

GENERAL

A. PROVIDE NEW ELECTRICAL WORK INDICATED. PERFORM WORK IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS, PROJECT REQUIREMENTS DOCUMENT (PRD), AND OTHER CONSTRUCTION DOCUMENT. IF DISCREPANCIES OR CONFLICTS BETWEEN ANY DOCUMENTS ARE IDENTIFIED, PROMPTLY NOTIFY THE SUBCONTRACT TECHNICAL REPRESENTATIVE (STR) AND DO NOT PROCEED WITH THAT PORTION OF THE WORK UNTIL THE STR PROVIDES DIRECTION FOR CORRECTIVE ACTION.

B. COMPLY WITH THE CURRENT VERSION OF THE NATIONAL ELECTRICAL CODE FOR ELECTRICAL CONNECTIONS AND INSTALLATIONS.

C. THE DRAWINGS AND SPECIFICATIONS DO NOT SPECIFICALLY SHOW OR MENTION EVERY ITEM NECESSARILY REQUIRED. PROVIDE COMPLETE AND OPERABLE SYSTEMS AND EQUIPMENT UNLESS EXPLICITLY STATED OTHERWISE.

D. ELECTRICAL DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC, ALTHOUGH THE LOCATIONS OF EQUIPMENT ARE SHOWN TO SCALE WHEREVER POSSIBLE. VERIFY EQUIPMENT SIZE WITH SHOP DRAWINGS. LAYOUT AND INSTALL WORK TO AVOID INTERFERENCE WITH OTHER TRADES.

E. NOTES ON THIS SHEET ARE GENERAL AND MAY NOT APPLY TO THE PROJECT.

F. ENSURE MATERIALS AND EQUIPMENT ARE INSTALLED CORRECTLY AND MAKE ADJUSTMENTS AS NECESSARY OR REQUIRED TO RESOLVE SPACE PROBLEMS AND PRESERVE SERVICE CLEARANCE. IN THE EVENT OF MAJOR REROUTING OF A SYSTEM APPEARS NECESSARY, PREPARE SHOP DRAWINGS OF THE PROPOSED REARRANGEMENT AND SUBMIT DRAWINGS FOR APPROVAL TO THE STR.

G. SUBMIT FOR APPROVAL EXACT LOCATION OF NEW EQUIPMENT WITH STR.

H. ELECTRICAL MATERIALS MUST BE NEW AND LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL). ELECTRICAL MATERIALS AND EQUIPMENT MUST MEET THE NRTL REQUIREMENTS AND BEAR THE NRTL LABEL.

I. ENCLOSURE CONSTRUCTION AND METHODS OF ASSEMBLY MUST BE IN ACCORDANCE WITH UL 50 AND NEMA PB 1.

J. NEUTRAL CONDUCTOR FOR ALL NON-LINEAR LOADS (EX. COMPUTER, ELECTRONIC RACKS, ETC.) MUST BE COUNTED AS CURRENT-CARRYING CONDUCTORS. MAXIMUM NUMBER OF CURRENT-CARRYING CONDUCTORS MUST NOT EXCEED 9 IN ANY HOME RUN CONDUIT.

K. CIRCUIT BREAKERS RATED 250 AMPS AND HIGHER MUST BE 100% RATED WITH ADJUSTABLE LONG TIME PICKUP AND DELAY, BANDS, ADJUSTABLE SHORT TIME PICKUP WITH MULTIPLE DELAY BANDS AND ADJUSTABLE INSTANTANEOUS PICKUP FOR OPTIMAL SYSTEM COORDINATION. INCLUDE A 3-PHASE AMMETER IN CIRCUIT BREAKER AND PROVIDE INTERCHANGEABLE/UNIVERSAL RATING PLUGS.

L. PROVIDE FIELD-ADJUSTABLE MAGNETIC INSTANTANEOUS TRIP SETTING FOR THERMAL MAGNETIC CIRCUIT BREAKERS RATED HIGHER THAN 150 AMPS.

M. CIRCUIT BREAKERS RATED, OR CAN BE ADJUSTED TO, 1200 AMPS OR HIGHER MUST HAVE ARC ENERGY REDUCTION MAINTENANCE SWITCH THAT CAN REDUCE CLEARING TIME FOR ARC-ENERGY REDUCTION AND DOCUMENTATION MADE AVAILABLE.

N. SERIES-RATED COMBINATION DEVICES ARE NOT PERMITTED. OVERCURRENT PROTECTION DEVICES MUST HAVE AN INTERRUPTING DUTY THAT EXCEEDS MAXIMUM AVAILABLE FAULT CURRENT.

O. DO NOT MOUNT MAIN CIRCUIT BREAKER IN A BRANCH BREAKER POSITION.

P. INDOOR PANELBOARD MUST BE PROVIDED WITH TWO DOORS. DOOR-IN-DOOR STYLE (INNER AND OUTER) DOORS THAT OPEN TO THE RIGHT. INNER DOOR EXPOSE THE CIRCUIT BREAKERS INSULATED BODY AND HANDLE ONLY WHEN OPEN. OUTER DOOR FULLY EXPOSE GUTTER SPACE, THE WIRING RACEWAY, AND CIRCUIT BREAKER LOAD SIDE TERMINALS WHEN OPEN. EACH DOOR MUST BE HINGED AND HAVE A FLUSH LOCKABLE HANDLE.

Q. OUTDOOR PANELBOARD MUST BE PROVIDED WITH THREE DOORS. NEMA 3R EXTERIOR DOOR WITH HINGED DOOR-IN-DOOR (INNER AND OUTER) STYLE DOORS THAT OPEN TO THE RIGHT. INNER DOOR EXPOSE THE CIRCUIT BREAKERS INSULATED BODY AND HANDLE ONLY WHEN OPEN. OUTER DOOR FULLY EXPOSE GUTTER SPACE, THE WIRING RACEWAY, AND CIRCUIT BREAKER LOAD SIDE TERMINALS WHEN OPEN. EACH DOOR MUST BE HINGED AND HAVE A FLUSH LOCKABLE HANDLE.

R. PANELBOARD DOOR HINGES MUST BE CONCEALED BUTT OR FULL LENGTH PIANO HINGES.

S. PANELBOARDS MUST BE SOURCED FROM INDUSTRIAL ELECTRIC MANUFACTURING (IEM).

T. ELECTRICAL PANELS MUST BE COPPER BUS, FULLY BUSSED WITH MINIMUM 30 TO MAXIMUM 42 CIRCUIT. DEAD-FRONTED SAFETY TYPE NEUTRAL BUS MUST BE FULL-SIZED AND FULLY RATED AND EQUAL TO THE PHASE BUS RATING. CIRCUIT BREAKERS MUST BE MOLDED CASE BOLT-ON TYPE. CIRCUIT BREAKERS MUST BE PROVIDED WITH LOCKING DEVICES SO THAT EACH CIRCUIT BREAKER MAY BE LOCKED IN THE OPEN POSITION. ENSURE THAT DEVICES CANNOT BE MOVED FROM THE FRONT OF PANEL WITH TRIM IN PLACE, AND THAT THE DEVICE IS FIRMLY INSTALLED.

U. SHORT CIRCUIT RATING OF EACH CIRCUIT BREAKER FOR NEW PANELBOARDS MUST BE MINIMUM 14 KAIC RMS SYMMETRICAL FOR 480/277V AND 22 KAIC RMS SYMMETRICAL FOR 240V OR LESS.

W. DRY-TYPE TRANSFORMER WINDINGS MUST BE COPPER, FULLY RATED WITH NO MOVING PARTS, INTERNAL SWITCH OR CIRCUIT BREAKER.

X. ALL CIRCUIT BREAKERS MUST BE MOLDED CASE BOLT-ON TYPE. PLUG-IN CIRCUIT BREAKERS ARE NOT ALLOWED. MULTI-POLE CIRCUIT BREAKERS MUST HAVE A COMMON TRIP MECHANISM. HANDLE TIES ARE NOT ALLOWED.

Y. MOTOR STARTERS MUST BE PROVIDED WITH THE FOLLOWING INDICATING LIGHT COLORS:
 - WHITE: INDICATES CONTROL POWER IS ON (LABELED AS "POWER ON")
 - GREEN: INDICATES MOTOR IS RUNNING (LABELED AS "RUNNING")
 - AMBER: INDICATES OVERLOAD RELAY IS TRIPPED (LABELED AS "OL TRIPPED")
 - RED: INDICATES MOTOR STOPPED (LABELED AS "STOPPED")

Z. PROVIDE 600 VOLT CONDUCTORS WITH TYPE THHN/THWN-2 INSULATED RATED FOR 90°C IN BOTH DRY AND WET LOCATIONS. MC CABLE IS PERMITTED TO BE THHN/THWN. ALL CONDUCTORS MUST BE STRANDED FOR ALL SIZES.

AA. PROVIDE COLOR-CODED, INSULATED CONDUCTORS FOR ALL SIZES. WHERE NEUTRAL CONDUCTORS OF DIFFERENT VOLTAGE SYSTEMS ARE MIXED IN THE SAME BOX, RACEWAY, OR ENCLOSURE, THE NEUTRALS MUST BE IDENTIFIED TO DIFFERENTIATE THEM. TRAVELER WIRING MUST BE UNIQUELY IDENTIFIED.

	208Y/120V 3Ø 4W	480Y/277V 3Ø 4W	240/120V 2Ø 3W
A PHASE	BLACK	BROWN	BLACK
B PHASE	RED	YELLOW	BLUE
C PHASE	BLUE	PURPLE	
NEUTRAL	WHITE/GRAY	WHITE/GRAY	WHITE

EXECUTION

A. ELECTRICAL INSTALLATIONS MUST BE INSPECTED BY BUILDING AUTHORITY HAVING JURISDICTION (BAHJ) OR BUILDING AUTHORITY HAVING JURISDICTION FIELD REPRESENTATIVE (BAHJFR). COORDINATE INSPECTION EFFORTS WITH THE STR.

B. FIELD VERIFY EXISTING CONDITIONS, INCLUDING LOCATION OF ELECTRICAL EQUIPMENT.

C. MAINTAIN AT LEAST 6 INCHES CLEARANCE BETWEEN ELECTRICAL CONDUITS AND OTHER SYSTEM PIPING AND TUBING. MAINTAIN 12 INCHES CLEARANCE BETWEEN ELECTRICAL CONDUIT AND STEAM PIPING. MAINTAIN 1 INCH CLEARANCE BETWEEN ELECTRICAL CONDUIT AND DUCTWORK. MAINTAIN 8 INCHES CLEARANCE BETWEEN ELECTRICAL CONDUIT AND ROOF. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.

D. PROTECT AND REPAIR ADJACENT EXISTING SURFACES AND UTILITIES AND AREAS DAMAGED AS A RESULT OF DEMOLITION OR NEW WORK. PATCH, REPAIR, AND FINISH SURFACES TO MATCH EXISTING ADJACENT SURFACES.

E. PERFORM CUTTING AND DEMOLITION BY METHODS THAT WILL NOT JEOPARDIZE THE STRUCTURAL INTEGRITY OF THE BUILDING AND THAT WILL NOT DAMAGE PORTIONS TO REMAIN.

F. IN ADDITION TO THOSE THAT MAY BE SHOWN ON THE DRAWINGS, PROVIDE PULL BOXES AND JUNCTION BOXES AS NEEDED TO FACILITATE THE INSTALLATION OF WIRING. EXTENSION BOXES ARE NOT ALLOWED ON NEW CONSTRUCTION.

G. PROVIDE DEDICATED NEUTRAL CONDUCTOR FOR EACH BRANCH CIRCUIT. ALL NEUTRALS FOR BRANCH CIRCUITS MUST BE CONSIDERED CURRENT-CARRYING CONDUCTORS.

H. PROVIDE GALVANIZED RIGID METAL CONDUIT AND FITTINGS IF EXPOSED AND WHEN INSTALLED IN AREAS SUBJECT TO PHYSICAL DAMAGE.

I. PROVIDE ELECTRICAL POWER WIRING FOR THE HVAC SYSTEM AND OTHER MECHANICAL, PLUMBING, AND FIRE PROTECTION EQUIPMENT, INCLUDING WIRING THROUGH LINE VOLTAGE CONTROL DEVICES. COORDINATE WITH DRAWINGS AND PROVIDE NECESSARY CONTROL WIRING.

J. COORDINATE EXACT LOCATIONS OF HVAC UNITS, DISCONNECTS, AND DEVICES IN FIELD. VERIFY AND CONFIRM THE ACTUAL MOUNTING LOCATION OF THE HVAC UNIT FOR PLACEMENT OF THE DISCONNECT.

K. DISCONNECT SWITCH MUST BE MOUNTED ON WALL OR STRUT, INDEPENDENT OF THE EQUIPMENT AND ANY OTHER STRUCTURES (FREE STANDING). LOCATION MUST COMPLY WITH NEC DEPTH AND HEIGHT OF WORKING SPACE.

L. EXISTING PANEL SCHEDULES FOR PANELS AFFECTED BY THIS PROJECT ARE SHOWN ON THE DRAWINGS. UPDATE EXISTING PANEL SCHEDULES FOR PANELS AFFECTED BY THIS PROJECT. PROVIDE NEW PANEL SCHEDULES FOR PANELS INCLUDED IN THIS PROJECT.

M. CIRCUIT NUMBERS TO EXISTING PANELS AS SHOWN ARE FOR REFERENCE. FIELD TRACE DOWN AND VERIFY CIRCUITS BEFORE WORK STARTS. FIELD RED LINE FINDINGS ON DRAWING FOR RECORD. PANEL SCHEDULE CHANGES ARE RED FOR DELETE AND GREEN FOR ADDITION.

N. MOUNT OUTLET BOXES FOR NOTED DEVICES AS FOLLOWS UNO. MEASUREMENTS ARE TO TOP OF BOX UNO.:

- 120V POWER RECEPTACLES AT 15" AFF TO BOTTOM OF BOX
- DATA OUTLETS AT 36" AFF
- TELEPHONE OUTLETS AT 48" AFF
- LIGHT SWITCHES AT 48" AFF
- COUNTERTOP POWER RECEPTACLES AND TELE/DATA OUTLETS AT 8" ABOVE COUNTER OR BACKSPLASH IF SPECIFIED.

O. DO NOT MOUNT OUTLETS OR BOXES BACK-TO-BACK. MOUNT OUTLETS AND BOXES MINIMUM HORIZONTAL DISTANCE OF ONE STUD BAY OR 16" APART, OR 24" APART IN FIRE-RATED WALLS.

P. ELECTRICAL COMPONENTS INSTALLED BEHIND LADDERS: DO NOT CREATE OBSTRUCTIONS THAT VIOLATE 29 CFR 1910.23(D)(2). PROVIDE AT LEAST 7 INCHES OF PERPENDICULAR CLEAR SPACE FROM THE FACE OF NEW WORK TO A PLANE RUNNING THROUGH THE LONGITUDINAL CENTERLINES OF THE LADDER RUNGS.

Q. UNLESS NOTED OTHERWISE PERFORM THE FOLLOWING WORK FOR ANY DEVICE OR EQUIPMENT IDENTIFIED TO BE DEMOLISHED AS A PART OF THIS PROJECT SCOPE:

- REMOVE ALL EXPOSED CONDUIT AND ALL WIRING BACK TO SOURCE PANELBOARD OR NEXT ACTIVE DEVICE TO REMAIN IN SERVICE.
- CONCEALED OR UNDERGROUND CONDUIT MUST BE ABANDONED IN PLACE. CUT CONCEALED CONDUIT FLUSH WITH SURFACE. CUT AND CAP UNDERGROUND CONDUIT 6" ABOVE FLOOR.

R. EXISTING LIGHTNING CIRCUITS MAY HAVE SHARED NEUTRALS. FIELD VERIFY ALL EXISTING LIGHTING CIRCUITS WITHIN PANELBOARD BEFORE DEMOLITION AND SAFE END SHARED NEUTRALS.

S. NO UNTERMINATED WIRING IS ALLOWED, AND WIRING ASSOCIATED WITH THE DEMOLITION SCOPE OF THIS PROJECT MUST NOT BE ABANDONED.

T. METAL-CLAD CABLE (MC) IS PERMITTED ONLY FOR CONCEALED APPLICATIONS IN DRY LOCATIONS SERVING BRANCH WIRING DEVICES AND LIGHTING WITH THE FOLLOWING RESTRICTIONS:

- DO NOT USE FOR CIRCUITS OVER 250V TO GROUND.
- DO NOT USE FOR HOMERUNS.
- BRANCH CIRCUIT RUNS MUST BE LIMITED TO 75 FEET.
- DO NOT USE AROUND HORIZONTAL CORNERS WHEN CONCEALED IN WALLS.
- DO NOT USE WHERE EXPOSED TO PHYSICAL DAMAGE.
- DO NOT USE IN CORROSIVE LOCATIONS.
- PROVIDE WITH ADDITIONAL ISOLATED INSULATED GROUNDING CONDUCTOR FOR ISOLATED GROUND CIRCUITS.

W. MAINTAIN CONTINUITY AND WIRING FOR EXISTING CIRCUITS AND SYSTEMS REMAINING IN SERVICE. IF CIRCUITS ARE INTERRUPTED, PROVIDE NEW WIRING TO MAINTAIN SYSTEM OPERATION.

X. PROVIDE GFCI PROTECTION FOR RECEPTACLES PER NEC.

Y. ALL NONHAZARDOUS ELECTRICAL EQUIPMENT INSTALLED INDOORS WITHIN 6 FEET FROM ANY WATER SOURCE (SINK, EYEWASH, SHOWER, ETC.) MUST BE RATED FOR INGRESS OF WATER (DRIPPING AND LIGHT SPLASHING).

Z. DO NOT ATTACH ELECTRICAL EQUIPMENT, CONDUIT OR DEVICES TO SEISMIC BRACING.

AA. DO NOT USE EQUIPMENT TO SUPPORT CONDUIT AND VICE VERSA.

AB. FOR UNDERGROUND GROUNDING ELECTRODE SYSTEM CONNECTIONS, USE IRREVERSIBLE CONNECTIONS. MECHANICAL CONNECTORS ENCASED IN CONCRETE ARE CONSIDERED IRREVERSIBLE. USE REMOVABLE COMPRESSION-TYPE CONNECTIONS AT THE GROUND RODS UNLESS BURIED.

AC. IN UNDERGROUND INSTALLATIONS, INSTALL AN ELECTRICALLY DETECTABLE WARNING TAPE ABOVE THE ENTIRE LENGTH OF THE DUCT BANK OR DIRECT BURIED CONDUIT.

AD. PROVIDE SCHEDULE 40 RIGID PVC CONDUIT, CONCRETE ENCASED, FOR UNDERGROUND INSTALLATIONS THAT ARE SUBJECT TO TRAFFIC BOTH DURING AND AFTER CONSTRUCTION.

AE. PROVIDE SCHEDULE 80 RIGID PVC CONDUIT FOR UNDERGROUND INSTALLATIONS THAT ARE PERMANENTLY IN NON-TRAFFIC AREAS.

AF. MAINTAIN AT LEAST 6 INCHES BETWEEN ELECTRICAL AND TELECOMMUNICATION UNDERGROUND CONDUITS, AND AT LEAST 12 INCHES BETWEEN ELECTRICAL OR TELECOMMUNICATION UNDERGROUND CONDUITS AND OTHER SYSTEM PIPING.

AG. VERTICAL STUB-UPS, HORIZONTAL BENDS AND OFF-SETS GREATER THAN 22 DEGREES IN THE DUCT BANK RUN MUST USE RIGID STEEL ELBOWS AND RISERS, WRAPPED WITH TWO LAYERS OF HALF-LAPPED, 10MIL THICK, BLACK VIRGIN POLYETHYLENE TAPE, OR FACTORY APPLIED EPOXY PVC COATING.

AH. JOINT UTILITY TRENCHES MUST ONLY CONTAIN ELECTRICAL AND TELECOMMUNICATION CONDUITS. NO OTHER SYSTEMS SHOULD BE LOCATED IN THE SAME TRENCH AS ELECTRICAL OR TELECOM.

AJ. OCCUPANCY SENSORS MUST NOT BE INSTALLED WITHIN 4 FEET OF ANY MECHANICAL DIFFUSERS.

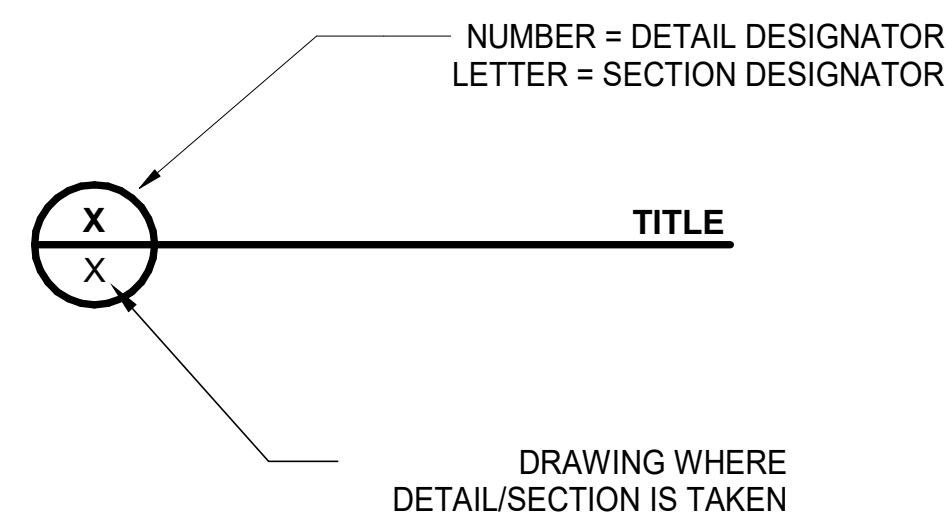
AK. PHOTOCELLS MUST NOT BE INSTALLED FACING INTO ELECTRICAL LIGHT THAT IS BEING CONTROLLED.

AL. DO NOT SPLICE FEEDER CONDUCTORS.

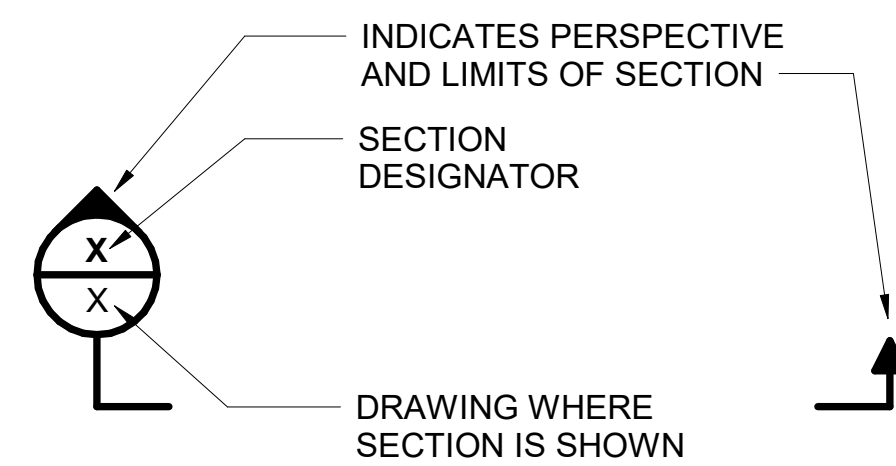
AM. DO NOT SPLICE CONDUCTORS IN PANELBOARDS, MOTOR CONTROL CENTERS, DISTRIBUTION PANELS, SWITCHBOARD, OR SWITCHGEAR.

AN. DO NOT USE GUTTERS FOR BRANCH CIRCUIT COLLECTION AT PANELBOARDS.

ELECTRICAL LEGENDS



SECTION CUT SYMBOL



Sheet Title	ELECTRICAL NOTES
Dwg. No.	PLE2021-0432-0002D
Sht. No.	E-002