

AE 481W: Penn State Architectural Engineering Senior Thesis

Salamander Hospitality Resort and Spa



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Technical Report 2: Lighting Existing Conditions and Design Criteria Report  
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## Executive Summary

The following technical report contains an analysis and documentation of the electrical systems design for the Salamander Resort and Spa in Middleburg, Virginia. The 230,000 square foot resort is a multi-use hospitality venue containing 30,000 square feet of spa, indoor and outdoor pools, a restaurant, a grand ballroom, and luxury guest rooms. As a luxury resort, the lighting, electrical, and communications systems were designed to reflect and support the level of extravagance within the building.

The analysis and documentation within this report includes information on the power distribution system, service entrance, utility, voltage systems, major equipment and their electrical loads, and any special equipment featured in the electrical system. A brief description of the communications systems is also provided.

A single line diagram was created to show the electrical path from the service entrance to branch circuit panel boards, and the service entrance was sized for different phases in the design.

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## Section I – Power Distribution Systems

### Summary Description of Distribution System

The electrical distribution system for the Salamander Resort and Spa is a simple radial system with one point of service entrance. The service entrance transformer is owned by the utility; therefore, the service feed from Dominion Power as well as the size of the service transformer is unspecified. The secondary voltage, however, is 480Y/277V, 3 Ph, 4W.

Power is distributed from the secondary side of the service transformer to two locations, a Nema 3R normal CT cabinet and a Nema 3R emergency CT cabinet to be metered. Normal power flows from the normal CT cabinet to a 3200A, 480Y/277V, 3 Ph, 4W, 65KAIC main switchboard, “MSB.” Emergency power is generated by the 650kW, 480Y/277V, 3 Ph, 4W emergency generator. The emergency power flows first to the 1200A, MLO, 480Y/277V, 3 Ph, 4W, 14KAIC emergency switchboard, “ESB.” ESB distributes power to the 75 HP fire pump and pump controller, as well as automatic transfer switches ATS-S (standby power) and ATS-E (emergency power). AT-S serves the UPS system and any electrical panels on standby power, while ATS-E distributes power to emergency distribution panel DE4B.

Main switchboard, MSB, distributes power to mainstack chiller #1; VFD motors, P-12 and P-13; as well as to panels serving branch circuits throughout the entire building.

### Utility Company Information

The utility company that provides power to the service entrance of the Salamander Resort and Spa is

#### **Dominion Virginia Power:**

120 Tredegar Street  
Richmond, VA 23261  
www.dom.com/dominion-virginia-power  
1-888-667-3000.

Dominion Virginia Power provides bundled rate schedules for those who purchase the supply and delivery of electric service. The Salamander Resort and Spa receives secondary voltage to the utility transformer. The 30-day rate breakdown of Dominion Power’s “Schedule GS-3: Large General Service, Secondary Voltage” is the following:

#### **Distribution Service Charges**

- i. Basic Customer Charge – \$129.73 per billing month
- ii. Plus Distribution Demand Charge – All kW of Distribution Demand @ \$2.296 per kW
- iii. Plus rkVA Demand Charge - @ \$0.162 per rkVA

#### **Electricity Supply (ES) Service Charges**

##### **On-Peak: June 1 through September 30, 10 a.m. to 10 p.m.**

- iv. On-Peak Generation Demand Charge  
All On-Peak ES kW @ \$11.908 per kW
- v. Plus Off-Peak Generation Demand Charge  
All Off-Peak ES kW @ \$0.690 per kW
- vi. Plus Generation Adjustment Demand Charge

- All kW of Demand @ (\$0.427) per kW
- vii. Plus Generation kWh Charge
- All On-peak ES kWh @ 0.425¢ per kWh
- All Off-peak ES kWh @ 0.286¢ per kWh

### Service Entrance

Primary conductors from Dominion Virginia Power run at a minimum of 36" underground along Salamander Lane to the pad-mounted transformer near the electrical room on the basement level of Area 2. The transformer itself is owned by Dominion Power, and the primary voltage is not listed in the construction documents or specifications. The secondary power is 480Y/277V, 3PH, 4W and fed through an underground ductbank and metered by NEMA 3R CT cabinets. The service entrance feeder, rated at 4000A, is routed from the pad-mounted transformer and owned by the building owner.

The service entrance feeder is routed into the building to the "Main Distribution Frame" room, number 2B03, to the Main Switchboard, MSB.

- Owned by Dominion Power: Primary conductors to pad-mounted transformer, pad-mounted transformer
- Owned by Salamander Hospitality: 4000A feeder from pad-mounted transformer to main switchboard MSB.

### Voltage Systems

- Primary service: N/A (supplied and owned by Dominion Virginia Power)
- Secondary feeder: 480Y/277V, 3 Ph, 4W
- Main switchboards "MSB" and "ESB" and distribution panels: 480Y/277V, 3 Ph, 4W
- Various electrical and dimming panels: 208Y/120V, 3 Ph, 4W
- Equipment:
  - Lighting equipment – Some exterior equipment is 277V, 1 Ph, 3W; primarily 120V, 1 Ph, 3W
  - HVAC equipment – 120V, 1Ph, 3W  
208V, 1Ph, 3W  
277V, 1Ph, 3W  
480V, 3Ph, 4W
  - Kitchen equipment – 120V, 1Ph, 3W  
208V, 1Ph, 3W  
208V, 3Ph, 4W  
480V, 3Ph, 4W

### Emergency Power Systems

A 650kW, 480Y/277V, 3 Ph, 4W diesel generator, located in "Emergency Generator" room 2B03, distributes emergency power to automatic transfer switch ATS-E (480V, 400A, 4 Pole, 65 kWCR). ATS-E, when switched to the emergency power position, distributes power to emergency distribution panel DE4B. DE4B feeds power to emergency panels throughout the building. Those emergency panels distribute power for life safety and fire protection equipment (egress lighting, exit signs, fire controls and equipment, elevators, jockey pump, etc.). There is also a UPS system for standby power, which is listed in the Special Equipment section.

### Locations of Switchgear

The main switchboard for normal power, “MSB,” is located on the Area 2 Basement electrical plan, E2.B2, and shows “MSB” in the Main Dist. Frame room, number 2B03. The automatic transfer switch for standby power, ATS-S, is also located in the Main Dist. Frame room.

The emergency switchboard, “ESB,” is located on drawing E2.B2 in the “Emerg. Gen.” room, number 2B04. The automatic transfer switch for emergency power, ATS-E, is also located in the Emergency Generator room.

There are main electrical closets within each major “Area” of the building, namely Areas 1-4. Main switchgear as well as electrical panels and dimming panels are located in these electrical rooms, as well as some mechanical rooms.

The following table lists those pieces of equipment, their locations within the building as well as their locations on the drawings. Note that it was discovered that more emergency electrical panels are shown in the electrical panel schedules than actually are shown on the floor plans or riser diagram. The panels listed in the following table are the electrical panels shown on the drawings as well as the electrical riser diagram.

MAJOR EQUIPMENT SCHEDULE						
TAG	TYPE	FLOOR LEVEL	ROOM NO.	ROOM NAME	1/8 SCALE DWG.	ENLARGED DWG.
MSB	MAIN SWITCHBOARD	BASEMENT	2B03	MAIN DIST. FRAME	E2.B2	NA
ESB	EMERGENCY SWITCHBOARD	BASEMENT	2B04	EMERG. GEN.	E2.B2	NA
DK212	DISTRIBUTION PANEL	FIRST FL.	1123	ELEC.	E1.12	NA
DN211	DISTRIBUTION PANEL	FIRST FL.	2100	CORRIDOR	E1.12	NA
DN212A	DISTRIBUTION PANEL	FIRST FL.	2109	E/I	E2.12	NA
DN2B1	DISTRIBUTION PANEL	BASEMENT	2B02	BOILER ROOM	E2.B2	NA
DN2B3	DISTRIBUTION PANEL	BASEMENT	3B20	MECH.	E3.B2	NA
DN413	DISTRIBUTION PANEL	FIRST FL.	3142	RASUL	E3.12	NA
DN4G4B	DISTRIBUTION PANEL	GROUND	4G53	ELEC/TELE	E4.G2	NA
DN4G4A	DISTRIBUTION PANEL	GROUND	4G56	ELEC/TELE	E4.G2	NA
DN4B3A	DISTRIBUTION PANEL	BASEMENT	3B13	AHU13 ROOM	E3.B2	NA
DS4B	DISTRIBUTION PANEL	BASEMENT	2B03	MAIN DIST. FRAME	E2.B2	NA
DS4G4A	DISTRIBUTION PANEL	GROUND	4G56	ELEC/TELE	E4.G2	NA
DS4G4B	DISTRIBUTION PANEL	GROUND	4G53	ELEC/TELE	E4.G2	NA
DE4B	DISTRIBUTION PANEL	BASEMENT	2B04	EMERG. GEN.	E2.B2	NA
T1	TRANSFORMER	BASEMENT	3B20	MECH.	E3.B2	NA
T2	TRANSFORMER	BASEMENT	3B02	E/T	E3.B2	NA
T3	TRANSFORMER	BASEMENT	3B20	MECH.	E3.B2	NA
T4	TRANSFORMER	FIRST FL.	3158	ELEC.	E3.12	NA
T5	TRANSFORMER	FIRST FL.	3158	ELEC.	E3.12	NA
T6	TRANSFORMER	FIRST FL.	3158	ELEC.	E3.12	NA
T7	TRANSFORMER	GROUND	4G53	ELEC/TELE	E4.G2	NA
T8	TRANSFORMER	FIRST FL.	4153	ELEC/TELE	E4.12	NA
T9	TRANSFORMER	SECOND	4253	ELEC/TELE	E4.22	NA
T10	TRANSFORMER	THIRD	4353	ELEC/TELE	E4.32	NA
T11	TRANSFORMER	GROUND	4G56	ELEC/TELE	E4.G2	NA
T12	TRANSFORMER	FIRST FL.	4156	ELEC/TELE	E4.12	NA
T13	TRANSFORMER	SECOND	4256	ELEC/TELE	E4.22	NA
T14	TRANSFORMER	THIRD	4356	ELEC/TELE	E4.32	NA
T15	TRANSFORMER	BASEMENT	2B03	MAIN DIST. FRAME	E2.B2	NA
T16	TRANSFORMER	FIRST FL.	1123	ELEC.	E1.12	NA
T17	TRANSFORMER	FIRST FL.	2100	CORRIDOR	E1.12	NA
T18	TRANSFORMER	FIRST FL.	2109	E/I	E2.12	NA
T19	TRANSFORMER	BASEMENT	2B02	BOILER ROOM	E2.B2	NA
T20	TRANSFORMER	BASEMENT	2B02	BOILER ROOM	E2.B2	NA

MAJOR EQUIPMENT SCHEDULE						
TAG	TYPE	FLOOR LEVEL	ROOM NO.	ROOM NAME	1/8 SCALE DWG.	ENLARGED DWG.
T21	TRANSFORMER	PENTHOUSE	2P01	MECH. ROOM	E2.P2	NA
T22	TRANSFORMER	PENTHOUSE	3P01	MECH. ROOM	E3.P2	NA
T23	TRANSFORMER	FIRST FL.	101	POOL EQUIP	E9.2	NA
T24	TRANSFORMER	FIRST FL.	101	POOL EQUIP	E9.2	NA
T25	TRANSFORMER	GROUND	4G53	ELEC/TELE	E4.G2	NA
T26	TRANSFORMER	FIRST FL.	4153	ELEC/TELE	E4.12	NA
T27	TRANSFORMER	SECOND	4253	ELEC/TELE	E4.22	NA
T28	TRANSFORMER	THIRD	4353	ELEC/TELE	E4.32	NA
T29	TRANSFORMER	GROUND	4G56	ELEC/TELE	E4.G2	NA
T30	TRANSFORMER	FIRST FL.	4156	ELEC/TELE	E4.12	NA
T31	TRANSFORMER	SECOND	4256	ELEC/TELE	E4.22	NA
T32	TRANSFORMER	THIRD	4356	ELEC/TELE	E4.32	NA
T33	TRANSFORMER	FIRST FL.	1123	ELEC.	E1.12	NA
T34	TRANSFORMER	FIRST FL.	2100	CORRIDOR	E1.12	NA
T35	TRANSFORMER	BASEMENT	3B20	MECH.	E3.B2	NA
T36	TRANSFORMER	BASEMENT	2B03	MAIN DIST. FRAME	E2.B2	NA
T37	TRANSFORMER	FIRST FL.	2108	STORAGE	E2.12	NA
T38	TRANSFORMER	FIRST FL.	2100	CORRIDOR	E1.12	NA
T39	TRANSFORMER	FIRST FL.	3158	ELEC.	E3.12	NA
T40	TRANSFORMER	BASEMENT	3B20	MECH.	E3.B2	NA
T41	TRANSFORMER	FIRST FL.	4157	HOUSE KEEPING	E4.12	NA
E-GEN	EMERGENCY GENERATOR	BASEMENT	2B04	EMERG. GEN.	E2.B2	NA
ATS-E	EMERGENCY TRANSFER SWITCH	BASEMENT	2B04	EMERG. GEN.	E2.B2	NA
ATS-S	STANDBY TRANSFER SWITCH	BASEMENT	2B03	MAIN DIST. FRAME	E2.B2	NA



PANEL BOARDS						
TAG	VOLTAGE SYST.	MAIN SIZE	FLOOR LEVEL	ROOM NO.	ROOM NAME	1/8 SCALE DWG.
E4B2A	480Y/277V,3PH,4W	100A	BASEMENT	2B03	MAIN DIST. FRAME	E2.B2
E2B2A	208Y/120V,3PH,4W	225A	BASEMENT	2B03	MAIN DIST. FRAME	E2.B2
N4B2A	480Y/277V,3PH,4W	225A	BASEMENT	2B03	MAIN DIST. FRAME	E2.B2
N2B2A	208Y/120V,3PH,4W	100A	BASEMENT	2B03	MAIN DIST. FRAME	E2.B2
K212A(1)	208Y/120V,3PH,4W	400A	FIRST FL.	1123	ELEC.	E1.12
K212A(2)	208Y/120V,3PH,4W	400A	FIRST FL.	1123	ELEC.	E1.12
K212B(1)	208Y/120V,3PH,4W	225A	FIRST FL.	1123	ELEC.	E1.12
K212B(1)	208Y/120V,3PH,4W	225A	FIRST FL.	1123	ELEC.	E1.12
DIM211A	208Y/120V,3PH,4W	150A	FIRST FL.	2100	CORRIDOR	E1.12
DIM211B	208Y/120V,3PH,4W	100A	FIRST FL.	2100	CORRIDOR	E1.12
EDIM211	208Y/120V,3PH,4W	100A	FIRST FL.	2100	CORRIDOR	E1.12
S213A	208Y/120V,3PH,4W	50A	FIRST FL.	2100	CORRIDOR	E1.12
N212A(1)	208Y/120V,3PH,4W	225A	FIRST FL.	2109	E/I	E2.12
N212A(2)	208Y/120V,3PH,4W	225A	FIRST FL.	2109	E/I	E2.12
N412A	480Y/277V,3PH,4W	400A	FIRST FL.	2109	E/I	E2.12
N4B2E	480Y/277V,3PH,4W	400A	BASEMENT	2B02	BOILER ROOM	E2.B2
N4B2D	480Y/277V,3PH,4W	400A	BASEMENT	2B02	BOILER ROOM	E2.B2
S4B2A	480Y/277V,3PH,4W	100A	BASEMENT	2B02	BOILER ROOM	E2.B2
N4B2C	480Y/277V,3PH,4W	400A	BASEMENT	2B02	BOILER ROOM	E2.B2
N2B2C(1)	208Y/120V,3PH,4W	225A	BASEMENT	2B02	BOILER ROOM	E2.B2
N2B2C(2)	208Y/120V,3PH,4W	225A	BASEMENT	2B02	BOILER ROOM	E2.B2
N4B1	480Y/277V,3PH,4W	400A	BASEMENT	2B02	BOILER ROOM	E2.B2
N2B3D(1)	208Y/120V,3PH,4W	225A	BASEMENT	3B20	MECH.	E3.B2
N2B3D(2)	208Y/120V,3PH,4W	225A	BASEMENT	3B20	MECH.	E3.B2
N2B3C	208Y/120V,3PH,4W	225A	BASEMENT	3B20	MECH.	E3.B2
N2B3B(1)	208Y/120V,3PH,4W	400A	BASEMENT	3B20	MECH.	E3.B2
N2B3B(2)	208Y/120V,3PH,4W	400A	BASEMENT	3B20	MECH.	E3.B2
N2G4B(1)	208Y/120V,3PH,4W	225A	GROUND	4G53	ELEC/TELE	E4.G2
N2G4B(2)	208Y/120V,3PH,4W	225A	GROUND	4G53	ELEC/TELE	E4.G2
S2G4B	208Y/120V,3PH,4W	100A	GROUND	4G53	ELEC/TELE	E4.G2
N2G4A(1)	208Y/120V,3PH,4W	225A	GROUND	4G56	ELEC/TELE	E4.G2
N2G4A(2)	208Y/120V,3PH,4W	225A	GROUND	4G56	ELEC/TELE	E4.G2
N2G4A(3)	208Y/120V,3PH,4W	225A	GROUND	4G56	ELEC/TELE	E4.G2
S2G4A	208Y/120V,3PH,4W	100A	GROUND	4G56	ELEC/TELE	E4.G2
EDIM2B3	208Y/120V,3PH,4W	100A	BASEMENT	3B02	E/T	E3.B2

PANEL BOARDS						
TAG	VOLTAGE SYST.	MAIN SIZE	FLOOR LEVEL	ROOM NO.	ROOM NAME	1/8 SCALE DWG.
SDIM2B3	208Y/120V,3PH,4W	100A	BASEMENT	3B02	E/T	E3.B2
N2B3A(1)	208Y/120V,3PH,4W	225A	BASEMENT	3B02	E/T	E3.B2
N2B3A(2)	208Y/120V,3PH,4W	225A	BASEMENT	3B02	E/T	E3.B2
DIM213	208Y/120V,3PH,4W	50A	FIRST FL.	3158	ELEC.	E3.12
N213A	208Y/120V,3PH,4W	225A	FIRST FL.	3158	ELEC.	E3.12
N213B	208Y/120V,3PH,4W	225A	FIRST FL.	3158	ELEC.	E3.12
N214B(1)	208Y/120V,3PH,4W	225A	FIRST FL.	4153	ELEC/TELE	E4.12
N214B(2)	208Y/120V,3PH,4W	225A	FIRST FL.	4153	ELEC/TELE	E4.12
S214B	208Y/120V,3PH,4W	100A	FIRST FL.	4153	ELEC/TELE	E4.12
N224B(1)	208Y/120V,3PH,4W	225A	SECOND	4253	ELEC/TELE	E4.22
N224B(2)	208Y/120V,3PH,4W	225A	SECOND	4253	ELEC/TELE	E4.22
S224B	208Y/120V,3PH,4W	100A	SECOND	4253	ELEC/TELE	E4.22
N234B(1)	208Y/120V,3PH,4W	225A	THIRD	4353	ELEC/TELE	E4.32
N234B(2)	208Y/120V,3PH,4W	225A	THIRD	4353	ELEC/TELE	E4.32
N234B(3)	208Y/120V,3PH,4W	225A	THIRD	4353	ELEC/TELE	E4.32
S234B	208Y/120V,3PH,4W	100A	THIRD	4353	ELEC/TELE	E4.32
N214A(1)	208Y/120V,3PH,4W	225A	FIRST FL.	4156	ELEC/TELE	E4.12
N214A(2)	208Y/120V,3PH,4W	225A	FIRST FL.	4156	ELEC/TELE	E4.12
S214A	208Y/120V,3PH,4W	100A	FIRST FL.	4156	ELEC/TELE	E4.12
N224A(1)	208Y/120V,3PH,4W	225A	SECOND	4256	ELEC/TELE	E4.22
N224A(2)	208Y/120V,3PH,4W	225A	SECOND	4256	ELEC/TELE	E4.22
S224A	208Y/120V,3PH,4W	100A	SECOND	4256	ELEC/TELE	E4.22
N234A(1)	208Y/120V,3PH,4W	225A	THIRD	4356	ELEC/TELE	E4.32
N234A(2)	208Y/120V,3PH,4W	225A	THIRD	4356	ELEC/TELE	E4.32
N234A(3)	208Y/120V,3PH,4W	225A	THIRD	4356	ELEC/TELE	E4.32
S234A	208Y/120V,3PH,4W	150A	THIRD	4356	ELEC/TELE	E4.32
N2P2	208Y/120V,3PH,4W	100A	PENTHOUSE	2P01	MECH. ROOM	E2.P2
N4P2	480Y/277V,3PH,4W	800A	PENTHOUSE	2P01	MECH. ROOM	E2.P2
S4P2	480Y/277V,3PH,4W	100A	PENTHOUSE	2P01	MECH. ROOM	E2.P2
N4P3	480Y/277V,3PH,4W	225A	PENTHOUSE	3P01	MECH. ROOM	E3.P2
N2P3	208Y/120V,3PH,4W	100A	PENTHOUSE	3P01	MECH. ROOM	E3.P2
ON2G3	208Y/120V,3PH,4W	225A	FIRST FL.	101	POOL EQUIP	E9.2
ON4G3	480Y/277V,3PH,4W	225A	FIRST FL.	101	POOL EQUIP	E9.2
EDIM212	208Y/120V,3PH,4W	100A	FIRST FL.	2108	STORAGE	E2.12
DIM212A	208Y/120V,3PH,4W	100A	FIRST FL.	2108	STORAGE	E2.12
DIM212B	208Y/120V,3PH,4W	100A	FIRST FL.	2108	STORAGE	E2.12
EDIM214A	208Y/120V,3PH,4W	100A	FIRST FL.	4157	HOUSE KEEPING	E4.12
N4P1	480Y/277V,3PH,4W	100A	FIRST FL.	1P03	FAN ROOM	E1.P1
N2B1A(1)	208Y/120V,3PH,4W	225A	BASEMENT	1B27	HALLWAY	E1.B2
N2B1A(2)	208Y/120V,3PH,4W	225A	BASEMENT	1B27	HALLWAY	E1.B2
N2B1B	208Y/120V,3PH,4W	225A	BASEMENT	1B27	HALLWAY	E1.B2

### Over-current Devices

From the service entrance, the main circuit breaker (MCB) to the main switchboard is a 3200A, 3P, 65kAIC over-current device. On the emergency power feeder, emergency generator is protected by a 1200A, 3P, 14kAIC circuit breaker. The fire pump control has a 600A, 3P MCB. The control and fire pump are a branch circuit on the Emergency Switchboard (ESB) and protected by a 225A, 3P circuit breaker. ESB and MSB protect feeders to ATS-E by use of a 400A, 3P circuit breaker, while ATS-S is protected by a 800A, 3P breaker.

The main switchboard (MSB) distributes power on 29 different feeders, for which all are protected by three-pole circuit breakers and three are set to trip at 800A, five at 600A, one at 500A, nine at 400A, four at 225A, three at 150A, three at 100A, and one at 60A. As shown on the single line diagram provided, some panels are protected by main circuit breakers and others contain main lugs only (MLO). Distribution panels are protected by circuit breakers rated at 10kAIC – 65kAIC, depending on the load of each distribution panel.

Fuses are not shown on the riser diagram, but are defined in the specifications. Fuse under 16491-3.2, applications are listed as cartridge fuses rated at 600-V ac and less for:

- Service Entrance: Class RK01, time delay
- Feeders: Class RK1, time delay
- Motor Branch Circuits: Class RK5, time delay
- Other Branch Circuits: Class RK5, time delay
- Control Circuits: Class CC, fast acting

### Transformers

Within the Salamander Resort and Spa, there are forty-one (41) transformers located in electrical and mechanical rooms and each one is specified in the following table. Every transformer steps down 480Y/277V, 3Ph, 4W power to 208Y/120V, 3Ph, 4W power. The higher voltage utility/service entrance transformer is not included in the table, as it is owned by Dominion Virginia Power and its size is not specified.

INDIVIDUAL TRANSFORMER SCHEDULE									
TAG	PRIMARY VOLTAGE	SECONDARY VOLTAGE	SIZE	TYPE	TEMP. RISE	TAPS	MOUNTING	REMARKS	
T1	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T2	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T3	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T4	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	45	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T5	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	45	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T6	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	K-13 RATED	
T7	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T8	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T9	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T10	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T11	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T12	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	

INDIVIDUAL TRANSFORMER SCHEDULE									
TAG	PRIMARY VOLTAGE	SECONDARY VOLTAGE	SIZE	TYPE	TEMP. RISE	TAPS	MOUNTING	REMARKS	
T13	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T14	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T15	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T16	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	150	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T17	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	K-13 RATED	
T18	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	K-13 RATED	
T19	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T20	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T21	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T22	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T23	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T24	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	75	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T25	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T26	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T27	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T28	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	112.5	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T29	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T30	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T31	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T32	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	45	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T33	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	15	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	ISOLATED GROUND	
T34	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	15	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	ISOLATED GROUND	
T35	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	K-13 RATED	
T36	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	15	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	NEMA TP1	
T37	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	K-13 RATED	
T38	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	K-13 RATED	
T39	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	K-13 RATED	
T40	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	K-13 RATED	
T41	480Y/277V, 3PH, 4W	208Y/120V, 3PH, 4W	30	DRY	220 DEGREE C	(2) 2.5%	PAD MOUNTED ON FLOOR	K-13 RATED	
<b>NOTES:</b>									
1. TAG DESIGNATIONS ARE AS FOLLOWS: T# IS NEMA TP1 TRANSFORMER, T#K IS MINIMUM K13 RATED TRANSFORMER, AND T#G IS MINIMUM K13 RATED TRANSFORMER WITH ISOLATED GROUND ON SECONDARY.									
2. PROVIDE NEUTRAL TO GROUND BONDING JUMPER OF TRANSFORMER. PROVIDE GROUNDING ELECTRODE CONDUCTOR FROM GROUNDED NEUTRAL TO THE NEAREST EFFECTIVELY GROUNDED METAL MEMBER OF STRUCTURE, WATER PIPE AND/OR ONE OF THE METHODS LISTED IN NEC 250.									
3. BOND NEUTRAL OF TRANSFORMER SECONDARY TO THE TRANSFORMER CASE WITH BONDING JUMPER AS PER NATIONAL ELECTRIC CODE.									
4. SECONDARY OVER-CURRENT PROTECTION SHALL BE LOCATED WITH TEN FEET OF THE TRANSFORMER SECONDARY TERMINALS EITHER IN A PANELBOARD (MAIN BREAKER) OR AN INDIVIDUALLY MOUNTED CIRCUIT BREAKER.									

### Grounding

The extent to which this building is grounded is shown in the Grounding Riser Diagram on drawing E6.2. A telecommunications grounding riser diagram is also shown on drawing AV0.200. Telecommunication equipment grounding details are shown on drawing LV5.200.

### Special Equipment

The Salamander Resort and Spa is equipped with an uninterruptible power supply (UPS), which is energized through the standby power automatic transfer switch, ATS-S. The 80kVA NPower UPS (480-208Y/120V) is located in the Area 2 basement level in room #2B27 ("I.T." room). Batteries provide 15 minutes of 100% power. Harmonic filtering is a maximum of 10% THD at 100% non-linear loading.

The UPS distributes power to distribution panel DS4B, which then feeds electrical panels on standby power. Equipment on standby power includes guest room receptacles and lighting, CCTV cameras, fire extinguishing systems, automatic door hardware, AV racks, elevators, and pumps.

### Lighting Loads

The typical lighting systems found within the Salamander Resort and Spa are highly decorative. Custom designed decorative chandeliers and wall sconces are prevalent in almost every space. Incandescent and halogen light sources are primarily used to emphasize the feeling of relaxation. The lighting systems add to the elegant and decorative interior design of the high-end spaces. Almost all lamps used are incandescent candelabras (chandeliers and sconces) and MR-16's (downlights).

The following Luminaire Schedule lists the luminaire tag, number of lamps, type of lamp, lamp wattage, ballast type, voltage, total input watts to the luminaire, ballast factor, operating current, and power factor. This table does not include the custom decorative chandeliers and wall sconces (DP and DS series), as their specifications are not as clearly defined in the construction documents. Some luminaire information has been left out of the existing schedule and will be labeled as "NA."

All manufacturers' catalog cuts/specifications for HID lamp/ballast combinations are included in Appendix B at the end of this report.

LUMINAIRE SCHEDULE									
TYPE	LAMPS			BALLAST TYPE	VOLTAGE	INPUT WATTS	BALLAST FACTOR	OPERATING CURRENT	POWER FACTOR
	NO.	TYPE	WATTAGE						
AA	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AA-1	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AA-2	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AB	1	<1> 250T4	250	NONE	120V	250	NONE	2.08	1
AC	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AC-1	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AD	1	<1> 100PAR38/HIR/ FL40 by G.E.	100	NONE	120V	100	NONE	0.83	1
AE	1	<1> 150AIF	150	NONE	120V	150	NONE	1.25	1
AF	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AF-1	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AG	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AH	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AH-1	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1

LUMINAIRE SCHEDULE									
TYPE	LAMPS			BALLAST TYPE	VOLTAGE	INPUT WATTS	BALLAST FACTOR	OPERATING CURRENT	POWER FACTOR
	NO.	TYPE	WATTAGE						
AH-2	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AI	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AJ	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
AK	4	<4> 50MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	200	NONE	120V	200	NONE	1.67	1
AK-1	2	<2> 65MR16/T/SP10 Tru-Aim Titan by Osram/Sylvania	130	NONE	120V	200	NONE	1.08	1
AL		Incandescent	200	NONE	120V	200	NONE	1.67	1
CP1		Incandescent	200	NONE	120V	200	NONE	1.67	1
EA	1	<1> 50W bi-pin	50	NONE	120V	NA	NONE	0.42	1
EB	1	<1> 20W G4	20	NONE	120V	NA	NONE	0.17	1
FB	3	<3> F32T8/TL830/ALTO by Philips	96	ELECTRONIC	120V	94	1	0.79	0.99
FC	4	<4> F32T8/TL830/ALTO by Philips	128	ELECTRONIC	120V	120	0.88	0.94	0.99
GA	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
JA	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
JA-1	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1

LUMINAIRE SCHEDULE									
TYPE	LAMPS			BALLAST TYPE	VOLTAGE	INPUT WATTS	BALLAST FACTOR	OPERATING CURRENT	POWER FACTOR
	NO.	TYPE	WATTAGE						
JB	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
LM	1	<1> CDM39PAR20/FL MasterColor by Philips	39	NONE	120V	39	NONE	0.33	1
LR	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
LR-1	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
LR-2	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
LS	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
LV	1	<1> 100W mini-can	100	NONE	120V	NA	NONE	0.83	1
OA	1	<1> BC75BT15/HAL/W Halogena by Philips	75	NONE	120V	NA	NONE	0.625	1
OA-1				NONE	120V	NA	NONE		1
OB	1	<1> CDM150/T6/830 MasterColor by Philips	150	ELECTRONIC	120V	165	1	1.38	0.9
OC	1	Metal Halide	70	ELECTRONIC	120V	80	1	0.67	0.9
OD	2	<2> 20W G4 bi-pin	40	ELECTRONIC	120V	NA	1	0.31	
OE	1	<1> CDM39T6/830 MasterColor by Philips	39	ELECTRONIC	120V	45	1	0.39	0.9
OF	1	<1> CDM39T6/830 MasterColor by Philips	39	ELECTRONIC	120V	45	1	0.39	0.9
PC		Incandescent		NONE	120V	NA	NONE		1



LUMINAIRE SCHEDULE									
TYPE	LAMPS			BALLAST TYPE	VOLTAGE	INPUT WATTS	BALLAST FACTOR	OPERATING CURRENT	POWER FACTOR
	NO.	TYPE	WATTAGE						
SA		COLD CATHODE	6.5W/FT	NONE	120V	14	NONE	0.06	1
SA-1		COLD CATHODE	6.5W/FT	NONE	120V	14	NONE	0.06	1
SA-2		COLD CATHODE	6.5W/FT	NONE	120V	14	NONE	0.06	1
SB	4/FT	<4ft.> AV-101 by Tokistar	5W/FT	NONE	120V	20	NONE		1
SB-1	4/FT	<4ft.> AV-101 by Tokistar	5W/FT	NONE	120V	20	NONE		1
SB-2	4/FT	<4ft.> AV-101 by Tokistar	5W/FT	NONE	120V	20	NONE		1
SB-3	4/FT	<4ft.> AV-101 by Tokistar	5W/FT	NONE	120V	20	NONE		1
SC		DIMMABLE NEON	6.5W/FT	NONE	120V	6.5	NONE	0.06	1
SD	10/FT	<10ft.> LSC-101a by Tokistar	5W/FT	NONE	120V	10	NONE		1
SE	2/3 PER FT	<2/3 per ft.> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	25	NONE	0.31	1
SF		LED		NONE	120V	NA	NONE		1
SG		LED		NONE	120V	50	NONE		1
SH	1	<1> F21T8/TL830/ALTO by Philips	21	NONE	120V	21	NONE	0.18	1
SJ	1	<1> F32T8/TL830/ALTO by Philips	32	ELECTRONIC	120V	38	1	0.34	1.1
SK		LED		NONE	120V	NA	NONE		1
TA	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
TB	1	<1> 35W bi-pin	35	ELECTRONIC	120V	37	1		1

LUMINAIRE SCHEDULE									
TYPE	LAMPS			BALLAST TYPE	VOLTAGE	INPUT WATTS	BALLAST FACTOR	OPERATING CURRENT	POWER FACTOR
	NO.	TYPE	WATTAGE						
TC	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
UA	1	<1> 37MR16/IR/SP10 Tru-Aim IR by Osram/Sylvania	37	NONE	120V	37	NONE	0.31	1
UL	1	150QT4MC HALOGEN	150	NONE	120V	150	NONE	1.25	1
UM	1	175W E17 medium base M-57 type Metal Halide	175	ELECTRONIC	120V	194	1	1.7	0.9
WA	1	100W Incandescent	100	NONE	120V	100	NONE	0.83	1
WB	3	<3> 60BA9C/4M by Philips (4,000 hr lamp life)	180	NONE	120V	NA	NONE	1.5	1
WC	4	<4> 60BA9C/4M by Philips (4,000 hr lamp life)	240	NONE	120V	NA	NONE	2	1
WD	2	<2> 60BA9C/4M by Philips (4,000 hr lamp life)	120	NONE	120V	NA	NONE	1	1
WE	1	<1> 60BA9C/4M by Philips (4,000 hr lamp life)	60	NONE	120V	NA	NONE	0.5	1
WF	1	<1> 60BA9C/4M by Philips (4,000 hr lamp life)	60	NONE	120V	NA	NONE	0.5	1
WG	1	<1> 60BA9C/4M by Philips (4,000 hr lamp life)	60	NONE	120V	250	NONE	0.5	1

LUMINAIRE SCHEDULE									
TYPE	LAMPS			BALLAST TYPE	VOLTAGE	INPUT WATTS	BALLAST FACTOR	OPERATING CURRENT	POWER FACTOR
	NO.	TYPE	WATTAGE						
WH	3	<3> 60BA9C/4M by Philips (4,000 hr lamp life)	180	NONE	120V	NA	NONE	1.5	1
WI	1	<1> 60BA9C/4M by Philips (4,000 hr lamp life)	60	NONE	120V	NA	NONE	0.5	1
WJ	2	<2> 60BA9C/4M by Philips (4,000 hr lamp life)	120	NONE	120V	NA	NONE	1	1
WL		Incandescent	NA	NONE	120V	NA	NONE	NA	1
WM	1	<1> 75A19/CL	75	NONE	120V	NA	NONE	0.625	1
WN	1	<1> 100G30/W/LL	100	NONE	120V	NA	NONE	0.83	1
XA	1	<1> CDM150/T6/830 MasterColor by Philips	150	ELECTRONIC	120V	169	1	1.38	0.9
XH	1	<1> CDM150/T6/830 MasterColor by Philips	150	ELECT.	120V	169	1	1.38	0.9
XM	1	<1> CDM150/T6/830 MasterColor by Philips	150	ELECT.	120V	169	1	1.38	0.9

### Lighting Control

- ASHRAE/IESNA 90.1 shutoff requirement compliancy:  
The Salamander Resort and Spa is equipped with automatic shutoff in the form of both time switches and occupancy sensors for indoor and outdoor spaces.
  - Time switches are electronic, solid-state programmable units with alphanumeric display. Each time switch has eight channels; each channel shall be individually programmable with 40 on-off operations per week, plus 4 seasonal schedules.
  - Indoor occupancy sensors are wall or ceiling-mounted, solid-state units with separate relay units. Passive Infrared, Ultrasonic, and Dual-Technology type sensors are utilized throughout the building.
- Lighting control systems:
  - Time switches (listed above)
  - Outdoor and indoor photoelectric switches:
    - Solid state, with DPST dry contacts rated for 1800-VA tungsten or 1000-VA inductive, to operate connected relay, contactor coils, or microprocessor input.
  - Indoor/outdoor occupancy sensors (listed above)
  - Outdoor motion sensors
  - Lighting contactors:
    - Electrically operated and mechanically held, combination type with fusible switch and non-fused disconnect.
  - Emergency shunt relays:
    - Normally closed, electrically held relay, arranged for wiring in parallel with manual or automatic switching contacts.
  - Dimming:
    - Complete functioning diming systems; solid-state; all spaces shall be controlled with a minimum of four preset scenes; five button preset scene controls, master raise/lower, master control touch screen. Grafik eye 7000 control

### Mechanical and Other Loads

Mechanical systems throughout the building cover a broad range of technologies. There are over twenty air handling units, equipped with cooling and heating coils. Air flow is distributed by constant and variable air volume, depending on different areas of the building. Heat recovery is prevalent throughout the spa and pool areas. Heating and cooling within the guest room lodging wing is done by vertical fan coil units. Power is needed to run boilers, chillers, air handlers, exhaust fans, air conditioners, fan coil units, pumps, variable frequency drives, unit heaters, etc.

Other loads in the Salamander Resort and Spa come from kitchen and laundry equipment. Various types of equipment and their motors must receive power for normal activities in the food preparation and laundry areas of the resort. Anything from coffee brewers and convection ovens to washers and dryers must operate on electricity.

The following Mechanical Equipment, Kitchen Equipment, and Laundry Equipment schedules include the individual piece of equipment's tag; quantity; description; load in kW, HP, minimum current ampacity (MCA), or kW; motor amps (if a motor load); voltage; number of phases; assumed power factor; and calculated kVA or kW. If a value in the schedule is listed as "NA" or left blank, that information was not provided in the construction documents.

MECHANICAL/PLUMBING EQUIPMENT SCHEDULE									
EQUIPMENT TAG	LOAD DESCRIPTION	LOAD	LOAD UNIT	MOTOR AMPS	VOLTAGE	PHASE(S)	ASSUMED P.F.	kVA	kW
AC-1	AIR CONDITIONER	37.1	MCA	29.7	277V,	1 $\phi$	0.85	8.2	7.0
AC-2	AIR CONDITIONER	37.1	MCA	29.7	277V,	1 $\phi$	0.85	8.2	7.0
AC-3	AIR CONDITIONER	37.1	MCA	29.7	277V,	1 $\phi$	0.85	8.2	7.0
AC-4	AIR CONDITIONER	17.0	MCA	16.0	208V,	1 $\phi$	0.85	3.3	2.8
AC-5	AIR CONDITIONER	17.0	MCA	16.0	208V,	1 $\phi$	0.85	3.3	2.8
AC-6	AIR CONDITIONER	17.0	MCA	16.0	208V,	1 $\phi$	0.85	3.3	2.8
ACH-1	AIR CURTAIN	22.1	MCA	19.6	120V,	1 $\phi$	0.8	2.4	1.9
ACH-2	AIR CURTAIN	1/2	HP	9.8	120V,	1 $\phi$	0.85	1.2	1.0
AHU-1	AIR HANDLING UNIT	15	HP	21.0	480V,	3 $\phi$	0.95	17.5	16.6
AHU-10	AIR HANDLING UNIT	40.3	MCA	35.0	480V,	3 $\phi$	0.95	29.1	27.6
AHU-11	AIR HANDLING UNIT	10	HP	14.0	480V,	3 $\phi$	0.95	11.6	11.1
AHU-12	AIR HANDLING UNIT	10	HP	14.0	480V,	3 $\phi$	0.95	11.6	11.1
AHU-13	AIR HANDLING UNIT	13.0	MCA	11.0	480V,	3 $\phi$	0.95	9.1	8.7
AHU-14	AIR HANDLING UNIT	18.6	MCA	15.8	480V,	3 $\phi$	0.95	13.1	12.5
AHU-15	AIR HANDLING UNIT	18.6	MCA	15.8	480V,	3 $\phi$	0.95	13.1	12.5
AHU-16	AIR HANDLING UNIT	10	HP	14.0	480V,	3 $\phi$	0.95	11.6	11.1
AHU-17	AIR HANDLING UNIT	10	HP	14.0	480V,	3 $\phi$	0.95	11.6	11.1
AHU-18	AIR HANDLING UNIT	5	HP	7.6	480V,	3 $\phi$	0.85	6.3	5.4
AHU-19	AIR HANDLING UNIT	18.6	MCA	15.8	480V,	3 $\phi$	0.95	13.1	12.5
AHU-2	AIR HANDLING UNIT	15	HP	21.0	480V,	3 $\phi$	0.95	17.5	16.6
AHU-20	AIR HANDLING UNIT	12.9	MCA	11.0	480V,	3 $\phi$	0.95	9.1	8.7
AHU-21	AIR HANDLING UNIT	7 1/2	HP	11.0	480V,	3 $\phi$	0.95	9.1	8.7
AHU-23	AIR HANDLING UNIT	18.6	MCA	15.8	480V,	3 $\phi$	0.95	13.1	12.5
AHU-3	AIR HANDLING UNIT	7 1/2	HP	11.0	480V,	3 $\phi$	0.95	9.1	8.7
AHU-4	AIR HANDLING UNIT	7 1/2	HP	11.0	480V,	3 $\phi$	0.95	9.1	8.7
AHU-5	AIR HANDLING UNIT	7 1/2	HP	11.0	480V,	3 $\phi$	0.95	9.1	8.7
AHU-6	AIR HANDLING UNIT	20	HP	27.0	480V,	3 $\phi$	0.95	22.4	21.3
AHU-7	AIR HANDLING UNIT	10	HP	14.0	480V,	3 $\phi$	0.95	11.6	11.1
AHU-8	AIR HANDLING UNIT	2	HP	3.4	480V,	3 $\phi$	0.85	2.8	2.4
AHU-9	AIR HANDLING UNIT	10	HP	14.0	480V,	3 $\phi$	0.95	11.6	11.1
B-1	BOILER	1	HP	16.0	120V,	1 $\phi$	0.85	1.9	1.6
B-2	BOILER	1	HP	16.0	120V,	1 $\phi$	0.85	1.9	1.6
B-3	BOILER	1	HP	16.0	120V,	1 $\phi$	0.85	1.9	1.6
B-4	BOILER	1	HP	16.0	120V,	1 $\phi$	0.85	1.9	1.6

MECHANICAL/PLUMBING EQUIPMENT SCHEDULE									
EQUIPMENT TAG	LOAD DESCRIPTION	LOAD	LOAD UNIT	MOTOR AMPS	VOLTAGE	PHASE(S)	ASSUMED P.F.	kVA	kW
CH-1	WATER COOLED CHILLER	142.3	KW	171.2	480V,	3φ	0.95	142.3	142.3
CH-2	WATER COOLED CHILLER	142.3	KW	171.2	480V,	3φ	0.95	142.3	142.3
CH-3	WATER COOLED CHILLER	142.3	KW	171.2	480V,	3φ	0.95	142.3	142.3
CRAC-1A	SERVER ROOM AC UNIT	-		31.4	480V,	3φ	0.95	-	
CRAC-1B	SERVER ROOM AC UNIT	-		31.4	480V,	3φ	0.95	-	
CRAC-2	SERVER ROOM AC UNIT	1/2	HP	1.1	208V,	1φ	0.85	-	
CRAC-3	SERVER ROOM AC UNIT	1/2	HP	1.1	208V,	1φ	0.85	-	
CT-1 FAN	COOLING TOWER FAN	25	HP	34	480V,	3φ	0.95	28.3	26.9
CT-1 FAN	COOLING TOWER FAN	25	HP		480V,	3φ	0.95		0.0
CT-1 (HTR)	COOLING TOWER HTR	5	KW		480V,	3φ	0.85		5.0
CT-1(HTR)	COOLING TOWER HTR	5.0	KW	6.0	480V,	3φ	0.85	5	5.0
CU-1	CONDITIONING UNIT	15.2	MCA	12.3	208V,	1φ	0.95	2.6	2.4
CU-2	CONDITIONING UNIT	15.2	MCA	12.3	208V,	1φ	0.95	2.6	2.4
CU-3	CONDITIONING UNIT	15.2	MCA	12.3	208V,	1φ	0.95	2.6	2.4
CUH-1	CABINET HEATER	1/10	HP	3.0	120V,	1φ	0.85	0.4	0.3
DC-1A		-		6.6	480V,	3φ	0.85	-	
DC-1B		-		6.6	480V,	3φ	0.85	-	
EF-1	EXHAUST FAN	1/3	HP	7.2	120V,	1φ	0.75	0.9	0.6
EF-10	EXHAUST FAN	2	HP	3.2	480V,	3φ	0.85	2.7	2.3
EF-11	EXHAUST FAN	1/3	HP	7.2	120V,	1φ	0.75	0.9	0.6
EF-12	EXHAUST FAN	80.0	Wm	0.8	120V,	1φ	0.75	0.1	0.1
EF-13	EXHAUST FAN	80.0	Wm	0.8	120V,	1φ	0.75	0.1	0.1
EF-14	EXHAUST FAN	80.0	Wm	0.8	120V,	1φ	0.75	0.1	0.1
EF-15	EXHAUST FAN	1/8	HP	3.0	120V,	1φ	0.75	0.4	0.3
EF-16	EXHAUST FAN	1/6	HP	4.4	120V,	1φ	0.75	0.5	0.4
EF-17	EXHAUST FAN	1/8	HP	3.0	120V,	1φ	0.75	0.4	0.3
EF-18	EXHAUST FAN	1/8	HP	3.0	120V,	1φ	0.75	0.4	0.3
EF-19	EXHAUST FAN	1/4	HP	5.8	120V,	1φ	0.75	0.7	0.5
EF-2	EXHAUST FAN	2	HP	3.4	480V,	3φ	0.85	2.8	2.4
EF-20	EXHAUST FAN	1 1/2	HP	3.0	480V,	3φ	0.85	2.5	2.1
EF-21	EXHAUST FAN	80.0	Wm	0.8	120V,	1φ	0.75	0.1	0.1
EF-22	EXHAUST FAN	1/3	HP	7.2	120V,	1φ	0.75	0.9	0.6
EF-23	EXHAUST FAN	1/3	HP	7.2	120V,	1φ	0.75	0.9	0.6
EF-24	EXHAUST FAN	129.0	Wm	1.3	120V,	1φ	0.75	0.2	0.1
EF-25	EXHAUST FAN	1/4	HP	5.8	120V,	1φ	0.75	0.7	0.5
EF-26	EXHAUST FAN	129.0	Wm	1.3	120V,	1φ	0.75	0.2	0.1
EF-3	EXHAUST FAN	1 1/2	HP	3	480V,	3φ	0.85	2.5	2.1
EF-4	EXHAUST FAN	1 1/2	HP	3	480V,	3φ	0.85	2.5	2.1
EF-5	EXHAUST FAN	1	HP	2.1	480V,	3φ	0.85	1.7	1.5
EF-6	EXHAUST FAN	1 1/2	HP	3	480V,	3φ	0.85	2.5	2.1
EF-7	EXHAUST FAN	3	HP	4.8	480V,	3φ	0.85	4.0	3.4

MECHANICAL/PLUMBING EQUIPMENT SCHEDULE									
EQUIPMENT TAG	LOAD DESCRIPTION	LOAD	LOAD UNIT	MOTOR AMPS	VOLTAGE	PHASE(S)	ASSUMED P.F.	kVA	kW
EF-8	EXHAUST FAN	2	HP	3.4	480V,	3φ		0.85	2.8
EF-9	EXHAUST FAN	1 1/2	HP	3	480V,	3φ		0.85	2.5
ELEV-P1	ELEVATOR PRIMARY PUMP	35	FLA	35	480V,	3φ		0.95	29.1
ELEV-P2	ELEVATOR PRIMARY PUMP	35	FLA	35	480V,	3φ		0.95	29.1
ELEV-S1	ELEVATOR SECONDARY PUMP	51	FLA	51	480V,	3φ		0.95	42.4
ELEV-S2	ELEVATOR SECONDARY PUMP	51	FLA	51	480V,	3φ		0.95	42.4
ELEV-S3	ELEVATOR SECONDARY PUMP	51	FLA	51	480V,	3φ		0.95	42.4
ELEV-S4	ELEVATOR SECONDARY PUMP	51	FLA	51	480V,	3φ		0.95	42.4
ELEV-S5	ELEVATOR SECONDARY PUMP	51	FLA	51	480V,	3φ		0.95	42.4
EUH-1	ELECT. UNIT HEATER	22.5	MCA	19	208V,	1φ		0.95	4.0
FB-x	FAN POWERED BOX	1/3	HP	7.2	120V,	1φ		0.75	0.9
FCU x-xx	FAN COIL UNIT	0.1	KW	1.0	120V,	1φ		0.75	0.1
FCU-x	FAN COIL UNIT	532.0	Wm	5.2	120V,	1φ		0.85	0.6
GWH-1	GAS FIRED WATER HEATER	12.0	FLA	12	120V,	1φ		0.95	1.4
GWH-2	GAS FIRED WATER HEATER	12.0	FLA	12	120V,	1φ		0.95	1.4
GWH-3	GAS FIRED WATER HEATER	12.0	FLA	12	120V,	1φ		0.95	1.4
GWH-4	GAS FIRED WATER HEATER	12.0	FLA	12	120V,	1φ		0.95	1.4
HWCP-1	HOT WATER CIRCULATING PUMP	1 1/2	HP	3	480V,	3φ		0.85	2.5
HWCP-2	HOT WATER CIRCULATING PUMP	1/8	HP	3	120V,	1φ		0.75	0.4
IDF-A	INDUCED DRAFT FAN	0.5	FLA	0.5	120V,	1φ		0.75	0.1
P-1	PUMP	2	HP	3.4	480V,	3φ		0.85	2.8
P-10	PUMP	15	HP	21	480V,	3φ		0.95	17.5
P-11	PUMP	15	HP	21	480V,	3φ		0.95	17.5
P-12	PUMP	60	HP	77	480V,	3φ		0.95	64.0
P-13	PUMP	60	HP	77	480V,	3φ		0.95	64.0
P-14	PUMP	2	HP	3.4	480V,	3φ		0.85	2.8
P-15	PUMP	1/4	HP	5.8	120V,	1φ		0.75	0.7
P-16	PUMP	1/25	HP	1.5	120V,	1φ		0.75	0.2
P-17	PUMP	1/25	HP	1.5	120V,	1φ		0.75	0.2
P-18	PUMP	3/4	HP	1.6	480V,	3φ		0.85	1.3
P-19	PUMP	1/4	HP	5.8	120V,	1φ		0.75	0.7
P-2	PUMP	2	HP	3.4	480V,	3φ		0.85	2.8
P-20	PUMP	3/4	HP	1.6	480V,	1φ		0.85	0.8
P-21	PUMP	3/4	HP	1.6	480V,	1φ		0.85	0.8
P-3	PUMP	2	HP	3.4	480V,	3φ		0.85	2.8
P-4	PUMP	30	HP	40	480V,	3φ		0.95	33.3
P-5	PUMP	30	HP	40	480V,	3φ		0.95	33.3

MECHANICAL/PLUMBING EQUIPMENT SCHEDULE									
EQUIPMENT TAG	LOAD DESCRIPTION	LOAD	LOAD UNIT	MOTOR AMPS	VOLTAGE	PHASE(S)	ASSUMED P.F.	kVA	kW
P-6	PUMP	25	HP	34	480V,	3 $\phi$	0.95	28.3	26.9
P-7	PUMP	25	HP	34	480V,	3 $\phi$	0.95	28.3	26.9
P-8	PUMP	25	HP	34	480V,	3 $\phi$	0.95	28.3	26.9
P-9	PUMP	15	HP	21	480V,	3 $\phi$	0.95	17.5	16.6
RAF-1	RETURN AIR FAN	5	HP	7.6	480V,	3 $\phi$	0.85	6.3	5.4
RAF-11	RETURN AIR FAN	3.0	HP	4.8	480V,	3 $\phi$	0.85	0	0.0
RAF-12	RETURN AIR FAN	1.5	HP	3	480V,	3 $\phi$	0.85	0	0.0
RAF-2	RETURN AIR FAN	7 1/2	HP	11	480V,	3 $\phi$	0.95	9.1	8.7
RAF-21	RETURN AIR FAN	2	HP	3.4	480V,	3 $\phi$	0.85	2.8	2.4
RAF-3	RETURN AIR FAN	1	HP	2.1	480V,	3 $\phi$	0.85	1.7	1.5
RAF-4	RETURN AIR FAN	1	HP	2.1	480V,	3 $\phi$	0.85	1.7	1.5
RAF-5	RETURN AIR FAN	1	HP	2.1	480V,	3 $\phi$	0.85	1.7	1.5
RAF-6	RETURN AIR FAN	5	HP	7.6	480V,	3 $\phi$	0.85	6.3	5.4
RAF-9	RETURN AIR FAN	2	HP	3.4	480V,	3 $\phi$	0.85	2.8	2.4
SP-1	SUMP PUMP	1/3	HP	7.2	120V,	1 $\phi$	0.75	0.9	0.6
SSF	SOLID SEPARATOR FILTER	2	HP	3.4	480V,	3 $\phi$	0.85	-	
UH-1	UNIT HEATER	1/20	HP	2	120V,	1 $\phi$	0.75	0.2	0.2
UH-2	UNIT HEATER	1/20	HP	2	120V,	1 $\phi$	0.75	0.2	0.2



KITCHEN EQUIPMENT SCHEDULE										
EQUIPMENT TAG	QUANTITY	LOAD DESCRIPTION	kW	HP	MOTOR AMPS	VOLTAGE	PHASE(S)	ASSUMED P.F.	kVA	kW
1.01	4	RANGE, INDUCTION, COUNTERTOP	2.3	--	--	208	1	1	2.30	2.30
1.05	1	STEAMER, DOUBLE	0.3	--	--	120	1	0.95	0.32	0.30
1.11	1	VENTILATOR CONTROL CABINET	--	--	--	120	1	0.95	1.10	1.05
1.11A	1	FIRE SUPPRESSION SYSTEM	--	--	--	120	1	0.95	2.40	2.28
1.14	1	REMOTE REFRIGERATED BASE	0.5	0.333	7.2	120	1	0.75	0.70	0.53
1.15	1	VENTILATOR CONTROL CABINET	--	--	--	120	1	0.95	1.43	1.36
1.15A	1	FIRE SUPPRESSION SYSTEM	--	--	--	120	1	0.95	2.40	2.28
1.16	1	VENTILATOR CONTROL CABINET	--	--	--	120	1	0.95	1.43	1.36
1.16A	1	FIRE SUPPRESSION SYSTEM	--	--	--	120	1	0.95	2.40	2.28
1.18	1	REMOTE REFRIGERATED BASE	0.384	0.333	7.2	120	1	0.75	0.51	0.38
1.22	1	GAS STEAM KETTLE	0.24	--	--	120	1	0.95	0.25	0.24
1.23	1	BRAISING PAN	0.5	--	--	120	1	0.95	0.53	0.50
1.25	1	VENTILATOR CONTROL CABINET	--	--	--	120	1	0.95	1.43	1.36
1.25A	1	FIRE SUPPRESSION SYSTEM	--	--	--	120	1	0.95	2.40	2.28
1.26	2	CONVECTION OVENS	1.5	0.75	13.8	120	1	0.85	1.75	1.49
1.28	1	STEAMER	1.1	--	--	120	1	0.95	2.70	1.10
1.29	1	VENTILATOR CONTROL CABINET	--	--	--	120	1	0.95	1.43	1.36
1.29A	1	FIRE SUPPRESSION SYSTEM	--	--	--	120	1	0.95	2.40	2.28
1.39	1	PREP TABLE REFRIGERATOR	0.3	--	--	120	1	0.9	0.38	0.35
1.43	2	BANQUET CART	1.65	--	--	120	1	0.95	1.74	1.65
1.44	1	VENTILATOR CONTROL CABINET	--	--	--	120	1	0.95	1.43	1.36
1.44A	1	FIRE SUPPRESSION SYSTEM	--	--	--	120	1	0.95	2.40	2.28
1.52	2	INFRARED FOODWARMER	2.2	--	--	120	1	1	2.20	2.20
1.53	3	MODULAR WARMER	1.24	--	--	208	1	1	1.24	1.24
1.54	1	MICROWAVE OVEN	2.1	--	--	208	1	0.9	2.33	2.10
1.57	1	DRAWER WARMERS	1.35	--	--	120	1	1	1.35	1.35
1.63	1	MODULAR WARMER	1.24	--	--	208	1	1	1.24	1.24
1.65	1	PREP TABLE REFRIGERATOR	0.35	--	--	120	1	0.9	0.38	0.35
2.02	1	WASTE DISPOSING SYSTEM	4.55	3	9.6	208	3	0.85	5.35	4.55
2.11	1	REFRIGERATOR/FREEZER	1.92	--	--	120	1	0.9	2.13	1.92
2.14	1	COFFEE BREWER	6.6	--	--	208	1	1	6.60	6.60
2.15	1	COFFEE GRINDER	--	0.75	13.8	120	1	0.85	1.66	1.41
2.2	1	ICE CUBE MACHINE	4.1	2	6.8	208	3	0.85	4.82	4.10
2.21	1	FLAKE ICE MACHINE	2.39	1	16	120	1	0.85	2.81	2.39
2.26	1	REFRIGERATOR	1.25	0.5	9.8	120	1	0.85	1.47	1.25
3.03	1	FOOD WASTE DISPOSER	3.17	3	9.6	208	3	0.85	3.72	3.17
3.04	1	FOOD WASTE DISPOSER CTL PNL	--	--	--	208	3	0.95		--
3.05	1	DISHWASHING MACHINE	34	0.5		480	3	0.85	40.00	34.00
3.06	1	BOOSTER CONNECTION	24	--	--	480	3	1	24.00	24.00
5.02	1	PREP TABLE REFRIGERATOR	0.52	0.25	5.8	120	1	0.75	0.69	0.52
5.05	1	FOOD PROCESSOR	0.94	1	3.6	208	3	0.85	1.11	0.94
5.12	1	MIXER	3.60	3	9.6	208	3	0.85	4.23	3.60
5.14	1	REFRIGERATOR	0.96	0.33	7.2	120	1	0.75	1.28	0.96
5.15	1	MIXER	0.96	0.5	9.8	120	1	0.85	1.13	0.96

KITCHEN EQUIPMENT SCHEDULE										
EQUIPMENT TAG	QUANTITY	LOAD DESCRIPTION	kW	HP	MOTOR AMPS	VOLTAGE	PHASE(S)	ASSUMED P.F.	kVA	kW
5.17	1	SLICER	0.6	0.5	9.8	120	1	0.85	0.71	0.60
5.19	1	ICE CREAM DISPENSER	0.72	0.25	5.8	120	1	0.75	0.96	0.72
5.22	1	ICE CREAM MACHINE	1	--	--	120	1	0.9	1.11	1.00
6.05	1	GLASS DOOR REFRIGERATOR	0.96	0.33	7.2	120	1	0.75	1.28	0.96
7.02	1	SLIDE TOP COOLER	0.73	0.2	4.4	120	1	0.75	0.98	0.73
7.12	2	COOLER	1.8	0.25	5.8	120	1	0.75	2.40	1.80
10.01	1	WALK-IN STORAGE LTS & HTR	2.0	--	--	120	1	1	1.98	1.98
10.02	2	EVAPORATOR COIL REMOTE SYSTEM	0.5	--	--	120	1	1	0.50	0.50
10.05	1	EVAPORATOR COIL REMOTE SYSTEM	0.43	--	--	120	1	1	0.43	0.43
10.13	1	VENTILATOR CONTROL CABINET	0.6	--	--	120	1	0.95	1.43	0.60
10.14	1	FIRE SUPPRESSION SYSTEM	0.5	--	--	120	1	0.95	2.40	0.50
10.17	1	CONVECTION OVEN	0.58	--	--	120	1	1	0.58	0.58
10.18	1	CONVECTION OVEN	0.95	--	--	120	1	1	0.95	0.95
10.19	1	DECK OVENS	14	--	--	208	3	1	14.00	14.00
10.22	1	DOUBLE WIDE PROOFER/RETARDER	4.24	--	--	208	3	0.95	4.46	4.24
10.27	1	MIXER	1.44	2.7	9.6	208	3	0.85	1.69	1.44
10.28	1	VACUUM PACKAGING MACHINE	3.6	4.4	15.2	208	3	0.85	4.24	3.60
10.31	1	MICROWAVE OVEN	3.24	--	--	208	1	0.9	3.60	3.24
10.35	1	FOOD PROCESSOR	1.44	1	16	120	1	0.85	1.69	1.44
10.36	1	ICE CREAM MACHINE	1	--	--	120	1	0.9	1.11	1.00
10.38	1	MIXER	1.02	0.5	9.8	120	1	0.85	1.20	1.02
10.39	1	REVERSIBLE DOUGH SHEETER	0.48	--	--	120	1	0.95	0.51	0.48
10.41	1	DOUGH DIVIDER/ROUNDER	0.96	--	--	208	1	0.95	1.01	0.96
10.42	1	REFRIGERATOR	1.27	0.33	7.2	120	1	0.75	1.70	1.27
10.43	1	PREP TABLE	1.08	0.33	7.2	120	1	0.75	1.44	1.08
10.45	1	MIXER	0.35	0.17	4.4	120	1	0.75	0.46	0.35
10.46	1	FOOD BLENDER	0.84	--	--	120	1	0.95	0.88	0.84
10.47	1	BATCH FREEZER	1.66	1	8	208	1	0.85	0.99	1.66
11.01	1	WALK-IN REF, LTS & HEATERS	1.8	--	--	120	1	1	1.80	1.80
11.02	2	EVAPORATOR COIL REMOTE SYSTEM	0.43	--	--	120	1	1	0.43	0.43
11.1	1	BEER SYSTEM	2.09	--	--	120	1	0.9	2.32	2.09
11.13	2	CARBONATOR	0.86	--	--	120	1	0.9	0.96	0.86
12.01	--	REFRIGERATOR	0.96	0.33	7.2	120	1	0.75	1.28	0.96
12.02	--	REFRIGERATED COLD PAN	0.6	0.25	5.8	120	1	0.75	0.80	0.60
12.03	--	HOT FOOD WELL	3.31	--	--	208	1	1	3.31	3.31
12.05	--	MERCHANDISE REFRIGERATOR	1.02	0.33	7.2	120	1	0.75	1.36	1.02
12.06	--	SODA TOWER / ICE BIN	2.4	--	--	120	1	0.9	2.67	2.40
12.07	--	CARBONATOR	0.86	--	--	120	1	0.9	0.96	0.86
12.09	--	HOLDING CABINET	1.44	--	--	120	1	0.95	1.52	1.44
12.13	--	COFFEE BREWER	1.52	--	--	120	1	1	1.52	1.52

LAUNDRY EQUIPMENT SCHEDULE									
EQUIPMENT TAG	QUANTITY	LOAD DESCRIPTION	kW	HP	MOTOR AMPS	VOLTAGE	PHASE(S)	ASSUME D.P.F.	kVA
L-2	1	SHEET FEEDER	2.4	1.5	2.6	480	3	0.85	2.82
L-4	4	165lb WASHER EXTRACTOR	17.4	15	21	480	3	0.95	18.32
L-5	1	LIQUID CHEMICAL CONTROL	0.5	--		120	1	0.85	0.59
L-6	3	190lb GAS DRYER	11.7	8.5	12	480	3	0.95	12.32
L-7	1	TOWEL FOLDER	2.4	1.5	2.6	480	3	0.85	2.82
L-9	1	SEWING MACHINE	0.5	--		120	1	0.85	0.59
L-10	1	35lb WASHER EXTRACTOR	1.2	0.75	1.4	480	3	0.85	1.41
L-11	1	55lb GAS DRYER	2.4	1.33	2.6	480	3	0.85	2.82
L-13	1	WASHER	1.2	0.5	9.8	120	1	0.85	1.41
L-13b	1	DRYER	0.8	0.33	3.6	208	1	0.75	1.07
L-14	1	LINT COLLECTOR	0.5	--		120	1	0.9	0.56
L-16	1	UTILITY PRESS	1	--		208	1	0.9	1.11
L-19	1	TWO ROLL GAS HEATED IRONER	11.7	8	11	480	3	0.95	12.32
L-20	1	AIR COMPRESSOR	6.3	5	7.6	480	3	0.85	7.41
L-21	1	FLOOR SCALE	0.5	--		120	1	0.85	0.59
L-24	1	GARMENT CONVEYOR	0.5	--		120	1	0.85	0.59
L-25	1	FOLDER/CROSSFOLDER/STACKER	1.8	2.4	4.5	480	3	0.85	2.12
L-28	1	SOIL SORT BELT CONVEYOR	0.9	0.5	1	480	3	0.85	1.06

Service Entrance Size

The following is a summary of three different calculations made to size the service entrance. The first sizing method is made for the Conceptual or Schematic Design phase, where the building square footage is multiplied by a demand load in VA/sq.ft. based on general building types. The second calculation, for the Design Development phase, is determined by adding demand loads in VA/sq.ft. for different specific loads in the building, such as lighting and receptacles. The third calculation method is completed based on actual building loads and NEC demand factors. The breakdown of each calculation method is shown in the summary below.

Service Entrance Size Calculation - Conceptual/Schematic Design		
Building Square Footage	VA/sq.ft.	Load - VA
230,000	12	2760000

Service Entrance Size Calculation - Design Development			
<b>Receptacles</b>			
	VA/sq.ft.	Building Sq.ft.	Load - kVA
	0.5	230000	115
<b>HVAC - cooling</b>			
	VA/sq.ft.	Building Sq.ft.	Load - kVA
	8	230000	1840
<b>Kitchen - full service</b>			
	VA/sq.ft.	Building Sq.ft.	Load - kVA
	20	10000	200
<b>Lighting</b>			
	VA/sq.ft.	Building Sq.ft.	Load - kVA
	2	230000	460
<b>Lighting demand factors: NEC Table 220.42</b>			
First 20 kVA: 50%	10 kVA		Load - kVA 167
20 kVA - 100kVA: 40%	32 kVA		
> 100 kVA: 30%	125 kVA		
<b>TOTAL</b>	167 kVA		
<b>Elevators</b>			
50 kW/elevator x 6 elevators = 300kW			Load - kVA
			333.33
<b>Load - Amps</b>			
115kVA + 1840kVA + 200kVA + 167kVA + 333 kVA = 2655 kVA ==> <b>3193.5 A</b>			

Service Entrance Size Calculation - Working Drawings		
LOAD	CONNECTED LOAD (kVA)	DEMAND LOAD (kVA)
Lighting	157.5	59.25
Receptacles	562	286
Mechanical/Plumbing Equip.	1477	1477
Kitchen Equipment	164.8	164.6
Laundry Equipment	63.7	63.7
Fitness Room Equipment	20.4	20.4
AV Equipment	38	38
Fountains	36.5	36.5
Dimming Panels	210	190
<b>Total kVA</b>		2335.45
<b>Total Current (A)</b>		<b>2809.1</b>

Service Entrance Size			
Phase	Load - kVA	Voltage System	Load - Amps
Conceptual/Schematic Design	2760	480Y/277V, 3PH, 4W	3319.8
Design Development	2655	480Y/277V, 3PH, 4W	3193.5
Working Drawings	2335.45	480Y/277V, 3PH, 4W	2809.1
Actual Conditions - Service Entrance	2660	480Y/277V, 3PH, 4W	3200

VA/sq.ft. for 230,000 sq.ft	11.6
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In comparing the three service entrance sizes above, the conceptual/schematic and design development phase service sizes are relatively close to the actual conditions service entrance size. The working drawings load calculation resulted in a slightly undersized service, however. This is likely due to the fact that complete loads for communication systems were not provided in the working drawings set.

### Environmental Stewardship Design

The Salamander Resort and Spa design team has taken great effort to become one of the only hospitality resorts to gain LEED Certification. Therefore, the electrical design must pass the USGBC LEED electrical requirements for certification. No special electrical systems have been implemented, however. Most LEED credit is awarded for energy efficient equipment.

### Design Issues

On a site visit to Middleburg in late August 2009, the electrical contractor described problems with the electrical design in which feeders were routed at too great of a length to the lodging wing without having an intermediate electrical room for the spa wing (Area 3) basement. A janitor's closet near the indoor pool was modified to become that intermediate electrical room. This design issue of extensive feeder lengths between distribution panels and branch circuits may be an area of interest.

## **Section II - Communication Systems**

### Audio Visual Systems

The Salamander Resort and Spa contains fourteen Audio Visual presentation room/area types (ballroom, board rooms, meeting rooms, hospitality suite, fitness center, movement studio, library, living room, win bar, billiards room, spa area, indoor pool, spa café, cooking studio, restaurant, whole house audio and video). AV systems include, but are not limited, to DVD/CD players, speaker audio systems, portable laptop input jacks, videoconferencing and audio conferencing capabilities, wireless microphones, volume controls, touch panel controls, plasma and or LCD displays, satellite TV capability, audio from MP3 servers and BOH system,

### Telecommunication Systems

The main communications equipment is located in the IDF low voltage termination room, found in Area 2 of the building on the basement level. Telecommunication systems are distributed throughout the building, providing voice and data outlets to most spaces. Wireless access points are also distributed throughout the resort to provide internet to guests. Guest room desk "jack pack plates" include outlets for the following: A/V, S-Video, PC Audio/VGA, HDMI, mp3 dock, internet, USB. Most equipment is placed on the UPS standby power, which is also located in the IDF room.

### Security Systems

The security system throughout the building is a complete IP Video Surveillance System (IPVS), which includes IPVS cameras (wide dynamic range; sensor input; alarm output; audio support; exterior pan-tilt-zoom), IPVS recording systems (network access; video recording; video server), fixed indoor camera power supplies, exterior and PTZ camera power supplies (24VAC; 48VA minimum), IPVS system cabling, network switches, an alternate analog CCTV system (cameras, DVRs), and a panic alarm system (Sentrol Panic Button, ATW Panic Alarm).

## **Appendix A – Feeder Schedule and Single-line Diagram**

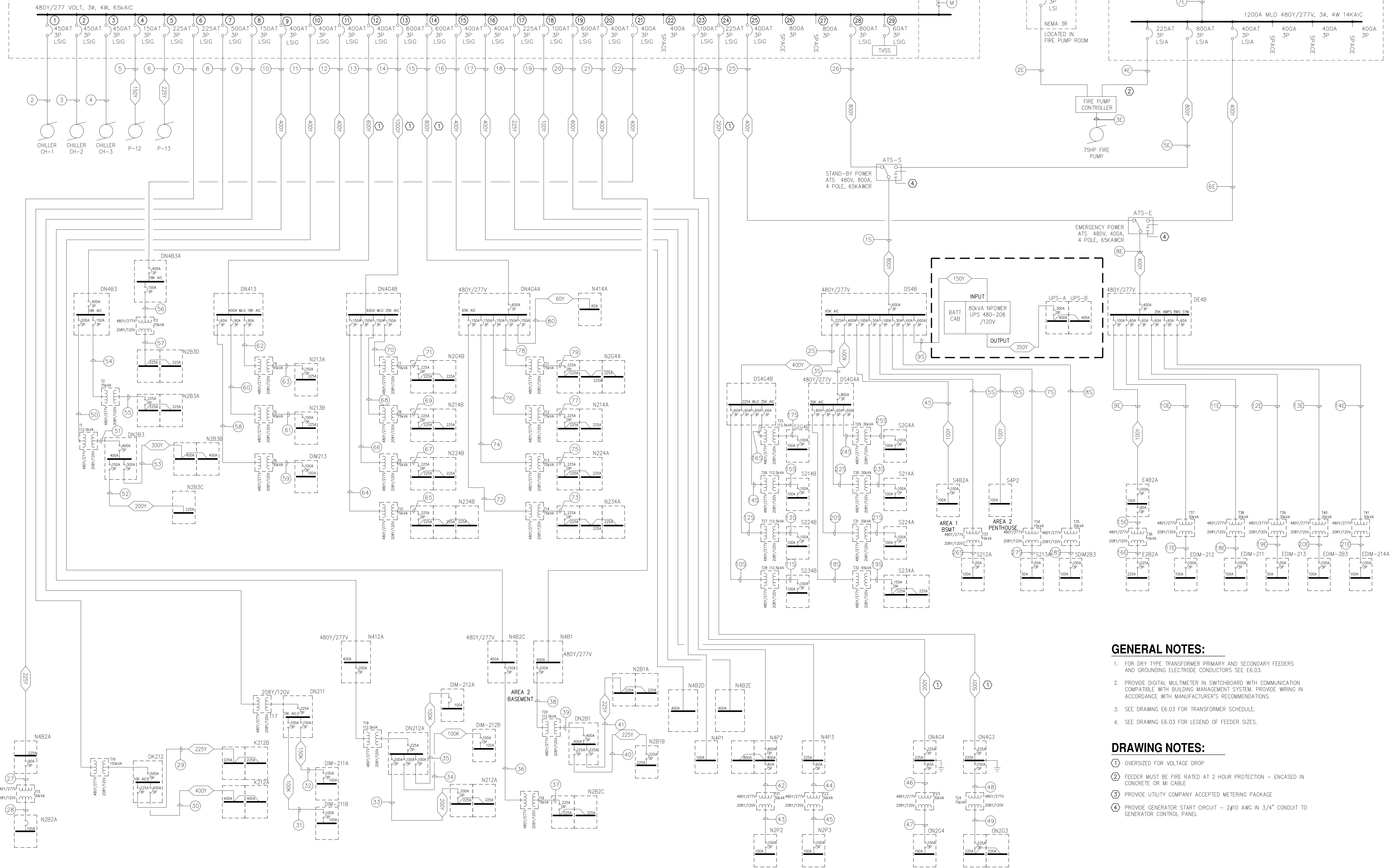
FEEDER SCHEDULE																
TAG	FROM	TO	NO. OF SETS	CONDUIT (PER SET)		CONDUCTORS (PER SET)									SIZE OF OVERCURRENT PROTECTION	FRAME OR SWITCH SIZE
				SIZE	TYPE	PHASE CONDUCTORS			NEUTRAL CONDUCTORS			GROUND CONDUCTORS				
						No.	SIZE	TYPE	No.	SIZE	TYPE	No.	SIZE	TYPE		
1	UTILITY XFMR	MSB	8	6"	DUCT-BANK	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	500KCMIL	CU THWN	3200	3200A/3P
2	MSB	CH-1	2	2-1/2"	EMT	3	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	2AWG	CU THWN	450	450A/3P
3	MSB	CH-2	2	2-1/2"	EMT	3	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	2AWG	CU THWN	450	450A/3P
4	MSB	CH-3	2	2-1/2"	EMT	3	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	2AWG	CU THWN	450	450A/3P
5	MSB	P-12	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
6	MSB	P-13	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
7	MSB	N4B2A	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
8	MSB	T16	2	3"	EMT	3	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	2AWG	CU THWN	500	500A/3P
9	MSB	T17	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
10	MSB	N412A	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
11	MSB	N4B2C	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
12	MSB	DN4B3	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
13	MSB	DN413	2	3-1/2"	EMT	3	350KCMIL	CU THWN	1	350KCMIL	CU THWN	1	1AWG	CU THWN	400	400A/3P
14	MSB	DN4G4B	3	3-1/2"	EMT	3	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	2/0AWG	CU THWN	600	600A/3P
15	MSB	DN4G4A	2	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	1/0AWG	CU THWN	600	600A/3P
16	MSB	N4B2D	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
17	MSB	N4B2E	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	600	600A/3P
18	MSB	N4P3	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
19	MSB	N4P1	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
20	MSB	N4P2	2	3-1/2"	EMT	3	350KCMIL	CU THWN	1	350KCMIL	CU THWN	1	1AWG	CU THWN	600	600A/3P
21	MSB	N4B1	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	600	600A/3P
22	MSB	DN4B3A	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	600	600A/3P
23	MSB	ON4G4	1	2"	EMT	3	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	100	100A/3P
24	MSB	ON4G3	2	3"	EMT	3	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	2AWG	CU THWN	225	225A/3P
25	MSB	ATS-E	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
26	MSB	ATS-S	2	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	1/0AWG	CU THWN	800	800A/3P
27	N4B2A	T15	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	90	90A/3P
28	T15	N2B2A	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
29	DK212	K212B	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
30	DK212	K212A	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
31	DN211	DIM-211B	1	2"	EMT	3	1AWG	CU THWN	1	3/0AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
32	DN211	DIM-211A	1	2-1/2"	EMT	3	1/0AWG	CU THWN	2	1/0AWG	CU THWN	1	6AWG	CU THWN	100	100A/3P
33	DN212A	N212A	1	2"	EMT	3	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	100	100A/3P
34	DN212A	DIM-212B	1	2"	EMT	3	1AWG	CU THWN	1	3/0AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
35	DN212A	DIM-212A	1	2"	EMT	3	1AWG	CU THWN	1	3/0AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
36	N4B2C	T19	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
37	T19	N2B2C	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
38	N4B1	T20	1	2"	EMT	3	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	200	200A/3P
39	T20	DN2B1	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
40	DN2B1	N2B1B	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
41	DN2B1	N2B1A	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
42	N4P2	T21	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
43	T21	N2P2	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
44	N4P3	T22	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
45	T22	N2P3	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
46	ON4G4	T23	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
47	T23	ON2G4	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
48	ON4G3	T24	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
49	T24	ON2G3	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
50	DN4B3	T1	1	2"	EMT	3	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	200	200A/3P
51	T1	DN2B3	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
52	DN2B3	N2B3C	1	2"	EMT	3	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
53	DN2B3	N2B3B	1	3"	EMT	3	350KCMIL	CU THWN	1	350KCMIL	CU THWN	1	4AWG	CU THWN	300	300A/3P
54	DN4B3	T2	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
55	T2	N2B3A	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
56	DN4B3A	T3	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
57	T3	N2B3D	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
58	DN413	T6	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
59	T6	DIM213	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
60	DN413	T5	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	90	90A/3P
61	T5	N213B	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
62	DN413	T4	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	90	90A/3P
63	T4	N213A	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
64	DN4G4B	T10	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
65	T10	N234B	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P



FEEDER SCHEDULE																
TAG	FROM	TO	NO. OF SETS	CONDUIT (PER SET)		CONDUCTORS (PER SET)									SIZE OF OVERCURRENT PROTECTION	FRAME OR SWITCH SIZE
						PHASE CONDUCTORS			NEUTRAL CONDUCTORS			GROUND CONDUCTORS				
				SIZE	TYPE	No.	SIZE	TYPE	No.	SIZE	TYPE	No.	SIZE	TYPE		
66	DN4G4B	T9	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
67	T9	N224B	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
68	DN4G4B	T8	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
69	T8	N214B	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
70	DN4G4B	T7	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
71	T7	N2G4B	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
72	DN4G4A	T14	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
73	T14	N234A	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
74	DN4G4A	T13	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
75	T13	N224A	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
76	DN4G4A	T12	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
77	T12	N214A	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
78	DN4G4A	T11	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
79	T11	N2G4A	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
80	DN4G4A	N414A	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	150	150A/3P
1E	UTILITY XFMR	FIRE PUMP	1	2"	EMT	3	2/0AWG	CU THWN	1	2/0AWG	CU THWN	1	1AWG	CU THWN	600	600A/3P
2E	FIRE PUMP PANEL	FIRE PUMP CONTROL	1	2"	EMT	3	2/0AWG	CU THWN	1	2/0AWG	CU THWN	1	1AWG	CU THWN	600	600A/3P
3E	FIRE PUMP CONTROL	FIRE PUMP	1	2"	EMT	3	2/0AWG	CU THWN	1	2/0AWG	CU THWN	1	1AWG	CU THWN	225	225A/3P
4E	ESB	FIRE PUMP CONTROL	1	2"	EMT	3	2/0AWG	CU THWN	1	2/0AWG	CU THWN	1	1AWG	CU THWN	225	225A/3P
5E	ESB	ATS-S	2	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	1/0AWG	CU THWN	800	800A/3P
6E	ESB	ATS-E	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
7E	ESB	GENERATOR	3	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3/0AWG	CU THWN	1200	1200A/3P
8E	ATS-E	DE4B	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
9E	DE4B	E4B2A	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
10E	DE4B	T37	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
11E	DE4B	T38	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
12E	DE4B	T39	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
13E	DE4B	T40	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
14E	DE4B	T41	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
15E	E4B2A	T36	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	90	90A/3P
16E	T36	E2B2A	1	2-1/2"	EMT	3	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P
17E	T37	EDIM-212	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
18E	T38	EDIM-211	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
19E	T39	EDIM-213	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	50	50A/3P
20E	T40	EDIM-2B3	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
21E	T41	EDIM-214A	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
1S	ATS-S	DS4B	2	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	1/0AWG	CU THWN	800	800A/3P
2S	DS4B	DS4G4B	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	225	225A/3P
3S	DS4B	DS4G4A	1	4"	EMT	3	600KCMIL	CU THWN	1	600KCMIL	CU THWN	1	3AWG	CU THWN	400	400A/3P
4S	DS4B	S4B2A	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
5S	DS4B	T33	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	30	30A/3P
6S	DS4B	S4P2	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
7S	DS4B	T34	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	30	30A/3P
8S	DS4B	T35	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
9S	DS4B	UPS	1	2"	EMT	3	2/0AWG	CU THWN	1	2/0AWG	CU THWN	1	1AWG	CU THWN	600	600A/3P
10S	DS4G4B	T28	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
11S	T28	S234B	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
12S	DS4G4B	T27	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
13S	T27	S224B	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
14S	DS4G4B	T26	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
15S	T26	S214B	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
16S	DS4G4B	T25	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
17S	T25	S2G4B	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
18S	DS4G4A	T32	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	90	90A/3P
19S	T32	S234A	1	2"	EMT	3	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P
20S	DS4G4A	T31	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
21S	T31	S224A	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
22S	DS4G4A	T30	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
23S	T30	S214A	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
24S	DS4G4A	T29	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	60	60A/3P
25S	T29	S2G4A	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P
26S	T33	S212A	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	50	50A/3P
27S	T34	S213A	1	1"	EMT	3	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	50	50A/3P
28S	T35	SDIM2B3	1	1-1/2"	EMT	3	1AWG	CU THWN	1	1AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P

- Drawings used to complete the single-line diagram and feeder schedule are: E6.1 – Electrical One-Line Power Riser Diagram; E6.3 – Electrical Details and Schedules; E7.0-E7.10 Electrical Panel Schedules.

INDOOR 3200A, 480Y/277V, 3Ø, 4W, 65KAIC - MAIN SWITCHBOARD "MSB"



- GENERAL NOTES:**
- FOR DRY TYPE TRANSFORMER PRIMARY AND SECONDARY FEEDERS AND GROUNDING ELECTRODE CONDUCTORS SEE E6.03.
  - PROVIDE DIGITAL MULTIMETER IN SWITCHBOARD WITH COMMUNICATION COMPATIBLE WITH BUILDING MANAGEMENT SYSTEM. PROVIDE WIRING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
  - SEE DRAWING E6.03 FOR TRANSFORMER SCHEDULE.
  - SEE DRAWING E6.03 FOR LEGEND OF FEEDER SIZES.

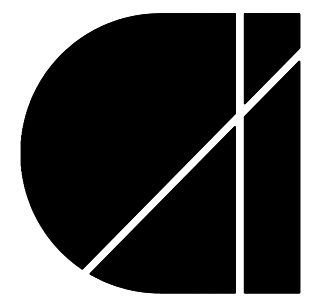
- DRAWING NOTES:**
- OVERSIZED FOR VOLTAGE DROP
  - FEEDER MUST BE FIRE RATED AT 2 HOUR PROTECTION - ENCASED IN CONCRETE OR MI CABLE
  - PROVIDE UTILITY COMPANY ACCEPTED METERING PACKAGE
  - PROVIDE GENERATOR START CIRCUIT - 2#10 AWG IN 3/4" CONDUIT TO GENERATOR CONTROL PANEL

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 AE481-CAPSTONE SENIOR THESIS

ELECTRICAL SINGLE-LINE DIAGRAM

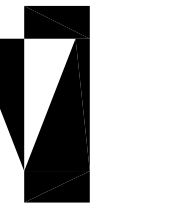
E6.1



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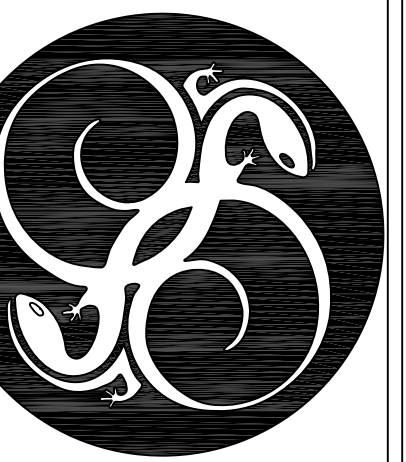
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Fax: 703-683-2480



Salamanca  
RESORT & SPA  
Middleburg, Virginia

Project: 26040.01

Revisions:

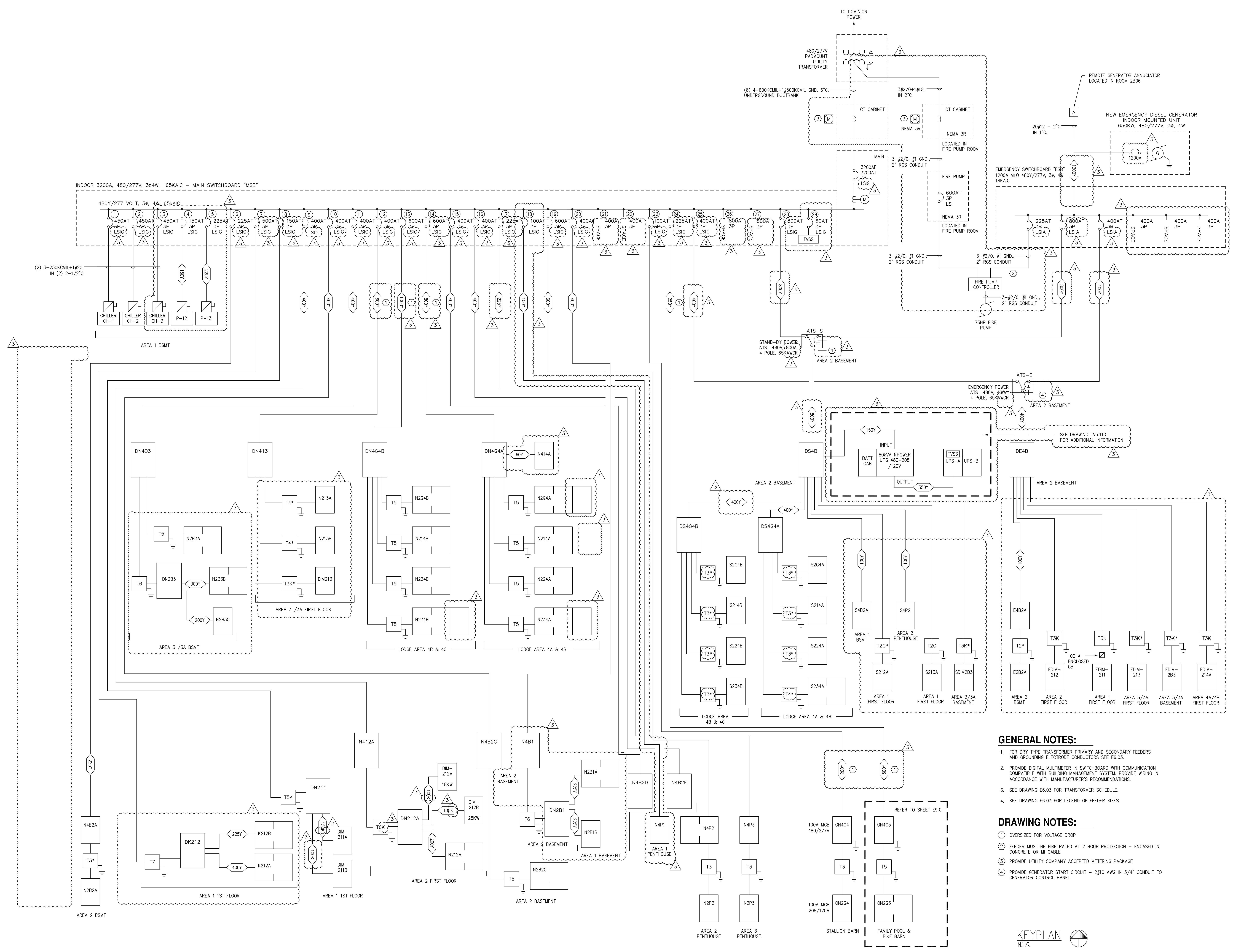
- 2 OWNER CHANGES 11/29/07
- 3 ELECTRICAL COMPLETION 01/11/08

ELECTRICAL  
ONE-LINE  
POWER RISER  
DIAGRAM

Scale: 1/8" = 1'-0"  
Drawn: EOO  
Checked: SLC  
Date: 10/15/07

E6.1

Sheet 53 of 68



**GENERAL NOTES:**

1. FOR DRY TYPE TRANSFORMER PRIMARY AND SECONDARY FEEDERS AND GROUNDING ELECTRODE CONDUCTORS SEE E6.03.
2. PROVIDE DIGITAL MULTIMETER IN SWITCHBOARD WITH COMMUNICATION COMPATIBLE WITH BUILDING MANAGEMENT SYSTEM. PROVIDE WIRING IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. SEE DRAWING E6.03 FOR TRANSFORMER SCHEDULE.
4. SEE DRAWING E6.03 FOR LEGEND OF FEEDER SIZES.

**DRAWING NOTES:**

- 1 OVERSIZED FOR VOLTAGE DROP
- 2 FEEDER MUST BE FIRE RATED AT 2 HOUR PROTECTION - ENCASED IN CONCRETE OR MI CABLE
- 3 PROVIDE UTILITY COMPANY ACCEPTED METERING PACKAGE
- 4 PROVIDE GENERATOR START CIRCUIT - 2#10 AWG IN 3/4" CONDUIT TO GENERATOR CONTROL PANEL

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Wednesday, November 14, 2007 10:10 AM

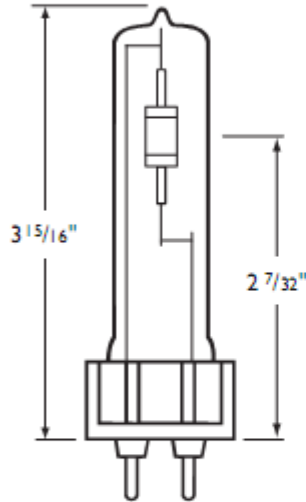
KEYPLAN  
NTS

## **Appendix B – H.I.D. Lamps/Ballasts**



Luminaire Tag: OE & OF – 1 lamp/luminaire  
Ballast Type: Electronic

## Philips MasterColor® Ceramic Metal Halide 39 Watt 4000K Tubular Single-Ended T6 Lamps



### Ordering Information

Ordering Code	CDM35/T6/B42
ANSI Designation	M130/E
Product Number	208868
Description	MasterColor Ceramic Metal Halide
Package Qty.	12

### Physical Characteristics

Bulb Size	T-6
Bulb Finish	Clear
Base	G-12 BI-Pin
Max. Overall Length (MOL)	3 15/16" (100 mm)
Light Center Length (LCL)	2 7/32" (56 mm)
Arc Length	0.2" (5 mm)
Arc Tube Material	Polycrystalline Alumina
Max. Permissible Bulb Temp.	500° C (932° F)
Max. Permissible Base Temp.	280° C (536° F)
Max. Bulb to Base Eccentricity	3°
Max. Arc Tube to Base Eccentricity	3°

### Operating Characteristics (Photometric)

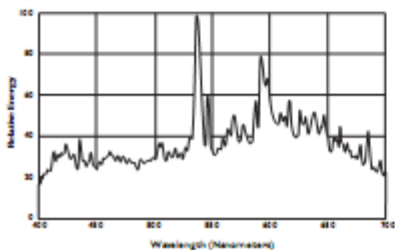
Initial Lumens, Approx. <sup>1</sup>	3300
Mean Lumens, Approx. <sup>2</sup>	2800
Rated Average Life, Hours <sup>2</sup>	6,000
Correlated Color Temp. (CCT) <sup>3</sup>	4200K
CIE Chromaticity, Approx. <sup>3</sup>	x-.365, y-.364
Color Rendering Index (CRI)	84
Efficacy (lpw)	81

### Operating Position

Universal-Enclosed Luminaires Only

Note: Use only on thermally protected electronic ballast.

Representative Spectral Power Distribution of MasterColor® 4000K Lamps



### Philips MasterColor® Ceramic Metal Halide 39 Watt 4000K Tubular Single-Ended T6 Lamps

Electrical Data (Subject to change without notice)

Lamp Watts (Nominal)	39
Lamp Operating Voltage (rms) (Nominal) <sup>1</sup>	85
Initial Lamp Voltage Range (rms) <sup>2</sup>	77-93
Lamp Operating Current (Amps) (rms) (Nominal)	0.46
Lamp Current Crest Factor (Maximum)	1.8
Warm-up Time to 80% of Output	2 Minutes
Re-ignite Time for Hot Lamp	4-8 Minutes
Ballast Type	ANSI M130/E
Ballast Open Circuit Voltage (Minimum)	198
Pulse Peak Volts	3000 Min., 4000 Max.
Pulse Width @ 90% Peak	2 Micro Second Min.
Pulse Repetition Rate (Minimum) <sup>3</sup>	2 per Half Cycle
Minimum Operating Temperature	-30°C

<sup>1</sup> Measured at 100 hrs. life. Appropriate lumen values listed are for vertical operation of the lamp.

<sup>2</sup> Appropriate lumen output at 40% of lamp rated average life.

<sup>3</sup> Rated average life is the life obtained, on the average, from large representative groups of lamps in laboratory tests under controlled conditions at 10 or more operating hours per start. It is based on survival of at least 50% of the lamps and allows for individual lamps or groups of lamps to vary considerably from the average.

<sup>4</sup> Measured at rated lamp watts on a linear reactor. LPW does not include ballast losses.

<sup>5</sup> Measured with the lamp operating at rated watts.

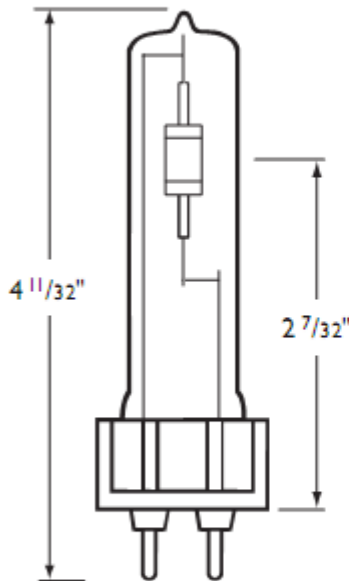
<sup>6</sup> Color-Pulse Width @ 90% Peak, 1 micro second minimum with 2 pulses per half cycle.

**Luminaire Tag: OE & OF – 1 lamp/luminaire**  
**Ballast Type: Electronic**

<b>PHILIPS ADVANCE</b>		<b>e-Vision® Electronic Ballast for Metal Halide Lamps</b>				Catalog Number: IMH-P39-G For 39W Philips Mini Master Color Lamps ANSI C179 120-277 50/60Hz Electronic Status: RELEASED				
<b>DIMENSIONS AND DATA</b>										
Lamp		Input Volts	Catalog Number*	Line Current (Amps)	Input Power (Watts)	Min Power Factor	Wiring Diag	Fig.	Weight (lb)	Max. Distance to Lamp (ft)
Number	Watts									
39W Watt Lamp, ANSI Code C179 Minimum Starting Temp -30°C/-20°F										
1	39	120 277	IMH-P39-G-XXX	0.39 0.17	46 45	0.95	3	G	0.9	5
							<p style="text-align: center;">Wiring Diagram 3</p>			
Case Figure	Overall Length	Case Length	Case Width	Height	Mountin Length	Mounting Width				
G	97mm [3.8"]	90mm [3.5"]	77mm [3.0"]	30mm [1.2"]	87mm [3.4"]	67mm [2.6"]				
<p style="text-align: center;">Case Temperature Measurement Location</p>										
<b>INSTALLATION &amp; APPLICATION NOTES:</b> 1. Maximum allowable case temperature is 90°C. See figure above for measurement location 2. Ignition pulse is 2.5 kV max 3. All leads are 9 inches long 4. Ballast output will shutdown after 20 minutes if lamp fails to ignite 5. Power must be cycled off – then on, after replacing lamp							<b>*Ordering Information</b>			
Order Suffix			Description							
-LF			Ballast with side exit leads and mounting feet							
-BLS			Ballast with bottom exit leads and mounting studs							
Data is based on tests performed by Philips Advance in a controlled environment and is representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.										

Luminaire Tag: OB,XA,XH,XM – 1 lamp/luminaire  
Ballast Type: Electronic

## MasterColor® CDM Elite Ceramic Metal Halide 150 Watt 3000K Tubular Single-Ended T6 Lamps



### Ordering Information

Ordering Code	CDM150/T6/930 ELITE
ANSI Designation	C142/E
Product Number	404953
Description	MasterColor CDM Elite Ceramic Metal Halide
Package Qty.	12

### Physical Characteristics

Bulb Size	T-6
Bulb Finish	Clear
Base	G-12 Bi-Pin
Max. Overall Length (MOL)	4 11/32" (110 mm)
Light Center Length (LCL)	2 7/32" (56 mm)
Arc Length	0.354" (9 mm)
Arc Tube Material	Polycrystalline Alumina
Max. Permissible Bulb Temp.	650°C (1202°F)
Max. Permissible Base Temp.	280°C (536°F)
Max. Bulb to Base Eccentricity	3°
Max. Arc Tube to Base Eccentricity	3°

### Operating Characteristics (Photometric)

Initial Lumens, Approx. <sup>1</sup>	15,000
Mean Lumens, Approx. <sup>2</sup>	13,500
Rated Average Life, Hours <sup>3</sup>	12,000
Correlated Color Temp. (CCT) <sup>4</sup>	3000K
CIE Chromaticity, Approx. <sup>5</sup>	x-.428, y-.395
Color Rendering Index (CRI)	90
Efficacy (lpw)	100

### Operating Position

Universal—Enclosed Luminaires Only

### MasterColor® CDM Elite Ceramic Metal Halide 150 Watt 3000K Tubular Single-Ended T6 Lamps

Electrical Data (Subject to change without notice)

Lamp Watts (Nominal)	150
Lamp Operating Voltage (rms) (Nominal) <sup>1</sup>	88
Initial Lamp Voltage Range (rms) <sup>2</sup>	82-94
Lamp Operating Current (Amps) (rms) (Nominal)	1.65
Lamp Current Crest Factor (Maximum)	1.8
Warm-up Time to 80% of Output	2 Minutes
Restrike Time for Hot Lamp	4-8 Minutes
Ballast Type	ANSI M142/E
Ballast Open Circuit Voltage (Minimum)	198
Pulse Peak Volts	3000 Min., 4000 Max.
Pulse Width @ 90% Peak	2 Micro Second Min.
Pulse Repetition Rate (Minimum) <sup>4</sup>	2 per Half Cycle
Minimum Operating Temperature	-30°C

1) Measured at 100 hrs. life. Approximate lumen values listed are for vertical operation of the lamp.

2) Approximate lumen output at 40% of lamp rated average life.

3) Rated average life is the life obtained, on the average, from large representative groups of lamps in laboratory tests under controlled conditions at 10 or more operating hours per start. It is based on survival of at least 50% of the lamps and allows for individual lamps or groups of lamps to vary considerably from the average.

4) Measured at rated lamp watts on a line reactor. LPW does not include ballast losses.

5) Measured with the lamp operating at rated watts.

6) Color-Pulse Width @ 90% Peak, 1 micro second minimum with 2 pulses per half cycle.

Luminaire Tag: OB,XA,XH,XM – 1 lamp/luminaire  
Ballast Type: Electronic

<b>PHILIPS ADVANCE</b>		<b>e-Vision® Electronic Ballast for Metal Halide Lamps</b>			Catalog Number: IMH-150-H For 150W Metal Halide Lamps ANSI M102 or M142 120-277V 50/60Hz Electronic Status: RELEASED					
<b>DIMENSIONS AND DATA</b>										
Lamp		Input Volts	Catalog Number*	Line Current (Amps)	Input Power (Watts)	Min Power Factor	Wiring Diag	Fig.	Weight (lb)	Max. Distance to Lamp (ft)
Number	Watts									
150 Watt Lamp, ANSI Code M102 or M142 Minimum Starting Temp -30°C/-20°F										
1	150	120 277	IMH-150-H-XXX	1.4 0.6	165 161	1	3	H	1.9	5
Case Figure	Overall Length	Case Length	Case Width	Height	Mountin Length	Mounting Width	Wiring Diagram 3			
H	161mm [6.3"]	144mm [5.7"]	92mm [3.6"]	38mm [1.5"]	152mm [6.0"]	73mm [2.9"]				
				<p style="text-align: center;">EISA Compliant</p>						
<b>INSTALLATION &amp; APPLICATION NOTES:</b> <ol style="list-style-type: none"> <li>Maximum allowable case temperature is 85°C. See figure above for measurement location</li> <li>Ignition pulse is 4 kV max</li> <li>All leads are 12 inches long</li> <li>Ballast output will shutdown after 20 minutes if lamp fails to ignite</li> <li>Power must be cycled off – then on, after replacing lamp</li> <li>Connect the red lead to the center terminal of the lamp when using screw base lamps</li> </ol>							<b>*Ordering Information</b>			
			Order Suffix	Description						
			-LF	Ballast with side exit leads and mounting feet						
			-BLS	Ballast with bottom exit leads and mounting studs						
<p>Data is based on tests performed by Philips Advance in a controlled environment and is representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.</p>										



Luminaire Tag: UM – 1 lamp/luminaire  
Ballast Type: Electronic

<b>PHILIPS ADVANCE</b>			<b>e-Vision® Electronic Ballast for Metal Halide Lamps</b>			Catalog Number: IMH-175-C For 150W or 175W Metal Halide Lamps ANSI M102, M142, S56, M137 or M152 120-277V 50/60Hz Electronic Status: RELEASED										
<b>DIMENSIONS AND DATA</b>																
Lamp		Input Volts	Catalog Number*	Line Current (Amps)	Input Power (Watts)	Min Power Factor	Wiring Diag	Fig.	Weight (lb)	Max. Distance to Lamp (ft)						
Number	Watts															
150 Watt Lamp, MH ANSI Code M102 or M142 and HPS ANSI Code S56 Minimum Starting Temp -30°C/-20°F																
1	150	120	IMH-175-C-XXX	1.4	169	1	1	C	2.5	5						
		277		0.6	166											
175 Watt Lamp, ANSI Code M137 or M152 Minimum Starting Temp -30°C/-20°F																
1	175	120	IMH-175-C-XXX	1.7	194	1	2	C	2.5	5						
		277		0.7	191											
Case Figure	Overall Length	Case Length	Case Width	Height	Mountin Length	Mounting Width										
C	204mm [8.0"]	184mm [7.2"]	92mm [3.6"]	38mm [1.5"]	195mm [7.7"]	73mm [2.9"]										
			MEASURE CASE TEMPERATURE ON RIGHT HEAT SINK CLIP AT BALLAST END													
<p><b>INSTALLATION &amp; APPLICATION NOTES:</b></p> <ol style="list-style-type: none"> <li>Maximum allowable case temperature is 85°C. See figure above for measurement location</li> <li>Ignition pulse is 4 kV max</li> <li>All leads are 12 inches long</li> <li>Ballast output will shutdown after 20 minutes if lamp fails to ignite</li> <li>Power must be cycled off – then on, after replacing lamp</li> </ol>			<p style="text-align: center;"><b>*Ordering Information</b></p> <table border="1"> <tr> <td>Order Suffix</td> <td>Description</td> </tr> <tr> <td>-LF</td> <td>Ballast with side exit leads and mounting feet</td> </tr> <tr> <td>-BLS</td> <td>Ballast with bottom exit leads and mounting studs</td> </tr> </table>								Order Suffix	Description	-LF	Ballast with side exit leads and mounting feet	-BLS	Ballast with bottom exit leads and mounting studs
Order Suffix	Description															
-LF	Ballast with side exit leads and mounting feet															
-BLS	Ballast with bottom exit leads and mounting studs															
Data is based on tests performed by Philips Advance in a controlled environment and is representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice. All specifications are nominal unless otherwise noted.																