

## LIGHTING, POWER & SIGNAL SYMBOLS

	2'X 4' LTG FIXTURE CIRCUIT DESIGNATION "1" SWITCH DESIGNATION (LOWER CASE) "a" LIGHTING FIXTURE TYPE (UPPER CASE) "A"
	2' X 2' FLUORESCENT LIGHTING FIXTURE TYPE.
	LIGHT FIXTURE ON GENERATOR BACK-UP LIFE SAFETY CIRCUIT
	1' X 4' LIGHTING FIXTURE TYPE.
	STRIP LIGHTING FIXTURE TYPE.
	RECESSED OR SURFACE MOUNTED LIGHT FIXTURE TYPE.
	CEILING MOUNTED VACANCY SENSOR W/ LOW VOLTAGE OVERRIDE
	CEILING MOUNTED OCCUPANCY SENSOR
	PHOTO CELL CONTROL
	DAYLIGHT SENSOR
	EXIT LIGHT - CONFIRM CHEVRON WITH ARCHITECTURAL LIFE SAFETY DRAWING
	LIGHT TRACK W/FIXTURES TYPE AND LENGTH AS INDICATED ON DWGS
	S <sub>a</sub> S <sub>b</sub> SINGLE POLE SWITCH 20A-125V MTD 48" AFF LOWER CASE LETTERS INDICATE FIXTURE TO BE CONTROLLED (GANGED SWITCHES)
	S <sub>3</sub> SINGLE POLE SWITCH (SUBSCRIPT INDICATES TYPE OF SWITCH) 3 - THREE WAY SWITCH 4 - FOUR WAY SWITCH DMC - LOW VOLTAGE DIMMER SWITCH FOR LIGHTING CONTROLS SYSTEM VC - VACANCY SENSOR SWITCH L - LOW VOLTAGE SWITCH M - MANUAL SW (MOTOR RATED) WITH LOCKOUT DEVICE AND OVERLOADS TC - TIME CONTROL SWITCH OR - OVERRIDE SWITCH
	CONDUIT RUN EXPOSED
	CONDUIT RUN EMBEDDED IN BUILDING CONSTRUCTION OR CONCEALED BY FINISH
	LOW VOLTAGE
	HOME RUN TO PANEL ARROWS AND NUMBERS INDICATE CIRCUITS
	CONDUIT TURNED OR STUBBED UP
	CONDUIT TURNED OR STUBBED DOWN
	120/208V 3- 4W PANEL
	TIME CLOCK
	CONTACTOR

## MOUNTING HEIGHT SCHEDULE

9" BELOW FINISHED CLG OR AS SHOWN ON INTERIOR ELEVATIONS, "IF" SERIES	WALL-MOUNTED CLOCKS, PROGRAM BELLS, (OR AS SHOWN ON ARCHITECTURAL DETAILS)
6" ABOVE FIRE HOUSE CABINET	BLUE SIGNAL LIGHT
10'-0"	BATTERY LIGHTING UNITS AND REMOTE WALL MOUNTED LIGHTHEADS (OR 1'-0" BELOW FINISHED CEILING OF TOP OF UNIT)
8'-6"	*PENDANT-HUNG INDUSTRIAL AND STRIP LIGHTING FIXTURES
CENTERED ABOVE DOOR OR WINDOW OPENING	WARNING OR SIGNALING FIXTURES/SIGNS
6'-8" -TO BOTTOM OF DEVICE	**VISUAL FIRE ALARM **AUDIO/VISUAL FIRE ALARM
6'-6"	TOP OF LTG OR POWER PNL BOARDS TOP OF TEL CABINET/BACKBOARD
6'-3"	TOP OF BACK-MTD EXIT FIXTS(NOT ABOVE DOOR)
6'-0" MAX.	TOP OF SAFETY DISC SW TOP OF CONTACTORS TOP OF MAGNETIC STARTERS
4'-6"	FIRE FIGHTER PHONE JACK TOP OF INTERCOM STATION
4'-0"	TOP OF MANUAL MOTOR STARTERS TOP OF FIRE ALARM PULL STA TOP OF LIGHT SWITCHES
2'-0"	ELECTRICAL RECEPTACLES W/IN MECHANICAL SPACES, ELECTRICAL AND ELEVATOR
1'-6"	*RECEPTACLES, TEL, OUTLETS (DESK) INTERCOM OUTLET FOR DESKS, TELEVISION OUTLETS, UNO COMPUTER OUTLETS W/ JUNCTION BOXES
0'-0"	FINISHED FLOOR

\* EXCEPT AS NOTED ON DRAWINGS OR IN SPECIFICATIONS  
\*\* IF CEILING HEIGHT IS BELOW 6'-8", MOUNT DEVICE 6" BELOW CEILING.

## LIGHTING, POWER & SIGNAL SYMBOLS

	WALL MOUNTED JUNCTION BOXES FOR POWER (P) & TELECOM (C) SERVICE TO SYSTEMS FURNITURE; PROVIDE CIRCUITRY AS INDICATED AT POWER JUNCTION BOX AND CONNECT TO SYSTEMS FURNITURE WHIP. TELECOM PROVISIONS SHALL INCLUDE 4-11/16" SQ X 2-1/8" D BOX WITH 2-GANG COVER AND 1-1/4" EMPTY CONDUIT STUBBED TO ABOVE ACCESSIBLE CEILING WITH BUSHING, U.O.N.
	PHOTO CELL CONTROL
	DUPLEX RECEPTACLE OUTLET
	QUADRUPLEX RECEPTACLE OUTLET
	DUPLEX RECEPTACLE OUTLET - FLOOR MOUNTED
	QUADRUPLEX RECEPTACLE OUTLET - FLOOR MOUNTED
	DUPLEX RECEPTACLE OUTLET WITH GROUND FAULT INTERRUPTER
	SPECIALTY RECEPTACLE OUTLET - NUMBERS DENOTE VOLTAGE AND AMPERE RATING.
	SPECIFIC MOUNTING HEIGHTS, REFER TO ARCH ELEVATIONS
	SURFACE MOUNTED RACEWAY WITH DEVICES AS SHOWN, REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING AND SPECIFICATION.
	MOTOR RATING IS INDICATED ON DRAWING ALL NECESSARY DISC SHALL BE INCLUDED AS NEEDED
	DISCONNECT SWITCH RATING AND TYPE AS REQUIRED BY NEC
	FUSED DISCONNECT SWITCH
	COMBINATION STARTER/DISCONNECT SWITCH
	MAGNETIC MOTOR STARTER
	JUNCTION BOX
	INDICATES MOUNTING HEIGHT OTHER THAN STANDARD DEVICE REFER TO ARCHITECTS DWGS
	EQUIPMENT LABEL IDENTIFICATION NUMBER
	GROUND ROD - 3/4" COPPER ROD 10'-0" LONG
	TELEDATA - DOUBLE GANG JUNCTION BOX, W/ PULL STRING SINGLE GANG PLASTER RING AND 1-1/4" RACEWAY, PROVIDE QUANTITY OF CAT 5 CABLES FROM DATA CLOSET.
	INDICATES FLOOR INDICATES CEILING (SPECIAL FUNCTION) C - CEILING MOUNTED FOR CAMERA WAP - FOR WIRELESS ACCESS POINT
	TELEPHONE - DOUBLE GANG JUNCTION BOX, W/ PULL STRING SINGLE GANG PLASTER RING AND 3/4" RACEWAY (TELEPHONE) (1) CAT 6E CABLES INSTALLED BY OTHERS).
	INDICATES FLOOR INDICATES CEILING (SPECIAL FUNCTION)
	WALL MOUNTED LOW VOLTAGE CLOCK AND SPEAKER COMBINATION
	DOUBLE GANG BOX FOR AV EQUIPMENT, COORDINATE EXACT REQUIREMENTS WITH AV INSTALLER
	FLUSH MTD FLOOR OUTLET WITH 20A-120V RECEPTACLES & DATA OUTLETS
	DUAL SERVICE, BLANK ALUMINUM POWER POLE FOR FURNITURE FEEDS, SIMILAR TO WIREMOLD AMTC-4 SERIES.

## SHEET NOTES ELECTRICAL:

- PROVIDE ALL DEVICES AND ACCESSORIES ETC. WHERE NOTED ON DRAWINGS OR AS DIRECTED BY ARCHITECT/TENANT.
- CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND CONDITIONS AT THE BUILDING SITE BEFORE INSTALLATION OF HIS WORK.
- PROVIDE A COMPLETE INSTALLATION INCLUDING DISCONNECT SWITCHES, PULLBOXES, EQUIPMENT AND WIRING AS INDICATED ON PLANS AND SPECIFICATIONS.
- ALL ELECTRICAL DEVICES INTENDED FOR OPERATION BY THE OCCUPANTS, INCLUDING THERMOSTATS SERVICING BASEBOARD HEATERS, SWITCHES (TO TOP OF SWITCH) SHALL BE ACCESSIBLE AND COMPLY WITH REACH RANGE REQUIREMENTS. THE HIGH FORWARD OR SIDE REACH SHALL BE 48-INCHES MAXIMUM ABOVE THE FLOOR. THE LOW FORWARD OR SIDE REACH SHALL BE 115 INCHES MINIMUM ABOVE FLOOR. ALL APPLICABLE CONTROLS AND EQUIPMENT MUST CONFORM TO THE IBC 1109.3.
- MATERIALS, WORKMANSHIP AND COMPLETE INSTALLATION SHALL CONFIRM TO THE 2011 NATIONAL ELECTRIC CODE, STATE, AND ALL APPLICABLE REGULATIONS. ALL EQUIPMENT SHALL BE U.L. LISTED FOR INTENDED APPLICATION.
- THE ELECTRICAL CONTRACTOR SHALL OBTAIN ANY NECESSARY PERMITS PRIOR TO BEGINNING WORK. AT THE COMPLETION OF THE JOB, THE ELECTRICAL CONTRACTOR SHALL FURNISH TO THE OWNER AN INSPECTION CERTIFICATE FROM A LICENSED INSPECTION AGENCY.
- TEST EQUIPMENT TO VERIFY THAT ITEMS ARE FREE FROM UNINTENDED GROUNDS, SHORT CIRCUITS, AND OPEN CIRCUITS AND THAT EQUIPMENT WILL OPERATE AS SPECIFIED. FURNISH LABOR AND MATERIAL FOR MAKING SUCH TESTS AND MAKE CORRECTIONS NECESSARY TO OBTAIN PROPER OPERATION.
- CONTRACTOR SHALL SUBMIT, TO THE OWNER FOR REVIEW, MANUFACTURERS CUT FOR ALL EQUIPMENT SPECIFIED. EQUIPMENT CUTS SHALL INDICATE MANUFACTURERS NAME AND MODEL NUMBER.
- ALL BRANCH CIRCUIT WIRING, JUNCTION BOXES, CONDUITS, PANELBOARDS, EQUIPMENT, DEVICES, ETC., SHALL BE GROUNDED IN ACCORDANCE WITH THE 2011 NATIONAL ELECTRIC CODE.
- ALL WIRING SHALL ADHERE STRICTLY TO THE 2011 NATIONAL ELECTRIC CODE.
- WIRING EXPOSED & SUBJECT TO DAMAGE SHALL BE EMT; ALL OTHER SHALL BE TYPE MC CABLE.
- ALL WIRING SHALL BE SOFT DRAWN COPPER OF 99.9% CONDUCTIVITY, 600 VOLT RATING, THHN/THWN.
- BUSHINGS SHALL BE PROVIDED FOR ALL TERMINATIONS AT PANELS, JUNCTION BOXES, WIRING TROUGHS, EQUIPMENT, ETC.
- ALL CONDUIT AND WIRE SHALL BE SUPPORTED DIRECTLY FROM THE STRUCTURE. CONDUIT AND WIRE SHALL NOT BE SUPPORTED FROM PIPING, DUCTWORK, ETC.
- PROVIDE EACH RACEWAY OR CABLE PASSING THROUGH A MASONRY OR CONCRETE WALL, FLOOR OR PARTITION WITH A SLEEVE MADE FROM STANDARD WEIGHT STEEL PIPE WITH SMOOTH EDGES, SECURELY AND NEATLY CEMENTED IN PLACE.
- WHERE SLEEVES OR CONDUIT PENETRATE FIRE RATED WALLS, FLOORS, PARTITIONS OR SLABS, FILL AND SEAL WITH FIRE SEALANT CREATING A FIRE STOP EQUAL TO OR EXCEEDING FIRE RATING OF CONSTRUCTION MATERIAL BEING PENETRATED. FIRE SEALANT SHALL PREVENT SPREAD OF FLAME, SMOKE, AIR AND WATER AND SHALL PASS A 3 HOUR TEST PER ASTM E814 AND UL 1479. FIRE SEALANT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
- PULL AND JUNCTION BOXES SHALL BE CODE GAUGE ZINC COATED SHEET STEEL CONFORMING TO THE 2011 NATIONAL ELECTRIC CODE AND AS REQUIRED TO FACILITATE INSTALLATION OF WIRES WITHOUT SHARP BENDS AND CROWDING CONDUCTORS AGAINST SIDES OR COVER. USE SCREW-ON AND/OR HINGED COVERS.
- SPlicing SHALL BE WITHIN OUTLET BOXES OR JUNCTION BOXES. NO SPlicing SHALL BE PERMITTED IN MAINS OR FEEDERS.
- WHEN OVERSIZED CONDUCTORS ARE INSTALLED, AND CONDUCTORS DO NOT FIT PROPERLY INTO THE DISTRIBUTION OF UTILIZATION EQUIPMENT PROVIDE JUNCTION BOX ADJACENT TO EQUIPMENT FOR TAP CHANGE OF CONDUCTOR SIZE FROM THE JUNCTION BOX TO THE EQUIPMENT. TAP CONDUCTOR SHALL BE AS LARGE AS POSSIBLE, AND IN NO CASE SHALL ITS CURRENT CARRYING CAPACITY BE LESS THAN THAT REQUIRED BY THE NEC.
- WIRES WITHIN EQUIPMENT, SUCH AS PANEL BOARDS, SHALL BE NEATLY ARRANGED AND TIED WITH CABLE TIES.
- ALL BRANCH CIRCUIT CONDUITS SHALL CONTAIN NOT MORE THAN ONE CONDUCTOR OF EACH PHASE (A, B, C) AND NEUTRAL CONDUCTOR, ONE EQUIPMENT GROUNDING CONDUCTOR, AND ASSOCIATED SWITCH OR CONTROL WIRING, UNLESS INDICATED OTHERWISE.
- RACEWAYS INSTALLED EXPOSED OR IN ACCESSIBLE SPACES SHALL BE PLACED AT RIGHT ANGLES TO OR PARALLEL WITH THE BUILDING WALLS AND CEILINGS.
- CONDUITS SHALL BE INSTALLED WITH A MINIMUM SEPARATION OF 6 INCHES BETWEEN ELECTRICAL RACEWAYS AND WATER OR STEAM LINES. WHEN INSTALLED AT CLOSER DISTANCE, PROVIDE INSULATING PIPE COVERING ON THE WATER AND STEAM LINES.
- WHERE CONDUIT TERMINATES IN A CABINET, BOX OR AUXILIARY GUTTER, THE CONDUCTORS SHALL BE PROTECTED BY AN INSULATING BUSHING. LOCKNUTS SHALL BE PROVIDED BOTH INSIDE AND OUTSIDE THE ENCLOSURE.
- SWAB OUT AND MAKE RACEWAYS DRY. DO NOT INSTALL WIRE UNTIL THE AREA IS PROTECTED FROM THE WEATHER AND SWABBING OF RACEWAYS HAS BEEN COMPLETED.
- ALL RECEPTACLES, JUNCTION BOXES AND PULL BOXES SHALL BE PERMANENTLY LABELED WITH LABELMAKER IN WORDS WITH LETTERS AT LEAST ONE INCH HIGH IDENTIFYING PANEL NAME AND CIRCUIT NUMBER.
- CONTRACTOR TO PROVIDE CONDUIT, PULL WIRE, PULL BOXES, AND FACEPLATES FOR TENANT SUPPLIED TELEDATA WIRING.
- ALL COMMUNICATIONS & FIRE ALARM CABLE SHALL BE PLENUM RATED. PROVIDE 3/4" FROM OUTLET TO ABOVE CEILING FOR NEW SIGNAL DEVICES.
- CONTRACTOR SHALL PROVIDE AN OPERATING MANUAL AND MAINTENANCE MANUAL TO THE BUILDING OWNER. THE MANUALS SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING: (A) SUBMITTAL DATA STATING EQUIPMENT RATING AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE; (B) OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED; (C) NAMES AND ADDRESSES OF AT LEAST ONE QUALIFIED SERVICE AGENCY.
- REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATION/COORDINATION OF ALL FIXTURES, LIGHTS, SPRINKLER HEADS, AIR DEVICES AND ALL MPE & FP ITEMS.

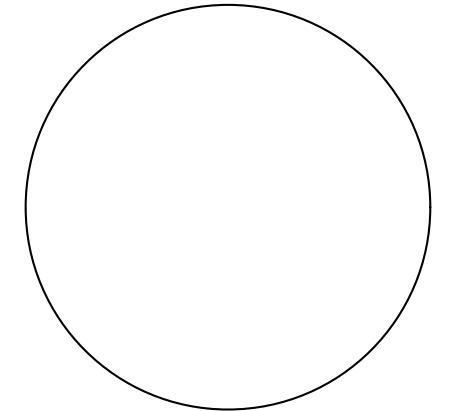
Fit Type	Description	Manufacturer	Model No.	# Lamps	Lamp Type	Watt/Lamp	Volt	Mounting	Remarks
A	FLAT RECESSED PANEL 2X4 LED	EATON CORELITE	DRI-WD-3435-UNV-24-X-STD	1	LED	40	120	RECESSED	-
B	6" EDGE-LIT ROUND LED	HUBBELL	LSBE-6RD-3068-WH	1	LED	13	120	RECESSED	-
B1	4" LED LENSED STRIP LIGHT FIXTURE	HUBBELL	LCL4-35LW-EU-C0HC	1	LED	19	120	SURFACE	PROVIDE CHAIN HANGER ACCESSORY IN AREAS WITH NO CEILING
C	4" LED BLEVELE LUMINAIRE WITH CONTROLS	HUBBELL	LBL4-35LW-EU	1	LED	31	120	SURFACE	-
D	5" LED SURFACE MOUNTED DOWNLIGHT	PRESCOLITE	LESLEDML-30K-9-WH	1	LED	13	120	SURFACE	-
E	WALL MOUNTED LED WALLPACK	HUBBELL	PVJ-30L-14K-035-82-PC-8BU	1	LED	40	120	SURFACE	-
EM	WALL MOUNTED EMERGENCY LIGHT	PHILIPS CHLORIDE	VURL	1	LED	5	120	SURFACE	-
X1	LED EXIT SIGN WITH BATTERY BACKUP	PHILIPS CHLORIDE	CXAL-3-R-W	-	LED	3	120/277	WALL/CEILING	COORDINATE CHEVRON DIRECTION WITH ARCHITECTURAL EGRESS PLANS

MATCH FIXTURE TRIM AND SUPPORT TO CEILING TYPE SHOWN ON ARCHITECTURAL DRAWINGS.

## PLATO MARINAKOS, JR. ARCHITECT, LLC

www.plato-studio.com

107 S 2nd Street  
4th Floor  
Philadelphia, PA 19106  
267-866-0930 OFFICE  
267-866-0931 DIRECT  
plato@plato-studio.com



ARCHITECT SEAL MUST BE IN RED INK

OWNER

ISSUED BY:  
PLATO A. MARINAKOS JR ARCHITECT, LLC  
FOR "APPROVAL" BY OUR CLIENT AND CUSTOMER

CLIENT IS REQUIRED TO CHECK (X) ONE BOX  APPROVED AS IS  APPROVED AS NOTED

CLIENT SIGNATURE DATE

NAME (PLEASE PRINT)

KINDLY RETURN ALL DRAWINGS FOR THE COMPLETE BUILDING, SIGNED AND DATED TO OUR OFFICE LOCATION.

716 EMERSON AVE - RECTORY

ELECTRICAL COVER SHEET

Project number N/A  
Date 05/01/2021  
Drawn by Author  
Checked by Checker

E001

Scale 1/8" = 1'-0"

DRAFT

ELECTRICAL SPECIFICATIONS

1.01 CODES AND STANDARDS

- A) ALL WORK SHALL BE SYSTEMATICALLY, CAREFULLY AND NEATLY PERFORMED AND SHALL CONFORM TO THE FOLLOWING STANDARDS:
1. 2015 IBC
2. 2014 NATIONAL ELECTRIC CODE
3. UNDERWRITERS LABORATORIES, INC.(UL)
4. OSHA AND ALL AGENCIES HAVING JURISDICTION

1.02 SUMMARY

- A) PROVIDE ALL LABOR, MATERIALS, EQUIPMENT AND SERVICES REQUIRED FOR COMPLETE INSTALLATION OF ALL WORK INDICATED ON THE DRAWINGS OR SPECIFIED HEREIN.
B) OBTAIN ALL PERMITS AND APPROVALS REQUIRED BY AUTHORITIES HAVING JURISDICTION AND PAY THE ASSOCIATED PRINTING AND FILING COSTS.
C) VERIFY EXISTING CONDITIONS IN FIELD AND INCLUDE IN THE BID PRICE ALL WORK REQUIRED TO ACCOMMODATE THE INSTALLATION.
D) PROVIDE TEMPORARY LIGHT AND POWER SYSTEM (AS PART OF THE CONTRACT) ADEQUATE FOR THE REQUIREMENTS OF ALL TRADES DURING CONSTRUCTION. TEMPORARY SYSTEM SHALL BE DISCONNECTED AND REMOVED WHEN PERMANENT SERVICE IS IN OPERATION.

1.03 AS-BUILT DRAWINGS AND MAINTENANCE MANUALS

- A) CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING ANY DEVIATION FROM THE ORIGINAL ELECTRICAL DESIGN. THE REVISED DRAWING SHALL BE STAMPED "AS-BUILT" WITH THE DATE AND CONTRACTOR'S SIGNATURE. ONE (1) SET OF PRINTS AND A COMPACT DISK CONTAINING AUTOCAD FILES SHALL BE DELIVERED TO THE ENGINEER BEFORE FINAL PAYMENT IS MADE. AFTER REVIEW AND APPROVAL OF AS-BUILT CONTRACTOR SHALL DELIVER COMPACT DISK TO THE OWNER. CONTRACTOR SHALL PROVIDE THREE (3) PRINTS AND A COMPACT DISK OF AS-BUILT DRAWINGS TO THE OWNER UPON COMPLETION OF WORK.
B) FURNISH TO THE ARCHITECT THREE (3) BOUND AND INDEXED COPIES OF OPERATIONS AND MAINTENANCE DATA MANUALS FOR THE INSTALLATION. THE MANUAL SHALL PROVIDE COMPREHENSIVE DETAILED INFORMATION ON THE APPROVED INSTALLATION, OPERATION AND USE, MAINTENANCE AND PARTS LIST.

1.05 QUALITY ASSURANCE

- A) MATERIALS, EQUIPMENT AND INSTALLATION SHALL CONFORM TO THE ADOPTED EDITION OF ALL APPLICABLE CODES THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION AND BUILDING MANAGEMENT. ALL UTILITY WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL UTILITY COMPANY.
B) MATERIALS, EQUIPMENT AND INSTALLATION SHALL CONFORM TO THE LATEST EDITION OF THE APPLICABLE REFERENCE STANDARDS PUBLISHED BY UL, ANSI, IEEE AND NEMA.
C) ALL WORK SHALL BE WARRANTED IN WRITING TO BE FREE FROM DEFECTS IN MATERIALS AND/OR WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE BY THE OWNER. WARRANTY SHALL INCLUDE ALL COSTS OF PARTS, LABOR, TRAVEL AND LIVING EXPENSES REQUIRED TO REPAIR OR REPLACE DEFECTIVE ITEMS.

1.06 BASIC MATERIAL AND METHODS

- A) COORDINATE ALL WORK WITH THE WORK OF OTHER TRADES PRIOR TO INSTALLATION. ASSIST IN THE PREPARATION OF COORDINATION DRAWINGS AS REQUIRED BY THE GENERAL CONDITIONS.
B) CUT AND PATCH NON STRUCTURAL SURFACES AS REQUIRED. REPAIRS SHALL MATCH ORIGINAL FINISH. PENETRATIONS OF FIRE RATED PARTITIONS SHALL BE SEALED WITH APPROVED MATERIAL TO PROVIDE THE SAME RATINGS AS THE PARTITION. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATIONS OF FIRE RATED PARTITIONS.
C) PROVIDE EXPANSION FITTINGS WHERE RACEWAYS CROSS BUILDING EXPANSION JOINTS.
D) EQUIPMENT, DEVICES AND ENCLOSURES SHALL BE RATED NEMA 1 FOR INTERIOR LOCATIONS, NEMA 3R FOR DAMP LOCATIONS AND WET LOCATIONS.
E) PROVIDE 4" HIGH SEALED CONCRETE HOUSEKEEPING PADS BELOW ALL FLOOR MOUNTED EQUIPMENT AND AROUND ALL CONDUITS PENETRATING FLOORS OF MECHANICAL EQUIPMENT ROOMS.

1.07 RACEWAYS

- A) ELECTRICAL METALLIC TUBING (EMT) SHALL CONFORM TO UL 797. FITTINGS SHALL BE GLAND AND RING COMPRESSION TYPE.
B) FLEXIBLE METALLIC CONDUIT SHALL CONFORM TO UL 1. LIQUID TIGHT FLEXIBLE METAL CONDUIT SHALL CONFORM TO UL 360.
C) ALL CONDUIT FITTINGS AND CONNECTORS SHALL BE STEEL WITH INSULATED THROATS. DIE-FORMED ZINC OR MALLEABLE IRON FITTINGS ARE NOT ACCEPTABLE. BUSHINGS SHALL BE PROVIDED AT ALL CONDUIT TERMINATIONS. BUSHINGS LARGER THAN 1" SHALL BE GROUNDING TYPE. PVC BUSHINGS MAY BE UTILIZED ONLY FOR 3/4" BRANCH CIRCUIT CONDUITS TERMINATING AT PANELBOARDS.
D) MINIMUM RACEWAY SIZE SHALL BE 3/4". RACEWAYS SHALL BE RUN PARALLEL TO BUILDING STRUCTURAL LINES. RACEWAYS SHALL NOT BE RUN HORIZONTALLY BELOW 8'-0" AFF IN PARTITIONS. ALL EMPTY RACEWAYS SHALL BE FURNISHED WITH A 200LB TEST NYLON DRAG LINE.
E) ALL WIRING BETWEEN JUNCTION BOXES AND FOR CIRCUIT HOMERUNS BETWEEN FIRST OUTLET SERVED BY THE BRANCH CIRCUIT AND THE PANELBOARD SHALL BE RUN IN EMT AS REQUIRED.
F) RACEWAY UTILIZATION SHALL BE AS FOLLOWS:
1. ELECTRICAL METALLIC TUBING (EMT) - INTERIOR CONCEALED AND EXPOSED LOCATIONS; (EXCEPT AS NOTED ABOVE) INTERIOR COMMUNICATIONS WIRING. EMT FITTINGS SHALL BE STEEL, CONNECTORS SHALL HAVE INSULATED THROATS.
2. FLEXIBLE METALLIC CONDUIT - FINAL CONNECTIONS TO LIGHTING FIXTURES IN INTERIOR LOCATIONS (MIN. LENGTH 18", MAX. LENGTH 6'-0"). WHERE APPROVED BY THE ENGINEER.
3. LIQUID TIGHT FLEXIBLE CONDUIT - FINAL CONNECTIONS TO MOTORS MECHANICAL EQUIPMENT AND SYSTEMS FURNITURE.
4. ARMORED CABLE (MC OR AC WITH INSULATED GROUND CONDUCTOR) - BRANCH CIRCUITING IN CONCEALED LOCATIONS ONLY.
5. RIGID NONMETALLIC CONDUIT - WET LOCATIONS, INSTALLED AND EQUIPPED SO AS TO PREVENT WATER FROM ENTERING CONDUIT, ALL SUPPORTS, STRAPS, SCREWS, ETC. SHALL BE OF CORROSION RESISTANT MATERIAL OR PROTECTED BY CORROSION RESISTANT MATERIAL. DRY AND DAMP LOCATIONS. UNDERGROUND INSTALLATIONS.

- H) ALL CONDUIT AND TUBING SHALL BE CUT SQUARE AND REAMED AT THE ENDS.
I) CONDUIT AND TUBING RUNS SHALL BE MECHANICALLY AND ELECTRICALLY CONTINUOUS FROM SERVICE STARTING TO ALL OUTLETS AND EQUIPMENT. CONDUIT SHALL ENTER AND BE SECURELY CONNECTED TO A CABINET, JUNCTION BOX, PULLBOX OR OUTLET BOX BY MEANS OF LOCKNUTS ON THE OUTSIDE AND INSIDE AND AN INSULATED BUSHING ON THE INSIDE. IN TUBING OR FLEXIBLE METAL CONDUIT THE ONE COMPRESSION LOCKNUT SHALL BE MADE WRENCH-TIGHT. ALL LOCKNUTS SHALL BE THE BONDING TYPE WITH SHARP EDGES FOR DIGGING INTO THE METAL WALL OF AN ENCLOSURE AND SHALL BE INSTALLED IN A MANNER THAT WILL ASSURE A LOCKING AND ELECTRICALLY CONTINUOUS INSTALLATION. LOCKNUTS AND BUSHINGS ARE NOT REQUIRED WHERE CONDUITS ARE SCREWED INTO TAPPED CONNECTIONS.
J) ALL VERTICAL RUNS OF CONDUIT OR TUBING TERMINATING IN THE BOTTOMS OF WALL BOXES OR CABINETS, OR SIMILAR LOCATIONS, SHALL BE PROTECTED FROM THE ENTRANCE OF FOREIGN MATERIAL PRIOR TO THE INSTALLATION OF CONDUCTORS.
K) UNLESS OTHERWISE SPECIFIED, ALL CONDUIT AND TUBING SHALL BE INSTALLED CONCEALED. IN GENERAL, ALL CONDUIT AND TUBING SHALL BE RUN IN HUNG CEILINGS AND FURRED SPACES WHERE THEY EXIST. WHERE CONDUIT IS RUN EXPOSED IT SHALL BE SECURELY SUPPORTED WITH ZINC COATED MALLEABLE IRON PIPE STRAPS OR OTHER APPROVED MEANS. ALL CONDUITS SHALL BE SUPPORTED FROM STRUCTURAL MEMBERS.
L) CONDUIT SYSTEMS SHALL BE INSTALLED COMPLETE BEFORE ANY CONDUCTORS ARE DRAWN IN. WIRE PULLING LUBRICANTS, WHEN UTILIZED, SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF UNDERWRITERS' LABORATORIES, INC., APPLICABLE TO THE SPECIFIC CONDUCTOR OR CABLE INSULATION AND RACEWAY MATERIAL.

- M) WHERE REQUIRED BY THE ENGINEER, EXTRA DEEP OR EXTRA SHALLOW OUTLET BOXES SHALL BE USED TO FACILITATE THE INSTALLATION OF THE CONDUIT SYSTEM.

1.08 BOXES

- A) OUTLET, PULL AND JUNCTION BOXES SHALL BE FABRICATED FROM STEEL AND CONFORM TO UL 50, UL 514 AND NEMA OS1. BOXES FOR INTERIOR LOCATIONS SHALL BE CODE GAUGE, GALVANIZED SHEET STEEL. BOXES FOR MECHANICAL ROOMS SHALL BE CAST STEEL WITH GASKETED COVERS.
B) BOXES SHALL CONTAIN SUITABLE KNOCKOUTS. BARRIERS SHALL BE FURNISHED AS REQUIRED BY CODE AND TO SEPARATE SWITCHES FOR 277 VOLT CIRCUITS ON DIFFERENT PHASES.
C) BOXES SHALL BE SIZED AS REQUIRED BY CODE FOR NUMBER AND GAUGE OF CONDUCTORS THEREIN. EXCEPT WHERE NOTED TO BE LARGER, THE MINIMUM BOX SHALL BE 4" SQUARE BY 1-1/2" DEEP. COVERS GREATER THAN 50LB SHALL BE DIVIDED INTO MULTIPLE SECTIONS.
D) WIREWAYS AND AUXILIARY GUTTERS SHALL BE TWO-PIECE STEEL CONSTRUCTION WITH ANSI 61 GRAY ENAMEL FINISH. COVERS SHALL BE COMBINATION HINGED AND SCREW-ON TYPE. HOUSINGS SHALL HAVE REGULARLY SPACED KNOCKOUTS FOR CONDUIT ENTRY. WIREWAYS SHALL BE MANUFACTURED BY SQUARE D OR APPROVED EQUAL. PROVIDE ALL END PIECES, CONNECTORS AND REQUIRED ACCESSORIES.

1.08 FASTENERS

- A) PROVIDE INSERTS, EXPANSION SHIELD LUGS, ANCHORS, BOLTS WITH NUTS AND WASHERS, SHIMS OR ANY OTHER TYPE OF FASTENING DEVICES REQUIRED TO FASTEN PANELS OR OTHER EQUIPMENT TO FLOORS, WALLS OR CEILINGS. UNLESS OTHERWISE SPECIFIED HEREIN OR SHOWN ON THE CONTRACT DRAWINGS, ALL FASTENERS SHALL BE HOT-DIPPED GALVANIZED, OF SIZES AND TYPES RECOMMENDED BY THE EQUIPMENT MANUFACTURER AND AS APPROVED BY THE ENGINEER.

1.09 WIRES, CABLES, SPLICES AND TERMINATIONS

- A) POWER AND CONTROL WIRING SHALL BE COPPER, MINIMUM 98% CONDUCTIVITY, WITH TYPE THHN/THWN INSULATION RATED 600 VOLTS. MINIMUM WIRE SIZE SHALL BE #12 AWG. CONDUCTORS SHALL BE SOLID FOR WIRE SIZED #10 AWG AND SMALLER AND STRANDED FOR WIRE SIZES #8 AWG AND LARGER.
B) METAL CLAD CABLE SHALL BE 90°C RATED CODE TYPE ACTHH WITH A SEPARATE GREEN INSULATED GROUND CONDUCTOR IN ACCORDANCE WITH UL 4. JACKET SHALL BE GALVANIZED STEEL ARMOR.
C) CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:
208/120V PHASE 480/277V
BLACK A BROWN
RED B ORANGE
BLUE C YELLOW
WHITE NEUTRAL GRAY
GREEN GROUND GREEN
WHITE WITH TRACER NEUTRAL FOR GF CIRCUIT
D) CONDUCTOR SIZES SHALL BE INCREASED WHERE REQUIRED BY CODE AND/OR THE ENGINEER TO COMPENSATE FOR VOLTAGE DROP AND HIGH AMBIENT TEMPERATURE.
E) COMMUNICATIONS CABLING RUN EXPOSED IN AIR HANDLING PLENUMS SHALL BE TYPE CMP PLENUM RATED.
F) SPLICES FOR WIRE SIZES #10 AWG AND SMALLER SHALL BE MADE WITH SPRING CONNECTORS AND TAPE. SPLICES FOR WIRE SIZES #8 AWG AND LARGER SHALL BE HYDRAULIC COMPRESSION TYPE WITH PRE-MOLDED COVER AND TAPE.
G) TERMINATIONS OF POWER AND CONTROL WIRING SHALL BE COMPRESSION TYPE, WITH TWO-HOLE LUGS FOR WIRE SIZES #8 AWG AND LARGER. MECHANICAL LUGS MAY ONLY BE UTILIZED FOR TERMINATIONS AT BRANCH CIRCUIT PANELBOARDS.

1.10 WIRING DEVICES

- A) WIRING DEVICES SHALL BE DECORA STYLE WITH NEMA CONFIGURATIONS AS INDICATED ON THE DRAWINGS. COLOR OF DEVICES SHALL BE AS SELECTED BY THE ARCHITECT. WIRING DEVICES SHALL BE MANUFACTURED BY ARROW-HART, HUBBELL, LEVITON, PASS & SEYMOUR OR APPROVED EQUAL.
B) FACEPLATES SHALL BE UNBREAKABLE NYLON UNLESS SPECIFIED BY THE ARCHITECT. FACEPLATES SHALL BE FURNISHED FOR ALL COMMUNICATIONS OUTLETS AND SHALL BE CONFIGURED TO SUIT THE SYSTEM SUPPLIERS' REQUIREMENTS.
C) DEVICES MOUNTED ADJACENT TO EACH OTHER SHALL BE FURNISHED WITH A COMMON FACEPLATE AND BE GANGED IN ONE BOX.
D) ALL DEVICES SHALL BE MOUNTED AT LOCATIONS AND HEIGHTS AS INDICATED ON ARCHITECTURAL DRAWINGS.
E) WHERE NEW, EXISTING OR NEW AND EXISTING SWITCHES ARE MOUNTED AT SAME LOCATION, MOUNT SWITCHES BEHIND COMMON FACEPLATE.

1.11 BRANCH CIRCUIT PANELBOARDS

- A) BRANCH CIRCUIT PANELBOARDS SHALL BE 208/120V, 3Ø, 4-WIRE CONFIGURATION WITH COPPER BUS BARS, NEUTRAL BUS AND SEPARATE GROUND BUS BONDED TO PANEL ENCLOSURE. CABLE LUGS SHALL BE MECHANICAL TYPE. FEED-THROUGH LUGS & CABLE CONNECTIONS SHALL BE PROVIDED FOR MULTI SECTION PANELS. PANELBOARDS SHALL BE MANUFACTURED BY SCHNEIDER ELECTRIC/SQUARE D, GENERAL ELECTRIC, SIEMENS, OR CUTLER-HAMMER.
B) CIRCUIT BREAKERS SHALL BE MOLDED CASE, BOLT-IN-PLACE WITH THERMAL-MAGNETIC TRIP ELEMENT. MINIMUM INTERRUPTING RATINGS SHALL BE 22,000 AIC. MAIN CIRCUIT BREAKERS SHALL BE MOUNTED SEPARATELY FROM BRANCH BREAKERS AT TOP OR BOTTOM.
C) PANELBOARD ENCLOSURES SHALL BE GALVANIZED CODE GAUGE STEEL. TRIMS SHALL BE SURFACE TYPE IN UNFINISHED SPACES AND FLUSH TYPE IN FINISHED SPACES, WITH ANSI 61 GRAY ENAMEL FINISH. DOORS SHALL BE DOOR IN DOOR TYPE CONSTRUCTION AND SHALL BE LOCKABLE AND ALL LOCKS SHALL BE KEVED ALIKE. FURNISH ONE KEY FOR EACH PANEL.
D) PANELS SHALL HAVE A MINIMUM OF 4" GUTTER SPACE ON BOTH SIDES.
E) FURNISH AND INSTALL TYPEWRITTEN DIRECTORIES FOR EACH PANELBOARD, NEW AND EXISTING, INDICATING DEVICES SERVED.
F) PANELS NOT MOUNTED ON STRUCTURAL WALLS SHALL BE SUPPORTED FROM THE FLOOR INDEPENDENTLY OF WALL CONSTRUCTION BUT LATERALLY SECURED TO WALL. FLUSH MOUNTED PANELBOARDS SHALL BE PROVIDED WITH (3) 1" EMPTY CONDUITS TERMINATED ABOVE THE FINISHED CEILING.
G) PANELS MOUNTED ON MASONRY WALLS SHALL BE SHIMMED WITH WASHERS TO PROVIDE A 1/2" SPACE BETWEEN PANELBOARD AND WALL.

1.12 DISTRIBUTION PANELBOARDS

- A) DISTRIBUTION PANELBOARDS SHALL BE 208/120V, 3Ø, 4-WIRE CONFIGURATION AS SCHEDULED WITH COPPER BUS BARS, NEUTRAL BUS AND SEPARATE GROUND BUS BONDED TO PANEL ENCLOSURE. CABLE LUGS SHALL BE MECHANICAL TYPE. PANELBOARDS SHALL BE MANUFACTURED BY SCHNEIDER ELECTRIC/SQUARE D, GENERAL ELECTRIC, SIEMENS, OR CUTLER-HAMMER.
B) CIRCUIT BREAKERS SHALL BE MOLDED CASE, BOLT-IN-PLACE WITH THERMAL-MAGNETIC TRIP ELEMENT. MINIMUM INTERRUPTING RATINGS SHALL BE 22,000 AIC FOR 208/120V AND 65,000 AIC FOR 480/277V. MAIN CIRCUIT BREAKERS SHALL BE MOUNTED SEPARATELY FROM BRANCH BREAKERS AT TOP OR BOTTOM.
C) PANELBOARD ENCLOSURES SHALL BE GALVANIZED CODE GAUGE STEEL. TRIMS SHALL BE SURFACE TYPE IN UNFINISHED SPACES AND FLUSH TYPE IN FINISHED SPACES, WITH ANSI 61 GRAY ENAMEL FINISH. DOORS SHALL BE DOOR IN DOOR TYPE CONSTRUCTION AND SHALL BE LOCKABLE AND ALL LOCKS SHALL BE KEVED ALIKE. FURNISH ONE KEY FOR EACH PANEL.
D) PANELS SHALL HAVE A MINIMUM OF 4" GUTTER SPACE ON BOTH SIDES.
E) FURNISH AND INSTALL TYPEWRITTEN DIRECTORIES FOR EACH PANELBOARD, NEW AND EXISTING, INDICATING DEVICES SERVED.
F) PANELS NOT MOUNTED ON MASONRY WALLS SHALL BE SUPPORTED FROM THE FLOOR INDEPENDENTLY OF WALL CONSTRUCTION BUT LATERALLY SECURED TO WALL.
G) PANELS MOUNTED ON MASONRY WALLS SHALL BE SHIMMED WITH WASHERS TO PROVIDE A 1/2" SPACE BETWEEN PANELBOARD AND WALL.

1.13 SAFETY SWITCHES

- A) SAFETY DISCONNECT SWITCHES SHALL BE 250V OR 600V AS REQUIRED, HEAVY DUTY, HORSEPOWER RATED, QUICK MAKE-QUICK BREAK DESIGN WITH HANDLES LOCKABLE IN THE OPEN (OFF) POSITION. SWITCH HOUSINGS SHALL INCLUDE COVER INTERLOCK AND LINE SIDE TERMINAL SHIELD AND GROUNDING LUG. FUSE CLIPS SHALL BE REJECTION TYPE. INTERRUPTING RATINGS SHALL BE A MINIMUM OF 100,000 AIC WHEN FUSED AND 12 TIMES THE CONTINUOUS CURRENT RATING WHEN UNFUSED AT RATED VOLTAGE.

1.14 LIGHTING FIXTURES AND EQUIPMENT

- A) LIGHTING FIXTURES SHALL BE SPECIFICATION GRADE AND FURNISHED COMPLETE WITH ALL REQUIRED MOUNTING HARDWARE. FIXTURES SPECIFIED IN THE LIGHTING FIXTURE SCHEDULE ESTABLISH THE PERFORMANCE REQUIREMENTS. SUBSTITUTIONS MUST MEET OR EXCEED THE PERFORMANCE OF THE SPECIFIED FIXTURE.
B) CONTRACTOR SHALL ENSURE COMPATIBILITY BETWEEN FIXTURE TRIMS AND CEILING SYSTEMS. FIXTURES RECESSED IN ACCESSIBLE CEILINGS SHALL BE FURNISHED WITH SEISMIC RESTRAINTS. FIXTURES RECESSED IN NON-ACCESSIBLE CEILINGS SHALL BE DESIGNED FOR BALLAST OR TRANSFORMER ACCESS THROUGH THE FIXTURE OPENING.
C) PROVIDE EMERGENCY LIGHTING INVERTERS FOR LED FIXTURES. PROVIDE FACTORY INSTALLED OR SINGLE FIXTURE EMERGENCY INVERTER FOR AREAS WITH (1) FIXTURE DENOTED AS EMERGENCY. PROVIDE EMERGENCY LIGHTING INVERTER SYSTEM FOR AREAS WITH MULTIPLE EMERGENCY FIXTURES.
D) BATTERY PACK / INVERTER SHALL HAVE UNIVERSAL INPUT CIRCUIT FOR 120/277VAC OPERATION, A TEST SWITCH AND PILOT LIGHT AND BE CAPABLE OF BEING WIRED TO OPERATE WITH SWITCHED, DIMMED OR NORMALLY OFF FIXTURE WITHOUT AFFECTING NORMAL OPERATION.
E) LOCATIONS OF LIGHTING FIXTURES INDICATED ON THE DRAWINGS ARE APPROXIMATE. CONTRACTOR SHALL REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS, MODELS, AND TRIM TYPES OF ALL LIGHTING FIXTURES PRIOR TO INSTALLATION.
F) FIXTURES SHALL BE ATTACHED TO CEILING SUPPORTING MEMBERS, AND SHALL NOT DEPEND UPON LATHING OR PLASTER FOR ALIGNMENT OR SUPPORT. FIXTURES IN SUSPENDED CEILINGS SHALL BE SUPPORTED BY SADDLE HANGERS OR TIE-BARS ATTACHED TO RUNNERS OR BETWEEN CROSSBARS OF CEILING SYSTEMS. MOUNTING SPLINES OR OTHER POSITIVE MEANS OF MAINTAINING ALIGNMENT AND RIGIDITY SHALL BE PROVIDED. SUPPORTING MEMBERS SHALL BE SURFACE PASSIVATED AND SHALL BE PRIMED OR PAINT PROTECTED TO RESIST CORROSION. FASTENING DEVICES SHALL BE OF A POSITIVE LOCKING TYPE, AND SHALL NOT REQUIRE THE USE OF SPECIAL TOOLS TO REMOVE. TIE WIRES SHALL NOT BE USED IN PLACE OF FASTENING DEVICES.
G) HANGING OF LIGHTING FIXTURES IS TO BE DONE IN ACCORDANCE WITH LOCAL CODES LIGHTING FIXTURES WEIGHING UP TO AND INCLUDING 40 POUNDS MAY BE SUPPORTED FROM THE STEEL "Z" BARS. LIGHTING FIXTURES WEIGHING FROM 41 POUNDS UP TO AND INCLUDING 80 POUNDS MAY BE SUPPORTED FROM THE PURLINS. LIGHTING FIXTURES WEIGHING OVER 80 POUNDS SHALL BE SUPPORTED FROM THE BUILDING STRUCTURE AND NOT FROM THE CEILING SUSPENSION SYSTEM.
H) SPLICES SHALL NOT BE PERMITTED IN ANY RUN OF LIGHTING FIXTURE HOOKUP WIRE.
I) SEPARATELY MOUNTED OUTLET BOXES AND FLEXIBLE CONDUIT PIGTAIL CONNECTIONS (MAXIMUM LENGTH OF 6'-0") SHALL BE PROVIDED FOR LIGHTING FIXTURES RECESSED IN HUNG CEILINGS WITH ACCESSIBLE TILES. ONE (1) OUTLET BOX MAY SERVE UP TO A MAXIMUM OF FOUR (4) RECESSED LIGHTING FIXTURES.

1.15 LIGHTING CONTROLS

- A) SENSORS AND SWITCH CONTROL SYSTEMS SHALL BE MANUFACTURED BY WATTSTOPPER, COOPER CONTROLS OR APPROVED EQUAL. SYSTEM SHALL CONSIST OF THE FOLLOWING:
1. CEILING MOUNTED OCCUPANCY/VACANCY SENSOR - WATTSTOPPER MODEL #DT-300
2. 24VDC UNIVERSAL VOLTAGE POWER PACK - WATTSTOPPER BZ-150
3. WALL MOUNTED OVERRIDE SWITCH FOR CEILING MOUNTED OCCUPANCY/VACANCY SENSORS - WATTSTOPPER MODEL #DCC2
4. WALL MOUNTED VACANCY SENSOR SWITCH - WATTSTOPPER MODEL #DSW-301
5. ALL ASSOCIATED WIRING AS PER MANUFACTURERS SPECIFICATIONS.
B) SENSORS SHALL UTILIZE A COMBINATION OF PASSIVE INFRARED AND ULTRASONIC TECHNOLOGY TO ACTIVATE AND/OR MAINTAIN LIGHTING. SENSORS SHALL INCLUDE ADJUSTMENT FOR COVERAGE PATTERN AND SENSITIVITY, TIME DELAY TO OFF (1 MIN. - 20 MIN.) WITH LED DISPLAYS.
C) BEFORE THE TENANT MOVE-IN DATE AND TURN OVER OF THE PROJECT, THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE SENSITIVITY, CALIBRATION AND ADJUSTMENTS OF ALL SENSORS IN THE FIELD IN CORRELATION WITH LIGHTING REQUIREMENTS, USAGE, AND THE OWNER.

1.16 GROUNDING

- A) THE DISTRIBUTION SYSTEM SHALL BE COMPLETELY AND PROPERLY GROUNDED USING APPROVED FITTINGS. SEPARATE INSULATED GROUND CONDUCTORS SHALL BE RUN WITH ALL FEEDERS WHERE INDICATED, RECEPTACLE BRANCH CIRCUITS AND FLEXIBLE CONNECTIONS TO LIGHTING FIXTURES AND EQUIPMENT.
B) METAL RACEWAYS, METAL ENCLOSURES OF ELECTRICAL DEVICES AND OTHER EQUIPMENT SHALL BE COMPLETELY GROUNDED IN AN APPROVED MANNER. PROPER HARDWARE REQUIRED FOR A COMPLETE GROUNDING SYSTEM SHALL BE INSTALLED BY THE CONTRACTOR.
C) GROUND RODS SHALL BE 3/4" X 10'-0" COPPERWELD TYPE WITH EXOTHERMICALLY WELDED CONNECTIONS.

1.17 FIRE ALARM SYSTEM

- A) GENERAL SYSTEM DESCRIPTION AND REQUIREMENTS:
1. THE SYSTEM SHALL CONSIST OF AN ADDRESSABLE MAIN FIRE ALARM CONTROL PANEL (FACP), REMOTE ANNUNCIATOR PANEL AND REMOTE DEVICES AS SPECIFIED OR SHOWN ON THE CONTRACT DRAWINGS.
2. THE FACP SHALL INCLUDE SUPERVISED MONITORING CIRCUITS AND CONTROL CIRCUITS, ALARM SIGNALING, CONTROL, AND SUPERVISION.
3. THE FACP SHALL CONTAIN ALL REQUIRED SYSTEM PROGRAMMING WHICH SHALL FACILITATE THE PRIORITIZED SELECTIVE OPERATION OF ANY OR ALL CONTROL CIRCUITS.
4. A FOUR (4) CHANNEL DIGITAL COMMUNICATOR AND CONNECTION TO TELEPHONE LINE SHALL BE PROVIDED FOR CENTRAL STATION NOTIFICATION AS SPECIFIED BELOW.
B) SUBMITTALS
1. IN ADDITION TO SUBMITTALS SPECIFIED ABOVE, SUBMIT SHOP DRAWINGS AND PRODUCT DATA FOR THE FIRE ALARM SYSTEM AS FOLLOWS:
1.1. DRAWINGS
1.1.1. THE SYSTEM MANUFACTURER SHALL PREPARE DETAILED SHOP DRAWINGS INCLUDING WIRING DIAGRAMS, VOLTAGE DROP AND BATTERY CALCULATIONS, MANUFACTURER CUT SHEETS AND FLOOR PLANS OF THE ENTIRE FIRE ALARM SYSTEM.
1.1.2. WIRING DIAGRAMS SHALL BE COMPLETE AND SHALL INCLUDE DEVICES, WIRING, RACEWAYS, CONNECTIONS AND TERMINAL DESIGNATIONS.
1.2. SEQUENCE OF OPERATION
1.2.1. THE SYSTEM MANUFACTURER SHALL PREPARE A WRITTEN DESCRIPTION OF THE SYSTEM HARDWARE AND OPERATIONS DETAILING THOSE ITEMS THAT ARE AT VARIANCE WITH THE CONTRACT DOCUMENTS.
C) SYSTEM OPERATION
1. THE ADDRESSABLE FIRE ALARM AND DETECTION SYSTEM SHALL PROVIDE FUNCTIONS AND OPERATING FEATURES AS REQUIRED BY CODE.
D) SYSTEM COMPONENTS
1. FIRE ALARM CONTROL PANEL (FACP) SHALL BE A MICROPROCESSOR BASED, FULLY ADDRESSABLE 2-LOOP (INDICATING CIRCUIT) PANEL AND SHALL INCLUDE THE FOLLOWING:
1.1. MAIN CONTROL BOARD WITH ADDITIONAL OR SUPPLEMENTARY MODULES AS REQUIRED TO ACCOMMODATE SPECIFIED FUNCTIONS, LCD ANNUNCIATOR AND KEYPAD.
1.2. 24V DC POWER SUPPLY WITH EXTENDER PANEL/POWER SUPPLY AS REQUIRED FOR SPECIFIED NOTIFICATION CIRCUITS (MIN. 1.5A PER CIRCUIT).
1.3. BATTERY BACK-UP MODULE (S).
1.4. ADDITIONAL MODULES AND ACCESSORIES REQUIRED FOR PROPER SYSTEM OPERATION.
1.5. 4-CHANNEL DIGITAL COMMUNICATOR FOR CENTRAL STATION NOTIFICATION.
2. INDICATION AND ANNUNCIATION DEVICES
2.1. AREA SMOKE DETECTORS-ADDRESSABLE PHOTOELECTRIC-LISTED FOR USE AT HIGH VELOCITY AIR FLOW WHEN MOUNTED AT AIR RETURNS.
2.2. DUCT SMOKE DETECTORS-ADDRESSABLE PHOTOELECTRIC WITH DUCT HOUSINGS AND SAMPLING TUBES.
2.3. MANUAL FIRE ALARM STATIONS-ADDRESSABLE, DOUBLE ACTION.

- 2.4. STROBES-ADA/UL 1575CD, FLUSH MOUNTED
2.5. GONGS-10" DIA, SURFACE MOUNTED
ALL DEVICES SHALL BE FLUSH MOUNTED (COORDINATE WITH EXISTING BACK BOXES WHERE NECESSARY)
3. REMOTE ANNUNCIATOR PANEL - DIGITAL DISPLAY FOR ANNUNCIATION OF FACP.

- E) SYSTEM POWER SUPPLY
1. PROVIDE THE FIRE ALARM CONTROL PANEL AND OTHER CONTROLS WITH 120VAC POWER. THE SYSTEM SHALL BE EQUIPPED WITH BATTERY STANDBY FOR SYSTEM OPERATION DURING LOSS OF NORMAL POWER SOURCE AND AUTOMATICALLY TRANSFER TO THE BATTERIES UPON THE LOSS OF 120VAC SUPPLY.
2. PROVIDE 25% CAPACITY FOR FUTURE DEVICES.
F) INSTALLATION
1. PROVIDE ALL POWER AND CONTROL WIRING REQUIRED FOR A FULLY OPERATIONAL SYSTEM WITH FULL MONITORING AND SUPERVISION IN ACCORDANCE WITH APPLICABLE STANDARDS. PROVIDE ALL APPURTENANCES (I.E. END OF LINE RESISTORS) NECESSARY.
2. FACP AND ALL EQUIPMENT SHALL BE COMPLETELY IDENTIFIED WITH ALL ZONE DATA AND NAMEPLATES AS SPECIFIED. PROVIDE COPIES OF THE PANEL AND SYSTEM WIRING DIAGRAMS IN A POCKET INSIDE THE FACP PANEL COVER.
3. PROVIDE CONTACTS AS REQUIRED TO CONTROL ALL HVAC EQUIPMENT. QUANTITY, LOCATION AND REQUIREMENTS FOR ALL INTERFACES SHALL BE COORDINATED WITH EXISTING HVAC EQUIPMENT AND SHALL BE IDENTIFIED ON THE FIRE ALARM SYSTEM SHOP DRAWING SUBMITTALS.

1.18 REMOVALS

- A) THE CONTRACTOR SHALL VISIT THE SITE AND CAREFULLY EXAMINE EXISTING CONDITIONS AND SHALL PERFORM ALL WORK REQUIRED TO ACHIEVE THE FINAL DESIGN INTENT AS REQUIRED BY THE CONTRACT DOCUMENTS. THE EXTENT OF ALL REMOVAL WORK SHALL BE COORDINATED WITH THE ARCHITECT.
B) IN THE PROCESS OF REMOVING WIRING DEVICES, LIGHTING FIXTURES AND OTHER ELECTRICAL EQUIPMENT AND MATERIALS, THIS CONTRACTOR SHALL EXERCISE EXTREME CAUTION TO PREVENT DAMAGE TO ARCHITECTURAL SURFACES AND MATERIALS WHICH ARE TO REMAIN, INCLUDING WALLS, FLOORS, CEILINGS, WINDOWS, DOORS, MOLDINGS, STRUCTURAL MEMBERS, ETC. THE COST TO REPAIR OR REPLACE ANY MATERIAL DEEMED BY THE ARCHITECT TO HAVE BEEN UNDULY DAMAGED BY THIS CONTRACTOR DURING DEMOLITION OR CONSTRUCTION SHALL BE PAID BY THIS CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
C) ALL EXISTING UNUSED CONDUIT AND WIRING SHALL BE DROPPED TO THE FLOOR BY THE ELECTRICIAN FOR REMOVAL FROM THE BUILDING BY DEMOLITION OR GENERAL CONTRACTOR.

1.19 IDENTIFICATION OF WORK

- A) ALL PANELBOARDS, EQUIPMENT AND CABINETS SPECIFIED HEREIN SHALL BE CLEARLY IDENTIFIED WITH THE EQUIPMENT DESIGNATION, VOLTAGE AND AMPERE RATING, FUSE RATING, EQUIPMENT SERVED AND ORIGIN OF THE INCOMING FEED. IDENTIFICATION SHALL BE WHITE ON BLACK PLASTIC NAMEPLATE WITH 1/2" MINIMUM LETTERING ATTACHED BY SCREWS.
B) FACEPLATES OF SWITCHES FOR EQUIPMENT SUCH AS REMOTE FANS AND MOTORIZED SCREENS SHALL BE IDENTIFIED WITH THE NAME OF THE DEVICE CONTROLLED. IDENTIFICATION SHALL BE BY INDELEBIL MARKER IN CONCEALED LOCATIONS AND ADHESIVE LABELS IN EXPOSED LOCATIONS. EMERGENCY DEVICES SHALL BE IDENTIFIED IN RED.
C) EMPTY CONDUITS SHALL BE IDENTIFIED WITH TAGS AT BOTH ENDS INDICATING THE LOCATION OF TERMINATION AT THE OPPOSITE END.
D) ALL WIRES SHALL BE IDENTIFIED BY PANEL AND CIRCUIT NUMBER AT ALL TERMINATION AND SPLICE POINTS BY THE USE OF BRADY B-500 VINYL CLOTH TAPE OR EQUIVALENT METHOD.
E) ALL JUNCTION BOXES SHALL BE IDENTIFIED WITH PANEL AND CIRCUIT NUMBERS OF ALL CIRCUITS OR NAME OF COMMUNICATIONS SYSTEM CABLING CONTAINED WITHIN. JUNCTION BOXES IN EXPOSED LOCATIONS SHALL BE CLEARLY MARKED WITH IDENTIFYING LABELS. JUNCTION BOXES IN CONCEALED LOCATIONS SHALL BE MARKED WITH A BOLD, INDELEBIL MARKING PEN. LETTERING SHALL BE NEATLY AND LEGIBLY PRINTED. JUNCTION BOXES ON EMERGENCY SERVICE SHALL BE PAINTED RED AND LABELED AS EMERGENCY.
F) CONDUIT RUNS FOR BRANCH CIRCUITING AND/OR COMMUNICATIONS CABLING SHALL BE IDENTIFIED AT EACH OUTLET AND PULL BOX WITH CIRCUIT NUMBER OR SYSTEM NAME.

1.20 HANGERS AND SUPPORTS

- A) THREADED RODS SHALL BE FULLY GALVANIZED, MINIMUM 3/8" DIAMETER. MODULAR CHANNEL SUPPORTS SHALL BE GALVANIZED STEEL. SUPPORT CLIPS AND FASTENERS SHALL BE LISTED AND APPROVED FOR THE APPLICATION. STRAPS AND CLAMPS SHALL BE MALLEABLE IRON.
B) SUPPORTS SHALL BE SIZED TO ACCOMMODATE THE LOAD REQUIRED. ALL WORK SHALL BE SUPPORTED INDEPENDENTLY OF THE WORK OF OTHER TRADES, INCLUDING CEILING SYSTEM SUPPORTS.
C) PANELS AND EQUIPMENT LOCATED ON OTHER THAN MASONRY WALLS SHALL BE MOUNTED WITH MODULAR CHANNEL SUPPORTS SECURED TO THE BUILDING STRUCTURE.

1.21 FINAL CLEANUP AND FIELD TESTS

- A) AFTER COMPLETION OF THE ENTIRE ELECTRICAL INSTALLATION:
1. THE CONTRACTOR, PRIOR TO FINAL ACCEPTANCE, SHALL CLEAN ALL PANELS, SWITCHES, CABINETS, DEVICES PLATES, FIXTURES AND OTHER ITEMS FURNISHED UNDER THIS CONTRACT AND SHALL ENSURE THAT ALL PANELBOARD DIRECTORIES ARE IN PLACE AND COMPLETED OR REVISED AS REQUIRED BY THE WORK, AND THAT ALL IDENTIFICATION AND MARKING OF EQUIPMENT, CABLES, ALL JUNCTION BOXES AND OTHER ITEMS IS COMPLETED.
2. THE CONTRACTOR SHALL REPAIR OR REPLACE, AS DIRECTED BY THE ENGINEER, ANY ITEM DAMAGED DUE TO INSTALLATION OR RELOCATION OF EQUIPMENT OR DEVICES AT NOT ADDITIONAL COST TO THE OWNER.
B) IN ADDITION TO OTHER TESTS WHICH MAY BE REQUIRED BY OTHER DIVISIONS, PERFORM FIELD TESTS IN THE PRESENCE OF THE ENGINEER, TO DEMONSTRATE THE PROPER FUNCTIONING OF THE ELECTRICAL INSTALLATION. THE ENGINEER SHALL BE GIVEN A MINIMUM OF 48 HOURS ADVANCE NOTICE OF ALL TESTS. REQUIRED FIELD TESTS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:

- 1. OPERATION OF ALL ELECTRICAL EQUIPMENT FOR A PERIOD FOR A PERIOD OF 24 HOURS WITHOUT INTERRUPTION.
2. 1,000 VOLT MEGOHMMETER TEST FOR ALL WIRES AND CABLES FURNISHED. CONTRACTOR SHALL FURNISH A TEST REPORT TO THE ENGINEER INDICATING TEST METHOD USED AND RESULTS.

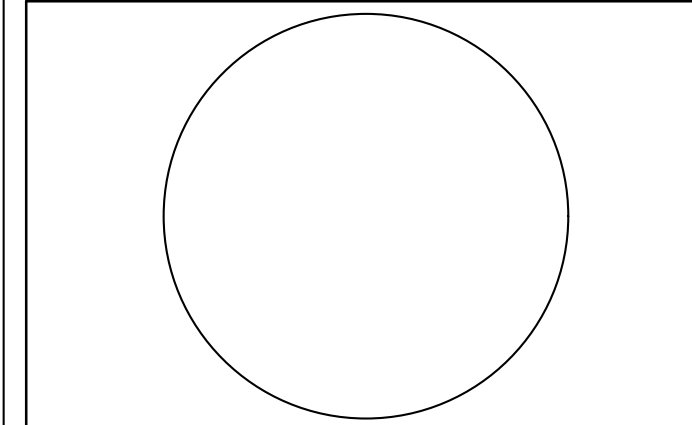
- C) ALL DEFECTIVE FIXTURES CABLES OR OTHER EQUIPMENT ENCOUNTERED DURING THE COURSE OF TESTING SHALL BE PROMPTLY REPLACED AND RETESTED TO THE SATISFACTION OF THE ENGINEER.

1.22 PROJECT CLOSEOUT

- A) AFTER COMPLETION OF PROJECT AND PRIOR TO REQUESTING FINAL PAYMENT, THE CONTRACTOR SHALL GIVEN WRITTEN NOTICE THAT THE FOLLOWING ITEMS HAVE BEEN COMPLETED:
1. REQUIRED AGENCY APPROVALS.
2. FINAL CLEANING AND ADJUSTMENT OF LIGHTING FIXTURES AND EQUIPMENT.
3. RESOLUTION OF OUTSTANDING SUBMITTALS AND PUNCH LIST ITEMS.
4. AS-BUILT DRAWINGS.
5. SYSTEM STARTUP, TESTING AND ADJUSTMENT.
6. MANUFACTURER'S CERTIFICATIONS, WARRANTIES AND O&M MANUALS.

DRAFT
Project number N/A
Date 05/01/2021
Drawn by Author
Checked by Checker
E002
Scale 1/8" = 1'-0"

PLATO MARINAKOS, JR. ARCHITECT, LLC
www.plato-studio.com
107 S 2nd Street
4th Floor
Philadelphia, PA 19106
267-866-0930 OFFICE
267-866-0931 DIRECT
plato@plato-studio.com



OWNER
ISSUED BY: PLATO A. MARINAKOS JR. ARCHITECT, LLC FOR "APPROVAL" BY OUR CLIENT AND CUSTOMER
CLIENT IS REQUIRED TO CHECK (X) ONE BOX
APPROVED AS IS
APPROVED AS NOTED
CLIENT SIGNATURE DATE
NAME (PLEASE PRINT)
KINDLY RETURN ALL DRAWINGS FOR THE COMPLETE BUILDING, SIGNED AND DATED TO OUR OFFICE LOCATION

Table with 4 columns and 10 rows for notes or additional information.

716 EMERSON AVE - RECTORY

ELECTRICAL SPECIFICATIONS
Project number N/A
Date 05/01/2021
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