A P 47	ELECTRICAL A	BBRE				E	LECTRICAL SYMBOLS LEGEND				1
AMP V	AMPERES ABOVE	M MC	METER MOMENTARY CONTACT OR	SYMBOL	DESIGNATIONS MTG HT	SYMBOL	DESIGNATIONS	MTG HT	SYMBOL	DESIGNATIONS	MTG HT
	ABOVE GRADE AUDIBLE ALARM	MCB	MECHANICAL CONTRACTOR MAIN CIRCUIT BREAKER	_	SYMBOL SCHEDULE NOTES		POWER			FIRE ALARM	
	ABOVE COUNTER	MCC	MOTOR CONTROL CENTER		SYMBOLS COMPRISE A STANDARD LIST, NOT ALL SYMBOLS MAY		BRANCH CIRCUIT PANEL	VERIFY	E-	MANUAL PULL STATION	48"
Н D	ABOVE COUNTER HEIGHT ADDENDUM	MH MLO	MAN HOLE MAIN LUG ONLY	=	ON THESE DRAWINGS. NG HEIGHTS INDICATED ARE STANDARD. DIMENSIONAL NUMBERS	HH.	EQUIPMENT CABINET TRANSFORMER	VERIFY VERIFY		HEAT DETECTOR (#=FIXED TEMP, R=RATE OF RISE) SMOKE DETECTOR (P=PHOTOELECTRIC, I=IONIZATION)	
3	AVAILABLE FAULT CURRENT	MMFO	MULTI MODE FIBER OPTIC	INDICATI	ED AT DEVICES SHALL OVERRIDE THESE STANDARDS. MOUNTED SARE TO THE CENTER OF THE DEVICE, UNLESS NOTED OTHERWISE.		MOTOR OR MOTOR CONNECTION	VERIFY	F 	DUCT MOUNTED PHOTOELECTRIC DETECTOR	
CI =	ARC FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR	MRS MSB	MOTOR RATED SWITCH MAIN SWITCHBOARD	C. MOUNTII	NG HEIGHTS INDICATED ARE FOR STUD WALL CONSTRUCTION.		MOTOR CONTROLLER, STARTER OF VFD	VERIFY	E ^{SA}	BEAM DET (B-T=TRANSMITTER, B-R=RECEIVER) COMBINATION SMOKE DETECTOR AND ALARM	VERIFY
J	AIR HANDLING UNIT	MT	EMPTY		LOCK OR BRICK CONSTRUCTION IS USED, ADJUST MOUNTING S TO ALIGN DEVICE PLATES WITH RUNNING JOINT.		COMBINATION STARTER & DISCONNECT SWITCH DISCONNECT SWITCH	VERIFY VERIFY	RSE-ERS	REMOTE STATION - WALL/CEILING MOUNT	72"
_	ALUMINUM	N	NEUTRAL	D. REFERT	O SPECIFICATIONS FOR FURTHER INFORMATION.	\$ ^{MR}	MOTOR RATED TOGGLE	VERIFY	RIF- ERI	REMOTE INDICATOR LAMP - WALL/CEILING MOUNT	72"
Г З	ANTENNA AUTOMATIC TRANSFER SWITCH	NC NEC	NORMALLY CLOSED NATIONAL ELECTRICAL CODE		GENERAL	\$ ^{MMS}	MANUAL MOTOR STARTER SWITCH WITH THERMAL OVERLOAD	VERIFY	E ^{FS}	FLOW SWITCH TAMPER SWITCH	
	AUDIO VISUAL	NIC	NOT IN CONTRACT		T	⊕ ⊕	DUPLEX RECEPTACLE - WALL/CEILING MOUNT	18"	EMM	MONITOR MODULE	
G S	AMERICAN WIRE GUAGE BUILDING AUTOMATION SYSTEM	NO NTS	NORMALLY OPEN NOT TO SCALE	-	HEAVY DASHED LINE WEIGHT INDICATES EXISTING ITEM TO BE REMOVED.	• •	EMERGENCY DUPLEX RECEPTACLE - WALL/CEILING MOUNT	18"	E ^{SD}	CONTROL MODULE	
))	BELOW FINISHED CEILING	oc	ON CENTER		LIGHT SOLID LINE WEIGHT INDICATES EXISTING ITEM TO REMAIN.	₩ ₩	SPLIT DUPLEX RECEPTACLE - WALL/CEILING MOUNT	18"	E ^{SD}	FIRE/SMOKE DAMPER CONNECTION DOOR HOLD OR DOOR HOLD CONNECTION	VERIFY
3	BOLTED PRESSURE SWITCH	PB	PULL BOX OR PUSHBUTTON		HEAVY SOLID LINE WEIGHT INDICATES NEW	• •	EMERGENCY SPLIT DUPLEX RECEPTACLE - WALL/CEILING MOUNT	18"	FS #0 #0	FIREMAN'S STATION - WALL MOUNT	48"
3	CONDUIT OR CONTROLLED RECEPT CABINET	PE PF	PNEUMATIC ELECTRIC POWER FACTOR		ITEM OR NEW LOCATION.	Θ	SIMPLEX RECEPTACLE - WALL/CEILING MOUNT	18"	# <u>F</u> - # <u>F</u>	STROBE - WALL/CEILING MOUNT (# = CANDELA) BELL - WALL/CEILING MOUNT	82" 82"
	CIRCUIT BREAKER	PH	PHASE	R	REMOVE EXISTING ITEM AND BELOCATE AS INDICATED	• •	EMERGENCY SIMPLEX RECEPTACLE - WALL/CEILING MOUNT	18"	ÖĒ-ÖĒ	BELL/STROBE - WALL/CEILING MOUNT (# = CANDELA)	82"
Γ ∨ Γ	CLOSED CIRCUIT TV CIRCUIT	PNL	PANEL	RL X	REMOVE EXISTING ITEM AND RELOCATE AS INDICATED EXISTING ITEM TO REMAIN	⊕ ○	QUADPLEX RECEPTACLE - WALL/CEILING MOUNT	18"	CF-CF	CHIME - WALL/CEILING MOUNT	82"
3	CEILING	PRI PT	PRIMARY POTENTIAL TRANSFORMER	NL	NEW LOCATION FOR RELOCATED ITEM	# ○#	EMERGENCY QUADPLEX RECEPTACLE - WALL/CEILING	18"		CHIME/STROBE - WALL/CEILING MOUNT (# = CANDELA) HORN - WALL/CEILING MOUNT	82" 82"
MM	COMMUNICATIONS	R	RACEWAY	_	NOTES & TAGS		MOUNT GFI RECEPTACLE, DUPLEX/QUADPLEX - WALL MOUNT	18"	#E- #E	HORN/STROBE - WALL/CEILING MOUNT (# = CANDELA)	82"
RL.	CURRENT TRANSFORMER CONTROL	RECEPT REFG	RECEPTACLE REFRIGERATOR	XX	EQUIPMENT IDENTIFICATION TAG - SEE EQUIPMENT SCHEDULES	c# c#	GFI RECEPTACLE, DUPLEX/QUADPLEX - WALL MOUNT GFI RECEPTACLE, DUPLEX/QUADPLEX - CEILING MOUNT	10	SF-SF	SPEAKER - WALL/CEILING MOUNT SPEAKER/STROBE - WALL/CEILING MOUNT	82" 82"
	COPPER	RTU	ROOF TOP UNIT			□ □: ■:	GFI DEAD FRONT DEVICE, NORMAL/EMERGENCY - WALL MOUNT	18"	# F - # F	(# = CANDELA)	82"
S	DISTRIBUTED ANTENNA SYSTEM	SEC	SECONDARY SERVICE COOLIND BAR	XXX-X	FEEDER SIZE TAG - SEE POWER RISER SCHEDULE		DUPLEX RECEPTACLE - CONTROLLED - WALL/CEILING	18"	#AF- #AF	COMBINATION FIRE ALARWMASS NOTIFICATION: SPEAKER/STROBE - WALL/CEILING MOUNT(# = CANDELA)	82"
<u>ر</u>	DEDICATED	SGB SMFO	SERVICE GROUND BAR SINGLE MODE FIBER OPTIC	#C #>	ELEC EQUIP CONNECTION TAG - SEE EQUIP SCHEDULE KEYNOTE	c ⇔ c ≎	DUPLEX RECEPTACLE - CONTROLLED - WALL/CEILING MOUNT		FACP	FIRE ALARM CONTROL PANEL - WALL MOUNT	VERIFY
	ELECTRICAL CONTRACTOR	SPKR	SPEAKER	#	MISCELLANEOUS NOTE	•	SPECIAL PURPOSE RECEPTACLE - WALL/CEILING MOUNT	18"	SI	GNAL AND COMMUNICATIONS	S
B <u></u>	ELECTRICAL GROUND BAR ELECTRIC OR ELECTRICAL	STP	SHIELDED TWISTED PAIR	(LC)	LIGHTING CONTROL SEQUENCE - SEE SCHEDULE		EMERGENCY SPECIAL PURPOSE RECEPTACLE -	18"	# >	DATA BOX - WALL MOUNT (# = WIRE COUNTS)	18"
	EMERGENCY ELECTRICAL	SUB	SUBSTATION SWITCH		CABLE TRAY TAG		WALL/CEILING MOUNT	-	#▶ #▶◎	VOICE/DATA BOX - WALL MOUNT/FLOOR BOX (# = WIRE COUNTS)	18"
T	ELECTRICAL METALLIC TUBING	SWBD	SWITCHBOARD	X"W X"H	X" W - WIDTH OF CABLE TRAY X" H - HEIGHT OF CABLE TRAY	● ● ● □	FLOOR BOX - DEVICES AS INDICATED POWER POLE - DEVICES AS INDICATED	VERIFY	#▶	VOICE BOX - WALL MOUNT (# = WIRE COUNTS)	18"
UL	ENCLOSURE ELECTRIC PNEUMATIC	TELCOM	TELEPHONE TELECOMMUNICATIONS	X' - X'' AFF	X' - X" AFF - MOUNTING HEIGHT OF CABLE TRAY (FROM FINISH FLOOR TO BOTTOM OF TRAY)		GROUND REFERENCE BUS - AS NOTED - WALL/CEILING	VERIFY	w ▶	DOUBLE GANG VOICE BOX - HIGH WALL MOUNT WIRELESS ACCESS POINT - WALL/CEILING MOUNT	48" VERIFY
Э	EMERGENCY POWER OFF	TGB	TELECOMMUNICATIONS GROUND BAR		RACEWAYS		MOUNT		©- ©	SPEAKER - WALL/CEILING MOUNT	96"
/C	ELECTRIC WATER COOLER	TMGB	TELECOMMUNICATIONS MAIN GROUND BAR		CONDUIT CONCEALED IN CEILING OR WALLS	-	SWITCHES AND CONTROLS		NS-	HORN SPEAKER - WALL MOUNT	96"
	FUSE OR FUSED FIRE ALARM	TR TSTAT	TAMPER RESISTANT THERMOSTAT		CONDUIT CONCEALED IN THE FLOOR OR BELOW	\$	SINGLE POLE TOGGLE SWITCH	48"	- ◇	VOLUME SWITCH - WALL MOUNT AUDIO JACK (M=MICROPHONE, A=AUXILIARY)	60" 18"
\P	FIRE ALARM ANNUNCIATOR PANEL	TYP	TYPICAL	/\ /- UG-	CONDUIT EXPOSED ON THE CEILING OR WALLS CONDUIT BURIED UNDERGROUND (# = DEPTH)	\$ ² \$ ³	DOUBLE POLE TOGGLE SWITCH THREE WAY TOGGLE SWITCH	48" 48"	IC⊳ _M	WALL INTERCOM STATION (M=MASTER, R=REMOTE)	48"
CP	FIRE ALARM CONTROL PANEL FLOOR BOX	UC UF	UNDER COUNTER UNDER FLOOR	#\	CONDUIT WITH BEND DOWN	\$ ⁴	FOUR WAY TOGGLE SWITCH	48"		BUZZER - WALL/CEILING MOUNT BELL - WALL/CEILING MOUNT	96"
	FIBER OPTIC	UG	UNDER FLOOR UNDER GROUND		CONDUIT WITH BEND UP	\$ ^a	TOGGLE SWITCH - "a" INDICATES SWITCHING PILOT LIGHT TOGGLE SWITCH	48"		CHIME - WALL/CEILING MOUNT	96"
)	FIRE-SMOKE DAMPER	UH	UNIT HEATER	,	CONDUIT WITH BUSHED END CONDUIT WITH BREAK OR CONTINUATION	\$ L	ILLUMINATED TOGGLE - TOGGLE SWITCH	48" 48"	# © - # ©	CLOCK - WALL/CEILING MOUNT (# = DIAMETER)	96"
GND	FILM VIEWER GROUND	UNO	UNLESS NOTED OTHERWISE UNIVERSAL SERIAL BUS		CIRCUIT HOME RUN	\$ ^K	KEYED SWITCH	48"	PRJ VID VID	PROJECTOR/VIDEO CAMERA/DOCUMENT CAMERA - WALL/CEILING MOUNT	VERIFY
ᆔ	GENERAL CONTRACTOR	UTP	UNSHIELDED TWISTED PAIR	\ <u>L1</u> 1,3,5	- L1 INDICATES PANEL - NUMBER	\$ ^{MC} \$ ^{TS}	MOMENTARY CONTACT TOGGLE SWITCH TIMER SWITCH	48" 48"	♦♦	TV SYSTEM OUTLET - WALL/CEILING MOUNT	18"
		1			PULL BOX, SIZE AS NOTED]	MULTI SWITCH, MULTI GANG BOX	48"	^ ^	AUDIO VIDEO SYSTEM OUTLET - WALL/CEILING MOUNT	18"
EP	GROUND FAULT EQUIPMENT PROTECTION	V	VOLT AND			 \$\$\$		40			10
	GROUND FAULT EQUIPMENT PROTECTION		VOLT OR VOLTAGE VOLT-AMP VOLTS ALTERNATING CURRENT	0 0 	JUNCTION BOX - WALL/CEILING MOUNT WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED	#D-	DIMMER SWITCH (# = WATTAGE)	48"	⋄	AV SYSTEMS CONTROLLER - WALL MOUNT AV MONITOR - WALL MOUNT	18"
EP	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO	V VA VAC VDC	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT				DIMMER SWITCH (# = WATTAGE) PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT		· · ·	AV SYSTEMS CONTROLLER - WALL MOUNT AV MONITOR - WALL MOUNT ANNUNCIATOR PANEL - WALL MOUNT	
EP	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE	V VA VAC	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED	#D- B- \$\infty\$	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH	48" 48"	⋄	AV MONITOR - WALL MOUNT	18" 18"
EP	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND	V VA VAC VDC W	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE	#D- B- S \$^*S	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL	48" 48" 48" VERIFY		AV MONITOR - WALL MOUNT ANNUNCIATOR PANEL - WALL MOUNT	18" 18"
EP	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE	#D- B- \$\infty\$	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH	48" 48"	SJ- CR - CARD RE	AV MONITOR - WALL MOUNT ANNUNCIATOR PANEL - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON	18" 18" VERIFY
EP	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT	V VA VAC VDC W WAP	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION)	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60" 60"		AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION	18" 18" VERIFY
EP	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING	######################################	WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE	#D- B- \$ \$ \$ \$ C-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60"	S- CR - CARD RE KP - KEYPAD KS - KEY SWIT	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION CH SECURITY - CEILING MOUNT - TYPICAL	18" 18" VERIFY
=P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60" 60"	©- ⊕- □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □ □	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT	18" 18" VERIFY
=P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING	######################################	WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED -	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60" 60"	©-	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT CSTRIKE ODC - OVERHEAD DOOR CON	18" 18" VERIFY
=P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60" 60"	S- CR - CARD RE KP - KEYPAD KS - KEY SWIT S RX - REQUEST ES - ELECTRIC ML - MAGNETI	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT CSTRIKE ODC - OVERHEAD DOOR CONTACT CLOCK MS - MONITOR STRIKE CLOCK MD - MOTION DETECTOR	18" 18" VERIFY 48"
=P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60" 60"	S- CR - CARD RE KP - KEYPAD KS - KEY SWIT S RX - REQUEST ES - ELECTRIC EL - ELECTRIC ML - MAGNETI TH - POWER T	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION CH SECURITY - CEILING MOUNT - TYPICAL TO EXIT C STRIKE ODC - OVERHEAD DOOR CONTACT C STRIKE C LOCK MS - MONITOR STRIKE C LOCK RANSFER HINGE GB - GLASS BREAKER DETECT	18" 18" VERIFY 48"
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60" 60"	S- CR - CARD RE KP - KEYPAD KS - KEY SWIT S RX - REQUEST ES - ELECTRIC EL - ELECTRIC ML - MAGNETI TH - POWER T ### ### ###########################	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT CSTRIKE ODC - OVERHEAD DOOR CONTACT CLOCK MS - MONITOR STRIKE CLOCK MD - MOTION DETECTOR	18" 18" VERIFY 48"
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED ROUND DOWNLIGHT, RECESSED OR SURFACE MOUNT	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60" 60"	S- CR - CARD RE KP - KEYPAD KS - KEY SWIT S RX - REQUEST ES - ELECTRIC EL - ELECTRIC ML - MAGNETI TH - POWER T ### ### ###########################	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT C STRIKE C DC - DOOR CONTACT C STRIKE C DC - OVERHEAD DOOR CONTACT C STRIKE C LOCK MS - MONITOR STRIKE C LOCK MD - MOTION DETECTOR RANSFER HINGE SECURITY CAMERA - WALL/CEILING MOUNT SECURITY PANEL - WALL MOUNT	18" 18" VERIFY 48" TACT TOR VERIFY
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60" 60"	S- CR - CARD RE KP - KEYPAD KS - KEY SWIT S EX - REQUES ES - ELECTRIC EL - ELECTRIC ML - MAGNET TH - POWER T SECURITY	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT C STRIKE ODC - OVERHEAD DOOR CON CLOCK MS - MONITOR STRIKE C LOCK MD - MOTION DETECTOR RANSFER HINGE GB - GLASS BREAKER DETEC SECURITY CAMERA - WALL/CEILING MOUNT	18" 18" VERIFY 48" TACT TOR VERIFY
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED ROUND DOWNLIGHT, RECESSED OR SURFACE MOUNT SQUARE DOWNLIGHT, RECESSED OR SURFACE MOUNT CEILING WALL WASH FIXTURE OR TRACK HEAD WALL MOUNT FIXTURE OR SCONCE VERIFY	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" 48" VERIFY 60" 60"	S-CR-CARD REKP-KEYPAD KS-KEYSWIT S RX-REQUEST ES-ELECTRIC ML-MAGNET TH-POWERT TH-POWERT SECURITY AI-AUXILIAR	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION CH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT CSTRIKE ODC - OVERHEAD DOOR CON CLOCK MS - MONITOR STRIKE CLOCK MD - MOTION DETECTOR RANSFER HINGE SECURITY CAMERA - WALL/CEILING MOUNT SECURITY PANEL - WALL MOUNT NURSE CALL NURSE CALL - WALL MOUNT - TYPICAL YINPUT STATION D - DUTY STATION	18" 18" VERIFY 48" TACT TOR VERIFY VERIFY
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED ROUND DOWNLIGHT, RECESSED OR SURFACE MOUNT SQUARE DOWNLIGHT, RECESSED OR SURFACE MOUNT CEILING WALL WASH FIXTURE OR TRACK HEAD	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" VERIFY 60" VERIFY 48"	S-CR-CARD REKP-KEYPAD KS-KEYSWIT S EX-REQUEST ES-ELECTRIC ML-MAGNETI TH-POWERT TH-POWERT SECURITY AI-AUXILIARY ANN-ANNUN	AV MONITOR - WALL MOUNT SECURITY SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT C STRIKE ODC - OVERHEAD DOOR CON CLOCK MS - MONITOR STRIKE CLOCK MD - MOTION DETECTOR RANSFER HINGE GB - GLASS BREAKER DETEC SECURITY CAMERA - WALL/CEILING MOUNT SECURITY PANEL - WALL MOUNT NURSE CALL NURSE CALL - WALL MOUNT - TYPICAL YINPUT STATION D - DUTY STATION CIATOR PANEL E - EMERGENCY PULL STATION	18" 18" VERIFY 48" TACT TOR VERIFY VERIFY VERIFY
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED ROUND DOWNLIGHT, RECESSED OR SURFACE MOUNT SQUARE DOWNLIGHT, RECESSED OR SURFACE MOUNT CEILING WALL WASH FIXTURE OR TRACK HEAD WALL MOUNT FIXTURE OR SCONCE VERIFY LINEAR SUSPENDED, LENGTH AS INDICATED	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" VERIFY 60" VERIFY 48"	S-CR-CARD REKP-KEYPAD KS-KEYSWIT S EX-REQUEST ES-ELECTRIC ML-MAGNETI TH-POWERT TH-POWERT SECURITY AI-AUXILIARY ANN-ANNUN	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT C STRIKE ODC - OVERHEAD DOOR CON CLOCK MS - MONITOR STRIKE CLOCK MD - MOTION DETECTOR RANSFER HINGE GB - GLASS BREAKER DETEC SECURITY CAMERA - WALL/CEILING MOUNT SECURITY PANEL - WALL MOUNT NURSE CALL NURSE CALL - WALL MOUNT - TYPICAL YINPUT STATION CIATOR PANEL BED STATION M - MASTER STATION M - MASTER STATION M - MASTER STATION	18" 18" VERIFY 48" TACT TOR VERIFY VERIFY VERIFY
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES CIRCUIT NUMBER LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED ROUND DOWNLIGHT, RECESSED OR SURFACE MOUNT SQUARE DOWNLIGHT, RECESSED OR SURFACE MOUNT CEILING WALL WASH FIXTURE OR TRACK HEAD WALL MOUNT FIXTURE OR SCONCE LINEAR SUSPENDED, LENGTH AS INDICATED VERIFY LINEAR RECESSED, LENGTH AS INDICATED VERIFY ROUND OR SQUARE PENDANT TAPE OR ROPE LIGHT	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" VERIFY 60" VERIFY 48"	S-CR - CARD REKP - KEYPAD KS - KEY SWIT S EX - REQUEST ES - ELECTRIC ML - MAGNETI TH - POWER TO SECURITY AI - AUXILIARY ANN - ANNUN BD - PATIENT C - CODE BLU C/SA - CODE	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT C STRIKE ODC - OVERHEAD DOOR CON C LOCK MS - MONITOR STRIKE C LOCK MD - MOTION DETECTOR RANSFER HINGE GB - GLASS BREAKER DETEC SECURITY CAMERA - WALL/CEILING MOUNT SECURITY PANEL - WALL MOUNT NURSE CALL VINPUT STATION D - DUTY STATION CIATOR PANEL E - EMERGENCY PULL STATION E STATION M - MASTER STATION M - MASTER STATION E STATION M - SECONDARY MASTER ST BLUE/STAFF ASSIST P - PATIENT STATION (ENHAN)	18" 18" VERIFY 48" TATION
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED ROUND DOWNLIGHT, RECESSED OR SURFACE MOUNT SQUARE DOWNLIGHT, RECESSED OR SURFACE MOUNT CEILING WALL WASH FIXTURE OR TRACK HEAD WALL MOUNT FIXTURE OR SCONCE LINEAR SUSPENDED, LENGTH AS INDICATED VERIFY LINEAR RECESSED, LENGTH AS INDICATED VERIFY ROUND OR SQUARE PENDANT	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" VERIFY 60" VERIFY 48"	S-CR - CARD REKP - KEYPAD KS - KEY SWIT S RX - REQUEST ES - ELECTRIC ML - MAGNETI TH - POWER TO SECURITY AI - AUXILIAR ANN - ANNUN BD - PATIENT C - CODE BLU C/SA - CODE I COMBINATION	AV MONITOR - WALL MOUNT SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TO EXIT DC - DOOR CONTACT CSTRIKE ODC - OVERHEAD DOOR CONTACT CLOCK MS - MONITOR STRIKE CLOCK MD - MOTION DETECTOR RANSFER HINGE GB - GLASS BREAKER DETEC SECURITY CAMERA - WALL/CEILING MOUNT SECURITY PANEL - WALL MOUNT NURSE CALL NURSE CALL - WALL MOUNT - TYPICAL (INPUT STATION CIATOR PANEL BED STATION M - MASTER STATION E - EMERGENCY PULL STATION D - DUTY STATION M - MASTER STATION ESTATION M - SECONDARY MASTER ST BLUE/STAFF ASSIST N STATION (BASIC)	18" 18" VERIFY 48" VERIFY VERIFY VERIFY VERIFY ON FATION ICED)
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORWAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED ROUND DOWNLIGHT, RECESSED OR SURFACE MOUNT SQUARE DOWNLIGHT, RECESSED OR SURFACE MOUNT CEILING WALL WASH FIXTURE OR TRACK HEAD WALL MOUNT FIXTURE OR SCONCE UNDER SUSPENDED, LENGTH AS INDICATED VERIFY LINEAR RECESSED, LENGTH AS INDICATED VERIFY ROUND OR SQUARE PENDANT TAPE OR ROPE LIGHT UNDER CABINET FIXTURE, LENGTH AS INDICATED	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" VERIFY 60" VERIFY 48"	S-CR-CARD REKP-KEYPAD KS-KEYSWIT S RX-REQUEST ES-ELECTRIC EL-ELECTRIC ML-MAGNETT TH-POWERT TH-POWERT TH-POWERT TH-POWERT AI-AUXILIARY ANN-ANNUN BD-PATIENT C-CODE BLU C/SA-CODE I COMBINATION C-B-CODE B	AV MONITOR - WALL MOUNT SECURITY SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT C STRIKE ODC - OVERHEAD DOOR CON C LOCK MS - MONITOR STRIKE C LOCK MD - MOTION DETECTOR RANSFER HINGE GB - GLASS BREAKER DETEC SECURITY CAMERA - WALL/CEILING MOUNT SECURITY PANEL - WALL MOUNT NURSE CALL VINPUT STATION D - DUTY STATION CIATOR PANEL BED STATION M - MASTER STATION M - MASTER STATION D - PATIENT STATION (ENHAN) P1 - PATIENT STATION (BASIC) ABY STATION SA - STAFF ASSIST STATION TO ADTIENT STATION P1 - PATIENT STATION (BASIC) ABY STATION TO ADTIENT STA	18" 18" VERIFY 48" VERIFY VERIFY VERIFY VERIFY ON FATION ICED)
= P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES CIRCUIT NUMBER b - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED ROUND DOWNLIGHT, RECESSED OR SURFACE MOUNT SQUARE DOWNLIGHT, RECESSED OR SURFACE MOUNT CEILING WALL WASH FIXTURE OR TRACK HEAD WALL MOUNT FIXTURE OR SCONCE UVERIFY LINEAR SUSPENDED, LENGTH AS INDICATED VERIFY LINEAR RECESSED, LENGTH AS INDICATED VERIFY UNDER CABINET FIXTURE, LENGTH AS INDICATED TRACK FIXTURE, NUMBER OF HEADS AS INDICATED VANITY FIXTURE EMERGENCY BATTERY LIGHT - WALL/CEILING MOUNT	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" VERIFY 60" VERIFY 48"	S-COMBINATIO	AV MONITOR - WALL MOUNT SECURITY SECURITY SECURITY - WALL MOUNT - TYPICAL ADER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT C STRIKE ODC - OVERHEAD DOOR CON CLOCK MS - MONITOR STRIKE CLOCK MD - MOTION DETECTOR RANSFER HINGE GB - GLASS BREAKER DETEC SECURITY CAMERA - WALL/CEILING MOUNT SECURITY PANEL - WALL MOUNT NURSE CALL NURSE CALL NURSE CALL VINPUT STATION D - DUTY STATION CIATOR PANEL BED STATION M - MASTER STATION M - MASTER STATION ME STATION M - SECONDARY MASTER ST BILUE/STAFF ASSIST N STATION SA - STAFF ASSIST STATION E BABBY/STAFF ASSIST N STATION TV - PATIENT TV STATION WF - WORK FLOW (TOUCH SO	18" 18" VERIFY 48" VERIFY VERIFY VERIFY VERIFY ON FATION ICED) CREEN)
=P	GROUND FAULT EQUIPMENT PROTECTION GROUND FAULT CIRCUIT INTERRUPTER HAND HOLE HAND OFF AUTO ISOLATED GROUND JUNCTION BOX KILOVOLT KILOVOLT-AMP KILOWATT	V VA VAC VDC W WAP WP X	VOLT-AMP VOLTS ALTERNATING CURRENT VOLTS DIRECT CURRENT WATT, WIRE OR WALL PHONE WIRELESS ACCESS POINT WEATHERPROOF EXISTING		WIREWAY, DUCT BANK, OR FLOOR DUCT AS NOTED CABLE TRAY, TYPE/SIZE AS INDICATED LIGHT FIXTURE ID - REFER TO LIGHT FIXTURE SCHEDULE (SCHEDULE OVERRIDES SYMBOL ABBREVIATION) A - INDICATES LIGHT FIXTURE TYPE # - INDICATES SWITCHING LIGHT FIXTURE CIRCUIT TYPE - NO HATCH INDICATES NORMAL CIRCUIT - ANGLED HATCH INDICATES CRITICAL CIRCUIT - SOLID HATCH INDICATES LIFE SAFETY CIRCUIT TROFFER TYPE LIGHT FIXTURE, SIZE AS INDICATED - CEILING MOUNT CHANNEL OR INDUSTRIAL, LENGTH AS INDICATED CHANNEL OR INDUSTRIAL WALL MOUNT, LENGTH AS INDICATED ROUND DOWNLIGHT, RECESSED OR SURFACE MOUNT SQUARE DOWNLIGHT, RECESSED OR SURFACE MOUNT CEILING WALL WASH FIXTURE OR TRACK HEAD WALL MOUNT FIXTURE OR SCONCE LINEAR SUSPENDED, LENGTH AS INDICATED VERIFY LINEAR RECESSED, LENGTH AS INDICATED VERIFY ROUND OR SQUARE PENDANT TAPE OR ROPE LIGHT UNDER CABINET FIXTURE, LENGTH AS INDICATED TRACK FIXTURE, NUMBER OF HEADS AS INDICATED VANITY FIXTURE	#D- B- S> \$°S \$°S C- D- R-	PUSH BUTTON SWITCH OCCUPANCY SENSOR - CLG MOUNT OCCUPANCY SENSOR WALL SWITCH PHOTO ELECTRIC CELL TIME CLOCK CONTACTOR RELAY	48" 48" VERIFY 60" VERIFY 48"	S-CR-CARD REKP-KEYPAD KS-KEYSWIT S RX-REQUEST ES-ELECTRICE L-ELECTRICE ML-MAGNET TH-POWERT TH-POWERT TH-POWERT AI-AUXILIAR ANN-ANNUN BD-PATIENT C-CODE BLU C/SA-CODE COMBINATION C-B-CODE B C-B/SA-COD COMBINATION CC-CALL CA	AV MONITOR - WALL MOUNT SECURITY SECURITY SECURITY - WALL MOUNT - TYPICAL ADDER EP - EXIT PUSHBUTTON M - MASTER STATION TCH SECURITY - CEILING MOUNT - TYPICAL TO EXIT DC - DOOR CONTACT CSTRIKE ODC - OVERHEAD DOOR CON CLOCK MS - MONITOR STRIKE CLOCK MS - MONITOR STRIKE CLOCK MD - MOTION DETECTOR RANSFER HINGE GB - GLASS BREAKER DETEC SECURITY CAMERA - WALL/CEILING MOUNT SECURITY PANEL - WALL MOUNT NURSE CALL NURSE CALL - WALL MOUNT - TYPICAL YINPUT STATION D - DUTY STATION CIATOR PANEL BED STATION M - MASTER STATION E STATION M - MASTER STATION BLUE/STAFF ASSIST N STATION P - PATIENT STATION (ENHAN P1 - PATIENT STATION (BASIC ABY STATION SA - STAFF ASSIST STATION WF - WORK FLOW (4-BUTTO) NCEL WE1 - WORK FLOW (4-BUTTO)	18" 18" VERIFY 48" VERIFY VERIFY VERIFY VERIFY ON FATION ICED) CREEN)
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0 4' 8' 16' 24' 1/16"=1'-0"

3/32"=1'-0"

1/8"=1'-0"

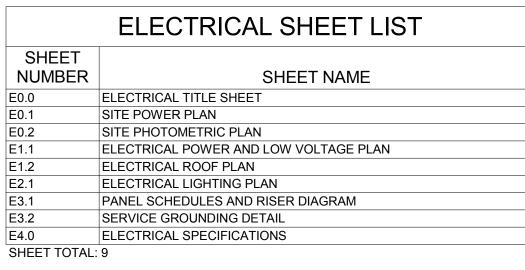
0 2' 4' 6' 1/4"=1'-0"

3/8"=1'-0"

0 6" 1' 2' 3'

3/4"=1'-0"

	ELECTRICAL SHEET LIST
SHEET NUMBER	SHEET NAME
E0.0	ELECTRICAL TITLE SHEET
E0.1	SITE POWER PLAN
E0.2	SITE PHOTOMETRIC PLAN
E1.1	ELECTRICAL POWER AND LOW VOLTAGE PLAN
E1.2	ELECTRICAL ROOF PLAN
E2.1	ELECTRICAL LIGHTING PLAN
E3.1	PANEL SCHEDULES AND RISER DIAGRAM
E3.2	SERVICE GROUNDING DETAIL
E4.0	ELECTRICAL SPECIFICATIONS
CLIEFT TOTAL.	



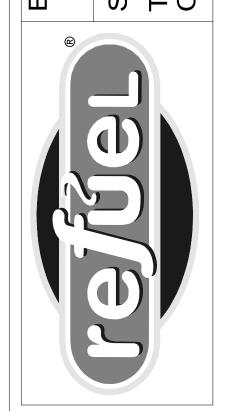


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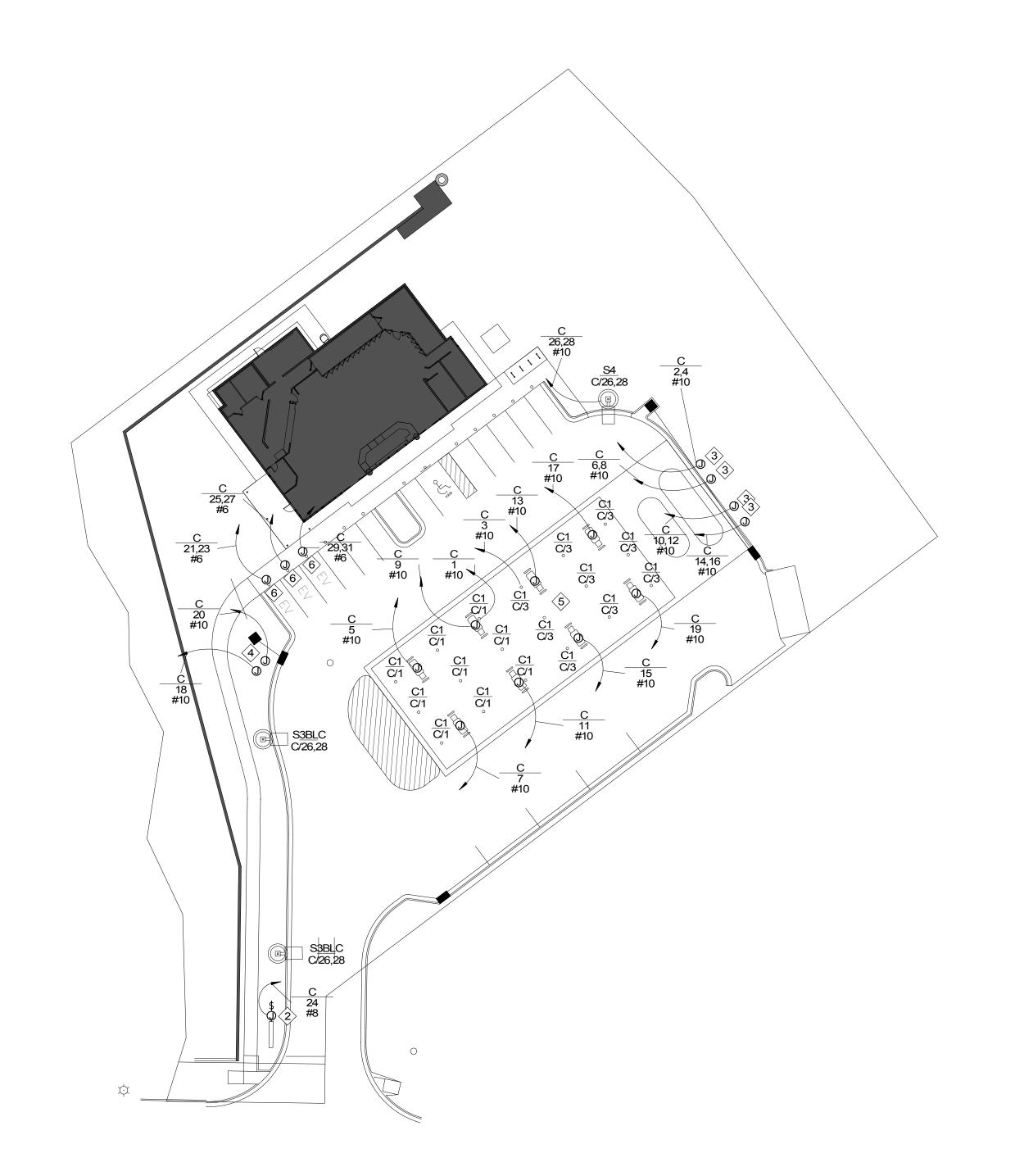


3"=1'-0"

6"=1'-0"

0 3" 6" 9" 1' 1.5' 0 3" 6" 9" 1' 1"=1'-0" 11/2"=1'-0"

E0.0



GENERAL NOTES:

- A. 120 VOLT BRANCH CIRCUITS IN EXCESS OF 75' SHALL HAVE CONDUCTOR SIZE INCREASED A MINIMUM OF 1 CONDUCTOR SIZE. INSTALLING CONTRACTOR SHALL DETERMINE ACTUAL CONDUCTOR SIZE TO BE INSTALLED TO ADHERE TO VOLTAGE DROP REQUIREMENTS.
- B. EACH SINGLE POLE BRANCH CIRCUIT SHALL BE PROVIDED WITH SEPARATE NEUTRAL CONDUCTOR. IF EC INSTALLS MULTIWIRE BRANCH CIRCUIT A MULTIPOLE BREAKER SHALL BE INSTALLED PER THE SPECIFICATION AS MEANS TO SIMULTANEOUSLY DISCONNECT ALL UNGROUNDED CONDUCTORS AT THE POINT WHERE THE BRANCH CIRCUIT ORIGINATES PER NEC 210.4B.
- C. ALL WORK SHALL COMPLY WITH NEC SECTIONS 514 AND 515.
- D. SUMBMRSIBLE PUMP CONTROLLER PROVIDED BY OTHERS. MAKE ALL CONNECTIONS AS REQUIRED.
- E. CONNECT ALL EQUIPMENT PER MANUFACTURERS WRITTEN INSTRUCTIONS.
- F. SEE RISER DIAGRAM ON SHEET E1.0 FOR FURTHER CONDUIT DETAILS AS THEY PERTAIN TO THE SITE.
- G. SEE SITE PHOTOMETRIC PLAN ON SHEET E0.2 FOR EXACT LOCATIONS OF SITE LIGHTS AND ARCHITECTURAL ELEVATIONS FOR LOCATIONS OF WALL MOUNTED LIGHTS.
- H. PROVIDE EXPLOSION PROOF CONNECTIONS AND SEAL OFFS AS REQUIRED FOR ALL HAZARDOUS AREAS AND WHEN ENTERING THE BUILDING FROM HAZARDOUS AERAS.
- SEE GASOLINE VENDOR DRAWINGS/SHOP DRAWINGS FOR ADDITIONAL REQUIREMENTS.

KEY NOTES:

- 1> PROVIDE CONNECTION TO FUEL PUMP DISPENSER. COORDINATE WITH FUEL PUMP VENDOR PRIOR TO ROUGH-IN.
- PROVIDE WEATHERPROOF LOCAL DISCONNECT PER NEC 600 AND MAKE FINAL CONNECTION TO MONUMENT SIGN. COORDINATE WITH SIGN VENDOR PRIOR TO ROUGH-IN.
- PROVIDE CONNECTION TO SUBMERSIBLE PUMP. LOCATION SHOWN FOR REFERENCE ONLY. VERIFY EXACT LOCATION WITH OWNER REPRESENTATIVE PRIOR TO ROUGH-IN.
- 4> PROVIDE POWER FOR AIR AND VACUUM STATION, COORDINATE EXACT LOCATION WITH CIVIL PRIOR TO ROUGH-IN.
- PROVIDE CONNECTION TO EMERGENCY SHUT OFF BUTTON LOCATED AT CHECKOUT.
- PROVIDE CONNECTION TO OWNER PROVIDED ELECTRIC VEHICLE CHARGING STATION. VERIFY EXACT REQUIREMENTS OF OWNER PROVIDE EQUIPMENT PRIOR TO ROUGH-IN AND ADJUST THE CIRCUIT BREAKER, WIRDENAM AND STREET OF ACCOMMODATE SPECIFIC MANUFACTURER CHARGING STATION REQUIREMENTS.

 1 #12 WIRE TO FIXTURE(S) OR AS INDICATED. PROVIDE IN-
 - LINE FUSE AND FUSE HOLDER WITH BREAKAWAY CAPABILITY, FERRAZ SHAWMUT FEY, COOPER HEB SERIES, (4)(20)(XX) AMPERE BUSSMAN TYPE KTK OR PRE-APPROVED EQUAL.
 - 2 PROVIDED BUSHED RIGID CONDUITS. CONDUIT STUBBED UP ADJACENT TO HANDHOLE; NUMBER AND SIZE AS REQUIRED. CAP SPARE CONDUITS.
 - (3) COPPER EQUIPMENT GROUNDING CONDUCTOR ATTACH TO INTERNAL LUG WELDED TO INTERIOR OF POLE. CONDUCTOR TO BE SAME SIZE AND TYPE AS SUPPLY PHASE CONDUCTOR.
 - (4) INSULATED COPPER GROUNDING CONDUCTOR ATTACHED TO INTERNAL LUG WELDED TO INTERIOR OF POLE. SIZE PER NFPA 70. EXOTHERMIC WELD TO DRIVEN GROUND ROD.
 - > 3/4"x10' COPPER GROUND ROD (MIN 6" BELOW GRADE).
 - FIXTURE POLE REFER TO SITE LIGHTING FIXTURE SCHEDULE AND LIGHTING STANDARD DETAILS.
 - (7) SET TOP OF CONCRETE FOUNDATION ABOVE GRADE 3'-0".
 - PROVIDE DOUBLE ANCHOR BOLT NUTS ABOVE AND BELOW POLE BASE. ADJUST TO PLUMB POLE. ANCHOR BOLT ASSEMBLY SHALL BE PROVIDED BY POLE MFG. INSTALL ACCORDING TO MFG TEMPLATE. USE SHRINK PROOF GROUT ON BASE. FURNISH BASE COVER FOR
 - 9 REINFORCED ROUND CONCRETE FOUNDATION BASE. CONCRETE 5-7% AIR ENTRAINED 4000 PSI MINIMUM. 3 INCH MINIMUM CONCRETE COVER ON BARS AND TIES. FINISH CONCRETE ABOVE GRADE LEVEL AND BEVEL EDGE 45 DEGREES. FOOTING SHALL BE FORMED WHERE SOIL CONDITIONS REQUIRE. CHAMFER ALL EDGES OF CONCRETE BASE 1/2". TREAT EXPOSED CONCRETE WITH PROSOCO SALT-GUARD WATER-BASED OR PRE-APPROVED EQUAL.
 - 10 FULLY COMPACTED BACKFILL.
 - (1) CIRCUIT CONDUCTORS AND CONDUIT TO POWER SOURCE OR NEXT POLE.
 - 12 #4 BARS VERTICAL AT 6" EACH FACE (UNLESS NOTED OTHERWISE ON SITE LIGHTING FIXTURE SCHEDULE).
 - (13) #3 BARS AT 12" ON CENTER HORIZONTALLY (UNLESS NOTED OTHERWISE ON SITE LIGHTING FIXTURE SCHEDULE).
 - REFER TO STRUCTURAL DRAWNGS FOR DEPTH "Y" AND WIDTH "X" DIMENSIONS.
 - 15 PROVIDE A MINIMUM ONE INCH RACEWAY FOR SECURITY DEVICES (AND CCTV CAMERAS). RACEWAY SHALL EXTEND TO SECURITY SYSTEM HEAD END UNLESS NOTED OTHERWISE.

BASE HEIGHT NOTES

- 1. BASE HEIGHT IS TYPICAL FOR SEDIMENTARY AND FOLIATED ROCK SOIL, ROUND TAPERED, POLES EXPOSED TO WINDS OF 70MPH, WITH ONE LIGHT FIXTURE.
- 2. CONFIRM WITH STRUCTURAL ENGINEER FOR BASE WIDTH AND DEPTH REQUIREMENTS IF ENVIRONMENTAL VARIABLES DIFFER FROM ABOVE. [REFER TO POLE DEPTH CALCULATION FOR ADDITIONAL INFORMATION].

DETAIL A

BASE HEIGHT SCHEDULE

-2 (9 - 1)		J J	
POLE HEIGHT	"Y" DEPTH (FEET)	"X" WIDTH (INCHES)	REBAR
<14'	5	16	(4)#5 REBAR
<14'	4.5	24	(4)#5 REBAR
15'-29'	6	24	(6)#5 REBAR
30'-40'	8	24	(8)#5 REBAR
30'-40'	6	30	(8)#5 REBAR

EXTERIOR POLE BASE DETAIL WITH GROUNDING NO SCALE

NOTE						GHT FIXTURE SCHEDULE - SITE ECTRICAL							
NOTE		CONTROL MEDIA (LENS,	FIXTURE	BALLAST/		LAMPS				FIXTURE			
INOIL	MANUFACTURER'S SERIES NUMBER	LOUVER, ETC.)	MAX VA	DRIVER	COLOR	TYPE	MOUNTING	VOLTAGE	FIXTURE STYLE	LETTER			
)0	CREE LIGHTING: CPY250-B-DM-F-B-UL-WH-4000	FLAT LENS	96 VA	N/A	4000K	INTEGRAL LED	SURFACE	120	CANOPY LIGHT	C1			
1,2 C	CREE LIGHTING: OSQL-B-22L-40K7-3M-UL-OSQ-ML-B-DA-BK-BLC	N/A	132	N/A	4000K	INTEGRAL LED	POLE	208	TYPE 3 POLE MOUNTED LIGHT	S3BLC			
2	CREE LIGHTING: OSQL-B-22L-40K7-4M-UL-OSQ-ML-B-DA-BK	N/A	132	N/A	4000K	INTEGRAL LED	POLE	208	TYPE 3 POLE MOUNTED LIGHT	S4			
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Chesapeake, VA 23320





E0.1

1 Site - Electrical - New - Plot 1" = 30'-0"

1/16"=1'-0"

3/32"=1'-0"

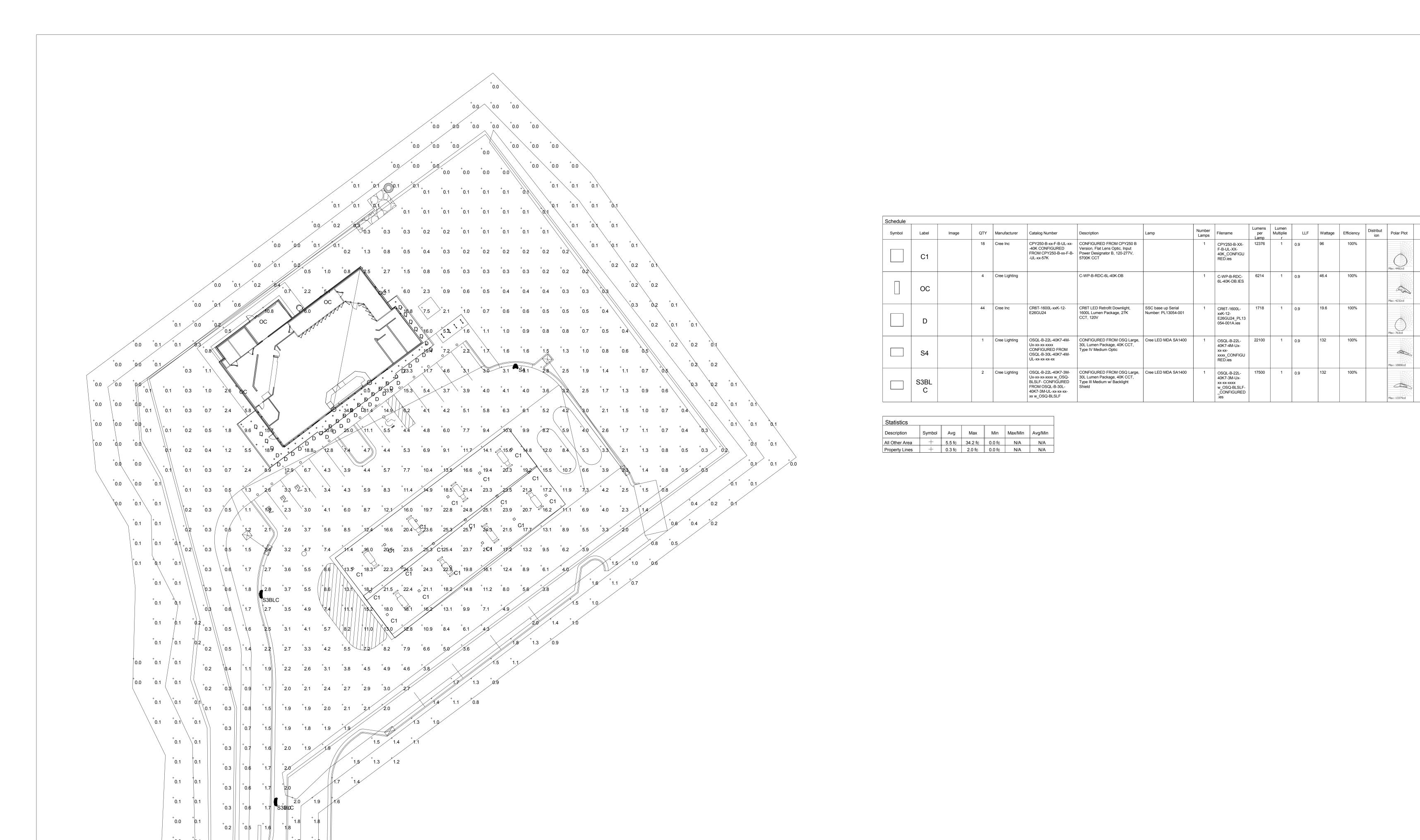
1/8"=1'-0"

1/4"=1'-0"

0 4' 8' 16' 24' 0 1" 2" 3" 4" 5" 6" 3"=1'-0" 0 1' 2' 3' 4' 0 6" 1' 2' 3' 0 6" 1' 0 3" 6" 9" 1' 1.5' 0 3" 6" 9" 1' 0 1" 2" 3" 6"=1'-0" 1"=1'-0" 3/4"=1'-0" 1 1/2"=1'-0"

1/2"=1'-0"

3/8"=1'-0"



3/8"=1'-0"

0 6" 1' 2' 3'

1/2"=1'-0"

0 2' 4' 6'

1/4"=1'-0"

+0.0 +0.0 +0.1 +0.1 +0.5 +0.9 +0.8

0.0 + 0.0 + 0.0 + 0.1 + 0.4 + 0.7

0 4' 8' 16'

3/32"=1'-0"

0 4' 8' 12'

1/8"=1'-0"

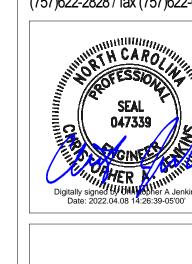
1 SITE PHOTOMETRIC NO SCALE

1/16"=1'-0"

0 4' 8' 16' 24'

DUNHAM

50 South Sixth Street / Suite 1100
Minneapolis, Minnesota 55402-1540
PHONE 612.465.7551
WEB dunhameng.com
FIRM LICENSE NO. C-1800
mechanical + electrical
consulting engineering



Chesapeake, VA 23320

PHOTOMETRIC PLAN
RE# 022 - CARRAWAY VILLAGE
- VILLAGE CENTER DRIVE



0 1" 2" 3" 4" 5" 6" 3"=1'-0"

0 3" 6" 9" 1' 1.5' 1"=1'-0"

0 6" 1' 2'

3/4"=1'-0"

0 3" 6" 9" 1' 1 1/2"=1'-0" 0 1" 2" 3" 6"=1'-0" E0.2

1.1 Scope of Work A. The general, special, and other conditions of the architectural, mechanical and vendor

documents shall be considered an integral part of these electrical specifications. B. Reference to "contractor" in this specification shall mean "electrical contractor (EC)" unless otherwise noted. Work specified herein is the responsibility of the electrical contractor unless specifically noted otherwise.

C. Furnish labor, materials, equipment, tools, and other items necessary for, or incidental to. installation of a complete electrical system as required for this project.

D. Also include other work and miscellaneous equipment not specifically mentioned, but reasonably inferred, that are required for a fully functional and tested system.

1.2 Drawings and Documents

A. The drawings and specifications form a complete set of plans for the electrical work for this project. In the event the drawings and specifications conflict, the greater requirement or cost shall be included in the bid, or if time, a clarification will be issued.

B. Bidders shall examine other trade and equipment vendor drawings and specifications to avoid omissions, duplications, and to ensure the complete installation of electrical work. Verify scales and report dimensional discrepancies or other conflicts with the architect before

C. The electrical drawings are diagrammatic and are intended to show approximate location only. Followed drawings as closely as actual construction and work of other trades will permit. Placement of electrical equipment and devices shall not interfere with locations or clearances of other trades' materials or equipment. Coordinate the placement of electrical devices with architectural plans, elevations, and details.

D. Govern exact routing of cable and wiring and the locations of outlets by the structure and equipment served. Use dimensions from architectural drawings.

E. The direct routing of conduits and wiring is not assured. Exact requirements shall be governed by the conditions of the project site. Extra lengths of wiring or the addition of pull or junction boxes, etc., necessitated by such conditions, shall be included in the bid.

F. Drawing representations; conduits, circuiting, devices, speakers, etc., shown on the drawings as existing are based on existing plans and may not be installed as originally shown. Verify the accuracy of the "existing conditions" as shown on the drawings as the demolition work progresses. Perform modifications and additions as necessary to correct for these hidden conditions and allow for the completion of the work.

1.3 Conditions at the Site

A. Examine the site and be familiar with existing building conditions and limitations before submitting a bid. No extra payment will be allowed for work required because of these conditions, or if the information is visible or readily attainable, for limitations or misunderstanding of existing conditions.

B. Discrepancies from these documents should be reported to the architect/engineer before bid. 1.4 Job Site Safety

A. The electrical contractor is responsible for electrical job site safety, including the safety of

people and property during the performance of work. This requirement will apply continuously

and not be limited to normal working hours. B. No act, drawing review or construction review by the owner, the engineers or their

consultants, is intended to include a review of the adequacy of the contractor's safety measures in, on, or near the construction site

PART 2 - GENERAL REQUIREMENTS

2.1 Codes, Inspections, and Fees

A. The completed electrical installation shall comply with the latest edition of the national electrical code as well as applicable federal, state, and local codes, regulations, and standards including interpretations by appropriate authorities having jurisdiction. Where the drawings and specifications call for workmanship or materials over code or regulatory requirements, the drawings and specifications shall govern.

B. The work specified herein shall be subject to inspection and approval by state and local

authorities having jurisdiction and the engineer. The contractor shall make the necessary arrangements to have the electrical work inspected by the appropriate inspector(s) and shall provide electronic *.pdf copies of final signed "certificate of inspection" to the owner. C. Obtain and pay for licenses, permits, and fees for work installed by the contractor. The

contractor is responsible to pay fees levied by the electric utility company for connection to

2.2 Workmanship and Contractor Qualifications

A. Provide electrical equipment and materials neatly and competently by persons experienced and skilled in the trade and accordance with available standards. Haphazard or poor installation will be a cause for rejection of work. Exposed components of the electrical systems shall be square and true with building lines and surfaces.

B. Contractor shall be licensed in the state in which the project is located.

2.3 Coordination of Work

A. Give careful consideration to the work of the general, mechanical and other contractors/subcontractors on the project. Organize and phase the electrical work so that it will not interfere with the work of other trades.

B. Drawings and specifications for other trades and general construction drawings shall be consulted for coordination information, details, dimensions, etc. Coordinate shafts, chases, furred spaces, suspended ceiling, locations of equipment, etc. The contractor shall review the mechanical-electrical drawings and equipment drawings of other disciplines, including data, security, audio-video, closed-circuit television, paging, fire alarm, and kitchen. The contractor shall be responsible to report discrepancies between these drawings to the engineer before bidding for clarification. Solutions to unreported discrepancies will be determined by the engineer, with no additional compensation due to the contractor.

C. The location of equipment outlets and wiring shall be verified with the actual equipment or approved shop drawings before rough-in work. Notify engineers of discrepancies.

D. Dimensions given on the drawings shall take precedence over scaled dimensions. Dimensions, whether calculated or scaled, shall be verified in the field.

E. Check actual job conditions before fabricating work. Coordinate with other trades to avoid rework due to field conditions. Changes or additions, subject to additional compensation, which is made without written authorization and an agreed price, shall be at the contractor's risk and expense

F. Coordinate routing of conduit and wire concealed in walls, soffits or ceilings installed by the general contractor. Coordinate work to conceal conduit and wire.

G. Verify items such as door swings, window locations, casework, etc., before installing electrical equipment or devices. H. Make minor adjustments to work when requested by the owner or the owner's representative

when adjustments are necessary for proper operation and within the intent of the contract. 2.4 Materials and Equipment

A. Unless otherwise specified, material and equipment shall be new and manufactured by approved or listed manufacturers. Materials and equipment shall meet the requirements of

B. Material and equipment shall be listed and labeled by Underwriters Laboratories, Inc. (UL), as conforming to its standards in every case where such a standard has been established for that type of material or equipment.

C. Obtain written approval seven days before bid, to use proposed substitute material or equipment before contracting to purchase such substitutes. The owner reserves the right to require the removal of material or equipment which does not have this written approval and which does not comply with the specifications, regardless of the state of installation of such

D. Where equipment supplied by the contractor has characteristics other than as specified herein, the contractor shall, at no additional cost to the owner, remove and replace the electrical work necessitated by the substituted product

E. Equipment and device terminals and lugs must be rated for 60/75 degrees C or 75 degrees C F. Provide necessary hardware, hangers, blocking, brackets, bracing, runners, etc., required for

2.5 Shop drawings and submittals

equipment specified under this section.

A. Submit shop drawings for electrical equipment in *.pdf format. Shop drawing submittals shall allow for a minimum of seven working days for engineer review.

B. Shop drawings shall be detailed, dimensioned manufacturers' drawings. Each set of documents shall list the project name and address, and the contractor's name, address, and telephone number. An index page shall list individually the items in the submittal with references to type designations or other identifiers noted on drawings.

C. Submittal to the engineer shall be via the general contractor and, where required, the architect. Do not submit incomplete shop drawings. Shop drawings that are incomplete or not signed by both the contractor and the general contractor shall be returned without review.

D. Cross out information or options not being provided or does not apply to the project. Failure to do so assumes that equipment, options, and accessories shown in the shop drawing submittal

E. If the contractor uses materials other than those specified, the contractor shall be responsible for replacement, at no additional cost to the owner.

F. The approval stamp on the shop drawings does not relieve the contractor or the supplier of responsibility for full contract compliance.

2.6 Operations and Maintenance Manuals and Record Drawings

A. Provide manuals to the owner covering the operation and maintenance of equipment provided under this contract. The manuals shall be digitally submitted to the architect/engineer for approval via e-mail, electronic files transfer, or USB. Manuals shall contain the following:

1. Complete manufacturer catalog data, manufacturer's literature, wiring diagrams, detailed operating instructions, and a complete listing of suppliers and distributors where replacement parts and maintenance services are available for installed equipment. Include electrical shop drawings in *.pdf. Provide an AutoCAD file of drawings if available

Physical description and installation instructions, user's manual and operating instructions.

Replaceable parts list. Include the light fixture schedule with replacement lamps per fixture

4. Inspection certificates, signed by the appropriate inspector. 5. Full listing of product warranties and extended warranties with registration and contact

Indexed *.pdf documents of items in the manual.

B. Markup a set of construction documents as work progresses. Show actual circuit routing with dimensioned information, sizes, types, etc., equipment location changes, and other changes or deviations between project work, as-built, and contract documents. Markings shall be neat, legible, and permanent. Transfer applicable markings to the second set of documents and

provide both sets of record documents to the owner. .7 Excavation and Backfilling A. Perform excavation and backfill required for the installation of underground piping. Surplus materials are to be disposed of by the contractor.

B. Trenches shall be of sufficient width. Brace trenches to prevent cave-in or settlement. Use pumping equipment if required for dewatering. C. Backfill trenches with a maximum of 6-inch layers of well tamped dry earth to prevent

2.8 Temporary Installations

A. Comply with the owner and general contractor requirements. Electrical work must conform to NEC Article 590, temporary installations.

B. Continuation of service: maintain continuity of existing equipment to remain. Maintain existing circuits of equipment energized. Restore circuits wiring which is to remain but was disturbed during demolition back to original condition.

C. Electric power system: provide an electrical distribution system of sufficient size, capacity, and power characteristics required for construction operations.

D. Provide temporary electrical service as required for the project.

1. Utilize existing building electrical distribution if available, and supplement as required for the project conditions. For service construction or service revisions, coordinate with the utility to provide temporary service for the duration of construction so as not to interfere with service construction. Pay for

utility charges associated with the temporary service including energy bills. E. Lighting: provide temporary lighting with local switching throughout the construction area. Provides adequate illumination for construction operations, observations, inspections, and traffic conditions.

F. Where light fixtures exist in the area of construction, utilize existing lights and outlets as much as practical to meet these requirements. Clean and re-lamp each fixture used for temporary at end of construction.

G.Remove the temporary installation of electrical equipment, raceway and wire at the end of the project. Patch and seal sleeve openings.

2.9 Protection of Equipment and Material A. Store and protect from damage equipment and material delivered to the job site. Cover with

waterproof, tear-resistant, heavy duty tarp or polyethylene plastic as required to protect from construction debris, water, dust, etc. B. Plug or cap open ends of pipes and ducts while stored or installed during construction to prevent entrance of debris into the systems.

A. Material Properties

ACI 318Reinforcing Steel (Fy): Typical 60,000 psi ATSM A615 Grade 60. Cast-in-Place Concrete (fc) at 28 days, u.n.o.: 4,000 psi w/c less than or equal to 0.42; maximum aggregate size=3/4 inches. max slump=3 inches at placement. B. The contractor shall verify dimensions and existing conditions in the field that affect construction before commencing work on the affected element of shop drawing submittals. Resolve any discrepancies with the architect before construction. Pad to be a minimum 4

inches greater than the equipment footprint. C. The detailing, fabrication and erection of reinforcing shall be done per the latest edition of ACI-315, "Manual of Standard Practice for Detailing Reinforced Concrete Structures and ACI-318, "Building Code Requirements for Structural Concrete.

Aluminum conduit, aluminum sleeves, and aluminum embeds are not permitted in concrete. Calcium chloride is not permitted as a concrete additive D. Provide suitable wire spacers, chairs, etc. for support of reinforcing steel in proper position while placing concrete. Bars shall be tied to prevent displacement while placing concrete. Chairs and slab bolsters shall be plastic or steel with plastic tips. Chairs are to be stable and

E. Where new pad abuts existing pad, place matching joints in new, i.e. match existing joints. Match pad existing height (provide 3½ inch min). F. Dowel new concrete pad extension to the existing concrete pa

G.Provide galvanized anchor bolts to secure equipment to the pad. Size, number, and placement per equipment manufacturer.

2.11 Cutting and Patching

resist tipping.

A. Workmanship; layout work in advance. Exercise care where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, or other surfaces is necessary for proper installation, support, or anchorage of conduit, raceways, or other electrical work. Repair

damage to buildings, piping, and equipment using skilled craftsmen of trades involved B. Perform core drilling, cutting and patching necessary for the completion of the electrical work for this project. Fill abandoned and unused core drills.

C. Surfaces that are disturbed by the contractor shall be repaired and refinished to provide a surface equal in strength, durability, and appearance to the original surface.

D. Where it is necessary to drill or cut concrete surfaces, the edges shall be sharply defined. Core holes shall be made with a rotary drill. Rectangular concrete cuts shall be made with a concrete saw. Do not penetrate post-tension slabs before the x-ray of the floor.

E. Penetrations through smoke, fire, hazardous area or other rated separations shall be fire sealed to preserve the ratings of the separations. F. Cutting, drilling, patching, repairing, and refinishing shall be done by persons skilled

G. Avoid cutting and boring holes through the structure or structural members wherever possible

Obtain prior approval of structural engineer and conform to structural requirements when cutting or boring the structure is necessary and permitted.

H. Clean away rubbish and litter generated during electrical installation.

A. Upon completion of the work and at other times directed, remove materials and scrap

generated by the electrical installation and leave the premises in a clean and orderly condition. B. Clean electrical equipment interiors before energizing and before final acceptance. Clean light fixtures lenses, reflectors, and trims. Repair, clean and touch up minor scratches or blemishes on the factory painted equipment.

C. Damaged, dented or refurbished equipment shall be rejected and replaced at the contractor's

2.13Acceptance Demonstration and Training

A. Perform system start-up, testing, and programming before the owner's training. Do not schedule demonstrations until systems are fully operational and ready to turn over to the

B. Demonstrate to the owner the operation of the electrical installations. The timing of the demonstration will be determined by the owner upon completion of the work. C. Properly set automatic time switches to perform switching operations per schedules provided

by the owner's representative, and demonstrate (using the manufacturer's operating

instructions) how to override, test and program lighting/systems.

and special conditions. Incandescent and halogen lamps are excluded.

A. Provide the owner with rebate forms, filled out with applicable project information, for utility or product rebate programs to which the owner is eligible.

2.15Guarantees and Warranties A. Furnish the owner with a written guarantee for one (1) year against the failure of part of the electrical systems installed due to faulty material or workmanship, without charges, to the owner. Guarantee period to start upon substantial completion or as specified under general B. Pass one extended warranty or product warranties exceeding one (1) year to the owner.

DIVISION 26 ELECTRICAL

3.1 260519 Low Voltage Conductors and Cables

A. Copper conductors complying with NEMA WC 70/ICEA S-95-658.

B. Aluminum conductors are prohibited. C. Insulation type: XHHW, XHHW-2, THHW, or THWN-2, color coded, color impregnated wire.

D. Conductor sizes are American Wire Gauge (AWG) or circular mils (kcmil) as follows: #12 AWG solid copper. #10 AWG and larger shall be stranged copper.

Branch circuits must be color-coded, color impregnated wire.

E. AC, core clad, or Romex cables are not allowed. F. Cord drops and portable appliance connections: type so, oil proof, hard service cord with

stainless steel, wire-mesh, strain relief device at terminations to suit the application. G.Home runs to panelboards are indicated as starting from the outlet nearest the panel and continuing in the general direction of that panel. Continue such circuits to the panel as though the routes were completely indicated. Terminate home runs of signal, alarm and communication systems in a similar manner

H. Provide #12 branch circuit conductors for 120v, 20 amp circuits less than 75' (100' for 277v circuits). Provide a minimum #10 branch circuit conductors for 120v, 20 amp circuits over 75' (100' for 277v circuits) and increase conductor and conduit size to limit voltage drop to 3%

I. Where more than three current-carrying conductors are installed in a single raceway (e.g. combining multi-circuit home runs), conductor ampacity shall be de-rated as required by the

J. Provide dedicated neutral conductors for every 120-volt and 277-volt branch circuit. K. Feeder and branch circuit conductors must be stranded copper, single conductors in a

L. Megger and record insulation resistance of 600-volt insulated conductors size #3/0 and larger using 500-volt megger for one minute. Make tests with circuits isolated from source and load. M. Metal-clad cable with green ground conductor allowed only for the following conditions:

Above accessible ceilings for final connections from junction boxes to light fixtures not exceeding 6' in length. Final connection not exceeding 6' in length to rotating or vibrating equipment. Allowed for branch circuits fished into existing wall construction. Allowed in casework or built up structures where flexibility is required.

3.2 260520 Voice/Data Systems Rough-In

A. Provide an empty conduit, backbox and junction box system for installation of the owner's voice and data system by others. Telephone and network systems equipment and cabling provided by the owner's communications cabling contractor.

B. For each telephone, data or telephone/data outlet indicated on the drawings provide a 4-11/16 inches square by 2-1/8 inches deep box with single gang ring, and 3/4 inches conduit concealed from device to the nearest accessible ceiling, floor space or accessible access panel in hard ceilings, unless noted otherwise.

C. Provide conduit bushings on conduit ends. Provide a pull cord in conduits.

D. The owner shall provide the wire, cable, connecting devices, and provide testing for wiring systems must be used as signal pathways for low voltage systems specified in this section where called for in the drawings. E. The contractor shall coordinate the installation and schedule for low voltage systems of this

section with the owner and adjacent affected tenants. The contractor shall run necessary conduits with pull wires, pull and junction boxes. F. Provide a complete conduit system in those spaces for the owner's wiring here low voltage systems pass through another tenant space or area not controlled by the owner,

G.Provide 120-volt connections to equipment as required. Provide a 120-volt receptacle adjacent to each voice and data system outlet.

3.3 260520 Miscellaneous Low Voltage Systems A. Provide an empty conduit, backbox and junction box rough-in for installation of the following

Security and duress systems Card access system. Point of sale systems (POS) Closed Circuit TV camera systems

Audio/Visual (A/V) systems. B. Equipment, cables, terminations, and testing of the miscellaneous systems are furnished and installed by the owner.

C. The electrical contractor shall coordinate the installation and installation schedule for miscellaneous low voltage systems of this section with the owner, landlord or affected tenants.

D. The minimum conduit size is 3/4 inches with larger sizes shown on the drawings and as Flexible metallic conduit: for final connection in dry locations less than 6'lengths. E. The electrical contractor shall run necessary conduits with pull wires, pull and junction boxes. Liquid-tight flexible metal conduit: for final connection in damp or wet locations less than 6'

F. Provide conduit bushings on conduit ends. Provide a pull cord in conduits. G.Provide 120-volt connections to equipment as required. Provide a 120-volt receptacle adjacent to CCTV and a/v system outlets.

H. Security and duress systems: backboxes as required by the vendor, 3/4 inches conduit

stubbed into the accessible ceiling or joist space. The owner's vendor provides security and duress systems and wiring. . Security and duress systems: backboxes as required by the vendor, 3/4 inches conduit stubbed into the accessible ceiling or joist space. The owner's vendor provides security and

duress systems and wiring. J. Card access system: backboxes as required by the vendor, 3/4 inches conduit stubbed into the accessible ceiling or joist space. Owner's vendor to provide card access systems and

K. CCTV camera systems: backboxes as required by the vendor, 3/4 inches conduit stubbed into the accessible ceiling or joist space. Owner's vendor to provide card access systems and L. A/V system:

1. Television (TV) outlet indicated on the drawings unless otherwise noted: provide 4-11/16 inches square by 2-1/8 inches deep box with single gang mud ring, and 1-1/4 inches conduit stubbed into the accessible ceiling or joist space. The owner's vendor provides telephone and network systems and wiring. Audio/visual (AV) outlet indicated on the drawings unless otherwise noted: provide a

4-11/16 inches square by 2-1/8 inches deep box with two gang mud ring, and 1-1/4 inches conduit stubbed into the accessible ceiling or joist space. The owner's vendor provides telephone and network systems and wiring. 3. VGA outlet indicated on the drawings unless otherwise noted: provide a 4-11/16 inches square by 2-1/8 inches deep box with two gang mud ring, and 1-1/4 inches conduit stubbed into the accessible ceiling or joist space. The owner's vendor provides telephone and network systems and wiring.

3.4 260523 Control Voltage Conductors and Cables

A. Where indicated on the drawings, provide cables along with associated termination hardware. 1. UTP cable: plenum rated, type CMP category 6, 100-ohm, four-pair. Listed and labeled complying with UL 444 and NFPA 70. UTP cable connecting hardware: IDC type, using modules designed for punch-down caps or tools.

Coaxial cable for CATV, MATV and DBS (less than 50 feet total length): RG-59 20 AWG. solid, copper-covered steel conductor; gas-injected, foam-pe insulation. Double shielded with

100 percent aluminum-foil shield and 40 percent aluminum braid. Plenum-rated, type CMP. 3. Coaxial cable for CATV, MATV and DBS (50 feet or greater total length): RG-6: 16 AWG, solid, copper-covered steel conductor; gas-injected, foam-PE insulation. Double shielded with 100 percent aluminum-foil shield and 60 percent aluminum braid. Plenum-rated, type CMP. B. Control circuits: conductors not installed in conduit or armor jacketed cable must be plenum

1. Class 1 control circuits: stranded copper, type THWN or XHHN, in a raceway or cable with . Class 2 control circuits: stranded copper, type THWN or XHHN, in a raceway or power-limited cable concealed in building finishes; in a cable tray or on hangers above

3. Class 3 remote-control and signal circuits: stranded copper, type TW or type TF, complying with UL 83. In raceway or power-limited cable concealed in building finishes; in a cable tray or on hangers above accessible ceilings.

C. Provide control voltage cables in a metal box and raceway system to an accessible ceiling or

D. UTP cables shall be terminated with connecting hardware of the same category or higher.

E. The minimum conduit size is 3/4 inch with larger sizes noted on the plans. Provide plastic

bushing on the conduit ends.

F. RG-59: used for a single device with cable length less than 50 feet or from a tap or splitter less than 50 feet. G.RG-6: use for connecting or splitting to more than one device and after a tap or splitter 50 feet

or greater in length. H. Group and bundle low voltage cables and provide support independent of ceiling supports. Utilize D rings, J hooks or approved nylon straps to hold cables and provide supports independent of the ceiling supports.

3.5 260526 Grounding and Bonding A. Circuits, metal raceway systems and other permanently installed electrical equipment shall be solidly grounded per the national electrical code to form a continuous, permanent and effective grounding system.

3. Grounding electrode conductor connections shall be made with solderless pressure type fittings. Where welded connections are practical, connections may be made by the use of a suitable welding process. Make connections in strict conformance with the manufacturer's

C. Bond flexible raceway sections with a bare ground conductor separate from the equipment grounding conductor installed with the branch or feeder conductors. Provide an external ground conductor with grounding bushings where required.

D. Isolated ground conductors: green colored insulation with a continuous yellow stripe.

E. Ground rods: 10 feet x 3/4 inch copper-clad steel. Ground rods at exterior area lights: 8 feet x 5/8 inch copper-clad steel. F. The building and electrical systems shall be grounded and bonded per the NEC, IEEE and best practices.

G.Electrical service and separately derived alternating current systems shall be grounded per H. All feeder and branch circuits shall have a green copper ground conductor run with the phase and neutral conductors.

. Bonding interior metal ducts: bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Provide a tinned bonding jumper to bond across flexible duct connections to achieve continuity. J. Provide a minimum #6 AWG copper ground conductor, or larger as indicated on the drawings,

3.6 260529 Hangers and Supports A. For individual conduit runs not directly fastened to the structure, use threaded rod and hangers manufactured by Caddy®, Unistrut® Or Powerstrut®.

C. Conduit and cable support devices must be steel with hangers and support suitable for raceway or cable must be supported.

B. Galvanized steel slotted channel support systems with fittings and supports by the same

D. Fabricated metal equipment support assemblies must be bolted structural steel or steel slotted support systems calculated by a registered structural engineer. E. Concrete bases installed by the electrical contractor. The base must be nominally 3000 psi concrete with dimensions noted on the drawings. Provide for floor mounted electrical

3.7 260533 Raceways and Outlet Boxes A. Provide raceways, fittings, connectors, and accessories for a complete raceway system.

and a 12-inch ground bus at telecommunication demarcation location.

Raceways include Rigid metal conduit (RMC): hot-dipped galvanized. Intermediate metal conduit (IMC): hot-dipped galvanized. Electrical metallic tubing (EMT): electro-galvanized. Polyvinyl chloride conduit (PVC) schedule 40 for below-grade installations. Wireways: enamel finish, hinged type.

B. Minimum electrical conduit size: 1/2 inch. Minimum branch circuit or feeder home run: 3/4 inch. Minimum control voltage and miscellaneous systems conduit: 3/4 inch. C. Provide fittings and accessories approved for the purpose, listed for use, with the type conduit or raceway. EMT connectors and couplings shall be steel setscrew type indoors and steel

compression type in damp or wet locations and outdoors. D. Special colors: fire alarm conduits factory applied red coating. E. Outlet boxes: 4-inch square x 1-1/2 inch deep (or larger) galvanized sheet steel KO-type with

painted with inhibitor-primed paint inside and out.

O.Permitted uses for EMT, IMC or RMC as follows:

plaster ring and cover for general interior use. Cast metal type FS or FD with matching screw covers for exterior and exposed interior locations (provide gaskets in damp or wet locations). Larger boxes as required; sized for NEC fill. F. Junction boxes shall be the same as outlet boxes up to 42 cubic inches. Use code-gauge steel in larger sizes with surface or flush-type screw-mounted trim covers. Boxes and covers

G.Pull boxes shall be the same as junction boxes unless indicated otherwise on the drawings, with covers. H. Voice, data and miscellaneous low voltage system outlet boxes shall be the type and size required by the system vendor but not smaller than 4-11/16 inch square x 2-1/8 inch deep with a single-gang ring. Other configurations as shown on the plan.

. Light fixtures shall not be used as a raceway unless listed and marked as a raceway per NEC article 410.64. J. Electrical conduit installations must be supported per NEC and not exceed 10 feet between

K. Floor boxes (in concrete): rectangular, modular, cast boxes with solid brass cover. See plans for devices. Each system to have independent compartments and flip-up covers. .. Service poles: factory assembled two-compartment channels extending from floor to 6 inches

above the ceiling. Steel with baked white enamel or anodized satin aluminum construction as

specific on plans. M. Provide necessary backing required to insure rigid mounting of outlet boxes. N. Enclose electrical power wiring in conduit.

Above ground: use EMT, IMC or RMC only. Locations subject to mechanical injury. IMC or RMC only. Dry locations and not subject to mechanical injury: EMT, IMC or RMC.

Damp or wet locations: IMC or RMC P. Use flexible conduits in the following applications:

Recessed lighting fixtures. Motor connections. At building joints.

4. In damp or wet locations flexible connections must be liquid-tight type. Q.Conduit cast in concrete floors is not allowed.

R. The conduit below grade must be PVC or IMC or RMC.

S. Fittings for EMT shall be steel compression type or steel set-screw type. Die-cast fitting is not

T. Provide nylon pull cords in empty conduits. U. Conduit installation for low voltage systems to have a maximum of 180 degrees total bends

V. Provide expansion fittings crossing expansion joints or spanning between isolated structures. W. Provide surface raceways with required fittings, accessories and device outlets noted on plans. Conceal conduit connections.

Run conduit concealed unless otherwise noted or shown.

X. General conduit installation:

Run conduit parallel to or at right angles to center lines of columns and beams. Conduits above ceiling shall not obstruct the removal of ceiling tiles, lighting fixtures, air 4. Conduits shall not cross duct shaft or area designated as future duct shaft horizontally. Conduit riser, when allowed in duct shaft must be coordinated with mechanical work or avoid

Y. Conduit supports

Support conduits with underwriter's laboratories listed steel conduit support at intervals required by the national electric code. Wires or sheet metal strips are not acceptable for conduit support. Use conduit hangers for conduits not directly fastened to structure and for multiple conduit runs. Do not attach the conduit to mechanical ducts or pipes. Avoid attaching conduit to fan plenums. When it is necessary to support conduit from fan plenum, provide a length of flexible conduit between portions attached to fan plenum and a portion attached to the building to minimize transmission of vibration to the building structure.

Z. Conduit penetration: 1. Fire-rated floor or wall: Provide conduit in conduit sleeve or framed opening. Seal penetration with fire retardant sealant specified herein.

possible and provided with escutcheons, one on each side of the wall.

2. Roof or exterior wall: avoid penetrating roof or exterior wall where possible. Where penetrations are necessary, building weatherproof integrity must be preserved. Sound insulated or air plenum wall: Provide conduit in conduit sleeve and seal the 4. Non-fire rated drywall: conduit sleeves are not required. Penetrations must be sealed with plaster before painting. Penetrations made after wall finish is applied must be as small as

escutcheon for each conduit below the ceiling.

Provide outlet boxes and pull boxes as required to accommodate lighting and receptacle branch circuit wiring.

5. Suspended ceiling: cut hole as small as possible to permit conduit penetration. Provide

Outlet boxes must not be installed back-to-back. Outlet boxes used for line voltage incandescent and halogen wall box dimmers may not be ganged unless noted on the drawings. Where wall box dimmers are shown ganged or grouped under one cover with other switches, de-rate the dimmers per manufacturer's installation 4. Provide cast steel floor boxes to accommodate power and data connections to freestanding

5. All outlet boxes shall be two-gang or 4-inch square x 2-inch deep minimum with plaster ring sized as required. 6. Exterior boxes for branch circuits must be cast aluminum with threaded hubs. BB. Floor boxes, poke-through, service poles, and multi-outlet assemblies:

Adjust floor service outlets and service poles to suit the arrangement of partitions and

equipment and furniture partitions.

3.8 260536 Cable Trays A. Wire basket cable tray: 12-inch wide by 3-inch deep. Furnish with accessories, hangers, splices, cable dropouts manufactured by the cable tray supplier. Cable tray must be galvanized steel, center-hung or wall hung on angle mounts.

3.9 260539 Underground Raceways and Boxes A. Schedule 40 PVC electrical conduit for below-grade installations with fittings and accessories by the same manufacturer

B. Hang cable tray with threaded rod below mechanical ductwork and piping above finished

lay-in ceiling. Cable trays must be center hung or angle wall hung for unobstructed cable

electrical conduit, concrete capped electrical conduit or concrete duct banks as shown on the B. Exterior branch circuit or feeder handholes must be cast fiberglass resin with an open bottom and heavy-duty bolted cover for non-vehicle or non-pedestrian traffic surfaces.

C. Exterior branch circuit or feeder handholes installed in sidewalks, roadways or parking lot

subject to pedestrian or vehicle traffic: precast handhole/manhole, manhole cover, and

Schedule 80 PVC electrical conduit, fiberglass electrical conduit, concrete encased

accessories as shown on the drawings. D. Underground conduits shall be schedule 40 PVC, IMC or RMC buried in the earth. Transitions through concrete slabs, pre-manufactured bends or elbows must be IMC or RMC conduit with

E. Provide underground traceable, plastic warning tape 12 inches above each feeder conduit or

F. Provide exterior branch circuit or feeder handholes in landscape areas. Do not install in sidewalks, roadways or parking lot subject to pedestrian or vehicle traffic. 3.10260533 Identification and Labeling A. Label control devices and device enclosures with individual nameplates or legend plates

B. Individual name or legend plates: black laminated plastic plates with white cut letters. Paper, foil or tape markers attached with adhesives shall not be used. C. Engraved, laminated acrylic or melamine label, punched or drilled for screw mounting. White letters on a dark-gray background. The minimum letter height shall be 3/8 inch. Label the

following equipment Panelboards, electrical cabinets, and enclosures. Access doors and panels for concealed electrical items. Electrical breakers in existing distribution panels. Transformers.

groups of branch circuit conduits.

Emergency system boxes and enclosures. Disconnect switches Enclosed circuit breakers. Motor starters. Push-button stations

panel and junction box locations within each room as follows:

Contactors. Remote-controlled switches, dimmer modules, and control devices. Panels, terminal cabinets, and racks. D. Fire alarm system: boxes and covers painted red; factory-applied red coating for fire alarm

E. Accessible raceways and cables of auxiliary systems: identify the following systems at the

Fire alarm system: red boxes and covers. Red conduit 120/208 volt: mark covers with panel and circuit numbers. 277/480 volt: mark covers with panel and circuit numbers.

F. Receptacles: identify panelboard and circuit number from which served. Use pre-manufactured hot-stamped or engraved machine printing with black filled lettering on the face of the plate, and durable wire markers or tags inside outlet boxes.

G.Provide nameplates for switchgear, panelboards, and similar devices. Nameplates shall be screwed (no adhesive) engraved plastic or photo-etched metallic nameplate identification

showing panel designation, voltage, and phase. H. Provide machine labels on lighting switches and convenience and special purpose

receptacles to show panel and circuit number to which the device is connected. . Panelboard schedules: after completion of work, provide typewritten updated panelboard schedules in a metal-framed circuit directory inside each panelboard cover, with plastic

J. Color code wires as follows:

Voltage phase A phase, B phase, C phase, neutral, ground.

120/208v black, red, blue, white, green. 277/480v brown, orange, yellow, gray, green.

control of selected channels.

solid-state control modules.

manufacturer's recommendation.

plates inside the door.

NEMA 3R/5/12.

3.13262726 Wiring Devices

3.11260923 Lighting Control Devices A. Electronic time switches solid-state, programmable unit, alphanumeric display and multiple channels for exterior lighting control. Allow the connection of a photoelectric relay for on/off

K. Provide Brady wire markers where the number of conductors in a box exceeds four.

B. Outdoor photoelectric switches: solid-state with dry contacts and metal oxide surge suppressor. Light-level monitoring ranges from 1.5 footcandles to 10 footcandles with adjustable levels for on and off controls. C. Automatic lighting control devices: operation shall either turn lights on manually or automatically controlled to turn on less than 50% lighting power with the remaining lighting power turned on manually; lighting shall turn off when unoccupied, with a time delay for turning lights off adjustable over a range of 1 to 15 minutes. The following spaces are

shall turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes. Indoor photoelectric switches: ceiling-mounted solid-state light level sensor connected to daylighting relays.

2. Indoor occupancy sensor: wall or ceiling mount as indicated on plans. Dual technology

exceptions and allow full-on automatic control: public corridors and stairwells, restrooms,

endanger the safety and/or security of the building or occupants. Full-on automatic control

primary building entrances and lobbies, and areas where manual on operation would

solid-state occupancy sensor with a separate power pack. D. Wall box occupancy sensors: adaptive technology with time delay, the number of integral switches as shown on the drawings (minimum of one (1) switch).

E. Lighting contactors: electrically operated and mechanically held, non-fused switch with 2 wire

F. Emergency shunt relay: normally closed electrically held with automatic switching contacts to bypass local room controls. G.LED line voltage dimmers rated for quantity and type of fixtures shown on drawings. Divide

the lighting load into multiple switch legs and add additional dimmers to meet the

H. Controllers: furnish 120-volt power to each control panel and time switch requiring a source of

I. Pull the circuit neutral conductor to light switches. Provide a dedicated neutral to each control.

perform tests and inspections. The testing agency shall be independent of the design, construction, and manufacture of equipment. Provide functional testing and certification per the latest edition of adopted energy code 3.12262416 Panelboards

ampere, I-line style for 400 ampere - 800 ampere or equal by Eaton, ABB/GE, or Siemens.

A. Panelboards: Schneider electric style #NQ (120/208v) and #NF 277/480v) for 100-400

J. Testing Agency: Engage a qualified testing agency to evaluate lighting control devices and

B. Dead front safety type with enclosures of code grade steel. Oversize gutters shall be provided for feed through where indicated or required. Where double lugs are not permitted by local code, a suitable pull box or gutter adjacent to panels shall be provided for connections. C. Trim and flat locking doors with both hinges and trim clamps completely concealed, a door-in-door construction, flush cover door locks common keyed. Provide two (2) keys for each panelboard. Mount a clear plastic-covered typewritten circuit directory in a cardholder attached to the inner side of the door. Provide engraved laminate nameplates stating

D.98 percent electrolytic copper or 55 percent conductivity aluminum busses independently supported (without dependence upon the circuit breakers). Where breakers and/or switches are listed in the schedules as "space only", includes extended bus and mounting provisions. E. Bolt-on circuit breakers with bolted line and load terminals, quick-make, quick-break, thermal magnetic, common trip on multi-pole breakers and a minimum ul short circuit rating as shown

panelboard name and voltage. Where panelboards are in public areas, mount identification

numbers, on the toggle handle. UL listed "swd" switching duty for lighting switching control. UL listed HACR rated for motor or high inductance loads. F. Fusible factory assembled panelboards shall be Schneider electric GMB for 225 amperes to 1600 amperes or equal by Eaton, GE, or Siemens with requirements noted above.

on the drawings. Each breaker shall have its current rating engraved, in easy to read

2. Fused switches: NEMA KS 1, type HD. Twin, side by side mount for 30a-200a. Single mount for 400a and above Furnish rejection fuses as noted in 2.14 below. G.Where panelboards are flush-mounted in walls, provide a minimum of four 1 inch conduits stubbed to an accessible ceiling above the panel for future use.

H. Circuit numbers appearing on drawings shall be used for reference only. Actual connections

shall be per phasing of the cabinet and load balance requirements. Room numbers or names

1. Trims: 4 pieces without door for NEMA 1; with a door where noted on the drawings or for

used for circuit identification shall correspond to nameplates installed on room doors by the general contractor or as selected by the owner and shall be verified as these may not be the same as room titles on the drawings. I. Top of panelboard tubs shall be 6 feet-6 inches above the finished floor.

A. Wiring devices shall be installed in metal device boxes.

B. Switches and receptacles shall be Hubbell, Bryant, Leviton, Pass & Seymour, or approved equal subject to approval by the engineer, color shall be grey for normal power and red for emergency power. Special color device outlets and matching cover-plate as noted on the

C. Switches shall be heavy-duty grade, federal specification FS, ac quiet type, 20-amp,

D. General-purpose duplex receptacles shall be heavy-duty grade, federal specification FS,

120/277-volt, with silver alloy contacts, equal to Hubbell #5362.

receptacles in patient care areas defined per NEC article 517.

H. Tamper-resistant rating in areas required by the NEC.

NEMA 5-20r, 20-amp, 125-volt, 3-wire grounding type devices with steel one-piece ground strap; third pole grounding to the outlet box. Hospital-grade duplex receptacles in patient care areas defined per NEC article 517. Fed spec grade. E. Ground fault circuit interrupter (GFI) duplex receptacles: heavy-duty grade, federal specification FS, 20-amp devices. GFI receptacles unit wired self-contained and not be

connected to feed through unless specifically noted on the drawings. Hospital-grade duplex

F. Dead front/Faceless/Blank Face GFCI outlets: UL 943, NEMA WD1 and WD6, feedthrough

type, rated 20 amperes at 125 volts, self-grounding, self-testing, with an LED indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection. G.NEC weather-resistant rating in damp or wet locations, suitable for "while-in-use" applications. AFCI outlets where required by the NEC

plates shall have backfill.

J. Isolated ground receptacles: orange in color or orange triangle on the face.

K. Surge protective device (SPD): type 3 duplex receptacle with indication light and audible

L. Cover plates: stainless steel type 302 as manufactured by Eagle, Bryant, General Electric,

Special color plastic cover plates to match to style line type receptacles as noted on the

M. GFCI protected with "while-in-use" weatherproof cover plate for outdoor weatherproof duplex

N. Provide wall plates for flush-mounted wiring devices and flush-mounted special system outlets. Sectional wallplates shall not be used. Blank plates shall be installed over outlets provided for future use. Wallplates shall be secured with matching screws. Engraved wall

O. Provide outlets for and make final electrical connections to electrically powered equipment indicated on the plans or equipment schedules. 3.14262813 Fuses

A. One-time cartridge fuses manufactured by Busman, Gould Shawmut, or Little Fuse. B. Provide fuses of the types and ratings designated in the drawings and specifications in each

Feeder and branch circuits class RK1 time delay. Motor circuits class RK5 time delay. Control circuit fuses must be a time delay.

fusible device installed by the contractor.

C. Furnish and store, at a location directed by the owner, three (3) spare fuses of each size and type installed during this project. The contractor shall provide a spare fuse list in the maintenance manuals.

3.15262816 Enclosed Switches, Circuit Breakers, and Controllers

C. Full voltage non-reversing starters size 0 minimum.

A. Disconnect switches: heavy-duty, ac, single throw safety switches, built per NEMA requirements with a voidable full cover interlock and quick-make, quick-break mechanism. Each switch shall be fusible unless non-fusible (NF) is specifically indicated. NEMA 1 enclosures in dry locations and NEMA 3R when exposed to the weather. Furnish neutral lug kit when the circuit has a neutral.

B. Provide auxiliary contacts to shut down VFD before disconnecting power. Provide rejection fuses where noted.

as noted on the drawings, with fused control transformer, auxiliary contacts, cover-mounted HOA and pilot lights. E. Fractional HP starters quick make quick break single pole switches for integrally protected

D. Starters must be combination starters with molded case circuit breaker or fused disconnect.

F. Multi-pole horsepower rated switches or enclosed circuit breakers in flush NEMA 1 enclosures where a means of disconnect is required in finished spaces.

shall be changed to properly protect the equipment.

the drawings and as specified in equipment schedules.

for fixture supports. Provide lamps in each fixture.

G.Suspended lighting fixture support:

3.16265100 Interior Lighting

G.Devices must be NEMA rated for the environment they are located in. H. Obtain exact information about location, electrical characteristics, and wiring for equipment furnished by others from the contractor furnishing the equipment. This information shall be verified by examining nameplates and manufacturer's wiring diagrams. Discrepancies between the equipment requirements and the provisions made by these specifications shall be reported. Equipment damaged as a result of the contractor's failure to observe the manufacturer's requirements shall be replaced or repaired by the contractor. The thermal protection elements in manual starters shall be rechecked with nameplate data at the site

before the operation of the equipment. Where necessary, the thermal protection elements

I. Provide manual thermal protection for motors not integrally equipped with thermal protection. J. Provide final electrical connections to motors and electrically powered equipment indicated on the plans or equipment schedule.

K. Provide a disconnect switch immediately ahead of and adjacent to each magnetic motor

starter or appliance unless the motor appliance is located adjacent and within sight of the

M. Provide disconnect switches having the number of poles and ampere ratings as shown on

serving panelboard, circuit breaker or switch. Verify equipment nameplate current ratings before installation. .. Provide a fused disconnect switch on transformer secondary where secondary conductors exceed 25' from terminal to secondary overcurrent device.

A. LED fixtures: Lumen output as indicated on the fixture schedule. Light Engine shall be rated for operation in ambient temperatures of Minus 22 Deg F (Minus 30 Deg C) and 104 Deg F (40 Deg C). Light engine drivers as specified on the drawings. Efficiency per LM-79. Driver

B. HID fixtures: electronic ballasts with the end of life detection and class p thermal cutout.

Life shall match Light Engine Rated Life; 50,000 hours minimum.

C.Dimming ballasts and drivers must be 0-10v compatible with the dimming controller selected. D. Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction E. Emergency Lighting Unit: self-contained, complying with UL 924. Battery sealed, maintenance-free, lead-acid type. Relay automatically turns a lamp on when power-supply circuit voltage drops to 80 percent of nominal voltage or below. The lamp automatically disconnects from the battery when the voltage approaches the deep-discharge level. When normal voltage is restored, relay disconnects lamps from the battery, and the battery is

emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED. F. Lighting fixtures: set level, plumb, and square with ceilings and walls complying with NFPA 70

factory-installed electronic device automatically initiates the code-required test of unit

automatically recharged and floated on the charger. Indicates normal power on. Normal glow

indicates trickle charge; bright glow indicates charging at end of the discharge cycle. The

suspension for each unit length of fixture chassis, including one at each end. Alternate: flexible cord connection for a single circuit. H. Adjust and aim lighting fixtures to provide required light intensities on vertical surfaces or at

directions noted on drawings. Provide additional adjustments for the owner before the final

. Lighting fixtures mounted in continuous rows maybe end fed with only the circuits feeding the

row (passing through of other circuits not allowed) with each row fed from individual junction

Continuous rows: use tubing or stem for wiring at one point and tubing or rod for

Pendants and rods: were longer than 48 inches, brace to limit swinging.

Stem-mounted, single-unit fixtures: suspend with twin-stem hangers.

J. Lighting fixtures must have individual feeds to each fixture except for tandem fixtures. "daisy-chaining" of fixtures not allowed. The lighting fixture whips must be 6-feet long or less.

DIVISION 28 ELECTRONIC SAFETY AND SECURITY

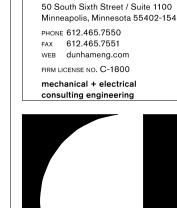
boxes at the end feed point.

turnover or at substantial completion.

3.17283111 Fire Alarm System A. Provide design build fire alarm system as required by local jurisdiction with all required

documentation, claculations and submission to city, by a qualified design build fire alarm

DUNHAM





0 1" 2" 3" 4" 5" 6" 0 1" 2" 3" 0 4' 8' 12' 0 1' 2' 3' 4' 0 6" 1' 2' 3' 0 6" 1' 0 3" 6" 9" 1' 1.5' 0 3" 6" 9" 1' 0 4' 8' 16' 24' 0 4' 8' 16' 0 2' 4' 6' 1/2"=1'-0" 3"=1'-0" 6"=1'-0" 1/16"=1'-0" 3/32"=1'-0" 1/8"=1'-0" 1/4"=1'-0" 3/8"=1'-0" 3/4"=1'-0" 1"=1'-0" 1 1/2"=1'-0"