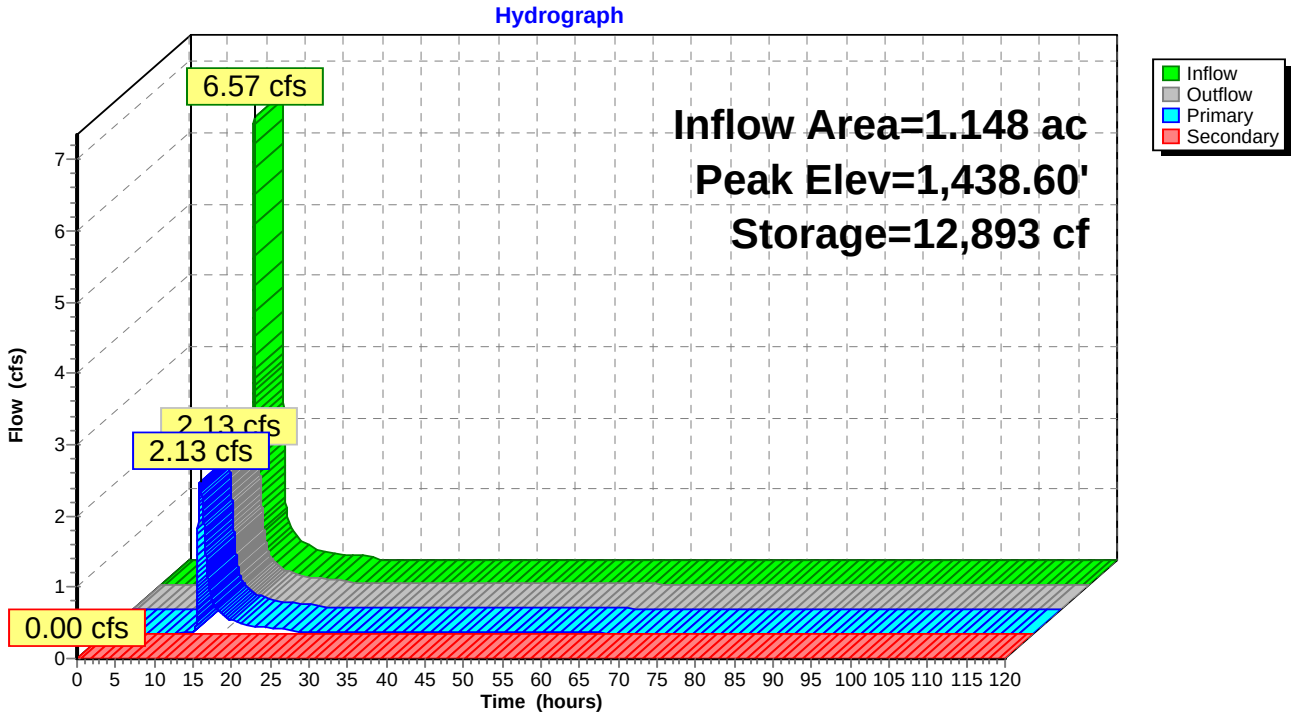
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,434.00	524	152.8	0	0	524
1,435.00	1,039	190.5	767	767	1,568
1,436.00	2,010	281.1	1,498	2,265	4,976
1,437.00	3,744	344.1	2,832	5,097	8,126
1,438.00	5,203	334.4	4,454	9,551	8,750
1,439.00	6,601	346.2	5,888	15,439	9,474
1,440.00	7,695	367.2	7,141	22,580	10,719

Device	Routing	Invert	Outlet Devices
#1	Primary	1,434.00'	**15.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,434.00' / 1,432.00' S= 0.1000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,437.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,437.80'	**6.0" Vert. Orifice/Grate X 3.00** C= 0.600
#4	Secondary	1,439.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

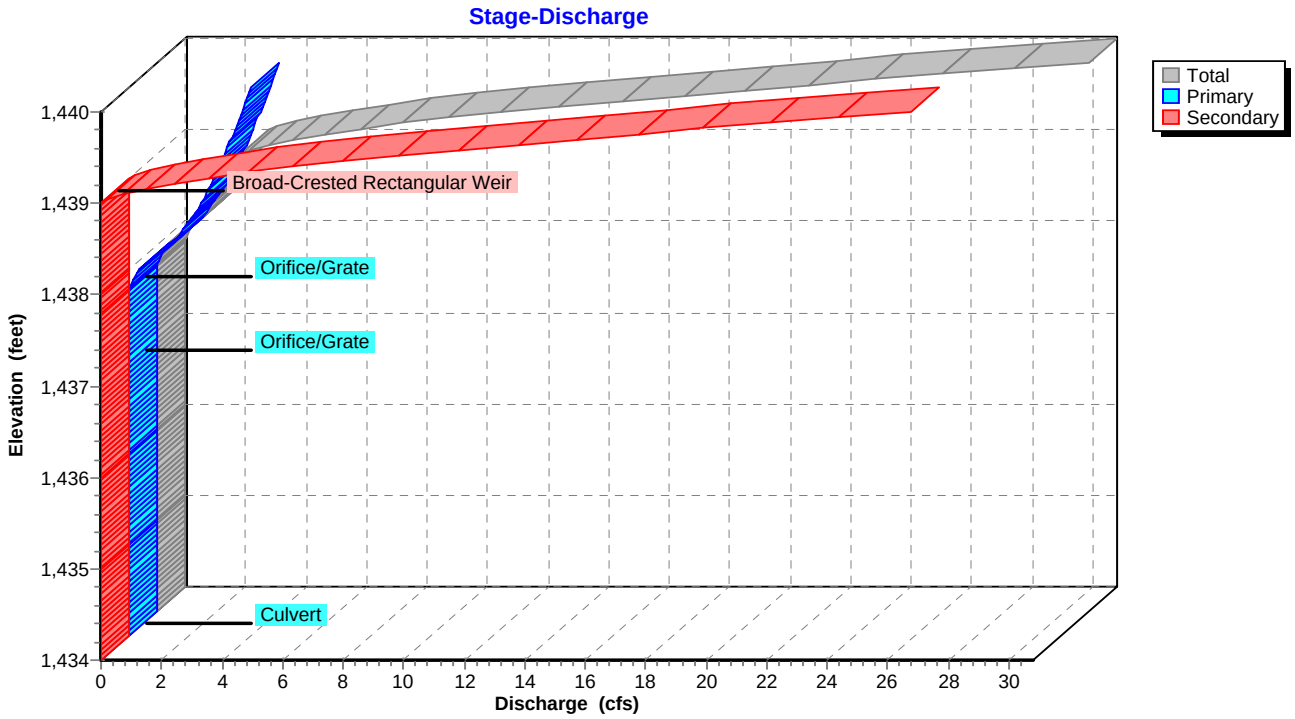
Primary OutFlow Max=2.13 cfs @ 12.29 hrs HW=1,438.60' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.13 cfs of 9.30 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.03 cfs @ 6.00 fps)
  └**3=Orifice/Grate** (Orifice Controls 2.10 cfs @ 3.56 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,437.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

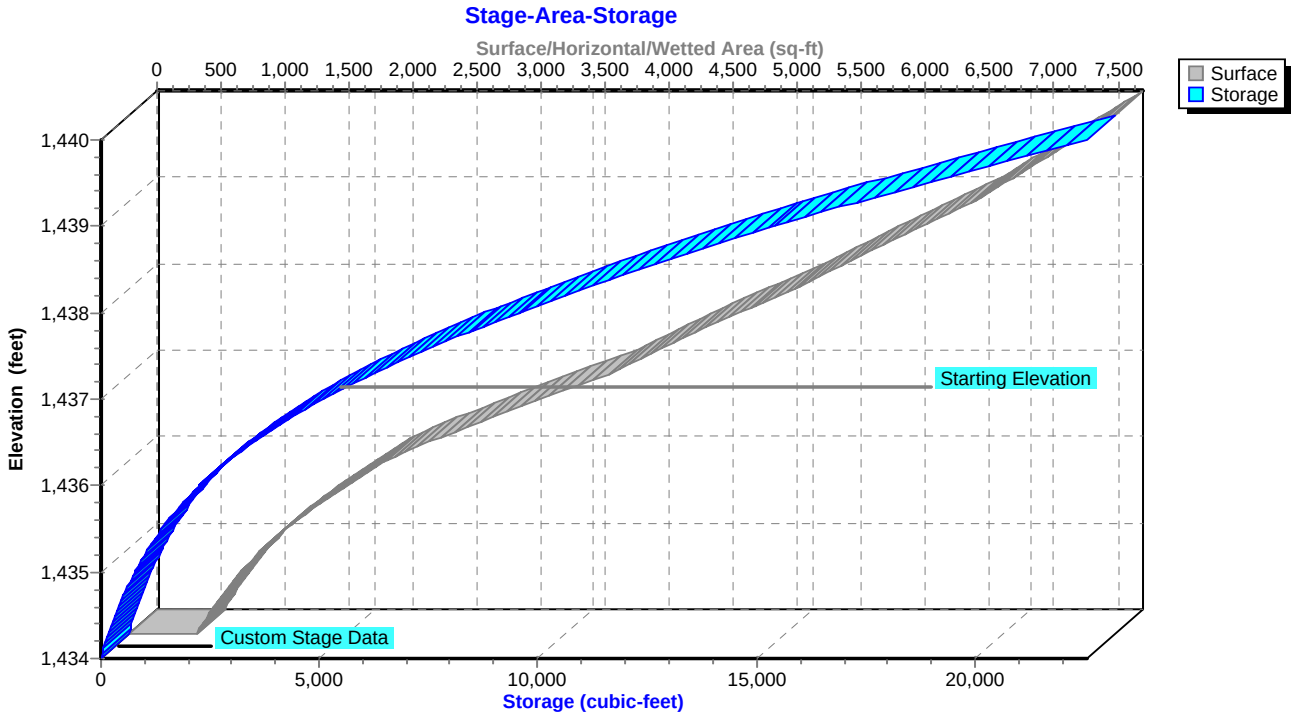
Pond 4P: Pocket Wetland 30



Pond 4P: Pocket Wetland 30



Pond 4P: Pocket Wetland 30



Summary for Pond 5P: Bioretention Area B

[80] Warning: Exceeded Pond 3P by 1.15' @ 24.08 hrs (3.00 cfs 24.500 af)

Inflow Area = 0.469 ac, 40.51% Impervious, Inflow Depth = 0.66" for 10-YR, 24-HR Storm event
Inflow = 0.30 cfs @ 12.00 hrs, Volume= 0.026 af
Outflow = 0.01 cfs @ 15.59 hrs, Volume= 0.011 af, Atten= 97%, Lag= 215.3 min
Primary = 0.01 cfs @ 15.59 hrs, Volume= 0.011 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,351.00' @ 15.59 hrs Surf.Area= 1,028 sf Storage= 948 cf

Plug-Flow detention time= 2,265.8 min calculated for 0.011 af (43% of inflow)
Center-of-Mass det. time= 2,099.9 min (2,823.2 - 723.3)

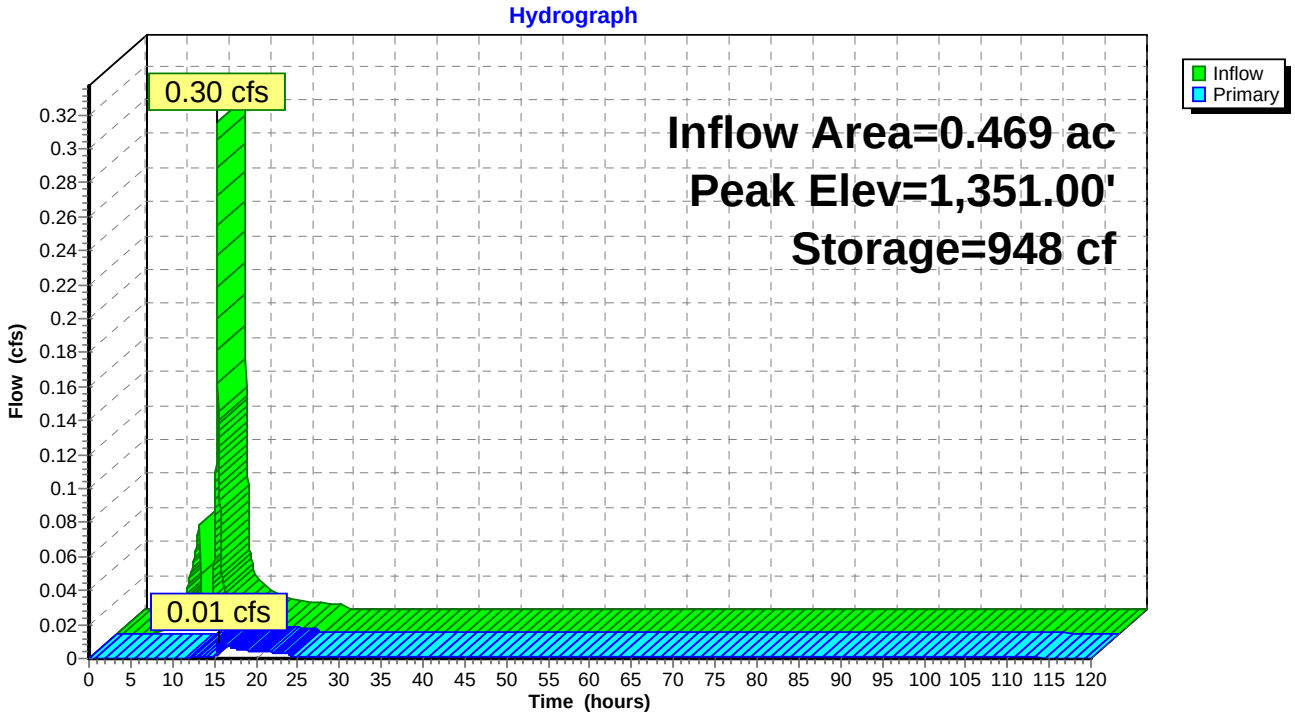
Volume	Invert	Avail.Storage	Storage Description
#1	1,348.00'	2,214 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,348.00	786	136.5	0.0	0	0	786
1,349.00	786	136.5	25.0	197	197	923
1,349.50	786	136.5	25.0	98	295	991
1,350.00	786	136.5	25.0	98	393	1,059
1,350.50	786	136.5	25.0	98	491	1,127
1,351.00	1,026	151.0	100.0	452	943	1,467
1,352.00	1,534	174.5	100.0	1,272	2,214	2,097

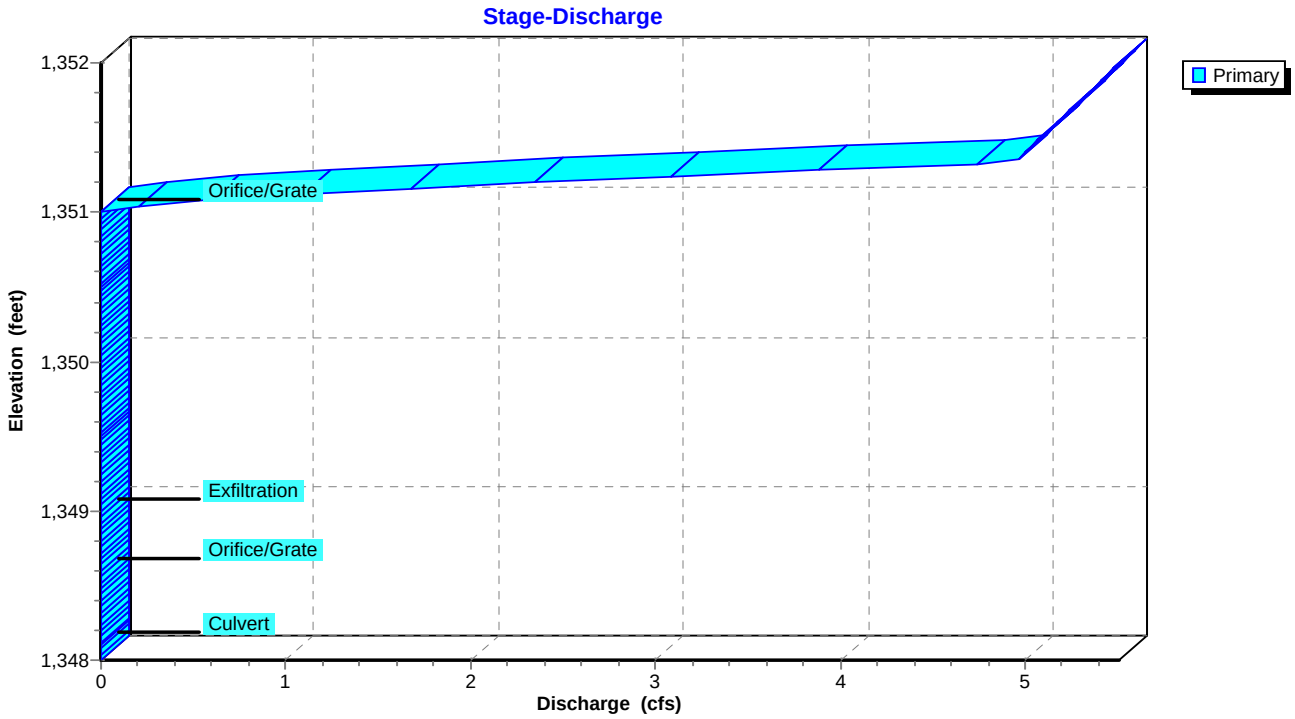
Device	Routing	Invert	Outlet Devices
#1	Primary	1,348.10'	**12.0" Round Culvert** L= 19.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,348.10' / 1,348.00' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,348.60'	**0.4" Horiz. Orifice/Grate X 960.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,349.00'	**0.250 in/hr Exfiltration over Surface area above 1,349.00'** Conductivity to Groundwater Elevation = 1,347.50' Excluded Surface area = 786 sf
#4	Device 1	1,351.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 15.59 hrs HW=1,351.00' TW=0.00' (Dynamic Tailwater)
└─**1=Culvert** (Passes 0.01 cfs of 4.63 cfs potential flow)
  ├─**2=Orifice/Grate** (Passes 0.00 cfs of 6.26 cfs potential flow)
  │ └─**3=Exfiltration** (Controls 0.00 cfs)
  └─**4=Orifice/Grate** (Weir Controls 0.01 cfs @ 0.22 fps)

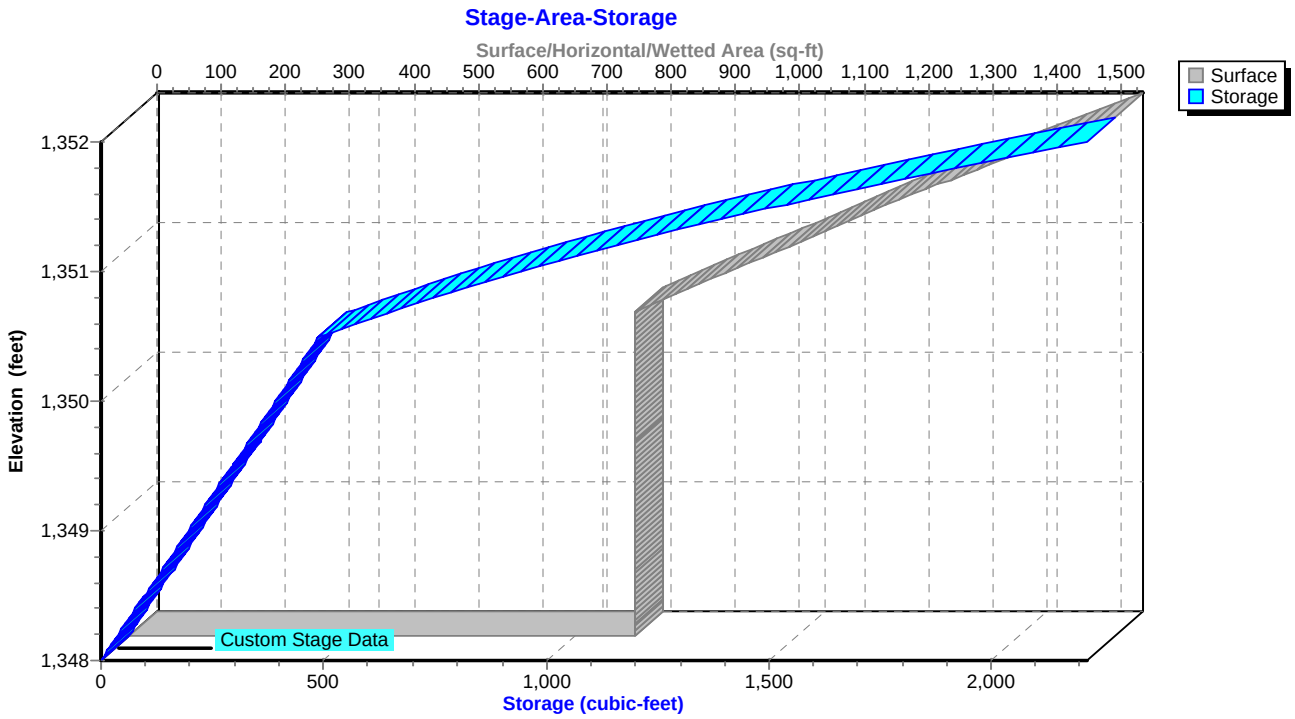
Pond 5P: Bioretention Area B



Pond 5P: Bioretention Area B



Pond 5P: Bioretention Area B



Summary for Pond 11P: Pocket Wetland 29B

Inflow Area = 1.788 ac, 51.12% Impervious, Inflow Depth = 4.56" for 10-YR, 24-HR Storm event
Inflow = 10.44 cfs @ 12.03 hrs, Volume= 0.679 af
Outflow = 8.50 cfs @ 12.08 hrs, Volume= 0.676 af, Atten= 19%, Lag= 2.9 min
Primary = 2.42 cfs @ 12.08 hrs, Volume= 0.519 af
Secondary = 6.08 cfs @ 12.08 hrs, Volume= 0.157 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,442.00' Surf.Area= 3,817 sf Storage= 5,150 cf
Peak Elev= 1,443.39' @ 12.08 hrs Surf.Area= 6,370 sf Storage= 12,163 cf (7,012 cf above start)

Plug-Flow detention time= 232.3 min calculated for 0.558 af (82% of inflow)
Center-of-Mass det. time= 115.6 min (905.2 - 789.5)

Volume	Invert	Avail.Storage	Storage Description
#1	1,438.00'	20,412 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

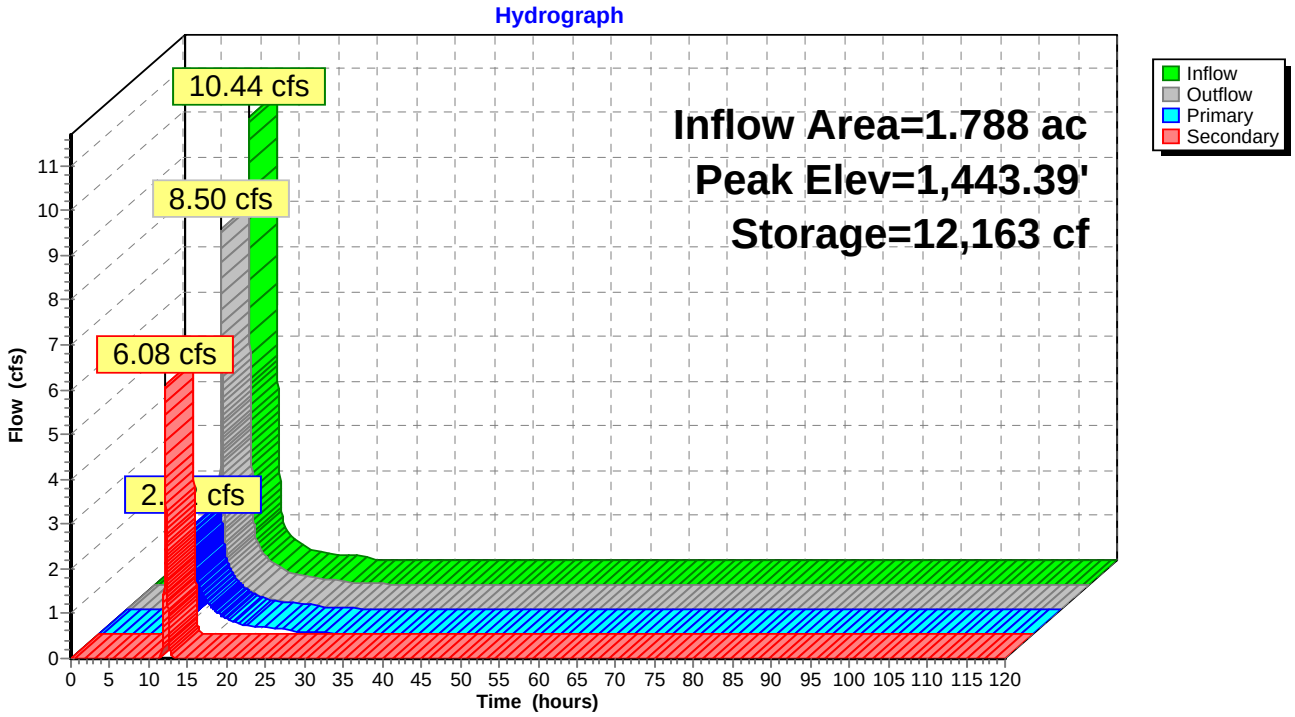
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,438.00	74	30.7	0	0	74
1,439.00	207	53.8	135	135	235
1,440.00	720	190.6	438	573	2,898
1,441.00	2,419	328.2	1,486	2,059	8,585
1,442.00	3,817	444.2	3,092	5,150	15,726
1,443.00	5,595	534.5	4,678	9,828	22,775
1,444.00	7,680	353.3	6,610	16,438	35,585
1,444.50	8,217	362.0	3,973	20,412	36,111

Device	Routing	Invert	Outlet Devices
#1	Primary	1,442.00'	**45.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)
#2	Secondary	1,443.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

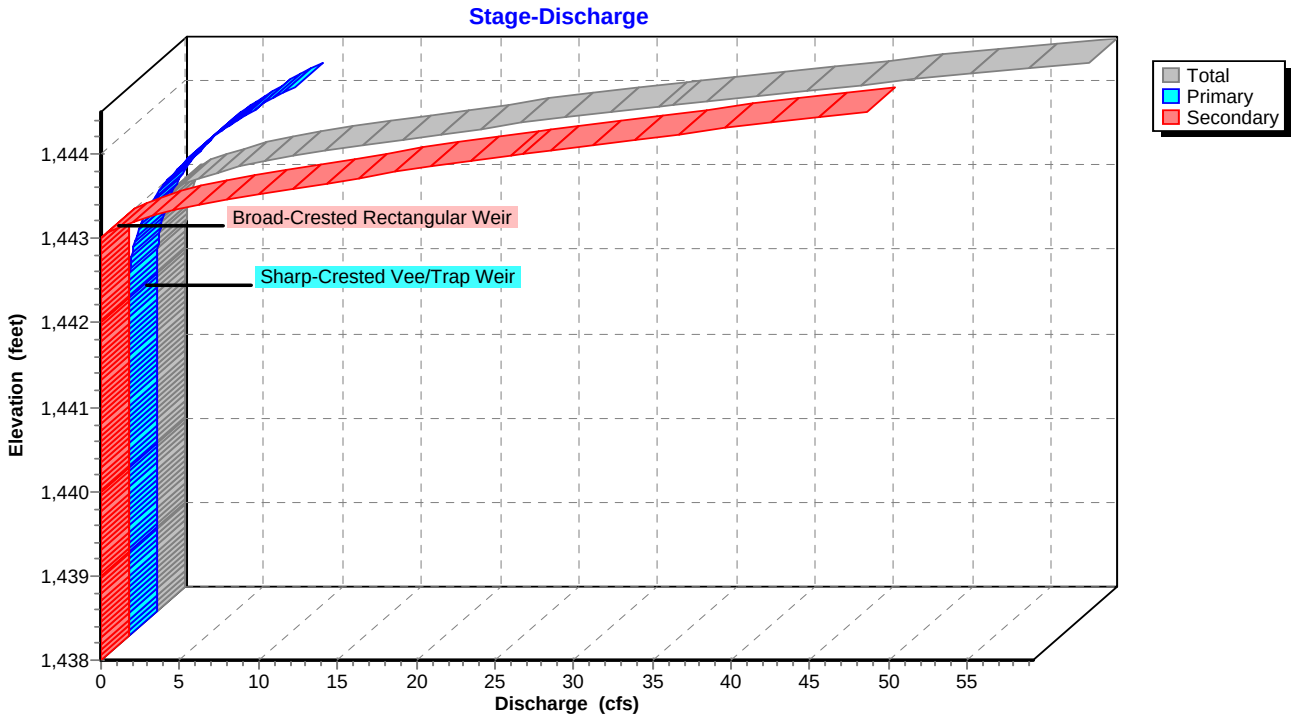
Primary OutFlow Max=2.42 cfs @ 12.08 hrs HW=1,443.39' TW=0.00' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 2.42 cfs @ 3.02 fps)

Secondary OutFlow Max=6.08 cfs @ 12.08 hrs HW=1,443.39' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 6.08 cfs @ 1.56 fps)

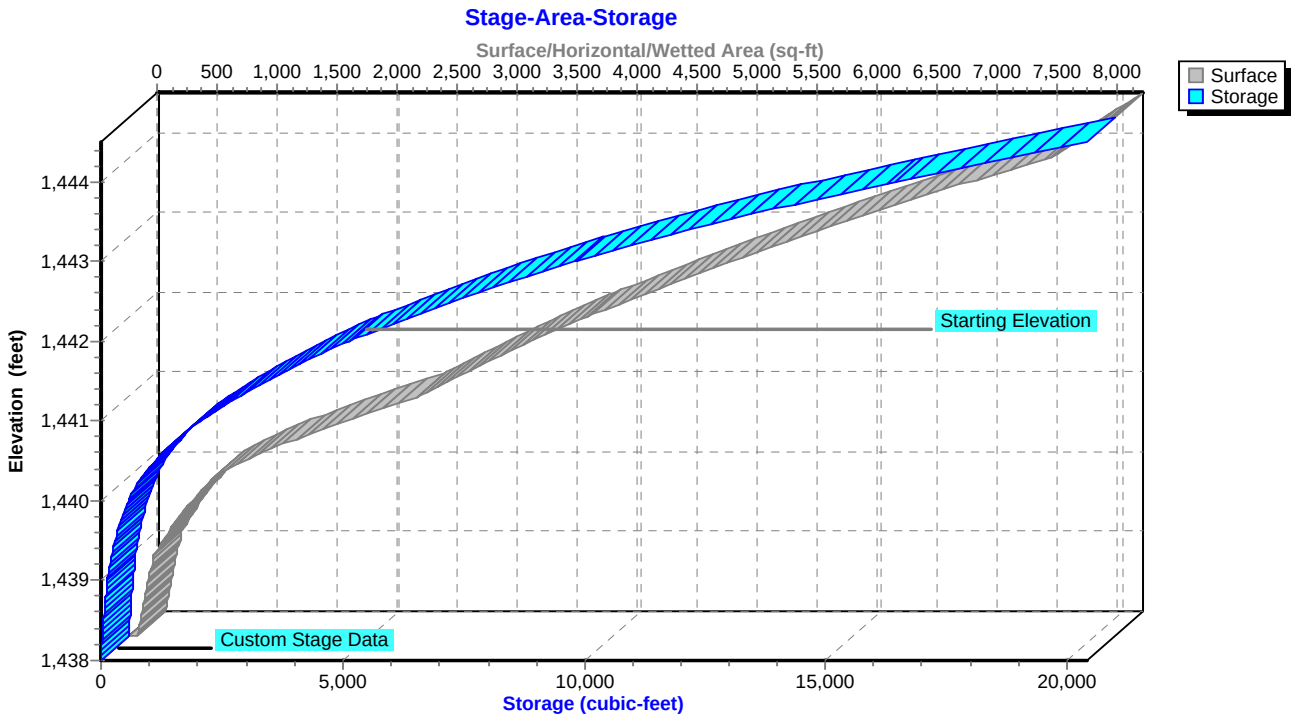
Pond 11P: Pocket Wetland 29B



Pond 11P: Pocket Wetland 29B



Pond 11P: Pocket Wetland 29B



Summary for Pond 12P: Pocket Wetland 29A

Inflow Area = 0.448 ac, 43.53% Impervious, Inflow Depth = 4.39" for 10-YR, 24-HR Storm event
Inflow = 2.38 cfs @ 12.03 hrs, Volume= 0.164 af
Outflow = 2.31 cfs @ 12.05 hrs, Volume= 0.164 af, Atten= 3%, Lag= 1.4 min
Primary = 2.31 cfs @ 12.05 hrs, Volume= 0.164 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,443.50' Surf.Area= 1,339 sf Storage= 1,565 cf
Peak Elev= 1,443.71' @ 12.05 hrs Surf.Area= 1,449 sf Storage= 1,859 cf (294 cf above start)

Plug-Flow detention time= 131.7 min calculated for 0.128 af (78% of inflow)
Center-of-Mass det. time= 4.8 min (797.4 - 792.6)

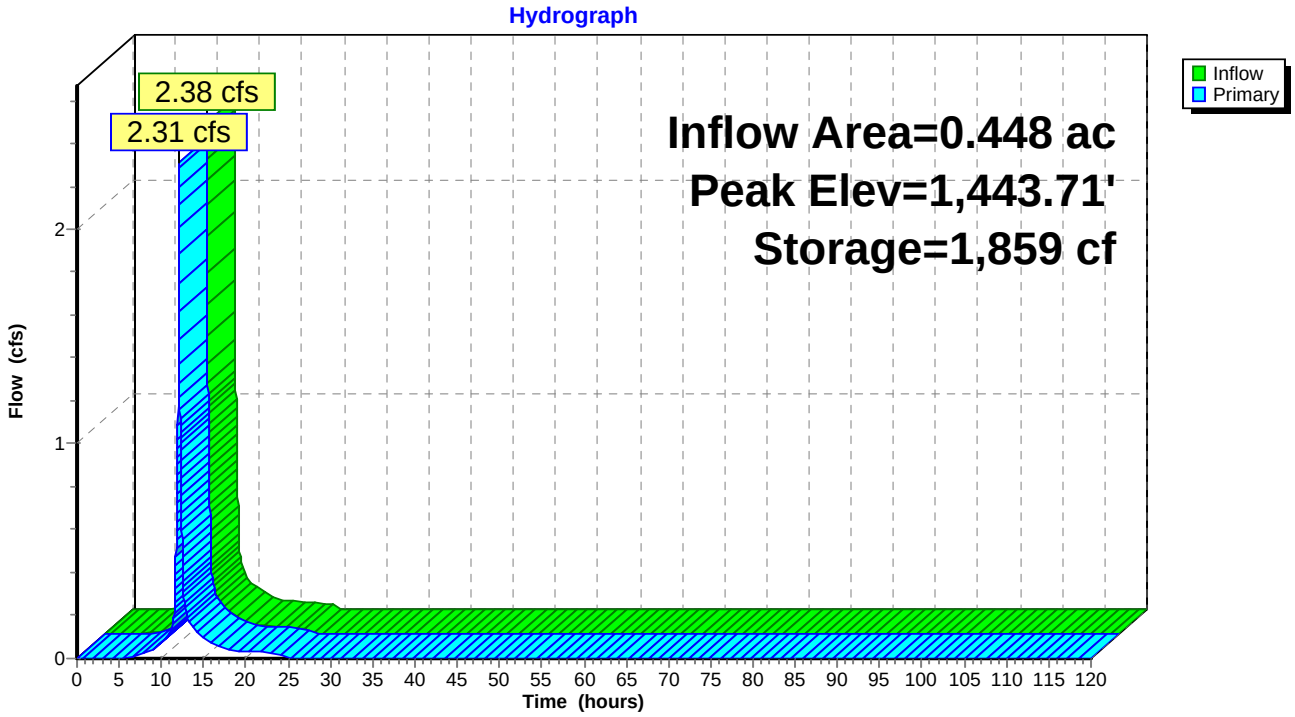
Volume	Invert	Avail.Storage	Storage Description
#1	1,441.00'	4,185 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,441.00	166	50.3	0	0	166
1,442.00	367	74.7	260	260	417
1,443.00	1,094	161.8	698	958	2,060
1,444.00	1,608	180.7	1,343	2,301	2,603
1,445.00	2,175	199.2	1,884	4,185	3,194

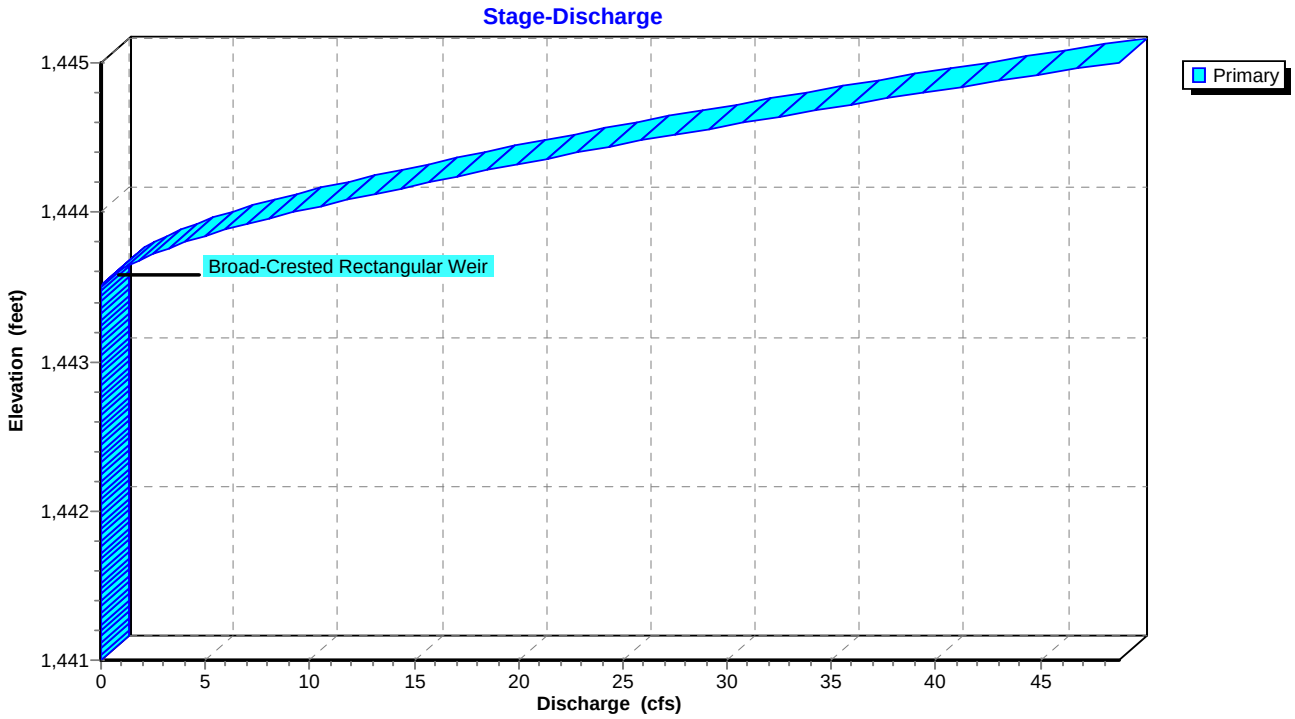
Device	Routing	Invert	Outlet Devices
#1	Primary	1,443.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.30 cfs @ 12.05 hrs HW=1,443.71' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 2.30 cfs @ 1.10 fps)

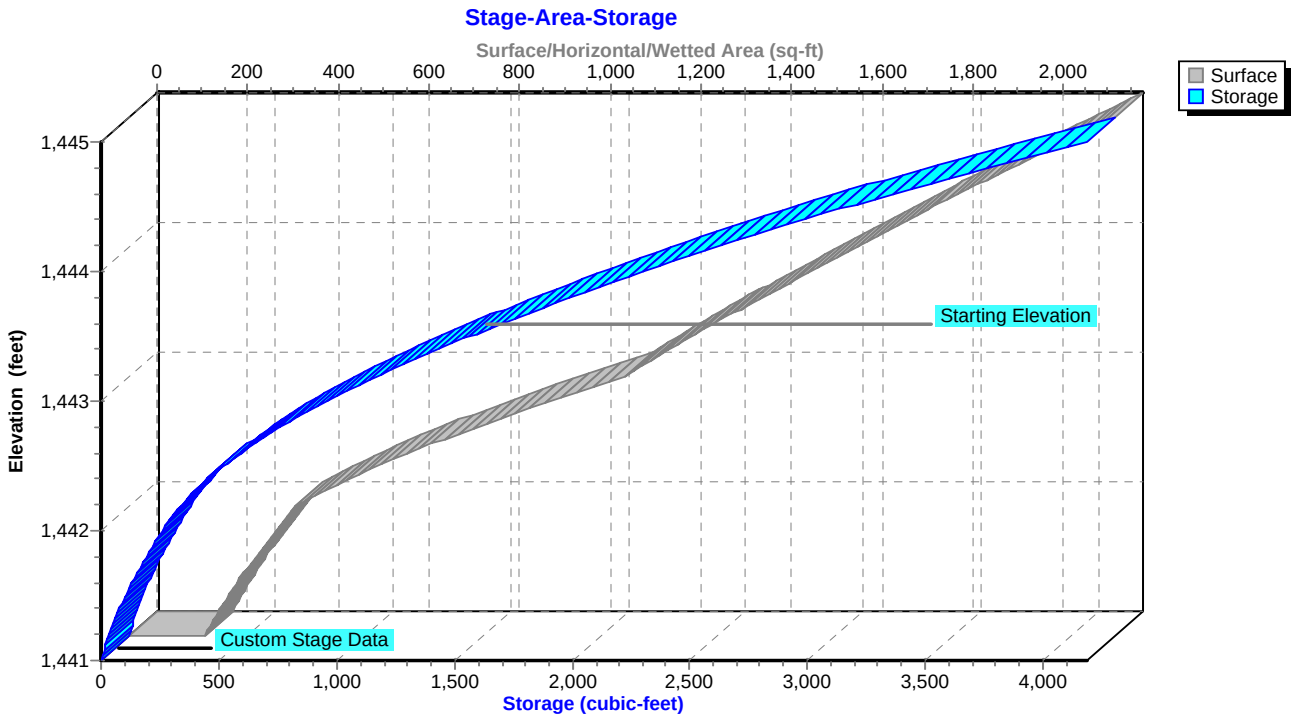
Pond 12P: Pocket Wetland 29A



Pond 12P: Pocket Wetland 29A



Pond 12P: Pocket Wetland 29A



Summary for Pond 13P: Flow Splitter to SW 29A

[57] Hint: Peaked at 1,444.16' (Flood elevation advised)

Inflow Area = 0.369 ac, 50.68% Impervious, Inflow Depth = 4.63" for 10-YR, 24-HR Storm event
Inflow = 2.25 cfs @ 12.03 hrs, Volume= 0.142 af
Outflow = 2.25 cfs @ 12.04 hrs, Volume= 0.142 af, Atten= 0%, Lag= 0.6 min
Primary = 2.06 cfs @ 12.04 hrs, Volume= 0.142 af
Secondary = 0.19 cfs @ 12.04 hrs, Volume= 0.001 af

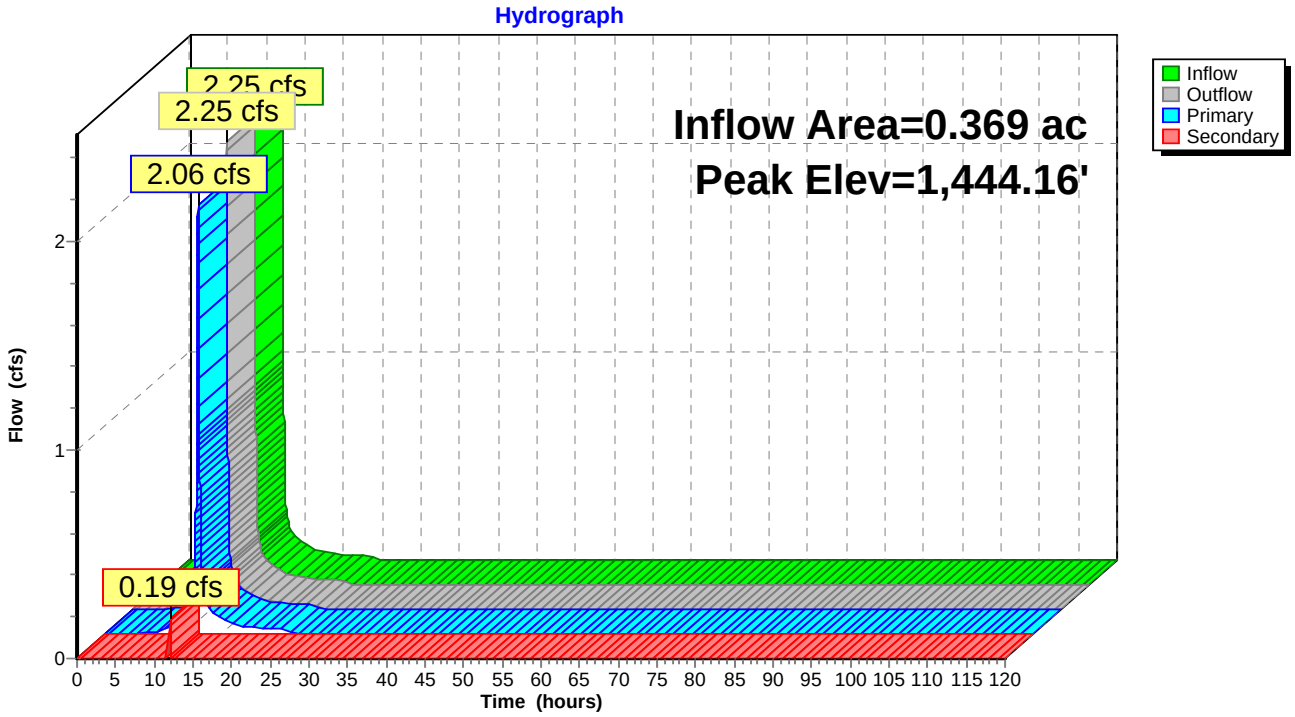
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,444.16' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,443.30'	**15.0" Round CMP_Round 15"** L= 41.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,443.30' / 1,443.00' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,443.30'	**15.0" Round Bypass Culvert** L= 46.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,443.30' / 1,443.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,444.10'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

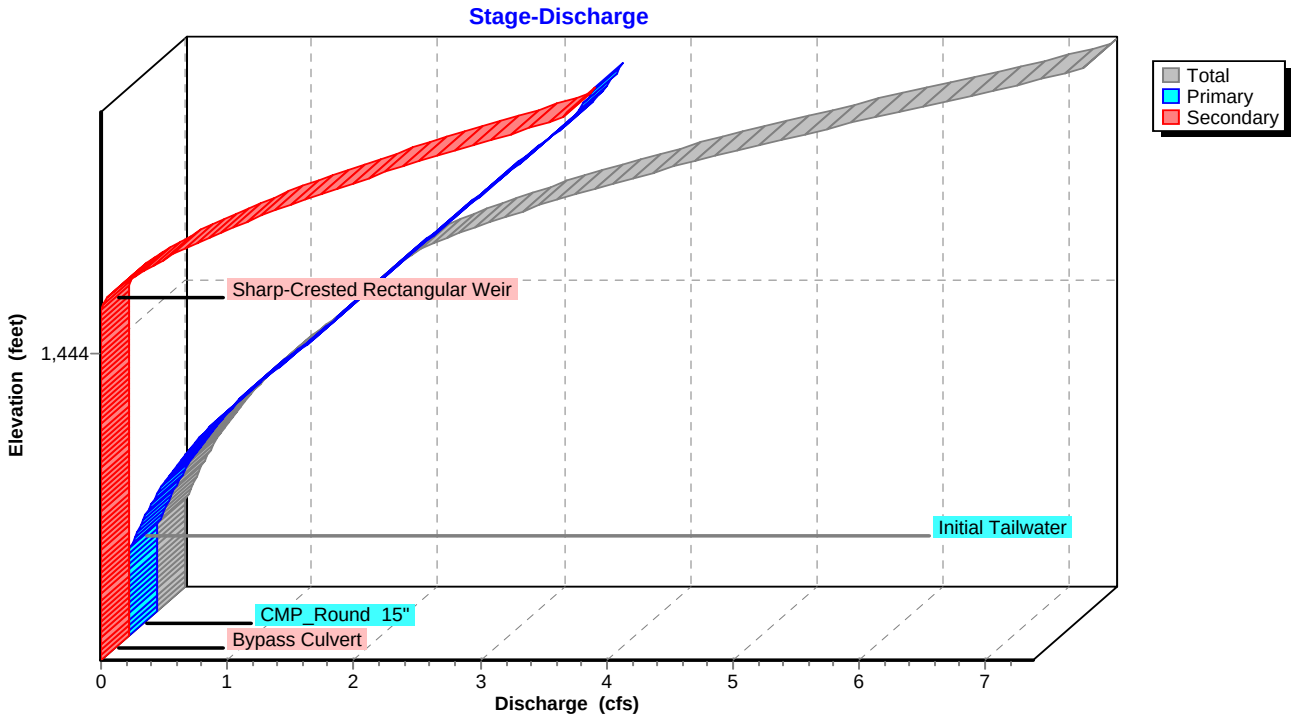
Primary OutFlow Max=2.04 cfs @ 12.04 hrs HW=1,444.16' TW=1,443.71' (Dynamic Tailwater)
└**1=CMP_Round 15"** (Outlet Controls 2.04 cfs @ 3.20 fps)

Secondary OutFlow Max=0.19 cfs @ 12.04 hrs HW=1,444.16' TW=0.00' (Dynamic Tailwater)
└**2=Bypass Culvert** (Passes 0.19 cfs of 2.14 cfs potential flow)
└**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.19 cfs @ 0.79 fps)

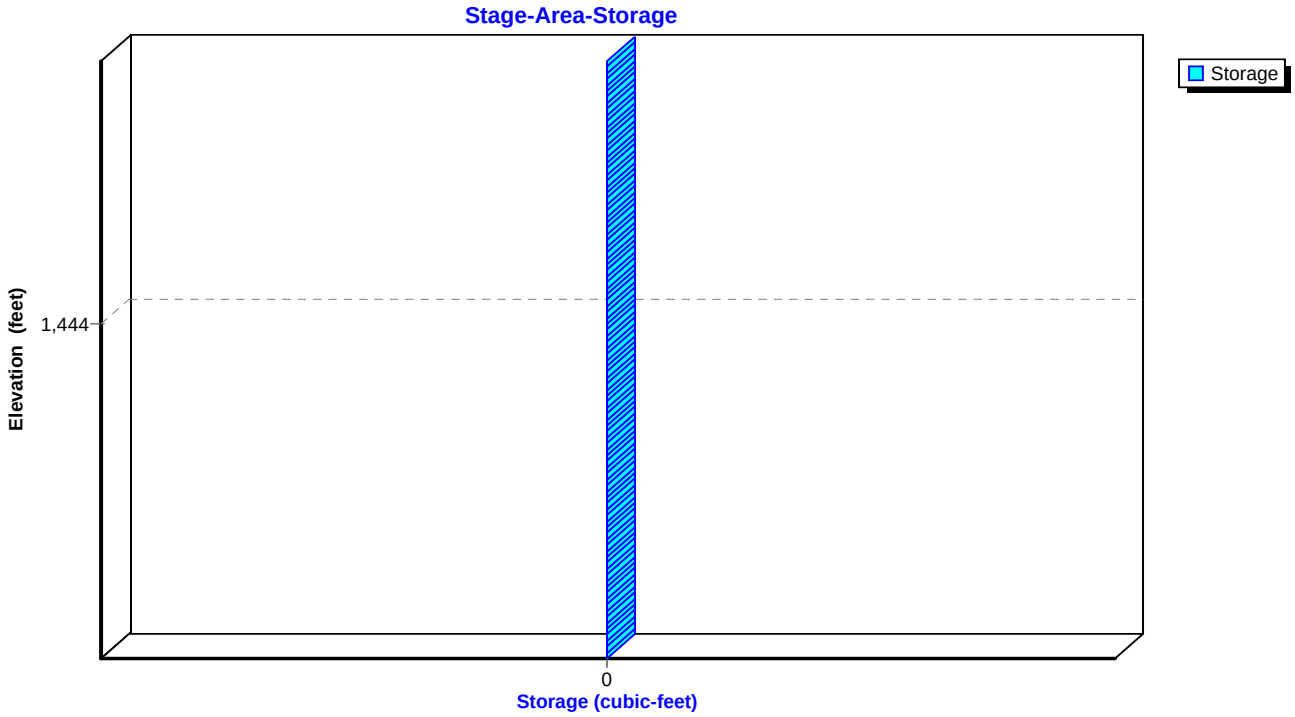
Pond 13P: Flow Splitter to SW 29A



Pond 13P: Flow Splitter to SW 29A



Pond 13P: Flow Splitter to SW 29A



Summary for Pond 93P: Flow Splitter to BMP

Inflow Area = 1.239 ac, 44.15% Impervious, Inflow Depth = 4.31" for 10-YR, 24-HR Storm event
Inflow = 7.14 cfs @ 12.03 hrs, Volume= 0.445 af
Outflow = 7.14 cfs @ 12.04 hrs, Volume= 0.445 af, Atten= 0%, Lag= 0.6 min
Primary = 3.57 cfs @ 12.04 hrs, Volume= 0.371 af
Secondary = 3.57 cfs @ 12.04 hrs, Volume= 0.074 af

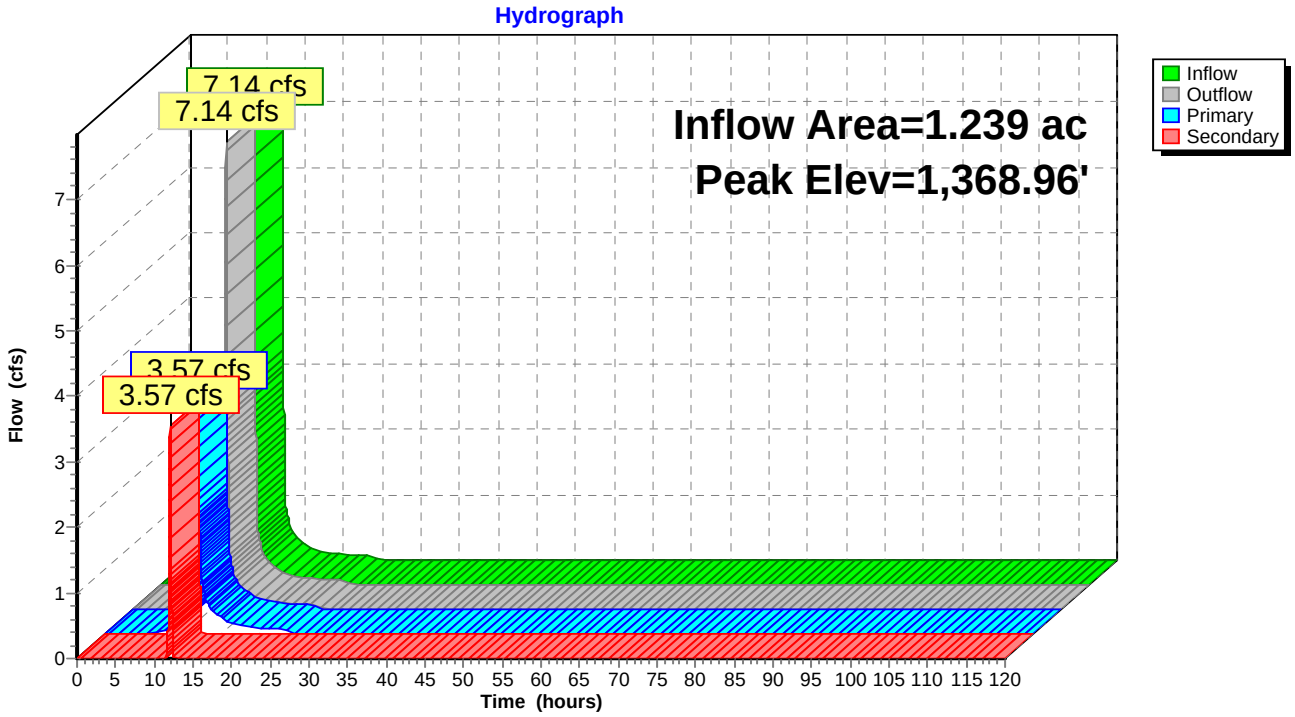
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,368.96' @ 12.04 hrs
Flood Elev= 1,369.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,367.76'	**15.0" Round Culvert** L= 21.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,367.76' / 1,366.50' S= 0.0578 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,367.76'	**15.0" Round Culvert** L= 93.7' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,367.76' / 1,363.37' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,368.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

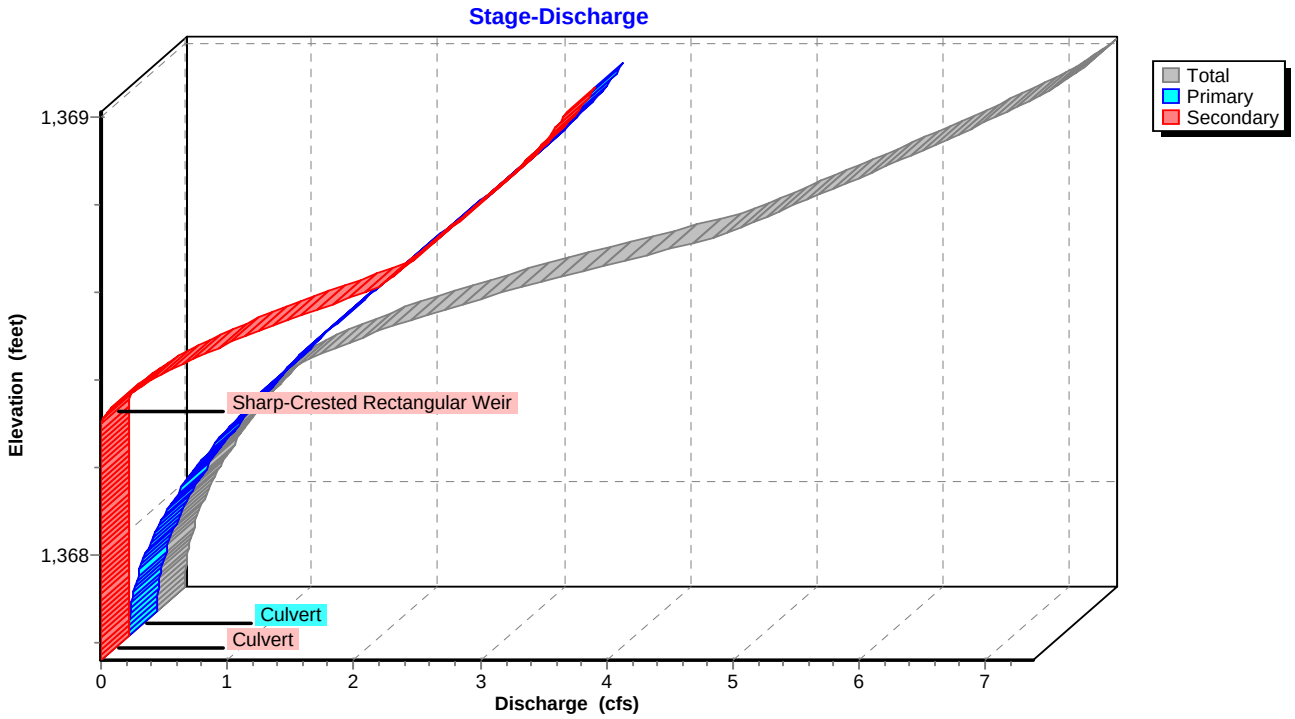
Primary OutFlow Max=3.55 cfs @ 12.04 hrs HW=1,368.96' TW=1,366.25' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 3.55 cfs @ 2.94 fps)

Secondary OutFlow Max=3.55 cfs @ 12.04 hrs HW=1,368.96' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 3.55 cfs @ 2.94 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 3.55 cfs of 6.72 cfs potential flow)

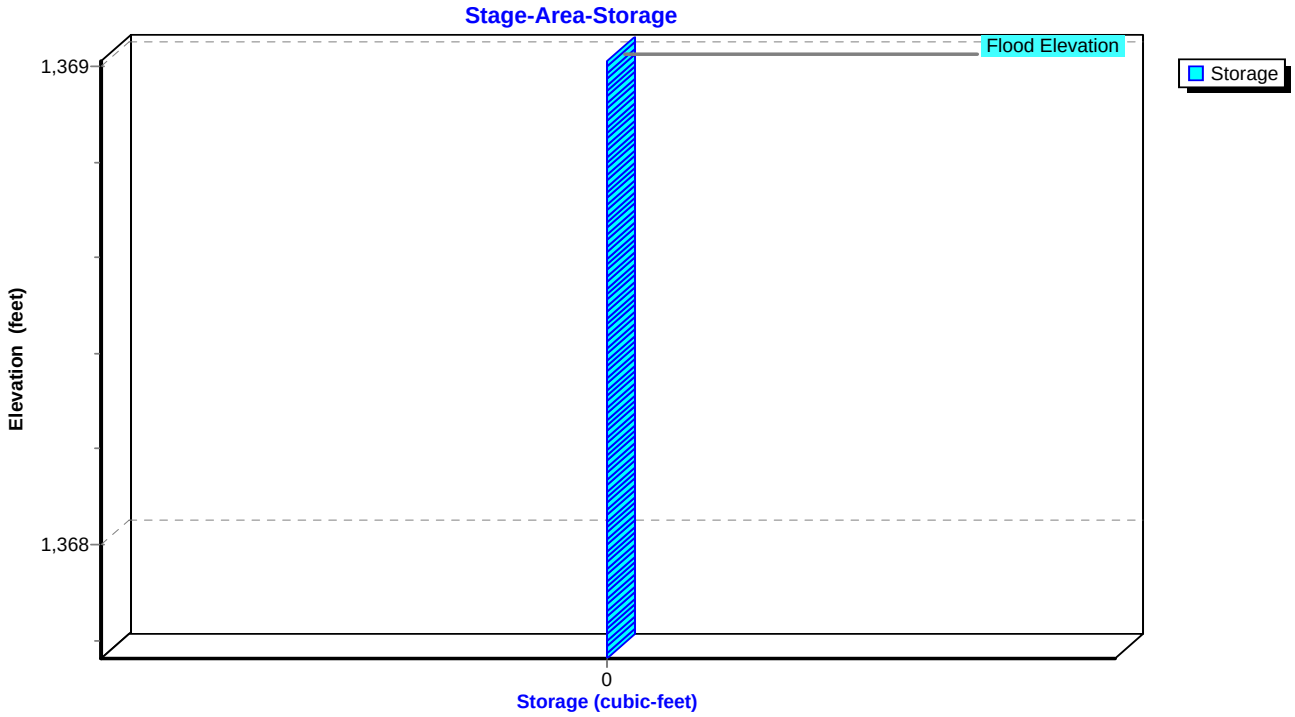
Pond 93P: Flow Splitter to BMP



Pond 93P: Flow Splitter to BMP



Pond 93P: Flow Splitter to BMP



Summary for Pond 94P: Stormwater Wetland C

Inflow Area = 0.959 ac, 50.05% Impervious, Inflow Depth = 4.52" for 10-YR, 24-HR Storm event
Inflow = 5.63 cfs @ 12.03 hrs, Volume= 0.361 af
Outflow = 4.91 cfs @ 12.07 hrs, Volume= 0.359 af, Atten= 13%, Lag= 2.3 min
Primary = 0.72 cfs @ 12.07 hrs, Volume= 0.227 af
Secondary = 4.19 cfs @ 12.07 hrs, Volume= 0.132 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,347.50' Surf.Area= 2,565 sf Storage= 2,214 cf
Peak Elev= 1,348.51' @ 12.07 hrs Surf.Area= 3,743 sf Storage= 5,477 cf (3,263 cf above start)

Plug-Flow detention time= 234.6 min calculated for 0.308 af (85% of inflow)
Center-of-Mass det. time= 132.7 min (921.6 - 788.9)

Volume	Invert	Avail.Storage	Storage Description
#1	1,345.00'	7,418 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

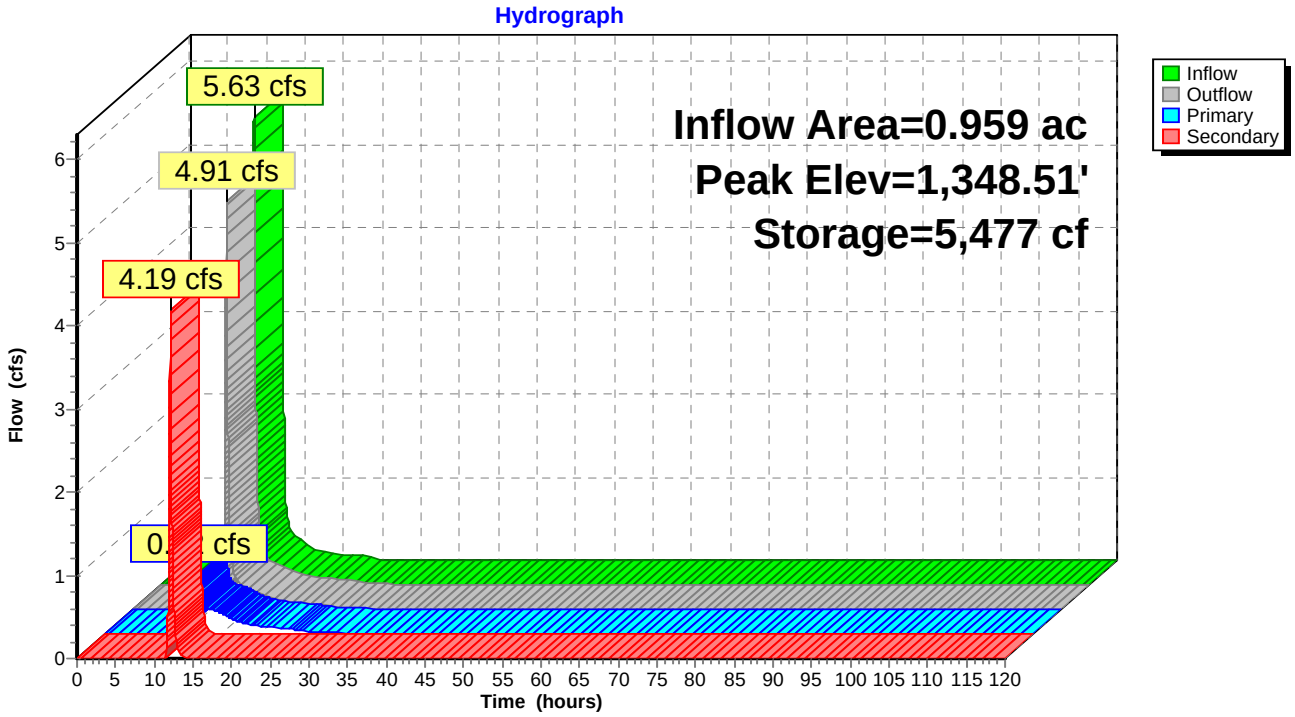
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,345.00	25	39.0	0	0	25
1,346.00	323	286.8	146	146	6,452
1,347.00	1,831	404.5	974	1,120	12,936
1,347.50	2,565	404.6	1,094	2,214	13,138
1,348.00	3,311	405.0	1,465	3,679	13,342
1,349.00	4,184	299.4	3,739	7,418	19,272

Device	Routing	Invert	Outlet Devices
#1	Primary	1,347.50'	**30.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.61 (C= 3.26)
#2	Secondary	1,348.20'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

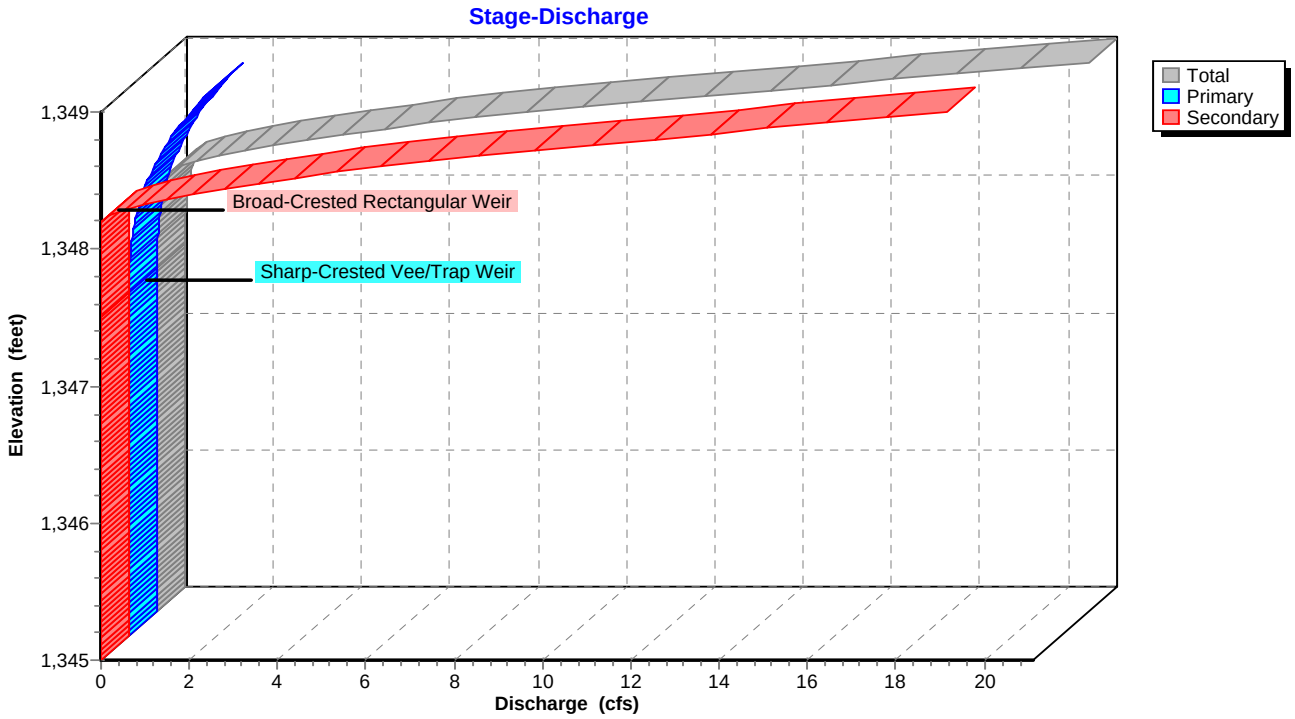
Primary OutFlow Max=0.72 cfs @ 12.07 hrs HW=1,348.51' (Free Discharge)
└**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.72 cfs @ 2.62 fps)

Secondary OutFlow Max=4.18 cfs @ 12.07 hrs HW=1,348.51' (Free Discharge)
└**2=Broad-Crested Rectangular Weir** (Weir Controls 4.18 cfs @ 1.35 fps)

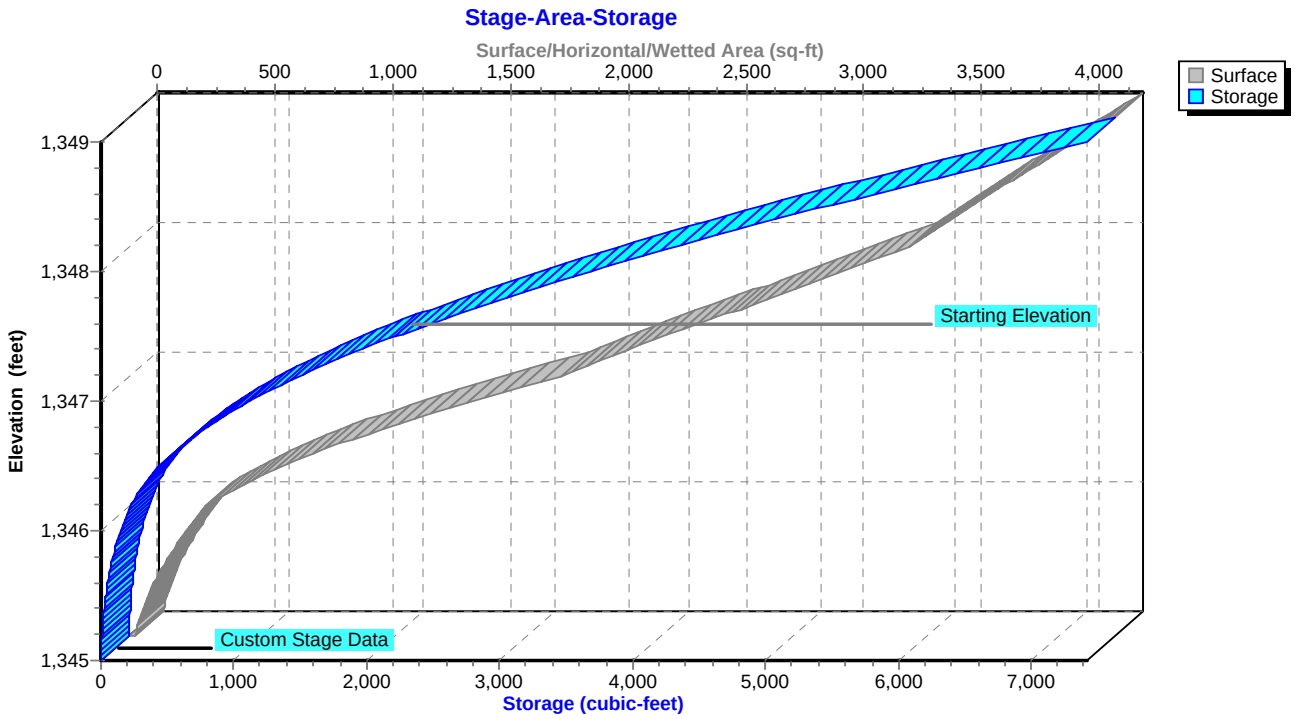
Pond 94P: Stormwater Wetland C



Pond 94P: Stormwater Wetland C



Pond 94P: Stormwater Wetland C



Summary for Pond 95P: Bioretention Area F

Inflow Area = 0.564 ac, 44.68% Impervious, Inflow Depth = 4.24" for 10-YR, 24-HR Storm event
Inflow = 3.23 cfs @ 12.02 hrs, Volume= 0.199 af
Outflow = 3.12 cfs @ 12.04 hrs, Volume= 0.174 af, Atten= 3%, Lag= 1.1 min
Primary = 3.12 cfs @ 12.04 hrs, Volume= 0.174 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,349.68' @ 12.04 hrs Surf.Area= 1,809 sf Storage= 1,942 cf

Plug-Flow detention time= 289.2 min calculated for 0.174 af (87% of inflow)
Center-of-Mass det. time= 232.7 min (1,029.3 - 796.6)

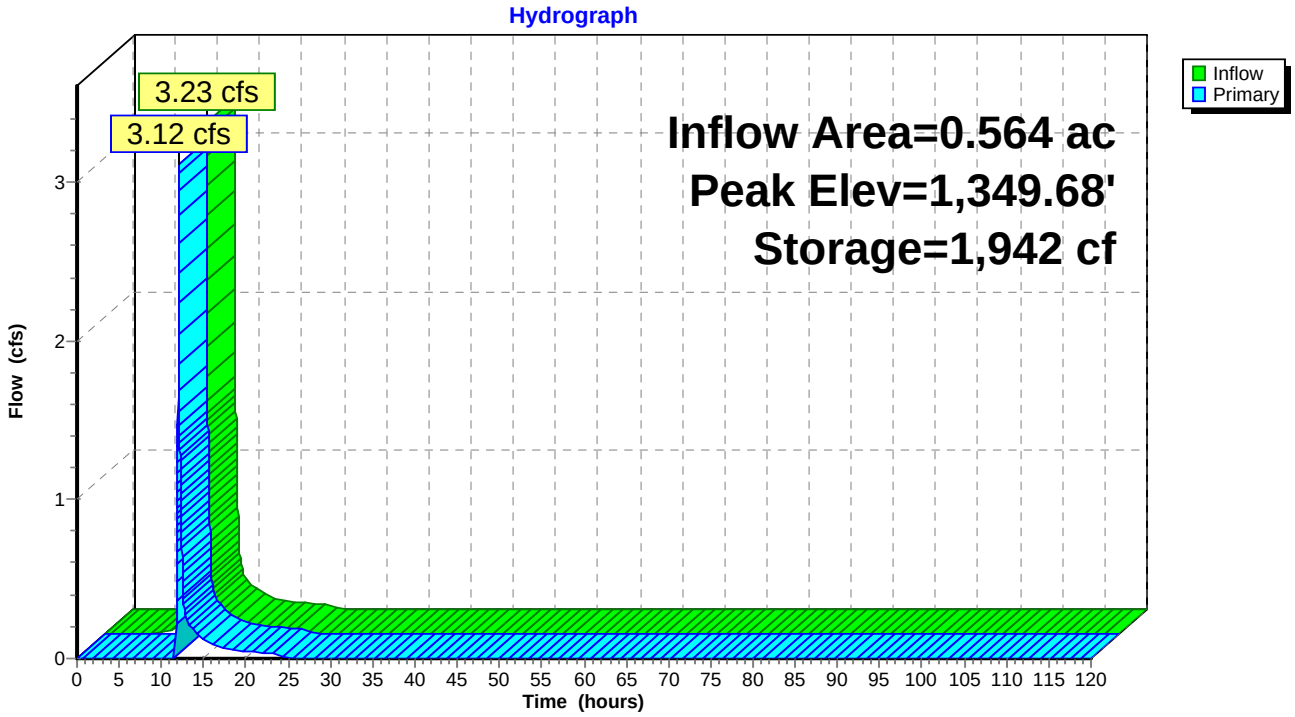
Volume	Invert	Avail.Storage	Storage Description
#1	1,345.00'	6,415 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,345.00	996	183.4	0.0	0	0	996
1,345.50	996	183.4	25.0	125	125	1,088
1,346.00	996	183.4	25.0	125	249	1,179
1,347.00	996	183.4	25.0	249	498	1,363
1,348.00	996	183.4	25.0	249	747	1,546
1,349.00	996	183.4	25.0	249	996	1,730
1,350.00	2,264	464.7	100.0	1,587	2,583	16,241
1,351.00	5,654	1,195.0	100.0	3,832	6,415	112,699

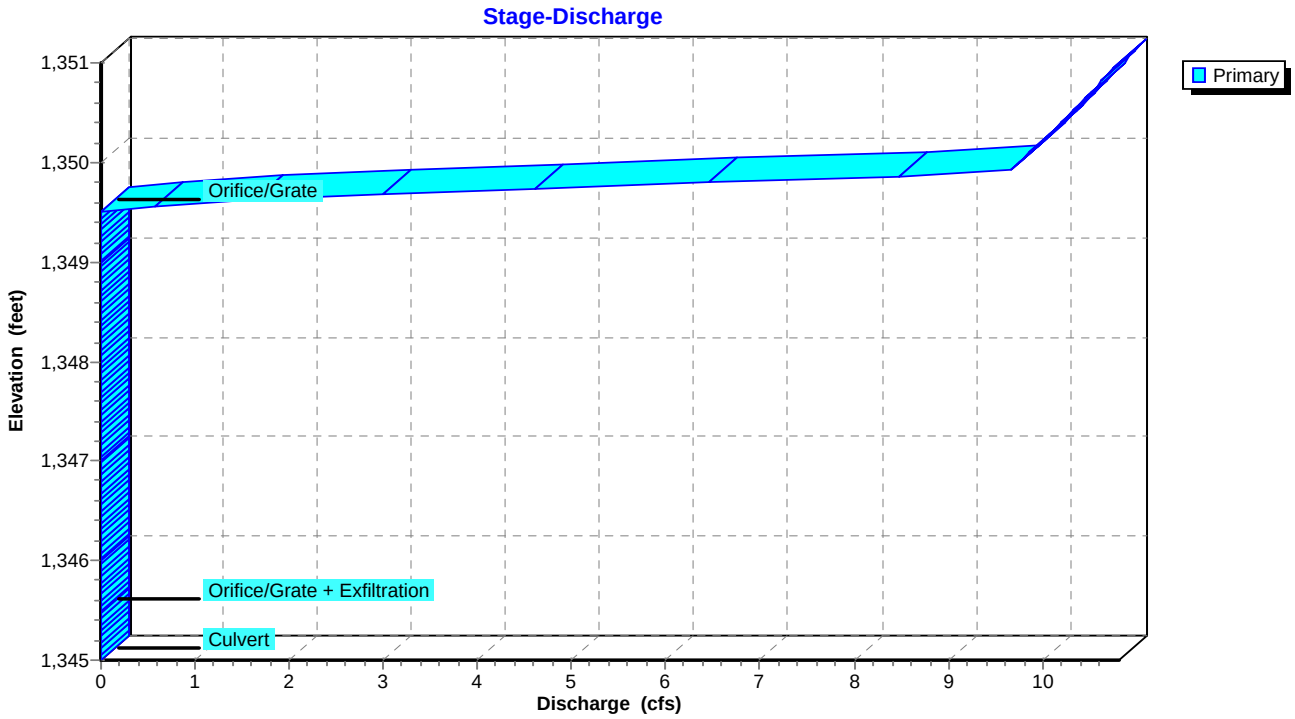
Device	Routing	Invert	Outlet Devices
#1	Primary	1,345.00'	**15.0" Round Culvert** L= 78.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,345.00' / 1,344.20' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,345.50'	**0.4" Horiz. Orifice/Grate X 340.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,345.50'	**0.250 in/hr Exfiltration over Surface area above 1,345.50'** Conductivity to Groundwater Elevation = 1,344.50' Excluded Surface area = 996 sf
#4	Device 1	1,349.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=3.11 cfs @ 12.04 hrs HW=1,349.68' (Free Discharge)
└**1=Culvert** (Passes 3.11 cfs of 9.40 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.00 cfs of 11.69 cfs potential flow)
└**3=Exfiltration** (Controls 0.00 cfs)
└**4=Orifice/Grate** (Weir Controls 3.11 cfs @ 1.40 fps)

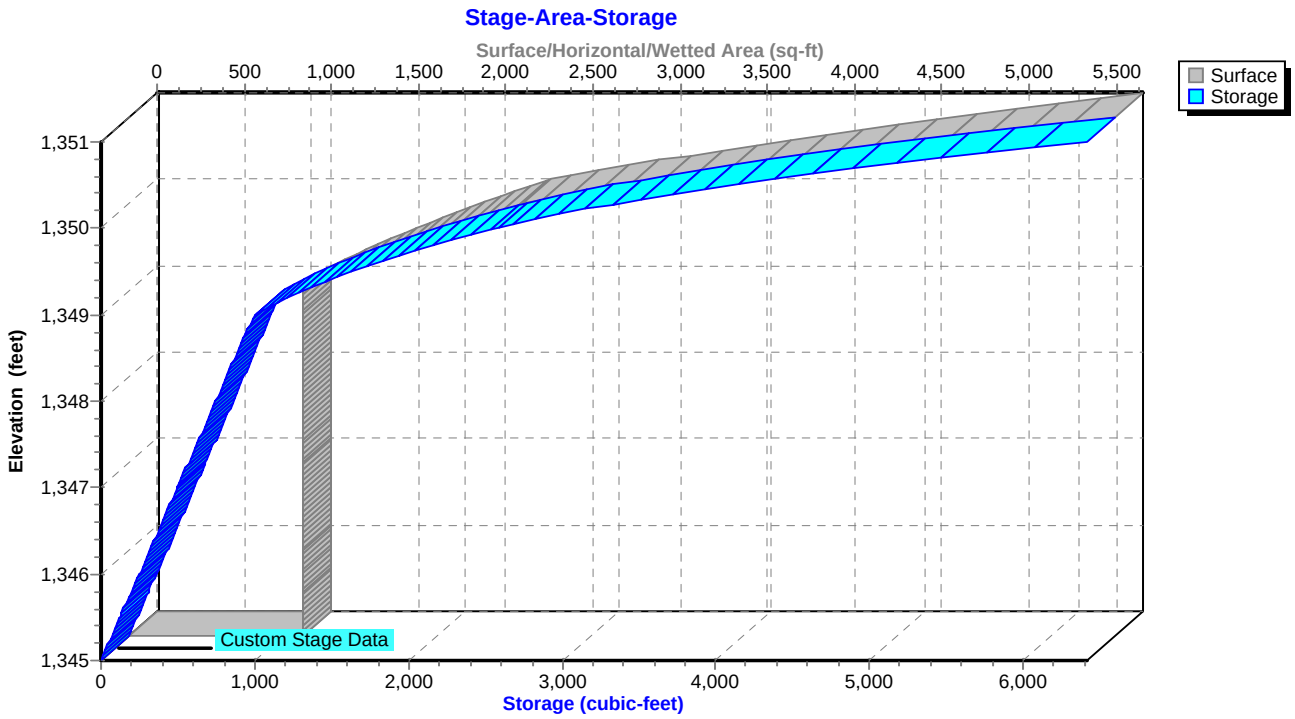
Pond 95P: Bioretention Area F



Pond 95P: Bioretention Area F



Pond 95P: Bioretention Area F



Summary for Pond 99P: Stormwater Pocket Wetland G

Inflow Area = 0.677 ac, 44.17% Impervious, Inflow Depth = 4.39" for 10-YR, 24-HR Storm event
Inflow = 3.99 cfs @ 12.02 hrs, Volume= 0.248 af
Outflow = 3.27 cfs @ 12.06 hrs, Volume= 0.248 af, Atten= 18%, Lag= 2.6 min
Primary = 3.27 cfs @ 12.06 hrs, Volume= 0.248 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,339.00' Surf.Area= 3,682 sf Storage= 5,147 cf
Peak Elev= 1,339.26' @ 12.06 hrs Surf.Area= 3,966 sf Storage= 6,138 cf (991 cf above start)

Plug-Flow detention time= 230.5 min calculated for 0.130 af (52% of inflow)
Center-of-Mass det. time= 11.3 min (803.1 - 791.8)

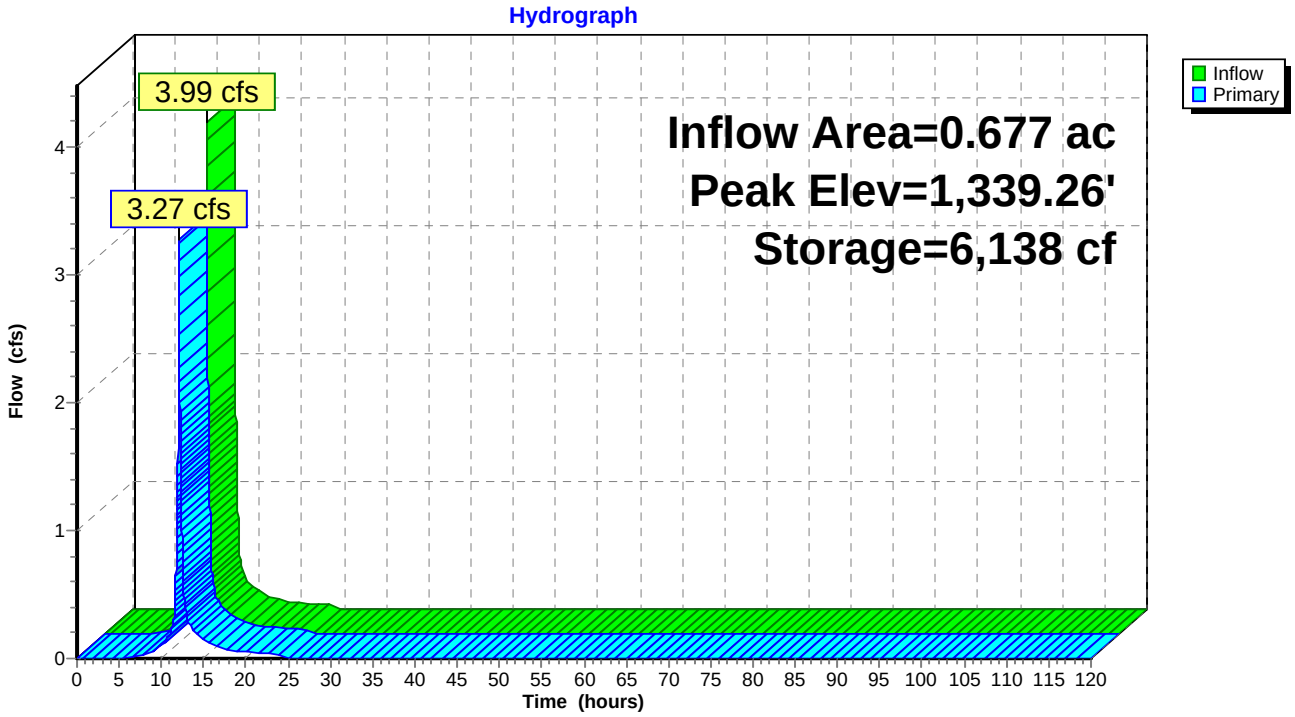
Volume	Invert	Avail.Storage	Storage Description
#1	1,335.00'	9,394 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,335.00	93	80.5	0	0	93
1,336.00	416	130.2	235	235	933
1,337.00	1,024	220.2	698	933	3,449
1,338.00	1,932	236.2	1,454	2,387	4,073
1,339.00	3,682	404.5	2,760	5,147	12,660
1,340.00	4,837	491.2	4,246	9,394	18,856

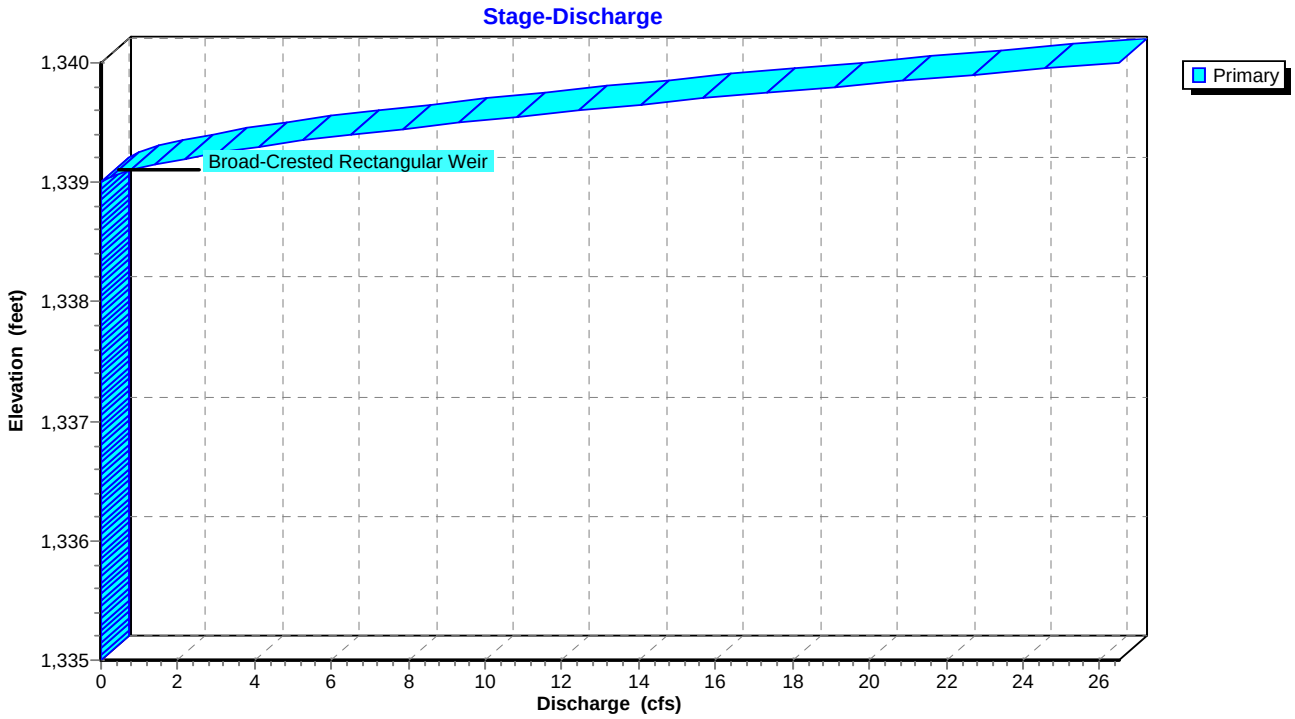
Device	Routing	Invert	Outlet Devices
#1	Primary	1,339.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=3.27 cfs @ 12.06 hrs HW=1,339.26' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 3.27 cfs @ 1.26 fps)

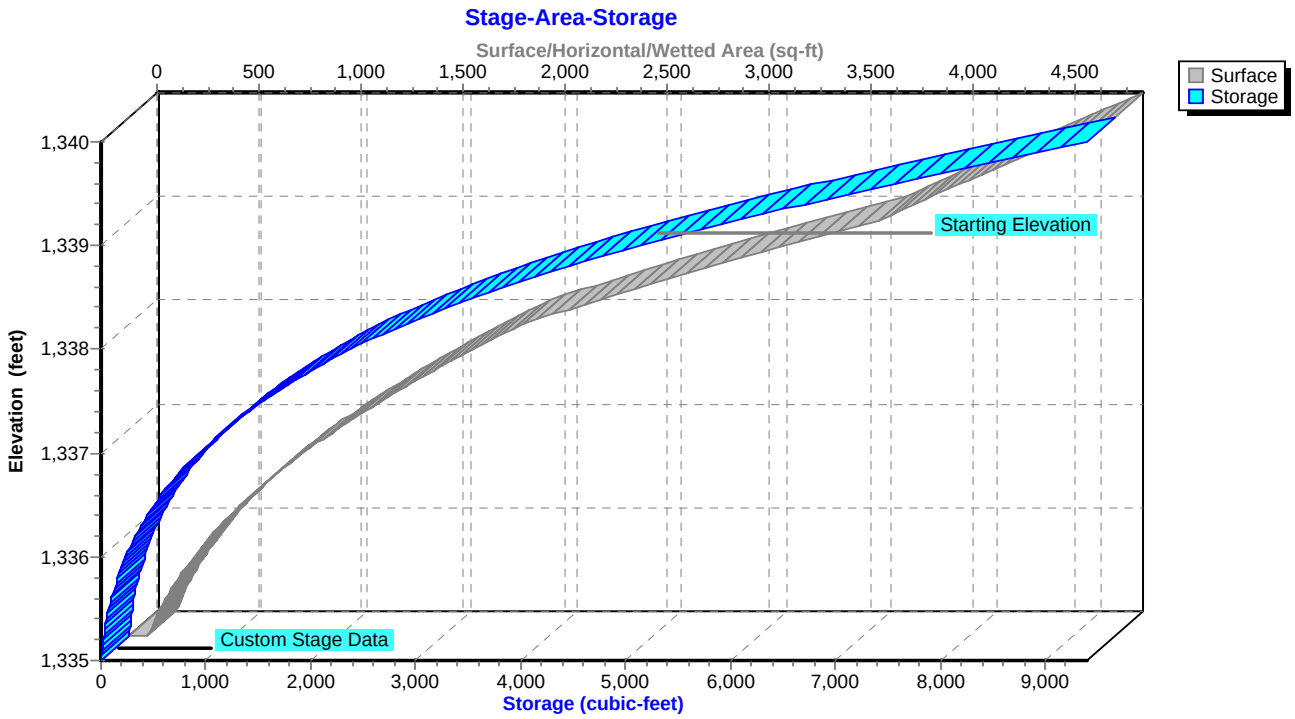
Pond 99P: Stormwater Pocket Wetland G



Pond 99P: Stormwater Pocket Wetland G



Pond 99P: Stormwater Pocket Wetland G



Summary for Pond 100P: Stormwater Wetland E

Inflow Area = 1.422 ac, 39.94% Impervious, Inflow Depth = 4.22" for 10-YR, 24-HR Storm event
Inflow = 8.00 cfs @ 12.02 hrs, Volume= 0.500 af
Outflow = 7.18 cfs @ 12.06 hrs, Volume= 0.500 af, Atten= 10%, Lag= 2.0 min
Primary = 0.62 cfs @ 12.06 hrs, Volume= 0.303 af
Secondary = 6.56 cfs @ 12.06 hrs, Volume= 0.197 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,346.80' Surf.Area= 2,420 sf Storage= 2,588 cf
Peak Elev= 1,347.41' @ 12.06 hrs Surf.Area= 3,563 sf Storage= 4,400 cf (1,812 cf above start)

Plug-Flow detention time= 93.0 min calculated for 0.441 af (88% of inflow)
Center-of-Mass det. time= 9.3 min (806.6 - 797.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,343.00'	13,221 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

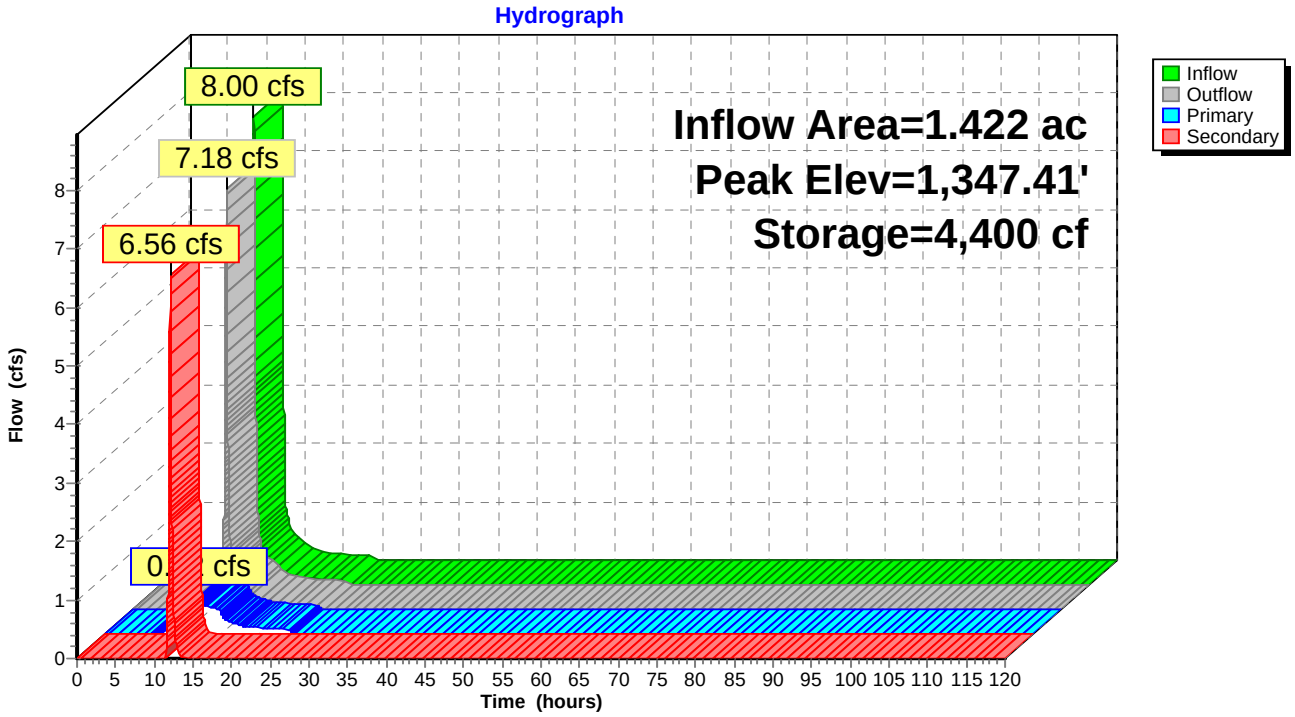
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,343.00	13	14.7	0	0	13
1,344.00	114	57.6	55	55	262
1,345.00	474	130.7	273	329	1,362
1,346.00	1,234	286.1	824	1,153	6,520
1,347.00	2,778	454.7	1,954	3,107	16,466
1,348.00	4,871	736.2	3,776	6,883	43,150
1,349.00	7,928	1,003.3	6,338	13,221	80,134

Device	Routing	Invert	Outlet Devices
#1	Primary	1,346.20'	**6.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,346.20' / 1,346.00' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Device 1	1,346.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	1,347.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

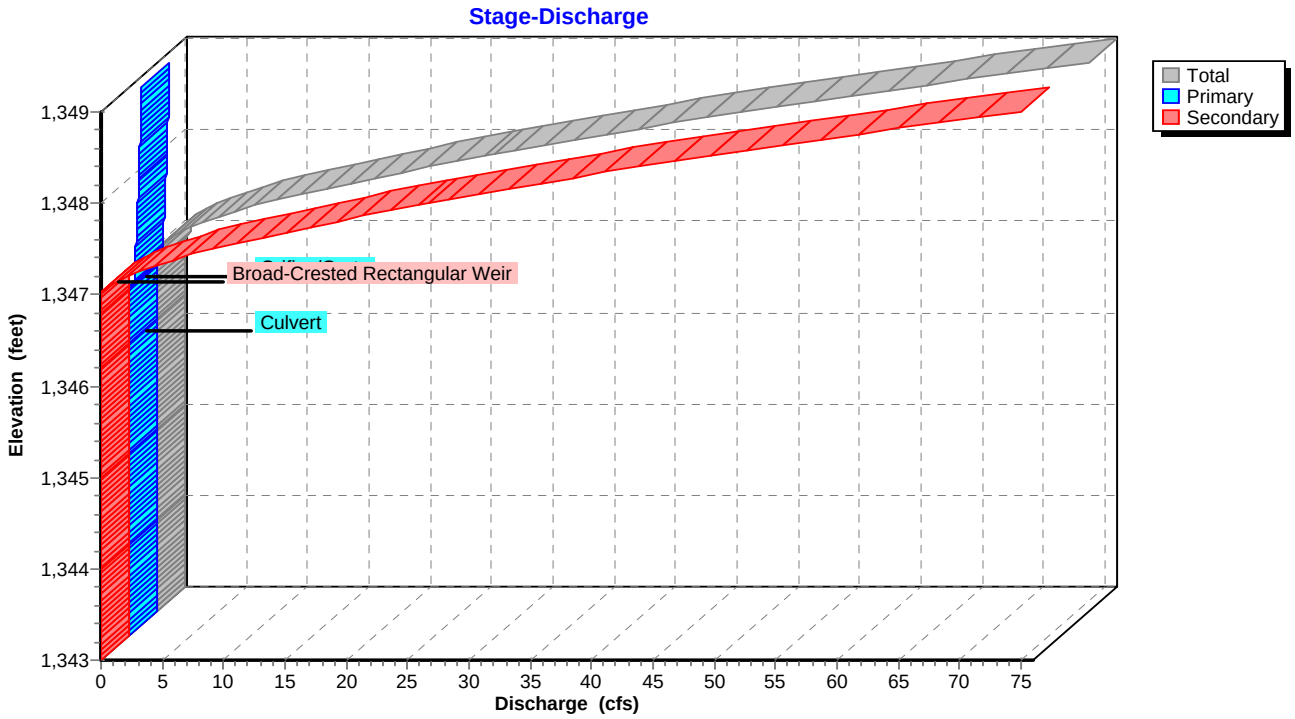
Primary OutFlow Max=0.62 cfs @ 12.06 hrs HW=1,347.41' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.62 cfs @ 3.16 fps)
└**2=Orifice/Grate** (Passes 0.62 cfs of 12.41 cfs potential flow)

Secondary OutFlow Max=6.54 cfs @ 12.06 hrs HW=1,347.41' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 6.54 cfs @ 1.60 fps)

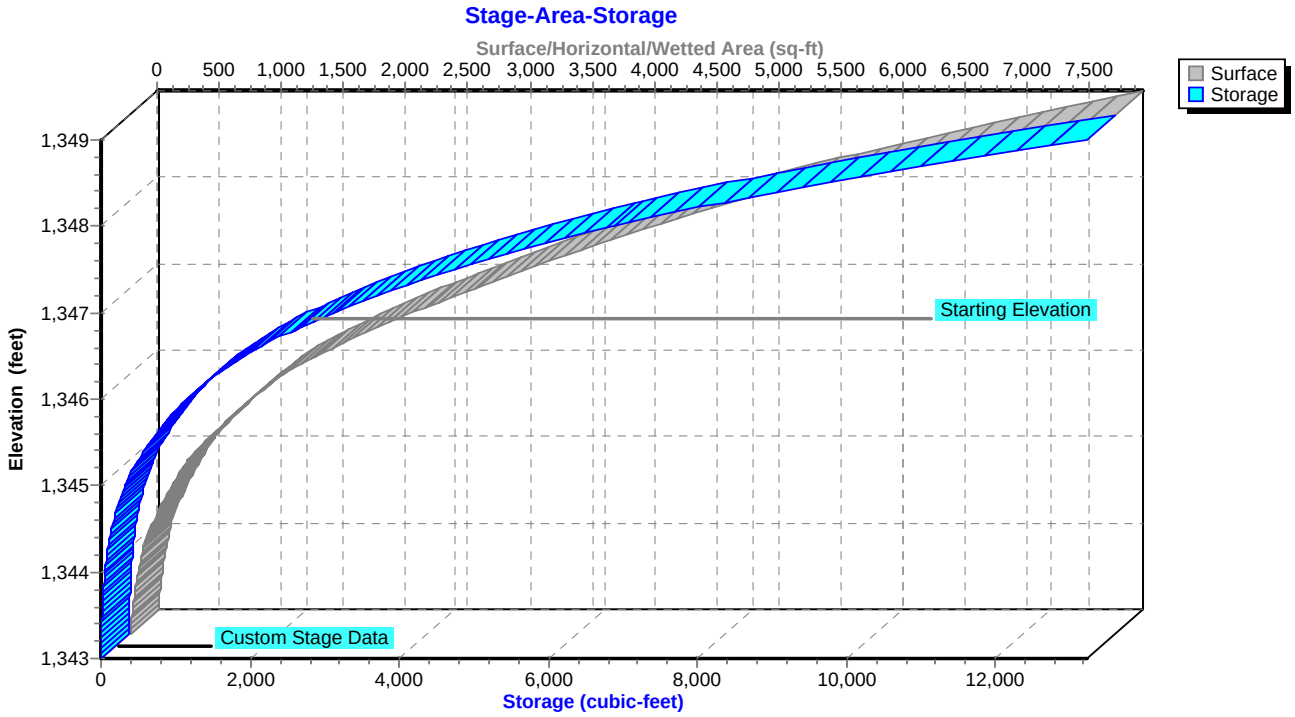
Pond 100P: Stormwater Wetland E



Pond 100P: Stormwater Wetland E



Pond 100P: Stormwater Wetland E



Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 1S: 30 Runoff Area=0.901 ac 52.39% Impervious Runoff Depth=0.38"
Flow Length=585' Tc=2.3 min CN=88 Runoff=0.43 cfs 0.028 af

Subcatchment 2S: SW30 Runoff Area=0.247 ac 34.82% Impervious Runoff Depth=0.20"
Tc=0.0 min CN=82 Runoff=0.05 cfs 0.004 af

Subcatchment 3S: 30A Runoff Area=0.277 ac 13.00% Impervious Runoff Depth=0.07"
Flow Length=197' Tc=24.8 min CN=75 Runoff=0.01 cfs 0.002 af

Subcatchment 4S: 29 Runoff Area=3.109 ac 7.14% Impervious Runoff Depth=0.07"
Flow Length=636' Tc=20.5 min CN=75 Runoff=0.06 cfs 0.019 af

Subcatchment 5S: 29A Runoff Area=1.558 ac 53.02% Impervious Runoff Depth=0.38"
Flow Length=600' Tc=2.3 min CN=88 Runoff=0.74 cfs 0.049 af

Subcatchment 6S: SW29B Runoff Area=0.230 ac 38.26% Impervious Runoff Depth=0.22"
Tc=0.0 min CN=83 Runoff=0.05 cfs 0.004 af

Subcatchment 7S: 29B Runoff Area=2.391 ac 0.00% Impervious Runoff Depth=0.04"
Flow Length=423' Tc=24.5 min CN=72 Runoff=0.01 cfs 0.008 af

Subcatchment 8S: 29C Runoff Area=0.369 ac 50.68% Impervious Runoff Depth=0.38"
Flow Length=271' Tc=1.8 min CN=88 Runoff=0.18 cfs 0.012 af

Subcatchment 9S: 29D Runoff Area=0.798 ac 0.00% Impervious Runoff Depth=0.03"
Flow Length=264' Tc=36.1 min CN=70 Runoff=0.00 cfs 0.002 af

Subcatchment 10S: SW29A Runoff Area=0.079 ac 10.13% Impervious Runoff Depth=0.09"
Tc=0.0 min CN=76 Runoff=0.00 cfs 0.001 af

Subcatchment A1: A1 Runoff Area=0.734 ac 36.10% Impervious Runoff Depth=0.22"
Flow Length=790' Tc=1.7 min CN=83 Runoff=0.17 cfs 0.013 af

Subcatchment A2: A2 Runoff Area=0.505 ac 55.84% Impervious Runoff Depth=0.38"
Flow Length=780' Tc=1.8 min CN=88 Runoff=0.24 cfs 0.016 af

Subcatchment A3: A3 Runoff Area=0.096 ac 0.00% Impervious Runoff Depth=0.09"
Tc=0.0 min CN=76 Runoff=0.00 cfs 0.001 af

Subcatchment B1: B1 Runoff Area=0.238 ac 36.97% Impervious Runoff Depth=0.22"
Flow Length=324' Tc=1.0 min CN=83 Runoff=0.06 cfs 0.004 af

Subcatchment B2: B2 Runoff Area=0.169 ac 60.36% Impervious Runoff Depth=0.38"
Flow Length=389' Tc=1.1 min CN=88 Runoff=0.08 cfs 0.005 af

Subcatchment B3: B3 Runoff Area=0.062 ac 0.00% Impervious Runoff Depth=0.09"
Tc=0.0 min CN=76 Runoff=0.00 cfs 0.000 af

Subcatchment C1: C1 Runoff Area=0.415 ac 53.98% Impervious Runoff Depth=0.38"
Flow Length=584' Tc=2.1 min CN=88 Runoff=0.20 cfs 0.013 af

Subcatchment C2: C2 Runoff Area=0.439 ac 58.31% Impervious Runoff Depth=0.41"
Flow Length=548' Tc=1.9 min CN=89 Runoff=0.24 cfs 0.015 af

Subcatchment C3: C3 Runoff Area=0.105 ac 0.00% Impervious Runoff Depth=0.06"
Tc=0.0 min CN=74 Runoff=0.00 cfs 0.001 af

Subcatchment D1: D1 Runoff Area=0.371 ac 38.54% Impervious Runoff Depth=0.22"
Flow Length=293' Tc=1.6 min CN=83 Runoff=0.09 cfs 0.007 af

Subcatchment D2: D2 Runoff Area=0.321 ac 51.09% Impervious Runoff Depth=0.34"
Flow Length=449' Tc=1.9 min CN=87 Runoff=0.14 cfs 0.009 af

Subcatchment D3: D3 Runoff Area=0.086 ac 0.00% Impervious Runoff Depth=0.06"
Tc=0.0 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment E1: E1 Runoff Area=0.264 ac 45.08% Impervious Runoff Depth=0.27"
Flow Length=335' Tc=1.8 min CN=85 Runoff=0.08 cfs 0.006 af

Subcatchment E2: E2 Runoff Area=0.221 ac 43.44% Impervious Runoff Depth=0.34"
Flow Length=246' Tc=1.3 min CN=87 Runoff=0.10 cfs 0.006 af

Subcatchment E4: E4 Runoff Area=0.081 ac 56.79% Impervious Runoff Depth=0.38"
Flow Length=225' Tc=1.3 min CN=88 Runoff=0.04 cfs 0.003 af

Subcatchment E5: E5 Runoff Area=0.078 ac 0.00% Impervious Runoff Depth=0.06"
Tc=0.0 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment F1: F1 Runoff Area=0.291 ac 39.18% Impervious Runoff Depth=0.22"
Flow Length=268' Tc=1.5 min CN=83 Runoff=0.07 cfs 0.005 af

Subcatchment F2: F2 Runoff Area=0.230 ac 60.00% Impervious Runoff Depth=0.38"
Flow Length=184' Tc=1.3 min CN=88 Runoff=0.11 cfs 0.007 af

Subcatchment F3: F3 Runoff Area=0.043 ac 0.00% Impervious Runoff Depth=0.06"
Tc=0.0 min CN=74 Runoff=0.00 cfs 0.000 af

Subcatchment G1: G1 Runoff Area=0.320 ac 44.69% Impervious Runoff Depth=0.31"
Flow Length=454' Tc=1.3 min CN=86 Runoff=0.12 cfs 0.008 af

Subcatchment G2: G2 Runoff Area=0.274 ac 56.93% Impervious Runoff Depth=0.41"
Flow Length=409' Tc=1.2 min CN=89 Runoff=0.15 cfs 0.009 af

Subcatchment G3: G3 Runoff Area=0.083 ac 0.00% Impervious Runoff Depth=0.06"
Tc=0.0 min CN=74 Runoff=0.00 cfs 0.000 af

Reach DP-10: DP-10 Inflow=0.15 cfs 0.091 af
Outflow=0.15 cfs 0.091 af

Reach DP-11: DP-11 Inflow=0.01 cfs 0.033 af
Outflow=0.01 cfs 0.033 af

Reach DP3: DP-3 Inflow=0.00 cfs 0.002 af
Outflow=0.00 cfs 0.002 af

Pond 1P: Bioretention Area A Peak Elev=1,363.01' Storage=1,305 cf Inflow=0.41 cfs 0.030 af
Outflow=0.00 cfs 0.000 af

Pond 3P: Flow Splitter to BMP Peak Elev=1,349.85' Inflow=0.14 cfs 0.010 af
Primary=0.14 cfs 0.008 af Secondary=0.00 cfs 0.002 af Outflow=0.14 cfs 0.010 af

Pond 4P: Pocket Wetland 30 Peak Elev=1,437.25' Storage=6,057 cf Inflow=0.47 cfs 0.032 af
Primary=0.01 cfs 0.031 af Secondary=0.00 cfs 0.000 af Outflow=0.01 cfs 0.031 af

Pond 5P: Bioretention Area B Peak Elev=1,349.88' Storage=370 cf Inflow=0.14 cfs 0.008 af
Outflow=0.00 cfs 0.000 af

Pond 11P: Pocket Wetland 29B Peak Elev=1,442.29' Storage=6,344 cf Inflow=0.79 cfs 0.053 af
Primary=0.05 cfs 0.050 af Secondary=0.00 cfs 0.000 af Outflow=0.05 cfs 0.050 af

Pond 12P: Pocket Wetland 29A Peak Elev=1,443.53' Storage=1,610 cf Inflow=0.18 cfs 0.012 af
Outflow=0.14 cfs 0.012 af

Pond 13P: Flow Splitter to SW 29A Peak Elev=1,443.61' Inflow=0.18 cfs 0.012 af
Primary=0.18 cfs 0.012 af Secondary=0.00 cfs 0.000 af Outflow=0.18 cfs 0.012 af

Pond 93P: Flow Splitter to BMP Peak Elev=1,368.10' Inflow=0.41 cfs 0.029 af
Primary=0.41 cfs 0.029 af Secondary=0.00 cfs 0.000 af Outflow=0.41 cfs 0.029 af

Pond 94P: Stormwater Wetland C Peak Elev=1,347.75' Storage=2,914 cf Inflow=0.43 cfs 0.029 af
Primary=0.02 cfs 0.027 af Secondary=0.00 cfs 0.000 af Outflow=0.02 cfs 0.027 af

Pond 95P: Bioretention Area F Peak Elev=1,347.23' Storage=555 cf Inflow=0.18 cfs 0.013 af
Outflow=0.00 cfs 0.000 af

Pond 99P: Stormwater Pocket Wetland G Peak Elev=1,339.03' Storage=5,269 cf Inflow=0.27 cfs 0.018 af
Outflow=0.15 cfs 0.018 af

Pond 100P: Stormwater Wetland E Peak Elev=1,346.85' Storage=2,719 cf Inflow=0.44 cfs 0.032 af
Primary=0.32 cfs 0.032 af Secondary=0.00 cfs 0.000 af Outflow=0.32 cfs 0.032 af

Total Runoff Area = 15.385 ac Runoff Volume = 0.259 af Average Runoff Depth = 0.20"
72.30% Pervious = 11.124 ac 27.70% Impervious = 4.261 ac

Summary for Subcatchment 1S: 30

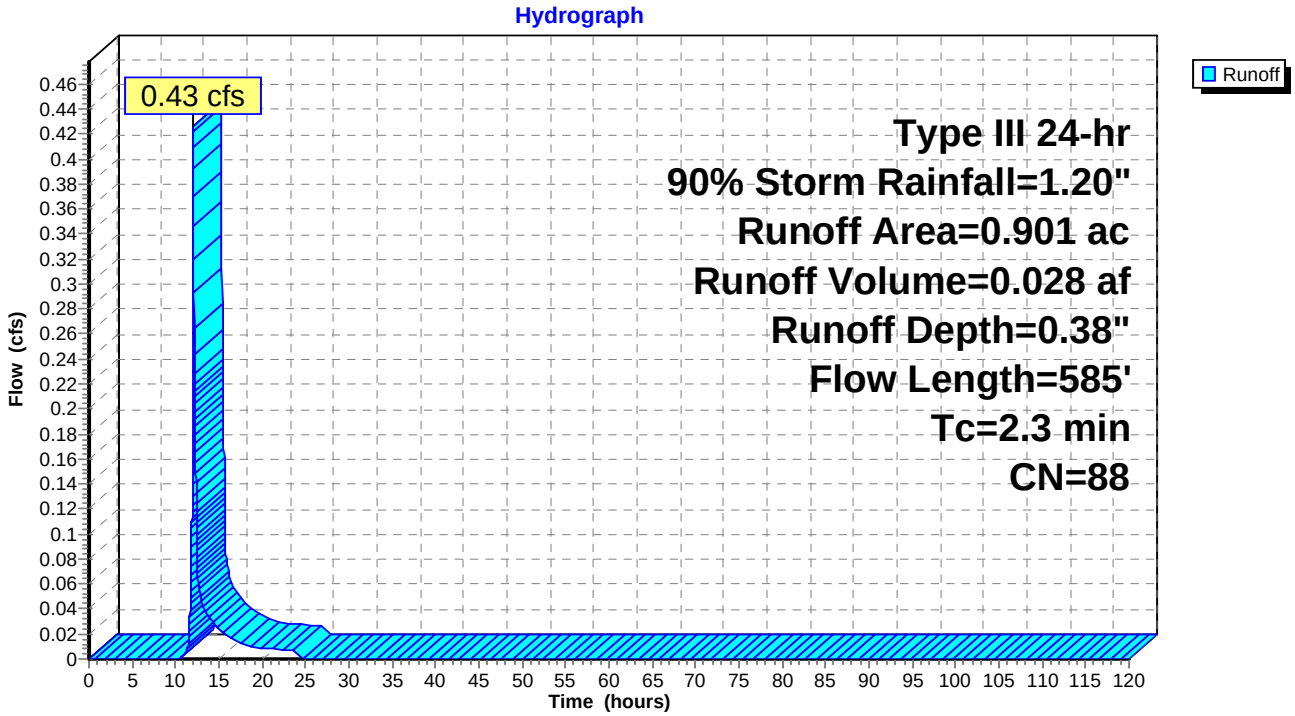
Runoff = 0.43 cfs @ 12.04 hrs, Volume= 0.028 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.328	74	>75% Grass cover, Good, HSG C
*	0.101	89	Porous Pavement Walkway (Gravel roads), HSG C
	0.472	98	Paved roads w/curbs & sewers, HSG C
	0.901	88	Weighted Average
	0.429		47.61% Pervious Area
	0.472		52.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	46	0.0200	1.27		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
1.0	178	0.0225	3.04		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.7	361	0.0224	8.90	15.72	**Pipe Channel, Storm Network** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.3	585	Total			

Subcatchment 1S: 30



Summary for Subcatchment 2S: SW30

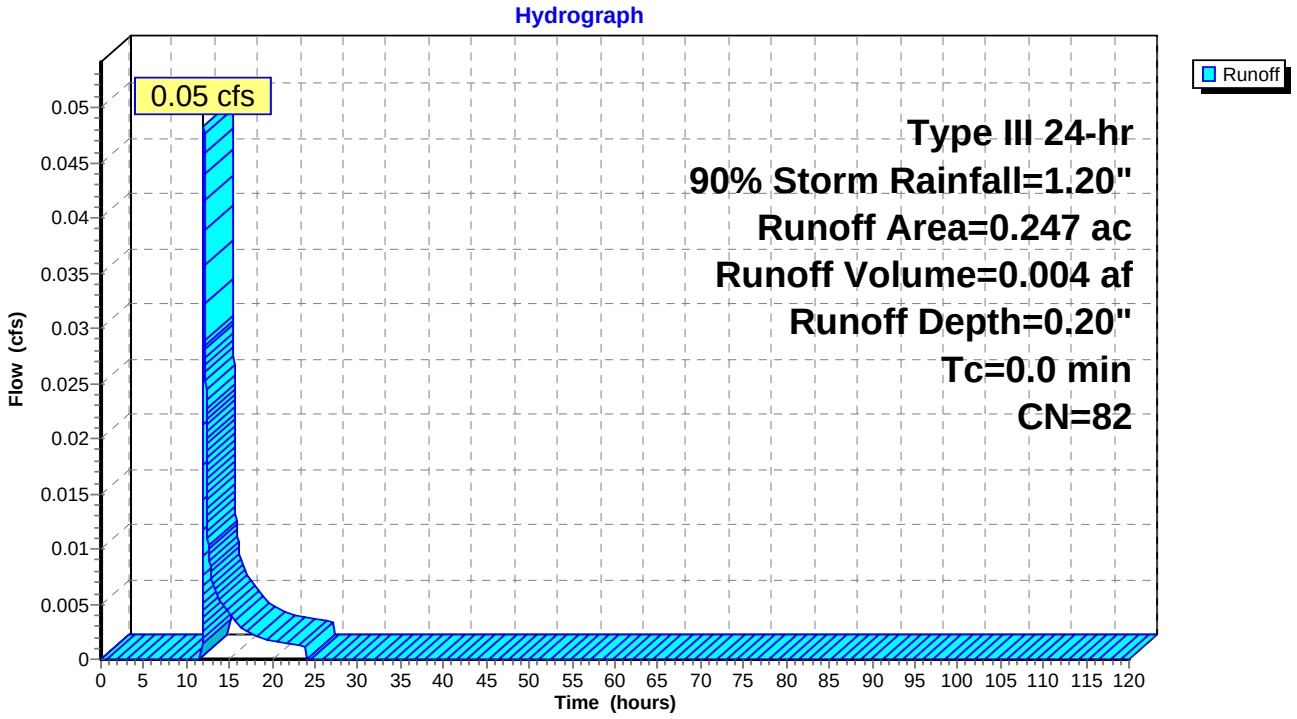
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.05 cfs @ 12.01 hrs, Volume= 0.004 af, Depth= 0.20"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.161	74	>75% Grass cover, Good, HSG C
0.086	98	Water Surface, HSG C
0.247	82	Weighted Average
0.161		65.18% Pervious Area
0.086		34.82% Impervious Area

Subcatchment 2S: SW30



Summary for Subcatchment 3S: 30A

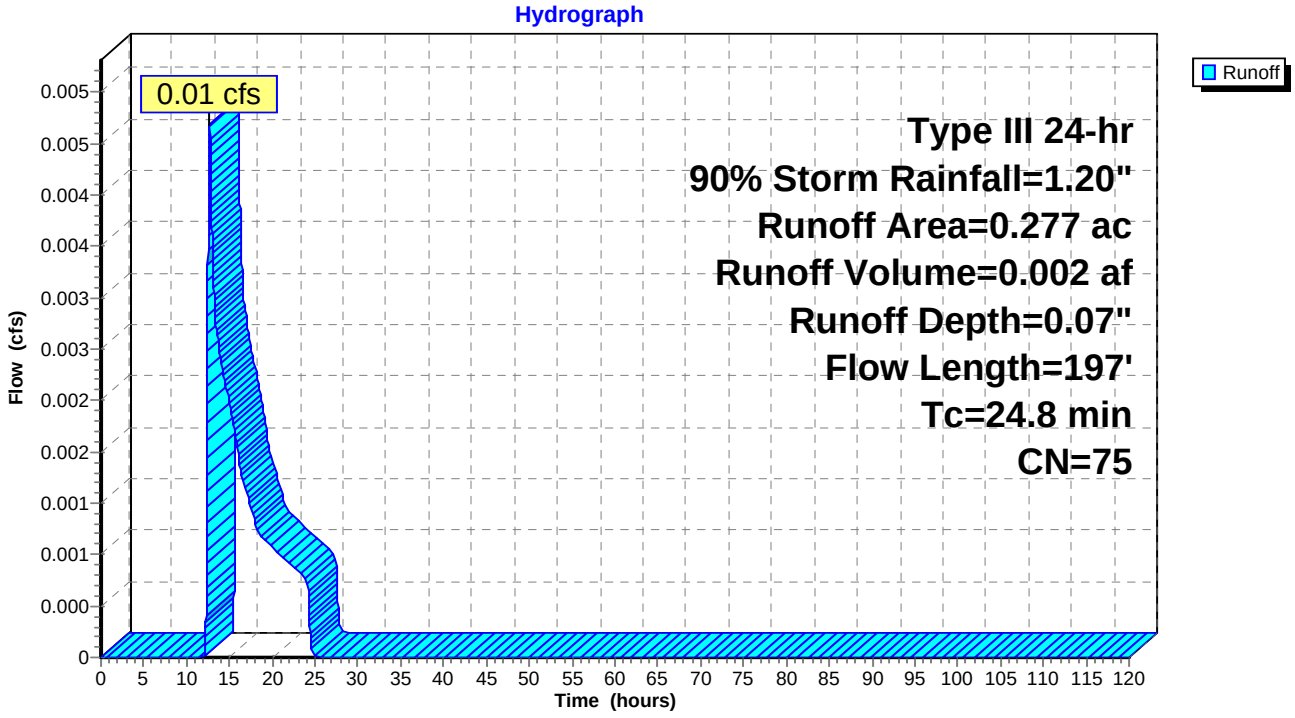
Runoff = 0.01 cfs @ 12.65 hrs, Volume= 0.002 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.097	74	>75% Grass cover, Good, HSG C
0.144	70	Woods, Good, HSG C
0.036	98	Paved roads w/curbs & sewers, HSG C
0.277	75	Weighted Average
0.241		87.00% Pervious Area
0.036		13.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	120	0.0170	0.08		**Sheet Flow, Overland** Woods: Light underbrush n= 0.400 P2= 3.75"
0.3	77	0.0250	5.13	18.45	**Channel Flow, Ditch** Area= 3.6 sf Perim= 6.8' r= 0.53' n= 0.030
24.8	197	Total			

Subcatchment 3S: 30A



Summary for Subcatchment 4S: 29

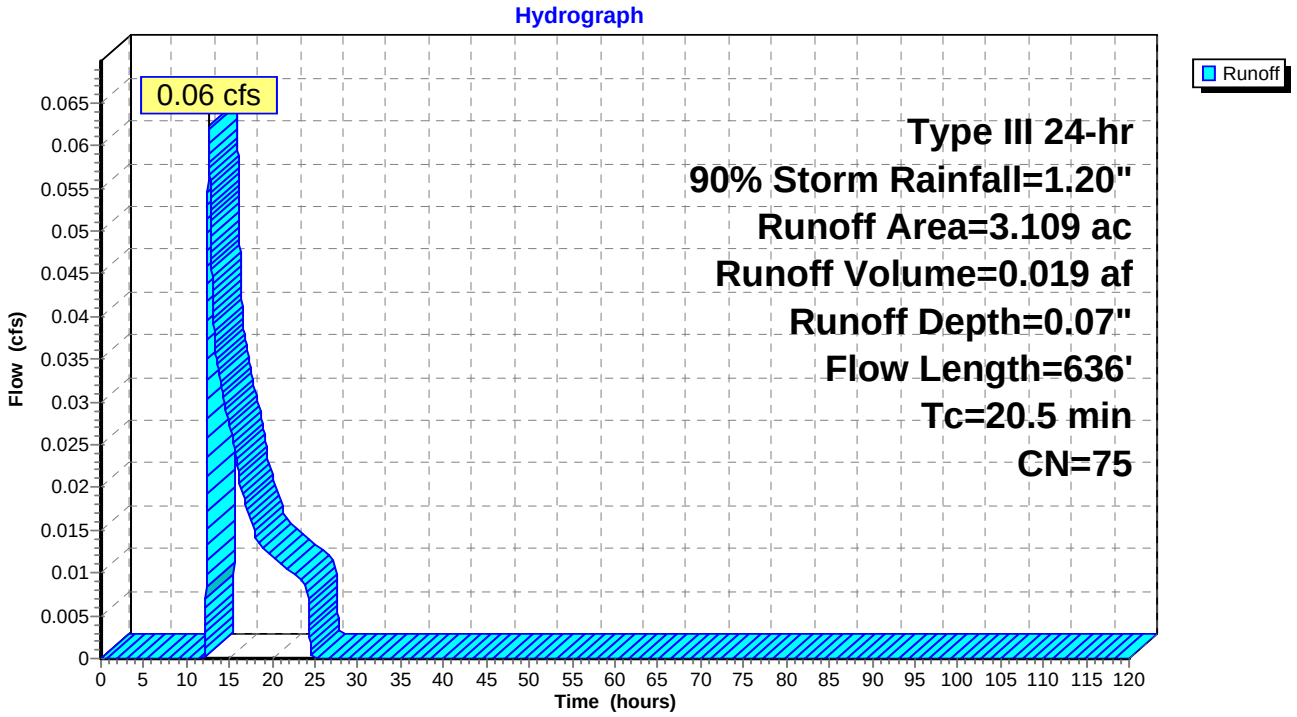
Runoff = 0.06 cfs @ 12.60 hrs, Volume= 0.019 af, Depth= 0.07"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.122	98	Roofs, HSG C
2.605	74	>75% Grass cover, Good, HSG C
0.100	98	Paved parking, HSG C
0.261	70	Woods, Good, HSG C
0.021	74	>75% Grass cover, Good, HSG C
3.109	75	Weighted Average
2.887		92.86% Pervious Area
0.222		7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	150	0.0133	0.17		**Sheet Flow, Overland** Grass: Short n= 0.150 P2= 3.75"
4.4	239	0.0167	0.90		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
1.1	156	0.0060	2.42	7.25	**Channel Flow, Roadside Ditch** Area= 3.0 sf Perim= 6.0' r= 0.50' n= 0.030
0.3	91	0.0055	5.34	16.78	**Pipe Channel, Proposed Roadside Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
20.5	636	Total			

Subcatchment 4S: 29



Summary for Subcatchment 5S: 29A

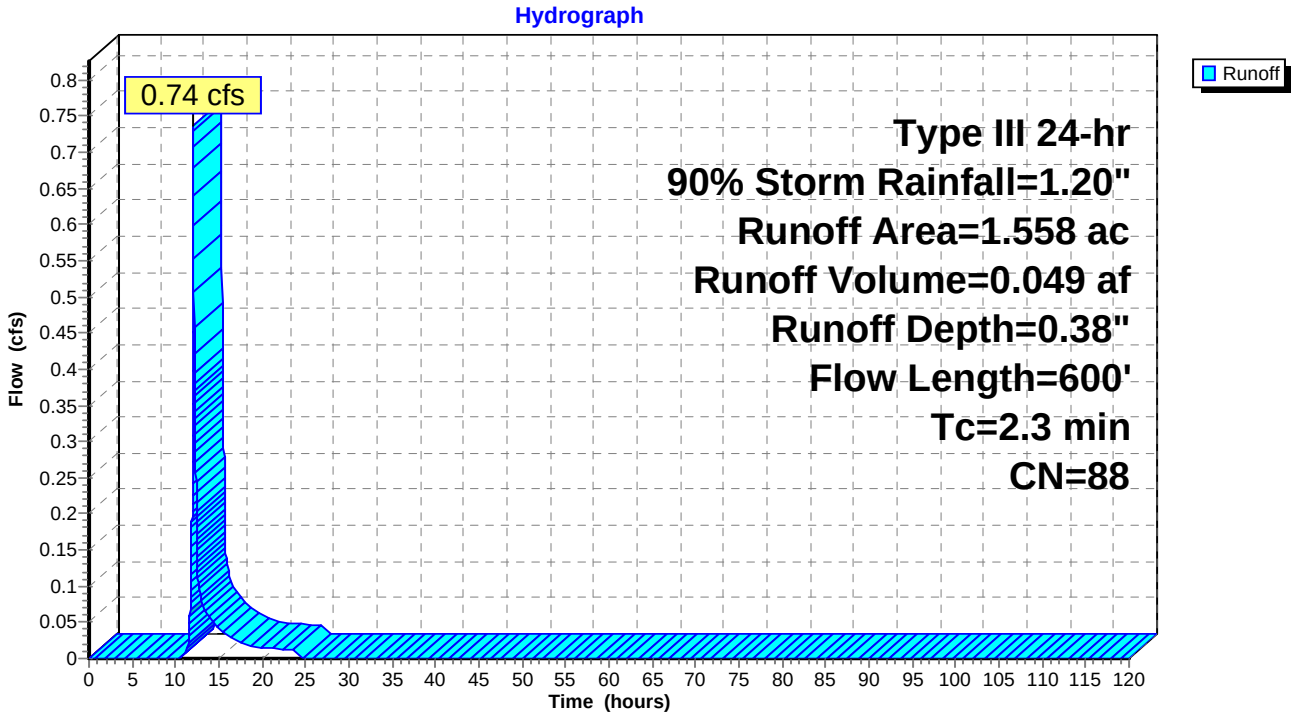
Runoff = 0.74 cfs @ 12.04 hrs, Volume= 0.049 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.005	98	Paved parking, HSG C
	0.003	71	Meadow, non-grazed, HSG C
	0.002	98	Unconnected pavement, HSG C
	0.560	74	>75% Grass cover, Good, HSG C
*	0.169	89	Porous Pavement (Gravel roads), HSG C
	0.819	98	Paved roads w/curbs & sewers, HSG C
	1.558	88	Weighted Average
	0.732		46.98% Pervious Area
	0.826		53.02% Impervious Area
	0.002		0.24% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	61	0.0200	1.35		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
0.9	152	0.0200	2.87		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.6	387	0.0238	11.11	34.90	**Pipe Channel, Storm Network** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
2.3	600	Total			

Subcatchment 5S: 29A



Summary for Subcatchment 6S: SW29B

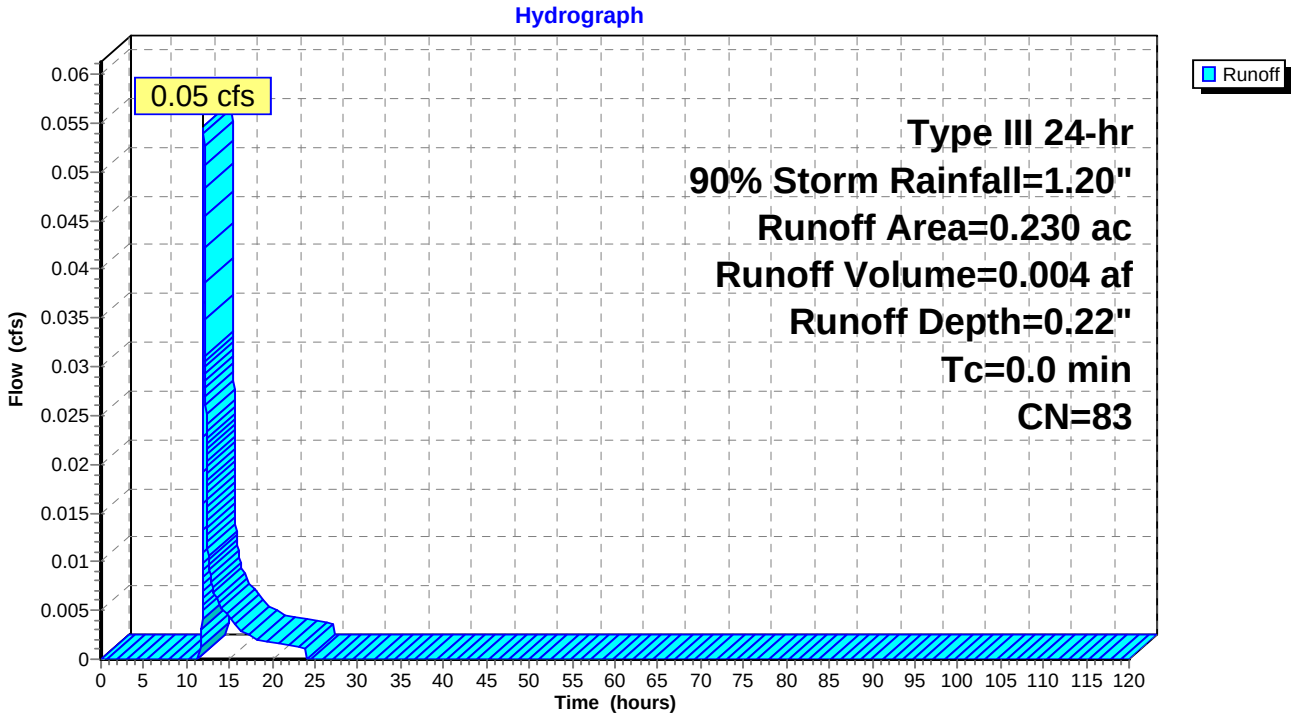
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.05 cfs @ 12.01 hrs, Volume= 0.004 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.088	98	Water Surface, HSG C
0.142	74	>75% Grass cover, Good, HSG C
0.230	83	Weighted Average
0.142		61.74% Pervious Area
0.088		38.26% Impervious Area

Subcatchment 6S: SW29B



Summary for Subcatchment 7S: 29B

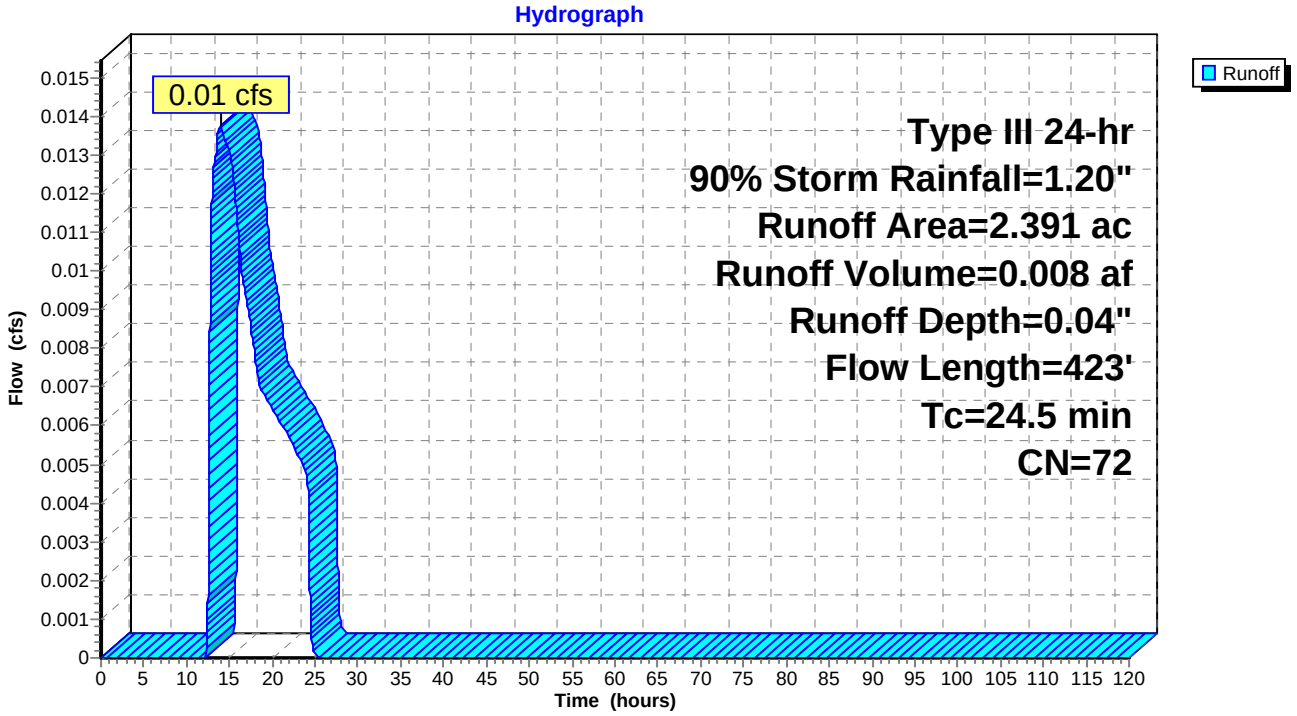
Runoff = 0.01 cfs @ 13.91 hrs, Volume= 0.008 af, Depth= 0.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.008	74	>75% Grass cover, Good, HSG C
0.949	74	>75% Grass cover, Good, HSG C
1.434	70	Woods, Good, HSG C
2.391	72	Weighted Average
2.391		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	150	0.0100	0.15		**Sheet Flow, Overland** Grass: Short n= 0.150 P2= 3.75"
8.0	273	0.0128	0.57		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
24.5	423	Total			

Subcatchment 7S: 29B



Summary for Subcatchment 8S: 29C

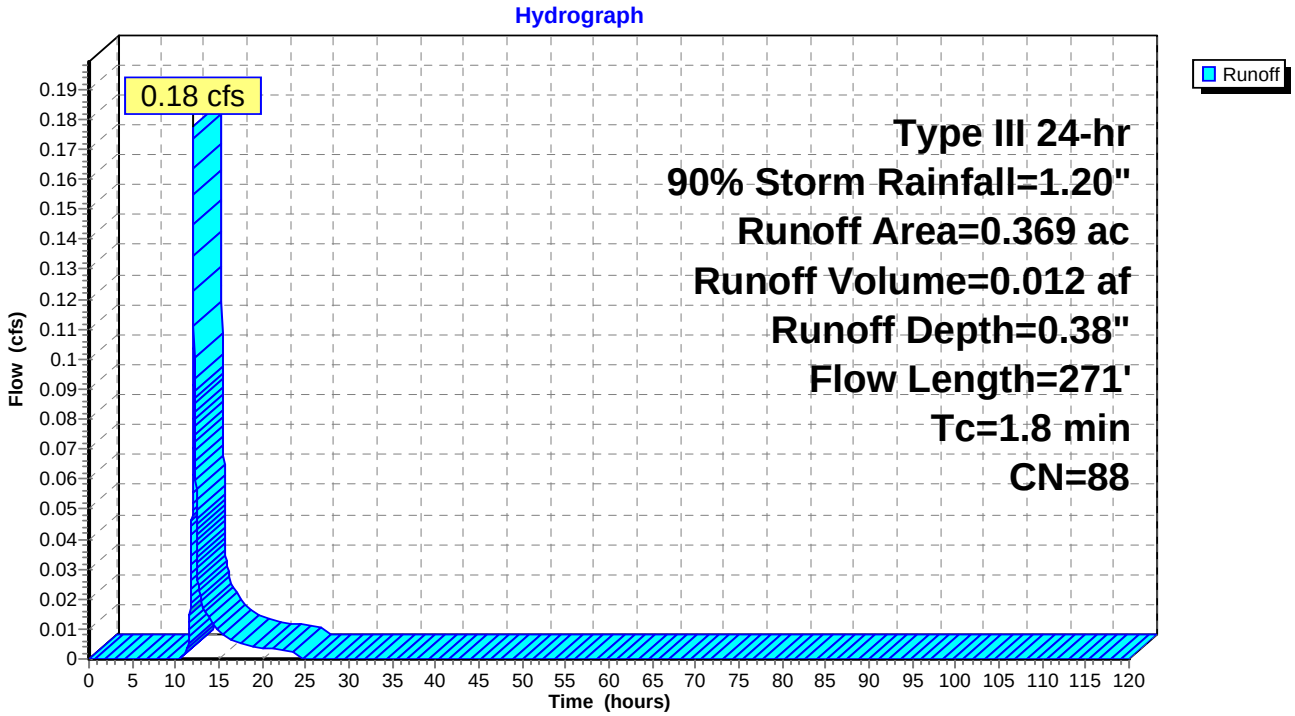
Runoff = 0.18 cfs @ 12.03 hrs, Volume= 0.012 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

	Area (ac)	CN	Description
	0.136	74	>75% Grass cover, Good, HSG C
*	0.046	89	Porous Pavement (Gravel roads), HSG C
	0.187	98	Paved roads w/curbs & sewers, HSG C
	0.369	88	Weighted Average
	0.182		49.32% Pervious Area
	0.187		50.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	64	0.0200	1.36		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
0.7	127	0.0200	2.87		**Shallow Concentrated Flow, Gutter** Paved Kv= 20.3 fps
0.3	80	0.0100	5.26	6.46	**Pipe Channel, Storm Network** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	271	Total			

Subcatchment 8S: 29C



Summary for Subcatchment 9S: 29D

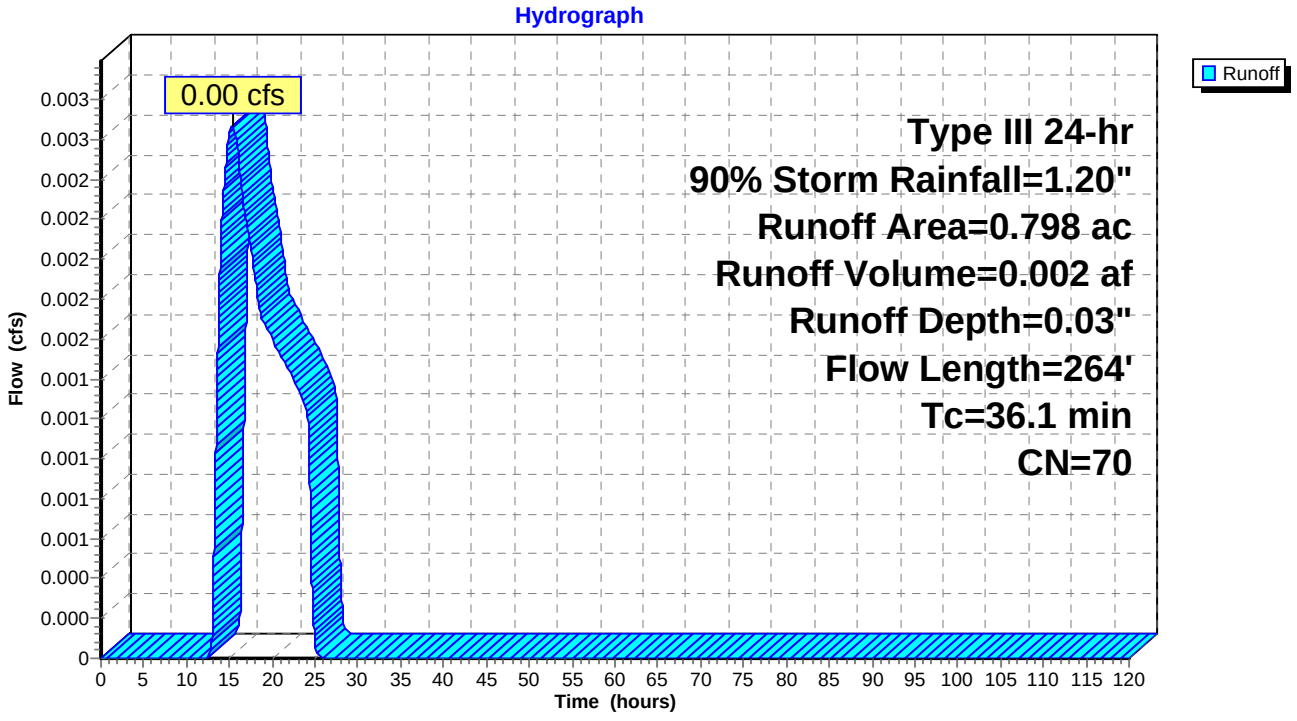
Runoff = 0.00 cfs @ 15.36 hrs, Volume= 0.002 af, Depth= 0.03"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.798	70	Woods, Good, HSG C
0.798		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.3	150	0.0133	0.08		**Sheet Flow, Overland** Woods: Light underbrush n= 0.400 P2= 3.75"
3.8	114	0.0100	0.50		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
36.1	264	Total			

Subcatchment 9S: 29D



Summary for Subcatchment 10S: SW29A

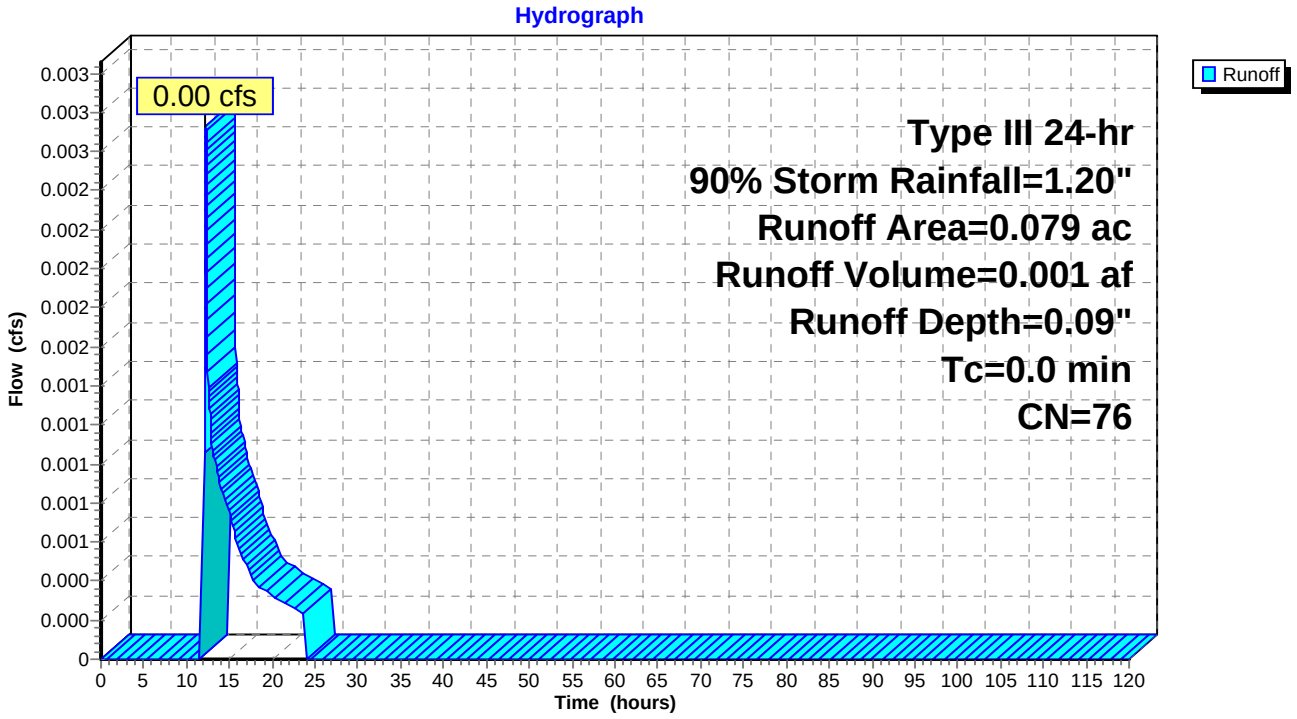
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.00 cfs @ 12.25 hrs, Volume= 0.001 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.008	98	Water Surface, HSG C
0.071	74	>75% Grass cover, Good, HSG C
0.079	76	Weighted Average
0.071		89.87% Pervious Area
0.008		10.13% Impervious Area

Subcatchment 10S: SW29A



Summary for Subcatchment A1: A1

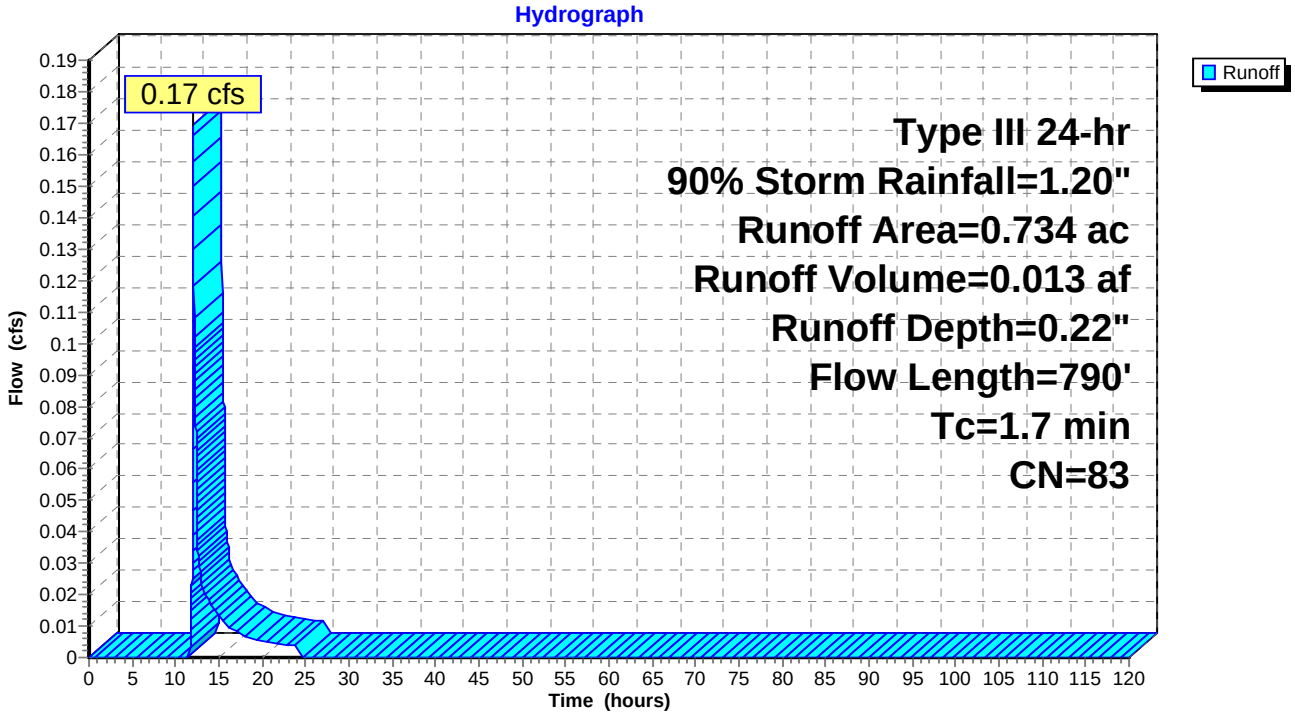
Runoff = 0.17 cfs @ 12.04 hrs, Volume= 0.013 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.004	74	>75% Grass cover, Good, HSG C
0.458	74	>75% Grass cover, Good, HSG C
0.007	89	Gravel roads, HSG C
0.265	98	Paved roads w/curbs & sewers, HSG C
0.734	83	Weighted Average
0.469		63.90% Pervious Area
0.265		36.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	81	0.0200	1.43		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	674	0.0846	15.82	193.04	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	35	0.0145	5.46	4.29	**Pipe Channel, Culvert Crossing** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.7	790	Total			

Subcatchment A1: A1



Summary for Subcatchment A2: A2

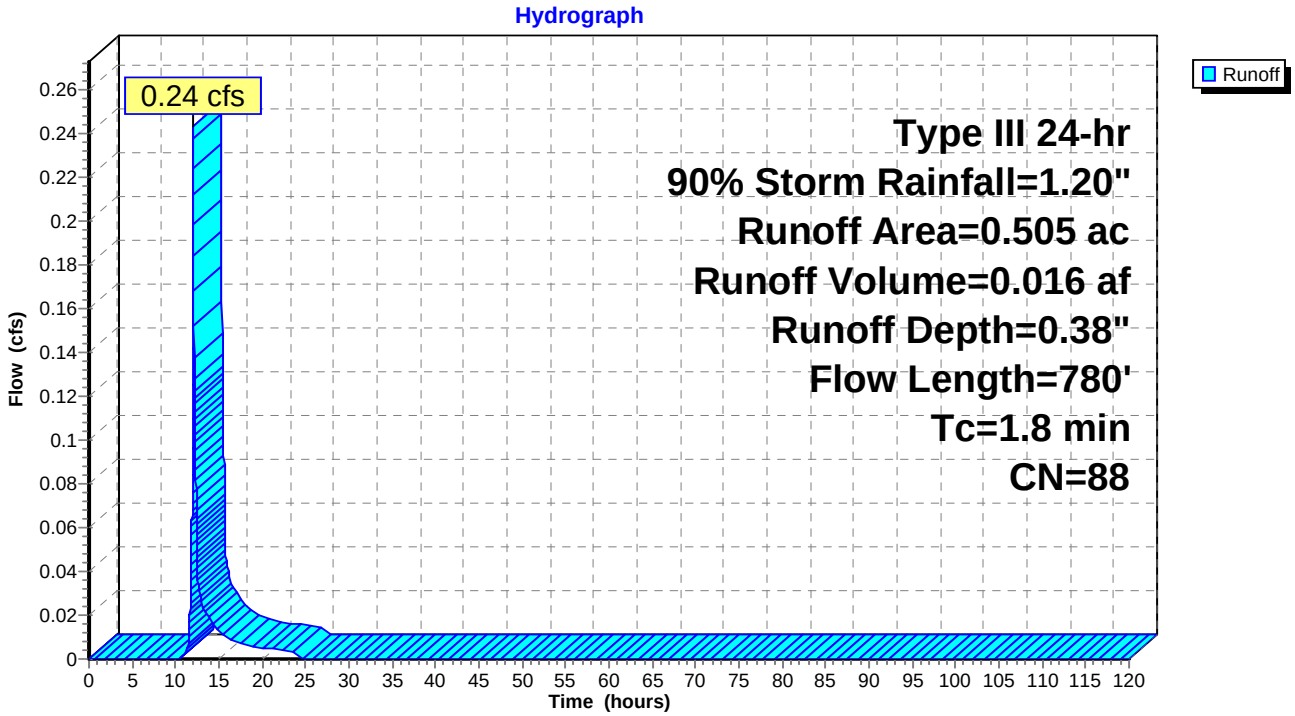
Runoff = 0.24 cfs @ 12.03 hrs, Volume= 0.016 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.200	74	>75% Grass cover, Good, HSG C
0.023	89	Gravel roads, HSG C
0.282	98	Paved roads w/curbs & sewers, HSG C
0.505	88	Weighted Average
0.223		44.16% Pervious Area
0.282		55.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	658	0.0836	15.73	191.89	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.0	22	0.0577	12.64	15.52	**Pipe Channel, Pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	780	Total			

Subcatchment A2: A2



Summary for Subcatchment A3: A3

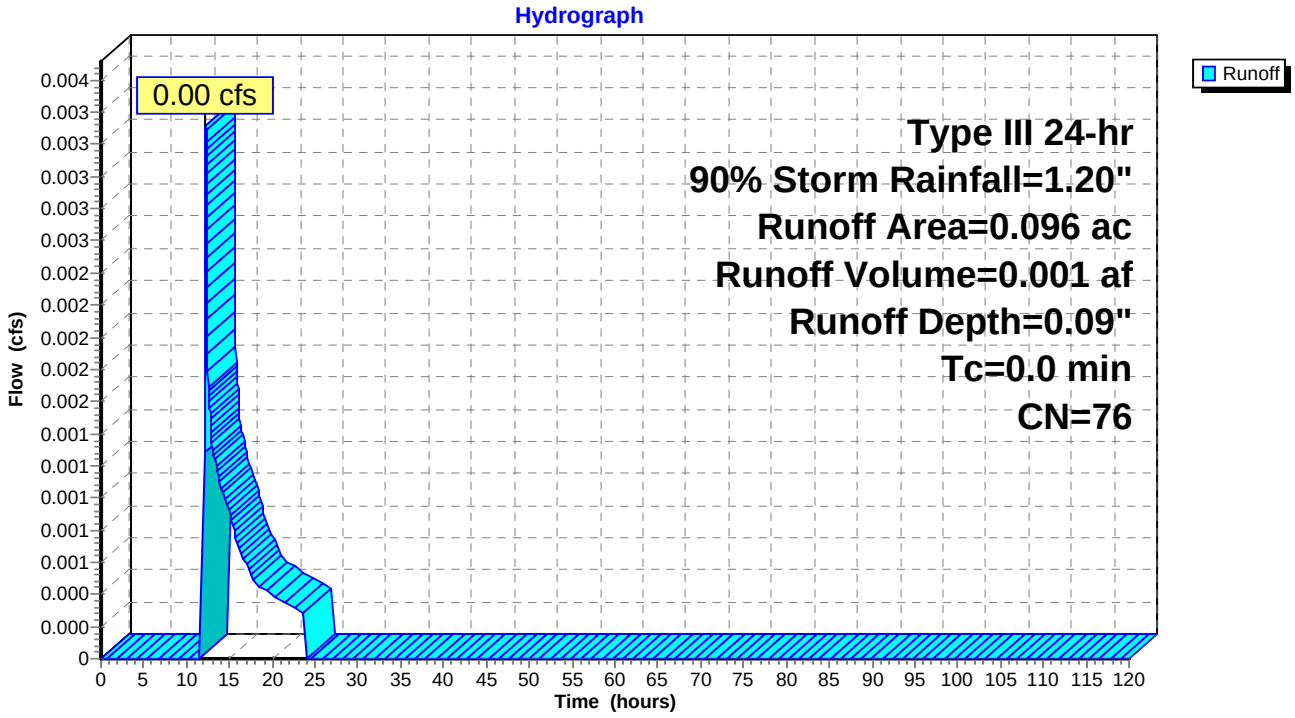
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.00 cfs @ 12.25 hrs, Volume= 0.001 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.085	74	>75% Grass cover, Good, HSG C
0.011	89	Gravel roads, HSG C
0.096	76	Weighted Average
0.096		100.00% Pervious Area

Subcatchment A3: A3



Summary for Subcatchment B1: B1

[49] Hint: Tc<2dt may require smaller dt

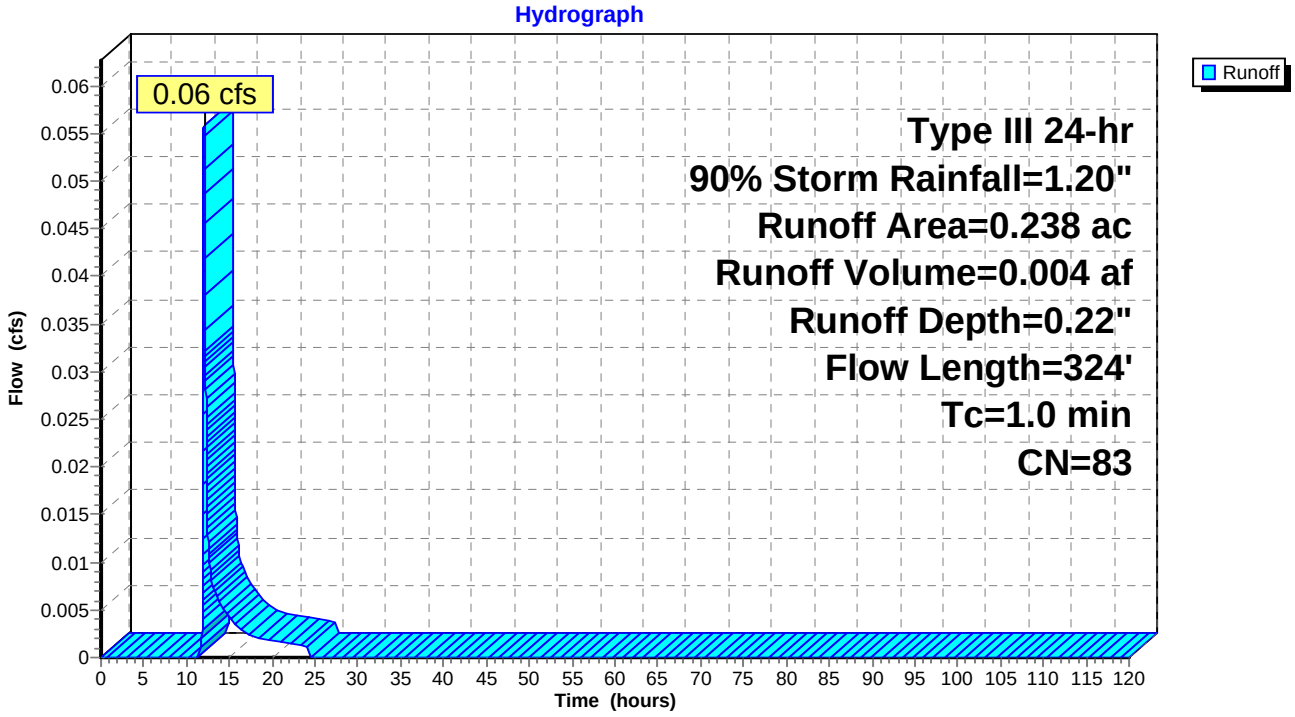
Runoff = 0.06 cfs @ 12.03 hrs, Volume= 0.004 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.150	74	>75% Grass cover, Good, HSG C
0.088	98	Paved roads w/curbs & sewers, HSG C
0.238	83	Weighted Average
0.150		63.03% Pervious Area
0.088		36.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0800	2.59		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	189	0.0476	11.87	144.80	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	35	0.0145	5.46	4.29	**Pipe Channel, Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.0	324	Total			

Subcatchment B1: B1



Summary for Subcatchment B2: B2

[49] Hint: Tc<2dt may require smaller dt

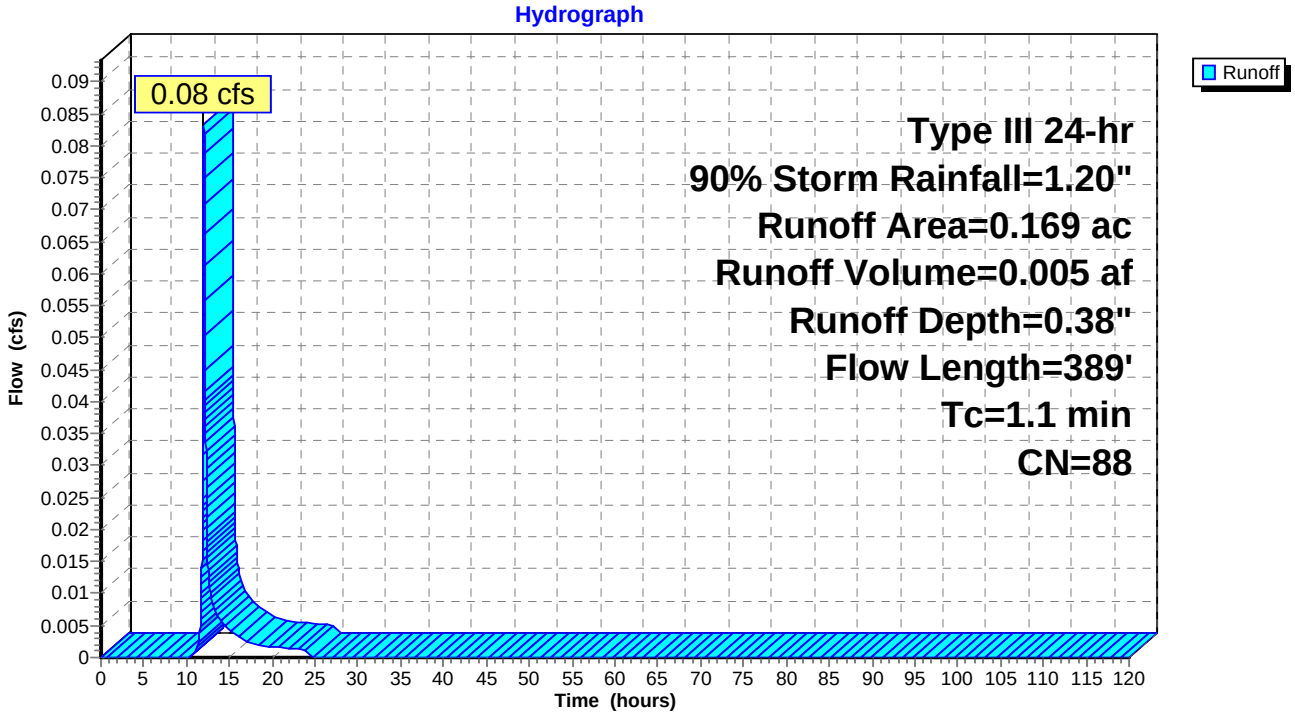
Runoff = 0.08 cfs @ 12.02 hrs, Volume= 0.005 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.067	74	>75% Grass cover, Good, HSG C
0.102	98	Paved roads w/curbs & sewers, HSG C
0.169	88	Weighted Average
0.067		39.64% Pervious Area
0.102		60.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0830	2.63		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.4	263	0.0380	10.60	129.38	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	26	0.0338	8.34	6.55	**Pipe Channel, Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.1	389	Total			

Subcatchment B2: B2



Summary for Subcatchment B3: B3

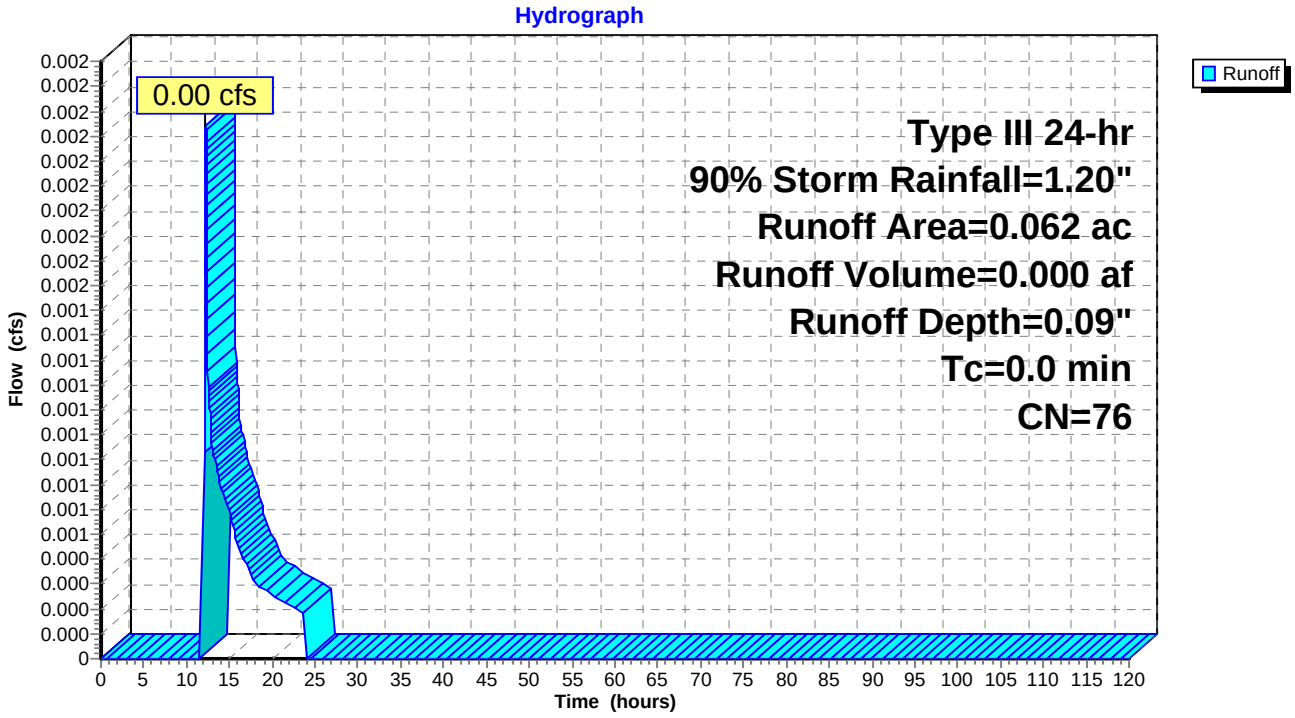
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.00 cfs @ 12.25 hrs, Volume= 0.000 af, Depth= 0.09"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.054	74	>75% Grass cover, Good, HSG C
0.008	89	Gravel roads, HSG C
0.062	76	Weighted Average
0.062		100.00% Pervious Area

Subcatchment B3: B3



Summary for Subcatchment C1: C1

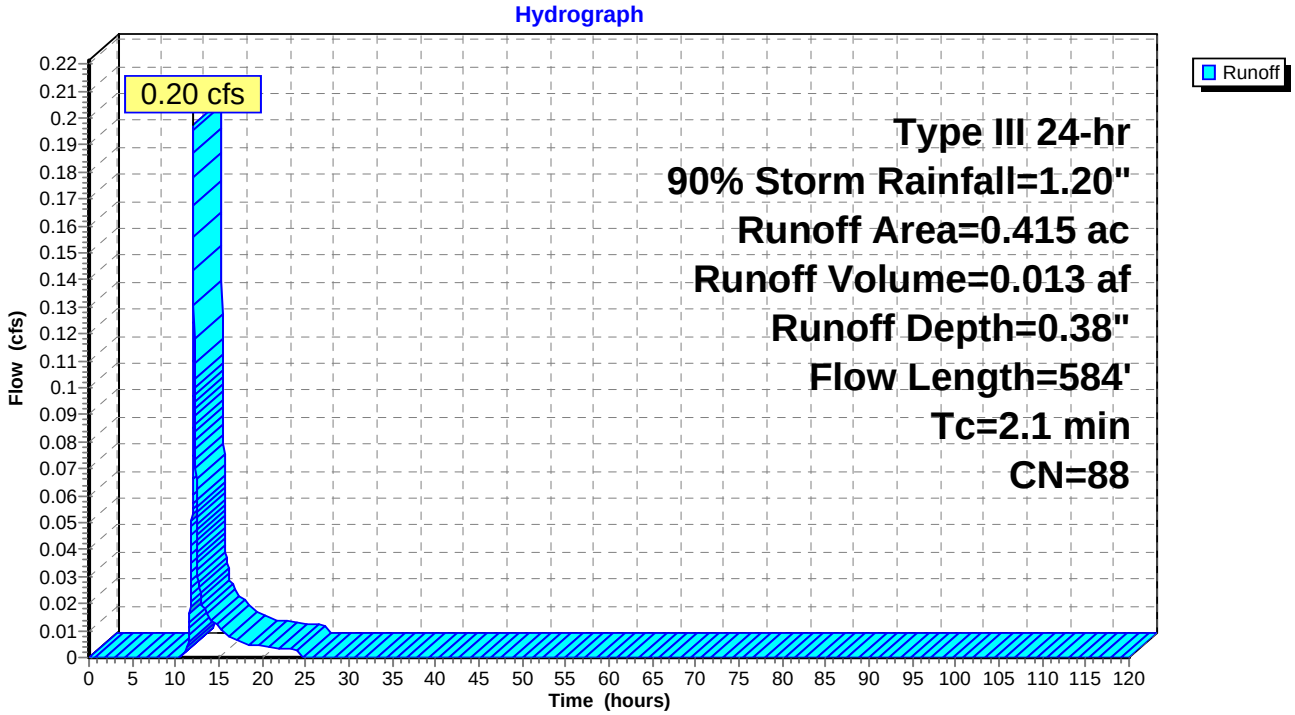
Runoff = 0.20 cfs @ 12.04 hrs, Volume= 0.013 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.143	74	>75% Grass cover, Good, HSG C
0.166	98	Paved roads w/curbs & sewers, HSG C
0.048	80	>75% Grass cover, Good, HSG D
0.058	98	Paved roads w/curbs & sewers, HSG D
0.415	88	Weighted Average
0.191		46.02% Pervious Area
0.224		53.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
1.0	462	0.0216	8.00	97.54	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	36	0.0118	4.93	3.87	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.1	584	Total			

Subcatchment C1: C1



Summary for Subcatchment C2: C2

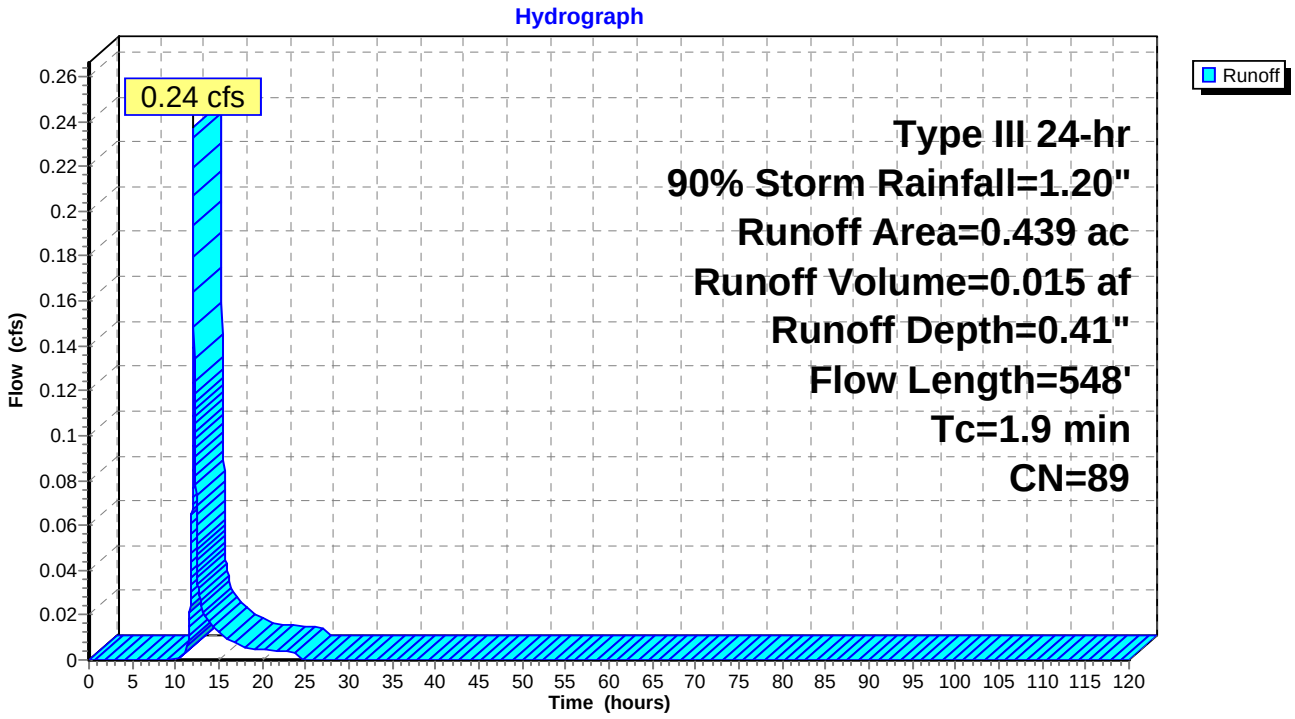
Runoff = 0.24 cfs @ 12.03 hrs, Volume= 0.015 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.140	74	>75% Grass cover, Good, HSG C
0.189	98	Paved roads w/curbs & sewers, HSG C
0.043	80	>75% Grass cover, Good, HSG D
0.067	98	Paved roads w/curbs & sewers, HSG D
0.439	89	Weighted Average
0.183		41.69% Pervious Area
0.256		58.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	77	0.0200	1.41		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
1.0	471	0.0191	7.52	91.72	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.9	548	Total			

Subcatchment C2: C2



Summary for Subcatchment C3: C3

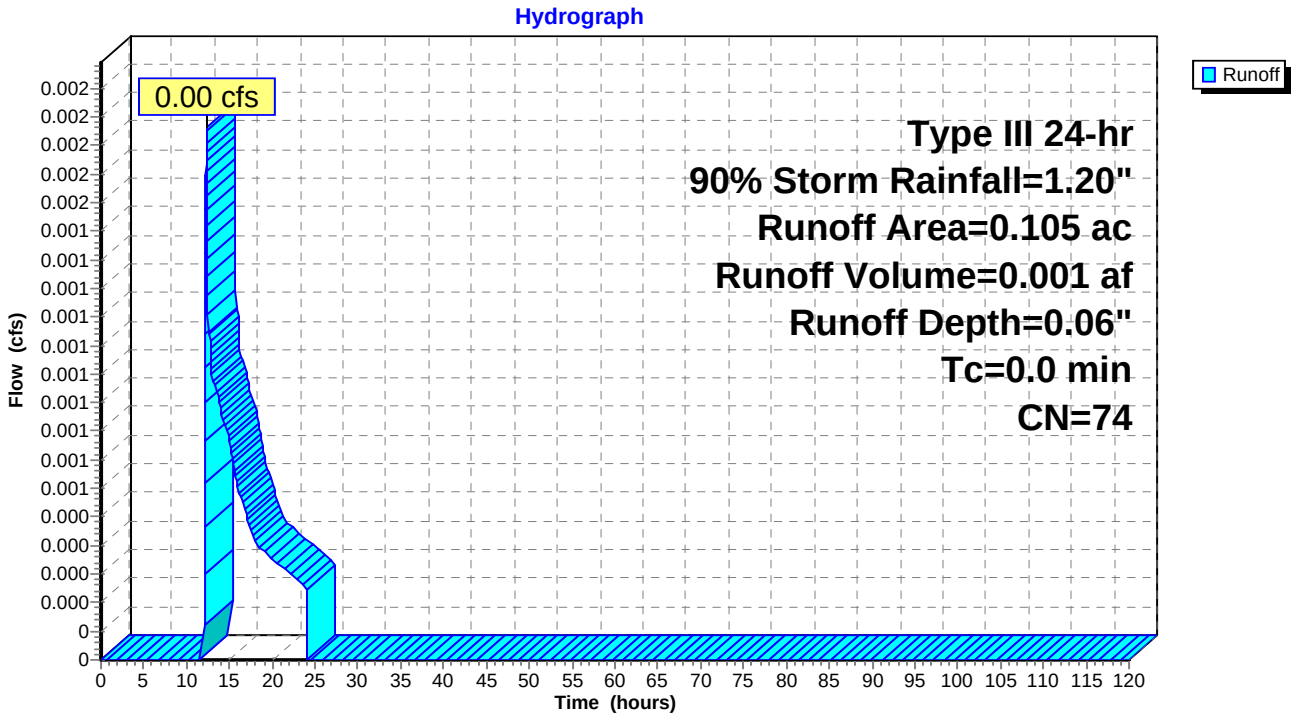
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.001 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.105	74	>75% Grass cover, Good, HSG C
0.105		100.00% Pervious Area

Subcatchment C3: C3



Summary for Subcatchment D1: D1

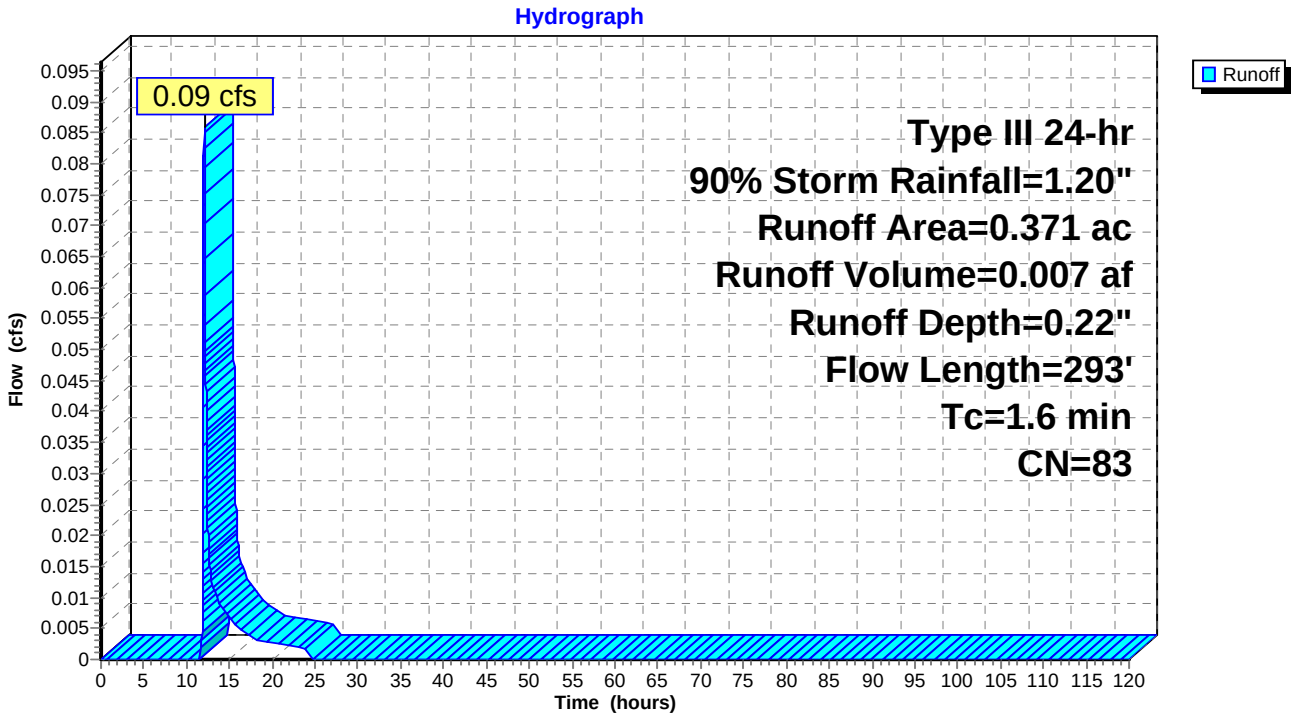
Runoff = 0.09 cfs @ 12.04 hrs, Volume= 0.007 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.228	74	>75% Grass cover, Good, HSG C
0.143	98	Paved roads w/curbs & sewers, HSG C
0.371	83	Weighted Average
0.228		61.46% Pervious Area
0.143		38.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	80	0.0100	1.08		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	183	0.0436	11.36	138.58	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	30	0.0118	4.93	3.87	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.6	293	Total			

Subcatchment D1: D1



Summary for Subcatchment D2: D2

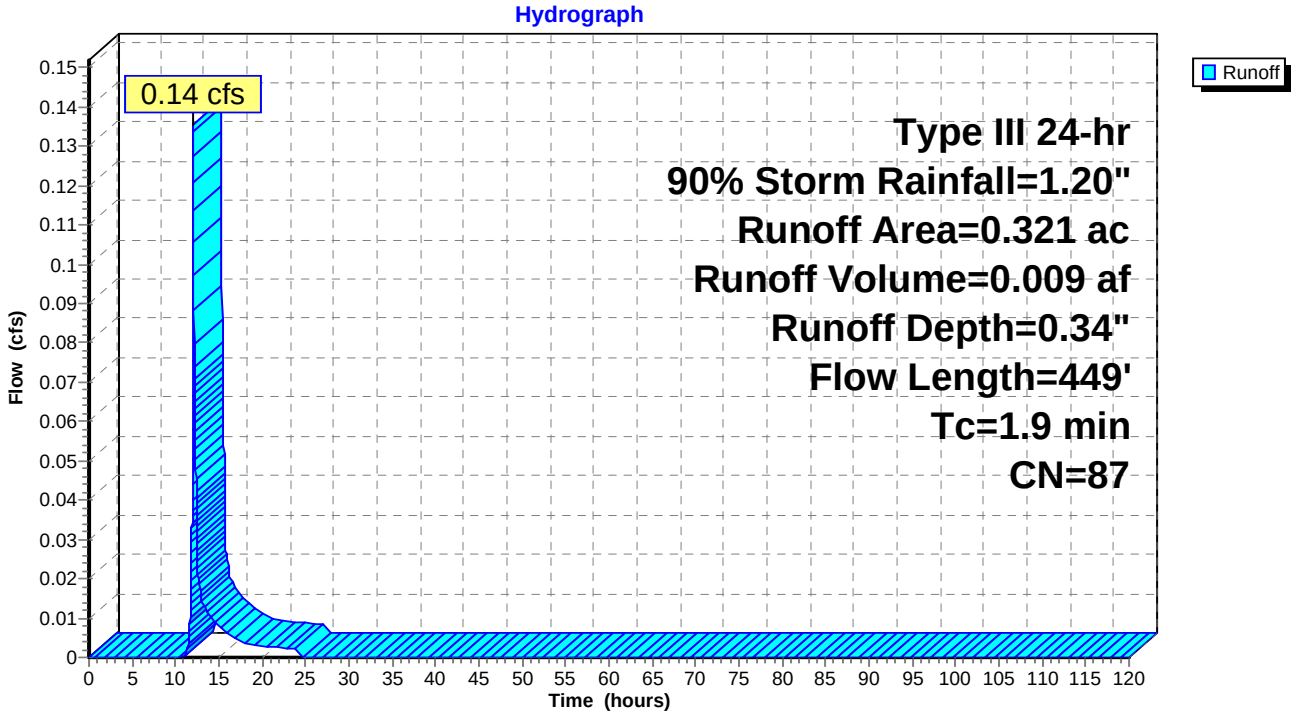
Runoff = 0.14 cfs @ 12.04 hrs, Volume= 0.009 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.140	74	>75% Grass cover, Good, HSG C
0.017	89	Gravel roads, HSG C
0.164	98	Paved roads w/curbs & sewers, HSG C
0.321	87	Weighted Average
0.157		48.91% Pervious Area
0.164		51.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	78	0.0100	1.07		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	371	0.0256	8.70	106.19	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.9	449	Total			

Subcatchment D2: D2



Summary for Subcatchment D3: D3

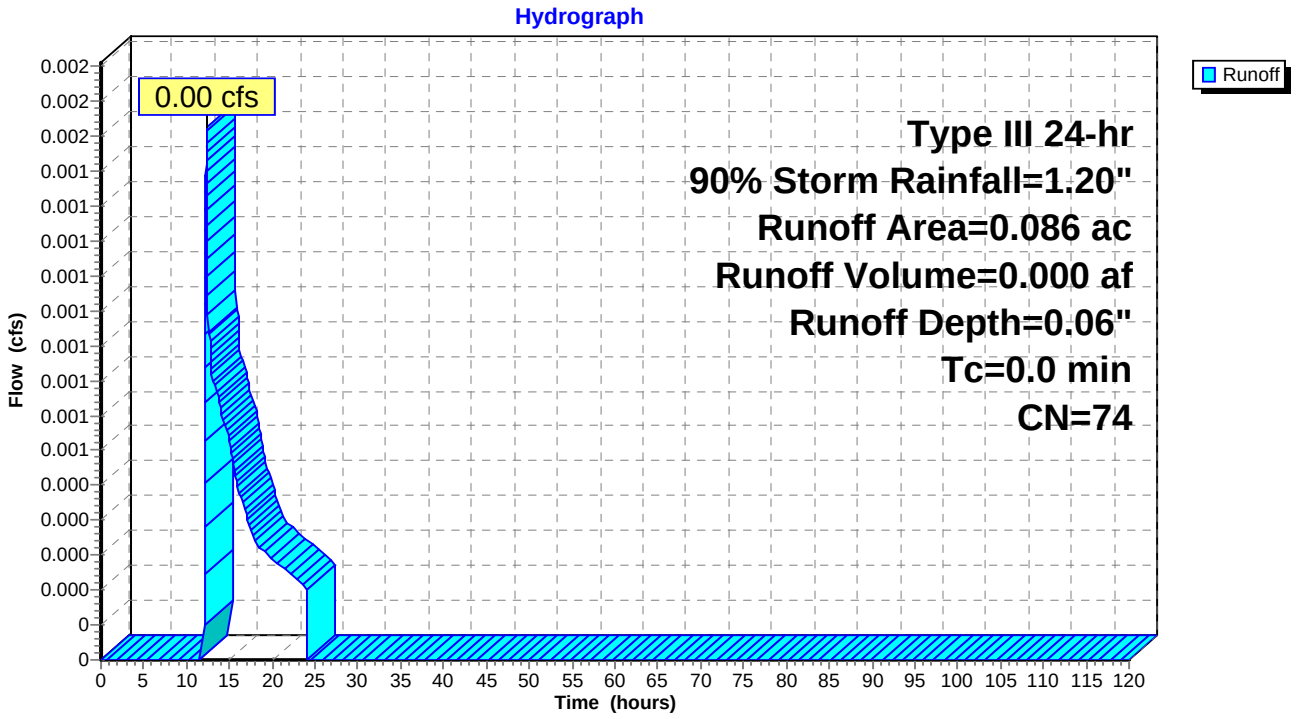
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.086	74	>75% Grass cover, Good, HSG C
0.086		100.00% Pervious Area

Subcatchment D3: D3



Summary for Subcatchment E1: E1

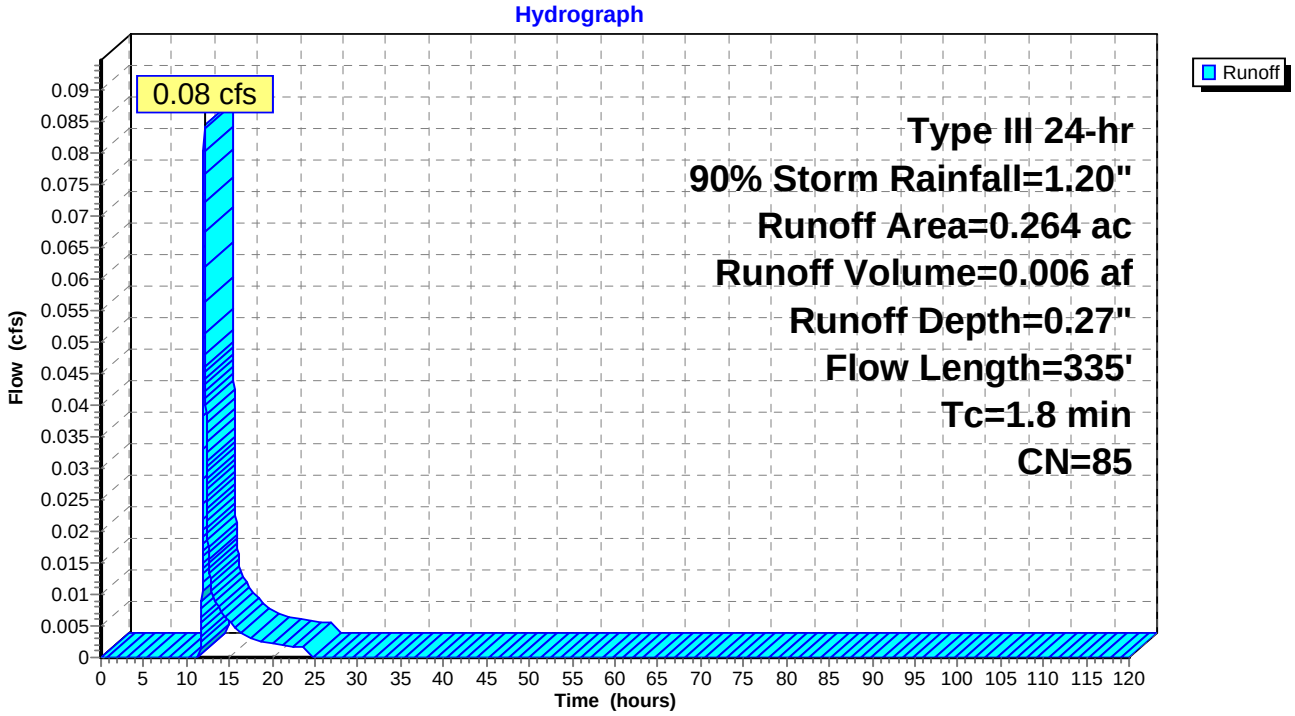
Runoff = 0.08 cfs @ 12.04 hrs, Volume= 0.006 af, Depth= 0.27"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.145	74	>75% Grass cover, Good, HSG C
0.119	98	Paved roads w/curbs & sewers, HSG C
0.264	85	Weighted Average
0.145		54.92% Pervious Area
0.119		45.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	81	0.0100	1.08		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	223	0.0179	7.28	88.79	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	31	0.0128	5.13	4.03	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.8	335	Total			

Subcatchment E1: E1



Summary for Subcatchment E2: E2

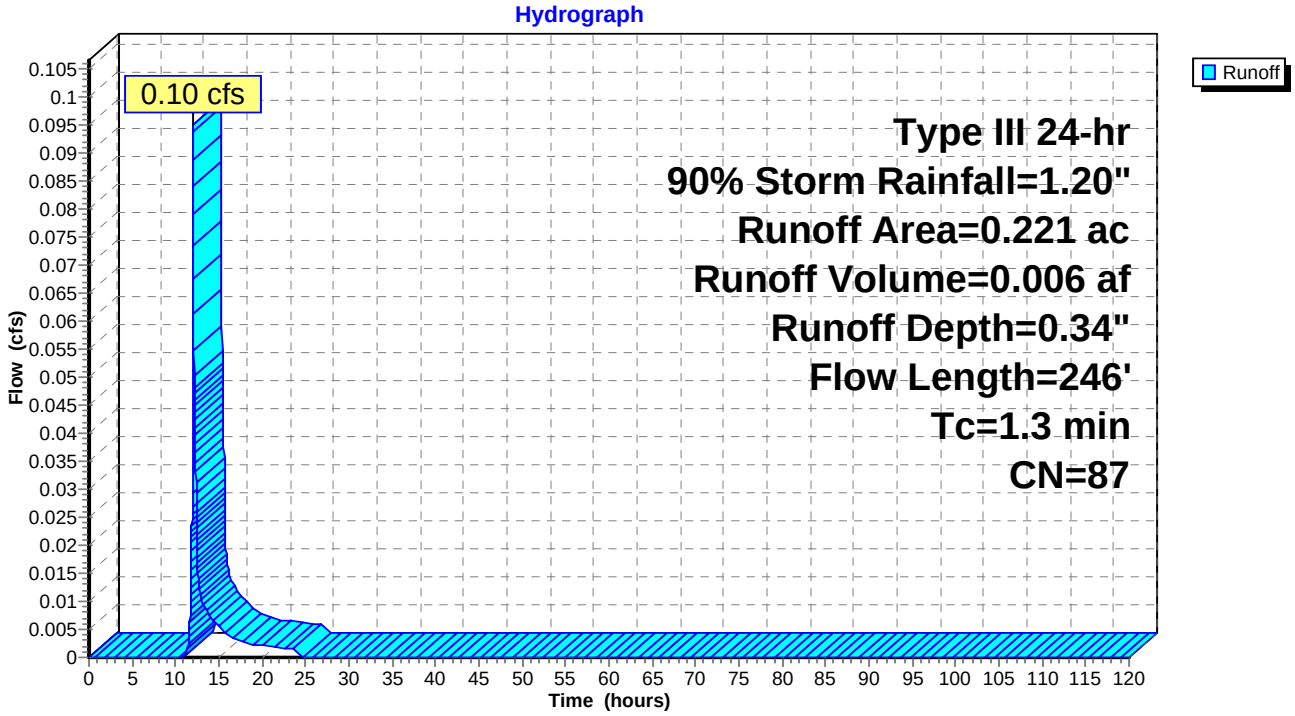
Runoff = 0.10 cfs @ 12.03 hrs, Volume= 0.006 af, Depth= 0.34"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.093	74	>75% Grass cover, Good, HSG C
0.032	89	Gravel roads, HSG C
0.096	98	Paved roads w/curbs & sewers, HSG C
0.221	87	Weighted Average
0.125		56.56% Pervious Area
0.096		43.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0100	0.98		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	196	0.0153	6.73	82.09	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	246	Total			

Subcatchment E2: E2



Summary for Subcatchment E4: E4

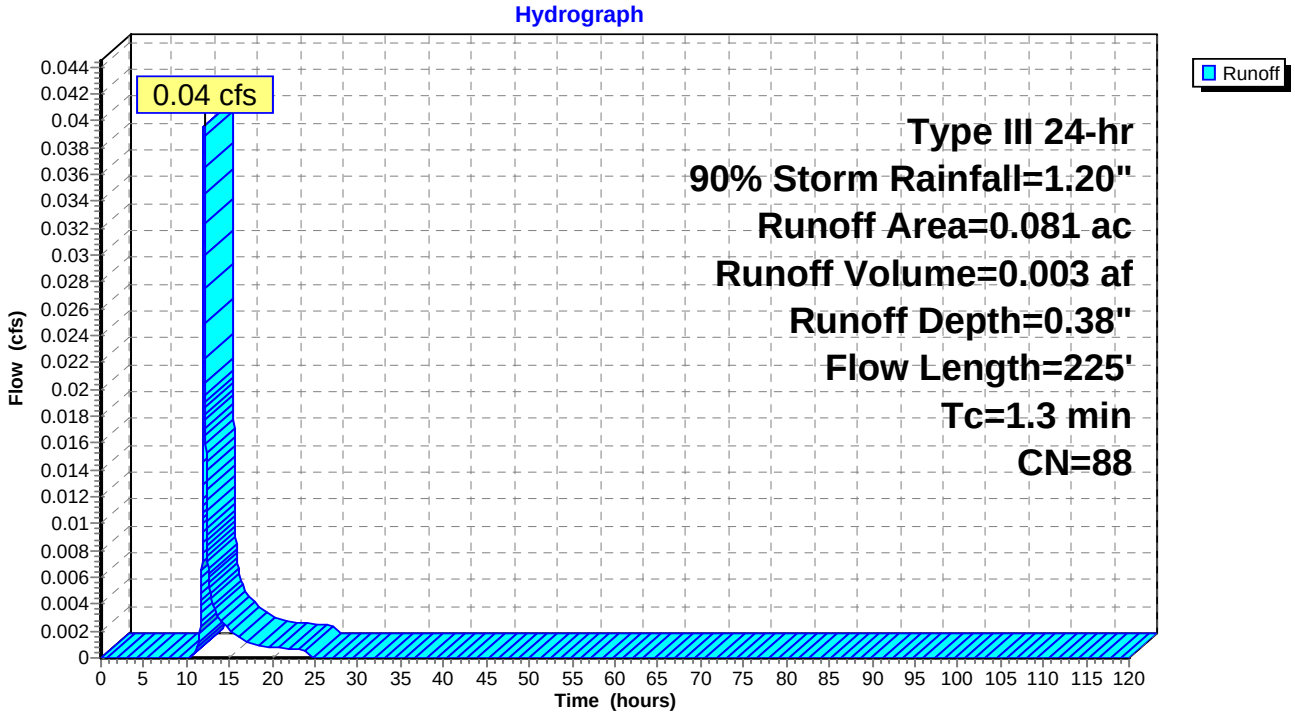
Runoff = 0.04 cfs @ 12.02 hrs, Volume= 0.003 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.046	98	Paved roads w/curbs & sewers, HSG C
0.035	74	>75% Grass cover, Good, HSG C
0.081	88	Weighted Average
0.035		43.21% Pervious Area
0.046		56.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	46	0.0100	0.97		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	179	0.0117	5.88	71.79	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	225	Total			

Subcatchment E4: E4



Summary for Subcatchment E5: E5

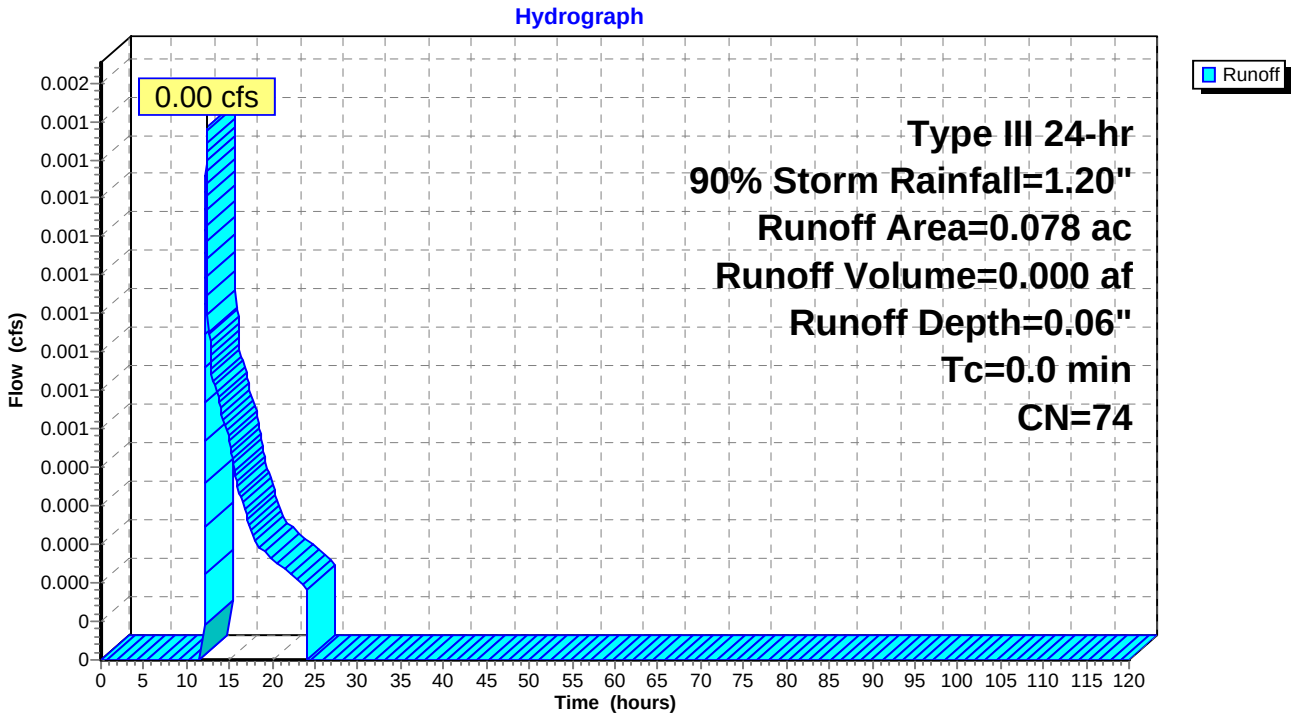
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.078	74	>75% Grass cover, Good, HSG C
0.078		100.00% Pervious Area

Subcatchment E5: E5



Summary for Subcatchment F1: F1

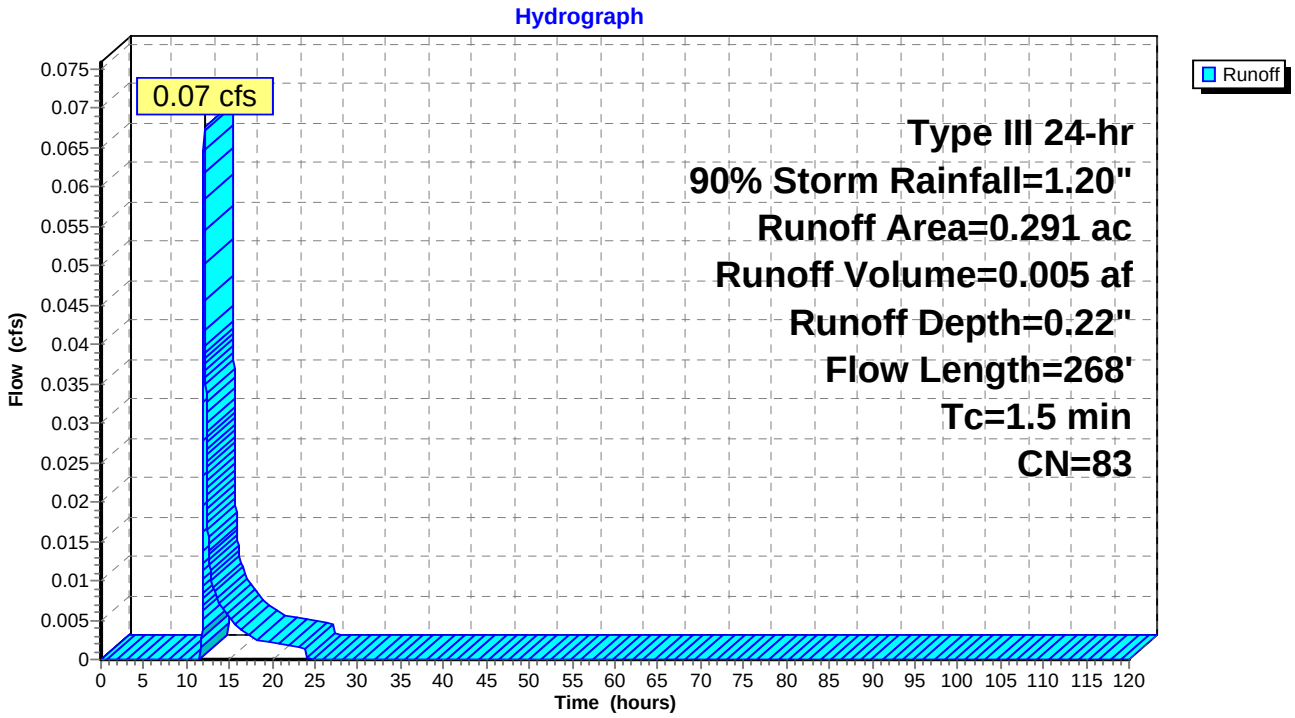
Runoff = 0.07 cfs @ 12.04 hrs, Volume= 0.005 af, Depth= 0.22"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.177	74	>75% Grass cover, Good, HSG C
0.114	98	Paved roads w/curbs & sewers, HSG C
0.291	83	Weighted Average
0.177		60.82% Pervious Area
0.114		39.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	54	0.0100	1.00		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	182	0.0110	5.71	69.61	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	32	0.0078	4.65	5.71	**Pipe Channel, Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.5	268	Total			

Subcatchment F1: F1



Summary for Subcatchment F2: F2

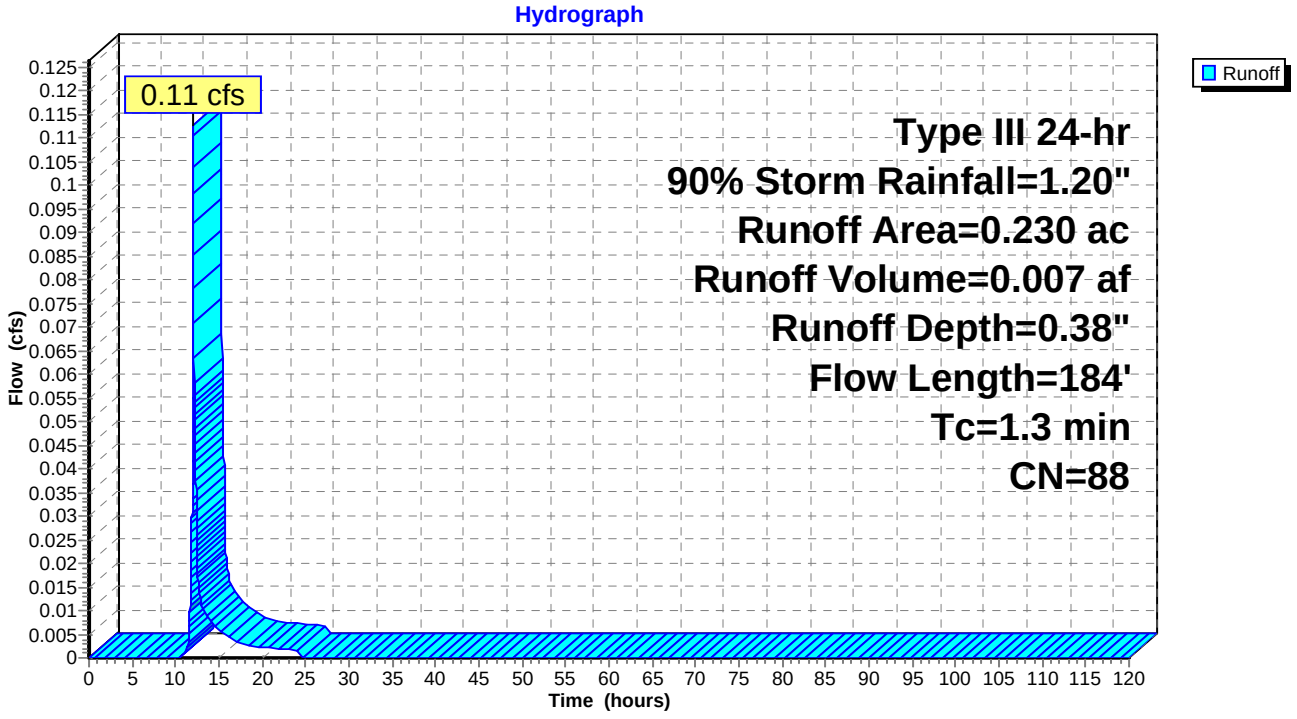
Runoff = 0.11 cfs @ 12.02 hrs, Volume= 0.007 af, Depth= 0.38"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.092	74	>75% Grass cover, Good, HSG C
0.138	98	Paved roads w/curbs & sewers, HSG C
0.230	88	Weighted Average
0.092		40.00% Pervious Area
0.138		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	58	0.0100	1.01		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	126	0.0160	6.88	83.95	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	184	Total			

Subcatchment F2: F2



Summary for Subcatchment F3: F3

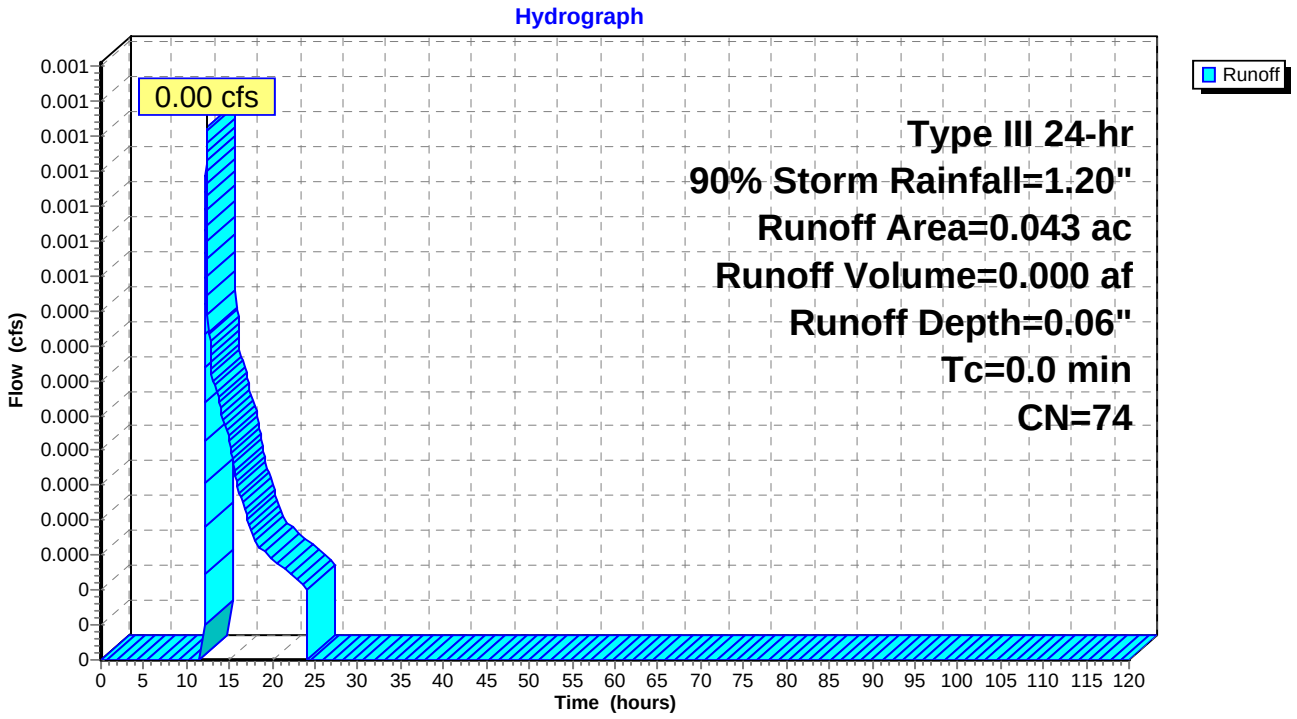
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.043	74	>75% Grass cover, Good, HSG C
0.043		100.00% Pervious Area

Subcatchment F3: F3



Summary for Subcatchment G1: G1

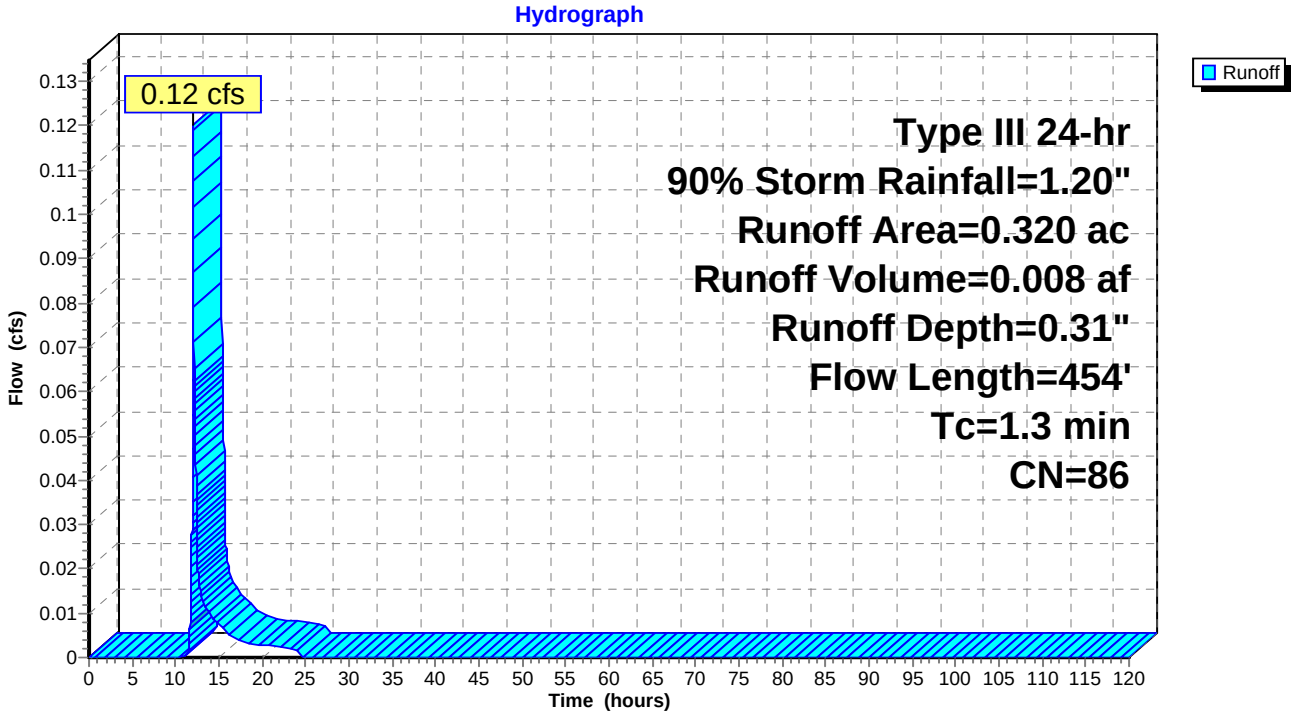
Runoff = 0.12 cfs @ 12.03 hrs, Volume= 0.008 af, Depth= 0.31"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.130	74	>75% Grass cover, Good, HSG C
0.095	98	Paved roads w/curbs & sewers, HSG C
0.047	80	>75% Grass cover, Good, HSG D
0.048	98	Paved roads w/curbs & sewers, HSG D
0.320	86	Weighted Average
0.177		55.31% Pervious Area
0.143		44.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	57	0.0200	1.33		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.6	364	0.0329	9.87	120.38	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.0	33	0.0920	13.76	10.81	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.3	454	Total			

Subcatchment G1: G1



Summary for Subcatchment G2: G2

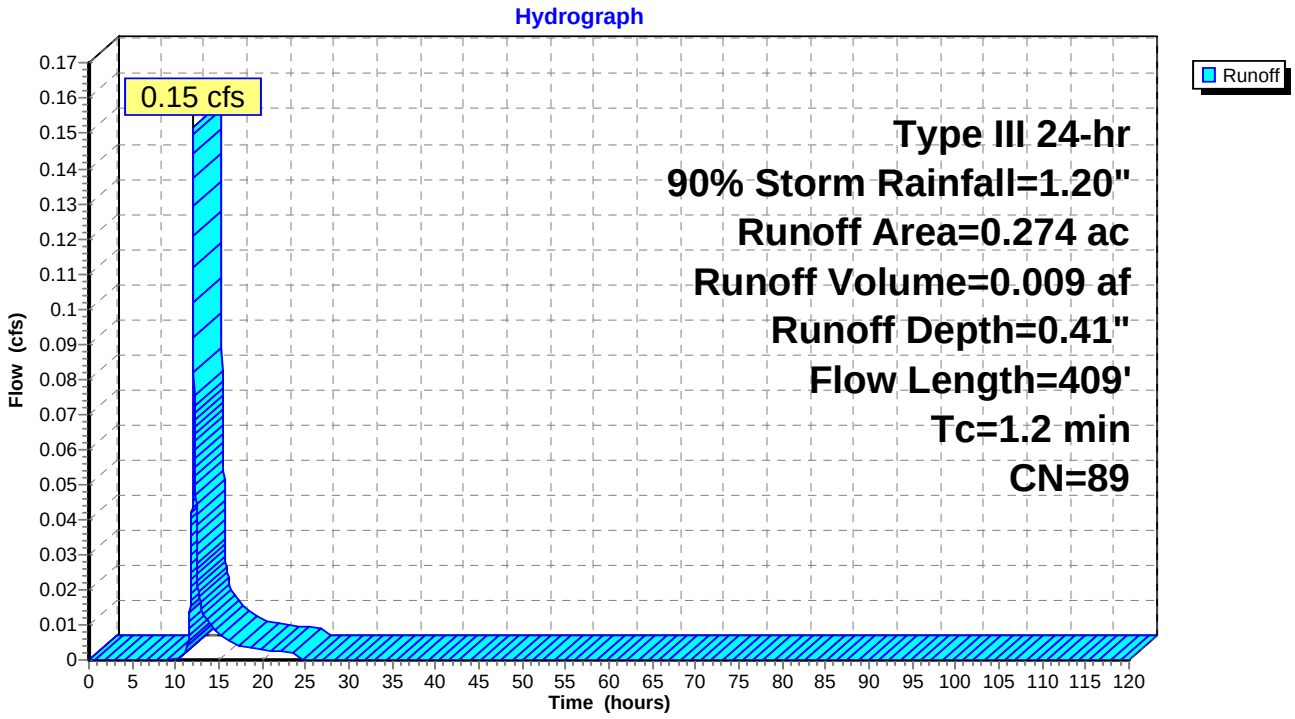
Runoff = 0.15 cfs @ 12.02 hrs, Volume= 0.009 af, Depth= 0.41"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.072	74	>75% Grass cover, Good, HSG C
0.101	98	Paved roads w/curbs & sewers, HSG C
0.046	80	>75% Grass cover, Good, HSG D
0.055	98	Paved roads w/curbs & sewers, HSG D
0.274	89	Weighted Average
0.118		43.07% Pervious Area
0.156		56.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	49	0.0200	1.29		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.6	360	0.0360	10.32	125.92	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.2	409	Total			

Subcatchment G2: G2



Summary for Subcatchment G3: G3

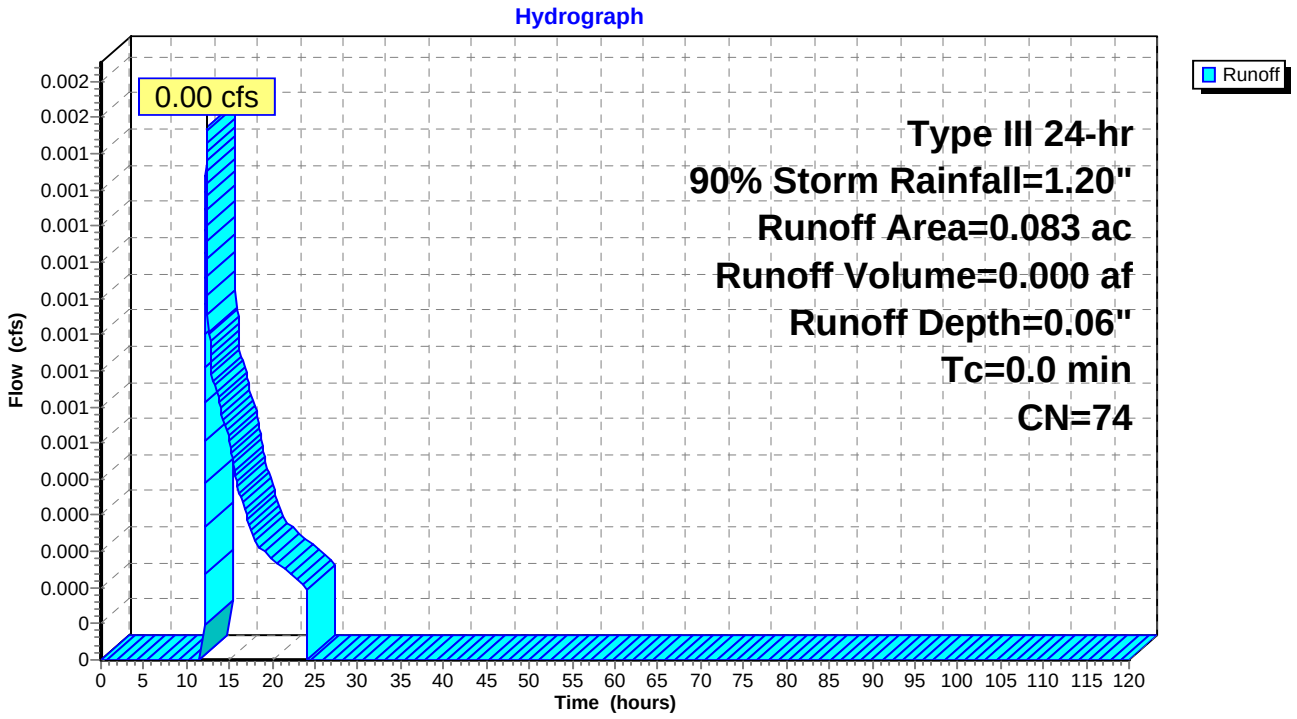
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.00 cfs @ 12.32 hrs, Volume= 0.000 af, Depth= 0.06"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 90% Storm Rainfall=1.20"

Area (ac)	CN	Description
0.083	74	>75% Grass cover, Good, HSG C
0.083		100.00% Pervious Area

Subcatchment G3: G3



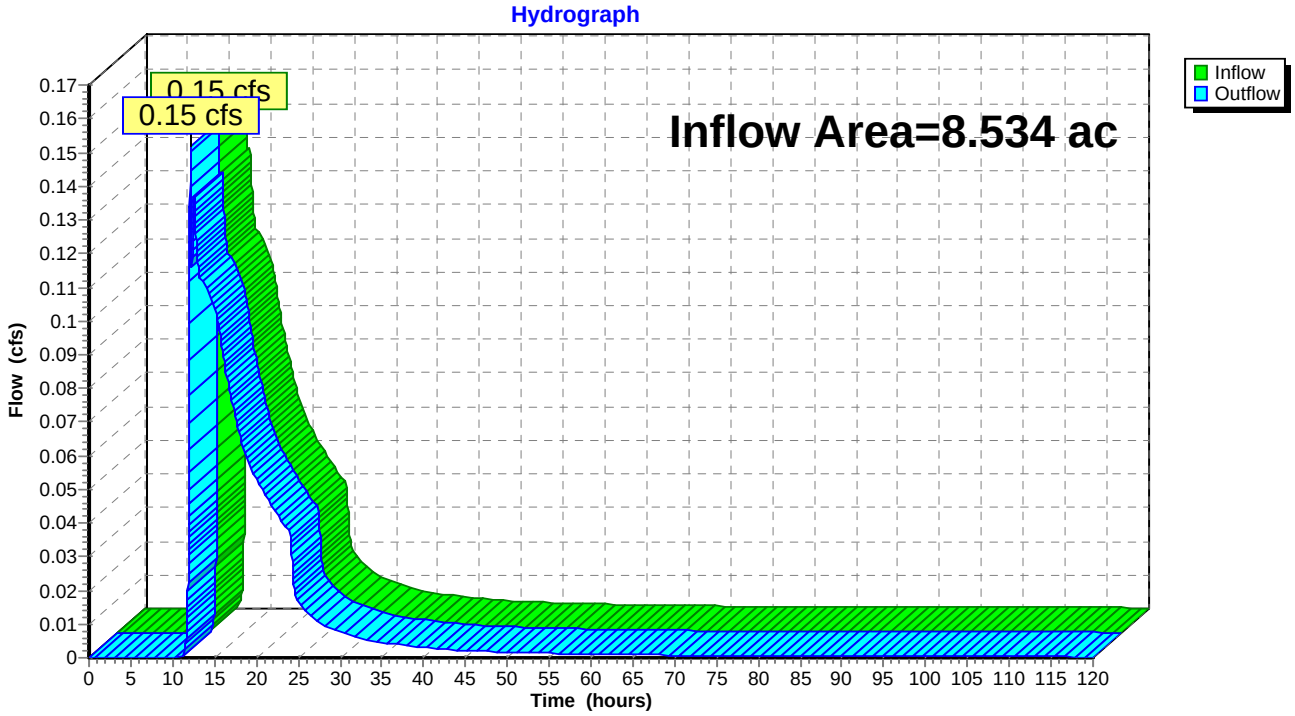
Summary for Reach DP-10: DP-10

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.534 ac, 15.60% Impervious, Inflow Depth > 0.13" for 90% Storm event
Inflow = 0.15 cfs @ 12.10 hrs, Volume= 0.091 af
Outflow = 0.15 cfs @ 12.11 hrs, Volume= 0.091 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP-10: DP-10



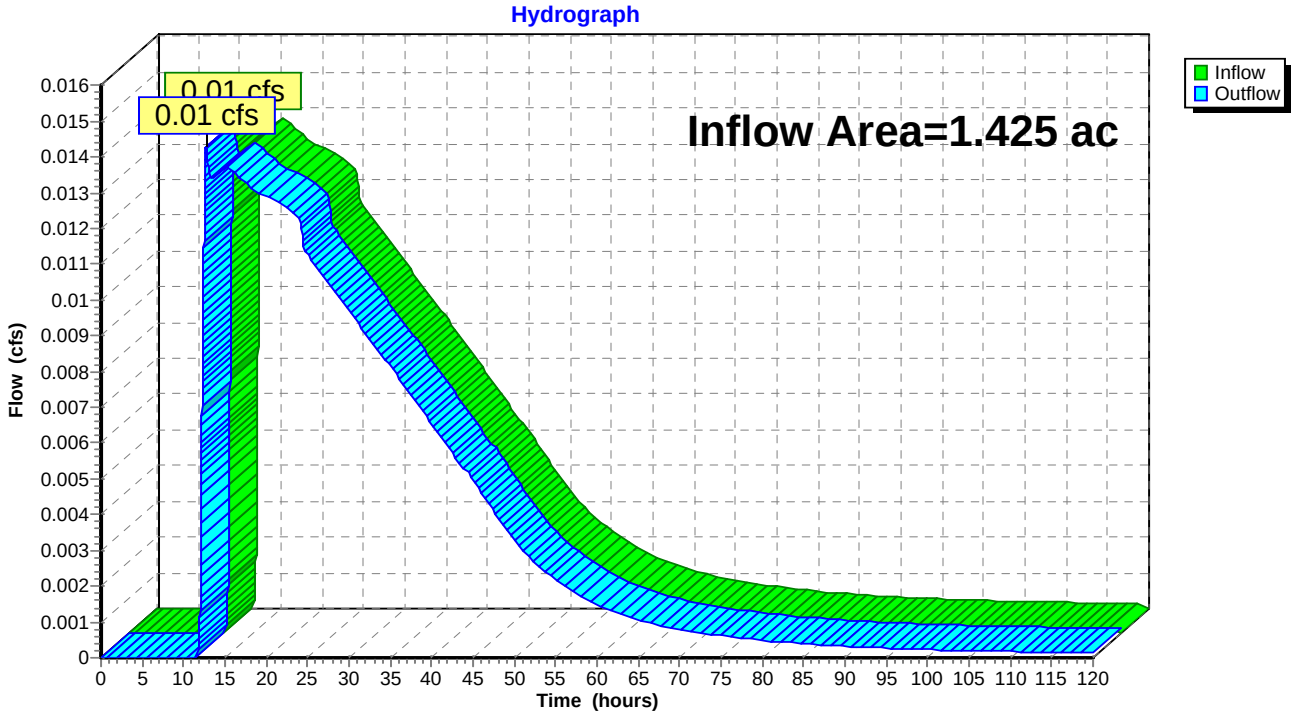
Summary for Reach DP-11: DP-11

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.425 ac, 41.68% Impervious, Inflow Depth > 0.28" for 90% Storm event
Inflow = 0.01 cfs @ 12.70 hrs, Volume= 0.033 af
Outflow = 0.01 cfs @ 12.71 hrs, Volume= 0.033 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP-11: DP-11



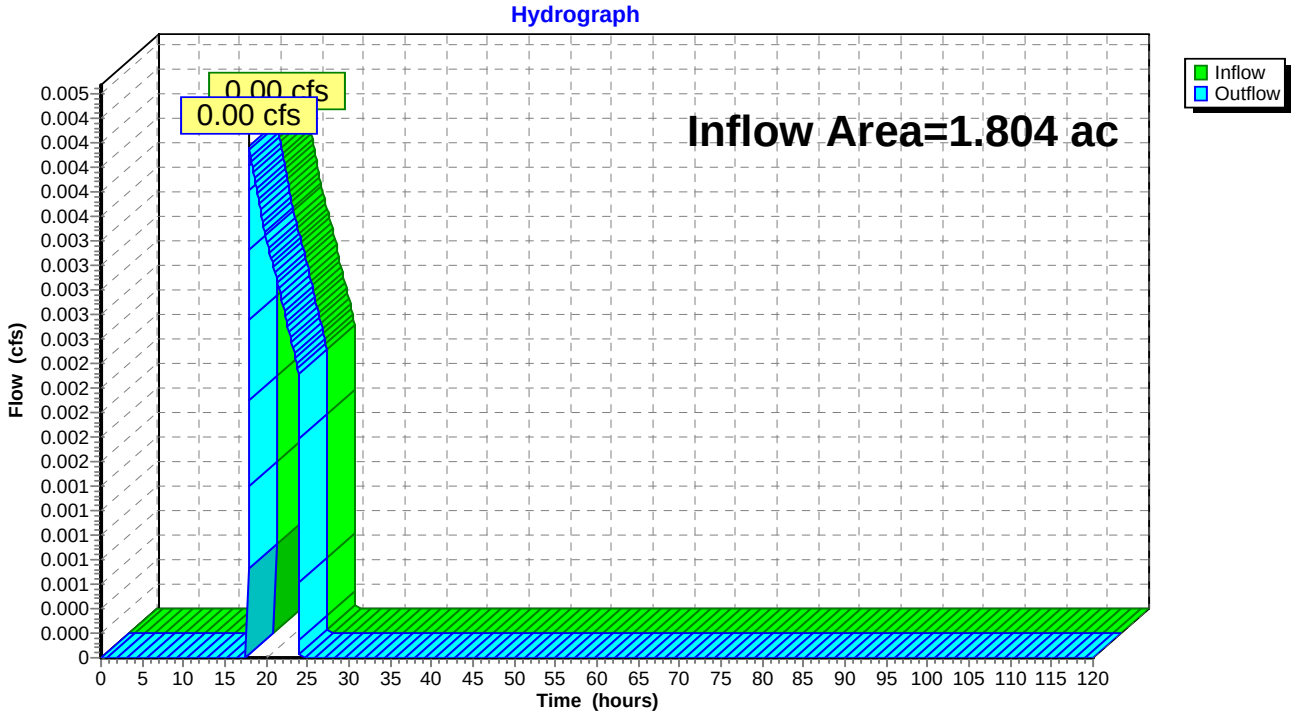
Summary for Reach DP3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.804 ac, 40.85% Impervious, Inflow Depth = 0.01" for 90% Storm event
Inflow = 0.00 cfs @ 17.95 hrs, Volume= 0.002 af
Outflow = 0.00 cfs @ 17.96 hrs, Volume= 0.002 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP3: DP-3



Summary for Pond 1P: Bioretention Area A

Inflow Area = 1.335 ac, 40.97% Impervious, Inflow Depth = 0.27" for 90% Storm event
Inflow = 0.41 cfs @ 12.05 hrs, Volume= 0.030 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,363.01' @ 24.12 hrs Surf.Area= 2,077 sf Storage= 1,305 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

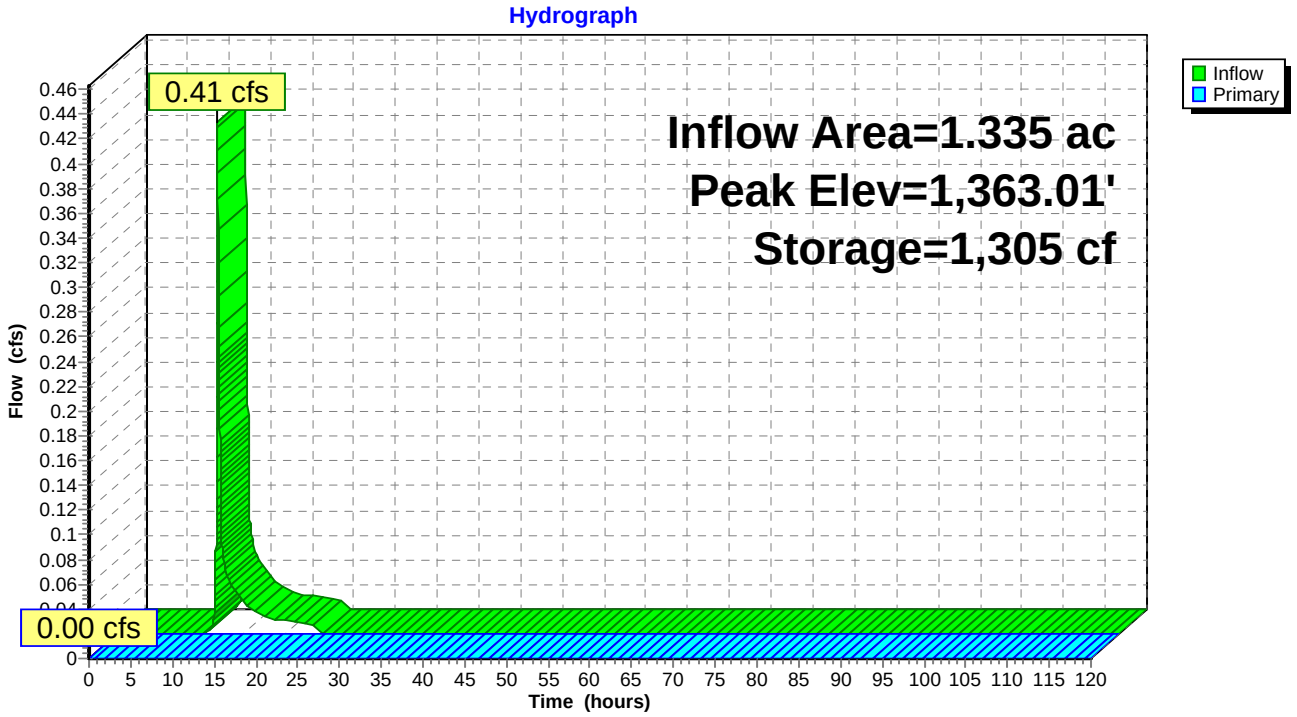
Volume	Invert	Avail.Storage	Storage Description
#1	1,360.50'	4,917 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,360.50	2,077	185.3	0.0	0	0	2,077
1,361.50	2,077	185.3	25.0	519	519	2,262
1,362.50	2,077	185.3	25.0	519	1,039	2,448
1,363.50	2,077	185.3	25.0	519	1,558	2,633
1,364.50	2,077	185.3	25.0	519	2,077	2,818
1,365.50	2,077	185.3	25.0	519	2,596	3,004
1,366.00	2,271	192.5	100.0	1,087	3,683	3,240
1,366.50	2,669	204.6	100.0	1,234	4,917	3,635

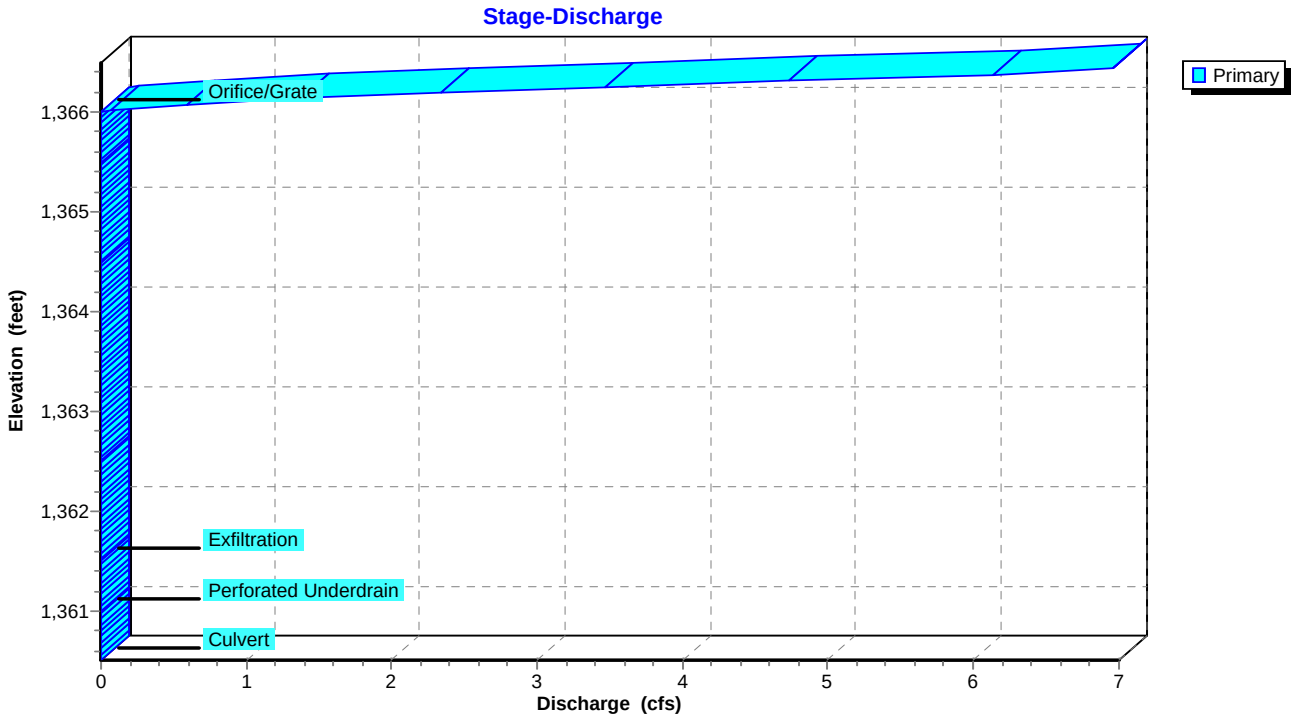
Device	Routing	Invert	Outlet Devices
#1	Primary	1,360.50'	**12.0" Round Culvert** L= 20.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,360.50' / 1,360.00' S= 0.0239 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,361.00'	**0.4" Horiz. Perforated Underdrain X 272.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,361.50'	**0.250 in/hr Exfiltration over Surface area above 1,361.50'** Conductivity to Groundwater Elevation = 1,360.00' Excluded Surface area = 2,077 sf
#4	Device 1	1,366.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,360.50' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Perforated Underdrain** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)

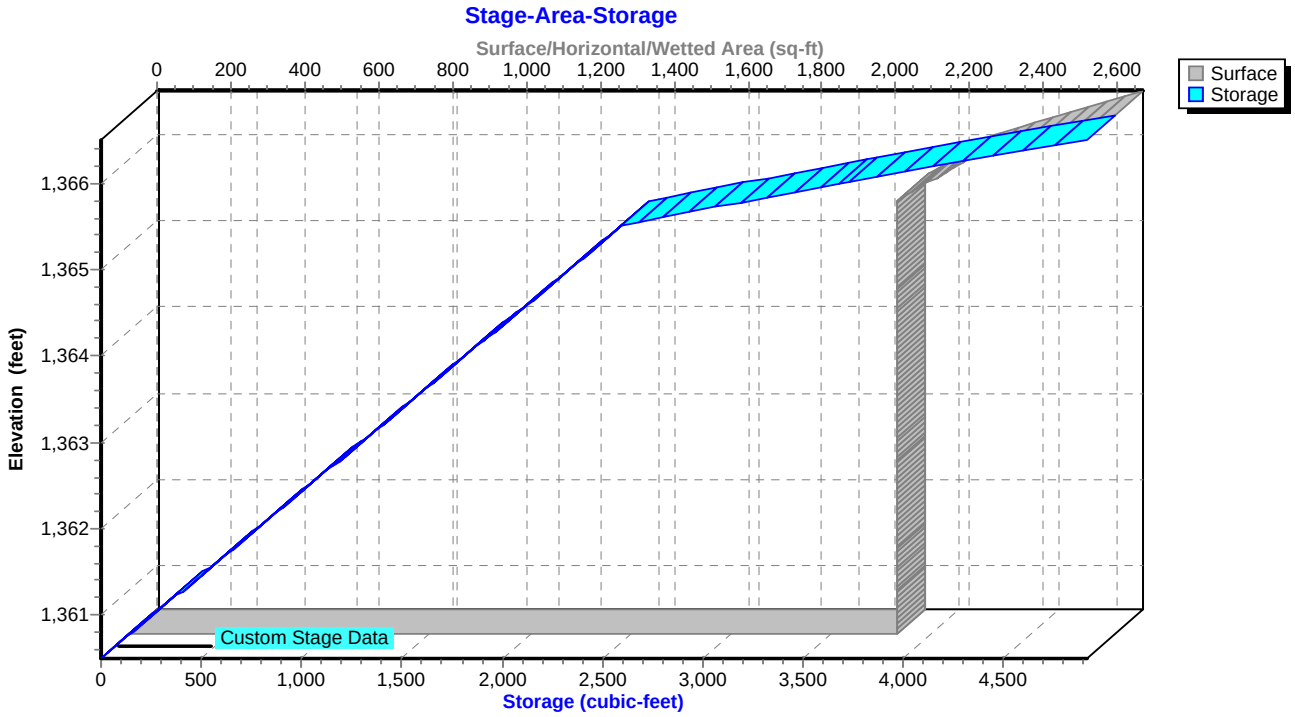
Pond 1P: Bioretention Area A



Pond 1P: Bioretention Area A



Pond 1P: Bioretention Area A



Summary for Pond 3P: Flow Splitter to BMP

Inflow Area = 0.407 ac, 46.68% Impervious, Inflow Depth = 0.28" for 90% Storm event
Inflow = 0.14 cfs @ 12.02 hrs, Volume= 0.010 af
Outflow = 0.14 cfs @ 12.03 hrs, Volume= 0.010 af, Atten= 0%, Lag= 0.6 min
Primary = 0.14 cfs @ 12.03 hrs, Volume= 0.008 af
Secondary = 0.00 cfs @ 17.95 hrs, Volume= 0.002 af

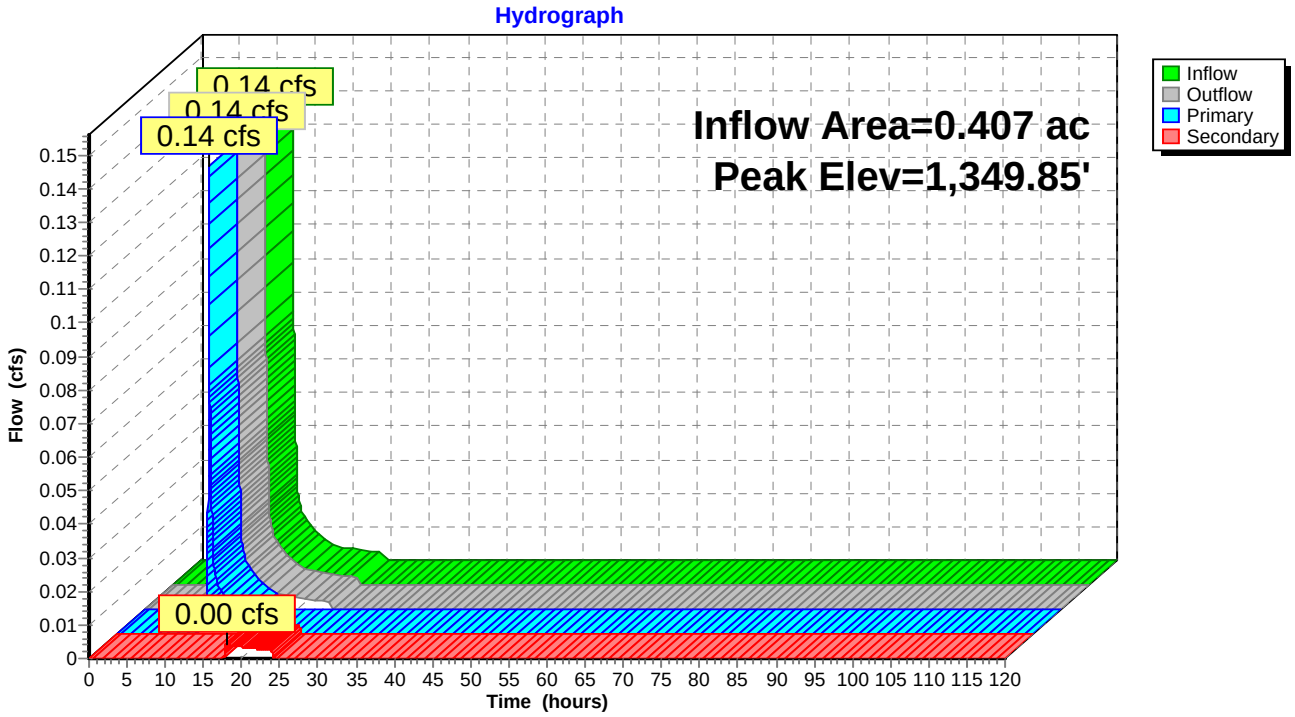
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,349.85' @ 17.95 hrs
Flood Elev= 1,350.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,349.49'	**12.0" Round Culvert** L= 18.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,349.49' / 1,348.85' S= 0.0339 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	1,349.49'	**15.0" Round Bypass Culvert** L= 119.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,349.49' / 1,348.00' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,349.85'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

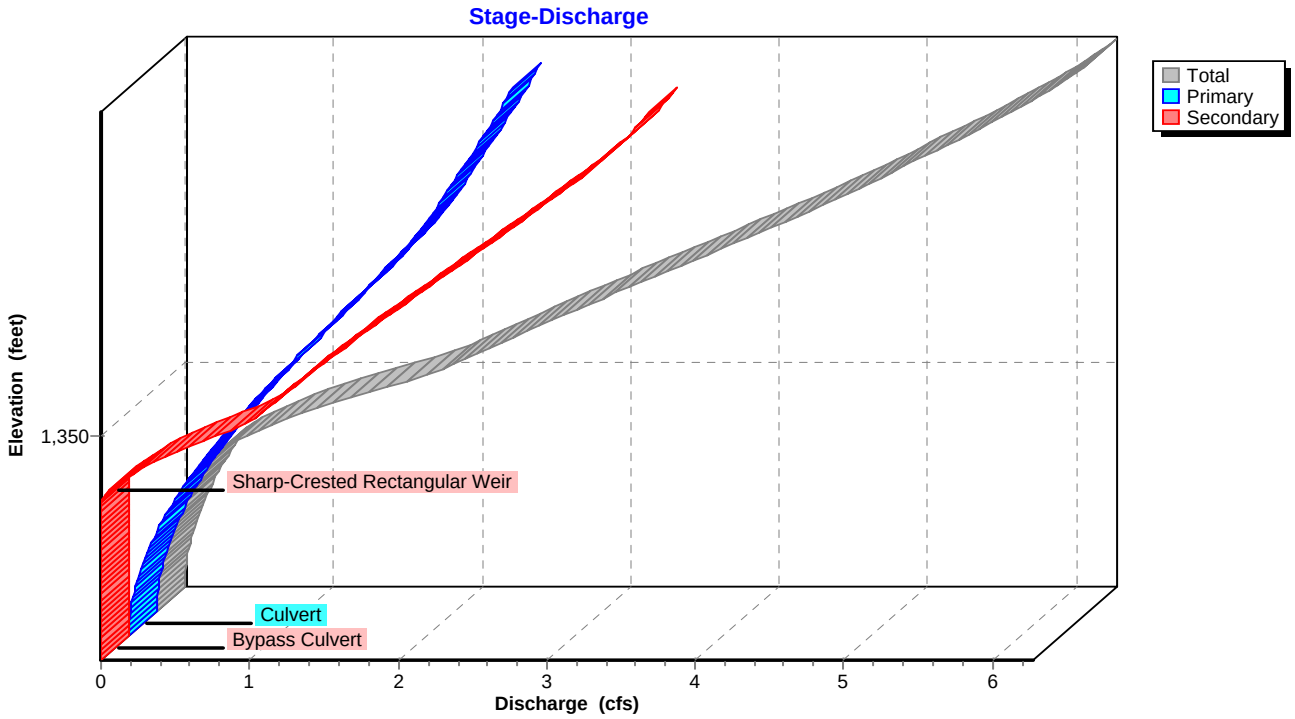
Primary OutFlow Max=0.14 cfs @ 12.03 hrs HW=1,349.69' TW=1,348.28' (Dynamic Tailwater)
└─**1=Culvert** (Inlet Controls 0.14 cfs @ 1.21 fps)

Secondary OutFlow Max=0.00 cfs @ 17.95 hrs HW=1,349.85' TW=0.00' (Dynamic Tailwater)
└─**2=Bypass Culvert** (Passes 0.00 cfs of 0.48 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.00 cfs @ 0.22 fps)

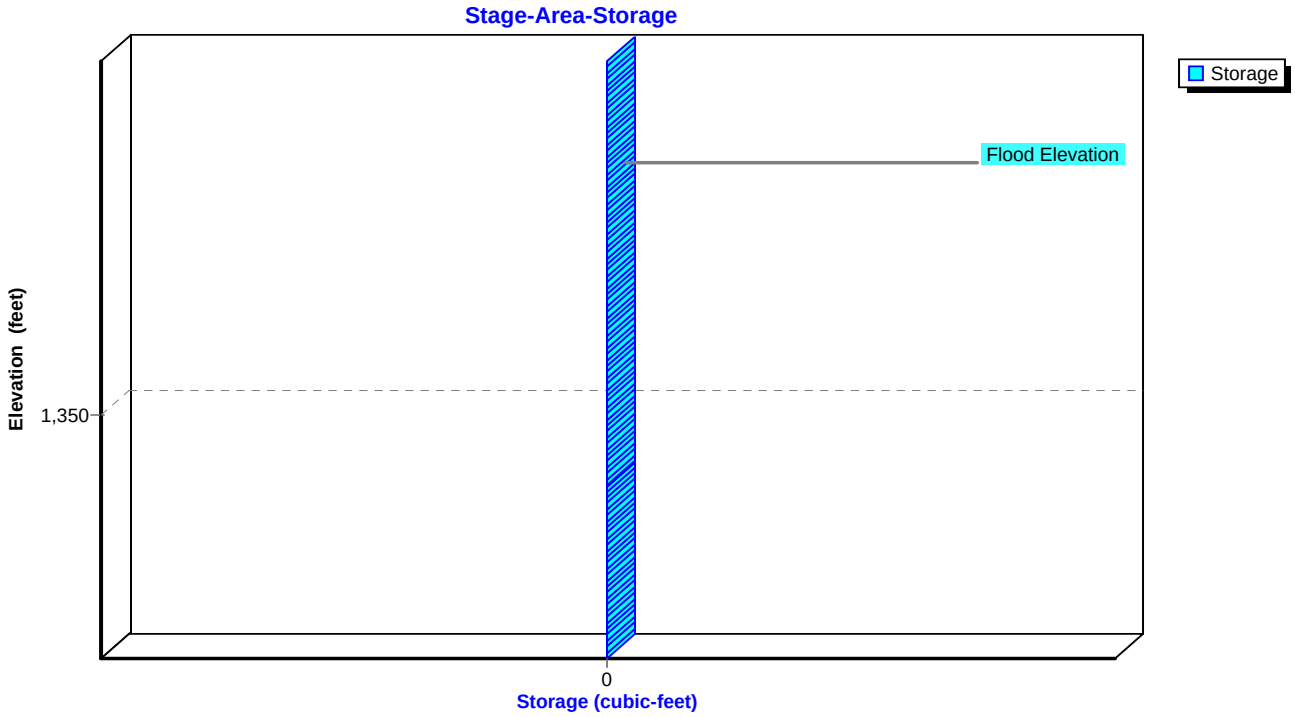
Pond 3P: Flow Splitter to BMP



Pond 3P: Flow Splitter to BMP



Pond 3P: Flow Splitter to BMP



Summary for Pond 4P: Pocket Wetland 30

Inflow Area = 1.148 ac, 48.61% Impervious, Inflow Depth = 0.34" for 90% Storm event
Inflow = 0.47 cfs @ 12.04 hrs, Volume= 0.032 af
Outflow = 0.01 cfs @ 18.88 hrs, Volume= 0.031 af, Atten= 97%, Lag= 410.5 min
Primary = 0.01 cfs @ 18.88 hrs, Volume= 0.031 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,437.00' Surf.Area= 3,744 sf Storage= 5,097 cf
Peak Elev= 1,437.25' @ 18.88 hrs Surf.Area= 4,080 sf Storage= 6,057 cf (960 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 1,121.7 min (1,987.3 - 865.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,434.00'	22,580 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

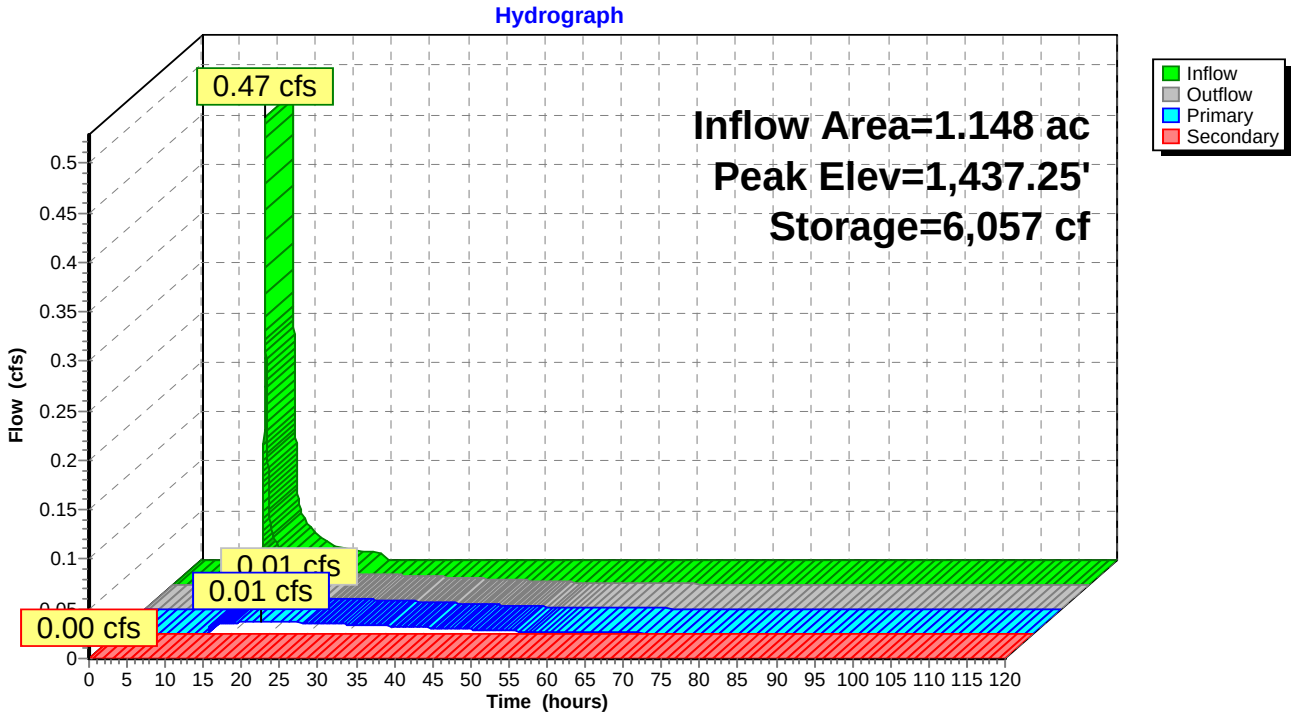
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,434.00	524	152.8	0	0	524
1,435.00	1,039	190.5	767	767	1,568
1,436.00	2,010	281.1	1,498	2,265	4,976
1,437.00	3,744	344.1	2,832	5,097	8,126
1,438.00	5,203	334.4	4,454	9,551	8,750
1,439.00	6,601	346.2	5,888	15,439	9,474
1,440.00	7,695	367.2	7,141	22,580	10,719

Device	Routing	Invert	Outlet Devices
#1	Primary	1,434.00'	**15.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,434.00' / 1,432.00' S= 0.1000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,437.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,437.80'	**6.0" Vert. Orifice/Grate X 3.00** C= 0.600
#4	Secondary	1,439.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

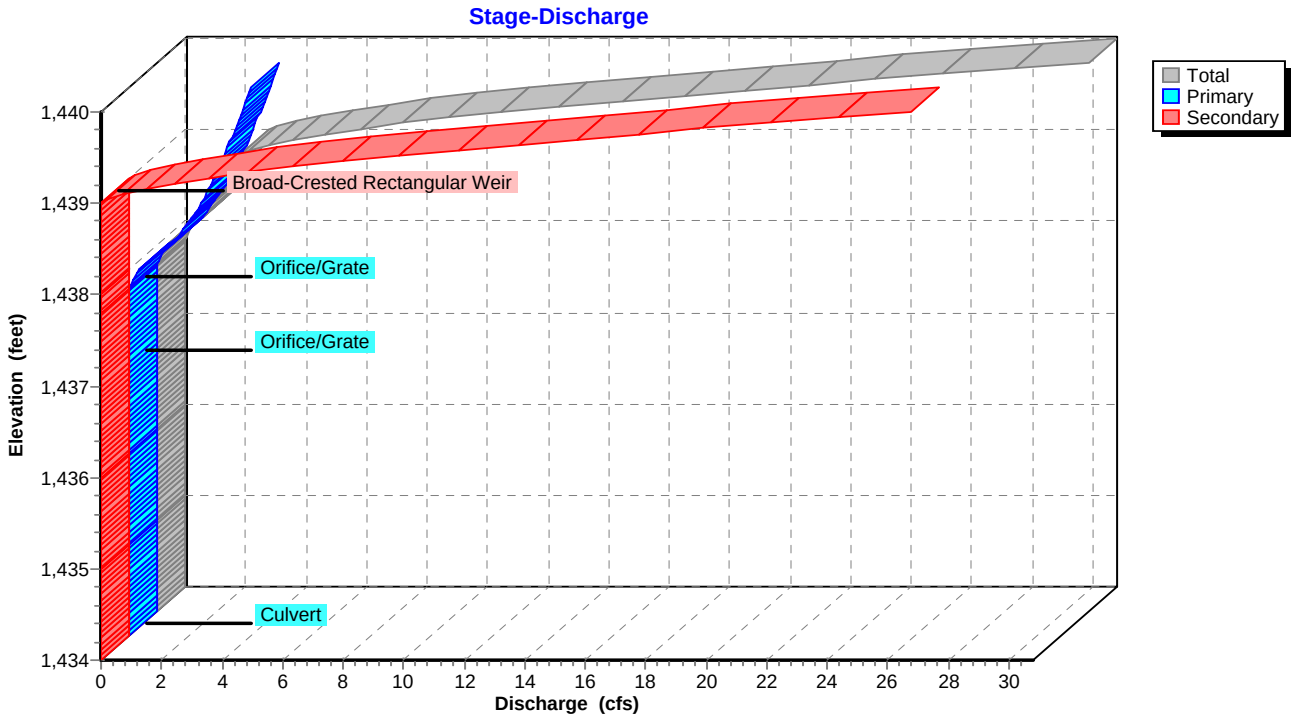
Primary OutFlow Max=0.01 cfs @ 18.88 hrs HW=1,437.25' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 0.01 cfs of 7.55 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.01 cfs @ 2.17 fps)
  └**3=Orifice/Grate** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,437.00' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

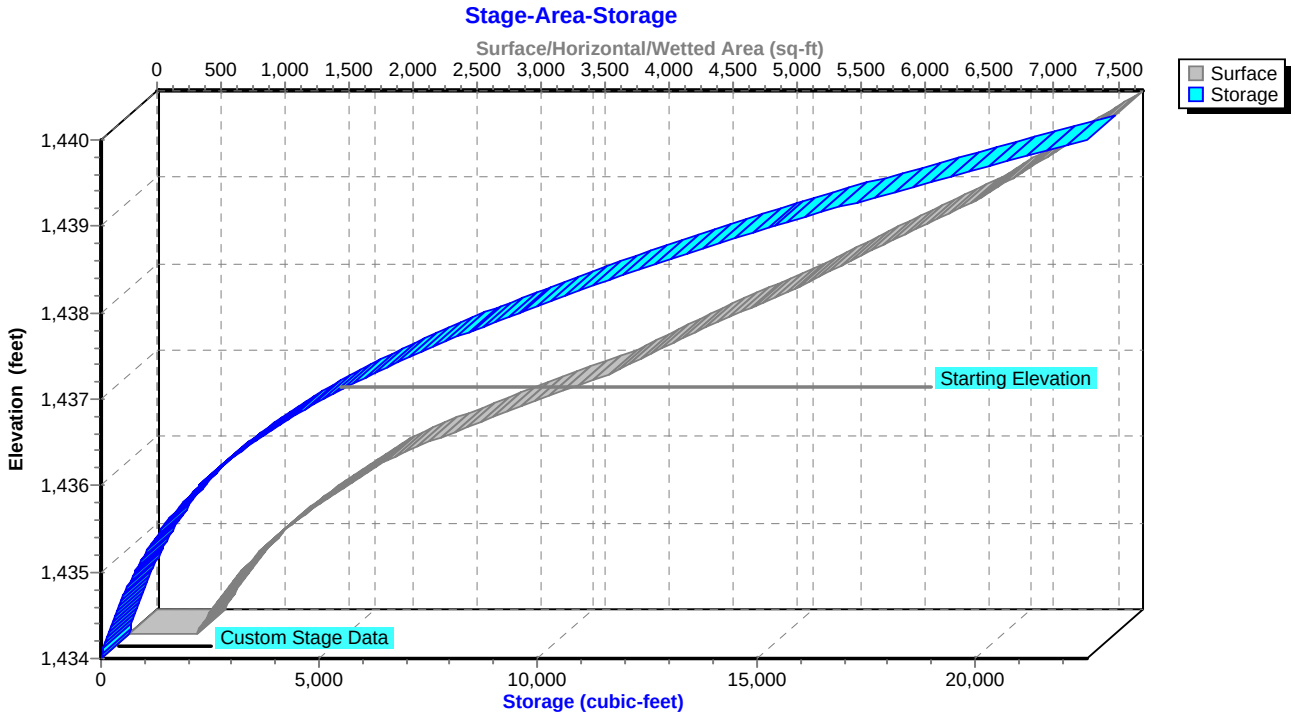
Pond 4P: Pocket Wetland 30



Pond 4P: Pocket Wetland 30



Pond 4P: Pocket Wetland 30



Summary for Pond 5P: Bioretention Area B

[80] Warning: Exceeded Pond 3P by 0.03' @ 24.09 hrs (0.16 cfs 1.323 af)

Inflow Area = 0.469 ac, 40.51% Impervious, Inflow Depth = 0.22" for 90% Storm event
Inflow = 0.14 cfs @ 12.03 hrs, Volume= 0.008 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,349.88' @ 24.01 hrs Surf.Area= 786 sf Storage= 370 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

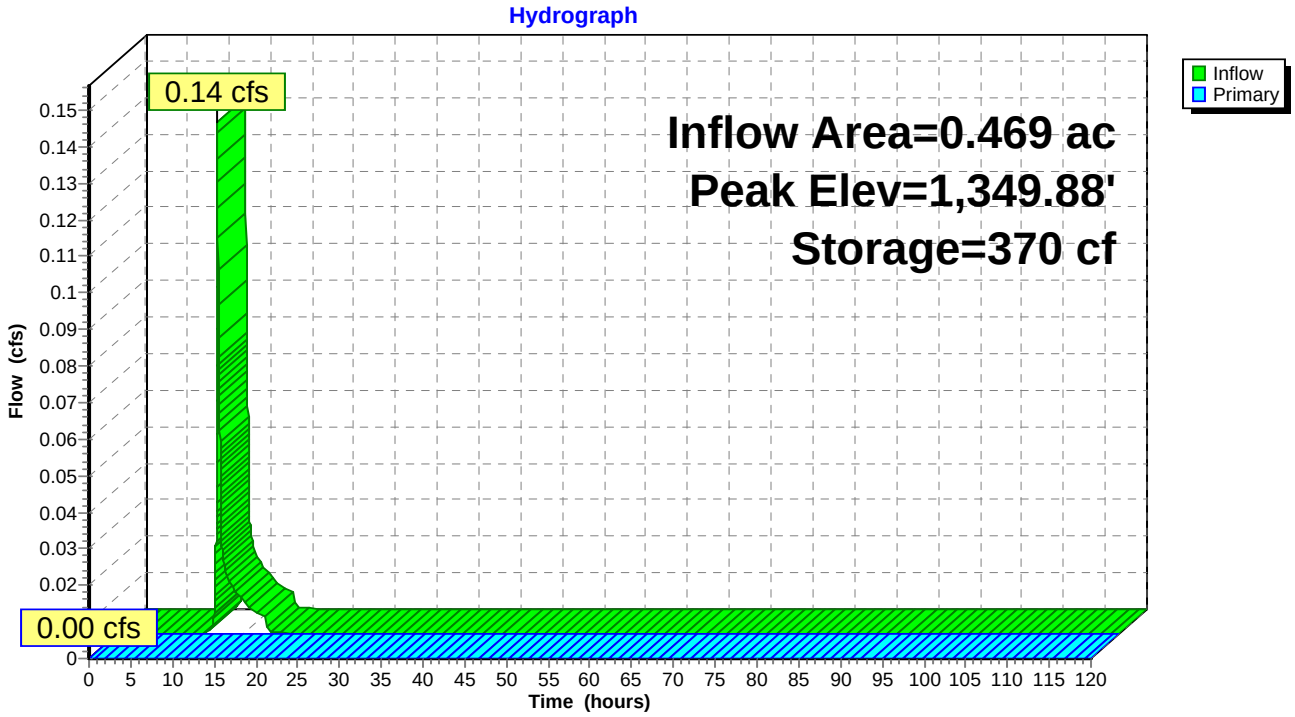
Volume	Invert	Avail.Storage	Storage Description
#1	1,348.00'	2,214 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,348.00	786	136.5	0.0	0	0	786
1,349.00	786	136.5	25.0	197	197	923
1,349.50	786	136.5	25.0	98	295	991
1,350.00	786	136.5	25.0	98	393	1,059
1,350.50	786	136.5	25.0	98	491	1,127
1,351.00	1,026	151.0	100.0	452	943	1,467
1,352.00	1,534	174.5	100.0	1,272	2,214	2,097

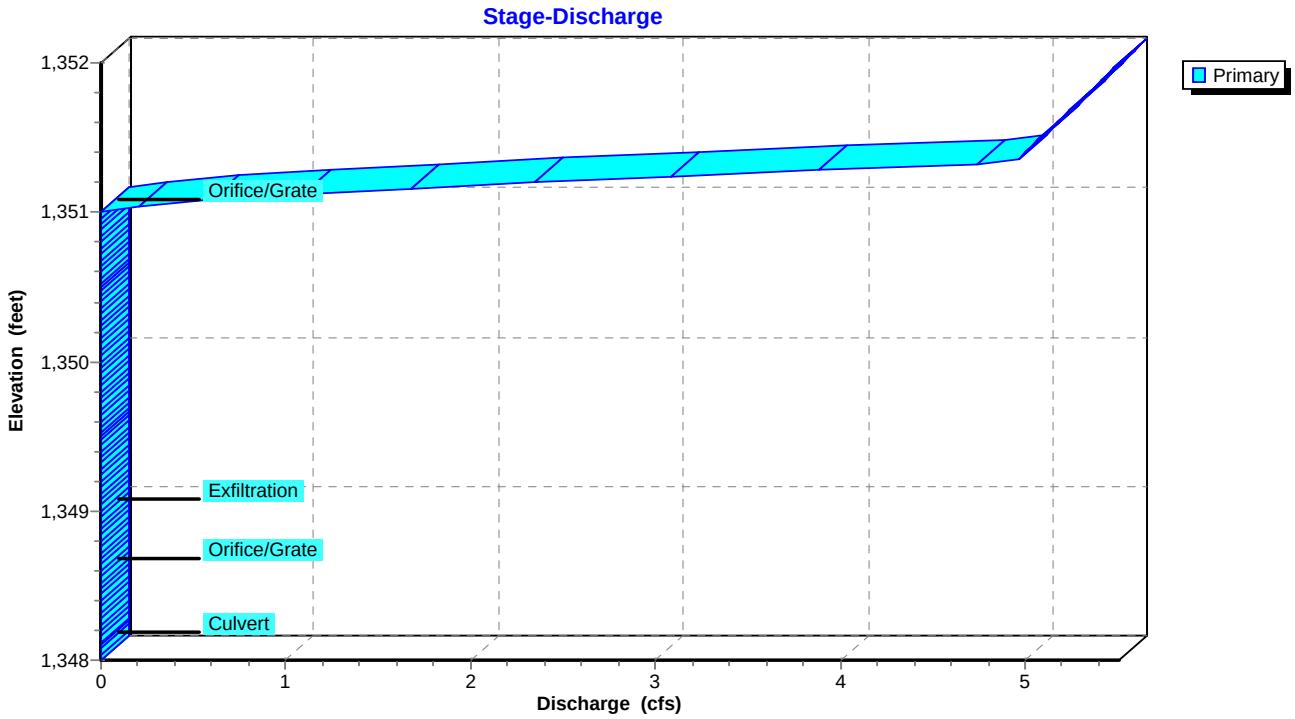
Device	Routing	Invert	Outlet Devices
#1	Primary	1,348.10'	**12.0" Round Culvert** L= 19.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,348.10' / 1,348.00' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,348.60'	**0.4" Horiz. Orifice/Grate X 960.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,349.00'	**0.250 in/hr Exfiltration over Surface area above 1,349.00'** Conductivity to Groundwater Elevation = 1,347.50' Excluded Surface area = 786 sf
#4	Device 1	1,351.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,348.00' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)

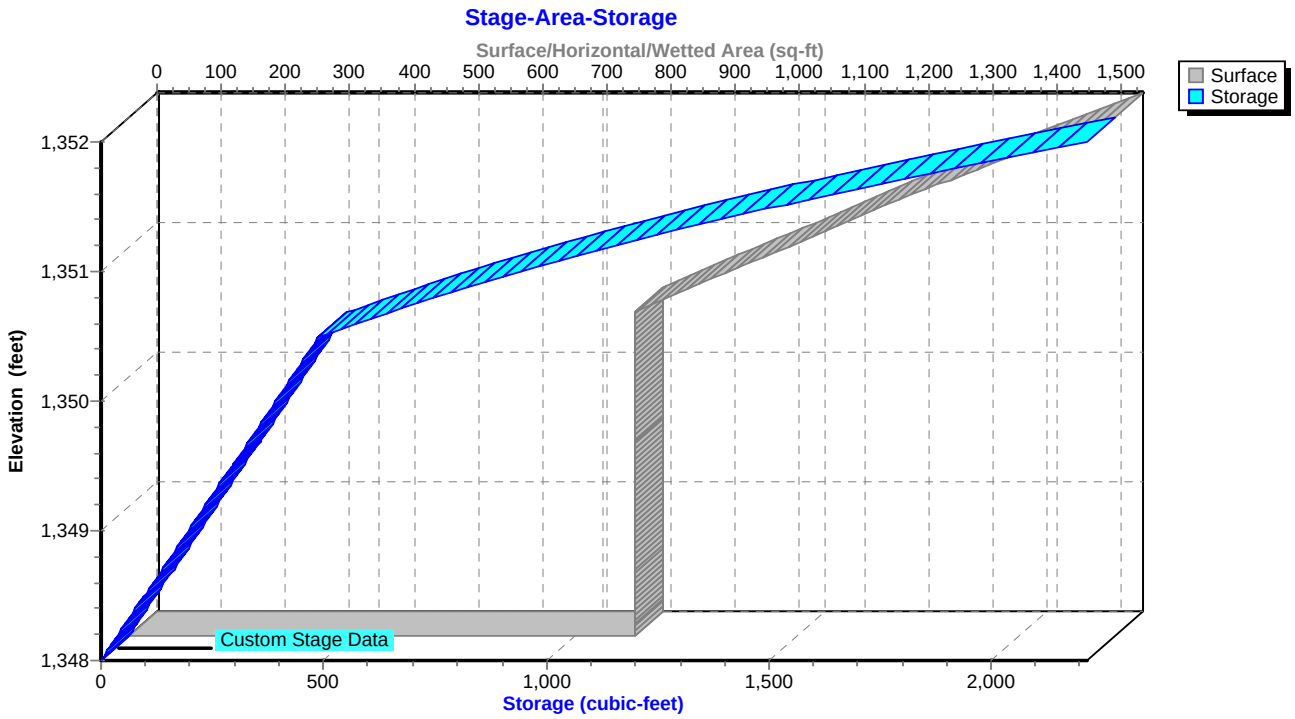
Pond 5P: Bioretention Area B



Pond 5P: Bioretention Area B



Pond 5P: Bioretention Area B



Summary for Pond 11P: Pocket Wetland 29B

Inflow Area = 1.788 ac, 51.12% Impervious, Inflow Depth = 0.36" for 90% Storm event
Inflow = 0.79 cfs @ 12.04 hrs, Volume= 0.053 af
Outflow = 0.05 cfs @ 14.70 hrs, Volume= 0.050 af, Atten= 94%, Lag= 159.8 min
Primary = 0.05 cfs @ 14.70 hrs, Volume= 0.050 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,442.00' Surf.Area= 3,817 sf Storage= 5,150 cf
Peak Elev= 1,442.29' @ 14.70 hrs Surf.Area= 4,305 sf Storage= 6,344 cf (1,193 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 633.2 min (1,496.5 - 863.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,438.00'	20,412 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

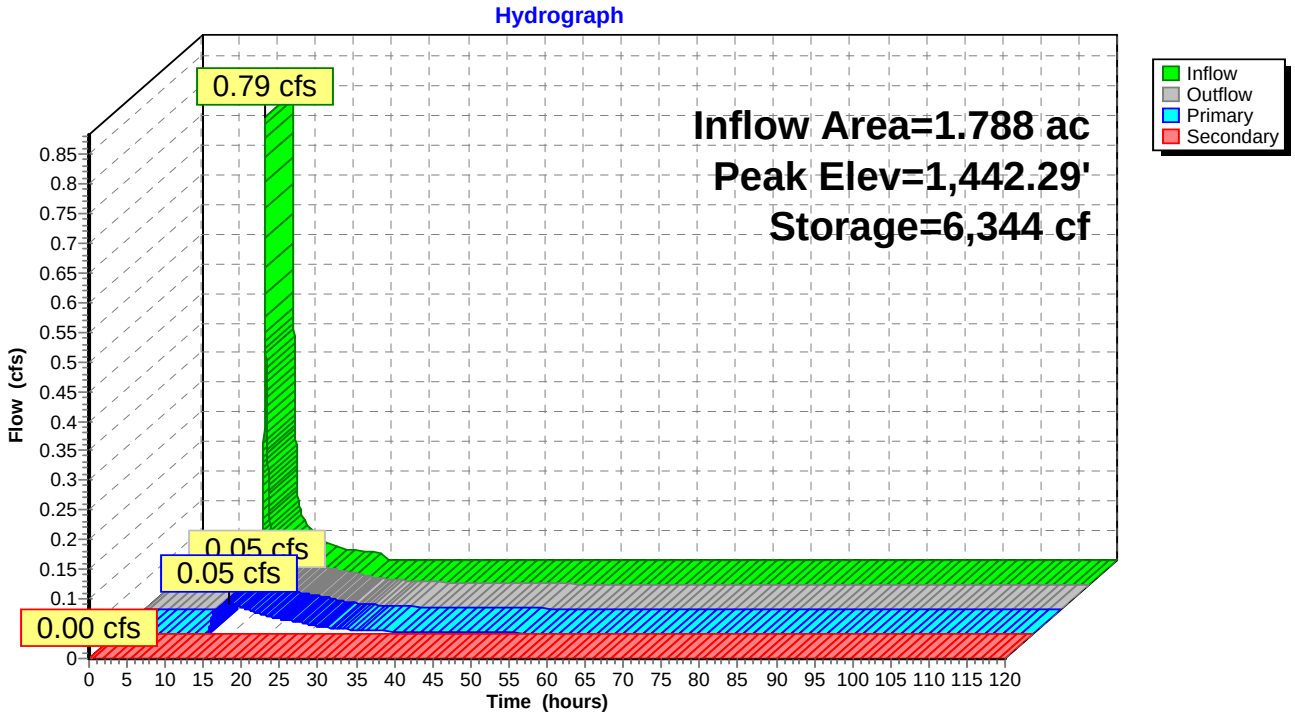
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,438.00	74	30.7	0	0	74
1,439.00	207	53.8	135	135	235
1,440.00	720	190.6	438	573	2,898
1,441.00	2,419	328.2	1,486	2,059	8,585
1,442.00	3,817	444.2	3,092	5,150	15,726
1,443.00	5,595	534.5	4,678	9,828	22,775
1,444.00	7,680	353.3	6,610	16,438	35,585
1,444.50	8,217	362.0	3,973	20,412	36,111

Device	Routing	Invert	Outlet Devices
#1	Primary	1,442.00'	**45.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)
#2	Secondary	1,443.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

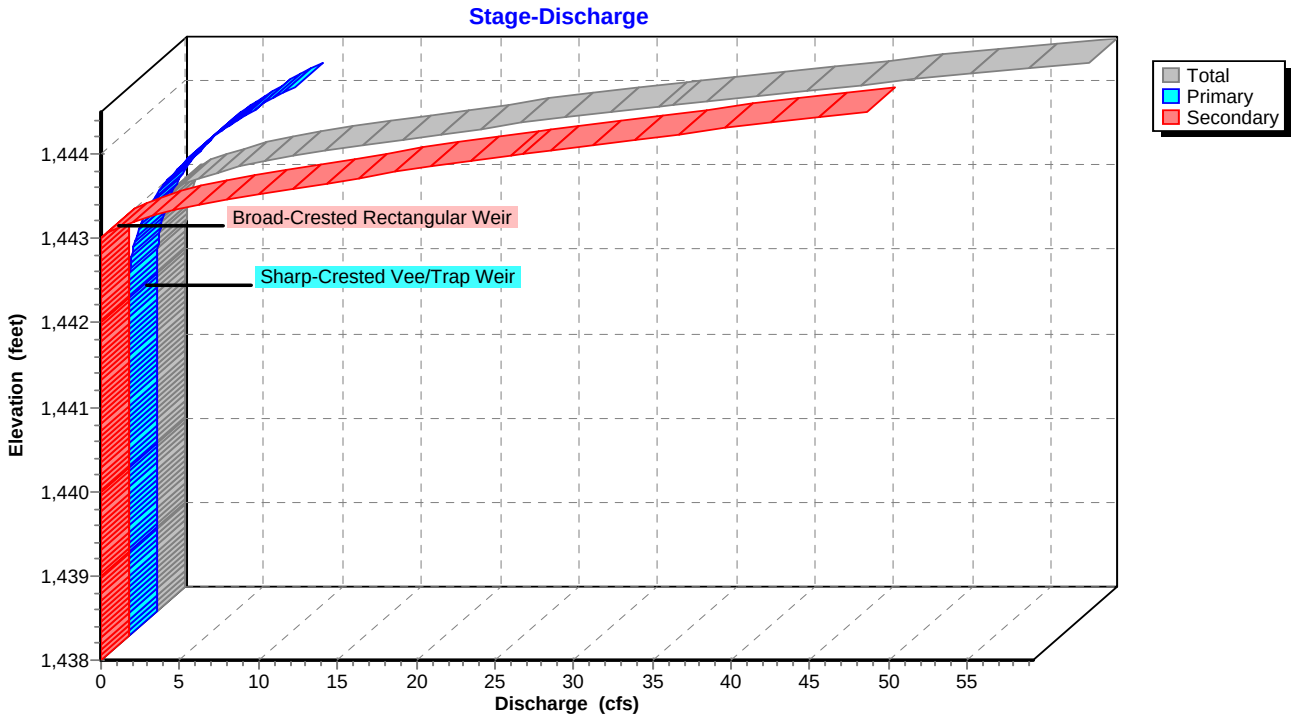
Primary OutFlow Max=0.05 cfs @ 14.70 hrs HW=1,442.29' TW=0.00' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 0.05 cfs @ 1.39 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,442.00' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

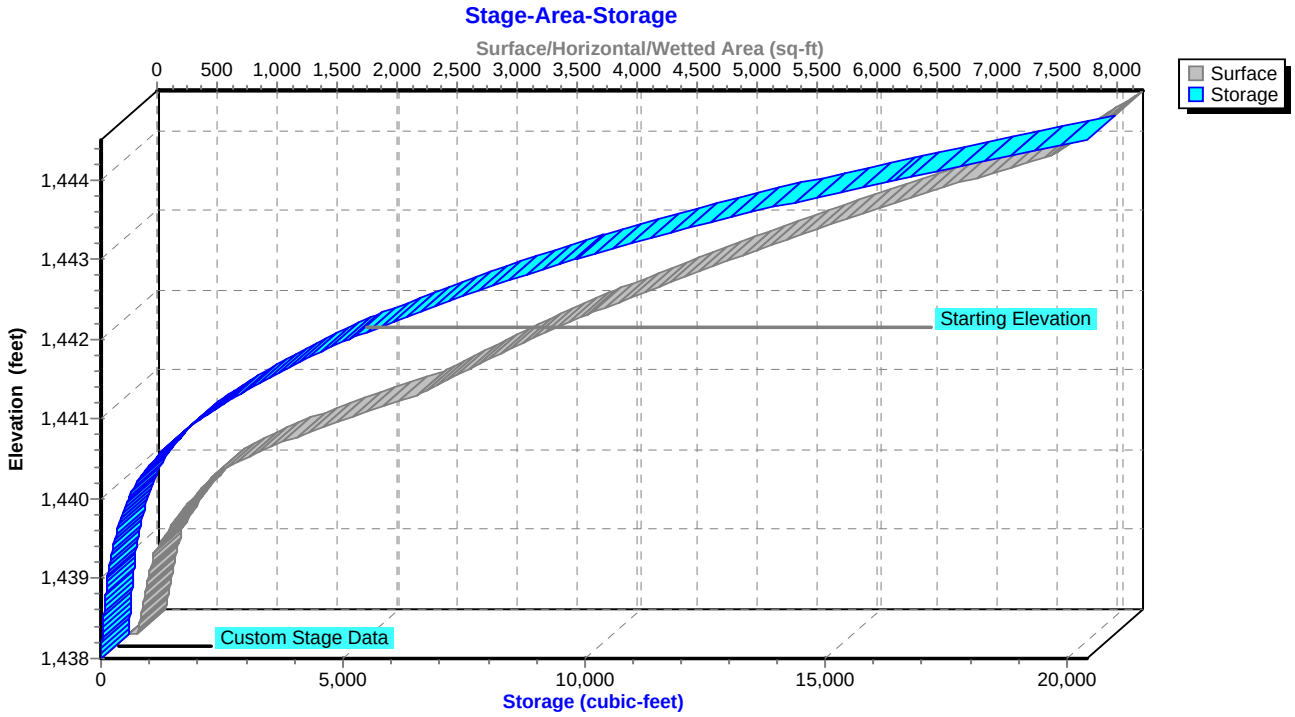
Pond 11P: Pocket Wetland 29B



Pond 11P: Pocket Wetland 29B



Pond 11P: Pocket Wetland 29B



Summary for Pond 12P: Pocket Wetland 29A

Inflow Area = 0.448 ac, 43.53% Impervious, Inflow Depth = 0.32" for 90% Storm event
Inflow = 0.18 cfs @ 12.04 hrs, Volume= 0.012 af
Outflow = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af, Atten= 19%, Lag= 3.2 min
Primary = 0.14 cfs @ 12.10 hrs, Volume= 0.012 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,443.50' Surf.Area= 1,339 sf Storage= 1,565 cf
Peak Elev= 1,443.53' @ 12.10 hrs Surf.Area= 1,356 sf Storage= 1,610 cf (45 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 10.7 min (876.2 - 865.5)

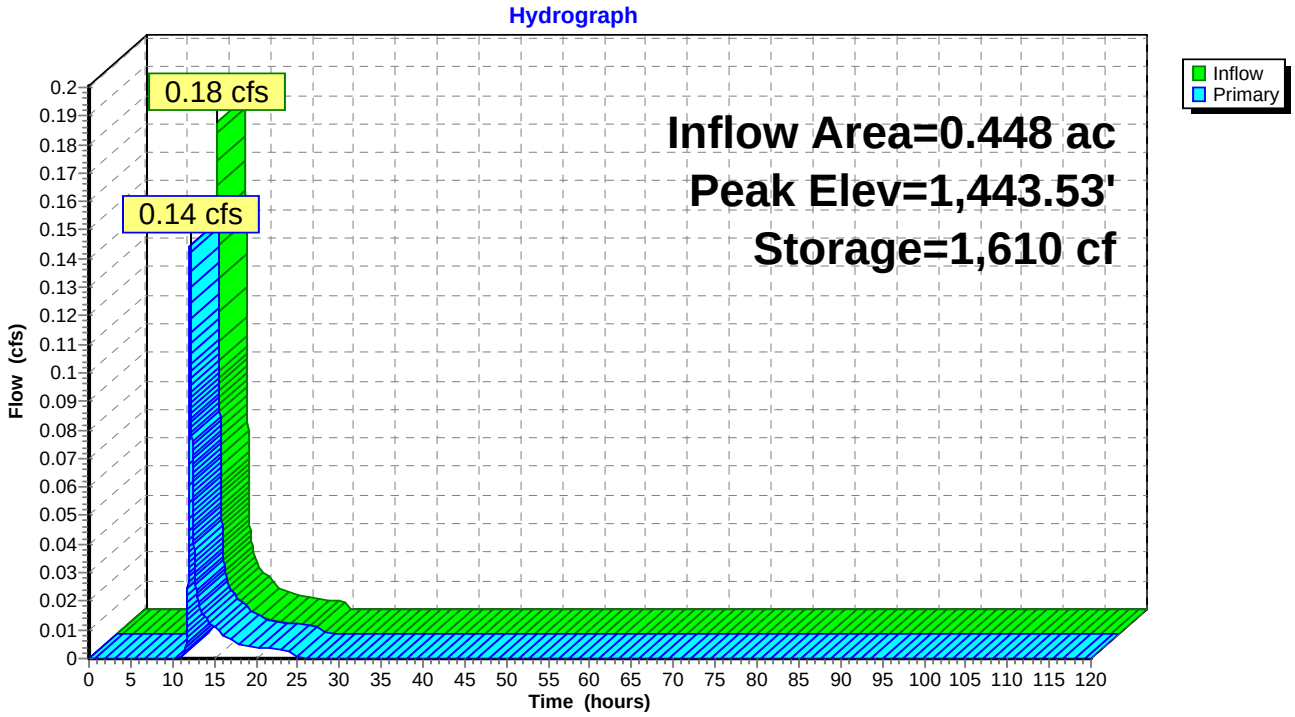
Volume	Invert	Avail.Storage	Storage Description
#1	1,441.00'	4,185 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,441.00	166	50.3	0	0	166
1,442.00	367	74.7	260	260	417
1,443.00	1,094	161.8	698	958	2,060
1,444.00	1,608	180.7	1,343	2,301	2,603
1,445.00	2,175	199.2	1,884	4,185	3,194

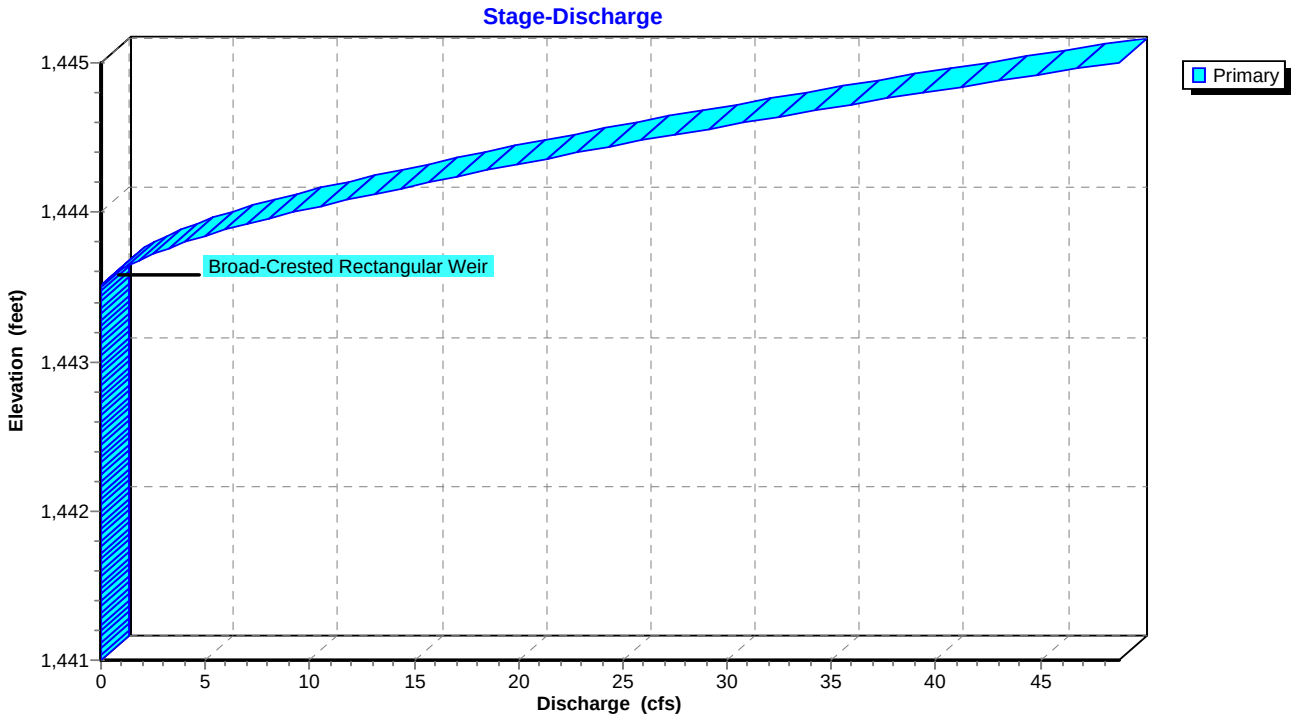
Device	Routing	Invert	Outlet Devices
#1	Primary	1,443.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=0.14 cfs @ 12.10 hrs HW=1,443.53' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 0.14 cfs @ 0.43 fps)

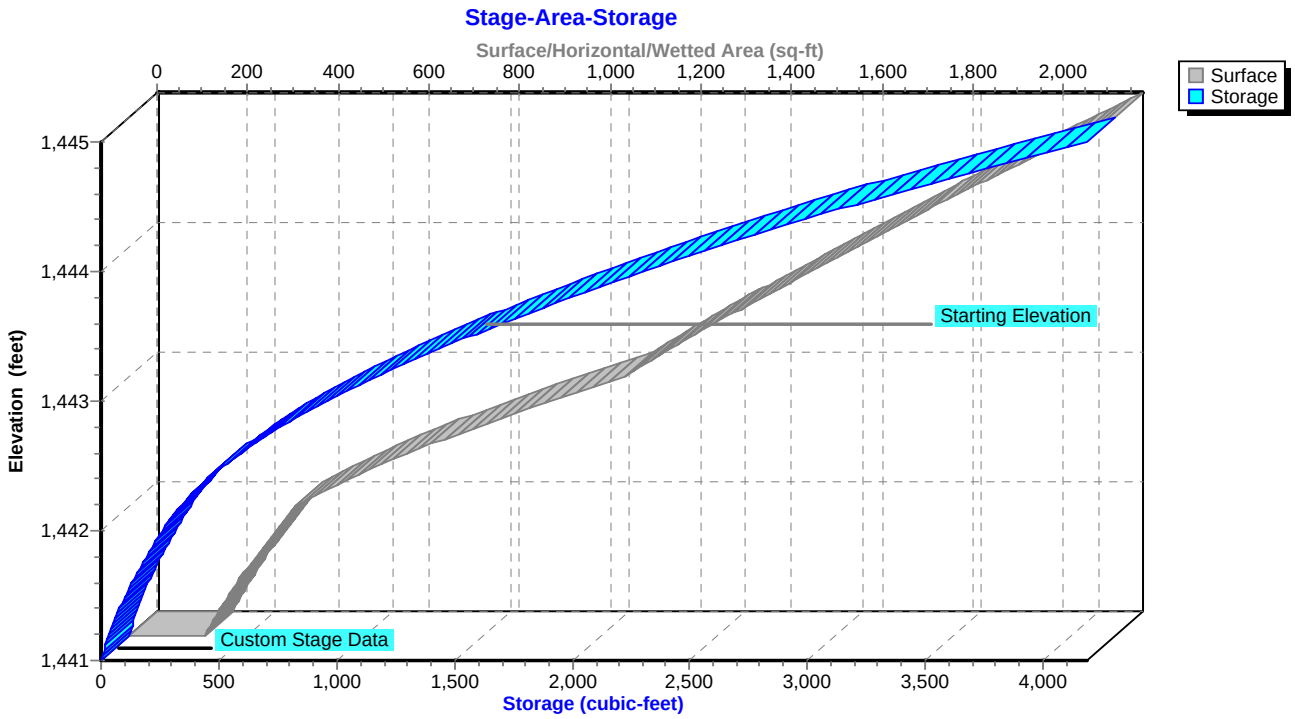
Pond 12P: Pocket Wetland 29A



Pond 12P: Pocket Wetland 29A



Pond 12P: Pocket Wetland 29A



Summary for Pond 13P: Flow Splitter to SW 29A

[57] Hint: Peaked at 1,443.61' (Flood elevation advised)

Inflow Area = 0.369 ac, 50.68% Impervious, Inflow Depth = 0.38" for 90% Storm event
Inflow = 0.18 cfs @ 12.03 hrs, Volume= 0.012 af
Outflow = 0.18 cfs @ 12.04 hrs, Volume= 0.012 af, Atten= 0%, Lag= 0.6 min
Primary = 0.18 cfs @ 12.04 hrs, Volume= 0.012 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

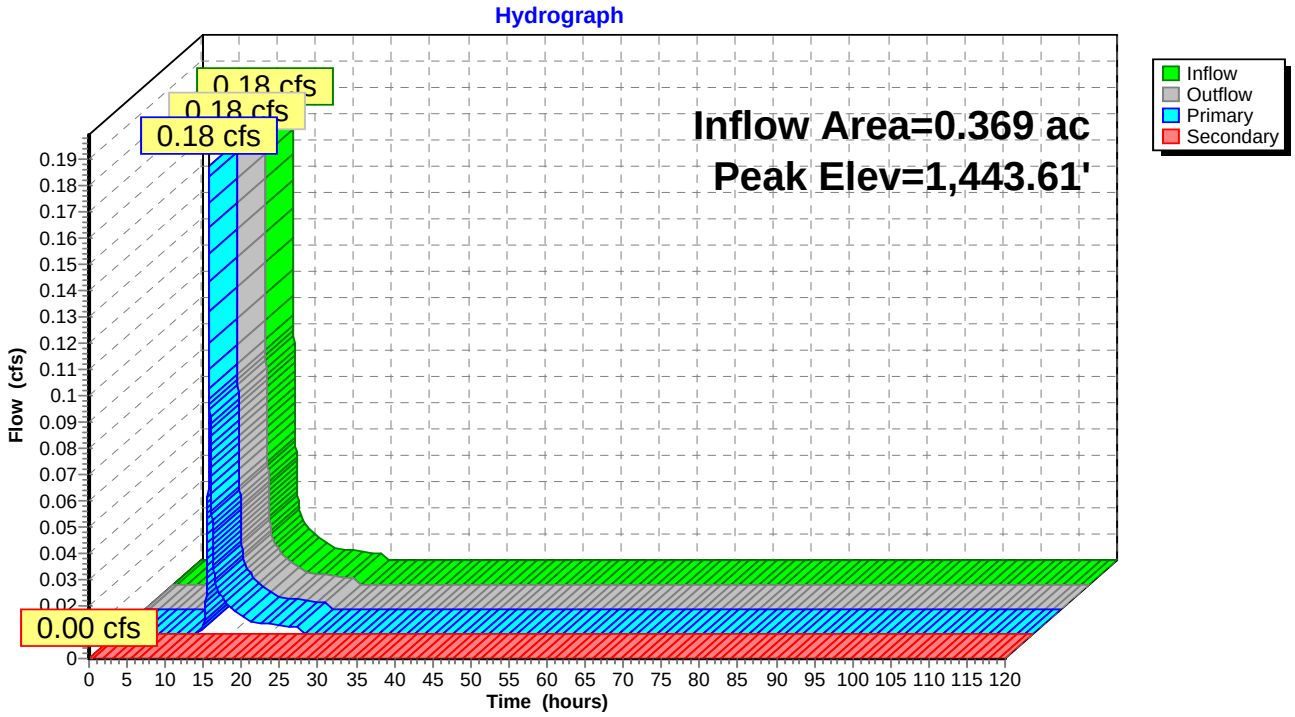
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,443.61' @ 12.05 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,443.30'	**15.0" Round CMP_Round 15"** L= 41.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,443.30' / 1,443.00' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,443.30'	**15.0" Round Bypass Culvert** L= 46.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,443.30' / 1,443.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,444.10'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

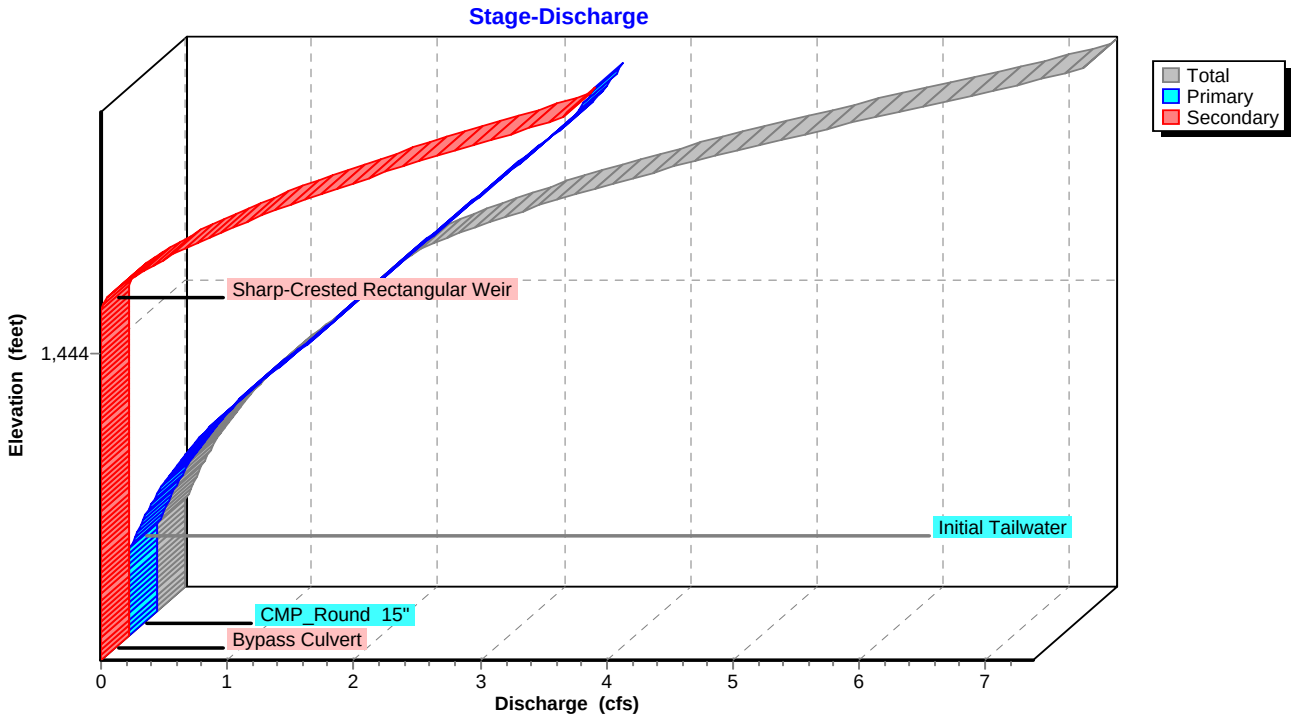
Primary OutFlow Max=0.18 cfs @ 12.04 hrs HW=1,443.61' TW=1,443.53' (Dynamic Tailwater)
↑—**1=CMP_Round 15"** (Outlet Controls 0.18 cfs @ 1.09 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,443.50' TW=0.00' (Dynamic Tailwater)
↑—**2=Bypass Culvert** (Passes 0.00 cfs of 0.15 cfs potential flow)
↑—**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

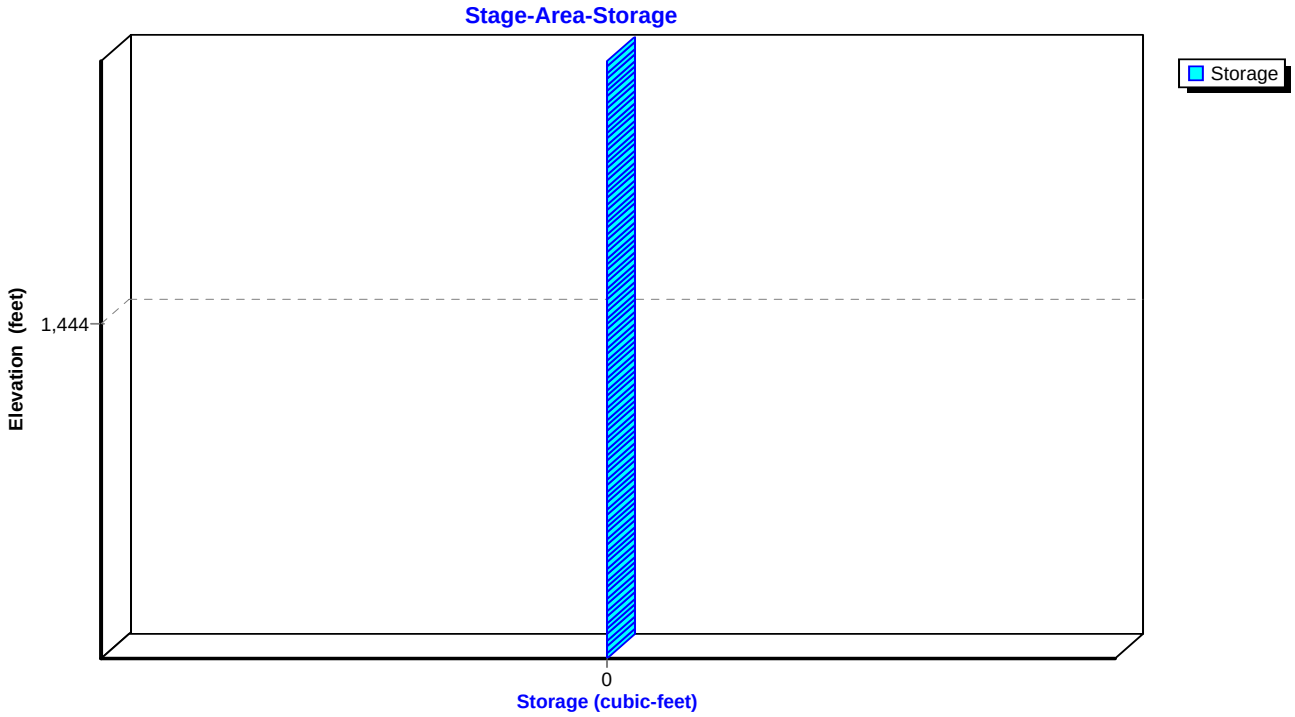
Pond 13P: Flow Splitter to SW 29A



Pond 13P: Flow Splitter to SW 29A



Pond 13P: Flow Splitter to SW 29A



Summary for Pond 93P: Flow Splitter to BMP

Inflow Area = 1.239 ac, 44.15% Impervious, Inflow Depth = 0.28" for 90% Storm event
Inflow = 0.41 cfs @ 12.04 hrs, Volume= 0.029 af
Outflow = 0.41 cfs @ 12.05 hrs, Volume= 0.029 af, Atten= 0%, Lag= 0.6 min
Primary = 0.41 cfs @ 12.05 hrs, Volume= 0.029 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

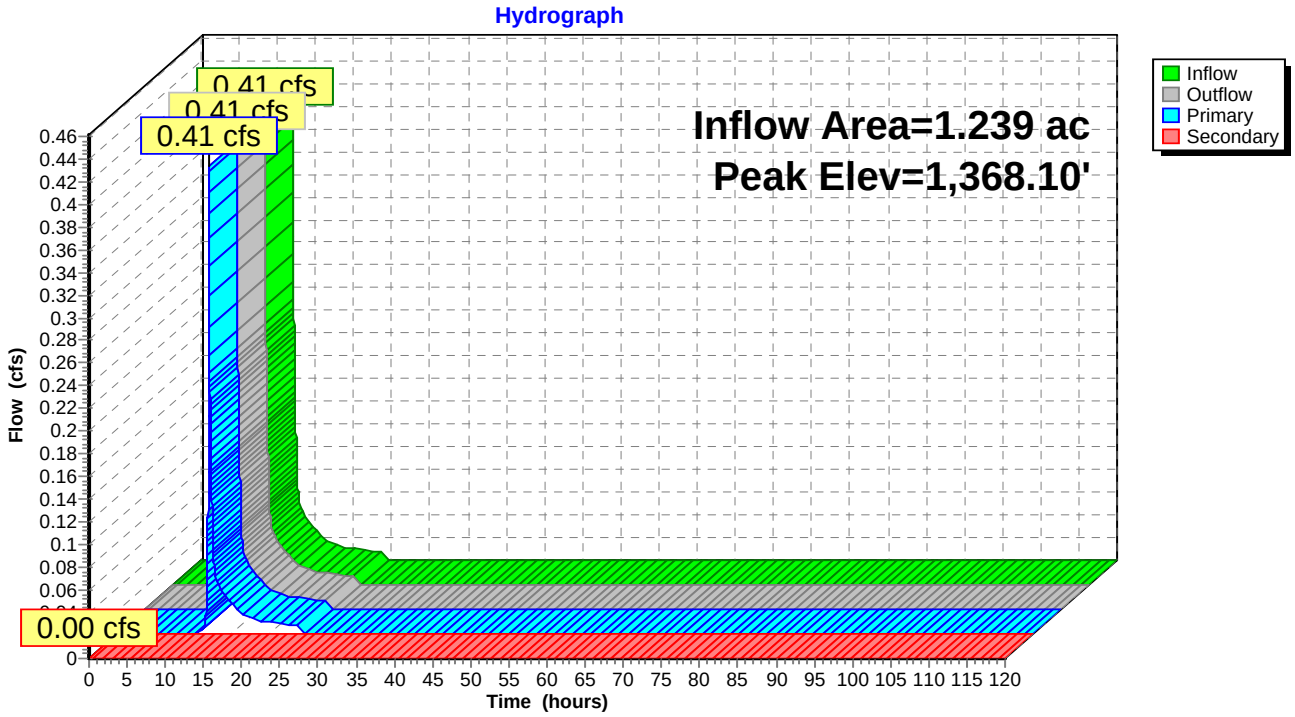
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,368.10' @ 12.05 hrs
Flood Elev= 1,369.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,367.76'	**15.0" Round Culvert** L= 21.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,367.76' / 1,366.50' S= 0.0578 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,367.76'	**15.0" Round Culvert** L= 93.7' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,367.76' / 1,363.37' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,368.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

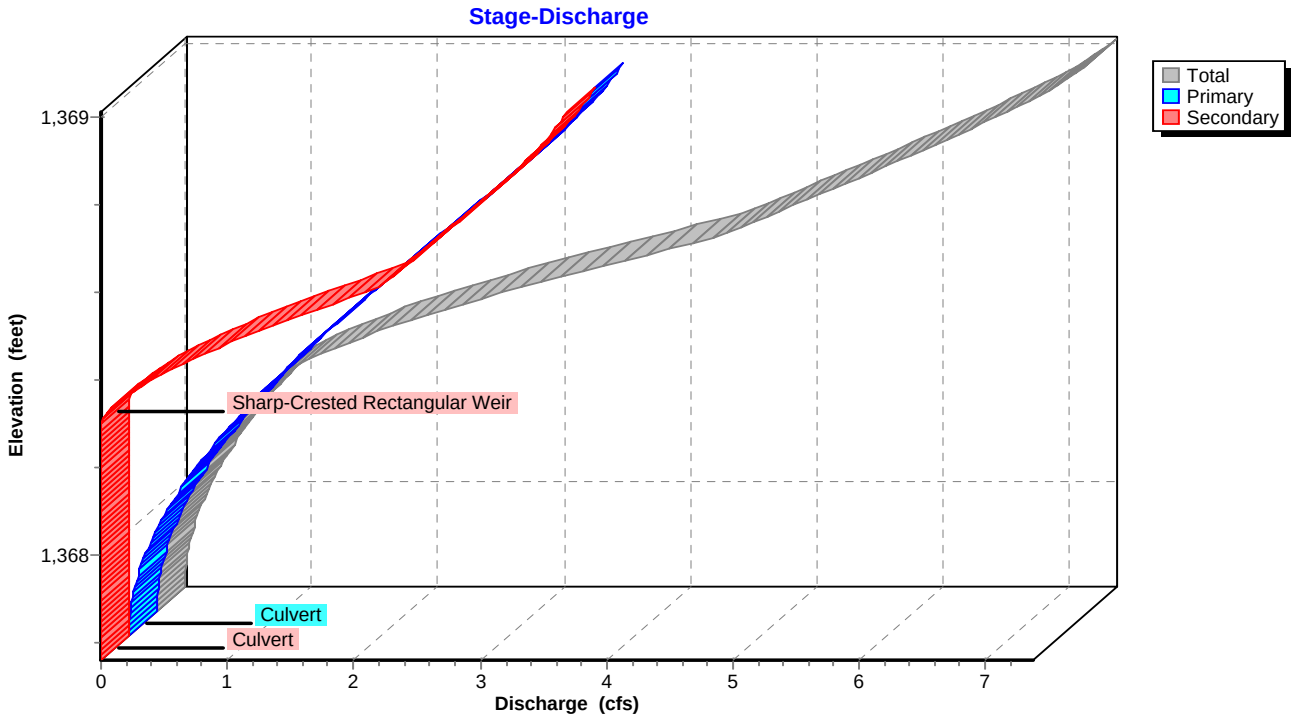
Primary OutFlow Max=0.41 cfs @ 12.05 hrs HW=1,368.09' TW=1,360.82' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 0.41 cfs @ 1.55 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,367.76' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Controls 0.00 cfs)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

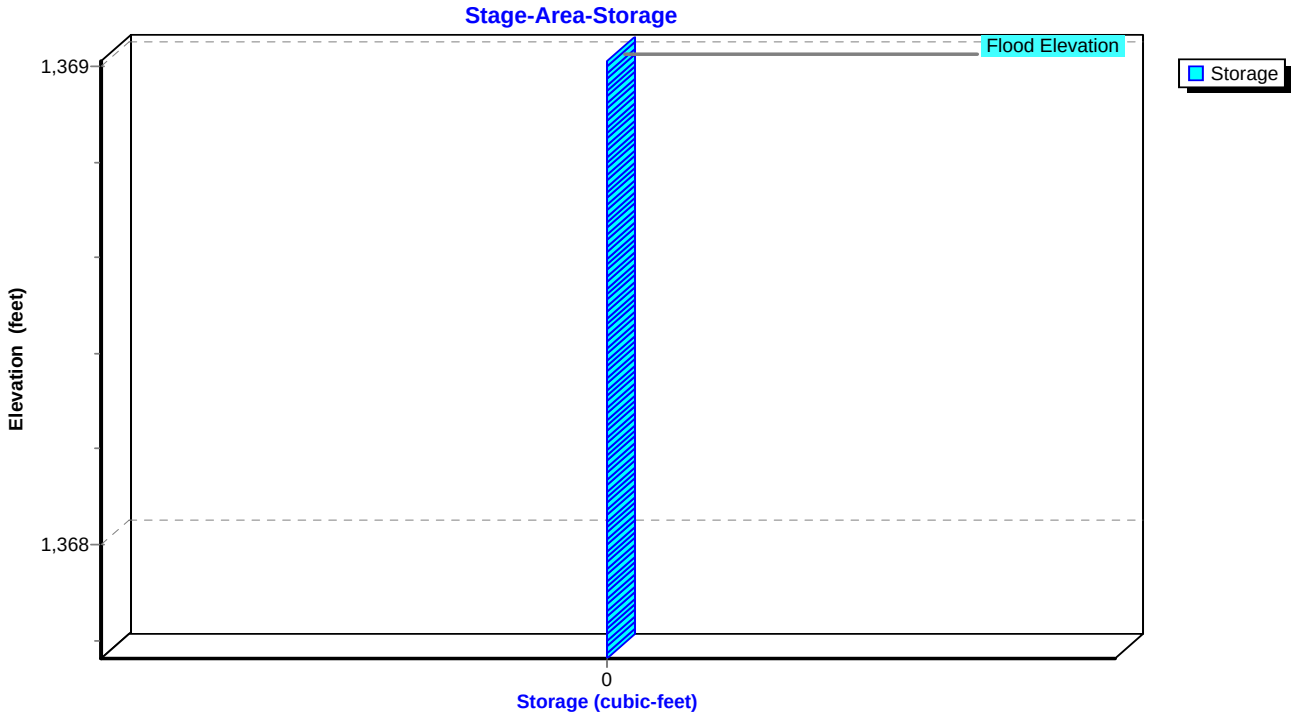
Pond 93P: Flow Splitter to BMP



Pond 93P: Flow Splitter to BMP



Pond 93P: Flow Splitter to BMP



Summary for Pond 94P: Stormwater Wetland C

Inflow Area = 0.959 ac, 50.05% Impervious, Inflow Depth = 0.36" for 90% Storm event
Inflow = 0.43 cfs @ 12.04 hrs, Volume= 0.029 af
Outflow = 0.02 cfs @ 15.23 hrs, Volume= 0.027 af, Atten= 95%, Lag= 191.4 min
Primary = 0.02 cfs @ 15.23 hrs, Volume= 0.027 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,347.50' Surf.Area= 2,565 sf Storage= 2,214 cf
Peak Elev= 1,347.75' @ 15.23 hrs Surf.Area= 2,933 sf Storage= 2,914 cf (700 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 746.1 min (1,605.7 - 859.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,345.00'	7,418 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

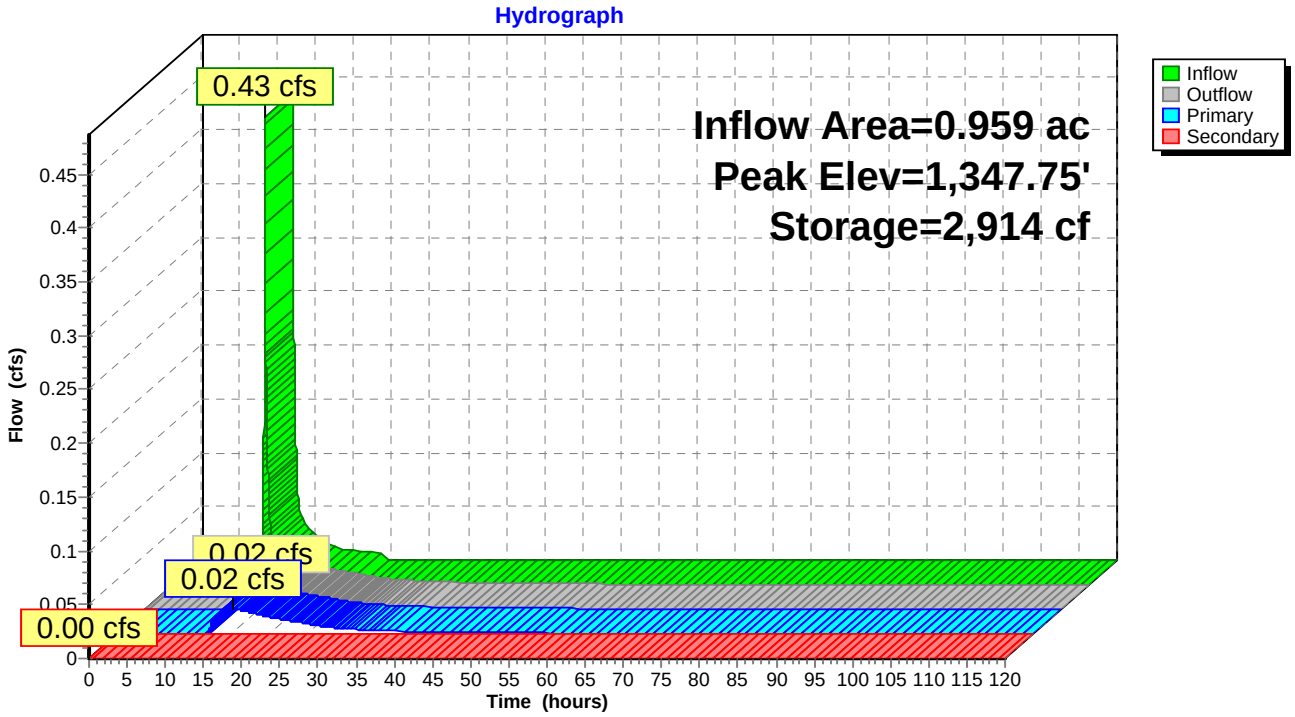
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,345.00	25	39.0	0	0	25
1,346.00	323	286.8	146	146	6,452
1,347.00	1,831	404.5	974	1,120	12,936
1,347.50	2,565	404.6	1,094	2,214	13,138
1,348.00	3,311	405.0	1,465	3,679	13,342
1,349.00	4,184	299.4	3,739	7,418	19,272

Device	Routing	Invert	Outlet Devices
#1	Primary	1,347.50'	**30.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.61 (C= 3.26)
#2	Secondary	1,348.20'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

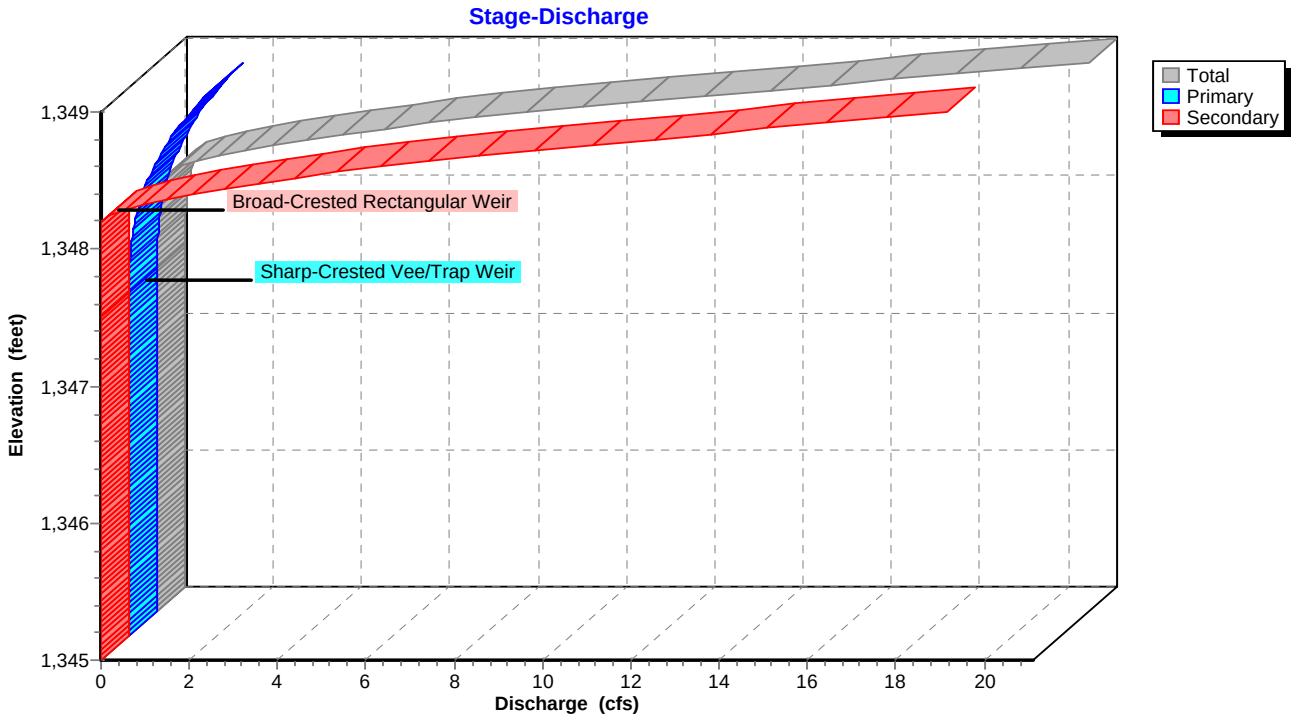
Primary OutFlow Max=0.02 cfs @ 15.23 hrs HW=1,347.75' (Free Discharge)
1=Sharp-Crested Vee/Trap Weir (Weir Controls 0.02 cfs @ 1.32 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,347.50' (Free Discharge)
2=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

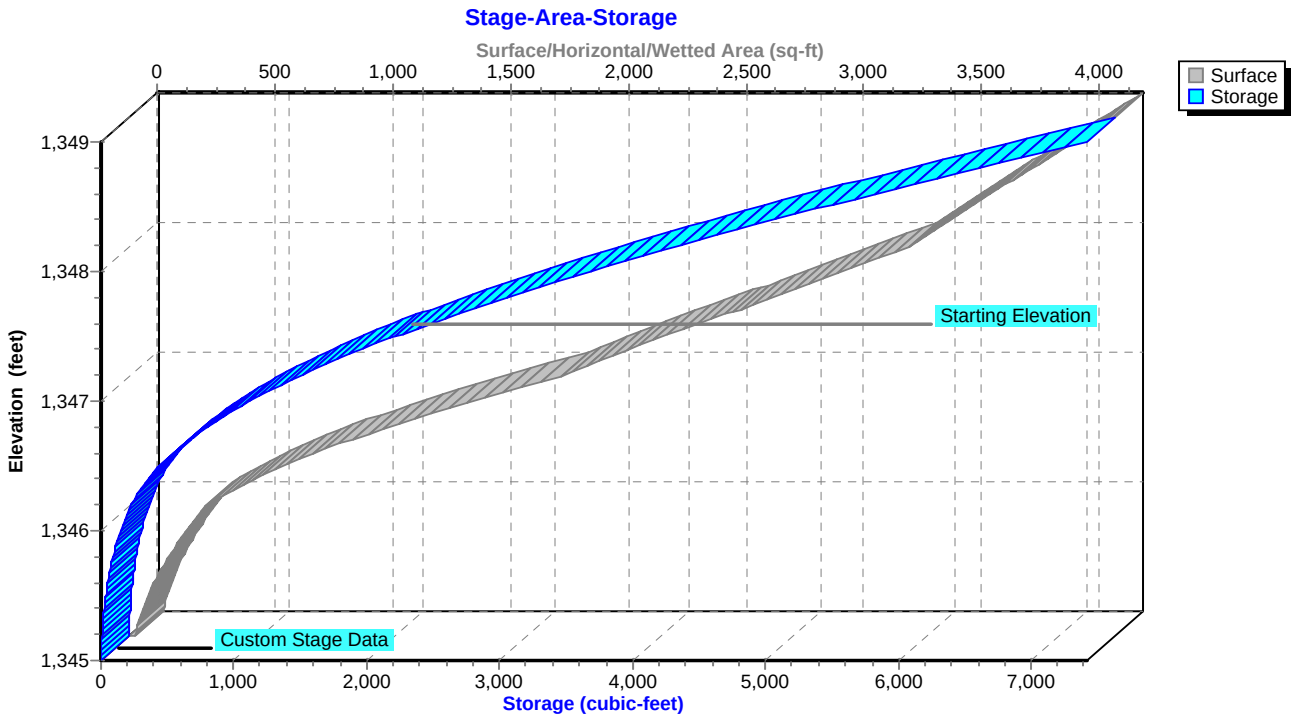
Pond 94P: Stormwater Wetland C



Pond 94P: Stormwater Wetland C



Pond 94P: Stormwater Wetland C



Summary for Pond 95P: Bioretention Area F

Inflow Area = 0.564 ac, 44.68% Impervious, Inflow Depth = 0.27" for 90% Storm event
Inflow = 0.18 cfs @ 12.03 hrs, Volume= 0.013 af
Outflow = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af, Atten= 100%, Lag= 0.0 min
Primary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,347.23' @ 24.09 hrs Surf.Area= 996 sf Storage= 555 cf

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= (not calculated: no outflow)

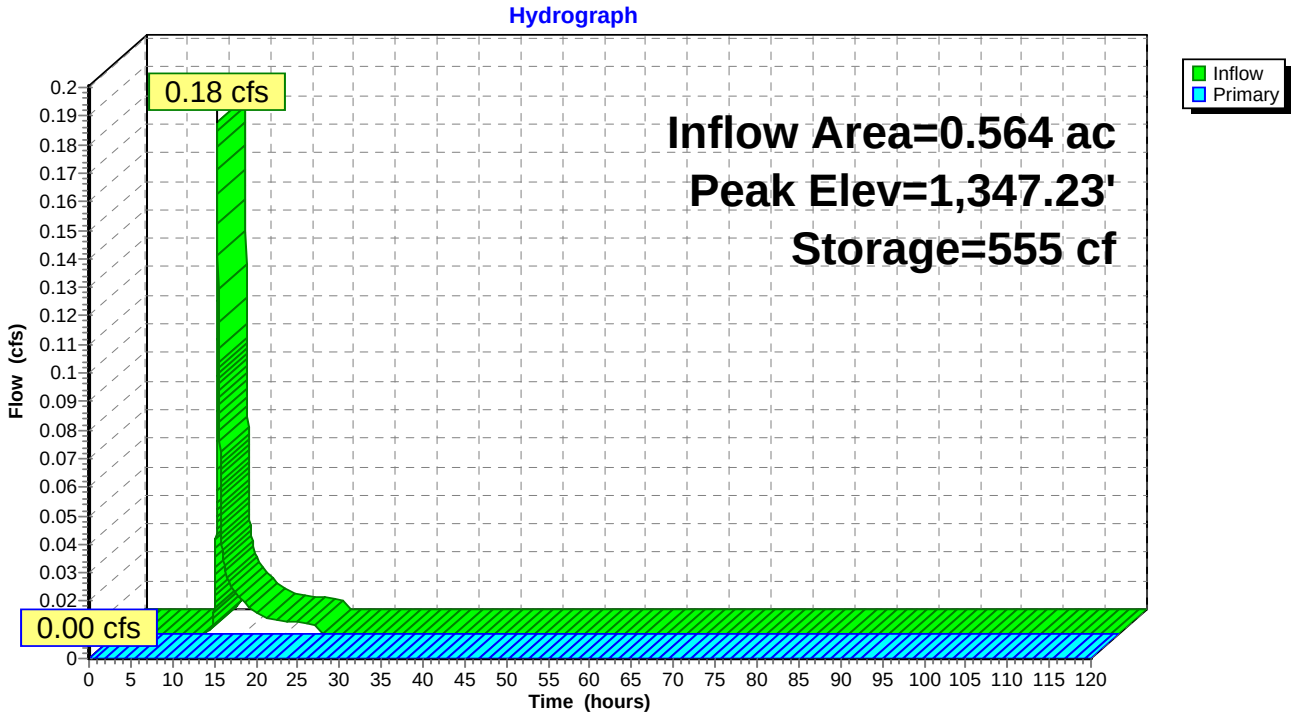
Volume	Invert	Avail.Storage	Storage Description
#1	1,345.00'	6,415 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,345.00	996	183.4	0.0	0	0	996
1,345.50	996	183.4	25.0	125	125	1,088
1,346.00	996	183.4	25.0	125	249	1,179
1,347.00	996	183.4	25.0	249	498	1,363
1,348.00	996	183.4	25.0	249	747	1,546
1,349.00	996	183.4	25.0	249	996	1,730
1,350.00	2,264	464.7	100.0	1,587	2,583	16,241
1,351.00	5,654	1,195.0	100.0	3,832	6,415	112,699

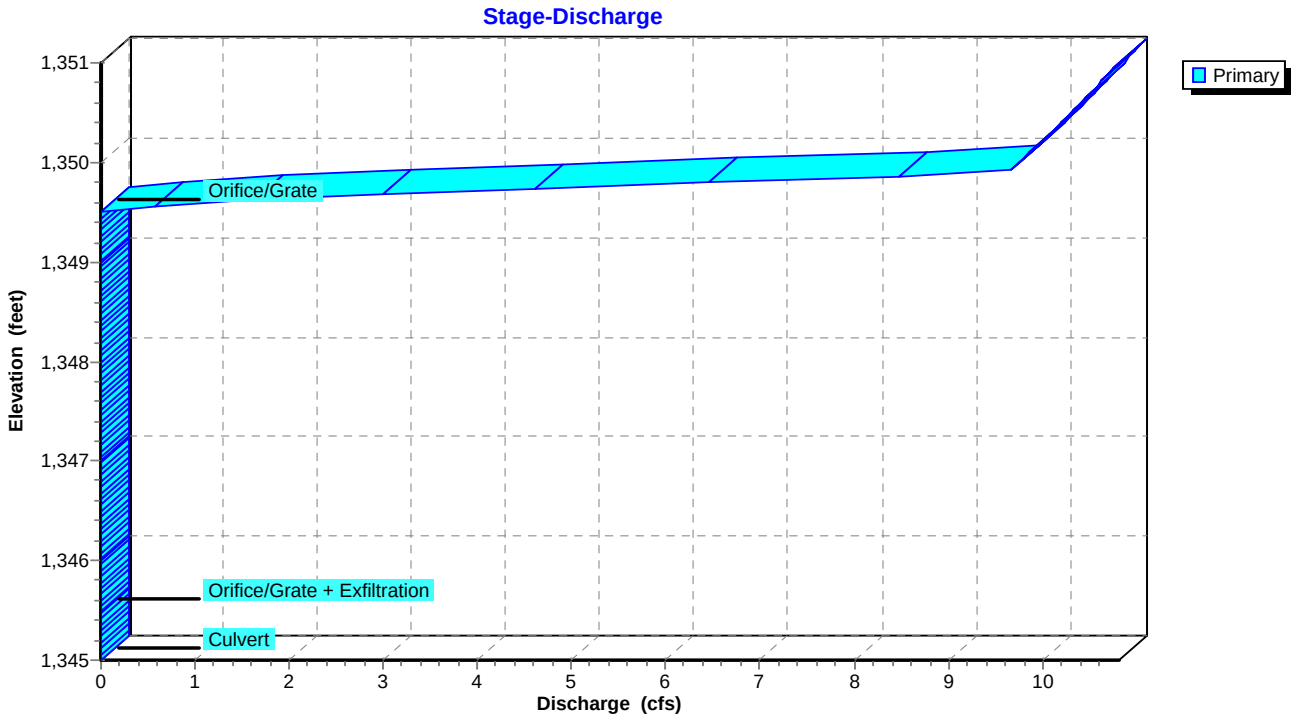
Device	Routing	Invert	Outlet Devices
#1	Primary	1,345.00'	**15.0" Round Culvert** L= 78.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,345.00' / 1,344.20' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,345.50'	**0.4" Horiz. Orifice/Grate X 340.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,345.50'	**0.250 in/hr Exfiltration over Surface area above 1,345.50'** Conductivity to Groundwater Elevation = 1,344.50' Excluded Surface area = 996 sf
#4	Device 1	1,349.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,345.00' (Free Discharge)
- **1=Culvert** (Controls 0.00 cfs)
- **2=Orifice/Grate** (Controls 0.00 cfs)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Controls 0.00 cfs)

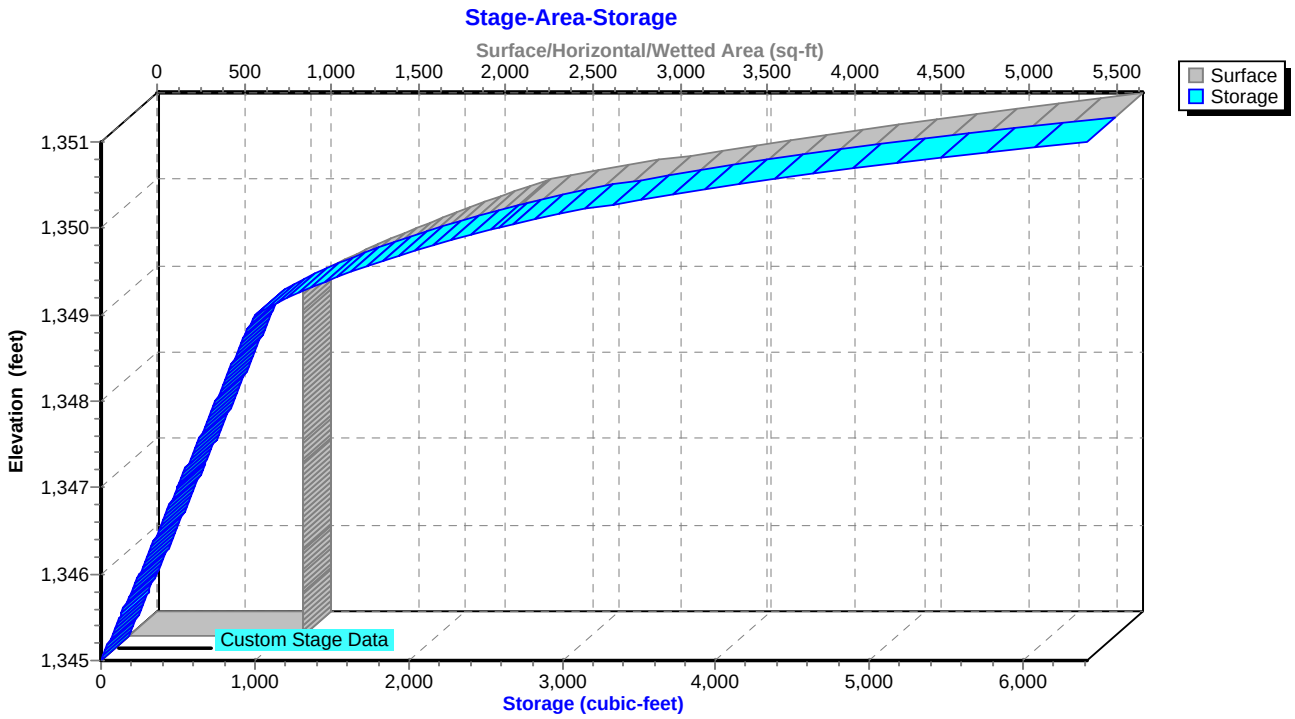
Pond 95P: Bioretention Area F



Pond 95P: Bioretention Area F



Pond 95P: Bioretention Area F



Summary for Pond 99P: Stormwater Pocket Wetland G

Inflow Area = 0.677 ac, 44.17% Impervious, Inflow Depth = 0.32" for 90% Storm event
Inflow = 0.27 cfs @ 12.02 hrs, Volume= 0.018 af
Outflow = 0.15 cfs @ 12.12 hrs, Volume= 0.018 af, Atten= 47%, Lag= 5.8 min
Primary = 0.15 cfs @ 12.12 hrs, Volume= 0.018 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,339.00' Surf.Area= 3,682 sf Storage= 5,147 cf
Peak Elev= 1,339.03' @ 12.12 hrs Surf.Area= 3,717 sf Storage= 5,269 cf (122 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 26.3 min (891.5 - 865.2)

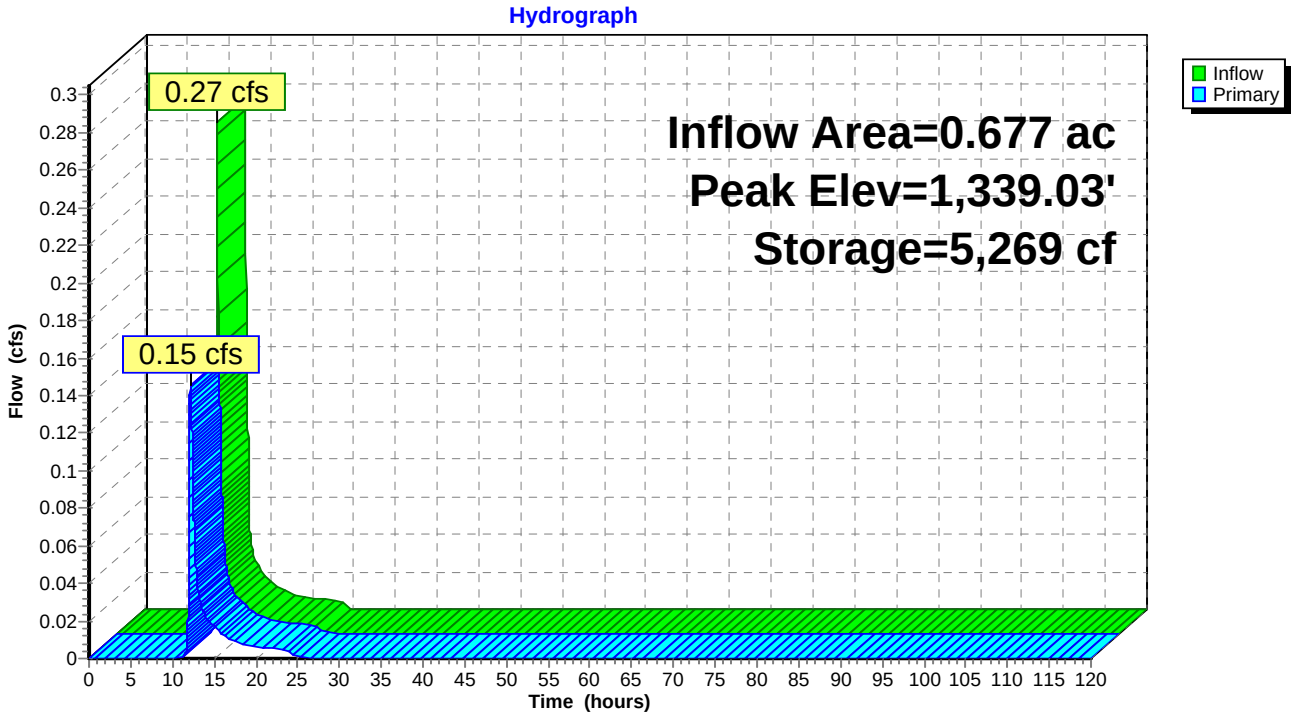
Volume	Invert	Avail.Storage	Storage Description
#1	1,335.00'	9,394 cf	**Custom Stage Data (Irregular)**Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,335.00	93	80.5	0	0	93
1,336.00	416	130.2	235	235	933
1,337.00	1,024	220.2	698	933	3,449
1,338.00	1,932	236.2	1,454	2,387	4,073
1,339.00	3,682	404.5	2,760	5,147	12,660
1,340.00	4,837	491.2	4,246	9,394	18,856

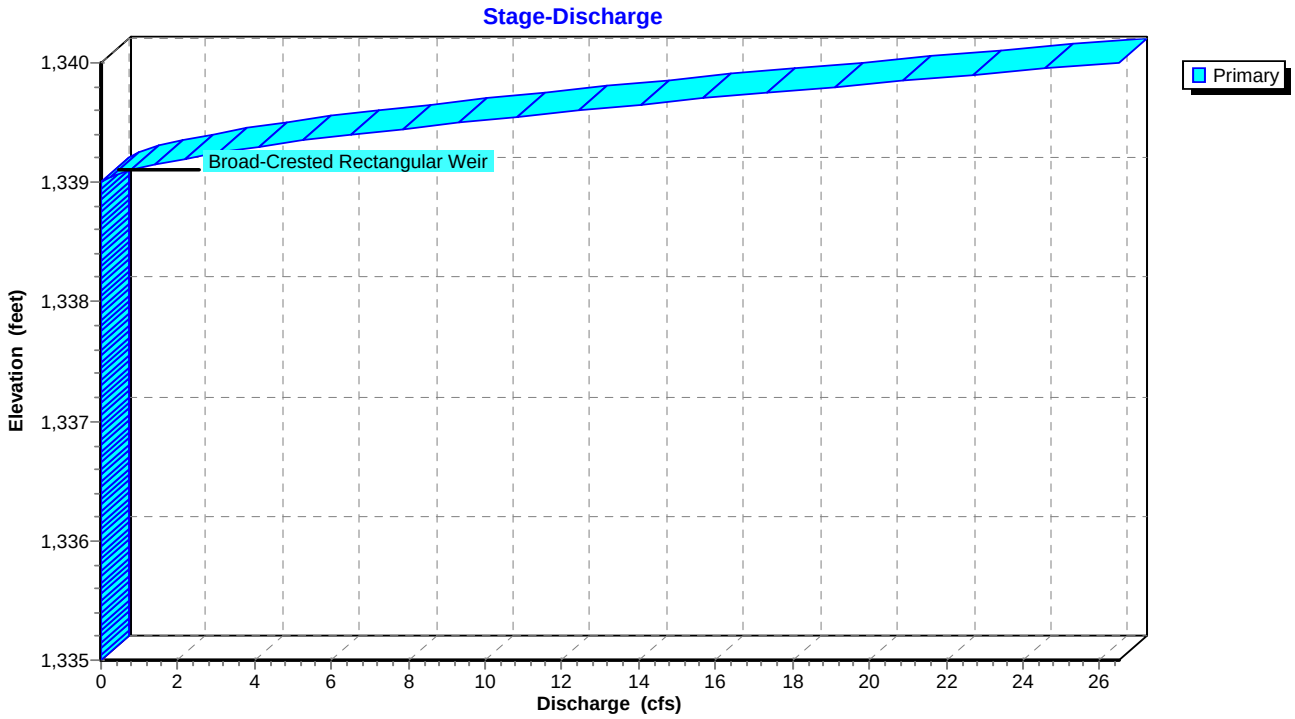
Device	Routing	Invert	Outlet Devices
#1	Primary	1,339.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=0.15 cfs @ 12.12 hrs HW=1,339.03' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 0.15 cfs @ 0.44 fps)

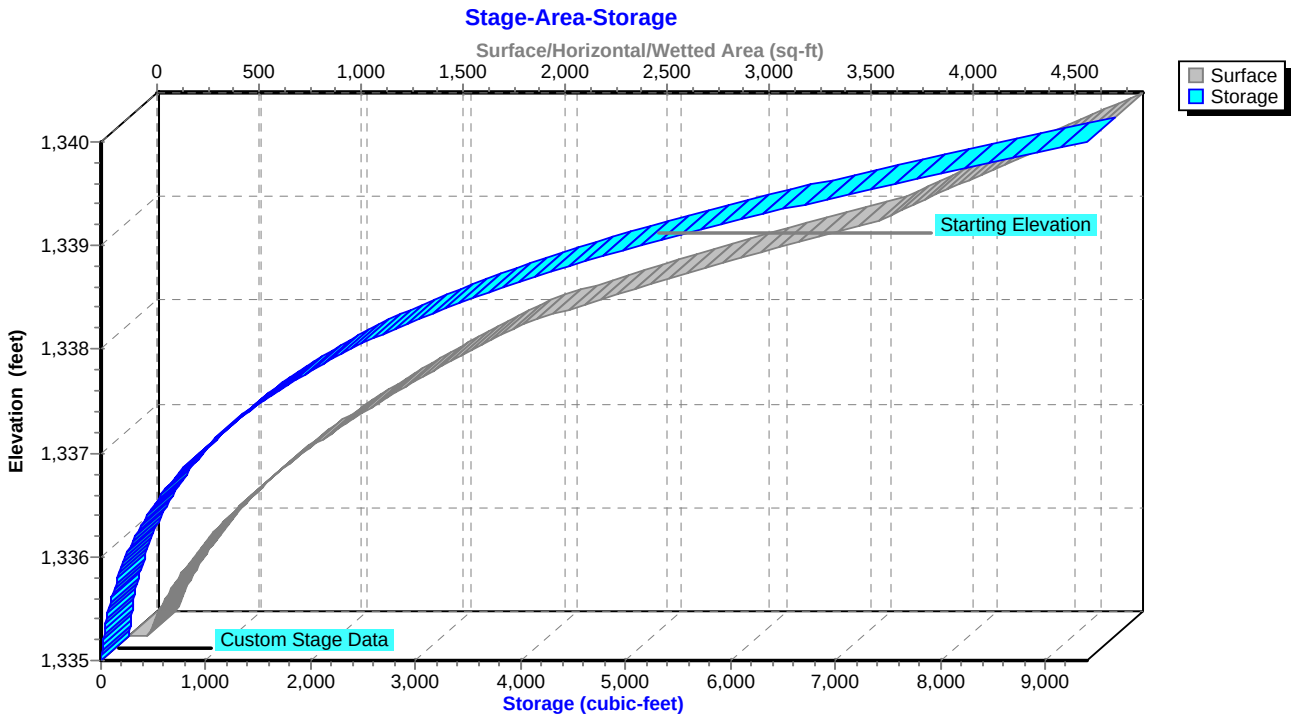
Pond 99P: Stormwater Pocket Wetland G



Pond 99P: Stormwater Pocket Wetland G



Pond 99P: Stormwater Pocket Wetland G



Summary for Pond 100P: Stormwater Wetland E

Inflow Area = 1.422 ac, 39.94% Impervious, Inflow Depth = 0.27" for 90% Storm event
Inflow = 0.44 cfs @ 12.03 hrs, Volume= 0.032 af
Outflow = 0.32 cfs @ 12.10 hrs, Volume= 0.032 af, Atten= 27%, Lag= 4.1 min
Primary = 0.32 cfs @ 12.10 hrs, Volume= 0.032 af
Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,346.80' Surf.Area= 2,420 sf Storage= 2,588 cf
Peak Elev= 1,346.85' @ 12.10 hrs Surf.Area= 2,513 sf Storage= 2,719 cf (131 cf above start)

Plug-Flow detention time= (not calculated: initial storage excedes outflow)
Center-of-Mass det. time= 13.5 min (890.7 - 877.2)

Volume	Invert	Avail.Storage	Storage Description
#1	1,343.00'	13,221 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

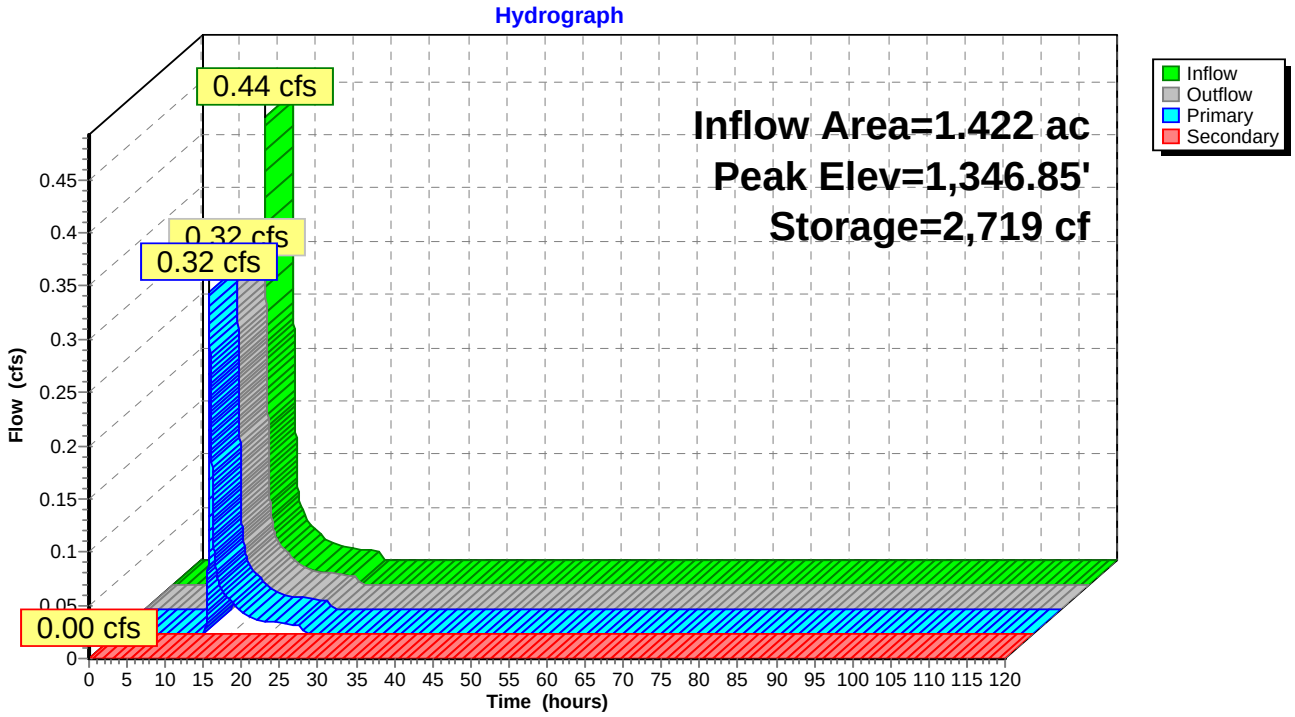
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,343.00	13	14.7	0	0	13
1,344.00	114	57.6	55	55	262
1,345.00	474	130.7	273	329	1,362
1,346.00	1,234	286.1	824	1,153	6,520
1,347.00	2,778	454.7	1,954	3,107	16,466
1,348.00	4,871	736.2	3,776	6,883	43,150
1,349.00	7,928	1,003.3	6,338	13,221	80,134

Device	Routing	Invert	Outlet Devices
#1	Primary	1,346.20'	**6.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,346.20' / 1,346.00' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Device 1	1,346.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	1,347.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

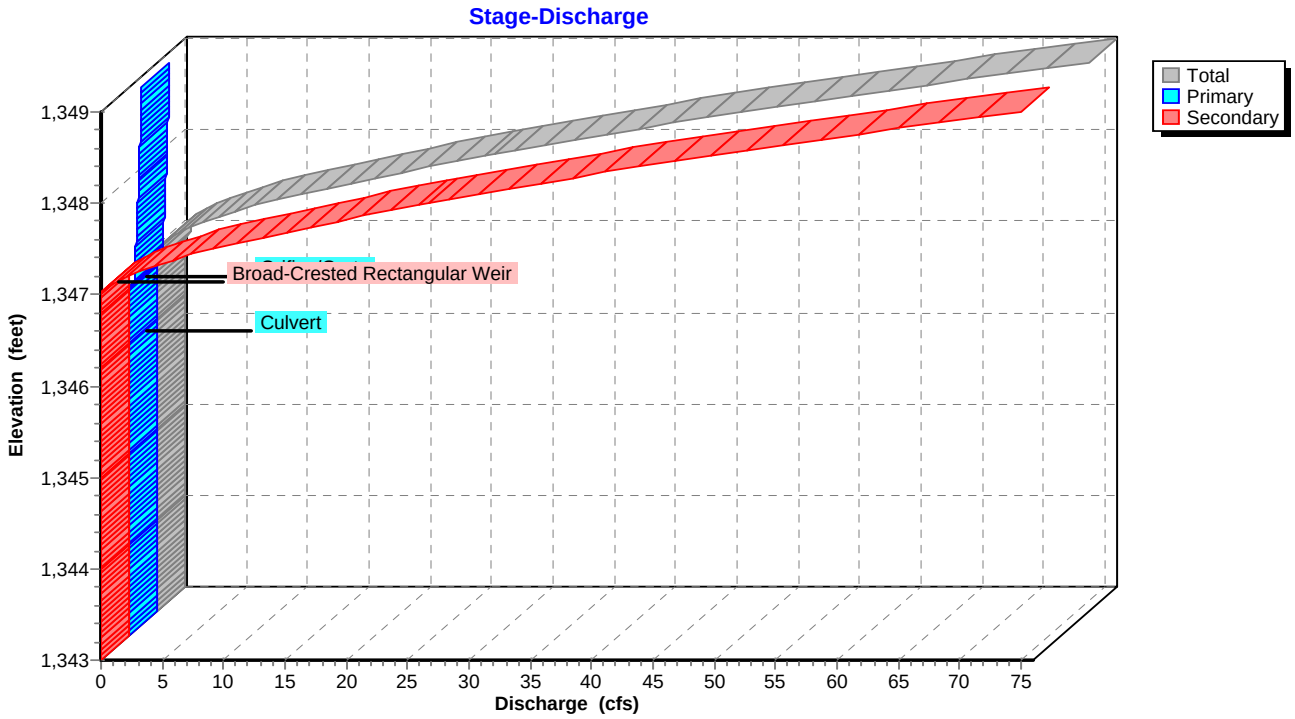
Primary OutFlow Max=0.32 cfs @ 12.10 hrs HW=1,346.85' (Free Discharge)
└**1=Culvert** (Passes 0.32 cfs of 0.41 cfs potential flow)
└**2=Orifice/Grate** (Weir Controls 0.32 cfs @ 0.75 fps)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=1,346.80' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

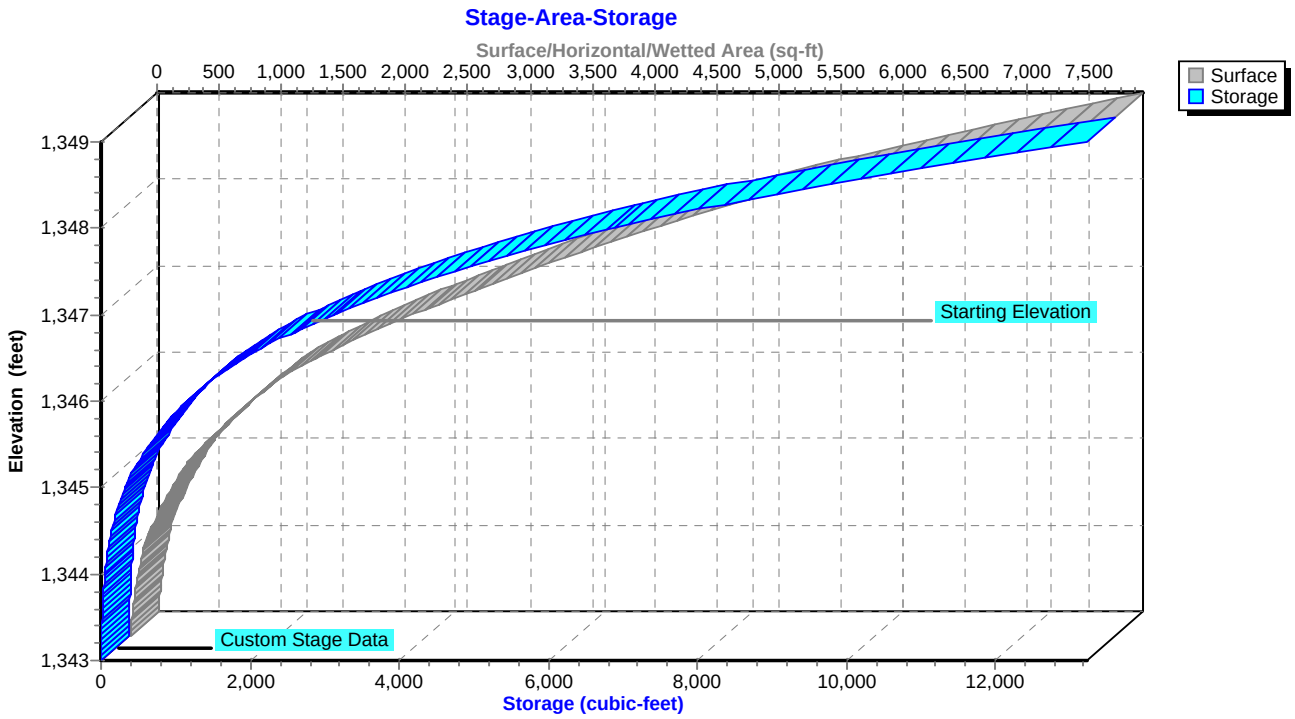
Pond 100P: Stormwater Wetland E



Pond 100P: Stormwater Wetland E



Pond 100P: Stormwater Wetland E



Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Subcatchment 1S: 30 Runoff Area=0.901 ac 52.39% Impervious Runoff Depth=6.57"
Flow Length=585' Tc=2.3 min CN=88 Runoff=7.51 cfs 0.493 af

Subcatchment 2S: SW30 Runoff Area=0.247 ac 34.82% Impervious Runoff Depth=5.86"
Tc=0.0 min CN=82 Runoff=2.03 cfs 0.121 af

Subcatchment 3S: 30A Runoff Area=0.277 ac 13.00% Impervious Runoff Depth=5.04"
Flow Length=197' Tc=24.8 min CN=75 Runoff=1.00 cfs 0.116 af

Subcatchment 4S: 29 Runoff Area=3.109 ac 7.14% Impervious Runoff Depth=5.04"
Flow Length=636' Tc=20.5 min CN=75 Runoff=12.26 cfs 1.306 af

Subcatchment 5S: 29A Runoff Area=1.558 ac 53.02% Impervious Runoff Depth=6.57"
Flow Length=600' Tc=2.3 min CN=88 Runoff=12.99 cfs 0.853 af

Subcatchment 6S: SW29B Runoff Area=0.230 ac 38.26% Impervious Runoff Depth=5.98"
Tc=0.0 min CN=83 Runoff=1.92 cfs 0.115 af

Subcatchment 7S: 29B Runoff Area=2.391 ac 0.00% Impervious Runoff Depth=4.69"
Flow Length=423' Tc=24.5 min CN=72 Runoff=8.16 cfs 0.935 af

Subcatchment 8S: 29C Runoff Area=0.369 ac 50.68% Impervious Runoff Depth=6.57"
Flow Length=271' Tc=1.8 min CN=88 Runoff=3.13 cfs 0.202 af

Subcatchment 9S: 29D Runoff Area=0.798 ac 0.00% Impervious Runoff Depth=4.46"
Flow Length=264' Tc=36.1 min CN=70 Runoff=2.16 cfs 0.297 af

Subcatchment 10S: SW29A Runoff Area=0.079 ac 10.13% Impervious Runoff Depth=5.16"
Tc=0.0 min CN=76 Runoff=0.58 cfs 0.034 af

Subcatchment A1: A1 Runoff Area=0.734 ac 36.10% Impervious Runoff Depth=5.98"
Flow Length=790' Tc=1.7 min CN=83 Runoff=5.84 cfs 0.366 af

Subcatchment A2: A2 Runoff Area=0.505 ac 55.84% Impervious Runoff Depth=6.57"
Flow Length=780' Tc=1.8 min CN=88 Runoff=4.28 cfs 0.276 af

Subcatchment A3: A3 Runoff Area=0.096 ac 0.00% Impervious Runoff Depth=5.16"
Tc=0.0 min CN=76 Runoff=0.71 cfs 0.041 af

Subcatchment B1: B1 Runoff Area=0.238 ac 36.97% Impervious Runoff Depth=5.98"
Flow Length=324' Tc=1.0 min CN=83 Runoff=1.93 cfs 0.119 af

Subcatchment B2: B2 Runoff Area=0.169 ac 60.36% Impervious Runoff Depth=6.57"
Flow Length=389' Tc=1.1 min CN=88 Runoff=1.47 cfs 0.093 af

Subcatchment B3: B3 Runoff Area=0.062 ac 0.00% Impervious Runoff Depth=5.16"
Tc=0.0 min CN=76 Runoff=0.46 cfs 0.027 af

Subcatchment C1: C1 Runoff Area=0.415 ac 53.98% Impervious Runoff Depth=6.57"
Flow Length=584' Tc=2.1 min CN=88 Runoff=3.49 cfs 0.227 af

Subcatchment C2: C2 Runoff Area=0.439 ac 58.31% Impervious Runoff Depth=6.69"
Flow Length=548' Tc=1.9 min CN=89 Runoff=3.75 cfs 0.245 af

Subcatchment C3: C3 Runoff Area=0.105 ac 0.00% Impervious Runoff Depth=4.93"
Tc=0.0 min CN=74 Runoff=0.74 cfs 0.043 af

Subcatchment D1: D1 Runoff Area=0.371 ac 38.54% Impervious Runoff Depth=5.98"
Flow Length=293' Tc=1.6 min CN=83 Runoff=2.97 cfs 0.185 af

Subcatchment D2: D2 Runoff Area=0.321 ac 51.09% Impervious Runoff Depth=6.45"
Flow Length=449' Tc=1.9 min CN=87 Runoff=2.68 cfs 0.173 af

Subcatchment D3: D3 Runoff Area=0.086 ac 0.00% Impervious Runoff Depth=4.93"
Tc=0.0 min CN=74 Runoff=0.61 cfs 0.035 af

Subcatchment E1: E1 Runoff Area=0.264 ac 45.08% Impervious Runoff Depth=6.21"
Flow Length=335' Tc=1.8 min CN=85 Runoff=2.16 cfs 0.137 af

Subcatchment E2: E2 Runoff Area=0.221 ac 43.44% Impervious Runoff Depth=6.45"
Flow Length=246' Tc=1.3 min CN=87 Runoff=1.89 cfs 0.119 af

Subcatchment E4: E4 Runoff Area=0.081 ac 56.79% Impervious Runoff Depth=6.57"
Flow Length=225' Tc=1.3 min CN=88 Runoff=0.70 cfs 0.044 af

Subcatchment E5: E5 Runoff Area=0.078 ac 0.00% Impervious Runoff Depth=4.93"
Tc=0.0 min CN=74 Runoff=0.55 cfs 0.032 af

Subcatchment F1: F1 Runoff Area=0.291 ac 39.18% Impervious Runoff Depth=5.98"
Flow Length=268' Tc=1.5 min CN=83 Runoff=2.33 cfs 0.145 af

Subcatchment F2: F2 Runoff Area=0.230 ac 60.00% Impervious Runoff Depth=6.57"
Flow Length=184' Tc=1.3 min CN=88 Runoff=1.99 cfs 0.126 af

Subcatchment F3: F3 Runoff Area=0.043 ac 0.00% Impervious Runoff Depth=4.93"
Tc=0.0 min CN=74 Runoff=0.30 cfs 0.018 af

Subcatchment G1: G1 Runoff Area=0.320 ac 44.69% Impervious Runoff Depth=6.33"
Flow Length=454' Tc=1.3 min CN=86 Runoff=2.70 cfs 0.169 af

Subcatchment G2: G2 Runoff Area=0.274 ac 56.93% Impervious Runoff Depth=6.69"
Flow Length=409' Tc=1.2 min CN=89 Runoff=2.40 cfs 0.153 af

Subcatchment G3: G3 Runoff Area=0.083 ac 0.00% Impervious Runoff Depth=4.93"
Tc=0.0 min CN=74 Runoff=0.59 cfs 0.034 af

Reach DP-10: DP-10 Inflow=28.63 cfs 3.738 af
Outflow=28.63 cfs 3.738 af

Reach DP-11: DP-11 Inflow=3.84 cfs 0.728 af
Outflow=3.84 cfs 0.728 af

Reach DP3: DP-3 Inflow=13.27 cfs 0.829 af
Outflow=13.27 cfs 0.829 af

Pond 1P: Bioretention Area A Peak Elev=1,366.34' Storage=4,507 cf Inflow=5.64 cfs 0.558 af
Outflow=5.25 cfs 0.481 af

Pond 3P: Flow Splitter to BMP Peak Elev=1,350.64' Inflow=3.40 cfs 0.211 af
Primary=0.06 cfs 0.008 af Secondary=3.40 cfs 0.203 af Outflow=3.40 cfs 0.211 af

Pond 4P: Pocket Wetland 30 Peak Elev=1,439.01' Storage=15,509 cf Inflow=9.21 cfs 0.614 af
Primary=2.82 cfs 0.612 af Secondary=0.03 cfs 0.000 af Outflow=2.84 cfs 0.612 af

Pond 5P: Bioretention Area B Peak Elev=1,351.03' Storage=969 cf Inflow=0.46 cfs 0.035 af
Outflow=0.11 cfs 0.020 af

Pond 11P: Pocket Wetland 29B Peak Elev=1,443.51' Storage=12,944 cf Inflow=14.58 cfs 0.967 af
Primary=2.98 cfs 0.684 af Secondary=9.53 cfs 0.280 af Outflow=12.51 cfs 0.964 af

Pond 12P: Pocket Wetland 29A Peak Elev=1,443.74' Storage=1,905 cf Inflow=2.93 cfs 0.231 af
Outflow=2.88 cfs 0.231 af

Pond 13P: Flow Splitter to SW 29A Peak Elev=1,444.24' Inflow=3.13 cfs 0.202 af
Primary=2.44 cfs 0.197 af Secondary=0.69 cfs 0.005 af Outflow=3.13 cfs 0.202 af

Pond 93P: Flow Splitter to BMP Peak Elev=1,369.56' Inflow=10.12 cfs 0.642 af
Primary=5.06 cfs 0.516 af Secondary=5.06 cfs 0.126 af Outflow=10.12 cfs 0.642 af

Pond 94P: Stormwater Wetland C Peak Elev=1,348.59' Storage=5,797 cf Inflow=7.87 cfs 0.515 af
Primary=0.88 cfs 0.288 af Secondary=6.18 cfs 0.224 af Outflow=7.06 cfs 0.513 af

Pond 95P: Bioretention Area F Peak Elev=1,349.73' Storage=2,035 cf Inflow=4.59 cfs 0.288 af
Outflow=4.47 cfs 0.264 af

Pond 99P: Stormwater Pocket Wetland G Peak Elev=1,339.33' Storage=6,416 cf Inflow=5.63 cfs 0.356 af
Outflow=4.76 cfs 0.356 af

Pond 100P: Stormwater Wetland E Peak Elev=1,347.52' Storage=4,806 cf Inflow=11.39 cfs 0.724 af
Primary=0.66 cfs 0.390 af Secondary=9.80 cfs 0.335 af Outflow=10.45 cfs 0.724 af

Total Runoff Area = 15.385 ac Runoff Volume = 7.276 af Average Runoff Depth = 5.68"
72.30% Pervious = 11.124 ac 27.70% Impervious = 4.261 ac

Summary for Subcatchment 1S: 30

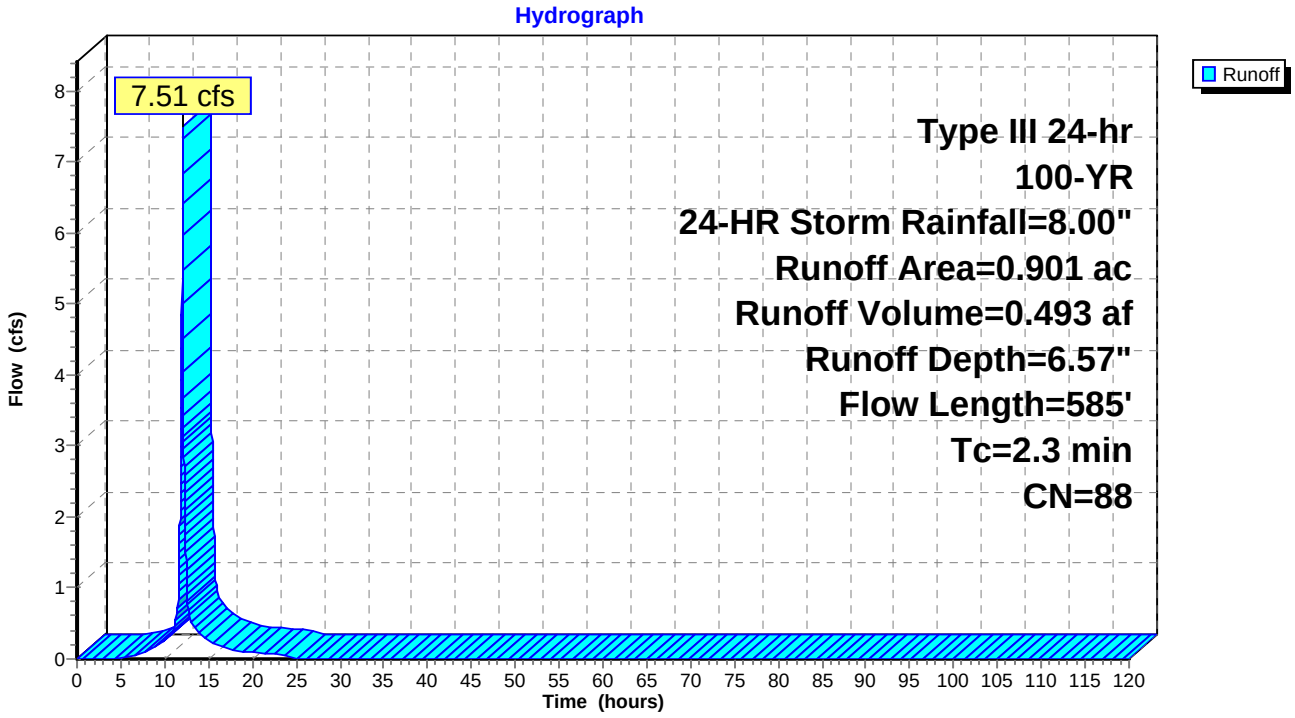
Runoff = 7.51 cfs @ 12.03 hrs, Volume= 0.493 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.328	74	>75% Grass cover, Good, HSG C
*	0.101	89	Porous Pavement Walkway (Gravel roads), HSG C
	0.472	98	Paved roads w/curbs & sewers, HSG C
	0.901	88	Weighted Average
	0.429		47.61% Pervious Area
	0.472		52.39% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	46	0.0200	1.27		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
1.0	178	0.0225	3.04		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.7	361	0.0224	8.90	15.72	**Pipe Channel, Storm Network** 18.0" Round Area= 1.8 sf Perim= 4.7' r= 0.38' n= 0.013
2.3	585	Total			

Subcatchment 1S: 30



Summary for Subcatchment 2S: SW30

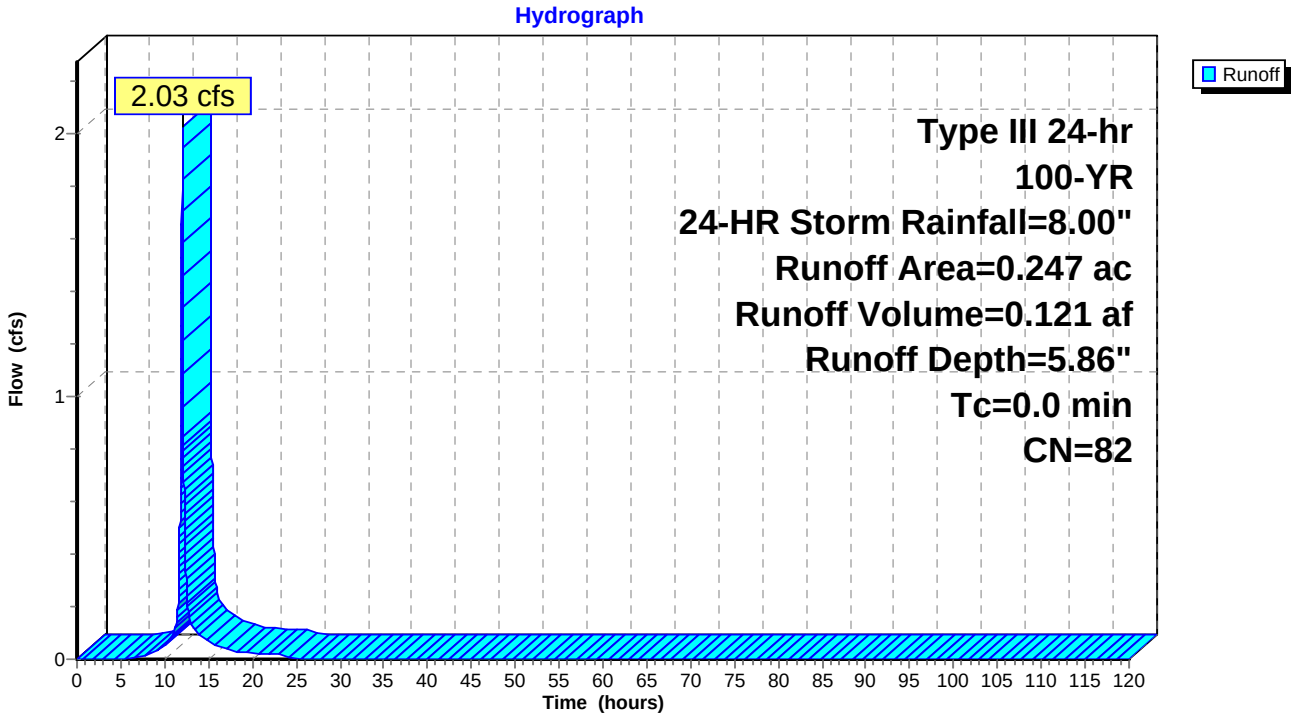
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 2.03 cfs @ 12.00 hrs, Volume= 0.121 af, Depth= 5.86"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.161	74	>75% Grass cover, Good, HSG C
0.086	98	Water Surface, HSG C
0.247	82	Weighted Average
0.161		65.18% Pervious Area
0.086		34.82% Impervious Area

Subcatchment 2S: SW30



Summary for Subcatchment 3S: 30A

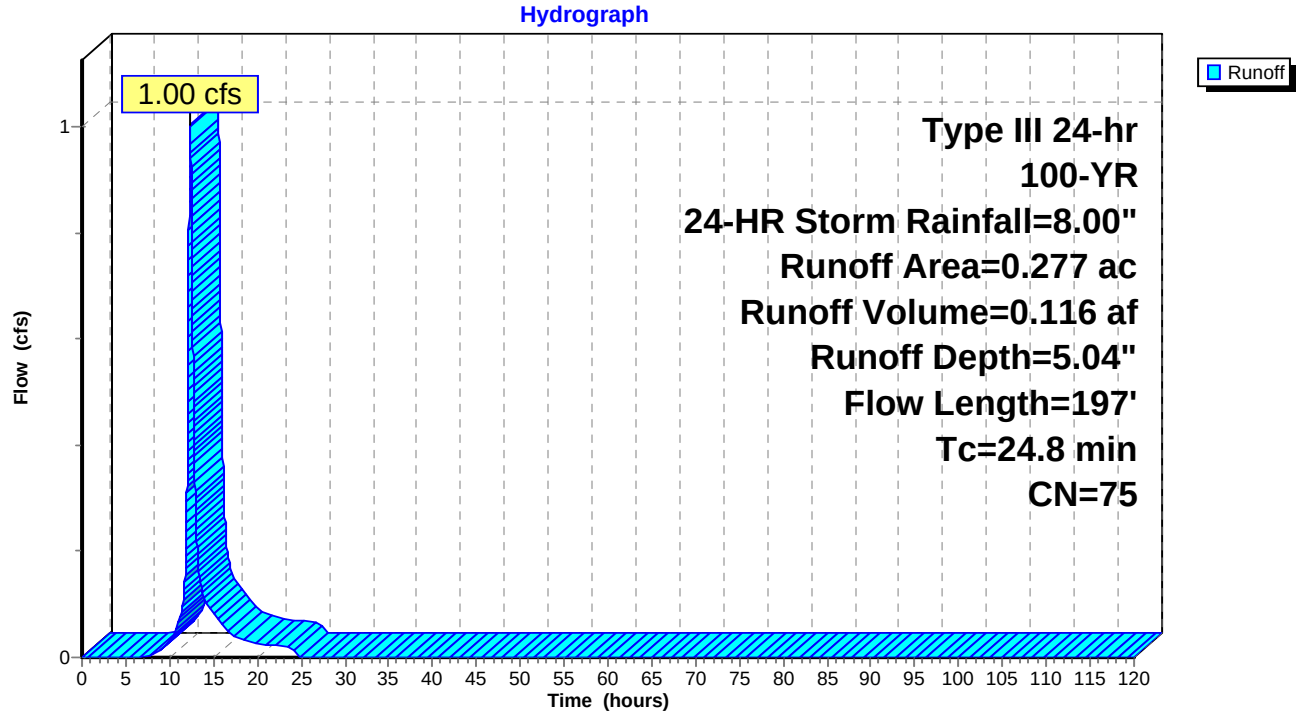
Runoff = 1.00 cfs @ 12.34 hrs, Volume= 0.116 af, Depth= 5.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.097	74	>75% Grass cover, Good, HSG C
0.144	70	Woods, Good, HSG C
0.036	98	Paved roads w/curbs & sewers, HSG C
0.277	75	Weighted Average
0.241		87.00% Pervious Area
0.036		13.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
24.5	120	0.0170	0.08		**Sheet Flow, Overland** Woods: Light underbrush n= 0.400 P2= 3.75"
0.3	77	0.0250	5.13	18.45	**Channel Flow, Ditch** Area= 3.6 sf Perim= 6.8' r= 0.53' n= 0.030
24.8	197	Total			

Subcatchment 3S: 30A



Summary for Subcatchment 4S: 29

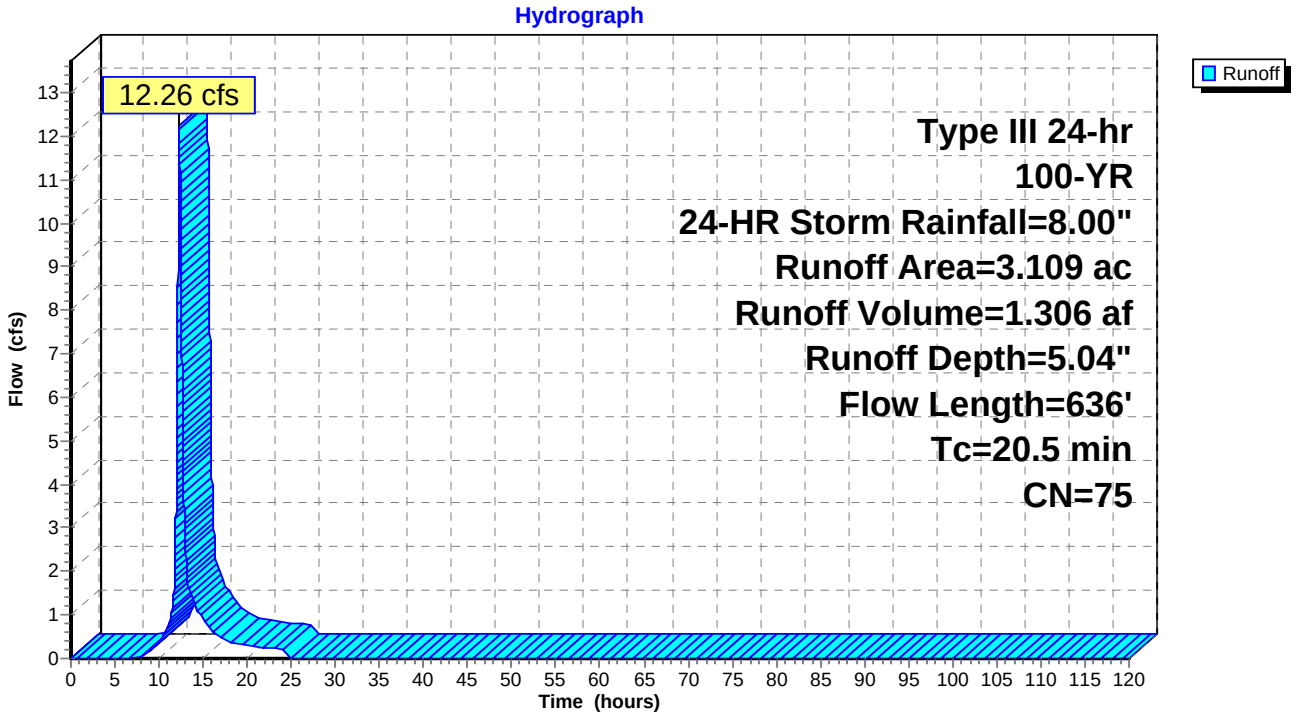
Runoff = 12.26 cfs @ 12.28 hrs, Volume= 1.306 af, Depth= 5.04"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.122	98	Roofs, HSG C
2.605	74	>75% Grass cover, Good, HSG C
0.100	98	Paved parking, HSG C
0.261	70	Woods, Good, HSG C
0.021	74	>75% Grass cover, Good, HSG C
3.109	75	Weighted Average
2.887		92.86% Pervious Area
0.222		7.14% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.7	150	0.0133	0.17		**Sheet Flow, Overland** Grass: Short n= 0.150 P2= 3.75"
4.4	239	0.0167	0.90		**Shallow Concentrated Flow, Shallow** Short Grass Pasture Kv= 7.0 fps
1.1	156	0.0060	2.42	7.25	**Channel Flow, Roadside Ditch** Area= 3.0 sf Perim= 6.0' r= 0.50' n= 0.030
0.3	91	0.0055	5.34	16.78	**Pipe Channel, Proposed Roadside Culvert** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
20.5	636	Total			

Subcatchment 4S: 29



Summary for Subcatchment 5S: 29A

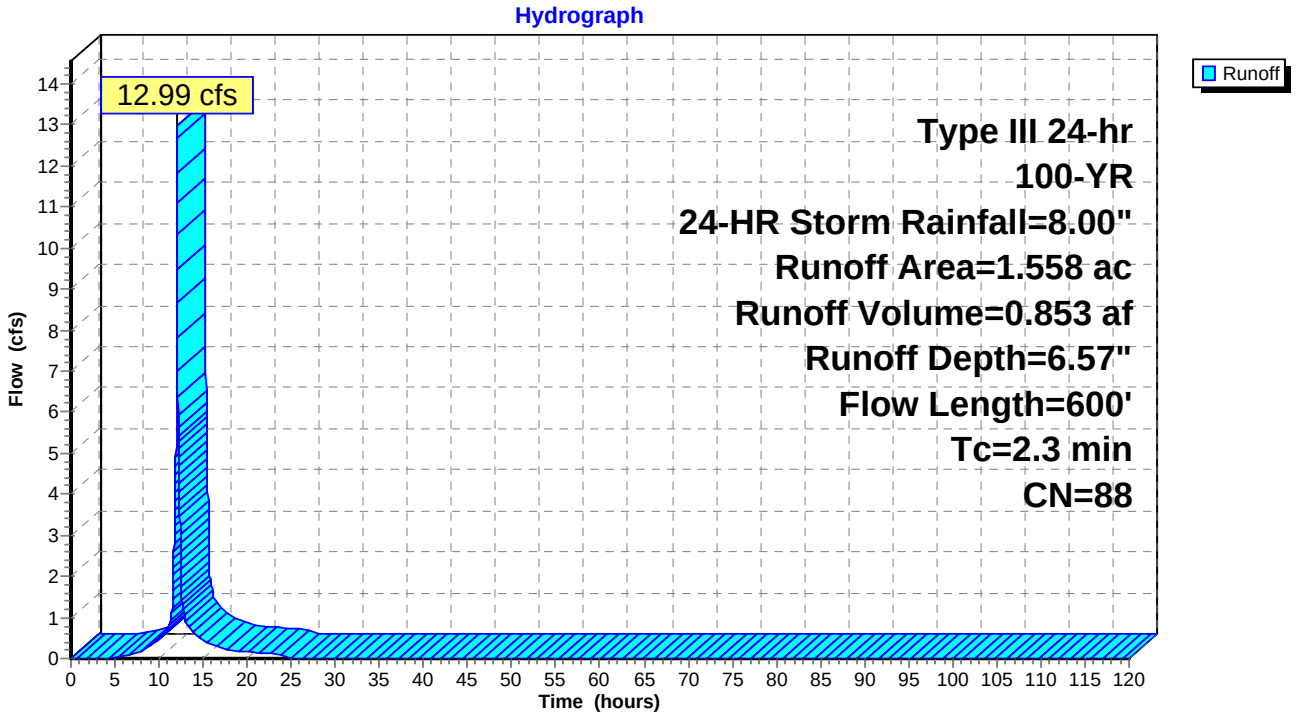
Runoff = 12.99 cfs @ 12.03 hrs, Volume= 0.853 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.005	98	Paved parking, HSG C
	0.003	71	Meadow, non-grazed, HSG C
	0.002	98	Unconnected pavement, HSG C
	0.560	74	>75% Grass cover, Good, HSG C
*	0.169	89	Porous Pavement (Gravel roads), HSG C
	0.819	98	Paved roads w/curbs & sewers, HSG C
	1.558	88	Weighted Average
	0.732		46.98% Pervious Area
	0.826		53.02% Impervious Area
	0.002		0.24% Unconnected

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	61	0.0200	1.35		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
0.9	152	0.0200	2.87		**Shallow Concentrated Flow, Gutter Flow** Paved Kv= 20.3 fps
0.6	387	0.0238	11.11	34.90	**Pipe Channel, Storm Network** 24.0" Round Area= 3.1 sf Perim= 6.3' r= 0.50' n= 0.013
2.3	600	Total			

Subcatchment 5S: 29A



Summary for Subcatchment 6S: SW29B

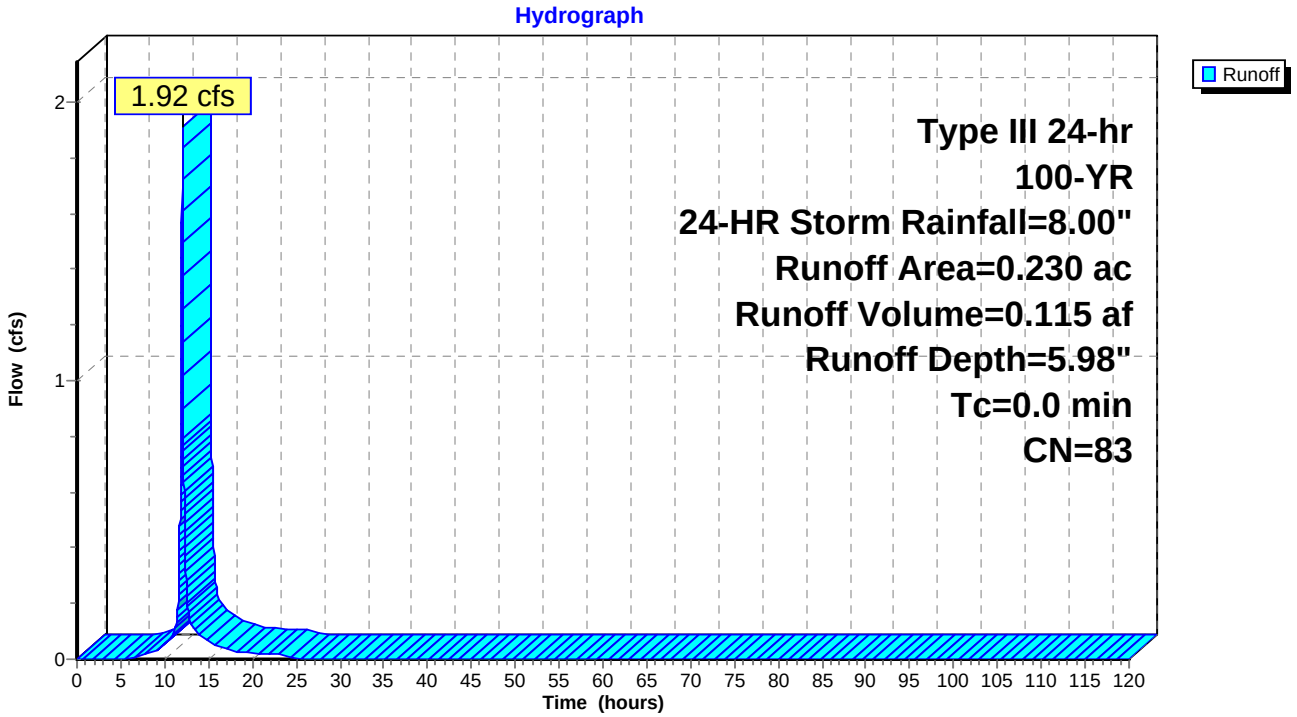
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 1.92 cfs @ 12.00 hrs, Volume= 0.115 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.088	98	Water Surface, HSG C
0.142	74	>75% Grass cover, Good, HSG C
0.230	83	Weighted Average
0.142		61.74% Pervious Area
0.088		38.26% Impervious Area

Subcatchment 6S: SW29B



Summary for Subcatchment 7S: 29B

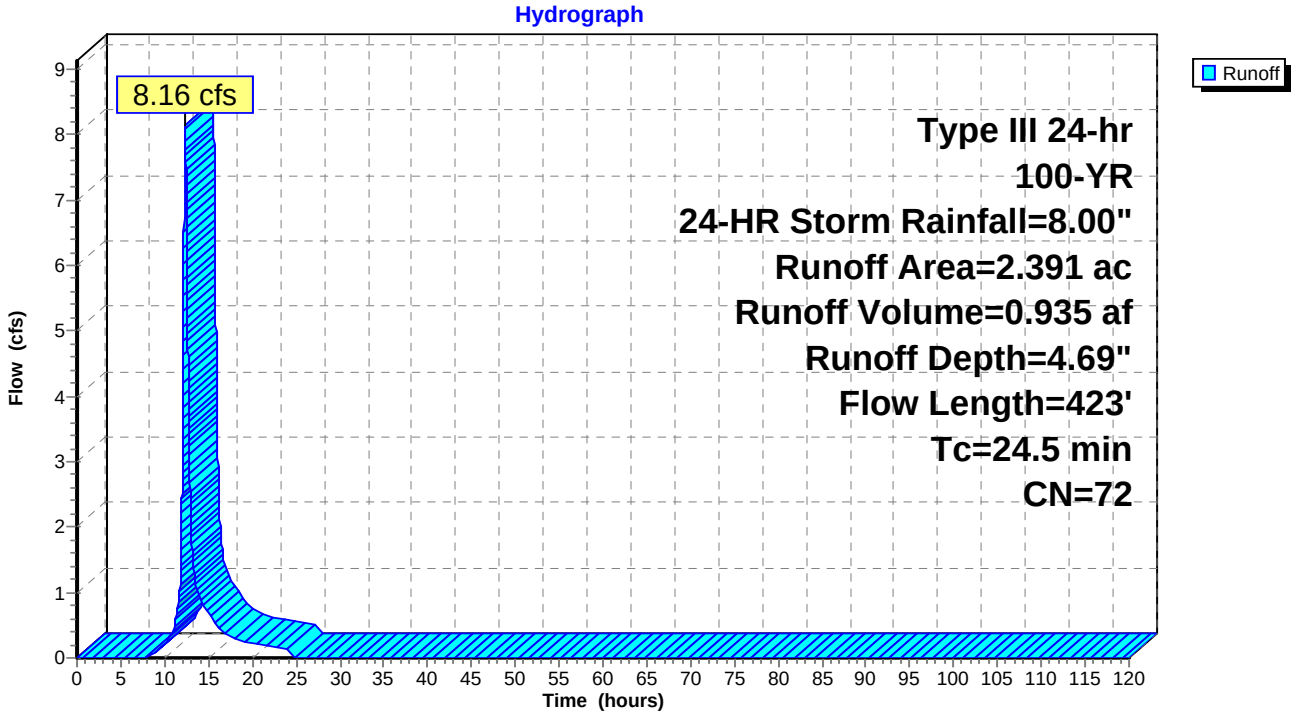
Runoff = 8.16 cfs @ 12.33 hrs, Volume= 0.935 af, Depth= 4.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.008	74	>75% Grass cover, Good, HSG C
0.949	74	>75% Grass cover, Good, HSG C
1.434	70	Woods, Good, HSG C
2.391	72	Weighted Average
2.391		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
16.5	150	0.0100	0.15		**Sheet Flow, Overland** Grass: Short n= 0.150 P2= 3.75"
8.0	273	0.0128	0.57		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
24.5	423	Total			

Subcatchment 7S: 29B



Summary for Subcatchment 8S: 29C

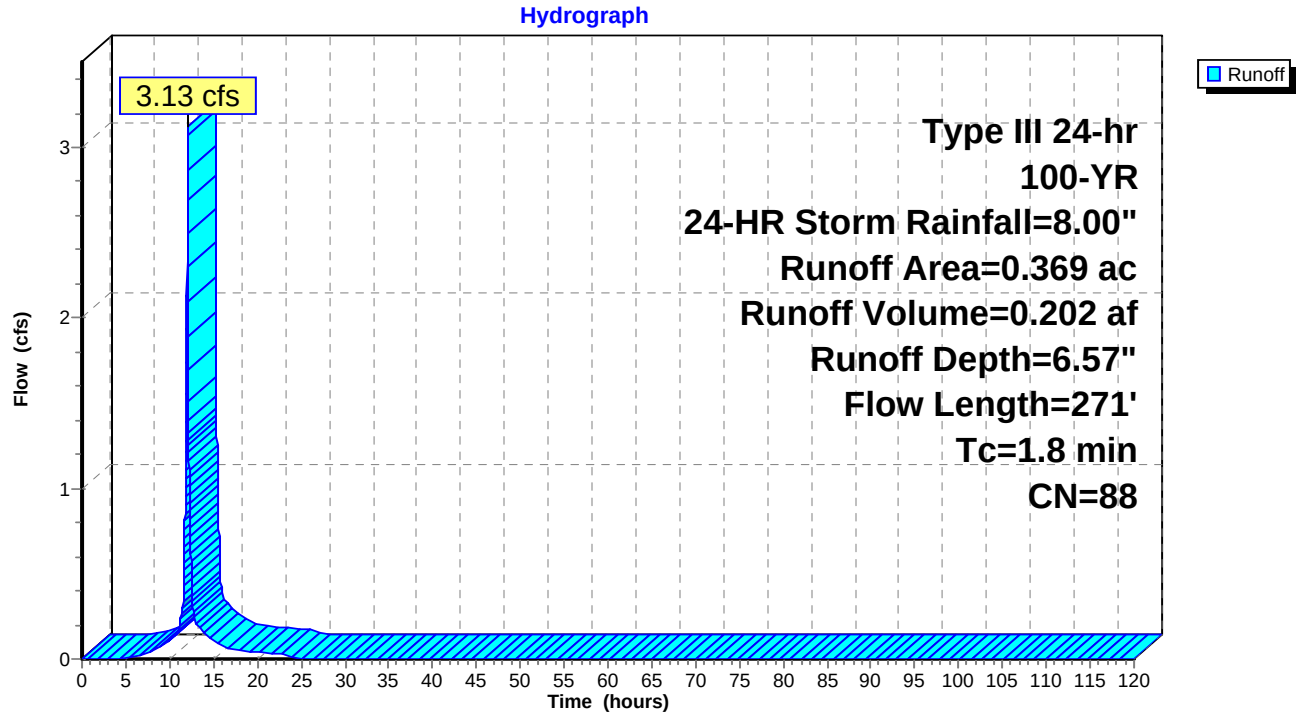
Runoff = 3.13 cfs @ 12.03 hrs, Volume= 0.202 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

	Area (ac)	CN	Description
	0.136	74	>75% Grass cover, Good, HSG C
*	0.046	89	Porous Pavement (Gravel roads), HSG C
	0.187	98	Paved roads w/curbs & sewers, HSG C
	0.369	88	Weighted Average
	0.182		49.32% Pervious Area
	0.187		50.68% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	64	0.0200	1.36		**Sheet Flow, Sheet Flow** Smooth surfaces n= 0.011 P2= 3.75"
0.7	127	0.0200	2.87		**Shallow Concentrated Flow, Gutter** Paved Kv= 20.3 fps
0.3	80	0.0100	5.26	6.46	**Pipe Channel, Storm Network** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	271	Total			

Subcatchment 8S: 29C



Summary for Subcatchment 9S: 29D

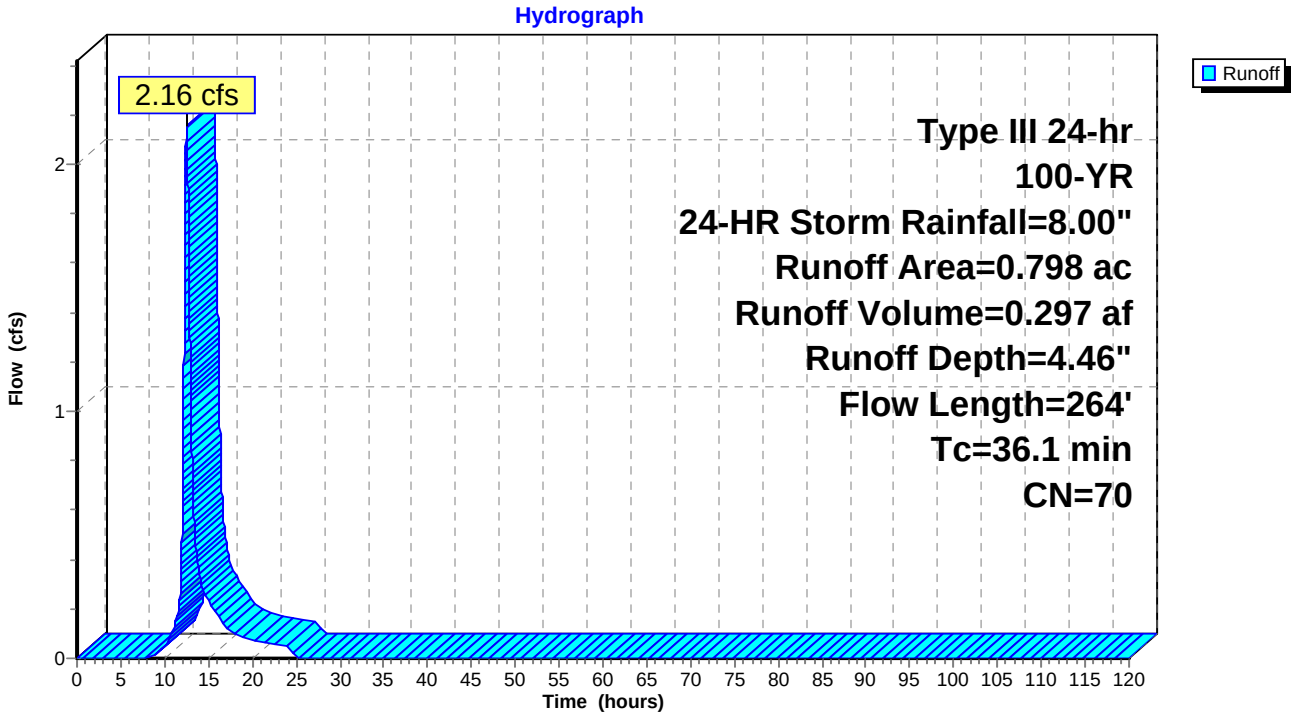
Runoff = 2.16 cfs @ 12.48 hrs, Volume= 0.297 af, Depth= 4.46"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.798	70	Woods, Good, HSG C
0.798		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
32.3	150	0.0133	0.08		**Sheet Flow, Overland** Woods: Light underbrush n= 0.400 P2= 3.75"
3.8	114	0.0100	0.50		**Shallow Concentrated Flow, Shallow** Woodland Kv= 5.0 fps
36.1	264	Total			

Subcatchment 9S: 29D



Summary for Subcatchment 10S: SW29A

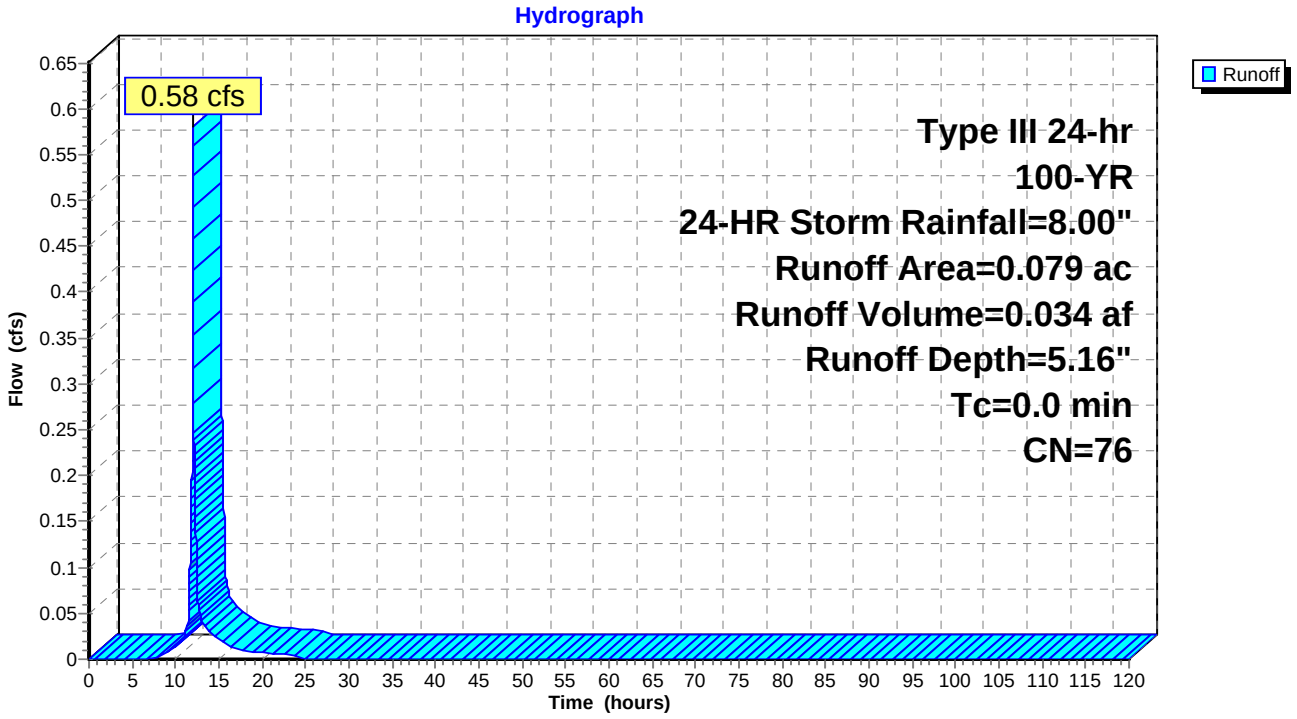
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.58 cfs @ 12.00 hrs, Volume= 0.034 af, Depth= 5.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.008	98	Water Surface, HSG C
0.071	74	>75% Grass cover, Good, HSG C
0.079	76	Weighted Average
0.071		89.87% Pervious Area
0.008		10.13% Impervious Area

Subcatchment 10S: SW29A



Summary for Subcatchment A1: A1

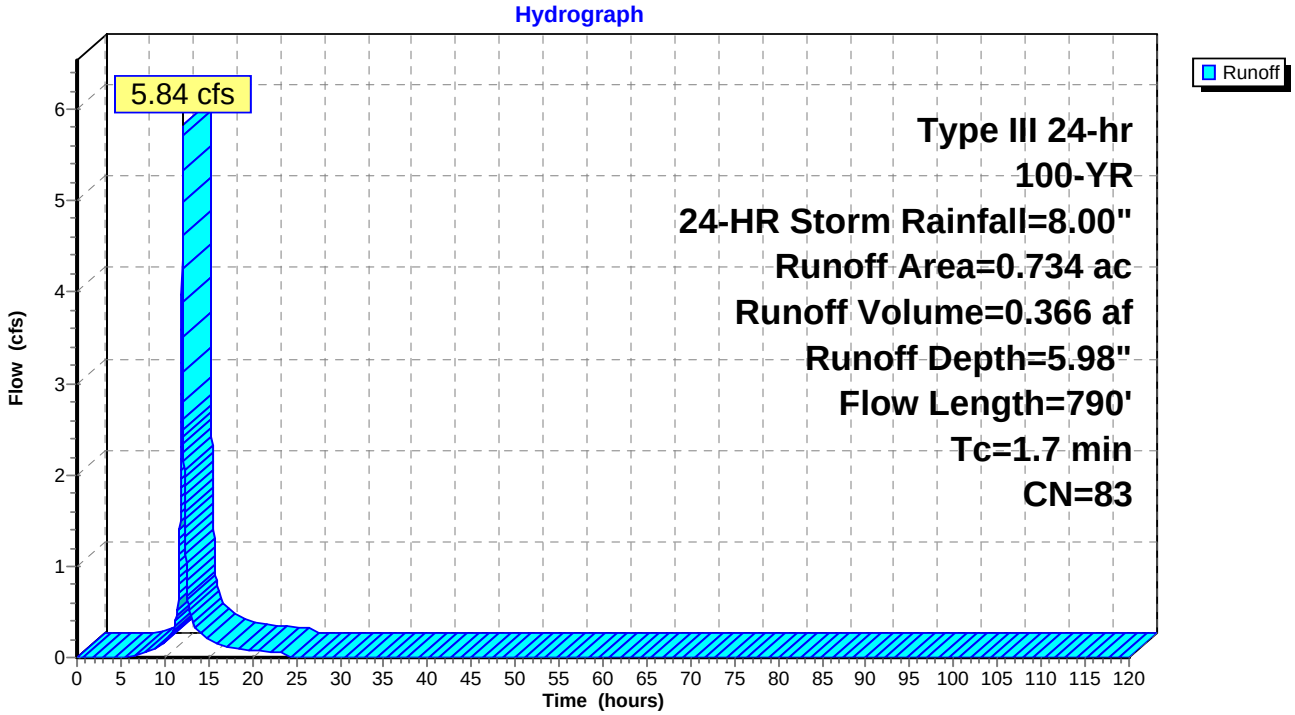
Runoff = 5.84 cfs @ 12.03 hrs, Volume= 0.366 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.004	74	>75% Grass cover, Good, HSG C
0.458	74	>75% Grass cover, Good, HSG C
0.007	89	Gravel roads, HSG C
0.265	98	Paved roads w/curbs & sewers, HSG C
0.734	83	Weighted Average
0.469		63.90% Pervious Area
0.265		36.10% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	81	0.0200	1.43		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	674	0.0846	15.82	193.04	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	35	0.0145	5.46	4.29	**Pipe Channel, Culvert Crossing** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.7	790	Total			

Subcatchment A1: A1



Summary for Subcatchment A2: A2

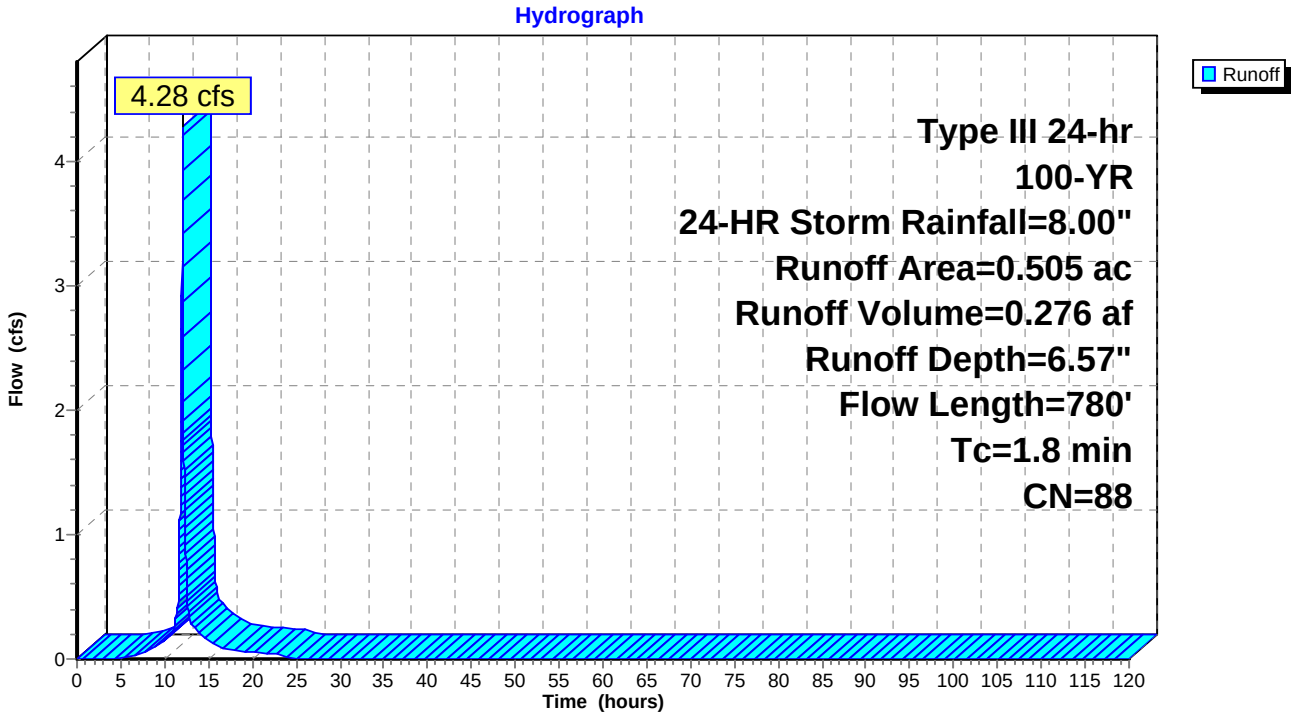
Runoff = 4.28 cfs @ 12.03 hrs, Volume= 0.276 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.200	74	>75% Grass cover, Good, HSG C
0.023	89	Gravel roads, HSG C
0.282	98	Paved roads w/curbs & sewers, HSG C
0.505	88	Weighted Average
0.223		44.16% Pervious Area
0.282		55.84% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.1	100	0.0200	1.49		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	658	0.0836	15.73	191.89	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.0	22	0.0577	12.64	15.52	**Pipe Channel, Pipe** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.8	780	Total			

Subcatchment A2: A2



Summary for Subcatchment A3: A3

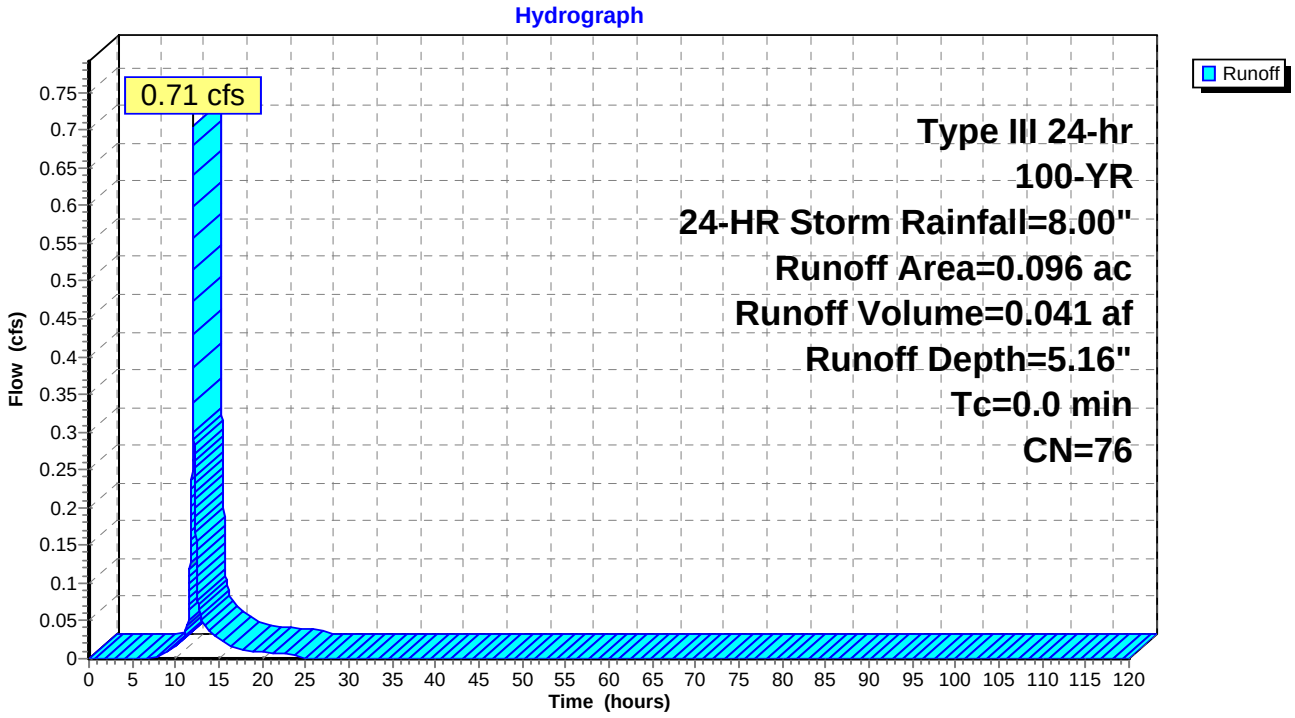
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.71 cfs @ 12.00 hrs, Volume= 0.041 af, Depth= 5.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.085	74	>75% Grass cover, Good, HSG C
0.011	89	Gravel roads, HSG C
0.096	76	Weighted Average
0.096		100.00% Pervious Area

Subcatchment A3: A3



Summary for Subcatchment B1: B1

[49] Hint: Tc<2dt may require smaller dt

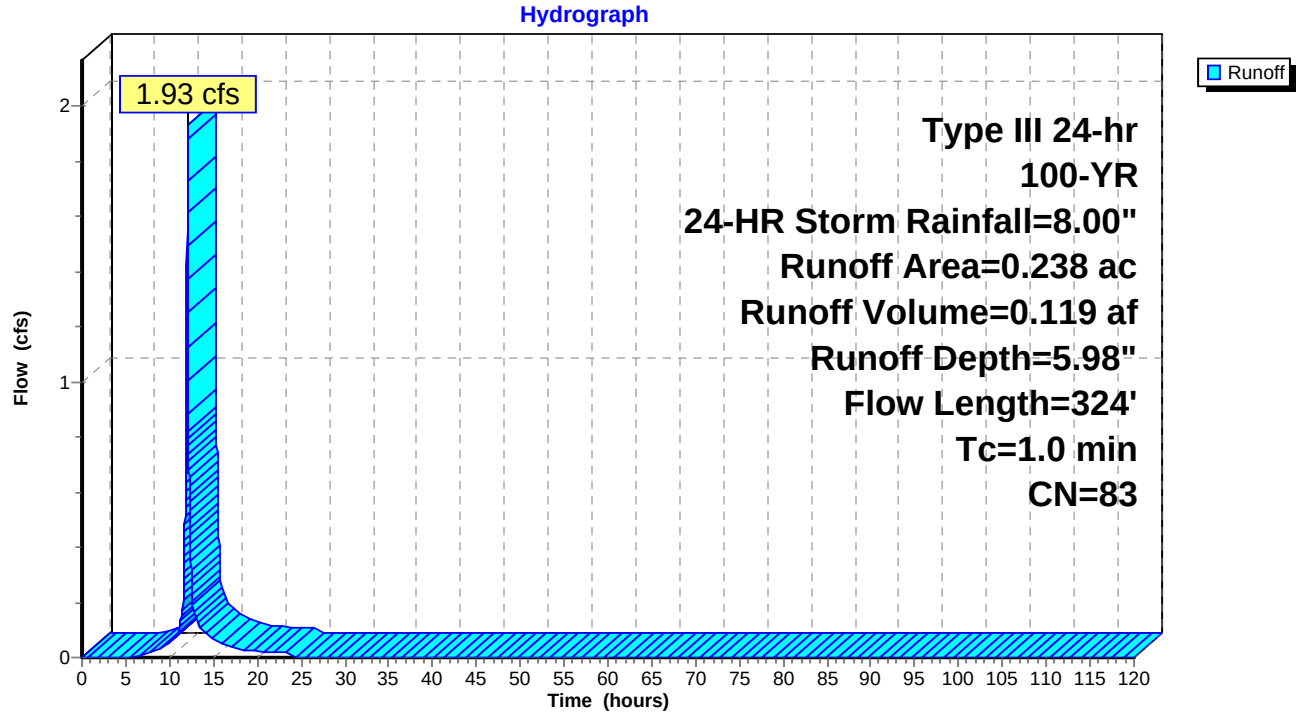
Runoff = 1.93 cfs @ 12.02 hrs, Volume= 0.119 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.150	74	>75% Grass cover, Good, HSG C
0.088	98	Paved roads w/curbs & sewers, HSG C
0.238	83	Weighted Average
0.150		63.03% Pervious Area
0.088		36.97% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0800	2.59		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	189	0.0476	11.87	144.80	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	35	0.0145	5.46	4.29	**Pipe Channel, Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.0	324	Total			

Subcatchment B1: B1



Summary for Subcatchment B2: B2

[49] Hint: Tc<2dt may require smaller dt

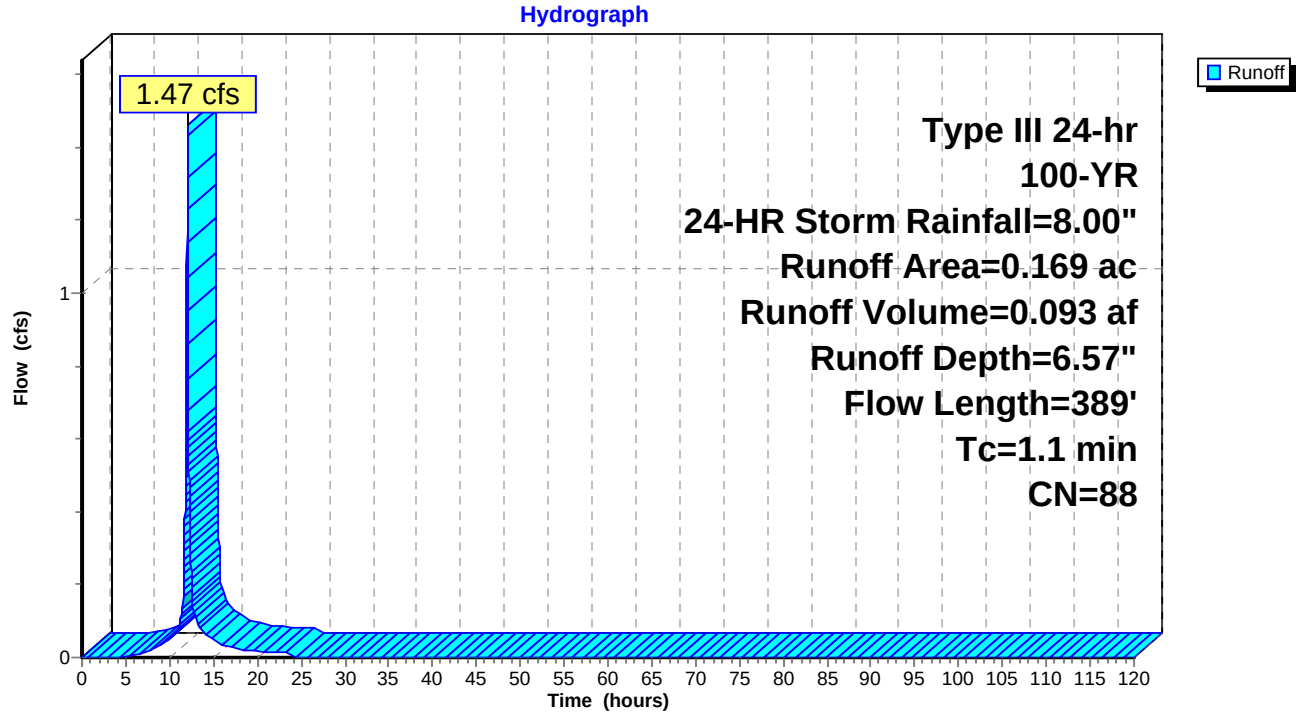
Runoff = 1.47 cfs @ 12.02 hrs, Volume= 0.093 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.067	74	>75% Grass cover, Good, HSG C
0.102	98	Paved roads w/curbs & sewers, HSG C
0.169	88	Weighted Average
0.067		39.64% Pervious Area
0.102		60.36% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	100	0.0830	2.63		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.4	263	0.0380	10.60	129.38	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	26	0.0338	8.34	6.55	**Pipe Channel, Pipe** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.1	389	Total			

Subcatchment B2: B2



Summary for Subcatchment B3: B3

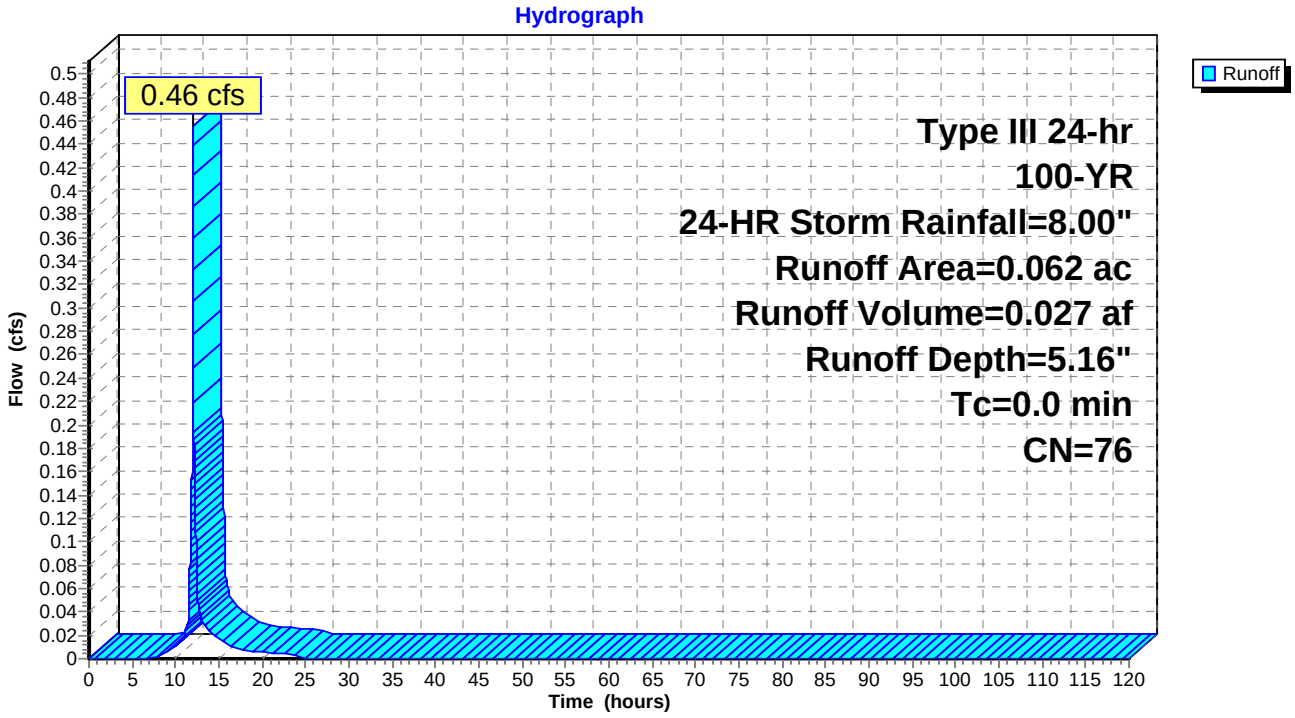
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.46 cfs @ 12.00 hrs, Volume= 0.027 af, Depth= 5.16"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.054	74	>75% Grass cover, Good, HSG C
0.008	89	Gravel roads, HSG C
0.062	76	Weighted Average
0.062		100.00% Pervious Area

Subcatchment B3: B3



Summary for Subcatchment C1: C1

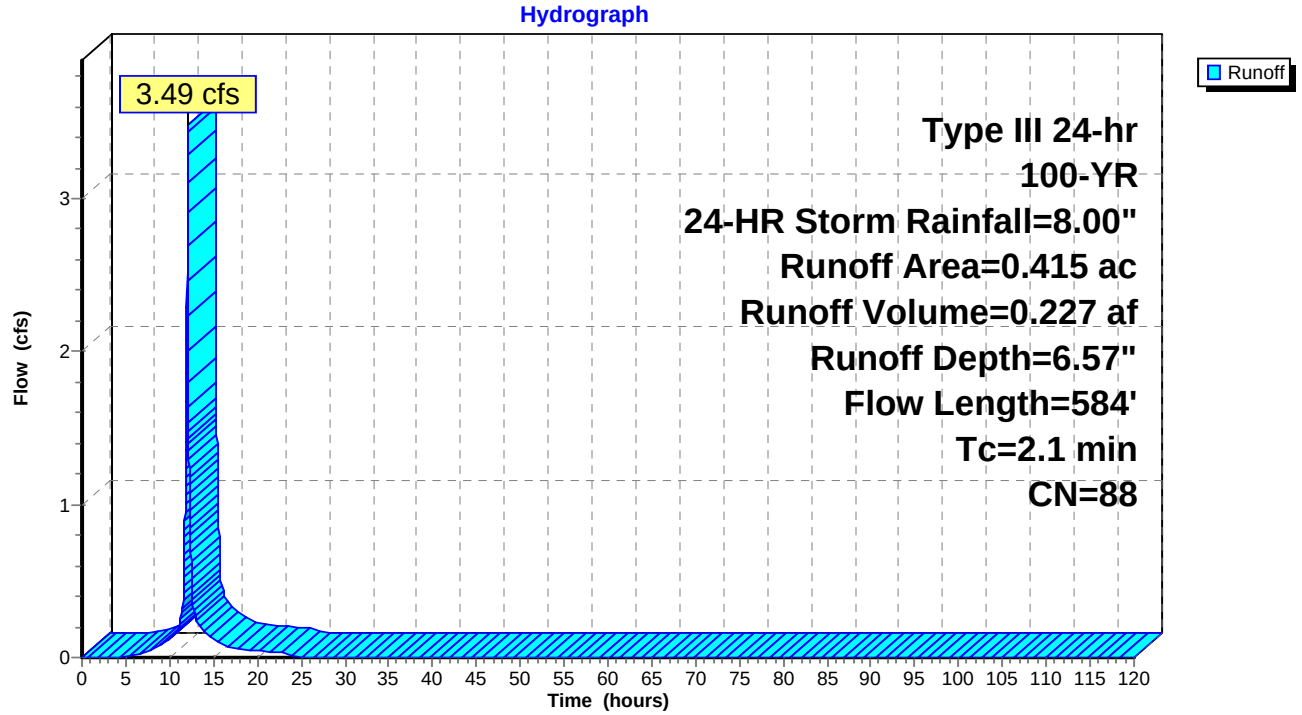
Runoff = 3.49 cfs @ 12.03 hrs, Volume= 0.227 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.143	74	>75% Grass cover, Good, HSG C
0.166	98	Paved roads w/curbs & sewers, HSG C
0.048	80	>75% Grass cover, Good, HSG D
0.058	98	Paved roads w/curbs & sewers, HSG D
0.415	88	Weighted Average
0.191		46.02% Pervious Area
0.224		53.98% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	86	0.0200	1.44		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
1.0	462	0.0216	8.00	97.54	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	36	0.0118	4.93	3.87	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
2.1	584	Total			

Subcatchment C1: C1



Summary for Subcatchment C2: C2

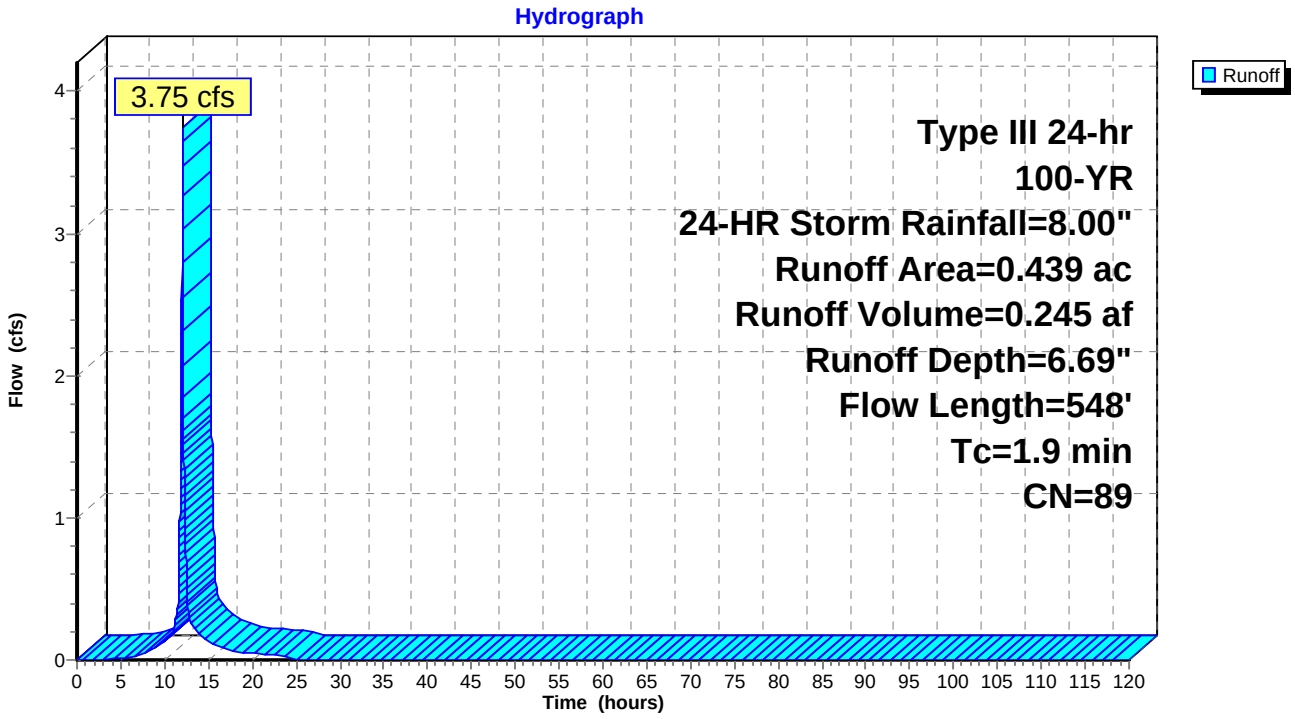
Runoff = 3.75 cfs @ 12.03 hrs, Volume= 0.245 af, Depth= 6.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.140	74	>75% Grass cover, Good, HSG C
0.189	98	Paved roads w/curbs & sewers, HSG C
0.043	80	>75% Grass cover, Good, HSG D
0.067	98	Paved roads w/curbs & sewers, HSG D
0.439	89	Weighted Average
0.183		41.69% Pervious Area
0.256		58.31% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	77	0.0200	1.41		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
1.0	471	0.0191	7.52	91.72	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.9	548	Total			

Subcatchment C2: C2



Summary for Subcatchment C3: C3

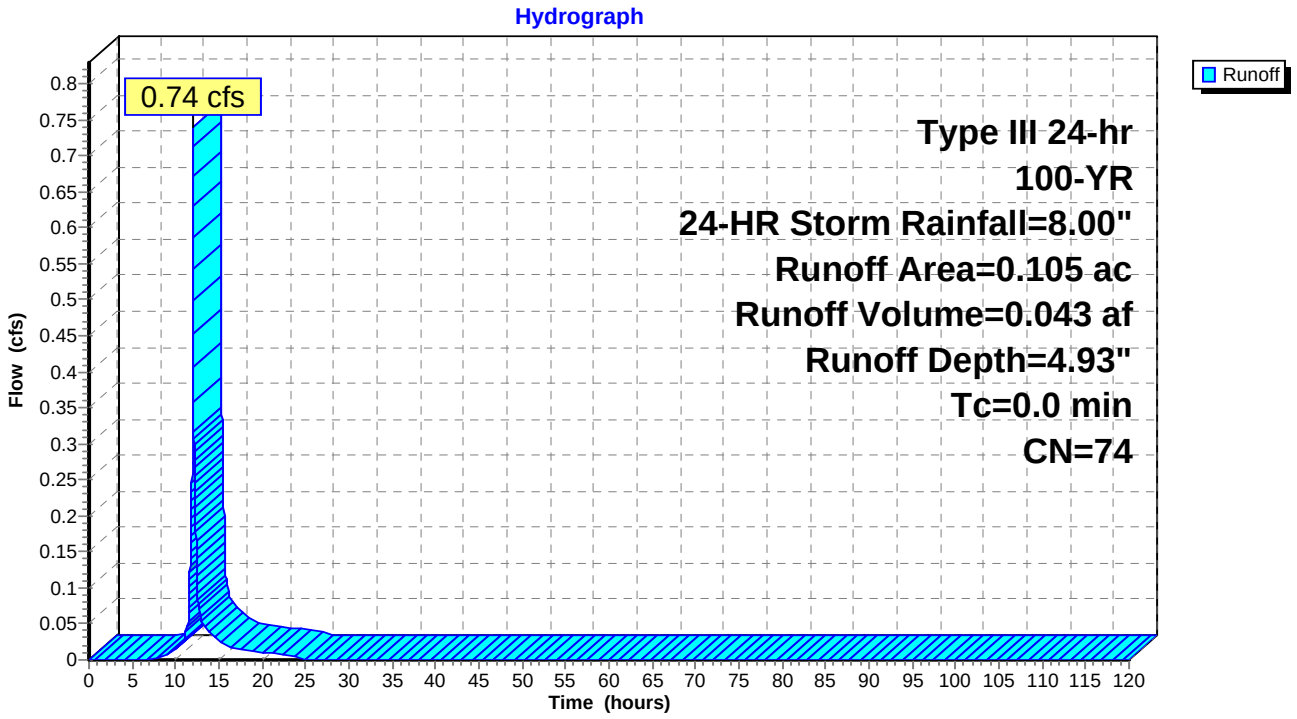
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.74 cfs @ 12.00 hrs, Volume= 0.043 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.105	74	>75% Grass cover, Good, HSG C
0.105		100.00% Pervious Area

Subcatchment C3: C3



Summary for Subcatchment D1: D1

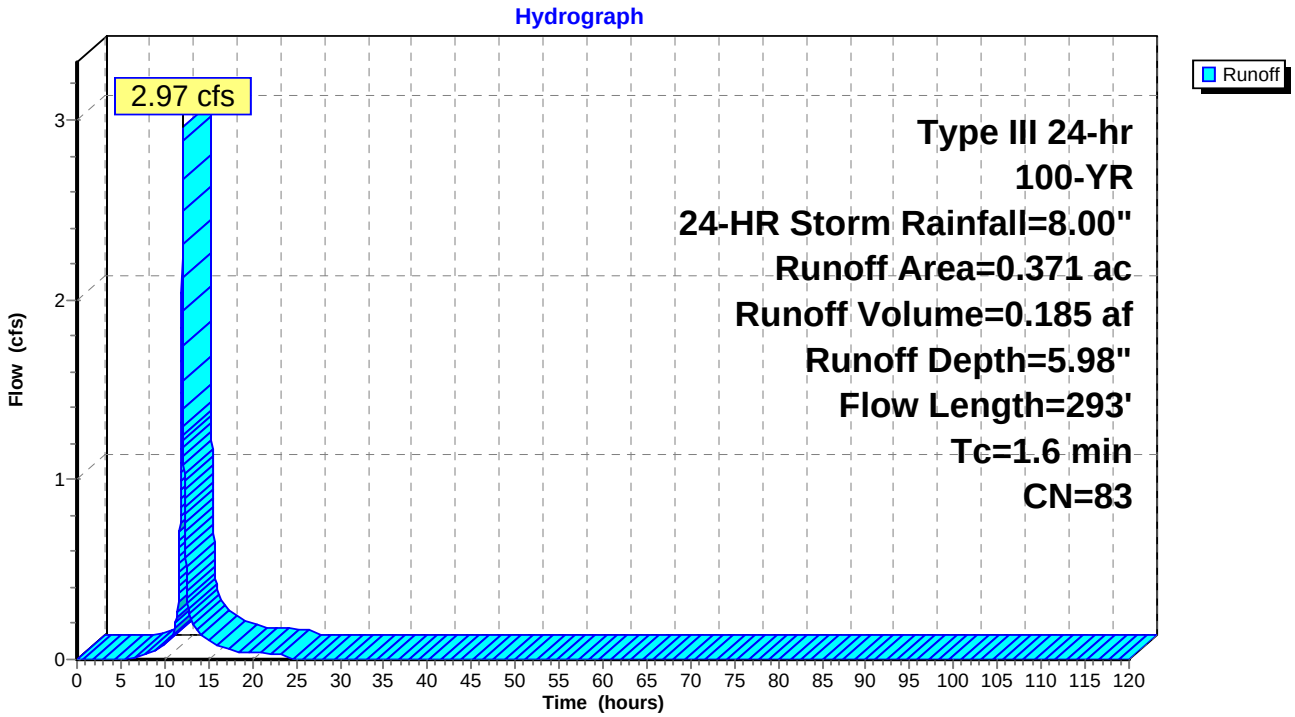
Runoff = 2.97 cfs @ 12.02 hrs, Volume= 0.185 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.228	74	>75% Grass cover, Good, HSG C
0.143	98	Paved roads w/curbs & sewers, HSG C
0.371	83	Weighted Average
0.228		61.46% Pervious Area
0.143		38.54% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	80	0.0100	1.08		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	183	0.0436	11.36	138.58	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	30	0.0118	4.93	3.87	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.6	293	Total			

Subcatchment D1: D1



Summary for Subcatchment D2: D2

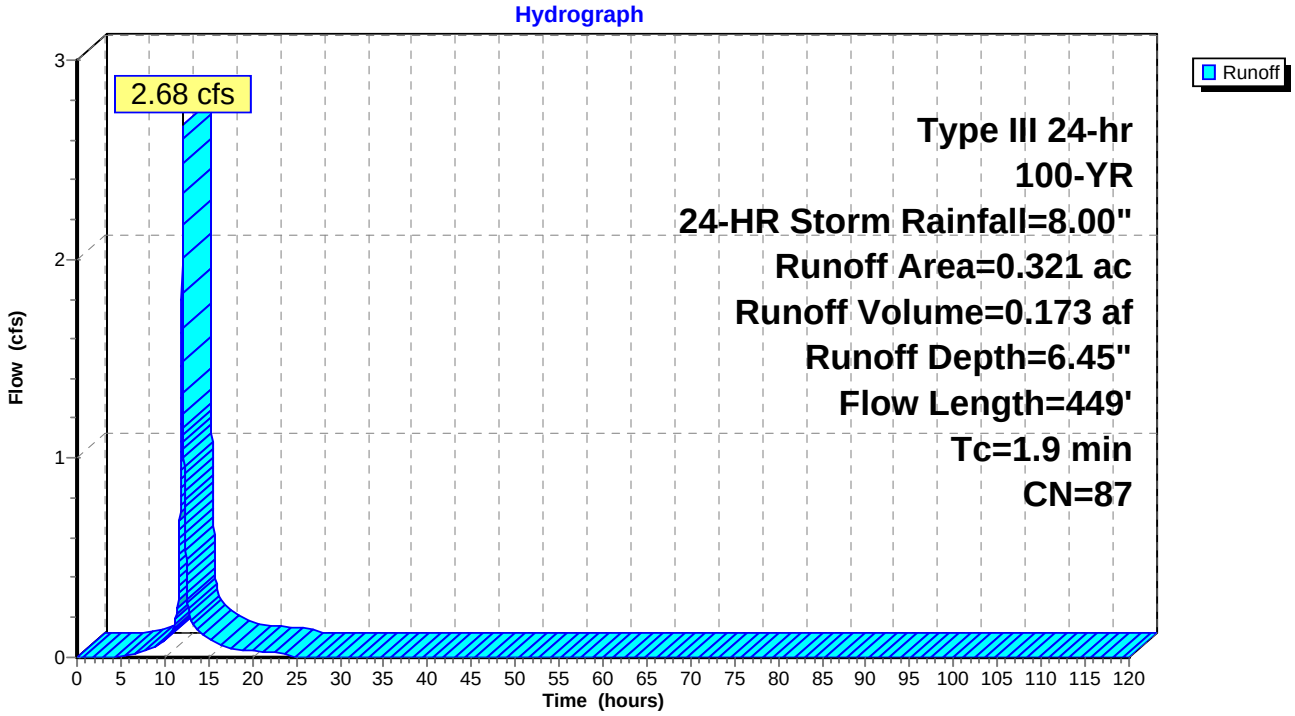
Runoff = 2.68 cfs @ 12.03 hrs, Volume= 0.173 af, Depth= 6.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.140	74	>75% Grass cover, Good, HSG C
0.017	89	Gravel roads, HSG C
0.164	98	Paved roads w/curbs & sewers, HSG C
0.321	87	Weighted Average
0.157		48.91% Pervious Area
0.164		51.09% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	78	0.0100	1.07		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.7	371	0.0256	8.70	106.19	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.9	449	Total			

Subcatchment D2: D2



Summary for Subcatchment D3: D3

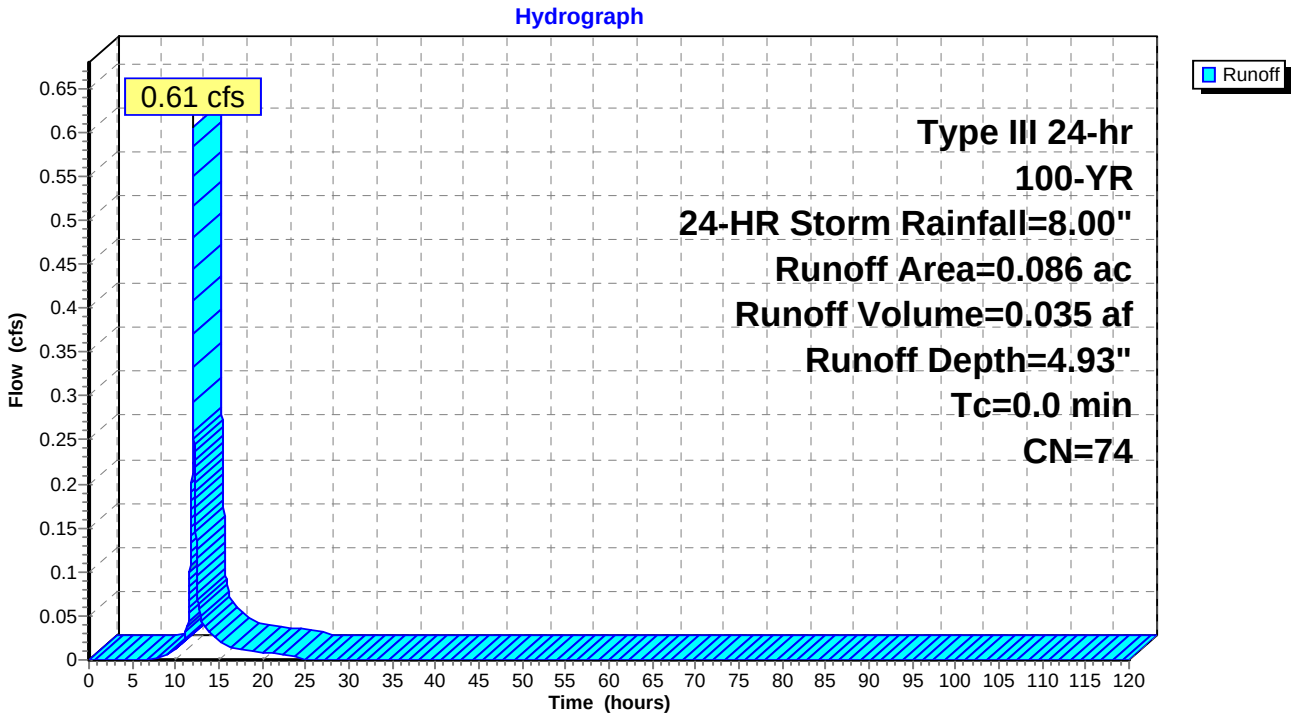
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.61 cfs @ 12.00 hrs, Volume= 0.035 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.086	74	>75% Grass cover, Good, HSG C
0.086		100.00% Pervious Area

Subcatchment D3: D3



Summary for Subcatchment E1: E1

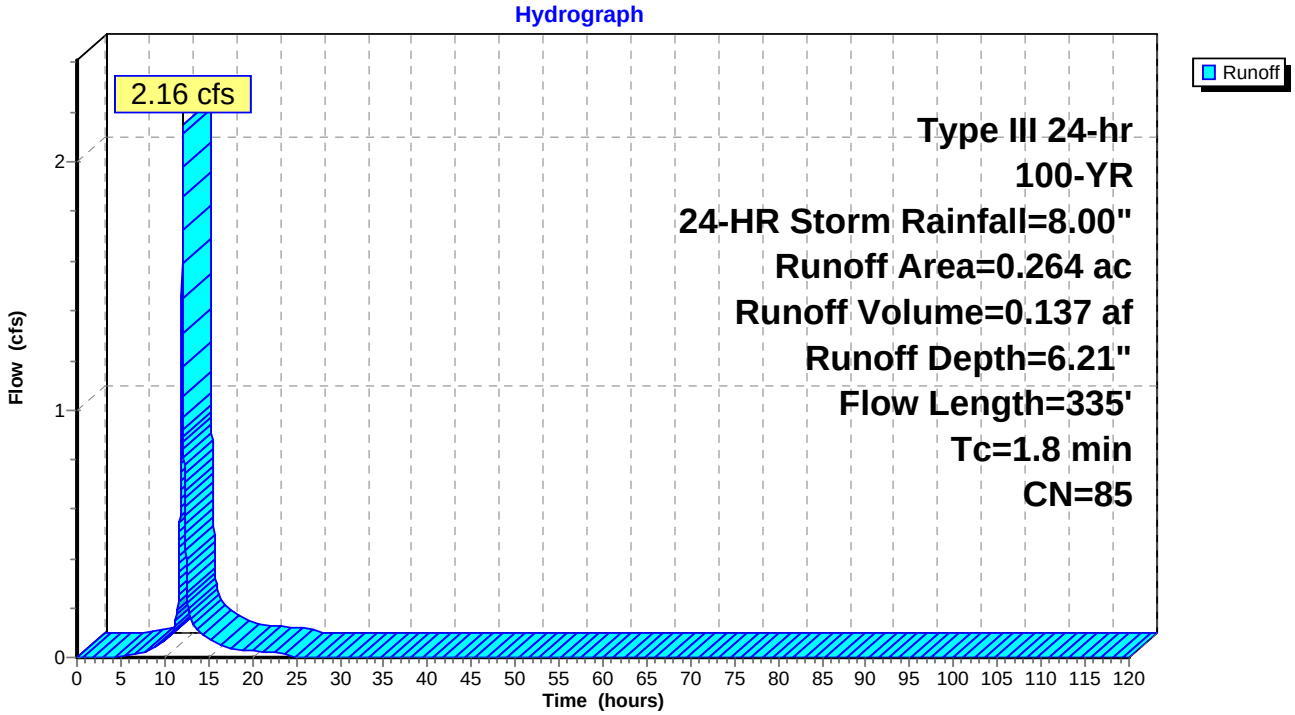
Runoff = 2.16 cfs @ 12.03 hrs, Volume= 0.137 af, Depth= 6.21"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.145	74	>75% Grass cover, Good, HSG C
0.119	98	Paved roads w/curbs & sewers, HSG C
0.264	85	Weighted Average
0.145		54.92% Pervious Area
0.119		45.08% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.2	81	0.0100	1.08		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	223	0.0179	7.28	88.79	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	31	0.0128	5.13	4.03	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.8	335	Total			

Subcatchment E1: E1



Summary for Subcatchment E2: E2

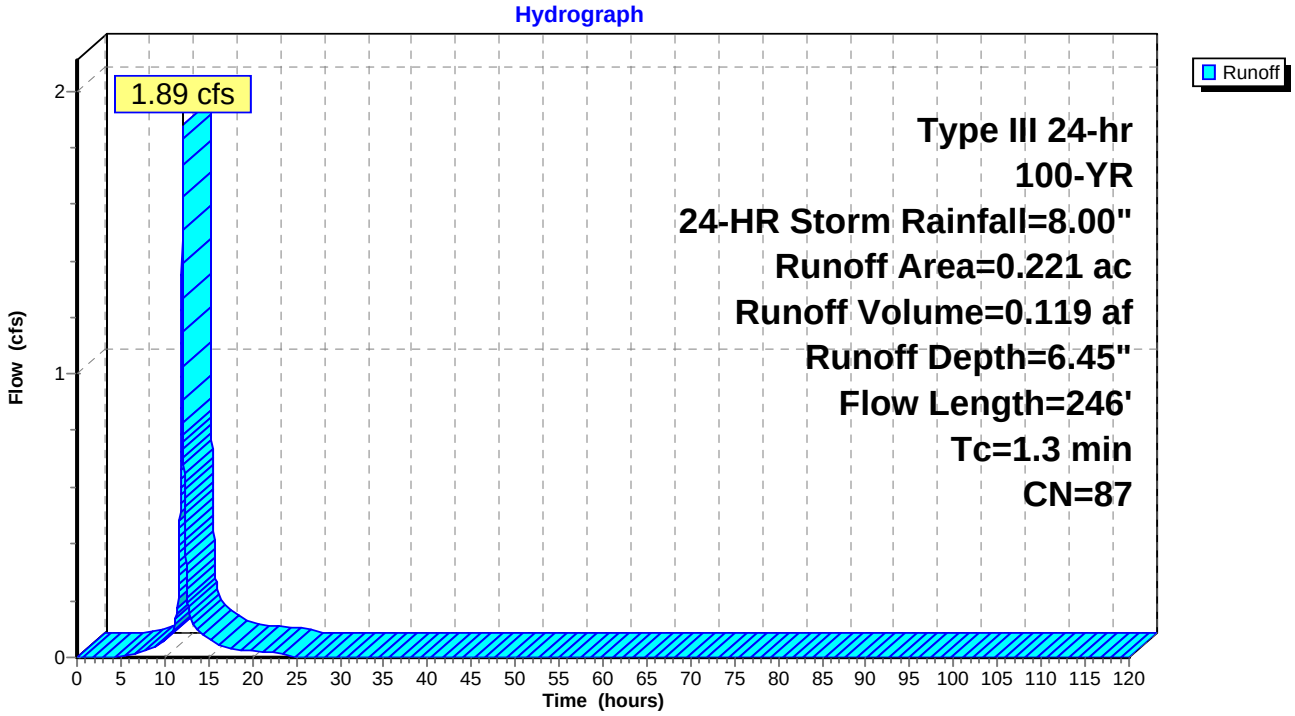
Runoff = 1.89 cfs @ 12.02 hrs, Volume= 0.119 af, Depth= 6.45"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.093	74	>75% Grass cover, Good, HSG C
0.032	89	Gravel roads, HSG C
0.096	98	Paved roads w/curbs & sewers, HSG C
0.221	87	Weighted Average
0.125		56.56% Pervious Area
0.096		43.44% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	50	0.0100	0.98		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	196	0.0153	6.73	82.09	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	246	Total			

Subcatchment E2: E2



Summary for Subcatchment E4: E4

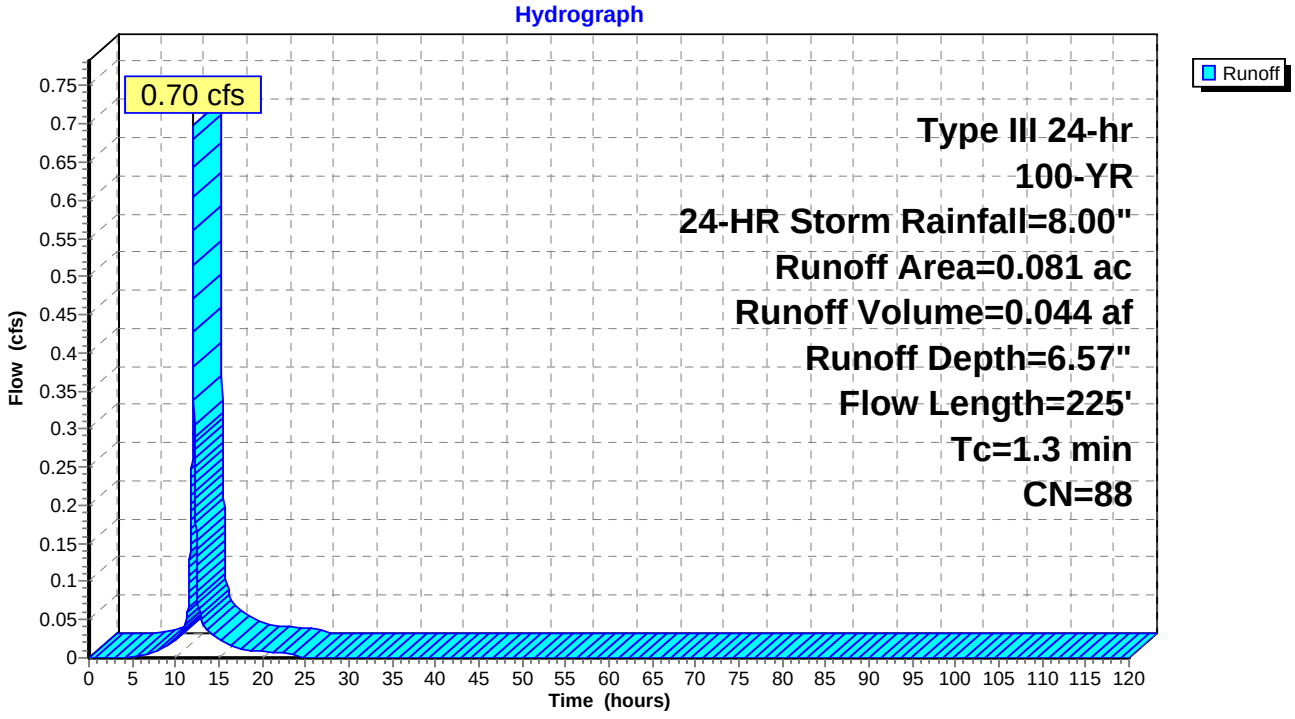
Runoff = 0.70 cfs @ 12.02 hrs, Volume= 0.044 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.046	98	Paved roads w/curbs & sewers, HSG C
0.035	74	>75% Grass cover, Good, HSG C
0.081	88	Weighted Average
0.035		43.21% Pervious Area
0.046		56.79% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.8	46	0.0100	0.97		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	179	0.0117	5.88	71.79	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	225	Total			

Subcatchment E4: E4



Summary for Subcatchment E5: E5

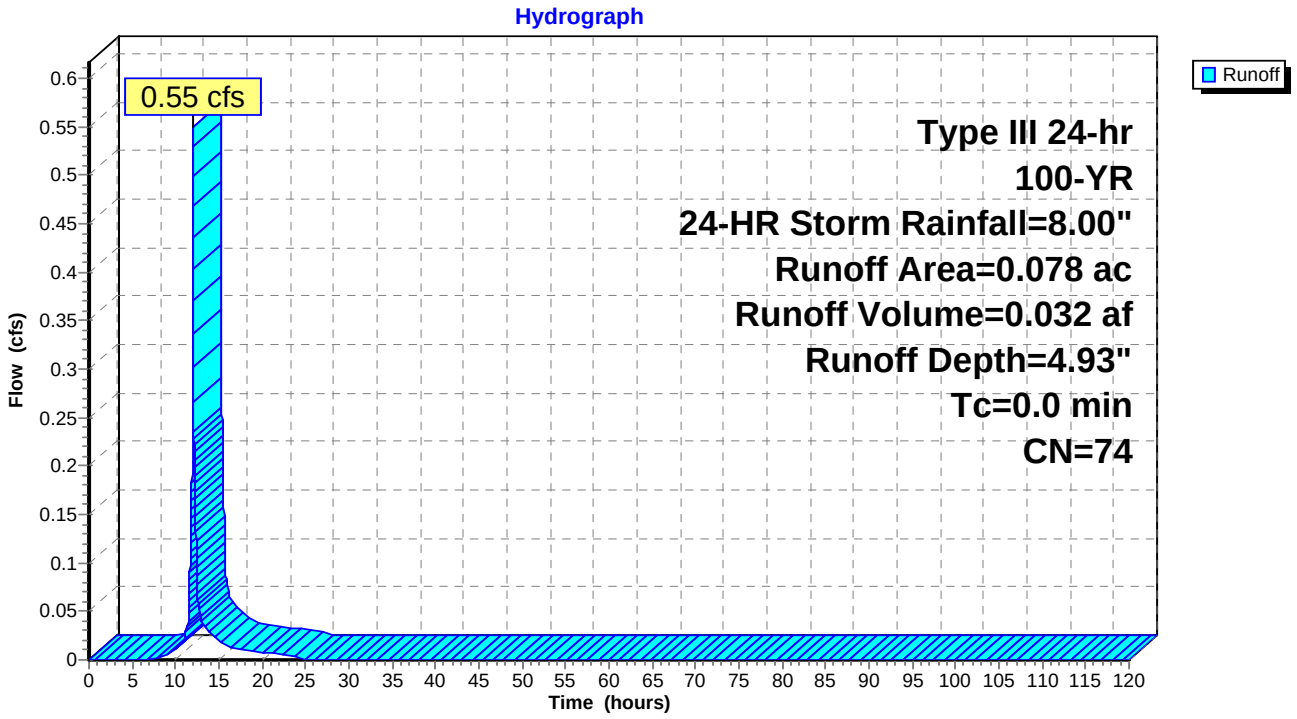
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.55 cfs @ 12.00 hrs, Volume= 0.032 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.078	74	>75% Grass cover, Good, HSG C
0.078		100.00% Pervious Area

Subcatchment E5: E5



Summary for Subcatchment F1: F1

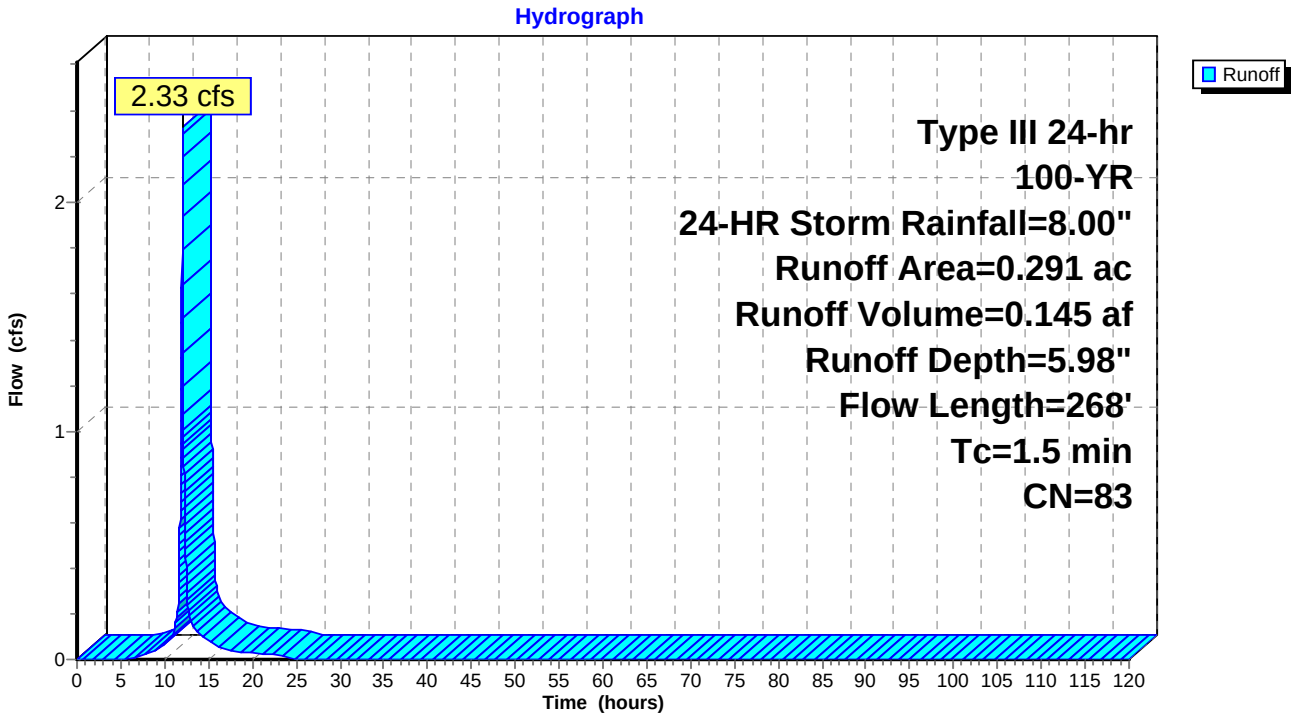
Runoff = 2.33 cfs @ 12.02 hrs, Volume= 0.145 af, Depth= 5.98"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.177	74	>75% Grass cover, Good, HSG C
0.114	98	Paved roads w/curbs & sewers, HSG C
0.291	83	Weighted Average
0.177		60.82% Pervious Area
0.114		39.18% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.9	54	0.0100	1.00		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.5	182	0.0110	5.71	69.61	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.1	32	0.0078	4.65	5.71	**Pipe Channel, Culvert** 15.0" Round Area= 1.2 sf Perim= 3.9' r= 0.31' n= 0.013
1.5	268	Total			

Subcatchment F1: F1



Summary for Subcatchment F2: F2

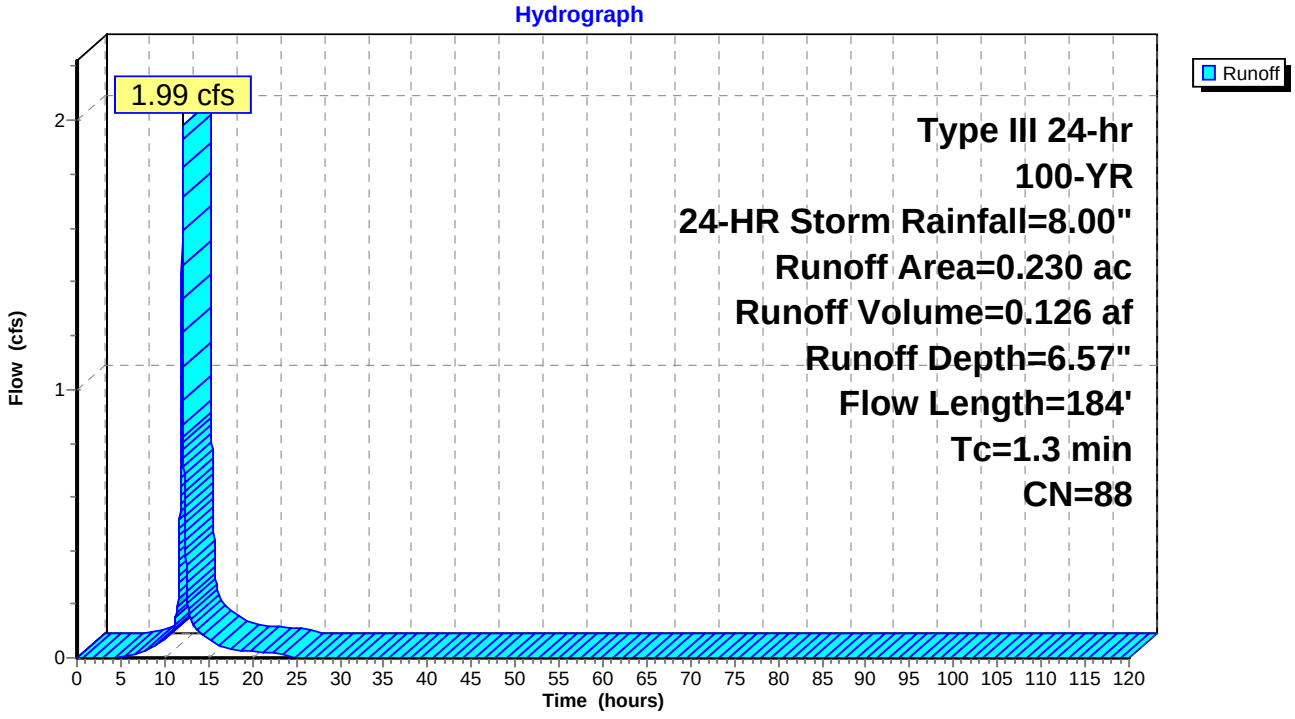
Runoff = 1.99 cfs @ 12.02 hrs, Volume= 0.126 af, Depth= 6.57"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.092	74	>75% Grass cover, Good, HSG C
0.138	98	Paved roads w/curbs & sewers, HSG C
0.230	88	Weighted Average
0.092		40.00% Pervious Area
0.138		60.00% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
1.0	58	0.0100	1.01		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.3	126	0.0160	6.88	83.95	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.3	184	Total			

Subcatchment F2: F2



Summary for Subcatchment F3: F3

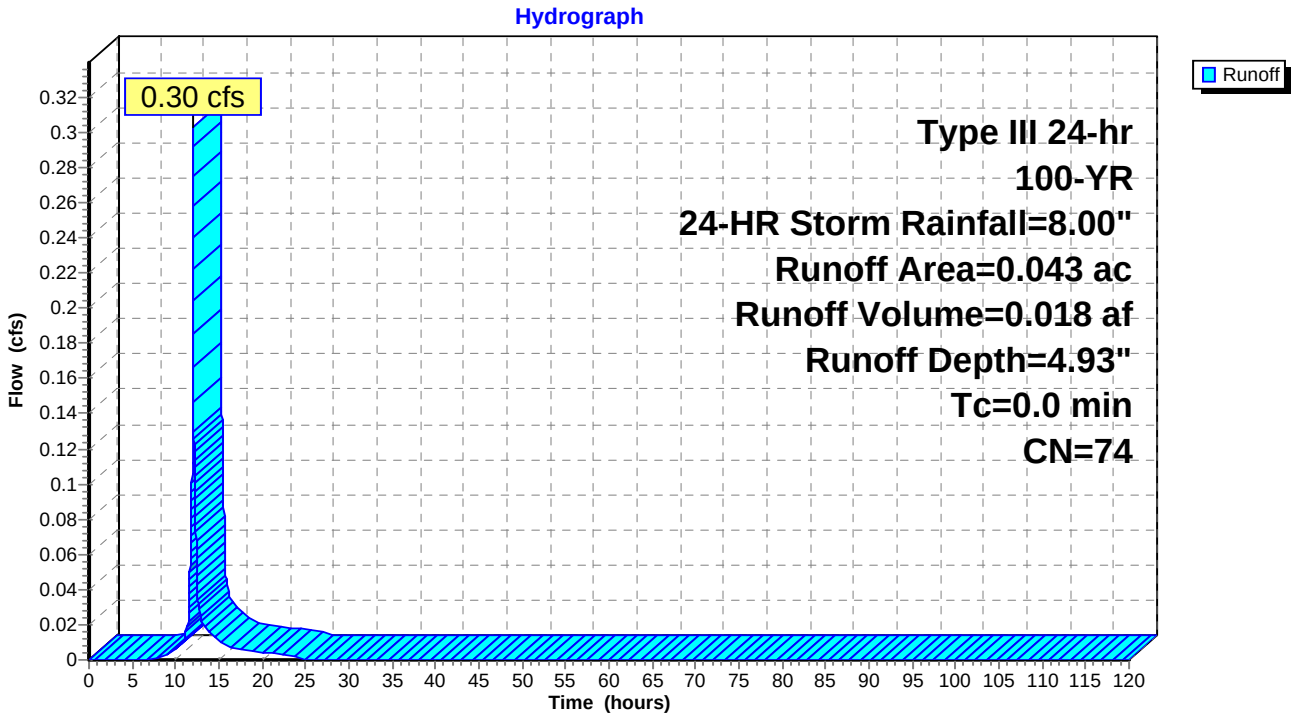
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.30 cfs @ 12.00 hrs, Volume= 0.018 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.043	74	>75% Grass cover, Good, HSG C
0.043		100.00% Pervious Area

Subcatchment F3: F3



Summary for Subcatchment G1: G1

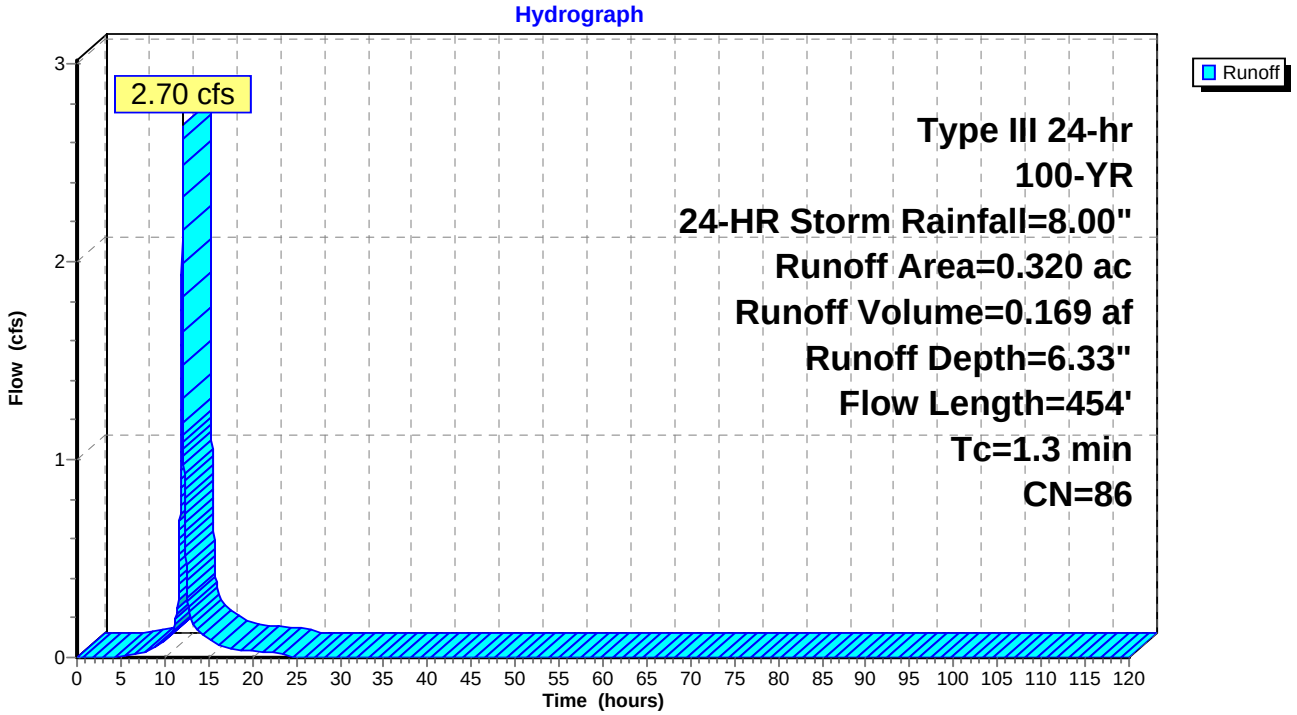
Runoff = 2.70 cfs @ 12.02 hrs, Volume= 0.169 af, Depth= 6.33"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.130	74	>75% Grass cover, Good, HSG C
0.095	98	Paved roads w/curbs & sewers, HSG C
0.047	80	>75% Grass cover, Good, HSG D
0.048	98	Paved roads w/curbs & sewers, HSG D
0.320	86	Weighted Average
0.177		55.31% Pervious Area
0.143		44.69% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.7	57	0.0200	1.33		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.6	364	0.0329	9.87	120.38	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
0.0	33	0.0920	13.76	10.81	**Pipe Channel, Culvert** 12.0" Round Area= 0.8 sf Perim= 3.1' r= 0.25' n= 0.013
1.3	454	Total			

Subcatchment G1: G1



Summary for Subcatchment G2: G2

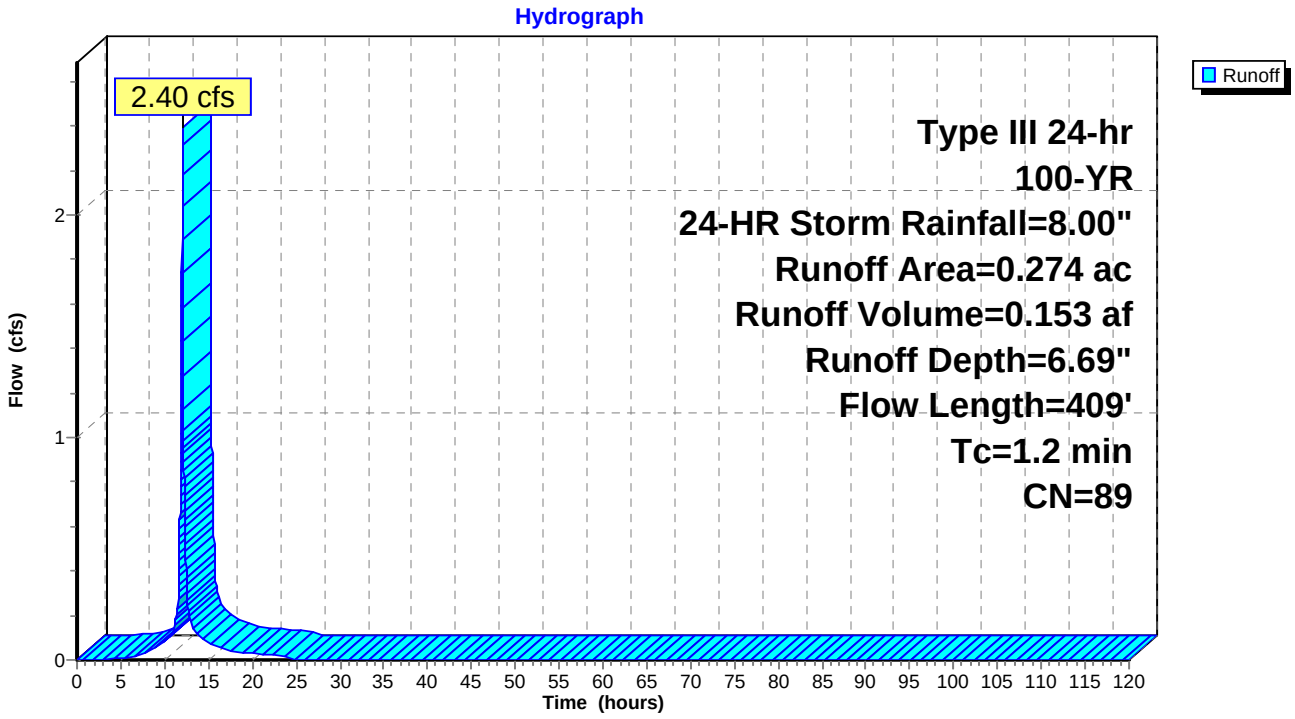
Runoff = 2.40 cfs @ 12.02 hrs, Volume= 0.153 af, Depth= 6.69"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.072	74	>75% Grass cover, Good, HSG C
0.101	98	Paved roads w/curbs & sewers, HSG C
0.046	80	>75% Grass cover, Good, HSG D
0.055	98	Paved roads w/curbs & sewers, HSG D
0.274	89	Weighted Average
0.118		43.07% Pervious Area
0.156		56.93% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
0.6	49	0.0200	1.29		**Sheet Flow, Pavement** Smooth surfaces n= 0.011 P2= 3.75"
0.6	360	0.0360	10.32	125.92	**Channel Flow, Vegetated Swale** Area= 12.2 sf Perim= 10.6' r= 1.15' n= 0.030
1.2	409	Total			

Subcatchment G2: G2



Summary for Subcatchment G3: G3

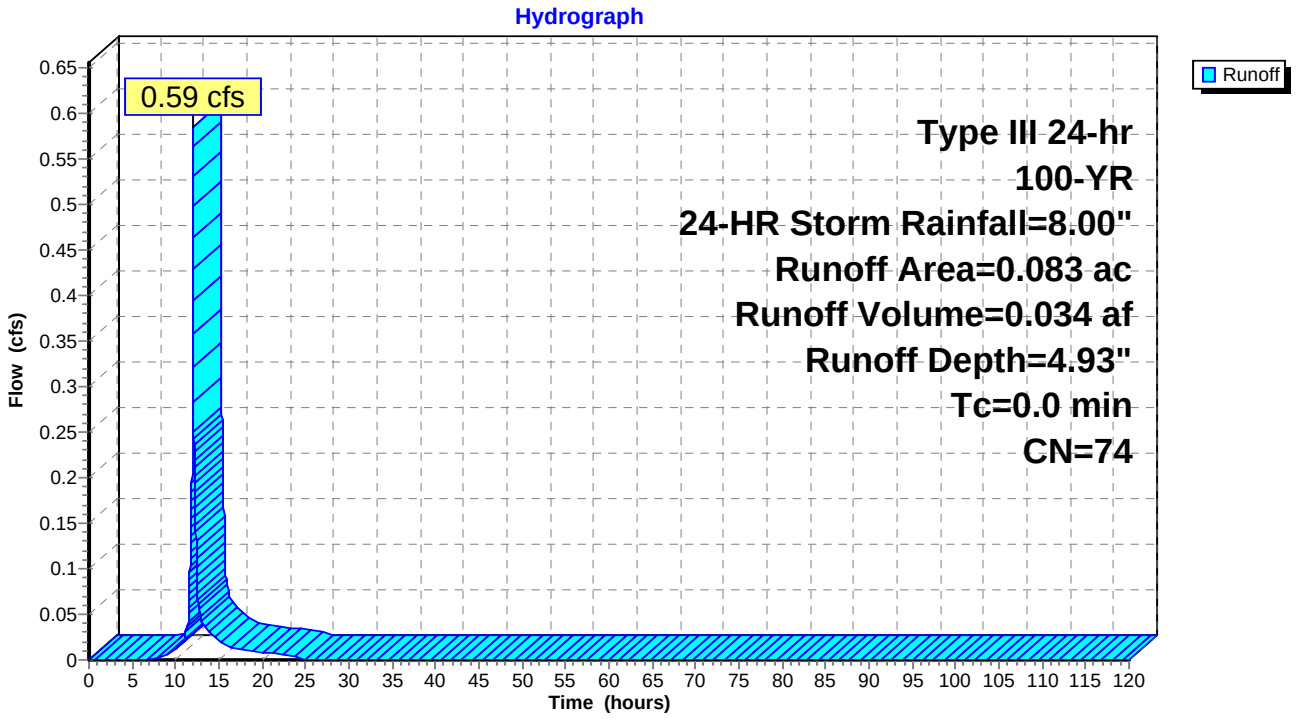
[46] Hint: Tc=0 (Instant runoff peak depends on dt)

Runoff = 0.59 cfs @ 12.00 hrs, Volume= 0.034 af, Depth= 4.93"

Runoff by SCS TR-20 method, UH=SCS, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Type III 24-hr 100-YR, 24-HR Storm Rainfall=8.00"

Area (ac)	CN	Description
0.083	74	>75% Grass cover, Good, HSG C
0.083		100.00% Pervious Area

Subcatchment G3: G3



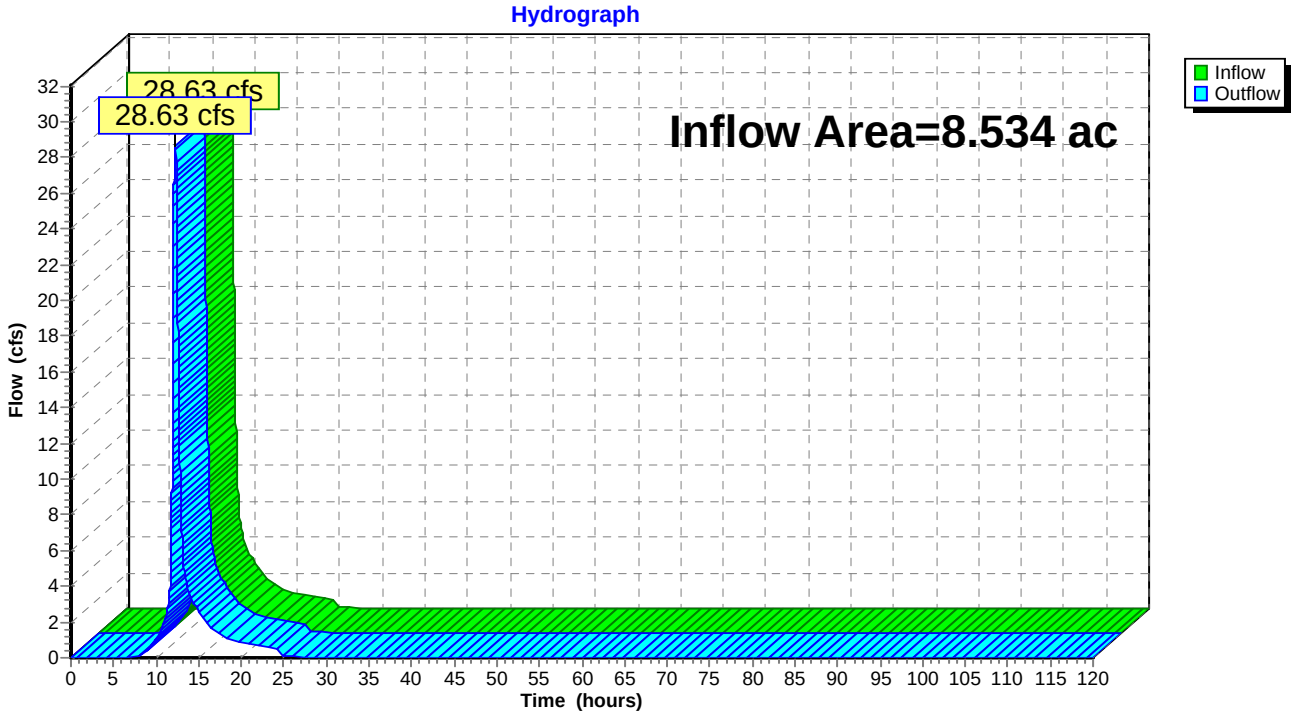
Summary for Reach DP-10: DP-10

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 8.534 ac, 15.60% Impervious, Inflow Depth = 5.26" for 100-YR, 24-HR Storm event
Inflow = 28.63 cfs @ 12.28 hrs, Volume= 3.738 af
Outflow = 28.63 cfs @ 12.29 hrs, Volume= 3.738 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP-10: DP-10



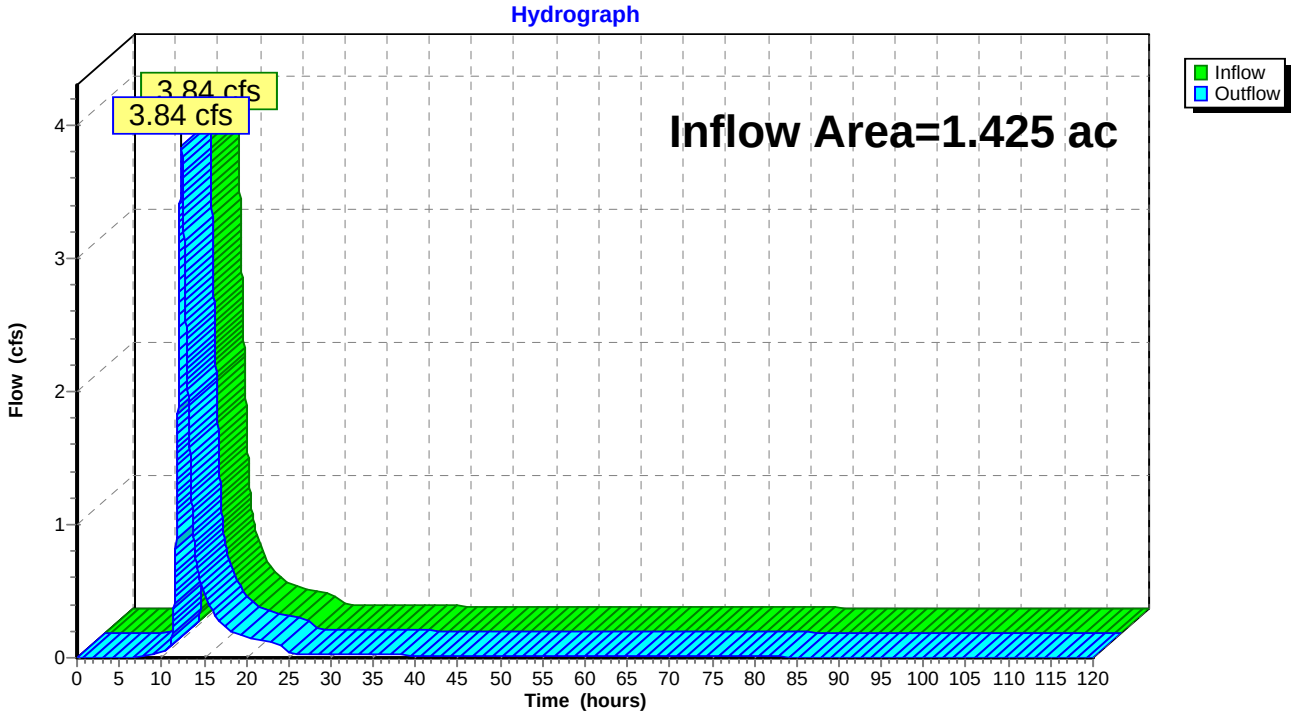
Summary for Reach DP-11: DP-11

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.425 ac, 41.68% Impervious, Inflow Depth > 6.13" for 100-YR, 24-HR Storm event
Inflow = 3.84 cfs @ 12.32 hrs, Volume= 0.728 af
Outflow = 3.84 cfs @ 12.33 hrs, Volume= 0.728 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP-11: DP-11



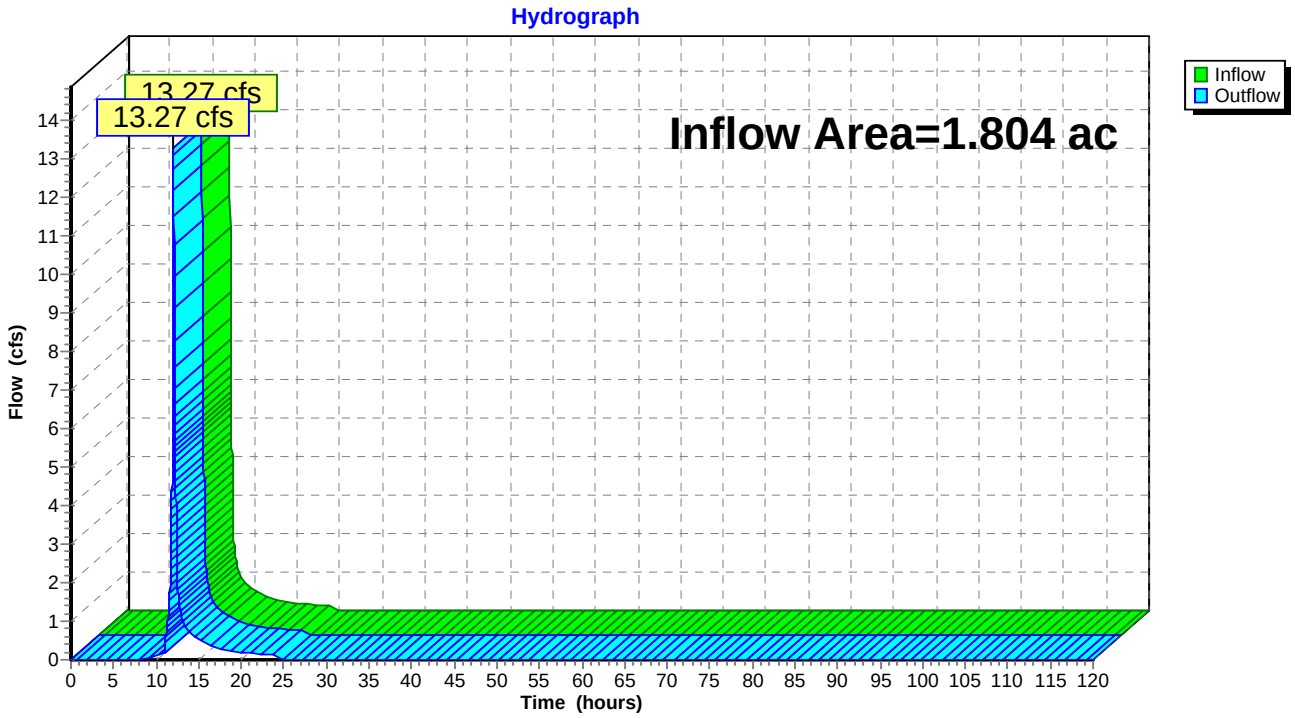
Summary for Reach DP3: DP-3

[40] Hint: Not Described (Outflow=Inflow)

Inflow Area = 1.804 ac, 40.85% Impervious, Inflow Depth = 5.52" for 100-YR, 24-HR Storm event
Inflow = 13.27 cfs @ 12.04 hrs, Volume= 0.829 af
Outflow = 13.27 cfs @ 12.05 hrs, Volume= 0.829 af, Atten= 0%, Lag= 0.6 min

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs

Reach DP3: DP-3



Summary for Pond 1P: Bioretention Area A

Inflow Area = 1.335 ac, 40.97% Impervious, Inflow Depth = 5.01" for 100-YR, 24-HR Storm event
Inflow = 5.64 cfs @ 12.03 hrs, Volume= 0.558 af
Outflow = 5.25 cfs @ 12.06 hrs, Volume= 0.481 af, Atten= 7%, Lag= 1.6 min
Primary = 5.25 cfs @ 12.06 hrs, Volume= 0.481 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,366.34' @ 12.06 hrs Surf.Area= 2,540 sf Storage= 4,507 cf

Plug-Flow detention time= 165.1 min calculated for 0.481 af (86% of inflow)
Center-of-Mass det. time= 101.2 min (903.3 - 802.2)

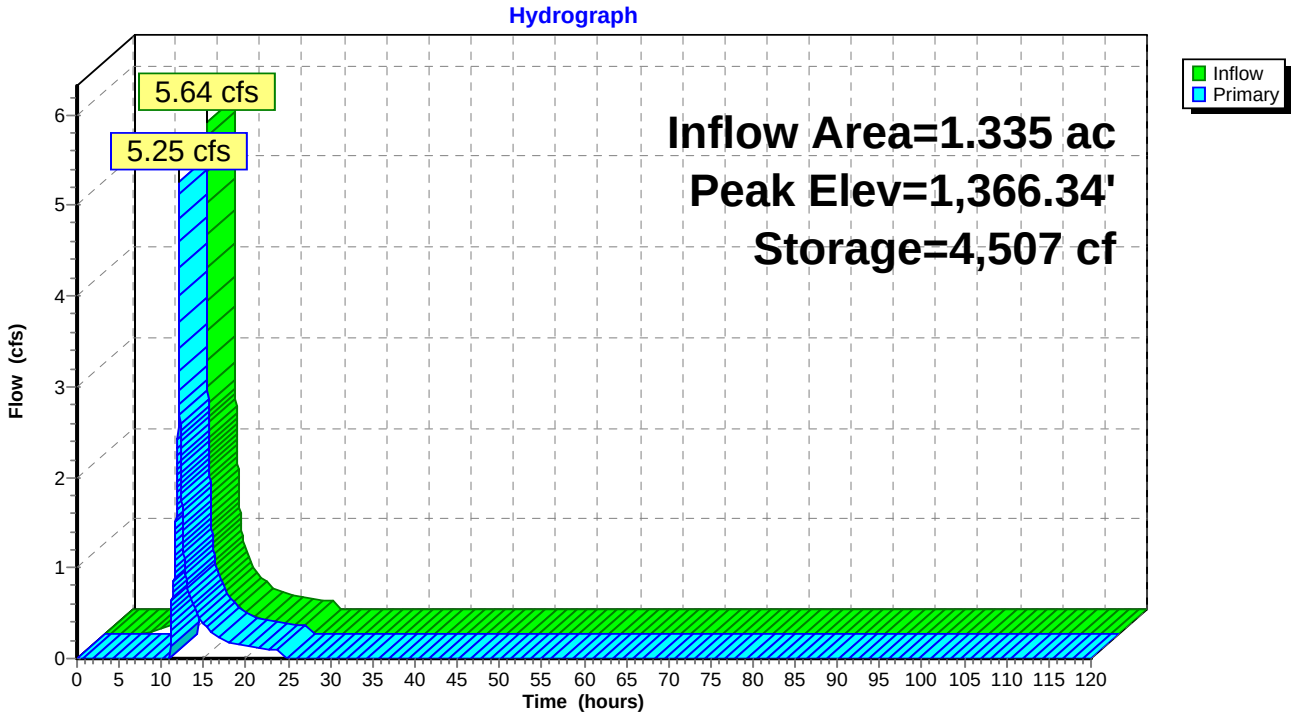
Volume	Invert	Avail.Storage	Storage Description
#1	1,360.50'	4,917 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,360.50	2,077	185.3	0.0	0	0	2,077
1,361.50	2,077	185.3	25.0	519	519	2,262
1,362.50	2,077	185.3	25.0	519	1,039	2,448
1,363.50	2,077	185.3	25.0	519	1,558	2,633
1,364.50	2,077	185.3	25.0	519	2,077	2,818
1,365.50	2,077	185.3	25.0	519	2,596	3,004
1,366.00	2,271	192.5	100.0	1,087	3,683	3,240
1,366.50	2,669	204.6	100.0	1,234	4,917	3,635

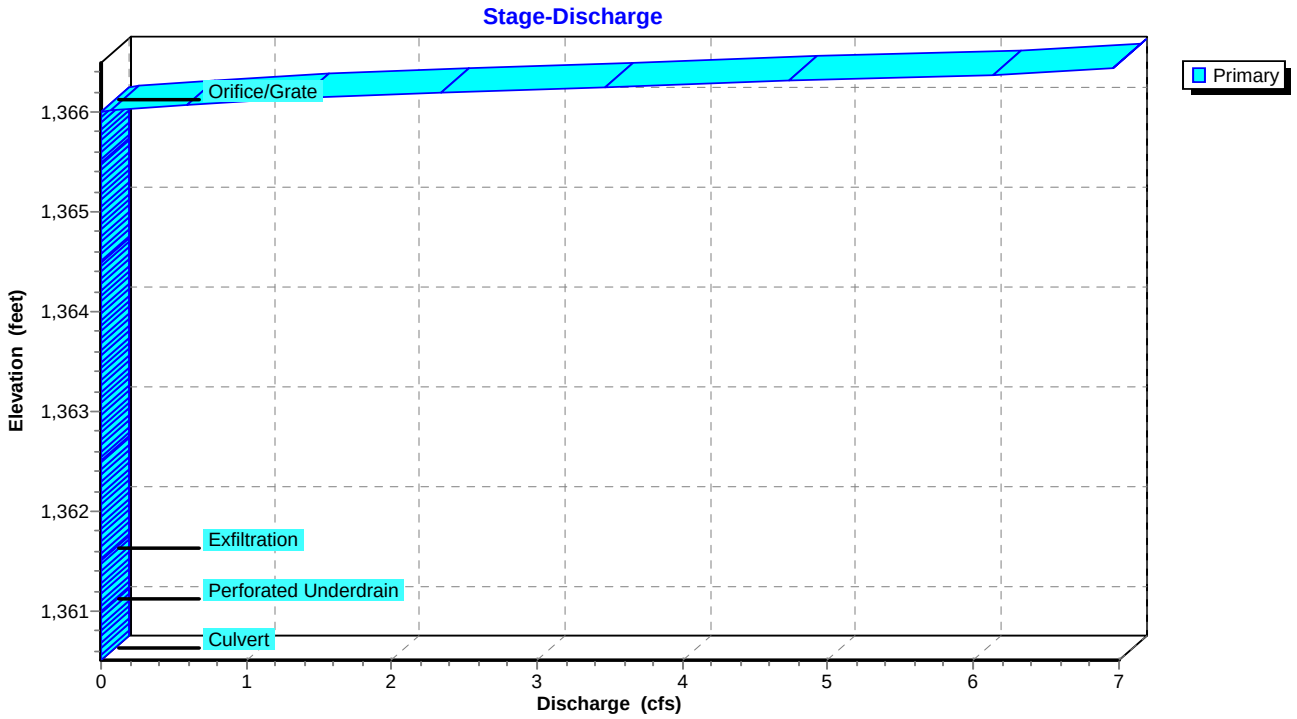
Device	Routing	Invert	Outlet Devices
#1	Primary	1,360.50'	**12.0" Round Culvert** L= 20.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,360.50' / 1,360.00' S= 0.0239 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,361.00'	**0.4" Horiz. Perforated Underdrain X 272.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,361.50'	**0.250 in/hr Exfiltration over Surface area above 1,361.50'** Conductivity to Groundwater Elevation = 1,360.00' Excluded Surface area = 2,077 sf
#4	Device 1	1,366.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=5.25 cfs @ 12.06 hrs HW=1,366.34' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 5.25 cfs of 6.90 cfs potential flow)
- **2=Perforated Underdrain** (Passes 0.00 cfs of 10.57 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Weir Controls 5.25 cfs @ 1.91 fps)

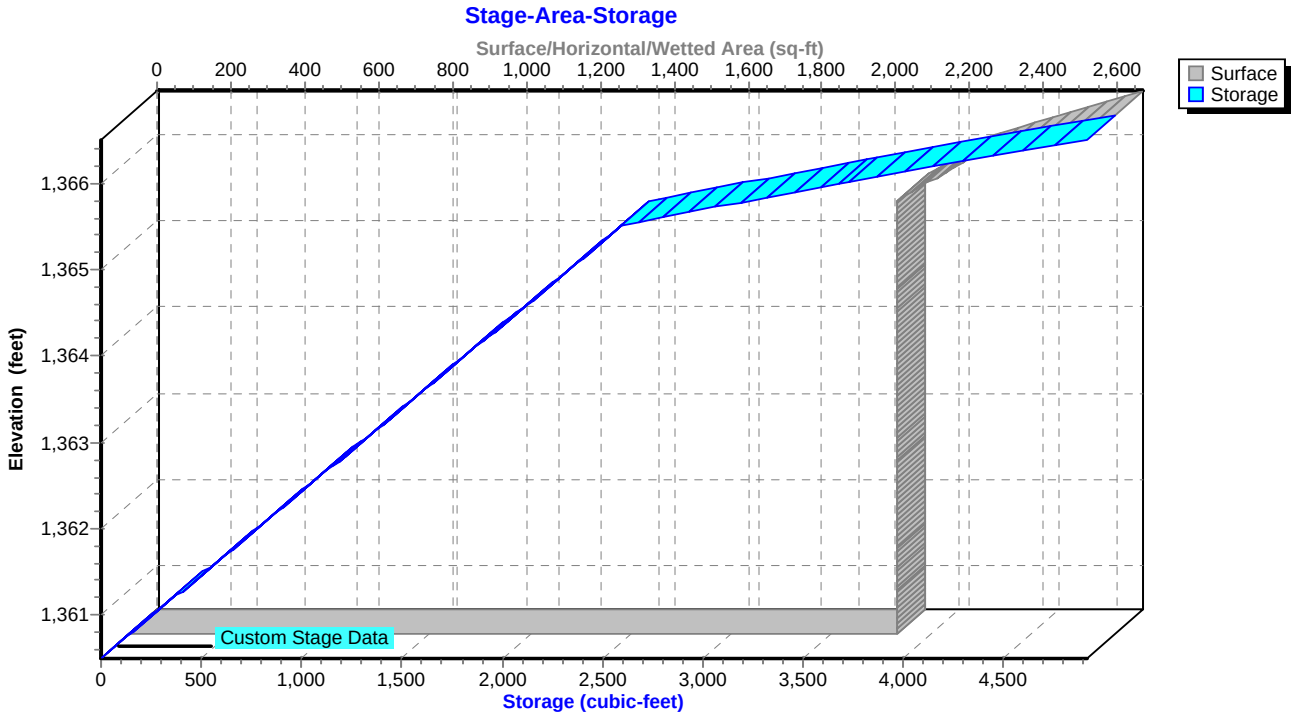
Pond 1P: Bioretention Area A



Pond 1P: Bioretention Area A



Pond 1P: Bioretention Area A



Summary for Pond 3P: Flow Splitter to BMP

[58] Hint: Peaked 0.14' above defined flood level

Inflow Area = 0.407 ac, 46.68% Impervious, Inflow Depth = 6.22" for 100-YR, 24-HR Storm event
Inflow = 3.40 cfs @ 12.02 hrs, Volume= 0.211 af
Outflow = 3.40 cfs @ 12.03 hrs, Volume= 0.211 af, Atten= 0%, Lag= 0.6 min
Primary = 0.06 cfs @ 8.84 hrs, Volume= 0.008 af
Secondary = 3.40 cfs @ 12.03 hrs, Volume= 0.203 af

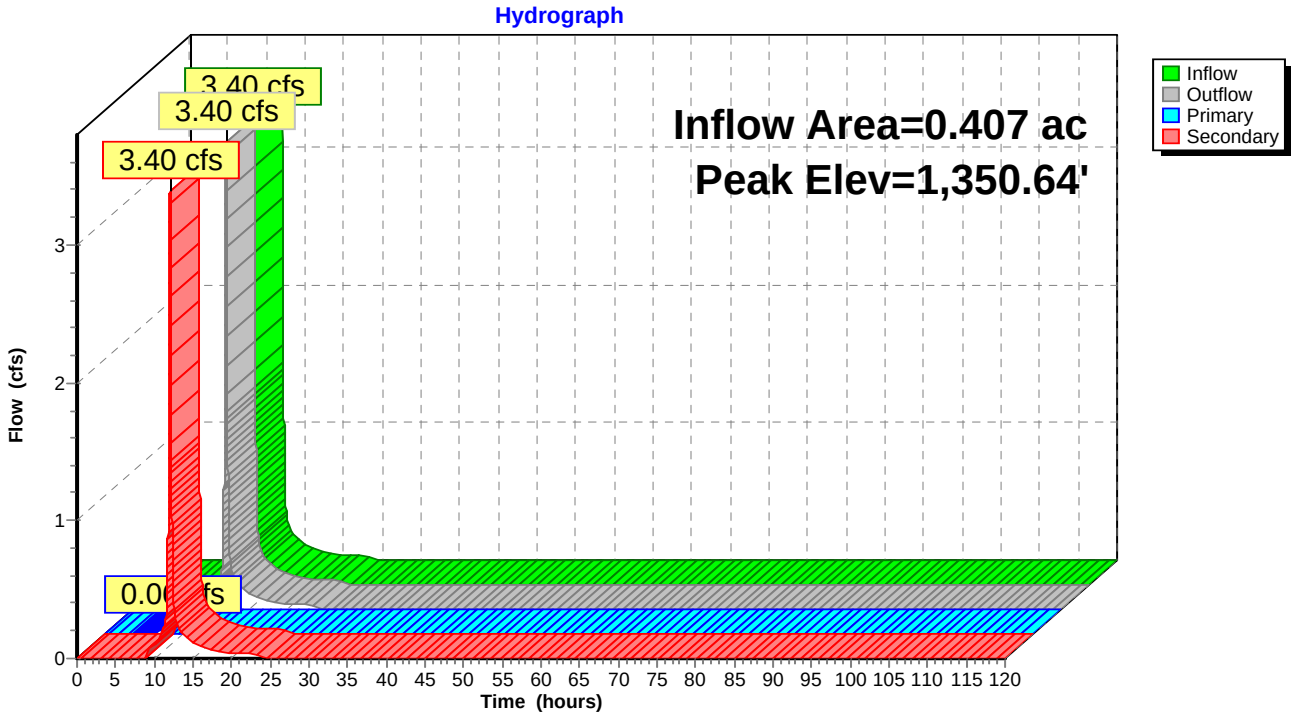
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,350.64' @ 12.03 hrs
Flood Elev= 1,350.50'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,349.49'	**12.0" Round Culvert** L= 18.9' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,349.49' / 1,348.85' S= 0.0339 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Secondary	1,349.49'	**15.0" Round Bypass Culvert** L= 119.4' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,349.49' / 1,348.00' S= 0.0125 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,349.85'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

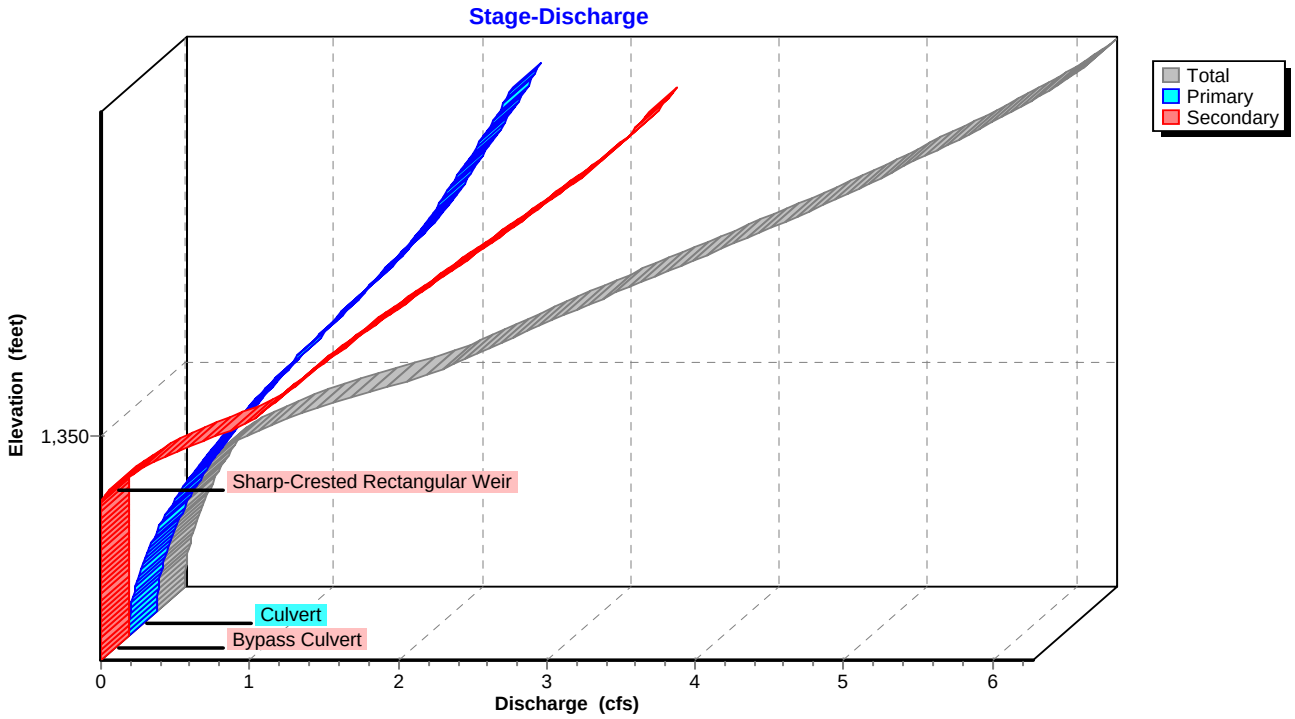
Primary OutFlow Max=0.00 cfs @ 8.84 hrs HW=1,349.85' TW=1,349.85' (Dynamic Tailwater)
└**1=Culvert** (Controls 0.00 cfs)

Secondary OutFlow Max=3.38 cfs @ 12.03 hrs HW=1,350.63' TW=0.00' (Dynamic Tailwater)
└**2=Bypass Culvert** (Inlet Controls 3.38 cfs @ 2.87 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 3.38 cfs of 8.71 cfs potential flow)

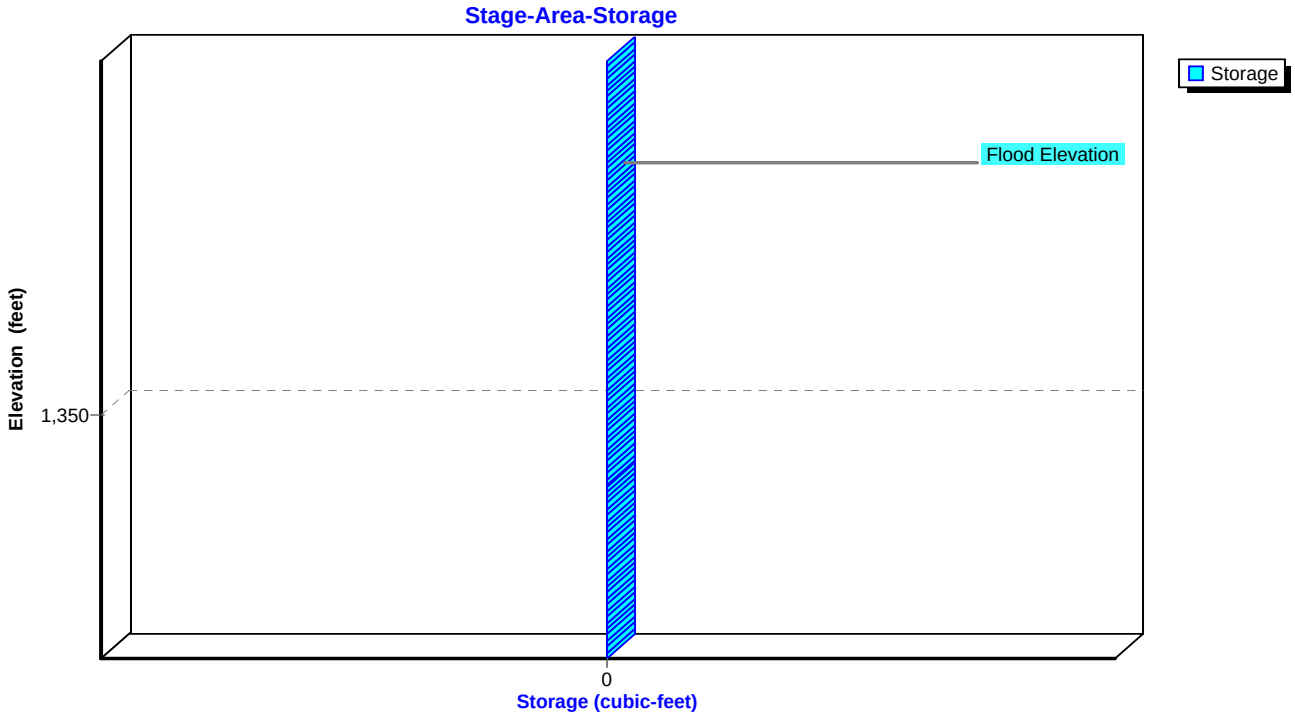
Pond 3P: Flow Splitter to BMP



Pond 3P: Flow Splitter to BMP



Pond 3P: Flow Splitter to BMP



Summary for Pond 4P: Pocket Wetland 30

Inflow Area = 1.148 ac, 48.61% Impervious, Inflow Depth = 6.42" for 100-YR, 24-HR Storm event
Inflow = 9.21 cfs @ 12.03 hrs, Volume= 0.614 af
Outflow = 2.84 cfs @ 12.30 hrs, Volume= 0.612 af, Atten= 69%, Lag= 16.2 min
Primary = 2.82 cfs @ 12.30 hrs, Volume= 0.612 af
Secondary = 0.03 cfs @ 12.30 hrs, Volume= 0.000 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,437.00' Surf.Area= 3,744 sf Storage= 5,097 cf
Peak Elev= 1,439.01' @ 12.30 hrs Surf.Area= 6,612 sf Storage= 15,509 cf (10,412 cf above start)

Plug-Flow detention time= 558.9 min calculated for 0.495 af (81% of inflow)
Center-of-Mass det. time= 378.8 min (1,160.1 - 781.4)

Volume	Invert	Avail.Storage	Storage Description
#1	1,434.00'	22,580 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

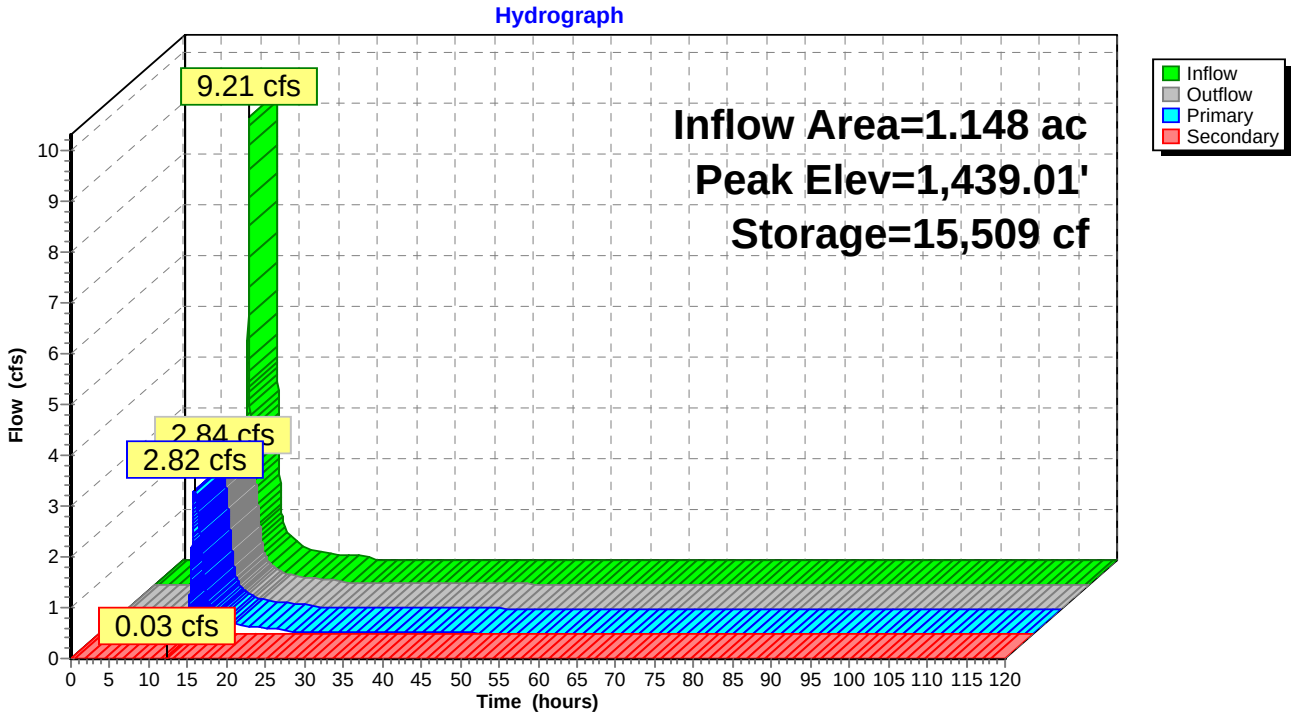
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,434.00	524	152.8	0	0	524
1,435.00	1,039	190.5	767	767	1,568
1,436.00	2,010	281.1	1,498	2,265	4,976
1,437.00	3,744	344.1	2,832	5,097	8,126
1,438.00	5,203	334.4	4,454	9,551	8,750
1,439.00	6,601	346.2	5,888	15,439	9,474
1,440.00	7,695	367.2	7,141	22,580	10,719

Device	Routing	Invert	Outlet Devices
#1	Primary	1,434.00'	**15.0" Round Culvert** L= 20.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,434.00' / 1,432.00' S= 0.1000 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,437.00'	**1.0" Vert. Orifice/Grate** C= 0.600
#3	Device 1	1,437.80'	**6.0" Vert. Orifice/Grate X 3.00** C= 0.600
#4	Secondary	1,439.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

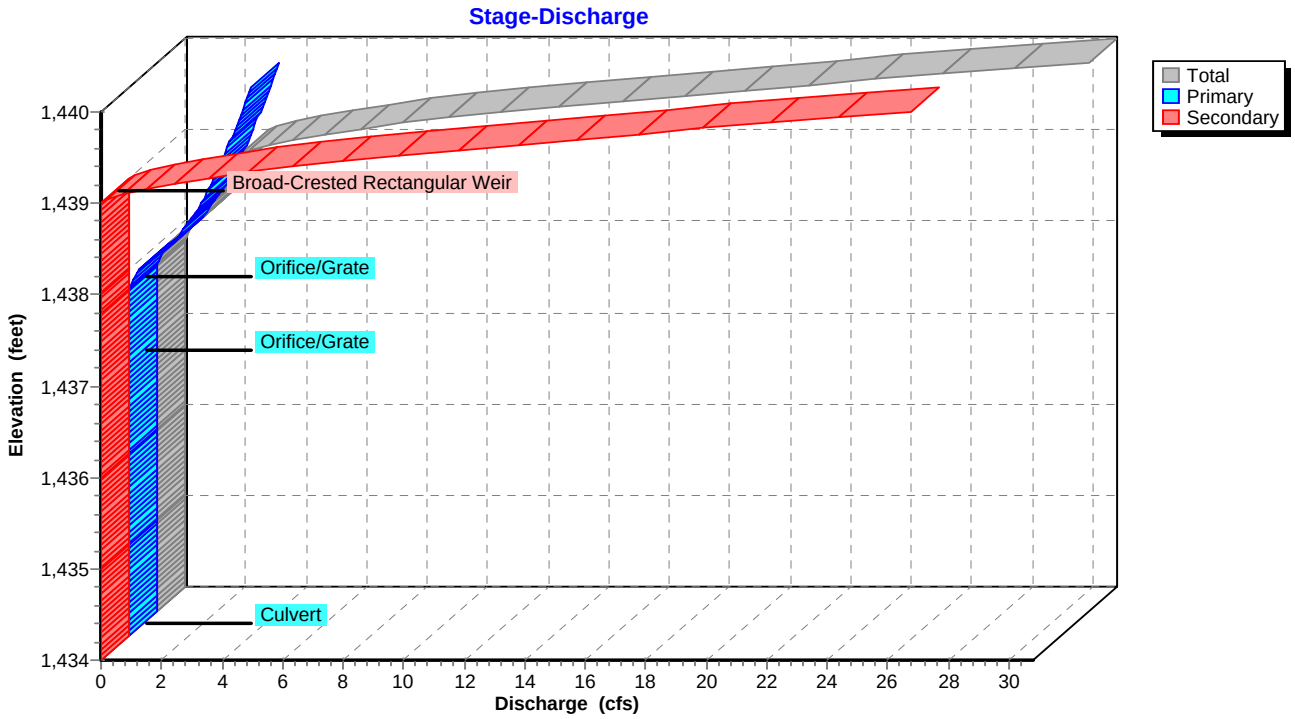
Primary OutFlow Max=2.82 cfs @ 12.30 hrs HW=1,439.01' TW=0.00' (Dynamic Tailwater)
└**1=Culvert** (Passes 2.82 cfs of 9.77 cfs potential flow)
  ├**2=Orifice/Grate** (Orifice Controls 0.04 cfs @ 6.76 fps)
  └**3=Orifice/Grate** (Orifice Controls 2.78 cfs @ 4.72 fps)

Secondary OutFlow Max=0.03 cfs @ 12.30 hrs HW=1,439.01' TW=0.00' (Dynamic Tailwater)
└**4=Broad-Crested Rectangular Weir** (Weir Controls 0.03 cfs @ 0.24 fps)

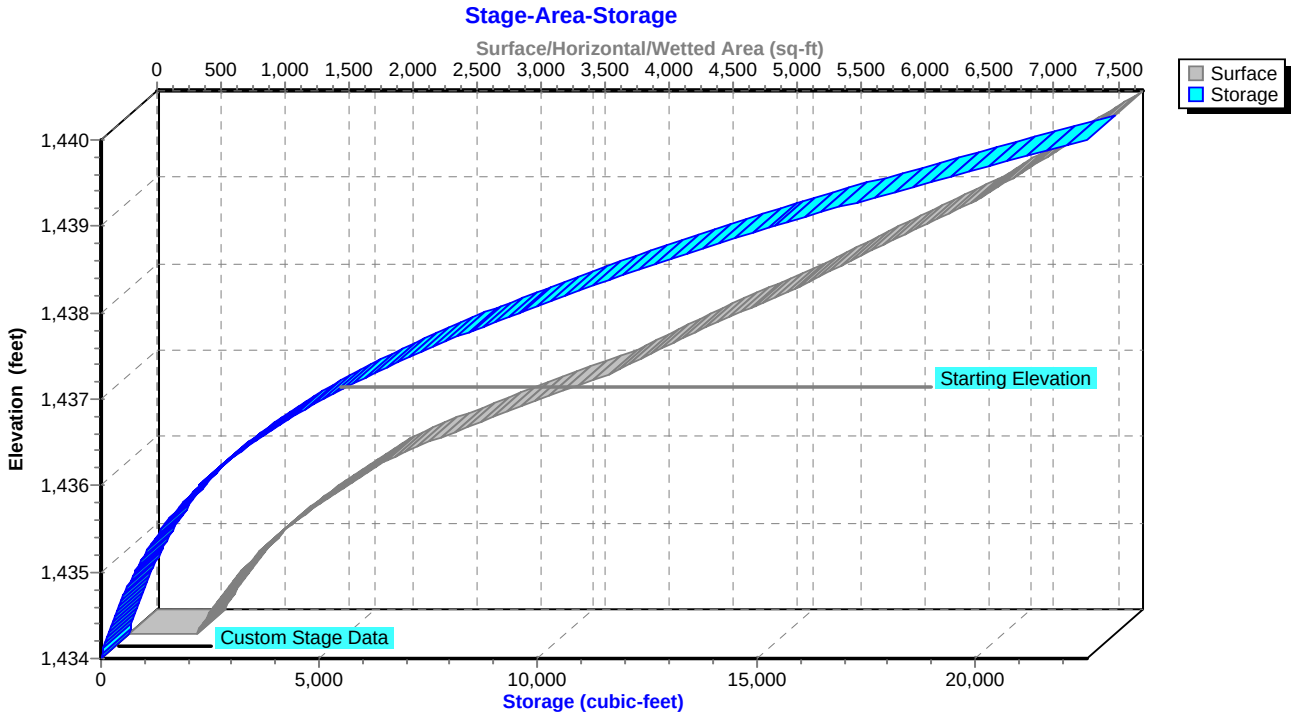
Pond 4P: Pocket Wetland 30



Pond 4P: Pocket Wetland 30



Pond 4P: Pocket Wetland 30



Summary for Pond 5P: Bioretention Area B

[80] Warning: Exceeded Pond 3P by 1.15' @ 24.08 hrs (3.00 cfs 24.690 af)

Inflow Area = 0.469 ac, 40.51% Impervious, Inflow Depth = 0.89" for 100-YR, 24-HR Storm event
Inflow = 0.46 cfs @ 12.00 hrs, Volume= 0.035 af
Outflow = 0.11 cfs @ 12.35 hrs, Volume= 0.020 af, Atten= 77%, Lag= 21.1 min
Primary = 0.11 cfs @ 12.35 hrs, Volume= 0.020 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,351.03' @ 12.35 hrs Surf.Area= 1,038 sf Storage= 969 cf

Plug-Flow detention time= 1,335.7 min calculated for 0.020 af (58% of inflow)
Center-of-Mass det. time= 1,205.3 min (1,927.9 - 722.6)

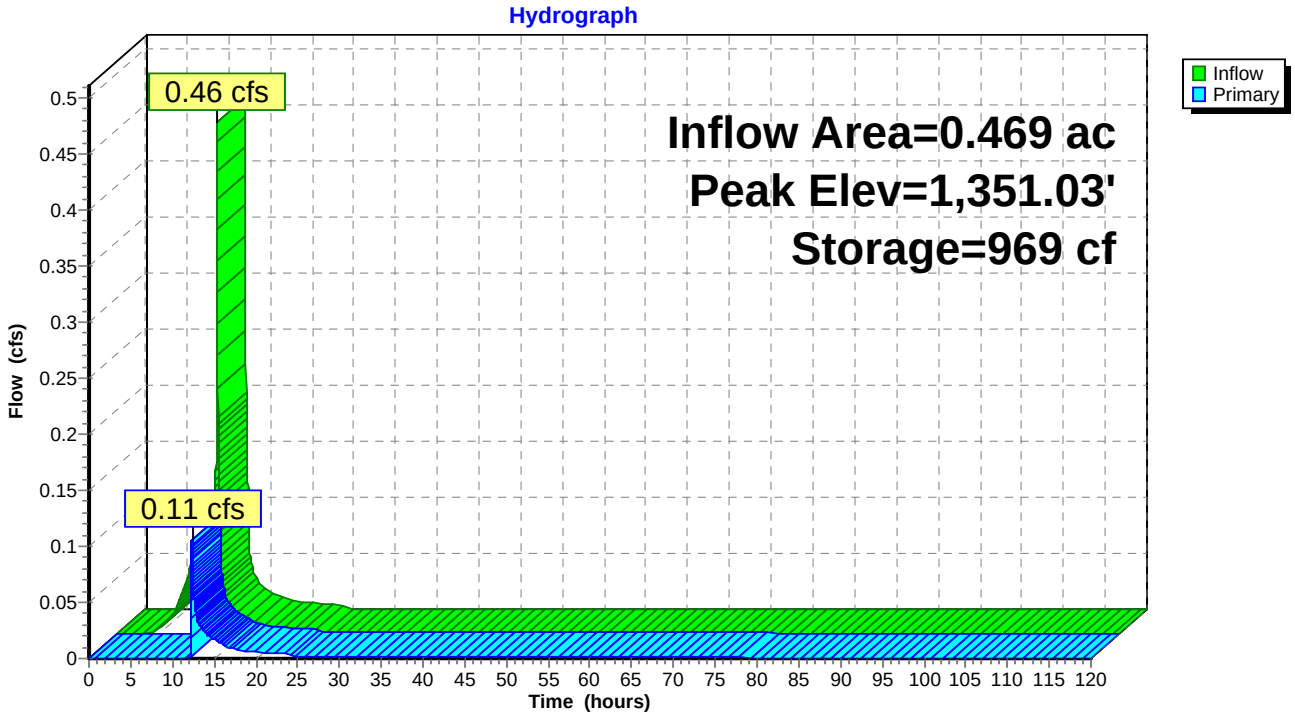
Volume	Invert	Avail.Storage	Storage Description
#1	1,348.00'	2,214 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,348.00	786	136.5	0.0	0	0	786
1,349.00	786	136.5	25.0	197	197	923
1,349.50	786	136.5	25.0	98	295	991
1,350.00	786	136.5	25.0	98	393	1,059
1,350.50	786	136.5	25.0	98	491	1,127
1,351.00	1,026	151.0	100.0	452	943	1,467
1,352.00	1,534	174.5	100.0	1,272	2,214	2,097

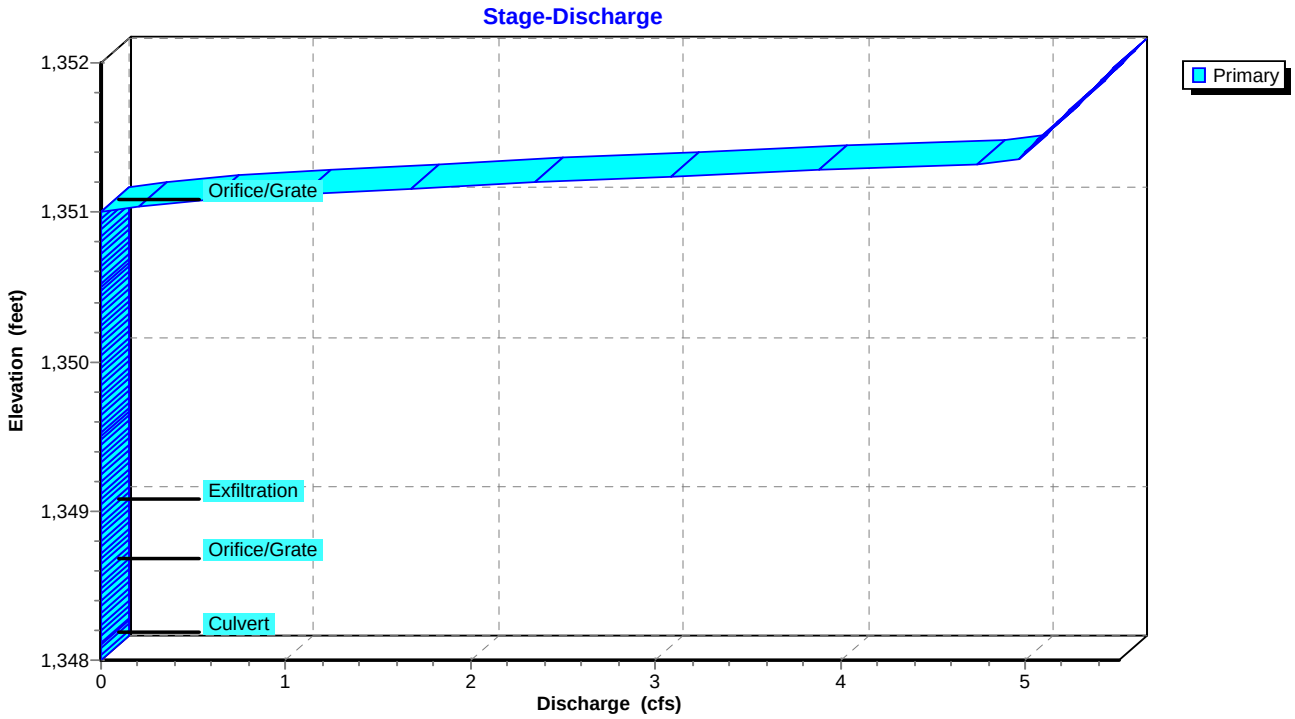
Device	Routing	Invert	Outlet Devices
#1	Primary	1,348.10'	**12.0" Round Culvert** L= 19.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,348.10' / 1,348.00' S= 0.0053 '/' Cc= 0.900 n= 0.013, Flow Area= 0.79 sf
#2	Device 1	1,348.60'	**0.4" Horiz. Orifice/Grate X 960.00** C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,349.00'	**0.250 in/hr Exfiltration over Surface area above 1,349.00'** Conductivity to Groundwater Elevation = 1,347.50' Excluded Surface area = 786 sf
#4	Device 1	1,351.00'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.11 cfs @ 12.35 hrs HW=1,351.03' TW=0.00' (Dynamic Tailwater)
- **1=Culvert** (Passes 0.11 cfs of 4.65 cfs potential flow)
- **2=Orifice/Grate** (Passes 0.00 cfs of 6.28 cfs potential flow)
  - **3=Exfiltration** (Controls 0.00 cfs)
- **4=Orifice/Grate** (Weir Controls 0.10 cfs @ 0.52 fps)

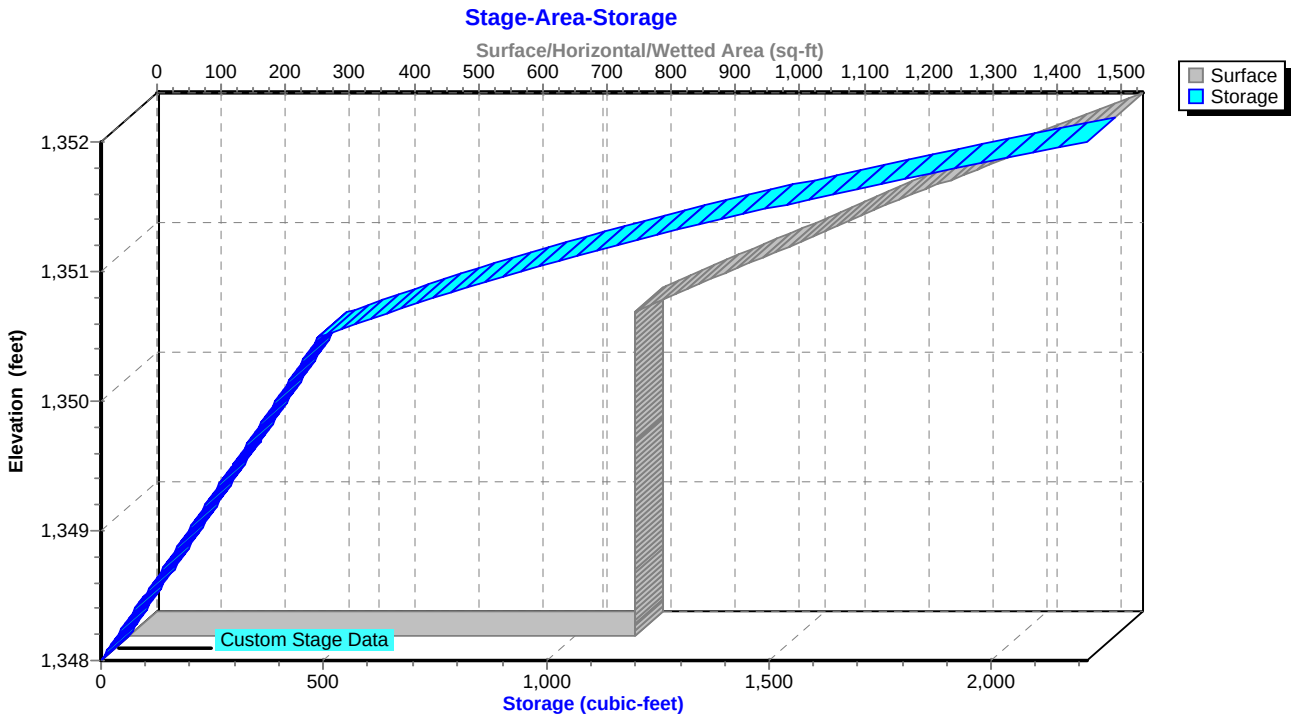
Pond 5P: Bioretention Area B



Pond 5P: Bioretention Area B



Pond 5P: Bioretention Area B



Summary for Pond 11P: Pocket Wetland 29B

Inflow Area = 1.788 ac, 51.12% Impervious, Inflow Depth = 6.49" for 100-YR, 24-HR Storm event
Inflow = 14.58 cfs @ 12.03 hrs, Volume= 0.967 af
Outflow = 12.51 cfs @ 12.07 hrs, Volume= 0.964 af, Atten= 14%, Lag= 2.5 min
Primary = 2.98 cfs @ 12.07 hrs, Volume= 0.684 af
Secondary = 9.53 cfs @ 12.07 hrs, Volume= 0.280 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,442.00' Surf.Area= 3,817 sf Storage= 5,150 cf
Peak Elev= 1,443.51' @ 12.07 hrs Surf.Area= 6,619 sf Storage= 12,944 cf (7,794 cf above start)

Plug-Flow detention time= 182.4 min calculated for 0.846 af (87% of inflow)
Center-of-Mass det. time= 93.3 min (873.3 - 780.0)

Volume	Invert	Avail.Storage	Storage Description
#1	1,438.00'	20,412 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

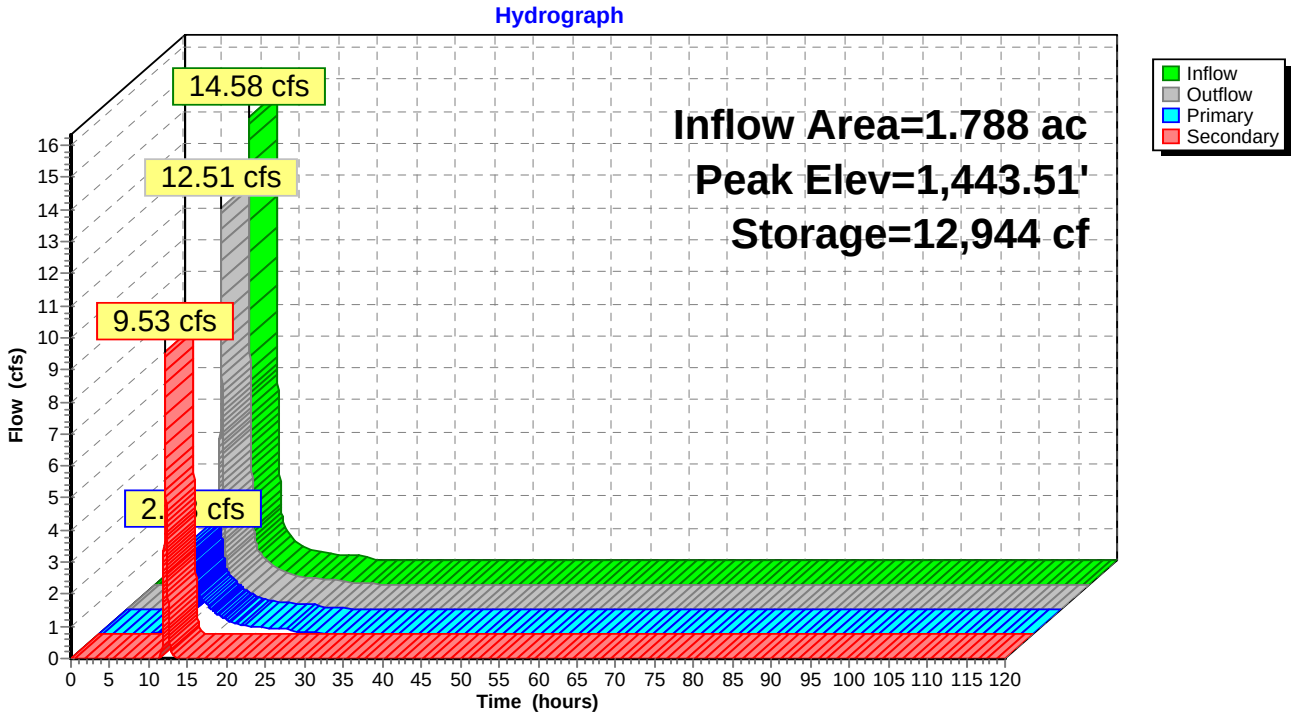
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,438.00	74	30.7	0	0	74
1,439.00	207	53.8	135	135	235
1,440.00	720	190.6	438	573	2,898
1,441.00	2,419	328.2	1,486	2,059	8,585
1,442.00	3,817	444.2	3,092	5,150	15,726
1,443.00	5,595	534.5	4,678	9,828	22,775
1,444.00	7,680	353.3	6,610	16,438	35,585
1,444.50	8,217	362.0	3,973	20,412	36,111

Device	Routing	Invert	Outlet Devices
#1	Primary	1,442.00'	**45.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.56 (C= 3.20)
#2	Secondary	1,443.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

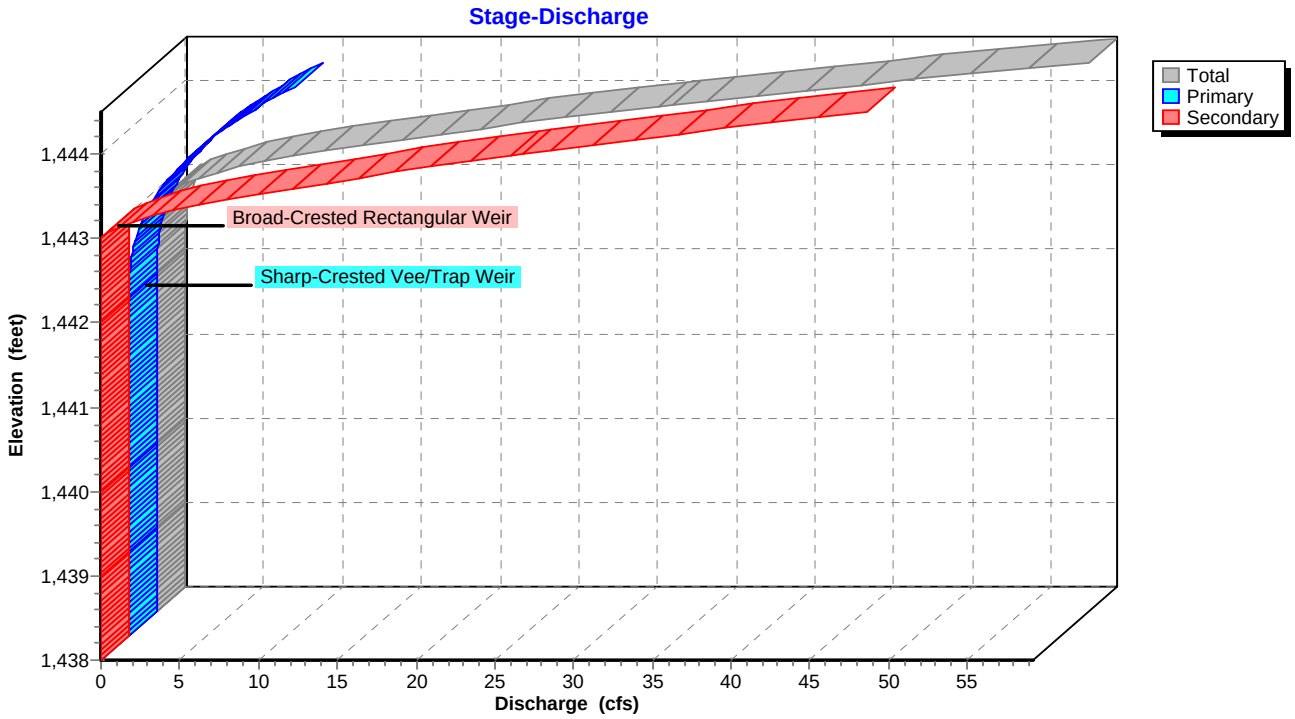
Primary OutFlow Max=2.97 cfs @ 12.07 hrs HW=1,443.51' TW=0.00' (Dynamic Tailwater)
↑—**1=Sharp-Crested Vee/Trap Weir** (Weir Controls 2.97 cfs @ 3.15 fps)

Secondary OutFlow Max=9.52 cfs @ 12.07 hrs HW=1,443.51' TW=0.00' (Dynamic Tailwater)
↑—**2=Broad-Crested Rectangular Weir** (Weir Controls 9.52 cfs @ 1.86 fps)

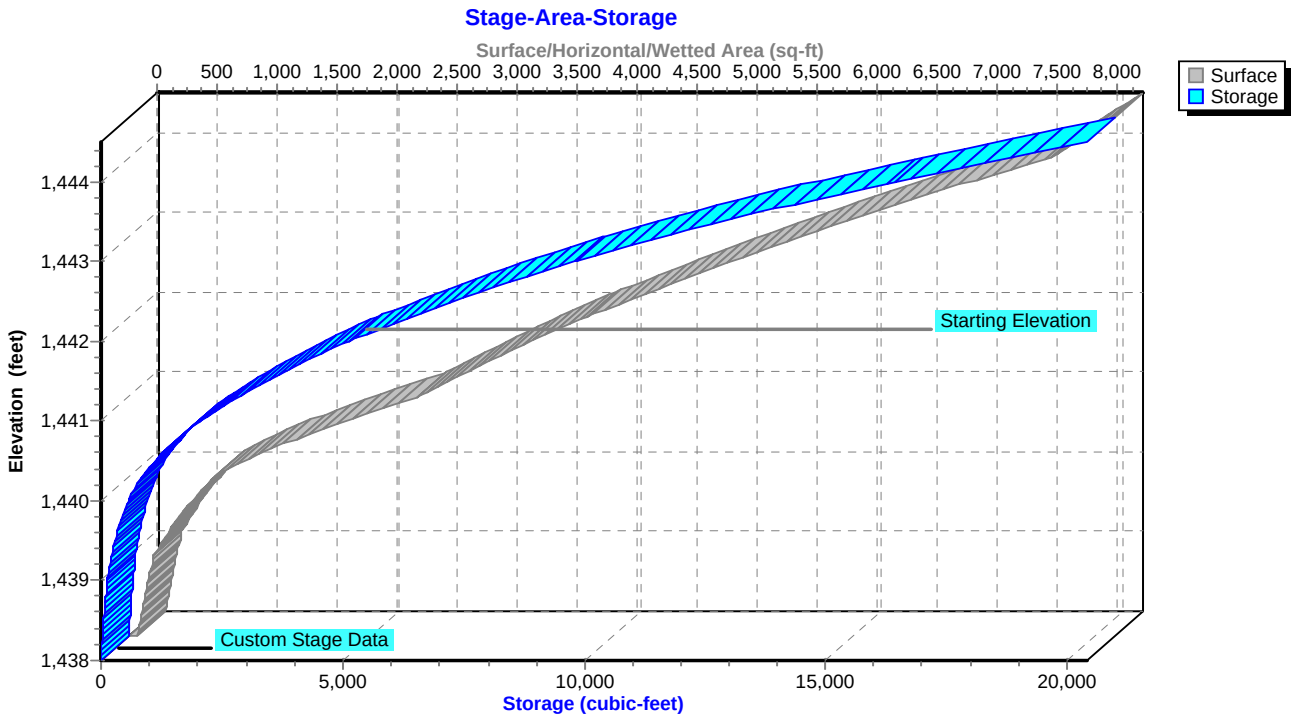
Pond 11P: Pocket Wetland 29B



Pond 11P: Pocket Wetland 29B



Pond 11P: Pocket Wetland 29B



Summary for Pond 12P: Pocket Wetland 29A

Inflow Area = 0.448 ac, 43.53% Impervious, Inflow Depth = 6.20" for 100-YR, 24-HR Storm event
Inflow = 2.93 cfs @ 12.03 hrs, Volume= 0.231 af
Outflow = 2.88 cfs @ 12.05 hrs, Volume= 0.231 af, Atten= 2%, Lag= 1.2 min
Primary = 2.88 cfs @ 12.05 hrs, Volume= 0.231 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,443.50' Surf.Area= 1,339 sf Storage= 1,565 cf
Peak Elev= 1,443.74' @ 12.05 hrs Surf.Area= 1,466 sf Storage= 1,905 cf (339 cf above start)

Plug-Flow detention time= 110.2 min calculated for 0.195 af (84% of inflow)
Center-of-Mass det. time= 4.3 min (788.3 - 784.0)

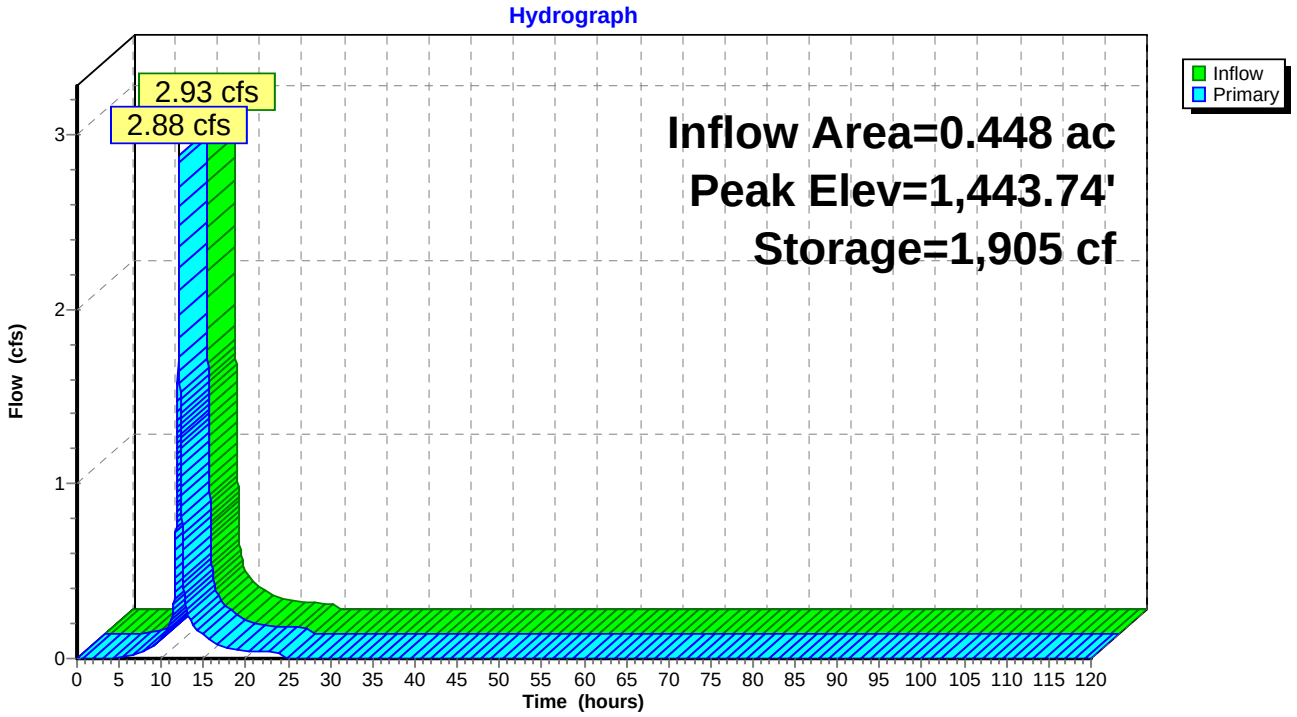
Volume	Invert	Avail.Storage	Storage Description
#1	1,441.00'	4,185 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,441.00	166	50.3	0	0	166
1,442.00	367	74.7	260	260	417
1,443.00	1,094	161.8	698	958	2,060
1,444.00	1,608	180.7	1,343	2,301	2,603
1,445.00	2,175	199.2	1,884	4,185	3,194

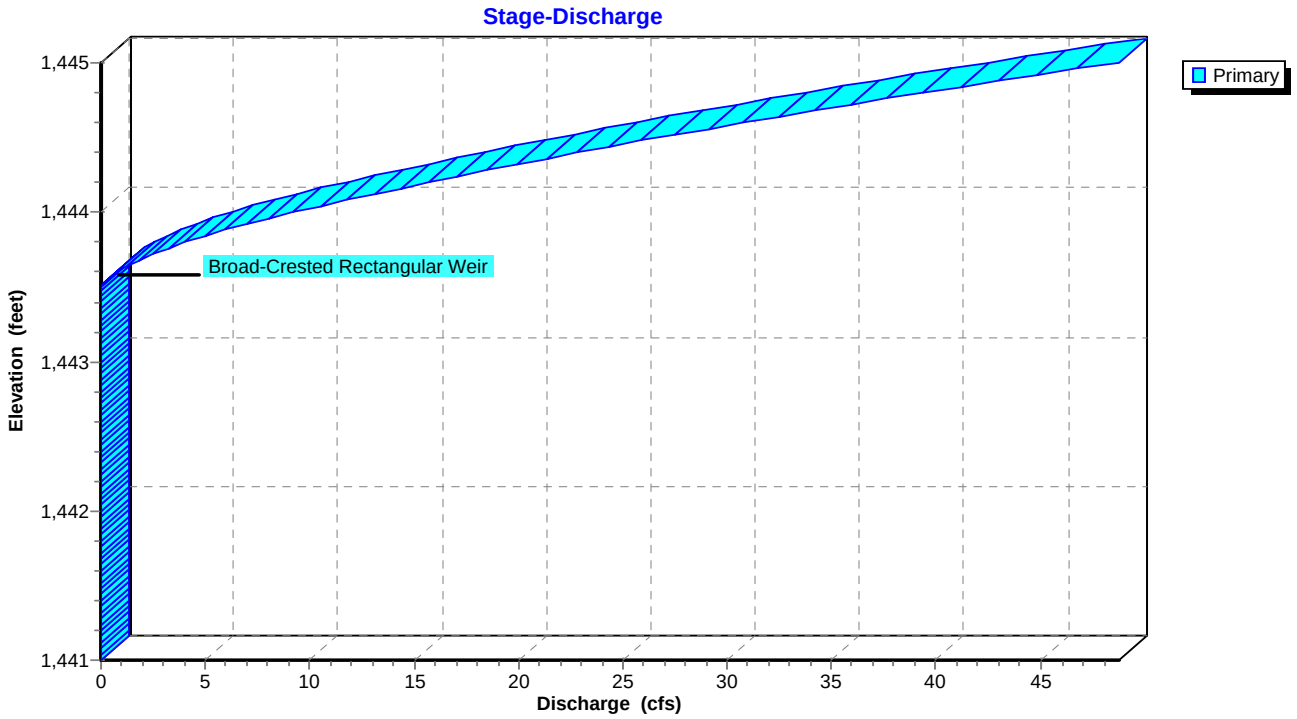
Device	Routing	Invert	Outlet Devices
#1	Primary	1,443.50'	**10.0' long x 4.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.38 2.54 2.69 2.68 2.67 2.67 2.65 2.66 2.66 2.68 2.72 2.73 2.76 2.79 2.88 3.07 3.32

Primary OutFlow Max=2.87 cfs @ 12.05 hrs HW=1,443.74' TW=0.00' (Dynamic Tailwater)
1=Broad-Crested Rectangular Weir (Weir Controls 2.87 cfs @ 1.19 fps)

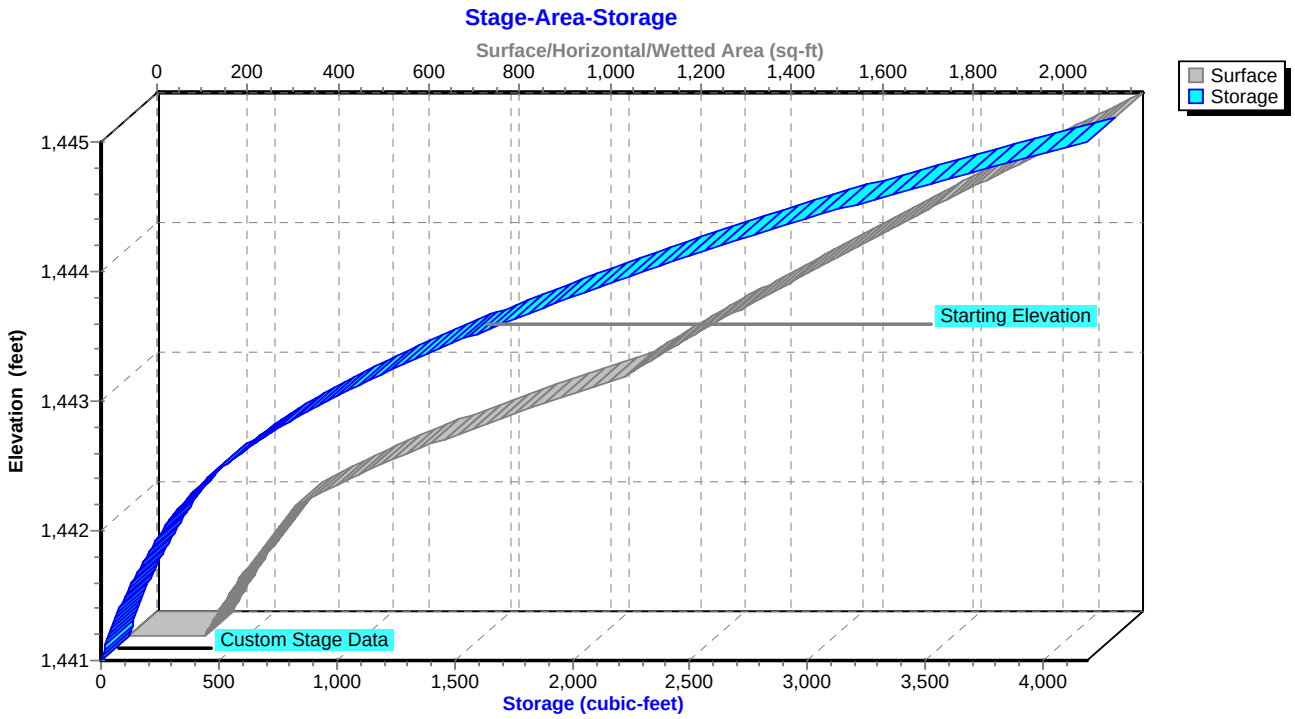
Pond 12P: Pocket Wetland 29A



Pond 12P: Pocket Wetland 29A



Pond 12P: Pocket Wetland 29A



Summary for Pond 13P: Flow Splitter to SW 29A

[57] Hint: Peaked at 1,444.24' (Flood elevation advised)

Inflow Area = 0.369 ac, 50.68% Impervious, Inflow Depth = 6.57" for 100-YR, 24-HR Storm event
Inflow = 3.13 cfs @ 12.03 hrs, Volume= 0.202 af
Outflow = 3.13 cfs @ 12.04 hrs, Volume= 0.202 af, Atten= 0%, Lag= 0.6 min
Primary = 2.44 cfs @ 12.04 hrs, Volume= 0.197 af
Secondary = 0.69 cfs @ 12.04 hrs, Volume= 0.005 af

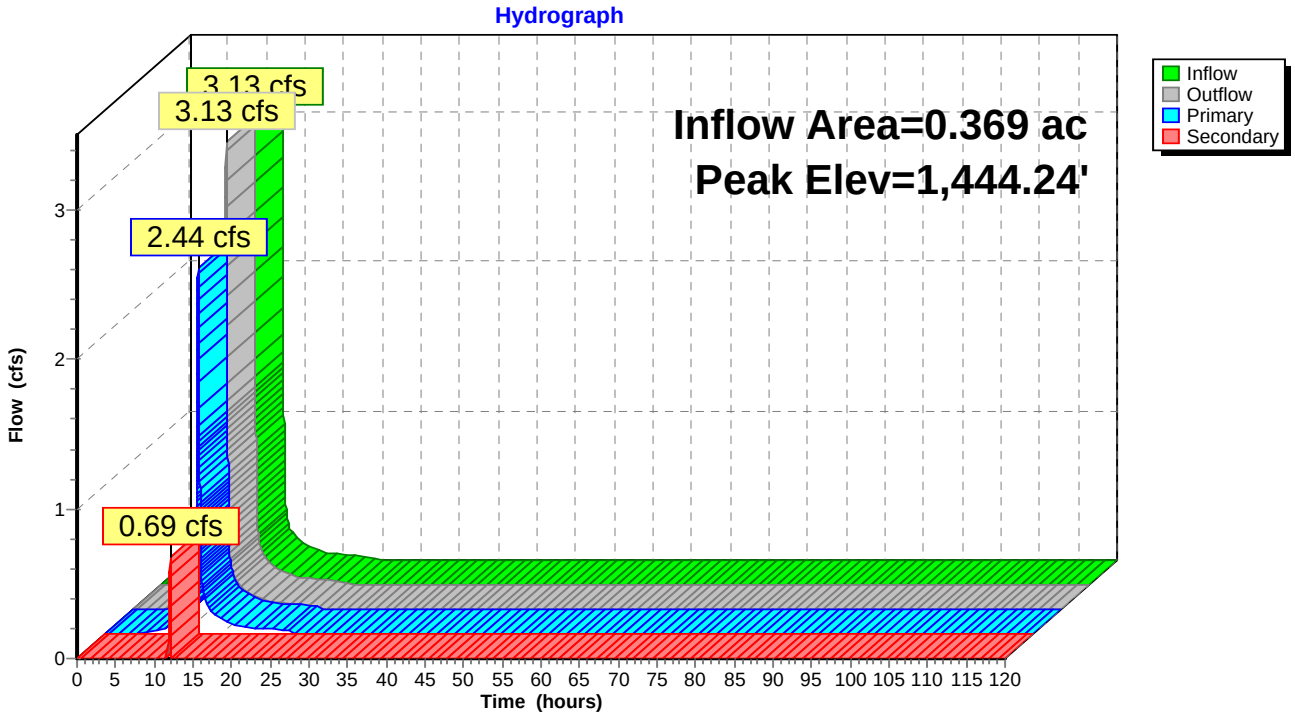
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,444.24' @ 12.04 hrs

Device	Routing	Invert	Outlet Devices
#1	Primary	1,443.30'	**15.0" Round CMP_Round 15"** L= 41.2' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,443.30' / 1,443.00' S= 0.0073 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,443.30'	**15.0" Round Bypass Culvert** L= 46.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,443.30' / 1,443.00' S= 0.0065 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,444.10'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

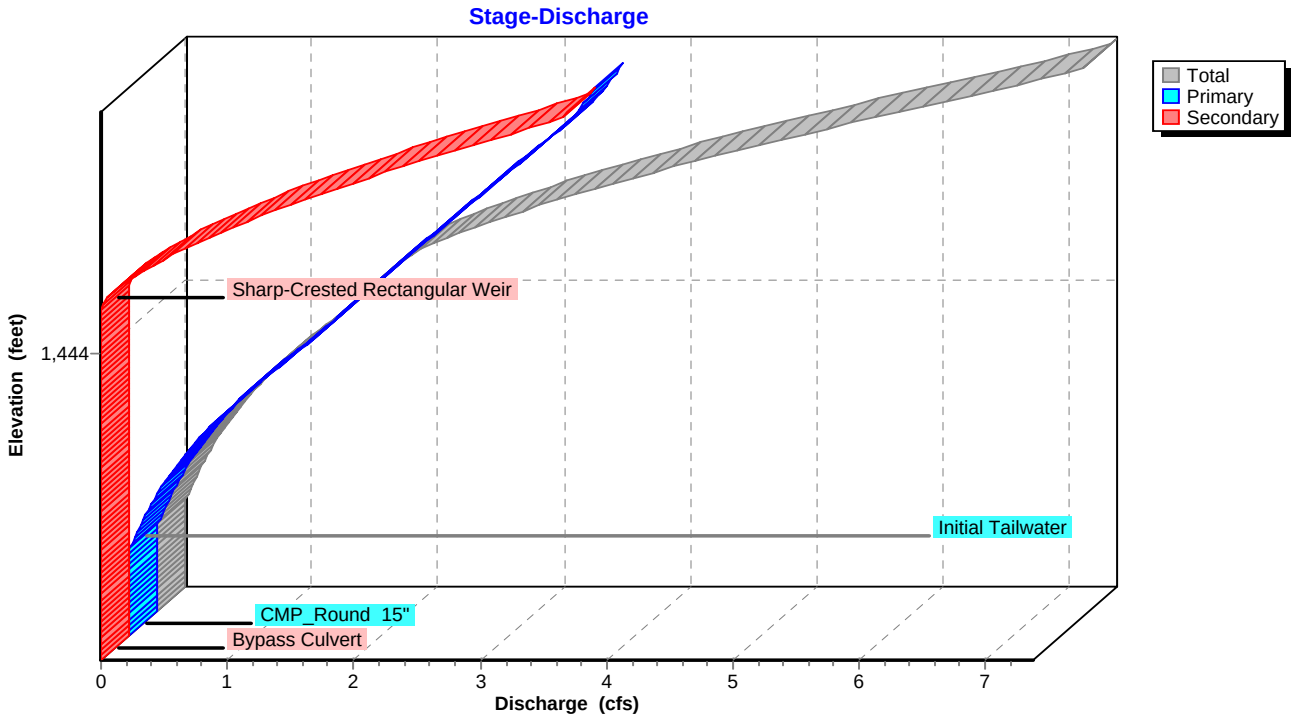
Primary OutFlow Max=2.43 cfs @ 12.04 hrs HW=1,444.24' TW=1,443.74' (Dynamic Tailwater)
└─**1=CMP_Round 15"** (Outlet Controls 2.43 cfs @ 3.41 fps)

Secondary OutFlow Max=0.68 cfs @ 12.04 hrs HW=1,444.24' TW=0.00' (Dynamic Tailwater)
└─**2=Bypass Culvert** (Passes 0.68 cfs of 2.47 cfs potential flow)
└─**3=Sharp-Crested Rectangular Weir** (Weir Controls 0.68 cfs @ 1.22 fps)

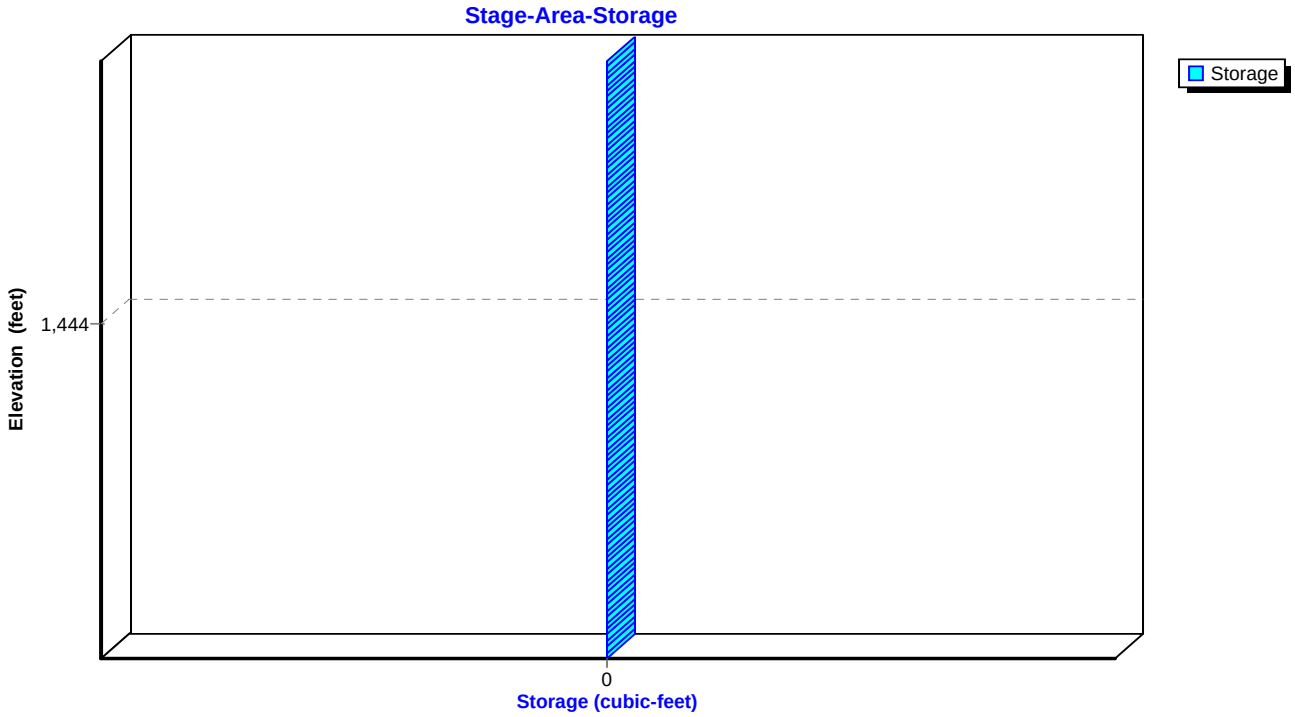
Pond 13P: Flow Splitter to SW 29A



Pond 13P: Flow Splitter to SW 29A



Pond 13P: Flow Splitter to SW 29A



Summary for Pond 93P: Flow Splitter to BMP

[58] Hint: Peaked 0.56' above defined flood level

Inflow Area = 1.239 ac, 44.15% Impervious, Inflow Depth = 6.22" for 100-YR, 24-HR Storm event
Inflow = 10.12 cfs @ 12.03 hrs, Volume= 0.642 af
Outflow = 10.12 cfs @ 12.04 hrs, Volume= 0.642 af, Atten= 0%, Lag= 0.6 min
Primary = 5.06 cfs @ 12.04 hrs, Volume= 0.516 af
Secondary = 5.06 cfs @ 12.04 hrs, Volume= 0.126 af

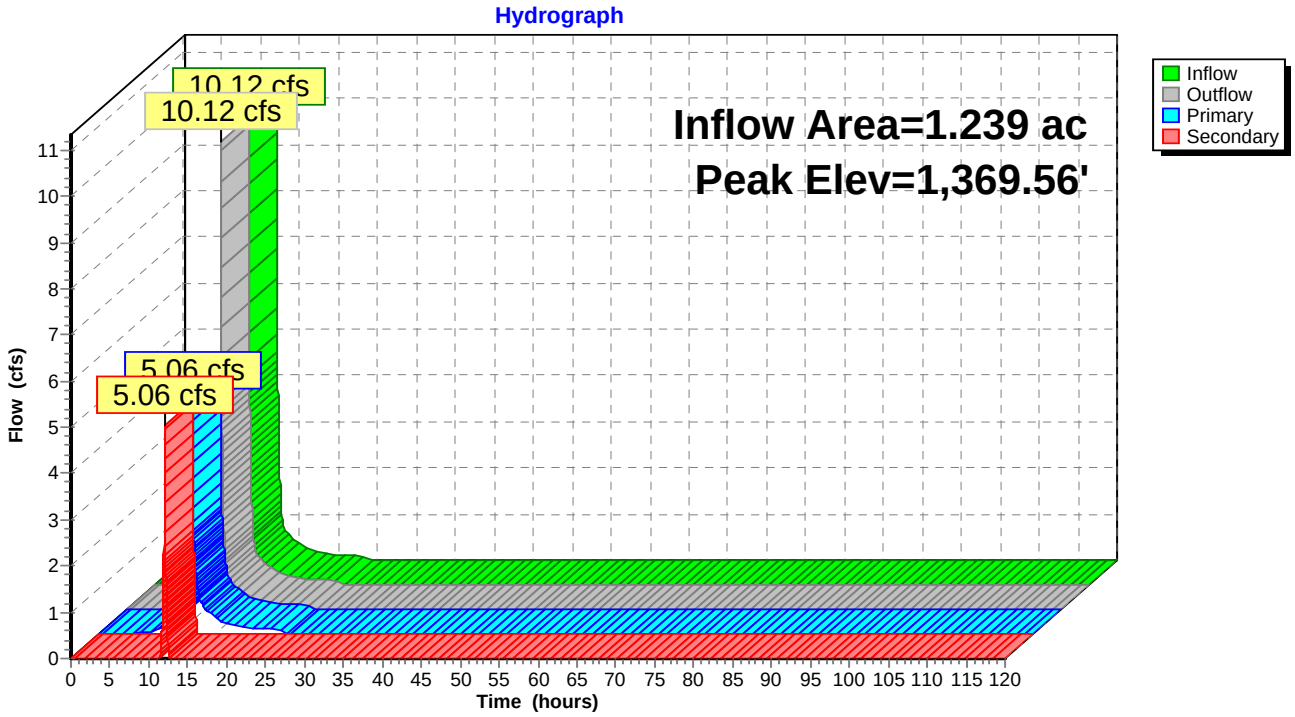
Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,369.56' @ 12.04 hrs
Flood Elev= 1,369.00'

Device	Routing	Invert	Outlet Devices
#1	Primary	1,367.76'	**15.0" Round Culvert** L= 21.8' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,367.76' / 1,366.50' S= 0.0578 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Secondary	1,367.76'	**15.0" Round Culvert** L= 93.7' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,367.76' / 1,363.37' S= 0.0469 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#3	Device 2	1,368.30'	**4.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s)

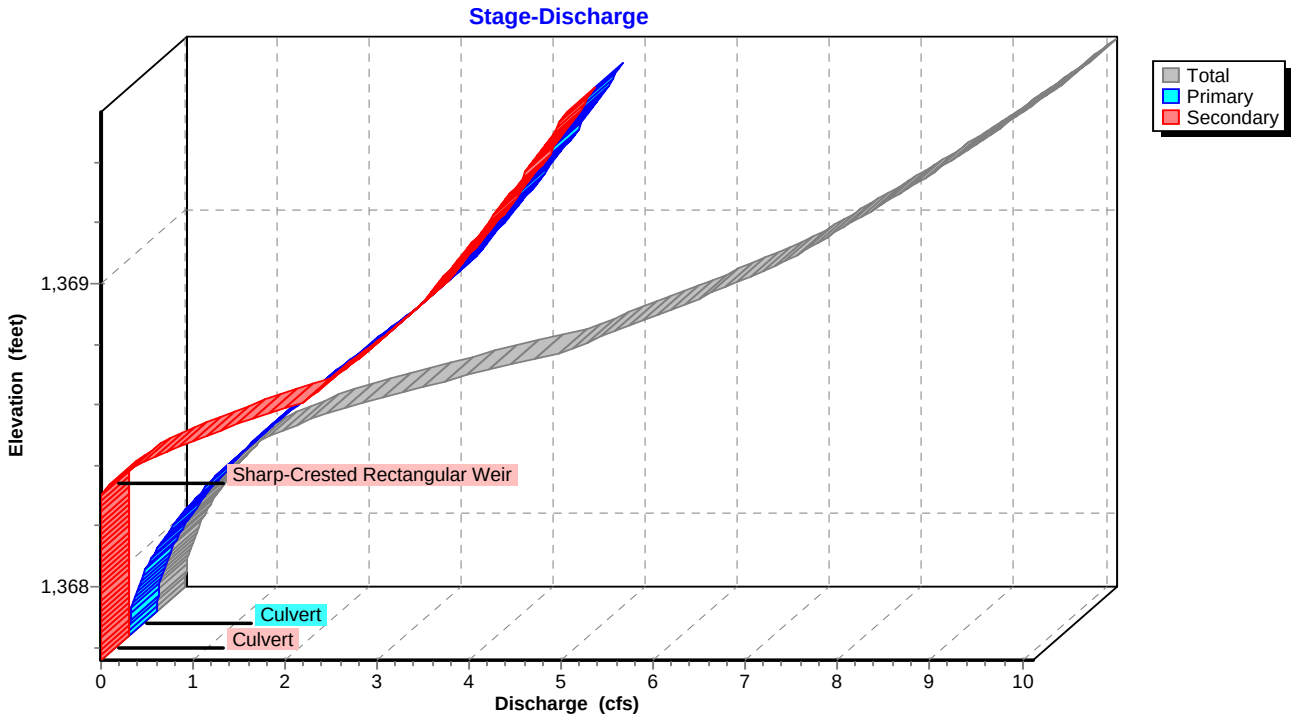
Primary OutFlow Max=5.04 cfs @ 12.04 hrs HW=1,369.55' TW=1,366.33' (Dynamic Tailwater)
└**1=Culvert** (Inlet Controls 5.04 cfs @ 4.11 fps)

Secondary OutFlow Max=5.04 cfs @ 12.04 hrs HW=1,369.55' TW=0.00' (Dynamic Tailwater)
└**2=Culvert** (Inlet Controls 5.04 cfs @ 4.11 fps)
└**3=Sharp-Crested Rectangular Weir** (Passes 5.04 cfs of 17.16 cfs potential flow)

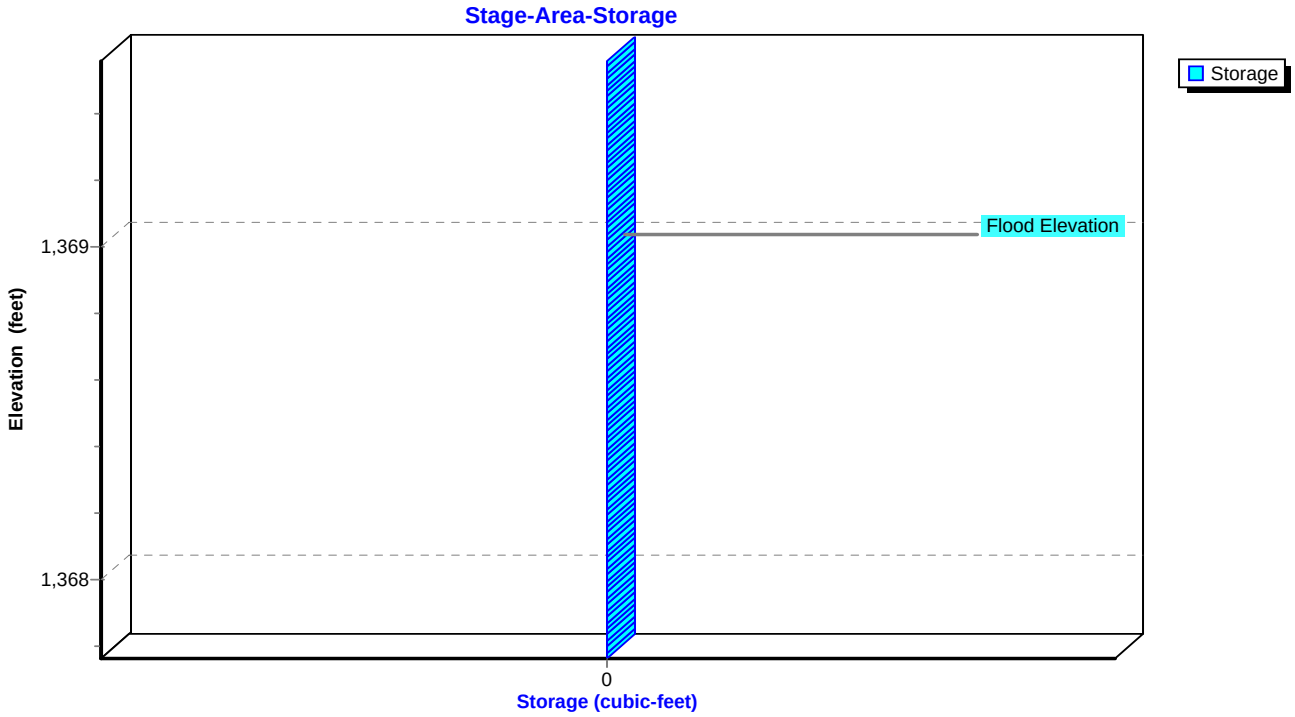
Pond 93P: Flow Splitter to BMP



Pond 93P: Flow Splitter to BMP



Pond 93P: Flow Splitter to BMP



Summary for Pond 94P: Stormwater Wetland C

Inflow Area = 0.959 ac, 50.05% Impervious, Inflow Depth = 6.44" for 100-YR, 24-HR Storm event
Inflow = 7.87 cfs @ 12.03 hrs, Volume= 0.515 af
Outflow = 7.06 cfs @ 12.06 hrs, Volume= 0.513 af, Atten= 10%, Lag= 2.0 min
Primary = 0.88 cfs @ 12.06 hrs, Volume= 0.288 af
Secondary = 6.18 cfs @ 12.06 hrs, Volume= 0.224 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,347.50' Surf.Area= 2,565 sf Storage= 2,214 cf
Peak Elev= 1,348.59' @ 12.06 hrs Surf.Area= 3,818 sf Storage= 5,797 cf (3,582 cf above start)

Plug-Flow detention time= 182.3 min calculated for 0.462 af (90% of inflow)
Center-of-Mass det. time= 105.3 min (885.0 - 779.6)

Volume	Invert	Avail.Storage	Storage Description
#1	1,345.00'	7,418 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

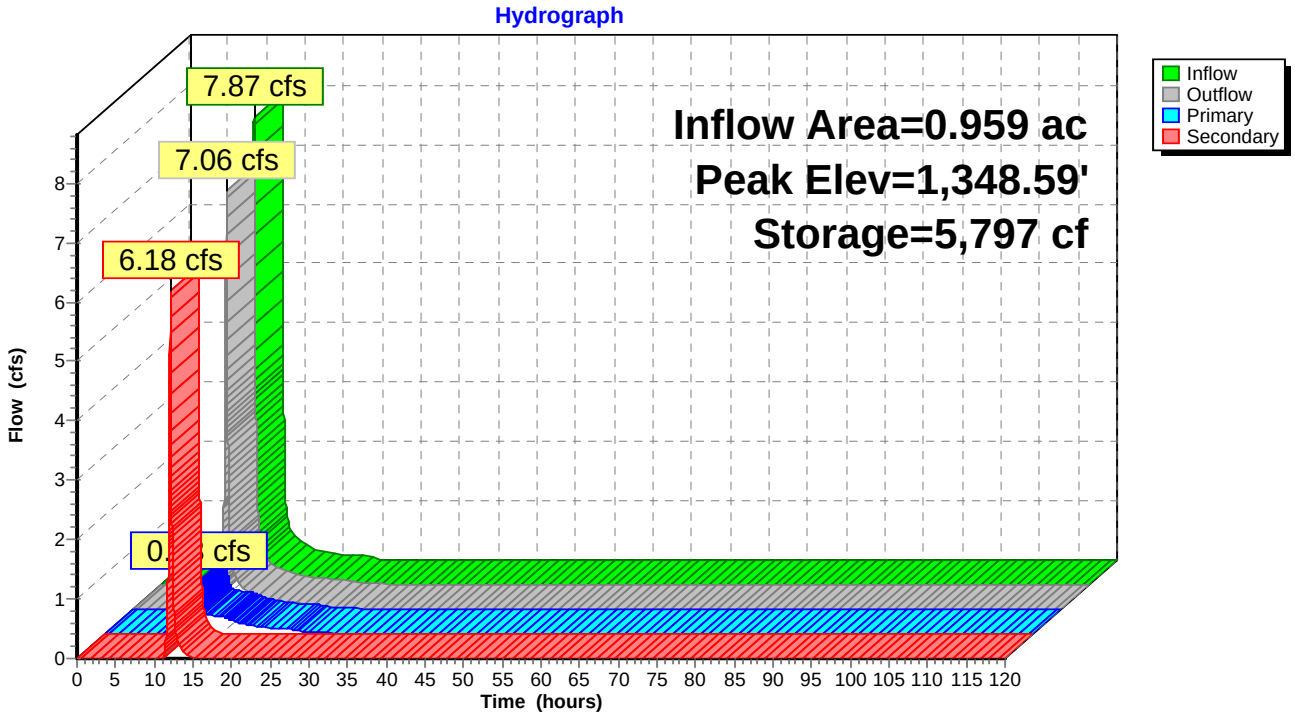
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,345.00	25	39.0	0	0	25
1,346.00	323	286.8	146	146	6,452
1,347.00	1,831	404.5	974	1,120	12,936
1,347.50	2,565	404.6	1,094	2,214	13,138
1,348.00	3,311	405.0	1,465	3,679	13,342
1,349.00	4,184	299.4	3,739	7,418	19,272

Device	Routing	Invert	Outlet Devices
#1	Primary	1,347.50'	**30.0 deg Sharp-Crested Vee/Trap Weir** Cv= 2.61 (C= 3.26)
#2	Secondary	1,348.20'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

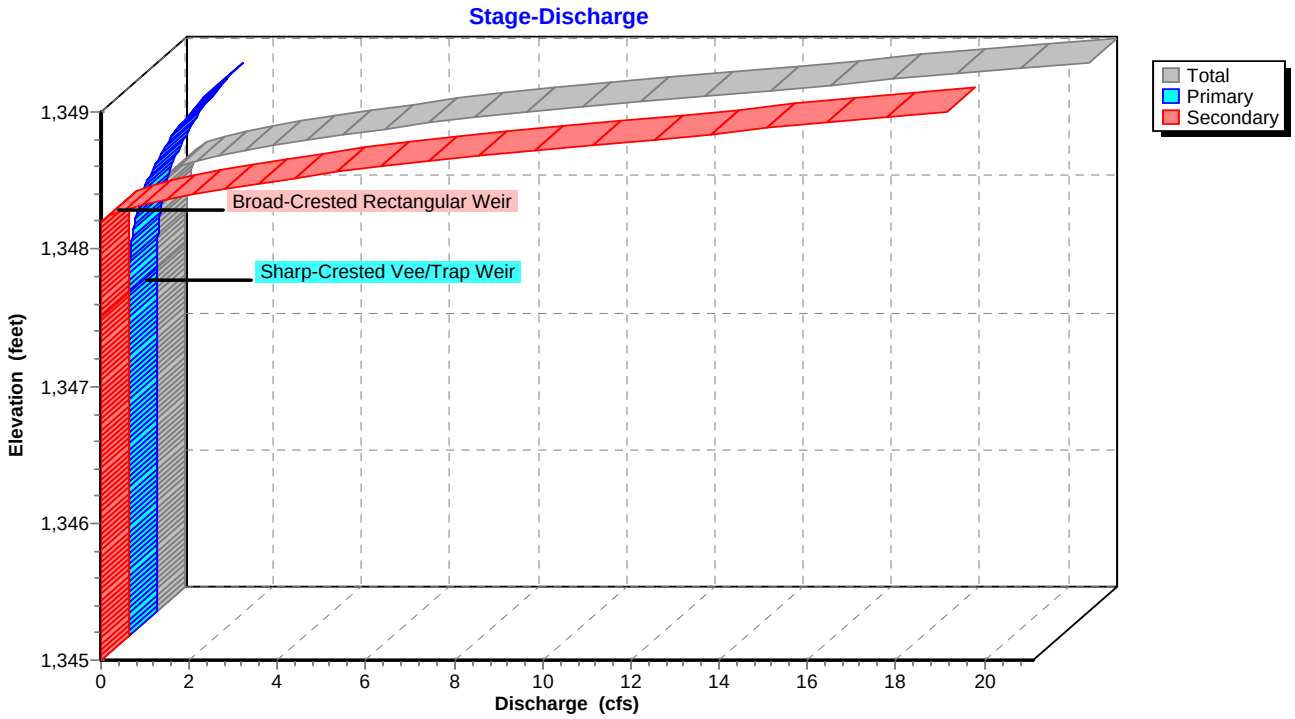
Primary OutFlow Max=0.88 cfs @ 12.06 hrs HW=1,348.59' (Free Discharge)
1=Sharp-Crested Vee/Trap Weir (Weir Controls 0.88 cfs @ 2.73 fps)

Secondary OutFlow Max=6.18 cfs @ 12.06 hrs HW=1,348.59' (Free Discharge)
2=Broad-Crested Rectangular Weir (Weir Controls 6.18 cfs @ 1.57 fps)

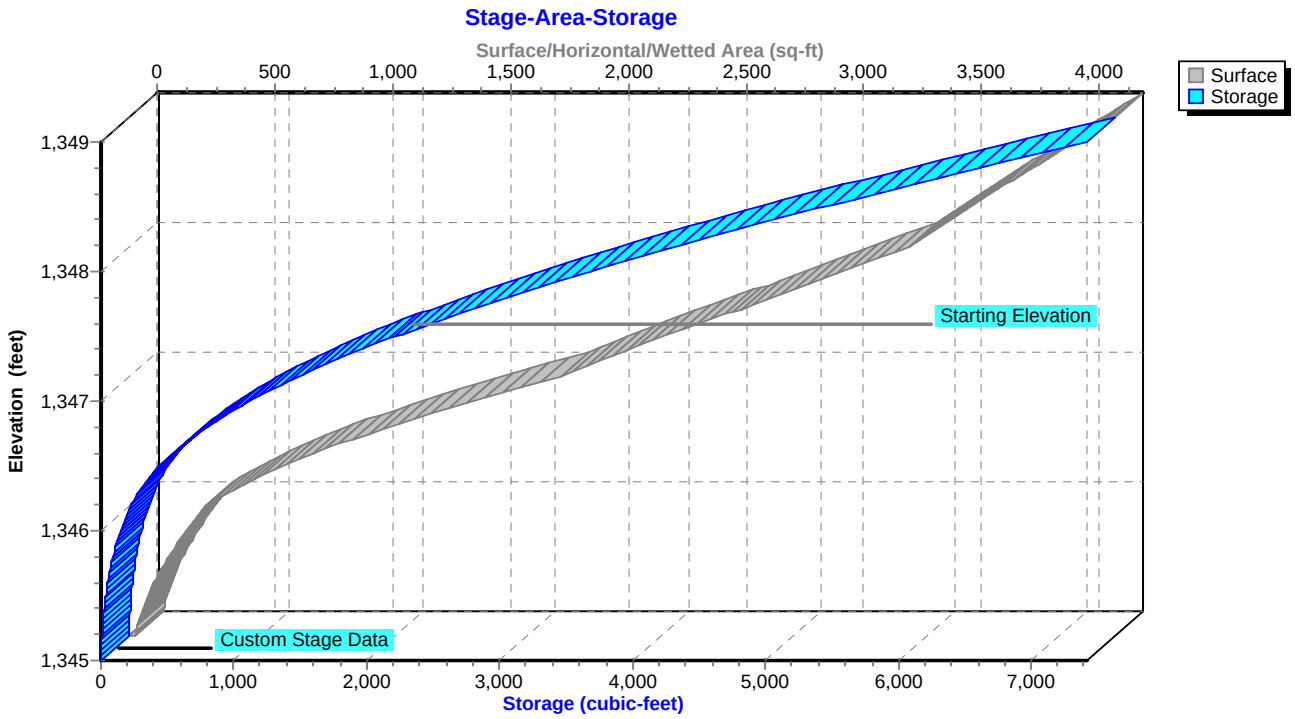
Pond 94P: Stormwater Wetland C



Pond 94P: Stormwater Wetland C



Pond 94P: Stormwater Wetland C



Summary for Pond 95P: Bioretention Area F

Inflow Area = 0.564 ac, 44.68% Impervious, Inflow Depth = 6.14" for 100-YR, 24-HR Storm event
Inflow = 4.59 cfs @ 12.02 hrs, Volume= 0.288 af
Outflow = 4.47 cfs @ 12.04 hrs, Volume= 0.264 af, Atten= 3%, Lag= 1.0 min
Primary = 4.47 cfs @ 12.04 hrs, Volume= 0.264 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Peak Elev= 1,349.73' @ 12.04 hrs Surf.Area= 1,877 sf Storage= 2,035 cf

Plug-Flow detention time= 205.8 min calculated for 0.264 af (91% of inflow)
Center-of-Mass det. time= 162.5 min (949.1 - 786.6)

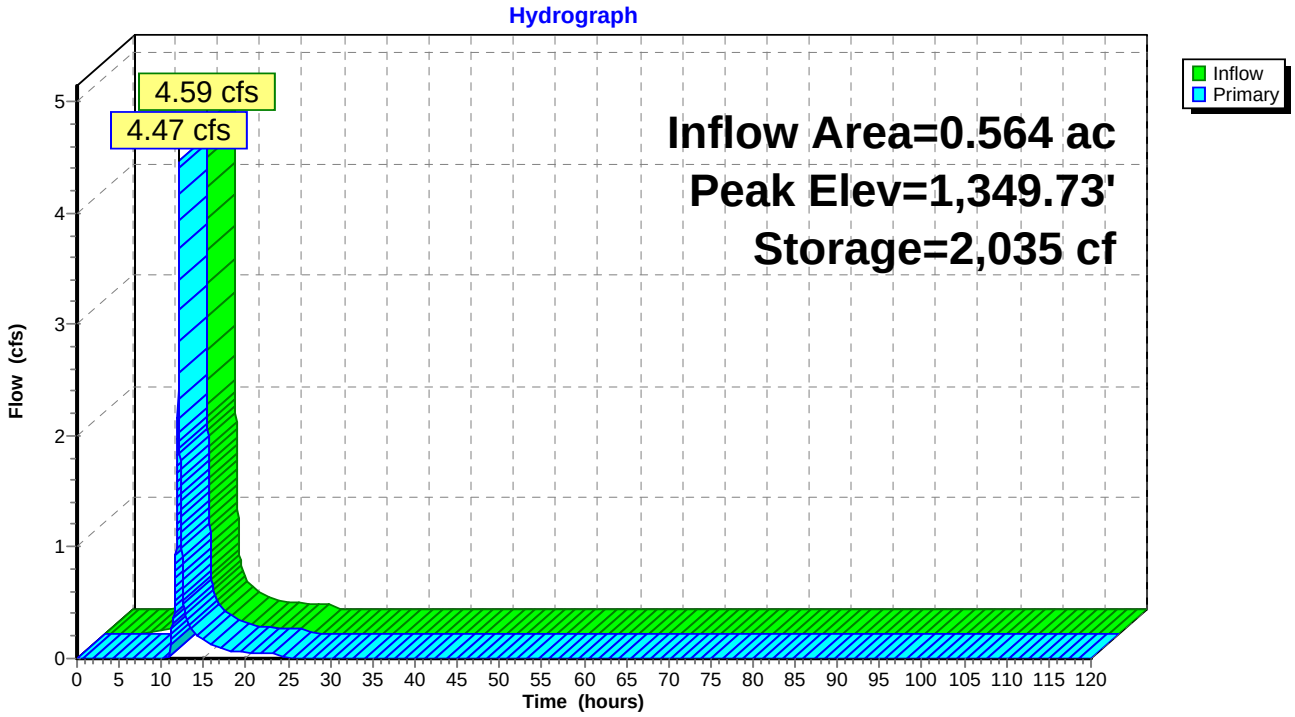
Volume	Invert	Avail.Storage	Storage Description
#1	1,345.00'	6,415 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,345.00	996	183.4	0.0	0	0	996
1,345.50	996	183.4	25.0	125	125	1,088
1,346.00	996	183.4	25.0	125	249	1,179
1,347.00	996	183.4	25.0	249	498	1,363
1,348.00	996	183.4	25.0	249	747	1,546
1,349.00	996	183.4	25.0	249	996	1,730
1,350.00	2,264	464.7	100.0	1,587	2,583	16,241
1,351.00	5,654	1,195.0	100.0	3,832	6,415	112,699

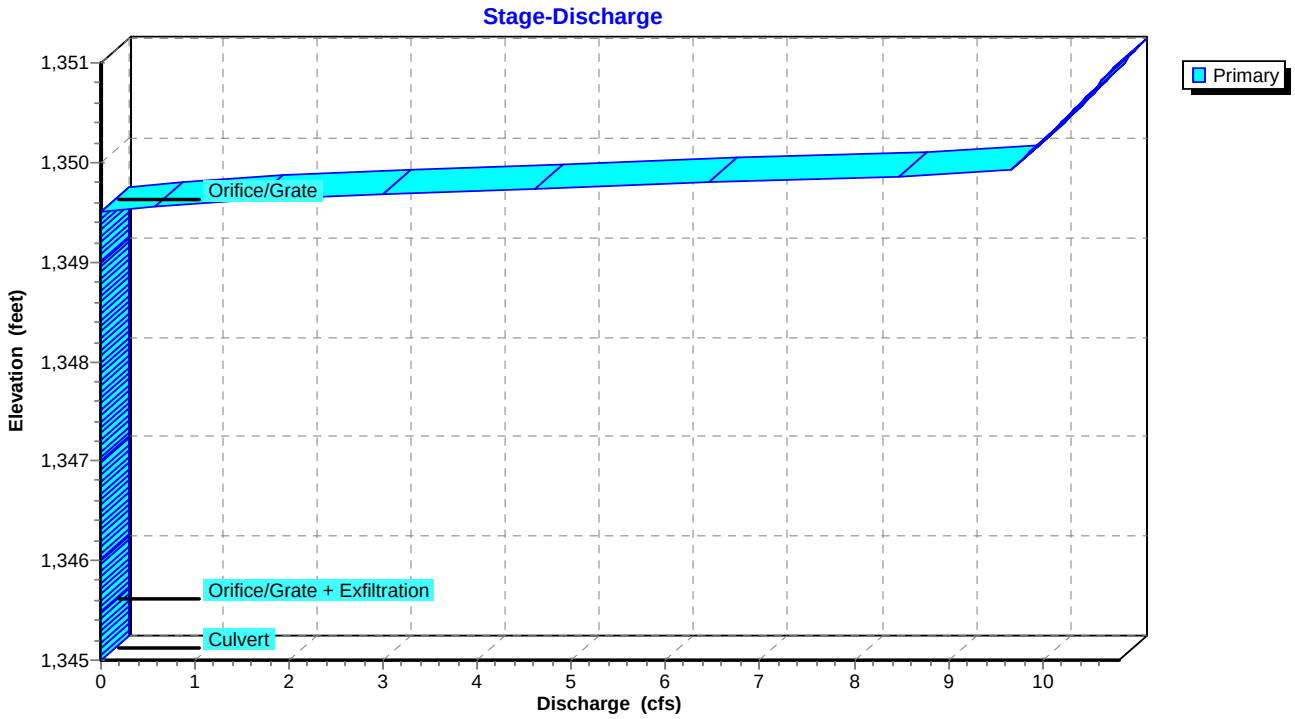
Device	Routing	Invert	Outlet Devices
#1	Primary	1,345.00'	**15.0" Round Culvert** L= 78.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,345.00' / 1,344.20' S= 0.0103 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,345.50'	**0.4" Horiz. Orifice/Grate X 340.00 columns** X 4 rows C= 0.600 Limited to weir flow at low heads
#3	Device 2	1,345.50'	**0.250 in/hr Exfiltration over Surface area above 1,345.50'** Conductivity to Groundwater Elevation = 1,344.50' Excluded Surface area = 996 sf
#4	Device 1	1,349.50'	**36.0" x 36.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=4.45 cfs @ 12.04 hrs HW=1,349.73' (Free Discharge)
└**1=Culvert** (Passes 4.45 cfs of 9.46 cfs potential flow)
└**2=Orifice/Grate** (Passes 0.01 cfs of 11.76 cfs potential flow)
└**3=Exfiltration** (Controls 0.01 cfs)
└**4=Orifice/Grate** (Weir Controls 4.45 cfs @ 1.58 fps)

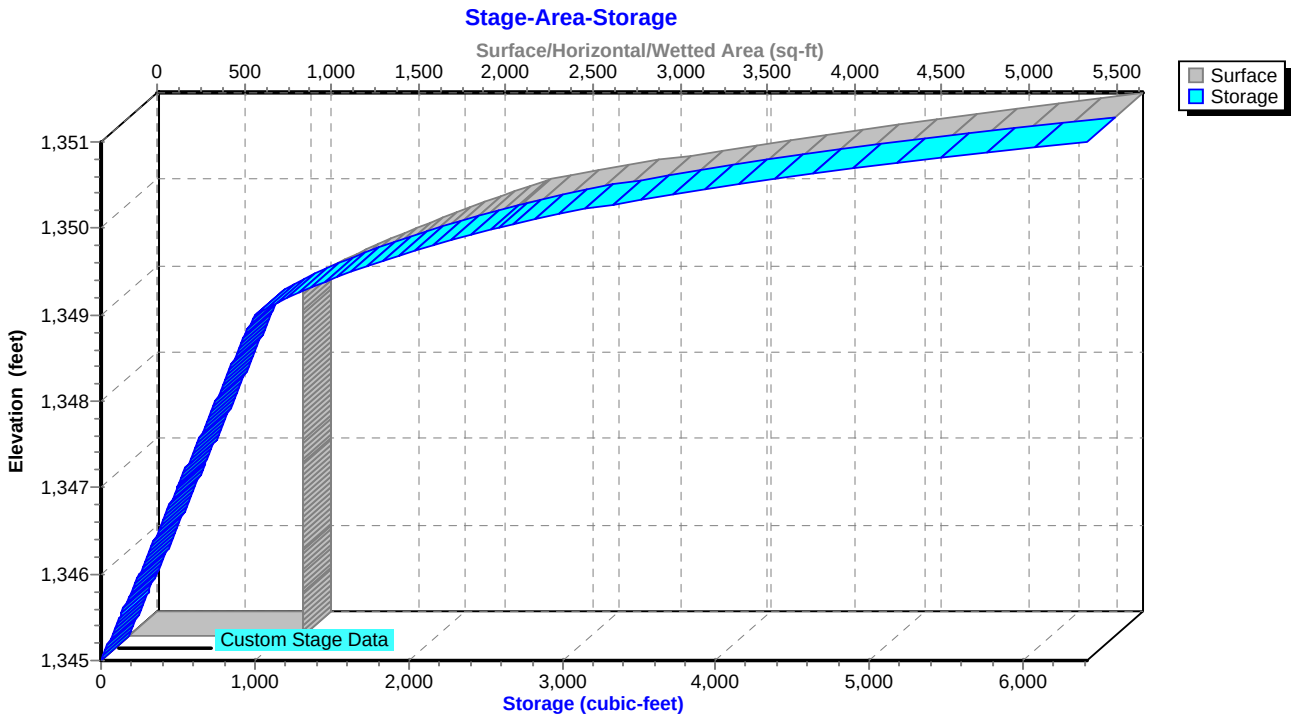
Pond 95P: Bioretention Area F



Pond 95P: Bioretention Area F



Pond 95P: Bioretention Area F



Summary for Pond 99P: Stormwater Pocket Wetland G

Inflow Area = 0.677 ac, 44.17% Impervious, Inflow Depth = 6.30" for 100-YR, 24-HR Storm event
Inflow = 5.63 cfs @ 12.02 hrs, Volume= 0.356 af
Outflow = 4.76 cfs @ 12.06 hrs, Volume= 0.356 af, Atten= 15%, Lag= 2.3 min
Primary = 4.76 cfs @ 12.06 hrs, Volume= 0.356 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,339.00' Surf.Area= 3,682 sf Storage= 5,147 cf
Peak Elev= 1,339.33' @ 12.06 hrs Surf.Area= 4,044 sf Storage= 6,416 cf (1,269 cf above start)

Plug-Flow detention time= 177.3 min calculated for 0.237 af (67% of inflow)
Center-of-Mass det. time= 10.1 min (792.4 - 782.3)

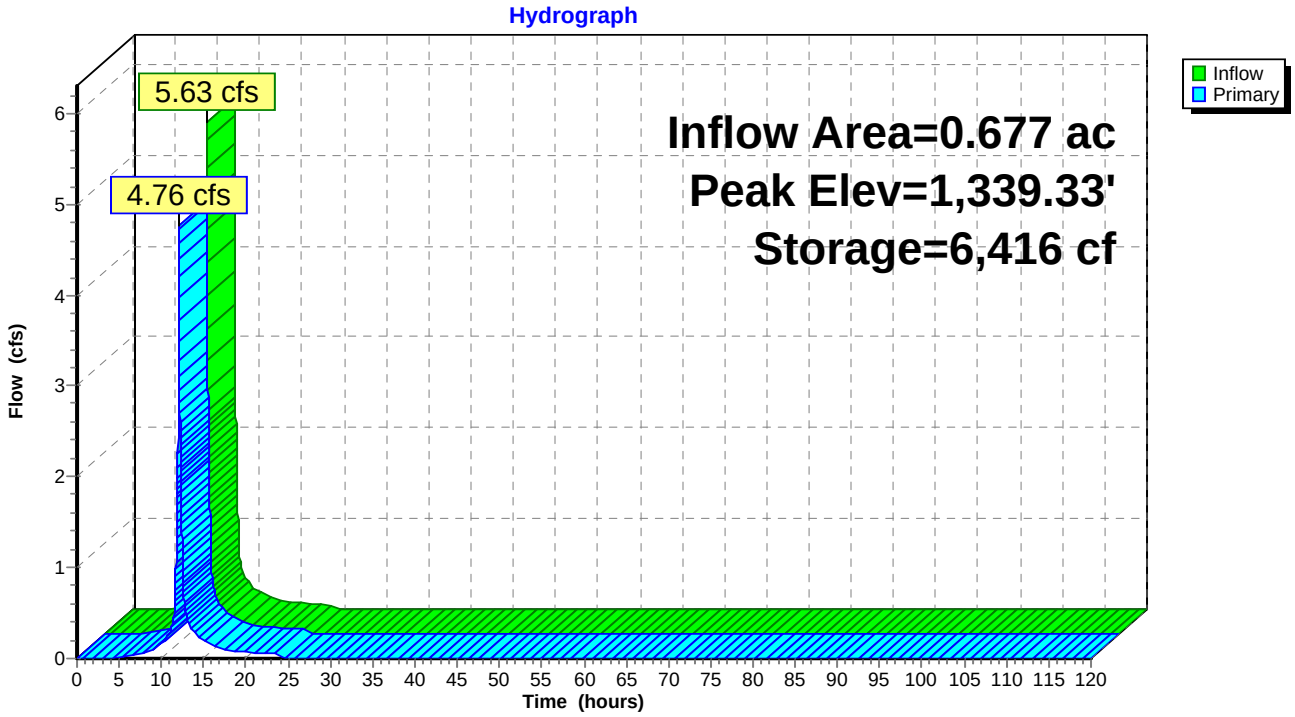
Volume	Invert	Avail.Storage	Storage Description
#1	1,335.00'	9,394 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,335.00	93	80.5	0	0	93
1,336.00	416	130.2	235	235	933
1,337.00	1,024	220.2	698	933	3,449
1,338.00	1,932	236.2	1,454	2,387	4,073
1,339.00	3,682	404.5	2,760	5,147	12,660
1,340.00	4,837	491.2	4,246	9,394	18,856

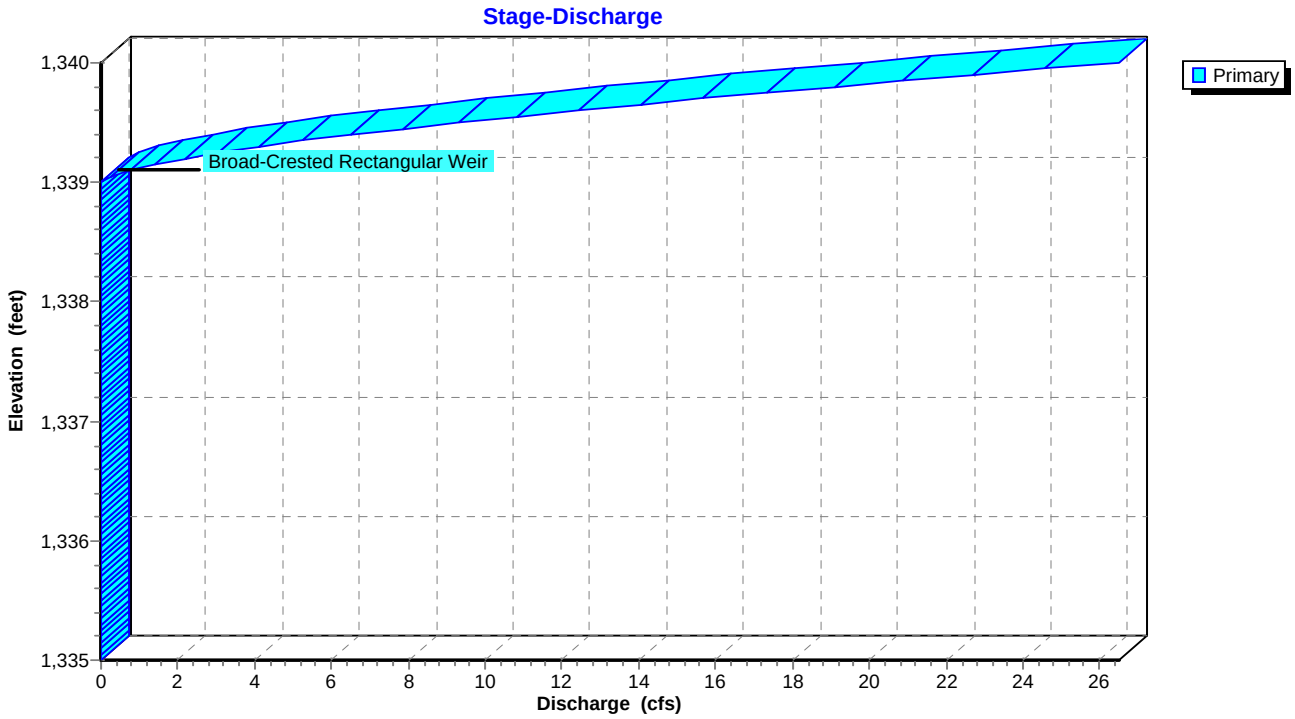
Device	Routing	Invert	Outlet Devices
#1	Primary	1,339.00'	**10.0' long x 3.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 Coef. (English) 2.44 2.58 2.68 2.67 2.65 2.64 2.64 2.68 2.68 2.72 2.81 2.92 2.97 3.07 3.32

Primary OutFlow Max=4.75 cfs @ 12.06 hrs HW=1,339.33' (Free Discharge)
1=Broad-Crested Rectangular Weir (Weir Controls 4.75 cfs @ 1.45 fps)

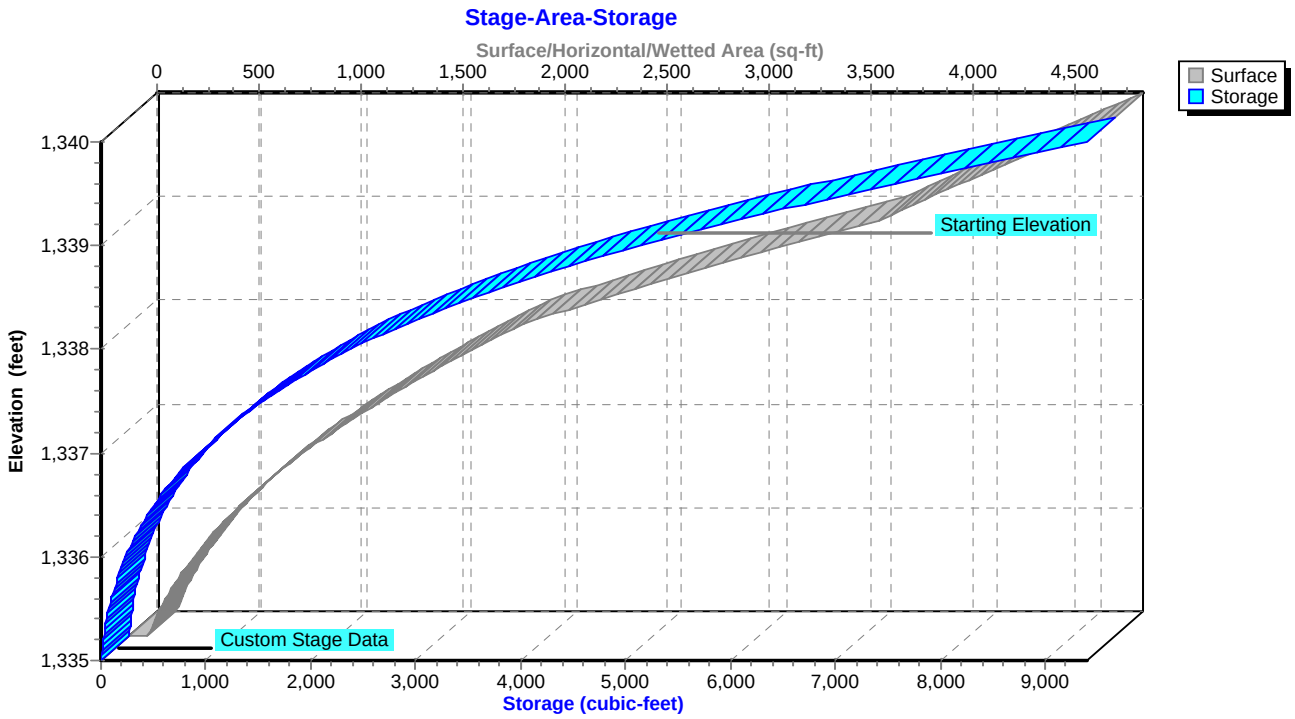
Pond 99P: Stormwater Pocket Wetland G



Pond 99P: Stormwater Pocket Wetland G



Pond 99P: Stormwater Pocket Wetland G



Summary for Pond 100P: Stormwater Wetland E

Inflow Area = 1.422 ac, 39.94% Impervious, Inflow Depth = 6.11" for 100-YR, 24-HR Storm event
Inflow = 11.39 cfs @ 12.02 hrs, Volume= 0.724 af
Outflow = 10.45 cfs @ 12.05 hrs, Volume= 0.724 af, Atten= 8%, Lag= 1.8 min
Primary = 0.66 cfs @ 12.05 hrs, Volume= 0.390 af
Secondary = 9.80 cfs @ 12.05 hrs, Volume= 0.335 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,346.80' Surf.Area= 2,420 sf Storage= 2,588 cf
Peak Elev= 1,347.52' @ 12.05 hrs Surf.Area= 3,792 sf Storage= 4,806 cf (2,218 cf above start)

Plug-Flow detention time= 74.9 min calculated for 0.665 af (92% of inflow)
Center-of-Mass det. time= 9.0 min (796.3 - 787.3)

Volume	Invert	Avail.Storage	Storage Description
#1	1,343.00'	13,221 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

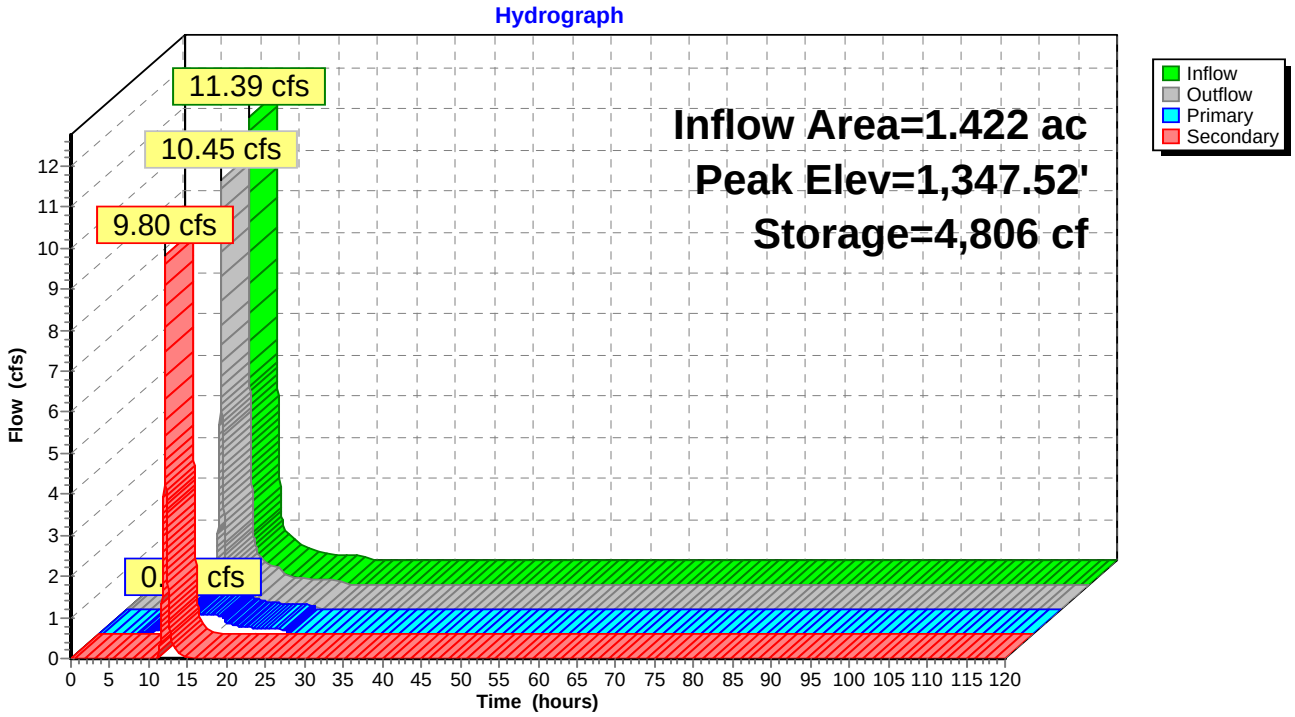
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,343.00	13	14.7	0	0	13
1,344.00	114	57.6	55	55	262
1,345.00	474	130.7	273	329	1,362
1,346.00	1,234	286.1	824	1,153	6,520
1,347.00	2,778	454.7	1,954	3,107	16,466
1,348.00	4,871	736.2	3,776	6,883	43,150
1,349.00	7,928	1,003.3	6,338	13,221	80,134

Device	Routing	Invert	Outlet Devices
#1	Primary	1,346.20'	**6.0" Round Culvert** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,346.20' / 1,346.00' S= 0.0040 '/' Cc= 0.900 n= 0.013, Flow Area= 0.20 sf
#2	Device 1	1,346.80'	**24.0" x 24.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads
#3	Secondary	1,347.00'	**10.0' long x 5.0' breadth Broad-Crested Rectangular Weir** Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 1.80 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.50 Coef. (English) 2.34 2.50 2.70 2.68 2.68 2.66 2.65 2.65 2.65 2.65 2.67 2.66 2.68 2.70 2.74 2.79 2.88

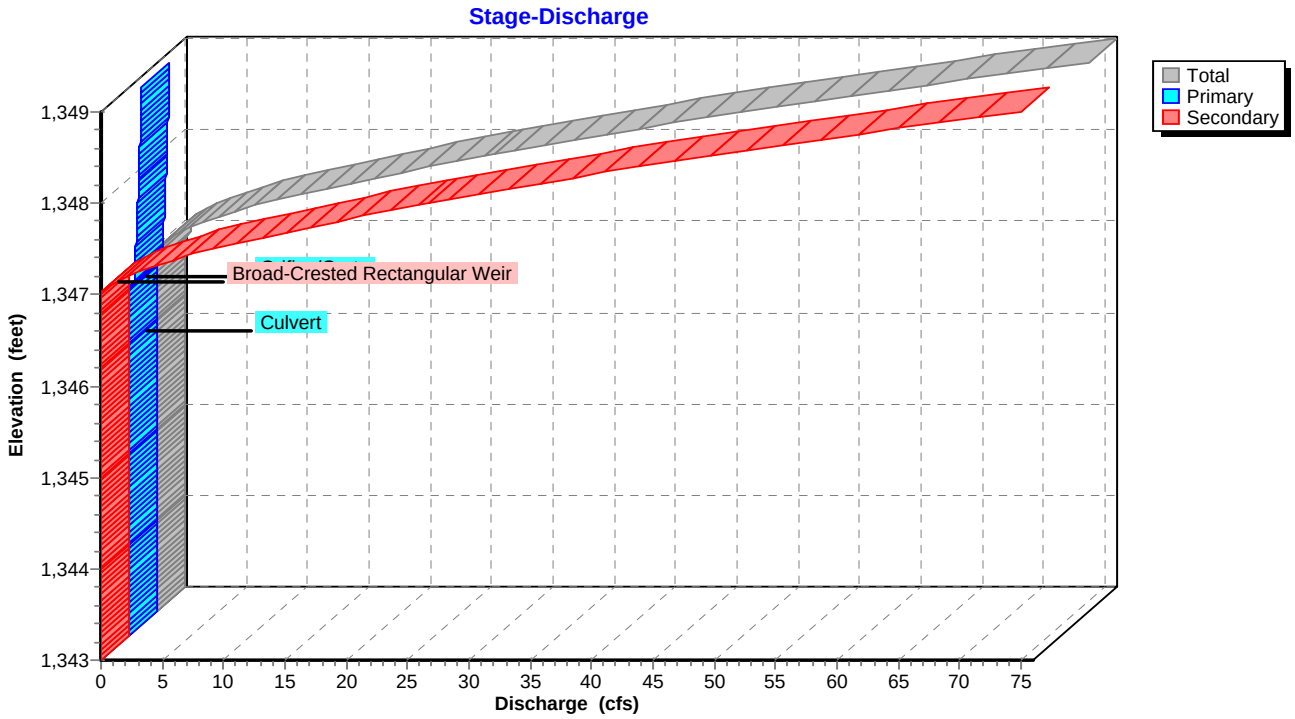
Primary OutFlow Max=0.66 cfs @ 12.05 hrs HW=1,347.52' (Free Discharge)
└**1=Culvert** (Barrel Controls 0.66 cfs @ 3.35 fps)
└**2=Orifice/Grate** (Passes 0.66 cfs of 15.93 cfs potential flow)

Secondary OutFlow Max=9.78 cfs @ 12.05 hrs HW=1,347.52' (Free Discharge)
└**3=Broad-Crested Rectangular Weir** (Weir Controls 9.78 cfs @ 1.89 fps)

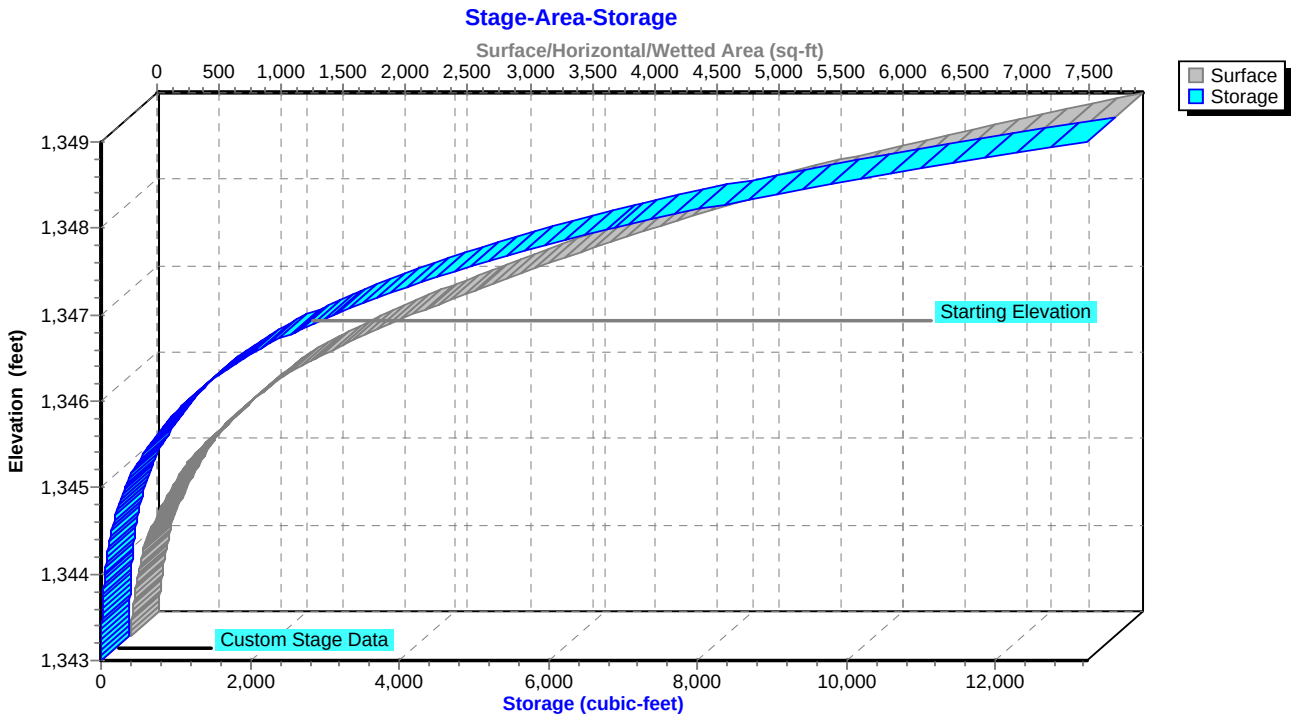
Pond 100P: Stormwater Wetland E



Pond 100P: Stormwater Wetland E



Pond 100P: Stormwater Wetland E



SWPPP

APPENDIX J

SUMMARY OF POND DESIGN ELEMENTS

The following is a summary of the proposed ponds and created wetlands that serve as water quality and quantity type ponds/wetlands. The proposed pond and wetland types were chosen based on various physical elements including contributing drainage area, land use, water table, etc. This appendix serves to outline the various required design elements of the New York State Stormwater Management Design Manual.

Table J-1
Summary of Pond Types

Pond No.	Location	Pond Type	In-line or off-line system	Drainage Area (acres)
C	Thompsonville Road	W-4 (Pocket Wetland)	Off-line	0.959
E	Thompsonville Road	W-4	In-Line Treatment	1.422
G	Thompsonville Road	W-4	In-Line Treatment	0.677
30	Joyland Road (between Thomsponville Rd. and Resort Entry Road)	W-4	In-Line Treatment	1.148
29A	Joyland Road (between Thomsponville Rd. and Resort Entry Road)	W-4	Off-Line Treatment	0.448
29B	Joyland Road (between Thomsponville Rd. and Resort Entry Road)	W-4	In-Line Treatment	1.788
28	Resort Entry Road	Pocket Pond (P-5)	In-Line Treatment	3.802
26	Resort Entry Road	P-5	In-Line Treatment	5.277
24	Resort Entry Road	Micropool Extended Detention Pond (P-1)	In-Line Treatment	12.441
23	Resort Entry Road	P-5	In-Line Treatment	7.321
21B	Resort Entry Road	P-5	In-Line Treatment	3.185
21A	Resort Entry Road	P-5	In-Line Treatment	3.680

1.0 THOMPSONVILLE ROAD

The following represents the three proposed ponds along Thompsonville Road that will be located within the right of way and will provide treatement for the redevelopment of the existing asphalt pavement. The roadway improvements include a defined 11 ft. asphalt paved travel lane in each direction, a 2 ft. gravel shoulder. The proposed redeveloped road will be crowned in the middle. A vegetated grassed swale is

proposed along the roadway conveying stormwater runoff to proposed bioretention basins and pocket wetlands.

1.1 Stormwater Wetland C (Off-Line Treatment)

Pocket Wetland (W-4 per the NYSSMDM)
The following parameters were used in designing and sizing the Pocket Wetland (W-4):

- Swale and Forebay - A forebay would be provided at each inlet point, which would provide primary settling for the larger particulates. Prior to the forebay, vegetated swales are designed to convey runoff to the proposed stormwater wetland as well as provide pre-treatment. The inflow from the vegetated swales would be stabilized with rip rap to minimize erosion. Due to subsurface site constraints and site features such as adjacent existing wetlands, and the extremely small volume, the proposed forebay depth was limited to 2 feet. Although it does not meet the optimal range of 4 to 6 feet deep, additional forebay volume was provided than required. In addition, the vegetated swales are expected to provide pre-treatment prior to runoff entering the proposed forebay. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.

Sediment Forebay Sizing		
Requirement:	10% of the WQv	
Requirement:	4 to 6 feet deep	
Water Quality Volume (90% Rule)		
WQv =	1,413	cf
10% of WQv =	141	cf

Forebay Volume Provided =	**442**	**cf @ EL. 1347'**
Forebay Depth Provided =	**2**	**ft**

- Side-Slopes - The minimum side slopes for the forebay and the proposed stormwater pocket wetland are 3:1(H:1). The side slopes will vary based on microtopography to achieve WQv zones (e.g., low marsh, high marsh).
- Micropool - A micropool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would be 2.5 feet in depth that stores approximately 10% of the WQv.
- Water Quality Volume – 100% of the water quality volume would be maintained within the stormwater pocket wetland.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.

- Permanent pool – The proposed design would provide 100% of the water quality volume within the stormwater pocket wetland. Through microtopography and internal grading, a minimum of 35% of the total surface area will have a depth of six inches or less, and at least 65% of the total surface area shall be shallower than 18 inches with at least 25% of the WQv in deep water zones with a depth greater than four feet.

Micropool Sizing

Requirement:	10% of WQv	
Requirement:	4 to 6 feet deep	
Water Quality Volume (90% Rule)		
WQv =	1,413	cf
10% of WQv =	141	cf

Micropool Volume Provided =	**422**	**cf @ EL. 1347.5'**
Micropool Depth Provided =	**2.5**	**ft**

Pocket Wetland Sizing

Requirement:	100% of WQv	
Requirement:	Varies*	
Water Quality Volume (90% Rule)		
WQv =	1,413	cf
100% of WQv =	1,413	cf

Permanent Pool Volume Provided =	**2,214**	**cf @ EL. 1347.5'**
Permanent Pool Depth Provided =	**< 6 in to**	**2.5 ft**

** Note – WQv zones vary based on microtopography and internal grading to achieve low marsh and high marsh planting requirements. See Paving, Grading, and Drainage Plan.*

- Geometry – The Pocket Wetland has been designed with a length to width ratio of 2:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Outlet control structure – The outlet control structure will consist of a primary weir set at the permanent pool elevation.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Freeboard - 1 foot of freeboard would be provided.

- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided through a bypass channel prior to the off-line stormwater pocket wetland. The weir elevation is determined by the 100-yr flood elevation and located such that stormwater flows would not adversely impact surrounding properties.
- Planting Maintenance – Reinforcement plantings will be required as outlined in the specifications after the second growing season if 50% coverage is not achieved.
- Wetland Safety – Signs warning the general public of standing water will be placed along the pond edge.

1.2 Proposed Stormwater Wetland E (In-Line Treatment)

Proposed Pocket Wetland (W-4 per the NYSSMDM)
The following parameters were used in designing and sizing the Pocket Wetland (W-4):

- Swale and Forebay - A forebay would be provided at each inlet point, which would provide primary settling for the larger particulates. Prior to the forebay, vegetated swales are designed to convey runoff to the proposed stormwater wetland as well as provide pre-treatment. The inflow from the vegetated swales would be stabilized with rip rap to minimize erosion. Due to subsurface site constraints and adjacent existing wetlands, the proposed forebay depth was limited to 2 feet. Although it does not meet the optimal range of 4 to 6 feet deep, additional forebay volume was provided than required. In addition, the vegetated swales are expected to provide pre-treatment prior to runoff entering the proposed forebay. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.

Sediment Forebay Sizing		
Requirement:	10% of the WQv	
Requirement:	4 to 6 feet deep	
Water Quality Volume (90% Rule)		
WQv =	2,542	cf
10% of WQv =	254	cf

Forebay Volume Provided =	**292**	**cf @ EL. 1346'**
Forebay Depth Provided =	**2**	**ft**

- Side-Slopes - The minimum side slopes for the forebay and the proposed stormwater pocket wetland are 3:1(H:1). The side slopes will vary based on microtopography to achieve WQv zones (e.g., low marsh, high marsh).
- Micropool - A micropool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would be 2.5 feet in depth that stores approximately 10% of the WQv.

- Water Quality Volume – 100% of the water quality volume would be maintained within the stormwater pocket wetland.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.
- Permanent pool – The proposed design would provide 100% of the water quality volume within the stormwater pocket wetland. Through microtopography and internal grading, a minimum of 35% of the total surface area will have a depth of six inches or less, and at least 65% of the total surface area shall be shallower than 18 inches with at least 25% of the WQv in deep water zones with a depth greater than four feet.

Micropool Sizing

Requirement: 10% of WQv
Requirement: 4 to 6 feet deep

Water Quality Volume (90% Rule)
WQv = 2,542 cf

10% of WQv = 254 cf

Micropool Volume Provided =	**403**	**cf @ EL. 1346'**
Micropool Depth Provided =	**2.5**	**ft**

Pocket Wetland Sizing

Requirement: 100% of WQv
Requirement: Varies*

Water Quality Volume (90% Rule)
WQv = 2,542 cf

100% of WQv = 2,542 cf

Permanent Pool Volume Provided =	**2,588**	**cf @ EL. 1346.8'**
Permanent Pool Depth Provided =	**<6 in. to 3.8**	**ft**

** Note – WQv zones vary based on microtopography and internal grading to achieve low marsh and high marsh planting requirements. See Grading Plan.*

- Geometry – The Pocket Wetland has been designed with a length to width ratio of 2:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.

- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Outlet control structure – The outlet control structure will consist of a primary weir set at the permanent pool elevation.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Freeboard - 1 foot of freeboard would be provided.
- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided through a secondary emergency overflow weir. The weir elevation is determined by the 100-yr flood elevation and located such that stormwater flows would not adversely impact surrounding properties.
- Planting Maintenance – Reinforcement plantings will be required as outlined in the specifications after the second growing season if 50% coverage is not achieved.
- Wetland Safety – Signs warning the general public of standing water will be placed along the pond edge.

1.3 Proposed Stormwater Wetland G (In-Line Treatment)

Proposed Pocket Wetland (W-4 per the NYSSMDM)
The following parameters were used in designing and sizing the Pocket Wetland (W-4):

- Swale and Forebay - A forebay would be provided at each inlet point, which would provide primary settling for the larger particulates. Prior to the forebay, vegetated swales are designed to convey runoff to the proposed stormwater wetland as well as provide pre-treatment. The inflow from the vegetated swales would be stabilized with rip rap to minimize erosion. Due to subsurface site constraints and surface constraints such as adjacent existing wetlands, the proposed forebay depth was limited to 2 feet. Although it does not meet the optimal range of 4 to 6 feet deep, additional forebay volume was provided than required. In addition, the vegetated swales are expected to provide pre-treatment prior to runoff entering the proposed forebay. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.

Sediment Forebay Sizing

Requirement:	10% of the WQv
Requirement:	4 to 6 feet deep

Water Quality Volume (90% Rule)

WQv =	1,320	cf
10% of WQv =	132	cf

Forebay Volume Provided =	**356**	**cf @ EL. 1337'**
Forebay Depth Provided =	**2**	**ft**

- Side-Slopes - The minimum side slopes for the forebay and the proposed stormwater pocket wetland are 3:1(H:1). The side slopes will vary based on microtopography to achieve WQv zones (e.g., low marsh, high marsh).
- Micropool - A micropool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would be two feet in depth that stores greater than 10% of the WQv.
- Water Quality Volume – 100% of the water quality volume would be maintained within the stormwater pocket wetland.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.
- Permanent pool – The proposed design would provide 100% of the water quality volume within the stormwater pocket wetland. Through microtopography and internal grading, a minimum of 35% of the total surface area will have a depth of six inches or less, and at least 65% of the total surface area shall be shallower than 18 inches with at least 25% of the WQv in deep water zones with a depth greater than four feet.

Micropool Sizing

Requirement:	10% of WQv	
Requirement:	4 to 6 feet deep	
Water Quality Volume (90% Rule)		
WQv =	1,320	cf
10% of WQv =	132	cf

Micropool Volume Provided =	**504**	**cf @ EL. 1337'**
Micropool Depth Provided =	**2**	**ft**

Pocket Wetland Sizing

Requirement:	100% of WQv	
Requirement:	Varies*	
Water Quality Volume (90% Rule)		
WQv =	1,320	cf
100% of WQv =	1,320	cf

Permanent Pool Volume Provided =	**5,147**	**cf @ EL. 1339'**
Permanent Pool Depth Provided =	**<6 in.**	**to 4 ft**

** Note – WQv zones vary based on microtopography and internal grading to achieve low marsh and high marsh planting requirements. See Grading Plan.*

- Geometry – The Pocket Wetland has been designed with a length to width ratio of 2:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Outlet control structure – The outlet control structure will consist of a primary weir set at the permanent pool elevation.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Freeboard - 1 foot of freeboard would be provided.
- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided through a secondary emergency overflow weir. The weir elevation is determined by the 100-yr flood elevation and located such that stormwater flows would not adversely impact surrounding properties.
- Planting Maintenance – Reinforcement plantings will be required as outlined in the specifications after the second growing season if 50% coverage is not achieved.
- Wetland Safety – Signs warning the general public of standing water will be placed along the pond edge.

2.0 JOYLAND ROAD

The following represents the three proposed ponds along Joyland Road that will be located within the right of way and will provide treatment for the redevelopment and widening of Joyland Road between Thompsonville Road and Resort Entry Road. The roadway improvements include a defined 11 ft. asphalt paved travel lane in each direction, crowned roadway with concrete curb and a system of catch basins and piping. Stormwater runoff from the asphalt pavement will be conveyed to proposed bioretntion basins or created wetlands located east of the proposed road.

2.1 Proposed Stormwater Wetland No. 30 (In-Line Treatment)

Proposed Pocket Wetland (W-4 per the NYSSMDM)

The following parameters were used in designing and sizing the Pocket Wetland (W-4):

- Forebay - A forebay would be provided at the inlet point, which would provide primary settling for the larger particulates. The outfall from the inlet pipe would be stabilized with rip rap to minimize erosion of the sideslopes. Due to subsurface site constraints and site features such as adjacent existing wetlands, and the extremely small volume, the proposed forebay depth was limited to 3 feet. Although it does not meet the optimal range of 4 to 6 feet deep, additional forebay volume was provided than required. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.

Sediment Forebay Sizing		
Requirement:	10% of the WQv	
Requirement:	4 to 6 feet deep	
Water Quality Volume (90% Rule)		
WQv =	2,047	cf
10% of WQv =	205	cf

Forebay Volume Provided =	**1,894**	**cf @ EL. 1437'**
Forebay Depth Provided =	**3**	**ft**

- Side-Slopes - The minimum side slopes for the forebay and the proposed stormwater pocket wetland are 3:1(H:1). The side slopes will vary based on microtopography to achieve WQv zones (e.g., low marsh, high marsh).
- Micropool - A micropool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would be three feet in depth that stores approximately 10% of the WQv.
- Water Quality Volume – 100% of the water quality volume would be maintained within the stormwater pocket wetland.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes

and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.

- Permanent pool – The proposed design would provide 100% of the water quality volume within the stormwater pocket wetland. Through microtopography and internal grading, a minimum of 35% of the total surface area will have a depth of six inches or less, and at least 65% of the total surface area shall be shallower than 18 inches with at least 25% of the WQv in deep water zones with a depth greater than four feet.

Micropool Sizing

Requirement: 10% of WQv
Requirement: 4 to 6 feet deep

Water Quality Volume (90% Rule)
WQv = 2,047 cf

10% of WQv = 205 cf

Micropool Volume Provided =	**3,912**	**cf @ EL. 1437'**
Micropool Depth Provided =	**3**	**ft**

Pocket Wetland Sizing

Requirement: 100% of WQv
Requirement: Varies*

Water Quality Volume (90% Rule)
WQv = 2,047 cf

100% of WQv = 2,047 cf

Permanent Pool Volume Provided =	**5,097**	**cf @ EL. 1437'**
Permanent Pool Depth Provided =	**<6 in. <6 in.**	**to 3 ft**

** Note – WQv zones vary based on microtopography and internal grading to achieve low marsh and high marsh planting requirements. See Grading Plan.*

- Geometry – The Pocket Wetland has been designed with a length to width ratio of 2:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Outlet control structure – The pre-cast concrete structure is designed with a low flow orifice that would detain the 1-year, 24-hour storm event for a minimum of 24 hours, meeting the NYSDEC and NYCDEP requirements. The larger storm events would also be conveyed through an opening at the

top of the outlet control structure designed to attenuate the larger storm events. The outlet control structure is located within the pond embankment.

- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Freeboard - 1 foot of freeboard would be provided.
- Planting Maintenance – Reinforcement plantings will be required as outlined in the specifications after the second growing season if 50% coverage is not achieved.
- Wetland Safety – Signs warning the general public of standing water will be placed along the pond edge.

2.2 Proposed Stormwater Wetland No. 29A (Off-Line Treatment)

Proposed Pocket Wetland (W-4 per the NYSSMDM)
The following parameters were used in designing and sizing the Pocket Wetland (W-4):

- Flow Diversion Structure - A flow diversion structure will be provided at the inlet point, which would bypass storm events greater than the WQv event to the stormwater conveyance network. The WQv event would be directed into the proposed stormwater pocket wetland. The outfall from the inlet pipe would be stabilized with rip rap to minimize erosion of the sideslopes. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.
- Side-Slopes - The minimum side slopes for the the proposed stormwater pocket wetland are 3:1(H:1). The side slopes will vary based on microtopography to achieve WQv zone requirements (e.g., low marsh, high marsh).
- Micropool - A micropool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would be 2.5 feet in depth that stores greater than 10% of the WQv.
- Water Quality Volume – 100% of the water quality volume would be maintained within the stormwater pocket wetland.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.
- Permanent pool – The proposed design would provide 100% of the water quality volume within the stormwater pocket wetland. Through microtopography and internal grading, a minimum of 35% of the total surface area will have a depth of six inches or less, and at least 65% of the total surface area shall be shallower than 18 inches with at least 25% of the WQv in deep water zones with a depth greater than four feet.

Pocket Wetland Sizing	
Requirement:	100% of WQv
Requirement:	Varies*

Water Quality Volume (90% Rule)

WQv = 814 cf

100% of WQv = 814 cf

Permanent Pool Volume Provided =	**1,565**	**cf @ EL. 1443.5'**
Permanent Pool Depth Provided =	**<6 in.**	**to 2.5 ft**

** Note – WQv zones vary based on microtopography and internal grading to achieve low marsh and high marsh planting requirements. See Grading Plan.*

- Geometry – The Pocket Wetland has been designed with a length to width ratio of 2:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Outlet control structure – Outlet control structure – The outlet control structure will consist of a primary weir set at the permanent pool elevation.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Freeboard - 1 foot of freeboard would be provided.
- Planting Maintenance – Reinforcement plantings will be required as outlined in the specifications after the second growing season if 50% coverage is not achieved.
- Wetland Safety – Signs warning the general public of standing water will be placed along the pond edge.

2.3 Proposed Stormwater Wetland No. 29B (In-Line Treatment)

Proposed Pocket Wetland (W-4 per the NYSSMDM)

The following parameters were used in designing and sizing the Pocket Wetland (W-4):

- Forebay - A forebay would be provided at each inlet point, which would provide primary settling for the larger particulates. The outfall from the inlet pipe would be stabilized with rip rap to minimize erosion of the sideslopes. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.

Sediment Forebay Sizing

Requirement: 10% of the WQv

Requirement: 4 to 6 feet deep

Water Quality Volume (90% Rule)

WQv = 3,578 cf

10% of WQv = 358 cf

Forebay No. 1

Forebay Volume Provided =	**1,440**	**cf @ EL. 1443'**
Forebay Depth Provided =	**3**	**ft**

Forebay No. 2

Forebay Volume Provided =	**1,628**	**cf @ EL. 1443'**
Forebay Depth Provided =	**3**	**ft**

- Side-Slopes - The minimum side slopes for the forebay and the proposed stormwater pocket wetland are 3:1(H:1). The side slopes will vary based on microtopography to achieve WQv zones (e.g., low marsh, high marsh).
- Micropool - A micropool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would be three feet in depth that stores greater than 10% of the WQv.
- Water Quality Volume – 100% of the water quality volume would be maintained within the stormwater pocket wetland.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.
- Permanent pool – The proposed design would provide 100% of the water quality volume within the stormwater pocket wetland. Through microtopography and internal grading, a minimum of 35% of the total surface area will have a depth of six inches or less, and at least 65% of the total surface area shall be shallower than 18 inches with at least 25% of the WQv in deep water zones with a depth greater than four feet.

Micropool Sizing

Requirement: 10% of WQv
Requirement: 4 to 6 feet deep

Water Quality Volume (90% Rule)
WQv = 3,578 cf

10% of WQv = 358 cf

Micropool Volume Provided =	**3,912**	**cf @ EL. 1442'**
Micropool Depth Provided =	**4**	**ft**

Pocket Wetland Sizing

Requirement: 100% of WQv
Requirement: Varies*

Water Quality Volume (90% Rule)
WQv = 3,578 cf

100% of WQv = 3,578 cf

Permanent Pool Volume Provided =	**5,097**	**cf @ EL. 1442'**
Permanent Pool Depth Provided =	**<6 in. to 4**	**ft**

** Note – WQv zones vary based on microtopography and internal grading to achieve low marsh and high marsh planting requirements. See Grading Plan.*

- Geometry – The Pocket Wetland has been designed with a length to width ratio of 2:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Outlet control structure – The outlet control structure will consist of a primary weir set at the permanent pool elevation.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Freeboard - 1 foot of freeboard would be provided.
- Planting Maintenance – Reinforcement plantings will be required as outlined in the specifications after the second growing season if 50% coverage is not achieved.
- Wetland Safety – Signs warning the general public of standing water will be placed along the pond edge.

3.0 RESORT ENTRY ROAD

The following represents the three proposed ponds along Thompsonville Road that will be located within the right of way and will provide treatement for the redevelopment of the existing asphalt pavement. The roadway improvements include a defined 11 ft. asphalt paved travel lane in each direction, a 2 ft. gravel shoulder. The proposed redeveloped road will be crowned in the middle. A vegetated grassed swale is proposed along the roadway conveying stormwater runoff to proposed bioretention basins and pocket wetlands.

3.1 Proposed Stormwater Pond No. 28

Proposed Pocket Pond (P-5 per the NYSSMDM)

The following parameters were used in designing and sizing the Pocket Pond (P-5):

- Forebay - A forebay would be provided at each inlet point. This would provide primary settling for the larger particulates. The sediment forebay would be sized to contain 10% of the WQv. The depth of the forebay is four feet. The outfall from the inlet pipe would be stabilized with rip rap to minimize erosion of the ponds' sideslopes. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.
- Side-Slopes - The side slopes for the forebay and the wet pond are 4:1(H:1).
- Wet Pool - A wet pool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would range from four to six feet in depth.
- Water Quality Volume – A minimum of 50% of the water quality volume would be maintained within the permanent pool area and a maximum of 50% of the water quality volume would be treated through extended detention.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.

Permanent/Micropool Sizing	
Requirement:	50% min. of WQv
Requirement:	4 to 6 feet deep

Water Quality Volume (90% Rule)

WQv =	7,729	cf
50% of WQv =	3,865	cf

Permanent Pool Volume Provided =	**4,285**	**cf @ EL. 1373.6'**
Permanent Pool Depth Provided =	**2.1**	**ft**

- Geometry – The Pocket Pond has been designed with a length to width ratio of 1.5:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Aquatic Bench – An aquatic bench will be provided that extends 15 feet inward from the normal shoreline with a maximum depth of 18 inches below the normal pool water surface elevation. A 15 foot wide aquatic bench was not provided around the perimeter of the permanent pool for this Pocket Pond in an effort to avoid and minimize impacts and disturbance to existing wetlands.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Freeboard - 1 foot of freeboard would be provided.
- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided through spillway secondary outlet control structure. The weir elevation is determined by the 100-yr flood elevation and located such that stormwater flows would not adversely impact surrounding properties.
- Maintenance access – An easement or public right of way will be provided for long term maintnenace.
- Outlet control structure – The pre-cast concrete structure is designed with a low flow orifice that would detain the 1-year, 24-hour storm event for a minimum of 24 hours, meeting the NYSDEC and NYCDEP requirements. The larger storm events would also be conveyed through an opening at the top of the outlet control structure designed to attenuate the larger storm events. The outlet control structure is located within the pond embankment.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Pond Safety – Signs warning the general public of standing water will be placed along the pond edge.

3.2 Proposed Stormwater Pond No. 26

Proposed Pocket Pond (P-5 per the NYSSMDM)

The following parameters were used in designing and sizing the Pocket Pond (P-5):

- Forebay - A forebay would be provided at each inlet point. This would provide primary settling for the larger particulates. The sediment forebay would be sized to contain 10% of the WQv. The depth of the forebay is four feet. The outfall from the inlet pipe would be stabilized with rip rap to minimize erosion of the ponds' sideslopes. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.
- Side-Slopes - The side slopes for the forebay and the wet pond are 4:1(H:1).
- Wet Pool - A wet pool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would range from four to six feet in depth.
- Water Quality Volume – A minimum of 50% of the water quality volume would be maintained within the permanent pool area and a maximum of 50% of the water quality volume would be treated through extended detention.

- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.

Permanent Pool Sizing

Requirement: 100% of WQv

Requirement: 4 to 6 feet deep

Water Quality Volume (90% Rule)

WQv = 3,418 cf

50% of WQv = 1,709 cf

Permanent Pool Volume Provided =	**14,978**	**cf @ EL. 1371'**
Permanent Pool Depth Provided =	**4**	**ft**

- Geometry – The Wet Pond has been designed with a length to width ratio of 1.5:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Aquatic Bench – An aquatic bench will be provided that extends 15 feet inward from the normal shoreline with a maximum depth of 18 inches below the normal pool water surface elevation.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Freeboard - 1 foot of freeboard would be provided.
- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided through spillway secondary outlet control structure. The weir elevation is determined by the 100-yr flood elevation and located such that stormwater flows would not adversely impact surrounding properties.
- Maintenance access – A 12-foot minimum wide access path would be provided for long term maintenance of the stormwater pond. The path would be constructed of grasspavers in order to decrease impervious surface and increase infiltration. The maintenance access path is accessible from the main driveway via a mountable curb. The permeable pavers are designed to withstand H20 vehicle and equipment loading.
- Outlet control structure – The pre-cast concrete structure is designed with a low flow orifice that would detain the 1-year, 24-hour storm event for a minimum of 24 hours, meeting the NYSDEC and NYCDEP requirements. The larger storm events would also be conveyed through an opening at the top of the outlet control structure designed to attenuate the larger storm events. The outlet control structure is located within the pond embankment.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Pond Safety – Signs warning the general public of standing water will be placed along the pond edge.

3.3 Proposed Stormwater Pond No. 24

Proposed Micropool Extended Detention Pond (P-1 per the NYSSMDM)
The following parameters were used in designing and sizing the Micropool Extended Detention Pond (P-1):

- Forebay - A forebay would be provided at each inlet point. This would provide primary settling for the larger particulates. The sediment forebay would be sized to contain 10% of the WQv. The depth of the forebay is four feet. The outfall from the inlet pipe would be stabilized with rip rap to minimize erosion of the ponds' sideslopes. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.
- Side-Slopes - The side slopes for the forebay and the wet pond are 4:1(H:1).
- Wet Pool - A wet pool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would range from four to six feet in depth.
- Water Quality Volume – A minimum of 20% of the water quality volume would be maintained within the permanent pool area and a maximum of 80% of the water quality volume would be treated through extended detention.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.

Permanent Pool Sizing		
Requirement:	20% min. of WQv	
Requirement:	4 to 6 feet deep	
Water Quality Volume (90% Rule)		
WQv =	5,224	cf
20% of WQv =	1,045	cf

Permanent Pool Volume Provided =	**10,821**	**cf @ EL. 1365'**
Permanent Pool Depth Provided =	**3**	**ft**

- Geometry – The Pond has been designed with a length to width ratio of 1.5:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Aquatic Bench – An aquatic bench will be provided that extends 15 feet inward from the normal shoreline with a maximum depth of 18 inches below the normal pool water surface elevation.

- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Freeboard - 1 foot of freeboard would be provided.
- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided through spillway secondary outlet control structure. The weir elevation is determined by the 100-yr flood elevation and located such that stormwater flows would not adversely impact surrounding properties.
- Maintenance access – A 12-foot minimum wide access path would be provided for long term maintenance of the stormwater pond. The path would be constructed of grasspavers in order to decrease impervious surface and increase infiltration. The maintenance access path is accessible from the main driveway via a mountable curb. The permeable pavers are designed to withstand H20 vehicle and equipment loading.
- Outlet control structure – The pre-cast concrete structure is designed with a low flow orifice that would detain the 1-year, 24-hour storm event for a minimum of 24 hours, meeting the NYSDEC and NYCDEP requirements. The larger storm events would also be conveyed through an opening at the top of the outlet control structure designed to attenuate the larger storm events. The outlet control structure is located within the pond embankment.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Pond Safety – Signs warning the general public of standing water will be placed along the pond edge.

3.4 Proposed Stormwater Pond No. 23

Proposed Pocket Pond (P-5 per the NYSSMDM)

The following parameters were used in designing and sizing the Pocket Pond (P-5):

- Forebay - A forebay would be provided at each inlet point. This would provide primary settling for the larger particulates. The sediment forebay would be sized to contain 10% of the WQv. The depth of the forebay is four feet. The outfall from the inlet pipe would be stabilized with rip rap to minimize erosion of the ponds' sideslopes. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.
- Side-Slopes - The side slopes for the forebay and the wet pond are 4:1(H:1).
- Wet Pool - A wet pool would be provided in order to protect the low flow pipe from clogging and prevent sediment resuspension. This area would range from four to six feet in depth.
- Water Quality Volume – A minimum of 50% of the water quality volume would be maintained within the permanent pool area and a maximum of 50% of the water quality volume would be treated through extended detention.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.

- Permanent pool – The proposed design would provide 100% of the water quality volume within the permanent pool, as required for wet ponds.

Permanent Pool Sizing	
Requirement:	50% min. of WQv
Requirement:	4 to 6 feet deep

Water Quality Volume (90% Rule)

WQv = 4,334 cf

50% of WQv = 2,167 cf

Permanent Pool Volume Provided =	**8,931**	**cf @ EL. 1381'**
Permanent Pool Depth Provided =	**4**	**ft**

- Geometry – The Wet Pond has been designed with a length to width ratio of 1.5:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Aquatic Bench – An aquatic bench will be provided that extends 15 feet inward from the normal shoreline with a maximum depth of 18 inches below the normal pool water surface elevation.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Freeboard - 1 foot of freeboard would be provided.
- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided through spillway secondary outlet control structure. The weir elevation is determined by the 100-yr flood elevation and located such that stormwater flows would not adversely impact surrounding properties.
- Maintenance access – A 12-foot minimum wide access path would be provided for long term maintenance of the stormwater pond. The path would be constructed of grasspavers in order to decrease impervious surface and increase infiltration. The maintenance access path is accessible from the main driveway via a mountable curb. The permeable pavers are designed to withstand H20 vehicle and equipment loading.
- Outlet control structure – The pre-cast concrete structure is designed with a low flow orifice that would detain the 1-year, 24-hour storm event for a minimum of 24 hours, meeting the NYSDEC and NYCDEP requirements. The larger storm events would also be conveyed through an opening at the top of the outlet control structure designed to attenuate the larger storm events. The outlet control structure is located within the pond embankment.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Pond Safety – Signs warning the general public of standing water will be placed along the pond edge.

3.5 Proposed Stormwater Pond No. 21B

Proposed Pocket Pond (P-5 per the NYSSMDM)
The following parameters were used in designing and sizing the Pocket Pond (P-5):

- Forebay - A forebay would be provided at each inlet point. This would provide primary settling for the larger particulates. The sediment forebay would be sized to contain 10% of the WQv. The depth of the forebay is four feet. The outfall from the inlet pipe would be stabilized with rip rap to minimize erosion of the ponds' sideslopes. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.
- Side-Slopes - The side slopes for the forebay and the wet pond are 4:1(H:1).
- Water Quality Volume – A minimum of 50% of the water quality volume would be maintained within the permanent pool area and a maximum of 50% of the water quality volume would be treated through extended detention.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.
- Permanent pool – The proposed design would provide 100% of the water quality volume within the permanent pool, as required for wet ponds.

Permanent Pool Sizing				
Requirement:	50% min. of WQv			
Requirement:	4 to 6 feet deep			
Water Quality Volume (90% Rule)				
WQv =	4,245	cf		
50% of WQv =	2,123	cf		

Permanent Pool Volume Provided =	**10,561**	**cf @ EL. 1378'**
Permanent Pool Depth Provided =	**3**	**ft**

- Geometry – The Wet Pond has been designed with a length to width ratio of 1.5:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Aquatic Bench – An aquatic bench will be provided that extends 15 feet inward from the normal shoreline with a maximum depth of 18 inches below the normal pool water surface elevation.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Freeboard - 1 foot of freeboard would be provided.

- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided through spillway secondary outlet control structure. The weir elevation is determined by the 100-yr flood elevation and located such that stormwater flows would not adversely impact surrounding properties.
- Maintenance access – A 12-foot minimum wide access path would be provided for long term maintenance of the stormwater pond. The path would be constructed of grasspavers in order to decrease impervious surface and increase infiltration. The maintenance access path is accessible from the main driveway via a mountable curb. The permeable pavers are designed to withstand H20 vehicle and equipment loading.
- Outlet control structure – The pre-cast concrete structure is designed with a low flow orifice that would detain the 1-year, 24-hour storm event for a minimum of 24 hours, meeting the NYSDEC and NYCDEP requirements. The larger storm events would also be conveyed through an opening at the top of the outlet control structure designed to attenuate the larger storm events. The outlet control structure is located within the pond embankment.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Pond Safety – Signs warning the general public of standing water will be placed along the pond edge.

3.6 Proposed Stormwater Pocket Pond No. 21A

Proposed Pocket Pond (P-5 per the NYSSMDM)
The following parameters were used in designing and sizing the Pocket Pond (P-5):

- Forebay - A forebay would be provided at each inlet point. This would provide primary settling for the larger particulates. The sediment forebay would be sized to contain 10% of the WQv. The outfall from the inlet pipe would be stabilized with rip rap to minimize erosion of the ponds' sideslopes. A fixed depth marker would be installed to assist in the long term inspection and maintenance plan. This would help determine the depth of sediment accumulation and when maintenance is required.
- Side-Slopes - The side slopes for the forebay and the wet pond are 4:1(H:1).
- Water Quality Volume – A minimum of 50% of the water quality volume would be maintained within the permanent pool area and a maximum of 50% of the water quality volume would be treated through extended detention.
- Vegetation – Landscape plans would be designed in order to establish wetland plants within shallow areas of the permanent pool areas. The plan would incorporate various grass species for the sideslopes and emergent wetland species. The plant variety would provide treatment through nutrient uptake. Minimum elements of a plan include: delineation of pondscaping zones, selection of corresponding plant species, planting plan, sequence for preparing the wetland bed and sources of plant material.

Permanent Pool Sizing	
Requirement:	50% min. of WQv
Requirement:	4 to 6 feet deep

Water Quality Volume (90% Rule)

WQv = 4,848 cf

50% of WQv = 2,424 cf

Permanent Pool Volume Provided =	**3,042**	**cf @ EL. 1376.5'**
Permanent Pool Depth Provided =	**2.5**	**ft**

- Geometry – The Pocket Pond has been designed with a length to width ratio of 1.5:1 as required by NYSSMDM. The design also meets the minimum surface area to drainage area ratio of 1:100.
- Aquatic Bench – An aquatic bench will be provided that extends 15 feet inward from the normal shoreline with a maximum depth of 18 inches below the normal pool water surface elevation.
- Energy Dissipater - A rip rap velocity dissipater would be installed at the inlet and at the emergency overflow outlet of the pond. This will help to minimize the potential for erosion and scouring.
- Freeboard - 1 foot of freeboard would be provided above the peak elevation of the 100-year storm event.
- Emergency overflow - Safe conveyance of the 100-year storm flow would be provided through spillway secondary outlet control structure. The weir elevation is determined by the 100-yr flood elevation and located such that stormwater flows would not adversely impact surrounding properties.
- Maintenance access – A maintenance right of way or easement shall extend to the pond from a public or private road.
- Outlet control structure – The pre-cast concrete structure is designed with a low flow orifice that would detain the 1-year, 24-hour storm event for a minimum of 24 hours, meeting the NYSDEC and NYCDEP requirements. The larger storm events would also be conveyed through an opening at the top of the outlet control structure designed to attenuate the larger storm events. The outlet control structure is located within the pond embankment.
- Pond Drain – An adjustable gate valve located within the outlet control structure will allow for the owner/operator to drawdown the pond within 24 hours.
- Pond Safety – Signs warning the general public of standing water will be placed along the pond edge

SWPPP

APPENDIX K

HYDRAULIC CALCULATIONS

- IDF CURVE SUMMARY
- RESORT ENTRY ROAD SWALE ANALYSIS
- RESORT ENTRY ROAD PIPE NETWORK ANALYSIS AND PROFILES
- THOMPSONVILLE ROAD & JOYLAND ROAD PIPE NETWORK ANALYSIS AND PROFILES

Storm Event Group Detailed Report: NYSDOT Region 8

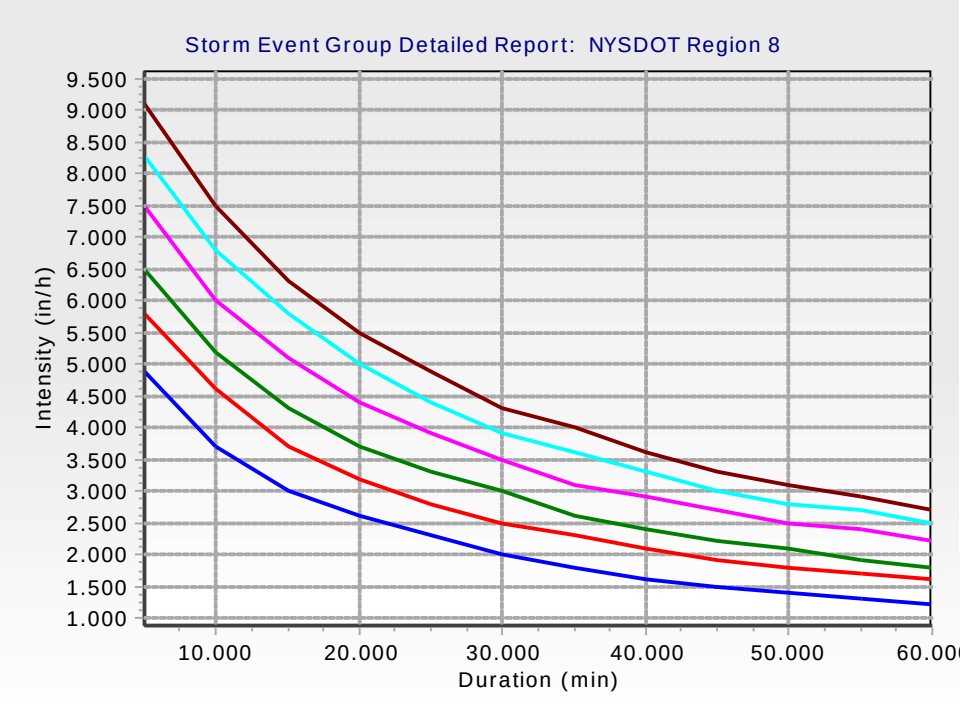
Element Details		
ID	300	Notes
Label	NYSDOT Region 8	

Duration (min)	2 Year (in/h)	5 Year (in/h)	10 Year (in/h)	25 Year (in/h)	50 Year (in/h)	100 Year (in/h)
5.000	4.900	5.800	6.500	7.500	8.300	9.100
10.000	3.700	4.600	5.200	6.000	6.800	7.500
15.000	3.000	3.700	4.300	5.100	5.800	6.300
20.000	2.600	3.200	3.700	4.400	5.000	5.500
25.000	2.300	2.800	3.300	3.900	4.400	4.900
30.000	2.000	2.500	3.000	3.500	3.900	4.300
35.000	1.800	2.300	2.600	3.100	3.600	4.000
40.000	1.600	2.100	2.400	2.900	3.300	3.600
45.000	1.500	1.900	2.200	2.700	3.000	3.300
50.000	1.400	1.800	2.100	2.500	2.800	3.100
55.000	1.300	1.700	1.900	2.400	2.700	2.900
60.000	1.200	1.600	1.800	2.200	2.500	2.700

Library Status Summary

	Synchronization Details
ID	300
Label	NYSDOT Region 8
Modified Date	2/11/2013 12:57:12 PM
Library Source	S:\00 StormCAD\IDF\NYSDOT REGION 8 IDF CURVE.xml
Library Modified Date	2/7/2013 9:15:49 AM
Synchronization Status	Synchronize from Library
Engineering Reference Guid	35eb9164-e5f8-46f5-b78f-dac640c9494c

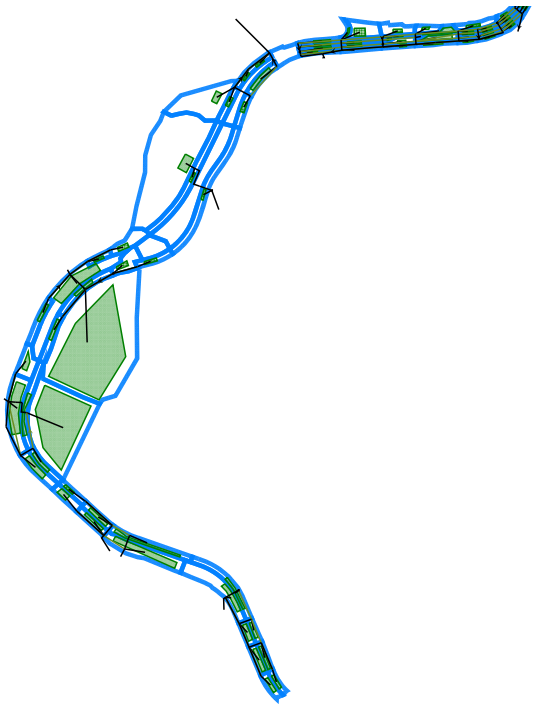
Storm Event Group Detailed Report: NYSDOT Region 8



ROADWAY INFRASTRUCTURE SWALES (STORMCAD)

Label	Length (Unified) (ft)	Upstream Inlet C	Upstream Inlet Area (acres)	System Intensity (in/h)	Capacity (Full Flow) (ft^3/s)	Swale Depth (in)	Velocity (Average) (ft/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Manning's n	Wetted Perimeter (ft)	Conduit Description	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In Link) (ft)	Energy Grade Line (Out Link) (ft)	Depth (Normal) (ft)
SWALE 23B	471	0.277	5.036	3.641	45.38	18	3.17	1,398.00	1,390.00	0.017	0.03	4.7	Trapezoidal Channel - 1.0 ft	1,398.59	1,390.57	1,398.74	1,390.74	0.59
SWALE 25A	478	0.281	5.726	4.205	45.05	18	3.39	1,397.00	1,389.00	0.017	0.03	5.2	Trapezoidal Channel - 1.0 ft	1,397.67	1,389.65	1,397.85	1,389.85	0.67
SWALE 23A	623	0.572	1.218	6	46.27	18	3.06	1,398.00	1,387.00	0.018	0.03	4.4	Trapezoidal Channel - 1.0 ft	1,398.53	1,387.52	1,398.68	1,387.68	0.53
SWALE 25B	525	0.451	1.715	6	48.06	18	3.23	1,397.00	1,387.00	0.019	0.03	4.5	Trapezoidal Channel - 1.0 ft	1,397.55	1,387.54	1,397.71	1,387.71	0.55
SWALE 21E	729	0.61	1.156	6	74.09	18	4.34	1,419.00	1,386.00	0.045	0.03	3.7	Trapezoidal Channel - 1.0 ft	1,419.52	1,386.43	1,419.68	1,386.72	0.43
SWALE 21F	748	0.641	1.043	6	79.52	18	4.51	1,420.00	1,381.00	0.052	0.03	3.6	Trapezoidal Channel - 1.0 ft	1,420.51	1,381.41	1,420.66	1,381.72	0.41
SWALE 21A	476	0.608	1.043	6	67.72	18	3.95	1,399.00	1,381.00	0.038	0.03	3.7	Trapezoidal Channel - 1.0 ft	1,399.49	1,381.43	1,399.65	1,381.67	0.43
SWALE 21B	594	0.629	0.992	6	60.62	18	3.62	1,398.00	1,380.00	0.03	0.03	3.8	Trapezoidal Channel - 1.0 ft	1,398.49	1,380.45	1,398.64	1,380.65	0.45
SWALE 24B	516	0.279	9.678	3.748	66.82	18	5.04	1,396.00	1,377.00	0.037	0.03	5.2	Trapezoidal Channel - 1.0 ft	1,396.79	1,377.67	1,397.02	1,378.07	0.67
SWALE 26B	446	0.562	0.757	6	61.7	18	3.32	1,391.00	1,377.00	0.031	0.03	3.3	Trapezoidal Channel - 1.0 ft	1,391.40	1,377.37	1,391.53	1,377.54	0.37
SWALE 26A	524	0.384	2.041	4.207	62.72	18	3.6	1,393.00	1,376.00	0.032	0.03	3.6	Trapezoidal Channel - 1.0 ft	1,393.46	1,376.41	1,393.60	1,376.61	0.41
SWALE 24A	496	0.571	1.836	6	71.65	18	4.7	1,392.00	1,371.00	0.042	0.03	4.3	Trapezoidal Channel - 1.0 ft	1,392.63	1,371.52	1,392.82	1,371.87	0.52
SWALE A-1	697	0.637	0.504	6	191.15	30	4.96	1,428.00	1,370.00	0.083	0.03	1.9	Trapezoidal Channel - 0.5 ft	1,428.48	1,370.35	1,428.62	1,370.73	0.35
SWALE A-2	715	0.505	0.733	6	190.35	30	5.12	1,429.00	1,370.00	0.083	0.03	2	Trapezoidal Channel - 0.5 ft	1,429.51	1,370.38	1,429.66	1,370.78	0.38
SWALE B-2	320	0.672	0.304	6	152.73	30	3.73	1,370.00	1,353.00	0.053	0.03	1.8	Trapezoidal Channel - 0.5 ft	1,370.38	1,353.31	1,370.50	1,353.53	0.31
SWALE B-1	229	0.553	0.368	6	190.87	30	4.39	1,370.00	1,351.00	0.083	0.03	1.6	Trapezoidal Channel - 0.5 ft	1,370.38	1,351.28	1,370.50	1,351.58	0.28
SWALE F-1	244	0.525	0.291	6	59.99	30	1.73	1,352.00	1,350.00	0.008	0.03	2.2	Trapezoidal Channel - 0.5 ft	1,352.43	1,350.33	1,352.47	1,350.43	0.43
SWALE F-2	162	0.67	0.23	6	52.06	30	1.56	1,351.00	1,350.00	0.006	0.03	2.4	Trapezoidal Channel - 0.5 ft	1,351.46	1,350.33	1,351.50	1,350.44	0.46
SWALE D-1	499	0.52	0.371	6	83.9	30	2.36	1,357.00	1,349.00	0.016	0.03	2.1	Trapezoidal Channel - 0.5 ft	1,357.41	1,349.37	1,357.49	1,349.49	0.41
SWALE D-2	499	0.607	0.321	6	83.9	30	2.36	1,357.00	1,349.00	0.016	0.03	2.2	Trapezoidal Channel - 0.5 ft	1,357.41	1,349.37	1,357.50	1,349.49	0.41
SWALE E-2	318	0.579	0.302	6	64.36	30	1.89	1,351.00	1,348.00	0.009	0.03	2.3	Trapezoidal Channel - 0.5 ft	1,351.44	1,348.35	1,351.50	1,348.46	0.44
SWALE C-2	548	0.65	0.306	6	84.92	30	2.4	1,357.00	1,348.00	0.016	0.03	2.2	Trapezoidal Channel - 0.5 ft	1,357.41	1,348.37	1,357.50	1,348.49	0.41
SWALE E-1	243	0.565	0.264	6	85.02	30	2.23	1,352.00	1,348.00	0.016	0.03	1.9	Trapezoidal Channel - 0.5 ft	1,352.36	1,348.32	1,352.44	1,348.43	0.36
SWALE C-1	548	0.625	0.287	6	89.51	30	2.43	1,357.00	1,347.00	0.018	0.03	2	Trapezoidal Channel - 0.5 ft	1,357.38	1,348.00	1,357.47	1,348.00	0.38
SWALE G-1	504	0.562	0.32	6	106.42	30	2.77	1,352.00	1,339.00	0.026	0.03	1.9	Trapezoidal Channel - 0.5 ft	1,352.36	1,339.35	1,352.47	1,339.47	0.35
SWALE G-2	502	0.649	0.275	6	106.63	30	2.76	1,352.00	1,339.00	0.026	0.03	1.9	Trapezoidal Channel - 0.5 ft	1,352.35	1,339.35	1,352.47	1,339.47	0.35

Scenario: Base



Conduit FlexTable: Combined Pipe/Node Report (NEW_ENTRY.stc)

Label	Start Node	Stop Node	Branch ID	Branch Element ID	Length (Unified) (ft)	Upstream Inlet C	Upstream Intensity (in/h)	Upstream Inlet Area (acres)	Upstream Structure Flow (Total Surface) (ft³/s)	System CA (acres)	System Intensity (in/h)	System Rational Flow (ft³/s)	Total Flow (ft³/s)	Pipe Diameter (in)	Capacity (Full Flow) (ft³/s)
E-1	CB-E1	CB-E2	25	1	18.0	0.950	6.000	0.073	0.42	0.069	6.000	0.42	0.42	15.0	6.81
E-2	CB-E2	CB-E3	25	2	25.0	0.617	5.982	0.141	0.53	0.156	5.982	0.94	0.94	15.0	7.08
E-3	CB-E3	CB-E4	25	3	18.0	0.601	5.964	0.109	0.39	0.222	5.964	1.33	1.33	15.0	6.81
E-4	CB-E4	MH-E4A	25	4	62.0	0.683	5.951	0.094	0.39	0.286	5.951	1.71	1.71	18.0	12.66
E-4B	MH-E4A	OF-E4C	25	5	48.0	(N/A)	5.914	(N/A)	0.00	0.286	5.914	1.70	1.70	18.0	17.29
E-37	CB-E37	MH-E37A	24	1	34.0	0.286	3.860	4.963	5.52	1.419	3.860	5.52	5.52	18.0	18.89
E-37B	MH-E37A	MH-E37C	24	2	89.0	(N/A)	3.855	(N/A)	0.00	1.419	3.855	5.51	5.51	18.0	14.94
E-37C	MH-E37C	MH-E37D	24	3	36.0	(N/A)	3.840	(N/A)	0.00	1.419	3.840	5.49	5.49	18.0	17.51
E-37D	MH-E37D	CB-E38	24	4	80.0	(N/A)	3.834	(N/A)	0.00	1.419	3.834	5.48	5.48	18.0	7.43
E-37E	CB-E38	OF-E38A	24	5	124.0	0.735	3.811	0.710	3.16	1.940	3.811	7.45	7.45	18.0	7.31
E-48	CB-E48	CB-E49	23	1	175.0	0.453	6.000	0.393	1.08	0.178	6.000	1.08	1.08	15.0	10.13
E-50	CB-E50	MH-E50A	22	1	33.0	0.259	2.772	4.142	3.00	1.074	2.772	3.00	3.00	18.0	11.56
E-50A	MH-E50A	MH-E50C	22	2	57.0	(N/A)	2.768	(N/A)	0.00	1.074	2.768	3.00	3.00	18.0	27.12
E-50B	MH-E50C	MH-E50D	22	3	38.0	(N/A)	2.764	(N/A)	0.00	1.074	2.764	2.99	2.99	18.0	15.24
E-50C	MH-E50D	CB-E49	22	4	46.0	(N/A)	2.760	(N/A)	0.00	1.074	2.760	2.99	2.99	18.0	10.95
E-52	CB-E52	CB-E51	21	1	87.0	0.733	6.000	0.227	1.01	0.166	6.000	1.01	1.01	15.0	7.90
E-51	CB-E51	MH-E49B	21	2	196.0	0.584	5.941	0.340	1.20	0.365	5.941	2.18	2.18	15.0	9.23
E-49	MH-E49B	CB-E49	21	3	152.0	(N/A)	5.845	(N/A)	0.00	0.365	5.845	2.15	2.15	15.0	8.28
E-49A	CB-E49	OF-E49A	21	4	31.0	0.468	2.755	0.917	2.59	2.045	2.755	5.68	5.68	24.0	28.73
E-53	CB-E53	CB-E55	20	1	219.0	0.583	6.000	0.239	0.84	0.139	6.000	0.84	0.84	15.0	14.14
E-54	CB-E54	CB-E56	19	1	217.0	0.769	6.000	0.151	0.70	0.116	6.000	0.70	0.70	15.0	14.54
E-56	CB-E56	CB-E55	19	2	79.0	0.654	5.894	0.217	0.86	0.258	5.894	1.53	1.53	15.0	5.63
E-55	CB-E55	MH-E55A	19	3	20.0	0.646	5.833	0.222	0.87	0.541	5.833	3.18	3.18	18.0	12.86
E-55A	MH-E55A	OF-55B	19	4	94.0	(N/A)	5.823	(N/A)	0.00	0.541	5.823	3.18	3.18	18.0	14.93
E-58	CB-E58	CB-E57	18	1	87.0	0.749	6.000	0.425	1.92	0.318	6.000	1.92	1.92	15.0	9.79
E-57	CB-E57	OF-E57A	18	2	53.0	0.488	5.958	0.846	2.50	0.731	5.958	4.39	4.39	15.0	7.42
E-66	CB-E66	CB-E64	17	1	175.0	0.770	6.000	0.129	0.60	0.099	6.000	0.60	0.60	15.0	17.94
E-64	CB-E64	CB-E63	17	2	79.0	0.730	5.922	0.151	0.67	0.210	5.922	1.25	1.25	15.0	7.27
E-65	CB-E65	CB-E63	16	1	189.0	0.609	6.000	0.189	0.70	0.115	6.000	0.70	0.70	15.0	17.77
E-63	CB-E63	CB-E61	16	2	155.0	0.596	5.869	0.217	0.78	0.454	5.869	2.69	2.69	15.0	20.06
E-62	CB-E62	CB-E61	15	1	79.0	0.718	6.000	0.132	0.57	0.094	6.000	0.57	0.57	15.0	12.59
E-61	CB-E61	CB-E59	15	2	179.0	0.595	5.828	0.180	0.65	0.656	5.828	3.85	3.85	18.0	24.39
E-60	CB-E60	CB-E59	14	1	90.0	0.754	6.000	0.419	1.91	0.316	6.000	1.91	1.91	18.0	22.96
E-59	CB-E59	MH-E59A	14	2	13.0	0.493	5.775	0.838	2.50	1.385	5.775	8.06	8.06	24.0	19.84
E-59A	MH-E59A	OF-59B	14	3	67.0	(N/A)	5.768	(N/A)	0.00	1.385	5.768	8.05	8.05	24.0	33.85
E-5	CB-E5	CB-E6	13	1	18.0	0.246	3.616	0.526	0.47	0.129	3.616	0.47	0.47	15.0	6.81
E-6	CB-E6	CB-E7	13	2	25.0	0.602	3.608	0.070	0.25	0.171	3.608	0.62	0.62	15.0	7.08
E-7	CB-E7	CB-E8	13	3	18.0	0.611	3.599	0.074	0.27	0.216	3.599	0.78	0.78	15.0	8.34
E-8	CB-E8	MH-E8A	13	4	9.0	0.675	3.593	0.088	0.36	0.276	3.593	1.00	1.00	15.0	8.61
E-8B	MH-E8A	CB-E12	13	5	150.0	(N/A)	3.591	(N/A)	0.00	0.276	3.591	1.00	1.00	15.0	15.23
E-9	CB-E9	CB-E10	12	1	18.0	0.950	6.000	0.031	0.18	0.030	6.000	0.18	0.18	15.0	6.81
E-10	CB-E10	CB-E11	12	2	25.0	0.604	5.977	0.065	0.24	0.069	5.977	0.42	0.42	15.0	7.08
E-11	CB-E11	CB-E12	12	3	18.0	0.613	5.954	0.069	0.25	0.111	5.954	0.67	0.67	15.0	6.81
E-12	CB-E12	CB-E16	12	4	123.0	0.685	3.562	0.057	0.24	0.426	3.562	1.53	1.53	18.0	26.95
E-13	CB-E13	CB-E14	11	1	18.0	0.331	4.400	0.260	0.38	0.086	4.400	0.38	0.38	15.0	6.81
E-14	CB-E14	CB-E15	11	2	25.0	0.608	4.390	0.059	0.22	0.122	4.390	0.54	0.54	15.0	10.01
E-15	CB-E15	CB-E16	11	3	18.0	0.606	4.380	0.059	0.22	0.157	4.380	0.69	0.69	15.0	6.81

Conduit FlexTable: Combined Pipe/Node Report (NEW_ENTRY.stc)

Label	Start Node	Stop Node	Branch ID	Branch Element ID	Length (Unified) (ft)	Upstream Inlet C	Upstream Intensity (in/h)	Upstream Inlet Area (acres)	Upstream Structure Flow (Total Surface) (ft³/s)	System CA (acres)	System Intensity (in/h)	System Rational Flow (ft³/s)	Total Flow (ft³/s)	Pipe Diameter (in)	Capacity (Full Flow) (ft³/s)	Velocity (Average) (ft/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Manning's n
E-16	CB-E16	MH-E16A	11	4	143.0	0.604	3.542	0.058	0.21	0.618	3.542	2.21	2.21	18.0	23.57	3.08	1,445.90	1,445.70	0.011	0.013
E-16B	MH-E16A	CB-E20	11	5	117.0	(N/A)	3.520	(N/A)	0.00	0.618	3.520	2.19	2.19	18.0	23.79	4.01	1,445.70	1,445.40	0.012	0.013
E-17	CB-E17	CB-E18	10	1	19.0	0.507	5.640	0.245	0.71	0.124	5.640	0.71	0.71	15.0	6.63	4.30	1,445.40	1,445.20	0.011	0.013
E-18	CB-E18	CB-E19	10	2	24.0	0.950	5.624	0.016	0.09	0.139	5.624	0.79	0.79	15.0	7.22	5.00	1,445.20	1,444.30	0.015	0.013
E-19	CB-E19	CB-E20	10	3	19.0	0.932	5.605	0.226	1.27	0.349	5.605	1.97	1.97	15.0	6.63	6.23	1,444.30	1,443.00	0.027	0.013
E-20	CB-E20	CB-E24	10	4	200.0	0.950	3.501	0.066	0.38	1.030	3.501	3.63	3.63	18.0	23.49	9.27	1,385.90	1,384.80	0.032	0.013
E-21	CB-E21	CB-E22	9	1	18.0	0.350	6.000	0.350	0.74	0.123	6.000	0.74	0.74	15.0	8.34	7.82	1,384.80	1,383.00	0.020	0.013
E-22	CB-E22	CB-E23	9	2	25.0	0.721	5.987	0.027	0.12	0.142	5.987	0.86	0.86	15.0	14.73	8.76	1,383.00	1,382.00	0.028	0.013
E-23	CB-E23	CB-E24	9	3	18.0	0.914	5.976	0.184	1.02	0.310	5.976	1.87	1.87	15.0	8.34	4.60	1,382.00	1,381.60	0.005	0.013
E-24	CB-E24	MH-E24A	9	4	60.0	0.950	3.473	0.050	0.29	1.387	3.473	4.86	4.86	18.0	25.37	4.71	1,381.60	1,381.00	0.005	0.013
E-24B	MH-E24A	CB-E28	9	5	190.0	(N/A)	3.466	(N/A)	0.00	1.387	3.466	4.85	4.85	18.0	19.87					
E-25	CB-E25	CB-E26	8	1	19.0	0.420	6.000	0.543	1.38	0.228	6.000	1.38	1.38	15.0	8.12					
E-26	CB-E26	CB-E27	8	2	25.0	0.609	5.988	0.123	0.45	0.303	5.988	1.83	1.83	15.0	9.14					
E-27	CB-E27	CB-E28	8	3	18.0	0.600	5.976	0.120	0.44	0.375	5.976	2.26	2.26	15.0	6.81					
E-28	CB-E28	MH-E32B	8	4	118.0	0.629	3.439	0.110	0.42	1.831	3.439	6.35	6.35	24.0	51.01					
E-29	CB-E29	CB-E30	7	1	23.0	0.950	6.000	0.135	0.78	0.128	6.000	0.78	0.78	18.0	10.95					
E-30	CB-E30	CB-E31	7	2	30.0	0.594	5.981	0.132	0.48	0.207	5.981	1.25	1.25	18.0	12.13					
E-31	CB-E31	CB-E32	7	3	18.0	0.610	5.960	0.125	0.46	0.283	5.960	1.70	1.70	18.0	11.07					
E-32	CB-E32	MH-E32A	7	4	12.0	0.664	5.948	0.102	0.41	0.351	5.948	2.10	2.10	18.0	11.74					
E-32A	MH-E32A	MH-E32B	7	5	131.0	(N/A)	5.941	(N/A)	0.00	0.351	5.941	2.10	2.10	18.0	8.94					
E-32B	MH-E32B	OF-E32C	7	6	22.0	(N/A)	3.425	(N/A)	0.00	2.182	3.425	7.53	7.53	24.0	30.50					
E-36	CB-E36	CB-E35	6	1	109.0	0.709	6.000	0.184	0.79	0.130	6.000	0.79	0.79	15.0	9.28					
E-35	CB-E35	CB-E35A	6	2	140.0	0.293	2.528	1.444	1.08	0.553	2.528	1.41	1.41	18.0	10.50					
E-35A	CB-E35A	CB-E33	6	3	160.0	0.918	2.505	0.226	1.25	0.761	2.505	1.92	1.92	18.0	17.81					
E-34	CB-E34	CB-E33	5	1	94.0	0.719	6.000	0.215	0.93	0.155	6.000	0.93	0.93	15.0	6.66					
E-33	CB-E33	OF-E33A	5	2	290.0	0.935	2.495	0.109	0.62	1.017	2.495	2.56	2.56	18.0	10.68					
E-46	CB-E46	CB-E44	4	1	194.0	0.764	6.000	0.237	1.09	0.181	6.000	1.09	1.09	15.0	10.37					
E-47	CB-E47	CB-E45	3	1	213.0	0.700	6.000	0.272	1.15	0.190	6.000	1.15	1.15	15.0	12.12					
E-41	CB-E41	CB-E43	2	1	152.0	0.732	6.000	0.191	0.84	0.139	6.000	0.84	0.84	15.0	15.00					
E-43	CB-E43	CB-E45	2	2	194.0	0.415	5.931	0.363	0.91	0.290	5.931	1.74	1.74	18.0	18.78					
E-44	CB-E45	CB-E44	2	3	130.0	0.233	3.292	7.702	5.96	2.275	3.292	7.55	7.55	24.0	50.97					
E-40	CB-E40	CB-E42	1	1	155.0	0.508	6.000	0.376	1.15	0.191	6.000	1.15	1.15	15.0	17.97					
E-42	CB-E42	CB-E44	1	2	133.0	0.749	5.943	0.153	0.69	0.306	5.943	1.83	1.83	18.0	18.22					
E-44A	CB-E44	OF-E44A	1	3	32.0	0.536	3.277	1.548	5.02	3.591	3.277	11.86	11.86	30.0	99.94					

Conduit FlexTable: Combined Pipe/Node Report (NEW_ENTRY.stc)

Velocity (Average) (ft/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Manning's n
5.37	1,385.80	1,381.50	0.025	0.013
5.50	1,387.00	1,386.60	0.012	0.013
10.10	1,386.60	1,382.80	0.067	0.013
6.70	1,382.80	1,382.00	0.021	0.013
5.28	1,382.00	1,381.50	0.011	0.013
4.41	1,390.30	1,389.00	0.015	0.013
6.16	1,388.00	1,384.00	0.020	0.013
5.67	1,384.00	1,381.50	0.016	0.013
7.12	1,381.50	1,381.00	0.016	0.013
6.33	1,390.50	1,380.00	0.048	0.013
6.11	1,391.10	1,380.10	0.051	0.013
3.91	1,380.10	1,379.50	0.008	0.013
6.03	1,379.50	1,379.20	0.015	0.013
6.71	1,379.20	1,377.30	0.020	0.013
6.20	1,380.00	1,378.00	0.023	0.013
6.30	1,378.00	1,377.30	0.013	0.013
6.77	1,417.70	1,404.20	0.077	0.013
4.43	1,404.20	1,403.20	0.013	0.013
7.02	1,417.50	1,403.20	0.076	0.013
11.38	1,403.20	1,388.25	0.096	0.013
5.19	1,391.25	1,388.25	0.038	0.013
10.08	1,388.25	1,378.60	0.054	0.013
7.87	1,382.90	1,378.60	0.048	0.013
5.99	1,378.60	1,378.50	0.008	0.013
8.83	1,378.50	1,377.00	0.022	0.013
3.18	1,436.60	1,436.40	0.011	0.013
3.55	1,436.40	1,436.10	0.012	0.013
4.27	1,436.10	1,435.80	0.017	0.013
4.69	1,435.80	1,435.64	0.018	0.013
7.01	1,435.64	1,427.30	0.056	0.013
2.39	1,428.00	1,427.80	0.011	0.013
3.15	1,427.80	1,427.50	0.012	0.013
3.53	1,427.50	1,427.30	0.011	0.013
8.25	1,427.30	1,419.20	0.066	0.013
2.99	1,420.20	1,420.00	0.011	0.013
4.34	1,420.00	1,419.40	0.024	0.013
3.57	1,419.40	1,419.20	0.011	0.013
8.36	1,419.20	1,412.00	0.050	0.013
8.40	1,412.00	1,406.00	0.051	0.013
3.52	1,407.00	1,406.80	0.011	0.013
3.86	1,406.80	1,406.50	0.013	0.013
4.71	1,406.50	1,406.30	0.011	0.013
9.65	1,406.00	1,396.00	0.050	0.013
4.20	1,397.90	1,397.60	0.017	0.013
6.54	1,397.60	1,396.30	0.052	0.013
5.48	1,396.30	1,396.00	0.017	0.013
11.07	1,396.00	1,392.50	0.058	0.013
9.28	1,392.50	1,385.70	0.036	0.013

Conduit FlexTable: Combined Pipe/Node Report (NEW_ENTRY.stc)

Velocity (Average) (ft/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Manning's n
4.93	1,386.70	1,386.40	0.016	0.013
5.81	1,386.40	1,385.90	0.020	0.013
4.98	1,385.90	1,385.70	0.011	0.013
11.06	1,385.00	1,379.00	0.051	0.013
3.58	1,375.95	1,375.70	0.011	0.013
4.43	1,375.70	1,375.30	0.013	0.013
4.54	1,375.30	1,375.10	0.011	0.013
5.03	1,375.10	1,374.95	0.013	0.013
4.14	1,374.95	1,374.00	0.007	0.013
8.04	1,374.00	1,373.60	0.018	0.013
4.61	1,382.25	1,380.00	0.021	0.013
4.14	1,380.00	1,378.60	0.010	0.013
6.59	1,378.60	1,374.00	0.029	0.013
3.83	1,375.00	1,374.00	0.011	0.013
4.96	1,374.00	1,371.00	0.010	0.013
5.49	1,370.00	1,365.00	0.026	0.013
6.22	1,381.00	1,373.50	0.035	0.013
6.60	1,388.20	1,380.00	0.054	0.013
6.64	1,379.70	1,373.50	0.032	0.013
11.63	1,373.50	1,366.90	0.051	0.013
8.23	1,382.90	1,370.90	0.077	0.013
6.60	1,370.90	1,366.90	0.030	0.013
13.68	1,366.90	1,365.00	0.059	0.013

Conduit FlexTable: Combined Pipe/Node Report (NEW_ENTRY.stc)

Label	Length (Unified) (ft)	Upstream Inlet C	Pipe Diameter (in)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Manning's n	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In Link) (ft)	Energy Grade Line (Out Link) (ft)
E-1	18.0	0.950	15.0	1,445.90	1,445.70	0.011	0.013	1,446.15	1,446.08	1,446.24	1,446.11
E-2	25.0	0.617	15.0	1,445.70	1,445.40	0.012	0.013	1,446.08	1,445.86	1,446.22	1,445.94
E-3	18.0	0.601	15.0	1,445.40	1,445.20	0.011	0.013	1,445.86	1,445.70	1,446.03	1,445.83
E-4	62.0	0.683	18.0	1,445.20	1,444.30	0.015	0.013	1,445.70	1,444.68	1,445.87	1,445.06
E-4B	48.0	(N/A)	18.0	1,444.30	1,443.00	0.027	0.013	1,444.79	1,443.32	1,444.97	1,443.92
E-37	34.0	0.286	18.0	1,385.90	1,384.80	0.032	0.013	1,386.81	1,385.39	1,387.19	1,386.54
E-37B	89.0	(N/A)	18.0	1,384.80	1,383.00	0.020	0.013	1,385.71	1,383.63	1,386.09	1,384.58
E-37C	36.0	(N/A)	18.0	1,383.00	1,382.00	0.028	0.013	1,383.91	1,383.02	1,384.29	1,383.31
E-37D	80.0	(N/A)	18.0	1,382.00	1,381.60	0.005	0.013	1,383.02	1,382.85	1,383.31	1,383.04
E-37E	124.0	0.735	18.0	1,381.60	1,381.00	0.005	0.013	1,382.85	1,382.06	1,383.20	1,382.55
E-48	175.0	0.453	15.0	1,385.80	1,381.50	0.025	0.013	1,386.21	1,382.34	1,386.36	1,382.37
E-50	33.0	0.259	18.0	1,387.00	1,386.60	0.012	0.013	1,387.66	1,387.13	1,387.91	1,387.59
E-50A	57.0	(N/A)	18.0	1,386.60	1,382.80	0.067	0.013	1,387.26	1,383.14	1,387.51	1,384.73
E-50B	38.0	(N/A)	18.0	1,382.80	1,382.00	0.021	0.013	1,383.46	1,382.46	1,383.71	1,383.13
E-50C	46.0	(N/A)	18.0	1,382.00	1,381.50	0.011	0.013	1,382.66	1,382.34	1,382.91	1,382.48
E-52	87.0	0.733	15.0	1,390.30	1,389.00	0.015	0.013	1,390.70	1,389.30	1,390.84	1,389.61
E-51	196.0	0.584	15.0	1,388.00	1,384.00	0.020	0.013	1,388.59	1,384.42	1,388.82	1,385.01
E-49	152.0	(N/A)	15.0	1,384.00	1,381.50	0.016	0.013	1,384.59	1,382.34	1,384.81	1,382.44
E-49A	31.0	0.468	24.0	1,381.50	1,381.00	0.016	0.013	1,382.34	1,381.63	1,382.66	1,382.33
E-53	219.0	0.583	15.0	1,390.50	1,380.00	0.048	0.013	1,390.86	1,380.21	1,390.99	1,380.83
E-54	217.0	0.769	15.0	1,391.10	1,380.10	0.051	0.013	1,391.43	1,380.59	1,391.55	1,380.63
E-56	79.0	0.654	15.0	1,380.10	1,379.50	0.008	0.013	1,380.59	1,380.18	1,380.78	1,380.26
E-55	20.0	0.646	18.0	1,379.50	1,379.20	0.015	0.013	1,380.18	1,379.73	1,380.44	1,380.24
E-55A	94.0	(N/A)	18.0	1,379.20	1,377.30	0.020	0.013	1,379.88	1,377.77	1,380.14	1,378.47
E-58	87.0	0.749	15.0	1,380.00	1,378.00	0.023	0.013	1,380.55	1,378.85	1,380.77	1,378.92
E-57	53.0	0.488	15.0	1,378.00	1,377.30	0.013	0.013	1,378.85	1,377.99	1,379.23	1,378.61
E-66	175.0	0.770	15.0	1,417.70	1,404.20	0.077	0.013	1,418.01	1,404.64	1,418.11	1,404.68
E-64	79.0	0.730	15.0	1,404.20	1,403.20	0.013	0.013	1,404.64	1,403.86	1,404.81	1,403.92
E-65	189.0	0.609	15.0	1,417.50	1,403.20	0.076	0.013	1,417.83	1,403.86	1,417.94	1,403.88
E-63	155.0	0.596	15.0	1,403.20	1,388.25	0.096	0.013	1,403.86	1,389.00	1,404.12	1,389.19
E-62	79.0	0.718	15.0	1,391.25	1,388.25	0.038	0.013	1,391.55	1,389.00	1,391.65	1,389.01
E-61	179.0	0.595	18.0	1,388.25	1,378.60	0.054	0.013	1,389.00	1,379.61	1,389.30	1,379.76
E-60	90.0	0.754	18.0	1,382.90	1,378.60	0.048	0.013	1,383.42	1,379.61	1,383.61	1,379.65
E-59	13.0	0.493	24.0	1,378.60	1,378.50	0.008	0.013	1,379.61	1,379.42	1,380.01	1,379.93
E-59A	67.0	(N/A)	24.0	1,378.50	1,377.00	0.022	0.013	1,379.51	1,377.68	1,379.91	1,378.84
E-5	18.0	0.246	15.0	1,436.60	1,436.40	0.011	0.013	1,436.87	1,436.71	1,436.96	1,436.77
E-6	25.0	0.602	15.0	1,436.40	1,436.10	0.012	0.013	1,436.71	1,436.45	1,436.82	1,436.53
E-7	18.0	0.611	15.0	1,436.10	1,435.80	0.017	0.013	1,436.45	1,436.20	1,436.57	1,436.28
E-8	9.0	0.675	15.0	1,435.80	1,435.64	0.018	0.013	1,436.20	1,435.95	1,436.34	1,436.24
E-8B	150.0	(N/A)	15.0	1,435.64	1,427.30	0.056	0.013	1,436.04	1,427.77	1,436.18	1,427.86
E-9	18.0	0.950	15.0	1,428.00	1,427.80	0.011	0.013	1,428.17	1,428.05	1,428.22	1,428.07
E-10	25.0	0.604	15.0	1,427.80	1,427.50	0.012	0.013	1,428.05	1,427.82	1,428.14	1,427.87
E-11	18.0	0.613	15.0	1,427.50	1,427.30	0.011	0.013	1,427.82	1,427.77	1,427.93	1,427.81
E-12	123.0	0.685	18.0	1,427.30	1,419.20	0.066	0.013	1,427.77	1,419.76	1,427.93	1,419.86
E-13	18.0	0.331	15.0	1,420.20	1,420.00	0.011	0.013	1,420.44	1,420.29	1,420.53	1,420.34
E-14	25.0	0.608	15.0	1,420.00	1,419.40	0.024	0.013	1,420.29	1,419.73	1,420.39	1,419.80
E-15	18.0	0.606	15.0	1,419.40	1,419.20	0.011	0.013	1,419.73	1,419.76	1,419.84	1,419.79
E-16	143.0	0.604	18.0	1,419.20	1,412.00	0.050	0.013	1,419.76	1,412.31	1,419.97	1,413.40

Conduit FlexTable: Combined Pipe/Node Report (NEW_ENTRY.stc)

Label	Length (Unified) (ft)	Upstream Inlet C	Pipe Diameter (in)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Manning's n	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In Link) (ft)	Energy Grade Line (Out Link) (ft)
E-16B	117.0	(N/A)	18.0	1,412.00	1,406.00	0.051	0.013	1,412.56	1,406.73	1,412.77	1,406.83
E-17	19.0	0.507	15.0	1,407.00	1,406.80	0.011	0.013	1,407.33	1,407.15	1,407.45	1,407.25
E-18	24.0	0.950	15.0	1,406.80	1,406.50	0.013	0.013	1,407.15	1,407.06	1,407.27	1,407.10
E-19	19.0	0.932	15.0	1,406.50	1,406.30	0.011	0.013	1,407.06	1,406.78	1,407.28	1,407.11
E-20	200.0	0.950	18.0	1,406.00	1,396.00	0.050	0.013	1,406.73	1,396.85	1,407.01	1,397.04
E-21	18.0	0.350	15.0	1,397.90	1,397.60	0.017	0.013	1,398.24	1,397.97	1,398.36	1,398.06
E-22	25.0	0.721	15.0	1,397.60	1,396.30	0.052	0.013	1,397.97	1,396.85	1,398.10	1,396.89
E-23	18.0	0.914	15.0	1,396.30	1,396.00	0.017	0.013	1,396.85	1,396.85	1,397.05	1,396.92
E-24	60.0	0.950	18.0	1,396.00	1,392.50	0.058	0.013	1,396.85	1,392.95	1,397.20	1,394.85
E-24B	190.0	(N/A)	18.0	1,392.50	1,385.70	0.036	0.013	1,393.35	1,386.21	1,393.69	1,387.55
E-25	19.0	0.420	15.0	1,386.70	1,386.40	0.016	0.013	1,387.17	1,386.94	1,387.34	1,387.06
E-26	25.0	0.609	15.0	1,386.40	1,385.90	0.020	0.013	1,386.94	1,386.50	1,387.14	1,386.66
E-27	18.0	0.600	15.0	1,385.90	1,385.70	0.011	0.013	1,386.50	1,386.21	1,386.74	1,386.57
E-28	118.0	0.629	24.0	1,385.00	1,379.00	0.051	0.013	1,385.89	1,379.48	1,386.24	1,381.38
E-29	23.0	0.950	18.0	1,375.95	1,375.70	0.011	0.013	1,376.28	1,376.12	1,376.40	1,376.18
E-30	30.0	0.594	18.0	1,375.70	1,375.30	0.013	0.013	1,376.12	1,375.79	1,376.27	1,375.89
E-31	18.0	0.610	18.0	1,375.30	1,375.10	0.011	0.013	1,375.79	1,375.65	1,375.97	1,375.78
E-32	12.0	0.664	18.0	1,375.10	1,374.95	0.013	0.013	1,375.65	1,375.40	1,375.85	1,375.75
E-32A	131.0	(N/A)	18.0	1,374.95	1,374.00	0.007	0.013	1,375.50	1,374.98	1,375.70	1,375.02
E-32B	22.0	(N/A)	24.0	1,374.00	1,373.60	0.018	0.013	1,374.98	1,374.34	1,375.36	1,375.14
E-36	109.0	0.709	15.0	1,382.25	1,380.00	0.021	0.013	1,382.60	1,380.45	1,382.72	1,380.51
E-35	140.0	0.293	18.0	1,380.00	1,378.60	0.010	0.013	1,380.45	1,379.13	1,380.61	1,379.23
E-35A	160.0	0.918	18.0	1,378.60	1,374.00	0.029	0.013	1,379.13	1,374.61	1,379.32	1,374.74
E-34	94.0	0.719	15.0	1,375.00	1,374.00	0.011	0.013	1,375.38	1,374.61	1,375.52	1,374.65
E-33	290.0	0.935	18.0	1,374.00	1,371.00	0.010	0.013	1,374.61	1,371.50	1,374.84	1,371.89
E-46	194.0	0.764	15.0	1,370.00	1,365.00	0.026	0.013	1,370.41	1,368.06	1,370.56	1,368.07
E-47	213.0	0.700	15.0	1,381.00	1,373.50	0.035	0.013	1,381.43	1,374.48	1,381.58	1,374.50
E-41	152.0	0.732	15.0	1,388.20	1,380.00	0.054	0.013	1,388.56	1,380.20	1,388.69	1,380.88
E-43	194.0	0.415	18.0	1,379.70	1,373.50	0.032	0.013	1,380.20	1,374.48	1,380.38	1,374.51
E-44	130.0	0.233	24.0	1,373.50	1,366.90	0.051	0.013	1,374.48	1,368.06	1,374.86	1,368.31
E-40	155.0	0.508	15.0	1,382.90	1,370.90	0.077	0.013	1,383.33	1,371.41	1,383.48	1,371.51
E-42	133.0	0.749	18.0	1,370.90	1,366.90	0.030	0.013	1,371.41	1,368.06	1,371.60	1,368.08
E-44A	32.0	0.536	30.0	1,366.90	1,365.00	0.059	0.013	1,368.06	1,365.66	1,368.50	1,367.75

FlexTable: Catch Basin Table (NEW_ENTRY.stc)

Label	Station (Calculated) (ft)	Elevation (Ground) (ft)	Set Rim to Ground Elevation?	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Inlet Drainage Area (acres)	Inlet C	Inlet	Inlet Location	Desired Sump Depth (ft)	Gutter Depth (in)	Gutter Spread (ft)
CB-E1	1+71	1,448.63	True	1,448.63	1,445.90	0.073	0.950	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.0	4.2
CB-E2	1+53	1,448.59	True	1,448.59	1,445.70	0.141	0.617	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.1	4.6
CB-E3	1+28	1,450.33	True	1,450.33	1,445.40	0.109	0.601	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.0	4.1
CB-E4	1+10	1,450.31	True	1,450.31	1,445.20	0.094	0.683	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.0	4.1
CB-E5	11+93	1,439.38	True	1,439.38	1,436.00	0.526	0.246	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.1	4.4
CB-E6	11+75	1,439.39	True	1,439.39	1,436.40	0.070	0.602	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.8	3.5
CB-E7	11+50	1,439.74	True	1,439.74	1,436.10	0.074	0.611	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.9	3.6
CB-E8	11+32	1,439.74	True	1,439.74	1,435.80	0.088	0.675	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.0	4.0
CB-E9	10+34	1,430.72	True	1,430.72	1,428.00	0.031	0.950	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.7	3.1
CB-E10	10+16	1,430.72	True	1,430.72	1,427.80	0.065	0.604	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.8	3.4
CB-E11	9+91	1,429.39	True	1,429.39	1,427.50	0.069	0.613	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.8	3.5
CB-E12	9+73	1,429.42	True	1,429.42	1,427.30	0.057	0.685	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.8	3.4
CB-E13	9+11	1,422.96	True	1,422.96	1,420.20	0.260	0.331	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.0	4.1
CB-E14	8+93	1,422.98	True	1,422.98	1,420.00	0.059	0.608	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.8	3.3
CB-E15	8+68	1,422.17	True	1,422.17	1,419.40	0.059	0.606	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.8	3.3
CB-E16	8+50	1,422.17	True	1,422.17	1,419.20	0.058	0.604	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.8	3.3
CB-E17	6+52	1,409.74	True	1,409.74	1,407.00	0.245	0.507	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.2	5.1
CB-E18	6+33	1,409.73	True	1,409.73	1,406.80	0.016	0.950	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.6	2.4
CB-E19	6+09	1,408.87	True	1,408.87	1,406.50	0.226	0.932	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.5	6.4
CB-E20	5+90	1,408.89	True	1,408.89	1,406.00	0.066	0.950	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.0	4.1
CB-E21	4+51	1,400.71	True	1,400.71	1,397.90	0.350	0.350	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.3	5.2
CB-E22	4+33	1,400.71	True	1,400.71	1,397.60	0.027	0.721	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.6	2.6
CB-E23	4+08	1,399.08	True	1,399.08	1,396.30	0.184	0.914	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.4	5.9
CB-E24	3+90	1,399.08	True	1,399.08	1,396.00	0.050	0.950	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	0.9	3.7
CB-E25	2+02	1,389.40	True	1,389.40	1,386.70	0.543	0.420	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.6	6.6
CB-E26	1+83	1,389.41	True	1,389.41	1,386.40	0.123	0.609	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.0	4.3
CB-E27	1+58	1,388.63	True	1,388.63	1,385.90	0.120	0.600	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.0	4.3
CB-E28	1+40	1,388.64	True	1,388.64	1,385.70	0.110	0.629	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.0	4.2
CB-E29	2+36	1,378.95	True	1,378.95	1,375.95	0.135	0.950	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E30	2+13	1,378.30	True	1,378.30	1,375.70	0.132	0.594	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E31	1+83	1,379.00	True	1,379.00	1,375.30	0.125	0.610	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E32	1+65	1,379.00	True	1,379.00	1,375.10	0.102	0.664	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E36	6+99	1,385.03	True	1,385.03	1,382.25	0.184	0.709	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.3	5.4
CB-E35	5+90	1,386.49	True	1,386.49	1,380.00	1.444	0.293	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.4	6.0
CB-E35A	4+50	1,380.84	True	1,380.84	1,378.60	0.226	0.918	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.5	6.4
CB-E34	3+84	1,376.67	True	1,376.67	1,375.00	0.215	0.719	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E33	2+90	1,375.67	True	1,375.67	1,374.00	0.109	0.935	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E37	3+63	1,388.87	True	1,388.87	1,385.90	4.963	0.286	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E38	1+24	1,385.59	True	1,385.59	1,381.60	0.710	0.735	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E40	3+20	1,385.62	True	1,385.62	1,382.90	0.376	0.508	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.5	6.2
CB-E42	1+65	1,373.90	True	1,373.90	1,370.90	0.153	0.749	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.2	5.1
CB-E41	5+08	1,390.93	True	1,390.93	1,388.20	0.191	0.732	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.3	5.5
CB-E43	3+56	1,382.70	True	1,382.70	1,379.70	0.363	0.415	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.4	5.7
CB-E45	1+62	1,376.45	True	1,376.45	1,373.50	7.702	0.233	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E47	3+75	1,383.83	True	1,383.83	1,381.00	0.272	0.700	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.5	6.2
CB-E46	2+26	1,377.10	True	1,377.10	1,370.00	0.237	0.764	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.5	6.1
CB-E44	0+32	1,370.38	True	1,370.38	1,366.90	1.548	0.536	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E48	2+06	1,388.51	True	1,388.51	1,385.80	0.393	0.453	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.4	6.0

FlexTable: Catch Basin Table (NEW_ENTRY.stc)

Label	Station (Calculated) (ft)	Elevation (Ground) (ft)	Set Rim to Ground Elevation?	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Inlet Drainage Area (acres)	Inlet C	Inlet	Inlet Location	Desired Sump Depth (ft)	Gutter Depth (in)	Gutter Spread (ft)
CB-E50	2+05	1,389.51	True	1,389.51	1,387.00	4.142	0.259	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E49	0+31	1,386.45	True	1,386.45	1,381.50	0.917	0.468	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E52	4+66	1,392.98	True	1,392.98	1,390.30	0.227	0.733	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.4	5.9
CB-E51	3+79	1,392.16	True	1,392.16	1,388.00	0.340	0.584	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.5	6.3
CB-E54	4+10	1,393.92	True	1,393.92	1,391.10	0.151	0.769	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.2	5.1
CB-E53	3+33	1,393.29	True	1,393.29	1,390.50	0.239	0.583	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.3	5.5
CB-E56	1+93	1,382.57	True	1,382.57	1,380.10	0.217	0.654	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.3	5.5
CB-E55	1+14	1,382.71	True	1,382.71	1,379.50	0.222	0.646	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.3	5.6
CB-E58	1+40	1,380.76	True	1,380.76	1,380.00	0.425	0.749	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E57	0+53	1,379.36	True	1,379.36	1,378.00	0.846	0.488	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E65	6+03	1,420.24	True	1,420.24	1,417.50	0.189	0.609	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.2	5.1
CB-E66	6+68	1,420.51	True	1,420.51	1,417.70	0.129	0.770	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.2	4.8
CB-E64	4+93	1,406.48	True	1,406.48	1,404.20	0.151	0.730	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.2	5.0
CB-E63	4+14	1,405.07	True	1,405.07	1,403.20	0.217	0.596	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.3	5.3
CB-E62	3+38	1,393.98	True	1,393.98	1,391.25	0.132	0.718	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.1	4.7
CB-E61	2+59	1,391.24	True	1,391.24	1,388.25	0.180	0.595	Campbell Curbed Bicycle Safe 2541	On Grade	1.00	1.2	5.0
CB-E60	1+70	1,385.85	True	1,385.85	1,382.90	0.419	0.754	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0
CB-E59	0+80	1,381.60	True	1,381.60	1,378.60	0.838	0.493	Campbell Curbed Bicycle Safe 2541	In Sag	1.00	0.0	0.0

FlexTable: Catchment Table (NEW_ENTRY.stc)

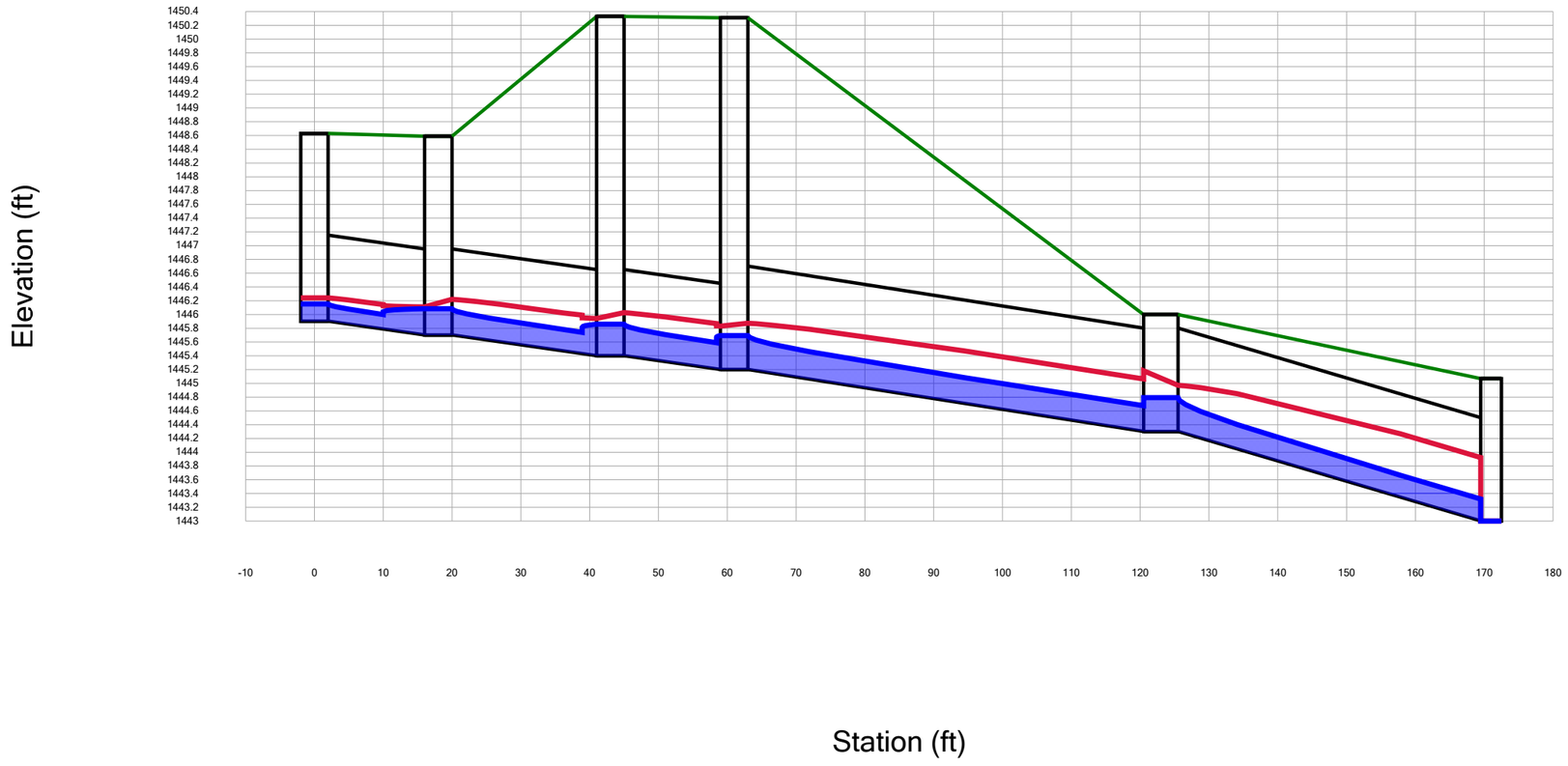
Label	Area (acres)	Rational C	Outflow Node	Catchment Intensity (in/h)	Catchment Rational Flow (ft^3/s)
DA E-1	0.073	0.950	CB-E1	6.000	0.42
DA E-2	0.141	0.617	CB-E2	6.000	0.53
DA E-3	0.109	0.601	CB-E3	6.000	0.39
DA E-4	0.094	0.683	CB-E4	6.000	0.39
DA C1	0.110	0.200	CB-E5	3.616	0.08
DA-E5	0.416	0.258	CB-E5	3.616	0.39
DA-E6	0.070	0.602	CB-E6	6.000	0.25
DA-E7	0.074	0.611	CB-E7	6.000	0.27
DA-E8	0.088	0.675	CB-E8	6.000	0.36
DA-E9	0.031	0.950	CB-E9	6.000	0.18
DA-E10	0.065	0.604	CB-E10	6.000	0.24
DA-E11	0.069	0.613	CB-E11	6.000	0.25
DA-E12	0.057	0.685	CB-E12	6.000	0.24
DA-C2	0.230	0.250	CB-E13	4.400	0.26
DA-E13	0.030	0.950	CB-E13	4.400	0.13
DA-E14	0.059	0.608	CB-E14	6.000	0.22
DA-E15	0.059	0.606	CB-E15	6.000	0.22
DA-E16	0.058	0.604	CB-E16	6.000	0.21
DA-C3	0.155	0.250	CB-E17	5.640	0.22
DA-E17	0.090	0.950	CB-E17	5.640	0.49
DA-E18	0.016	0.950	CB-E18	6.000	0.09
DA-E19	0.226	0.932	CB-E19	6.000	1.27
DA-E20	0.066	0.950	CB-E20	6.000	0.38
DA-C4	0.300	0.250	CB-E21	6.000	0.45
DA-E21	0.050	0.950	CB-E21	6.000	0.29
DA-E22	0.027	0.721	CB-E22	6.000	0.12
DA-E23	0.184	0.914	CB-E23	6.000	1.02
DA-E24	0.050	0.950	CB-E24	6.000	0.29
DA-E25	0.127	0.950	CB-E25	6.000	0.73
DA-C5	0.416	0.258	CB-E25	6.000	0.65
DA-E26	0.123	0.609	CB-E26	6.000	0.45
DA-E27	0.120	0.600	CB-E27	6.000	0.44
DA-E28	0.110	0.629	CB-E28	6.000	0.42
DA-E29	0.135	0.950	CB-E29	6.000	0.78
DA-E30	0.132	0.594	CB-E30	6.000	0.48
DA-E31	0.125	0.610	CB-E31	6.000	0.46
DA-E32	0.102	0.664	CB-E32	6.000	0.41
DA-E36	0.184	0.709	CB-E36	6.000	0.79
DA-E35	0.194	0.889	CB-E35	2.528	0.44
DA-35A	0.226	0.918	CB-E35A	6.000	1.25
DA-33	0.109	0.935	CB-E33	6.000	0.62
DA-E34	0.215	0.719	CB-E34	6.000	0.93
DA-C6	1.250	0.200	CB-E35	2.528	0.64
DA-E37	0.663	0.843	CB-E37	3.860	2.17
DA-C7	4.300	0.200	CB-E37	3.860	3.35
DA-E38	0.710	0.735	CB-E38	6.000	3.16
DA-E40	0.376	0.508	CB-E40	6.000	1.15
DA-E41	0.191	0.732	CB-E41	6.000	0.84

FlexTable: Catchment Table (NEW_ENTRY.stc)

Label	Area (acres)	Rational C	Outflow Node	Catchment Intensity (in/h)	Catchment Rational Flow (ft^3/s)
DA-E43	0.363	0.415	CB-E43	6.000	0.91
DA-E42	0.153	0.749	CB-E42	6.000	0.69
DA-E45	0.353	0.796	CB-E45	3.292	0.93
DA-E44	1.548	0.536	CB-E44	6.000	5.02
DA-E46	0.237	0.764	CB-E46	6.000	1.09
DA-E47	0.272	0.700	CB-E47	6.000	1.15
DA-C8	7.349	0.206	CB-E45	3.292	5.02
DA-E48	0.393	0.453	CB-E48	6.000	1.08
DA-C9	3.663	0.200	CB-E50	2.772	2.05
DA-E50	0.480	0.712	CB-E50	2.772	0.95
DA-E49	0.917	0.468	CB-E49	6.000	2.59
DA-E52	0.227	0.733	CB-E52	6.000	1.01
DA-E51	0.340	0.584	CB-E51	6.000	1.20
DA-E54	0.151	0.769	CB-E54	6.000	0.70
DA-E53	0.239	0.583	CB-E53	6.000	0.84
DA-E56	0.217	0.654	CB-E56	6.000	0.86
DA-E55	0.222	0.646	CB-E55	6.000	0.87
DA-E58	0.425	0.749	CB-E58	6.000	1.92
DA-E57	0.846	0.488	CB-E57	6.000	2.50
DA-E65	0.189	0.609	CB-E65	6.000	0.70
DA-E66	0.129	0.770	CB-E66	6.000	0.60
DA-E64	0.151	0.730	CB-E64	6.000	0.67
DA-E63	0.217	0.596	CB-E63	6.000	0.78
DA-E62	0.132	0.718	CB-E62	6.000	0.57
DA-E61	0.180	0.595	CB-E61	6.000	0.65
DA-E60	0.419	0.754	CB-E60	6.000	1.91
DA-59	0.838	0.493	CB-E59	6.000	2.50

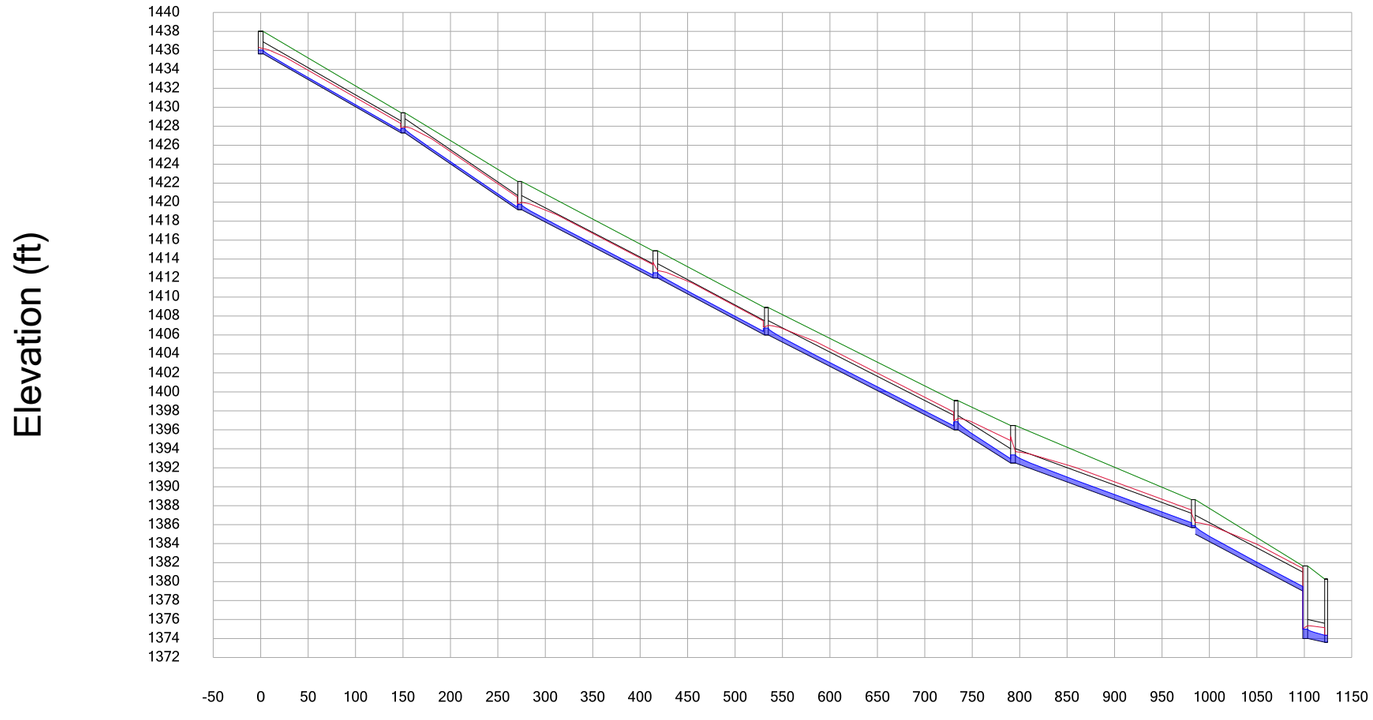
Profile Report
Profile: E1 TO E4C

E1 TO E4C - Base



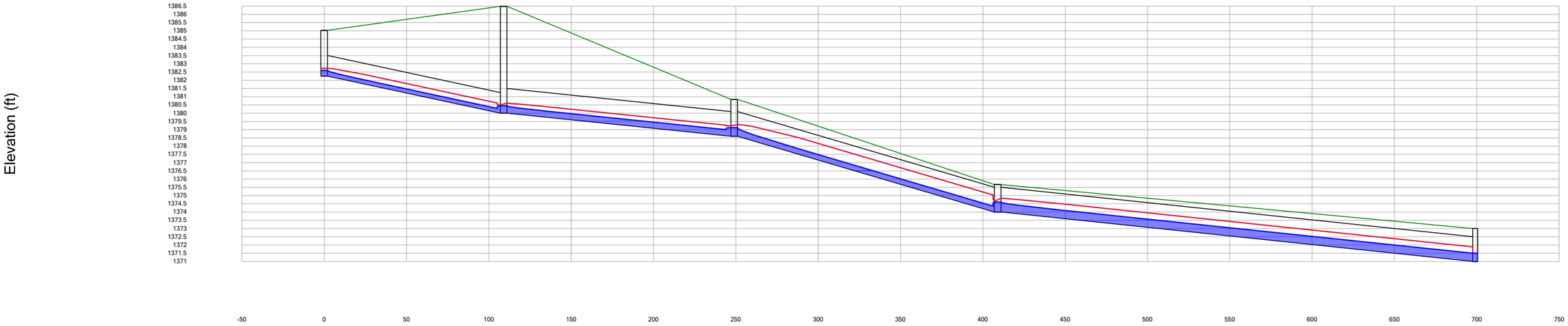
Profile Report
Profile: E8A TO E32C

E8A TO E32C - Base



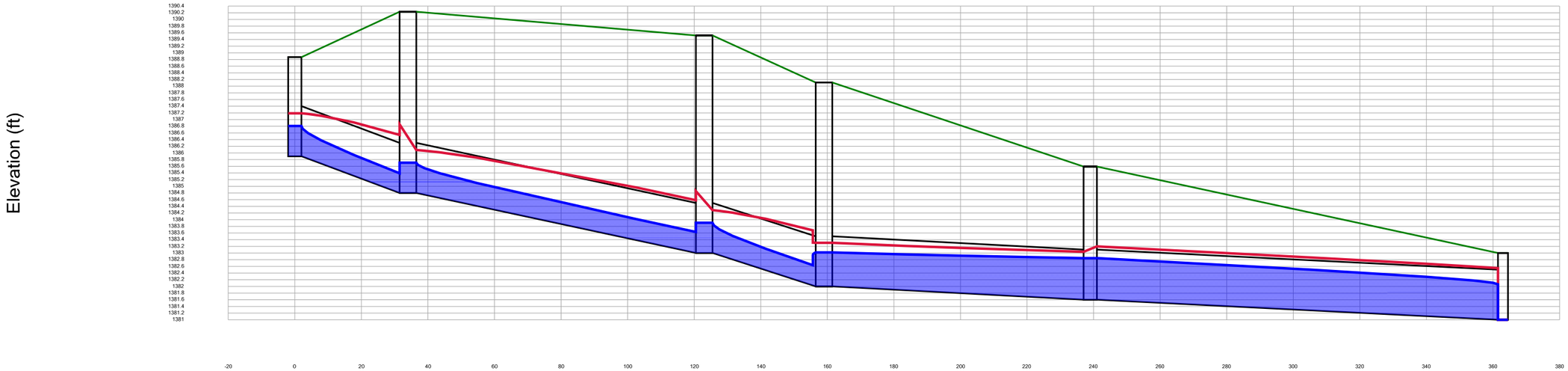
Profile Report
Profile: E36 TO E33A

E36 TO E33A - Base



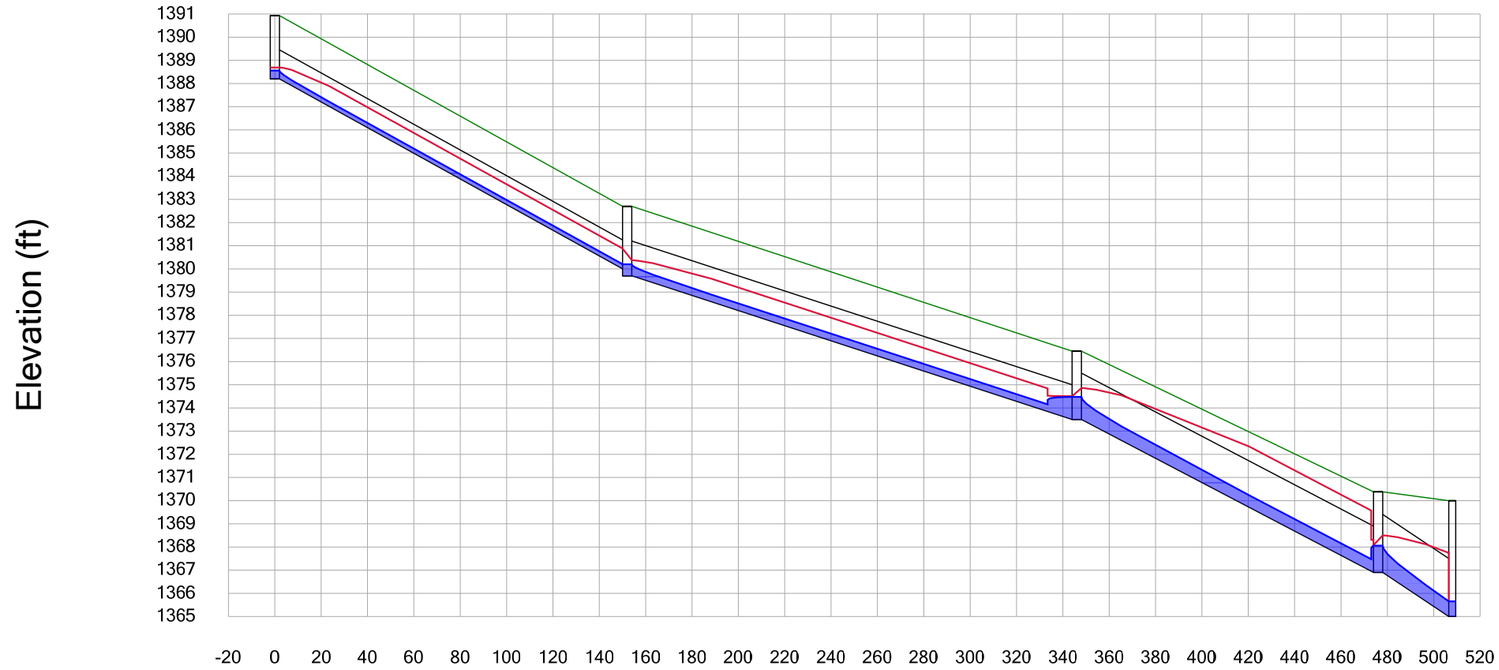
Profile Report
Profile: E37 TO E38A

E37 TO E38A - Base



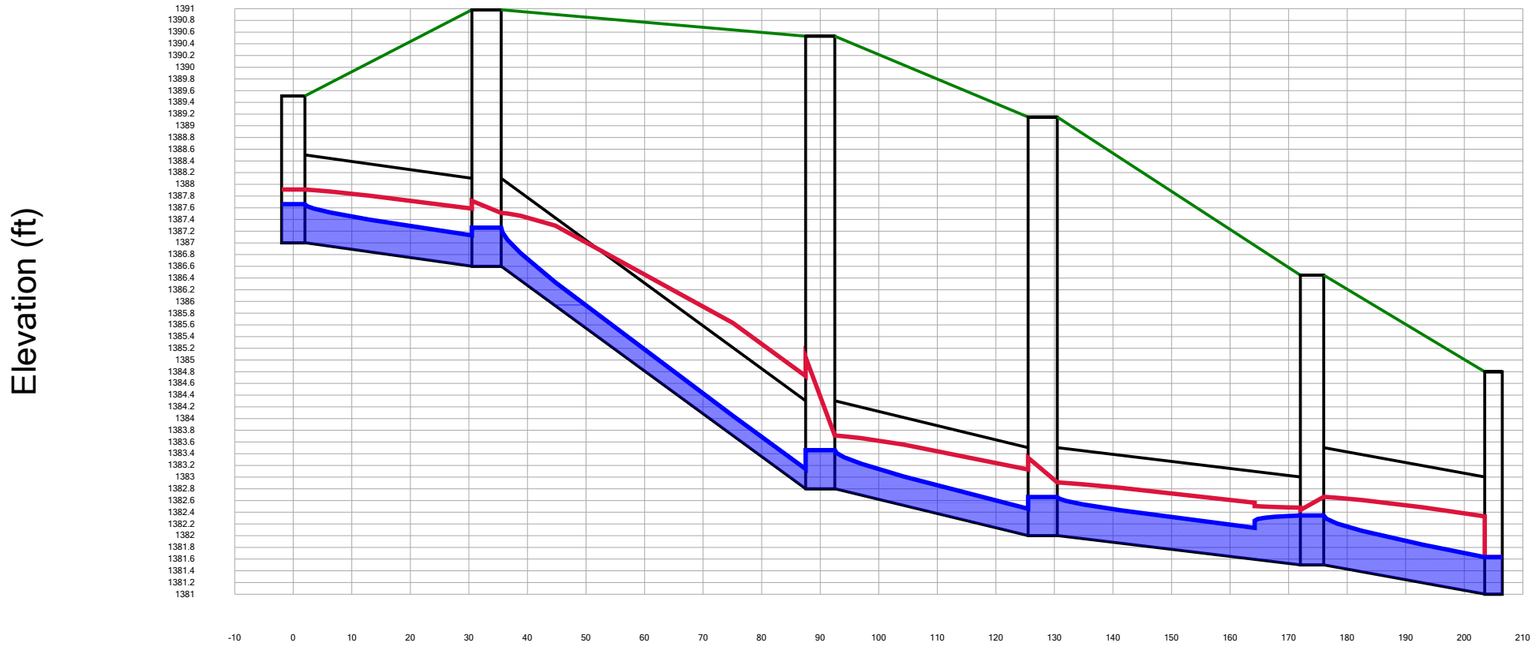
Profile Report
Profile: E41 TO E44A

E41 TO E44A - Base



Profile Report
Profile: E50 TO E49A

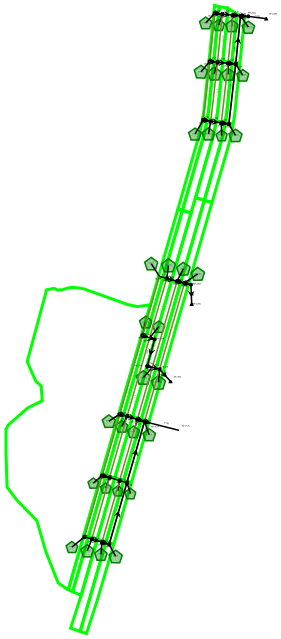
E50 TO E49A - Base



Profile Report
Profile: E66 TO E59B

E66 TO E59B - Base

Scenario: Base



Conduit FlexTable: Combined Pipe/Node Report (JOYLAND.stc)

Label	Start Node	Stop Node	Branch ID	Branch Element ID	Length (Unified) (ft)	Upstream Inlet C	Upstream Intensity (in/h)	Upstream Inlet Area (acres)	Upstream Structure Flow (Total Surface) (ft³/s)	System CA (acres)	System Intensity (in/h)	System Rational Flow (ft³/s)	Total Flow (ft³/s)	Pipe Diameter (in)
J-17	CB-J17	CB-J18	8	1	18.0	0.950	6.000	0.0422	0.24	0.0400	6.000	0.24	0.24	15.0
J-18	CB-J18	CB-J19	8	2	25.0	0.608	5.981	0.0822	0.30	0.0901	5.981	0.54	0.54	15.0
J-19	CB-J19	CB-J20	8	3	18.0	0.608	5.959	0.1004	0.37	0.1511	5.959	0.91	0.91	15.0
J-20	CB-J20	MH-J20A	8	4	16.0	0.655	5.945	0.0885	0.35	0.2091	5.945	1.25	1.25	15.0
J-20A	MH-J20A	OF-J20C	8	5	46.0	(N/A)	5.934	(N/A)	0.00	0.2091	5.934	1.25	1.25	15.0
J-1	CB-J1	CB-J2	7	1	18.0	0.950	6.000	0.0337	0.19	0.0320	6.000	0.19	0.19	15.0
J-2	CB-J2	CB-J3	7	2	25.0	0.604	5.981	0.0674	0.25	0.0728	5.981	0.44	0.44	15.0
J-3	CB-J3	CB-J4	7	3	18.0	0.603	5.966	0.1097	0.40	0.1389	5.966	0.84	0.84	15.0
J-4	CB-J4	CB-J8	7	4	151.0	0.678	5.955	0.0908	0.37	0.2005	5.955	1.20	1.20	18.0
J-5	CB-J5	CB-J6	6	1	18.0	0.950	6.000	0.0379	0.22	0.0361	6.000	0.22	0.22	15.0
J-6	CB-J6	CB-J7	6	2	25.0	0.608	5.981	0.0743	0.27	0.0812	5.981	0.49	0.49	15.0
J-7	CB-J7	CB-J8	6	3	18.0	0.609	5.969	0.0741	0.27	0.1263	5.969	0.76	0.76	15.0
J-8	CB-J8	CB-J12	6	4	150.0	0.655	5.876	0.0655	0.26	0.3697	5.876	2.19	2.19	24.0
J-9	CB-J9	CB-J10	5	1	18.0	0.950	6.000	0.0380	0.22	0.0361	6.000	0.22	0.22	15.0
J-10	CB-J10	CB-J11	5	2	25.0	0.608	5.980	0.0742	0.27	0.0812	5.980	0.49	0.49	15.0
J-11	CB-J11	CB-J12	5	3	18.0	0.608	5.969	0.0742	0.27	0.1263	5.969	0.76	0.76	15.0
J-12	CB-J12	MH-J12A	5	4	19.0	0.655	5.793	0.0656	0.26	0.5389	5.793	3.15	3.15	24.0
J-12B	MH-J12A	OF-J12C	5	5	65.0	(N/A)	5.782	(N/A)	0.00	0.5389	5.782	3.14	3.14	24.0
J-13	CB-J13	CB-J14	4	1	18.0	0.950	6.000	0.0840	0.48	0.0798	6.000	0.48	0.48	15.0
J-14	CB-J14	MH-J14A	4	2	12.0	0.608	5.983	0.1643	0.60	0.1797	5.983	1.08	1.08	15.0
J-14A	MH-J14A	MH-J14B	4	3	65.0	(N/A)	5.975	(N/A)	0.00	0.1797	5.975	1.08	1.08	15.0
J-14B	MH-J14B	CB-J15	4	4	12.0	(N/A)	5.925	(N/A)	0.00	0.1797	5.925	1.07	1.07	15.0
J-15	CB-J15	CB-J16	4	5	18.0	0.608	5.915	0.1645	0.61	0.2798	5.915	1.67	1.67	15.0
J-16	CB-J16	OF-J16A	4	6	39.0	0.655	5.903	0.1456	0.58	0.3752	5.903	2.23	2.23	15.0
J-21	CB-J21	CB-J22	3	1	18.0	0.950	6.000	0.0559	0.32	0.0531	6.000	0.32	0.32	15.0
J-22	CB-J22	CB-J23	3	2	25.0	0.607	5.980	0.1101	0.40	0.1200	5.980	0.72	0.72	15.0
J-23	CB-J23	CB-J24	3	3	18.0	0.609	5.960	0.0928	0.34	0.1765	5.960	1.06	1.06	15.0
J-24	CB-J24	CB-J28	3	4	142.0	0.654	5.947	0.0830	0.33	0.2309	5.947	1.38	1.38	15.0
J-25	CB-J25	CB-J26	2	1	18.0	0.950	6.000	0.0351	0.20	0.0333	6.000	0.20	0.20	15.0
J-26	CB-J26	CB-J27	2	2	25.0	0.607	5.978	0.0692	0.25	0.0753	5.978	0.45	0.45	15.0
J-27	CB-J27	CB-J28	2	3	18.0	0.609	5.955	0.0699	0.26	0.1179	5.955	0.71	0.71	15.0
J-28	CB-J28	CB-J32	2	4	114.0	0.654	5.875	0.0624	0.25	0.3896	5.875	2.31	2.31	18.0
J-29	CB-J29	CB-J30	1	1	18.0	0.950	6.000	0.0326	0.19	0.0310	6.000	0.19	0.19	15.0
J-30	CB-J30	CB-J31	1	2	25.0	0.609	5.978	0.0628	0.23	0.0692	5.978	0.42	0.42	15.0
J-31	CB-J31	CB-J32	1	3	18.0	0.600	5.954	0.0595	0.22	0.1049	5.954	0.63	0.63	15.0
J-32	CB-J32	MH-J32A	1	4	18.0	0.659	5.826	0.0491	0.20	0.5269	5.826	3.09	3.09	18.0
J-32A	MH-J32A	OF-J32B	1	5	43.0	(N/A)	5.809	(N/A)	0.00	0.5269	5.809	3.08	3.08	18.0

Capacity (Full Flow) (ft³/s)	Velocity (Average) (ft/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Pipe Material	Manning's n
7.61	2.83	1,444.25	1,444.00	0.014	Reinforced Concrete Pipe	0.013
7.08	3.41	1,444.00	1,443.70	0.012	Reinforced Concrete Pipe	0.013
6.81	3.86	1,443.70	1,443.50	0.011	Reinforced Concrete Pipe	0.013
7.22	4.41	1,443.50	1,443.30	0.013	Reinforced Concrete Pipe	0.013
5.22	3.49	1,443.30	1,443.00	0.007	Reinforced Concrete Pipe	0.013
8.34	2.81	1,450.80	1,450.50	0.017	Reinforced Concrete Pipe	0.013
13.67	5.10	1,450.50	1,449.38	0.045	Reinforced Concrete Pipe	0.013

Conduit FlexTable: Combined Pipe/Node Report (JOYLAND.stc)

Capacity (Full Flow) (ft³/s)	Velocity (Average) (ft/s)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Pipe Material	Manning's n
9.39	4.73	1,449.38	1,449.00	0.021	Reinforced Concrete Pipe	0.013
17.73	5.73	1,449.00	1,444.70	0.028	Reinforced Concrete Pipe	0.013
8.34	2.92	1,447.10	1,446.80	0.017	Reinforced Concrete Pipe	0.013
16.84	6.08	1,446.80	1,445.10	0.068	Reinforced Concrete Pipe	0.013
9.63	4.67	1,445.10	1,444.70	0.022	Reinforced Concrete Pipe	0.013
28.91	5.42	1,444.70	1,442.25	0.016	Reinforced Concrete Pipe	0.013
7.61	2.74	1,445.25	1,445.00	0.014	Reinforced Concrete Pipe	0.013
18.27	6.43	1,445.00	1,443.00	0.080	Reinforced Concrete Pipe	0.013
7.61	3.97	1,443.00	1,442.75	0.014	Reinforced Concrete Pipe	0.013
25.95	5.59	1,442.25	1,442.00	0.013	Reinforced Concrete Pipe	0.013
23.48	5.20	1,442.00	1,441.30	0.011	Reinforced Concrete Pipe	0.013
6.81	3.21	1,442.90	1,442.70	0.011	Reinforced Concrete Pipe	0.013
7.22	4.23	1,442.70	1,442.55	0.013	Reinforced Concrete Pipe	0.013
6.46	3.91	1,442.55	1,441.90	0.010	Reinforced Concrete Pipe	0.013
5.90	3.65	1,441.90	1,441.80	0.008	Reinforced Concrete Pipe	0.013
6.81	4.58	1,441.80	1,441.60	0.011	Reinforced Concrete Pipe	0.013
6.54	4.83	1,441.60	1,441.20	0.010	Reinforced Concrete Pipe	0.013
6.46	2.74	1,442.28	1,442.10	0.010	Reinforced Concrete Pipe	0.013
7.08	3.71	1,442.10	1,441.80	0.012	Reinforced Concrete Pipe	0.013
6.81	4.03	1,441.80	1,441.60	0.011	Reinforced Concrete Pipe	0.013
10.57	5.96	1,441.60	1,437.80	0.027	Reinforced Concrete Pipe	0.013
6.81	2.47	1,438.50	1,438.30	0.011	Reinforced Concrete Pipe	0.013
7.08	3.24	1,438.30	1,438.00	0.012	Reinforced Concrete Pipe	0.013
6.81	3.59	1,438.00	1,437.80	0.011	Reinforced Concrete Pipe	0.013
17.60	6.89	1,437.80	1,434.60	0.028	Reinforced Concrete Pipe	0.013
6.81	2.42	1,435.30	1,435.10	0.011	Reinforced Concrete Pipe	0.013
7.08	3.16	1,435.10	1,434.80	0.012	Reinforced Concrete Pipe	0.013
6.81	3.47	1,434.80	1,434.60	0.011	Reinforced Concrete Pipe	0.013
5.54	3.22	1,434.60	1,434.55	0.003	Reinforced Concrete Pipe	0.013
11.66	5.57	1,434.40	1,433.87	0.012	Reinforced Concrete Pipe	0.013

Conduit FlexTable: Combined Pipe/Node Report (JOYLAND.stc)

Label	Length (Unified) (ft)	Upstream Inlet C	Pipe Diameter (in)	Invert (Upstream) (ft)	Invert (Downstream) (ft)	Slope (ft/ft)	Manning's n	Hydraulic Grade Line (In) (ft)	Hydraulic Grade Line (Out) (ft)	Energy Grade Line (In Link) (ft)	Energy Grade Line (Out Link) (ft)
J-17	18.0	0.950	15.0	1,444.25	1,444.00	0.014	0.013	1,444.44	1,444.29	1,444.51	1,444.31
J-18	25.0	0.608	15.0	1,444.00	1,443.70	0.012	0.013	1,444.29	1,444.08	1,444.39	1,444.12
J-19	18.0	0.608	15.0	1,443.70	1,443.50	0.011	0.013	1,444.08	1,443.94	1,444.21	1,444.03
J-20	16.0	0.655	15.0	1,443.50	1,443.30	0.013	0.013	1,443.94	1,443.66	1,444.11	1,443.95
J-20A	46.0	(N/A)	15.0	1,443.30	1,443.00	0.007	0.013	1,443.74	1,443.42	1,443.91	1,443.61
J-1	18.0	0.950	15.0	1,450.80	1,450.50	0.017	0.013	1,450.97	1,450.76	1,451.03	1,450.78
J-2	25.0	0.604	15.0	1,450.50	1,449.38	0.045	0.013	1,450.76	1,449.74	1,450.85	1,449.78
J-3	18.0	0.603	15.0	1,449.38	1,449.00	0.021	0.013	1,449.74	1,449.41	1,449.87	1,449.50
J-4	151.0	0.678	18.0	1,449.00	1,444.70	0.028	0.013	1,449.41	1,445.22	1,449.56	1,445.30
J-5	18.0	0.950	15.0	1,447.10	1,446.80	0.017	0.013	1,447.28	1,447.08	1,447.35	1,447.09
J-6	25.0	0.608	15.0	1,446.80	1,445.10	0.068	0.013	1,447.08	1,445.44	1,447.17	1,445.49
J-7	18.0	0.609	15.0	1,445.10	1,444.70	0.022	0.013	1,445.44	1,445.22	1,445.57	1,445.26
J-8	150.0	0.655	24.0	1,444.70	1,442.25	0.016	0.013	1,445.22	1,442.87	1,445.40	1,442.98
J-9	18.0	0.950	15.0	1,445.25	1,445.00	0.014	0.013	1,445.43	1,445.28	1,445.50	1,445.29
J-10	25.0	0.608	15.0	1,445.00	1,443.00	0.080	0.013	1,445.28	1,443.34	1,445.37	1,443.39
J-11	18.0	0.608	15.0	1,443.00	1,442.75	0.014	0.013	1,443.34	1,443.02	1,443.47	1,443.26
J-12	19.0	0.655	24.0	1,442.25	1,442.00	0.013	0.013	1,442.87	1,442.49	1,443.10	1,442.92
J-12B	65.0	(N/A)	24.0	1,442.00	1,441.30	0.011	0.013	1,442.62	1,441.80	1,442.85	1,442.22
J-13	18.0	0.950	15.0	1,442.90	1,442.70	0.011	0.013	1,443.17	1,443.11	1,443.27	1,443.14
J-14	12.0	0.608	15.0	1,442.70	1,442.55	0.013	0.013	1,443.11	1,442.89	1,443.26	1,443.15
J-14A	65.0	(N/A)	15.0	1,442.55	1,441.90	0.010	0.013	1,442.96	1,442.25	1,443.11	1,442.49
J-14B	12.0	(N/A)	15.0	1,441.90	1,441.80	0.008	0.013	1,442.31	1,442.32	1,442.46	1,442.40
J-15	18.0	0.608	15.0	1,441.80	1,441.60	0.011	0.013	1,442.32	1,442.20	1,442.51	1,442.33
J-16	39.0	0.655	15.0	1,441.60	1,441.20	0.010	0.013	1,442.20	1,441.71	1,442.43	1,442.07
J-21	18.0	0.950	15.0	1,442.28	1,442.10	0.010	0.013	1,442.50	1,442.44	1,442.58	1,442.46
J-22	25.0	0.607	15.0	1,442.10	1,441.80	0.012	0.013	1,442.44	1,442.21	1,442.55	1,442.28
J-23	18.0	0.609	15.0	1,441.80	1,441.60	0.011	0.013	1,442.21	1,442.07	1,442.36	1,442.17
J-24	142.0	0.654	15.0	1,441.60	1,437.80	0.027	0.013	1,442.07	1,438.38	1,442.24	1,438.48
J-25	18.0	0.950	15.0	1,438.50	1,438.30	0.011	0.013	1,438.68	1,438.56	1,438.74	1,438.58
J-26	25.0	0.607	15.0	1,438.30	1,438.00	0.012	0.013	1,438.56	1,438.33	1,438.66	1,438.38
J-27	18.0	0.609	15.0	1,438.00	1,437.80	0.011	0.013	1,438.33	1,438.38	1,438.45	1,438.40
J-28	114.0	0.654	18.0	1,437.80	1,434.60	0.028	0.013	1,438.38	1,435.36	1,438.59	1,435.46
J-29	18.0	0.950	15.0	1,435.30	1,435.10	0.011	0.013	1,435.47	1,435.35	1,435.53	1,435.37
J-30	25.0	0.609	15.0	1,435.10	1,434.80	0.012	0.013	1,435.35	1,435.35	1,435.44	1,435.36
J-31	18.0	0.600	15.0	1,434.80	1,434.60	0.011	0.013	1,435.35	1,435.36	1,435.38	1,435.37
J-32	18.0	0.659	18.0	1,434.60	1,434.55	0.003	0.013	1,435.36	1,435.22	1,435.55	1,435.48
J-32A	43.0	(N/A)	18.0	1,434.40	1,433.87	0.012	0.013	1,435.07	1,434.40	1,435.33	1,434.88

FlexTable: Catch Basin Table (JOYLAND.stc)

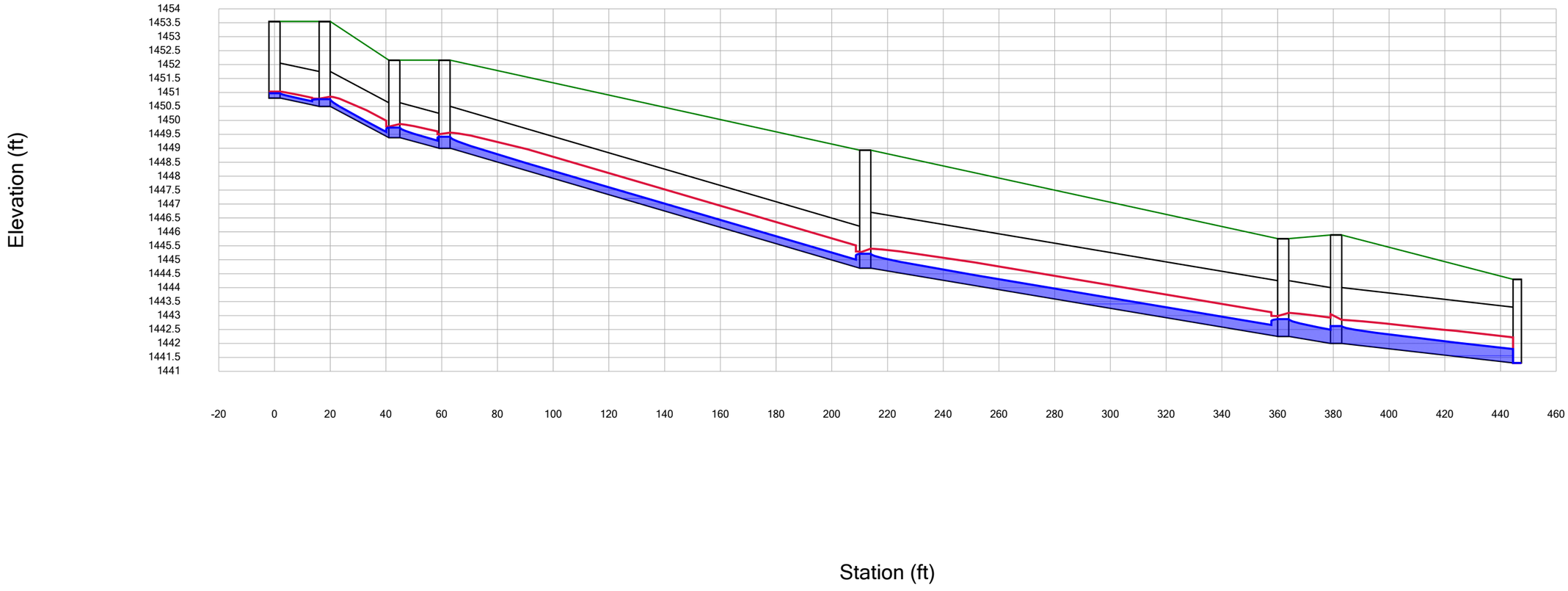
Label	Station (Calculated) (ft)	Elevation (Ground) (ft)	Set Rim to Ground Elevation?	Elevation (Rim) (ft)	Elevation (Invert) (ft)	Inlet Drainage Area (acres)	Inlet C	Local CA (acres)	Inlet	Desired Sump Depth (ft)	Inlet Location	Gutter Depth (in)	Gutter Spread (ft)	Total Rational Flow to Inlet (ft³/s)
CB-J1	4+46	1,453.55	True	1,453.55	1,450.80	0.0337	0.950	0.0320	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.2	0.19
CB-J2	4+28	1,453.55	True	1,453.55	1,450.50	0.0674	0.604	0.0407	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.5	0.25
CB-J3	4+03	1,452.16	True	1,452.16	1,449.38	0.1097	0.603	0.0662	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	1.0	4.2	0.40
CB-J4	3+85	1,452.16	True	1,452.16	1,449.00	0.0908	0.678	0.0615	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	1.0	4.0	0.37
CB-J5	2+95	1,450.79	True	1,450.79	1,447.10	0.0379	0.950	0.0361	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.3	0.22
CB-J6	2+77	1,450.79	True	1,450.79	1,446.80	0.0743	0.608	0.0451	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.9	3.6	0.27
CB-J7	2+52	1,448.93	True	1,448.93	1,445.10	0.0741	0.609	0.0451	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.9	3.6	0.27
CB-J8	2+34	1,448.93	True	1,448.93	1,444.70	0.0655	0.655	0.0430	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.5	0.26
CB-J9	1+45	1,448.03	True	1,448.03	1,445.25	0.0380	0.950	0.0361	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.3	0.22
CB-J10	1+27	1,448.03	True	1,448.03	1,445.00	0.0742	0.608	0.0451	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.9	3.6	0.27
CB-J11	1+02	1,445.76	True	1,445.76	1,443.00	0.0742	0.608	0.0451	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.9	3.6	0.27
CB-J12	0+84	1,445.76	True	1,445.76	1,442.25	0.0656	0.655	0.0430	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.5	0.26
CB-J15	0+57	1,444.61	True	1,444.61	1,441.80	0.1645	0.608	0.1001	Campbell Curbed Bicycle Safe 2541	1.00	In Sag	0.0	0.0	0.61
CB-J16	0+39	1,444.61	True	1,444.61	1,441.60	0.1456	0.655	0.0954	Campbell Curbed Bicycle Safe 2541	1.00	In Sag	0.0	0.0	0.58
CB-J13	1+64	1,445.69	True	1,445.69	1,442.90	0.0840	0.950	0.0798	Campbell Curbed Bicycle Safe 2541	1.00	In Sag	0.0	0.0	0.48
CB-J14	1+46	1,445.69	True	1,445.69	1,442.70	0.1643	0.608	0.0999	Campbell Curbed Bicycle Safe 2541	1.00	In Sag	0.0	0.0	0.60
CB-J17	1+23	1,447.04	True	1,447.04	1,444.25	0.0422	0.950	0.0400	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.4	0.24
CB-J18	1+05	1,447.04	True	1,447.04	1,444.00	0.0822	0.608	0.0500	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.9	3.7	0.30
CB-J19	0+80	1,447.11	True	1,447.11	1,443.70	0.1004	0.608	0.0610	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	1.0	4.0	0.37
CB-J20	0+62	1,447.12	True	1,447.12	1,443.50	0.0885	0.655	0.0580	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.9	4.0	0.35
CB-J21	3+78	1,445.03	True	1,445.03	1,442.28	0.0559	0.950	0.0531	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.9	3.8	0.32
CB-J22	3+60	1,445.03	True	1,445.03	1,442.10	0.1101	0.607	0.0669	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	1.0	4.2	0.40
CB-J23	3+35	1,446.83	True	1,446.83	1,441.80	0.0928	0.609	0.0566	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.9	3.9	0.34
CB-J24	3+17	1,446.81	True	1,446.81	1,441.60	0.0830	0.654	0.0543	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.9	3.9	0.33
CB-J25	2+36	1,441.21	True	1,441.21	1,438.50	0.0351	0.950	0.0333	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.2	0.20
CB-J26	2+18	1,441.22	True	1,441.22	1,438.30	0.0692	0.607	0.0420	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.5	0.25
CB-J27	1+93	1,441.94	True	1,441.94	1,438.00	0.0699	0.609	0.0426	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.5	0.26
CB-J28	1+75	1,441.95	True	1,441.95	1,437.80	0.0624	0.654	0.0409	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.5	0.25
CB-J29	1+22	1,438.08	True	1,438.08	1,435.30	0.0326	0.950	0.0310	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.7	3.1	0.19
CB-J30	1+04	1,438.09	True	1,438.09	1,435.10	0.0628	0.609	0.0383	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.4	0.23
CB-J31	0+79	1,437.84	True	1,437.84	1,434.80	0.0595	0.600	0.0357	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.3	0.22
CB-J32	0+61	1,437.84	True	1,437.84	1,434.60	0.0491	0.659	0.0323	Campbell Curbed Bicycle Safe 2541	1.00	On Grade	0.8	3.2	0.20

FlexTable: Catchment Table (JOYLAND.stc)

Label	Area (acres)	Rational C	Catchment CA (acres)	Outflow Node	Catchment Intensity (in/h)	Catchment Rational Flow (ft^3/s)
CM-J1	0.0337	0.950	0.0320	CB-J1	6.000	0.19
CM-J2	0.0674	0.604	0.0407	CB-J2	6.000	0.25
CM-J3	0.1097	0.603	0.0662	CB-J3	6.000	0.40
CM-J4	0.0908	0.678	0.0615	CB-J4	6.000	0.37
CM-J5	0.0379	0.950	0.0361	CB-J5	6.000	0.22
CM-J6	0.0743	0.608	0.0451	CB-J6	6.000	0.27
CM-J7	0.0741	0.609	0.0451	CB-J7	6.000	0.27
CM-J8	0.0655	0.655	0.0430	CB-J8	6.000	0.26
CM-J9	0.0380	0.950	0.0361	CB-J9	6.000	0.22
CM-J10	0.0742	0.608	0.0451	CB-J10	6.000	0.27
CM-J11	0.0742	0.608	0.0451	CB-J11	6.000	0.27
CM-J12	0.0656	0.655	0.0430	CB-J12	6.000	0.26
CM-J13	0.0840	0.950	0.0798	CB-J13	6.000	0.48
CM-J14	0.1643	0.608	0.0999	CB-J14	6.000	0.60
CM-J15	0.1645	0.608	0.1001	CB-J15	6.000	0.61
CM-J16	0.1456	0.655	0.0954	CB-J16	6.000	0.58
CM-J17	0.0422	0.950	0.0400	CB-J17	6.000	0.24
CM-J18	0.0822	0.608	0.0500	CB-J18	6.000	0.30
CM-J19	0.1004	0.608	0.0610	CB-J19	6.000	0.37
CM-J20	0.0885	0.655	0.0580	CB-J20	6.000	0.35
CM-J21	0.0559	0.950	0.0531	CB-J21	6.000	0.32
CM-J22	0.1101	0.607	0.0669	CB-J22	6.000	0.40
CM-J23	0.0928	0.609	0.0566	CB-J23	6.000	0.34
CM-J24	0.0830	0.654	0.0543	CB-J24	6.000	0.33
CM-J25	0.0351	0.950	0.0333	CB-J25	6.000	0.20
CM-J26	0.0692	0.607	0.0420	CB-J26	6.000	0.25
CM-J27	0.0699	0.609	0.0426	CB-J27	6.000	0.26
CM-J28	0.0624	0.654	0.0409	CB-J28	6.000	0.25
CM-J29	0.0326	0.950	0.0310	CB-J29	6.000	0.19
CM-J30	0.0628	0.609	0.0383	CB-J30	6.000	0.23
CM-J31	0.0595	0.600	0.0357	CB-J31	6.000	0.22
CM-J32	0.0491	0.659	0.0323	CB-J32	6.000	0.20

Profile Report
Profile: CB-J1 TO OF-J12C

CB-J1 TO OF-J12C - Base



Profile Report
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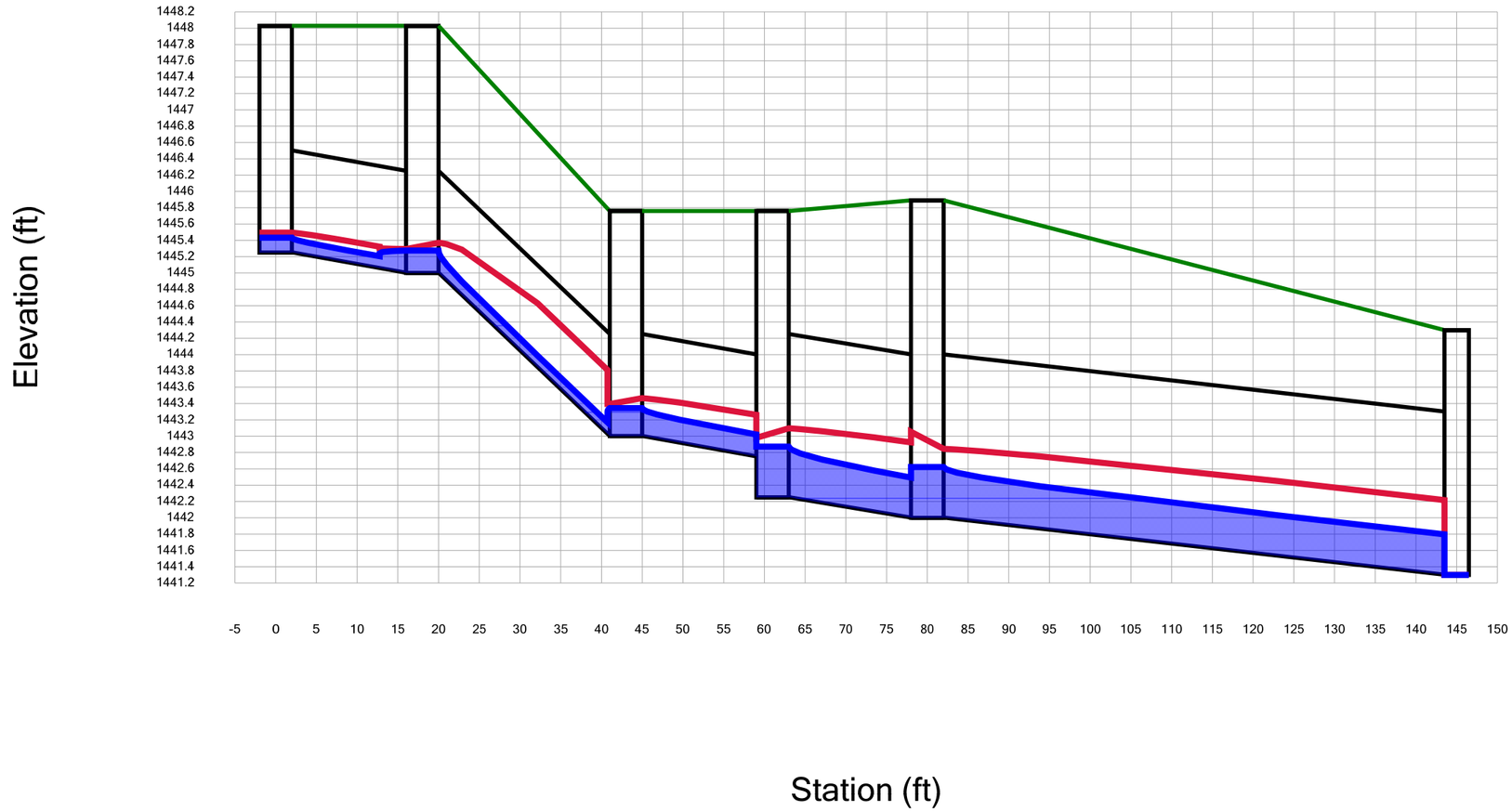
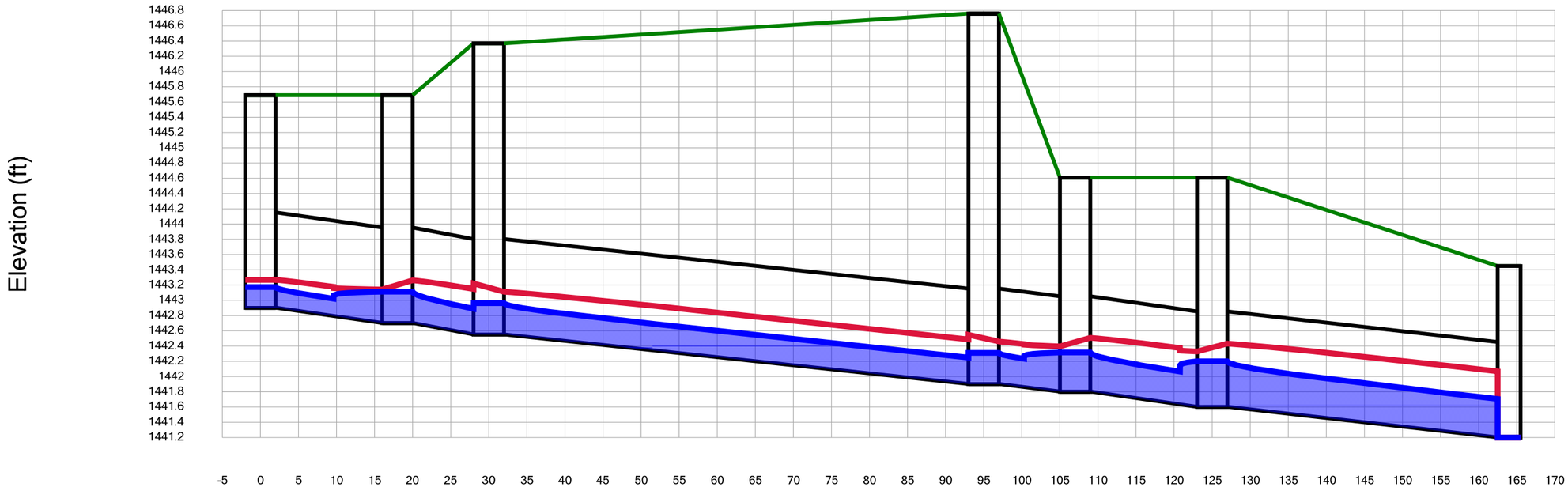
CB-J9 TO OF-J12C - Base



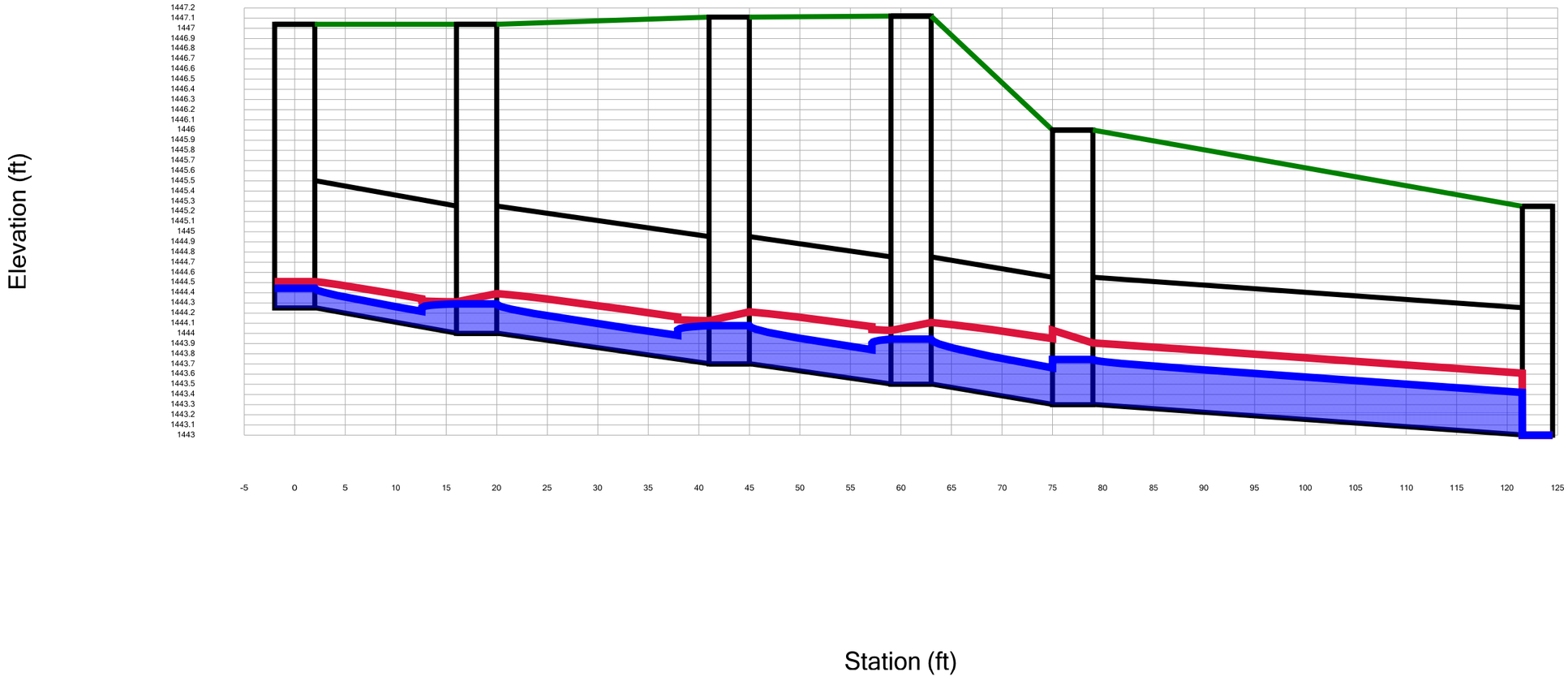
Profile Report
Profile: CB-J13 TO OF-J16A

CB-J13 TO OF-J16A - Base



Profile Report
Profile: CB-J17 TO OF-J20C

CB-J17 TO OF-J20C - Base



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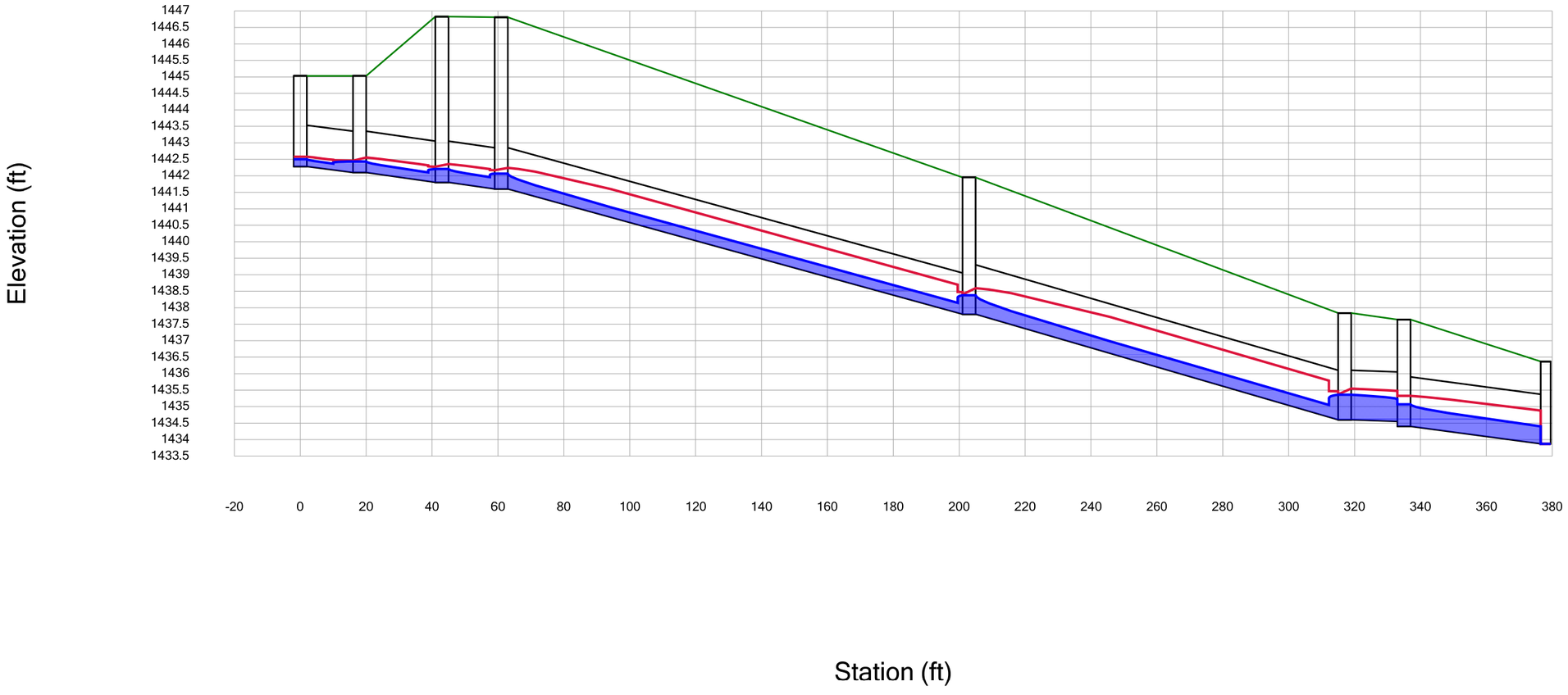
CB-J21 TO OF-J32B - Base



Profile Report
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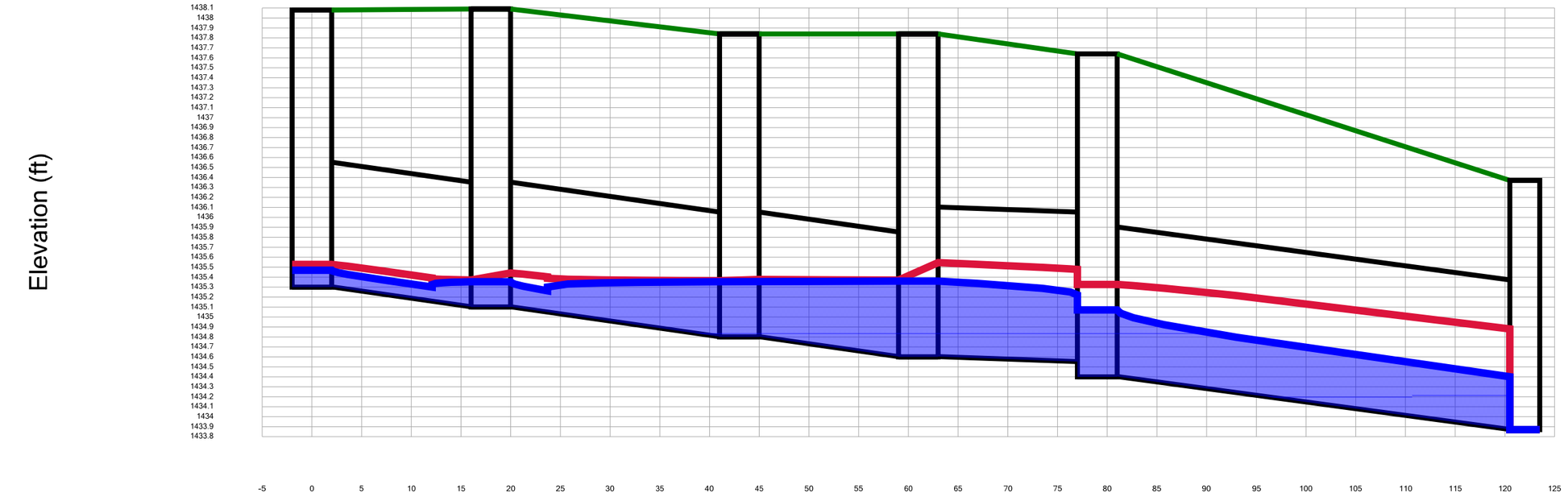
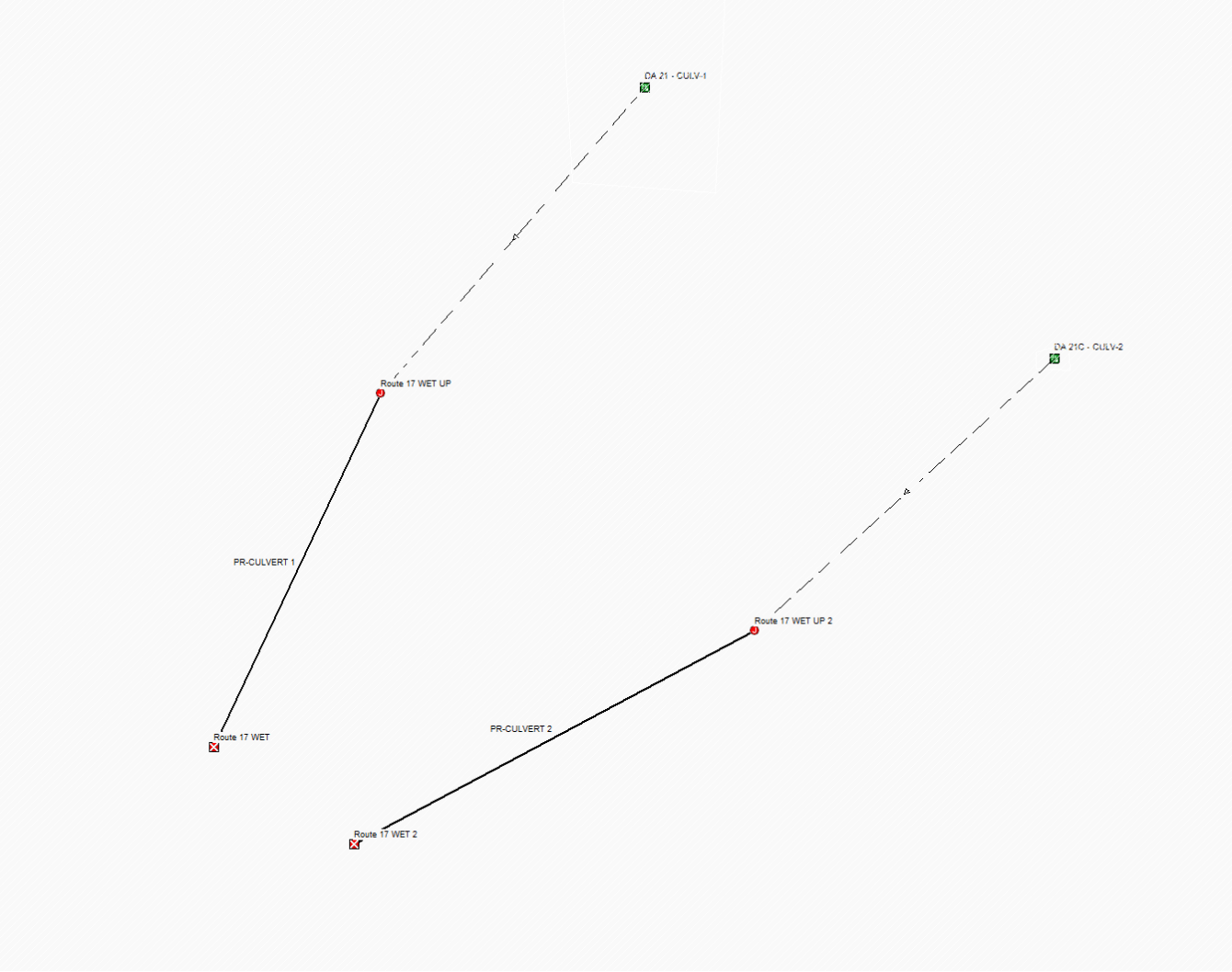
CB-J29 TO OF-J32B - Base



SWPPP

APPENDIX L

CULVERT ANALYSIS



Autodesk Storm and Sanitary Analysis

100 - Year Storm Event - Proposed Culvert Modeling at NYSDEC/USACE Wetland 71 Crossing

SN	Element ID	Description	Area (acres)	Drainage Node ID	Weighted Runoff Coefficient	Accumulated Precipitation (inches)	Total Runoff (inches)	Peak Runoff (cfs)	Rainfall Intensity (inches/hr)	Time of Concentration (days hh:mm:ss)
9	DA 21 - CULV-1	WETLAND CROSSING NEW ENTRY	27.05	Route 17 WET UP	0.3600	2.14	0.77	42.53	4.367	0 00:29:21
10	DA 21C - CULV-2	WETLAND CROSSING NEW ENTRY	12.22	Route 17 WET UP 2	0.3600	2.34	0.84	17.43	3.963	0 00:35:25

SN	Element ID	Description	From (Inlet) Node	To (Outlet) Node	Length	Inlet Invert Elevation	Inlet Invert Offset	Outlet Invert Elevation	Outlet Invert Offset	Total Drop	Average Slope	Pipe Shape	Pipe Diameter or Height	Pipe Width	Manning's Roughness	Entrance Losses	Exit/Bend Losses	Additional Losses	Initial Flow	Flap Gate	Lengthening Factor	Peak Flow	Time of Peak Flow Occurrence	Max Flow Velocity	Travel Time	Design Flow Capacity	Max Flow / Design Flow Ratio	Max Flow Depth / Total Depth Ratio	Total Time Surcharged	Max Flow Depth	Reported Condition
					(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(%)		(inches)	(inches)					(cfs)			(cfs)	(days hh:mm)	(ft/sec)	(min)	(cfs)			(min)	(ft)	
1	PR-CULVERT 1		Route 17 WET UP	Route 17 WET	188.20	1384.00	0.00	1379.00	0.00	5.00	2.6600	Horizontal Ellipse	24.000	38.04	0.0150	0.5000	0.5000	0.0000	0.00	NO	1.00	42.47	0 00:29	9.58	0.33	59.10	0.72	0.80	0.00	1.61	Calculated
2	PR-CULVERT 2		Route 17 WET UP 2	Route 17 WET 2	203.70	1386.00	0.00	1380.00	0.00	6.00	2.9500	Horizontal Ellipse	18.960	30.00	0.0150	0.5000	0.5000	0.0000	0.00	NO	1.00	17.40	0 00:35	6.61	0.51	33.38	0.52	0.75	0.00	1.19	Calculated

SWPPP

APPENDIX M

EROSION AND SEDIMENT CONTROL DESIGN CALCULATIONS

- SEDIMENT BASIN CALCULATION SUMMARY
- SEDIMENT TRAP CALCULATION SUMMARY
- SEDIMENT BASIN DESIGN DATA SHEETS
- SEDIMENT BASIN AND TRAP HYDROLOGIC ROUTING CALCULATIONS

Table M1.0: Temporary Sediment Basin Design Summary Table

DATA SHEET STEP NUMBER															
SITE PARAMETERS						1			2				3		
Sediment Basin Designation	**Bottom of Basin**	**Top of Berm**	**Design High Water [1]**	**Principal Spillway / Riser Crest**	**Total Area Draining to Basin**	**Minimum Storage Volume**		**Storage Volume @ Principal Spillway El. [2]**	**50% of Minimum Storage Volume / Clean-Out Volume**		**Corresponding Clean-Out [2]**	**Distance Below top of Riser**	**One Year Storm Peak Discharge - $Q_{(1)}$**	**Minimum Surface Area @ Principal Spillway El.**		**Surface Area @ Principal Spillway El.**
	EL.	**EL.**	**EL.**	**EL.**	**Ac**	**yd^3**	**ft^3**	**ft^3**	**yd^3**	**ft^3**	**EL.**	**ft**	**cfs**	**Ac**	**ft^2**	**ft^2**
Pond 23	1377.0	1386.0	1385.0	**1383.0**	7.321	981	26,487	28,130	491	13,244	**1381.5**	**1.50**	5.27	0.110	4,784	11,418
Pond 24	1361.0	1369.0	1368.0	**1367.2**	12.22	1,637	44,212	49,118	819	22,106	**1366.0**	**1.20**	8.12	0.183	7,985	20,568
Pond 26	1367.0	1375.0	1374.0	**1371.4**	5.277	707	19,092	19,930	354	9,546	**1370.6**	**0.80**	2.96	0.079	3,448	12,787

TableM1.1: Temporary Sediment Basin Spillway Design Summary Table

DATA SHEET STEP NUMBER															
	4	5	6			7				8		9		10	
Sediment Basin Designation	**Ten Year Storm Peak Discharge - $Q_{p(10)}$**	**Minimum Pipe Spillway Cacpacity - Q_{ps} [3]**	**Centerline of Outlet Pipe**	**H [4]**	**Barrel Length**	**Barrel Diameter [5]**	**Barrel Capacity - Q [6]**	**Correction Factor [6]**	**Corrected Barrel Capacity - Q_{ps} [6]**	**Riser Diameter [7]**	**h [8]**	**Trash Rack Diameter [9]**	**Trash Rack Height [9]**	**Ten Year Storm Event Peak [10]**	**Freeboard for Ten Year Storm Event**
	cfs	**cfs**	**EL.**	**ft**	**ft**	**in**	**cfs**		**cfs**	**in**	**ft**	**in**	**in**	**EL.**	**ft**
Pond 23	21.97	21.97	1376.0	9.0	168.0	**18**	24.90	0.80	19.92	**30**	2.0	**54**	**17**	1383.7	2.3
Pond 24	30.94	30.94	1360.0	8.0	115.0	**21**	33.30	0.82	27.31	**48**	0.8	**72**	**21**	1367.8	1.2
Pond 26	11.62	11.62	1366.5	7.5	132.0	**15**	14.90	0.84	12.52	**24**	2.6	**36**	**13**	1371.9	3.1

Table M1.2: Temporary Sediment Basin Anti-Seep Collar and Dewatering Orifice Design Summary Table

DATA SHEET STEP NUMBER													
	12							13					
Sediment Basin Designation	**y [11]**	**z [12]**	**Pipe Slope**	**Length of Pipe in Saturated Zone - Ls**	**# of Anti-Seep Collars**	**Collar Square Dimension**	**Vertical Projection**	**Dewatering Orifice**	**Surface Area of Basin at Orifice El. - A_s**	**Head of Water Above Orifice - h**	**Surface Area of Orifice - A_o**	**Max Orifice Diameter**	**Design Orifice Diameter [13]**
	ft	**ft/ft**	**ft/ft**	**ft**		**ft**	**ft**	**EL.**	**ft^2**	**ft**	**ft^2**	**in**	**in**
Pond 23	6.0	5.6	0.006	59	2	6.0	2.2	**1381.5**	8,702	1.5	0.12	4.7	**6**
Pond 24	6.2	5.5	0.009	61	2	6.3	2.2	**1366.0**	16,533	1.2	0.21	6.2	**6**
Pond 26	4.4	11.8	0.004	71	2	6.5	2.6	**1370.6**	8,410	0.8	0.09	4.0	**6**

[1] - All sediment basins are designed without an emergency spillway
[2] - Refer to corresponding Stage vs. Storage Table in HydroCAD Analysis
[4] - H is the interval between the centerline of the outlet pipe and design high water
[5] - All barrels and riser will be constructed with HDPE or PVC (n=0.011) and are conservatively sized as RCP (n=0.013)
[6] - Refer to NYSSESC Figure 5A.27
[7] - Refer to NYSSESC Figure 5A.25
[8] - h is the interval between the emergency spillway crest and principal spillway crest
[9] - Refer to NYSSESC Figure 5A.29
[10] - Refer to attached HydroCAD analysis to confirm temporary outlet control structure can route 10-year event
[11] - Distance from upstream invert of pipe to riser crest
[12] - Average slope of upstream embankment
[13] - Minimum Orifice Diameter is 6-inch

Concord - Phase 1 - Resort Entry Road
Stormwater Pollution Prevention Plan

Table M2.0: Temporary Sediment Trap Design Summary Table

Sediment Trap Designation	Bottom of Basin	Top of Berm	Total Area Draining to Basin	Minimum Storage Volume	Riser Crest	Storage Volume @ Riser Crest El.	50% of Minimum Storage Volume / Clean-Out Volume	Corresponding Clean-Out	Distance Below top of Riser	Barrel Diameter	Riser Diameter
	EL.	EL.	Ac	ft^3	EL.	ft^3	ft^3	EL.	ft	in	in
21A	1375.0	1380.0	3.680	13,248	**1377.6**	13,835	6,624	**1376.9**	**0.70**	**21**	**24**
21B	1376.0	1381.0	3.182	11,455	**1378.2**	13,071	5,728	**1377.0**	**1.20**	**21**	**24**
28	1373.0	1378.0	3.820	13,752	**1376.0**	13,765	6,876	**1374.8**	**1.20**	**21**	**24**

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

Computed by J Seeney Date 3/25/13 Checked by _____ Date _____

Project Concord - Roadway Basin # 23

Location Pond 23 Total Area draining to basin 7.321 Acres

BASIN SIZE DESIGN

1. Minimum sediment storage volume = 134 cu. yds. x 7.3 acres of drainage area = 981 cu.yds.
2. a. Cleanout at 50 percent of minimum required volume = 491 cu. yds.
   b. Elevation corresponding to scheduled time to clean out 1381.5
   c. Distance below top of riser 1.5 feet
3. Minimum surface area is larger of 0.01 $Q_{(1)}$ 0.053 or, 0.015 DA = 0.110 use 0.110 acres

DESIGN OF SPILLWAYS & ELEVATIONS

Runoff

4. $Q_{p(10)}$ = 21.97 cfs
   (EFH, Ch. 2, TR-55, or Section 4; Attach runoff computation sheet)

Pipe Spillway (Q_{ps})

5. Min. pipe spillway cap., Q_{ps} = 0.2 x N/A ac. Drainage = N/A cfs
   Note: If there is no emergency spillway, then req'd Q_{ps} = $Q_{p(10)}$ = 21.97 cfs.
6. H = 9.0 ft. Barrel length = 168 ft
7. Barrel: Diam. 18 inches; Q_{ps} = (Q) 24.90 x (cor.fac.) 0.80 = 19.92 cfs.
8. Riser: Diam. 30 inches; Length 6.0 ft.; h = 2.0 ft. Crest Elev. 1383.0
9. Trash Rack: Diam. 54 inches; H = 17 inches

Emergency Spillway Design N/A

10. Emergency Spillway Flow, Q_{es} = Q_p - Q_{ps} = _____ - _____ = _____ cfs.
11. Width _____ ft.; H_p _____ ft Crest elevation _____; Design High Water Elev. _____
    Entrance channel slope _____ % ; Top of Dam Elev. _____
    Exit channel slope _____ %

ANTI-SEEP COLLAR/ SEEPAGE DIAPHRAGM DESIGN

Collars:

12. y = 6.0 ft.; z = 5.6 :1; pipe slope = 0.6 %, L_s = 59 ft.
    Use 2 collars, 6 - 0 inches square; projection = 2.2 ft.

Diaphragms:

_____ width _____ ft. height _____ ft.

DEWATERING ORIFICE SIZING

13. $Ao = \frac{A_s \times (2h)^{0.5}}{122{,}568}$ = 0.12 sq. ft.; h = 1.5 ft.; therefore use, 4.7" => use 6"

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

Computed by J. Seeney Date 3/25/13 Checked by _____ Date _____
Project Concord - Roadway Basin # 24
Location Pond 24 Total Area draining to basin 12.220 Acres

BASIN SIZE DESIGN

1. Minimum sediment storage volume = 134 cu. yds. x 12.2 acres of drainage area = 1,637 cu.yds.
2. a. Cleanout at 50 percent of minimum required volume = 819 cu. yds.
   b. Elevation corresponding to scheduled time to clean out 1366.0
   c. Distance below top of riser 1.20 feet
3. Minimum surface area is larger of 0.01 $Q_{(1)}$ 0.081 or, 0.015 DA = 0.183 use 0.183 acres

DESIGN OF SPILLWAYS & ELEVATIONS

Runoff

4. $Q_{p(10)}$ = 30.94 cfs
   (EFH, Ch. 2, TR-55, or Section 4; Attach runoff computation sheet)

Pipe Spillway (Q_{ps})

5. Min. pipe spillway cap., Q_{ps} = 0.2 x N/A ac. Drainage = N/A cfs
   Note: If there is no emergency spillway, then req'd Q_{ps} = $Q_{p(10)}$ = 30.94 cfs.
6. H = 8.0 ft. Barrel length = 115 ft
7. Barrel: Diam. 21 inches; Q_{ps} = (Q) 33.3 x (cor.fac.) 0.82 = 27.31 cfs.
8. Riser: Diam. 48 inches; Length 6.2 ft.; h = 0.8 ft. Crest Elev. 1367.2
9. Trash Rack: Diam. 72 inches; H = 21 inches

Emergency Spillway Design N/A

10. Emergency Spillway Flow, Q_{es} = Q_p - Q_{ps} = _____ - _____ = _____ cfs.
11. Width _____ ft.; H_p _____ ft Crest elevation _____; Design High Water Elev. _____
    Entrance channel slope _____ % ; Top of Dam Elev. _____
    Exit channel slope _____ %

ANTI-SEEP COLLAR/
SEEPAGE DIAPHRAGM DESIGN

Collars:

12. y = 6.2 ft.; z = 5.5 :1; pipe slope = 0.9 %, L_s = 61 ft.
    Use 2 collars, 6 - 4 inches square; projection = 2.2 ft.

Diaphragms:

_____ width _____ ft. height _____ ft.

DEWATERING ORIFICE SIZING

13. $Ao = \frac{A_s \times (2h)^{0.5}}{122{,}568}$ = 0.21 sq. ft.; h = 1.2 ft.; therefore use, 6.2" => use 6"

TEMPORARY SEDIMENT BASIN DESIGN DATA SHEET

Computed by J. Seeney Date 3/25/13 Checked by _____ Date _____

Project Concord - Roadway Basin # 26

Location Pond 26 Total Area draining to basin 5.277 Acres

BASIN SIZE DESIGN

1. Minimum sediment storage volume = 134 cu. yds. x 5.3 acres of drainage area = 707 cu.yds.
2. a. Cleanout at 50 percent of minimum required volume = 354 cu. yds.
   b. Elevation corresponding to scheduled time to clean out 1370.6
   c. Distance below top of riser 0.80 feet
3. Minimum surface area is larger of 0.01 $Q_{(1)}$ 0.029 or, 0.015 DA = 0.079 use 0.079 acres

DESIGN OF SPILLWAYS & ELEVATIONS

Runoff

4. $Q_{p(10)}$ = 11.62 cfs
   (EFH, Ch. 2, TR-55, or Section 4; Attach runoff computation sheet)

Pipe Spillway (Q_{ps})

5. Min. pipe spillway cap., Q_{ps} = 0.2 x N/A ac. Drainage = N/A cfs
   Note: If there is no emergency spillway, then req'd Q_{ps} = $Q_{p(10)}$ = 11.62 cfs.
6. H = 7.5 ft. Barrel length = 132 ft
7. Barrel: Diam. 15 inches; Q_{ps} = (Q) 14.90 x (cor.fac.) 0.84 = 12.52 cfs.
8. Riser: Diam. 24 inches; Length 4.4 ft.; h = 2.6 ft. Crest Elev. 1371.9
9. Trash Rack: Diam. 36 inches; H = 13 inches

Emergency Spillway Design N/A

10. Emergency Spillway Flow, Q_{es} = Q_p - Q_{ps} = _____ - _____ = _____ cfs.
11. Width _____ ft.; H_p _____ ft Crest elevation _____; Design High Water Elev. _____
    Entrance channel slope _____ % ; Top of Dam Elev. _____
    Exit channel slope _____ %

ANTI-SEEP COLLAR/ SEEPAGE DIAPHRAGM DESIGN

Collars:

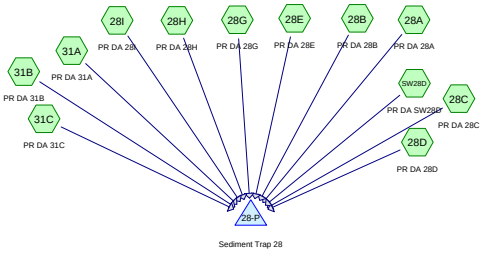
12. y = 4.4 ft.; z = 11.8 :1; pipe slope = 0.4 %, L_s = 71 ft.
    Use 2 collars, 6 - 6 inches square; projection = 2.6 ft.

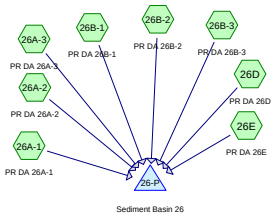
Diaphragms:

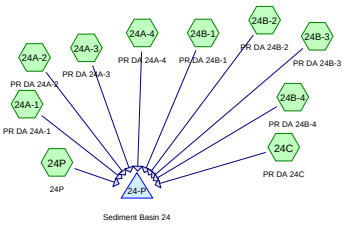
_____ width _____ ft. height _____ ft.

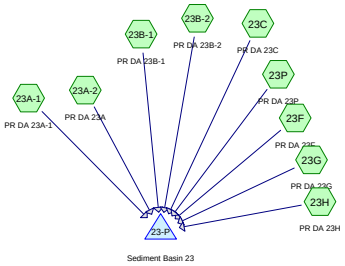
DEWATERING ORIFICE SIZING

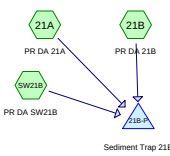
13. $Ao = \frac{A_s \times (2h)^{0.5}}{122{,}568}$ = 0.09 sq. ft.; h = 0.8 ft.; therefore use, 4" => use 6"

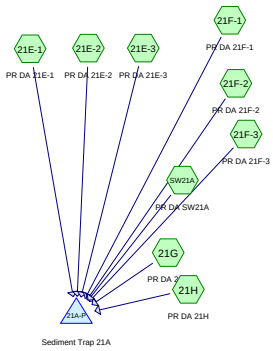


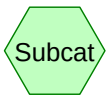


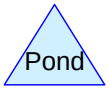












Routing Diagram for Concord Roadway Infrastructure- Temporary Storage Basins

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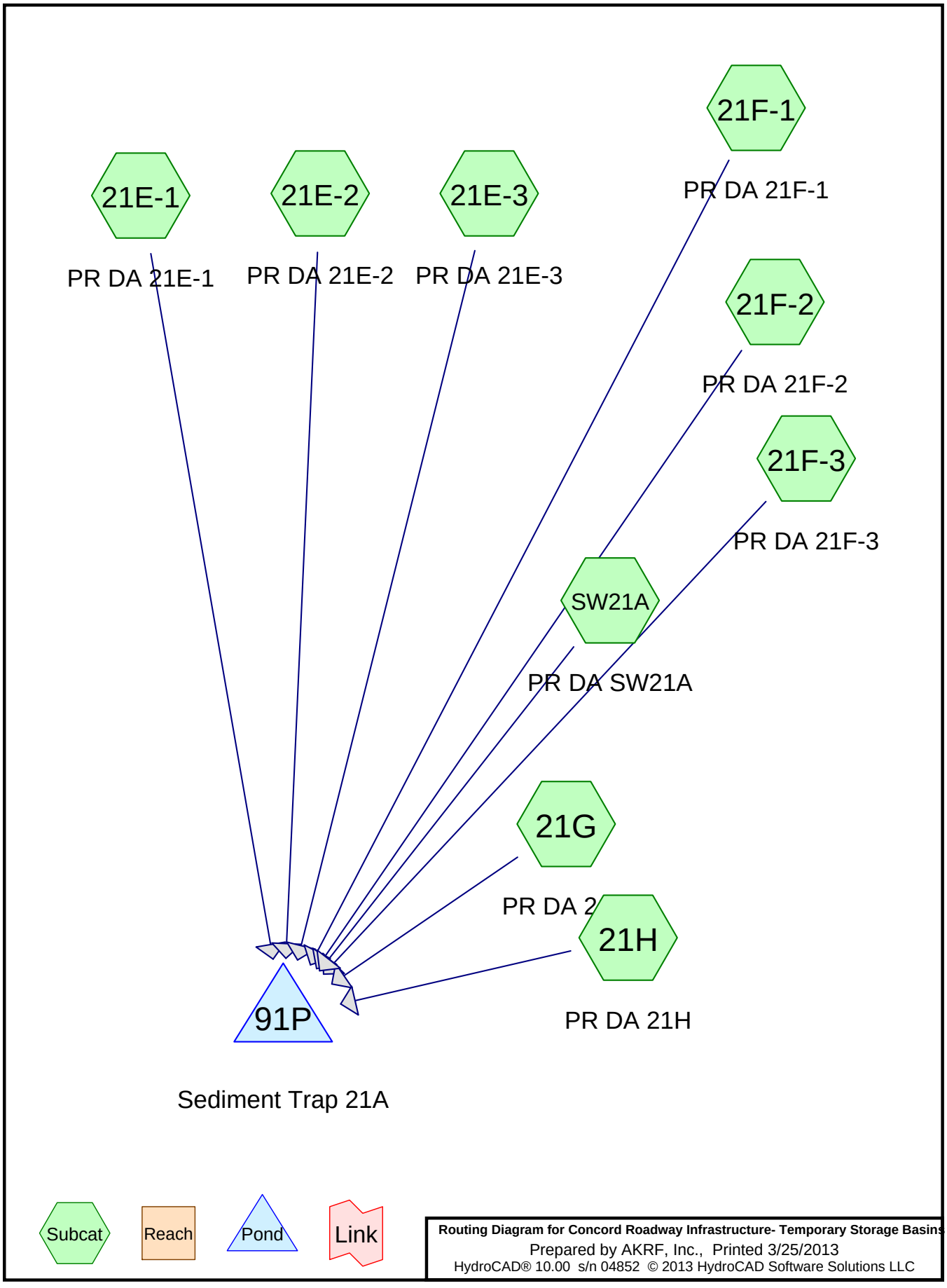

Routing Diagram for Concord Roadway Infrastructure- Temporary Storage Basins

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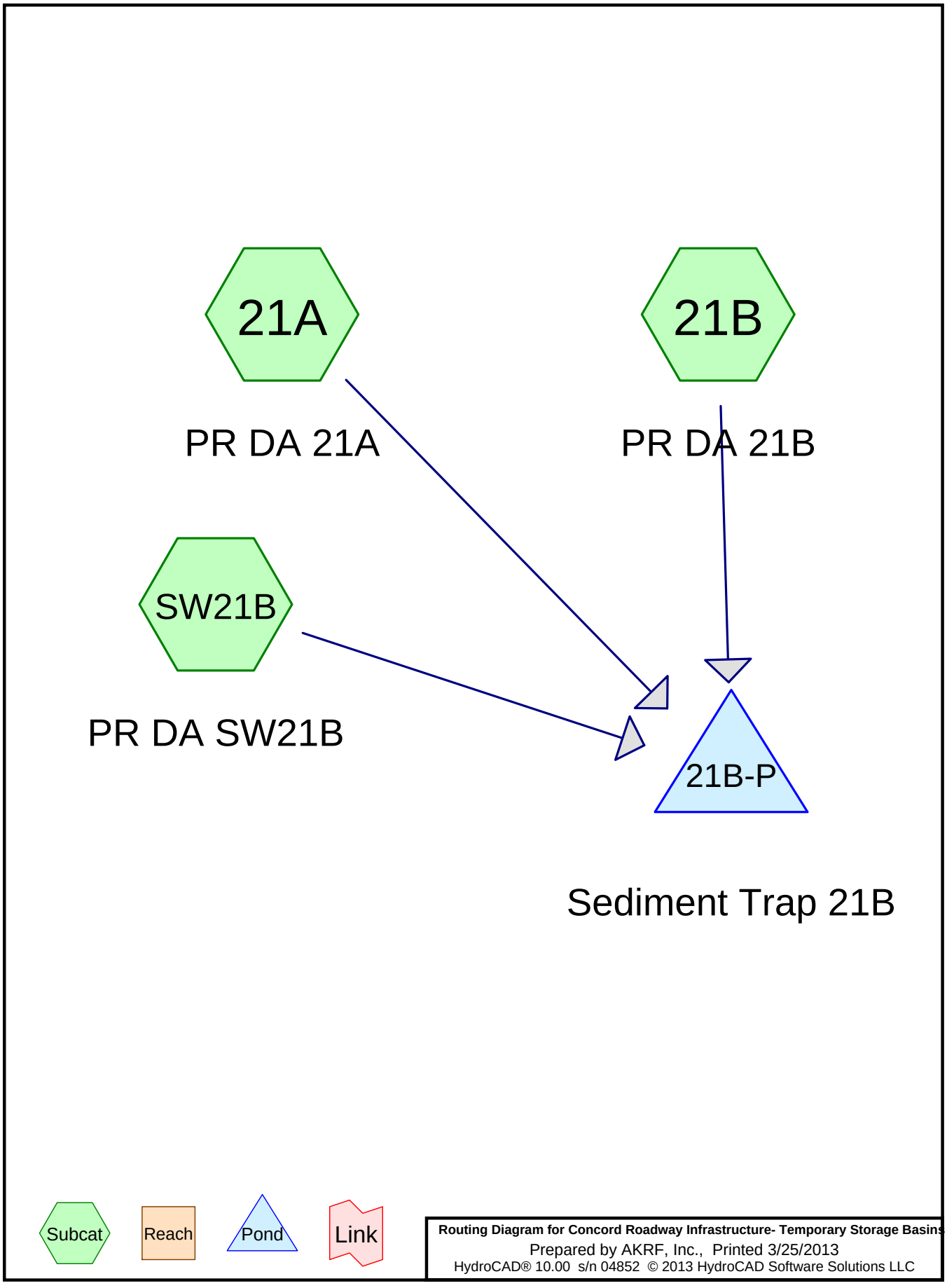

Routing Diagram for Concord Roadway Infrastructure- Temporary Storage Basins

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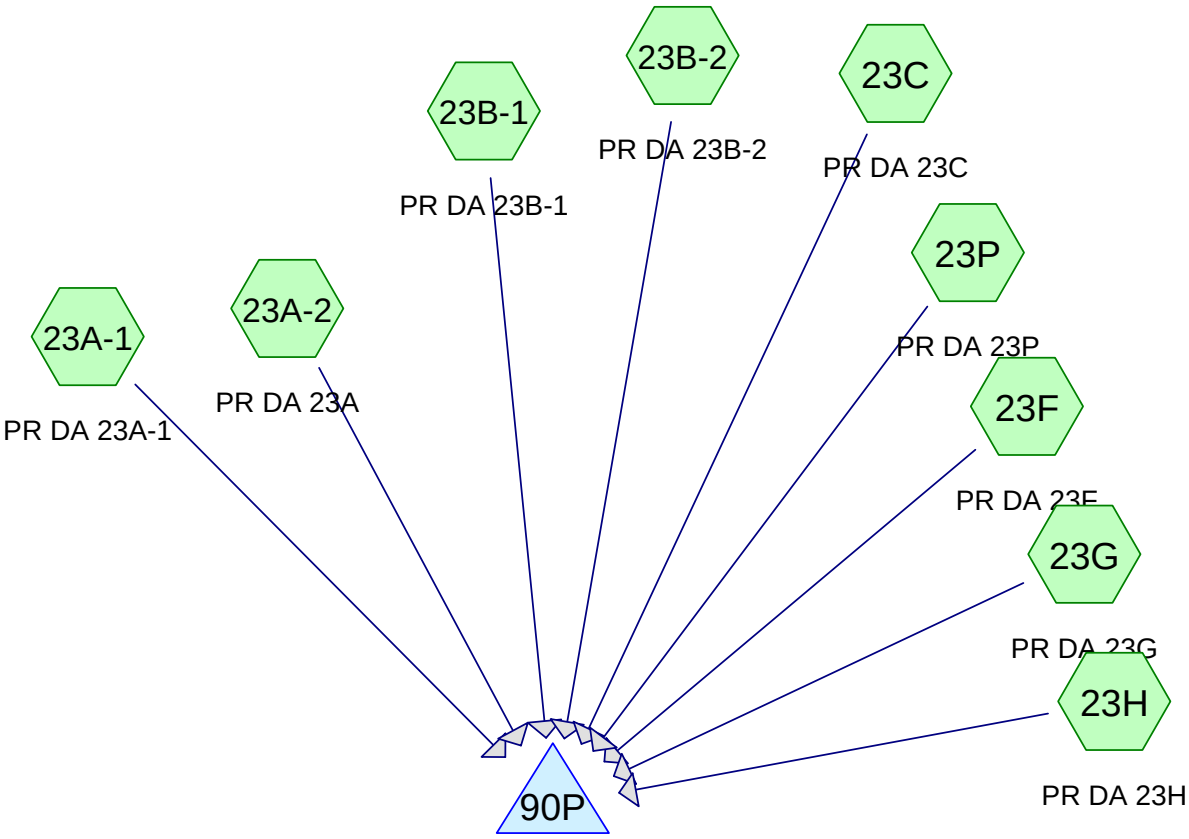

Sediment Basin 23

Subcat Reach Pond Link

Routing Diagram for Concord Roadway Infrastructure- Temporary Storage Basins

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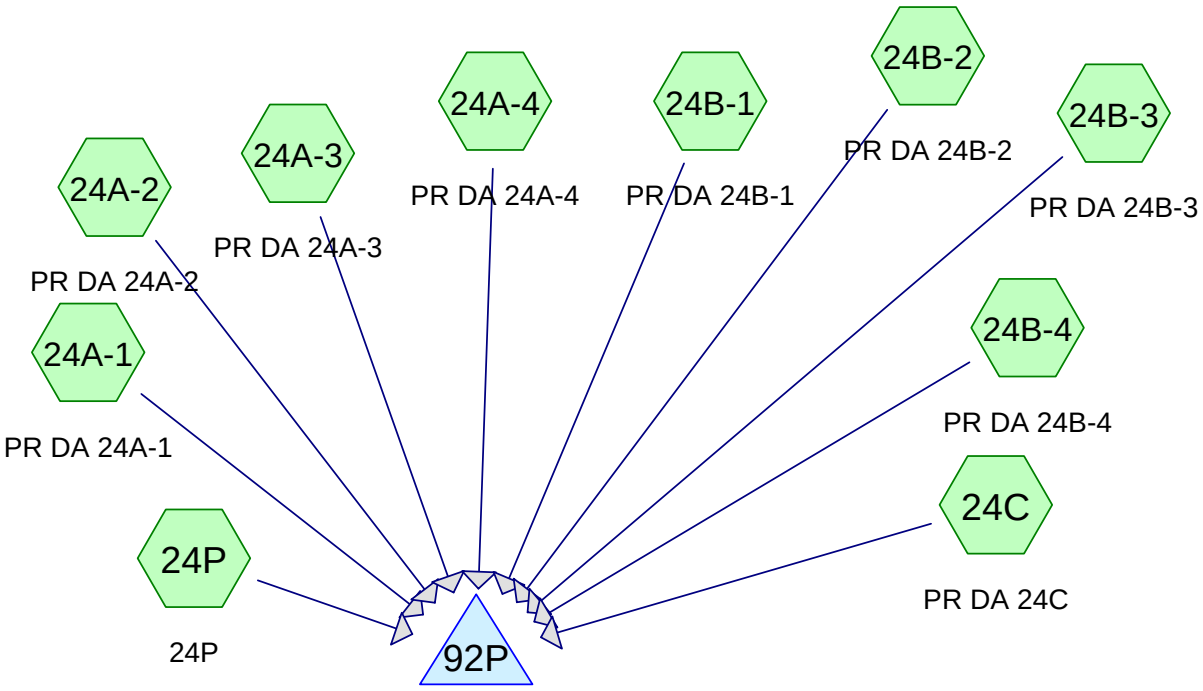

Subcat Reach Pond Link

Routing Diagram for Concord Roadway Infrastructure- Temporary Storage Basins

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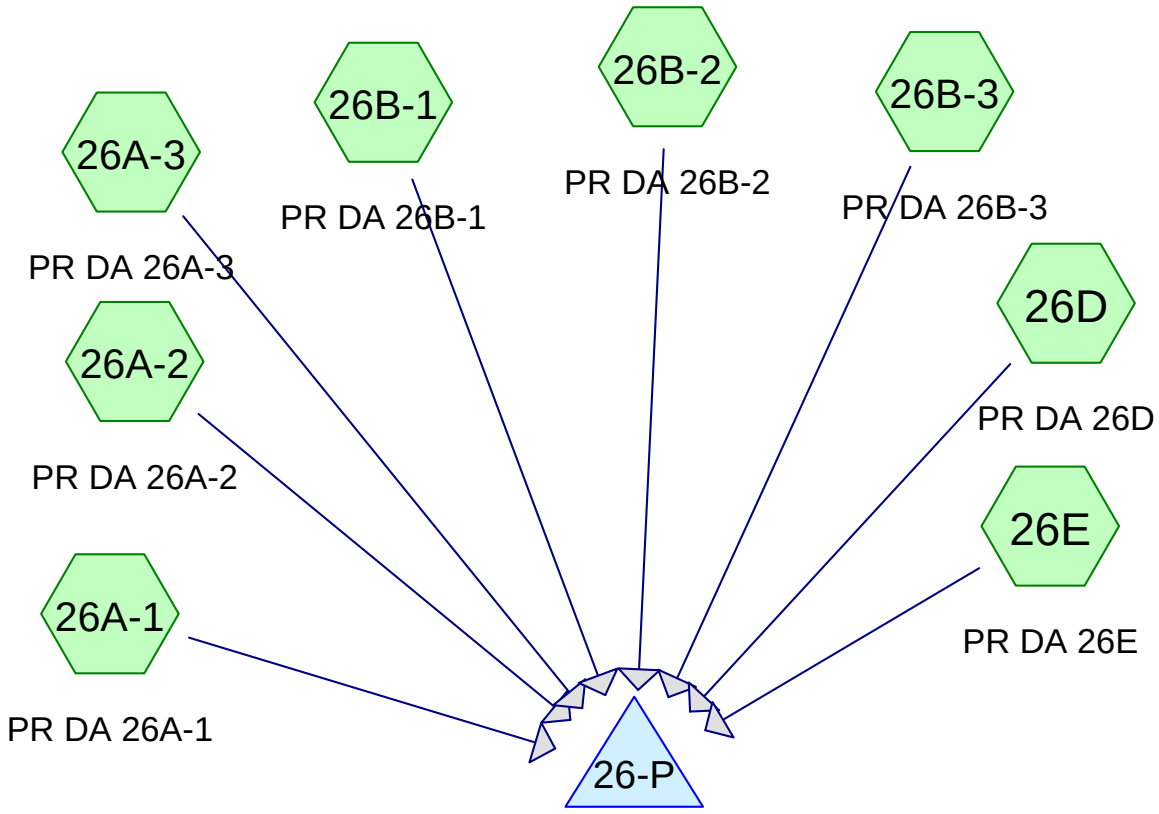

Sediment Basin 26

Subcat Reach Pond Link

Routing Diagram for Concord Roadway Infrastructure- Temporary Storage Basins

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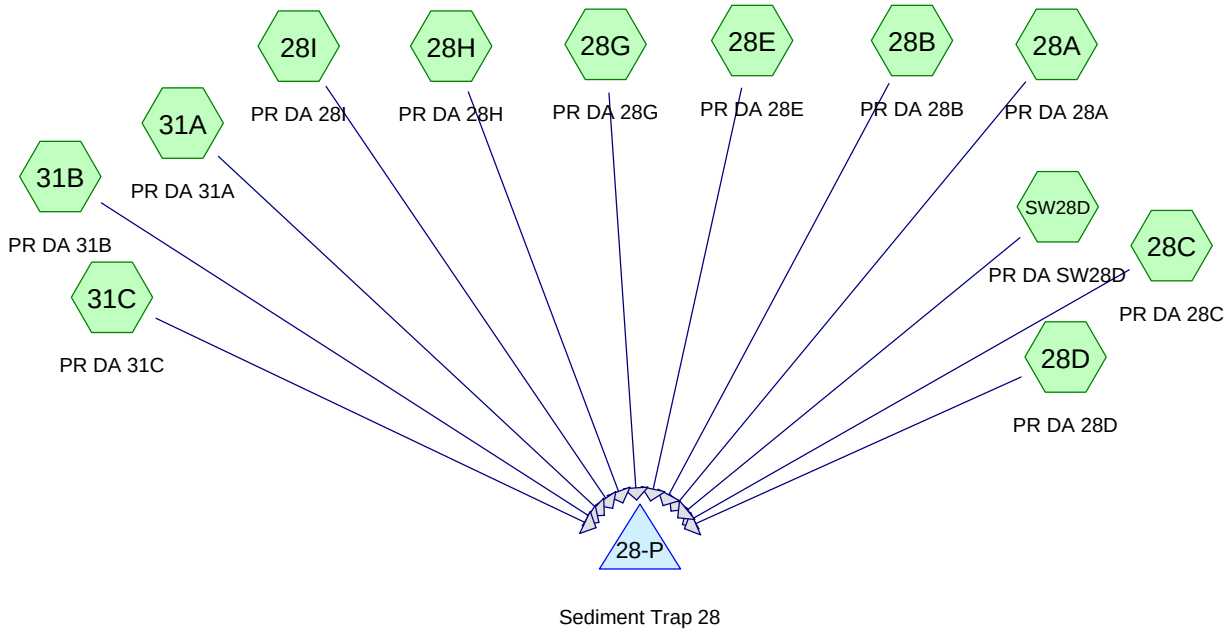

Subcat Reach Pond Link

Routing Diagram for Concord Roadway Infrastructure- Temporary Storage Basins

Prepared by AKRF, Inc., Printed 3/25/2013

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Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Pond 21A-P: Sediment Trap 21A	Peak Elev=1,377.63' Storage=14,232 cf Inflow=4.87 cfs 0.325 af	Outflow=0.12 cfs 0.065 af
Pond 21B-P: Sediment Trap 21B	Peak Elev=1,378.37' Storage=15,361 cf Inflow=4.69 cfs 0.303 af	Outflow=1.50 cfs 0.246 af
Pond 23-P: Sediment Basin 23	Peak Elev=1,383.04' Storage=28,606 cf Inflow=5.27 cfs 0.548 af	Outflow=0.22 cfs 0.107 af
Pond 24-P: Sediment Basin 24	Peak Elev=1,367.20' Storage=47,482 cf Inflow=8.12 cfs 0.842 af	Outflow=0.01 cfs 0.002 af
Pond 26-P: Sediment Basin 26	Peak Elev=1,371.52' Storage=21,443 cf Inflow=2.96 cfs 0.358 af	Outflow=0.82 cfs 0.244 af
Pond 28-P: Sediment Trap 28	Peak Elev=1,376.09' Storage=14,412 cf Inflow=5.27 cfs 0.438 af	Outflow=0.40 cfs 0.161 af

Summary for Pond 21A-P: Sediment Trap 21A

Inflow Area = 3.680 ac, 29.21% Impervious, Inflow Depth = 1.06" for 1-YR, 24-HR Storm event
Inflow = 4.87 cfs @ 12.04 hrs, Volume= 0.325 af
Outflow = 0.12 cfs @ 17.68 hrs, Volume= 0.065 af, Atten= 97%, Lag= 338.0 min
Primary = 0.12 cfs @ 17.68 hrs, Volume= 0.065 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,376.50' Surf.Area= 2,567 sf Storage= 2,494 cf
Peak Elev= 1,377.63' @ 17.68 hrs Surf.Area= 12,127 sf Storage= 14,232 cf (11,737 cf above start)

Plug-Flow detention time= 909.1 min calculated for 0.008 af (2% of inflow)
Center-of-Mass det. time= 386.7 min (1,229.4 - 842.8)

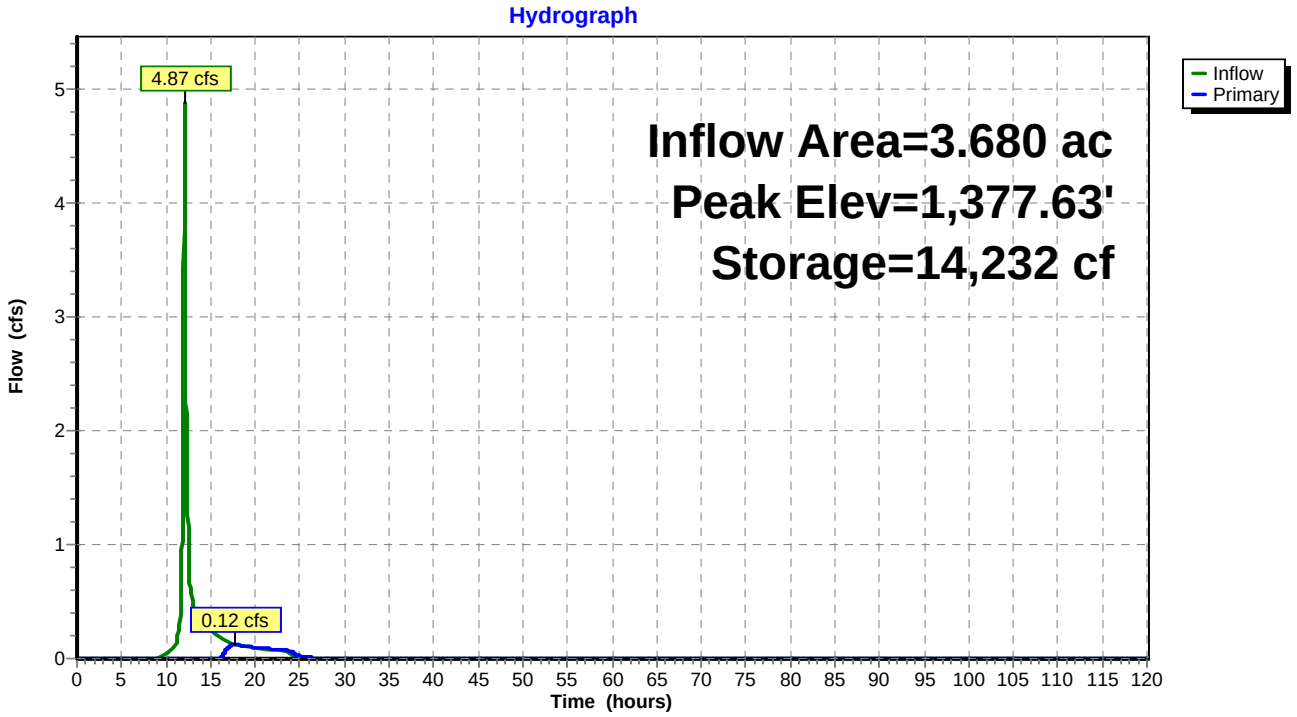
Volume	Invert	Avail.Storage	Storage Description
#1	1,375.00'	50,866 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,375.00	875	200.4	0	0	875
1,376.00	1,938	331.0	1,372	1,372	6,404
1,376.50	2,567	347.4	1,123	2,494	7,306
1,376.51	9,076	469.5	55	2,549	15,243
1,377.00	10,035	482.1	4,680	7,229	16,225
1,378.00	13,431	599.0	11,692	18,921	26,297
1,379.00	15,954	633.4	14,674	33,596	29,726
1,380.00	18,622	668.8	17,271	50,866	33,452

Device	Routing	Invert	Outlet Devices
#1	Primary	1,375.00'	**21.0" Round Barrel** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,375.00' / 1,373.50' S= 0.0300 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf
#2	Device 1	1,377.60'	**24.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.12 cfs @ 17.68 hrs HW=1,377.63' (Free Discharge)
└**1=Barrel** (Passes 0.12 cfs of 12.12 cfs potential flow)
└**2=Riser** (Weir Controls 0.12 cfs @ 0.59 fps)

Pond 21A-P: Sediment Trap 21A



Stage-Area-Storage for Pond 21A-P: Sediment Trap 21A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,375.00	875	0
1,375.05	918	45
1,375.10	963	92
1,375.15	1,008	141
1,375.20	1,054	193
1,375.25	1,102	247
1,375.30	1,150	303
1,375.35	1,200	362
1,375.40	1,250	423
1,375.45	1,302	487
1,375.50	1,354	553
1,375.55	1,408	622
1,375.60	1,463	694
1,375.65	1,518	768
1,375.70	1,575	846
1,375.75	1,633	926
1,375.80	1,692	1,009
1,375.85	1,752	1,095
1,375.90	1,813	1,184
1,375.95	1,875	1,276
1,376.00	1,938	1,372
1,376.05	1,997	1,470
1,376.10	2,057	1,571
1,376.15	2,117	1,676
1,376.20	2,179	1,783
1,376.25	2,241	1,894
1,376.30	2,305	2,007
1,376.35	2,369	2,124
1,376.40	2,434	2,244
1,376.45	2,500	2,368
1,376.50	2,567	2,494
1,376.55	9,152	2,914
1,376.60	9,249	3,374
1,376.65	9,345	3,839
1,376.70	9,442	4,308
1,376.75	9,540	4,783
1,376.80	9,638	5,262
1,376.85	9,736	5,747
1,376.90	9,835	6,236
1,376.95	9,935	6,730
1,377.00	10,035	7,229
1,377.05	10,193	7,735
1,377.10	10,352	8,249
1,377.15	10,513	8,770
1,377.20	10,675	9,300
1,377.25	10,838	9,838
1,377.30	11,002	10,384
1,377.35	11,167	10,938
1,377.40	11,334	11,501
1,377.45	11,502	12,072
1,377.50	11,671	12,651
1,377.55	11,842	13,239
1,377.60	12,013	13,835
1,377.65	12,186	14,440
1,377.70	12,360	15,054
1,377.75	12,536	15,676
1,377.80	12,712	16,307
1,377.85	12,890	16,947
1,377.90	13,069	17,596
1,377.95	13,249	18,254
1,378.00	13,431	18,921
1,378.05	13,552	19,596
1,378.10	13,674	20,276
1,378.15	13,796	20,963
1,378.20	13,918	21,656
1,378.25	14,041	22,355
1,378.30	14,165	23,060
1,378.35	14,289	23,772
1,378.40	14,414	24,489
1,378.45	14,539	25,213
1,378.50	14,665	25,943
1,378.55	14,792	26,680
1,378.60	14,919	27,422
1,378.65	15,046	28,171
1,378.70	15,174	28,927
1,378.75	15,303	29,689
1,378.80	15,432	30,457
1,378.85	15,562	31,232
1,378.90	15,692	32,013
1,378.95	15,823	32,801
1,379.00	15,954	33,596
1,379.05	16,083	34,397
1,379.10	16,212	35,204
1,379.15	16,341	36,018
1,379.20	16,471	36,838
1,379.25	16,602	37,665
1,379.30	16,733	38,498
1,379.35	16,864	39,338
1,379.40	16,996	40,185
1,379.45	17,129	41,038
1,379.50	17,262	41,898
1,379.55	17,396	42,764
1,379.60	17,530	43,637
1,379.65	17,665	44,517
1,379.70	17,800	45,404
1,379.75	17,936	46,297
1,379.80	18,072	47,197
1,379.85	18,209	48,104
1,379.90	18,346	49,018
1,379.95	18,484	49,939
1,380.00	**18,622**	**50,866**

Summary for Pond 21B-P: Sediment Trap 21B

Inflow Area = 3.182 ac, 29.54% Impervious, Inflow Depth = 1.14" for 1-YR, 24-HR Storm event
Inflow = 4.69 cfs @ 12.03 hrs, Volume= 0.303 af
Outflow = 1.50 cfs @ 12.35 hrs, Volume= 0.246 af, Atten= 68%, Lag= 19.2 min
Primary = 1.50 cfs @ 12.35 hrs, Volume= 0.246 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,378.00' Surf.Area= 5,813 sf Storage= 10,561 cf
Peak Elev= 1,378.37' @ 12.35 hrs Surf.Area= 13,316 sf Storage= 15,361 cf (4,799 cf above start)

Plug-Flow detention time= 1,085.5 min calculated for 0.003 af (1% of inflow)
Center-of-Mass det. time= 78.3 min (915.1 - 836.8)

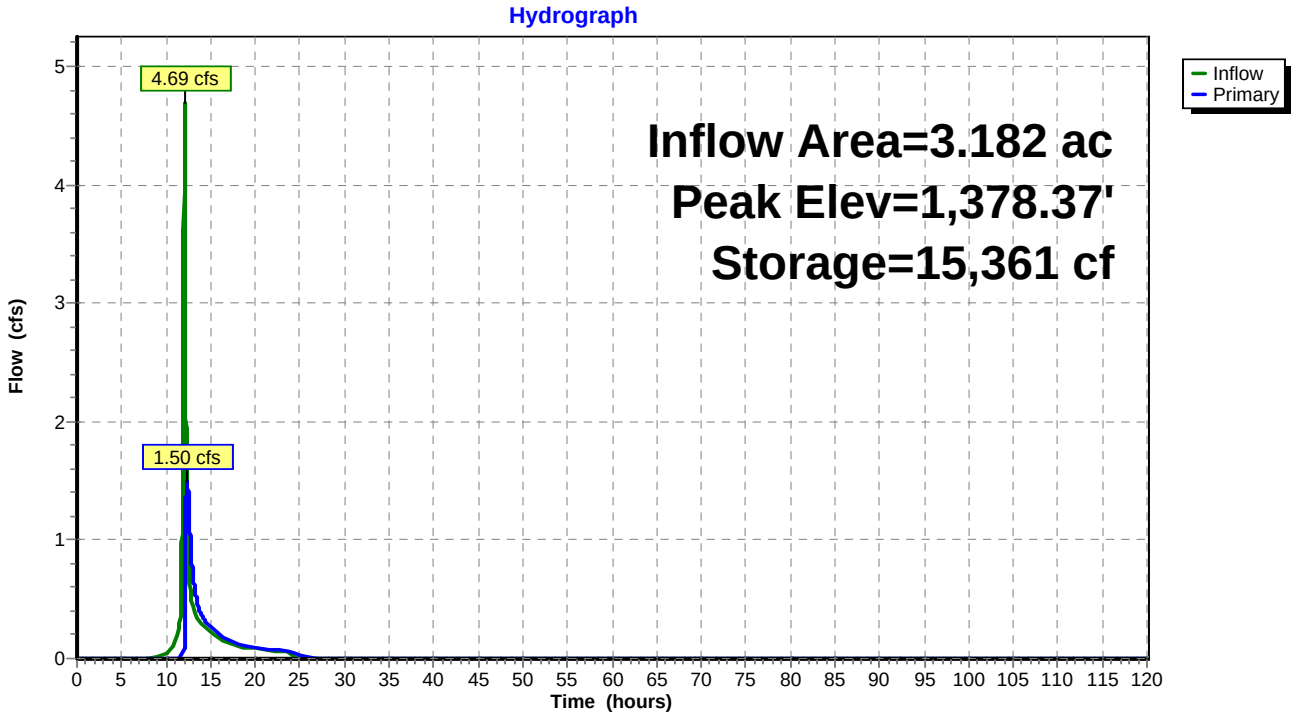
Volume	Invert	Avail.Storage	Storage Description
#1	1,375.00'	58,169 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,375.00	1,530	196.8	0	0	1,530
1,376.00	2,694	275.3	2,085	2,085	4,489
1,377.00	4,273	340.8	3,453	5,538	7,715
1,378.00	5,813	381.6	5,023	10,561	10,088
1,378.01	12,538	491.4	90	10,651	17,716
1,379.00	14,705	523.2	13,471	24,122	20,332
1,380.00	16,999	554.8	15,838	39,960	23,096
1,381.00	19,446	587.7	18,209	58,169	26,141

Device	Routing	Invert	Outlet Devices
#1	Primary	1,376.00'	**21.0" Round Barrel** L= 52.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,376.00' / 1,375.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf
#2	Device 1	1,378.20'	**24.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.50 cfs @ 12.35 hrs HW=1,378.37' (Free Discharge)
└**1=Barrel** (Passes 1.50 cfs of 12.51 cfs potential flow)
└**2=Riser** (Weir Controls 1.50 cfs @ 1.37 fps)

Pond 21B-P: Sediment Trap 21B



Stage-Area-Storage for Pond 21B-P: Sediment Trap 21B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,375.00	1,530	0
1,375.10	1,632	158
1,375.20	1,737	326
1,375.30	1,845	505
1,375.40	1,956	696
1,375.50	2,071	897
1,375.60	2,189	1,110
1,375.70	2,310	1,335
1,375.80	2,435	1,572
1,375.90	2,563	1,822
1,376.00	2,694	2,085
1,376.10	2,836	2,361
1,376.20	2,981	2,652
1,376.30	3,130	2,957
1,376.40	3,282	3,278
1,376.50	3,438	3,614
1,376.60	3,598	3,966
1,376.70	3,761	4,334
1,376.80	3,928	4,718
1,376.90	4,099	5,119
1,377.00	4,273	5,538
1,377.10	4,416	5,972
1,377.20	4,562	6,421
1,377.30	4,710	6,885
1,377.40	4,861	7,363
1,377.50	5,013	7,857
1,377.60	5,169	8,366
1,377.70	5,326	8,891
1,377.80	5,486	9,432
1,377.90	5,648	9,988
1,378.00	5,813	10,561
1,378.10	12,728	11,788
1,378.20	12,941	13,071
1,378.30	13,155	14,376
1,378.40	13,371	15,702
1,378.50	13,589	17,050
1,378.60	13,809	18,420
1,378.70	14,030	19,812
1,378.80	14,253	21,226
1,378.90	14,478	22,663
1,379.00	14,705	24,122
1,379.10	14,927	25,604
1,379.20	15,151	27,107
1,379.30	15,376	28,634
1,379.40	15,603	30,183
1,379.50	15,831	31,754
1,379.60	16,061	33,349
1,379.70	16,293	34,967
1,379.80	16,527	36,608
1,379.90	16,762	38,272
1,380.00	16,999	39,960
1,380.10	17,236	41,672
1,380.20	17,475	43,407
1,380.30	17,716	45,167
1,380.40	17,958	46,951
1,380.50	18,202	48,759
1,380.60	18,447	50,591
1,380.70	18,695	52,448
1,380.80	18,943	54,330
1,380.90	19,194	56,237
1,381.00	**19,446**	**58,169**

Summary for Pond 23-P: Sediment Basin 23

Inflow Area = 7.321 ac, 12.46% Impervious, Inflow Depth = 0.90" for 1-YR, 24-HR Storm event
Inflow = 5.27 cfs @ 12.03 hrs, Volume= 0.548 af
Outflow = 0.22 cfs @ 17.94 hrs, Volume= 0.107 af, Atten= 96%, Lag= 354.5 min
Primary = 0.22 cfs @ 17.94 hrs, Volume= 0.107 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,381.00' Surf.Area= 7,857 sf Storage= 8,931 cf
Peak Elev= 1,383.04' @ 17.94 hrs Surf.Area= 11,496 sf Storage= 28,606 cf (19,675 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 374.6 min (1,239.6 - 865.0)

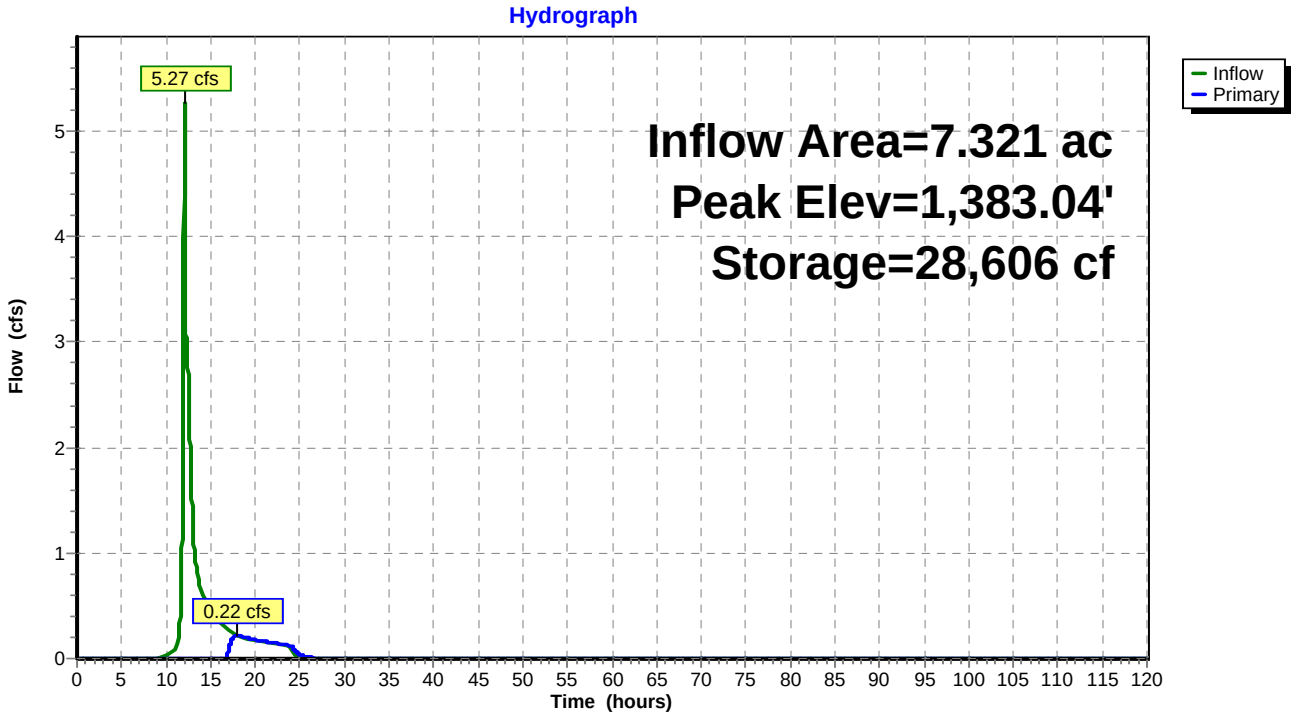
Volume	Invert	Avail.Storage	Storage Description
#1	1,377.00'	71,310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,377.00	234	63.1	0	0	234
1,378.00	802	196.1	490	490	2,980
1,379.00	1,699	233.8	1,223	1,713	4,288
1,380.00	2,685	258.9	2,173	3,886	5,302
1,381.00	7,857	376.4	5,045	8,931	11,251
1,382.00	9,589	415.8	8,709	17,639	13,766
1,383.00	11,418	451.2	10,490	28,130	16,247
1,384.00	13,357	481.7	12,375	40,504	18,559
1,385.00	15,433	511.5	14,383	54,887	20,966
1,386.00	17,433	538.9	16,423	71,310	23,316

Device	Routing	Invert	Outlet Devices
#1	Primary	1,380.00'	**18.0" Round Barrel** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,380.00' / 1,379.00' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,383.00'	**30.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.22 cfs @ 17.94 hrs HW=1,383.04' (Free Discharge)
↑**1=Barrel** (Passes 0.22 cfs of 10.17 cfs potential flow)
↑**2=Riser** (Weir Controls 0.22 cfs @ 0.67 fps)

Pond 23-P: Sediment Basin 23



Stage-Area-Storage for Pond 23-P: Sediment Basin 23

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,377.00	234	0
1,377.10	276	25
1,377.20	320	55
1,377.30	369	90
1,377.40	420	129
1,377.50	476	174
1,377.60	534	224
1,377.70	596	281
1,377.80	661	344
1,377.90	730	413
1,378.00	802	490
1,378.10	877	574
1,378.20	955	665
1,378.30	1,036	765
1,378.40	1,121	873
1,378.50	1,209	989
1,378.60	1,300	1,114
1,378.70	1,395	1,249
1,378.80	1,493	1,394
1,378.90	1,594	1,548
1,379.00	1,699	1,713
1,379.10	1,787	1,887
1,379.20	1,878	2,070
1,379.30	1,971	2,263
1,379.40	2,066	2,464
1,379.50	2,164	2,676
1,379.60	2,264	2,897
1,379.70	2,366	3,129
1,379.80	2,470	3,370
1,379.90	2,576	3,623
1,380.00	2,685	3,886
1,380.10	3,080	4,174
1,380.20	3,502	4,503
1,380.30	3,952	4,875
1,380.40	4,428	5,294
1,380.50	4,932	5,762
1,380.60	5,463	6,281
1,380.70	6,021	6,855
1,380.80	6,606	7,486
1,380.90	7,218	8,177
1,381.00	7,857	8,931
1,381.10	8,022	9,725
1,381.20	8,190	10,535
1,381.30	8,359	11,363
1,381.40	8,529	12,207
1,381.50	8,701	13,069
1,381.60	8,876	13,947
1,381.70	9,051	14,844
1,381.80	9,229	15,758
1,381.90	9,408	16,690
1,382.00	9,589	17,639
1,382.10	9,765	18,607
1,382.20	9,942	19,592
1,382.30	10,121	20,596
1,382.40	10,301	21,617
1,382.50	10,484	22,656
1,382.60	10,667	23,713
1,382.70	10,853	24,789
1,382.80	11,039	25,884
1,382.90	11,228	26,997
1,383.00	11,418	28,130
1,383.10	11,605	29,281
1,383.20	11,794	30,451
1,383.30	11,984	31,640
1,383.40	12,175	32,847
1,383.50	12,369	34,075
1,383.60	12,563	35,321
1,383.70	12,759	36,587
1,383.80	12,957	37,873
1,383.90	13,156	39,179
1,384.00	13,357	40,504
1,384.10	13,558	41,850
1,384.20	13,760	43,216
1,384.30	13,964	44,602
1,384.40	14,169	46,009
1,384.50	14,376	47,436
1,384.60	14,585	48,884
1,384.70	14,794	50,353
1,384.80	15,006	51,843
1,384.90	15,219	53,354
1,385.00	15,433	54,887
1,385.10	15,628	56,440
1,385.20	15,823	58,013
1,385.30	16,020	59,605
1,385.40	16,218	61,217
1,385.50	16,418	62,848
1,385.60	16,618	64,500
1,385.70	16,820	66,172
1,385.80	17,023	67,864
1,385.90	17,228	69,577
1,386.00	**17,433**	**71,310**

Summary for Pond 24-P: Sediment Basin 24

Inflow Area = 12.222 ac, 8.25% Impervious, Inflow Depth = 0.83" for 1-YR, 24-HR Storm event
Inflow = 8.12 cfs @ 12.04 hrs, Volume= 0.842 af
Outflow = 0.01 cfs @ 24.83 hrs, Volume= 0.002 af, Atten= 100%, Lag= 767.6 min
Primary = 0.01 cfs @ 24.83 hrs, Volume= 0.002 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,365.00' Surf.Area= 12,290 sf Storage= 10,821 cf
Peak Elev= 1,367.20' @ 24.83 hrs Surf.Area= 20,579 sf Storage= 47,482 cf (36,661 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 846.3 min (1,707.8 - 861.5)

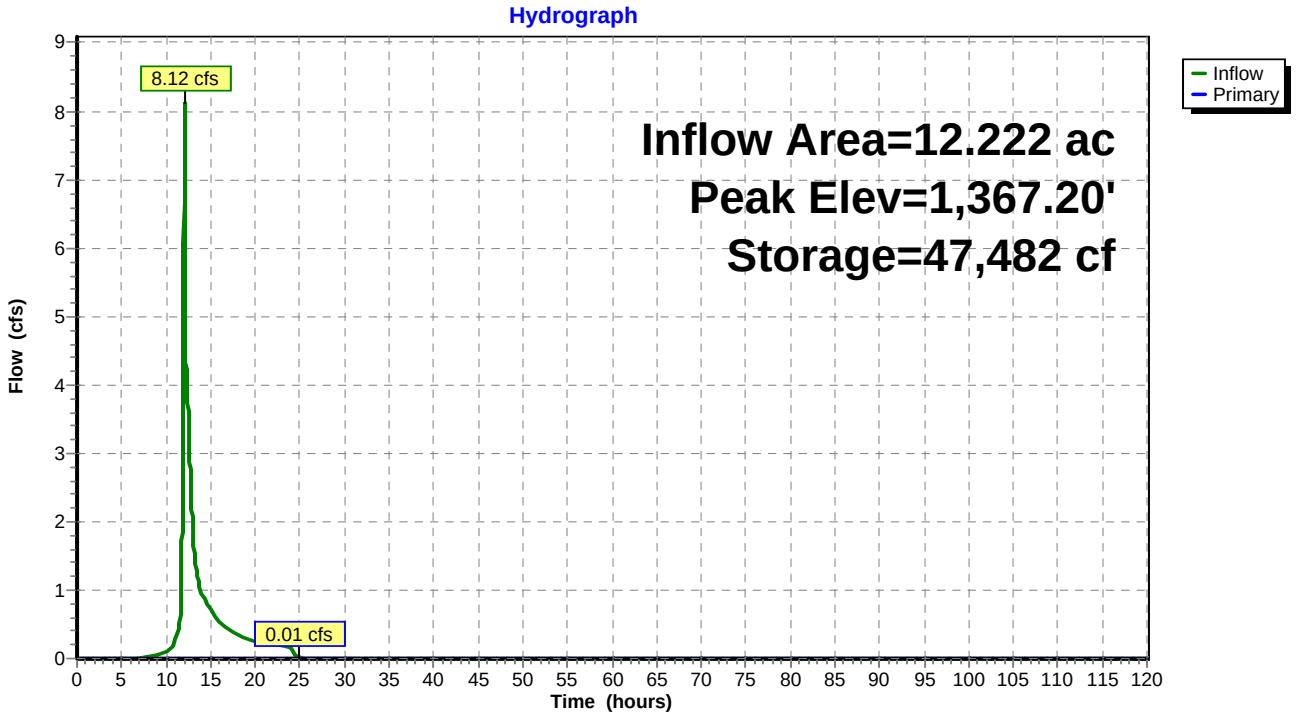
Volume	Invert	Avail.Storage	Storage Description
#1	1,361.00'	90,100 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,361.00	144	79.7	0	0	144
1,362.00	778	180.4	419	419	2,232
1,363.00	1,724	246.8	1,220	1,639	4,500
1,364.00	2,762	271.9	2,223	3,862	5,568
1,365.00	12,290	631.5	6,959	10,821	31,423
1,366.00	16,533	762.9	14,359	25,180	46,021
1,367.00	19,892	828.3	18,187	43,367	54,340
1,368.00	23,383	865.9	21,614	64,981	59,479
1,369.00	26,897	891.0	25,120	90,100	63,097

Device	Routing	Invert	Outlet Devices
#1	Primary	1,361.00'	**21.0" Round Barrel** L= 162.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,361.00' / 1,360.00' S= 0.0062 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf
#2	Device 1	1,367.20'	**48.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.01 cfs @ 24.83 hrs HW=1,367.20' (Free Discharge)
↑—**1=Barrel** (Passes 0.01 cfs of 23.72 cfs potential flow)
↑—**2=Riser** (Weir Controls 0.01 cfs @ 0.19 fps)

Pond 24-P: Sediment Basin 24



Stage-Area-Storage for Pond 24-P: Sediment Basin 24

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,361.00	144	0
1,361.10	185	16
1,361.20	230	37
1,361.30	281	63
1,361.40	337	94
1,361.50	398	130
1,361.60	464	173
1,361.70	535	223
1,361.80	611	280
1,361.90	692	345
1,362.00	778	419
1,362.10	856	501
1,362.20	937	590
1,362.30	1,023	688
1,362.40	1,112	795
1,362.50	1,205	911
1,362.60	1,301	1,036
1,362.70	1,401	1,171
1,362.80	1,505	1,316
1,362.90	1,613	1,472
1,363.00	1,724	1,639
1,363.10	1,817	1,816
1,363.20	1,912	2,002
1,363.30	2,010	2,198
1,363.40	2,110	2,404
1,363.50	2,213	2,621
1,363.60	2,318	2,847
1,363.70	2,425	3,084
1,363.80	2,535	3,332
1,363.90	2,647	3,591
1,364.00	2,762	3,862
1,364.10	3,409	4,170
1,364.20	4,124	4,546
1,364.30	4,906	4,997
1,364.40	5,757	5,529
1,364.50	6,676	6,150
1,364.60	7,663	6,867
1,364.70	8,718	7,685
1,364.80	9,840	8,613
1,364.90	11,031	9,656
1,365.00	12,290	10,821
1,365.10	12,686	12,070
1,365.20	13,088	13,358
1,365.30	13,497	14,688
1,365.40	13,912	16,058
1,365.50	14,333	17,470
1,365.60	14,760	18,925
1,365.70	15,194	20,423
1,365.80	15,634	21,964
1,365.90	16,080	23,550
1,366.00	16,533	25,180
1,366.10	16,855	26,850
1,366.20	17,180	28,551
1,366.30	17,508	30,286
1,366.40	17,839	32,053
1,366.50	18,174	33,854
1,366.60	18,511	35,688
1,366.70	18,852	37,556
1,366.80	19,195	39,458
1,366.90	19,542	41,395
1,367.00	19,892	43,367
1,367.10	20,228	45,373
1,367.20	20,568	47,413
1,367.30	20,910	49,486
1,367.40	21,255	51,595
1,367.50	21,602	53,737
1,367.60	21,953	55,915
1,367.70	22,306	58,128
1,367.80	22,662	60,377
1,367.90	23,021	62,661
1,368.00	23,383	64,981
1,368.10	23,723	67,336
1,368.20	24,066	69,726
1,368.30	24,411	72,149
1,368.40	24,759	74,608
1,368.50	25,109	77,101
1,368.60	25,462	79,630
1,368.70	25,817	82,194
1,368.80	26,175	84,793
1,368.90	26,535	87,429
1,369.00	**26,897**	**90,100**

Summary for Pond 26-P: Sediment Basin 26

Inflow Area = 5.277 ac, 13.14% Impervious, Inflow Depth = 0.81" for 1-YR, 24-HR Storm event
Inflow = 2.96 cfs @ 12.04 hrs, Volume= 0.358 af
Outflow = 0.82 cfs @ 13.15 hrs, Volume= 0.244 af, Atten= 72%, Lag= 66.6 min
Primary = 0.82 cfs @ 13.15 hrs, Volume= 0.244 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,371.00' Surf.Area= 11,978 sf Storage= 14,978 cf
Peak Elev= 1,371.52' @ 13.15 hrs Surf.Area= 13,029 sf Storage= 21,443 cf (6,465 cf above start)

Plug-Flow detention time= (not calculated: initial storage exceeds outflow)
Center-of-Mass det. time= 120.1 min (990.0 - 869.9)

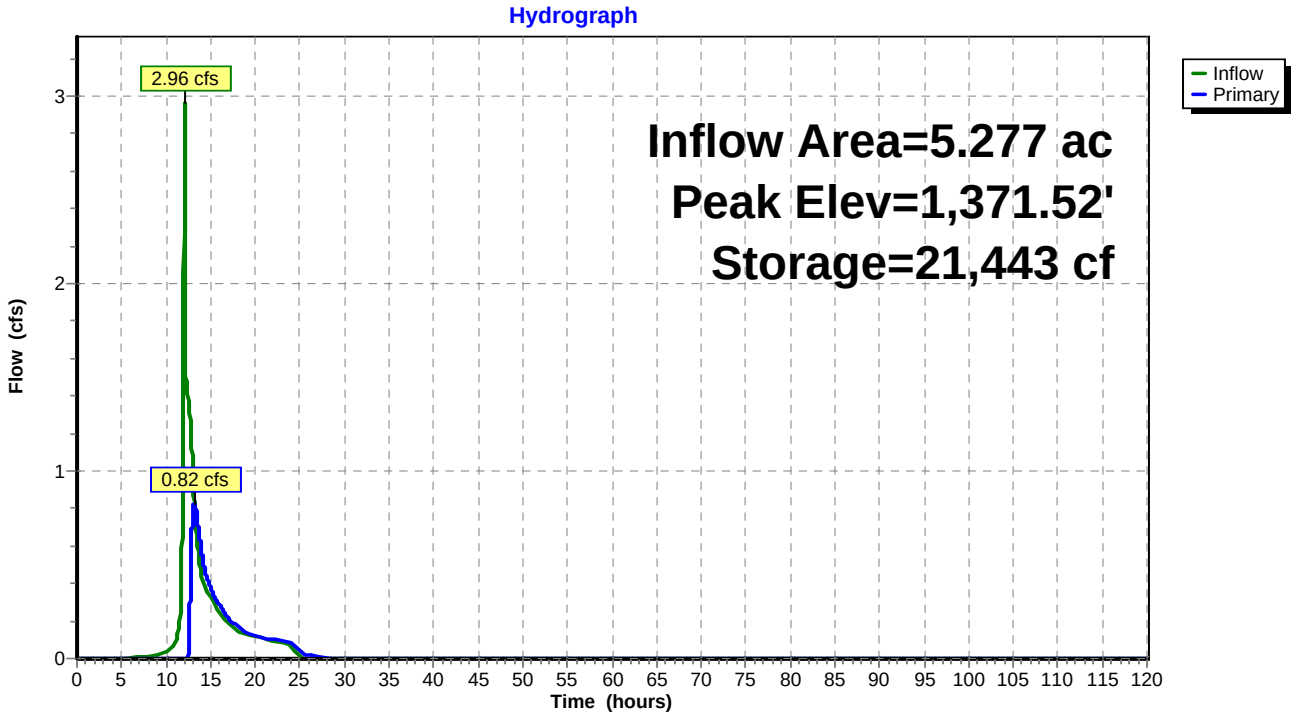
Volume	Invert	Avail.Storage	Storage Description
#1	1,367.00'	80,070 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,367.00	790	132.3	0	0	790
1,368.00	1,854	246.6	1,285	1,285	4,242
1,369.00	2,907	273.0	2,361	3,646	5,364
1,370.00	4,238	315.4	3,552	7,197	7,371
1,371.00	11,978	471.7	7,780	14,978	17,168
1,372.00	14,050	507.1	13,000	27,978	19,969
1,373.00	16,216	538.7	15,120	43,098	22,650
1,374.00	18,484	568.5	17,338	60,435	25,334
1,375.00	20,808	593.7	19,635	80,070	27,736

Device	Routing	Invert	Outlet Devices
#1	Primary	1,367.00'	**15.0" Round Barrel** L= 132.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,367.00' / 1,366.50' S= 0.0038 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,371.40'	**24.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.82 cfs @ 13.15 hrs HW=1,371.52' (Free Discharge)
↑—**1=Barrel** (Passes 0.82 cfs of 8.74 cfs potential flow)
↑—**2=Riser** (Weir Controls 0.82 cfs @ 1.12 fps)

Pond 26-P: Sediment Basin 26



Stage-Area-Storage for Pond 26-P: Sediment Basin 26

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,367.00	790	0
1,367.10	876	83
1,367.20	967	175
1,367.30	1,062	277
1,367.40	1,162	388
1,367.50	1,266	509
1,367.60	1,375	641
1,367.70	1,488	784
1,367.80	1,605	939
1,367.90	1,727	1,106
1,368.00	1,854	1,285
1,368.10	1,949	1,475
1,368.20	2,046	1,675
1,368.30	2,145	1,884
1,368.40	2,247	2,104
1,368.50	2,351	2,334
1,368.60	2,458	2,574
1,368.70	2,566	2,825
1,368.80	2,678	3,087
1,368.90	2,791	3,361
1,369.00	2,907	3,646
1,369.10	3,029	3,942
1,369.20	3,153	4,251
1,369.30	3,280	4,573
1,369.40	3,409	4,908
1,369.50	3,541	5,255
1,369.60	3,676	5,616
1,369.70	3,812	5,990
1,369.80	3,952	6,378
1,369.90	4,094	6,781
1,370.00	4,238	7,197
1,370.10	4,835	7,651
1,370.20	5,471	8,166
1,370.30	6,147	8,746
1,370.40	6,862	9,396
1,370.50	7,616	10,120
1,370.60	8,410	10,921
1,370.70	9,243	11,803
1,370.80	10,115	12,771
1,370.90	11,027	13,828
1,371.00	11,978	14,978
1,371.10	12,178	16,185
1,371.20	12,379	17,413
1,371.30	12,582	18,661
1,371.40	12,787	19,930
1,371.50	12,993	21,219
1,371.60	13,201	22,528
1,371.70	13,411	23,859
1,371.80	13,622	25,211
1,371.90	13,835	26,583
1,372.00	14,050	27,978
1,372.10	14,260	29,393
1,372.20	14,471	30,830
1,372.30	14,684	32,287
1,372.40	14,898	33,766
1,372.50	15,114	35,267
1,372.60	15,331	36,789
1,372.70	15,550	38,333
1,372.80	15,770	39,899
1,372.90	15,992	41,487
1,373.00	16,216	43,098
1,373.10	16,436	44,730
1,373.20	16,658	46,385
1,373.30	16,881	48,062
1,373.40	17,105	49,761
1,373.50	17,331	51,483
1,373.60	17,559	53,228
1,373.70	17,788	54,995
1,373.80	18,019	56,785
1,373.90	18,251	58,599
1,374.00	18,484	60,435
1,374.10	18,710	62,295
1,374.20	18,938	64,178
1,374.30	19,167	66,083
1,374.40	19,397	68,011
1,374.50	19,629	69,962
1,374.60	19,862	71,937
1,374.70	20,096	73,935
1,374.80	20,332	75,956
1,374.90	20,569	78,001
1,375.00	**20,808**	**80,070**

Summary for Pond 28-P: Sediment Trap 28

Inflow Area = 3.802 ac, 46.84% Impervious, Inflow Depth = 1.38" for 1-YR, 24-HR Storm event
Inflow = 5.27 cfs @ 12.02 hrs, Volume= 0.438 af
Outflow = 0.40 cfs @ 13.81 hrs, Volume= 0.161 af, Atten= 92%, Lag= 107.1 min
Primary = 0.40 cfs @ 13.81 hrs, Volume= 0.161 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,373.60' Surf.Area= 3,232 sf Storage= 1,698 cf
Peak Elev= 1,376.09' @ 13.81 hrs Surf.Area= 7,114 sf Storage= 14,412 cf (12,714 cf above start)

Plug-Flow detention time= 462.9 min calculated for 0.122 af (28% of inflow)
Center-of-Mass det. time= 227.8 min (1,030.3 - 802.5)

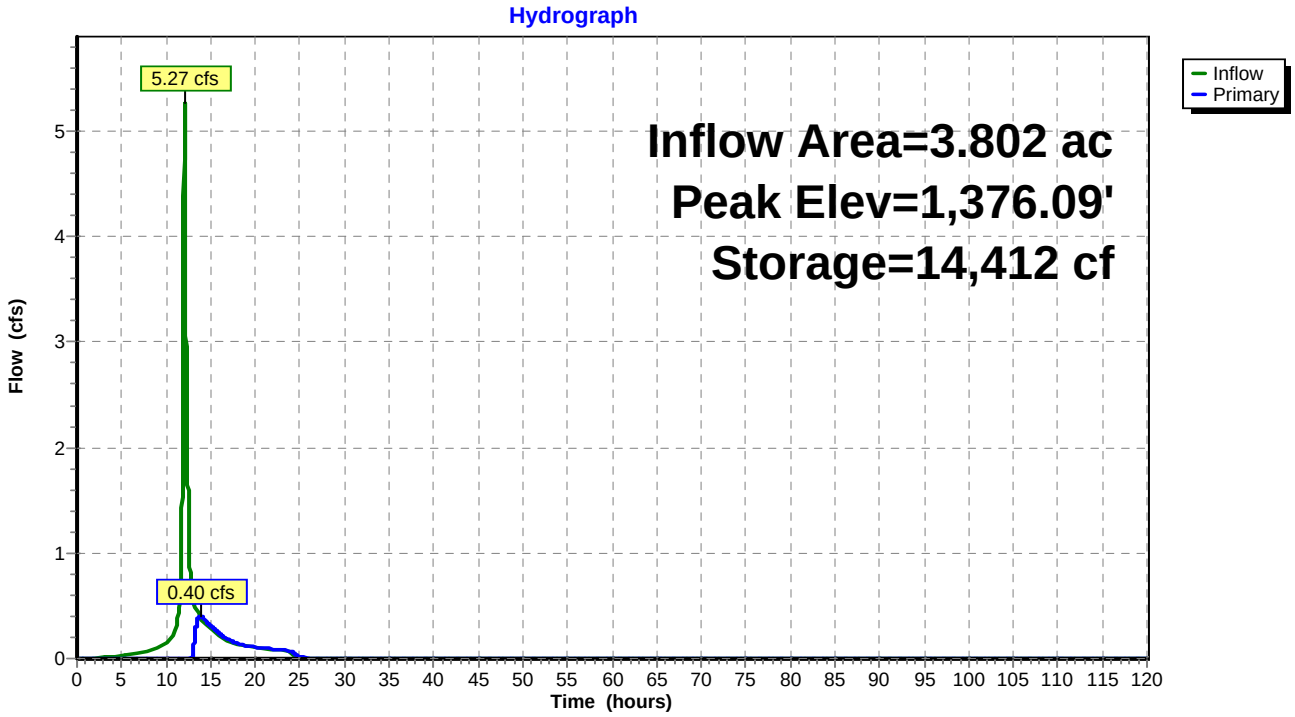
Volume	Invert	Avail.Storage	Storage Description
#1	1,373.00'	31,418 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,373.00	2,447	249.8	0	0	2,447
1,374.00	3,816	343.3	3,106	3,106	6,870
1,375.00	5,311	374.0	4,543	7,649	8,659
1,376.00	6,958	407.2	6,116	13,765	10,759
1,377.00	8,749	443.2	7,836	21,602	13,232
1,378.00	10,923	486.7	9,816	31,418	16,485

Device	Routing	Invert	Outlet Devices
#1	Primary	1,373.00'	**18.0" Round Culvert** L= 20.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,373.00' / 1,372.00' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,376.00'	**18.0" W x 12.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#3	Device 1	1,377.00'	**16.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=0.40 cfs @ 13.81 hrs HW=1,376.09' (Free Discharge)
└**1=Culvert** (Passes 0.40 cfs of 11.49 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 0.40 cfs @ 0.97 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 28-P: Sediment Trap 28



Stage-Area-Storage for Pond 28-P: Sediment Trap 28

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,373.00	2,447	0
1,373.05	2,508	124
1,373.10	2,570	251
1,373.15	2,633	381
1,373.20	2,697	514
1,373.25	2,761	651
1,373.30	2,826	790
1,373.35	2,892	933
1,373.40	2,958	1,079
1,373.45	3,026	1,229
1,373.50	3,094	1,382
1,373.55	3,162	1,538
1,373.60	3,232	1,698
1,373.65	3,302	1,862
1,373.70	3,373	2,029
1,373.75	3,445	2,199
1,373.80	3,518	2,373
1,373.85	3,591	2,551
1,373.90	3,665	2,732
1,373.95	3,740	2,917
1,374.00	3,816	3,106
1,374.05	3,885	3,299
1,374.10	3,954	3,495
1,374.15	4,025	3,694
1,374.20	4,095	3,897
1,374.25	4,167	4,104
1,374.30	4,239	4,314
1,374.35	4,311	4,528
1,374.40	4,384	4,745
1,374.45	4,458	4,966
1,374.50	4,533	5,191
1,374.55	4,608	5,419
1,374.60	4,683	5,652
1,374.65	4,760	5,888
1,374.70	4,837	6,128
1,374.75	4,914	6,371
1,374.80	4,992	6,619
1,374.85	5,071	6,871
1,374.90	5,150	7,126
1,374.95	5,230	7,386
1,375.00	5,311	7,649
1,375.05	5,388	7,917
1,375.10	5,466	8,188
1,375.15	5,544	8,463
1,375.20	5,623	8,742
1,375.25	5,702	9,026
1,375.30	5,782	9,313
1,375.35	5,862	9,604
1,375.40	5,943	9,899
1,375.45	6,025	10,198
1,375.50	6,107	10,501
1,375.55	6,189	10,809
1,375.60	6,273	11,120
1,375.65	6,356	11,436
1,375.70	6,441	11,756
1,375.75	6,525	12,080
1,375.80	6,611	12,408
1,375.85	6,697	12,741
1,375.90	6,783	13,078
1,375.95	6,870	13,419
1,376.00	6,958	13,765
1,376.05	7,043	14,115
1,376.10	7,128	14,469
1,376.15	7,214	14,828
1,376.20	7,300	15,191
1,376.25	7,387	15,558
1,376.30	7,474	15,930
1,376.35	7,562	16,305
1,376.40	7,650	16,686
1,376.45	7,739	17,070
1,376.50	7,828	17,460
1,376.55	7,918	17,853
1,376.60	8,008	18,251
1,376.65	8,099	18,654
1,376.70	8,190	19,061
1,376.75	8,282	19,473
1,376.80	8,374	19,889
1,376.85	8,467	20,310
1,376.90	8,561	20,736
1,376.95	8,655	21,167
1,377.00	8,749	21,602
1,377.05	8,852	22,042
1,377.10	8,956	22,487
1,377.15	9,060	22,937
1,377.20	9,165	23,393
1,377.25	9,270	23,854
1,377.30	9,376	24,320
1,377.35	9,482	24,791
1,377.40	9,590	25,268
1,377.45	9,697	25,750
1,377.50	9,806	26,238
1,377.55	9,915	26,731
1,377.60	10,024	27,229
1,377.65	10,135	27,733
1,377.70	10,245	28,243
1,377.75	10,357	28,758
1,377.80	10,469	29,279
1,377.85	10,582	29,805
1,377.90	10,695	30,337
1,377.95	10,809	30,874
1,378.00	**10,923**	**31,418**

Time span=0.00-120.00 hrs, dt=0.01 hrs, 12001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-CN
Reach routing by Sim-Route method - Pond routing by Sim-Route method

Pond 21A-P: Sediment Trap 21A Peak Elev=1,378.20' Storage=21,676 cf Inflow=18.14 cfs 1.210 af
Outflow=9.58 cfs 0.949 af

Pond 21B-P: Sediment Trap 21B Peak Elev=1,378.81' Storage=21,434 cf Inflow=16.51 cfs 1.084 af
Outflow=9.90 cfs 1.026 af

Pond 23-P: Sediment Basin 23 Peak Elev=1,383.68' Storage=36,309 cf Inflow=21.97 cfs 2.228 af
Outflow=11.49 cfs 1.788 af

Pond 24-P: Sediment Basin 24 Peak Elev=1,367.78' Storage=59,860 cf Inflow=30.94 cfs 3.510 af
Outflow=18.02 cfs 2.670 af

Pond 26-P: Sediment Basin 26 Peak Elev=1,371.89' Storage=26,411 cf Inflow=11.62 cfs 1.512 af
Outflow=6.99 cfs 1.398 af

Pond 28-P: Sediment Trap 28 Peak Elev=1,376.84' Storage=20,251 cf Inflow=15.73 cfs 1.379 af
Outflow=11.18 cfs 1.102 af

Summary for Pond 21A-P: Sediment Trap 21A

Inflow Area = 3.680 ac, 29.21% Impervious, Inflow Depth = 3.94" for 10-YR, 24-HR Storm event
Inflow = 18.14 cfs @ 12.04 hrs, Volume= 1.210 af
Outflow = 9.58 cfs @ 12.15 hrs, Volume= 0.949 af, Atten= 47%, Lag= 6.8 min
Primary = 9.58 cfs @ 12.15 hrs, Volume= 0.949 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,376.50' Surf.Area= 2,567 sf Storage= 2,494 cf
Peak Elev= 1,378.20' @ 12.15 hrs Surf.Area= 13,922 sf Storage= 21,676 cf (19,182 cf above start)

Plug-Flow detention time= 165.2 min calculated for 0.892 af (74% of inflow)
Center-of-Mass det. time= 67.2 min (873.3 - 806.0)

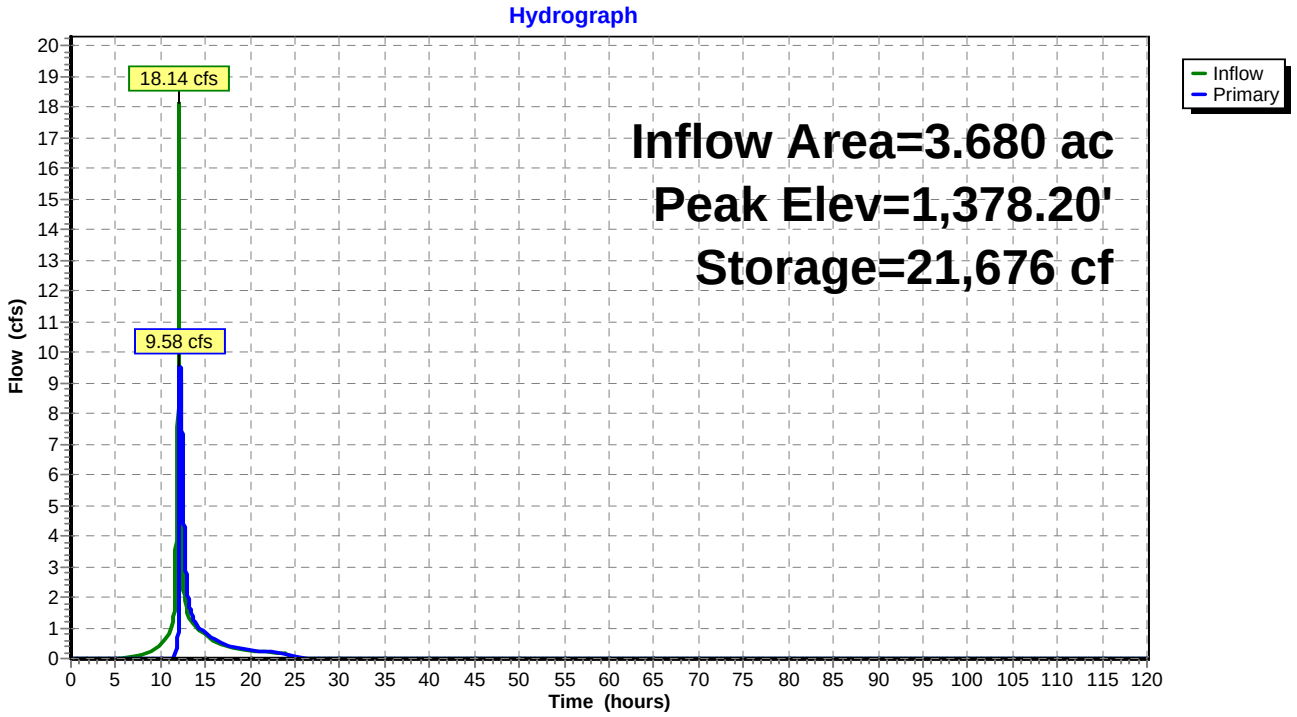
Volume	Invert	Avail.Storage	Storage Description
#1	1,375.00'	50,866 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,375.00	875	200.4	0	0	875
1,376.00	1,938	331.0	1,372	1,372	6,404
1,376.50	2,567	347.4	1,123	2,494	7,306
1,376.51	9,076	469.5	55	2,549	15,243
1,377.00	10,035	482.1	4,680	7,229	16,225
1,378.00	13,431	599.0	11,692	18,921	26,297
1,379.00	15,954	633.4	14,674	33,596	29,726
1,380.00	18,622	668.8	17,271	50,866	33,452

Device	Routing	Invert	Outlet Devices
#1	Primary	1,375.00'	**21.0" Round Barrel** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,375.00' / 1,373.50' S= 0.0300 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf
#2	Device 1	1,377.60'	**24.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=9.58 cfs @ 12.15 hrs HW=1,378.20' (Free Discharge)
└**1=Barrel** (Passes 9.58 cfs of 13.95 cfs potential flow)
└**2=Riser** (Weir Controls 9.58 cfs @ 2.54 fps)

Pond 21A-P: Sediment Trap 21A



Stage-Area-Storage for Pond 21A-P: Sediment Trap 21A

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,375.00	875	0
1,375.05	918	45
1,375.10	963	92
1,375.15	1,008	141
1,375.20	1,054	193
1,375.25	1,102	247
1,375.30	1,150	303
1,375.35	1,200	362
1,375.40	1,250	423
1,375.45	1,302	487
1,375.50	1,354	553
1,375.55	1,408	622
1,375.60	1,463	694
1,375.65	1,518	768
1,375.70	1,575	846
1,375.75	1,633	926
1,375.80	1,692	1,009
1,375.85	1,752	1,095
1,375.90	1,813	1,184
1,375.95	1,875	1,276
1,376.00	1,938	1,372
1,376.05	1,997	1,470
1,376.10	2,057	1,571
1,376.15	2,117	1,676
1,376.20	2,179	1,783
1,376.25	2,241	1,894
1,376.30	2,305	2,007
1,376.35	2,369	2,124
1,376.40	2,434	2,244
1,376.45	2,500	2,368
1,376.50	2,567	2,494
1,376.55	9,152	2,914
1,376.60	9,249	3,374
1,376.65	9,345	3,839
1,376.70	9,442	4,308
1,376.75	9,540	4,783
1,376.80	9,638	5,262
1,376.85	9,736	5,747
1,376.90	9,835	6,236
1,376.95	9,935	6,730
1,377.00	10,035	7,229
1,377.05	10,193	7,735
1,377.10	10,352	8,249
1,377.15	10,513	8,770
1,377.20	10,675	9,300
1,377.25	10,838	9,838
1,377.30	11,002	10,384
1,377.35	11,167	10,938
1,377.40	11,334	11,501
1,377.45	11,502	12,072
1,377.50	11,671	12,651
1,377.55	11,842	13,239
1,377.60	12,013	13,835
1,377.65	12,186	14,440
1,377.70	12,360	15,054
1,377.75	12,536	15,676
1,377.80	12,712	16,307
1,377.85	12,890	16,947
1,377.90	13,069	17,596
1,377.95	13,249	18,254
1,378.00	13,431	18,921
1,378.05	13,552	19,596
1,378.10	13,674	20,276
1,378.15	13,796	20,963
1,378.20	13,918	21,656
1,378.25	14,041	22,355
1,378.30	14,165	23,060
1,378.35	14,289	23,772
1,378.40	14,414	24,489
1,378.45	14,539	25,213
1,378.50	14,665	25,943
1,378.55	14,792	26,680
1,378.60	14,919	27,422
1,378.65	15,046	28,171
1,378.70	15,174	28,927
1,378.75	15,303	29,689
1,378.80	15,432	30,457
1,378.85	15,562	31,232
1,378.90	15,692	32,013
1,378.95	15,823	32,801
1,379.00	15,954	33,596
1,379.05	16,083	34,397
1,379.10	16,212	35,204
1,379.15	16,341	36,018
1,379.20	16,471	36,838
1,379.25	16,602	37,665
1,379.30	16,733	38,498
1,379.35	16,864	39,338
1,379.40	16,996	40,185
1,379.45	17,129	41,038
1,379.50	17,262	41,898
1,379.55	17,396	42,764
1,379.60	17,530	43,637
1,379.65	17,665	44,517
1,379.70	17,800	45,404
1,379.75	17,936	46,297
1,379.80	18,072	47,197
1,379.85	18,209	48,104
1,379.90	18,346	49,018
1,379.95	18,484	49,939
1,380.00	**18,622**	**50,866**

Summary for Pond 21B-P: Sediment Trap 21B

Inflow Area = 3.182 ac, 29.54% Impervious, Inflow Depth = 4.09" for 10-YR, 24-HR Storm event
Inflow = 16.51 cfs @ 12.03 hrs, Volume= 1.084 af
Outflow = 9.90 cfs @ 12.12 hrs, Volume= 1.026 af, Atten= 40%, Lag= 5.4 min
Primary = 9.90 cfs @ 12.12 hrs, Volume= 1.026 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,378.00' Surf.Area= 5,813 sf Storage= 10,561 cf
Peak Elev= 1,378.81' @ 12.12 hrs Surf.Area= 14,286 sf Storage= 21,434 cf (10,873 cf above start)

Plug-Flow detention time= 174.5 min calculated for 0.784 af (72% of inflow)
Center-of-Mass det. time= 41.7 min (843.2 - 801.5)

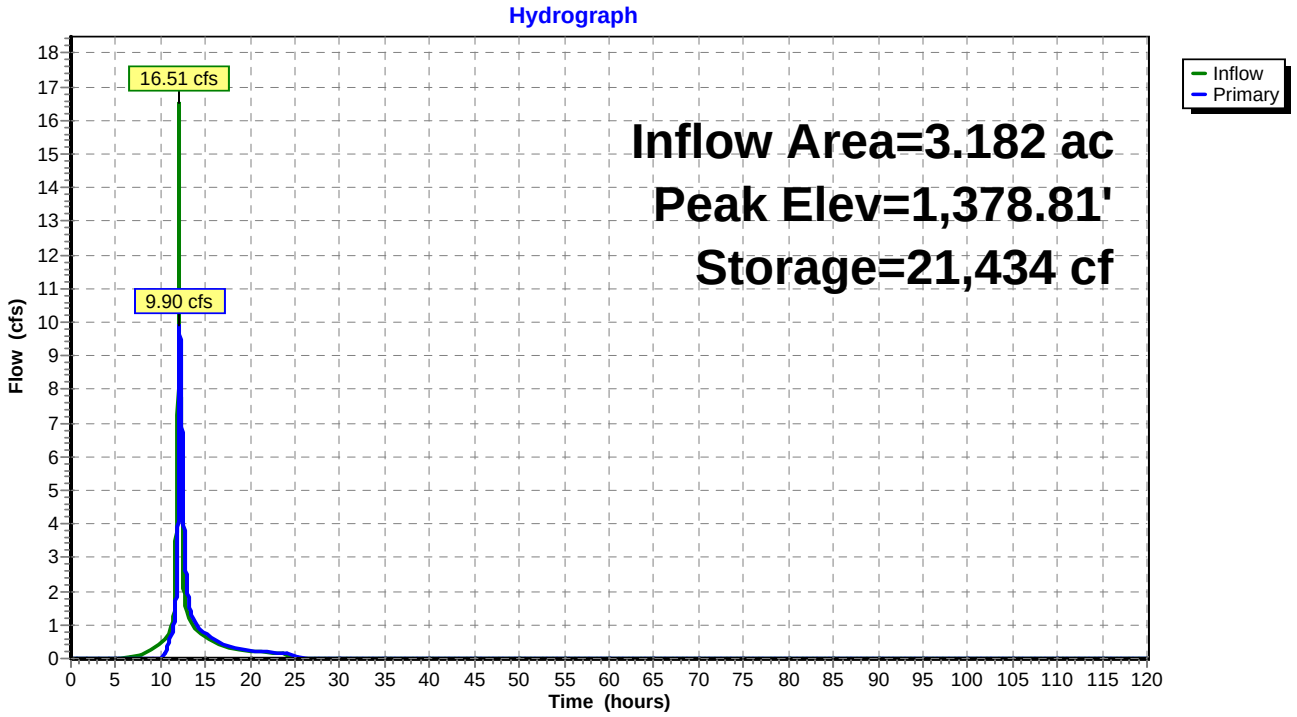
Volume	Invert	Avail.Storage	Storage Description
#1	1,375.00'	58,169 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,375.00	1,530	196.8	0	0	1,530
1,376.00	2,694	275.3	2,085	2,085	4,489
1,377.00	4,273	340.8	3,453	5,538	7,715
1,378.00	5,813	381.6	5,023	10,561	10,088
1,378.01	12,538	491.4	90	10,651	17,716
1,379.00	14,705	523.2	13,471	24,122	20,332
1,380.00	16,999	554.8	15,838	39,960	23,096
1,381.00	19,446	587.7	18,209	58,169	26,141

Device	Routing	Invert	Outlet Devices
#1	Primary	1,376.00'	**21.0" Round Barrel** L= 52.0' CMP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,376.00' / 1,375.00' S= 0.0192 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf
#2	Device 1	1,378.20'	**24.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=9.90 cfs @ 12.12 hrs HW=1,378.81' (Free Discharge)
└**1=Barrel** (Passes 9.90 cfs of 14.23 cfs potential flow)
└**2=Riser** (Weir Controls 9.90 cfs @ 2.56 fps)

Pond 21B-P: Sediment Trap 21B



Stage-Area-Storage for Pond 21B-P: Sediment Trap 21B

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,375.00	1,530	0
1,375.10	1,632	158
1,375.20	1,737	326
1,375.30	1,845	505
1,375.40	1,956	696
1,375.50	2,071	897
1,375.60	2,189	1,110
1,375.70	2,310	1,335
1,375.80	2,435	1,572
1,375.90	2,563	1,822
1,376.00	2,694	2,085
1,376.10	2,836	2,361
1,376.20	2,981	2,652
1,376.30	3,130	2,957
1,376.40	3,282	3,278
1,376.50	3,438	3,614
1,376.60	3,598	3,966
1,376.70	3,761	4,334
1,376.80	3,928	4,718
1,376.90	4,099	5,119
1,377.00	4,273	5,538
1,377.10	4,416	5,972
1,377.20	4,562	6,421
1,377.30	4,710	6,885
1,377.40	4,861	7,363
1,377.50	5,013	7,857
1,377.60	5,169	8,366
1,377.70	5,326	8,891
1,377.80	5,486	9,432
1,377.90	5,648	9,988
1,378.00	5,813	10,561
1,378.10	12,728	11,788
1,378.20	12,941	13,071
1,378.30	13,155	14,376
1,378.40	13,371	15,702
1,378.50	13,589	17,050
1,378.60	13,809	18,420
1,378.70	14,030	19,812
1,378.80	14,253	21,226
1,378.90	14,478	22,663
1,379.00	14,705	24,122
1,379.10	14,927	25,604
1,379.20	15,151	27,107
1,379.30	15,376	28,634
1,379.40	15,603	30,183
1,379.50	15,831	31,754
1,379.60	16,061	33,349
1,379.70	16,293	34,967
1,379.80	16,527	36,608
1,379.90	16,762	38,272
1,380.00	16,999	39,960
1,380.10	17,236	41,672
1,380.20	17,475	43,407
1,380.30	17,716	45,167
1,380.40	17,958	46,951
1,380.50	18,202	48,759
1,380.60	18,447	50,591
1,380.70	18,695	52,448
1,380.80	18,943	54,330
1,380.90	19,194	56,237
1,381.00	**19,446**	**58,169**

Summary for Pond 23-P: Sediment Basin 23

Inflow Area = 7.321 ac, 12.46% Impervious, Inflow Depth = 3.65" for 10-YR, 24-HR Storm event
Inflow = 21.97 cfs @ 12.03 hrs, Volume= 2.228 af
Outflow = 11.49 cfs @ 12.44 hrs, Volume= 1.788 af, Atten= 48%, Lag= 24.5 min
Primary = 11.49 cfs @ 12.44 hrs, Volume= 1.788 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,381.00' Surf.Area= 7,857 sf Storage= 8,931 cf
Peak Elev= 1,383.68' @ 12.44 hrs Surf.Area= 12,716 sf Storage= 36,309 cf (27,378 cf above start)

Plug-Flow detention time= 168.9 min calculated for 1.582 af (71% of inflow)
Center-of-Mass det. time= 55.4 min (880.8 - 825.4)

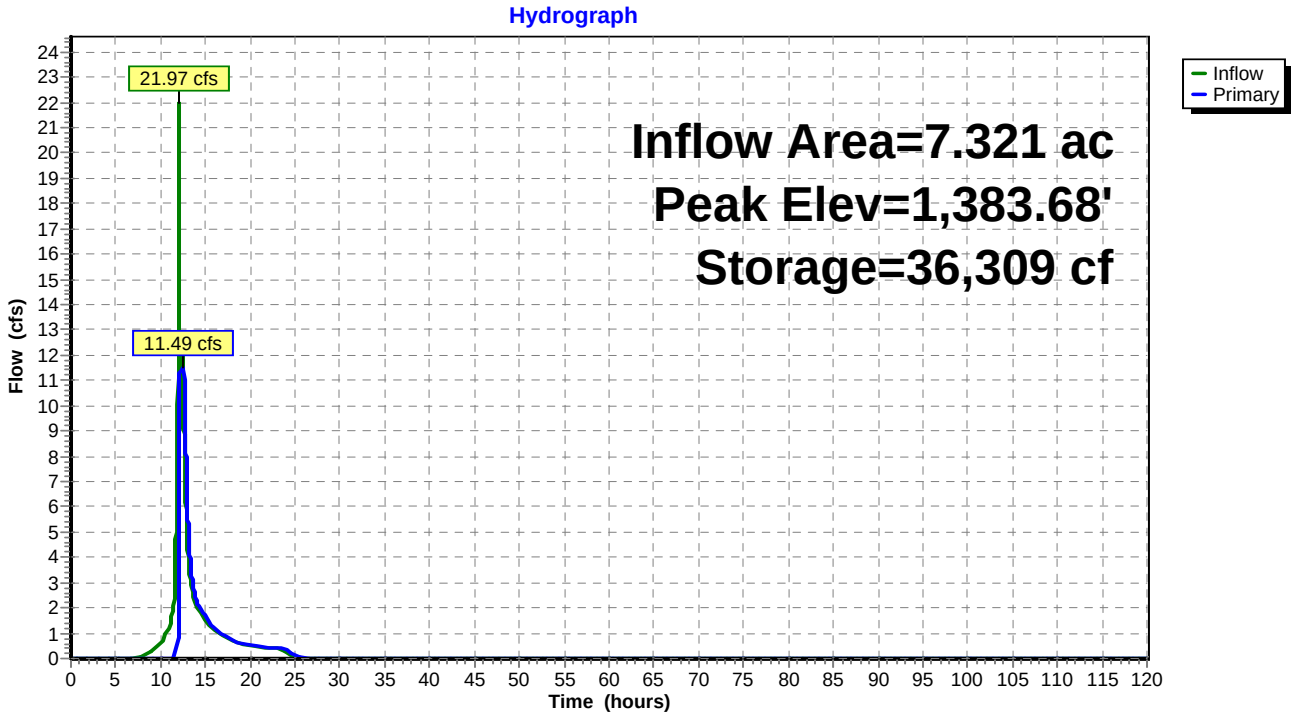
Volume	Invert	Avail.Storage	Storage Description
#1	1,377.00'	71,310 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,377.00	234	63.1	0	0	234
1,378.00	802	196.1	490	490	2,980
1,379.00	1,699	233.8	1,223	1,713	4,288
1,380.00	2,685	258.9	2,173	3,886	5,302
1,381.00	7,857	376.4	5,045	8,931	11,251
1,382.00	9,589	415.8	8,709	17,639	13,766
1,383.00	11,418	451.2	10,490	28,130	16,247
1,384.00	13,357	481.7	12,375	40,504	18,559
1,385.00	15,433	511.5	14,383	54,887	20,966
1,386.00	17,433	538.9	16,423	71,310	23,316

Device	Routing	Invert	Outlet Devices
#1	Primary	1,380.00'	**18.0" Round Barrel** L= 50.0' CMP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 1,380.00' / 1,379.00' S= 0.0200 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,383.00'	**30.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=11.49 cfs @ 12.44 hrs HW=1,383.68' (Free Discharge)
↑—**1=Barrel** (Inlet Controls 11.49 cfs @ 6.50 fps)
↑—**2=Riser** (Passes 11.49 cfs of 14.34 cfs potential flow)

Pond 23-P: Sediment Basin 23



Stage-Area-Storage for Pond 23-P: Sediment Basin 23

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,377.00	234	0
1,377.10	276	25
1,377.20	320	55
1,377.30	369	90
1,377.40	420	129
1,377.50	476	174
1,377.60	534	224
1,377.70	596	281
1,377.80	661	344
1,377.90	730	413
1,378.00	802	490
1,378.10	877	574
1,378.20	955	665
1,378.30	1,036	765
1,378.40	1,121	873
1,378.50	1,209	989
1,378.60	1,300	1,114
1,378.70	1,395	1,249
1,378.80	1,493	1,394
1,378.90	1,594	1,548
1,379.00	1,699	1,713
1,379.10	1,787	1,887
1,379.20	1,878	2,070
1,379.30	1,971	2,263
1,379.40	2,066	2,464
1,379.50	2,164	2,676
1,379.60	2,264	2,897
1,379.70	2,366	3,129
1,379.80	2,470	3,370
1,379.90	2,576	3,623
1,380.00	2,685	3,886
1,380.10	3,080	4,174
1,380.20	3,502	4,503
1,380.30	3,952	4,875
1,380.40	4,428	5,294
1,380.50	4,932	5,762
1,380.60	5,463	6,281
1,380.70	6,021	6,855
1,380.80	6,606	7,486
1,380.90	7,218	8,177
1,381.00	7,857	8,931
1,381.10	8,022	9,725
1,381.20	8,190	10,535
1,381.30	8,359	11,363
1,381.40	8,529	12,207
1,381.50	8,701	13,069
1,381.60	8,876	13,947
1,381.70	9,051	14,844
1,381.80	9,229	15,758
1,381.90	9,408	16,690
1,382.00	9,589	17,639
1,382.10	9,765	18,607
1,382.20	9,942	19,592
1,382.30	10,121	20,596
1,382.40	10,301	21,617
1,382.50	10,484	22,656
1,382.60	10,667	23,713
1,382.70	10,853	24,789
1,382.80	11,039	25,884
1,382.90	11,228	26,997
1,383.00	11,418	28,130
1,383.10	11,605	29,281
1,383.20	11,794	30,451
1,383.30	11,984	31,640
1,383.40	12,175	32,847
1,383.50	12,369	34,075
1,383.60	12,563	35,321
1,383.70	12,759	36,587
1,383.80	12,957	37,873
1,383.90	13,156	39,179
1,384.00	13,357	40,504
1,384.10	13,558	41,850
1,384.20	13,760	43,216
1,384.30	13,964	44,602
1,384.40	14,169	46,009
1,384.50	14,376	47,436
1,384.60	14,585	48,884
1,384.70	14,794	50,353
1,384.80	15,006	51,843
1,384.90	15,219	53,354
1,385.00	15,433	54,887
1,385.10	15,628	56,440
1,385.20	15,823	58,013
1,385.30	16,020	59,605
1,385.40	16,218	61,217
1,385.50	16,418	62,848
1,385.60	16,618	64,500
1,385.70	16,820	66,172
1,385.80	17,023	67,864
1,385.90	17,228	69,577
1,386.00	**17,433**	**71,310**

Summary for Pond 24-P: Sediment Basin 24

Inflow Area = 12.222 ac, 8.25% Impervious, Inflow Depth = 3.45" for 10-YR, 24-HR Storm event
Inflow = 30.94 cfs @ 12.04 hrs, Volume= 3.510 af
Outflow = 18.02 cfs @ 12.47 hrs, Volume= 2.670 af, Atten= 42%, Lag= 25.9 min
Primary = 18.02 cfs @ 12.47 hrs, Volume= 2.670 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,365.00' Surf.Area= 12,290 sf Storage= 10,821 cf
Peak Elev= 1,367.78' @ 12.47 hrs Surf.Area= 22,581 sf Storage= 59,860 cf (49,039 cf above start)

Plug-Flow detention time= 183.7 min calculated for 2.422 af (69% of inflow)
Center-of-Mass det. time= 68.0 min (896.0 - 828.0)

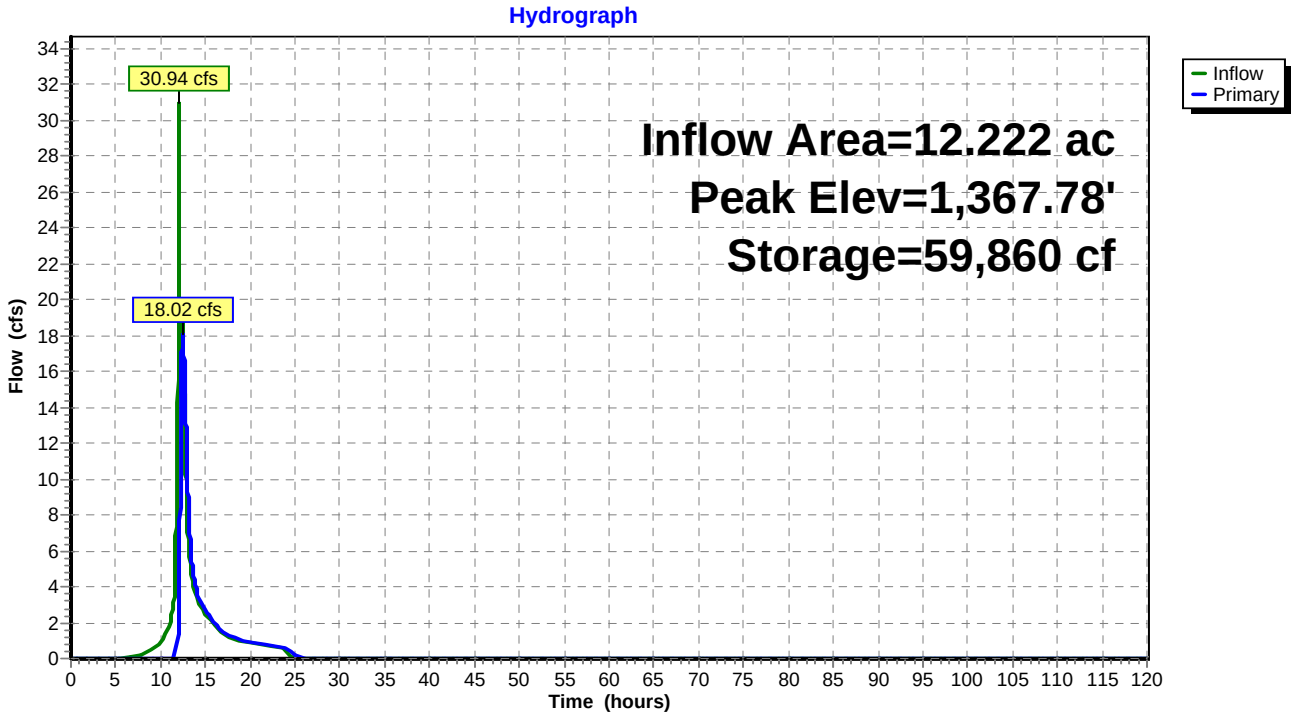
Volume	Invert	Avail.Storage	Storage Description
#1	1,361.00'	90,100 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,361.00	144	79.7	0	0	144
1,362.00	778	180.4	419	419	2,232
1,363.00	1,724	246.8	1,220	1,639	4,500
1,364.00	2,762	271.9	2,223	3,862	5,568
1,365.00	12,290	631.5	6,959	10,821	31,423
1,366.00	16,533	762.9	14,359	25,180	46,021
1,367.00	19,892	828.3	18,187	43,367	54,340
1,368.00	23,383	865.9	21,614	64,981	59,479
1,369.00	26,897	891.0	25,120	90,100	63,097

Device	Routing	Invert	Outlet Devices
#1	Primary	1,361.00'	**21.0" Round Barrel** L= 162.0' RCP, groove end projecting, Ke= 0.200 Inlet / Outlet Invert= 1,361.00' / 1,360.00' S= 0.0062 '/' Cc= 0.900 n= 0.013, Flow Area= 2.41 sf
#2	Device 1	1,367.20'	**48.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=18.02 cfs @ 12.47 hrs HW=1,367.78' (Free Discharge)
↑—**1=Barrel** (Passes 18.02 cfs of 24.93 cfs potential flow)
↑—**2=Riser** (Weir Controls 18.02 cfs @ 2.48 fps)

Pond 24-P: Sediment Basin 24



Stage-Area-Storage for Pond 24-P: Sediment Basin 24

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,361.00	144	0
1,361.10	185	16
1,361.20	230	37
1,361.30	281	63
1,361.40	337	94
1,361.50	398	130
1,361.60	464	173
1,361.70	535	223
1,361.80	611	280
1,361.90	692	345
1,362.00	778	419
1,362.10	856	501
1,362.20	937	590
1,362.30	1,023	688
1,362.40	1,112	795
1,362.50	1,205	911
1,362.60	1,301	1,036
1,362.70	1,401	1,171
1,362.80	1,505	1,316
1,362.90	1,613	1,472
1,363.00	1,724	1,639
1,363.10	1,817	1,816
1,363.20	1,912	2,002
1,363.30	2,010	2,198
1,363.40	2,110	2,404
1,363.50	2,213	2,621
1,363.60	2,318	2,847
1,363.70	2,425	3,084
1,363.80	2,535	3,332
1,363.90	2,647	3,591
1,364.00	2,762	3,862
1,364.10	3,409	4,170
1,364.20	4,124	4,546
1,364.30	4,906	4,997
1,364.40	5,757	5,529
1,364.50	6,676	6,150
1,364.60	7,663	6,867
1,364.70	8,718	7,685
1,364.80	9,840	8,613
1,364.90	11,031	9,656
1,365.00	12,290	10,821
1,365.10	12,686	12,070
1,365.20	13,088	13,358
1,365.30	13,497	14,688
1,365.40	13,912	16,058
1,365.50	14,333	17,470
1,365.60	14,760	18,925
1,365.70	15,194	20,423
1,365.80	15,634	21,964
1,365.90	16,080	23,550
1,366.00	16,533	25,180
1,366.10	16,855	26,850
1,366.20	17,180	28,551
1,366.30	17,508	30,286
1,366.40	17,839	32,053
1,366.50	18,174	33,854
1,366.60	18,511	35,688
1,366.70	18,852	37,556
1,366.80	19,195	39,458
1,366.90	19,542	41,395
1,367.00	19,892	43,367
1,367.10	20,228	45,373
1,367.20	20,568	47,413
1,367.30	20,910	49,486
1,367.40	21,255	51,595
1,367.50	21,602	53,737
1,367.60	21,953	55,915
1,367.70	22,306	58,128
1,367.80	22,662	60,377
1,367.90	23,021	62,661
1,368.00	23,383	64,981
1,368.10	23,723	67,336
1,368.20	24,066	69,726
1,368.30	24,411	72,149
1,368.40	24,759	74,608
1,368.50	25,109	77,101
1,368.60	25,462	79,630
1,368.70	25,817	82,194
1,368.80	26,175	84,793
1,368.90	26,535	87,429
1,369.00	**26,897**	**90,100**

Summary for Pond 26-P: Sediment Basin 26

Inflow Area = 5.277 ac, 13.14% Impervious, Inflow Depth = 3.44" for 10-YR, 24-HR Storm event
Inflow = 11.62 cfs @ 12.04 hrs, Volume= 1.512 af
Outflow = 6.99 cfs @ 12.49 hrs, Volume= 1.398 af, Atten= 40%, Lag= 27.0 min
Primary = 6.99 cfs @ 12.49 hrs, Volume= 1.398 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,371.00' Surf.Area= 11,978 sf Storage= 14,978 cf
Peak Elev= 1,371.89' @ 12.49 hrs Surf.Area= 13,809 sf Storage= 26,411 cf (11,433 cf above start)

Plug-Flow detention time= 189.5 min calculated for 1.054 af (70% of inflow)
Center-of-Mass det. time= 43.2 min (879.7 - 836.4)

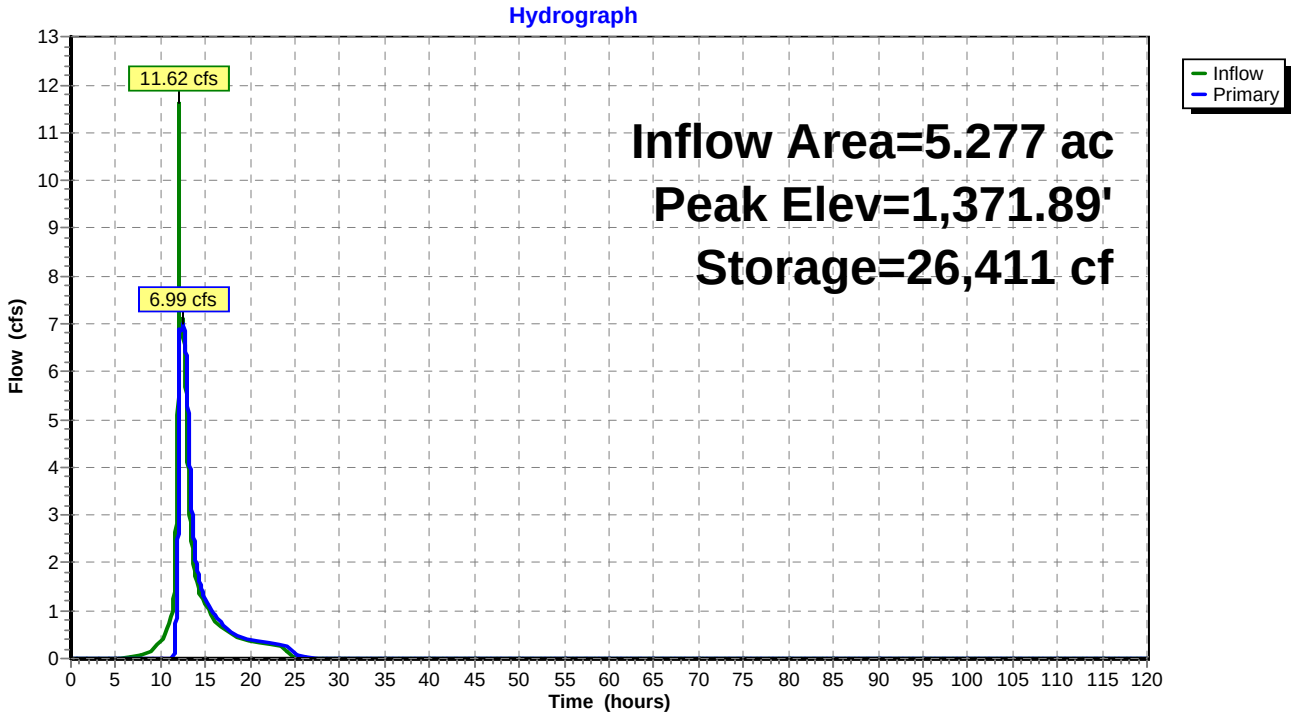
Volume	Invert	Avail.Storage	Storage Description
#1	1,367.00'	80,070 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,367.00	790	132.3	0	0	790
1,368.00	1,854	246.6	1,285	1,285	4,242
1,369.00	2,907	273.0	2,361	3,646	5,364
1,370.00	4,238	315.4	3,552	7,197	7,371
1,371.00	11,978	471.7	7,780	14,978	17,168
1,372.00	14,050	507.1	13,000	27,978	19,969
1,373.00	16,216	538.7	15,120	43,098	22,650
1,374.00	18,484	568.5	17,338	60,435	25,334
1,375.00	20,808	593.7	19,635	80,070	27,736

Device	Routing	Invert	Outlet Devices
#1	Primary	1,367.00'	**15.0" Round Barrel** L= 132.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,367.00' / 1,366.50' S= 0.0038 '/' Cc= 0.900 n= 0.013, Flow Area= 1.23 sf
#2	Device 1	1,371.40'	**24.0" Horiz. Riser** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=6.99 cfs @ 12.49 hrs HW=1,371.89' (Free Discharge)
└**1=Barrel** (Passes 6.99 cfs of 9.16 cfs potential flow)
└**2=Riser** (Weir Controls 6.99 cfs @ 2.28 fps)

Pond 26-P: Sediment Basin 26



Stage-Area-Storage for Pond 26-P: Sediment Basin 26

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,367.00	790	0
1,367.10	876	83
1,367.20	967	175
1,367.30	1,062	277
1,367.40	1,162	388
1,367.50	1,266	509
1,367.60	1,375	641
1,367.70	1,488	784
1,367.80	1,605	939
1,367.90	1,727	1,106
1,368.00	1,854	1,285
1,368.10	1,949	1,475
1,368.20	2,046	1,675
1,368.30	2,145	1,884
1,368.40	2,247	2,104
1,368.50	2,351	2,334
1,368.60	2,458	2,574
1,368.70	2,566	2,825
1,368.80	2,678	3,087
1,368.90	2,791	3,361
1,369.00	2,907	3,646
1,369.10	3,029	3,942
1,369.20	3,153	4,251
1,369.30	3,280	4,573
1,369.40	3,409	4,908
1,369.50	3,541	5,255
1,369.60	3,676	5,616
1,369.70	3,812	5,990
1,369.80	3,952	6,378
1,369.90	4,094	6,781
1,370.00	4,238	7,197
1,370.10	4,835	7,651
1,370.20	5,471	8,166
1,370.30	6,147	8,746
1,370.40	6,862	9,396
1,370.50	7,616	10,120
1,370.60	8,410	10,921
1,370.70	9,243	11,803
1,370.80	10,115	12,771
1,370.90	11,027	13,828
1,371.00	11,978	14,978
1,371.10	12,178	16,185
1,371.20	12,379	17,413
1,371.30	12,582	18,661
1,371.40	12,787	19,930
1,371.50	12,993	21,219
1,371.60	13,201	22,528
1,371.70	13,411	23,859
1,371.80	13,622	25,211
1,371.90	13,835	26,583
1,372.00	14,050	27,978
1,372.10	14,260	29,393
1,372.20	14,471	30,830
1,372.30	14,684	32,287
1,372.40	14,898	33,766
1,372.50	15,114	35,267
1,372.60	15,331	36,789
1,372.70	15,550	38,333
1,372.80	15,770	39,899
1,372.90	15,992	41,487
1,373.00	16,216	43,098
1,373.10	16,436	44,730
1,373.20	16,658	46,385
1,373.30	16,881	48,062
1,373.40	17,105	49,761
1,373.50	17,331	51,483
1,373.60	17,559	53,228
1,373.70	17,788	54,995
1,373.80	18,019	56,785
1,373.90	18,251	58,599
1,374.00	18,484	60,435
1,374.10	18,710	62,295
1,374.20	18,938	64,178
1,374.30	19,167	66,083
1,374.40	19,397	68,011
1,374.50	19,629	69,962
1,374.60	19,862	71,937
1,374.70	20,096	73,935
1,374.80	20,332	75,956
1,374.90	20,569	78,001
1,375.00	**20,808**	**80,070**

Summary for Pond 28-P: Sediment Trap 28

Inflow Area = 3.802 ac, 46.84% Impervious, Inflow Depth = 4.35" for 10-YR, 24-HR Storm event
Inflow = 15.73 cfs @ 12.02 hrs, Volume= 1.379 af
Outflow = 11.18 cfs @ 12.12 hrs, Volume= 1.102 af, Atten= 29%, Lag= 5.9 min
Primary = 11.18 cfs @ 12.12 hrs, Volume= 1.102 af

Routing by Sim-Route method, Time Span= 0.00-120.00 hrs, dt= 0.01 hrs
Starting Elev= 1,373.60' Surf.Area= 3,232 sf Storage= 1,698 cf
Peak Elev= 1,376.84' @ 12.12 hrs Surf.Area= 8,454 sf Storage= 20,251 cf (18,553 cf above start)

Plug-Flow detention time= 159.0 min calculated for 1.063 af (77% of inflow)
Center-of-Mass det. time= 69.6 min (855.1 - 785.5)

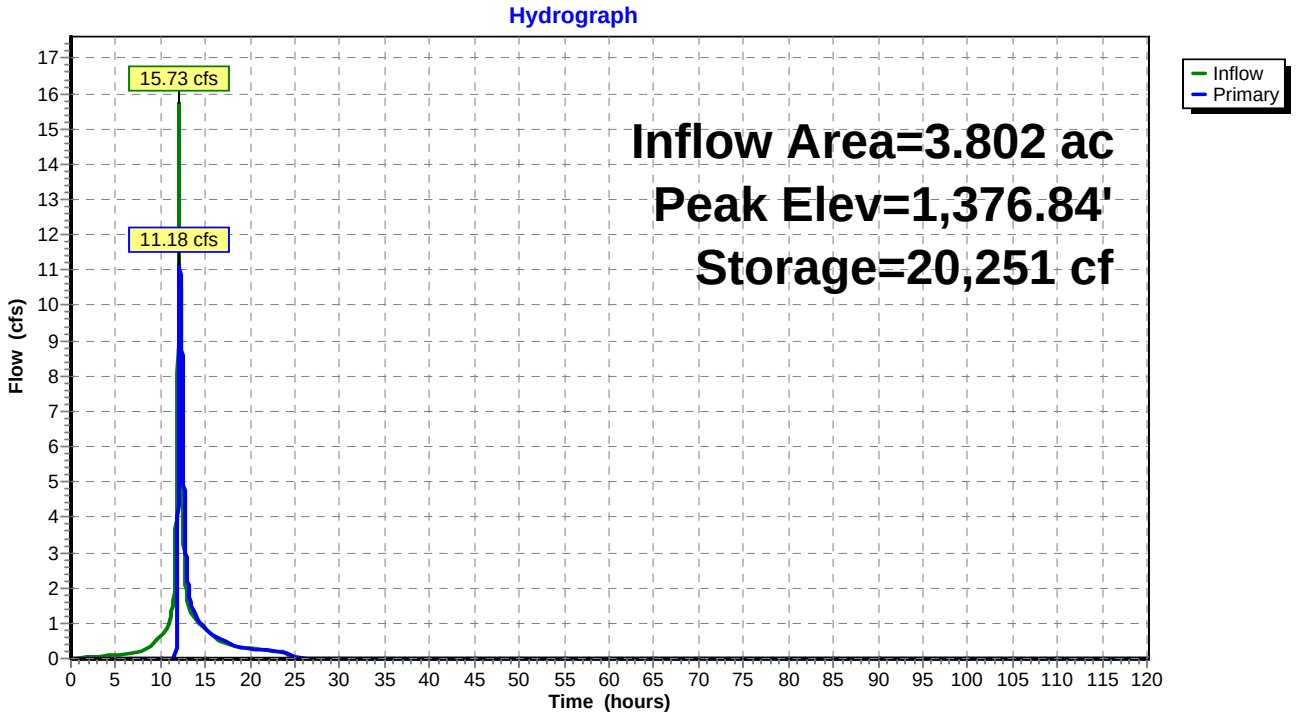
Volume	Invert	Avail.Storage	Storage Description
#1	1,373.00'	31,418 cf	**Custom Stage Data (Irregular)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
1,373.00	2,447	249.8	0	0	2,447
1,374.00	3,816	343.3	3,106	3,106	6,870
1,375.00	5,311	374.0	4,543	7,649	8,659
1,376.00	6,958	407.2	6,116	13,765	10,759
1,377.00	8,749	443.2	7,836	21,602	13,232
1,378.00	10,923	486.7	9,816	31,418	16,485

Device	Routing	Invert	Outlet Devices
#1	Primary	1,373.00'	**18.0" Round Culvert** L= 20.0' RCP, mitered to conform to fill, Ke= 0.700 Inlet / Outlet Invert= 1,373.00' / 1,372.00' S= 0.0500 '/' Cc= 0.900 n= 0.013, Flow Area= 1.77 sf
#2	Device 1	1,376.00'	**18.0" W x 12.0" H Vert. Orifice/Grate X 3.00** C= 0.600
#3	Device 1	1,377.00'	**16.0' long Sharp-Crested Rectangular Weir** 2 End Contraction(s) 1.0' Crest Height

Primary OutFlow Max=11.18 cfs @ 12.12 hrs HW=1,376.84' (Free Discharge)
└**1=Culvert** (Passes 11.18 cfs of 13.20 cfs potential flow)
└**2=Orifice/Grate** (Orifice Controls 11.18 cfs @ 2.95 fps)
└**3=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 28-P: Sediment Trap 28



Stage-Area-Storage for Pond 28-P: Sediment Trap 28

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
1,373.00	2,447	0
1,373.05	2,508	124
1,373.10	2,570	251
1,373.15	2,633	381
1,373.20	2,697	514
1,373.25	2,761	651
1,373.30	2,826	790
1,373.35	2,892	933
1,373.40	2,958	1,079
1,373.45	3,026	1,229
1,373.50	3,094	1,382
1,373.55	3,162	1,538
1,373.60	3,232	1,698
1,373.65	3,302	1,862
1,373.70	3,373	2,029
1,373.75	3,445	2,199
1,373.80	3,518	2,373
1,373.85	3,591	2,551
1,373.90	3,665	2,732
1,373.95	3,740	2,917
1,374.00	3,816	3,106
1,374.05	3,885	3,299
1,374.10	3,954	3,495
1,374.15	4,025	3,694
1,374.20	4,095	3,897
1,374.25	4,167	4,104
1,374.30	4,239	4,314
1,374.35	4,311	4,528
1,374.40	4,384	4,745
1,374.45	4,458	4,966
1,374.50	4,533	5,191
1,374.55	4,608	5,419
1,374.60	4,683	5,652
1,374.65	4,760	5,888
1,374.70	4,837	6,128
1,374.75	4,914	6,371
1,374.80	4,992	6,619
1,374.85	5,071	6,871
1,374.90	5,150	7,126
1,374.95	5,230	7,386
1,375.00	5,311	7,649
1,375.05	5,388	7,917
1,375.10	5,466	8,188
1,375.15	5,544	8,463
1,375.20	5,623	8,742
1,375.25	5,702	9,026
1,375.30	5,782	9,313
1,375.35	5,862	9,604
1,375.40	5,943	9,899
1,375.45	6,025	10,198
1,375.50	6,107	10,501
1,375.55	6,189	10,809
1,375.60	6,273	11,120
1,375.65	6,356	11,436
1,375.70	6,441	11,756
1,375.75	6,525	12,080
1,375.80	6,611	12,408
1,375.85	6,697	12,741
1,375.90	6,783	13,078
1,375.95	6,870	13,419
1,376.00	6,958	13,765
1,376.05	7,043	14,115
1,376.10	7,128	14,469
1,376.15	7,214	14,828
1,376.20	7,300	15,191
1,376.25	7,387	15,558
1,376.30	7,474	15,930
1,376.35	7,562	16,305
1,376.40	7,650	16,686
1,376.45	7,739	17,070
1,376.50	7,828	17,460
1,376.55	7,918	17,853
1,376.60	8,008	18,251
1,376.65	8,099	18,654
1,376.70	8,190	19,061
1,376.75	8,282	19,473
1,376.80	8,374	19,889
1,376.85	8,467	20,310
1,376.90	8,561	20,736
1,376.95	8,655	21,167
1,377.00	8,749	21,602
1,377.05	8,852	22,042
1,377.10	8,956	22,487
1,377.15	9,060	22,937
1,377.20	9,165	23,393
1,377.25	9,270	23,854
1,377.30	9,376	24,320
1,377.35	9,482	24,791
1,377.40	9,590	25,268
1,377.45	9,697	25,750
1,377.50	9,806	26,238
1,377.55	9,915	26,731
1,377.60	10,024	27,229
1,377.65	10,135	27,733
1,377.70	10,245	28,243
1,377.75	10,357	28,758
1,377.80	10,469	29,279
1,377.85	10,582	29,805
1,377.90	10,695	30,337
1,377.95	10,809	30,874
1,378.00	**10,923**	**31,418**

SWPPP

APPENDIX N

EROSION AND SEDIMENT CONTROL INSPECTION REPORT

Project Name: _____ **Date:** _____

Project Number: _____ **Logged by:** _____

Weather: _____

SITE PLAN/SKETCH

Provide a concise sketch indicating construction activities, location and description of stormwater runoff from the site, stabilization activities, and soil erosion and sediment control BMPs. Indicate BMPs improperly installed or in need of repair. The inspector shall notify the contractor(s) and subcontractor(s) of necessary repairs of BMPs required within one business day of this inspection.

Maintain Water Quality

Yes	No	NA	
[ ]	[ ]	[ ]	Is there an increase in turbidity causing a substantial visible contrast to natural conditions?
[ ]	[ ]	[ ]	Is there residue from oil and floating substances, visible oil film, or globules or grease?
[ ]	[ ]	[ ]	All disturbance is within the limits of the approved plans.
[ ]	[ ]	[ ]	Have receiving lake/bay, stream, and/or wetland been impacted by silt from project?

Housekeeping

1. General Site Conditions

Yes	No	NA	
[ ]	[ ]	[ ]	Is construction site litter and debris appropriately managed?
[ ]	[ ]	[ ]	Are facilities and equipment necessary for implementation of erosion and sediment control in working order and/or properly maintained?
[ ]	[ ]	[ ]	Is construction impacting the adjacent property?
[ ]	[ ]	[ ]	Is dust adequately controlled?

2. Temporary Stream Crossing

Yes	No	NA	
[ ]	[ ]	[ ]	Maximum diameter pipes necessary to span creek without dredging are installed.
[ ]	[ ]	[ ]	Installed non-woven geotextile fabric beneath approaches.
[ ]	[ ]	[ ]	Is fill composed of aggregate (no earth or soil)?
[ ]	[ ]	[ ]	Rock on approaches is clean enough to remove mud from vehicles & prevent sediment from entering stream during high flow.

Runoff Control Practices

1. Excavation Dewatering

Yes	No	NA	
[ ]	[ ]	[ ]	Upstream and downstream berms (sandbags, inflatable dams, etc.) are installed per plan.
[ ]	[ ]	[ ]	Clean water from upstream pool is being pumped to the downstream pool.
[ ]	[ ]	[ ]	Sediment laden water from work area is being discharged to a silt-trapping device.
[ ]	[ ]	[ ]	Constructed upstream berm with one-foot minimum freeboard.

2. Level Spreader

Yes	No	NA	
[ ]	[ ]	[ ]	Installed per plan.
[ ]	[ ]	[ ]	Constructed on undisturbed soil, not on fill, receiving only clear, non-sediment laden flow.
[ ]	[ ]	[ ]	Flow sheets out of level spreader without erosion on downstream edge.

3. Interceptor Dikes and Swales

Yes	No	NA	
[ ]	[ ]	[ ]	Installed per plan with minimum side slopes 2H:1V or flatter.
[ ]	[ ]	[ ]	Stabilized by geotextile fabric, seed, or mulch with no erosion occurring.
[ ]	[ ]	[ ]	Sediment-laden runoff directed to sediment trapping structure.

4. Stone Check Dam

Yes	No	NA	
[ ]	[ ]	[ ]	Is channel stable (the flow is not eroding soil underneath or around the structure)?
[ ]	[ ]	[ ]	Check is in good condition (rocks in place and no permanent pools behind structure).
[ ]	[ ]	[ ]	Has accumulated sediment been removed?

5. Rock Outlet Protection

Yes	No	NA	
[ ]	[ ]	[ ]	Installed per plan.
[ ]	[ ]	[ ]	Installed concurrently with pipe installation.

Soil Stabilization

1. Topsoil and Spoil Stockpiles

Yes	No	NA	
[ ]	[ ]	[ ]	Stockpiles are stabilized with vegetation and/or mulch.
[ ]	[ ]	[ ]	Sediment control is installed at the toe of the slope.

2. Revegetation

Yes	No	NA	
[ ]	[ ]	[ ]	Temporary seeding and mulch have been applied to idle areas.
[ ]	[ ]	[ ]	4 inches minimum of topsoil has been applied under permanent seeding.

Sediment Control

1. Stabilized Construction Entrance

Yes	No	NA	
[ ]	[ ]	[ ]	Stone is clean enough to effectively remove mud from vehicles.
[ ]	[ ]	[ ]	Installed per standards and specifications?
[ ]	[ ]	[ ]	Does all traffic use the stabilized entrance to enter and leave site?
[ ]	[ ]	[ ]	Is adequate drainage provided to prevent ponding at entrance?

2. Silt Fence

Yes	No	NA	
[ ]	[ ]	[ ]	Installed on Contour, 10 feet from toe of slope (not across conveyance channels).
[ ]	[ ]	[ ]	Joints constructed by wrapping the two ends together for continuous support.
[ ]	[ ]	[ ]	Fabric buried 6 inches minimum.
[ ]	[ ]	[ ]	Posts are stable, fabric is tight and without rips or frayed areas. Sediment accumulation is % of design capacity.

3. Storm Drain Inlet Protection (Use for Stone & Block; Filter Fabric; Curb; or, Excavated practices)

Yes	No	NA	
[ ]	[ ]	[ ]	Installed concrete blocks lengthwise so open ends face outward, not upward.
[ ]	[ ]	[ ]	Placed wire screen between No. 3 crushed stone and concrete blocks.
[ ]	[ ]	[ ]	Drainage area is 1acre or less.
[ ]	[ ]	[ ]	Excavated area is 900 cubic feet.
[ ]	[ ]	[ ]	Excavated side slopes should be 2:1.
[ ]	[ ]	[ ]	2" x 4" frame is constructed and structurally sound.
[ ]	[ ]	[ ]	Posts 3-foot maximum spacing between posts.
[ ]	[ ]	[ ]	Fabric is embedded 1 to 1.5 feet below ground and secured to frame/posts with staples at max 8-inch spacing.
[ ]	[ ]	[ ]	Posts are stable, fabric is tight and without rips or frayed areas. Sediment accumulation % of design capacity.

4. Temporary Sediment Trap

Yes	No	NA	
[ ]	[ ]	[ ]	Outlet structure is constructed per the approved plan or drawing.
[ ]	[ ]	[ ]	Geotextile fabric has been placed beneath rock fill. Sediment accumulation is % of design capacity.

5. Temporary Sediment Basin

Yes	No	NA	
[ ]	[ ]	[ ]	Basin and outlet structure constructed per the approved plan.
[ ]	[ ]	[ ]	Basin side slopes are stabilized with seed/mulch.
[ ]	[ ]	[ ]	Drainage structure flushed and basin surface restored upon removal of sediment basin facility. Sediment accumulation is % of design capacity.

Note: Not all erosion and sediment control practices are included in this listing. Add additional pages to this list as required by site specific design.

Construction inspection checklists for post-development stormwater management practices can be found in the SWPPP.

RECOMMENDATIONS

b. Modifications to the SWPPP (To be completed as described below)

The Operator shall amend the SWPPP whenever:

1. There is a significant change in design, construction, operation, or maintenance which may have a significant effect on the potential for the discharge of pollutants to the waters of the United States and which has not otherwise been addressed in the SWPPP; or

2. The SWPPP proves to be ineffective in:

   a. Eliminating or significantly minimizing pollutants from sources identified in the SWPPP and as required by this permit; or

   b. Achieving the general objectives of controlling pollutants in stormwater discharges from permitted construction activity; and

3. Additionally, the SWPPP shall be amended to identify any new contractor or subcontractor that will implement any measure of the SWPPP.

MODIFICATION & REASON:

Qualified Inspector (print name)

Date of Inspection

Qualified Professional (print name)

Qualified Professional Signature

The above signed acknowledges that, to the best of his/her knowledge, all information provided on the forms is accurate and complete.

SWPPP APPENDIX P

CONSTRUCTION INSPECTION CHECKLISTS

- Stormwater Pond/Created Wetland
- Bioretention Basin

STORMWATER POND/ WETLAND CONSTRUCTION INSPECTION CHECKLIST		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Construction Sequence	**Satisfactory/ Unsatisfactory**	**Comments**
Pre-Construction/Materials and Equipment		
Pre-construction meeting		
Pipe and appurtenances on-site prior to construction and dimensions checked		
1. Material (including protective coating, if specified)		
2. Diameter		
3. Dimensions of metal riser or pre-cast concrete outlet structure		
4. Required dimensions between water control structures (orifices, weirs, etc.) are in accordance with approved plans		
5. Barrel stub for prefabricated pipe structures at proper angle for design barrel slope		
6. Number and dimensions of prefabricated anti-seep collars		
7. Watertight connectors and gaskets		
8. Outlet drain valve		
Project benchmark near pond site		
Equipment for temporary de-watering		
2. Subgrade Preparation		

STORMWATER POND/ WETLAND CONSTRUCTION INSPECTION CHECKLIST		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Construction Sequence	**Satisfactory/ Unsatisfactory**	**Comments**
Area beneath embankment stripped of all vegetation, topsoil, and organic matter		
3. Pipe Spillway Installation		
Method of installation detailed on plans		
A. Bed preparation		
Installation trench excavated with specified side slopes		
Stable, uniform, dry subgrade of relatively impervious material (If subgrade is wet, contractor shall have defined steps before proceeding with installation)		
Invert at proper elevation and grade		
B. Pipe placement		
Metal / plastic pipe		
1. Watertight connectors and gaskets properly installed		
2. Anti-seep collars properly spaced and having watertight connections to pipe		
3. Backfill placed and tamped by hand under “haunches” of pipe		
4. Remaining backfill placed in max. 8 inch lifts using small power tamping equipment until 2 feet cover over pipe is reached		

STORMWATER POND/ WETLAND CONSTRUCTION INSPECTION CHECKLIST		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Construction Sequence	**Satisfactory/ Unsatisfactory**	**Comments**
3. Pipe Spillway Installation		
Concrete pipe		
1. Pipe set on blocks or concrete slab for pouring of low cradle		
2. Pipe installed with rubber gasket joints with no spalling in gasket interface area		
3. Excavation for lower half of anti-seep collar(s) with reinforcing steel set		
4. Entire area where anti-seep collar(s) will come in contact with pipe coated with mastic or other approved waterproof sealant		
5. Low cradle and bottom half of anti-seep collar installed as monolithic pour and of an approved mix		
6. Upper half of anti-seep collar(s) formed with reinforcing steel set		
7. Concrete for collar of an approved mix and vibrated into place (protected from freezing while curing, if necessary)		
8. Forms stripped and collar inspected for honeycomb prior to backfilling. Parge if necessary.		
C. Backfilling		

STORMWATER POND/ WETLAND CONSTRUCTION INSPECTION CHECKLIST		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Construction Sequence	**Satisfactory/ Unsatisfactory**	**Comments**
Fill placed in maximum 8 inch lifts		
Backfill taken minimum 2 feet above top of anti- seep collar elevation before traversing with heavy equipment		
4. Riser / Outlet Structure Installation		
Riser located within embankment		
A. Metal riser		
Riser base excavated or formed on stable subgrade to design dimensions		
Set on blocks to design elevations and plumbed		
Reinforcing bars placed at right angles and projecting into sides of riser		
Concrete poured so as to fill inside of riser to invert of barrel		
B. Pre-cast concrete structure		
Dry and stable subgrade		
Riser base set to design elevation		
If more than one section, no spalling in gasket interface area; gasket or approved caulking material placed securely		
Watertight and structurally sound collar or gasket joint where structure connects to pipe spillway		
C. Poured concrete structure		
Footing excavated or formed on stable subgrade, to design dimensions with reinforcing steel set		

STORMWATER POND/ WETLAND CONSTRUCTION INSPECTION CHECKLIST		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Construction Sequence	**Satisfactory/ Unsatisfactory**	**Comments**
Structure formed to design dimensions, with reinforcing steel set as per plan		
Concrete of an approved mix and vibrated into place (protected from freezing while curing, if necessary)		
Forms stripped & inspected for "honeycomb"prior to backfilling; parge if necessary		
5. Embankment Construction		
Fill material		
Compaction		
Embankment		
1. Fill placed in specified lifts and compacted with appropriate equipment		
2. Constructed to design cross-section, side slopes and top width		
3. Constructed to design elevation plus allowance for settlement		
6. Impounded Area Construction		
Excavated / graded to design contours and side slopes		
Inlet pipes have adequate outfall protection		
Excavated / graded to design contours and side slopes		
Inlet pipes have adequate outfall protection		
Forebay(s)		
Pond benches		
7. Earth Emergency Spillway Construction		
Spillway located in cut or structurally stabilized with riprap, gabions, concrete,		

STORMWATER POND/ WETLAND
CONSTRUCTION INSPECTION CHECKLIST

Project Name: **Location:**

Site Status: **Weather Condition:**

Inspector: **Date:** **Time:**

Construction Sequence	Satisfactory/ Unsatisfactory	Comments
etc.		
Excavated to proper cross-section, side slopes and bottom width		
Entrance channel, crest, and exit channel constructed to design grades and elevations		
8. Outlet Protection		
A. End section		
Securely in place and properly backfilled		
B. Endwall		
Footing excavated or formed on stable subgrade, to design dimensions and reinforcing steel set, if specified		
Endwall formed to design dimensions with reinforcing steel set as per plan		
Concrete of an approved mix and vibrated into place (protected from freezing, if necessary)		
Forms stripped and structure inspected for “honeycomb” prior to backfilling; parge if necessary		
C. Riprap apron / channel		
Apron / channel excavated to design crosssection with proper transition to existing ground		
Filter fabric in place		
Stone sized as per plan and uniformly place at the thickness specified		
9. Vegetative Stabilization		
Approved seed mixture or sod		
Proper surface preparation and required soil amendments		

STORMWATER POND/ WETLAND
CONSTRUCTION INSPECTION CHECKLIST

Project Name:	**Location:**
Site Status:	**Weather Condition:**
Inspector:	**Date:** **Time:**

Construction Sequence	Satisfactory/ Unsatisfactory	Comments
Excelsior mat or other stabilization, as per plan		
10. Miscellaneous		
Drain for ponds having a permanent pool		
Trash protection for low flow pipes, orifices, etc.		
Fencing (when required)		
Access road		
Set aside for clean-out maintenance		
11. Stormwater Wetlands		
Adequate water balance		
Variety of depth zones present		
Approved pondscaping plan in place Reinforcement budget for additional plantings		
Plants and materials ordered 6 months prior to construction		
Construction planned to allow for adequate planting and establishment of plant community (April-June planting window)		
Wetland buffer area preserved to maximum extent possible		

STORMWATER POND/ WETLAND CONSTRUCTION INSPECTION CHECKLIST		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Construction Sequence	**Satisfactory/ Unsatisfactory**	**Comments**

Comments:

Actions to be Taken:

BIORETENTION CONSTRUCTION INSPECTION CHECKLIST		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Construction Sequence	**Satisfactory/ Unsatisfactory**	**Comments**
1. Pre-Construction		
Pre-construction meeting		
Runoff diverted		
Facility area cleared		
If designed as exfilter, soil testing for permeability		
Facility location staked out		
2. Excavation		
Size and location		
Lateral slopes completely level		
If designed as exfilter, ensure that excavation does not compact susoils.		
Longitudinal slopes within design range		
3. Structural Components		
Stone diaphragm installed correctly		
Outlets installed correctly		
Underdrain		
Pretreatment devices installed		
Soil bed composition and texture		
4. Vegetation		
Complies with planting specs		
Topsoil adequate in composition and placement		
Adequate erosion control measures in place		

BIORETENTION CONSTRUCTION INSPECTION CHECKLIST		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Construction Sequence	**Satisfactory/ Unsatisfactory**	**Comments**
5. Final Inspection		
Dimensions		
Proper stone diaphragm		
Proper outlet		
Soil/ filter bed permeability testing		
Effective stand of vegetation and stabilization		
Construction generated sediments removed		
Contributing watershed stabilized before flow is diverted to the practice		

Comments:

Actions to be Taken:

SWPPP

APPENDIX P

LONG TERM OPERATION AND MAINTENANCE PLAN &

POST-CONSTRUCTION INSPECTION AND MAINTENANCE CHECKLISTS

EPT Concord Resort: Roadway Infrastructure

Long-Term Operation and Maintenance Plan for Stormwater Management Facilities

March 2013

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1. Inspection and Maintenance Form Templates for Permanent Stormwater Management Practices

1. Introduction

1.1. Purpose

This Long-Term Operation and Maintenance Plan (O&M Plan) for the development of the Monticello Raceway Management Inc. parcel associated with the overall EPT Concord Resort master plan has been prepared for the New York State Department of Environmental Conservation (NYSDEC), and shall be a reference document to be used by NYSDEC personnel, as well as consultant and contractor staff, as guidance for the proper operation and maintenance of the permanent stormwater controls. The information provided in this O&M Plan is compiled from several sources, listed below:

- The New York State Stormwater Management Design Manual prepared through a joint effort of the New York State Department of Environmental Conservation (NYSDEC), the Soil and Water Conservation Committee, and the Central New York Regional Planning and Development Board;

- The New York State Guidelines for Urban Erosion and Sediment Control (Blue Book) developed by the Natural Resource Conservation Service (NRCS) in cooperation with state and local agencies, for use by soil and water conservation districts, as well as planning boards, land developers, contractors, and consultants;

- Engineering Bulletins and Engineering Instructions issued by the New York State Department of Transportation.

1.2. Organization of O&M Plan

Stormwater Management facilities have been installed as required by the NYSDEC State Pollutant Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity – Permit No. GP-0-10-001 (General Permit).

This O&M Plan was written to serve as a reference document to assist NYSDEC personnel, as well as consultants and contractors, during long-term maintenance of the stormwater controls, in order to ensure compliance with GP-0-10-001. The O&M Plan is broken down into two sections, as described below:

- **Permanent Stormwater Management Practices.** This section includes descriptions of all permanent stormwater management practices installed at the Site;

- **Long-Term Operation and Maintenance Requirements.** This section will instruct the maintenance crew on the requirements for proper operation of permanent stormwater controls, including:
  - **Maintenance Requirements.** This section provides the maintenance crew with details of the required methods for maintenance of the permanent stormwater controls;
  - **Inspection and Recordkeeping Requirements.** This section provides the maintenance crew with details of the required methods and documentation for inspection of the stormwater controls.

1.3. Site Details

The Site consists of the newly constructed Resort Entry Road and the redeveloped portions of Joyland Road (Resort Entry Road) and Thompsonville Road. The drainage areas to be managed contains impervious surface consisting almost entirely of roadway surfaces.

2. List of Permanent Stormwater Management Practices

Post-construction Stormwater Management Practices (SMPs) are used to minimize the long-term effects of stormwater runoff from developed sites and to meet stormwater quality and quantity objectives. Practices that are considered acceptable by the NYSDEC for water quality and quantity control meet one or more of the following criteria:

- The practice can capture and treat the water quality volume in conjunction with other practices;
- The practice is capable of 80 percent total suspended solids removal and 40 percent total phosphorus removal;
- The practice has acceptable longevity in the field;
- The practice has pre-treatment mechanisms;
- The practice provides channel protection, overbank flood protection, and/or extreme flood protection.

All of the SMPs installed at the Site must provide stormwater management to treat:

- *Water Quality Volume*: a certain volume (WQ_v) developed using the 90% rule to be detained on-site to meet water quality objectives, and based on site-specific rainfall and impervious cover;
- *Runoff Reduction Volume:* Runoff reduction of a portion of (ideally all of) WQ_v by application of green infrastructure techniques that reduce contributing area or runoff volume to the maximum extent practicable. The minimum required runoff reduction volume *(RR_v)* is based on the Hydrologic Soil Group (HSG) of the site and defined as the Specified Reduction Factor (S);
- *Channel Protection Volume*: 24-hour extended detention of the 1-year 24 hour storm volume (CP_v) to protect stream channels;
- *Overbank Flood*: control of 10-year storm peak flow (Q_p) to pre-development rates to protect channel banks; and
- *Extreme Storm*: control of 100-year storm peak flow (Q_f) to pre-development rates to minimize flood damage and risk.

NYSDEC acceptable SMPs include stormwater ponds and wetlands, infiltration practices, filtering practices, and open channels. The acceptable NYSDEC practices that were installed at the Site are listed and described in Table 2-1.

Table 2-1

List of NYSDEC-Acceptable SMPs and Descriptions

Group	Practice	Description	Requirement treated
Pond	Micropool Extended Detention (P-1)	Constructed stormwater retention basin that has a permanent pool. Runoff from each rain event is detained and treated in the pool through settling and biological uptake mechanisms.	WQ_v CP_v Q_p Q_f
Ponds	Pocket Pond (P-5)	Constructed stormwater retention basin that has a permanent pool. Runoff from each rain event is detained and treated in the pool through settling and biological uptake mechanisms.	WQ_v CP_v Q_p Q_f
Wetlands	Pocket Wetland (W-4)	Constructed stormwater retention basin that has a permanent pool. Runoff from each rain event is detained and treated in the pool through settling and biological uptake mechanisms.	WQ_v CP_v Q_p Q_f
Filtration	Bioretention (F-5)	Shallow stormwater basin or landscaped area which utilizes engineered soils and vegetation to capture and treat runoff.	RR_v
Green Infrastructure	Tree Plantings	Trees help reduce stormwater runoff, increase nutrient uptake, and provide stabilization.	RR_v
Green Infrastructure	Porous Pavement	Permeable paving used in a section of Resort Entry Road to help reduce stormwater runoff through infiltration directly into the pavement's underlying soils.	RR_v
Green Infrastructure	Vegetated Swale	A turf-lined swale designed to convey stormwater at a low velocity, promoting natural treatment and infiltration.	RR_v

Refer to Figures 4a and 4b in the SWPPP for a map of the Site depicting the location of the stormwater management facilities. Also refer to the construction documents depicting all stormwater management facilities.

3. Long-Term Operation and Maintenance

3.1. Introduction

Owners and Operators of project sites that obtained coverage under GP-0-10-001 and use permanent SMPs to meet the water quality and quantity objectives for the developed site, are responsible for the long-term inspection, operation, and maintenance of the permanent SMPs unless other contractual arrangements have been made for these activities. Penalties are in place to deter violations. All SMPs should be inspected for continued effectiveness and structural integrity on a regular basis. The frequency of scheduled inspections will vary among SMPs. During each inspection, the inspector should document whether the SMP is performing correctly, whether any damage to the SMP has occurred since the last inspection, and what should be done to repair the SMP if damage has occurred.

3.2. Inspection and Maintenance Requirements

The proper design and construction of permanent stormwater controls provides for their initial performance. Proper inspection and maintenance are essential to ensure the long-term performance of the controls. Generally, inspection and maintenance of permanent stormwater controls are categorized into two groups:

1. Expected routine maintenance; and
2. Non-routine (repair) maintenance.

Routine maintenance refers to checks performed on a recurring basis to keep the controls in good working order. Routine inspection and maintenance is also an efficient way to prevent potential nuisance situations (odors, mosquitoes, weeds, etc.), reduce the need for maintenance repairs, and reduce the chance of polluting downstream areas by finding and correcting problems before they become significant. This section describes the maintenance required for the permanent SMPs installed at the Site.

3.2.1. Permanent SMPs

For the permanent SMPs, there are certain long-term maintenance and inspection requirements that must be met. Table 3-1 lists the routine maintenance requirements for new SMPs. In addition to routine maintenance, the NYSDEC also requires that records be maintained of all inspections and maintenance activities that are performed on the SMPs. The appendix contains template inspection and maintenance forms that must be completed for all inspections. The inspection forms are divided into two groups:

1. Monthly; and
2. Annual and after major storms.

Additional inspection and maintenance guidance can be found in these forms.

Table 3-1

Maintenance Requirements for Permanent SMPs

Type of SMP	Routine Maintenance Required
Ponds: **Micropool Extended Detention Basins** **Pocket Ponds** **Pocket Wetlands**	Remove sediment from forebay a minimum of once every 5 to 6 years or when capacity has been reduced by half.
	Mow as necessary to maintain grass height of 4" to 6".
	Remove debris clogging outlet culvert or outlet orifices.
	Check emergency spillway, piped inlets and outlet pipe channel for signs of erosion. Remediate as required.
	Check forebay rip rap spillway for signs of erosion or lost rock. Replace rock and/or remediate erosion.
Bioretention Facility	Inspect and repair/ replace treatment area components.
	Remulch annually.
	Inspect inlets and outlets for signs of erosion. Remediate as required.
	Inspect observation wells for accumulated sediment in underdrain system and take appropriate actions to remove sediment if required.
Tree Plantings	During the first three years, mulching, watering and protection of young trees may be necessary and should be included in the inspection list.
	Determine tree survival rate and replace any that have died.
	Inspect trees for evidence of insect and disease damage; treat as necessary.
	Inspect trees for damages or dead limbs; prune as necessary.

Porous Pavement	Inspect monthly to ensure paving area is clean of debris.
	Inspect monthly and after storm events (>0.5 in.) to ensure paving dewaters.
	Inspect monthly to ensure area is clean of sediments.
	Mow upland and adjacent areas and seed bare areas as needed.
	Three to four times a year, vacuum sweep to keep surface free of sediment.
	Inspect surface annually for deterioration or spalling.
	Inspect observation wells for accumulated sediment in underdrain system and take appropriate actions to remove sediment if required.
Vegetated Swales	Fertilize and lime as needed to maintain dense vegetation.
	Mow as required during growing season to maintain grass heights at 4-inches to 6-inches.
	Inspect monthly and remove any sediment or debris buildup by hand if possible in the bottom of the channel when the depth reaches 2-inches.
	Inspect monthly for pools of standing water. Regrade to restore design grade and revegetate.
	Inspect monthly for rills in channel bottom and repair with compacted topsoil, anchored with mesh or filter fabric. Seed and mulch.

3.2.1.1. Micropool Extended Detention Basin

One Micropool Extended Detention Basin is located on the site.

Pond 24 is located approximately 370-feet from the entrance of Resort Entry Road. The detention basin has been sized with a volume of approximately 2.1 acre-feet (ac-ft) at a top elevation of 1369.0. The bottom of the permanent pool is at elevation 1361.0 and is surrounded by an aquatic bench at elevation 1365.0. The outlet control structure is a precast concrete catch basin with a cast iron frame and grate set at elevation 1367.0. A 12.5-inch wide by 12.5-inch high outlet orifice is set at elevation 1365.8 and a 1-inch diameter low flow outlet orifice is set at elevation 1364.0. The outlet pipe is a 58-foot long, 21-inch pipe that discharges to the surface leading to a wetland. The outlet pipe runs from invert elevation 1361.0 to 1358.0.

There is one point of stormwater entering the pond protected by rip rap. An emergency spillway consisting of a 15-foot wide stone lined channel set at elevation 1368.0 capable of passing the entire 100-year influent to the pond has been installed on the northern berm. The computed 100-year peak elevation is 1368.1.

3.2.1.2. Pocket Ponds

Five Wet Ponds are located on the site.

Pocket Pond 21A is located at the beginning of Resort Entry Road, near Route 17. The detention basin has been sized with a volume of approximately 1.2 acre-feet (ac-ft) at a top elevation of 1380.0. The bottom of the micropool is at elevation 1374.0 and is surrounded by an aquatic bench at elevation 1376.5. The outlet control structure is a precast concrete catch basin with a cast iron frame and grate. A 1-inch diameter low flow outlet orifice is set at elevation 1376.5. The outlet pipe is an 31-foot long, 21-inch pipe that discharges to the surface leading to NYSDEC Wetland 71. The outlet pipe runs from invert elevation 1374.0 to 1373.5.

There is one point of stormwater entering the pond's forebay protected by rip rap. An emergency spillway consisting of a 15-foot wide stone lined channel set at elevation 1379.0 capable of passing the entire 100-year influent to the pond has been installed. The computed 100-year peak elevation is 1379.35.

Pocket Pond 21B is located approximately 170-feet from the entrance of Resort Entry Road. The detention basin has been sized with a volume of approximately 1.3 acre-feet (ac-ft) at a top elevation of 1381.0. The bottom of the permanent pool is at elevation 1375.0 and is surrounded by an aquatic bench at elevation 1378.0. The outlet control structure is a precast concrete catch basin with a cast iron frame and grate. A 6-inch wide by 6-inch high outlet orifice is set at elevation 1379.0 and a 1-inch diameter low flow outlet orifice is set at elevation 1378.00. The outlet pipe is a 55-foot long, 21-inch pipe that discharges to the surface leading to NYSDEC Wetland 71. The outlet pipe runs from invert elevation 1376.0 to 1375.0.

There are three points of stormwater entering the pond protected by rip rap. An emergency spillway consisting of a 15-foot wide stone lined channel set at elevation 1380.0 capable of passing the entire 100-year influent to the pond has been installed. The computed 100-year peak elevation is 1380.29.

Pocket Pond 23 is located approximately 280-feet from the entrance of Resort Entry Road. The detention basin has been sized with a volume of approximately 1.6 acre-feet (ac-ft) at a top elevation of 1386.0. The bottom of the permanent pool is at elevation 1377.0 and is surrounded by an aquatic bench at elevation 1381.0. The outlet control structure is a precast concrete catch basin with a cast iron frame and grate. A 36-inch wide by 12-inch high outlet orifice is set at elevation 1383.0 and a 1-inch diameter low flow outlet orifice is set at elevation 1381.0. The outlet pipe is a 141-foot long, 21-inch pipe that discharges to the surface leading to a wetland. The outlet pipe runs from invert elevation 1377.0 to 1376.0.

There is one point of stormwater entering the pond protected by rip rap. An emergency spillway consisting of a 15-foot wide stone lined channel set at elevation 1384.0 capable of passing the entire 100-year influent to the pond has been installed on the northern berm. The computed 100-year peak elevation is 1384.54.

Pocket Pond 26 is located to the west of the bridge on Resort Entry Road. The detention basin has been sized with a volume of approximately 1.8 acre-feet (ac-ft) at a top elevation of 1375.0. The bottom of the permanent pool is at elevation 1367.0 and is surrounded by an aquatic bench at elevation 1371.0. The outlet control structure is a precast concrete catch basin with a cast iron frame and grate. A 5-inch wide by 5-inch high outlet orifice is set at elevation 1372.0 and a 1-inch diameter low flow outlet orifice is set at elevation 1371.0. The outlet pipe is a 60-foot long, 15-inch pipe that discharges to the surface leading to a NYSDEC Class B stream. The outlet pipe runs from invert elevation 1368.0 to 1367.0.

There is one point of stormwater entering the pond protected by rip rap. An emergency spillway consisting of a 15-foot wide stone lined channel set at elevation 1374.0 capable of passing the entire 100-year influent to the pond has been installed. The computed 100-year peak elevation is 1374.1.

Pocket Pond 28 is located to the east of the bridge on Resort Entry Road. The detention basin has been sized with a volume of approximately 0.76 acre-feet (ac-ft) at a top elevation of 1378.0. The bottom of the micropool is at elevation 1371.5 and is surrounded by an aquatic bench at elevation 1373.6. The outlet control structure is a precast concrete catch basin with a cast iron frame and grate. An 18-inch wide by 12-inch high outlet orifice is set at elevation 1376.0 and a 1-inch diameter low flow outlet orifice is set at elevation 1373.6. The outlet pipe is a 24-foot long, 21-inch pipe that discharges to the surface leading to a NYSDEC Class B stream. The outlet pipe runs from invert elevation 1373.0 to 1372.0.

There is one point of stormwater entering the pond's forebay protected by rip rap. An emergency spillway consisting of a 15-foot wide stone lined channel set at elevation 1379.0 capable of passing the entire 100-year influent to the pond has been installed. This spillway is solely a safety measure as the computed 100-year peak elevation is 1376.87.

3.2.1.3. Pocket Wetlands

There are three stormwater pocket ponds located to the east of the redeveloped portion of Joyland Road and three stormwater pocket wetlands located to the north of the redeveloped portion of Thompsonville Road.

Pocket Wetland "C" is an off-line system located to the north of Thompsonville Road and west of the entrance to the casino's northern parking lot. The pond has been sized with a volume of approximately 0.2 acre-feet (ac-ft) at a top elevation of 1349.0. The bottom of

the permanent pool is at elevation 1345.0. The outlet structure is a 10-foot wide stone lined weir set at elevation 1347.50, the elevation of the pond's permanent pool. This weir discharges to the surface leading to a USACE Wetland 34.

The forebay volume is approximately 0.01 ac-ft. The forebay elevations range from 1345.0 at the bottom to 1347.0 at the top. There is a stone lined overflow weir connecting the forebay to the main pond set at an overflow elevation of 1347.0. There is one point of pipe discharged stormwater entering the pond protected by rip rap. The remainder of runoff entering the pond is conveyed via vegetated swales to the north of Thompsonville Road.

Emergency overflow is provided through a bypass channel prior to the stormwater pocket wetland. This weir is set at elevation 1348.20. The 100-year peak elevation 1348.6.

Pocket Wetland "E" is an off-line system located to the north of Thompsonville Road and east of the entrance to the casino's paddock building parking lot. The pond has been sized with a volume of approximately 0.3 acre-feet (ac-ft) at a top elevation of 1349.0. The bottom of the permanent pool is at elevation 1343.0. The outlet control structure is a precast concrete catch basin with a cast iron frame and grate set at elevation 1346.80. The outlet pipe is a 58-foot long, 12-inch pipe that discharges to the surface leading to a wetland. The outlet pipe runs from invert elevation 1346.2 to 1346.0.

There is one point of stormwater entering the pond protected by rip rap. The remainder of stormwater entering the pond is conveyed via vegetated swales to the north of Thompsonville Road.

Emergency overflow is provided through a bypass channel prior to the stormwater pocket wetland. This weir is set at elevation 1347.0. The 100-year peak elevation is 1347.5.

Pocket Wetland "G" is an off-line system located to the northwest of Thompsonville Road and east of the Tannery Brook crossing. The pond has been sized with a volume of approximately 0.2 acre-feet (ac-ft) at a top elevation of 1340.0. The bottom of the permanent pool is at elevation 1335.0. The outlet structure is a 10-foot wide stone lined weir set at elevation 1339.0, the elevation of the pond's permanent pool. This weir discharges to the surface leading to a NYSDEC Wetland 57 / Tannery Brook.

The forebay volume is approximately 0.008 ac-ft. The forebay elevations range from 1335.0 at the bottom to 1337.0 at the top. Runoff is conveyed to the pond via vegetated swales to the north of Thompsonville Road. No emergency overflow is provided. The 100-year peak elevation is 1339.3.

Pocket Wetland 30 is located to the southeast of the intersection of Joyland Road, Thompsonville Road, and Chalet Road. The pond has been sized with a volume of

approximately 0.5 acre-feet (ac-ft) at a top elevation of 1440.0. The bottom of the permanent pool is at elevation 1434.0. The outlet control structure is a precast concrete catch basin with a cast iron frame and grate. A 6-inch diameter outlet orifice is set at elevation 1437.8 and a 1-inch diameter low flow outlet orifice is set at elevation 1437.0. The outlet pipe is a 20-foot long, 15-inch pipe that discharges to the swale leading to an existing culvert. The outlet pipe runs from invert elevation 1334.0 to 1332.0.

The forebay volume is approximately 0.04 ac-ft. The forebay elevations range from 1434.0 at the bottom to 1438.0 at the top. There is one point of pipe discharged stormwater entering the pond protected by rip rap.

An emergency spillway consisting of a 6-foot wide stone lined channel set at elevation 1439.0 capable of passing the entire 100-year influent to the pond has been installed on the eastern berm. This spillway is solely a safety measure as the computed 100-year peak elevation is 1439.0.

Pocket Wetland 29A is located to the east of Joyland Road. The pond has been sized with a volume of approximately 0.1 acre-feet (ac-ft) at a top elevation of 1445.0. The bottom of the permanent pool is at elevation 1441.0. The outlet structure is a 10-foot wide stone lined weir set at elevation 1443.5, the elevation of the pond's permanent pool. This weir discharges to the surface leading to a USACE Wetland 9. There is one point of pipe discharged stormwater entering the pond protected by rip rap. No emergency overflow is provided. The 100-year peak elevation is 1443.74.

Pocket Wetland 29B is located to the east of Joyland Road. The pond has been sized with a volume of approximately 0.5 acre-feet (ac-ft) at a top elevation of 1444.5. The bottom of the permanent pool is at elevation 1438.0. The outlet structure is a 10-foot wide stone lined weir set at elevation 1442.0

There are two separate forebays. The first forebay volume is approximately 0.03 ac-ft. The second forebay volume is approximately 0.04 ac-ft. The forebay elevations range from 1440.0 at the bottom to 1443.0 at the top. There are two points of stormwater entering the pond protected by rip rap. No emergency overflow is provided. The 100-year peak elevation is 1443.5.

3.2.1.4. Bioretention Facility

A total of twelve bioretention facilities have been installed throughout the site in vegetated areas along the roadway. Stormwater runoff is collected by the roadways drainage system and routed to flow splitters, which direct stormwater to the bioretention areas for small storm events and bypass flow to downstream SMPs for larger storm events. Piped discharge points at each basin are protected by rip rap. Stormwater is able to pond at the surface of the basin from 6-12-inches depending on the specific system. Stormwater passes though the bioretention soil mix to an underdrain located 3-5-feet

below the bioretention areas bottom. An overflow grate is provided to pass storms larger than the water quality event. Specialized plantings are included in the bioretention areas and must be maintained regularly. The top layer of mulch must be replaced annually.

The surface area a bioretention area at the elevation of the overflow grate, also known as the filter bed area (A_f), is critical to the design and long term functionality of the system. Table 3-2 below depicts each bioretention area's design filter bed area. The outlet structure label has been provided for ease of locating each system.

Table 3-2

Bioretention Area Minimum Filter Bed Areas

Bioretention Area	Outlet Structure	Filter Bed Area, Af (sf)	Location Description
SW21C	E63B	2,129	South of Pond 21A
BRA-53	53D	2,399	NW of Pond 21B
BRA-50	50D	2,068	East of Pond 23
SW23A	E48B	744	North of Pond 23
SW23B	E51B	1,923	South of Pond 23
BRA-46	E46B	1,367	SW of Pond 24
BRA-37	E37D	3,939	West of Waterbody on Resort Entry Road
BRA-38	E38	3,650	West of Waterbody on Resort Entry Road
SW28C	E24C	2,515	East of Pond 28
SW28B	E20A	2,545	South of Casino Site Main Entry Drive
SW28A	E8C	674	Intersection of Joyland and Resort Entry
SW31	E4D	1,567	Intersection of Joyland and Resort Entry
A	T5D	2,271	North of Thompsonville Road
B	T7D	1,026	North of Thompsonville Road
F	T18	1,334	North of Thompsonville Road

3.2.1.5. Tree Plantings

Trees have been planted throughout the site within vegetated areas.

3.2.1.6. Porous Pavements

Porous pavement has been installed in a section of the Resort Entry Roadway. The reservoir course depth ranges from 6-inches to 24-inches.Rainfall passes through the porous asphalt and underlying filter course to the reservoir course where it is retained before infiltrating in to the underlying soils.

3.2.1.7. Vegetated Swales

Conveyance swales are located along Resort Entry Road from the start at the Route 17 Interchange, to the stream crossing bridge. Certain sections of the swale are constructed as vegetated swales. The vegetated swales have a 2-foot wide bottom width and slopes ranging from 0.5% to 4.0%. Specialized plantings are used in the vegetated swale sections. Plant height is maintained at 4-6-inches.

3.2.2. Stormwater Drainage Maintenance

Similar to the SMPs discussed earlier, the stormwater drainage system must also be properly maintained in order to function as designed. While the NYSDEC does not require that inspection and maintenance records be completed for stormwater drainage, it is recommended that records be kept to facilitate an effective maintenance program. Table 3-2 lists the routine maintenance required for the stormwater drainage systems.

Table 3-3

Maintenance Requirements for Stormwater Drainage Systems

Type of Structure	Routine Maintenance Required
Grassed Waterway	During establishment period, inspect grass-lined channels after every rainfall.
	After grass is established, periodically check channel and make repairs to vegetation immediately.
	Remove significant accumulations of sediment and debris from channel to maintain the design cross-section and grade and prevent spot erosion.
Rock Outlet Protection	Inspect after high flows to see if scour beneath the riprap has occurred, or any stones have been dislodged. Make any required repairs immediately.
	Repair any erosion at the sides and ends of the apron.
Storm Drainage System	Inspect inlet grates and pipe end sections for clogging or damage. Clear debris and repair damage.
	Inspect areas where pipe is installed below ground for signs of settlement. Check downstream areas for signs that subgrade has collapsed and sediment has been transported. Repair damaged areas and clean out accumulated sediment.

APPENDIX

INSPECTION AND MAINTENANCE FORMS FOR POST-CONSTRUCTION PRACTICES

STORMWATER POND/ WETLAND		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Maintenance Item	**Satisfactory/ Unsatisfactory**	**Comments**
Embankment and emergency spillway (Annual, After Major Storms)		
1. Vegetation and ground cover adequate		
2. Embankment erosion		
3. Animal burrows		
4. Unauthorized planting		
5. Cracking, bulging, or sliding of dam		
a. Upstream face		
b. Downstream face		
c. At or beyond toe downstream/downstream		
d. Emergency spillway		
6. Pond, toe & chimney drains clear and functioning		
7. Seeps/leaks on downstream face		
8. Slope protection or riprap failure		
9. Vertical/horizontal alignment of top of dam As-Built		
10. Emergency spillway clear of obstructions and debris		
Riser and principal spillway (Annual)		
Type: Reinforced concrete _____		
Corrugated pipe _____		
1. Low flow orifice obstructed		

STORMWATER POND/ WETLAND		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Maintenance Item	**Satisfactory/ Unsatisfactory**	**Comments**
2. Low flow trash rack.		
a. Debris removal necessary		
b. Corrosion control		
3. Weir trash rack maintenance		
a. Debris removal necessary		
b. corrosion control		
4. Excessive sediment accumulation insider riser		
5. Concrete/masonry condition riser and barrels		
a. cracks or displacement		
b. Minor spalling (<1")		
c. Major spalling (exposed rebar)		
d. Joint failures		
e. Water tightness		
6. Metal pipe condition		
7. Control valve		
a. Operational/exercised		
b. Chained and locked		
8. Pond drain valve		
a. Operational/exercised		
b. Chained and locked		
9. Outfall channels functioning		

STORMWATER POND/WETLAND		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Maintenance Item	**Satisfactory/ Unsatisfactory**	**Comments**
Permanent Pool (Wet Ponds)	**(monthly)**	
1. Undesirable vegetative growth		
2. Floating or floatable debris removal required		
3. Visible pollution		
4. Shoreline problem		
Sediment Forebay		
1.Sedimentation noted		
2. Sediment cleanout when depth < 50% design depth		
Dry Pond Areas		
1. Vegetation adequate		
2. Undesirable vegetative growth		
3. Undesirable woody vegetation		
4. Low flow channels clear of obstructions		
5. Standing water or wet spots		
6. Sediment and / or trash accumulation		
Condition of Outfalls (Annual, After Major Storms)		
1. Riprap failures		
2. Slope erosion		
3. Storm drain pipes		
4. Endwalls / Headwalls		

STORMWATER POND/ WETLAND		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Maintenance Item	**Satisfactory/ Unsatisfactory**	**Comments**
Other (monthly)		
1. Encroachment on pond, wetland or easement area		
2. Complaints from residents		
3.Aesthetics		
a. Grass growing required		
b. Graffiti removal needed		
4. Conditions of maintenance access routes.		
5. Signs of hydrocarbon build-up		
6. Any public hazards (specify)		
Wetland Vegetation (Annual)		
1. Vegetation healthy and growing		
Wetland maintaining 50% surface area coverage of wetland plants after the second growing season. (If unsatisfactory, reinforcement plantings needed)		
2. Dominant wetland plants:		
Survival of desired wetland plant species		
Distribution according to landscaping plan?		
3. Evidence of invasive species		
4. Maintenance of adequate water depths for desired wetland plant species		
5. Harvesting of emergent plantings needed		
6. Have sediment accumulations reduced pool volume significantly or are plants choked with sediment?		

STORMWATER POND/ WETLAND		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Maintenance Item	**Satisfactory/ Unsatisfactory**	**Comments**
7. Eutrophication level of the wetland.		

Comments:

Actions to be Taken:

BIORETENTION AREA

Project Name: **Location:**

Site Status: **Weather Condition:**

Inspector: **Date:** **Time:**

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
1. Debris Cleanout (Monthly)		
Bioretention and contributing areas clean of debris		
No dumping of yard wastes into practice		
Litter (branches, etc.) have been removed		
2. Vegetation (Monthly)		
Plant height not less than design water depth		
Fertilized per specifications		
Plant composition according to approved plans		
No placement of inappropriate plants		
Grass height not greater than 6 inches		
No evidence of erosion		
3. Check Dams/Energy Dissipaters/Sumps (Annual, After Major Storms)		
No evidence of sediment buildup		
Sumps should not be more than 50% full of sediment		
No evidence of erosion at downstream toe of drop structure		
4. Dewatering (Monthly)		
Dewaters between storms		
No evidence of standing water		
5. Sediment Deposition (Annual)		
Area clean of sediments		

BIORETENTION AREA		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Maintenance Item	**Satisfactory/ Unsatisfactory**	**Comments**
Sediments should not be > 20% of area design depth		
Inspect observation wells for accumulated sediment in underdrain system and take appropriate actions to remove sediment if required.		
6. Outlet/Overflow Spillway (Annual, After Major Storms)		
Good conditions, no need for repair		
No evidence of erosion		
No evidence of any blockages		
7. Integrity of Filter Bed (Annual)		
Filter bed has not been blocked or filled inappropriately		

Comments:

Actions to be Taken:

VEGETATED SWALE

Project Name: **Location:**

Site Status: **Weather Condition:**

Inspector: **Date:** **Time:**

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
1. Debris Cleanout (Monthly)		
Contributing areas clean of debris		
2. Check Dams or Energy Dissipators (Annual, After Major Storms)		
No evidence of flow going around structures		
No evidence of erosion at downstream toe		
Soil permeability		
Groundwater / bedrock		
3. Vegetation (Monthly)		
Mowing done when needed		
Minimum mowing depth not exceeded		
No evidence of erosions		
Fertilized per specification		
4. Dewatering (Monthly)		
Dewaters between storms		
5. Sediment Deposition (Annual)		
Clean of sediments		
6. Outlet/Overflow Spillway (Annual, After Major Storms)		
Good conditions, no need for repair		
No evidence of erosion		

VEGETATED SWALE		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Maintenance Item	**Satisfactory/ Unsatisfactory**	**Comments**

Comments:

Actions to be Taken:

POROUS PAVEMENT

Project Name: **Location:**

Site Status: **Weather Condition:**

Inspector: **Date:** **Time:**

Maintenance Item	Satisfactory/ Unsatisfactory	Comments
1. Debris Cleanout (Monthly)		
Paving areas clean of debris		
2. Vegetation (Monthly)		
Upland areas mowed		
Seed bare areas		
3. Dewatering (Monthly)		
Paving area dewaters between storms		
4. Sediment Deposition (Monthly)		
Paving area clean of sediments		
Vacuum sweep as required. Minimum 4 times a year.		
5. Sediment Deposition (Annual)		
Inspect observation wells for accumulated sediment in underdrain system and take appropriate actions to remove sediment if required.		
6. Structural Components (Annual)		
No evidence of structural deterioration		
No evidence of spalling or cracking of structural pars		

Comments:

POROUS PAVEMENT		
Project Name:	**Location:**	
Site Status:	**Weather Condition:**	
Inspector:	**Date:**	**Time:**
Maintenance Item	**Satisfactory/ Unsatisfactory**	**Comments**

Actions to be Taken:

SWPPP

APPENDIX Q

POROUS PAVEMENT SPECIFICATIONS

- 312000 – Earth Moving
- 321216 – Asphalt Paving

SECTION 312000 EARTH MOVING (Walks, Pavements, Utilities)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 01 Specification Sections, apply to this Section.

B. Subsurface Investigation Report prepared by Melick-Tully and Associates, P.C.

C. Stormwater Pollution Prevention Plan (SWPPP), Erosion and Sediment Controls and Sequence of Construction.

1.2 SUMMARY

A. Section Includes:

1. Preparing subgrades for walks, pavements, utility structures, stormwater management and bioretention basins, turf and grasses and plants.
2. Subbase course for concrete walks and pavements.
3. Excavating and backfilling for utility trenches.
4. Soil restoration.
5. Fill material for underdrains.
6. Fill material for bioretention soils.
7. Rock removal.

B. Related Sections:

1. Section 311000 “Site Clearing”.
2. Section 312513 “Erosion Controls”.
3. Section 321216 “Asphalt Paving”.
4. Section 321313 “Concrete Paving”.
5. Section 329219 “Seeding”.
6. Section 329223 “Sodding”.
7. Section 329300 “Plants”.
8. Section 331116 “Site Water Utility Distribution Piping”.
9. Section 333100 “Sanitary Utility Sewerage Piping”.
10. Section 333216 "Packaged Utility Wastewater Pumping Stations”.
11. Section 333400 "Sanitary Utility Sewerage Force Mains”.
12. Section 334100 “Storm Utility Drainage Piping”.
13. Section 337119 "Electrical Underground Ducts and Manholes”.

1.3 REFERENCES

A. New York State Department of Transportation (NYSDOT) 2008 Standard Specifications.

B. New York State Department of Environmental Conservation (NYSDEC), New York State Standards and Specifications for Erosion and Sediment Control, 2005 or latest edition ("Blue Book").

C. Town of Thompson Town Code.

D. Occupational Safety and Health Administration (OSHA) Excavation Regulations, latest edition.

1.4 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

C. Bioretention Soil Media: Engineered soil blend for use in stormwater treatment system.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Crushed Stone: Natural, non-friable crushed material used for drainage and granular backfill.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

G. Engineered Fill: Soil materials used to raise existing grades and placed under controlled conditions.

H. Pea Gravel: Natural non-friable rounded material to be used as filter blanket for porous pavement.

I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cubic yard for bulk excavation or ¾ cubic yard for footing trench, and pit excavation that cannot be removed by rock excavating equipment without systematic drilling, ram hammering, ripping, or blasting, when permitted.

J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

K. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

L. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

M. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within structures.

1.5 SUBMITTALS

A. Materials Source: Submit name of imported materials source.

B. Material Test Reports: For each soil material proposed for fill and backfill.

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.

C. Product Data: Submit gradation, maximum wash loss, minimum durability index, maximum abrasion loss, air voids.

1.6 QUALITY ASSURANCE

A. Pre-excavation Conference: Conduct conference at Project site.

B. Field quality-control test reports.

1.7 PROJECT CONDITIONS

A. Do not commence earth moving operations until temporary erosion and sedimentation control measures, specified in Section 312513 “Erosion Controls” are in place.

B. Rock removal may be required for deeper excavations. Contractor to refer to and comply with Town of Thompson Town Code for rock removal.

C. Provide groundwater and runoff controls consisting of drains and diversions or additional measures, as necessary, so as to maintain dry excavations. Implement in accordance with the SWPPP and regulations of the New York State Department of Environmental Conservation (NYSDEC).

D. Provide erosion and sediment controls and construction sequencing in accordance with the SWPPP and regulations of the New York State Department of Environmental Conservation.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940. Meet NYSDOT 2008 Standard Specifications Type 4 gradation.

B. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve, not more than 15 percent (by weight) passing a No. 200 sieve, and a maximum particle size of 6 inches.

C. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and no fines (no material passing a No. 200 sieve).

D. Drainage Course, Choker Course and Reservoir Course for bioretention basins, asphalt porous pavement. All stone must be clean washed stone from the quarry or material producer as identified below.

US Standard Sieve Size (inches)	Drainage Course/Choker Course (AASHTO No. 57) Percent Passing	Reservoir Course (AASHTO No. 3) Percent Passing
2.5		100
2		90-100
1.5	100	35-70
1	95-100	0-15
¾		
½	25-60	0-5
3/8		
No.4	0-10	
No.8	0-5	
% Compaction (ASTM D698/AASHTO T99)	**95%**	**95%**

E. Filter Blanket for Porous Pavement: uniformly graded, clean washed, 3/8-inch Pea Gravel.

F. Bioretention Areas:

1. 12-inch Drainage Course
2. Bioretention Soil Media Characteristics:
   a. pH Range: 5.2 to 7.0.
   b. Organic Matter: 1.5 to 4.0%
   c. Magnesium: minimum 35 pounds per acre.
   d. Phosphorous (P205): minimum 75 pounds per acre.
   e. Potassium (K20): minimum 85 pounds per acre.
   f. Soluble Salts: 500 ppm.
   g. Clay: 10 to 25%.
   h. Silt: 30 to 55%.
   i. Sand: 35 to 60%.

G. Subsurface Drain – Drainage Course specified in the above table to be used as the stone fill within these drains.

H. Granular Backfill – ¾ inch clean, crushed stone.

2.2 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored to comply with local practice or requirements of authorities having jurisdiction.

B. Filter Fabric: 140N by Mirafi, or approved equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection and all frost damaged soils before placing subsequent materials.

D. Perform all excavations in accordance with current OSHA safety requirements. Excavation side slope support shall be provided using soldier piles and lagging, where necessary.

3.2 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

B. Any excavations resulting from demolition and utility removal to be backfilled with compacted engineered fill.

C. Contractor shall provide all equipment, labor and acceptable means necessary to maintain dry excavations at all times. No changes in the Contract Sum or the Contract Time will be authorized for dewatering, treatment, or disposal of water.

3.3 ROCK REMOVAL

A. Refer to and comply with Town of Thompson Town Code for any rock removal.

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR STORMWATER MANAGEMENT AND BIORETENTION BASINS

A. Excavate surfaces to indicated lines, cross sections, elevations, and subgrades.

B. Sequence Work so as to avoid densifying the soil subgrade within areas where porous pavement and bioretention areas will be constructed.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material, 4 inches deeper elsewhere, to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.7 SUBGRADE INSPECTION

A. Proof-roll subgrade below the pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

D. Place and compact final backfill of satisfactory soil to final subgrade elevation.

E. Install detectable warning tape directly above utilities, 12 inches below finished grade.

3.10 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks, pavements, and utility structures, use engineered fill.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials below to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 98 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 98 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 98 percent.

D. Compact drainage course, choker course, reservoir course soil materials to not less than 95 percent according to ASTM D 698.

3.13 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Site Rough Grading: Slope grades to direct water away from structures and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Protect prepared areas from damage.

3.14 SUBBASE COURSE UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course under pavements and walks as follows:

1. Shape subbase course to required crown elevations and cross-slope grades.
2. Place subbase course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

3. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98 percent of maximum dry unit weight according to ASTM D 1557.

3.15 SOIL RESTORATION

A. The Contractor will be required to complete soil restoration in the areas of the proposed pervious surfaces once final grade has been achieved in these areas. The type of soil restoration will depend on the type of soil disturbance and the type of hydrologic soil group. The Contractor will be required to complete soil restoration in conformance with the various methods outlined in the following table:

Type of Soil Disturbance	**Soil Restoration Requirement**		**Comments/Examples**
No soil disturbance	Restoration not permitted		Preservation of Natural Features
Minimal soil disturbance	Restoration not permitted		Clearing and grubbing
Areas where topsoil is stripped only - no change in grade	HSG A &B	HSG C&D	Protect area from any ongoing construction activities.
	Apply 6 inches of topsoil	Aerate and apply 6 inches of topsoil	
Areas of cut or fill	HSG A &B	HSG C & D	
	Aerate and apply 6 inches of topsoil	Apply full Soil Restoration	
Heavy traffic areas on site (especially in a zone 5-25 feet around buildings but not within a 5 foot perimeter around foundation walls)	Apply full Soil Restoration (de-compaction and compost enhancement)		
Areas where Runoff Reduction and/or infiltration practices are applied	Restoration not required, but may be applied to enhance the reduction specified for appropriate practices.		Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area.

3.16 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000

SECTION 321216 ASPHALT PAVING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Cold milling of existing asphalt pavement.
2. Hot-mix asphalt patching.
3. Hot-mix asphalt paving.
4. Hot-mix asphalt overlay.
5. Asphalt surface treatments.
6. Porous pavement.

B. Related Requirements:

1. Section 312000 "Earth Moving" for subgrade preparation, fill material, unbound-aggregate subbase and base courses, and aggregate pavement shoulders.

1.3 REFERENCES

A. New York State Department of Transportation (NYSDOT) 2008 Standard Specifications.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to hot-mix asphalt paving including, but not limited to, the following:
   a. Review proposed sources of paving materials, including capabilities and location of plant that will manufacture hot-mix asphalt.
   b. Review requirements for protecting paving work, including restriction of traffic during installation period and for remainder of construction period.

1.5 SUBMITTALS

A. Product Data: For each type of product.

1. Include technical data and tested physical and performance properties.
2. Job-Mix Designs: Certification, by authorities having jurisdiction, of approval of each job mix proposed for the Work.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For manufacturer and testing agency.

B. Material Certificates: For each paving material. Include statement that mixes containing recycled materials will perform equal to mixes produced from all new materials.

C. Material Test Reports: For each paving material, by a qualified testing agency.

D. Field quality-control reports.

1.7 QUALITY ASSURANCE

A. Manufacturer Qualifications: A paving-mix manufacturer specializing in the production of asphaltic concrete for at least five years.

B. Installer: Company specializing in installation of asphaltic concrete shall have more than three years experience and at least two jobs with similar quantity and type of material.

C. Regulatory Requirements:

1. Work of this section shall comply with the requirements of New York State Department of Environmental Conservation.
2. Requirements for asphaltic concrete, including, but not limited to handling, equipment, transportation, etc. not specified herein shall conform to the AASHTO 'Standard Specification for Transportation, Materials, Methods of Sampling and Testing'.

D. Testing Agency Qualifications: Qualified according to ASTM D 3666 for testing indicated.

1.8 FIELD CONDITIONS

A. Environmental Limitations: Do not apply asphalt materials if subgrade is wet or excessively damp, if rain is imminent or expected before time required for adequate cure, or if the following conditions are not met:

1. Prime Coat: Minimum surface temperature of 60 deg F.
2. Tack Coat: Minimum surface temperature of 60 deg F.
3. Slurry Coat: Comply with weather limitations in ASTM D 3910.
4. Asphalt Base Course: Minimum surface temperature of 40 deg F and rising at time of placement.
5. Asphalt Surface Course: Minimum surface temperature of 40 deg F at time of placement.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Pavement Sealer

1. Neyra Industries, Inc., Cincinnati, Ohio
2. VelveTop Products, Huntington Station NY

B. Reflective Cracking Membrane

1. Amoco Fabrics and Fibers Co., Atlanta, Ga. 30339
2. Polyguard Products, Inc., Ennis, Tx. 75120

C. Joint Sealer

1. W.R. Meadows

2.2 MATERIALS

A. Asphaltic Concrete

1. Materials shall comply with Section 402 of the NYSDOT 2008 Standard Specifications.

B. Prime Coat

1. Asphalt emulsion prime coat complying with NYSDOT 2008 Standard Specifications.

C. Tack Coat

1. Materials shall comply with Section 407 of the NYSDOT 2008 Standard Specifications

D. Pavement Sealer

1. Polymer modified asphalt emulsion sealer meeting ASTM D2939, D140, D244, and D529; containing no coal tar, and less than 10 grams per liter of volatile organic compounds.
   a. Neyra Jennite AE polymer modified asphalt sealer.
   b. VelveTop PM Polymer Modified Asphalt Sealer.

E. Reflective Cracking Membrane

1. Woven or Non-woven polypropylene fabric precoated with a rubberized adhesive base at least 18" in width used for preventing cracks in substrate emanating through the asphalt topping.
2. Product:
   a. Petrotac by Amoco Fabrics and Fibers Co., with Celotex primer
   b. Polyguard NW 75 by Polyguard Products, Inc., with 650 RC Liquid Adhesive and Mastic to prime surface.

F. Joint Sealer

1. Cold-applied low modulus pourable two-component sealant comprised of polymeric compounds compatible for both Portland cement concrete and asphaltic concrete surfaces providing a flexible, rubber-like finish. Material shall not become brittle to temperatures as low as -20°F.
2. SOF-SEAL by W.R. Meadows.

G. Porous Pavement

1. Porous asphalt, 4-inches thick bituminous mix

Sieve Size (inch)	Percent Passing (%)
0.75	100
0.5	85-100
.375	55-75
No. 4	10-25
No. 8	5-10
No. 200	2-4
Binder Content (AASHTO T164)	6-6.5
Fiber Content by Total Mixture Mass	0.3% cellulose or 0.4% mineral
Rubber Solids (SBR) Content by Weight of Bitumen	1.5-3% or TBD
Air Void Content (ASTM D6752/AASHTO T275)	18-22%
Draindown (ASTM D6390)	<0.3%
Retained Tensile Strength	>80%
Cantabro abrasion test on unaged samples (ASTM D7064-04)	<20%
Cantabro abrasion test on 7 day aged samples	<30%

H. Geotextile Fabric – Mirafi 160N or approved equal.

2.3 EQUIPMENT

A. Provide proper compaction equipment to properly compact asphaltic concrete pavement.

2.4 MIXES

A. Bituminous material shall come from one source only.

B. Bitumen and aggregate composition shall be plant mixed entirely.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that all grades onto which asphaltic concrete is to be placed are at the required levels prior to placement. Verify that all miscellaneous concrete work has been installed. Notify the Engineer in writing of conditions that will interfere with the proper completion of this Work. Do not begin work until all improper conditions are remedied. Installation of aggregate base is described in Section 312000 “Earth Moving”.

3.2 PREPARATION

A. Protection

1. Provide tarpaulins for use during conditions such as such as rain, chilling winds or unavoidable delay to cover and protect paving materials.
2. Protect pavement from debris and damage from equipment and other work.
3. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Clean surfaces of bituminous materials when smearing occurs.

3.3 SURFACE PREPARATION FOR POROUS ASPHALT

A. Contactor shall take care to not compact the subgrade under the reservoir base course prior to geotextile and stone depth placement.

B. Contractor to install geotextile on the sidewalls/sideslope of the transition between porous asphalt and standard asphalt pavement.

C. Subbase shall be dry and free from any standing water.

3.4 SURFACE PREPARATION FOR ALL OTHER ASPHALT PAVEMENT

A. Remove all loose and foreign materials before proof rolling and application of prime coat.

B. Proofroll prepared subbase surface to check for unstable areas and areas requiring additional compaction.

C. Do not begin paving work until deficient subbase areas have been corrected and are ready to receive paving.

D. Subbase shall be dry and free from any standing water.

E. Apply prime coat at rate of 0.20 to 0.50 gal per sq yd over compacted subbase. Apply material to penetrate and seal, but not flood, surface. Cure and dry as long as necessary to attain penetration and to allow for evaporation of volatiles.

F. Asphaltic concrete placed on Portland cement concrete pavements or existing asphaltic concrete pavement.

G. Any joints (expansion, contraction, construction, etc.) in the base shall be covered with the reflective cracking membrane.

H. The surface onto which the membrane is placed shall be dry and free of debris. Clean joints over 1/8" wide by pneumatic means and fill with asphaltic joint filler.

I. Prime surface to receive membrane as specified by the membrane manufacturer. Place the membrane in strict accordance with the manufacturer's instructions. Ends shall be overlapped 4" to 6".

J. Placement of the surface course shall closely follow membrane laydown. Do not place more membrane than can be overlaid that working day.

3.5 WOOD FORMS

A. Provide temporary wood forms at perimeter of areas to be paved where permanent side supports (i.e., curbs, gutters or edgings) have not been constructed. Forms are to remain in place until surface course has been thoroughly rolled and compacted to require thickness.

B. Oil wood forms before placing any paving materials against them. Stake forms securely to line and grade, using at least 3 bracing stakes or pins to each ten feet of length, to properly resist pressure and impact of roller without springing form.

C. Forms are to rest firmly upon the thoroughly compacted subbase through their entire length.

D. Clean and re-oil forms each time before reuse.

3.6 PLACEMENT

A. General

1. Prior to installation of pavement, verify all miscellaneous concrete items have been installed.
2. Establish and maintain required lines and elevations.
3. Place asphaltic concrete mixture on prepared surface, spread and strike-off. Spread mixture at the temperature required by Table 403-1 of the NYSDOT Standard Specification. Place inaccessible and small areas by hand. Place each course to required grade, cross-section, and compacted thickness.

4. Begin rolling when mixture will bear roller weight without excessive displacement. Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
5. After final compression, field density shall be not less than 92% of the theoretical maximum density as determined by ASTM D2041.

B. Asphaltic Concrete Base Course - Plant-Mix

1. Provide plant-mix base.
2. Spread sufficient plant-mix to develop a uniform 3" thickness after rolling and compaction.
3. Sprinkle with clean water and compact with a vibratory 10-ton or greater roller. Smaller weight rollers may be required due to load prohibitions on existing structures. Provide multiple rollers for large areas. In areas where the use of a roller is impracticable, heavy mechanical tampers may be used to consolidate the material. Laydown temperature of mixture shall be adjusted to take into account the longer time of the many multiple passes required by smaller compactors or mechanical tampers to achieve the required density.

C. Asphaltic Concrete Surface Course (Top and Binder Course) - Surfacing Mix

1. Prior to placement of surface course, apply tack coat to contact surfaces of previously constructed asphaltic or Portland cement concrete and surfaces abutting or projecting into asphaltic concrete pavement. Distribute at rate of 0.10 gal per sq yd of surface. Allow to dry until at proper condition to receive paving.
2. Place surface course over base only when base is dry and free from standing water.
3. Spread in loose layers and of such depth to result in a uniform course (see Drawings for thickness) after compaction and rolling.
4. Compact the material with approved roller to a smooth even surface and to the levels indicated.
5. Roller shall be a minimum 10-ton tandem type having a rear wheel minimum compression of 225 lbs per lineal inch.
6. Motion of roller shall be slow enough to avoid displacement of the surface rolled.
7. Keep roller wheels moistened with water to prevent adhesion of the materials to wheels, but without use of excessive amount. Use of any liquids other than water for this purpose is prohibited.
8. If the operation of laying materials is interrupted, the end of the laid material shall be left unrolled until the work is resumed so that there will be no joints in the topping.
9. If it is necessary to pass the roller over or to permit traffic to pass over such temporary end, thus consolidating it, cut back the material before recommencing laying operations in order to present a fresh clean surface for contact with the newly placed material.
10. Make joints between old and new pavements, or between successive days' work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density and smoothness as other sections of the asphaltic concrete course. Clean contact surfaces and apply tack coat.
11. The use of liquid bitumen or hot smoothing irons in finishing such joints is prohibited.
12. At locations adjacent to curbing and gutters inaccessible to rollers, compression shall be effected with iron tampers weighing not less than 25 lbs, having a maximum bearing area of 48 in^2.
13. Any surfacing material (i.e., sealer, paint, wearing surface, etc.) to be placed on the asphaltic concrete surface shall only be done after the asphaltic concrete has cured and

the oils have dissipated. Consult with the product manufacturer for their exact requirements.

D. Porous Asphaltic Concrete

1. Install the lower and upper lifts of porous asphaltic concrete to the lines and grades shown on the Drawings. Each lift shall be compacted with a conventional static steel wheel roller to the satisfaction of the Contractor's Engineer. In all instances, the asphaltic concrete shall have the highest stability with minimum loss of permeability. Minimum density shall be 85% of the laboratory specimen.
2. No tack coat shall be used between lifts. Surface of lower lift shall be clean and dry before placing upper lift.
3. Hand compaction shall be used only where roller compaction is impossible and then shall be by hot hand tampers. Hand compaction shall match the results of roller compaction.
4. In-place asphalt lifts shall be tested for compliance with density requirements as determined by nuclear density tests in accordance with ASTM D2950. A minimum of one test for each 5000 square feet of pavement lift shall be conducted and any additional to verify any questionable areas. The cost of all tests conducted shall be included in the Contractor's base bid.
5. Care shall be taken to control the temperature of the asphaltic concrete mix so as to minimize asphaltic cement separation from the aggregate. Typical temperature range should be from 290ºF to 320ºF before compacting it with the roller. For optimum compaction, the asphaltic concrete, after spreading, should be allowed to drop to 260ºF - 290ºF before compacting it with the roller. In no event should the contractor dump and roll the asphalt if the temperature drops below 250ºF.
6. In all instances the asphaltic concrete shall be a uniform mixture of aggregate, bituminous material, and anti-stripping agents such as hydrated lime. The hydrated lime shall be added at a rate of 1% based on the dry weight of the aggregate in the hot mix plant at a point prior to the introduction of the asphaltic cement. The lime shall have adequate mixing time to sufficiently coat the dry aggregate before the asphaltic cement is applied. It shall also be added to a point such as not to become air entrained in the exhaust air system of the hot mix.
7. The contact surfaces of concrete work shall be painted with a thin, uniform coating of liquid asphalt or emulsified asphalt.
8. The entire porous asphaltic surface shall be flooded to check for ponding. Any areas that retain water or drain slowly shall be repaired.
9. The final elevation of the top lift of the asphaltic concrete pavement shall not deviate from the required elevations shown on the Drawings by more than 1/4" plus or minus. Surface smoothness shall not deviate more than 1/4" in 10 feet for the bottom lift and 1/8" in 10 feet for the top lift in any direction when tested with a 10-foot highway straightedge. Areas of the surface which fail to meet this criteria shall be remedied as required to meet this condition at the Contractor's expense. Remedial measures shall consist of replacing the full lift depth of porous asphalt material. Patching the asphalt surface will not be permitted.

3.7 FINISH

A. The rolled finish surface shall be free from porosity, fissures, or blemishes, true to crown and grade; free from depression, waves, bunches, or unevenness so as to allow complete runoff.

B. Should defects in composition compactness or surface finish appear in the completed work, remove defective areas to full depth of the course and replace with thickness and finish specified.

C. With permission of the Engineer, minor surface defects may be repaired with approved sealing compound.

D. Cracking, blistering, running, or deviation from requirements specified above that occur during the guarantee period are considered defects under the warranty conditions of the Contract.

3.8 FINISH FOR POROUS ASPHALT

A. The rolled finish surface shall be free from blemishes, true to crown and grade; free from depression, waves, bunches, or unevenness.

B. Should defects in composition compactness or surface finish appear in the completed work, remove defective areas to full depth of the course and replace with thickness and finish specified.

3.9 PATCHING

A. Remove and replace paving areas mixed with foreign materials and defective areas in a manner acceptable to the Engineer. Cut-out such areas and fill with fresh, hot, asphaltic concrete. Compact by rolling to maximum surface density and smoothness.

3.10 PAVEMENT SEALER APPLICATION

A. Do not apply pavement sealer on pavements covered with other materials.

B. After asphaltic concrete surface course has been tested and approved for allowable tolerances and the surface is hardened to a degree acceptable to the sealer manufacturer (a minimum of 30 days), apply the sealer in accordance with the manufacturer's instructions.

C. Sweep or mechanically clean surfaces thoroughly free of dust, dirt and foreign materials; remove oil and grease spots with household detergent. Flush entire surface with water; remove all remaining water puddles. Apply primer if recommended by the manufacturer.

D. Dampen pavement as recommended by the manufacturer; pour sealer mix in spots or ribbons, then spread evenly with push broom or squeegee. Mechanical applicators may be used, and mix must be periodically agitated for uniformity. Two coats shall be applied, allowing for complete drying, tack free, between coats. Surface shall be uniform, with no holidays or pinholes.

E. Allow sealer to dry about 24 hours minimum depending on weather conditions before opening surface to traffic. Temperature for drying conditions shall not be less than 50°F for 48 hours after application.

F. Apply at a minimum rate per coat of 1.10 gallons of sealer concentrate for every 100 square feet of surface, or more concentrate if required by the sealer manufacturer. Concentrate shall be

mixed with water and clean, dry, silica sand in quantities recommended by the manufacturer. Typical sand content is 5 pounds per gallon of concentrate, and shall meet fineness rating recommended by manufacturer. Maximum water content is 15% of undiluted concentrate volume.

3.11 TOLERANCES

A. The thickness of the plant-mix and surface course shall not vary by more than 1/2".

B. The finish elevation for the plant-mix shall not vary from plan grade by more than 1/2", the surface course by more than 1/4".

C. The smoothness tolerance for the plant-mix is 1/4", the surface course 1/8".

3.12 CLEANING

A. After completion of paving operations, clean surfaces of excess or spilled asphalt materials to the satisfaction of the Engineer.

3.13 PROTECTION

A. After final rolling, do not permit vehicular traffic on asphaltic concrete pavement until it has cooled and hardened so as not to be marked and in no case sooner than 6 hours.

B. Provide barricades and warning devices as required to protect pavement.

C. Cover openings of structures in the area of paving until permanent coverings are placed.

END OF SECTION 321216

SWPPP

APPENDIX R

BIORETENTION SOIL MEDIA SPECIFICATION

- 312000 – Earth Moving

SECTION 312000 EARTH MOVING (Walks, Pavements, Utilities)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplemental Conditions and Division 01 Specification Sections, apply to this Section.

B. Subsurface Investigation Report prepared by Melick-Tully and Associates, P.C.

C. Stormwater Pollution Prevention Plan (SWPPP), Erosion and Sediment Controls and Sequence of Construction.

1.2 SUMMARY

A. Section Includes:

1. Preparing subgrades for walks, pavements, utility structures, stormwater management and bioretention basins, turf and grasses and plants.
2. Subbase course for concrete walks and pavements.
3. Excavating and backfilling for utility trenches.
4. Soil restoration.
5. Fill material for underdrains.
6. Fill material for bioretention soils.
7. Rock removal.

B. Related Sections:

1. Section 311000 “Site Clearing”.
2. Section 312513 “Erosion Controls”.
3. Section 321216 “Asphalt Paving”.
4. Section 321313 “Concrete Paving”.
5. Section 329219 “Seeding”.
6. Section 329223 “Sodding”.
7. Section 329300 “Plants”.
8. Section 331116 “Site Water Utility Distribution Piping”.
9. Section 333100 “Sanitary Utility Sewerage Piping”.
10. Section 333216 "Packaged Utility Wastewater Pumping Stations”.
11. Section 333400 "Sanitary Utility Sewerage Force Mains”.
12. Section 334100 “Storm Utility Drainage Piping”.
13. Section 337119 "Electrical Underground Ducts and Manholes”.

1.3 REFERENCES

A. New York State Department of Transportation (NYSDOT) 2008 Standard Specifications.

B. New York State Department of Environmental Conservation (NYSDEC), New York State Standards and Specifications for Erosion and Sediment Control, 2005 or latest edition ("Blue Book").

C. Town of Thompson Town Code.

D. Occupational Safety and Health Administration (OSHA) Excavation Regulations, latest edition.

1.4 DEFINITIONS

A. Backfill: Soil material used to fill an excavation.

1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
2. Final Backfill: Backfill placed over initial backfill to fill a trench.

B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.

C. Bioretention Soil Media: Engineered soil blend for use in stormwater treatment system.

D. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.

E. Crushed Stone: Natural, non-friable crushed material used for drainage and granular backfill.

F. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.

G. Engineered Fill: Soil materials used to raise existing grades and placed under controlled conditions.

H. Pea Gravel: Natural non-friable rounded material to be used as filter blanket for porous pavement.

I. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cubic yard for bulk excavation or ¾ cubic yard for footing trench, and pit excavation that cannot be removed by rock excavating equipment without systematic drilling, ram hammering, ripping, or blasting, when permitted.

J. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

K. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.

L. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.

M. Utilities: On-site underground pipes, conduits, ducts, and cables, as well as underground services within structures.

1.5 SUBMITTALS

A. Materials Source: Submit name of imported materials source.

B. Material Test Reports: For each soil material proposed for fill and backfill.

1. Classification according to ASTM D 2487.
2. Laboratory compaction curve according to ASTM D 1557.

C. Product Data: Submit gradation, maximum wash loss, minimum durability index, maximum abrasion loss, air voids.

1.6 QUALITY ASSURANCE

A. Pre-excavation Conference: Conduct conference at Project site.

B. Field quality-control test reports.

1.7 PROJECT CONDITIONS

A. Do not commence earth moving operations until temporary erosion and sedimentation control measures, specified in Section 312513 “Erosion Controls” are in place.

B. Rock removal may be required for deeper excavations. Contractor to refer to and comply with Town of Thompson Town Code for rock removal.

C. Provide groundwater and runoff controls consisting of drains and diversions or additional measures, as necessary, so as to maintain dry excavations. Implement in accordance with the SWPPP and regulations of the New York State Department of Environmental Conservation (NYSDEC).

D. Provide erosion and sediment controls and construction sequencing in accordance with the SWPPP and regulations of the New York State Department of Environmental Conservation.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

A. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940. Meet NYSDOT 2008 Standard Specifications Type 4 gradation.

B. Engineered Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2-inch sieve, not more than 15 percent (by weight) passing a No. 200 sieve, and a maximum particle size of 6 inches.

C. Bedding Course: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch sieve and no fines (no material passing a No. 200 sieve).

D. Drainage Course, Choker Course and Reservoir Course for bioretention basins, asphalt porous pavement. All stone must be clean washed stone from the quarry or material producer as identified below.

US Standard Sieve Size (inches)	Drainage Course/Choker Course (AASHTO No. 57) Percent Passing	Reservoir Course (AASHTO No. 3) Percent Passing
2.5		100
2		90-100
1.5	100	35-70
1	95-100	0-15
¾		
½	25-60	0-5
3/8		
No.4	0-10	
No.8	0-5	
% Compaction (ASTM D698/AASHTO T99)	**95%**	**95%**

E. Filter Blanket for Porous Pavement: uniformly graded, clean washed, 3/8-inch Pea Gravel.

F. Bioretention Areas:

1. 12-inch Drainage Course
2. Bioretention Soil Media Characteristics:
   a. pH Range: 5.2 to 7.0.
   b. Organic Matter: 1.5 to 4.0%
   c. Magnesium: minimum 35 pounds per acre.
   d. Phosphorous (P205): minimum 75 pounds per acre.
   e. Potassium (K20): minimum 85 pounds per acre.
   f. Soluble Salts: 500 ppm.
   g. Clay: 10 to 25%.
   h. Silt: 30 to 55%.
   i. Sand: 35 to 60%.

G. Subsurface Drain – Drainage Course specified in the above table to be used as the stone fill within these drains.

H. Granular Backfill – ¾ inch clean, crushed stone.

2.2 ACCESSORIES

A. Detectable Warning Tape: Acid- and alkali-resistant, polyethylene film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (750 mm) deep; colored to comply with local practice or requirements of authorities having jurisdiction.

B. Filter Fabric: 140N by Mirafi, or approved equal.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth moving operations.

B. Protect and maintain erosion and sedimentation controls during earth moving operations.

C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection and all frost damaged soils before placing subsequent materials.

D. Perform all excavations in accordance with current OSHA safety requirements. Excavation side slope support shall be provided using soldier piles and lagging, where necessary.

3.2 EXCAVATION, GENERAL

A. Unclassified Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated materials may include rock, soil materials, and obstructions. No changes in the Contract Sum or the Contract Time will be authorized for rock excavation or removal of obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

B. Any excavations resulting from demolition and utility removal to be backfilled with compacted engineered fill.

C. Contractor shall provide all equipment, labor and acceptable means necessary to maintain dry excavations at all times. No changes in the Contract Sum or the Contract Time will be authorized for dewatering, treatment, or disposal of water.

3.3 ROCK REMOVAL

A. Refer to and comply with Town of Thompson Town Code for any rock removal.

3.4 EXCAVATION FOR WALKS AND PAVEMENTS

A. Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5 EXCAVATION FOR STORMWATER MANAGEMENT AND BIORETENTION BASINS

A. Excavate surfaces to indicated lines, cross sections, elevations, and subgrades.

B. Sequence Work so as to avoid densifying the soil subgrade within areas where porous pavement and bioretention areas will be constructed.

3.6 EXCAVATION FOR UTILITY TRENCHES

A. Excavate trenches to indicated gradients, lines, depths, and elevations.

B. Excavate trenches to uniform widths to provide the following clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe or conduit unless otherwise indicated.

1. Clearance: 12 inches each side of pipe or conduit.

C. Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes and conduit. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits. Remove projecting stones and sharp objects along trench subgrade.

1. Excavate trenches 6 inches deeper than elevation required in rock or other unyielding bearing material, 4 inches deeper elsewhere, to allow for bedding course.

D. Trenches in Tree- and Plant-Protection Zones:

1. Hand-excavate to indicated lines, cross sections, elevations, and subgrades. Use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
2. Do not cut main lateral roots or taproots; cut only smaller roots that interfere with installation of utilities.

3.7 SUBGRADE INSPECTION

A. Proof-roll subgrade below the pavements with a pneumatic-tired dump truck to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.

B. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.8 STORAGE OF SOIL MATERIALS

A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 UTILITY TRENCH BACKFILL

A. Place backfill on subgrades free of mud, frost, snow, or ice.

B. Place and compact bedding course on trench bottoms and where indicated. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.

C. Place and compact initial backfill of subbase material, free of particles larger than 1 inch in any dimension, to a height of 12 inches over the pipe or conduit.

1. Carefully compact initial backfill under pipe haunches and compact evenly up on both sides and along the full length of piping or conduit to avoid damage or displacement of piping or conduit. Coordinate backfilling with utilities testing.

D. Place and compact final backfill of satisfactory soil to final subgrade elevation.

E. Install detectable warning tape directly above utilities, 12 inches below finished grade.

3.10 SOIL FILL

A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.

B. Place and compact fill material in layers to required elevations as follows:

1. Under grass and planted areas, use satisfactory soil material.
2. Under walks, pavements, and utility structures, use engineered fill.

3.11 SOIL MOISTURE CONTROL

A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.

1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

A. Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.

B. Place backfill and fill soil materials evenly on all sides of structures to required elevations, and uniformly along the full length of each structure.

C. Compact soil materials below to not less than the following percentages of maximum dry unit weight according to ASTM D 1557:

1. Under pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 98 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 98 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 95 percent.
4. For utility trenches, compact each layer of initial and final backfill soil material at 98 percent.

D. Compact drainage course, choker course, reservoir course soil materials to not less than 95 percent according to ASTM D 698.

3.13 GRADING

A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.

B. Site Rough Grading: Slope grades to direct water away from structures and to prevent ponding. Finish subgrades to required elevations within the following tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch.
2. Walks: Plus or minus 1/2 inch.
3. Pavements: Plus or minus 1/2 inch.

C. Protect prepared areas from damage.

3.14 SUBBASE COURSE UNDER PAVEMENTS AND WALKS

A. Place subbase course and base course on subgrades free of mud, frost, snow, or ice.

B. On prepared subgrade, place subbase course under pavements and walks as follows:

1. Shape subbase course to required crown elevations and cross-slope grades.
2. Place subbase course that exceeds 6 inches in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick.

3. Compact subbase course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 98 percent of maximum dry unit weight according to ASTM D 1557.

3.15 SOIL RESTORATION

A. The Contractor will be required to complete soil restoration in the areas of the proposed pervious surfaces once final grade has been achieved in these areas. The type of soil restoration will depend on the type of soil disturbance and the type of hydrologic soil group. The Contractor will be required to complete soil restoration in conformance with the various methods outlined in the following table:

Type of Soil Disturbance	**Soil Restoration Requirement**		**Comments/Examples**
No soil disturbance	Restoration not permitted		Preservation of Natural Features
Minimal soil disturbance	Restoration not permitted		Clearing and grubbing
Areas where topsoil is stripped only - no change in grade	HSG A &B	HSG C&D	Protect area from any ongoing construction activities.
	Apply 6 inches of topsoil	Aerate and apply 6 inches of topsoil	
Areas of cut or fill	HSG A &B	HSG C & D	
	Aerate and apply 6 inches of topsoil	Apply full Soil Restoration	
Heavy traffic areas on site (especially in a zone 5-25 feet around buildings but not within a 5 foot perimeter around foundation walls)	Apply full Soil Restoration (de-compaction and compost enhancement)		
Areas where Runoff Reduction and/or infiltration practices are applied	Restoration not required, but may be applied to enhance the reduction specified for appropriate practices.		Keep construction equipment from crossing these areas. To protect newly installed practice from any ongoing construction activities construct a single phase operation fence area.

3.16 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.

B. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.

C. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.17 PROTECTION

A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.

C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

   1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.18 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION 312000