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Schematic Design Systems Report
Montreign Resort Casino
ALTERNATIVE #2

Montreign Resort Casino
Town of Thompson, New York

JCJ Architecture, PC
230 Park Avenue, 10th Floor
New York, New York 10169

June 2, 2014
M/E Reference 121012.00

Value-driven solutions.
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No Competition Model
Attachment VIII. C.16-1-ALT-2

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I. HVAC DESIGN AND SYSTEM DESCRIPTION

A. Design Criteria:

1. Design Conditions – Outdoor:

a. System load calculations will be based on the following outdoor design conditions:

Winter: 0°F
Summer: 91.3°F DB
74.0°F WB

2. Design Conditions – Indoor:

a. Systems will be designed to maintain the following conditions:

Area	Temperature °F	Relative Humidity %
Office Areas	72-75	40-60
Gaming Areas	72-75	40-60
Meeting Areas	72-75	40-60
Restaurants	72-75	40-60
Pool	78-84	50-60
Storage Areas	65-80	---
Kitchen	70-80	---

3. Ventilation and Air Balance:

a. Air distribution systems will be designed to maintain air balance relationships and ventilation rates based on the applicable codes having jurisdiction and on the Owner's requirements.

4. Codes:

a. Systems will be designed in accordance with, but not limited to, the following codes:

1) 2010 Building Code of New York State
2) 2010 Mechanical Code of New York State
3) 2010 Plumbing Code of New York State
4) 2010 Fuel Gas Code of New York State
5) 2010 Energy Conservation Code of New York State
6) 2008 National Electric Code
7) 2006 Life Safety Codes, NFPA 101

5. Standards:

   a. The following reference standards will be used in design:

      1) ASHRAE – Handbooks and Standards
      2) SMACNA – Standards for Duct Construction
      3) AMCA – Air Handling Equipment Standards
      4) ARI – Air Conditioning and Refrigeration Institute
      5) ANSI – Safety Code for Mechanical Refrigeration
      6) UL – Underwriter's Laboratories, Inc.
      7) IRI – Industrial Risk Insurers
      8) FM - Factory Mutual

6. Equipment and Materials:

   a. Acceptable Manufacturers:

      1) Systems will be designed using the following manufacturers of equipment:

a)	Air Filters	Farr, Cambridge
b)	Air Outlets	Anemostat, Price, Titus
c)	Heat Recovery Units	Semco, Venmar, DesChamps
d)	Kitchen Hood Makeup Air Unit	Greenheck Sterling, Reznor
e)	Air Handling Units	McQuay, York, Carrier
f)	Exhaust Fans	Greenheck, Cook, Acme
g)	Insulation	Owens-Corning, Knauf
h)	Unit Heaters (Hot Water)	Sterling, McQuay, York, Carrier
i)	Cabinet Unit Heater (Hot Water)	Sterling, McQuay, York
j)	Variable Air Volume Boxes	Titus, McQuay
k)	Direct Digital Controls	Johnson Controls, Siemens, Andover
l)	Chillers	Carrier, York, McQuay
m)	Cooling Towers and Closed Circuit Coolers	Evapco, Tower Tech, Baltimore Air Coil
n)	Fan Coil Units	IEC, McQuay, Carrier, Johnson Controls
o)	Water Specialties	Bell & Gossett, Taco
p)	Boilers	Fulton, Lochinvar, Cleaver Brooks

b. Materials:

1) The following materials will be specified:

a) Sheet Metal Ductwork – Galvanized sheet steel, lock-forming quality in accordance with the latest SMACNA Standards.
b) Piping - Type "L" copper with wrought iron fittings for piping 2 inch and smaller, Schedule 40 black steel piping with welded or victaulic fittings for 2-1/2 inch and larger.

B. HVAC System Descriptions

1. The Chiller Plant will consists of the following equipment:

a. Chillers - Three (3) McQuay magnetic bearing centrifugal nominal 400 ton chillers, 232 kW input, 800 gpm chilled water flow (12°F ΔT), 1200 gpm condenser water flow (10° F ΔT).

b. Condenser Water Pumps - Three (3) Bell and Gossett Model VSC-4 x 6 x 13-1/2, 1200 gpm @ 80 ft. head, 40 HP, 460/3/60 (variable speed) 1780 rpm.

c. Primary Chilled Water Pumps - Two (2) Bell and Gossett Model VSC 5 x 6 x 13-1/2, 1600 gpm @ 100 ft. head, 60 HP, 460/3/60 (variable speed), 1780 rpm.

d. Cooling Tower - Three (3) Baltimore Air Coil Model VT1-N418-P, two (2) 40 HP motors each, 1200 gpm from 95°F to 85°F at 75°F WB, 460/3/60 with access ladders, sump heaters and electric water level controls vibration switches.

e. Closed Circuit Cooler - One (1) Baltimore Air Coil Model YFL-048-31M, 180 gpm from 95°F to 85°F at 75°F wb, one (1) 20 HP fan, one (1) 1-1/2 HP spray pump. (Serves Hotel ice machines and miscellaneous kitchen equipment.)

f. Condenser Water Pumps (Serving Closed Circuit Cooler) - Two (2) Bell and Gossett, Series 1510 Model 2E, 180 gpm @ 90 ft. head, 7-1/2 HP, 460/3/60, 1750 rpm.

g. Free Cooling Heat Exchanger - Cool 800 gpm from 72°F to 60°F using 1200 gpm from 48°F to 58°F.

2. The Heating Plant will consists of the following equipment:

a. Hot Water Boilers - Four (4) Fulton Model VTG-6000, 6000 MBH input each, 5280 MBH output.

b. Primary Hot Water Pumps - Two (2) Bell and Gossett Model VSC 4 x 6 x 10-1/2B, 900 gpm @ 80 ft. head, 30 HP, 460/3/60.

3. The Ventilation Systems will include the following Air Handling units and Heat Recovery units and Air Handling Units:

   a. Roof Mounted Heat Recovery Units (100% Outside Air) shall include dual heat recovery wheels, supply fan with VFD, exhaust fan with VFD, chilled water coils, electric reheat coil and 30% filters. The one (1) Heat Recovery unit serving the Hotel make-up air will be single wheel unit with hot water reheat for providing neutral make-up air.

HEAT RECOVERY UNIT SCHEDULE					
Unit Number	**Area Served**	**CFM**	**Model**	**AC/H R**	**Capacity (Tons)**
HRU-1	Gaming	36,000	SEMCO EPD-43	8	120
HRU-2	Gaming	36,000	SEMCO EPD-43	8	120
HRU-3	Gaming	36,000	SEMCO EPD-43	8	120
HRU-4	Gaming	36,000	SEMCO EPD-43	8	120
HRU-5	Steakhouse	9,000	SEMCO EPD-18	6	30
HRU-6	Food Court	9,500	SEMCO EPD-18	6	32
HRU-7	Hotel Makeup	10,000	SEMCO EPD-18	1	34
HRU-8	Health Club	7,500	SEMCO EPD-13	8	25

   b. Roof Mounted Air Handling Units (50% Outside Air) shall include supply fan with VFD (unless noted otherwise as single zone), chilled water coil, 30% filters, electric reheat coil and mixing box.

AIR HANDLING UNIT SCHEDULE					
Unit Number	**Area Served**	**CFM**	**Model**	**AC/H R**	**Capacity (Tons)**
AHU-1	First Floors BOH	6,000	McQuay Skyline OAH018 (VAV)	6.0	15
AHU-2	Conference Center	15,000	McQuay Skyline OAH045 (VAV)	6.0	37
AHU-3	Lower Level 1 BOH	18,000	McQuay Skyline OAH045 (VAV)	6.0	45
AHU-4	Hotel BOH	9,000	McQuay Skyline OAH024 (VAV)	6.0	22
AHU-5	Lower Level 2 BOH	18,000	McQuay Skyline OAH045 (VAV)	6.0	45

AIR HANDLING UNIT SCHEDULE					
Unit Number	**Area Served**	**CFM**	**Model**	**AC/H R**	**Capacity (Tons)**
AHU-6	Show Room	15,000	McQuay Skyline OAH045 (VAV)	6.0	38
AHU-7	Kitchen	15,000	McQuay Skyline OAH045 (VAV)	6.0	38

c. Return Fans shall serve each respective Air Handling Unit and shall include vibration isolation hangers, access doors and variable frequency drives.

MAKEUP AIR UNIT SCHEDULE			
Unit Number	**Area Served**	**CFM**	**Model**
MAU-1	Kitchen Hood	8,000	Greenheck Model MSX-32
MAU-2	Kitchen Hood	8,000	Greenheck Model MSX-32

d. Makeup Air unit shall include supply fan, gas heat exchanger and 30% filters.

4. Insulated supply ductwork will run from the new air handling units to the respective zones. The air handling units designated as variable air volume will have variable frequency drives on the AHU's and respective RAF's and will include VAV boxes for individual room control. Each VAV box will serve up to a maximum of 2500 square feet. Return air will be ducted back to the respective HRU and AHU.

5. The Hotel Rooms and Hotel Corridors will be served by 4 pipe fan coil units. Each unit will be nominal one (1) ton unit with unit mounted controls and an associated wall occupancy sensor with enhanced capabilities that can be tied into the Hotel Billing system with various setback options.

6. Exhaust systems will serve the Toilet Rooms, Electrical Rooms, Janitor's Closets and Mechanical Equipment Rooms. Kitchen exhaust hoods will be served by dedicated exhaust fans with grease ducts with "Firewrap" insulation and access doors per NFPA. All Hotel exhaust systems will be fully ducted.

7. The two (2) Hotel stair towers will each be served by a stairwell pressurization system.

8. Entrance Vestibules and stairs will be heated with hot water cabinet heaters. Equipment Rooms, Storage Rooms and Loading Docks will be heated with hot water unit heaters.

9. A new Energy Management and Control DDC system will be installed to monitor and control all new HVAC equipment, monitor plumbing equipment, integrate interior and exterior lighting controls, monitor electric equipment, and monitor coolers and freezers.

10. All new equipment will be provided with the required vibration isolation and all rooftop HVAC equipment will be properly supported.

11. All new systems will be tested and balanced with respect to air and water flow per the required design criteria.

12. All control wiring will be installed in accordance with the National Electric Code.

13. All new hydronic systems will be furnished with the required water treatment and will be properly cleaned and flushed prior to operation.

14. Security and Surveillance Rooms shall be provided with dedicated Liebert 15 ton "DS" floor mounted A/C systems (two (2) units per room). I.T. Room will be provided with dedicated Liebert 3 ton "Mini-Mate" ceiling mounted A/C systems.

15. Fire and fire/smoke dampers will be provided as required by code.

16. The Contractor will be responsible for providing complete closeout documentation including Owner instructions lubrication charts, Operation and Maintenance Manuals, and Record Drawings (Certified As-Built Drawings).

II. PLUMBING DESIGN AND SYSTEM DESCRIPTION

A. Design Criteria

1. Codes:

a. All work will comply with the following:

1) 2010 Building Code of New York State
2) 2010 Plumbing Code of New York State
3) 2010 Fuel Gas Code of New York State
4) 2006 NFPA-101 Life Safety Code
5) Americans with Disabilities Act (ADA)

2. Standards:

a. All work will comply with the following:

1) Underwriter's Laboratories, Inc. (UL)
2) IRI - Industrial Risk Insurers
3) AGA - American Gas Association
4) ANSI - American National Standards Institute
5) ASME - American Society of Mechanical Engineers
6) ASSE - American Society of Sanitary Engineers
7) ASTM - American Society for Testing and Materials
8) FM - Factory Mutual
9) NSF - National Sanitation Foundation

3. Equipment and Materials:

a. Acceptable Manufacturers:

1) Systems will be designed using the following manufacturers of equipment:

a)	Drainage Products	J.R. Smith, Zurn, Wade, Watts
b)	Backflow Preventers	Watts, Ames, Wilkins
c)	Pressure Reducing Valves (Water)	Watts, Wilkins, A.W. Cash
d)	Insulation	Owens Corning, Knauf, Certainteed
e)	Plumbing Fixtures	American Standard, Eljer, Kohler
f)	Electric Drinking Fountains	Elkay, Haws, Halsey Taylor
g)	Valves	Watts, Nibco, Milwaukee
h)	Domestic Water Pressure Booster System	Grundfos, Bell and Gossett, Armstrong
i)	Pumps	Bell and Gossett, Armstrong, Grundfos
j)	Flushometers	Sloan, Zurn

k) Mop Receptors..... Fiat, Stern-Williams
l) Stainless Steel Sinks..... Just, Elkay
m) Water Heaters..... Wheeler, Lochinvar, PVI
n) Grease Interceptor..... Proceptor, Schier

b. Materials:

1) Interior Storm and Sanitary Underground:

a) Schedule 40 PVC polyvinyl chloride plastic pipe with socket type cement weld fittings.
b) Dishwasher drain piping to be service weight cast iron.

2) Interior Storm Aboveground:

a) Service weight cast iron bell and spigot soil pipe and fittings with neoprene gaskets.

3) Interior Sanitary Aboveground:

a) Hubless cast iron pipe and fittings with stainless steel housing clamp assembly.
b) Copper Type "DWV" piping and fittings.
c) Sovent aerator and deaerator cast iron fittings for Hotel Sovent System.

4) Domestic Water Piping Underground:

a) Class 52 ductile iron pipe and fittings, asphaltic coated, cement lined, push-on type joints.

5) Domestic Water piping Aboveground:

a) Copper Type "L" piping and fittings.
b) Schedule 40 galvanized steel pipe and roll grooved mechanical type couplings.

6) Natural Gas Piping Underground:

a) Polyethylene pipe and fittings with fusion joints.

7) Natural Gas Piping Aboveground:

a) Schedule 40 black steel pipe and threaded/welded fittings.

B. Scope of Work

1. Domestic Water Systems:

a. An 6 inch domestic water service will be provided. An 8 inch fire protection service will also be provided under the plumbing work. Dual 6 inch reduced pressure backflow preventers will be installed in the domestic water service piping. An 8 inch double check detector assembly backflow preventer will be installed in the 8 inch fire service under the plumbing work. Connection of fire protection system to the

backflow preventer will be made under the fire protection work. All backflow preventers will be installed as required by the State Department of Health. The backflow preventers will be arranged to drain to the building exterior. The installation of two (2) backflow devices on the domestic water service will facilitate the required annual testing of these devices without completely shutting off domestic water to the building. Domestic water will be distributed throughout the facility to all fixtures and equipment as required. A total of two (2) water pressure booster systems will be provided for the Casino and Hotel. This will provide the required pressure at the most remote plumbing fixtures in the Casino and Hotel. Pressure reducing valve stations will be provided in the Mechanical Room to regulate the pressure to the Casino and Hotel Zone No. 1. The connection of the new domestic water and fire services to the site water service to be made by the Site Contractor. The anticipated peak domestic water demand is estimated at 300 gpm. The anticipated peak fire suppression system water demand is estimated at 1,000 gpm.

b. Domestic hot water will be generated by water-to-water storage type water heaters.

The Hotel will be divided into one (1) domestic water zone. Two (2) 300 gallon water heaters will be provided. Vertical CW & HW risers will be provided from the Mechanical Room to feed all the Suites up to the Fourth Floor. At the First Floor ceiling a recirculating line will connect to the HW risers with a recirculating riser returning to the water heaters.

Three (3) 500 gallon water heaters will be provided for the Casino.

c. Hot water recirculating systems with recirculating pumps will maintain hot water availability within the systems at all times.

d. Water will be stored in the water heaters at 140°F. Mixing valves will be provided to supply 110°F water for general fixtures and the Hotel. The mixing valves for the Hotel will be adjustable to provide temperatures higher than 110°F, if desired. 140°F water will be supplied to the kitchens. 140°F water with a master mixing valve will be provided for the Spa showers. This will provide hot water temperature adjustment for the Spa showers.

e. Backflow prevention devices will be provided at all potential sources of cross contamination within the building.

f. All water piping will be insulated.

2. Sanitary Systems:

a. Interior sanitary sewers, soil, waste and vent piping including connections to all fixtures, floor drains, floor sinks, and equipment will be provided. Two (2) 10 in. sanitary sewers will terminate 5'-0" beyond the building. Connection to the site sanitary system to be made by the Site Contractor. The anticipated peak sanitary demand is estimated at 300 gpm.

b. Trap primer connections will be provided for all floor drains.

c. Cleanouts will be provided as required by Code.

d. Sanitary drainage and vent piping will be provided as required for all bar/beverage/food service areas.

e. An exterior underground grease interceptor will be provided for the kitchen and other areas as required to prevent grease from entering the site sanitary sewer system.

f. A sovent single pipe drain system will be provided for the Hotel.

3. Storm Water Systems:

a. Roof drains, storm water piping and storm water conductors will be provided. Two (2) 12 inch primary and secondary storm sewers will be provided. Storm water sewers will terminate 5'-0" beyond the building. Secondary roof drains and storm water piping will be required at all flat roof areas with parapets which prevent storm water from spilling to grade, as required by the Plumbing Code. Connection to the site storm water system to be made by the Site Contractor. The secondary storm system will discharge above grade.

b. Pump discharge from elevator pumps will connect to the sanitary system. The pumps will be equipped with an oil sensor which will allow the pumps to operate when oil is not present. If oil is present, the pumps will not operate, preventing the introduction of oil into the sanitary system, but will generate a signal to notify the maintenance staff that oil-containing liquid is accumulating in the sump. Pumps will be sized to handle 50 gpm for each elevator cab in each shaft.

c. Roof drain bodies, horizontal storm water piping, and the first 12 inches of vertical piping will be insulated.

d. The storm water system for large flat areas will be an engineered siphonic roof drainage system.

4. Natural Gas:

a. Internal gas piping will be provided to all gas fired equipment. The gas service will terminate at 5'-0" from the building. Connection to the site gas service will be by the Site Contractor. The estimated peak gas load is 24,000 MBH with an annual consumption of approximately 35,000 MCF/year.

5. Fixtures and Equipment:

a. Plumbing fixtures conforming to the Plumbing Fixture Law of the State Department of Environmental Conservation will be provided for the Casino and Hotel. Floor drains, floor sinks, condensate drains and all water, waste and vent piping will be provided as required. Plumbing fixtures for the physically challenged will be provided. Flush valves and lavatory faucets in the Casino will be hard-wired, sensor operated.

b. Roughing and final connections will be provided to all equipment furnished by others, including all kitchen and food service equipment.

c. Water hammer arrestors will be provided at all flush valves, quick-closing devices, and where required to prevent water hammer in the domestic water systems.

d. Wall hydrants will be provided at the exterior walls.

e. Access doors will be provided in areas of drywall ceilings and walls as required for access to shutoff valves, cleanouts, etc.

f. Hose bibbs will be provided in Mechanical Rooms, Gang Toilet Rooms, and where required.

g. The swimming pool, water feature, filtration systems, Spa equipment and heaters, and housekeeping equipment to be provided by the equipment supplier. Water and waste piping and connections to the pool, water feature, and Spa equipment will be provided as required. An emergency eyewash with mixing valve to supply tepid water will be provided in the Pool Filtration Room. All work will comply with the State Sanitary Code for Swimming Pools.

III. FIRE PROTECTION DESIGN AND SYSTEM DESCRIPTION

A. Design Criteria

1. Codes:

   a. All work will comply with the following:

      1) 2010 Fire Code of New York State

2. Standards:

   a. All work will comply with the following:

      1) NFPA 13 - Standard for the Installation of Sprinkler Systems.
      2) NFPA 14 - Standard for the Installation of Standpipe and Hose System.
      3) NFPA 20 - Standard for the Installation of Fire Pumps.
      4) NFPA 24 - Standard for the Installation of Private Fire Service Mains and their Appurtenances.
      5) FM - Factory Mutual

3. Equipment and Materials:

   a. Acceptable Manufacturers:

      1) Systems will be designed using the following manufacturers of equipment:

a)	Fire Pump	Allis-Chalmers, Patterson, Peerless
b)	Hose Valves	Crocker, Elkhart, Potter-Roemer
c)	Sprinkler Equipment	Gem, Reliable, Viking

   b. Materials:

      1) Piping 2 inch and smaller: Schedule 40 black steel pipe and threaded fittings.
      2) Piping 2-1/2 inch and larger: Schedule 10 black steel pipe and grooved fittings

B. Scope of Work

1. The fire protection service and backflow preventer will be provided by the Plumbing Contractor. The Fire Protection Contractor's scope of work will begin at the outlet of the backflow preventer.

2. A fire pump will be designed to pressurize the sprinkler and standpipe systems to provide the water quantities and pressures required by NFPA 13 and 14. The fire pump will take suction from a new 8 inch fire protection service, will be rated for approximately 1000 gpm at 150 psi and will be driven by a 150 horsepower electric motor. A fire pump test header will be provided on the building exterior wall as required by NFPA 20.

3. The entire Casino and Hotel Building will be provided with a Class I automatic wet standpipe system with 2-1/2 inch adjustable, pressure-reducing fire hose valves and 2-1/2 inch by 1-1/2 inch reducers to facilitate the use of either 1-1/2 inch or 2-1/2 inch fire hose by the Fire Department. No fire hoses will be provided. A drain stack arranged to discharge to the building exterior will be provided adjacent to each standpipe to facilitate testing of the fire hose valves. A roof manifold will be provided at the top of each standpipe to supply water for fire fighting on/from the roof.

4. The entire enclosed Parking Garage will be provided with a Class I automatic dry standpipe system with 2-1/2 inch adjustable, pressure-reducing fire hose valves and 2-1/2 inch by 1-1/2 inch reducers to facilitate the use of either 1-1/2 inch or 2-1/2 inch fire hose by the Fire Department. No fire hoses will be provided. A drain stack arranged to discharge to the building exterior will be provided adjacent to each standpipe to facilitate testing of the fire hose valves.

5. The entire Casino and Hotel Building will be protected by wet pipe automatic sprinkler systems. The sprinkler systems will be supplied by the fire pump. The Hotel sprinkler system will be fed through the standpipe system.

6. The entire enclosed Parking Garage will be protected by dry pipe automatic sprinkler systems. Due to the size of the Parking Garage, four (4) separate systems will be required for each level. A sprinkler riser room on each level will house the dry pipe alarm check valves and air compressors. These sprinkler systems will be supplied by the fire pump.

7. Any other areas subject to freezing temperatures, such as the Porte-Cochere, Vestibules, Loading Dock, etc., will be protected by dry pipe automatic sprinkler systems.

II. ELECTRICAL DESIGN AND SYSTEM DESCRIPTION

A. Design Criteria:

1. Code Standards:

a. Systems will be designed in accordance with, but not limited to, the following codes:

1) 2010 Building Code of New York State
2) 2010 Energy Conservation Code of New York State
3) 2008 National Electrical Code
4) National Fire Protection Association 90, National Electrical Code
5) National Fire Protection Association 101, Life Safety Code
6) National Fire Protection Association 72, Fire Alarm Code
7) National Fire Protection Association 110, Standard for Emergency and Standby Power systems
8) ADA Code (Latest Edition)

2. Design Standards:

a. Systems shall be designed in accordance with, but not limited to, the following standards:

1)	ANSI	American National Standards Institute
2)	ASTM	American Society of Testing and Materials
3)	IEEE	Institute of Electrical and Electronic Engineers
4)	IES	Illumination Engineering Society
5)	ICEA	Insulated Cable Engineers Association
6)	NEMA	National Electrical Manufacturers Association
7)	NFPA	National Fire Protection Association
8)	UL	Underwriter's Laboratories
9)	FM	Factory Mutual
10)	TIA/EIA	Telecommunications Industry Association/Electronic Industries Alliance
11)	NRTL	Nationally Recognized Testing Laboratory

B. Description of Existing Utilities at the Site:

1. Electric Service/Telephone/CATV:

a. Presently, the site is a plot of vacant land. The site is located within the New York State Electric Gas (NYSEG) territory.

2. Communications:

a. At this point, it has not been determined who will be the communications providers. When the provider is determined, temporary and permanent facilities for communications will be discussed and coordinated.

C. Description of Proposed Facility Electrical Systems

1. Temporary Construction Electric Service:

a. It is anticipated that a 2500 amp service at 480 volts, three phase will be required for temporary electric for the site. This would require a 2000 kVA pad mount transformer.

b. The temporary electric service will be utilized for man lifts, welders, tower cranes, construction lighting/power, etc.

2. Electric Service:

a. The following information is preliminary and is derived from the information available at the time. Anticipated demands and the sizes and quantities of substations are subject to change as additional information becomes available.

b. The anticipated electrical peak demand for the Casino Resort is approximately 1.9MW for the complete build-out which includes Casino, Resort Hotel, Parking, and miscellaneous support buildings. The average monthly demand is anticipated to be 1.4MW. The monthly average usage will be 864,000 KWH with a monthly peak usage of 1,128,000 KWH. The anticipated annual usage is 10,370,000 KWH.

c. One (1), oil-filled 2000 kVA pad-mount transformer will be utilized. The padmount will be rated 34.5Y/19.92 kV - 408Y/277 volts and will be located adjacent to the loading dock and near the main Electrical Room. The transformers will be furnished by NYSEG for installation by the Electrical Contractor. The Electrical Contractor shall also provide the pads and ductbanks for the transformers. NYSEG will install primary billing metering at the transformers. The transformer will feed a single-ended 3000A, 480V switchboard.

3. Normal Power Distribution:

a. Each single ended switchboard will include a 3000 amp main drawout circuit breaker that will be utilized as the service disconnect. From 480V switchboard, the circuit breakers, feeders will be routed to switchboards and distribution panels located strategically throughout the Casino and Hotel.

1) The single ended substation will be tapped before it terminates in the main 3000 amp drawout circuit breaker and this feeder will be routed to the fire pump controller.

b. Switchboards will furnish power to 480 volt HVAC equipment, elevators and lighting. The switchboards will also furnish power to 480 volt delta to 208Y/120 volt transformers and distribution panels for Hotel Rooms, kitchen equipment, slot machines, etc.

4. Casino and Hotel Normal Power Distribution:

   a. One switchboard will be located near the Hotel tower. This switchboard will provide power to dry type transformers that will furnish power to feeder bus that will be routed up the center of the Hotel through the Electric Rooms on every floor. This bus riser will furnish power to lighting, receptacles, fan coil units, etc. in the Hotel Rooms.

   b. Stand-by and emergency panels will be on every other floor. These panels will furnish power to egress lighting fire alarm and data rack.

   c. A second switchboard will be strategically located for power for kitchen equipment, miscellaneous HVAC equipment, and for power to harmonic rated (K13 rated) transformers for Class II and Class III gaming machines that do not receive power from the transformer mentioned in "c" above.

   d. The third switchboard will be located in close proximity to the heavy HVAC loads which would include chillers, cooling towers, pumps, etc.

   e. Distribution panelboards and branch circuit panelboards will be strategically located throughout the Casino and Hotel areas for ease of providing branch circuit wiring and for future extension of services. Kitchen equipment and miscellaneous equipment will receive power from panelboards located in Utility Corridors or Electric Rooms in the area of use.

5. Generator Power Distribution and Uninterruptible Power Supplies (UPS):

   a. One (1) 1500 kW outdoor diesel generator units in a sound attenuated enclosures will be provided for emergency power.

   b. The physical dimensions of a 1500 kW weatherproof unit would be approximately 22'-0" feet long by 10'-6" feet wide by 9 feet high.

   c. The generator unit will be provided with a skid mounted fuel tank and will have the capability of running for 48 hours at full load before refueling is required.

   d. Generator power will support the fire pump, branch circuit panelboards for egress lighting, gaming tables lighting, cages lighting, exit signs, fire alarm equipment, security/surveillance lighting and to selected elevators for handicapped exit.

   e. Gaming machines, surveillance, security, data (IT), specific HVAC equipment and other critical loads to the Casino operation will be supported by the emergency generators.

   f. UPS's will be provided for gaming table lighting, security, surveillance and data equipment. Ten kVA units will be provided for data closets. Larger kVA units will be furnished for security/surveillance and gaming table lighting. It is recommended to provide N+1 redundancy for the UPS units.

   g. Two (2) 300kVA centralized UPS units are being considered for back-up of slot machines on Casino floor.

h. The following list is included in the load calculations for the emergency generator power:

1) Parking lot lighting
2) All table game lighting (UPS too)
3) Kitchen hoods, exhaust and MAU for one (1) restaurant
4) Walk-In Coolers and freezers
5) Cooking equipment for one (1) restaurant
6) Soda guns
7) Beer system, etc.
8) Ventilation and/or A/C for Gaming area
9) A/C for telephone/data/surveillance equipment rooms
10) Door hardware and card access
11) Surveillance equipment
12) Elevators: one (1) elevator per elevator bank
13) Slots and slot signage
14) Fire pump and jockey pump
15) Exit signs
16) Egress lighting
17) Supplemental lighting in critical areas (e.g. Cage, Count Room, Executive Office Space)
18) FA system
19) Fire suppression equipment
20) Telephone/data equipment
21) I/T Data, Security and Surveillance system and network electronics
22) Smoke evac fans

i. The following list is included to assist the Facility in making decisions on what additional loads can be placed on generator power. Caution should be exercised because the recommended generator sizing above may have to be increased to support the equipment selected:

ITEMS TO CONSIDER FOR GENERATOR POWER:

1) Exterior signage
2) Exterior building lighting in addition to code required lighting
3) Sinks, towels, soap dispensers
4) Hot water heaters and associated pumps
5) Pump stations (waste, grease recovery, etc.)
6) Exhaust fans for toilets
7) Sump pumps
8) Public address system
9) TV Dist. system
10) Escalators
11) Window washing equipment
12) Additional restaurants and support spaces
13) Data outlets
14) Building management system
15) General lighting in the Gaming area
16) One (1) lighting fixture in each Hotel Room

6. Elevators:

   a. Legally Required Standby Power would not be of sufficient capacity to operate all elevators at the same time. The elevators would transfer to Legally Required Standby Power in sequence, return to the designated landing and disconnect from the Standby Power Source. After all elevators have been returned to the designated level, at least one elevator would remain operable from the Legally Required Standby Power source for the Fire Department use.

   b. Where Legally Required Standby Power is connected to elevators the Machine Room ventilation or air conditioning would also be connected to the Legally Required Standby Power source.

   c. A fused elevator disconnect switch with shunt trip would be provided adjacent to the Elevator Equipment Room entry door to power each elevator controller.

   d. A fused single-pole, single-throw toggle switch would be provided 120 volt, 20 ampere emergency power for the elevator cab lighting.

   e. A fused dual-pole, single throw toggle switch would be provided 120 volt, 20 ampere emergency power for the elevator controller(s). The extra contacts are to be used to open the battery powered lowering device circuit when specified as an option for a hydraulic elevator.

   f. A GFCI receptacle and fluorescent luminaire would be provided in the Elevator Machine Room and the Elevator Pit. Fluorescent luminaires would also be provided every third floor and at the top of each elevator shaft.

   g. A telephone outlet would be provided at the elevator controller for communications and signaling to an accessible location for emergency assistance in case of an elevator failure.

   h. The fused elevator disconnect switch with shunt trip would provide automatic disconnection of the main elevator power to the affected elevator prior to the application of water from the elevator sprinkler system.

7. Lighting Systems:

   a. Lighting systems will include incandescent, low voltage, LED, HID, fiber-optic and fluorescent light sources. Each application will be coordinated with the Architect. Automatic shutdown control will be evaluated on an area-by-area basis. Typical automatic shutdown will consist of a lighting relay control panels mounted adjacent to source lighting power panels. The lighting control panels will be coordinated with the HVAC Contract for control and integration through the Building Management system to provide a fully automated design.

b. Specialty and custom lighting will also be designed and selected through architectural coordination. Specialty lighting includes chandeliers, sconces and pendants. Each specialty or custom fixture will undergo its own submittal review process and will include the production of a scaled AutoCAD drawing, internal lamping type, proposed mounting, voltage requirements and re-lamping directions all provided by the manufacturer. For certain large scale specialty fixtures a "mock up" will also be required prior to Shop Drawing approval.

c. Food Preparation areas will be illuminated utilizing compact fluorescent troffer type fixtures and will maintain a minimum 50 footcandle average. All fixtures will include lenses.

d. Food Service areas will be illuminated utilizing low voltage, incandescent, LED and fluorescent type fixtures. Each restaurant will be provided with a dimming system including preset scenes and time clock controlled functions. Emergency lighting will be provided if desired by Owner for restaurant operation during utility power failure.

e. Public spaces will be illuminated with combinations of fixed downlighting, cove, sconces, wall wash downlights, etc. depending upon the area. Emergency lighting will be provided along the means of egress at an average of (one) 1 footcandle of illumination. Additional battery packs will be added in high traffic areas and Restrooms to cover the 7 second generator transfer delay. In high profile areas, battery packs will be utilized that incorporate a regressed battery and head design.

f. Administrative areas will be illuminated utilizing fluorescent troffers and task lighting. All areas will be controlled through a combination of ceiling mounted and wall mounted motion sensors. Executive Offices will be provided with complete emergency lighting coverage for operations to continue during a power outage.

g. At the cage area all fixtures will be connected to emergency power and no means of shut down will be provided. An average of 40 footcandles of illumination will be designed for these areas. The luminaires will be connected to a dedicated UPS.

h. Table gaming area design will incorporate low voltage MR16 or LED type lighting in the form of a track system or adjustable downlights. Each table game will be provided a minimum of three (3) 50 watt MR16 luminaries with a 36 degree beam spread or LED equivalent. All table game lighting will be connected to a dedicated UPS unit.

i. The general area Gaming Floor will be illuminated to a level of 10 footcandles in order to supplement the estimated 15 footcandles provided by the machines and signage. All fixtures located in the ceiling over the Gaming area will be connected to emergency power to allow gaming to continue in the event of an outage.

j. Guest Rooms will be illuminated utilizing incandescent or LED downlighting, specialty pendants, wall sconces, floor lamps and table lamps. Each bathroom will contain a LED night light. The entrance ceiling mounted light fixture will be circuited to an emergency panel for room illumination during a utility power outage. Architectural dimming will be added to specific fixtures in suites through coordination with the Architect.

k. Guest rooms and Suites will be equipped with an energy management automatic lighting control system. Automatic control system will consist of an occupancy sensor or key card unit mounted at the entry door. The system will shut down all lighting loads hard wired and cord connected in each room based on occupancy. Associated wall switch controls will be required to communicate and actuate automatic shutdown.

l. Dimmable compact fluorescent downlights and linear cove fluorescent fixtures will illuminate meeting rooms and similar type spaces. The Meeting Room area will be provided with a full scale architectural dimming system and provide capability to communicate with the local A/V presentation system. Shade controls will also be integrated with the architectural dimming system if required.

m. Mechanical Rooms and utility spaces shall be provided with protected 1 feet x 4 feet fluorescent fixtures. All rooms will contain time switches or occupancy sensors for automatic lighting shut off. All Electrical and Data room lighting will be connected to emergency power and battery packs will also be included.

n. Pool area lighting will maintain a minimum of 50 footcandles of illumination on the deck by utilizing indirect HID or LED lighting sources. Unit mounted UPS systems will be provided to maintain the arc necessary for such lighting to remain illuminated until generator power is provided. If under water type lighting systems are provided LED type color changing fixtures are recommended and the minimum deck footcandle requirement can be lowered to 30 footcandles.

o. Parking lot lighting will be designed to a minimum footcandle average of three (3) footcandles utilizing LED surface mounted luminaries. Special illumination levels for security systems will be considered if requested by the Owner.

8. Branch Circuit Wiring in Casino:

a. A flexible method to allow future relocation and addition of slot machines will be provided. It is proposed that an in-floor slab cellular type system will be utilized.

b. Four (4) slot machines will be circuited together to each 20A-1P circuit breaker on UPS power. The branch circuit panelboards supporting the slot machines will be a part of an integrated distribution system that would include a distribution panelboard and from four to six branch circuit panelboards in a single unit. This approach will be used to maximize on space in the Electric Rooms. A "K4" rated transformer will be provided ahead of the distribution panelboard to withstand the overheating caused by the non-linear gaming machine load. An additional branch circuit will be routed to each group of gaming machines for signage.

c. 10 feet x 10 feet Electric Rooms on each end of the Gaming Floor will be utilized for the branch circuit panelboards.

d. Additional rooms throughout the Casino building will contain additional branch circuit panelboards for kitchen equipment, back of house equipment, and other miscellaneous loads.

9. Branch Circuit Wiring in Hotel:

    a. Horizontal Branch circuiting will be utilized for Hotel Rooms. Each standard Hotel Rooms will be served by three (3) 20A, 120V circuits. An additional circuit will be provided for hair dryers, heat lamps and other Toilet Room equipment in each Hotel Room.

    b. If Jacuzzis are utilized in the suites, additional branch circuits will be provided depending on the requirements of the manufacturer.

10. Wiring Methods:

    a. Rigid Metal Conduit (RMC) would be provided for outdoor use above grade and underground use. RMC will also be provided for indoor installations where exposed physical damage and for fire pump installation.

    b. Electrical Metallic Tubing (EMT) would be provided for indoor use both concealed and exposed.

    c. Metal Clad Cable (MC) with ground conductor would be provided for indoor use concealed in walls or in ceilings.

    d. Rigid non-metallic conduit (Schedule 80) would be provided for underground use.

    e. Non-metallic conduit (Schedule 40) would be provided for encasement in concrete duct banks or in or below ground slabs.

    f. All conductors would be provided as 98 percent copper with thermal plastic insulation (Type THHN/THWN).

    g. Conductors No. 12 AWG and smaller would be solid. Conductors No. 16 AWG and larger would be multiple stranded.

    h. All branch circuits would be No. 12 AWG minimum, copper. Control wiring will be No. 14 AWG minimum, copper.

11. Fire Alarm System:

    a. The fire alarm system will be provided following the International Building Code and NFPA 72. The system will be point addressable with a main fire alarm panel equipped with voice evacuation and a firefighter phone system. The fire alarm system will be fully ADA compliant including strobes rated 110 cd in the guestrooms of the Hotel. The minimum sound pressure level of audible alarms will be 70 db in Guest Rooms and 90 db in mechanical spaces.

    b. The system will utilize annunciators at the main entrances and the Main Security Room. The building will require a Fire Command Center, which will contain the main fire alarm control panel, voice evacuation panel, generator/transfer switch annunciator, elevator annunciator and control, etc. This room should be located where the local fire department arrives when there is an alarm. Coordination with the local fire department will take place during design to include their requirements.

c. The addressable system shall include the following notification devices; area smoke detectors, single station smoke detectors (Hotel Rooms), heat detectors, duct smoke detectors, manual stations, sprinkler tamper/flow switch connections, connections to kitchen hood suppression systems. NAC panels will be installed on every third floor of the Hotel and in other areas of the Facility to minimize on wiring runs.

d. Indication devices shall include synchronized strobes in all occupied spaces with speaker tones. The system shall also include a voice evacuation system and shall be a class 'A' wiring type.

12. Lightning Protection:

a. Although not required by code, it is highly recommended that the Owner consider the installation of lightning protection. Because of the height of the building, which would attract lightning and the sophistication of electronics within the building, it could be a worthwhile investment to pursue lightning protection.

b. A Master Labeled Lightning Protection System would be recommended for the Racetrack, Casino, Hotel and miscellaneous support buildings.

c. The system would include copper air terminals, copper horizontal and down leaders, copper clad ground rods, etc. for a complete Lightning Protection System.

d. Each down conductor would be connected to its own ground rod and that ground rod would be connected with the earth grounding Counterpoise System.

13. Security/Surveillance System:

a. The security/surveillance system shall consist of separate 8 feet x 10 feet wiring closets located in secure locations to accommodate security and surveillance equipment. A total of four (4) wiring closets shall be located in the Casino portion of the structure. Wiring closets shall also be provided in the Hotel portion on every third floor for security equipment.

b. Category 6 data cable or fiber optic cable shall be utilized for camera wiring final terminations. Category 6 data cable or multi-conductor shielded cable shall be utilized for security system/access control use. Security and surveillance equipment shall be connected to dedicated UPS units. A separate 25 feet x 25 feet minimum room shall be provided for surveillance monitoring purposes. The surveillance and security system headend equipment shall be located on the Second Floor in a 25 feet x 25 feet Equipment Room.

c. Local wiring closets in the Hotel shall consist of an 12 feet x 10 feet room for low voltage system wiring use. A local wiring closet on every three (3) floors shall be dedicated for security/surveillance system use. This wiring closet shall serve security and surveillance equipment on the specific floor the wiring closet is located along with the floors immediately above and below the wiring closet floor. The voltage source for all security/surveillance equipment shall be by a dedicated UPS system. During a utility power interruption the UPS shall receive power from the generator system.

d. Security/surveillance network electronics may be provided under separate contract. This needs to be discussed with the Owner.

14. Voice/Data System:

a. Incoming services for voice and data shall be provided to serve the proposed Casino and Hotel. Redundant services for voice, data, surveillance and security will be included. The services will be extended to the Facility via either an underground fiber optic wide area network design or the possible use of a microwave RF system. Discussions will be held with the area service provider and the Owner's personnel to determine the extent of the systems.

b. The systems within the buildings shall consist of fiber optic backbone cabling from the Computer Room to wiring closets located throughout the building. Wiring closets shall be approximately 8 feet x 10 feet and shall be located in secure locations. A minimum of four (4) voice/data wiring closets shall be provided for the Casino portion of the structure. Hotel design shall consist of a wiring closet located on every third floor. These closets shall share delivery of services of voice/data, and CATV distribution. One (1) closet shall be provided and services shall feed that floor along with the floor above and the floor below.

c. Work area communication outlets shall consist of double duplex convenience outlets, two (2) data outlets and one (1) voice outlet.

d. Hotel Rooms shall be provided with data outlet wiring enabling high speed Internet access and multiple voice outlet locations.

e. UPS's will be provided for all data equipment. During a utility power interruption the UPS's shall receive power from the generator system.

f. These systems will be coordinated with the Owner. Voice/Data systems network electronics, PBX, etc. may be provided under separate contract. This needs to be discussed with the Owner.

15. Cable CATV:

a. RF distribution to Hotel Rooms and to TV display message boards in the Casino and Hotel shall be accomplished by extending satellite dish service (Direct TV, etc.) or by local CATV service from the utility source.

b. A total of two (2) local wiring closets on the Facility Main Floor shall function as local wiring closets containing amplifiers, splitters, etc. In the Hotel, a local wiring closet on every third floor shall be utilized to house splitters, amplifiers, etc. to feed TV locations on the wiring closet and the TV on locations on the floors immediately above and below the wiring closet location.

c. CATV/RF distribution head-end equipment shall be located in a Main Equipment Room on the Second Floor. The Main Equipment Room shall be 20 feet x 20 feet minimum and shall also house the sound system head-end equipment.

16. Rescue Assistance Communication:

    a. A rescue assistance communication system will be installed at locations determined in the ADA Guidelines and building codes.

17. Sound System:

    a. Requirements will be discussed with the Owner, but it is recommended that a system as described below be included as a part of the project.

    b. The system head-end equipment will be installed in several racks that will be located in a centrally located dedicated room on the Second Floor. The head-end equipment will consist of amplifiers, sequential switchers, mixers, digital signal processors, power conditioners, CD player, mini-disk recorders, dual cassette deck, FM tuner, etc.

    c. The system design will be multi-zone on all levels and will include input options (microphone outlets) at all zones on the gaming level.

    d. Zoning of the system will consist of a selected number of loudspeakers grouped together in a logical arrangement and wired back to the head-end location as a separate zone.

    e. Ambient noise sensors will be included for selected Gaming area zones to allow the system to function more efficiently in high noise areas.

    f. The system will be PC controllable to allow system control from several locations and will include emergency announcement system capability and telephone system interface.

    g. Separate sub-systems will be provided for restaurants, bar and entertainment areas.

    h. System will include multiple input capability including FM tuner, cassette, CD, satellite radio and mini-disk operations.

    i. Zone quantities shall be approximately as follows:

        1) Main Floor Hotel, 5 zones.
        2) Gaming Area, 5 zones.
        3) Common Areas, back of house, exterior, parking lot areas, etc. per Owner's request.

    j. In addition to the general sound system, discussions will be held to determine if a theatrical pro sound system will be required in entertainment areas.

18. Event Center/Meeting Rooms:

    a. Event Center and Meeting Rooms systems shall be designed to allow the Event Center area to be utilized as one large room, or several smaller rooms or combined into a combinations of large and small rooms.

b. Meeting Rooms design shall include overhead projector, display, sound and lighting control means. Room combining functions shall also be included. In general each Meeting Room will include a master control Crestron touchscreen that allows for control of all systems.

c. The event center will be equipped with a convention center style floor box system. Floor boxes will provide both 3-phase and 1-phase power for convention style booths and equipment through a series of twist lock and straight blade type receptacles. The floor box system will provide power, data and phone service in an array format. Boxes array on approximate 20 foot centers.

d. Convention center style company switches will be provided at two back of house locations to allow for connection to roaming act type and stage type equipment in the Events Center. At each location (2) 200A 3-phase units will be provided for sound and (1) 400A 3-phase unit for lighting.

D. Outline Specifications of Manufacturer (Detailed specifications in a separate book)

Section 16100 - Basic Materials & Methods

1. Underfloor Raceway

   a. Walkerduct

2. Architectural Dimming

   a. Lutron
   b. Crestron
   c. Leviton

3. Theatrical Dimming

   a. ETC
   b. Strand
   c. Lehigh

4. Occupancy Sensors

   a. Wattstopper
   b. Lutron
   c. Leviton

Section 16340 - UPS System

1. UPS

   a. Powerware
   b. Liebert
   c. American Power Conversion

Section 16362 - Medium Voltage, Switchgear

1. Switchgear

    a. Powercon
    b. Eaton
    c. Square D

Section 16400 - Electric Distribution

1. Switchboard/Panelboards/Distribution Boards

    a. Square D
    b. Eaton
    c. Siemens

2. Variable Frequency Drives

    a. Reliance
    b. Siemens
    c. Square D
    d. Eaton

Section 16427 - Unit Substation, Double Ended and Single Ended

1. Dry Type Transformer and Secondary Switchboard

    a. Eaton
    b. Siemens
    c. Square D

Section 16500 - Lighting

1. Lamps

    a. General Electric
    b. Sylvania
    c. Philips

2. Exit Luminaires

    a. Chloride
    b. Sure-Lites
    c. Lithonia

Section 16620 - Power Generation

1. Engine Generator

    a. Spectrum Detroit Diesel
    b. Cummins Onan
    c. Kohler
    d. Caterpillar

Section 16722 - Point Addressable Fire Alarm System

1. Fire Alarm

    a. EST
    b. Notifier
    c. Simplex

Section 16770 - Sound System

1. Sound System

    a. Dynacord
    b. IED
    c. Telex

Section 16790 - Local Area Network System

1. Network System

    a. Tyco - Amp
    b. Panduit
    c. Ortronics