

# Franklin Square Hospital Center

Baltimore, MD



## Technical Report 2 | Electrical Systems Existing Conditions + Building Load Summary Report

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## Executive Summary

The following report provides existing conditions of the Franklin Square Hospital Center's electrical system. Three primary 13.2KV services feeders supply the building with a 480Y/277V, 3PH, 4W and 208Y/120V, 3PH, 4W voltage systems. An emergency power system is powered by three engine generator sets in addition a UPS system. The distribution system is described as well as documented in a single-line diagram.

An analysis of the existing lighting, mechanical, architectural and plumbing conditions of the building equipment is performed and summarized in tables. Various methods to size service entrances depending on the project phase were used to size the feeders of the primary utility switchgear within the facility. The sizes calculated were compared to the actual conditions

The report contains a narrative of the existing communication systems of the hospital. The systems covered are telecommunications, fire alarm, nurse call, paging and audiovisual.

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## Power Distribution Systems

### Summary Description of Distribution System

The main distribution of Franklin Square Hospital Center is a secondary selective system allowing for multiple paths of supply power. Two service entrances with separate transformers create two radial systems that are connected with a tie breaker. The tie breaker is located on the bus bar and remains open unless one of the feeders fails. When this happens the tie breaker closes and the entire load runs through a single feeder. Both substation feeders are sized to accommodate this increased load. Transformers located in substations step-down the voltage from 13.2KV to 480Y/277V, 3PH, 4W which is run throughout the building. Other transformers step this voltage down to 208Y/120V, 3PH, 4W for mostly lighting and receptacle loads. Three emergency generators fed by a 480Y/277V, 3PH, 4W voltage system are each rated at 2000KW along with another service entrance, supply power to equipment and life safety branches when needed. An uninterruptable power system (UPS) rated at 180KVA/162KW provides 208Y/120V, 3PH, 4W emergency power to the building.

### Utility Company Information

Baltimore Gas and Electric Company (BGE) is part of the Constellation Energy Group. BGE's address and website are as follows:

Baltimore Gas and Electric Company  
 P.O. Box 1475  
 Baltimore, MD 21203  
 www.bge.com

Franklin Square Hospital Center is not scheduled to open the doors to the new patient tower until the summer of 2010 therefore a summary of the electric utility load data for the past 12 months could not be obtained.

The available rates for a primary voltage service are as follows:

- Generation:

Table 1: Generation market-priced service

	SEPT. 1 - 30, 2009	OCT. 1 - NOV. 30, 2009
<b>PEAK</b>	\$0.11551/kWh	\$0.0901/kWh
<b>INTERMEDIATE-PEAK</b>	\$0.09265/kWh	\$0.07717/kWh
<b>OFF-PEAK</b>	\$0.08824/kWh	\$0.06253/kWh

- Distribution: \$0.00456/kWh

## Service Entrance

Three utility feeders provided by BGE supply power to Franklin Square Hospital Center. The service entrance for two service feeders is located on the east wall of the central plant close to the northeast corner of the building. Underground conduit runs from the utility owned transformers to the primary switchgear located in the electrical room on the ground floor of the central plant.

The second service entrance is located on the north wall of the central plant near the northwest corner of the building. A run of underground conduit from a disconnect located in the electrical room on the ground floor of the central plant to the fire pump room on the ground floor of the hospital carries the one remaining service feeder.

All of the utility owned transformers are located outside of the building on concrete pads close to their respective service entrance. Meters are located on service feeders and on all substation feeders.

## Voltage Systems

Within the hospital, there are three major operating voltage systems; 13.2KV, 480Y/277V, and 208Y/120V. 13.2KV enters the building and powers the primary switchgear and all of the substations. The substation transformers step down the voltage to 480Y/277V, 3PH, 4W which runs from the substations to other switchboards and panels primarily loaded with equipment. Transformers located throughout the building step down the voltage system to 208Y/120V, 3PH, 4W that is mainly used for the lighting and receptacle loads. Mechanical equipment such as fans and pumps are run on either a 460V, 3PH, 3W or 115V, 1PH, 2W voltage system. The four elevators in the building are feed by a 480V, 3PH, 3W system.

## Emergency Power System

Emergency Paralleling switchgear provides a power distribution system for the three 2000KW engine generator sets. The diesel generators all run on 480Y/277V, 3PH, 4W voltage system with a 0.8 lagging power factor. The generators and emergency paralleling switchgear are located in the generator room and electrical room respectively, on the first floor of the central plant building.

A combined total of 19 automatic transfer switches are present in the distribution system; 4 in central plant and 15 in the hospital building. When any phase of the normal power is reduced by 80% or less of the rated value and the emergency generators reach 90% rated voltage, the switches will transfer the load to the emergency power. This whole process takes between 0.5 to 3 seconds. When the normal power regains 90% of the rated voltage for a time period between 0 to 30 minutes, the switches will transfer the loads back to normal power.

A UPS also provides additional emergency power by incorporating a rectifier/battery charger that converts incoming utility AC power to DC power can be distributed by the inverter in the case of a power outage.

## Locations of Switchgear

The main switchgear is located on the ground floor of the central plant and the ground floor of the hospital in the main electrical rooms of each building. Other major equipment is located in the central plant building or hospital main electrical room. Transformers are located on each floor to supply power to the lighting and appliance panel boards which are located in various places of the building in dedicated electrical closets.

Table 2: Major equipment schedule

MAJOR EQUIPMENT SCHEDULE						
TAG	TYPE OF EQUIPMENT	FLOOR LEVEL	ROOM NO.	ROOM NAME	1/4" SCALE DRAWING NO.	ENLARGED PLAN DRAWING NO.
E1-1	AUTOMATIC TRANSFER SWITCH	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E2-1	AUTOMATIC TRANSFER SWITCH	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E2-2	AUTOMATIC TRANSFER SWITCH	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E2-3	AUTOMATIC TRANSFER SWITCH	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E3-1	AUTOMATIC TRANSFER SWITCH	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E3-2	AUTOMATIC TRANSFER SWITCH	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E3-3	AUTOMATIC TRANSFER SWITCH	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E3-4	AUTOMATIC TRANSFER SWITCH	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
FP	AUTOMATIC TRANSFER SWITCH	GROUND	0901	FIRE PUMP ROOM	E05.0C	E01.00
EX. ATS #1	AUTOMATIC TRANSFER SWITCH	EX. FIRST	-	EX. MAIN ELECTRICAL ROOM	E08.A	E01.10
EX. ATS #2	AUTOMATIC TRANSFER SWITCH	EX. FIRST	-	EX. MAIN ELECTRICAL ROOM	E08.A	E01.10
EX. ATS #3	AUTOMATIC TRANSFER SWITCH	EX. FIRST	-	EX. MAIN ELECTRICAL ROOM	E08.A	E01.10
EX. ATS #4	AUTOMATIC TRANSFER SWITCH	EX. FIRST	-	EX. MAIN ELECTRICAL ROOM	E08.A	E01.10
EX. ATS #5	AUTOMATIC TRANSFER SWITCH	EX. FIRST	-	EX. MAIN ELECTRICAL ROOM	E08.A	E01.10
EX. ATS #6	AUTOMATIC TRANSFER SWITCH	EX. FIRST	-	EX. MAIN ELECTRICAL ROOM	E08.A	E01.10
E1-1P	AUTOMATIC TRANSFER SWITCH	PLANT FIRST	1602	ELECTRICAL ROOM	E07.1D	E01.10
E3-1P	AUTOMATIC TRANSFER SWITCH	PLANT GROUND	0909	ELECTRICAL ROOM	E07.0B	E01.00
E3-2P	AUTOMATIC TRANSFER SWITCH	PLANT GROUND	0909	ELECTRICAL ROOM	E07.0B	E01.00
E3-3P	AUTOMATIC TRANSFER SWITCH	PLANT GROUND	0909	ELECTRICAL ROOM	E07.0B	E01.00
SWGR-U	INCOMING UTILITY SWITCHGEAR	PLANT GROUND	0909	ELECTRICAL ROOM	E07.0B	E01.00
SWGR-C1	CHILLER SUBSTATION 1 SWITCHGEAR	PLANT GROUND	0909	ELECTRICAL ROOM	E07.0B	E01.00
SWGR-C2	CHILLER SUBSTATION 2 SWITCHGEAR	PLANT GROUND	0909	ELECTRICAL ROOM	E07.0B	E01.00
E3CP1	LOW VOLTAGE EQUIPMENT SWITCHGEAR	PLANT GROUND	0903	CHILLER ROOM	E07.0C	E01.00
SWGR-1	UNIT SUBSTATION 1 SWITCHGEAR	GROUND	0900	ELEC SWITCHGEAR ROOM	E04.0F	E01.00
SWGR-2	UNIT SUBSTATION 2 SWITCHGEAR	GROUND	0900	ELEC SWITCHGEAR ROOM	E04.0C	E01.00
SWGR-3	UNIT SUBSTATION 3 SWITCHGEAR	GROUND	0900	ELEC SWITCHGEAR ROOM	E04.0C	E01.00
SWGR-EG	EMERGENCY GENERATOR CONTROL SWITCHGEAR	PLANT FIRST	1602	ELECTRICAL ROOM	E07.1D	E01.10
EMCC	EQUIPMENT MOTOR CONTROL CENTER	PLANT GROUND	0908	BOILER ROOM	E07.0B	E01.00
EGS #1	EMERGENCY GENERATOR	PLANT FIRST	1603	GENERATOR ROOM	E07.1D	E01.10
EGS #2	EMERGENCY GENERATOR	PLANT FIRST	1603	GENERATOR ROOM	E07.1D	E01.10
EGS #3	EMERGENCY GENERATOR	PLANT FIRST	1603	GENERATOR ROOM	E07.1D	E01.10
T-1	TRANSFORMER	GROUND	0900	ELEC SWITCHGEAR ROOM	E05.0C	E01.00
T-2	TRANSFORMER	GROUND	0900	ELEC SWITCHGEAR ROOM	E05.0C	E01.00
T-3	TRANSFORMER	GROUND	0900	ELEC SWITCHGEAR ROOM	E05.0C	E01.00
T-4	TRANSFORMER	GROUND	0434	ELECTRICAL ROOM	E05.0F	E01.00
T-5	TRANSFORMER	GROUND	0434	ELECTRICAL ROOM	E05.0F	E01.00
T-6	TRANSFORMER	GROUND	0434	ELECTRICAL ROOM	E05.0F	E01.00
T-7	TRANSFORMER	GROUND	0704	ELECTRICAL ROOM	E05.0E	E01.00
T-8	TRANSFORMER	FIRST	1406	ELECTRICAL ROOM	E05.1C	E01.10
T-9	TRANSFORMER	FIRST	1406	ELECTRICAL ROOM	E05.1C	E01.10

MAJOR EQUIPMENT SCHEDULE (CONT.)						
TAG	TYPE OF EQUIPMENT	FLOOR LEVEL	ROOM NO.	ROOM NAME	1/4" SCALE DRAWING NO.	ENLARGED PLAN DRAWING NO.
T-10	TRANSFORMER	FIRST	1406	ELECTRICAL ROOM	E05.1C	E01.10
T-11	TRANSFORMER	FIRST	1406	ELECTRICAL ROOM	E05.1C	E01.10
T-12	TRANSFORMER	SECOND	2406	ELECTRICAL ROOM	E05.2C	E01.20
T-13	TRANSFORMER	SECOND	2406	ELECTRICAL ROOM	E05.2C	E01.20
T-14	TRANSFORMER	SECOND	2406	ELECTRICAL ROOM	E05.2C	E01.20
T-15	TRANSFORMER	SECOND	2406	ELECTRICAL ROOM	E05.2C	E01.20
T-16	TRANSFORMER	THIRD	3408	ELECTRICAL ROOM	E05.3C	E01.30
T-17	TRANSFORMER	THIRD	3408	ELECTRICAL ROOM	E05.3C	E01.30
T-18	TRANSFORMER	THIRD	3408	ELECTRICAL ROOM	E05.3C	E01.30
T-19	TRANSFORMER	THIRD	3408	ELECTRICAL ROOM	E05.3C	E01.30
T-20	TRANSFORMER	FOURTH	4408	ELECTRICAL ROOM	E05.3C	E01.40
T-21	TRANSFORMER	FOURTH	4408	ELECTRICAL ROOM	E05.3C	E01.40
T-22	TRANSFORMER	FOURTH	4408	ELECTRICAL ROOM	E05.3C	E01.40
T-23	TRANSFORMER	FOURTH	4408	ELECTRICAL ROOM	E05.3C	E01.40
T-24	TRANSFORMER	FIFTH	5408	ELECTRICAL ROOM	E05.3C	E01.50
T-25	TRANSFORMER	FIFTH	5408	ELECTRICAL ROOM	E05.3C	E01.50
T-26	TRANSFORMER	FIFTH	5408	ELECTRICAL ROOM	E05.3C	E01.50
T-27	TRANSFORMER	FIFTH	5408	ELECTRICAL ROOM	E05.3C	E01.50
T-28	TRANSFORMER	SIXTH	6408	ELECTRICAL ROOM	E05.3C	E01.60
T-29	TRANSFORMER	SIXTH	6408	ELECTRICAL ROOM	E05.3C	E01.60
T-30	TRANSFORMER	SIXTH	6408	ELECTRICAL ROOM	E05.3C	E01.60
T-31	TRANSFORMER	SIXTH	6408	ELECTRICAL ROOM	E05.3C	E01.60
T-32	TRANSFORMER	SEVENTH	7100	MECHANICAL PENTHOUSE	E5.7B	E01.70
T-33	TRANSFORMER	SEVENTH	7100	MECHANICAL PENTHOUSE	E5.7B	E01.70
T-34	TRANSFORMER	SEVENTH	7100	MECHANICAL PENTHOUSE	E5.7B	E01.70
T-1P	TRANSFORMER	PLANT GROUND	0908	BOILER ROOM	E07.0D	E01.00
EX. T-2P	TRANSFORMER	PLANT GROUND	0909	ELECTRICAL ROOM	E07.0D	E01.00
T-3P	TRANSFORMER	PLANT GROUND	0908	BOILER ROOM	E07.0D	E01.00
EX. T-4P	TRANSFORMER	PLANT GROUND	0901	MAINTENANCE GARAGE	E07.0C	E01.00
UPS-1	UNINTERRUPTABLE POWER SUPPLY	GROUND	0853	EMERG DIST RM	E04.0F	E01.00
CLR-1	CURRENT LIMITING REACTOR	PLANT GROUND	0909	ELECTRICAL ROOM	E07.0B	E01.00
EMPD-1	EMERGENCY SWITCHBOARD	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
EMPD-2	EMERGENCY SWITCHBOARD	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E1DP-1	LIFE SAFETY DISTRIBUTION PANEL	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E2DP-1	CRITICAL DISTRIBUTION PANEL	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E2DP-2	CRITICAL DISTRIBUTION PANEL	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E2DP-3	EQUIPMENT DISTRIBUTION PANEL	GROUND	0853	EMERG DIST RM	E04.0C	E01.00
E3DP-4	CRITICAL DISTRIBUTION PANEL	GROUND	0900	ELECTRICAL SWITCHGEAR RM	E04.0C	E01.00
E2RDP-1	EMERGENCY DISTRIBUTION PANEL	GROUND	0900	ELECTRICAL SWITCHGEAR RM	E04.0C	E01.00
U2RDP	EMERGENCY DISTRIBUTION PANEL	GROUND	0900	ELECTRICAL SWITCHGEAR RM	E04.0C	E01.00
FDP-1	NORMAL DISTRIBUTION PANEL	GROUND	0900	ELECTRICAL SWITCHGEAR RM	E04.0C	E01.00
DRP-1	NORMAL DISTRIBUTION PANEL	GROUND	0900	ELECTRICAL SWITCHGEAR RM	E04.0C	E01.00
FDP-2	NORMAL DISTRIBUTION PANEL	GROUND	0900	ELECTRICAL SWITCHGEAR RM	E04.0C	E01.00
MDP-72	NORMAL DISTRIBUTION PANEL	SEVENTH	7100	MECHANICAL PENTHOUSE	E5.7B	E01.70
E3DP-72	EQUIPMENT DISTRIBUTION PANEL	SEVENTH	7100	MECHANICAL PENTHOUSE	E5.7B	E01.70
MDP-71	NORMAL DISTRIBUTION PANEL	SEVENTH	7100	MECHANICAL PENTHOUSE	E5.7B	E01.70
E3DP-71	EQUIPMENT DISTRIBUTION PANEL	SEVENTH	7100	MECHANICAL PENTHOUSE	E5.7B	E01.70
E3DP-73	EQUIPMENT DISTRIBUTION PANEL	SEVENTH	7100	MECHANICAL PENTHOUSE	E5.7B	E01.70
EMDP-3	EMERGENCY SWITCHBOARD	PLANT FIRST	-	EX. MAIN ELECTRICAL ROOM	E08.C	E01.10
EMDP-4	EMERGENCY SWITCHBOARD	PLANT FIRST	1602	ELECTRICAL ROOM	E07.1D	E01.10
NCP1	NORMAL SWITCHBOARD	PLANT GROUND	0903	CHILLER PLANT	E07.0A	E01.00
E3CP1	EQUIPMENT SWITCHBOARD	PLANT GROUND	0903	CHILLER PLANT	E07.0A	E01.00

Table 3: Lighting and appliance panel board and load centers schedule

LIGHTING AND APPLIANCE PANEL BOARDS AND LOAD CENTERS SCHEDULE							
TAG	VOLTAGE SYSTEM	MAIN SIZE	FLOOR LEVEL	ROOM NO.	ROOM NAME	1/4" SCALE DRAWING NO.	ENLARGED PLAN DRAWING NO.
E1LG1 (LIFE SAFETY)	480Y/277V, 3PH, 4W	100A MLO	GROUND	0434	ELECTRICAL ROOM	E04.0F	E01.00
E1RG1 (LIFE SAFETY)	208Y/120V, 3PH, 4W	50A MCB	GROUND	0434	ELECTRICAL ROOM	E04.0F	E01.00
E2LG1 (CRITICAL)	480Y/277V, 3PH, 4W	150A MLO	GROUND	0434	ELECTRICAL ROOM	E04.0F	E01.00
E2RG1 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MCB	GROUND	0434	ELECTRICAL ROOM	E04.0F	E01.00
E2RG1 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	GROUND	0434	ELECTRICAL ROOM	E04.0F	E01.00
LPG1 (NORMAL)	480Y/277V, 3PH, 4W	150A MLO	GROUND	0434	ELECTRICAL ROOM	E04.0F	E01.00
RPG1 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MCB	GROUND	0434	ELECTRICAL ROOM	E04.0F	E01.00
RPG1 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	GROUND	0434	ELECTRICAL ROOM	E04.0F	E01.00
RPG3 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0701	ELECTRICAL ROOM	E04.0E	E01.00
RPG3 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0701	ELECTRICAL ROOM	E04.0E	E01.00
E2RG3 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0702	ELECTRICAL ROOM	E04.0E	E01.00
E2RG3 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0702	ELECTRICAL ROOM	E04.0E	E01.00
E1LG5 (LIFE SAFETY)	480Y/277V, 3PH, 4W	100A MLO	GROUND	0703	ELECTRICAL ROOM	E04.0E	E01.00
E2LG5 (CRITICAL)	480Y/277V, 3PH, 4W	100A MLO	GROUND	0703	ELECTRICAL ROOM	E04.0E	E01.00
LPG5 (NORMAL)	480Y/277V, 3PH, 4W	100A MLO	GROUND	0703	ELECTRICAL ROOM	E04.0E	E01.00
E1RG5 (LIFE SAFETY)	208Y/120V, 3PH, 4W	100A MCB	GROUND	0704	ELECTRICAL ROOM	E04.0E	E01.00
E3RG5 SECTION 1 (EQUIPMENT)	208Y/120V, 3PH, 4W	150A MLO	GROUND	0704	ELECTRICAL ROOM	E04.0E	E01.00
E3RG5 SECTION 2 (EQUIPMENT)	208Y/120V, 3PH, 4W	150A MLO	GROUND	0704	ELECTRICAL ROOM	E04.0E	E01.00
E2RG6 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0705	ELECTRICAL ROOM	E04.0D	E01.00
E2RG6 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0705	ELECTRICAL ROOM	E04.0D	E01.00
RPG6 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0705	ELECTRICAL ROOM	E04.0D	E01.00
RPG6 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0705	ELECTRICAL ROOM	E04.0D	E01.00
E3LG1 (EQUIPMENT)	480Y/277V, 3PH, 4W	350A MLO	GROUND	0900	ELECTRICAL SWITCHGEAR ROOM	E04.0C	E01.00
E3RG1 (EQUIPMENT)	208Y/120V, 3PH, 4W	250A MCB	GROUND	0900	ELECTRICAL SWITCHGEAR ROOM	E04.0C	E01.00
LPSL1 (NORMAL)	480Y/277V, 3PH, 4W	100A MLO	GROUND	0900	ELECTRICAL SWITCHGEAR ROOM	E04.0C	E01.00
U2RG1 (UPS)	208Y/120V, 3PH, 4W	100A MLO	GROUND	0900	ELECTRICAL SWITCHGEAR ROOM	E04.0C	E01.00
RPCP2 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	225A MCB	PLANT	0901	MAINTENANCE GARAGE	E07.0A	E01.00
RPCP2 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	PLANT	0901	MAINTENANCE GARAGE	E07.0A	E01.00
E3LCP1 (EQUIPMENT)	480Y/277V, 3PH, 4W	50A MLO	PLANT	0903	CHILLER ROOM	E07.0A	E01.00
E3LCP (EQUIPMENT)	480Y/277V, 3PH, 4W	50A MLO	PLANT	0908	BOILER ROOM	E07.0B	E01.00
E3RCP SECTION 1 (EQUIPMENT)	208Y/120V, 3PH, 4W	225A MCB	PLANT	0908	BOILER ROOM	E07.0B	E01.00
E3RCP SECTION 2 (EQUIPMENT)	208Y/120V, 3PH, 4W	225A MLO	PLANT	0908	BOILER ROOM	E07.0B	E01.00
RPCP SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	225A MCB	PLANT	0908	BOILER ROOM	E07.0B	E01.00
RPCP SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	PLANT	0908	BOILER ROOM	E07.0B	E01.00
EX. E1LCP (LIFE SAFETY)	480Y/277V, 3PH, 4W	150A MLO	PLANT	0909	ELECTRICAL ROOM	E07.0B	E01.00
EX. E1RCP (LIFE SAFETY)	208Y/120V, 3PH, 4W	50A MCB	PLANT	0909	ELECTRICAL ROOM	E07.0B	E01.00
EX. LPCP (NORMAL)	480Y/277V, 3PH, 4W	100A MLO	PLANT	0909	ELECTRICAL ROOM	E07.0B	E01.00
EX. LPSL (NORMAL)	480Y/277V, 3PH, 4W	100A MLO	PLANT	0909	ELECTRICAL ROOM	E07.0B	E01.00
E2R14 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1205	ELECTRICAL ROOM	E04.1E	E01.10
E2R14 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1205	ELECTRICAL ROOM	E04.1E	E01.10
RP14 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1205	ELECTRICAL ROOM	E04.1E	E01.10
RP14 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1205	ELECTRICAL ROOM	E04.1E	E01.10
E2R13 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1303	ELECTRICAL ROOM	E04.1A	E01.10
E2R13 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1303	ELECTRICAL ROOM	E04.1A	E01.10
RP13 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1303	ELECTRICAL ROOM	E04.1A	E01.10
RP13 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1303	ELECTRICAL ROOM	E04.1A	E01.10
E2R12 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1333	ELECTRICAL ROOM	E04.1C	E01.10
E2R12 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1333	ELECTRICAL ROOM	E04.1C	E01.10
E3R12 (EQUIPMENT)	208Y/120V, 3PH, 4W	100A MLO	FIRST	1333	ELECTRICAL ROOM	E04.1C	E01.10
RP12 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1333	ELECTRICAL ROOM	E04.1C	E01.10
RP12 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1333	ELECTRICAL ROOM	E04.1C	E01.10
U2R12 (UPS)	208Y/120V, 3PH, 4W	100A MLO	FIRST	1333	ELECTRICAL ROOM	E04.1C	E01.10
E1L11 (LIFE SAFETY)	480Y/277V, 3PH, 4W	100A MLO	FIRST	1406	ELECTRICAL ROOM	E04.1C	E01.10
E1R11 (LIFESAFETY)	208Y/120V, 3PH, 4W	100A MCB	FIRST	1406	ELECTRICAL ROOM	E04.1C	E01.10
E2L11 (CRITICAL)	480Y/277V, 3PH, 4W	100A MLO	FIRST	1406	ELECTRICAL ROOM	E04.1C	E01.10
E2R11 (CRITICAL)	208Y/120V, 3PH, 4W	500A MCB	FIRST	1406	ELECTRICAL ROOM	E04.1C	E01.10
LP11 (NORMAL)	480Y/277V, 3PH, 4W	100A MLO	FIRST	1406	ELECTRICAL ROOM	E04.1C	E01.10
RP11 (NORMAL)	208Y/120V, 3PH, 4W	500A MCB	FIRST	1406	ELECTRICAL ROOM	E04.1C	E01.10
RP15 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIRST	1423	STORAGE	E04.1G	E01.10
E2R24 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	SECOND	2200	CORRIDOR	E04.2E	E01.20
E2R24 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	SECOND	2200	CORRIDOR	E04.2E	E01.20
E2R24 SECTION 3 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	SECOND	2200	CORRIDOR	E04.2E	E01.20
RP24 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SECOND	2200	CORRIDOR	E04.2E	E01.20



LIGHTING AND APPLIANCE PANEL BOARDS AND LOAD CENTERS SCHEDULE (CONT.)							
TAG	VOLTAGE SYSTEM	MAIN SIZE	FLOOR LEVEL	ROOM NO.	ROOM NAME	1/4" SCALE DRAWING NO.	ENLARGED PLAN DRAWING NO.
RP24 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SECOND	2200	CORRIDOR	E04.2E	E01.20
E2R23 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	SECOND	2300	CORRIDOR	E04.2A	E01.20
E2R23 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	SECOND	2300	CORRIDOR	E04.2A	E01.20
E2R23 SECTION 3 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	SECOND	2300	CORRIDOR	E04.2A	E01.20
RP23 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SECOND	2300	CORRIDOR	E04.2A	E01.20
RP23 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SECOND	2300	CORRIDOR	E04.2A	E01.20
E2R22 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	SECOND	2333	ELECTRICAL ROOM	E04.2C	E01.20
E2R22 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	SECOND	2333	ELECTRICAL ROOM	E04.2C	E01.20
E3R22 (EQUIPMENT)	208Y/120V, 3PH, 4W	100A MLO	SECOND	2333	ELECTRICAL ROOM	E04.2C	E01.20
RP22 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SECOND	2333	ELECTRICAL ROOM	E04.2C	E01.20
RP22 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SECOND	2333	ELECTRICAL ROOM	E04.2C	E01.20
U2R22 (UPS)	208Y/120V, 3PH, 4W	100A MLO	SECOND	2333	ELECTRICAL ROOM	E04.2C	E01.20
E1L21 (LIFE SAFETY)	480Y/277V, 3PH, 4W	100A MLO	SECOND	2406	ELECTRICAL ROOM	E04.2C	E01.20
E1R21 (LIFE SAFETY)	208Y/120V, 3PH, 4W	100A MCB	SECOND	2406	ELECTRICAL ROOM	E04.2C	E01.20
E2L21 (CRITICAL)	480Y/277V, 3PH, 4W	100A MLO	SECOND	2406	ELECTRICAL ROOM	E04.2C	E01.20
E2R21 (CRITICAL)	208Y/120V, 3PH, 4W	500A MCB	SECOND	2406	ELECTRICAL ROOM	E04.2C	E01.20
LP21 (NORMAL)	480Y/277V, 3PH, 4W	100A MLO	SECOND	2406	ELECTRICAL ROOM	E04.2C	E01.20
RP21 (NORMAL)	208Y/120V, 3PH, 4W	500A MCB	SECOND	2406	ELECTRICAL ROOM	E04.2C	E01.20
RP25 (NORMAL)	208Y/120V, 3PH, 4W	100A MLO	SECOND	2413	EQUIPMENT STORAGE	E04.2G	E01.20
E2R34 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3205	ELECTRICAL ROOM	E04.1E	E01.30
E2R34 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3205	ELECTRICAL ROOM	E04.1E	E01.30
RP34 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3205	ELECTRICAL ROOM	E04.1E	E01.30
RP34 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3205	ELECTRICAL ROOM	E04.1E	E01.30
E2R33 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3303	ELECTRICAL ROOM	E04.1A	E01.30
E2R33 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3303	ELECTRICAL ROOM	E04.1A	E01.30
RP33 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3303	ELECTRICAL ROOM	E04.1A	E01.30
RP33 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3303	ELECTRICAL ROOM	E04.1A	E01.30
E2R32 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3333	ELECTRICAL ROOM	E04.3C	E01.30
E2R32 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3333	ELECTRICAL ROOM	E04.3C	E01.30
E3R32 (EQUIPMENT)	208Y/120V, 3PH, 4W	100A MLO	THIRD	3333	ELECTRICAL ROOM	E04.3C	E01.30
RP32 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3333	ELECTRICAL ROOM	E04.3C	E01.30
RP32 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	THIRD	3333	ELECTRICAL ROOM	E04.3C	E01.30
U2R32 (UPS)	208Y/120V, 3PH, 4W	100A MLO	THIRD	3333	ELECTRICAL ROOM	E04.3C	E01.30
E1L31 (LIFE SAFETY)	480Y/277V, 3PH, 4W	100A MLO	THIRD	3408	ELECTRICAL ROOM	E04.3C	E01.30
E1R31 (LIFE SAFETY)	208Y/120V, 3PH, 4W	100A MCB	THIRD	3408	ELECTRICAL ROOM	E04.3C	E01.30
E2L31 (CRITICAL)	480Y/277V, 3PH, 4W	100A MLO	THIRD	3408	ELECTRICAL ROOM	E04.3C	E01.30
E2R31 (CRITICAL)	208Y/120V, 3PH, 4W	500A MCB	THIRD	3408	ELECTRICAL ROOM	E04.3C	E01.30
LP31 (NORMAL)	480Y/277V, 3PH, 4W	150A MLO	THIRD	3408	ELECTRICAL ROOM	E04.3C	E01.30
RP31 (NORMAL)	208Y/120V, 3PH, 4W	500A MCB	THIRD	3408	ELECTRICAL ROOM	E04.3C	E01.30
E3L35 (EQUIPMENT)	480Y/277V, 3PH, 4W	300A MLO	THIRD	3414	MECHANICAL ROOM	E04.3F	E01.30
LP31X (NORMAL)	480Y/277V, 3PH, 4W	50A MLO	THIRD	3414	MECHANICAL ROOM	E04.3F	E01.30
E2R44 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4205	ELECTRICAL ROOM	E04.1E	E01.40
E2R44 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4205	ELECTRICAL ROOM	E04.1E	E01.40
RP44 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4205	ELECTRICAL ROOM	E04.1E	E01.40
RP44 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4205	ELECTRICAL ROOM	E04.1E	E01.40
E2R43 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4303	ELECTRICAL ROOM	E04.1A	E01.40
E2R43 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4303	ELECTRICAL ROOM	E04.1A	E01.40
RP43 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4303	ELECTRICAL ROOM	E04.1A	E01.40
RP43 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4303	ELECTRICAL ROOM	E04.1A	E01.40
E2R42 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4333	ELECTRICAL ROOM	E04.3C	E01.40
E2R42 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4333	ELECTRICAL ROOM	E04.3C	E01.40
E3R42 (EQUIPMENT)	208Y/120V, 3PH, 4W	100A MLO	FOURTH	4333	ELECTRICAL ROOM	E04.3C	E01.40
RP42 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4333	ELECTRICAL ROOM	E04.3C	E01.40
RP42 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FOURTH	4333	ELECTRICAL ROOM	E04.3C	E01.40
U2R42 (UPS)	208Y/120V, 3PH, 4W	100A MLO	FOURTH	4333	ELECTRICAL ROOM	E04.3C	E01.40
E1L41 (LIFE SAFETY)	480Y/277V, 3PH, 4W	100A MLO	FOURTH	4408	ELECTRICAL ROOM	E04.3C	E01.40
E1R41 (LIFE SAFETY)	208Y/120V, 3PH, 4W	100A MCB	FOURTH	4408	ELECTRICAL ROOM	E04.3C	E01.40
E2L41 (CRITICAL)	480Y/277V, 3PH, 4W	100A MLO	FOURTH	4408	ELECTRICAL ROOM	E04.3C	E01.40
E2R41 (CRITICAL)	208Y/120V, 3PH, 4W	500A MCB	FOURTH	4408	ELECTRICAL ROOM	E04.3C	E01.40
LP41 (NORMAL)	480Y/277V, 3PH, 4W	100A MLO	FOURTH	4408	ELECTRICAL ROOM	E04.3C	E01.40
RP41 (NORMAL)	208Y/120V, 3PH, 4W	500A MCB	FOURTH	4408	ELECTRICAL ROOM	E04.3C	E01.40
E2R54 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5205	ELECTRICAL ROOM	E04.1E	E01.50
E2R54 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5205	ELECTRICAL ROOM	E04.1E	E01.50
RP54 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5205	ELECTRICAL ROOM	E04.1E	E01.50
RP54 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5205	ELECTRICAL ROOM	E04.1E	E01.50

LIGHTING AND APPLIANCE PANEL BOARDS AND LOAD CENTERS SCHEDULE (CONT.)							
TAG	VOLTAGE SYSTEM	MAIN SIZE	FLOOR LEVEL	ROOM NO.	ROOM NAME	1/4" SCALE DRAWING NO.	ENLARGED PLAN DRAWING NO.
E2R53 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5303	ELECTRICAL ROOM	E04.1A	E01.50
E2R53 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5303	ELECTRICAL ROOM	E04.1A	E01.50
RP53 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5303	ELECTRICAL ROOM	E04.1A	E01.50
RP53 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5303	ELECTRICAL ROOM	E04.1A	E01.50
E2R52 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5332	ELECTRICAL ROOM	E04.3C	E01.50
E2R52 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5332	ELECTRICAL ROOM	E04.3C	E01.50
E3R52 (EQUIPMENT)	208Y/120V, 3PH, 4W	100A MLO	FIFTH	5332	ELECTRICAL ROOM	E04.3C	E01.50
RP52 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5332	ELECTRICAL ROOM	E04.3C	E01.50
RP52 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	FIFTH	5332	ELECTRICAL ROOM	E04.3C	E01.50
U2R52 (UPS)	208Y/120V, 3PH, 4W	100A MLO	FIFTH	5332	ELECTRICAL ROOM	E04.3C	E01.50
E1L51 (LIFE SAFETY)	480Y/277V, 3PH, 4W	100A MLO	FIFTH	5408	ELECTRICAL ROOM	E04.3C	E01.50
E1R51 (LIFE SAFETY)	208Y/120V, 3PH, 4W	100A MLCB	FIFTH	5408	ELECTRICAL ROOM	E04.3C	E01.50
E2L51 (CRITICAL)	480Y/277V, 3PH, 4W	100A MLO	FIFTH	5408	ELECTRICAL ROOM	E04.3C	E01.50
E2R51 (CRITICAL)	208Y/120V, 3PH, 4W	500A MCB	FIFTH	5408	ELECTRICAL ROOM	E04.3C	E01.50
LP51 (NORMAL)	480Y/277V, 3PH, 4W	100A MLO	FIFTH	5408	ELECTRICAL ROOM	E04.3C	E01.50
RP51 (NORMAL)	208Y/120V, 3PH, 4W	500A MCB	FIFTH	5408	ELECTRICAL ROOM	E04.3C	E01.50
E2R64 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6205	ELECTRICAL ROOM	E04.1E	E01.60
E2R64 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6205	ELECTRICAL ROOM	E04.1E	E01.60
RP64 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6205	ELECTRICAL ROOM	E04.1E	E01.60
RP64 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6205	ELECTRICAL ROOM	E04.1E	E01.60
E2R63 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6303	ELECTRICAL ROOM	E04.1A	E01.60
E2R63 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6303	ELECTRICAL ROOM	E04.1A	E01.60
RP63 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6303	ELECTRICAL ROOM	E04.1A	E01.60
RP63 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6303	ELECTRICAL ROOM	E04.1A	E01.60
E2R62 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6332	ELECTRICAL ROOM	E04.3C	E01.60
E2R62 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6332	ELECTRICAL ROOM	E04.3C	E01.60
E3R62 (EQUIPMENT)	208Y/120V, 3PH, 4W	100A MLO	SIXTH	6332	ELECTRICAL ROOM	E04.3C	E01.60
RP62 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6332	ELECTRICAL ROOM	E04.3C	E01.60
RP62 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	150A MLO	SIXTH	6332	ELECTRICAL ROOM	E04.3C	E01.60
U2R62 (UPS)	208Y/120V, 3PH, 4W	100A MLO	SIXTH	6332	ELECTRICAL ROOM	E04.3C	E01.60
E1L61 (LIFE SEFETY)	480Y/277V, 3PH, 4W	100A MLO	SIXTH	6408	ELECTRICAL ROOM	E04.3C	E01.60
E1R61 (LIFE SAFETY)	208Y/120V, 3PH, 4W	100A MCB	SIXTH	6408	ELECTRICAL ROOM	E04.3C	E01.60
E2L61 (CRITICAL)	480Y/277V, 3PH, 4W	100A MLO	SIXTH	6408	ELECTRICAL ROOM	E04.3C	E01.60
E2R61 (CRITICAL)	208Y/120V, 3PH, 4W	500A MCB	SIXTH	6408	ELECTRICAL ROOM	E04.3C	E01.60
LP61 (NORMAL)	480Y/277V, 3PH, 4W	100A MLO	SIXTH	6408	ELECTRICAL ROOM	E04.3C	E01.60
RP61 (NORMAL)	208Y/120V, 3PH, 4W	500A MCB	SIXTH	6408	ELECTRICAL ROOM	E04.3C	E01.60
E1L71 (LIFE SAFETY)	480Y/277V, 3PH, 4W	100A MLO	SEVENTH	7100	MECHANICAL PENTHOUSE	E04.7B	E01.70
E1R71 (LIFE SAFETY)	208Y/120V, 3PH, 4W	100A MCB	SEVENTH	7100	MECHANICAL PENTHOUSE	E04.7B	E01.70
E2L71 (CRITICAL)	480Y/277V, 3PH, 4W	200A MLO	SEVENTH	7100	MECHANICAL ROOM	E04.7B	E01.70
E3L71 (EQUIPMENT)	480Y/277V, 3PH, 4W	150A MLO	SEVENTH	7100	MECHANICAL ROOM	E04.7B	E01.70
E3R71 SECTION 1 (EQUIPMENT)	208Y/120V, 3PH, 4W	250A MCB	SEVENTH	7100	MECHANICAL ROOM	E04.7B	E01.70
E3R71 SECTION 2 (EQUIPMENT)	208Y/120V, 3PH, 4W	250A MLO	SEVENTH	7100	MECHANICAL ROOM	E04.7B	E01.70
LP71 (NORMAL)	480Y/277V, 3PH, 4W	200A MLO	SEVENTH	7100	MECHANICAL ROOM	E04.7B	E01.70
RP71 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	250A MCB	SEVENTH	7100	MECHANICAL ROOM	E04.7B	E01.70
RP71 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	250A MLO	SEVENTH	7100	MECHANICAL ROOM	E04.7B	E01.70
EX. E2R-1B SUBPANEL (CRITICAL)	208Y/120V, 3PH, 4W	70A MLO	EX. FIRST	-	EX. ELECTRICAL ROOM	E08.A	E01.10
EX. NE1A (CRITICAL)	480Y/277V, 3PH, 4W	800A MLO	EX. FIRST	-	EX. BOILER ROOM	E08.A	E01.10
EX. NE2B (CRITICAL)	208Y/120V, 3PH, 4W	100A MLO	EX. FIRST	-	EX. BOILER ROOM	E08.A	E01.10
EX. PIN-A (NORMAL)	208Y/120V, 3PH, 4W	60A MLO	EX. FIRST	-	EX. MATERIALS MGMT.	E04.1I	E01.10
EX. 208-P2N SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	250A MCB	EX. SECOND	-	EX. ELECTRICAL ROOM	E04.2I	E01.20
EX. 208-P2N SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	250A MLO	EX. SECOND	-	EX. ELECTRICAL ROOM	E04.2I	E01.20
EX. 480-L2N	480Y/277V, 3PH, 4W	200A MCB	EX. SECOND	-	EX. CORR ELEC ROOM	E04.2I	E01.20
EX. E2RP-11 RIGHT (CRITICAL)	208Y/120V, 3PH, 4W	225A MCB	EX. SECOND	-	EX. ICU ALCOVE	E04.2H	E01.20
EX. LP-2D	480Y/277V, 3PH, 4W	100A MLO	EX. SECOND	-	EX. ELECTRICAL ROOM	E04.2H	E01.20
EX. RP-11 LEFT 1 (NORMAL)	208Y/120V, 3PH, 4W	225A MCB	EX. SECOND	-	EX. ICU ALCOVE	E04.2H	E01.20
EX. RP-11 LEFT 2 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	EX. SECOND	-	EX. ICU ALCOVE	E04.2H	E01.20
EX. RP-11 RIGHT 1 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	EX. SECOND	-	EX. ICU ALCOVE	E04.2H	E01.20
E2RG2 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0101A	ELECTRICAL ROOM	E04.0H	E01.00
E2RG2 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0101A	ELECTRICAL ROOM	E04.0H	E01.00
RPG2 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0101B	ELECTRICAL ROOM	E04.0H	E01.00
RPG2 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0101B	ELECTRICAL ROOM	E04.0H	E01.00
E2RG4 SECTION 1 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0101C	ELECTRICAL ROOM	E04.0H	E01.00
E2RG4 SECTION 2 (CRITICAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0101C	ELECTRICAL ROOM	E04.0H	E01.00
RPG4 SECTION 1 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0101D	ELECTRICAL ROOM	E04.0H	E01.00
RPG4 SECTION 2 (NORMAL)	208Y/120V, 3PH, 4W	225A MLO	GROUND	0101D	ELECTRICAL ROOM	E04.0H	E01.00

## Over-current Devices

Over-current devices used most popularly used throughout the building are circuit breakers. Enclosed circuit breakers found on panel boards and other equipment are general purpose NEMA 1. Enclosures for circuit breakers utilized for elevator equipment disconnecting are NEMA 12. All lighting and receptacle panel boards have a maximum AIC rating of 35,000.

Medium voltage switchgear includes the emergency switchboards which have an AIC rating of 200,000, and the primary service switchgear which has an AIC rating of 500MVA. Vacuum-interrupting circuit breakers have a maximum interrupting capacity of 23KA symmetrical.

Chiller substations and unit substations have an AIC rating of 65,000 and use a fuse as well as a circuit breaker. Low voltage fuses rated at 600A or less are dual-element, Class RK-5 current limiting time-delay type are used for low voltage distribution switchgear. Time-delay of 10 seconds maximum or 500% of rated amperes will blow the fuse. The interrupting rating is 200,000RMS symmetrical amperes and the dimensions area NEMA Standard FU-1 for Class H fuses.

Bolted pressure switches are used between the ATS fed from the chiller substation 1 to the emergency paralleling switchgear. The NEMA 1 enclosed type switches are tripped electronically.

## Transformers

Franklin Square Hospital Center houses a total of 46 new dry type transformers; 34 located in the addition and 4 located in the central plant. Eight of the forty-six found in the hospital building are installed in unit substations that step down the service voltage of 13.2 kV to 480Y/277V. The remaining transformers step down the voltage from 480Y/277V to 208Y/120V.

Table 4: Individual transformer schedule

INDIVIDUAL TRANSFORMER SCHEDULE								
TAG	PRIMARY VOLTAGE	SECONDARY VOLTAGE	SIZE (KVA)	TYPE	TEMP. RISE	TAPS	MOUNTING	REMARKS
T-C1	13,200V, 3PH, 3W	480Y/277V, 3PH, 4W	2000	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN CHILLER SUBSTATION 1
T-C2	13,200V, 3PH, 3W	480Y/277V, 3PH, 4W	2000	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN CHILLER SUBSTATION 2
T-1S1	13,200V, 3PH, 3W	480Y/277V, 3PH, 4W	2000	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN UNIT SUBSTATION 1
T-2S1	13,200V, 3PH, 3W	480Y/277V, 3PH, 4W	2000	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN UNIT SUBSTATION 1
T-1S2	13,200V, 3PH, 3W	480Y/277V, 3PH, 4W	2000	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN UNIT SUBSTATION 2
T-2S2	13,200V, 3PH, 3W	480Y/277V, 3PH, 4W	2000	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN UNIT SUBSTATION 2
T-1S3	13,200V, 3PH, 3W	480Y/277V, 3PH, 4W	2000	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN UNIT SUBSTATION 3
T-2S3	13,200V, 3PH, 3W	480Y/277V, 3PH, 4W	2000	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN UNIT SUBSTATION 3
T-1	480V, 3PH, 3W	208Y/120V, 3PH, 4W	75	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-2	480V, 3PH, 3W	208Y/120V, 3PH, 4W	225	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-3	480V, 3PH, 3W	208Y/120V, 3PH, 4W	225	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-4	480V, 3PH, 3W	208Y/120V, 3PH, 4W	45	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-5	480V, 3PH, 3W	208Y/120V, 3PH, 4W	15	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-6	480V, 3PH, 3W	208Y/120V, 3PH, 4W	45	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-7	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-8	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-9	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	

INDIVIDUAL TRANSFORMER SCHEDULE (CONT.)								
TAG	PRIMARY VOLTAGE	SECONDARY VOLTAGE	SIZE (KVA)	TYPE	TEMP. RISE	TAPS	MOUNTING	REMARKS
T-10	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-11	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-12	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-13	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-14	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-15	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-16	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-17	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-18	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-19	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-20	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-21	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-22	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-23	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-24	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-25	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-26	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-27	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-28	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-29	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	WALL/CEILING HUNG	
T-30	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-31	480V, 3PH, 3W	208Y/120V, 3PH, 4W	150	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-32	480V, 3PH, 3W	208Y/120V, 3PH, 4W	30	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-33	480V, 3PH, 3W	208Y/120V, 3PH, 4W	75	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-34	480V, 3PH, 3W	208Y/120V, 3PH, 4W	75	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
T-1P	480V, 3PH, 3W	208Y/120V, 3PH, 4W	75	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
EX. T-2P	480V, 3PH, 3W	208Y/120V, 3PH, 4W	15	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN PREVIOUS PHASE
T-3P	480V, 3PH, 3W	208Y/120V, 3PH, 4W	75	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	
EX. T-4P	480V, 3PH, 3W	208Y/120V, 3PH, 4W	15	DRY	150°C	(6) 2.5%	PAD MOUNTED ON FLOOR	INSTALLED IN PREVIOUS PHASE

## Grounding

An exterior grounding grid system spaces rods 15 feet apart to create a lightning protection system. The copper-clad steel rods have a dimension of 0.75 inch diameter and 10 feet long. Cable connections to ground rods are a minimum size of #4/0AWG of uninsulated stranded copper.

Interior insulated grounding conductors are bare copper wire no smaller than #6AWG as specified by the NEC. Grounding conductors are provided for feeder and branch circuit wiring in addition to all distribution equipment, outlets, junction boxes and utilization equipment.

## Special Equipment

### Power Factor Correction Capacitor

A new capacitor will be provided and installed by the utility. The exterior location of the capacitor is by the service entrance at the northeast corner of the central plant building.

### Current Limiting Reactor

The current limiting reactor is located by emergency switchboard EMDP-3 in the existing main electrical room on the ground floor of the hospital.

### Uninterruptable Power System (UPS)

The UPS is located on the ground floor of the hospital in the electrical switchgear room. Input voltage of the UPS is 480Y/277V, 3PH, 3W as well as an input current of 260A. The system is rated at 180KVA/162KW with a lagging power factor of 0.98. The output voltage system is 208Y/120V. The UPS is designed to operate as an on-line solid state reverse transfer system with a normal and bypass mode.

In normal mode, the inverter supplies power to the critical branch. The rectifier/battery charger derives power from the utility AC source and supply DC power to the inverter while charging the battery at the same time. Upon failure of the utility AC power, the critical load will be powered by battery. When the utility AC power is restored, the rectifier/battery charger powers the inverter and recharges the battery.

During bypass mode, the static bypass transfer switch transfers the load to the bypass without interruption to the critical load. This is accomplished by turning the inverter off. When the inverter is turned back on the loads are automatically re-transfer. Motor circuit protectors and circuit breakers are used as over-current protection devices.

### Motor Control System

The equipment motor control center is located on the ground floor of the central plant building in the main electrical room. The motor control center is fed a 480Y/277V, 3PH, 4W voltage system and houses a horizontal bus rated at 800A that extends the full length of the center.

## Lighting Loads

The main source used throughout Franklin Square Hospital Center is an energy efficient 4100K fluorescent T-8 lamp containing low mercury. Twin-tube compact fluorescent and high intensity discharge (HID) lamps (see Appendix B – HID) are also found within the space. Fluorescent fixtures are found in corridors, patient rooms, waiting rooms, nurse stations and various other locations. The majority of the HID sources are located in exterior fixtures. Cold cathode lighting system is incorporated in the exterior canopy entrance to the main lobby.

The fluorescent, HID and LED sources operate on 480Y/277V system and the incandescent sources run on a 208Y/120V system.

Table 5: Lighting fixture schedule

LIGHTING FIXTURE SCHEDULE									
TYPE	LAMP	WATTAGE	NO. OF LAMPS	BALLAST TYPE	VOLTAGE	INPUT WATTS	BALLAST FACTOR	CURRENT (AMPS)	POWER FACTOR
A1	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A2	F32T8/4100K	32	3	ELECTRONIC, PS	277	91	0.88	0.34	0.99
A3	F32T8/4100K	32	4	ELECTRONIC, PS	277	121	0.88	0.45	0.99
A4	F32T8/4100K	32	3	ELECTRONIC, PS	277	91	0.88	0.34	0.99
A4R	F32T8/4100K	32	3	ELECTRONIC, PS	277	91	0.88	0.34	0.99
A5	F32T8/4100K	32	4	ELECTRONIC, PS	277	121	0.88	0.45	0.99
A6A	F40BX/4100K	40	4	ELECTRONIC, RS	277	174	1	0.68	0.98
A10A	F32T8/4100K	32	3	ELECTRONIC, PS	277	91	0.88	0.34	0.99
A11	F17T8/4100K	17	2	ELECTRONIC, PS	277	39	1	0.15	0.99
A11A	F17T8/4100K	17	2	ELECTRONIC, PS	277	39	1	0.15	0.99
A12	F17T8/4100K	17	4	ELECTRONIC, PS	277	79	1	0.29	0.99
A13	F17T8/4100K	17	3	ELECTRONIC, PS	277	61	1	0.22	0.99
A15A	F40BX/4100K	40	2	ELECTRONIC, RS	277	87	1	0.34	0.98
A18	F40BX/4100K	40	2	ELECTRONIC, RS	277	87	1	0.34	0.98
A21A	F17T8/4100K	17	2	ELECTRONIC, PS	277	39	1	0.15	0.99
A22	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A26	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A29	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A29A	F32T8/4100K	32	1	ELECTRONIC, PS	277	34	0.9	0.13	0.98
A31	F17T8/4100K	17	2	ELECTRONIC, PS	277	39	1	0.15	0.99
A31A	F17T8/4100K	17	1	ELECTRONIC, PS	277	22	1	0.08	0.97
A33	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A33A	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A33R	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A34	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A39	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A45	F13DBX(4P)/4100K	13	2	ELECTRONIC, RS	277	29	1	0.25/0.38	0.99
A46	F35T5/4100K	35	1	ELECTRONIC, PS	277	41	1.01	0.15	0.98
A46A	F35T5/4100K	35	2	ELECTRONIC, PS	277	77	1	0.28	0.99
A48	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
A48R	F32T8/4100K	32	2	ELECTRONIC, PS	277	63	0.88	0.23	0.99
B2	F18DBX(4P)/4100K	18	2	ELECTRONIC, RS	277	35	0.95	0.13	0.98
B3	F26DBX(4P)/4100K	26	2	ELECTRONIC, RS	277	56	0.98	0.21	0.98
B4A	F32TRT(4P)/4100K	32	1	ELECTRONIC 10% DIMMING, PS	277	38	1.05	0.14/0.22	0.98
B4D	F32TRT(4P)/4100K	32	1	ELECTRONIC 10% DIMMING, PS	277	38	1.05	0.14/0.22	0.98
B8	F26TRT(4P)/4100K	26	1	ELECTRONIC, RS	277	28	1.02	0.11	0.98
B9A	F26DBX(4P)	26	2	ELECTRONIC, RS	277	56	0.98	0.21	0.98

LIGHTING FIXTURE SCHEDULE (CONT.)									
TYPE	LAMP	WATTAGE	NO. OF LAMPS	BALLAST TYPE	VOLTAGE	INPUT WATTS	BALLAST FACTOR	CURRENT (AMPS)	POWER FACTOR
B15	F26DBX(4P)/4100K	26	2	ELECTRONIC, RS	277	56	0.98	0.21	0.98
B17	F26DBX(4P)/4100K	26	2	ELECTRONIC, RS	277	56	0.98	0.21	0.98
B19	400W MH (ED28)	400	1	MAGNETIC, PS	277	454	1	1.30/1.65	0.9
B19R	400W MH (ED28)	400	1	MAGNETIC, PS	277	454	1	1.30/1.65	0.9
B20	250W MH (ED28)	250	1	MAGNETIC, PS	277	284	1	0.73/1.03	0.9
B20R	250W MH (ED28)	250	1	MAGNETIC, PS	277	284	1	0.73/1.03	0.9
B21	F32TRT(4P)/4100K	32	2	ELECTRONIC, RS	277	32	1	0.26	0.98
B22	F18DBX(4P)/4100K	18	2	ELECTRONIC, RS	277	35	0.95	0.13	0.98
B22A	F18DBX(4P)/4100K	18	2	ELECTRONIC, RS	277	35	0.95	0.13	0.98
B23	F26DBX(4P)/4100K	26	2	ELECTRONIC, RS	277	56	0.98	0.21	0.98
B24	F32TRT(4P)/4100K	32	2	ELECTRONIC, RS	277	32	1	0.26	0.98
B25	35W MR16/3000K	35	1	-	277	35	-	0.13	1
C1	F17T8/4100K	17	1	ELECTRONIC, PS	277	22	1	0.08	0.97
C8	F14BX/41000K	14	2	ELECTRONIC, RS	277	33	0.95	0.12	0.95
D1A	100W MH (ED17)	100	1	ELECTRONIC	277	109	1	0.4	0.9
D2A	100W MH	100	1	ELECTRONIC	277	109	1	0.4	0.9
D5	250W MH (ED28)	250	1	MAGNETIC, PS	480	284	1	0.43/0.60	0.9
D6	350W MH (ED28)	350	1	MAGNETIC, PS	480	397	1	0.65/0.85	0.9
D7	400W MH (ED28)	400	1	MAGNETIC, PS	480	452	1	0.75/1.00	0.9
D8	F39BX/4100K	39	1	ELECTRONIC, RS	277	42	0.98	0.16	0.98
D9	F39BX/4100K	39	1	ELECTRONIC, RS	277	42	0.98	0.16	0.98
D10	175W MH (ED17)	175	1	ELECTRONIC	277	191	1	0.7	1
D10A	175W MH (ED17)	175	1	ELECTRONIC	277	191	1	0.7	1
D11	F39BX/4100K	39	1	ELECTRONIC, RS	277	42	0.98	0.16	0.98
D11A	F13DBX/4100K	13	1	ELECTRONIC, RS	277	18	1	0.07	0.95
D12	150W MH (T6)	150	1	ELECTRONIC	277	161	1	0.6	1
D13	F26DBX/4100K	26	1	ELECTRONIC, RS	277	28	1.02	0.11	0.98
D14	35W MH (T4)	35	1	ELECTRONIC, PS	277	56	1	0.22/0.20	0.9
E1	7W HALOGEN (INCLUDED)	7	2	-	277	14	-	0.05	1
F1	4200K CATHODE (13 FEET)	149.5	1	INTEGRATED	277	149.5	1	1.84	1
G1	50W MR16 SPOT/3000K	50	1	-	277	50	-	0.18	1
G2	75W AR111 SPOT/2950K	75	3	-	277	225	-	0.81	1
G2A	75W AR111 FLOOD/2950K	75	3	-	277	225	-	0.81	1
G3	35W MR16 SPOT/3000K	35	1	-	277	35	-	0.13	1
G4	20W PAR38	20	1	-	120	20	-	0.17	1
H1	F40/30BX/4100K	40	6	ELECTRONIC, RS	277	87	1	0.34	0.98
H3	500W-QUARTZ (T4)	500	1	-	120	500	-	4.17	1
H5	WHITE LED (INCLUDED)	0.49	1	-	120	0.49	-	0.05	1
H5A	WHITE LED (INCLUDED)	0.49	1	-	277	0.49	-	0.05	1
H9	F32T8/4100K	32	4	ELECTRONIC, PS	277	121	0.88	0.45	0.99
J1	F40BX/4100K	40	2	ELECTRONIC, RS	277	87	1	0.34	0.98
J2	F24BX/4100K	24	1	ELECTRONIC, RS	277	26	1.01	0.1	0.95
X5	GREEN LED (INCLUDED)	0.74	1	-	277	0.74	-	0.05	1
X5R	GREEN LED (INCLUDED)	0.74	1	-	277	0.74	-	0.05	1
X6	GREEN LED (INCLUDED)	0.74	1	-	277	0.74	-	0.05	1
X13	GREEN LED (INCLUDED)	1.9	1	-	277	1.9	-	0.09	1

## Lighting Control

A dimming system with modular switching relays each rated at 16A allows for control of the lighting system. A total of 6 presets can be stored in the control unit at one time. 24 different zones of is able to be set and incorporated into the preset scenes. Lighting levels fade smoothly between scenes at a desired time interval. An astronomical time clock is provided and can be used to program scenes.

Photoelectric controllers are located on the ceiling surface in the main lobby. The atrium space gets a high amount of daylight penetration through the storefront façade. The photoelectric controllers provide an on/off switching of the lighting fixtures. There is an adjustable time delay up to two minutes to prevent false switching

Automatic Lighting Shutoff requirements of ASHRAE/IESNA 90.1 are fulfilled by the implementation of occupancy sensors. The occupancy sensors are either ultrasonic or infrared ceiling mounted devices.

Table 6: Switching control schedule

SWITCHING CONTROL SCHEDULE					
SCENE(S)	CIRCUIT*	CIRCUIT DESCRIPTION	CONTROL TYPE	MAX. WATTAGE	REMARKS
1	1	DOWNLIGHTS ADJACENT PATIENT ROOMS	NONDIMMED FLUORESCENT	350	
1, 2	2	THIRD FLOOR DOWNLIGHTS & LINEARS	NONDIMMED FLUORESCENT	938	
1	3	NORTH ATRIUM LINEARS	NONDIMMED FLUORESCENT	628.79	
1	4	THIRD FLOOR DOWNLIGHTS & LINEARS	NONDIMMED FLUORESCENT	1024	
1	5	SOUTH ATRIUM LINEARS	NONDIMMED FLUORESCENT	421.04	PHOTOCELL CONTROL A
1, 3	6	SPOTS: LOBBY	NON-DIMMED HALOGEN	969.5	
1, 2	7	WELCOME DESK COVE	NON-DIMMED COLD CATHODE	831	
1, 2	8	COVE LOBBY	NON-DIMMED COLD CATHODE	1246.5	
1, 4	9	WELCOME DESK TRACK	NON-DIMMED HALOGEN	1108	
1	10	DOWNLIGHTS FRONT LOBBY	NONDIMMED FLUORESCENT	858	PHOTOCELL CONTROL B
1, 5	11	ATRIUM WALL SCONCES (FIRST FL LEVEL)	NONDIMMED FLUORESCENT	360.1	
1, 2	12	DOWNLIGHTS FRONT LOBBY	NONDIMMED FLUORESCENT	726	PHOTOCELL CONTROL C
1, 2	13	FIRST AND SECOND FLOOR DOWNLIGHTS & LINEARS	NONDIMMED FLUORESCENT	2316	
	14	SPARE			
1	15	FIRST AND SECOND FLOOR DOWNLIGHTS & LINEARS	NONDIMMED FLUORESCENT	2148	
	16	SPARE			
	17	SPARE			
	18	SPARE			
	19	SPARE			
	20	SPARE			

\* REFER TO PANEL LP31X FOR CIRCUIT NUMBERS.

## Mechanical + Other Loads

Franklin Square Hospital Center is a healthcare facility which calls for a load intensive mechanical system. The patient tower addition includes six new air handling units, mechanical fans, pumps, cooling towers and other equipment that requires electrical power. Various voltage systems including both 3PH and 1PH are used to provide power to the equipment. The following tables show the loads in KVA and KW associated with each piece of equipment.



Table 7: Mechanical equipment schedule

MECHANICAL EQUIPMENT SCHEDULE									
EQUIPMENT TAG	LOAD DESCRIPTION	QTY.	LOAD MAGNITUDE	LOAD UNITS	MOTOR AMPS	VOLTAGE SYSTEM	ASSUMED POWER FACTOR	LOAD (KVA)	LOAD (KW)
CH-1	WATER COOLED CHILLER	1	829.6	KW	1375	460V, 3PH, 3W	0.95	873.26	829.6
CH-2	WATER COOLED CHILLER	1	829.6	KW	1375	460V, 3PH, 3W	0.95	873.26	829.6
P-CHW-1	CHILLED WATER PUMP	1	200	HP	240	460V, 3PH, 3W	0.95	191.22	181.66
P-CHW-2	CHILLED WATER PUMP	1	200	HP	240	460V, 3PH, 3W	0.95	191.22	181.66
P-CHW-3	CHILLED WATER PUMP	1	200	HP	240	460V, 3PH, 3W	0.95	191.22	181.66
P-CW-1	CONDENSER WATER PUMP	1	150	HP	180	460V, 3PH, 3W	0.95	143.41	136.24
P-CW-2	CONDENSER WATER PUMP	1	150	HP	180	460V, 3PH, 3W	0.95	143.41	136.24
CT-1	COOLING TOWER	1	30	HP	40	460V, 3PH, 3W	0.95	31.87	30.28
CT-1-BH	COOLING TOWER	2	9	KW	27.1	460V, 3PH, 3W	0.95	9.47	9.00
CT-2	COOLING TOWER	1	30	HP	40	460V, 3PH, 3W	0.95	31.87	30.28
CT-2-BH	COOLING TOWER	2	9	KW	27.1	460V, 3PH, 3W	0.95	9.47	9.00
B-1A	STEAM BOILER AIR COMPRESSER	1	20	HP	27	460V, 3PH, 3W	0.95	21.51	20.44
B-1B	STEAM BOILER OIL PUMP	1	1.5	HP	20	120V, 1PH, 2W	0.85	2.40	2.04
B-2A	STEAM BOILER AIR COMPRESSER	1	20	HP	27	460V, 3PH, 3W	0.95	21.51	20.44
B-2B	STEAM BOILER OIL PUMP	1	1.5	HP	20	120V, 1PH, 2W	0.85	2.40	2.04
B-3A	STEAM BOILER AIR COMPRESSER	1	20	HP	27	460V, 3PH, 3W	0.95	21.51	20.44
B-3B	STEAM BOILER OIL PUMP	1	1.5	HP	20	120V, 1PH, 2W	0.85	2.40	2.04
P-BF-1	BOILER FEEDWATER PUMP	1	15	HP	63	460V, 3PH, 3W	0.95	50.19	47.69
P-BF-2	BOILER FEEDWATER PUMP	1	15	HP	63	460V, 3PH, 3W	0.95	50.19	47.69
P-BF-3	BOILER FEEDWATER PUMP	1	15	HP	63	460V, 3PH, 3W	0.95	50.19	47.69
P-T-1	CONDENSATE TRANSFER PUMP	1	7.5	HP	22	460V, 3PH, 3W	0.95	17.53	16.65
P-T-2	CONDENSATE TRANSFER PUMP	1	7.5	HP	22	460V, 3PH, 3W	0.95	17.53	16.65
P-FO-1	FUEL OIL PUMP	1	1	HP	4.2	460V, 3PH, 3W	0.85	3.35	2.84
P-FO-2	FUEL OIL PUMP	1	1	HP	4.2	460V, 3PH, 3W	0.85	3.35	2.84
P-FO-3	FUEL OIL PUMP	1	1	HP	4.2	460V, 3PH, 3W	0.85	3.35	2.84
P-FO-4	FUEL OIL PUMP	1	1	HP	4.2	460V, 3PH, 3W	0.85	3.35	2.84
FCU-4	FAN COIL UNIT	2	1/2	HP	12	115V, 1PH, 2W	0.85	1.38	1.17
AHU-9	AIR HANDLING UNIT	1	1	HP	10	460V, 3PH, 3W	0.85	7.97	6.77
AHU-10	AIR HANDLING UNIT	1	10	HP	58	460V, 3PH, 3W	0.95	46.21	43.90
EF-7	REFRIGERANT PURGE EXHAUST FAN	1	7.5	HP	11	460V, 3PH, 3W	0.95	8.76	8.33
EF-8	CEP GENERAL EXHAUST FAN	1	1/4	HP	5.8	115V, 1PH, 2W	0.75	0.67	0.50
EF-10	BATTERY ROOM EXHAUST FAN	1	1/15	HP	15	115V, 1PH, 2W	0.75	1.73	1.29
EF-11	GENERATOR ROOM EXHAUST FAN	1	1.5	HP	6.6	208V, 1PH, 2W	0.85	1.37	1.17
P-S-1	ELEVATOR SUMP PUMP	1	0.5	HP	9.8	115V, 1PH, 2W	0.85	1.13	0.96
P-S-2	ELEVATOR SUMP PUMP	1	0.5	HP	9.8	115V, 1PH, 2W	0.85	1.13	0.96
P-S-3	ELEVATOR SUMP PUMP	2	5	HP	15	460V, 3PH, 3W	0.95	11.95	11.35
P-HW-5	HEATING HOT WATER PUMP	1	1.5	HP	3	460V, 3PH, 3W	0.85	2.39	2.03
P-HW-6	HEATING HOT WATER PUMP	1	1.5	HP	3	460V, 3PH, 3W	0.85	2.39	2.03
DWH-3	ELECTRIC DOMESTIC WATER HEATER	2	4.5	KW	21.6	208V, 1PH, 2W	0.95	4.74	4.50
P-PH-1	AHU PREHEAT COIL RECIRC.	1	2	HP	3.4	460V, 3PH, 3W	0.85	2.71	2.30
P-PH-2	AHU PREHEAT COIL RECIRC.	1	2	HP	3.4	460V, 3PH, 3W	0.85	2.71	2.30
P-PH-3	AHU PREHEAT COIL RECIRC.	1	5	HP	7.6	460V, 3PH, 3W	0.85	6.06	5.15
P-PH-4	AHU PREHEAT COIL RECIRC.	1	5	HP	7.6	460V, 3PH, 3W	0.85	6.06	5.15
P-PH-5	AHU PREHEAT COIL RECIRC.	1	5	HP	7.6	460V, 3PH, 3W	0.85	6.06	5.15
P-PH-6	AHU PREHEAT COIL RECIRC.	1	5	HP	7.6	460V, 3PH, 3W	0.85	6.06	5.15
P-HW-1	HEATING HOT WATER PUMP	1	20	HP	27	480V, 3PH, 3W	0.95	22.45	21.33
P-HW-2	HEATING HOT WATER PUMP	1	20	HP	27	480V, 3PH, 3W	0.95	22.45	21.33
P-HW-3	HEATING HOT WATER PUMP	1	20	HP	27	480V, 3PH, 3W	0.95	22.45	21.33
P-HW-4	HEATING HOT WATER PUMP	1	20	HP	27	480V, 3PH, 3W	0.95	22.45	21.33
P-DW-2	DOMESTIC HOT WATER RECIRC.	1	1.5	HP	3	460V, 3PH, 3W	0.85	2.39	2.03
FCU-7	FAN COIL UNIT	1	1.5	HP	3	460V, 3PH, 3W	0.85	2.39	2.03

MECHANICAL EQUIPMENT SCHEDULE (CONT.)									
EQUIPMENT TAG	LOAD DESCRIPTION	QTY.	LOAD MAGNITUDE	LOAD UNITS	MOTOR AMPS	VOLTAGE SYSTEM	ASSUMED POWER FACTOR	LOAD (KVA)	LOAD (KW)
ACCU-3	AIR COOLED CONDENSING UNIT	1	5	HP	24	480V, 3PH, 3W	0.95	19.95	18.96
FCU-6	FAN COIL UNIT	1	2	HP	3.4	460V, 3PH, 3W	0.85	2.71	2.30
SF-1A	SUPPLY FAN	1	50	HP	65	460V, 3PH, 3W	0.95	51.79	49.20
SF-1B	SUPPLY FAN	1	50	HP	65	460V, 3PH, 3W	0.95	51.79	49.20
SF-2A	SUPPLY FAN	1	50	HP	65	460V, 3PH, 3W	0.95	51.79	49.20
SF-2B	SUPPLY FAN	1	50	HP	65	460V, 3PH, 3W	0.95	51.79	49.20
SF-3A	SUPPLY FAN	1	100	HP	124	460V, 3PH, 3W	0.95	98.80	93.86
SF-3B	SUPPLY FAN	1	100	HP	124	460V, 3PH, 3W	0.95	98.80	93.86
SF-4A	SUPPLY FAN	1	100	HP	124	460V, 3PH, 3W	0.95	98.80	93.86
SF-4B	SUPPLY FAN	1	100	HP	124	460V, 3PH, 3W	0.95	98.80	93.86
SF-5A	SUPPLY FAN	1	100	HP	124	460V, 3PH, 3W	0.95	98.80	93.86
SF-5B	SUPPLY FAN	1	100	HP	124	460V, 3PH, 3W	0.95	98.80	93.86
SF-6A	SUPPLY FAN	1	100	HP	124	460V, 3PH, 3W	0.95	98.80	93.86
SF-6B	SUPPLY FAN	1	100	HP	124	460V, 3PH, 3W	0.95	98.80	93.86
RF-1	AHU-1 RETURN FAN	1	40	HP	52	460V, 3PH, 3W	0.95	41.43	39.36
RF-2	AHU-2 RETURN FAN	1	40	HP	52	460V, 3PH, 3W	0.95	41.43	39.36
RF-3	AHU-3 RETURN FAN	1	100	HP	124	460V, 3PH, 3W	0.95	98.80	93.86
RF-4	AHU-4 RETURN FAN	1	75	HP	96	460V, 3PH, 3W	0.95	76.49	72.66
RF-5	AHU-5 RETURN FAN	1	75	HP	96	460V, 3PH, 3W	0.95	76.49	72.66
RF-6	AHU-6 RETURN FAN	1	75	HP	96	460V, 3PH, 3W	0.95	76.49	72.66
EF-15	STORAGE ROOM EXHAUST FAN	1	1/3	HP	7.2	120V, 1PH, 2W	0.75	0.86	0.65
A-D	AIR DRYER	1	6.1	FLA	6.1	208V, 1PH, 2W	0.85	1.27	1.08
EF-1	GENERAL EXHAUST FAN	1	25	HP	34	460V, 3PH, 3W	0.95	27.09	25.73
EF-2	GENERAL EXHAUST FAN	1	25	HP	34	460V, 3PH, 3W	0.95	27.09	25.73
EF-4	ISOLATION EXHAUST FAN	1	40	HP	52	460V, 3PH, 3W	0.95	41.43	39.36
EF-5	ISOLATION EXHAUST FAN	1	40	HP	52	460V, 3PH, 3W	0.95	41.43	39.36
EF-6	ISOLATION EXHAUST FAN	1	40	HP	52	460V, 3PH, 3W	0.95	41.43	39.36
CRU-1	CONDENSATE RETURN UNIT	2	3	HP	9.6	460V, 3PH, 3W	0.85	7.65	6.50
CRU-2	CONDENSATE RETURN UNIT	2	3	HP	9.6	460V, 3PH, 3W	0.85	7.65	6.50
HP-1	PACKAGED HEAT PUMP UNIT	1	0.5	HP	39	460V, 3PH, 3W	0.85	31.07	26.41
SPF-A	STAIR PRESSURIZATION	1	10	HP	14	480V, 3PH, 3W	0.95	11.64	11.06
SPF-B	STAIR PRESSURIZATION	1	10	HP	14	480V, 3PH, 3W	0.95	11.64	11.06
SPF-C	STAIR PRESSURIZATION	1	10	HP	14	480V, 3PH, 3W	0.95	11.64	11.06
REF-1	SIXTH FLOOR RELIEF	1	20	HP	27	480V, 3PH, 3W	0.95	22.45	21.33
REF-2	SIXTH FLOOR RELIEF	1	25	HP	34	480V, 3PH, 3W	0.95	28.27	26.85
ACCU-1	AIR COOLED CONDENSING UNIT	1	1/15	HP	10	208V, 1PH, 2W	0.75	2.08	1.56
AHU-7	AIR HANDLING UNIT	1	40	HP	138	460V, 3PH, 3W	0.95	109.95	104.45
AC-1	BOILER PLANT AIR COMPRESSOR	1	20	HP	27	460V, 3PH, 3W	0.95	21.51	20.44
P-DW-1	DOMESTIC HOT WATER RECIRC.	3	5	HP	22.8	460V, 3PH, 3W	0.95	18.17	17.26
EF-3	ED WAITING EXHAUST FAN	1	7.5	HP	11	480V, 3PH, 3W	0.95	9.15	8.69
AF-1	ATRIUM SMOKE EXHAUST FAN	1	75	HP	96	480V, 3PH, 3W	0.95	79.81	75.82
AF-2	ATRIUM SMOKE EXHAUST FAN	1	75	HP	96	480V, 3PH, 3W	0.95	79.81	75.82
AHU-11	AIR HANDLING UNIT	1	10	HP	27	480V, 3PH, 3W	0.95	22.45	21.33
REF-11	AHU-11 RELIEF	1	7.5	HP	11	480V, 3PH, 3W	0.95	9.15	8.69
EF-9	MAIN LOBBY EXHAUST FAN	1	3/4	HP	1.6	480V, 3PH, 3W	0.85	1.33	1.13
EF-12	AMBULANCE CANOPY EXHAUST FAN	1	1/2	HP	9.8	120V, 1PH, 2W	0.85	1.18	1.00
EF-13	AMBULANCE CANOPY EXHAUST FAN	1	1/2	HP	9.8	120V, 1PH, 2W	0.85	1.18	1.00
EF-14	AMBULANCE CANOPY EXHAUST FAN	1	1/2	HP	9.8	120V, 1PH, 2W	0.85	1.18	1.00
P-PH-11	AHU PREHEAT COIL RECIRC.	1	2	HP	3.4	480V, 3PH, 3W	0.85	2.83	2.40
FCU-5	FAN COIL UNIT	1	1/2	HP	2.88	208V, 1PH, 2W	0.85	0.60	0.51
ACCU-2	AIR COOLED CONDENSING UNIT	1	1/15	HP	10	208V, 1PH, 2W	0.75	2.08	1.56
B-FO-1	NO IDENTIFICATION ON DRAWINGS	1	1.5	HP	3	480V, 3PH, 3W	0.85	2.49	2.12

MECHANICAL EQUIPMENT SCHEDULE (CONT.)									
EQUIPMENT TAG	LOAD DESCRIPTION	QTY.	LOAD MAGNITUDE	LOAD UNITS	MOTOR AMPS	VOLTAGE SYSTEM	ASSUMED POWER FACTOR	LOAD (KVA)	LOAD (KW)
B-FO-2	NO IDENTIFICATION ON DRAWINGS	1	1.5	HP	3	480V, 3PH, 3W	0.85	2.49	2.12
B-FO-3	NO IDENTIFICATION ON DRAWINGS	1	1.5	HP	3	480V, 3PH, 3W	0.85	2.49	2.12
ACU-1	AIR CONDITIONING UNIT	1	20	HP	26	480V, 3PH, 3W	0.95	21.62	20.54

Table 8: Architectural equipment schedule

ARCHITECTURAL EQUIPMENT SCHEDULE									
EQUIPMENT TAG	LOAD DESCRIPTION	QTY.	LOAD MAGNITUDE	LOAD UNITS	MOTOR AMPS	VOLTAGE SYSTEM	ASSUMED POWER FACTOR	LOAD (KVA)	LOAD (KW)
PE-1	PASSANGER ELEVATOR #1	1	40	HP	52	480V, 3PH, 3W	0.95	14.41	13.69
PE-2	PASSANGER ELEVATOR #2	1	40	HP	52	480V, 3PH, 3W	0.95	14.41	13.69
SE-1	SERVICE ELEVATOR #1	1	40	HP	52	480V, 3PH, 3W	0.95	14.41	13.69
SE-2	SERVICE ELEVATOR #2	1	40	HP	52	480V, 3PH, 3W	0.95	14.41	13.69

Table 9: Plumbing equipment schedule

PLUMBING EQUIPMENT SCHEDULE									
EQUIPMENT TAG	LOAD DESCRIPTION	QTY.	LOAD MAGNITUDE	LOAD UNITS	MOTOR AMPS	VOLTAGE SYSTEM	ASSUMED POWER FACTOR	LOAD (KVA)	LOAD (KW)
MVP-1	MEDICAL VACUUM PUMP	4	10	HP	65	480V, 3PH, 3W	0.95	54.04	51.34
MAP-1	MEDICAL AIR COMPRESSOR	5	15	HP	92	480V, 3PH, 3W	0.95	76.49	72.66
P-SE-1	SEWAGE EJECTOR PUMP	3	7.5	HP	33	460V, 3PH, 3W	0.95	26.29	24.98
P-SE-2	SEWAGE EJECTOR PUMP	2	7.5	HP	22	460V, 3PH, 3W	0.95	17.53	16.65
P-DW-1	TRIPLEX BOOSTER PUMP	3	5	HP	25	208V, 1PH, 2W	0.95	5.20	4.94
P-SW-1	SOILED WATER TANK PUMP	1	1.5	HP	3	460V, 3PH, 3W	0.95	2.39	2.27

## Service Entrance Size

The service entrance was sized using three different methods; Conceptual/schematic design, design development, and working drawings methods.

During the conceptual/schematic design of the project, the square footage of the building can be used to size the service entrance. Demand loading information for various building types are used to calculate the estimated loads of the building. The demand loading for a hospital is listed as 40 VA/SF.

Table 10: Conceptual/schematic design method

HOSPITAL SERVICE ENTRANCE SIZE - CONCEPTUAL/SCHEMATIC DESIGN			
FLOOR	AREA (SF)	VA/SF	LOAD (VA)
GROUND	85,224	40	3,408,960
FIRST	58,092	40	2,323,680
SECOND	46,035	40	1,841,400
THIRD	39,971	40	1,598,840
FOURTH	36,757	40	1,470,280
FIFTH	36,757	40	1,470,280
SIXTH	36,757	40	1,470,280
SEVENTH	25,197	40	1,007,880
TOTAL KVA			14,592
TOTAL CURRENT AT 480V			17,551
TOTAL SWITCHBOARDS			(3) 6000A

Design Development is the next step in the design process. Demand factors of more specific load categories can be found in the NEC Code. Using the square footage of the building and the demand loading information for various load categories, the estimated connected loads of the building are calculated. In the NEC Code, hospitals are listed to have a general lighting load by occupancy of 2 VA/SF as seen below.

Table 11: Conceptual/schematic design method

HOSPITAL SERVICE ENTRANCE SIZE - DESIGN DEVELOPMENT					
LOAD CATEGORY	AREA (SF)	VA/SF	LOAD (VA)	DEMAND FACTOR	CONNECTED LOAD (VA)
LIGHTING - FIRST 50KVA	364,790	2	50,000	0.4	20,000
LIGHTING - OVER 50KVA	364,790	2	679,580	0.2	135,916
RECEPTACLES - FIRST 10KVA	364,790	0.5	10,000	1.0	10,000
RECEPTACLES - OVER 10KVA	364,790	0.5	172,395	0.5	86,198
MECHANICAL - COOLING	364,790	12	4,377,480	0.8	3,501,984
PLUMBING - PUMPS	364,790	2	729,580	0.8	583,664
MEDICAL EQUIPMENT	364,790	20	7,295,800	1.0	7,295,800
TOTAL KVA					11,634
TOTAL CURRENT AT 480V					13,993
TOTAL SWITCHBOARDS					(3) 5000A

Construction documents are used to calculate the connected load to each panel board in the building. Demand factors are applied to the respective load category via the NEC Code or institution standard.

Table 12: Working drawings method

HOSPITAL SERVICE ENTRANCE SIZE - WORKING DRAWINGS			
LOAD CATEGORY	DEMAND FACTOR	CONNECTED LOAD (VA)	DEMAND LOAD (VA)
LIGHTING	1.25	563,100	703,875
RECEPTACLES	-	1,898,000	1,898,000
EQUIPMENT	1.0	1,186,060	1,186,060
MOTORS	1.0	361,500	361,500
HEATING	1.0	31,600	31,600
OTHER	1.0	1,116,360	1,116,360
TOTAL KVA			5,297
TOTAL CURRENT AT 480V			6,372
TOTAL SWITCHBOARDS			(2) 4000A

Actual service entrance conditions differ greatly from the conceptual/schematic design method. The load values are more similar when comparing the working drawings method to the actual conditions. Since the distribution system of the hospital is able to carry extra amounts of load through a tie breaker in the event of a power failure, the actual service entrances are over sized for the actual load being fed.

Table 13: Service entrance size summary

HOSPITAL SERVICE ENTRANCE SIZE SUMMARY			
PHASE	LOAD (KVA)	VOLTAGE SYSTEM	LOAD (A)
CONCEPTUAL/SCHEMATIC DESIGN	14,592	480Y/277V	17,551
DESIGN DEVELOPMENT	13,993	480Y/277V	13,993
WORKING DRAWINGS	5,297	480Y/277V	6,372
SERVICE ENTRANCE	SIZE (A)	VOLTAGE SYSTEM	CAPACITY (KVA)
ACTUAL CONDITIONS - SERVICE ENTRANCE 1	600	13.2KV	2000
ACTUAL CONDITIONS - SERVICE ENTRANCE 2	600	13.2KV	2000
ACTUAL CONDITIONS - SERVICE ENTRANCE 3	1200	13.2KV	4000
TOTAL ACTUAL CONDITIONS (KVA)			8000
SUMMARY (VA/SF)			31.89

## Environmental Stewardship Design

Franklin Square Hospital Center is not LEED certified but there is post-design consideration for certification. Patient care was a higher concern when designing this medical center therefore the importance of facility sustainability has been sacrificed at times. Although there are no “green” electrical system design features, some equipment in the building such as occupancy sensors, photoelectric controls and energy efficient light sources decrease the building’s impact on the environment.

## Design Issues

In healthcare facilities, reliability of supply power is significantly important. The emergency power system and UPS system are sized to supply the critical loads. The tie breaker devices found in most of the switchgear and substations also provides reliability to the distribution system in the case of a power outage. Voltage drop and short circuit calculations were run before the design was submitted therefore no other design issues were encounter.

## Drawings

The following is a list of construction documents used to create a single-line diagram in addition to a feeder schedule that corresponds to the diagram located in Appendix A.

Table 14: Drawing list

DWG. NO.	TITLE
E10.A	SCHEMATIC POWER RISER DIAGRAM - CENTRAL PLANT & MAIN HOSPITAL
E10.B	SCHEMATIC POWER RISER DIAGRAM - PATIENT TOWER
E11.A	ELECTRICAL SUBSTATION SCHEDULES AND DETAILS - CENTRAL PLANT
E11.B	ELECTRICAL SUBSTATION SCHEDULES AND DETAILS
E11.C	ATS AND EMERGENCY PARALLELING GEAR SCHEDULES AND DETAILS
E11.D	MOTOR CONTROL CENTER SCHEDULES AND DETAILS
E11.E	ELECTRICAL SCHEDULES
E11.F	ELECTRICAL SCHEDULES
E11.H	ELECTRICAL SCHEDULES

Table 15: Feeder schedule

FEEDER SCHEDULE																	
TAG	FROM	TO	NO. OF SETS	CONDUIT (PER SET)		CONDUTORS (PER SET)									SIZE OF OVERCURRENT PROTECTION	FRAME OR SWITCH SIZE	REMARKS
				SIZE	TYPE	PHASE CONDUCTORS			NEUTRAL CONDUCTORS			GROUND CONDUCTORS					
						NO.	SIZE	TYPE	NO.	SIZE	TYPE	NO.	SIZE	TYPE			
P1	BGE FEEDER #1	PRIMARY SERVICE SWITCHGEAR	2	6"	EMT	2	4/0AWG	CU MV-90	-	-	-	-	-	-	600	600A/3P	13.2 KV CABLE
P2	BGE FEEDER #2	PRIMARY SERVICE SWITCHGEAR	2	6"	EMT	2	4/0AWG	CU MV-90	-	-	-	-	-	-	600	600A/3P	13.2 KV CABLE
P4	PRIMARY SERVICE SWITCHGEAR	EX. SUBSTATION A	1	3"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2 KV CABLE
P5	PRIMARY SERVICE SWITCHGEAR	EX. SUBSTATION A	1	3"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2 KV CABLE
P6	PRIMARY SERVICE SWITCHGEAR	EX. SUBSTATION B	1	3"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2 KV CABLE
P7	PRIMARY SERVICE SWITCHGEAR	EX. SUBSTATION B	1	3"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2 KV CABLE
P8	PRIMARY SERVICE SWITCHGEAR	CHILLER SUBSTATION 1	1	3"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2 KV CABLE
P9	PRIMARY SERVICE SWITCHGEAR	CHILLER SUBSTATION 2	1	3"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2 KV CABLE
P10	EMERGENCY SWITCHGEAR	SWITCHBORAD EMDP-3	8	4"	EMT	8	750KCMIL	CU THWN	1	750KCMIL	CU THWN	8	250KCMIL	CU THWN	2000	2000A/3P	
P11	EMERGENCY SWITCHGEAR	SWITCHBOARD EMDP-4	5	3.5"	EMT	5	600KCMIL	CU THWN	1	600KCMIL	CU THWN	5	250KCMIL	CU THWN	2000	2000A/3P	
P12	GENSET #1	EMERGENCY SWITCHGEAR	8	3"	EMT	8	500KCMIL	CU THWN	-	-	-	8	400KCMIL	CU THWN	3000	3000A/3P	
P13	GENSET #2	EMERGENCY SWITCHGEAR	8	3"	EMT	8	500KCMIL	CU THWN	-	-	-	8	400KCMIL	CU THWN	3000	3000A/3P	
P14	GENSET #3	EMERGENCY SWITCHGEAR	8	3"	EMT	8	500KCMIL	CU THWN	-	-	-	8	400KCMIL	CU THWN	3000	3000A/3P	
P15	CHILLER SUBSTATION 2	ATS E3-3P	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
P16	ATS 3-3P	EMCC	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
P17	SWITCHBOARD EMDP-4	ATS E3-3P	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
P18	CHILLER SUBSTATION 2	SWITCHBOARD NCP1	5	3"	EMT	5	400KCMIL	CU THWN	1	400KCMIL	CU THWN	5	4/0AWG	CU THWN	1600	1600A/3P	
P19	SWITCHBOARD NCP1	XFMR T-1P	1	1.25"	EMT	1	2AWG	CU THWN	-	-	-	1	6AWG	CU THWN	100	100A/3P	
P20	XFMR T-1P	PANEL RPCP	1	2.5"	EMT	1	4AWG	CU THWN	1	4AWG	CU THWN	1	2AWG	CU THWN	225	225A/3P	
P21	SWITCHBOARD NCP1	ATS E1-1P	1	2"	EMT	1	1AWG	CU THWN	1	1AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
P22	ATS E1-1P	EX. PANEL E1LCP	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
P23	SWITCHBOARD EMDP-4	ATS E1-1P	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
P24	EX. PANEL E1LCP	EX. XFMR T-2P	1	0.75"	EMT	1	10AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	INSTALLED UNDER PREVIOUS PHASE
P25	EX. XFMR T-2P	EX. PANEL E1RCP	1	1"	EMT	1	6AWG	CU THWN	1	6AWG	CU THWN	1	8AWG	CU THWN	50	50A/3P	INSTALLED UNDER PREVIOUS PHASE
P26	ATS E3-2P	PANEL E3LCP1	3	3"	EMT	3	400KCMIL	CU THWN	1	400KCMIL	CU THWN	3	2/0AWG	CU THWN	1000	1000A/3P	
P27	EMCC	PANEL E3LCP	1	1"	EMT	1	6AWG	CU THWN	1	6AWG	CU THWN	1	8AWG	CU THWN	50	50A/3P	
P28	CHILLER SUBSTATION 1	ATS E3-1P	5	3.5"	EMT	5	600KCMIL	CU THWN	1	600KCMIL	CU THWN	5	250KCMIL	CU THWN	2000	2000A/3P	
P29	ATS E3-1P	SWGR E3CP1	5	3.5"	EMT	5	600KCMIL	CU THWN	1	600KCMIL	CU THWN	5	250KCMIL	CU THWN	2000	2000A/3P	
P30	EMERGENCY SWITCHGEAR	ATS E3-1P	5	3.5"	EMT	5	600KCMIL	CU THWN	1	600KCMIL	CU THWN	5	250KCMIL	CU THWN	2000	2000A/3P	
P31	SWITCHBOARD EMDP-3	EX. ATS-5	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
P32	EMCC	XFMR T-3P	1	1.25"	EMT	1	2AWG	CU THWN	-	-	-	1	6AWG	CU THWN	100	100A/3P	
P33	EFMR T-3P	PANEL E3RCP	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	2AWG	CU THWN	225	225A/3P	
P34	SWITCHBOARD EMDP-3	EX. ATS-2	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
P35	SWITCHBOARD EMDP-3	EX. ATS-3	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
P36	SWITCHBOARD EMDP-3	EX. ATS-5	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
P37	SWITCHBOARD EMDP-3	EX. ATS-4	1	2"	EMT	1	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	200	200A/3P	
P38	SWITCHBOARD EMDP-3	EX. ATS-1	1	2"	EMT	1	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	200	200A/3P	

FEEDER SCHEDULE (CONT.)																	
TAG	FROM	TO	NO. OF SETS	CONDUIT (PER SET)		CONDUCTORS (PER SET)									SIZE OF OVERCURRENT PROTECTION	FRAME OR SWITCH SIZE	REMARKS
				SIZE	TYPE	PHASE CONDUCTORS			NEUTRAL CONDUCTORS			GROUND CONDUCTORS					
						NO.	SIZE	TYPE	NO.	SIZE	TYPE	NO.	SIZE	TYPE			
P39	CHILLER SWITCHGEAR 1	ATS E3-2P	3	3"	EMT	3	400KCMIL	CU THWN	1	400KCMIL	CU THWN	3	2/0AWG	CU THWN	1000	1000A/3P	
P40	EMERGENCY SWITCHGEAR	ATS E3-2P	3	3"	EMT	3	400KCMIL	CU THWN	1	400KCMIL	CU THWN	3	2/0AWG	CU THWN	1000	1000A/3P	
P41	SWITCHBOARD NCP1	EX. PANEL LPCP	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
P42	EX. PANEL LPCP	EX. XFMR T-4P	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	INSTALLED UNDER PREVIOUS PHASE
P43	EX. XFMR T-4P	EX. PANEL RPCP2	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	INSTALLED UNDER PREVIOUS PHASE
P44	SWITCHBOARD NCP1	EX. PANEL LPSL	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
M1	SWGR E3CP1	CH-1	5	3"	CW	3	400KCMIL	CU THWN	-	-	-	1	250KCMIL	CU THWN	2000	2000A/3P	
M2	CHILLER SUBSTATION 2	CH-2	5	3"	CW	3	400KCMIL	CU THWN	-	-	-	1	250KCMIL	CU THWN	2000	2000A/3P	
M3	SWGR E3CP1	P-CHW-1	1	2.5	CW	1	350KCMIL	CU THWN	-	-	-	1	3AWG	CU THWN	400	400A/3P	
M4	CHILLER SUBSTATION 2	P-CHW-2	1	2.5	CW	1	350KCMIL	CU THWN	-	-	-	1	3AWG	CU THWN	400	400A/3P	
M5	SWGR E3CP1	P-CHW-3	1	2.5	CW	1	350KCMIL	CU THWN	-	-	-	1	3AWG	CU THWN	400	400A/3P	
1	PRIMARY SERVICE SWITCHGEAR	SUBSTATION 1	1	4"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2KV CABLE
2	PRIMARY SERVICE SWITCHGEAR	SUBSTATION 1	1	4"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2KV CABLE
3	PRIMARY SERVICE SWITCHGEAR	SUBSTATION 2	1	4"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2KV CABLE
4	PRIMARY SERVICE SWITCHGEAR	SUBSTATION 2	1	4"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2KV CABLE
5	PRIMARY SERVICE SWITCHGEAR	SUBSTATION 3	1	4"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2KV CABLE
6	PRIMARY SERVICE SWITCHGEAR	SUBSTATION 3	1	4"	EMT	1	1AWG	CU MV-90	-	-	-	-	-	-	150	150A/3P	13.2KV CABLE
7	EMERGENCY SWITCHGEAR	SWITCHBOARD EMDP-1	7	4"	EMT	7	750KCMIL	CU THWN	1	750KCMIL	CU THWN	7	400KCMIL	CU THWN	3000	3000A/3P	
8	EMERGENCY SWITCHGEAR	SWITCHBOARD EMDP-2	7	4"	EMT	7	750KCMIL	CU THWN	1	750KCMIL	CU THWN	7	400KCMIL	CU THWN	3000	3000A/3P	
9	EMERGENCY SWITCHGEAR	FIRE PUMP CONTROLLER/ATS	3	4"	EMT	3	600KCMIL	CU THWN	-	-	-	3	3/0AWG	CU THWN	1200	1200A/3P	M1 CABLE
10	FIRE PUMP CONTROLLER/ATS	FIRE PUMP	3	4"	EMT	3	600KCMIL	CU THWN	-	-	-	3	3/0AWG	CU THWN	1200	1200A/3P	M1 CABLE
11	SUBSTATION 3	PANEL FDP-2	3	3"	EMT	3	400KCMIL	CU THWN	1	400KCMIL	CU THWN	3	2/0AWG	CU THWN	1000	1000A/3P	
12	SUBSTATION 3	ATS E2-2	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
13	ATS E2-2	PANEL E2DP-2	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
14	SWITCHBOARD EMDP-2	ATS E2-2	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
15	SUBSTATION 3	ATS E1-1	1	2.5"	EMT	1	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	4AWG	CU THWN	250	250A/3P	
16	ATS E1-1	PANEL E1DP-1	1	2.5"	EMT	1	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	4AWG	CU THWN	250	250A/3P	
17	SWITCHBOARD EMDP-1	ATS E1-1	1	2.5"	EMT	1	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	4AWG	CU THWN	250	250A/3P	
18	SUBSTATION 3	ATS E3-4	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
19	ATS E3-4	PANEL E3DP-4	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
20	SWITCHBOARD EMDP-1	ATS E3-4	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
21	PANEL E3DP-4	PANEL E3LG1	1	3.5"	EMT	1	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	3AWG	CU THWN	350	350A/3P	
22	PANEL E3DP-4	XFMR T-1	1	1.25"	EMT	1	2AWG	CU THWN	-	-	-	1	6AWG	CU THWN	100	100A/3P	
23	XFMR T-1	PANEL E3RG1	1	2.5"	EMT	1	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	2AWG	CU THWN	250	250A/3P	
24	SUBSTATION 3	PANEL FDP-1	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
25	PANEL FDP-1	XFMR T-2	3	2"	EMT	3	3/0AWG	CU THWN	1	3/0AWG	CU THWN	3	3AWG	CU THWN	350	350A/3P	
26	XFMR T-2	PANEL DRP-1	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
27	SUBSTATION 3	ATS E2-1	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
28	ATS E2-1	PANEL E2DP-1	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	



FEEDER SCHEDULE (CONT.)																	
TAG	FROM	TO	NO. OF SETS	CONDUIT (PER SET)		CONDUCTORS (PER SET)									SIZE OF OVERCURRENT PROTECTION	FRAME OR SWITCH SIZE	REMARKS
				SIZE	TYPE	PHASE CONDUCTORS			NEUTRAL CONDUCTORS			GROUND CONDUCTORS					
						NO.	SIZE	TYPE	NO.	SIZE	TYPE	NO.	SIZE	TYPE			
29	SWITCHBOARD EMDP-1	ATS E2-1	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
30	PANEL E2DP-1	XFMR T-3	3	2"	EMT	3	3/0AWG	CU THWN	1	3/0AWG	CU THWN	3	3AWG	CU THWN	350	350A/3P	
31	XFMR T-3	PANEL E2RDP-1	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
32	SUBSTATION 2	PANEL MDP-72	5	3"	EMT	5	400KCMIL	CU THWN	1	400KCMIL	CU THWN	5	4/0AWG	CU THWN	1600	1600A/3P	
33	SUBSTATION 2	ATS E3-2	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
34	ATS E3-2	PANEL E3DP-72	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
35	SWITCHBOARD EMDP-2	ATS E3-2	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
36	SUBSTATION 1	PANEL MDP-71	5	3"	EMT	5	400KCMIL	CU THWN	1	400KCMIL	CU THWN	5	4/0AWG	CU THWN	1600	1600A/3P	
37	SUBSTATION 1	ATS E2-3	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
38	ATS E2-3	PANEL E2DP-3	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
39	SWITCHBOARD EMDP-1	ATS E2-3	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
40	PANEL E3DP-4	PANEL E3L35	1	2.5"	EMT	1	350KCMIL	CU THWN	1	350KCMIL	CU THWN	1	4AWG	CU THWN	300	300A/3P	
41	SUBSTATION 1	ATS E3-1	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
42	ATS E3-1	PANEL E3DP-71	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
43	SWITCHBOARD EMDP-1	ATS E3-1	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
44	SUBSTATION 1	ATS E3-3	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
45	ATS E3-3	PANEL E3DP-73	3	2.5"	EMT	3	300KCMIL	CU THWN	1	300KCMIL	CU THWN	3	1/0AWG	CU THWN	800	800A/3P	
46	SWITCHBOARD EMDP-2	ATS E3-3	1	2.5"	EMT	1	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	4AWG	CU THWN	250	250A/3P	
47	PANEL FDP-1	PANEL LPG1	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
48	PANEL LPG1	XFMR T-4	1	1"	EMT	1	4AWG	CU THWN	-	-	-	1	8AWG	CU THWN	100	100A/3P	
49	XFMR T-4	PANEL RPG1	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
50	PANEL E1DP-1	PANEL E1LG1	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
51	PANEL E1LG1	XFMR T-5	1	0.75"	EMT	1	10AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
52	XFMR T-5	PANEL E2RG1	1	1"	EMT	1	6AWG	CU THWN	1	6AWG	CU THWN	1	8AWG	CU THWN	50	50A/3P	
53	PANEL E2DP-1	PANEL E2LG1	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
54	PANEL E2LG1	XFMR T-6	1	1"	EMT	1	4AWG	CU THWN	-	-	-	1	8AWG	CU THWN	100	100A/3P	
55	XFMR T-6	PANEL E2RG1	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
56	PANEL DRP-1	PANEL RPG2	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
57	PANEL E2RDP-1	PANEL E2RG2	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
58	PANEL DRP-1	PANEL RPG3	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
59	PANEL E2RDP-1	PANEL E2RG3	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
60	PANEL DRP-1	PANEL RPG4	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
61	PANEL E2RDP-1	PANEL E2RG4	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
62	PANEL FDP-1	PANEL LPG5	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
63	PANEL E2DP-1	PANEL E2LG5	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
64	PANEL E1DP-1	PANEL E1LG5	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
65	PANEL E1LG5	XFMR T-7	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
66	XFMR T-7	PANEL E1RG5	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
67	PANEL E3RG1	PANEL E3RG5	1	3"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	

FEEDER SCHEDULE (CONT.)																	
TAG	FROM	TO	NO. OF SETS	CONDUIT (PER SET)		CONDUTORS (PER SET)									SIZE OF OVERCURRENT PROTECTION	FRAME OR SWITCH SIZE	REMARKS
				SIZE	TYPE	PHASE CONDUCTORS			NEUTRAL CONDUCTORS			GROUND CONDUCTORS					
						NO.	SIZE	TYPE	NO.	SIZE	TYPE	NO.	SIZE	TYPE			
68	PANEL DRP-1	PANEL RPG6	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
69	PANEL E2RDP-1	PANEL E2RG6	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
70	PANEL FDP-1	PANEL LP11	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
71	PANEL E1DP-1	PANEL E1L11	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
72	PANEL E1L11	XFMR T-8	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
73	XFMR T-8	PANEL E1R11	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
74	PANEL E2DP-1	PANEL E2L11	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
75	PANEL E3DP-4	XFMR T-9	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
76	XFMR T-9	PANEL E3R12 (VIA ECB)	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
77	PANEL E2DP-1	XFMR T-10	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
78	XFMR T-10	PANEL E2R11	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
79	PANEL FDP-1	XFMR T-11	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
80	XFMR T-11	PANEL RP11	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
81	PANEL RP11	PANEL RP12	1	2"	EMT	1	6AWG	CU THWN	1	6AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
82	PANEL E2R11	PANEL E2R12	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
83	PANEL RP11	PANEL RP13	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
84	PANEL E2R11	PANEL E2R13	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
85	PANEL RP11	PANEL RP14	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
86	PANEL E2R11	PANEL E2R14	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
87	PANEL FDP-2	PANEL LP21	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
88	PANEL E1DP-1	PANEL E1L21	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
89	PANEL E1L21	XFMR T-12	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
90	XFMR T-12	PANEL E1R21	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
91	PANEL E2DP-2	PANEL E2L21	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
92	PANEL E3DP-4	XFMR T-13	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
93	XFMR T-13	PANEL E3R22 (VIA ECB)	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
94	PANEL E2DP-2	XFMR T-14	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
95	XFMR T-14	PANEL E2R21	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
96	PANEL FDP-2	XFMR T-15	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
97	XFMR T-15	PANEL RP21	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
98	PANEL RP21	PANEL RP22	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
99	PANEL E2R21	PANEL E2R22	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
100	PANEL RP21	PANEL RP23	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
101	PANEL E2R21	PANEL E2R23	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
102	PANEL RP21	PANEL RP24	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
103	PANEL E2R21	PANEL E2R24	1	2.5"	EMT	1	4/0AWG	CU THWN	1	4/0AWG	CU THWN	1	4AWG	CU THWN	225	225A/3P	
104	PANEL FDP-2	PANEL LP31	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
105	PANEL E1DP-1	PANEL E1L31	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
106	PANEL E1L31	XFMR T-16	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	

FEEDER SCHEDULE (CONT.)																	
TAG	FROM	TO	NO. OF SETS	CONDUIT (PER SET)		CONDUTORS (PER SET)									SIZE OF OVERCURRENT PROTECTION	FRAME OR SWITCH SIZE	REMARKS
				SIZE	TYPE	PHASE CONDUCTORS			NEUTRAL CONDUCTORS			GROUND CONDUCTORS					
						NO.	SIZE	TYPE	NO.	SIZE	TYPE	NO.	SIZE	TYPE			
107	XFMR T-16	PANEL E1R31	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
108	PANEL E2DP-2	PANEL E2L31	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
109	PANEL E3DP-4	XFMR T-17	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
110	XFMR T-17	PANEL E3R32 (VIA ECB)	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
111	PANEL E2DP-2	XFMR T-18	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
112	XFMR T-18	PANEL E2R31	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
113	PANEL FDP-2	XFMR T-19	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
114	XFMR T-19	PANEL RP31	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
115	PANEL RP31	PANEL RP32	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
116	PANEL E2R31	PANEL E2R32	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
117	PANEL RP31	PANEL RP33	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
118	PANEL E2R31	PANEL E2R33	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
119	PANEL RP31	PANEL RP34	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
120	PANEL E2R31	PANEL E2R34	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
121	PANEL FDP-2	PANEL LP41	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
122	PANEL E1DP-1	PANEL E1L41	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
123	PANEL E1L41	XFMR T-20	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
124	XFMR T-20	PANEL E1R41	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
125	PANEL E2DP-2	PANEL E2L41	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
126	PANEL E3DP-4	XFMR T-21	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
127	XFMR T-21	PANEL E3R42 (VIA ECB)	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
128	PANEL E2DP-2	XFMR T-22	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
129	XFMR T-22	PANEL E2R41	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
130	PANEL FDP-2	XFMR T-23	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
131	XFMR T-23	PANEL RP41	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
132	PANEL RP41	PANEL RP42	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
133	PANEL E2R41	PANEL E2R42	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
134	PANEL RP41	PANEL RP43	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
135	PANEL E2R41	PANEL E2R43	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
136	PANEL RP41	PANEL RP44	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
137	PANEL E2R41	PANEL E2R44	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
138	PANEL FDP-2	PANEL LP51	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
139	PANEL E1DP-1	PANEL E1L51	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
140	PANEL E1L51	XFMR T-24	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
141	XFMR T-24	PANEL E1R51	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
142	PANEL E2DP-2	PANEL E2L51	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
143	PANEL E3DP-4	XFMR T-25	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
144	XFMR T-25	PANEL E3R52 (VIA ECB)	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
145	PANEL E2DP-2	XFMR T-26	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	

FEEDER SCHEDULE (CONT.)																	
TAG	FROM	TO	NO. OF SETS	CONDUIT (PER SET)		CONDUTORS (PER SET)									SIZE OF OVERCURRENT PROTECTION	FRAME OR SWITCH SIZE	REMARKS
				SIZE	TYPE	PHASE CONDUCTORS			NEUTRAL CONDUCTORS			GROUND CONDUCTORS					
						NO.	SIZE	TYPE	NO.	SIZE	TYPE	NO.	SIZE	TYPE			
146	XFMR T-26	PANEL E2R51	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
147	PANEL FDP-2	XFMR T-27	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
148	XFMR T-27	PANEL RP51	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
149	PANEL RP51	PANEL RP52	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
150	PANEL E2R51	PANEL E2R52	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
151	PANEL RP51	PANEL RP53	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
152	PANEL E2R51	PANEL E2R53	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
153	PANEL RP51	PANEL RP54	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
154	PANEL E2R51	PANEL E2R54	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
155	PANEL FDP-2	PANEL LP61	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
156	PANEL E1DP-1	PANEL E1L61	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
157	PANEL E1L61	XFMR T-28	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
158	XFMR T-28	PANEL E2R61	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
159	PANEL E2DP-2	PANEL E2L61	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
160	PANEL E3DP-4	XFMR T-29	1	0.75"	EMT	1	6AWG	CU THWN	-	-	-	1	10AWG	CU THWN	100	100A/3P	
161	XFMR T-29	PANEL E3R62 (VIA ECB)	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
162	PANEL E2DP-2	XFMR T-30	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
163	XFMR T-30	PANEL E2R61	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
164	PANEL FDP-2	XFMR T-31	1	2.5"	EMT	1	250KCMIL	CU THWN	-	-	-	1	4AWG	CU THWN	225	225A/3P	
165	XFMR T-31	PANEL RP61	2	2.5"	EMT	2	250KCMIL	CU THWN	1	250KCMIL	CU THWN	2	1/0AWG	CU THWN	500	500A/3P	
166	PANEL RP61	PANEL RP62	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
167	PANEL E2R61	PANEL E2R62	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
168	PANEL RP61	PANEL RP63	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
169	PANEL E2R61	PANEL E2R63	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
170	PANEL RP61	PANEL RP64	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
171	PANEL E2R61	PANEL E2R64	1	2"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
172	PANEL E1DP-1	PANEL E1L71	1	1.25"	EMT	1	3AWG	CU THWN	-	-	-	1	8AWG	CU THWN	100	100A/3P	
173	PANEL E1L71	XFMR T-32	1	0.75"	EMT	1	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	100	100A/3P	
174	XFMR T-32	PANEL E1R71	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
175	PANEL E2DP-1	PANEL E2L71	1	2"	EMT	1	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	200	200A/3P	
176	PANEL MDP-71	PANEL LP71	1	2"	EMT	1	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	200	200A/3P	
177	PANEL LP71	XFMR T-33	1	1.25"	EMT	1	2AWG	CU THWN	-	-	-	1	6AWG	CU THWN	100	100A/3P	
178	XFMR T-33	PANEL RP71	1	2.5"	EMT	1	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	2AWG	CU THWN	250	250A/3P	
179	PANEL E3DP-71	XFMR T-34	1	1.25"	EMT	1	2AWG	CU THWN	-	-	-	1	6AWG	CU THWN	100	100A/3P	
180	XFMR T-34	PANEL E3R71	1	2.5"	EMT	1	250KCMIL	CU THWN	1	250KCMIL	CU THWN	1	2AWG	CU THWN	250	250A/3P	
181	PANEL FDP-1	PANEL LPSL1 (VIA CONTRACTOR)	1	1.24"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
182	BGE FEEDER #3	FIRE PUMP CONTROLLER/ATS	3	4"	EMT	3	600KCMIL	CU THWN	-	-	-	3	3/0AWG	CU THWN	1200	1200A/3P	VIA SERVICE DISCONNECT
183	PANEL E2DP-1	UPS-1	1	3"	EMT	1	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	3AWG	CU THWN	300	300A/3P	
184	UPS-1	PANEL U2RDP	2	3"	EMT	2	350KCMIL	CU THWN	1	350KCMIL	CU THWN	2	2/0AWG	CU THWN	600	600A/3P	

FEEDER SCHEDULE (CONT.)																	
TAG	FROM	TO	NO. OF SETS	CONDUIT (PER SET)		CONDUTORS (PER SET)									SIZE OF OVERCURRENT PROTECTION	FRAME OR SWITCH SIZE	REMARKS
				SIZE	TYPE	PHASE CONDUCTORS			NEUTRAL CONDUCTORS			GROUND CONDUCTORS					
						NO.	SIZE	TYPE	NO.	SIZE	TYPE	NO.	SIZE	TYPE			
185	PANEL U2RDP	PANEL U2RG1	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
186	PANEL U2RDP	PANEL U2R12	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
187	PANEL U2RDP	PANEL U2R22	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
188	PANEL U2RDP	PANEL U2R32	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
189	PANEL U2RDP	PANEL U2R42	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
190	PANEL U2RDP	PANEL U2R52	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
191	PANEL U2RDP	PANEL U2R62	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
192	PANEL E3DP-71	PANEL E3L71	1	1.5"	EMT	1	1/0AWG	CU THWN	1	1/0AWG	CU THWN	1	6AWG	CU THWN	150	150A/3P	
193	EX. PANEL 480-L2N	PANEL 480-L2N	1	2"	EMT	1	3/0AWG	CU THWN	1	3/0AWG	CU THWN	1	6AWG	CU THWN	200	200A/3P	NOTE 1
194	PANEL RP21	PANEL RP25	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
195	PANEL RP11	PANEL RP15	1	1.25"	EMT	1	3AWG	CU THWN	1	3AWG	CU THWN	1	8AWG	CU THWN	100	100A/3P	
196	PANEL LP31	PANEL LP31X	1	1"	EMT	1	6AWG	CU THWN	1	6AWG	CU THWN	1	10AWG	CU THWN	50	50A/3P	
197	PANEL E2DP-2	UPS-1	1	3"	EMT	1	500KCMIL	CU THWN	1	500KCMIL	CU THWN	1	3AWG	CU THWN	300	300A/3P	BYPASS

NOTE 1: INTERCEPT AND EXTENT EXISTING FEEDER TO NEW PANEL

## Communication Systems

### Telecommunications System

The fiber optic cables that make up the telecommunication system run throughout the build and terminate in the main technology systems room. Each workstation is required to have two outlet/connectors. Every floor has a technology systems closet but the main technology systems room is located on the ground floor.

### Fire Alarm System

An emergency voice alarm communication system using a digitally recorded voice message notifies occupants that there is a fire condition and the emergency instructions. There are designated zones throughout the building that transmit a different alarms and signals to the fire command center. The system is UL listed and complies with the requirements of NFPA Standard 72. The system also includes manual pull stations, duct detectors, sprinklers, door closers-holders, strobes, photoelectric area smoke detectors, addressable beam smoke detectors and heat detectors, all tying back to the main fire alarm control panel.

### Nurse Call System

An Internet Protocol (IP) network based system that allows data to be distributed over a common network infrastructure such as a wireless telephone or vocera system. Patient stations provide a two-way communication via a pillow speaker with three or more call buttons and a cancel button. The pillow speakers also have a built-in microphone and speaker. A main computer displays patient-to-staff assignments and other information on large flat screen monitors.

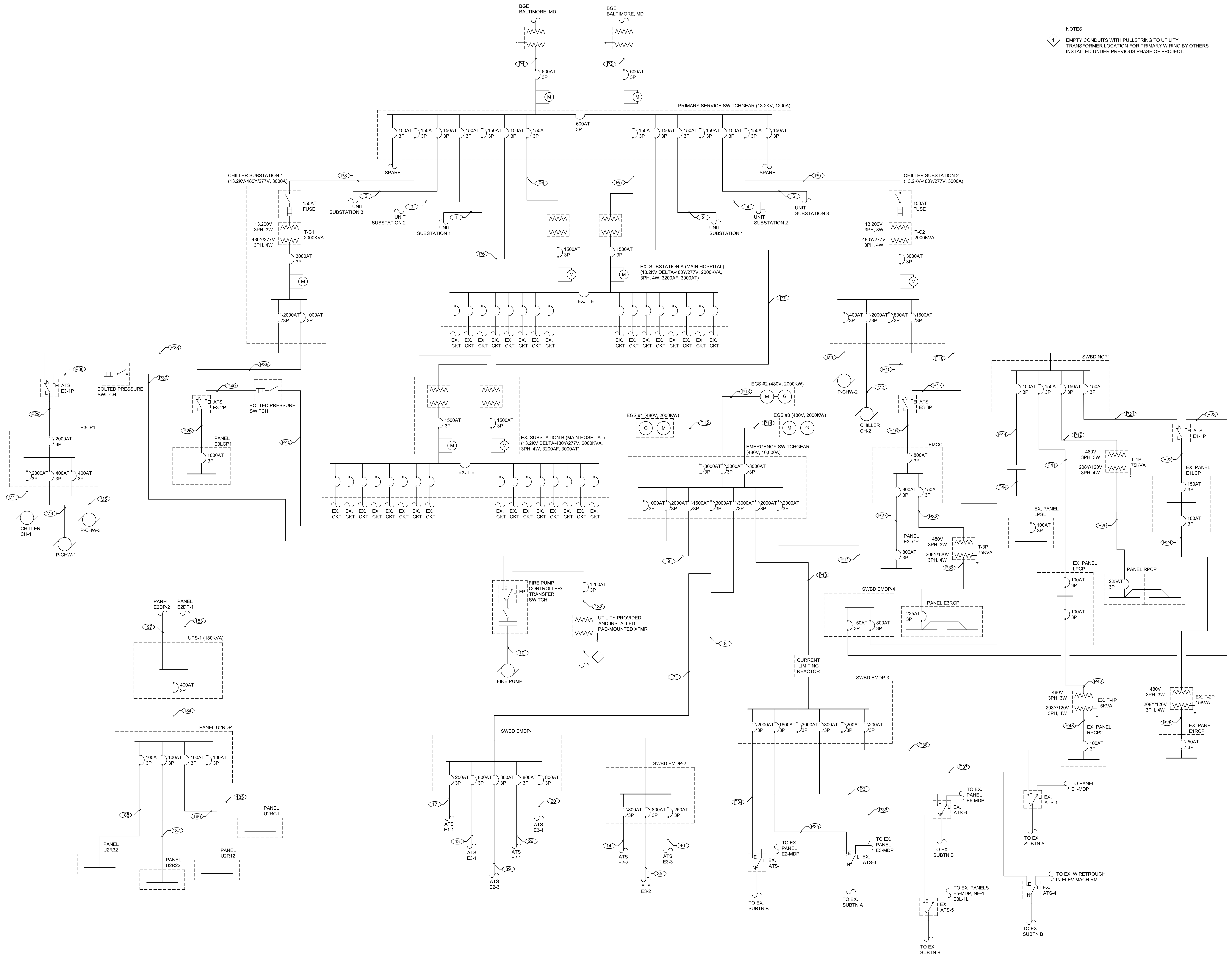
### Paging System

The paging system emits a frequency that cannot be heard by humans but is received by a pocket pager or clip on pager device with a specific number or name associated with it. Any brand of pocket paging device can be used as locate staff, equipment or a wandering patient. The location of the pagers can be seen on monitor. Different zones can be implemented using different frequencies.

### Audiovisual System

Various devices are located throughout the building containing speaker and video connections. The waiting rooms and all patient rooms have televisions located in them with speakers in the ceiling that are connect to the audiovisual system. Conference rooms and some offices have projectors and projection screens for presentations.

## Appendix A – Single –Line Diagram



NOTES:  
 1. EMPTY CONDUITS WITH PULLSTRING TO UTILITY TRANSFORMER LOCATION FOR PRIMARY WIRING BY OTHERS INSTALLED UNDER PREVIOUS PHASE OF PROJECT.

**FRANKLIN SQUARE HOSPITAL CENTER  
 PATIENT TOWER AND EMERGENCY DEPARTMENT ADDITION**  
 9000 FRANKLIN SQUARE DRIVE, BALTIMORE, MARYLAND 21237

CASSANDRA WATSON

AE 481W - SENIOR THESIS

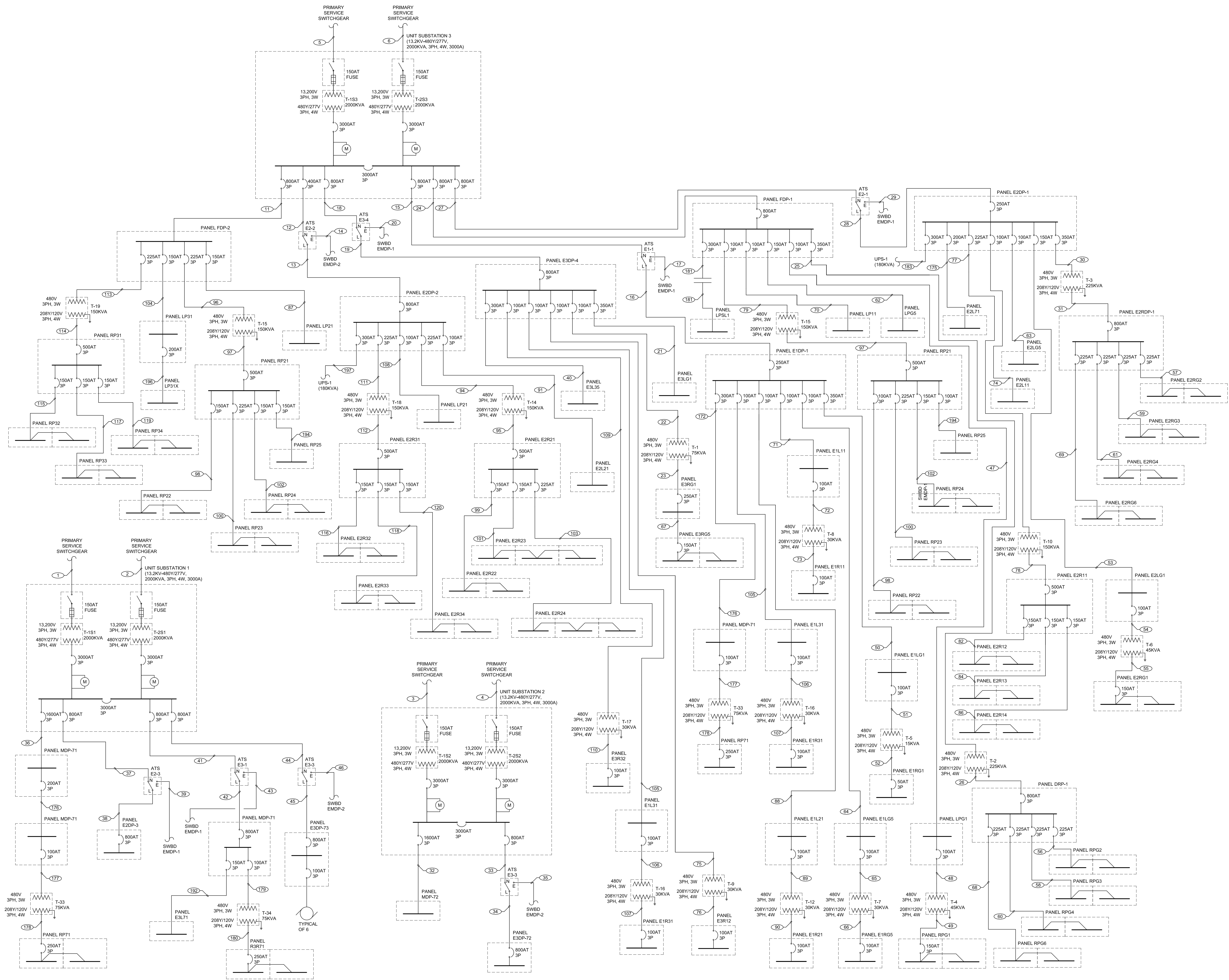
DATE: NOV. 11, 2009

TECHNICAL REPORT 2  
 SINGLE-LINE DIAGRAM

**E1**



**FRANKLIN SQUARE HOSPITAL CENTER**  
**PATIENT TOWER AND EMERGENCY DEPARTMENT ADDITION**  
 9000 FRANKLIN SQUARE DRIVE, BALTIMORE, MARYLAND 21237



CASSANDRA WATSON

AE 481W - SENIOR THESIS

DATE: NOV. 11, 2009

TECHNICAL REPORT 2  
SINGLE-LINE DIAGRAM

Revisions	Date	No.
ADDENDUM #1	08/02/07	1
AS113/CBE-1	12/14/07	2



**PATIENT TOWER & EMERGENCY DEPARTMENT ADDITION**

**LW** Leach Wallace Associates, Inc.  
 Consulting Engineers  
 6522 Meadowlark Road  
 Bowie, MD 21075  
 (410) 579-8100 FAX (410) 540-9041

**SCHEMATIC POWER RISER DIAGRAM - CENTRAL PLANT & MAIN HOSPITAL**

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 29856, Expiration Date: 01/12/08

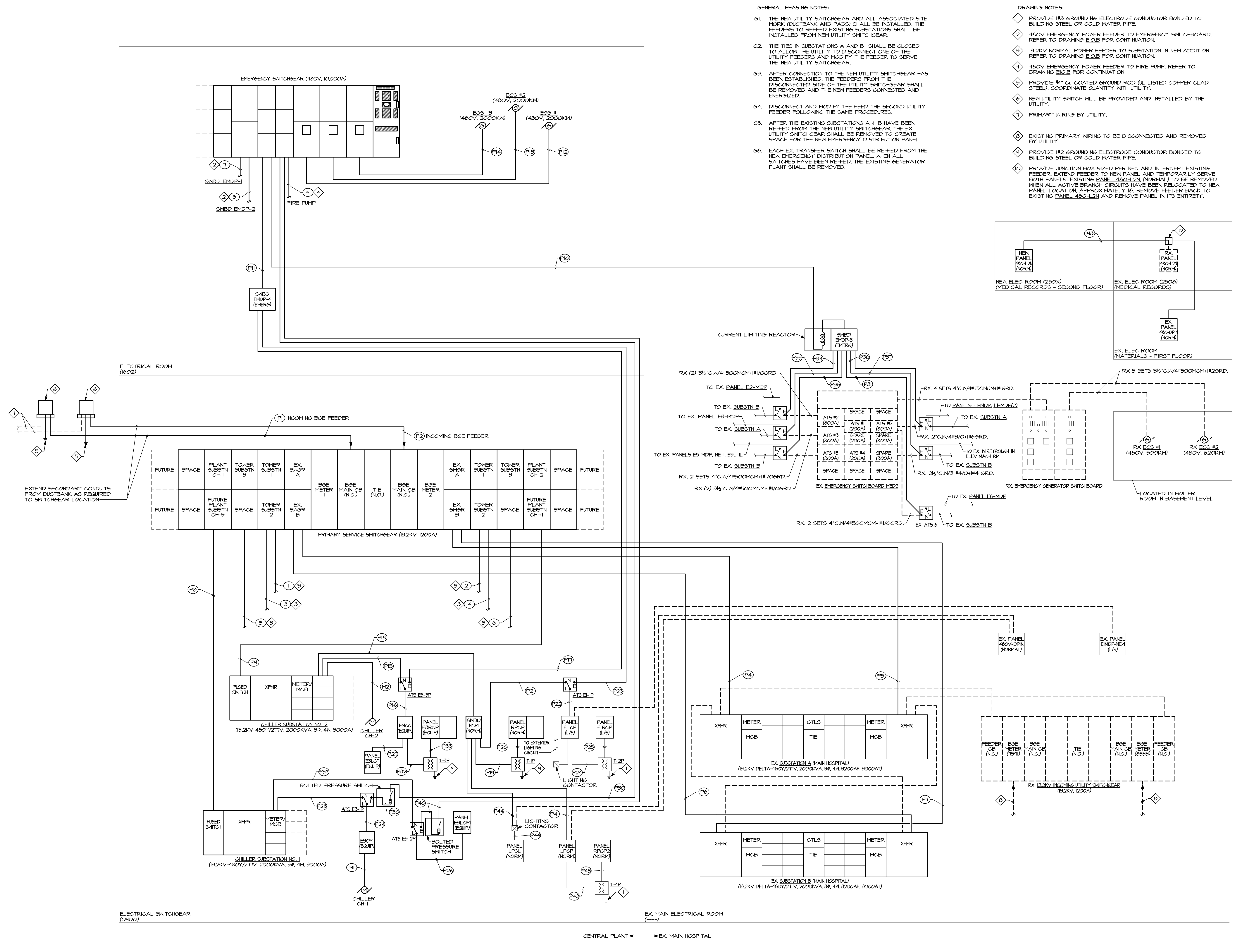


**WILMOT SANZ**  
 ARCHITECTURE  
 PLANNING

18310 Montgomery Village Avenue  
 Gaithersburg, Maryland 20879  
 301-590-2900 (Fax) 301-590-8150

Project Number: 9850.01  
 Scale: NONE  
 Date: July 16, 2007

Drawing No.: **E10.A**  
 Construction Documents



**SCHEMATIC POWER RISER DIAGRAM - CENTRAL PLANT AND MAIN HOSPITAL**  
 NOT TO SCALE

- GENERAL PHASING NOTES:**
- THE NEW UTILITY SWITCHGEAR AND ALL ASSOCIATED SITE WORK (DUG/BANK AND PADS) SHALL BE INSTALLED. THE FEEDERS TO REFEED EXISTING SUBSTATIONS SHALL BE INSTALLED FROM NEW UTILITY SWITCHGEAR.
  - THE TIES IN SUBSTATIONS A AND B SHALL BE CLOSED TO ALLOW THE UTILITY TO DISCONNECT ONE OF THE UTILITY FEEDERS AND MODIFY THE FEEDER TO SERVE THE NEW UTILITY SWITCHGEAR.
  - AFTER CONNECTION TO THE NEW UTILITY SWITCHGEAR HAS BEEN ESTABLISHED, THE FEEDERS FROM THE DISCONNECTED SIDE OF THE UTILITY SWITCHGEAR SHALL BE REMOVED AND THE NEW FEEDERS CONNECTED AND ENERGIZED.
  - DISCONNECT AND MODIFY THE FEED THE SECOND UTILITY FEEDER FOLLOWING THE SAME PROCEDURES.
  - AFTER THE EXISTING SUBSTATIONS A & B HAVE BEEN RE-FED FROM THE NEW UTILITY SWITCHGEAR, THE EX. UTILITY SWITCHGEAR SHALL BE REMOVED TO CREATE SPACE FOR THE NEW EMERGENCY DISTRIBUTION PANEL.
  - EACH EX. TRANSFER SWITCH SHALL BE RE-FED FROM THE NEW EMERGENCY DISTRIBUTION PANEL. WHEN ALL SWITCHES HAVE BEEN RE-FED, THE EXISTING GENERATOR PLANT SHALL BE REMOVED.
- DRAWING NOTES:**
- PROVIDE #8 GROUNDING ELECTRODE CONDUCTOR BONDED TO BUILDING STEEL OR COLD WATER PIPE.
  - 480V EMERGENCY POWER FEEDER TO EMERGENCY SWITCHBOARD. REFER TO DRAWING E10B FOR CONTINUATION.
  - 13.2KV NORMAL POWER FEEDER TO SUBSTATION IN NEW ADDITION. REFER TO DRAWING E10B FOR CONTINUATION.
  - 480V EMERGENCY POWER FEEDER TO FIRE PUMP. REFER TO DRAWING E10B FOR CONTINUATION.
  - PROVIDE 3" GALV-COATED GROUND ROD (ALL LISTED COPPER CLAD STEEL), COORDINATE QUANTITY WITH UTILITY.
  - NEW UTILITY SWITCH WILL BE PROVIDED AND INSTALLED BY THE UTILITY.
  - PRIMARY WIRING BY UTILITY.
  - EXISTING PRIMARY WIRING TO BE DISCONNECTED AND REMOVED BY UTILITY.
  - PROVIDE #2 GROUNDING ELECTRODE CONDUCTOR BONDED TO BUILDING STEEL OR COLD WATER PIPE.
  - PROVIDE JUNCTION BOX SIZED PER NEC AND INTERCEPT EXISTING FEEDER. EXTEND FEEDER TO NEW PANEL AND TEMPORARILY SERVE BOTH PANELS. EXISTING PANEL 480-L2N (NORMAL) TO BE REMOVED WHEN ALL ACTIVE BRANCH CIRCUITS HAVE BEEN RELOCATED TO NEW PANEL LOCATION APPROXIMATELY 16. REMOVE FEEDER BACK TO EXISTING PANEL 480-L2N AND REMOVE PANEL IN ITS ENTIRETY.

Revisions	Date	No.
ADDENDUM #1	08/02/07	▲

Franklin Square Hospital Center  
**PATIENT TOWER & EMERGENCY DEPARTMENT ADDITION**

**Leach Wallace Associates, Inc.**  
 Consulting Engineers  
 6522 Meadowdale Road  
 Bowie, MD 21075  
 (410) 579-8100 FAX (410) 540-9041

## SCHMATIC POWER RISER DIAGRAM - PATIENT TOWER

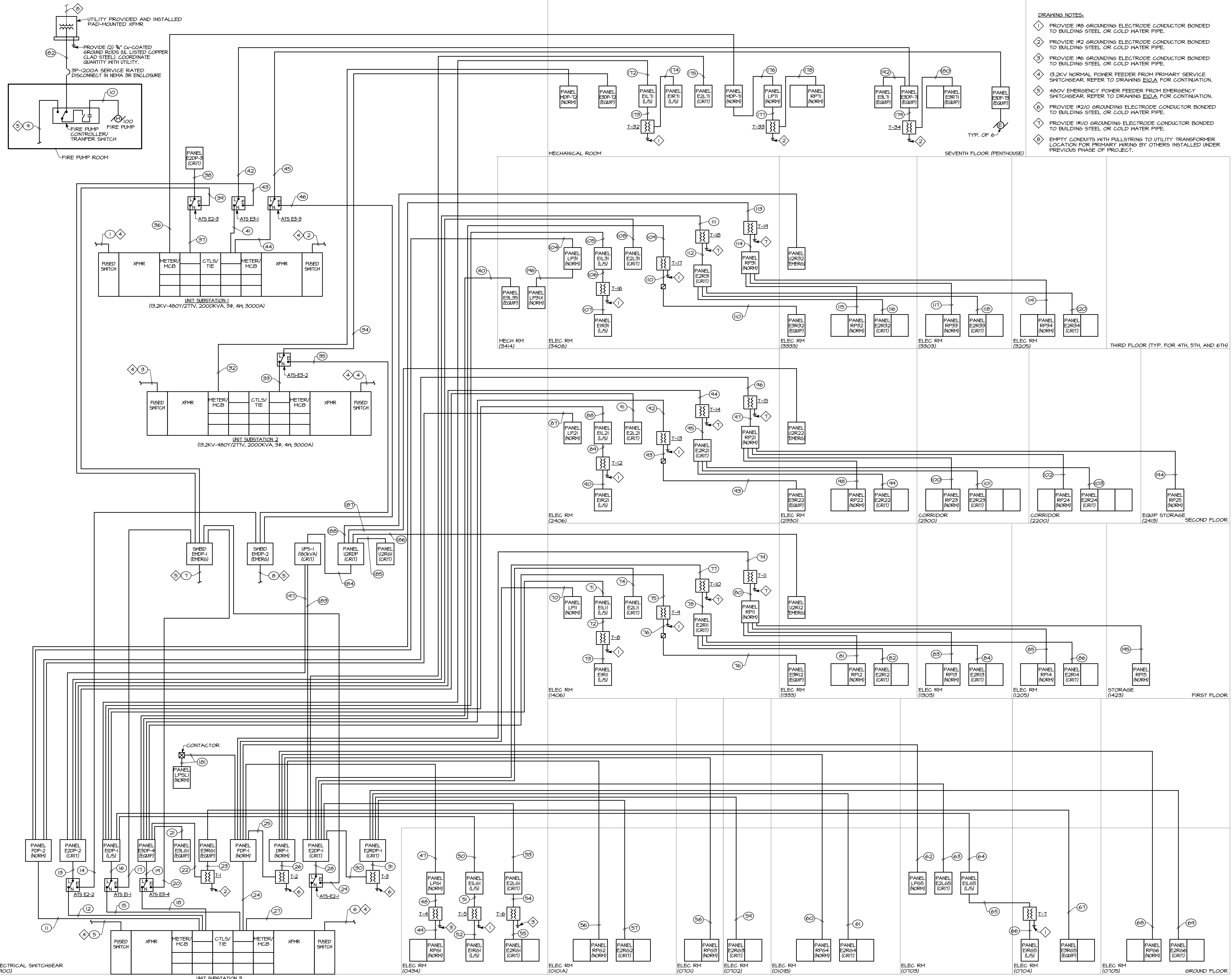
Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No. 29856. Expiration Date: 01/12/08



**WILMOT SANZ**  
 ARCHITECTURE  
 PLANNING  
 18310 Montgomery Village Avenue  
 Gaithersburg, Maryland 20879  
 301-590-2900 (Fax) 301-590-8150

Project Number: 9850.01  
 Scale: NONE  
 Date: July 16, 2007

Drawing No.: **E10.B**  
 Construction Documents



**SCHMATIC POWER RISER DIAGRAM - PATIENT TOWER**  
 NOT TO SCALE

Date: 07/16/07 11:56 AM  
 User: J. WILSON  
 Plot Scale: 1" = 1'-0"  
 Plot: E10.B.DWG  
 Title: SCHMATIC POWER RISER DIAGRAM - PATIENT TOWER

FILENAME: E10.B.DWG, PLOT SCALE: 1" = 1'-0", SPACE, PAPER, DWG, NUMBER: E10.B, SAVED: 6/14/2007 8:14 AM, PLOTTED BY: JAMES FITZGERALD

## Appendix B – HID Ballasts

**Fixture Tag** – B19

**Lamp Quantity/Type** – (2) 400W MH (ED28)

**Ballast Type** – MAGNETIC, PS

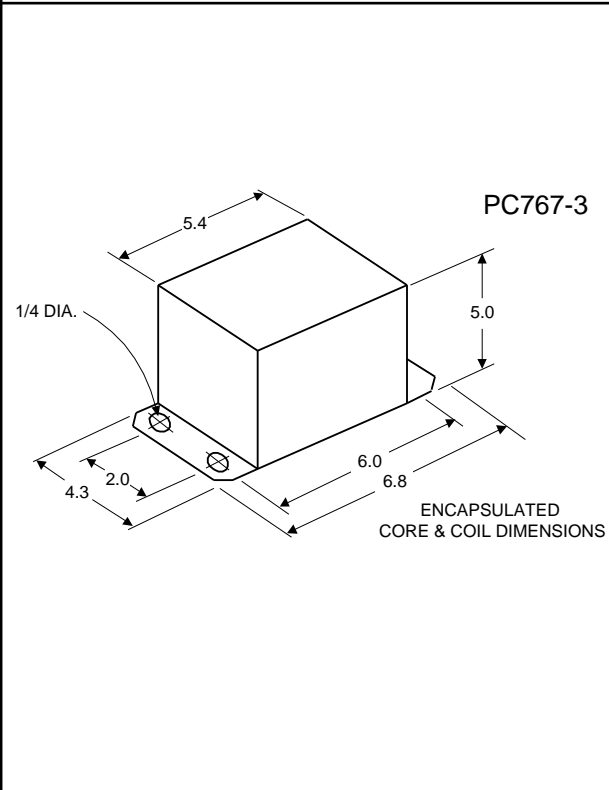
**PHILIPS  
ADVANCE**

**B19**

**Metal  
Halide  
Lamp Ballast**

**Catalog Number 73B6092AEE  
For 400W M135/M155 (P.S.)  
60 Hz SUPER-CWA  
Status: Active**

**DIMENSIONS AND DATA**

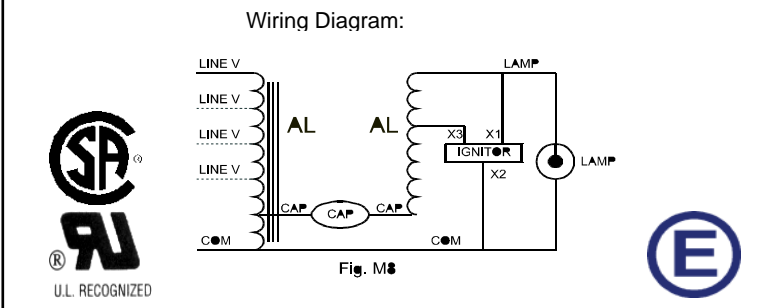


	120	208	240	277
INPUT VOLTS				
CIRCUIT TYPE	SUPER-CWA			
POWER FACTOR (min)	90%			
REGULATION				
Line Volts	±10%			
Lamp Watts	±10%			
LINE CURRENT (Amps)				
Operating.....	3.80	2.20	1.90	1.65
Open Circuit.....	2.60	1.56	1.31	1.17
Starting.....	3.00	1.75	1.50	1.30
UL TEMPERATURE RATINGS				
Insulation Class	H(180°C)			
Coil Temperature Code	1029			
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C			
NOM. OPEN CIRCUIT VOLTAGE	270			
INPUT VOLTAGE AT LAMP DROPOUT.....	60	104	120	138
INPUT WATTS	454			
RECOMMENDED FUSE (Amps).....	10	7	5	5
CORE and COIL				
Dimension (A)				
Dimension (B)	14.75			
Weight (lbs.)	12"			
Lead Lengths				
CAPACITOR REQUIREMENT				
Microfarads	26.0			
Volts (min.)	330			
Fault Current Withstand (amps)				
60 Hz TEST PROCEDURES (Refer to Philips Lighting Electronics N.A. TEST Procedure for HID Ballasts - Form 127)				
High Potential Test (Volts)				
1 minute	2000			
2 seconds	2500			
Open Circuit Voltage Test (Volts)	235-290			
Short-Circuit Current Test (Amps)	3.60-4.40			
Secondary Current				
Input Current.....	2.40-3.60	1.40-2.10	1.20-1.80	1.05-1.55

Capacitor: 7C260P33-R



Capacitance: 26  
Dia/Oval Dim: 1.75  
Height: 5.15  
Temp Rating: 105°C



Ignitor: LI533-H4



Ballast to Lamp Distance (BTL) = 2 feet  
Temp Rating: 105°C

Typical Ordering Information	
(please call Philips Lighting Electronics N.A. for suffix availability)	
Order Suffix	Description

Data is based upon tests performed by Philips Lighting Electronics N.A. 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.

**PHILIPS LIGHTING ELECTRONICS N.A.**  
10275 WEST HIGGINS ROAD · ROSEMONT, IL 60018  
Tel: 800-322-2086 · Fax: 888-423-1882 · www.philips.com/advance  
Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

Revised: 03/06/09

**Fixture Tag** – B19R

**Lamp Quantity/Type** – (2) 400W MH (ED28)

**Ballast Type** – MAGNETIC, PS

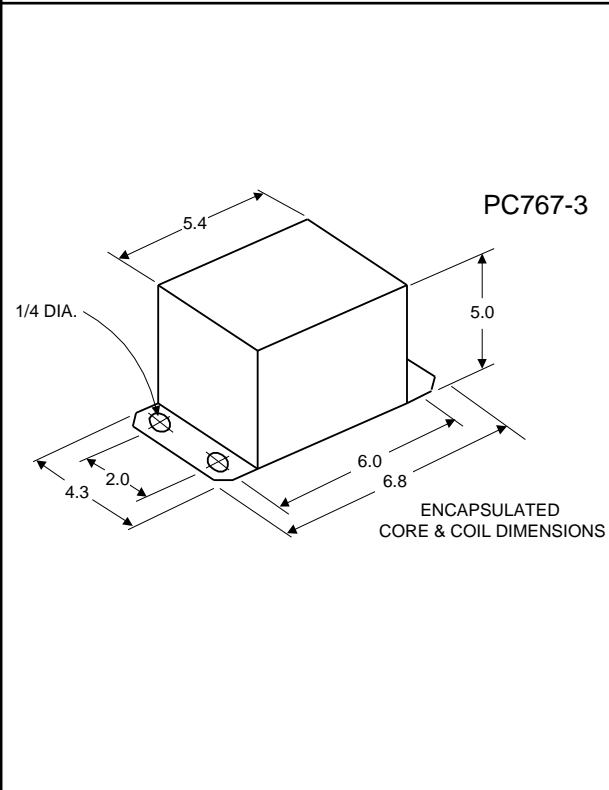
**PHILIPS  
ADVANCE**

**B19R**

**Metal  
Halide  
Lamp Ballast**

**Catalog Number 73B6092AEE  
For 400W M135/M155 (P.S.)  
60 Hz SUPER-CWA  
Status: Active**

**DIMENSIONS AND DATA**

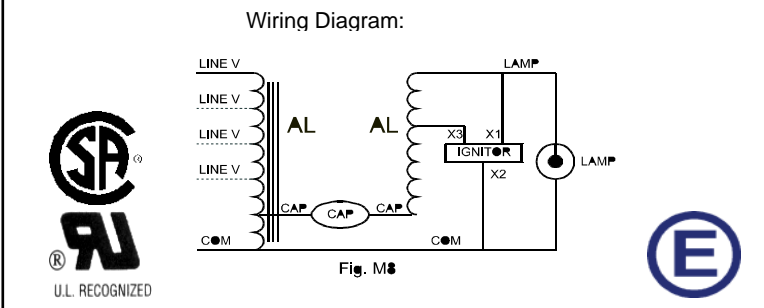


	120	208	240	277
INPUT VOLTS				
CIRCUIT TYPE	SUPER-CWA			
POWER FACTOR (min)	90%			
REGULATION				
Line Volts	±10%			
Lamp Watts	±10%			
LINE CURRENT (Amps)				
Operating.....	3.80	2.20	1.90	1.65
Open Circuit.....	2.60	1.56	1.31	1.17
Starting.....	3.00	1.75	1.50	1.30
UL TEMPERATURE RATINGS				
Insulation Class	H(180°C)			
Coil Temperature Code	1029			
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C			
NOM. OPEN CIRCUIT VOLTAGE	270			
INPUT VOLTAGE AT LAMP DROPOUT.....	60	104	120	138
INPUT WATTS	454			
RECOMMENDED FUSE (Amps).....	10	7	5	5
CORE and COIL				
Dimension (A)	14.75			
Dimension (B)	12"			
Weight (lbs.)	12"			
Lead Lengths				
CAPACITOR REQUIREMENT				
Microfarads	26.0			
Volts (min.)	330			
Fault Current Withstand (amps)				
60 Hz TEST PROCEDURES (Refer to Philips Lighting Electronics N.A. TEST Procedure for HID Ballasts - Form 127				
High Potential Test (Volts)				
1 minute	2000			
2 seconds	2500			
Open Circuit Voltage Test (Volts)	235-290			
Short-Circuit Current Test (Amps)	3.60-4.40			
Secondary Current				
Input Current.....	2.40-3.60	1.40-2.10	1.20-1.80	1.05-1.55

Capacitor: 7C260P33-R



Capacitance: 26  
Dia/Oval Dim: 1.75  
Height: 5.15  
Temp Rating: 105°C



Ignitor: LI533-H4



Ballast to Lamp Distance (BTL) = 2 feet  
Temp Rating: 105°C

**Typical Ordering Information**  
(please call Philips Lighting Electronics N.A. for suffix availability)

Order Suffix	Description

Data is based upon tests performed by Philips Lighting Electronics N.A. 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.

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Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

Revised: 03/06/09

**Fixture Tag** – B20

**Lamp Quantity/Type** – (1) 250W MH (ED28)

**Ballast Type** – MAGNETIC, PS



**PHILIPS  
ADVANCE**

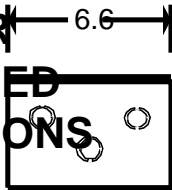
**B20**

**Metal  
Halide  
Lamp Ballast**

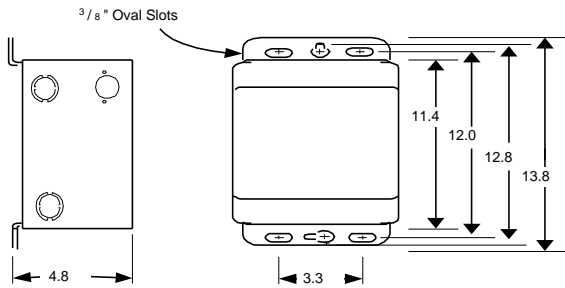
**Catalog Number 78E5752EE  
For 250W M138/M153 (P.S.)  
60 Hz SUPER-CWA  
Status: Active**

**DIMENSIONS AND DATA**

**78E  
INDOOR  
ENCLOSED  
DIMENSIONS**



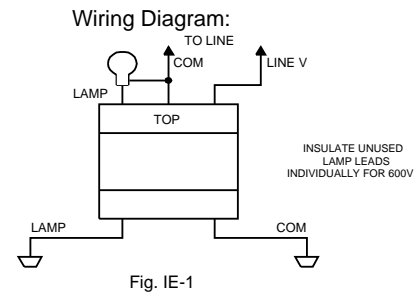
Top view  
3 double  
7/8" and 1/8"  
knockouts



INPUT VOLTS	120	208	240	277	480
CIRCUIT TYPE	SUPER-CWA				
POWER FACTOR (min)	90%				
REGULATION					
Line Volts	±10%				
Lamp Watts	±10%				
LINE CURRENT (Amps)					
Operating.....	2.37	1.39	1.18	1.03	0.60
Open Circuit.....	1.38	0.82	0.70	0.62	0.37
Starting.....	1.65	0.97	0.84	0.73	0.43
UL TEMPERATURE RATINGS					
Insulation Class	H(180°C)				
Coil Temperature Code	1029				
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C				
NOM. OPEN CIRCUIT VOLTAGE	280				
INPUT VOLTAGE AT LAMP DROPOUT.....	60	104	120	138	240
INPUT WATTS	284				
RECOMMENDED FUSE (Amps).....	8	5	5	3	2
CORE and COIL					
Dimension (A)					
Dimension (B)	23				
Weight (lbs.)	12"				
Lead Lengths					
CAPACITOR REQUIREMENT					
Microfarads					
Volts (min.)					
Fault Current Withstand (amps)					
60 Hz TEST PROCEDURES (Refer to Philips Lighting Electronics N.A. TEST Procedure for HID Ballasts - Form 127					
High Potential Test (Volts)					
1 minute	2000				
2 seconds	2500				
Open Circuit Voltage Test (Volts)	254-308				
Short-Circuit Current Test (Amps)	2.35-2.88				
Secondary Current					
Input Current.....	1.28-	0.75-	0.64-	0.56-	0.32-
	1.92	1.12	0.97	0.84	0.49

Capacitor:

The capacitor is included as part of the potted assembly.



Ignitor: IN CAN

The ignitor is included as part of the potted assembly.

Ballast to Lamp Distance (BTL) = 50 feet  
Temp Rating: 90°C

**Typical Ordering Information**

(please call Philips Lighting Electronics N.A. for suffix availability)

Order Suffix	Description
001EE	88% EFFICIENCY - COMPLIANT

Data is based upon tests performed by Philips Lighting Electronics N.A. 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.

**PHILIPS LIGHTING ELECTRONICS N.A.**

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Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

Revised: 09/24/09

**Fixture Tag** – B20R

**Lamp Quantity/Type** – (1) 250W MH (ED28)

**Ballast Type** – MAGNETIC, PS

**PHILIPS  
ADVANCE**

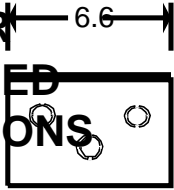
**B20R**

**Metal  
Halide  
Lamp Ballast**

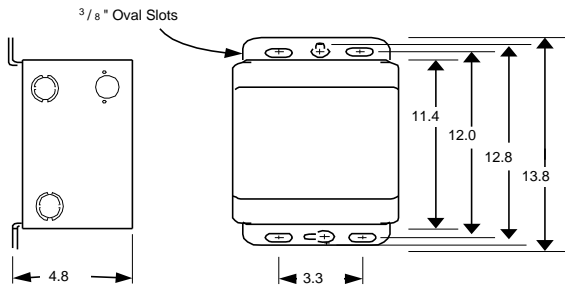
**Catalog Number 78E5752EE  
For 250W M138/M153 (P.S.)  
60 Hz SUPER-CWA  
Status: Active**

**DIMENSIONS AND DATA**

**78E  
INDOOR  
ENCLOSED  
DIMENSIONS**



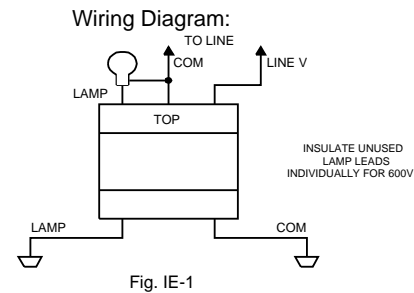
Top view  
3 double  
7/8" and 1/8"  
knockouts



INPUT VOLTS	120	208	240	277	480
CIRCUIT TYPE	SUPER-CWA				
POWER FACTOR (min)	90%				
REGULATION					
Line Volts	±10%				
Lamp Watts	±10%				
LINE CURRENT (Amps)					
Operating.....	2.37	1.39	1.18	1.03	0.60
Open Circuit.....	1.38	0.82	0.70	0.62	0.37
Starting.....	1.65	0.97	0.84	0.73	0.43
UL TEMPERATURE RATINGS					
Insulation Class	H(180°C)				
Coil Temperature Code	1029				
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C				
NOM. OPEN CIRCUIT VOLTAGE	280				
INPUT VOLTAGE AT LAMP DROPOUT.....	60	104	120	138	240
INPUT WATTS	284				
RECOMMENDED FUSE (Amps).....	8	5	5	3	2
CORE and COIL					
Dimension (A)					
Dimension (B)	23				
Weight (lbs.)	12"				
Lead Lengths					
CAPACITOR REQUIREMENT					
Microfarads					
Volts (min.)					
Fault Current Withstand (amps)					
60 Hz TEST PROCEDURES (Refer to Philips Lighting Electronics N.A. TEST Procedure for HID Ballasts - Form 127					
High Potential Test (Volts)					
1 minute	2000				
2 seconds	2500				
Open Circuit Voltage Test (Volts)	254-308				
Short-Circuit Current Test (Amps)	2.35-2.88				
Secondary Current					
Input Current.....	1.28-	0.75-	0.64-	0.56-	0.32-
	1.92	1.12	0.97	0.84	0.49

Capacitor:

The capacitor is included as part of the potted assembly.



Ignitor: IN CAN

The ignitor is included as part of the potted assembly.

Ballast to Lamp Distance (BTL) = 50 feet  
Temp Rating: 90°C

**Typical Ordering Information**

(please call Philips Lighting Electronics N.A. for suffix availability)

Order Suffix	Description
001EE	88% EFFICIENCY - COMPLIANT

Data is based upon tests performed by Philips Lighting Electronics N.A. 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.

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Customer Support/Technical Service: 800-372-3331 · OEM Support: 866-915-5886

Revised: 09/24/09

**Fixture Tag** – D1A

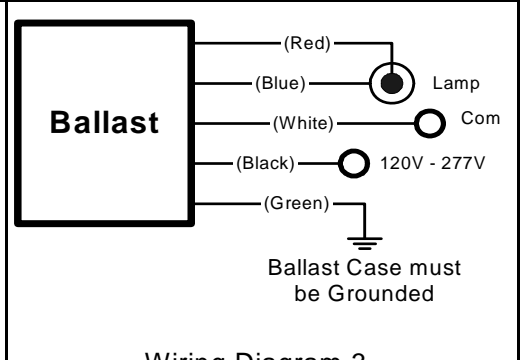
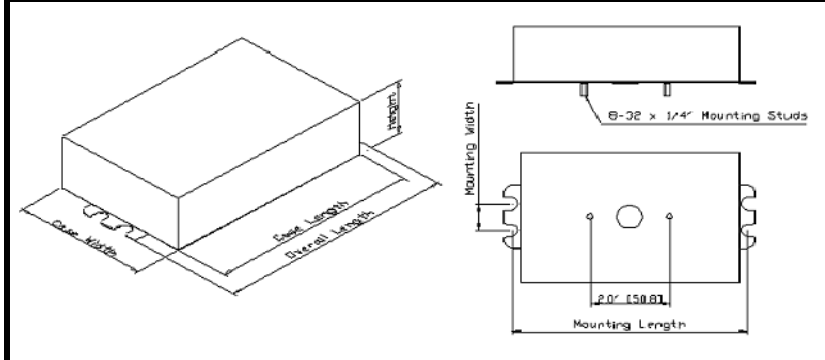
**Lamp Quantity/Type** – (1) 100W MH (ED17)

**Ballast Type** – ELECTRONIC, PS

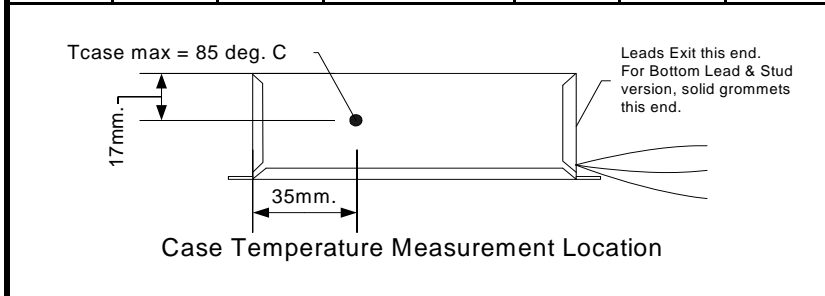
	<b>e-Vision® Electronic Ballast for Metal Halide Lamps</b>	Catalog Number: IMH-100-D For 100W Metal Halide Lamps ANSI M90 or M140 120-277 50/60Hz Electronic Status: RELEASED
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DIMENSIONS AND DATA											
Lamp		Input Volts	Catalog Number*	Line Current (Amps)	Input Power (Watts)	Min Power Factor	Wiring Diag	Fig.	Weight (lb)	Max. Distance to Lamp (ft)	
Number	Watts										

100W Watt Lamp, ANSI Code M90 or M140 Minimum Starting Temp -30°C/-20°F											
1	100	120 277	IMH-100-D-XXX	0.92 0.4	110 109	0.9	3	D	1.6	5	



Case Figure	Overall Length	Case Length	Case Width	Height	Mountin Length	Mounting Width
D	128mm [5.0"]	108mm [4.3"]	77mm [3.0"]	38mm [1.5"]	118mm [4.6"]	19mm [0.7"]



- INSTALLATION & APPLICATION NOTES:**
- Maximum allowable case temperature is 85°C. See figure above for measurement location
  - Ignition pulse is 4 kV max
  - All leads are 12 inches long
  - Ballast output will shutdown after 20 minutes if lamp fails to ignite
  - Power must be cycled off – then on, after replacing lamp

*Ordering Information	
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.

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**Fixture Tag** – D2A

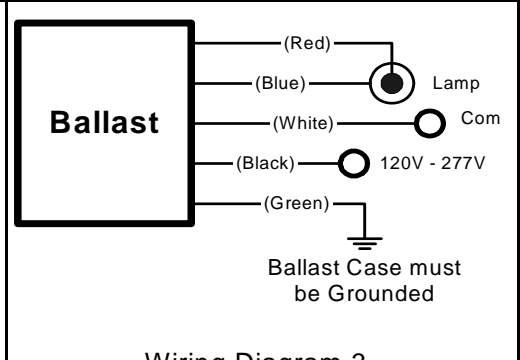
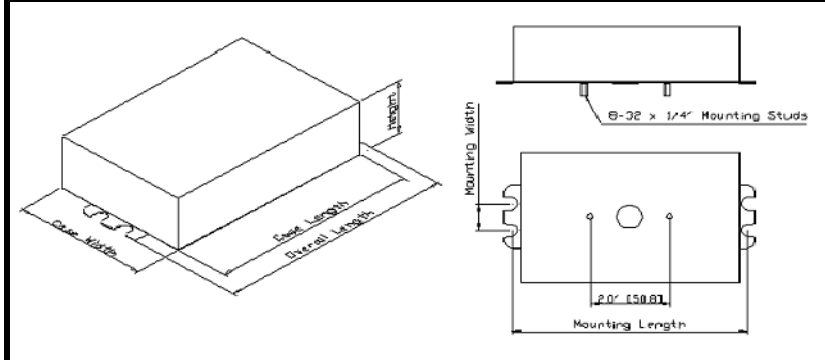
**Lamp Quantity/Type** – (1) 100W MH

**Ballast Type** – ELECTRONIC, PS

	<b>e-Vision® Electronic Ballast for Metal Halide Lamps</b>	Catalog Number: IMH-100-D For 100W Metal Halide Lamps ANSI M90 or M140 120-277 50/60Hz Electronic Status: RELEASED
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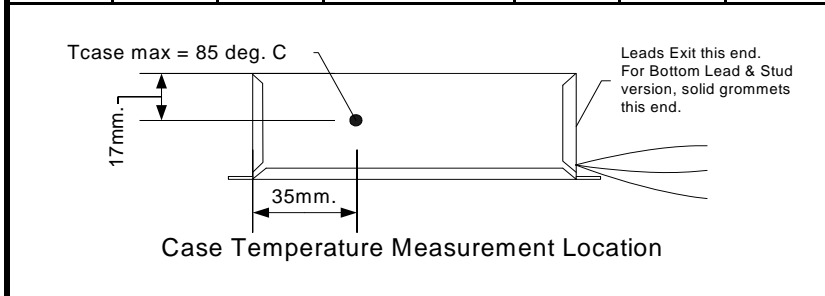
DIMENSIONS AND DATA											
Lamp		Input Volts	Catalog Number*	Line Current (Amps)	Input Power (Watts)	Min Power Factor	Wiring Diag	Fig.	Weight (lb)	Max. Distance to Lamp (ft)	
Number	Watts										

100W Watt Lamp, ANSI Code M90 or M140 Minimum Starting Temp -30°C/-20°F											
1	100	120 277	IMH-100-D-XXX	0.92 0.4	110 109	0.9	3	D	1.6	5	



Case Figure	Overall Length	Case Length	Case Width	Height	Mountin Length	Mounting Width
D	128mm [5.0"]	108mm [4.3"]	77mm [3.0"]	38mm [1.5"]	118mm [4.6"]	19mm [0.7"]

Wiring Diagram 3



- INSTALLATION & APPLICATION NOTES:**
1. Maximum allowable case temperature is 85°C. See figure above for measurement location
  2. Ignition pulse is 4 kV max
  3. All leads are 12 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

*Ordering Information	
Order Suffix	Description
-LF	Ballast with side exit leads and mounting feet
-BLS	Ballast with bottom exit leads and mounting studs

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**Fixture Tag** – D5

**Lamp Quantity/Type** – (1) 250W MH (ED28)

**Ballast Type** – MAGNETIC, PS



**PHILIPS  
ADVANCE**

**D5**

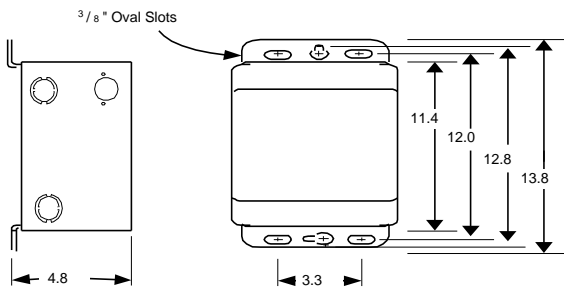
**Metal  
Halide  
Lamp Ballast**

**Catalog Number 78E5752EE  
For 250W M138/M153 (P.S.)  
60 Hz SUPER-CWA  
Status: Active**

**DIMENSIONS AND DATA**



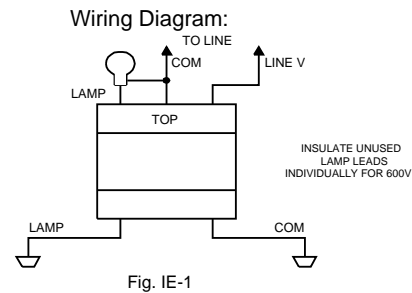
Top view  
3 double  
7.8" and 1.1"  
knockouts



	120	208	240	277	480
INPUT VOLTS					
CIRCUIT TYPE	SUPER-CWA				
POWER FACTOR (min)	90%				
REGULATION					
Line Volts	±10%				
Lamp Watts	±10%				
LINE CURRENT (Amps)					
Operating.....	2.37	1.39	1.18	1.03	0.60
Open Circuit.....	1.38	0.82	0.70	0.62	0.37
Starting.....	1.65	0.97	0.84	0.73	0.43
UL TEMPERATURE RATINGS					
Insulation Class	H(180°C)				
Coil Temperature Code	1029				
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C				
NOM. OPEN CIRCUIT VOLTAGE	280				
INPUT VOLTAGE AT LAMP DROPOUT.....	60	104	120	138	240
INPUT WATTS	284				
RECOMMENDED FUSE (Amps).....	8	5	5	3	2
CORE and COIL					
Dimension (A)					
Dimension (B)	23				
Weight (lbs.)	12"				
Lead Lengths					
CAPACITOR REQUIREMENT					
Microfarads					
Volts (min.)					
Fault Current Withstand (amps)					
60 Hz TEST PROCEDURES (Refer to Philips Lighting Electronics N.A. TEST Procedure for HID Ballasts - Form 127					
High Potential Test (Volts)					
1 minute	2000				
2 seconds	2500				
Open Circuit Voltage Test (Volts)	254-308				
Short-Circuit Current Test (Amps)	2.35-2.88				
Secondary Current					
Input Current.....	1.28-1.92	0.75-1.12	0.64-0.97	0.56-0.84	0.32-0.49

Capacitor:

The capacitor is included as part of the potted assembly.



Ignitor: IN CAN

The ignitor is included as part of the potted assembly.

Ballast to Lamp Distance (BTL) = 50 feet  
Temp Rating: 90°C

**Typical Ordering Information**

(please call Philips Lighting Electronics N.A. for suffix availability)

Order Suffix	Description
001EE	88% EFFICIENCY - COMPLIANT

Data is based upon tests performed by Philips Lighting Electronics N.A. 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.

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Revised: 09/24/09

**Fixture Tag** – D6

**Lamp Quantity/Type** – (1) 350W MH (ED28)

**Ballast Type** – MAGNETIC, PS

**PHILIPS  
ADVANCE**

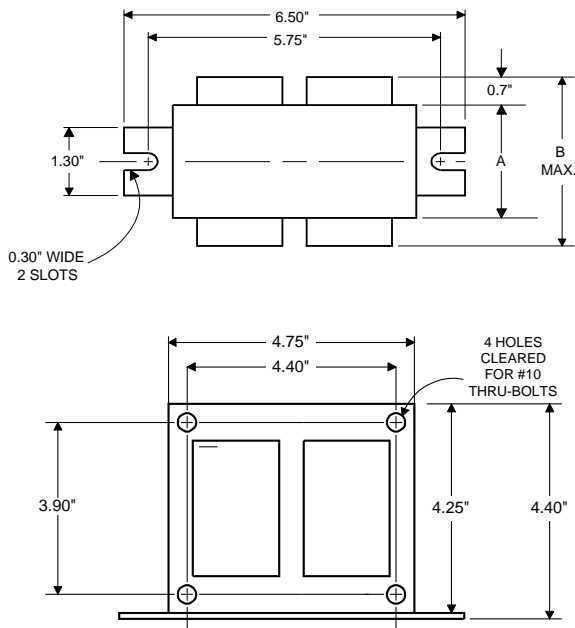
**D6**

**Metal  
Halide  
Lamp Ballast**

**Catalog Number 71A5953AEE  
For 350W M131/M171 (P.S.)  
60 Hz SUPER-CWA  
Status: Active**

**DIMENSIONS AND DATA**

4 1/4 X 4 3/4 CORE - 2 COIL UNIT



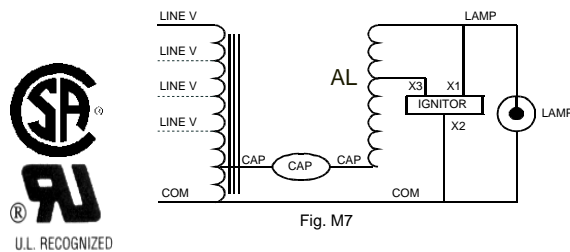
	120	208	240	277	480
INPUT VOLTS					
CIRCUIT TYPE	SUPER-CWA				
POWER FACTOR (min)	90%				
REGULATION					
Line Volts	±10%				
Lamp Watts	±10%				
LINE CURRENT (Amps)					
Operating.....	3.40	2.00	1.70	1.50	0.85
Open Circuit.....	2.00	1.30	1.00	0.90	0.50
Starting.....	2.40	1.40	1.25	1.01	0.65
UL TEMPERATURE RATINGS					
Insulation Class	H(180°C)				
Coil Temperature Code	1029				
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C				
NOM. OPEN CIRCUIT VOLTAGE	290				
INPUT VOLTAGE AT LAMP DROPOUT.....	60	104	120	139	240
INPUT WATTS	397				
RECOMMENDED FUSE (Amps).....	10	7	5	5	3
CORE and COIL					
Dimension (A)	2.20				
Dimension (B)	4.10				
Weight (lbs.)	11.2				
Lead Lengths	12"				
CAPACITOR REQUIREMENT					
Microfarads	22.5				
Volts (min.)	345				
Fault Current Withstand (amps)					
60 Hz TEST PROCEDURES (Refer to Philips Lighting Electronics N.A. TEST Procedure for HID Ballasts - Form 127 High Potential Test (Volts)					
1 minute	2000				
2 seconds	2500				
Open Circuit Voltage Test (Volts)	270-315				
Short-Circuit Current Test (Amps)					
Secondary Current	3.15-3.85				
Input Current.....	1.90-2.90	1.10-1.70	1.00-1.50	0.85-1.35	0.50-0.80

Capacitor: 7C225P40



Capacitance: 22.5  
Dia/Oval Dim: 1.75  
Height: 5.12  
Temp Rating: 105°C

Wiring Diagram:



**Typical Ordering Information**

(please call Philips Lighting Electronics N.A. for suffix availability)

Order Suffix	Description
EE	EISA COMPLIANT - 88% EFFICIENT BALLAST

Ignitor: LI533-H4



Ballast to Lamp Distance (BTL) = 2 feet  
Temp Rating: 105°C

Data is based upon tests performed by Philips Lighting Electronics N.A. 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.

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Revised: 10/26/09

**Fixture Tag** – D7

**Lamp Quantity/Type** – (1) 400W MH (ED28)

**Ballast Type** – MAGNETIC, PS

**PHILIPS  
ADVANCE**

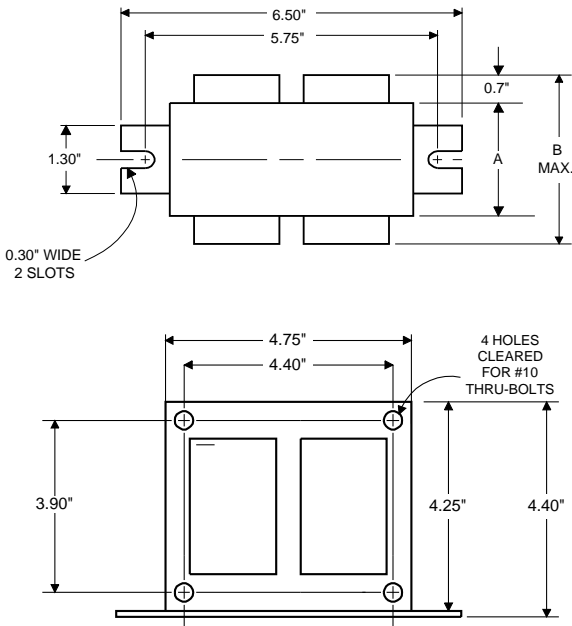
**D7**

**Metal  
Halide  
Lamp Ballast**

**Catalog Number 71A6042TAE**  
**For 400W M135/M155 (P.S.)**  
**60 Hz SUPER-CWA**  
**Status: Active**

**DIMENSIONS AND DATA**

4 1/4 X 4 3/4 CORE - 2 COIL UNIT



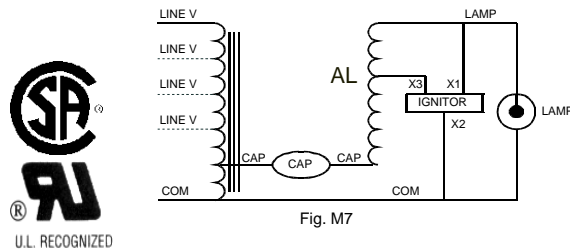
INPUT VOLTS	480				
CIRCUIT TYPE	SUPER-CWA				
POWER FACTOR (min)	90%				
REGULATION					
Line Volts	±10%				
Lamp Watts	±10%				
LINE CURRENT (Amps)					
Operating.....	1.00				
Open Circuit.....	0.70				
Starting.....	0.75				
UL TEMPERATURE RATINGS					
Insulation Class	H(180°C)				
Coil Temperature Code	1029	D			
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C				
NOM. OPEN CIRCUIT VOLTAGE	270				
INPUT VOLTAGE AT LAMP DROPOUT.....	240				
INPUT WATTS	452				
RECOMMENDED FUSE (Amps).....	3				
CORE and COIL					
Dimension (A)	2.10				
Dimension (B)	3.90				
Weight (lbs.)	12				
Lead Lengths	12"				
CAPACITOR REQUIREMENT					
Microfarads	26.0				
Volts (min.)	330				
Fault Current Withstand (amps)					
60 Hz TEST PROCEDURES (Refer to Philips Lighting Electronics N.A. TEST Procedure for HID Ballasts - Form 127 High Potential Test (Volts)					
1 minute	2000				
2 seconds	2500				
Open Circuit Voltage Test (Volts)	240-300				
Short-Circuit Current Test (Amps)					
Secondary Current	3.60-4.40				
Input Current.....	0.50-0.80	-	-	-	-

Capacitor: 7C260P33-R



Capacitance: 26  
Dia/Oval Dim: 1.75  
Height: 5.15  
Temp Rating: 105°C

Wiring Diagram:



**Typical Ordering Information**

(please call Philips Lighting Electronics N.A. for suffix availability)

Order Suffix	Description
EE	EISA COMPLIANT - 88% EFFICIENT BALLAST

Ignitor: LI533-H4



Ballast to Lamp Distance (BTL) = 2 feet  
Temp Rating: 105°C

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Revised: 10/26/09

**Fixture Tag** – D10

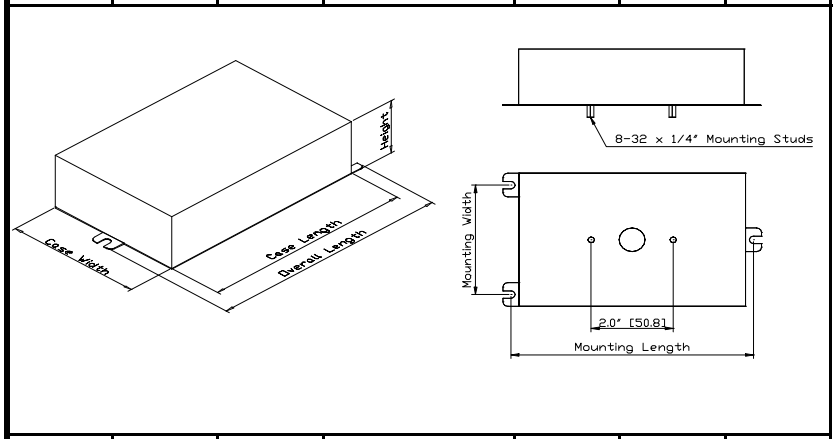
**Lamp Quantity/Type** – 175W MH (ED17)

**Ballast Type** – ELECTRONIC, PS

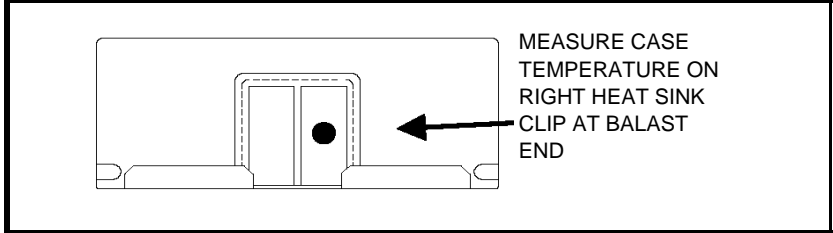
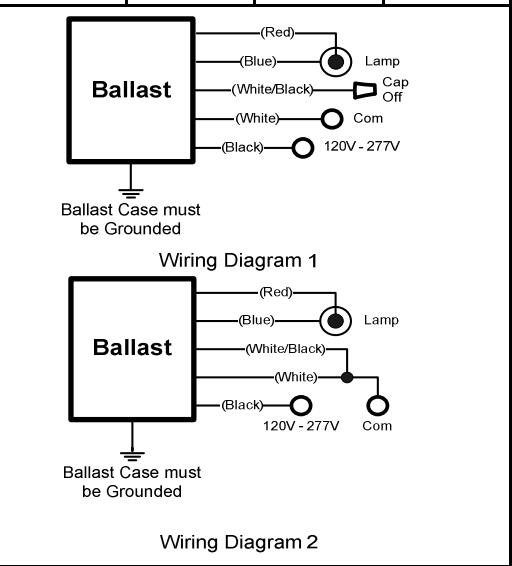
	<b>e-Vision® Electronic Ballast for Metal Halide Lamps</b>	Catalog Number: IMH-175-C For 150W or 175W Metal Halide Lamps ANSI M102, M142, S56, M137 or M152 120-277V 50/60Hz Electronic Status: RELEASED
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**DIMENSIONS AND DATA**

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	Mounting Length	Mounting Width
C	204mm [8.0"]	184mm [7.2"]	92mm [3.6"]	38mm [1.5"]	195mm [7.7"]	73mm [2.9"]





EISA Compliant

- INSTALLATION & APPLICATION NOTES:**
- Maximum allowable case temperature is 85°C. See figure above for measurement location
  - Ignition pulse is 4 kV max
  - All leads are 12 inches long
  - Ballast output will shutdown after 20 minutes if lamp fails to ignite
  - Power must be cycled off – then on, after replacing lamp

*Ordering Information	
Order Suffix	Description
-LF	Ballast with side exit leads and mounting feet
-BLS	Ballast with bottom exit leads and mounting studs

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**Fixture Tag** – D10A

**Lamp Quantity/Type** – 175W MH (ED17)

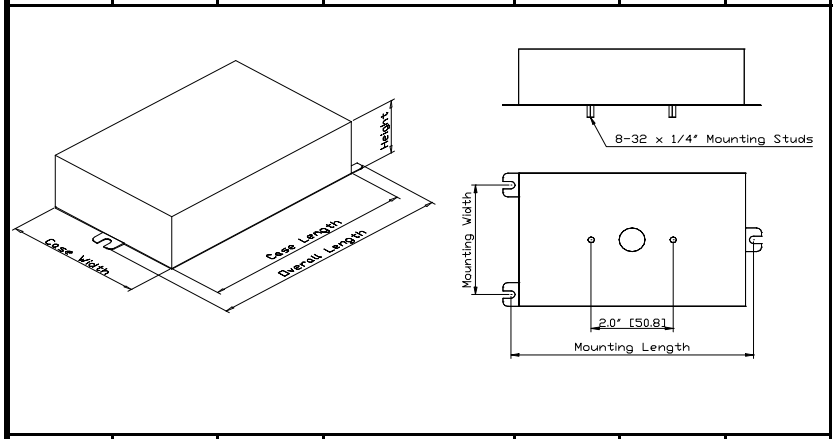
**Ballast Type** – ELECTRONIC, PS



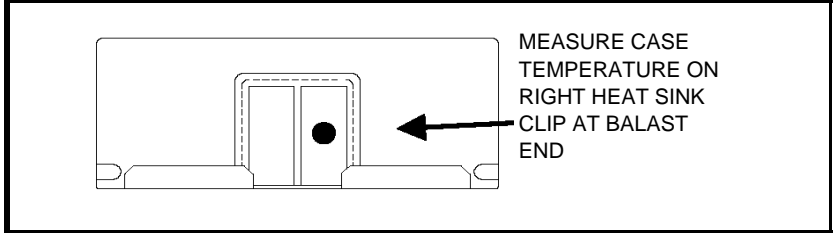
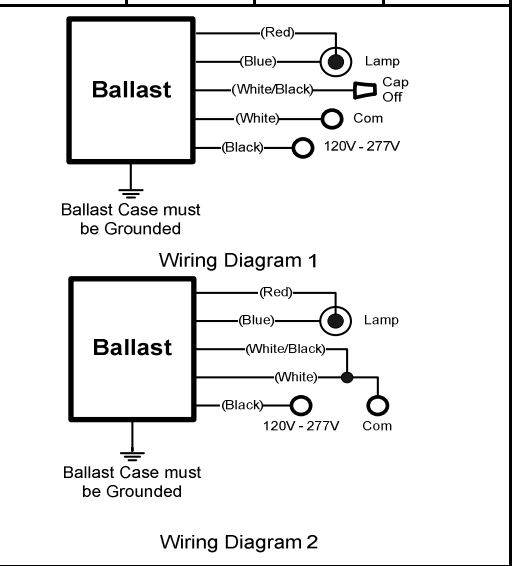
	<b>e-Vision® Electronic Ballast for Metal Halide Lamps</b>	Catalog Number: IMH-175-C For 150W or 175W Metal Halide Lamps ANSI M102, M142, S56, M137 or M152 120-277V 50/60Hz Electronic Status: RELEASED
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**DIMENSIONS AND DATA**

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"]





EISA Compliant

- INSTALLATION & APPLICATION NOTES:**
- Maximum allowable case temperature is 85°C. See figure above for measurement location
  - Ignition pulse is 4 kV max
  - All leads are 12 inches long
  - Ballast output will shutdown after 20 minutes if lamp fails to ignite
  - 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

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**Fixture Tag** – D12

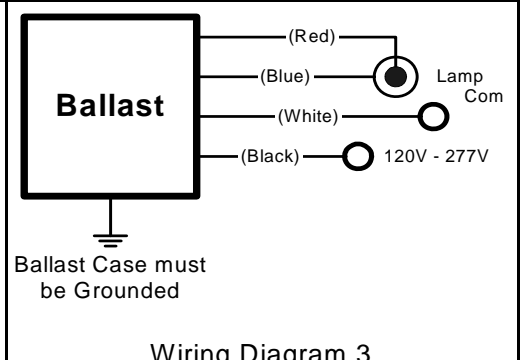
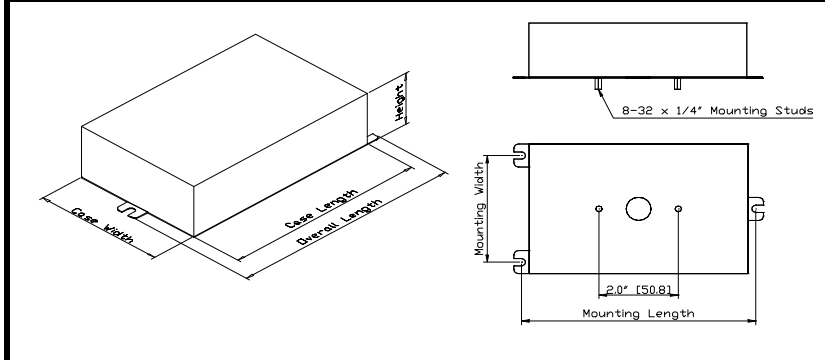
**Lamp Quantity/Type** – 150W MH (T6)

**Ballast Type** – ELECTRONIC, PS

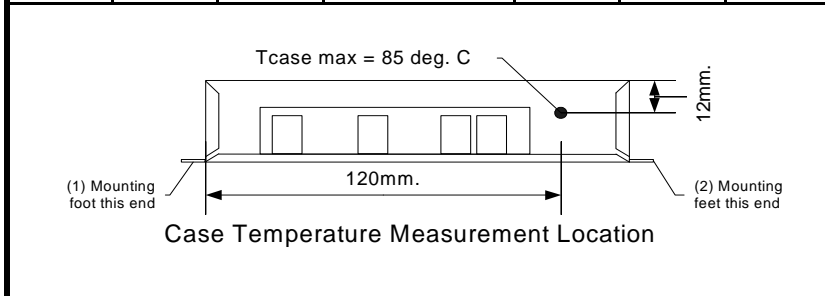
	<b>e-Vision® Electronic Ballast for Metal Halide Lamps</b>	Catalog Number: IMH-150-H For 150W Metal Halide Lamps ANSI M102 or M142 120-277V 50/60Hz Electronic Status: RELEASED
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**DIMENSIONS AND DATA**

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	Mounting Length	Mounting Width
H	161mm [6.3"]	144mm [5.7"]	92mm [3.6"]	38mm [1.5"]	152mm [6.0"]	73mm [2.9"]





EISA Compliant

- INSTALLATION & APPLICATION NOTES:**
- Maximum allowable case temperature is 85°C. See figure above for measurement location
  - Ignition pulse is 4 kV max
  - All leads are 12 inches long
  - Ballast output will shutdown after 20 minutes if lamp fails to ignite
  - Power must be cycled off – then on, after replacing lamp
  - Connect the red lead to the center terminal of the lamp when using screw base lamps

*Ordering Information	
Order Suffix	Description
-LF	Ballast with side exit leads and mounting feet
-BLS	Ballast with bottom exit leads and mounting studs

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**Fixture Tag** – D14

**Lamp Quantity/Type** – 35W MH (T4)

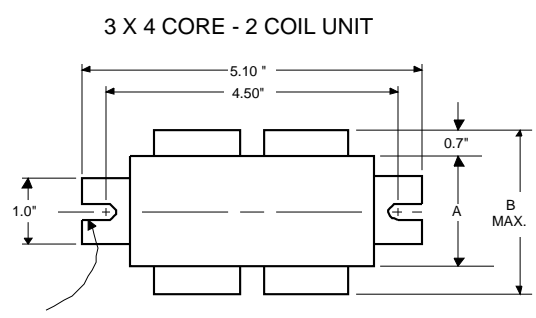
**Ballast Type** – ELECTRONIC, PS



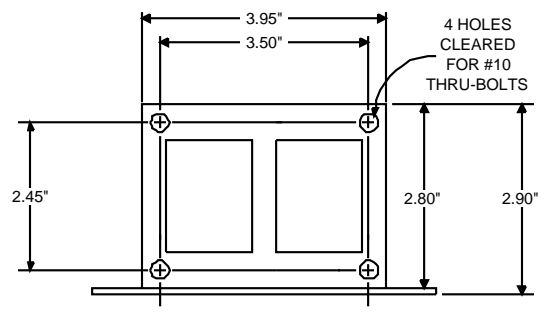
**Metal Halide Lamp Ballast**

**Catalog Number 71A5081**  
**For 35/39W M130**  
**60 Hz HX-HPF**  
**Status: Active**

**DIMENSIONS AND DATA**

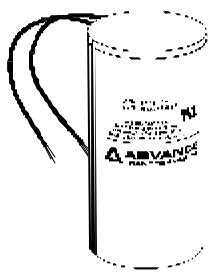


0.25" WIDE  
2 SLOTS



INPUT VOLTS	120	277			
CIRCUIT TYPE	HX-HPF				
POWER FACTOR (min)	90%				
REGULATION					
Line Volts	±5%				
Lamp Watts	±10%				
LINE CURRENT (Amps)					
Operating.....	0.45	0.20			
Open Circuit.....	0.90	0.40			
Starting.....	0.50	0.22			
UL TEMPERATURE RATINGS					
Insulation Class	H(180°C)				
Coil Temperature Code	1029				
	B	A			
MIN. AMBIENT STARTING TEMP.	-20°F or -30°C				
NOM. OPEN CIRCUIT VOLTAGE	230				
INPUT VOLTAGE AT LAMP DROPOUT.....	85	195			
INPUT WATTS	56				
RECOMMENDED FUSE (Amps).....	3	1			
CORE and COIL					
Dimension (A)	0.80				
Dimension (B)	2.10				
Weight (lbs.)	3.5				
Lead Lengths	12"				
CAPACITOR REQUIREMENT					
Microfarads	5.0				
Volts (min.)	277				
Fault Current Withstand (amps)					
60 Hz TEST PROCEDURES (Refer to Advance Test Procedure for HID Ballasts - Form 1270)					
High Potential Test (Volts)					
1 minute	2000				
2 seconds	2500				
Open Circuit Voltage Test (Volts)	205-255				
Short-Circuit Current Test (Amps)					
Secondary Current	0.60-0.75				
Input Current.....	0.35	0.15	-	-	-
	0.55	0.25			

Capacitor: 7C050L33

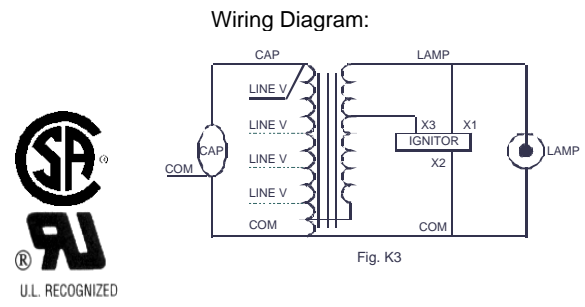


Capacitance: 5  
 Dia/Oval Dim: 1.25  
 Height: 2.9  
 Temp Rating: 105°C

Ignitor: LI533-H4



Ballast to Lamp Distance (BTL) = 15 feet  
 Temp Rating: 105°C



**Typical Ordering Information**  
 (please call Advance for suffix availability)

Order Suffix	Description
500D.	Ballast With Ignitor and Dry Film Capacitor
510D.	Ballast w/Welded Bracket, Ignitor, & Dry Film Capacitor
600.	Ballast and Ignitor, No Capacitor
610.	Ballast with Welded Bracket and Ignitor, No Capacitor

Data is based upon tests performed by Advance Transformer in a controlled environment and representative of relative performance. Actual performance can vary depending on operating conditions. Specifications are subject to change without notice.

**ADVANCE**

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