

## **Exhibit VIII.C.16 (Physical Plant and Mechanical Systems):**

*Submit as Exhibit VIII. C.16. a brief description of plans for mechanical systems and on-site infrastructure, with particular emphasis on unique features (e.g. district hot or cold water, on-site power generation, on-site water or waste treatment, etc.). Indicate whether the project relies on distributed or building HVAC, chilled and hot water, and other systems. Describe plans for systems redundancy, if any. Describe significant dedicated physical plant spaces by location and approximate square footage. Describe plans for emergency power generation and uninterruptable power supply.*

### **Preliminary Conceptual Design Criteria and System Summary**

The conceptual design criteria and system description are based on initial assessments on the design approach using a Central Utility Plant consisting of a central chiller plant, central boiler plant and centralized plumbing and electrical services where feasible and appropriate. This design approach will be examined further during the exhaustive design process during which alternative design solutions will be examined, considered, and selected where appropriate.

#### **HVAC**

Cooling for the Saratoga Casino, Hotel and Entertainment Center is envisioned to be provided via a central chilled water plant. The central chilled water plant will most likely consist of high-efficiency electrically driven centrifugal water chillers using an environmentally friendly refrigerant piped in a parallel arrangement for redundancy as well as better part load performance.

The central chilled water plant would include plate-and-frame heat exchangers that will be configured for both waterside economizer with all chillers off (parallel configuration) as well as chilled water return precooling (series configuration).

Refrigerant vapor in the chiller condensers are envisioned to be cooled by multiple-cell factory-fabricated induced-draft cross-flow cooling towers arranged in an N+1 configuration. The cooling towers would be located on-grade adjacent to the proposed central chiller plant.

Chilled water and condenser water pumping systems would consist of multiple variable speed primary chilled water pumps which provide chilled and condenser water distribution.

The hot water generation system would consist of multiple condensing hot water boilers also piped in a parallel arrangement for redundancy and better part load performance. Hot water will be used for space heating and domestic hot water use.

The hot water distribution system would be through a variable primary flow configuration.

It is envisioned that multiple variable air volume and variable temperature systems of air conditioning supply and return will be provided for all the podium spaces (excluding the Hotel) including, but not limited to, Hotel Operations, Casino Gaming, Casino Support, Entertainment, Bars, Lounges, Food and Beverage, Restaurants, Administrative Areas, Retail Shops, etc. Air handling systems will be roof-mounted, where possible, or indoor systems located in Mechanical Rooms.

The Spa, Fitness Center and Pool would be provided with separate factory-assembled low-pressure, low-velocity constant air volume and variable air temperature supply air conditioning systems, return and exhaust fans.

Each Kitchen would be provided with an individual kitchen exhaust fan to the kitchen hoods. Ventilation systems are envisioned to be provided for makeup air and air-to-air heat recovery to individual Kitchens.

Systems of air transfer, toilet exhaust, laundry exhaust, general exhaust, outside air makeup, Mechanical Equipment Room exhaust, Garbage Room exhaust, Grease Recovery Room exhaust, Truck Dock exhaust and Garage exhaust, etc., will be provided for all spaces requiring air exhaust, all as required by code. All electrical and technology spaces would be cooled by factory-assembled chilled water air conditioning units. Critical systems are envisioned to be provided with air conditioning units configuration.

Primary air supply systems are also envisioned to be provided to serve Hotel Guest Rooms and Suites. Under this scenario, primary air supply systems would provide conditioned 100% outside air ducted to each room to provide a pressure balance for each floor when combined with corridor A/C and Guest Room toilet exhaust.

It is envisioned that all Guest Rooms and Suites will be air conditioned, most likely via a four-pipe vertically stacked modular-type fan coil unit with slave units connected and piped to the master unit in a back-to-back configuration.

It is currently envisioned that the central air conditioning systems for all areas will be arranged to provide 100% supply air and 100% exhaust to purge the building of smoke in the event of a fire/smoke condition as well as provide a full airside economizer cycle.

It is currently envisioned that a fully stand-alone microprocessor-based direct digital automatic temperature and energy management control system (DDC) will be provided for the project.

## **Electrical**

The facility is also envisioned to be supplied with two 13.2 kV electrical circuits, each capable of carrying 100% of the peak electrical load of the entire site, which will be fed from Central Hudson Gas & Electric. The services would run in two separate concrete-encased duct banks from the property line along Route 17K to the primary distribution Switchgear Room. Each of the two services will most likely be distributed to multiple double-ended substations, each sized such that a loss of either transformer in each substation will not cause a loss of electrical service to any space or piece of equipment and will provide a significant amount of redundancy in the service for service and maintenance.

The utilization voltage within the building will most likely be at 277/480 volt for motors and lighting. All small power and utility loads will be distributed at 120/208 volts. It is envisioned that all distribution to the casino equipment will be via a raised floor utilizing wire raceways and low-voltage cable management systems.

Code-mandated emergency power will be provided for life safety and smoke control as well as stair and egress lighting. In addition, it is envisioned that a second generator, operated in parallel with the first, will be provided to allow the Casino to operate selected critical activities in the event of a significant electric utility system failure.

The code-mandated fire alarm/life safety systems will incorporate both audible as well as visual annunciation from a Fire Control Station located adjacent to the main entrance of the Casino Hotel at a location acceptable to the local Authorities. In addition, a Fire Department one-way voice communication system will most likely be provided to permit the Fire Department to issue voice commands to the occupants of the entire facility.

It is envisioned that all of the project lighting controls will all be of the electronic type to permit intelligent zone controls, dimming, occupied/unoccupied and cleaning modes. In addition, it is envisioned that the Hotel will incorporate intelligent room controls and occupancy monitoring for maximum energy savings.

## **Plumbing and Fire Protection**

A complete cold water distribution system will be provided to supply water to all fixtures and water-

consuming equipment. Currently, it is envisioned that two domestic water services will be brought into the project site and extended to a quadruplex variable frequency drive (VFD) booster pump system with pneumatic tank and controls. The domestic water system will serve the plumbing fixtures and equipment throughout the building, including water supply to the hot water heaters and makeup water during periods of dry weather for the proposed stormwater reclamation tank/system, which will most likely provide the majority of the water used for cooling tower makeup.

The domestic hot water system will parallel the domestic cold water system. The domestic hot water system would utilize water-to-water plate-and-frame heat exchangers with storage tanks to generate hot water from the heating boiler plant. The Hotel Tower and the Gaming Area Restaurants will most likely be provided with duplex hot water heaters located adjacent to the boiler plant. It is envisioned that the domestic hot water will be distributed to all fixtures and equipment requiring hot water through a central hot water system utilizing supply and return circulation piping with associated mixing valves.

A complete, code-compliant soil, waste and vent system will be provided from all plumbing fixtures, mechanical equipment and floor drains. To the greatest extent possible, the system will be arranged for gravity flow to a point of connection with the municipal sewer. Multiple sets of duplex ejectors will most likely be provided at the lowest level to serve all below-grade levels and areas that cannot drain to the gravity sanitary system. Grease interceptors/automatic removal devices will be provided to remove grease from the kitchen waste stream, per code.

Gas service will be provided to the project from the municipal street main. The project will be provided with a high-pressure gas service and will be metered to supply gas to all gas-consuming equipment, including gas-fired condensing boilers for space heating and domestic hot water generation, and for restaurant cooking requirements.

The project will be provided with a complete storm drainage system to serve the roof, all setback roofs, terrace, plaza and area way drains. The system will be arranged for gravity flow to the site storm drainage facility. The stormwater system for the complex will be provided with detention tanks as may be required to comply with the stormwater strategies for the site. It is currently envisioned that the stormwater will be captured and reused for cooling tower makeup, and to the extent possible, pool water makeup.

All water-utilizing fixtures would be high-efficiency water-saver type to meet all water-conserving statutes as well as flow rates required to achieve points for LEED water efficiency.

The building will be protected throughout by a combination fire standpipe system.

Two fire services will be brought into the building, cross-connected and extended to an automatic fire pump and jockey pump. The fire standpipe system will be provided with exterior fire department connections around the project property at all locations having fire department vehicle access.

The building will be protected throughout by an automatic sprinkler system supplied from the combination fire standpipe system risers.

All areas subject to freezing will be provided with a dry sprinkler system.

All Electrical Equipment Rooms and Critical Technology Rooms will be provided with a preaction sprinkler system.

All sprinkler and fire standpipe control valves, sectionalizing valves and all water flow devices will be supervised and connected to the building fire alarm system.

The entire combination fire standpipe and automatic sprinkler systems will be seismically restrained.

The entire installation will comply with provisions of the 2010 New York State Construction Codes (NYSCC), National Electrical Code – NFPA 70, as well as all other applicable Codes and Regulations.