[redacted] LV3 EVCS - ELECTRIC VEHICLE CHARGING SYSTEM

THIS ELECTRIC VEHICLE CHARGING SYSTEM (EVCS) IS TO BE INSTALLED AT THE DEALERSHIP IN [redacted]
THE SYSTEM SHALL BE INTERCONNECTED WITH THE UTILITY GRID THROUGH A NEW ON-SITE MAIN SERVICE PANEL.

SHEET INDEX

COMPONENTS LIST

ELECTRICAL		
QTY	NAME	DESCRIPTION
2	EV CHARGER	CHARGEPOINT EXPRESS PLUS POWER LINK 2000 LEVEL III, 1000 VDC, 500 A
2	POWER BLOCK	CHARGEPOINT EXPRESS PLUS POWER BLOCK LEVEL III, 480 VAC, 260 A
1	EV AC COMBINER PANEL	480 VAC, 800 A, NEMA 3R

GOVERNING CODES & STANDARDS

2022 CA ELECTRICAL CODE: § 110, 240, 250, 690, 705, 706
2022 CA BUILDING CODE: § 1507.17, 1511.9, 3111
2022 CA RESIDENTIAL CODE: § R324, R908
2022 CA FIRE CODE: § 1205, 1207
UNDERWRITERS LABORATORIES (UL) STANDARDS
OSHA 29 CFR 1910.269

PARCEL MAP 1

AERIAL MAP 2

PROJECT LOCATION

VICINITY MAP 3

Contractor:

Project:
[redacted] LV3 EVCS [redacted]

Project Details:
[redacted]

Engineering Approval:

REVISIONS

DESCRIPTION	DATE	REV
PERMIT SET	6/3/2024	A

Sheet Title:
COVER

Sheet Number:
T1.0

Sheet Size:
ARCH D - 36" x 24"

Design & Drafting by:
ALAN CHEW

Reviewed & Approved by:
RD

CONTRACTOR NOTES:

1. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND NOTIFY THE SYSTEM DESIGN ENGINEER OF ANY DISCREPANCIES BETWEEN EXISTING CONDITIONS AND DRAWINGS.
2. THE CONTRACTOR SHALL SUPPLY AND INSTALL ALL WORK AS SHOWN IN THE CONSTRUCTION DOCUMENTS UNLESS OTHERWISE NOTED. ALL WORK SHALL BE PERFORMED IN AN ORDERLY, WORKMAN-LIKE AND SAFE MANNER BY WORKERS SKILLED AND EXPERIENCED IN THEIR TRADES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL INSPECTIONS TO BE WITNESSED BY THE AHJ AND/OR THE OWNER. THE CONTRACTOR SHALL WORK WITH THE OWNER'S INSPECTION AGENCY TO PLAN THE INSPECTIONS, AND NOTIFY ALL PARTIES INVOLVED SUFFICIENTLY IN ADVANCE TO ALLOW THE INSPECTIONS TO TAKE PLACE IN A TIMELY MANNER AND NOT DELAY THE PROGRESS OF THE WORK. THE OWNER AND SYSTEM DESIGN ENGINEER WILL NOT BE RESPONSIBLE FOR SCHEDULING, ARRANGING OR COORDINATING THE INSPECTIONS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING THE AREAS WHERE WORK IS TAKING PLACE, AS WELL AS ANY ADJOINING AREAS WHICH MAY BE AFFECTED BY THE WORK, TO PREVENT SUBJECTING THE OCCUPANTS, STRUCTURES, VEHICLES, EQUIPMENT, OR ANY OTHER PARTS OR CONTENTS OF THE SITE TO HAZARD OR DAMAGE.
5. CONTRACTOR SHALL FURNISH ALL NECESSARY BOXES, OUTLETS, SUPPORTS, CONDUITS, FITTINGS, AND ACCESSORIES TO FULFILL APPLICABLE CODES, REGULATIONS, BUILDING STANDARDS, AND THE BEST PRACTICE OF THE TRADE FOR THE INSTALLATION OF ELECTRICAL WORK.
6. THE CONTRACTOR SHALL, AT ALL TIMES DURING THE WORK, MAINTAIN ACCESSIBILITY FROM THE STREET TO ALL FIRE HYDRANTS, POWER OR LIGHT POLES, AND SIMILAR UTILITY AND PUBLIC SERVICE ITEMS WITHIN OR ADJACENT TO THE CONSTRUCTION SITE.
7. WORK SHALL NOT RESTRICT CLEAR AND UNOBSTRUCTED ACCESS TO ANY WATER OR POWER DISTRIBUITION FACILITIES (POWER POLES, PULLBOXES, TRANSFORMERS, VAULTS, PUMPS, VALVES, METERS, APPURTENANCES, ETC.) OR TO THE LOCATION OF THE HOOKUP.
8. THE OWNERS AND THE AHJ SHALL BE NOTIFIED IN WRITING IN ADVANCE OF ANY REQUIRED CONSTRUCTION OPERATION THAT WILL INVOLVE INTERRUPTION OF THE HEATING, WATER, FIRE PROTECTION SYSTEMS, TELEPHONE, GAS OR ELECTRICAL SERVICES TO THE OTHER BUILDINGS AND AREAS OF THE SITE. THE CONTRACTOR SHALL COORDINATE ANY REQUIRED SHUTDOWN OF THE UTILITIES WITH THE OWNERS, THE AHJ, AND THE UTILITY COMPANY.
9. UPON REVIEW OF ELECTRICAL DRAWINGS, THE ELECTRICAL CONTRACTOR SHALL INFORM THE SYSTEM DESIGN ENGINEER OF ANY DISCREPANCIES OR REQUEST CLARIFICATION, IF NECESSARY, CONCERNING THE INTENT OF THE PLANS AND SPECIFICATIONS TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION.
10. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS WHOSE WORK MIGHT AFFECT THIS INSTALLATION. CONTRACTORS SHALL ARRANGE ALL PARTS OF THIS WORK AND EQUIPMENT IN PROPER RELATION TO THE WORK AND EQUIPMENT OF OTHERS AND WITH BUILDING CONSTRUCTION AND ARCHITECTURAL FINISH SO THAT IT WILL HARMONIZE IN SERVICE AND APPEARANCE.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE OWNER'S INSPECTION AGENCY TO ARRANGE FOR INSPECTIONS RELATED TO ALL SPECIAL INSPECTIONS IN A TIMELY MANNER, AND SHALL BE PRESENT AS REQUIRED AT THE INSPECTIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSURING THAT THE APPROPRIATE SUBCONTRACTORS ARE PRESENT DURING TESTS AND INSPECTIONS OF THE SYSTEMS FOR WHICH THE SUBCONTRACTORS ARE RESPONSIBLE.

EQUIPMENT NOTES:

1. ALL MATERIALS, SUPPLIES, AND EQUIPMENT SHALL BE LISTED, USED, AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND INSTRUCTIONS, AND APPLICABLE NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL) REQUIREMENTS.
2. ALL EQUIPMENT SHALL BE RATED FOR THE ENVIRONMENT IN WHICH IT IS INSTALLED.
3. WORKING SPACE AROUND ELECTRIAL EQUPMENT SHALL COMPLY WITH NEC 110.26.
4. THE APPROXIMATE LOCATIONS OF ALL JUNCTION BOXES, COMBINER BOXES, CONDUITS, ETC. SHALL BE DETERMINED FROM THE DRAWINGS, AND VERIFIED BY THE CONTRACTOR FOR INSTALLATION.
5. ALL JUNCTION BOXES, COMBINER BOXES, AND DISCONNECTS SHALL BE INSTALLED IN AN ACCESSIBLE LOCATION.
6. PROVIDE NEMA 3R RATED EQUIPMENT OR BETTER WHERE EXPOSED TO OUTDOORS.
7. WHERE SIZES OF RACEWAYS OR BOXES ARE NOT INDICATED ON THE DRAWINGS, THE CONTRACTOR SHALL SIZE THESE ITEMS AS REQUIRED FOR THE INSTALLATION.
8. ALL VERTICAL RUNS OF CONDUIT OR TUBING TERMINATING IN THE BOTTOM OF WALL BOXES OR CABINETS OR SIMILAR LOCATIONS, SHALL BE PROTECTED FROM THE ENTRANCE OF FOREIGN MATERIAL PRIOR TO THE INSTALLATION OF CONDUCTORS.
9. METAL RACEWAYS, METAL ENCLOSURES OF ELECTRICAL DEVICES AND EQUIPMENT, MODULE FRAMES, AND OTHER EQUIPMENT SHALL BE COMPLETELY GROUNDED IN ACCORDANCE WITH THE NEC.
10. PROPER HARDWARE FOR A COMPLETE GROUNDING AND BONDING SYSTEM SHALL BE INSTALLED BY THE CONTRACTOR, IF NECESSARY.
11. GROUNDING RODS SHALL HAVE A RESISTANCE TO GROUND OF 25 OHMS OR LESS AND SHALL BE 5/8" x 8' MIN, COPPER-BONDED STEEL. ALL GROUND CLAMPS USED SHALL BE UL 467 LISTED.
12. ALL PVC CONDUIT EXPOSED TO SUNLIGHT SHALL BE SCHEDULE 80 AND MARKED AS SUNLIGHT RESISTANT. ALL UNDERGROUND PVC CONDUIT SHALL BE SCHEDULE 40 OR 80.

ELECTRICAL NOTES:

1. ELECTRICAL POWER MUST BE SHUT OFF PRIOR TO THE CONTRACTOR PERFORMING ANY WORK IN RACEWAYS WITH LIVE ELECTRICAL CIRCUITS OR ANY OTHER EQUIPMENT. WHEN SWITCHES OR CIRCUIT BREAKERS ARE OPENED FOR WORK ON ELECTRICAL EQUIPMENT OR WIRING, SIGNS OR TAGS SHOULD BE INSTALLED AT THE SWITCH OR BREAKER STATING THAT WORK IS BEING PERFORMED ON THEM. INCLUDE THE TIME, DATE, AND CONTRACTOR'S NAME ON THE SIGN OR TAG. IF DEVICE IS LOCKABLE, IT SHOULD BE PADLOCKED.
2. THE ELECTRICAL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE AHJ, NATIONAL FIRE PROTECTION AGENCY (NFPA), NATIONAL ELECTRICAL CODE (NEC), AND OSHA.
3. PHASING OF NEW CONDUCTORS TO MATCH EXISTING CONDUCTORS. IF INSTALLATING A NEW CIRCUIT, THEN CONTRACTOR SHALL FOLLOW THE PHASING SCHEMES PROVIDED IN THE ELECTRICAL DIAGRAM.
4. ALL CONDUCTORS SHALL BE COPPER, RATED FOR 90°C WET ENVIRONMENT, AND 1000 VOLTS DC OR 600 VOLTS AC, UNLESS OTHERWISE NOTED.
5. GROUNDING ELECTRODE CONDUCTOR (G.E.C.) SHALL BE CONTINUOUS AND/OR IRREVERSIBLY SPLICED/WELDED.
6. FLEXIBLE, FINE-STRANDED CABLES SHALL BE TERMINATED ONLY WITH TERMINALS, LUGS, DEVICES, OR CONNECTORS THAT ARE IDENTIFIED AND LISTED FOR SUCH USE PER NEC 690.31(F).
7. ALL WIRES SHALL BE IDENTIFIED BY CIRCUITS IN ALL CABINETS, BOXES, WIRING TROUGHS, AND OTHER ENCLOSURES, AND AT ALL TERMINAL POINTS, I.E., RECEPTACLES, MECHANICAL LUGS, COMPRESSION FITTINGS. THE CIRCUIT DESIGNATIONS SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS OR AS DIRECTED BY THE SYSTEM DESIGN ENGINEER. LABELS OR TAGS SHALL BE APPLIED TO WIRES SO THAT THEY WILL BE READILY VISIBLE.
8. BREAKERS SHALL BE 80% RATED UNLESS OTHERWISE SPECIFIED.
9. EQUIPMENT TERMINALS SHALL BE 75°C RATED UNLESS OTHERWISE SPECIFIED.
10. FUSES FOR SWITCHES SHALL BE CURRENT-LIMITING TYPE WITH A MINIMUM INTERRUPTING CAPACITY OF 200,000 AMPERES RMS (UNLESS OTHERWISE NOTED) AND OF THE CONTINUOUS CURRENT RATINGS AS INDICATED ON THE DRAWINGS OR AS RECOMMENDED BY THE MANUFACTURER.
11. THE SHORT-CIRCUIT INTERRUPTING RATING OF ALL NEW EQUIPMENT SHALL BE NO LESS THAN THE INTERRUPTING RATING OF THE EXISTING SERVICE EQUIPMENT, UNLESS A MINIMUM VALUE WAS CALCULATED AND SPECIFIED ON THE PLANS FOR THE NEW EQUIPMENT.

SITE/ARRAY PLAN LEGEND

- = CONDUIT ROUTES
- = CONDUIT ROUTES (UGND OR INDOORS)
- = PV MODULE
- = PV EQUIPMENT
- = RAFTER/TRUSS
- = STANDING SEAM
- = VENT
- = CHIMNEY
- = SKYLIGHT
- = HVAC UNIT
- = ROOF HATCH
- = PV ATTACHMENT FLASHING
- = RACKING RAIL
- = SETBACKS/PATHWAYS
- = SWINGING DOOR
- = TREE/BUSH

ELECTRICAL LEGEND

- = CIRCUIT CONDUCTORS
- = EQUIPMENT GROUNDING CONDUCTORS
- = TERMINAL BLOCK
- = FUSE
- = CIRCUIT BREAKER
- = THROW SWITCH (KNIFE-BLADE)
- = RECLOSING CIRCUIT BREAKER
- = RECLOSING DISCONNECT/RELAY
- = GROUNDING ELECTRODE SYSTEM
- = PV MODULE
- = INVERTER
- = MICROINVERTER
- = POWER OPTIMIZER
- = METER/MONITORING DEVICE
- = TRANSFORMER
- = GENERATOR
- = TRANSFER SWITCH
- = BATTERY
- = CURRENT TRANSFORMER (CT)

ELECTRICAL LEGEND - DC

- = POSITIVE TERMINAL (PHASED RED)
- = NEGATIVE TERMINAL (PHASED BLACK)
- G = GROUND TERMINAL (PHASED GREEN)

ELEC. LEGEND - 480 VAC

- L1 = LINE 1 TERMINAL (PHASED BROWN)
- L2 = LINE 2 TERMINAL (PHASED ORANGE)
- L3 = LINE 3 TERMINAL (PHASED YELLOW)
- N = NEUTRAL TERMINAL (PHASED WHITE)
- G = GROUND TERMINAL (PHASED GREEN)

Contractor:

Project:
[redacted] LV3 EVCS
[redacted]

Project Details:
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PROJECT NOTES

Sheet Number:
T1.1

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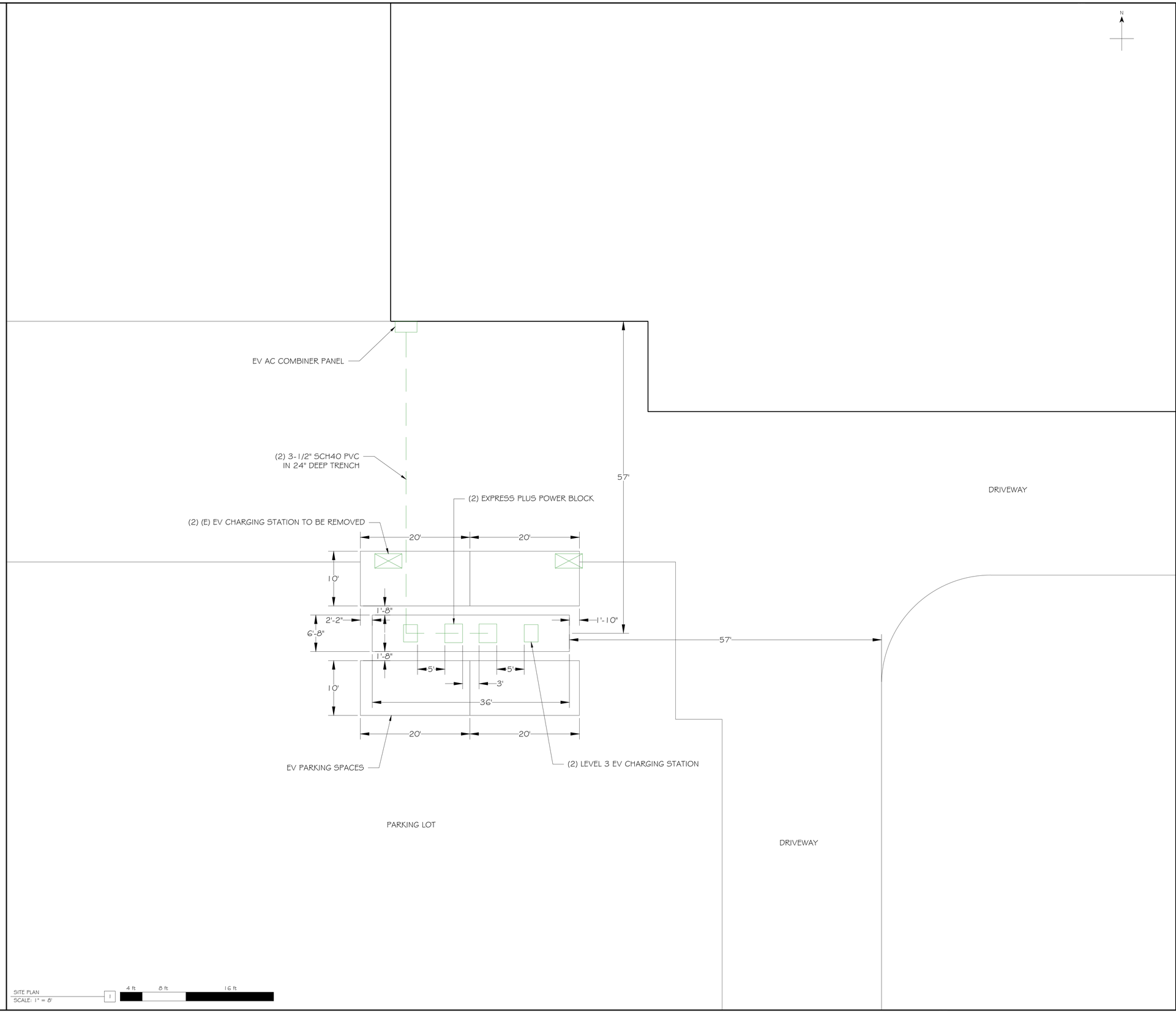
Design & Drafting by:
ALAN CHEW

Reviewed & Approved by:
RD

NOTE:
SITE DIMENSIONS DERIVED FROM GOOGLE AERIAL IMAGERY:
RESOLUTION OF 6", DIMENSIONS PRECISE UP TO 1m (CE-90)



SITE PLAN
SCALE: 1" = 8'

1 | 4 ft | 8 ft | 16 ft

Contractor:

Project:
[redacted] LV3 EVCS

Project Details:
[redacted]

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SITE PLAN

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480V | ----- = EQUIP. GROUNDING CONDUCTOR | ——— = CIRCUIT CONDUCTOR | = FUSE | = CIRCUIT BREAKER | (N) = NEW EQUIP. | (E) = EXISTING EQUIP. | L1 = LINE 1 (BROWN) | L2 = LINE 2 (ORANGE) | L3 = LINE 3 (YELLOW) | N = NEUTRAL (WHITE) | G = GROUND (GREEN) | = POSITIVE (RED) | = NEGATIVE (BLACK)

TAG	CIRCUIT ORIGIN	CIRCUIT DESTINATION	CONDUCTOR SPECIFICATIONS				
			MATERIAL	CONN. TEMP. RATING	TRADE SIZE	NUMBER OF PARALLEL CONDUCTORS	AMPACITY PER 310.16 & 310.17
DC1	EVCS	POWER BLOCK	COPPER	75°C	**400 kcmil**	**2**	**670 Amps**

REQUIRED CONDUCTOR AMPACITY					AMPACITY CHECK #1		
MAX CURRENT	x	CONT. OPERATION	=	MAX CONT. CURRENT	MAX CURRENT PER 690.8(B)(1)	<	CONDUCTOR AMPACITY
500.0 Amps	x	1.25	=	625.0 Amps	625.0 Amps	<	670.0 Amps

CONDUCTOR TEMPERATURE DERATING				
CIRCUIT ENVIRONMENT	LOCAL 2% AVG. HIGH TEMP (°C)	TEMP. ADDER PER 310.15(B)(3)(c)	EXPECTED OPERATING TEMP (°C)	AMPACITY CORRECTION 310.15(B)(1)
UNDERGROUND (+0°C)	37	N/A	37	0.91

CONDUIT FILL DERATING	
# OF UNGROUNDED CONDUCTORS	AMPACITY CORRECTION 310.15(C)(1)
4	0.80

CORRECTED AMPACITY CALCULATION								
90°C CONDUCTOR AMPACITY	x	TEMP DERATE	x	CONDUIT FILL DERATE	=	DERATED CONDUCTOR AMPACITY		
760	x	0.91	x	0.80	=	553.3 Amps		

AMPACITY CHECK #2		
MAX CURRENT PER 690.8(B)(2)	<	DERATED CORRECTED AMPACITY
500.0 Amps	<	553.3 Amps

VOLTAGE DROP	
EST. ONE-WAY DISTANCE	VOLTAGE DROP
15 ft	0.02%

TAG	CIRCUIT ORIGIN	CIRCUIT DESTINATION	CONDUCTOR SPECIFICATIONS				
			MATERIAL	TERMINAL TEMP. RATING	TRADE SIZE	NUMBER OF PARALLEL CONDUCTORS	AMPACITY PER 310.16 & 310.17
AC1	POWER BLOCK	AC COMBINER PANEL	COPPER	75°C	**500 kcmil**	**1**	**380 Amps**
AC2	AC COMBINER PANEL	PANELBOARD	COPPER	75°C	**500 kcmil**	**2**	**760 Amps**

CONDUCTOR TEMPERATURE DERATING				
CIRCUIT ENVIRONMENT	LOCAL 2% AVG. HIGH TEMP (°C)	EXPECTED OPERATING TEMP (°C)	AMPACITY CORRECTION 310.15(B)(1)	
UNDERGROUND (+0°C)	37	37	0.91	
UNDERGROUND (+0°C)	37	37	0.91	

CONDUIT FILL DERATING	
# OF UNGROUNDED CONDUCTORS	AMPACITY CORRECTION 310.15(C)(1)
3	1.00
3	1.00

CORRECTED AMPACITY CALCULATION								
90°C CONDUCTOR AMPACITY	x	TEMP DERATE	x	CONDUIT FILL DERATE	=	DERATED CORRECTED AMPACITY		
430	x	0.91	x	1.00	=	391.3 Amps		
860	x	0.91	x	1.00	=	782.6 Amps		

AMPACITY CHECK				
SPECIFIED OCPD RATING		NEXT STD. OCPD SIZE DOWN, 240.4	<	DERATED CONDUCTOR AMPACITY
400 Amps		350 Amps	<	391.3 Amps
800 Amps		700 Amps	<	782.6 Amps

VOLTAGE DROP	
EST. ONE-WAY DISTANCE	VOLTAGE DROP
150 ft	0.56%
15 ft	0.06%

WIRE AND CONDUIT SCHEDULE

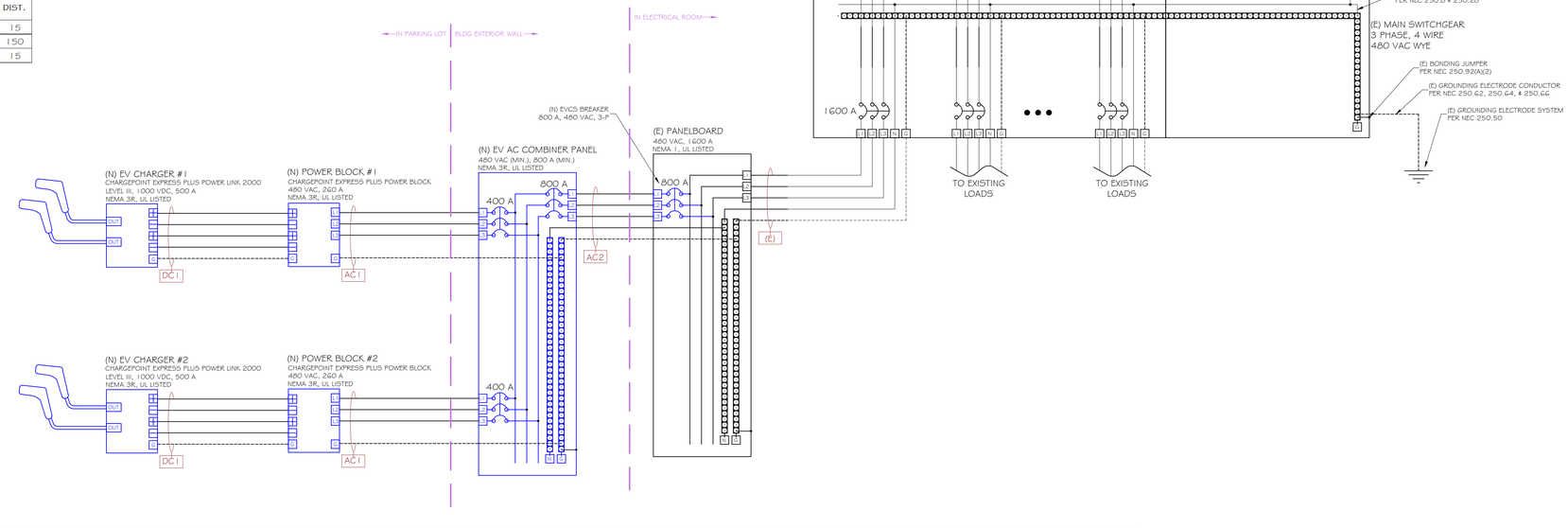
TAG	# OF PARALLEL CONDUITS	CONDUIT SIZE	CONDUIT TYPE	PHASE CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			NEUTRAL CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			GROUND CONDUCTOR QTY, SIZE AND TYPE PER CONDUIT			EST. DIST.
DC1	(1)	3"	SCH40 PVC	4	400 kcmil	THWN-2	N/A	N/A	N/A	1	AWG #2	THWN-2	15
AC1	(1)	3-1/2"	SCH40 PVC	3	500 kcmil	THWN-2	1	500 kcmil	THWN-2	1	AWG #3	THWN-2	150
AC2	(2)	3"	EMT	3	500 kcmil	THWN-2	1	500 kcmil	THWN-2	1	AWG #1/0	THWN-2	15

PANEL SCHEDULE

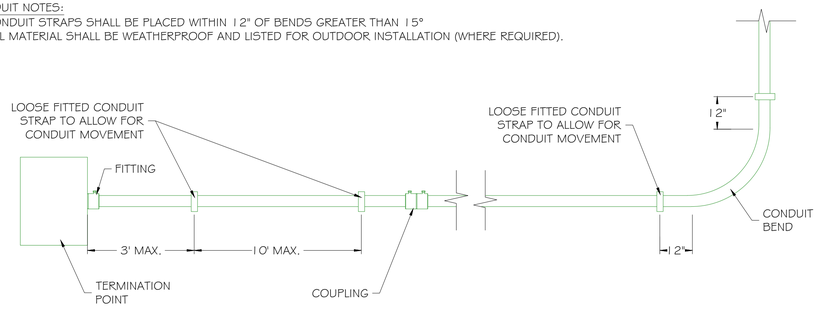
SERVICE CONFIGURATION: 277/480V Wye
PANEL BUS RATING: 800 A
PANEL AIC RATING: 35kAIC
PANEL TYPE: MCB
PANEL MAIN BREAKER RATING: 800 A
MOUNTING: SURFACE
FEED TYPE: BOTTOM FEED

VA	Description	Breaker	Circuit	A	B	C	Circuit	Breaker	Description	VA
66667			1				2			
66667	EV CHARGER #1	400 A	3				4			
66667			5				6			
66667			7				8			
66667	EV CHARGER #2	400 A	9				10			
66667			11				12			
			13				14			
			15				16			
			17				18			
			19				20			
			21				22			
			23				24			
			25				26			
			27				28			
			29				30			

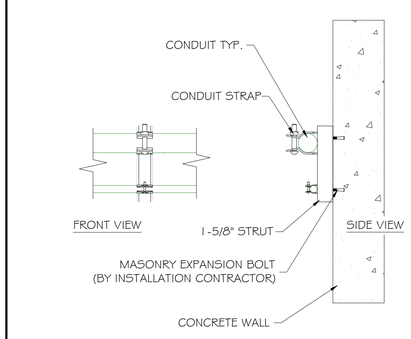
	A	B	C
TOTAL LOAD IN VA =	133334	133334	133334
TOTAL LOAD IN AMPS @ 277V =	481.35	481.35	481.35



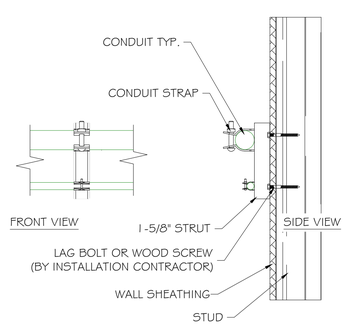
CONDUIT NOTES:
1.) CONDUIT STRAPS SHALL BE PLACED WITHIN 12" OF BENDS GREATER THAN 15°
2.) ALL MATERIAL SHALL BE WEATHERPROOF AND LISTED FOR OUTDOOR INSTALLATION (WHERE REQUIRED).



CONDUIT DETAIL 1A
SCALE: NTS



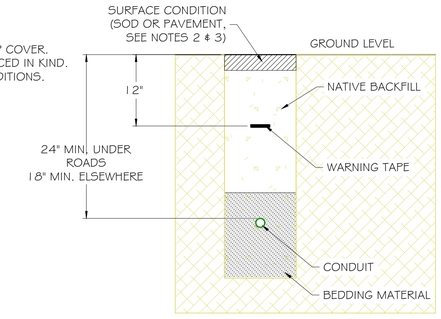
CONDUIT WALL MOUNTING 2A
SCALE: NTS



CONDUIT WALL MOUNTING 2B
SCALE: NTS

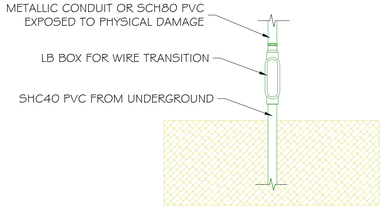
NOTES:
1.) BACKFILL WITH NATIVE MATERIAL IN COMPLIANCE WITH NEC 300.5(F).
NATIVE MATERIAL SHALL BE APPROVED BY THE OWNERS REP. PRIOR TO USE.
IF NOT ACCEPTABLE, USE FINE GRANULAR MATERIAL FOR BEDDING AND SIDE/TOP COVER.
2.) ASPHALT TO BE SAWCUT PRIOR TO TRENCHING. PAVEMENT SHALL BE REPLACED IN KIND.
3.) UNPAVED SURFACES SHALL BE RESTORED IN KIND TO MATCH EXISTING CONDITIONS.
4.) DETECTABLE WARNING TAPE SHALL BE INSTALLED 12" BELOW GRADE.
5.) REFER TO ELECTRICAL DRAWINGS FOR SIZE AND TYPE OF CONDUIT.
6.) NOTIFY UTILITY COMPANY PRIOR TO DIGGING PER "DIG SAFE" REQUIREMENTS.

811 Know what's below. Call before you dig.

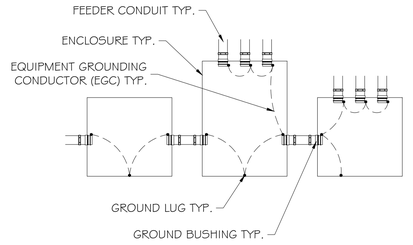


TRENCH CROSS-SECTION 5
SCALE: NTS

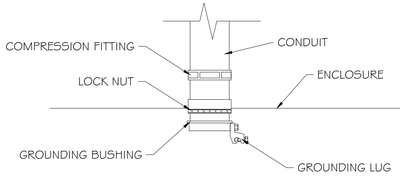
NOTES:
1.) CONDUIT SHALL BE INSTALLED WHERE 1000V CONDUCTORS ARE RAN IN AN ACCESSIBLE LOCATION.
2.) WHERE EXPOSED TO PHYSICAL DAMAGE, SCH40 PVC SHALL TRANSITION TO AN APPROVED METALLIC CONDUIT OR SCH80 PVC WITHIN A REASONABLE DISTANCE FROM WHERE THE CONDUIT EXITS THE EARTH.
3.) SCH80 PVC IS PERMITTED WHERE EXPOSED TO PHYSICAL DAMAGE.



PULLBOX TRANSITION 7B
SCALE: NTS



EQUIPMENT GROUNDING 8
SCALE: NTS



CONDUIT GROUNDING 9
SCALE: NTS

Contractor:

Project: [redacted] LV3 EVCS

Project Details: [redacted]

Engineering Approval:

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Sheet Title: ELECTRICAL DIAGRAM

Sheet Number: E2.0

Sheet Size: ARCH D - 36" x 24"

Design & Drafting by: ALAN CHEW

Reviewed & Approved by: RD

ChargePoint® Express Plus

A flexible DC fast charging platform that grows with you.

Express Plus Specifications

Express Plus Power Module

Express Plus Power Module Output	
Max Output Power	40 kW
Max Output Current	100 A
Power Conversion Efficiency	Up to 96%
Power Factor	0.99 at full load

Express Plus Power Module Specifications	
Power Module Dimensions	430 mm (H) x 130 mm (W) x 760 mm (L) (1 ft 5 in x 5 ft x 2 ft 6 in)
Power Module Weight	45 kg (98.5 lb)
Power Module Cooling	Liquid Cooled Technology
Harmonics	iTHD < 5% (Complies with IEEE 519)

Express Plus Power Block

Express Plus Power Block Input	
Input Rating	3-phase, 400-480Y VAC, 310-260 A 50/60 Hz (200 kW) Optional: 3-phase, 400-480Y VAC, 255-210 A 50/60 Hz (160 kW)
Wiring	L1, L2, L3, Earth
Short Circuit Current Rating	65 kA

Express Plus Power Block Output	
Max Output Power	200 kW Optional: 160 kW
Output Voltage, Charging	100 to 1000 VDC
Max Current per Output	250 A, 300 A, 350 A, 500 A
Number of Stations Served	One Power Block can serve up to 2 Power Link stations. Additional Power Blocks can be added to serve more stations or increase power output.
Max Power Modules per Power Block	5

Express Plus Power Block Specifications	
Power Block Dimensions	2191 mm (H) x 988 mm (W) x 1039 mm (L) (7 ft 3 in x 3 ft 3 in x 3 ft 5 in)
Power Block Weight	455 kg (1000 lb) without Power Modules
Power Block Enclosure Rating	Type 3R, IP56, IK10

Express Plus Power Link 2000

Express Plus Power Link Output	
Max Output Power per Connector	Up to 500 kW, dependent on cable amperage and Power Block configuration
Output Voltage, Charging	100 to 1000 VDC
CCS1 Max Output Current	Option 1: 250 A continuous with Power Blocks Option 2: 350 A continuous with Power Blocks Option 3: 500 A continuous liquid cooled cable with Power Blocks
CCS2 Max Output Current*	Option 1: 250 A continuous with Power Blocks Option 2: 300 A continuous with Power Blocks Option 3: 500 A continuous liquid cooled cable with Power Blocks
CHAdeMO Max Output Current*	North American and Europe: 200 A continuous with Power Blocks

* Availability may vary

Express Plus Power Link Specifications	
Station Dimensions	See Diagrams below
Station Footprint	See Diagrams below
Station Weight	Approximately 209 kg (459 lb). Refer to Site Design Guide for more details.
Number of Connectors*	Up to 2 connectors per station. Simultaneous or sequential charging.
Supported Connector Types	CHAdeMO, CCS1 (SAE J1772™ Combo), CCS2 (IEC 61851-23)
Cable Length	Standard 4.5 m (15 ft) with Cable Management Kit (CMK)** Optional 7.6m (25ft) with cable management
Station Enclosure Rating	Type 3R, IP56, IK10 (Except credit card chip reader)
Locking Holster	Optional for Pedestal stations
Mounting Type	Ground, Overhead (Non-Liquid Cooled Cable Only), Wall (Non-Liquid Cooled Cable Only)

* *Horizontal reach to typical vehicle charging port: 3.76 m (12 ft 4 in)

Express Plus Specifications

Functional Interfaces	
Indicators	Multicolor LEDs
LCD Display	Optional: Full color 203 mm (8 in) interactive display with full motion video, UV protection, gesture touch controls, and multi-language support
Authentication	RFID: ISO 15693, ISO 14443, NEMA EVSE 1.2-2015 (UR) Tap to Charge (NFC on Apple & Android) Contactless credit card Remote: Mobile and in vehicle (If supported by vehicle) ISO 15118-2, Plug&Charge Optional: Credit card chip reader

Connectivity Features	
Local Area Network	2.4 GHz and 5 GHz WiFi (802.11 b/g/n)
Wide Area Network	4G LTE
Supported Communication Protocols	OCPP 2.0.1
Service and Maintenance	Remote system monitoring, diagnostic, and proactive maintenance

Safety Ratings & Protocol	
Vehicle Communication	CHAdeMO: JEVS G104 over CAN CCS1: SAE J1772 over PLC CCS2: IEC 61851-23, ISO 15118
Plug-Out Detection	Power terminated per JEVS G104 (CHAdeMO), SAE J2931 (CCS1) and IEC 61851-23 (CCS2)
Safety Compliance	cUL and UL listed. Complies with UL 2202, UL 2231-1, UL 2231-2 CE and UKCA marked. Complies with IEC 61851-1 and IEC 61851-23 (In progress)
Surge Protection	Tested to IEC 61000-4-5, Level 5 (6 kV @ 3,000 A)
EMC Compliance	North America: FCC part 15 Class B Europe: EN55011, EN55022, and IEC61000-6-3 Class B

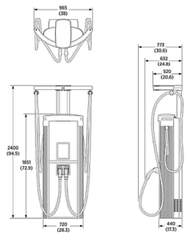
Generic Specifications	
Operational Altitude	< 3,000 m (9,800 ft)
Operating Temperature	-40°C to 50°C (-40°F to 122°F) with derating
Storage Temperature	-40°C to 70°C (-40°F to 158°F)
Operating Humidity	Up to 95% at 50°C (122°F) non-condensing
Metering	Eichrecht (In progress)
Buy America	Buy America (FTA & FHWA) options available upon request

Energy Management Features	
Dynamic Power Management	Allows a fixed maximum power output per station or lets the system dynamically manage the power distribution per station
Remote Energy Management	Manage output power via the ChargePoint Admin Portal, API, and Open ADR 2.0b VEN

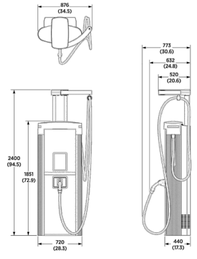
Architectural Drawings

Note: Images are not to scale. Measurements appear in metric units (mm), followed by imperial equivalents(inches).

Express Plus Power Link 2000, with liquid cooled cable, dual connectors

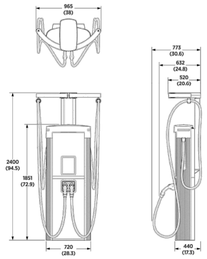


Express Plus Power Link 2000, with liquid cooled cable, single connector

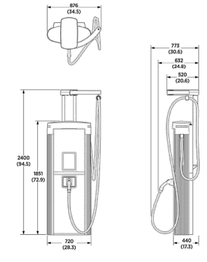


Note: Images are not to scale. Measurements appear in metric units (mm), followed by imperial equivalents(inches).

Express Plus Power Link 2000, with non-liquid cooled cables, dual connectors

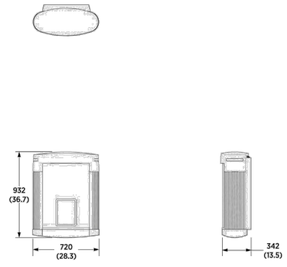


Express Plus Power Link 2000, with non-liquid cooled cables, single connector



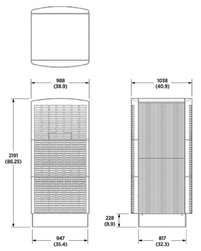
Note: Images are not to scale. Measurements appear in metric units (mm), followed by imperial equivalents(inches).

Express Plus Overhead Mounting Option

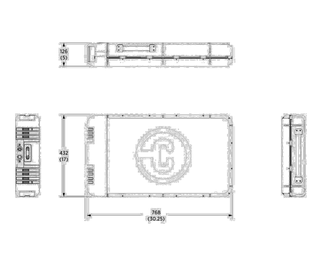


Note: Images are not to scale. Measurements appear in metric units (mm), followed by imperial equivalents(inches).

Express Plus Power Block



Express Plus Power Module



Contractor:

Project:

[redacted] LV3 EVCS

[redacted]

Project Details:

[redacted]

Engineering Approval:

REVISIONS

DESCRIPTION	DATE	REV
PERMIT SET	6/3/2024	A

Sheet Title:

EQUIPMENT DATASHEETS

Sheet Number:

D1.0

Sheet Size:

ARCH D - 36" x 24"

Design & Drafting by:

ALAN CHEW

Reviewed & Approved by:

RD