

DESIGNER NOTES: (for designer use only, not to be used on final drawings)

- THERE ARE 3 LEVELS OF EV CHARGERS USED TO CHARGE ELECTRIC VEHICLES. LEVEL 1 CHARGERS ARE LOWEST VOLTAGE 120V CHARGERS AND ARE NOT USED IN LANL. LEVEL 2 CHARGERS ARE 208 VOLTS, THESE CHARGERS ARE MID-TIER CHARGERS; LEVEL 3 CHARGERS ARE THE HIGHEST RATED CHARGE THAT OPERATES AT 480 VOLTS. THE USE OF LEVEL 2 AND/OR LEVEL 3 CHARGERS WILL TYPICALLY REQUIRE A LARGE AMOUNT OF POWER AND CAREFUL CONSIDERATION IF A UTILITY TRANSFORMER IS REQUIRED TO BE ADDED OR CHANGED. ONE-LINE DIAGRAMS SHOULD BE USED AS TEMPLATES AND TAILORED TO EACH SPECIFIC DESIGN. CUSTOMER, BUILDING LIMITATIONS AND COST WILL DETERMINE THE NUMBER AND TYPE OF CHARGERS NEEDED IN THE SPECIFIC ELECTRICAL DESIGNS.
- THIS DESIGN INCLUDES THE STRUCTURAL AND ELECTRICAL DESIGN TEMPLATES FOR USE WITH "CHARGEPOINT" BRAND EQUIPMENT.
- A "CHARGEPOINT" APP IS REQUIRED TO RUN AND USE THE CHARGING STATIONS. EACH FOD SHALL DETERMINE USE OF THE APP.
- EQUIPMENT TAGGING SHALL BE IN ACCORDANCE WITH ESM CHAPTER 1 SECTION 200 ITEM NUMBERING AND LABELING.
- THE CHARGING EQUIPMENT STRUCTURAL MOUNTING DETAILS CAN BE USED FOR EITHER LEVEL OF CHARGER. WALL MOUNTED AND PEDESTAL MOUNTED DESIGNS CAN BE USED DEPENDING ON PROJECT NEEDS.
- THE PANEL SCHEDULES WILL BE PROJECT SPECIFIC. ELECTRICAL DESIGNS OFFER THE MAXIMUM NUMBER OF POSSIBLE CHARGERS DEPENDING ON TRANSFORMER AND PANEL SIZES. INSTALLATIONS MAY INCORPORATE FEWER CHARGERS THAN THE MAXIMUM ALLOWED AS SHOWN IN THE TEMPLATES.
- PP-A OUTSIDE WILL BE USED AS THE DISCONNECT POINT FOR ALL CHARGERS. THIS WILL BE THE DEDICATED SHUT OFF FOR FIRE DEPARTMENT EMERGENCY RESPONDERS.
- PANELS ARE WIRED SUCH THAT 120 VOLT CAN BE MADE AVAILABLE IF THE NEED ARISES SUCH AS FOR SMALLER EV VEHICLES.
- THE NAMEPLATE SCHEDULE WILL BE PROJECT SPECIFIC. EACH CHARGER, TRANSFORMER, BREAKER, AND ELECTRICAL EQUIPMENT WILL HAVE DESIGNATED IDS. CABLING SHALL BE LABELED IN ACCORDANCE WITH THE SPECIFICATIONS.
- STRUCTURAL ENGINEERING CALCULATIONS HAVE PREDETERMINED LIMITS AS LISTED IN THE STRUCTURAL TABLES AND ARE NOT REQUIRED FOR THE CONCRETE PADS OR POSTS. THESE CALCULATIONS DETERMINE THE ANCHORS NEEDED, WEIGHT LIMITS AND ENVIRONMENTAL CONDITIONS.
- SIGNAGE-** IN ADDITION TO THE STANDARD NAMEPLATES, THE FOLLOWING SIGNAGE SHALL BE REQUIRED:

ELECTRICAL ARC FLASH SIGNAGE ON ALL PANELS AS NOTED IN SPECS.
MAIN BREAKER SHUT OFF/ DISCONNECT ON PP-A FOR FIRE DEPARTMENT USE.
DESIGNATED EV PARKING SIGN FOR GOVERNMENT USE ONLY.
EMERGENCY CONTACT NUMBER TO CALL OR FOR UTILITY CONCERNS.
ANY SITE SPECIFIC SIGNAGE AS NEEDED.
- THERE ARE NO SECURITY REQUIREMENTS FOR THESE CHARGING STATIONS UNLESS THERE ARE SITE SPECIFIC REQUIREMENTS.
- AN ARCHITECT/CIVIL ENGINEER SHOULD BE CONSULTED WITH EACH DESIGN TO ENSURE PROPER EQUIPMENT PLACEMENT FOR PARKING ACCESS AND REGULATIONS ARE OBSERVED.
- INSTALLERS ARE NOT REQUIRED TO BE CERTIFIED, HOWEVER TRAINING COURSE (#) MUST BE COMPLETED BEFORE INSTALLATION. INFO AND CERTIFICATION CAN BE FOUND AT WWW.CHARGEPOINT.COM LANL TO DO VALIDATION. (MOVE HIGHER IN LIST AND CHANGE WORDING TO STATE TRAINING ONLY, NO CERTIFICATION REQUIRED)
- RECOMMENDED SPECIFICATIONS TO BE USED FOR DESIGN PURPOSES.

ELECTRICAL:
26_2816R5 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS
26_0519R8 – LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES
26_0526R3 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
26_0533R9 – RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS
26_0553R7 – IDENTIFICATION FOR ELECTICALELECTRICAL SYSTEMS
26_2213R4 – LOW VOLTAGE DISTRIBUTION TRANSFORMERS
26_2416R4 – PANELBOARDS

STRUCTURAL:
03_3001R9 – REINFORCED CONCRETEREINFORCED CONCRETE
03_6021R0 – GROUTINGROUTING
03_1550R4 – POST-INSTALLED CONCRETE ANCHORS

TABLE 1. CHARGING STATION TYPES

EV CHARGER LEVEL	LEVEL 1	LEVEL 2	LEVEL 3
OPERATING VOLTAGE	120V	208V	480V
LOCATIONS FOUND	RESIDENTIAL (NOT USED AT LANL)	COMMERCIAL/LANL USED	COMMERCIAL/LANL USED
OPERATING AMPERAGE	10-32A	30A	80A
CHARGE RATE MILES/HOUR	3-5 MILES/HR	5.5-32 MILES/HOUR	200-500 MILES/HOUR

*FOR LARGER STATIONS, CONSULT WITH UTILITIES ENGINEERING FOR FURTHER INFORMATION ON DESIGNS.

- PROHIBITED EXTERIOR EV CHARGING STATION LOCATIONS (VEHICLE DISTANCE):

NEAR EMERGENCY EGRESS DOORS OR PATHS (50FT)
NEAR NUCLEAR, RADIOLOGICAL, EXPLOSIVE OR HIGH HAZARD/VALUE FACILITIES (100FT)
NEAR ANY FACILITY WALL OR WILDLAND AREA (10FT) 30FT PER FIELD OFFICE.
NEAR AIR INTAKES (50FT)
LOCATION MUST HAVE FIRE DEPARTMENT ACCESS.
INTERIOR CHARGING GENERALLY NOT ALLOWED. EXCEPTIONS PARKING GARAGES IN ACCORDANCE WITH NFPA 88A AND POTENTIALLY AREAS SPECIFICALLY DESIGNED WITH FIRE SEPARATION AND VENTING.
- REQUIREMENTS BASIS:

NFPA 101 (2018): 7.1.10.1 MAINTENANCE. MEANS OF EGRESS SHALL BE CONTINUOUSLY MAINTAINED FREE OF ALL OBSTRUCTIONS OR IMPEDIMENTS TO FULL INSTANT USE IN THE CASE OF FIRE OR OTHER EMERGENCY.

IFC (2015): 1031.2 RELIABILITY. REQUIRED EXIT ACCESSSES, EXITS AND EXIT DISCHARGES SHALL BE CONTINUOUSLY MAINTAINED FREE FROM OBSTRUCTIONS OR IMPEDIMENTS TO FULL INSTANT USE IN THE CASE OF FIRE OR OTHER EMERGENCY WHERE THE BUILDING AREA SERVED BY THE MEANS OF EGRESS IS OCCUPIED.

PD1220: DOES NOT ALLOW STORAGE OF COMBUSTIBLES AND IGNITION SOURCES IN HIGH IMPORTANCE EGRESS PATHS SUCH AS STAIRS.
- MASTER EQUIPMENT LIST (MEL)
FOR THE MEL INPUT USE THE FOLLOWING IDS FOR THE EV CHARGERS:

SECTION 210

G	OSI	OP SYS	SI	SYS	NOTES
U	UES	UTILITIES ELECTRICAL SUPPLY	EP	ELECTRICAL POWER	INCLUDES ATS, MTS, SAFETY SWITCH (CDD), SWITCHGEAR, PDUS, POWER PANELS, LIGHTING PANELS, BREAKERS, MCCS, BUS DUCTS, AND ELECTRIC VEHICLE CHARGING STATIONS.

SECTION 230

TYPE	OSI	SUBTYPE	SUBTYPE NAME	NOTES	ORIGIN	PRIMARY DISCIPLINE
PANEL	PANEL	EVSE	ELECTRICAL VEHICLE SUPPLY EQUIPMENT	INCLUDES ALL EQUIPMENT ASSOCIATED WITH ELECTRIC VEHICLE CHARGING STATIONS INCLUDING THE DISCONNECT SWITCH.	NEMA	UTILITIES

LBO-DESIGN PACKAGE REVIEWER	N/A		
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ENGINEERING STANDARDS
ELECTRICAL VEHICLE CHARGING STATIONS

DESIGNER NOTES

TA-XX BLDG XXXX

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