

Electric Vehicle (EV) Chargers, Curbside Pedestal



1. Scope

This standard covers the requirements for installing curbside pedestal electric vehicle (EV) chargers and associated equipment, such as gateway modules, mounting brackets, steel pedestals, and RFID readers.

This standard applies to both single and dual charger installations.

For EV chargers installed on wood utility poles, see SCL 0098.51.

2. Application

This standard is for Seattle City Light (SCL) engineers, crews, and contractors who are responsible for installing curbside pedestal EV chargers within the right-of-way.

Chargers will not be metered with a utility meter when owned by SCL.

This standard applies to the EVSE LLC model 3704 family of EV chargers or SCL-approved equivalent.

The termination handhole is the point of demarcation for EV charger electric service.



3. Definitions

Radio Frequency Identification (RFID) Reader: A radio frequency transmitter and receiver that can read and write information to an RFID tag. In the case of an EV charger, it is used to identify users and their payment information to activate the EV charger.

Gateway Module: A device that provides a communication link between one or more EV chargers and the host network.

4. Requirements

4.1 Codes, Permits, and Approvals

Installations shall meet or exceed the applicable structural and clearance requirements of the latest revision of the following:

- SCL construction standards
- National Electrical Safety Code (NESC)
- National Electric Code (NEC)
- City of Seattle Standard Specifications for Road, Bridge and Municipal Construction

In case of conflict, the most stringent requirements will prevail.

Permits and applications for all work, which includes installation, modifications, and relocations, shall be reviewed, and approved by an SCL engineer.

4.2 Electric Service

Electric service voltage will be single phase, 120/240 Vac.

An electric service enclosure shall be required at each pedestal location.

4.3 Equipment Mounting and Orientation

The contractor shall be responsible for the installation of electric service equipment between the EV charger pedestal and the SCL power source. This includes the underground conduits, handholes, service risers, and service wires. See figures 4.3a, 4.3b, and 4.3c.

Curbside pedestal EV chargers and associated equipment (gateway modules, electric service enclosures, mounting brackets, steel pedestals, and RFID readers) shall be supplied by the charger manufacturer (EVSE LLC).

EV charger locations shall be designed to accommodate either a single or dual EV charger.

Electric service enclosures shall be mounted on the back side of the pedestal, facing away from the road.

To meet the requirements of the American Disabilities Act (ADA), the following mounting requirements shall be followed:

- 40 inches above the top of the curb to the RFID reader and EV charger connection
- 29 inches from the face of the curb to the center axis of the precast foundation
- 18 inches from the face of the curb to the closest edge of the EV charger

See Figure 4.3b.

Figure 4.3a. Pedestal EV Charger Installation

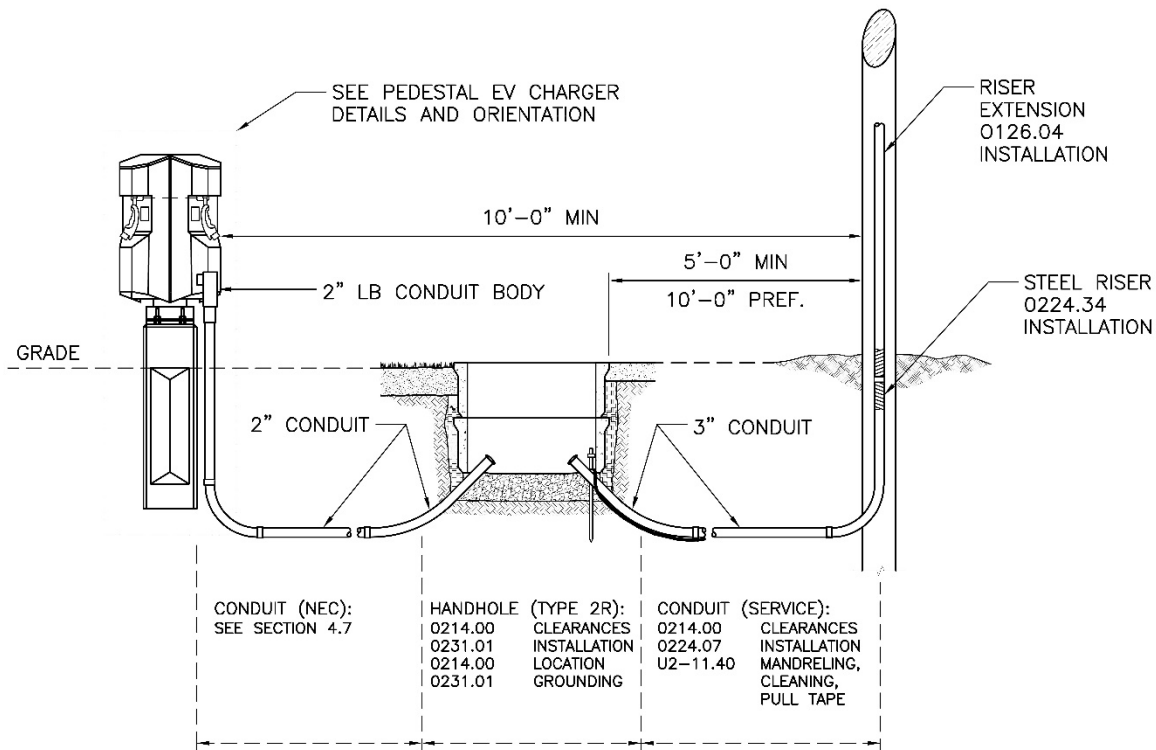


Figure 4.3b. Pedestal EV Charger Installation, Detail

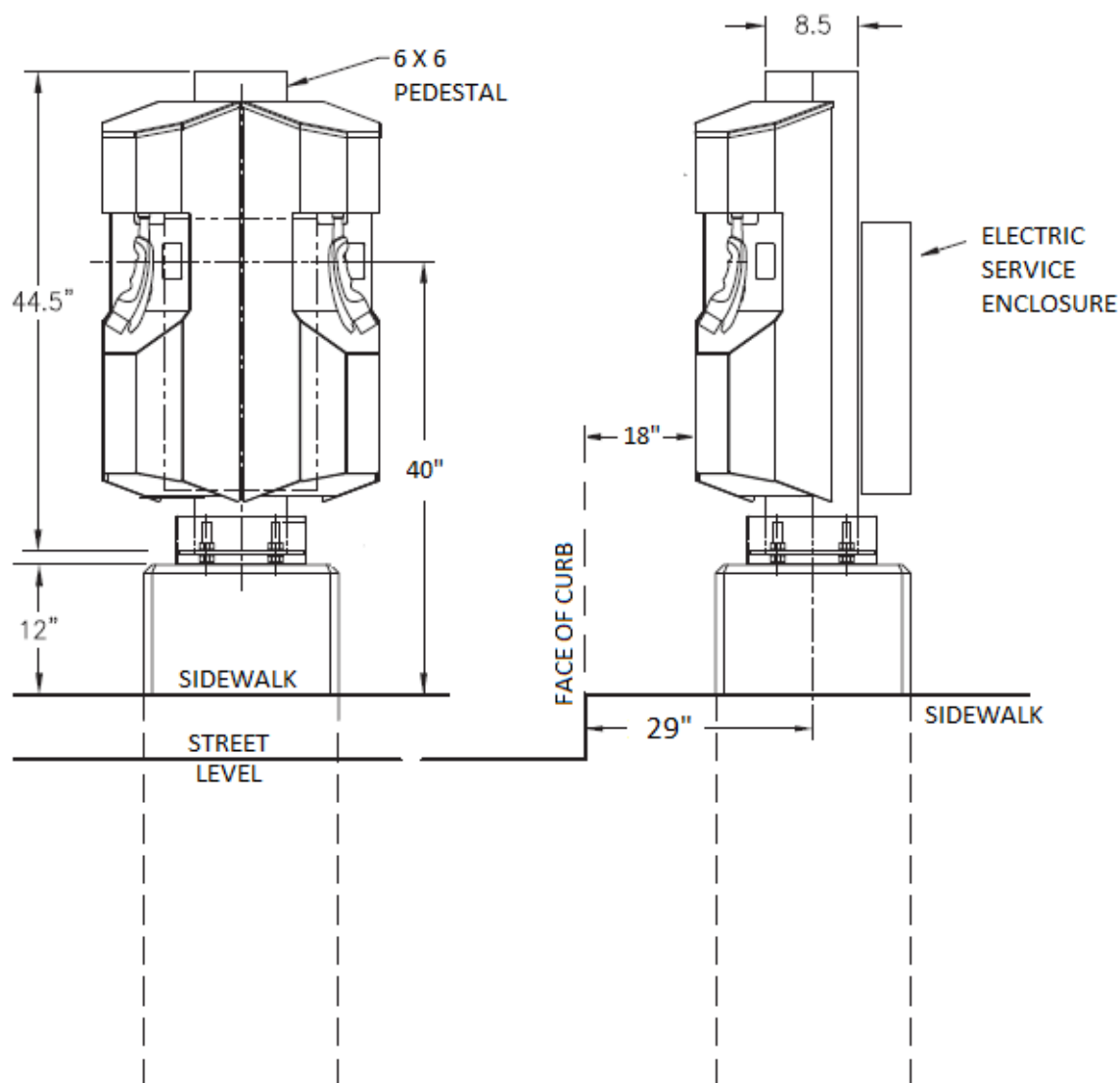
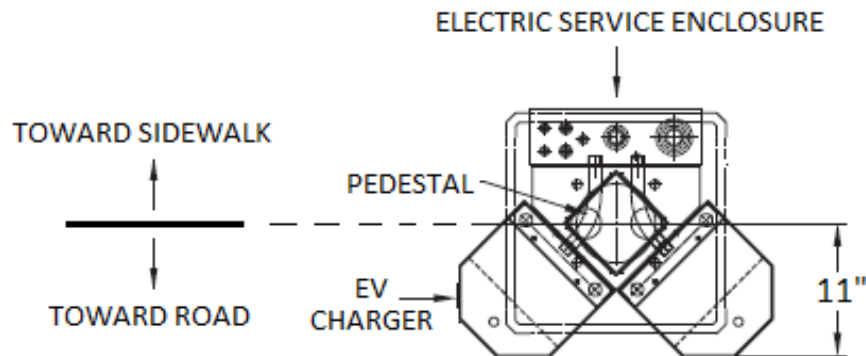


Figure 4.3c. Equipment Orientation



4.4 Service Cables

The service cable between the termination handhole and the service enclosure shall be sized and installed by the installation contractor.

The service cable between the termination handhole and the SCL distribution source shall be installed by the SCL crew. The SCL cable shall meet the requirements of SCL 6010.00.

4.5 Service Risers

Service risers at the pole shall be installed per SCL 0126.04 and SCL 0224.34.

4.6 Clearances

Curbside pedestal EV charger installations shall meet the following clearance requirements:

- A minimum clearance of 5 ft between the service pole and the handhole, as shown in Figure 4.3a. 10 ft of clearance is preferred and shall be used when possible.
- A minimum clearance of 10 ft between the service pole and the EV charger pedestal as shown in Figure 4.3a.
- Clearances from SCL underground structures to other structures in the public-right-of-way as specified in SCL 0214.00.

4.7 Conduit

Underground conduit (service) between the termination handhole and the service pole or vault shall be three-inch conduit, installed to meet the requirements of SCL 0214.00, 0224.07, and U2-11.40.

Underground conduit (NEC) between the termination handhole and the EV charger pedestal shall be 2 in conduit with a minimum of 24 in of cover.

Conduit and trench shall be constructed and installed to meet the minimum requirements of Seattle Standard Plan Section 8-33 Electrical Conduit Trenching.

Above-grade conduit shall be rigid steel (RGS).

Underground conduit and ground wire shall be covered with controlled density fill (CDF).

Trench shall be backfilled to subgrade with Type 17 aggregate or CDF and backfilled to grade with clean native soil or topsoil.

4.8 Grounding and Bonding

All conductive equipment attached to the pedestal shall be effectively grounded and bonded. See Figure 4.8.

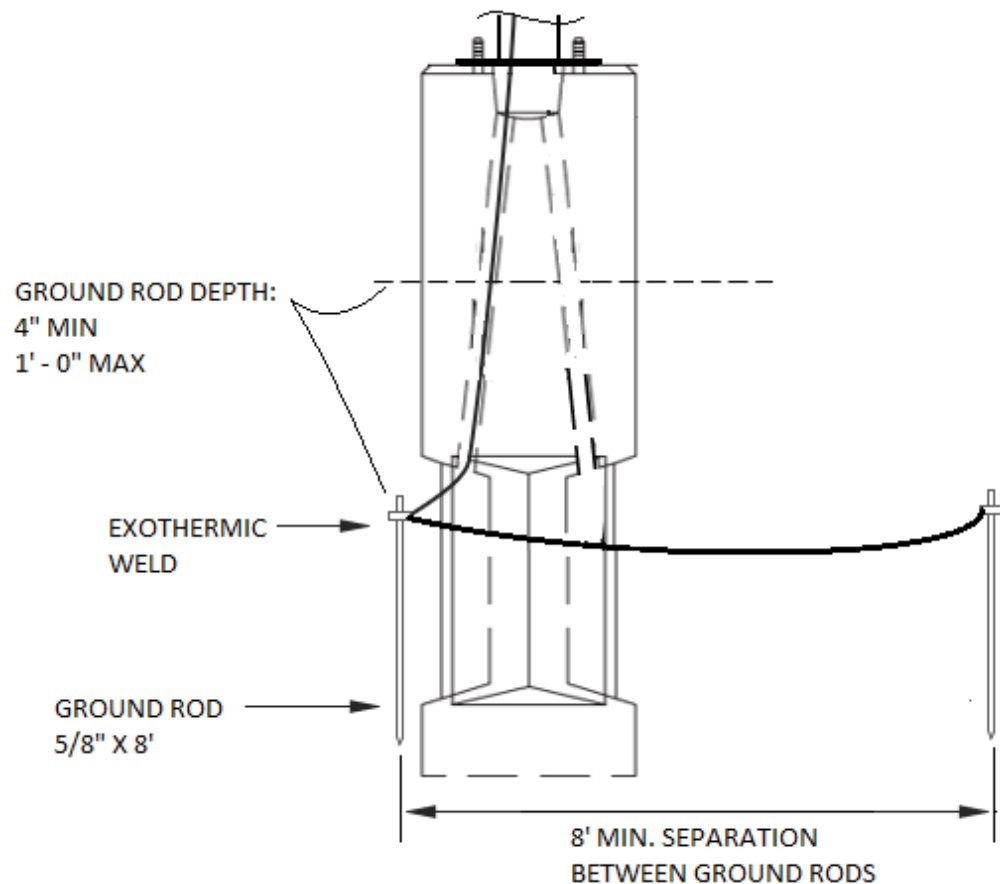
A minimum of two, 5/8-inch by 8-ft ground rods shall be installed as shown in Figure 4.8. The ground rod shall be tested to ensure it has a resistance to ground of 25 ohms or less prior to connecting to the neutral or service.

A ground wire (#2 AWG, copper, stranded, bare) shall be installed from conductive equipment to the ground rods using an exothermic weld connection.

The ground wire shall be routed internally in the pedestal and connected to the ground rod with an exothermic weld.

Grounding of handholes shall meet the requirements of SCL 0231.01.

Figure 4.8. Grounding Details



4.9 Precast Foundations

Pedestals shall be designed to fit on the precast foundation as specified in SCL 5778.20.

For level-ground installations, the top of the precast foundation shall be 12 inches above grade.

For installations on an incline, the downslope edge of the precast foundation shall be 12 inches above grade.

See Figure 4.3b.

4.10 Handholes

A termination handhole shall be required at each pedestal location.

Handholes shall be Type 2 with a 12-inch riser, with an anti-slip cover marked with "SCL." See 7203.10.

Handholes shall be installed as specified in SCL 0231.01.

See Figure 4.3a.

4.11 Identification (ID) Tags

Identification of the EV charger equipment is necessary to assist in repair, restoration, and coordination of work around the pedestal.

SCL ID tags shall be installed on each EV charger enclosure. ID tags shall contain, at a minimum, the following:

- SCL logo
- Site ID name or number
- SCL contact phone number for emergency, information, or notification

4.12 Aesthetics

Equipment aesthetics shall meet the requirements and approval of the Authority Having Jurisdiction (AHJ).

4.13 Inspection

Inspection points are put in place to ensure conformity to SCL requirements.

An inspection by an SCL Electrical Reviewer is required for the following points:

- Conduits and #2 AWG ground wire, before cover
- Handholes, before cover, if applicable
- Conduit mandrel, before wire install
- Grounding and bonding inspection and test
- Handhole and fixture wiring
- Foundations, pedestal, and fixtures

5. Construction Notes

For installation instructions for single or dual EV chargers, see "EVSE Dual EV charger model 3704 Family" provided by the manufacturer.

Install Controlled-Density Fill (CDF) at the precast foundation to plumb and level the EV charger pedestal. See SCL 7150.30.

6. References

City of Seattle Standard Specifications for Road, Bridge and Municipal Construction

Electric Vehicle Supply Equipment (EVSE), Model 3704 Family, For Wall and Pole Mounted Installation; EVSE, LLC

National Electrical Safety Code (NESC), C2-2017 Edition; Institute of Electrical and Electronics Engineers (IEEE) Inc., New York, NY

NFPA-70; National Electric Code (NEC); National Fire Protection Association, Quincy, MA, 2017

SCL Construction Standard U2-11.40; "Mandreling and Cleaning of Ducts and Conduits"

SCL Construction Standard 0098.51; "Electric Vehicle (EV) Chargers on Wood Poles"

SCL Construction Standard 0126.04; "Riser Extensions"

SCL Construction Standard 0214.00; "Clearance between SCL Underground Structures and Other Utility Structures in the Public Right-of-Way"

SCL Construction Standard 0224.07; "Requirements for Secondary Conduit Installation"

SCL Construction Standard 0224.34; "Steel Conduit Risers"

SCL Construction Standard 0231.01; "Secondary Handhole Installation and Grounding"

SCL Material Standard 5778.20; "Footings, Precast Concrete, for Residential Streetlight Poles"

SCL Material Standard 6010.00; "600 V, Copper, Underground, Single-Conductor Cable"

SCL Material Standard 7150.30; "Controlled Density Fill"

SCL Material Standard 7203.10; "Type 1 and Type 2 Open Bottom Handhole, Precast, Secondary and Streetlight"

7. Sources

Borek, Tom; SCL Streetlight Engineer and subject matter expert for 0098.61

Neuansourinh, Ponet; SCL Standards Engineer and subject matter expert for 0098.61

Orenberg, Jacob; SCL Sr Capital Project Coordinator and subject matter expert for 0098.61

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