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### DRAWING LIST

DRAWING NO.	DESCRIPTION
E1	COVER PAGE
E2	LIGHTING PLAN
E3	POWER & AUXILIARY PLAN
E4	SPECIFICATIONS

### SYMBOL LEGEND

	CEILING OR WALL MTD. LED FIXTURE		THERMAL SWITCH C/W NEON PILOT LIGHT		JUNCTION BOX		SMOKE ALARM
	RECESSED LED FIXTURE (POT LIGHT)		KEY OPERATED SWITCH		CONTROL VALVE		FIRE ALARM PULL STATION
	EXTERIOR CEILING OR WALL MOUNTED LED FIXTURE		DIMMER SWITCH		DOOR OPERATOR PUSH BUTTON		FIRE ALARM BELL W/ STROBE
	LED STRIP LIGHT FIXTURE		KEYED THERMAL SWITCH C/W NEON PILOT LIGHT		TELEPHONE OUTLET		FIRE ALARM STROBE ONLY
	CEILING SURFACE/SUSPENDED LED FIXTURE		VARIABLE SPEED SWITCH		TELEPHONE PAYSTATION		MAGNETIC DOOR HOLDER
	LED FLEX LIGHT		DUPLEX RECEPTACLE		DATA OUTLET		DOOR CONTACT
	RECESSED LED FIXTURE		SPLIT RECEPTACLE		TELEVISION OUTLET		FIRE ALARM HORN
	TRACK LIGHTING		DOUBLE DUPLEX RECEPTACLE (QUAD)		HDMI OUTLET		FIRE ALARM HORN W/ STROBE
	SITE LIGHT LED FIXTURE		ISOLATED GROUND RECEPTACLE		COMBINATION TELEPHONE/DATA OUTLET - 4" SQUARE J.B. C/W SINGLE GANG PLASTER RING		END-OF-LINE RESISTOR
	CEILING OR WALL MOUNTED EXIT LIGHT		GFI RECEPTACLE		COMBINATION BUZZER AND TRANSFORMER		PIEZO HORN
	COMBINATION EXIT SIGN W/ LED REMOTE HEADS		GFI ABOVE RECEPTACLE		WALL MOUNTED SPEAKER		PIEZO HORN W/ SILENCER
	BATTERY PACK C/W INTEGRAL HEADS		1/2 SWITCHED RECEPTACLE		CEILING SURFACE MOUNTED OR RECESSED SPEAKER		CONDUIT RUN IN WALLS OR CEILING
	REMOTE EMERGENCY HEADS		MOUNT 6" (150mm) ABOVE COUNTERTOP OR SPLASHBACK		SPEAKER HORN		NUMBER OF WIRES IN CONDUIT (3)
	DENOTES FIXTURE TYPE (101)		FLUSH FLOOR MOUNTED RECEPTACLE (POWER/PHONE/DATA)		MICROPHONE OUTLET		CONDUIT RUN IN OR UNDER FLOOR
	LOW VOLTAGE SWITCH(ES)		SPECIAL RECEPTACLE		SECURITY CAMERA		CONDUIT CONTAINING LOW VOLTAGE WIRING
	SINGLE POLE SWITCH, SINGLE GANGED		T-SLOT RECEPTACLE (20A)		HEAT DETECTOR		MDP MAIN DISTRIBUTION PANEL
	SINGLE POLE SWITCH, MULTI-GANGED		HOSPITAL GRADE RECEPTACLE		HEAT DETECTOR (HIGH TEMPERATURE)		CDP SUB-DISTRIBUTION PANEL
	TWO POLE SWITCH		CONDU-POLE		SMOKE DETECTOR		PEC PHOTO ELECTRIC CELL
	THREE WAY SWITCH		CLOCK		DUCT TYPE SMOKE DETECTOR		FACP FIRE ALARM CONTROL PANEL
	FOUR WAY SWITCH		MOTOR		CARD READER		TC TIME CLOCK
	OCCUPANCY SENSOR SWITCH - WALL MTD.		THERMOSTAT		WIFI		TVTC TELEVISION TERMINAL CABINET
	JUNCTION BOX WITH DISCONNECT SWITCH		HUMIDISTAT		CONTROL MODULE		TTC TELEPHONE TERMINAL CABINET
	MOTOR WITH DISCONNECT SWITCH		MAGNETIC STARTER		MONITOR MODULE		TVTB TELEVISION TERMINAL BACKBOARD
	DISCONNECT SWITCH		CEILING RECEPTACLE				TTB TELEPHONE TERMINAL BACKBOARD

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REVISION SCHEDULE

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PROJECT TITLE  
 SKYVIEW PHARMA & MEDICAL

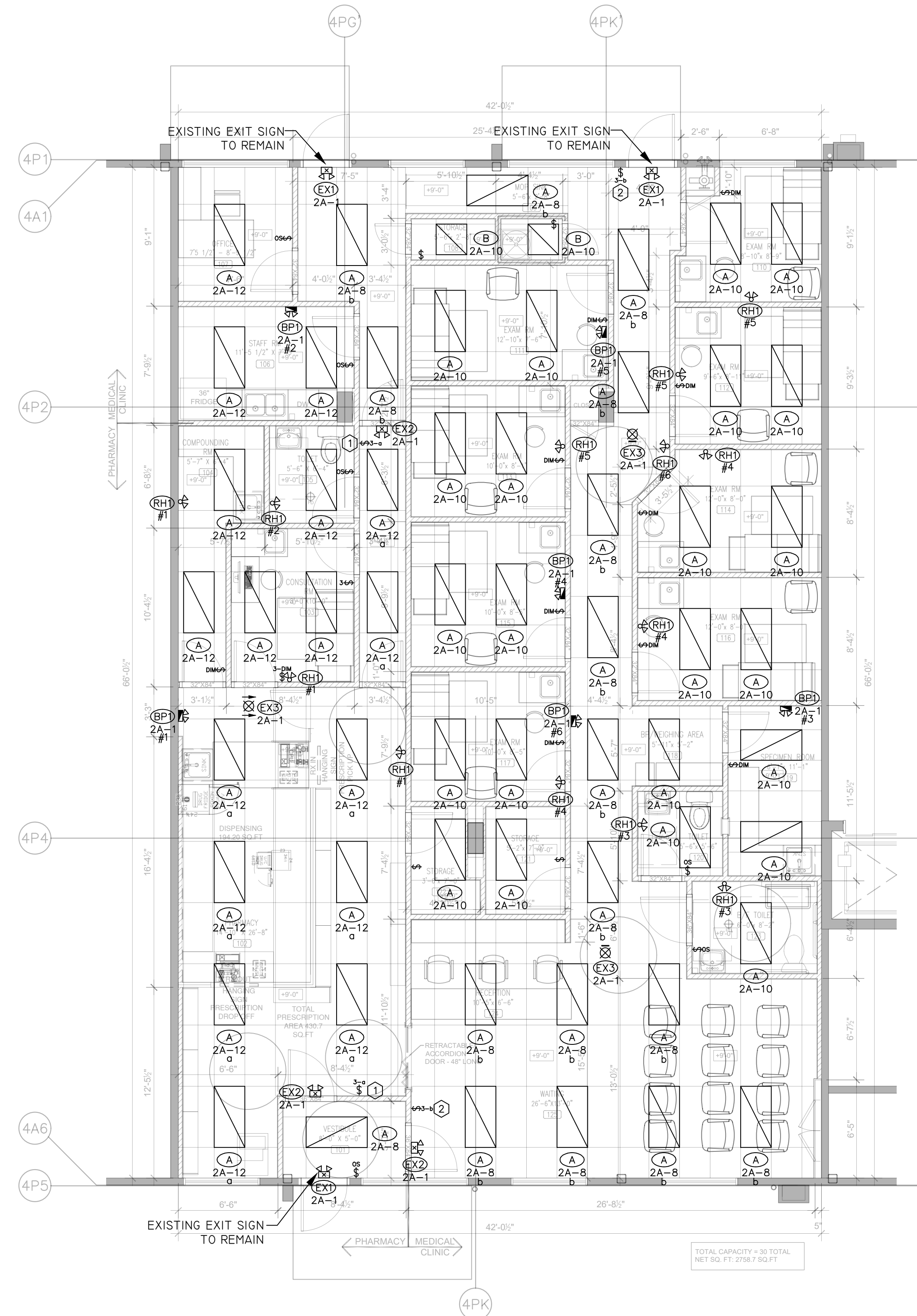
SHEET TITLE  
 ELECTRICAL COVER PAGE

DATE	PROJECT NO.	SHEET NO.
2024-06-07	202409	E1

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**GENERAL NOTES:**

- E/C TO CONFIRM ELECTRICAL LOADS OF ALL LIGHT FIXTURES AND MAKE SURE NOT TO EXCEED 1200W PER CIRCUIT.
- E/C TO ENSURE EMERGENCY BATTERY PACKS ARE SIZED FOR MINIMUM 30 MINUTES BACKUP.
- INSTALLATION OF LIGHTING SHALL COMPLY WITH CEC SECTION 30.
- LIGHTING FIXTURES AS PER LUMINAIRE SCHEDULE. CONFIRM WITH OWNER PRIOR TO ORDERING TO FINALIZE LIGHT FIXTURES. INSTALL LIGHT FIXTURES AS PER MANUFACTURER'S RECOMMENDATION.
- E/C TO CONFIRM WITH OWNER WHETHER NIGHT LIGHTS ARE REQUIRED. IF SO, E/C TO PROVIDE DEDICATED CIRCUIT AND WIRE NIGHT LIGHT FIXTURES TO THE DEDICATED CIRCUIT.
- E/C TO COORDINATE LIGHT SWITCH LOCATIONS/QUANTITY PRIOR TO ROUGH-IN.
- E/C TO COORDINATE LIGHTING CONTROLS OF ENTIRE AREA WITH OWNER.
- E/C TO COORDINATE LIGHT FIXTURES LOCATIONS WITH EXACT T-BAR CEILING LAYOUT AND VENTILATION EQUIPMENT ON SITE. ADJUST LIGHT FIXTURE LAYOUT ACCORDINGLY.
- E/C TO ENSURE LIGHTING/LIGHTING CONTROL REQUIREMENTS MEET NECB STANDARD. E/C TO PROVIDE/INSTALL OCCUPANCY SENSORS AS REQUIRED.



**1 LIGHTING PLAN**  
 E2.0  
 SCALE: 3/16" = 1'-0"

**KEY NOTES:**

- 3 WAY SWITCH TO CONTROL ALL LIGHT FIXTURES LABELED 'a' IN PHARMACY AREA INCLUDING CONNECTED CORRIDOR.
- 3 WAY SWITCH TO CONTROL ALL LIGHT FIXTURES IN OPEN AREAS OF MEDICAL CLINIC SIDE LABELED 'b' INCLUDING WAITING/RECEPTION AND CORRIDORS. E/C TO CONFIRM LOCATION OF 3 WAY SWITCHES WITH OWNER PRIOR TO ROUGH-IN.

**BUILDING AREA INTERIOR LIGHTING NECB TABLE 4.2.1.5**

GROSS LIGHTING AREA (m <sup>2</sup> )	BUILDING TYPE	LIGHTING POWER DENSITY (W/m <sup>2</sup> )	LIGHTING POWER ALLOWANCE (W/m <sup>2</sup> )	LIGHTING POWER INSTALLED (W)	LIGHTING POWER DIFFERENCE (W/m <sup>2</sup> )
256	HEALTHCARE CLINIC	5.6	8.7	1440	8.7-5.6 = 3.1

**LUMINAIRE SCHEDULE**

NO.	MAKE	MODEL NUMBER	LAMPS	DESCRIPTION AND MOUNTING REMARKS
A	LITHONIA LIGHTING	CPX-2X4-AL08-80CRI-SWW7-MVOLT	25W LED 4000 LUMENS	2X4 RECESSED LIGHT IN T-BAR CEILING. SWITCHABLE LUMEN/COLOUR OUTPUT - T-BAR CEILING AREAS
B	LITHONIA LIGHTING	CPX-2X2-AL07-80CRI-SWW7-MVOLT	20W LED 2500 LUMENS	2X2 RECESSED LIGHT IN T-BAR CEILING. SWITCHABLE LUMEN/COLOUR OUTPUT - T-BAR CEILING AREAS
EX1	EXISTING	-	-	EXISTING EXIT SIGNS.
EX2	LUMACELL	LAC-1-W-1250-2-LD7-ATN	2-4W LED	COMBINATION EXIT SIGN/RUNNING MAN. FACE AND ARROW CONFIG. AS NOTED ON LIGHTING PLAN DWG. E2.0
EX3	LUMACELL	LDE SERIES	LED	PICTOGRAM EXIT SIGN. CEILING MTD. FACE AND ARROW CONFIG. AS NOTED ON LIGHTING PLAN DWG. E2.0.
BP1	LUMACELL	RG12S-72-2-LD7-ATN	2-4W LED	EMERGENCY BATTERY PACK C/W DUAL HEADS 12V/72W.
RH1	LUMACELL	M-QM-2-LD7	2-4W LED	12V. EMERGENCY DOUBLE REMOTE HEADS. CONNECT TO NEAREST BATTERY PACK OR COMBO EXIT AS LABELED ON DWG. E2.0.

NOTES:  
 E/C MAY SELECT ALTERNATE FIXTURES WITH PRIOR APPROVAL OF ENGINEER/OWNER. E/C MAY SELECT EMERGENCY LIGHTING FIXTURES WHICH MATCH SPEC OF EXISTING EXIT SIGNS AT SITE.

**PANEL SCHEDULE**

PANEL	2A	CCT#	84	PROJECT NO.	202409										
VOLTAGE	120/208 V	3	PHASE	NAME:	Skyview Pharma & Medical Clinic										
				LOCATION:	Electrical Closet - Waiting Area										
DESCRIPTION	POWER	CCT	3Φ	CCT	POWER	DESCRIPTION									
C	HP	WATTS	A	P	#	A	B	C	#	P	A	WATTS	HP	C	DESCRIPTION
L		400	15	1	1	1	1	1	15	1	15	500		C	WEST FAN COL.
R		400	15	1	3	1	1	1	15	1	15	500		C	CONDENSATION PUMP
R		500	15	1	5	1	1	1	15	1	15	500		C	EAST FAN COL.
C		2667	30	3	7	1	1	1	15	1	15	450		L	MEDICAL GEN. LIGHTS
///		2667	///	///	9	1	1	1	15	1	15	565		L	MEDICAL ROOM LIGHTS
///		2667	///	///	11	1	1	1	15	1	15	425		L	PHARMACY LIGHTS
C		2667	30	3	13	1	1	1	15	1	15	400		R	WIFI
///		2667	///	///	15	1	1	1	15	1	15	400		R	W/R GFI
///		2667	///	///	17	1	1	1	15	1	15	800		R	RECEPTION 1
H		2000	25	2	19	1	1	1	15	1	15	800		R	RECEPTION 2
///		2000	///	///	21	1	1	1	15	1	15	400		R	STORAGE RECEIPTS
H		797	15	3	23	1	1	1	15	1	15	600		R	WAITING AREA RECEIPT.
///		797	///	///	25	1	1	1	15	1	15	800		R	GEN. CORR PLUGS
///		797	///	///	27	1	1	1	15	1	15	800		R	PHARMACY GEN. PLUGS
H		2667	30	3	29	1	1	1	15	1	15	800		R	EXAM ROOM 115/117
///		2667	///	///	31	1	1	1	15	1	15	800		R	EXAM ROOM 111/113
///		2667	///	///	33	1	1	1	15	1	15	800		R	EXAM ROOM 114/116
M		200	15	1	35	1	1	1	15	1	15	800		R	EXAM ROOM 110/112
R		800	15	1	37	1	1	1	15	1	15	400		R	BP WEIGHING AREA
					39	1	1	1	15	1	15	800		R	OFFICE
					41	1	1	1	15	1	15	600		R	STAFF/COMPOUND RM
					43	1	1	1	15	1	15	500		R	FRIDGE
					45	1	1	1	15	1	15	500		R	DISHWASHER
					47	1	1	1	20	1	20	1200		R	O/C T-SLOT
					49	1	1	1	15	1	15	400		R	CONSULT RM CPU
					51	1	1	1	15	1	15	400		R	CONSULT RM. PLUGS
					53	1	1	1	15	1	15	400		R	U/C FRIDGE
					55	1	1	1	15	1	15	400		R	PICK UP CPU
					57	1	1	1	15	1	15	400		R	DROP OFF CPU
					59	1	1	1	15	1	15	400			
					61	1	1	1	15	1	15	400			
					63	1	1	1	15	1	15	400			
					65	1	1	1	15	1	15	400			
					67	1	1	1	15	1	15	400			
					69	1	1	1	15	1	15	400			
					71	1	1	1	15	1	15	400			
					73	1	1	1	15	1	15	400			
					75	1	1	1	15	1	15	400			
					77	1	1	1	15	1	15	400			
					79	1	1	1	15	1	15	400			
					81	1	1	1	15	1	15	400			
					83	1	1	1	15	1	15	400			

CONTINUOUS LOAD	49830 W
DEMAND LOAD	49830 W
TOTAL AMPS	138.4 A

- NOTES:
- CONTRACTOR TO VERIFY ALL LOADS PRIOR TO CONNECTING THEM TO THE PANEL. RE-SIZE CIRCUIT BREAKERS AS NEEDED.
  - ALL LOADS CALCULATED AT 100% DEMAND FACTOR.
  - CONTRACTOR TO CONFIRM ALL EXISTING LOADS ON ELECTRICAL PANEL. NEW CIRCUITS MAY NEED TO BE REASSIGNED BASED ON EXISTING LOADS AND CIRCUIT ASSIGNMENT.
  - CONTRACTOR TO REFER TO DRAWINGS PRIOR TO CONSTRUCTION ON SITE. CONTRACTOR TO RAISE ANY DISCREPANCIES BETWEEN DRAWINGS AND SITE TO ELECTRICAL ENGINEER PRIOR TO COMMENCING ANY WORK.
  - ⊕ DENOTES EXISTING CIRCUITS WHICH ARE TO REMAIN AS-BUILT.

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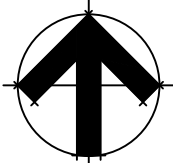
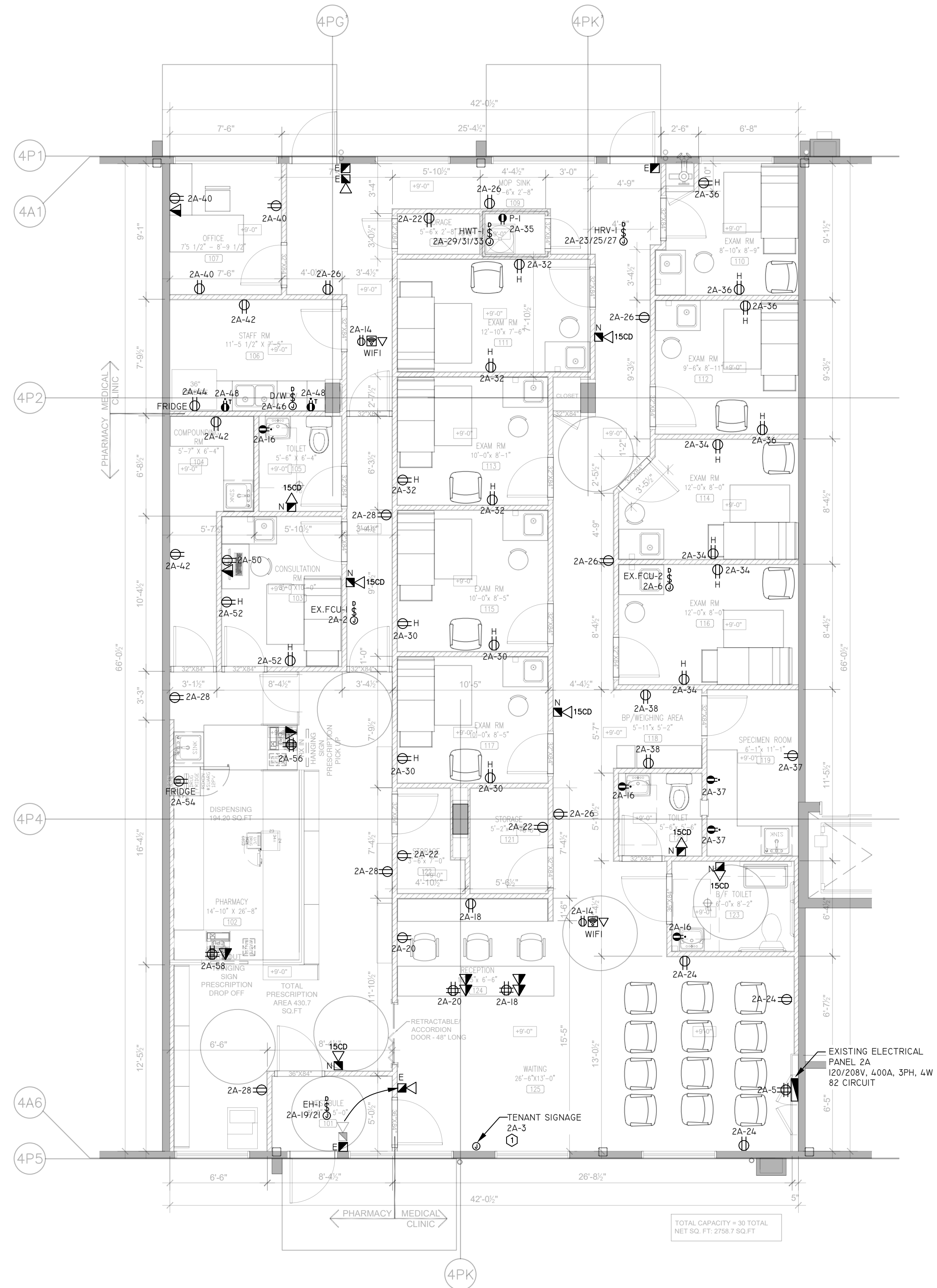
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PROJECT TITLE  
 SKYVIEW PHARMA & MEDICAL

SHEET TITLE  
 LIGHTING PLAN

DATE 2024-06-07 PROJECT NO. 202409 SHEET NO. E2

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1  
E3.0

**POWER & AUXILIARY PLAN**  
 SCALE: 3/16" = 1'-0"

- GENERAL NOTES:**
- COORDINATE EXACT LOCATION AND HEIGHT OF OUTLETS AND CONNECTIONS WITH EQUIPMENT SUPPLIER AND OWNER PRIOR TO ROUGH-IN.
  - COORDINATE OUTLET HEIGHTS AND CONNECTIONS WITH MILLWORK AND ARCHITECT PRIOR TO ROUGH-IN.
  - CONFIRM LOCATION AND ELECTRICAL REQUIREMENTS OF MECHANICAL EQUIPMENT WITH MECHANICAL CONTRACTOR ON SITE PRIOR TO ROUGH-IN. CONFIRM WITH MECHANICAL CONTRACTOR WHETHER ALL EXISTING MECHANICAL EQUIPMENT WILL REMAIN.
  - SECURITY SYSTEM (CAMERA, DOOR, GLASS CONTACT) TO BE VERIFIED WITH OWNER, IF NEEDED. COORDINATE WITH OWNER REGARDING POWER REQUIREMENTS.
  - EXTRA ELECTRICAL CIRCUITS MAY BE REQUIRED FOR MISCELLANEOUS ITEMS. COORDINATE WITH OWNER FOR FINAL EQUIPMENT LIST.
  - NO WIRE SMALLER THAN #12 CU AWG. SHALL BE USED FOR BRANCH CIRCUIT.
  - SECURITY SYSTEM AND WIFI ACCESS POINT (WAP) REQUIREMENTS TO BE DETERMINED BY CONTRACTOR ON SITE PRIOR TO ROUGH-IN.
  - ALL NETWORK DROPS TO BE CAT5E OR CAT6 AND TO BE TERMINATED TO COMMUNICATION BACKBOARD.
  - ALL CABLING TO BE TERMINATED AND TESTED BY ELECTRICAL CONTRACTOR
  - IF APPLICABLE, CONFIRM TV/PROJECTOR/COMPUTER REQUIREMENTS AND LOCATIONS WITH OWNER.
  - CONTRACTOR TO CONFIRM ALL EXISTING LOADS ON ELECTRICAL PANEL.
  - CONTRACTOR TO REFER TO DRAWINGS PRIOR TO COMMENCING CONSTRUCTION ON SITE. CONTRACTOR TO RAISE ANY DISCREPANCIES BETWEEN DRAWINGS AND SITE TO ELECTRICAL ENGINEER PRIOR TO COMMENCING WORK.
  - ALL RECEPTACLES IN PATIENT CARE AREAS ARE TO BE HOSPITAL GRADE RECEPTACLES AND WIRED AND GROUNDED AS PER THE REQUIREMENTS OF CSA Z32-15. PROVIDE GROUNDING BOXES IN CEILING SPACE AS REQUIRED. ALL GROUNDING BOXES TO BE CONNECTED TO PANEL GROUND BUS. INSTALL GROUND BUS BAR AS NEEDED.
  - ALL NON-HOSPITAL GRADE RECEPTACLES TO BE RATED AS COMMERCIAL GRADE RECEPTACLES.
  - CONFIRM EQUIPMENT SPECIFICATIONS (IF ANY) IN EXAM ROOMS, SPECIMEN ROOM, AND COMPOUNDING ROOM WITH OWNER PRIOR TO ELECTRICAL ROUGH-IN.

- FIRE ALARM NOTES:**
- ALL EXISTING AND NEW HORN/STROBE TO BE SYNCHRONIZED.
  - AUDIO OUTPUT OF HORNS TO BE IN COMPLIANCE WITH ULC-5524
  - ALL NEW FIRE ALARM DEVICES TO BE CONNECTED AND PROGRAMMED TO BUILDING'S FIRE ALARM CONTROL PANEL. COORDINATE WITH OWNER/LANDLORD FOR ACCESS TO FIRE ALARM CONTROL PANEL.
  - IF APPLICABLE, COORDINATE WITH MECHANICAL HVAC CONTRACTOR TO TIE-IN AIR HANDLING UNIT FIRE ALARM CONTROL MODULES TO FIRE ALARM SYSTEM.
  - EXISTING FIRE ALARM DEVICES TO BE REUSED/RELOCATED AS SHOWN IN DRAWINGS. VERIFY FIRE ALARM DEVICES PRIOR TO INSTALLATION.

- KEY NOTES:**
- E/C TO CONFIRM WHETHER ROUGH-IN FOR SIGNAGE LOCATION IS EXISTING ON-SITE. CONFIRM MOUNTING HEIGHT WITH OWNER AND ARCHITECT. E/C TO USE EXISTING CIRCUIT 2A-3 FOR SIGNAGE POWER.
  - PROVIDE POWER AND DATA OUTLET FOR WIFI LOCATION. E/C TO CONFIRM WITH OWNER WHETHER THIS IS REQUIRED AS WIFI COULD BE POWERED OVER ETHERNET.
  - RELOCATE EXISTING HORN AND STROBE FROM PREVIOUS LOCATION TO NEW LOCATION AS SHOWN IN DRAWING.

**MECH EQUIPMENT SCHEDULE**

NO.	EQUIPMENT	LOCATION	LOAD	Ø	VOLTS	BREAKER	COMMENTS
EX.FCU-1,2	EXISTING FAN COIL	EXISTING	13.8MCA	1	120V	15A-1P	EXISTING. EQUIPMENT WIRING TO REMAIN AS-BUILT.
EH-1	ELECTRIC HEATER	VESTIBULE	4.0KW	1	208V	25A-1P	
HRV-1	HEAT RECOVERY VENTILATOR	AS SHOWN	8.3MCA	3	208V	15A-3P	REMOTE DIGITAL STANDALONE CONTROLLER. PROVIDE DISCONNECT.
HWT-1	HOT WATER HEATER	MOP SINK	8.0KW	3	208V	40A-3P	CONFIRM ELECTRICAL REQUIREMENTS PRIOR TO ROUGH-IN.
P-1	PUMP	MOP SINK	FRAC.	1	120V	15A-1P	

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PROJECT TITLE  
 SKYVIEW PHARMA & MEDICAL

SHEET TITLE  
 POWER & AUXILIARY PLAN

DATE	PROJECT NO.	SHEET NO.
2024-06-07	202409	E3

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**GENERAL NOTES**

- IT IS THE INTENT THAT THESE DRAWINGS AND SPECIFICATIONS PROVIDE FOR AN ELECTRICAL INSTALLATION THAT IS COMPLETE AND IN OPERATING CONDITION. CONTRACTOR SHALL EXAMINE ALL DRAWINGS AND SPECIFICATIONS INCLUDED IN THE TENDER DOCUMENTS AND RELATED TO THIS PROJECT AND THE VARIATIONS BETWEEN DRAWINGS AND SPECIFICATIONS WHICH LEAVES THE ELECTRICAL CONTRACTOR IN DOUBT AS TO TRUE INTENT AND MEANING. OBTAIN RULING BEFORE SUBMITTING TENDER.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL MATERIAL, APPARATUS, TOOL SERVICE, AND LABOR NECESSARY TO ACCOMPLISH THIS, EXCEPT WHERE SPECIFICALLY NOTED THAT SUCH WORK OR MATERIAL IS NOT INCLUDED.
- DISCREPANCIES OCCURRING IN THE CONTRACT DOCUMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO TENDER CLOSE. IF NOT, IT SHALL BE ASSUMED THAT THE MORE EXPENSIVE OPTION IS TO BE USED.
- THESE DRAWINGS AND SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH THE ARCHITECTURAL AND MECHANICAL AND WHAT IS CALLED FOR IN ONE AND/OR ANOTHER SHALL BE BINDING ON THIS CONTRACTOR.
- THE ELECTRICAL CONTRACTOR SHALL EXAMINE CAREFULLY ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS AND WORK OF OTHER TRADES AND CONFIRM THAT THE WORK UNDER THIS CONTRACT CAN BE SATISFACTORILY CARRIED OUT WITHOUT CHANGES AS SHOWN ON THE DRAWINGS. SHOULD ANY CONFLICTS ARISE OR IF IT IS IDENTIFIED THAT ADDITIONAL WORK IS REQUIRED BEYOND THE WORK SHOWN ON THE DRAWINGS, THE MATTER SHALL BE BROUGHT TO THE ENGINEER PRIOR TO SUBMITTING TENDER.
- BEFORE SUBMITTING TENDER, CAREFULLY EXAMINE THE SITE OF THE PROPOSED WORK SO AS TO ASCERTAIN ALL EXISTING CONDITIONS AFFECTING THE WORK. NO EXTRAS WILL BE ALLOWED FOR WORK NECESSITATED BY CONDITIONS ORDINARILY EVIDENT ON THE SITE.
- THE ELECTRICAL CONTRACTOR SHALL CONSULT WITH THE GENERAL CONTRACTOR TO ASCERTAIN ANY CHANGES THAT MAY HAVE TO BE MADE AND OBTAIN THE ARCHITECT'S APPROVAL, IN WRITING THROUGH THE GENERAL CONTRACTOR, FOR ANY SUCH CHANGE.

**1. ELECTRICAL REQUIREMENTS**

- REGULATORY REQUIREMENTS
  - COMPLY WITH SAFETY CODES ACT AND RULES AND REGULATIONS MADE PURSUANT THERETO, INCLUDING THE CANADIAN ELECTRICAL CODE.
  - UNLESS OTHERWISE INDICATED, ALL REFERENCES TO "CANADIAN ELECTRICAL CODE" OR "CEC" SHALL MEAN THE EDITION OF THE CANADIAN ELECTRICAL CODE, PART I, CSA C22.1, 2004 AND THE VARIATIONS MADE THERETO BY ALBERTA REGULATION, WHICH ARE IN FORCE ON THE DATE OF BID CLOSING FOR THE CONTRACT.
  - ALL ELECTRICAL PRODUCTS SHALL BE TESTED, CERTIFIED AND LABELED IN ACCORDANCE WITH A CERTIFICATION PROGRAM ACCREDITED BY THE STANDARDS COUNCIL OF CANADA. SUCH CERTIFICATION OF A PRODUCT IS NOT SO LABELED, PRODUCE WRITTEN APPROVAL BY THE AUTHORITY HAVING JURISDICTION.
  - ELECTRICAL TRADE SHALL TAKE OUT ALL PERMITS AT THE BEGINNING OF THE WORK AND PAY ASSOCIATED FEES.
  - SUBMIT TO OWNER AND ELECTRICAL ENGINEER, COPY OF ELECTRICAL PERMIT OBTAINED FROM AUTHORITY HAVING JURISDICTION.
  - WHEN AUTHORITY HAVING JURISDICTION CONDUCTS AN ELECTRICAL INSPECTION, SUBMIT COPY OF CERTIFICATE OF ACCEPTANCE PROVIDED BY AUTHORITY HAVING JURISDICTION.

**1.2 SHOP DRAWINGS & PRODUCT DATA**

- SUBMIT SHOP DRAWINGS AND PRODUCT DATA, AS SPECIFIED, INDICATING DETAILS OF CONSTRUCTION, DIMENSIONS, CAPACITIES, SCHEMATICS & WIRING DIAGRAMS, HEIGHTS AND ELECTRICAL PERFORMANCE CHARACTERISTICS OF EQUIPMENT AND MATERIALS PRIOR TO MANUFACTURING.
- PRIOR TO COMMENCEMENT OF CONSTRUCTION, PROVIDE PRODUCT DATA FOR BUT NOT LIMITED TO: TRANSFORMER, PANEL BOARDS, LUMINAIRES, EMERGENCY LIGHTING AND EXIT SIGNAGE, AND RECEPTACLES.
- ENGINEER'S REVIEW OF SHOP DRAWINGS AND PRODUCT DATA TO BE FOR GENERAL DESIGN ONLY AND WILL NOT RELIEVE ELECTRICAL TRADE OR SUPPLIERS FROM RESPONSIBILITY FOR ERRORS, PROPER FITTING, CONSTRUCTION OF WORK AND FURNISHING OF MATERIALS. REVIEW WILL NOT BE CONSIDERED AS APPROVING DEPARTURES FROM CONTRACT DOCUMENT REQUIREMENTS IF SUCH DEPARTURES ARE NOT SPECIFICALLY NOTED. ELECTRICAL TRADE TO BE RESPONSIBLE FOR VERIFYING ALL DIMENSIONS.

**1.3 RECORD DRAWINGS AND MANUALS**

- THE ELECTRICAL CONTRACTOR IS TO HAVE ONE (1) SET OF ELECTRICAL DRAWINGS ON SITE AT ALL TIMES TO BE RED LINED ACCORDING TO THE ACTUAL INSTALLATION OF ELECTRICAL EQUIPMENT INCLUDING ALL CHANGES TO THE ORIGINAL TENDER DRAWINGS COVERED BY ADDENDA, CHANGE ORDERS, FIELD CHANGES, JOB CONDITIONS, ETC. AND TURN THESE OVER TO THE ENGINEER IN ELECTRONIC AND HARD COPY FORM. COMPLETED RECORD DRAWINGS TO BE CLEARLY MARKED "RECORD DRAWINGS".
- CONTRACTOR TO SHOW ALL FINAL LOCATIONS AND DIMENSIONS OF THE DISTRIBUTION EQUIPMENT, MAJOR JUNCTION BOXES, PANEL BOARDS, EQUIPMENT & ENCLOSURES, STRUCTURAL AND MECHANICAL DRAWINGS, MECHANICAL EQUIPMENT INCLUDING NUMBERSING DESIGNATION, CORRECT FIXTURE AND EQUIPMENT SUPPLIER CATALOGUE INFORMATION, AND ANY CHANGES TO CIRCUIT DESIGNATIONS.
- PROVIDE THREE (3) COPIES OF MAINTENANCE MANUALS TO INCLUDE ALL NEW ELECTRICAL EQUIPMENT (LIGHT FIXTURES INCLUDING LAMPS AND GLASS COVERS), EXIT LIGHTS, BATTERY UNITS, PANEL BOARDS (INCLUDING BREAKER RATINGS), TRANSFORMERS, ETC.)
- THE MAINTENANCE MANUALS SHALL CONSIST OF MANUFACTURERS' AND GENERAL MAINTENANCE SCHEDULE AND PROCEDURE. IT SHALL ALSO INCLUDE ALL WARRANTIES, NAME/ADDRESS/TELEPHONE # OF THE COMPANY PROVIDING WARRANTY.
- PROVIDE AS-BUILT DRAWINGS AND MANUALS TO BUILDING MAINTENANCE UPON COMPLETION OF WORK. DRAWINGS AND MANUALS SHALL BE REVIEWED AND APPROVED BY ENGINEER PRIOR TO SUBMISSION TO BUILDING MAINTENANCE.

**1.4 COORDINATION AND WORK SETTING**

- ELECTRICAL CONTRACTOR TO COORDINATE WORK WITH OTHER TRADES TO ENSURE SUCCESSFUL COMPLETION OF WORK.
- PRIOR TO INSTALLATION OF ANY ELECTRICAL EQUIPMENT, THE CONTRACTOR SHALL ENSURE THAT THE ELECTRICAL MATERIAL CAN BE LOCATED WITH RESPECT TO EQUIPMENT CONNECTIONS, STRUCTURAL AND ARCHITECTURAL DETAILS OF THE PROJECT.
- ELECTRICAL CONTRACTOR TO BE RESPONSIBLE FOR CORRECTING ALL WORK COMPLETED CONTRARY TO INTENT OF DRAWINGS AND SPECIFICATIONS AND BEAR ALL COST FOR SAME, WHERE INTENT OF DRAWINGS AND SPECIFICATIONS IS NOT CLEAR, CONTRACTOR TO OBTAIN CLARIFICATION BEFORE PROCEEDING WITH WORK.
- ELECTRICAL CONTRACTOR TO MAKE REFERENCE TO ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS, CONSULT WITH RESPECTIVE CONTRACTORS IN SETTING OUT LOCATIONS FOR CONDUIT RUNS, LIGHT FIXTURES, PANEL ASSEMBLIES, ETC. SO THAT CONDUITS AND EQUIPMENT SPACING IS MAINTAINED.
- ELECTRICAL CONTRACTOR TO COORDINATE ANY INTERRUPTIONS TO NEARBY TENANTS IN ORDER TO AVOID ANY INCONVENIENCES. IF NECESSARY, CONTRACTOR TO PERFORM REQUIRED CONNECTION AFTER BUSINESS HOURS.

**1.5 UNIFORMITY OF EQUIPMENT**

- UNLESS OTHERWISE SPECIFIED, UNIFORMITY OF MANUFACTURER TO BE MAINTAINED FOR ANY PARTICULAR ITEM THROUGHOUT.

**1.6 PRODUCT SUBSTITUTION**

- SUBSTITUTIONS ARE TO BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO TENDER CLOSE. NO SUBSTITUTIONS WILL BE ACCEPTED AFTER TENDER HAS CLOSED.
- IN THE CASE THAT AN ALTERNATE IS APPROVED, THE ELECTRICAL CONTRACTOR SHALL PROVIDE TWO PRICES FOR THE TENDER, ONE WITH THE SPECIFIED PRODUCT AND ONE WITH THE APPROVED SUBSTITUTION.

**1.7 GUARANTEE WARRANTY**

- THE ELECTRICAL TRADE SHALL FURNISH A WRITTEN GUARANTEE WARRANTY STATING THAT ALL WORK EXECUTED UNDER THIS CONTRACT WILL BE FREE FROM DEFECTS OF WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THIS WORK.
- THE ABOVE PARTIES FURTHER AGREE THAT THEY WILL, AT THEIR OWN EXPENSE, REPAIR AND REPLACE ALL SUCH DEFECTIVE WORK AND OTHER WORK DAMAGED THEREBY OR REPAIR OR REPLACE DEFECTIVE WORK UNDER THE TERM OF THE GUARANTEE WARRANTY PROVIDED THAT SUCH FAILURE IS NOT CAUSED BY IMPROPER USAGE.
- THE PERIOD OF THE GUARANTEE SPECIFIED ABOVE SHALL IN NO WAY SUPPLANT ANY OTHER GUARANTEE OF A LONGER PERIOD BUT SHALL BE BINDING ON WORK NOT OTHERWISE COVERED.

**1.8 ELECTRICAL IDENTIFICATION**

- NAMEPLATE IDENTIFICATION: IDENTIFY FOLLOWING EQUIPMENT WITH LAMACOID NAMEPLATES, 3 MM THICK, BLACK FACE, WHITE LETTERING, MECHANICALLY ATTACHED, 20 MM HIGH WITH 8 MM HIGH LETTERS: PANELS, DISCONNECT SWITCHES, MAGNETIC MOTOR STARTERS AND CONTACTORS, TRANSFORMERS, WIRE WAYS, LINE VOLTAGE CABINETS AND ENCLOSURES, LOW VOLTAGE CABINETS AND ENCLOSURES, & PULL AND JUNCTION BOX COVERS OVER 100 MM SIZE.
- IDENTIFY LOADS CONTROLLED BY EACH OVERCURRENT PROTECTIVE DEVICE IN EACH PANEL, BY MEANS OF A TYPEWRITTEN PANEL DIRECTORY.
- RECEPTACLE FACEPLATES TO BE LABELED INDICATING SOURCE PANEL & CIRCUIT NUMBER.

**1.9 FIRE STOPPING OF CABLE PENETRATIONS**

- ELECTRICAL WIRE, CABLE, AND OR CONDUIT PENETRATING A FIREWALL SHALL BE SEALED AT THE PENETRATION BY A FIRE STOP SYSTEM THAT HAS AN FT RATING NOT LESS THAN THE FIRE-RESISTANCE RATING FOR THE FIRE SEPARATION. COORDINATE EXACT REQUIREMENTS ON SITE.

**1.10 INSPECTION AND TESTING**

- ELECTRICAL CONTRACTOR IS TO NOTIFY ENGINEER 10 BUSINESS DAYS BEFORE PRE-BOARD INSPECTION. FAILURE TO DO SO WILL RESULT IN THE OPENING OF WALLS TO EXPOSE THE ROUGH IN INSTALLATION AT THE ELECTRICAL CONTRACTOR'S EXPENSE.
- THE ENTIRE SYSTEM MUST TEST FREE FROM SHORT CIRCUITS AND GROUNDS AND BEFORE ENERGIZING ANY PORTION OF THE ELECTRICAL SYSTEM, PERFORM MEGGER TESTS ON ALL FEEDERS AND BRANCH CIRCUITS. RESULTS OF SUCH TESTS SHALL CONFORM TO REQUIREMENTS OF CEC AND TO SATISFACTION OF AUTHORIZED INSPECTION AGENCY AND ENGINEER.
- UPON COMPLETION AND IMMEDIATELY PRIOR TO FINAL INSPECTION, CHECK LOAD BALANCE ON ALL FEEDERS AND PANELS. TEST TO BE CARRIED OUT BY TURNING ON POSSIBLE LOADS AND CHECKING LOAD CURRENT BALANCE. IF LOAD BALANCE EXCEEDS 15%, RECONNECT CIRCUITS TO BALANCE LOADS.
- AT THE TIME OF FINAL INSPECTION AND TEST, ALL CONNECTIONS SHALL BE MADE, ALL EQUIPMENT SHALL BE INSTALLED AND THE ENTIRE ELECTRICAL SYSTEM SHALL BE CONNECTED AS FOR NORMAL OPERATION.
- ALL NECESSARY TESTING EQUIPMENT TO BE SUPPLIED BY ELECTRICAL CONTRACTOR AND BEAR ALL EXPENSES IN CONNECTION WITH CARRYING OUT THE TESTS.

**1.11 PAINTING AND FINISHING**

- ALL ELECTRICAL SUPPORTS, HANGER RODS, PULL BOXES, CHANNEL FRAMES, CONDUITS RACKS, OUTLET BOXES, BRACKETS, CLAMPS, ETC. TO HAVE GALVANIZED FINISH OVER CORROSION RESISTANT PRIMER.
- PULL BOXES, JUNCTION BOXES, ETC. TO BE FINISHED IN ACCORDANCE WITH EXISTING BUILDING.

**1.12 CLEANUP**

- ELECTRICAL CONTRACTOR AT ALL TIMES DURING CONSTRUCTION SHALL KEEP SITE FREE OF ALL DEBRIS, BOXES, PACKING, ETC.
- UPON COMPLETION OF WORK, ELECTRICAL INSTALLATION TO BE LEFT IN A CLEAN AND FINISHED CONDITION TO SATISFACTION OF ENGINEER.

**2. STANDARDS OF MATERIAL AND WORKMANSHIP**

- ALL MATERIAL SUPPLIED BY THE CONTRACTOR SHALL BE NEW AND OF THE QUALITY SPECIFIED. ALL SUCH MATERIAL SHALL CONFORM TO THE STANDARDS OF THE CANADIAN STANDARDS ASSOCIATION (CSA) AND SHALL BEAR THE NECESSARY CSA LABEL OR APPROVED EQUIVALENT. FOR ANY MATERIAL, NOT CSA APPROVED, THE CONTRACTOR SHALL OBTAIN THE APPROVAL OF THE LOCAL INSPECTION AUTHORITY, AND SHALL BEAR ALL INSPECTION CHARGES LEVIED AND ANY MODIFICATION COSTS INCURRED.
- WHERE EQUIPMENT OR MATERIALS ARE SPECIFIED BY TECHNICAL DESCRIPTION ONLY, THEY SHALL BE OF THE BEST COMMERCIAL QUALITY OBTAINABLE FOR THE PURPOSE.
- WHERE EQUIPMENT TYPE OR MAKE ARE LISTED ON DRAWING ONLY THESE TYPES SHALL BE USED IN TENDERING AND INSTALLED ON A PROJECT. SUBMIT TO ENGINEER COMPLETE INFORMATION OF MATERIALS TO BE INSTALLED ON PROJECT.
- ALL WORK SHALL BE EXECUTED IN A SATISFACTORY, WORKMANLIKE MANNER AND SHALL PRESENT A NEAT MECHANICAL APPEARANCE WHEN COMPLETED. WORK NOT CONSIDERED SATISFACTORY TO THE ENGINEER SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE.
- THE ENTIRE INSTALLATION SHALL COMPLY WITH THE CANADIAN ELECTRICAL CODE - LATEST EDITION, THE ALBERTA ELECTRICAL CODE AND ANY MODIFICATION COSTS INCURRED. THESE REQUIREMENTS SHALL BE MET WITH NO ADDITIONAL CHARGE TO THE OWNER.
- THE ELECTRICAL CODE OF WORK IS TO BE COMPLETED BY A QUALIFIED PERSON AS DEFINED BY THE CANADIAN ELECTRICAL CODE.

**3. ELECTRICAL MATERIALS AND METHODS**

- CONDUIT
  - CONDUITS SHALL BE INSTALLED IN SPECIFIC LOCATIONS AS FOLLOWS:
    - RIID PVC TYPE CONDUIT IN CONCRETE (UNPLASTICIZED) BELOW OR ON GRADE. CONDUITS RISING ABOVE FLOOR SLAB MUST EXIT AT A 90-DEGREE ANGLE TO THE SLAB SURFACE. ADAPT TO METAL WHEN EXISTING SLAB.
    - ELECTRIC METALLIC TUBING (EMT) CONDUIT IN CONCEALED OR INDOOR EXPOSED WALLS & CEILINGS AND SURFACE MOUNTED WHERE IT IS NOT EXPOSED TO MECHANICAL DAMAGE. CONDUITS SHALL BE CONCEALED WHENEVER POSSIBLE. CONDUITS CONCEALED IN CEILING SPACES SHALL BE RUN NEATLY AND PARALLEL TO BUILDING LINES AND SUPPORTED AS FOR SURFACE MOUNTED CONDUITS.
    - RIID GALVANIZED STEEL (RGS) CONDUIT FOR ALL EXPOSED RUNS OUTDOOR AND WHERE IN JUDGEMENT BY ELECTRICAL INSPECTION AUTHORITY IS SUBJECT TO MECHANICAL DAMAGE.
    - FLEXIBLE PVC JACKET CONDUIT ON ALL CONNECTIONS OF MECHANICAL EQUIPMENT INCLUDING BUT NOT LIMITED TO MOTORS AND SUBJECT TO VIBRATION FROM STUB-UPS OR JUNCTION BOXES.
  - ALL NON-METALLIC RACEWAYS (EXCEPT THOSE IN PLenums) MUST BE MARKED FT-4 AND NOT EXCEED 175MM IN OUTSIDE DIAMETER OR EQUIVALENT CROSS-SECTIONAL AREA WHEN USED IN NON-COMBUSTIBLE BUILDINGS. WHEN NON-METALLIC RACEWAYS ARE INSTALLED IN A PLenum OF A NON-COMBUSTIBLE BUILDING, SUCH NON-METALLIC RACEWAYS MUST HAVE THE FT-6 RATING.
  - CONDUITS RUNNING ON FLAT SURFACES SHALL BE SPACED OFF THE MOUNTING SURFACE, SPACERS, STRAPS AND HARDWARE SHALL BE OF THE SAME METAL AS THE CONDUIT.
  - EMT SHALL BE MADE TO CSA C22.2 NO. 63 AND SHALL HAVE COUPLINGS AND CONNECTORS OF THE SET SCREW, SEAMLESS STEEL, CONCRETE-TIGHT FITTING.
  - RIID PVC SHALL BE MADE TO CSA C22.2 NO.2112. SHALL HAVE COUPLINGS AND ADAPTERS WHICH ARE SECURED WITH SOLVENT CEMENT. FIELD BENDS WILL NOT BE ACCEPTED. IT SHALL NOT BE INSTALLED WHERE EXPOSED TO MECHANICAL DAMAGE OR WHERE SUBJECT TO TEMPERATURES ABOVE 75C.
  - RGS CONDUIT SHALL BE MADE TO CSA C22.2 NO. 451 AND SHALL BE THREADED, AND THE JOINTS AND FITTINGS SHALL BE MADE WATER-TIGHT.
  - FLEXIBLE CONDUIT SHALL BE MADE TO CSA C22.2 NO.56 AND CAN BE STEEL OR ALUMINUM, WITH TWO (2) SREW CONNECTORS AND ANTI-SHIRT BUSHINGS IN DRY-AREA. MET AREAS SHALL BE LIQUID TIGHT. PVC JACKETED FLEXIBLE CONDUITS ARE REQUIRED TO ALL MOTOR CONNECTIONS.
  - ALL CONDUIT ENDS TO BE PLUGGED TO PREVENT ENTRY OF DIRT. ENSURE CONDUITS ARE CLEAN BEFORE PULLING CONDUITS.
  - COORDINATE THE INSTALLATION OF CONDUITS WITH OTHER TRADES.
  - ELECTRICAL CONTRACTOR TO SELECT PROPER SIZES TO SUIT INTENDED USE, FULFILL WIRING REQUIREMENTS, AND COMPLY WITH CEC.

**3.2 WIRE AND CABLE**

- CONDUCTORS SHALL BE COPPER, RW-90 X-LINK, 600V INSULATION.
- FLEXIBLE METALLIC CABLE (BX) IS PERMISSIBLE ON FIXTURE DROPS ONLY UNLESS OTHERWISE NOTED ON DRAWINGS.
- ALUMINUM CONDUCTORS SHALL NOT BE UTILIZED, UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
- ALL WIRING WITHIN A PLenum SPACE MUST BE FT-6 FOR NON-COMBUSTIBLE BUILDINGS AND FT-4 FOR COMBUSTIBLE BUILDINGS AND INSTALLED IN A ENCLOSED RACEWAY. ALL RACEWAYS INSTALLED IN PLenum SPACE MUST MEET THE SAME RATING.
- MINIMUM CONDUIT SIZE TO BE #12 AWG. MINIMUM #10 AWG ON ALL RUNS GREATER THAN 100 FT.
- ALL CONDUCTORS TO BE COLOR CODED AS FOLLOWS:
 

PHASE 'A'	RED	120/208V	347/600V
PHASE 'B'	BLACK	BROWN	
PHASE 'C'	BLUE	YELLOW	
NEUTRAL	WHITE	GREEN	
GROUND	GREEN	GREY	
TRACERS FOR EM CIRCUITS	YELLOW	RED	
- A GROUNDING CONDUIT SHALL BE INSTALLED IN CONDUITS AND DUCTS AS SPECIFIED IN THE CEC; WHETHER THE CONDUIT IS WRITTEN OR UNWRITTEN UPDATES PANEL SCHEDULES. PANELS IN RESIDENTIAL SUITES MAY LOCADRENTE TYPE WITH SMOOTH HINGED DOORS.
- PROVIDE AND INSTALL CONDUITS FOR POWER, LIGHTING AND CONTROLS AS SHOWN ON THE PANEL SCHEDULES AND SPECIFIED HEREIN.

**3.3 BOXES**

- INSTALL BOXES FLUSH WHERE PRACTICABLE AND FOR VERTICAL MOUNTING OF DEVICES. INSTALL TO NEAREST AVAILABLE, ETC. SO THAT CONDUITS AND SYMMETRICAL SPACING IS MAINTAINED.
- OUTLET BOXES MAKE AND TYPE SHALL BE AS PER CSA C22.2 NO.18 FOR THE INTENT PURPOSE AND INSTALLATION. SHEET STEEL, GALVANIZED FOR CONCEALED BOXES, CAST METAL FOR SURFACE AND WEATHERPROOF BOXES, AND NON-METALLIC PVC FLOOR BOXES FOR CONCRETE.
- JUNCTION AND PULL BOXES MAKE AND TYPE SHALL BE AS PER CSA C22.2 NO. 40. SHEET STEEL WITH SCREW-ON COVERS AND BARRIERS AS REQUIRED.
- OWNER OR ENGINEER MAY CHANGE LOCATION OF OUTLETS PRIOR TO INSTALLATION, WITH NO CHANGE IN CONDUIT PRICE. PROVIDED THAT DISTANCE DOES NOT EXCEED 3 M FROM ORIGINALLY INDICATED LOCATION.
- FLOOR OUTLETS SHALL BE INSTALLED STRAIGHT AND PARALLEL.

**3.4 WIRING DEVICES**

- SWITCHES
  - SWITCHES MADE TO CSA C22.2 NO.1111. TOGGLE TYPE, FULL LOAD RATED 15A AT 120V (WHITE COLOR), 120V RATED SWITCHES SHALL BE COMMERCIAL GRADE.
  - DIMMABLE SWITCHES MADE TO CSA C22.2 NO.1821. SLIDE TYPE. DIMMER WATTAGE SHALL BE RATED AT LEAST TWICE THE MINIMUM TOTAL WATTAGE OF THE BULBS IT IS CONTROLLING.
  - SWITCHES IN FINISHED AREA INSIDE ROOMS SHALL BE OF DECORATOR TYPE.
  - SWITCHES FOR FLOURESCENT, RESISTANCE AND TUNGSTEN LAMPS SHALL BE RATED UP TO FULL AMPERAGE RATING.
  - SWITCHES FOR MOTOR LOADS SHALL BE RATED AT LEAST 125% OF THE FULL LOAD CURRENT OF THE MOTOR.
  - ALL SWITCHES SHALL BE OF THE SAME MANUFACTURER THROUGHOUT.
  - SWITCHES SHALL BE MOUNTED 48" A.F.F.
  - COVER PLATE SHALL BE N/04 WHITE IN FINISHED AREA, STAMPED SHEET STEEL IN UNFINISHED AREAS, AND CAST OR POLYCARBONATE, GASKEETED IN WET AREAS.
- RECEPTACLES
  - ALL RECEPTACLES SHALL BE CERTIFIED TO CSA C22.2 NO. 42 AND SHALL BE OF THE TYPE SPECIFIED ON THE DRAWINGS.
  - STANDARD 15A 15A AND 20A RECEPTACLES SHALL BE 3-POLE 3-WIRE GROUNDING, COMMERCIAL GRADE, DUPLEX, NYLON FACE, WHITE, STRAIGHT BLADE, TEMPER-RESISTANT, 125V RATED.
  - ALL RECEPTACLES SHALL BE OF THE SAME MANUFACTURER THROUGHOUT.
  - FOR ALL RECEPTACLES OTHER THAN THE STANDARD 15A DUPLEX RECEPTACLE, PROVIDE LAMACOID NAMETAGS GIVING AMP RATING, PHASE AND SHUT-OFF VALVE.
  - RECEPTACLES SHALL BE MOUNTED 12" A.F.F., UNLESS OTHERWISE INDICATED ON DRAWINGS.
  - RECEPTACLES AT COUNTERS SHALL BE MOUNTED 8" ABOVE COUNTER, UNLESS OTHERWISE INDICATED ON DRAWINGS.
  - RECEPTACLES EXPOSED TO WEATHER SHALL BE SUITABLE TO WET LOCATIONS AND SHALL HAVE WEATHERPROOF COVER PLATES AND MARKED EXTRA DUTY.
  - COVER PLATE SHALL BE N/04 WHITE IN FINISHED AREA, STAMPED SHEET STEEL IN UNFINISHED AREAS, AND CAST OR POLYCARBONATE, GASKEETED IN WET AREAS.

**3.5 GROUNDING**

- SUPPLY AND INSTALL A COMPLETE GROUNDING SYSTEM AS REQUIRED BY THE CANADIAN ELECTRICAL CODE AND ELECTRICAL INSPECTION DEPARTMENT, WHETHER OR NOT REQUIREMENTS ARE INDICATED ON DRAWINGS OR SPECIFIED HEREIN. ALL COMPONENTS TO BE SECURELY AND ADEQUATELY GROUNDING AND WHERE REQUIRED TO BE SECURELY AND ADEQUATELY GROUNDING TO THE GROUNDING STUDS AND BUSHINGS TO BE USED.
- GROUNDING EQUIPMENT TO CSA C22.2 NO. 41 AND AS FOLLOWS:
  - GROUND PLATE: CSA MANUFACTURED ELECTRODE PLATE, GALVANIZED 1/4" THICK.
  - CONDUCTORS: COPPER, STRANDED, BARE.
  - CONNECTORS: THERMALSEALED WHERE UNDERGROUND OR EXPOSED TO MOISTURE, COMPRESSION TYPE BOLT-ON IN OTHER LOCATIONS.
  - PROVIDE SEPARATE, INSULATED GROUND CONDUCTOR IN CONDUIT INSTALLED UNDERGROUND, IN SLABS POURED ON GRADE OR EXPOSED TO MOISTURE AND IN NON-METALLIC CONDUIT.
  - RECEPTACLE BUILDING GROUND AS PER LOCAL UTILITY REQUIREMENTS AND CONNECTED BY A GROUND BARE CONDUIT AS INDICATED ON THE SINGLE LINE DIAGRAM.
  - BOND EXISTING TELEPHONE BACKBOARD WITH #6 AWG GROUND, COPPER.
  - GROUND ALL METAL PARTS OF BUILDING STRUCTURE AND MECHANICAL EQUIPMENT INCLUDING PIPING SYSTEMS SUCH AS GAS LINE AND WATER LINE AREA OF SHUT-OFF VALVE.
  - PROVIDE A #12 INSULATED ISOLATED GREEN GROUND WIRE FROM EACH ISOLATED GROUND OUTLET TO INSULATED ISOLATED GROUND BUS IN PANEL.
  - BOND ALL ELECTRICALLY POWERED EQUIPMENT TO GROUND USING SUITABLY SIZED CONNECTORS AS PER CEC.
- SUPPORTS
  - PROVIDE METAL BRACKETS, FRAMES, CLAMPS, CHANNELS, STRAPS AND RELATED DEVICES TO ADEQUATELY SUPPORT WEIGHT OF EQUIPMENT AND RACEWAYS.
  - DO NOT FASTEN SUPPORTS TO PIPING, DUCTWORK OR MECHANICAL EQUIPMENT.

**4. MECHANICAL EQUIPMENT WIRING**

- SUPPLY AND INSTALL ALL NECESSARY DISCONNECT SWITCHES, MOTOR PROTECTION SWITCHES, MANUAL STARTERS, MAGNETIC STARTERS AND ALL CONTROL STATIONS REQUIRED FOR THE CONTROL OF MECHANICAL EQUIPMENT EXCEPT THOSE STARTERS OR CONTROLLERS WHICH ARE PART OF PACKAGED MECHANICAL EQUIPMENT SHALL BE SUPPLIED BY MECHANICAL TRADE. PROVIDE AND INSTALL ALL LINE VOLTAGE POWER INTO THE TERMINAL HOUSING OF THE MECHANICAL EQUIPMENT OR MOTOR.
- LOW VOLTAGE CONTROL WIRING WHICH FORMS PART OF AN AUTOMATIC CONTROL SYSTEM FOR THE CONTROL OF MECHANICAL EQUIPMENT SHALL BE BY MECHANICAL TRADE. THIS WIRING SHALL BE IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS.
- LINE AND LOW VOLTAGE WIRING FOR CONTROL DEVICES SUCH AS THERMOSTATS THAT DO NOT FORM A PART OF AN AUTOMATIC SYSTEM, SHALL BE SUPPLIED AND INSTALLED BY ELECTRICAL TRADE. THIS INCLUDES UNIT HEATERS, FORCE VUL HEATERS AND MANUALLY CONTROLLED FANS.
- THERMOSTATS AND HUMIDISTATS TO BE SUPPLIED BY MECHANICAL TRADE AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR AS DESCRIBED EARLIER. CONTROLS ON MECHANICAL PIPING TO BE DONE BY MECHANICAL TRADE AS PER ELECTRICAL SPECIFICATIONS.
- ELECTRIC TRADE TO CONFIRM ALL REQUIREMENTS WITH MECHANICAL TRADE PRIOR TO SUBMITTING TENDER.
- INSTALLATION OF CONDUITS, OUTLETS AND EQUIPMENT SHALL NOT BE PROCEEDED WITH UNTIL THE INSTALLATION OF MECHANICAL EQUIPMENT IS FAR ENOUGH PROGRESSED TO AVOID CONFLICTS. POSITION OF ELECTRICAL EQUIPMENT AND OUTLETS SHALL BE ADJUSTED IN THESE AREAS TO COORDINATE WITH MECHANICAL EQUIPMENT.

**5. MOTOR STARTERS**

- MANUAL (FULL VOLTAGE) MOTOR STARTERS TO BE QUICK-MAKE QUICK-BREAK WITH THERMAL OVERLOAD PROTECTION, 2X NORMALLY OPEN & 2 NORMALLY CLOSED AUXILIARY CONTACTS, NEMA 1 ENCLOSURES FOR INDOOR AND NEMA 3R FOR OUTDOOR.
- ALL MAGNETIC STARTERS SHALL HAVE CONTROL TRANSFORMERS, OVERLOAD/OVERHEAT PROTECTION RELAY, 120V HOLDING COIL, PILOT LIGHTS, HOA SWITCHES AND 2X NORMALLY OPEN & 2 NORMALLY CLOSED AUXILIARY CONTACTS.
- COMBINATION MAGNETIC STARTERS ARE TO BE COMPLETED WITH CIRCUIT BREAKER TYPE DISCONNECT SWITCHES.
- FURNISH DIAGNETS FOR ALL MOTORS AS REQUIRED BY THE CANADIAN ELECTRICAL CODE.
- DISCONNECTS SHALL BE TO CAN/CSA NO.4-M8B, HEAVY DUTY, LOCKABLE, NON-FUSED, WITH POLES, VOLTAGE, AMPERAGE, KW RATINGS AND ENCLOSURES AS INDICATED ON DRAWINGS AND REQUIRED BY CEC TO SUIT APPLICATION.
- FLEXIBLE PVC JACKET CONDUIT ON ALL CONNECTIONS OF MECHANICAL EQUIPMENT INCLUDING BUT NOT LIMITED TO MOTORS AND SUBJECT TO VIBRATION FROM STUB-UPS OR JUNCTION BOXES.
- ALL NON-METALLIC RACEWAYS (EXCEPT THOSE IN PLenums) MUST BE MARKED FT-4 AND NOT EXCEED 175MM IN OUTSIDE DIAMETER OR EQUIVALENT CROSS-SECTIONAL AREA WHEN USED IN NON-COMBUSTIBLE BUILDINGS. WHEN NON-METALLIC RACEWAYS ARE INSTALLED IN A PLenum OF A NON-COMBUSTIBLE BUILDING, SUCH NON-METALLIC RACEWAYS MUST HAVE THE FT-6 RATING.
- CONDUITS RUNNING ON FLAT SURFACES SHALL BE SPACED OFF THE MOUNTING SURFACE, SPACERS, STRAPS AND HARDWARE SHALL BE OF THE SAME METAL AS THE CONDUIT.
- EMT SHALL BE MADE TO CSA C22.2 NO. 63 AND SHALL HAVE COUPLINGS AND CONNECTORS OF THE SET SCREW, SEAMLESS STEEL, CONCRETE-TIGHT FITTING.
- RIID PVC SHALL BE MADE TO CSA C22.2 NO.2112. SHALL HAVE COUPLINGS AND ADAPTERS WHICH ARE SECURED WITH SOLVENT CEMENT. FIELD BENDS WILL NOT BE ACCEPTED. IT SHALL NOT BE INSTALLED WHERE EXPOSED TO MECHANICAL DAMAGE OR WHERE SUBJECT TO TEMPERATURES ABOVE 75C.
- RGS CONDUIT SHALL BE MADE TO CSA C22.2 NO. 451 AND SHALL BE THREADED, AND THE JOINTS AND FITTINGS SHALL BE MADE WATER-TIGHT.
- FLEXIBLE CONDUIT SHALL BE MADE TO CSA C22.2 NO.56 AND CAN BE STEEL OR ALUMINUM, WITH TWO (2) SREW CONNECTORS AND ANTI-SHIRT BUSHINGS IN DRY-AREA. MET AREAS SHALL BE LIQUID TIGHT. PVC JACKETED FLEXIBLE CONDUITS ARE REQUIRED TO ALL MOTOR CONNECTIONS.
- ALL CONDUIT ENDS TO BE PLUGGED TO PREVENT ENTRY OF DIRT. ENSURE CONDUITS ARE CLEAN BEFORE PULLING CONDUITS.
- COORDINATE THE INSTALLATION OF CONDUITS WITH OTHER TRADES.
- ELECTRICAL CONTRACTOR TO SELECT PROPER SIZES TO SUIT INTENDED USE, FULFILL WIRING REQUIREMENTS, AND COMPLY WITH CEC.

**6. POWER DISTRIBUTION**

- ELECTRICAL SERVICE 120/208V, 400A PANEL, 3 PHASE, 4 WIRE SYSTEM.
- NOTIFY UTILITY COMPANY PRIOR TO COMMENCING WORK ON SITE. INSTALLATION TO BE PROVIDED IN ACCORDANCE TO UTILITY AND LOCAL JURISDICTION REQUIREMENTS. SUBMIT DRAWINGS AND SPECIFICATIONS TO THE UTILITY IF REQUESTED.
- CONFIRM SERVICE ENTRY POINT WITH UTILITY PRIOR TO TRENCING.
- THE MAIN DISTRIBUTION PANELBOARD WITH (MFD) TO BE SOLID NEUTRAL DESIGN, FLOOR MOUNTED, FREE STANDING. REFER TO SINGLE LINE DIAGRAM AND CONFIRM VOLTAGE, AMPERAGE, ETC.
- UTILITY METERING SECTION TO BE BARRIRED INTERNALLY FROM OTHER SECTIONS, OF SIZE REQUIRED BY THE UTILITY FOR C/T EQUIPMENT, SUPPLY AND INSTALL ALL APPROPRIATE METER SOCKETS, METER CABINETS, C/T'S AND P/T'S TO UTILITY COMPANY REQUIREMENTS.
- INTERRUPTING CAPACITY SHALL BE IN ACCORDANCE WITH THE FOLLOWING CHART UNLESS OTHERWISE MENTIONED. A MAJOR CITY NETWORK CONNECTED INTERRUPTING CAPACITY SHALL BE 100KA (REGARDLESS OF VOLTAGE AND AMPERAGE), OTHERWISE REFER TO THE FOLLOWING:  

MAIN BREAKER 120/208V	347/600V
0-200A	25KA
201-400A	42KA
401-1200A	65KA
1201-2000A	65KA
- MAIN BREAKER SHALL BE MOLDED CASE ELECTRONIC SOLID STATE DESIGN SIZED AS INDICATED IN THE SINGLE LINE DIAGRAM WITH AN INTERRUPTING CAPACITY TO MATCH THE MAIN DISTRIBUTION. PROVIDE GROUND FAULT PROTECTION IF 2000A OR LARGER AT 208V, OR 1000A OR LARGER AT 480V OR 600V.
- DISTRIBUTION BREAKERS SHALL BE MOLDED CASE SIZED AS INDICATED ON THE SINGLE LINE DIAGRAM WITH AN INTERRUPTING CAPACITY TO MATCH THE MAIN DISTRIBUTION.
- THE MAIN DISTRIBUTION PANELBOARD WITH (MFD) TO BE SOLID NEUTRAL DESIGN, FLOOR MOUNTED, FREE STANDING. REFER TO SINGLE LINE DIAGRAM AND CONFIRM VOLTAGE, AMPERAGE, ETC.
- UTILITY METERING SECTION TO BE BARRIRED INTERNALLY FROM OTHER SECTIONS, OF SIZE REQUIRED BY THE UTILITY FOR C/T EQUIPMENT, SUPPLY AND INSTALL ALL APPROPRIATE METER SOCKETS, METER CABINETS, C/T'S AND P/T'S TO UTILITY COMPANY REQUIREMENTS.
- INTERRUPTING CAPACITY SHALL BE IN ACCORDANCE WITH THE FOLLOWING CHART UNLESS OTHERWISE MENTIONED. A MAJOR CITY NETWORK CONNECTED INTERRUPTING CAPACITY SHALL BE 100KA (REGARDLESS OF VOLTAGE AND AMPERAGE), OTHERWISE REFER TO THE FOLLOWING:  

MAIN BREAKER 120/208V	347/600V
0-200A	25KA
201-400A	42KA
401-1200A	65KA
1201-2000A	65KA
- MAIN BREAKER SHALL BE MOLDED CASE ELECTRONIC SOLID STATE DESIGN SIZED AS INDICATED IN THE SINGLE LINE DIAGRAM WITH AN INTERRUPTING CAPACITY TO MATCH THE MAIN DISTRIBUTION. PROVIDE GROUND FAULT PROTECTION IF 2000A OR LARGER AT 208V, OR 1000A OR LARGER AT 480V OR 600V.
- DISTRIBUTION BREAKERS SHALL BE MOLDED CASE SIZED AS INDICATED ON THE SINGLE LINE DIAGRAM WITH AN INTERRUPTING CAPACITY TO MATCH THE MAIN DISTRIBUTION.
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