
Small Wireless Facilities on Metal Streetlight Poles



1. Scope

This standard covers requirements for the installation of small wireless facilities co-located on metal streetlight poles served by an underground Seattle City Light (SCL) Looped Radial or Network distribution system.

2. Application

This standard is intended for use by SCL engineers, crews, and customers responsible for designing and installing co-located small wireless facilities on underground-fed metal streetlight poles.

This standard is intended be used in conjunction with SCL 1714.50.

3. Conflict

Where conflict exists between requirements, the following order of precedence shall apply:

- SCL standards
- City of Seattle Standard Specifications and Plans and Right-of-Way Improvement Manual
- NESC/NEC/WAC, whichever is most stringent
- Project-specific drawings
- Other industry standards

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4. Definitions

Authority Having Jurisdiction (AHJ): An organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure. Examples: Seattle Department of Construction & Inspections (SDCI), Labor and Industries (L&I), and City of Burien.

Baffle: Physical barrier inside streetlight pole that separates SCL streetlight electric service from customer electric service.

Customer: Any non-SCL party responsible for the application, installation, and ownership of the co-located small wireless facilities.

Festoon outlet: 120 V single-phase, GFCI receptacle outlet.

Luminaire: A complete lighting unit consisting of a light source such as a lamp or lamps, together with the parts designed to position the light source and connect it to the power supply. It may also include parts to protect the light source or the ballast or to distribute the light.

Small wireless facility: A type of wireless attachment where each antenna is no greater than 3 cubic feet in volume, and associated accessory equipment is no greater than 28 feet in volume.

Co-located streetlight pole: A shared single steel streetlight pole owned by SCL that is engineered with a baffle to accommodate installation of both a luminaire and a small wireless facility. The SCL side is governed by NESC rules and the wireless provider side is governed by NEC rules.

Co-located service handhole: A shared handhole to accommodate the wiring for both the SCL streetlight system and the small wireless facility.

5. Requirements

5.1 Codes, Permits, Approvals, and Restrictions

All necessary permits shall be obtained by the wireless unit owner.

Only one customer shall be allowed per pole location.

Permits and applications for all proposed work, which include installation, modifications, and relocations, shall be reviewed and approved by SCL Streetlight and Joint Use Engineering.

All installations shall meet or exceed all applicable structural and clearance requirements of the latest revision of the National Electrical Safety Code (NESC), as well as SCL construction standards. In case of conflict, the most stringent requirement will prevail.

All electrical service to provide power to the communication equipment shall meet or exceed all requirements of the latest revision of the National Electrical Code (NEC).

A Non-Ionizing Electromagnetic Radiation (NIER) report shall be submitted to the pole owner(s) and retained on file for each equipment type/model. See SCL 0095.06, "Non-Ionizing Electromagnetic Radiation (NIER) Report Requirements."

Co-located small wireless facilities are not allowed on the following poles:

- Owned by Seattle Department of Transportation (SDOT)
- Co-owned by King County (KC) Metro
- Globe light luminaire
- Post-top decorative luminaire

5.2 Electric Service Requirements

Electric service for co-located small wireless facilities shall be installed as shown in Figure 5.2 and 5.3a, supplied from the co-located streetlight handhole.

Underground electric service, back to the source, shall meet the requirements of SCL 1714.50 for both Looped Radial and Network systems.

Electric service for co-located small wireless facilities will be fused per Section 5.4.

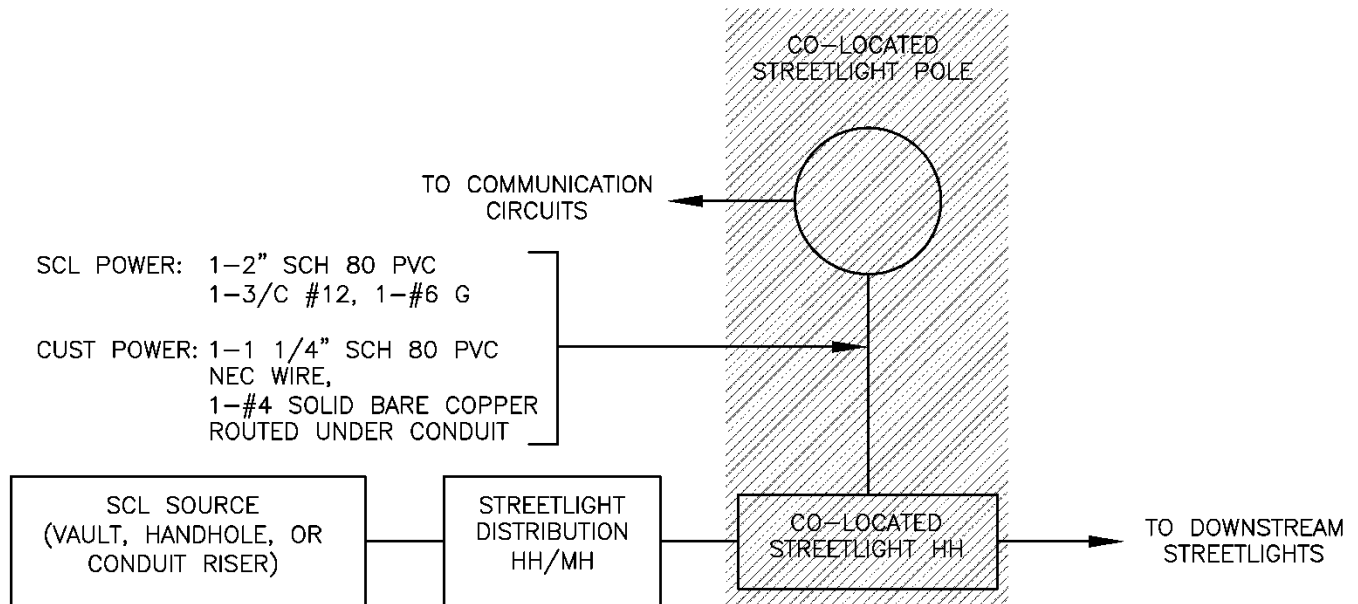
SCL is responsible for the final service connection.

An external service disconnect switch shall be installed that is capable of isolating all electric service, including battery backups and generators. The disconnect switch shall be mounted as follows:

- 15 ft–6 in minimum above finished grade for poles 26 ft or greater in length
- 9 ft–0 in minimum above finished grade for 23-ft poles.

The preferred location of the external disconnect switch is on the side of the wireless equipment enclosure, if such equipment is installed.

Figure 5.2. Basic Infrastructure of a Co-Located Streetlight System



5.3 Co-Located Metal Streetlight Pole

Poles shall be installed as shown in figures 5.3a and 5.3b.

Poles shall meet the following requirements:

- Poles design shall be approved and stamped by a Washington State licensed Professional Engineer.
- Poles shall have a baffle separating SCL-owned and Customer-owned utilities.
- SCL-owned utilities inside the pole shall be located on the street-side of the baffle.
- Customer-owned utilities inside the pole shall be located on property-side of the baffle.
- Pole anchor-bases shall meet existing SCL standards for bolt-circle requirements.
- Poles shall have a minimum 4-position grounding bus inside the pole accessible by the pole handhole.
- Poles shall include a festoon outlet per SCL 1714.50 and City of Seattle Standard Plan 572.
- Pole tops shall include a minimum 3-in x 6-in port to facilitate cable pulling.

Poles shall be at least three feet from awnings and any other permanent overhead structures.

Any deviations from this standard shall be approved by SCL Streetlight and Joint Use Engineering.

Figure 5.3a. Co-Located Small Wireless Facilities Below Streetlight Bracket Arm

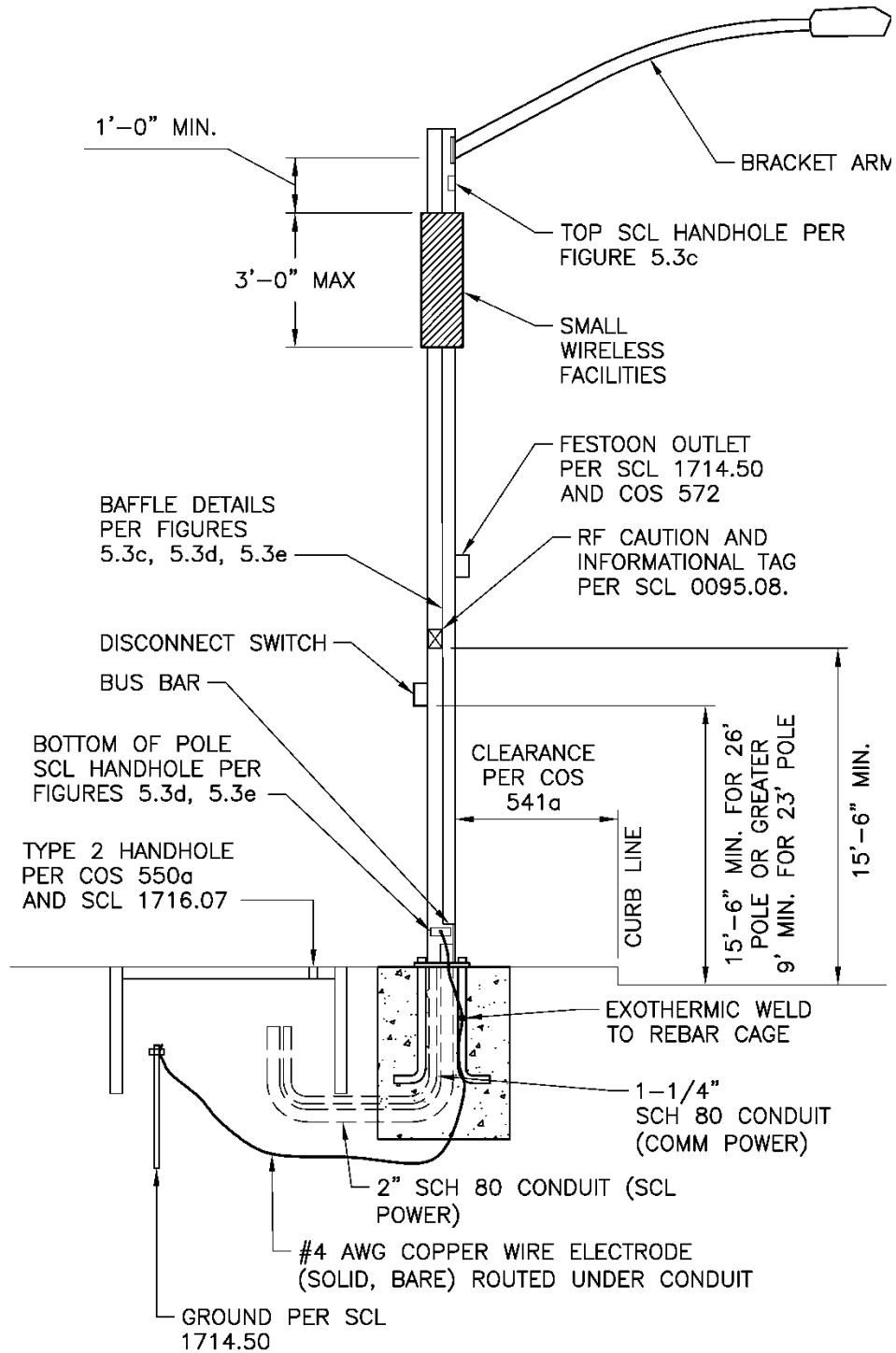


Figure 5.3b. Co-Located Small Wireless Facilities Above Streetlight Bracket Arm

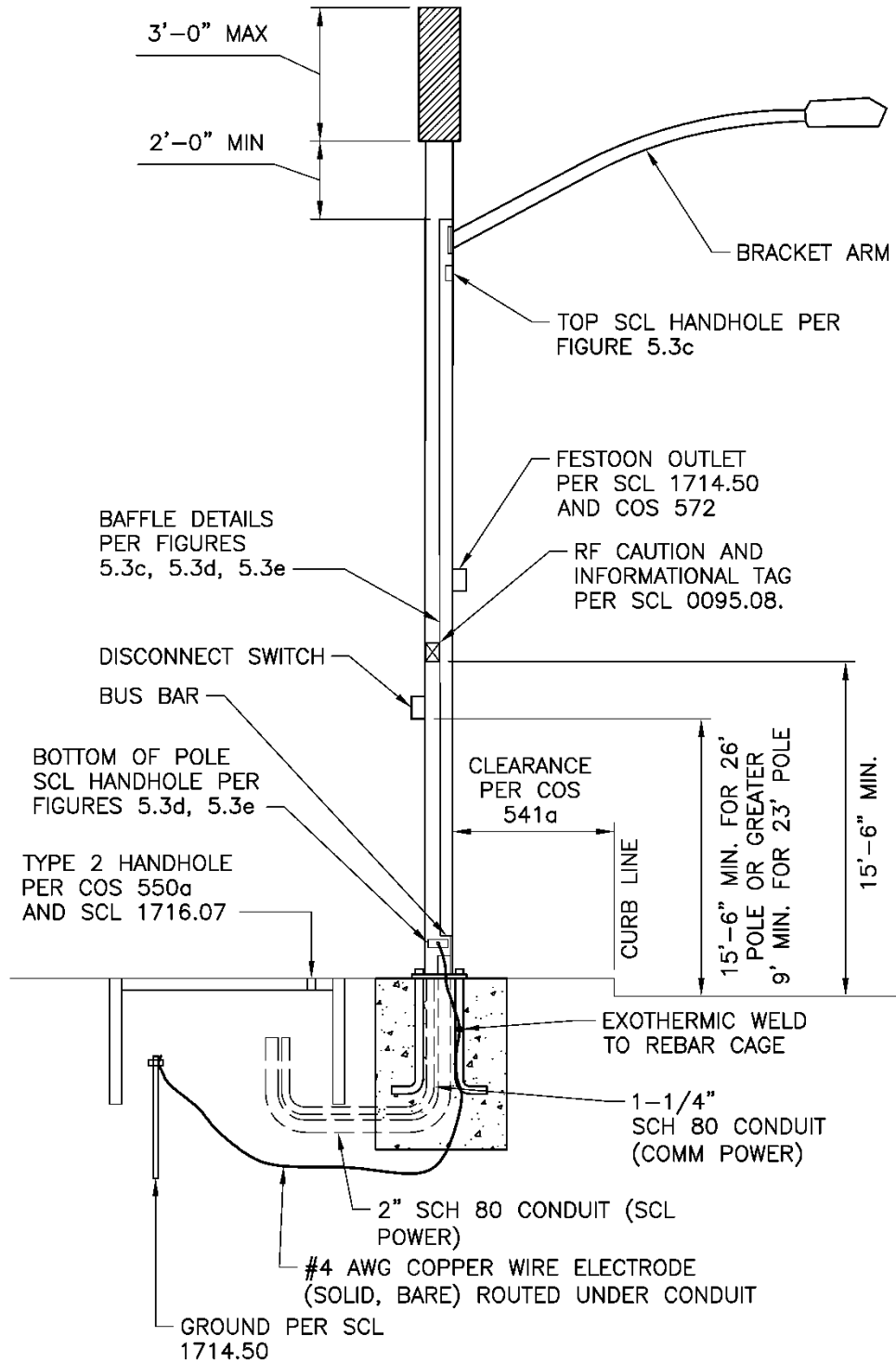


Figure 5.3c. Pole Top Detail

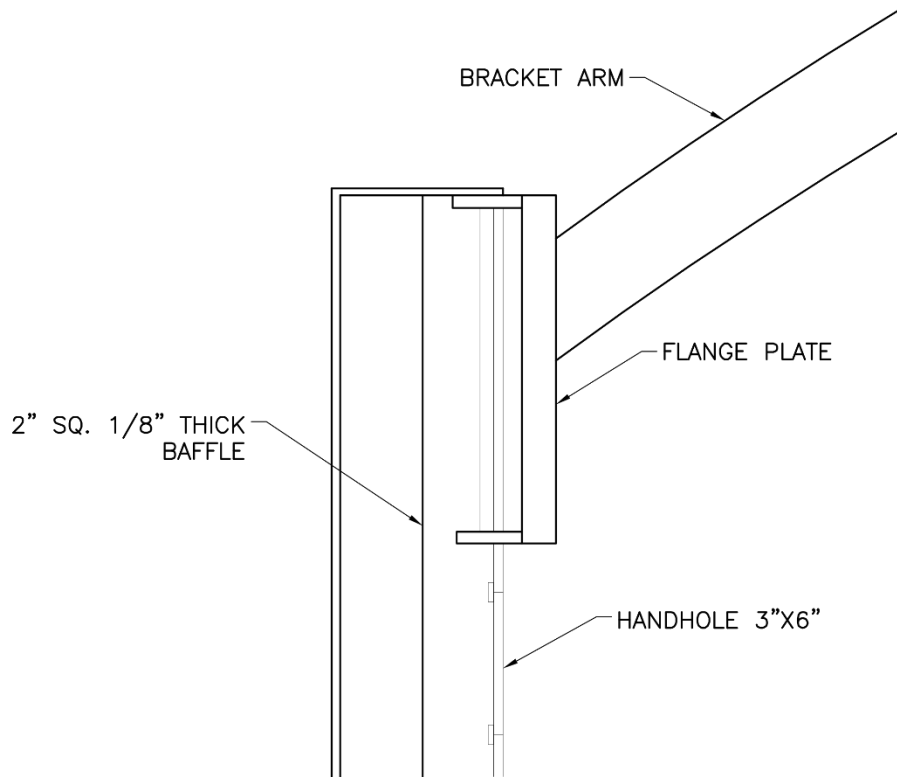


Figure 5.3d. Pole Base Detail

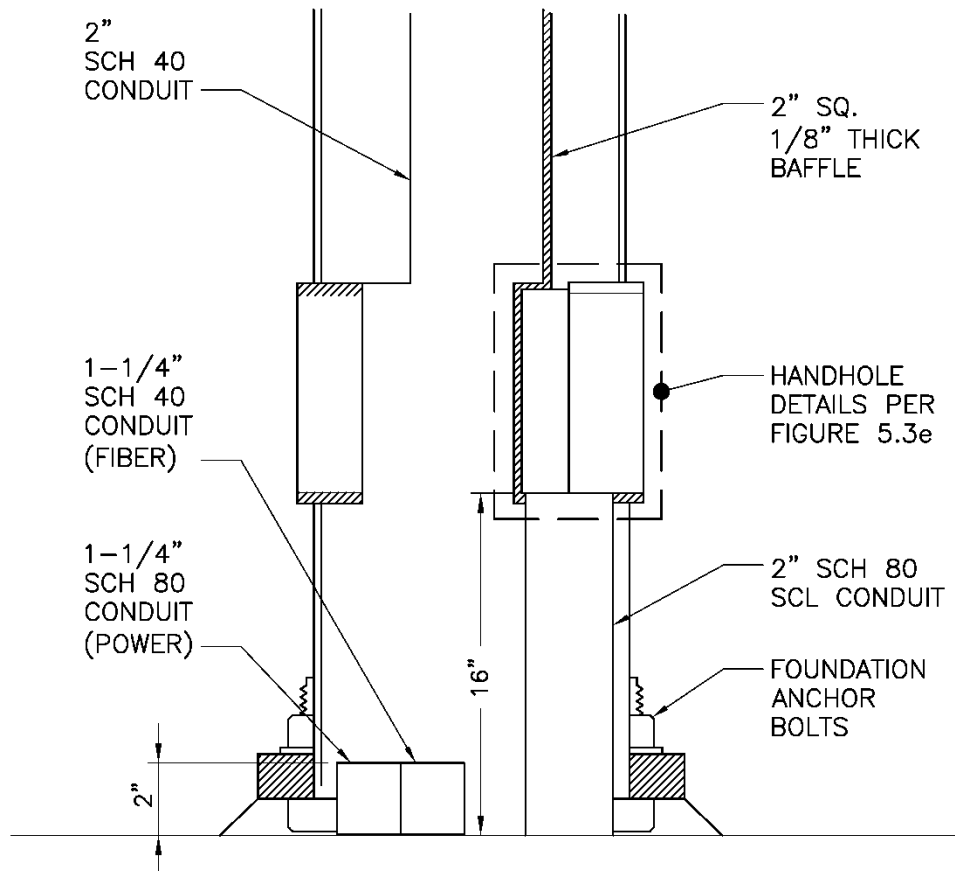
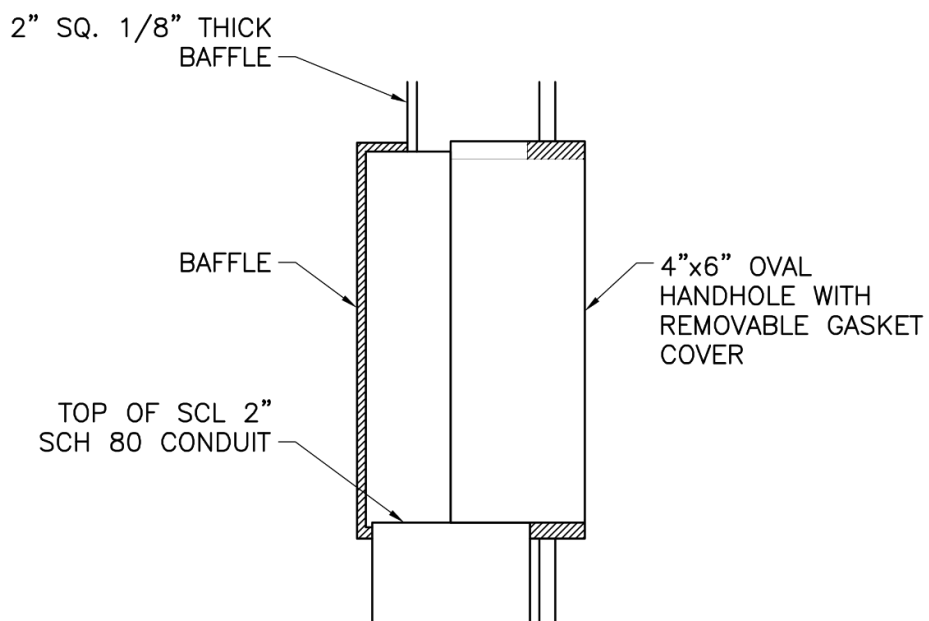


Figure 5.3e. Pole Handhole Detail



5.4 Wiring and Fusing

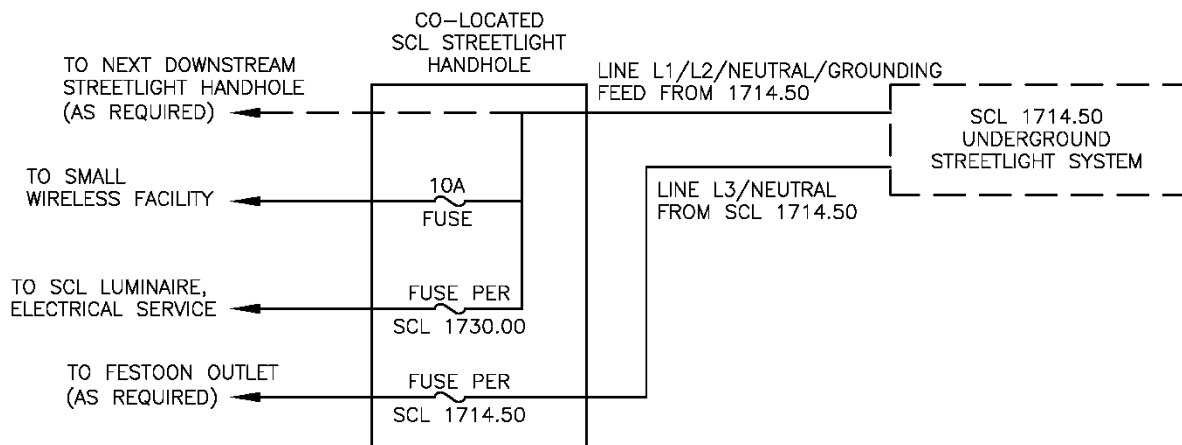
The streetlight wiring system shall meet the requirements of SCL 1714.50.

Wiring for the streetlight handhole feeding co-located streetlight pole shall conform to the requirements of figures 5.2 and 5.4.

The multiple connector shall have a minimum of four positions and meet the requirements of SCL 6780.46.

Festoon outlet wiring shall meet the requirements of SCL 1714.50.

Figure 5.4. Handhole Wiring



All small wireless electric service in the SCL electric system shall be 10 A, with a 10 A service fuse. SCL to provide the service fuse. See SCL 6855.55.

Service voltage in the SCL Looped Radial system shall be 120 Vac.

Service voltage in the Network system shall be determined by the SCL Engineer.

5.5 Grounding

Ground wire from the handhole to the pole grounding bus, at the bottom of the metal pole, shall be minimum #6 AWG green wire installed in conduit. See Figure 5.2.

All circuits shall be effectively grounded and bonded together, and bonded to the streetlight grounding system to meet the requirements of SCL 1714.50.

5.6 Handholes, Conduits, and Co-Located Streetlight Pole Foundation

Co-located streetlight handholes and conduits to co-located streetlight poles shall meet the requirements of SCL 1716.07 and Figure 5.2.

The co-located streetlight pole foundation shall be cast-in-place and meet the clearance requirements of SCL 0214.00 and the requirements of Table 5.6.

Table 5.6. Co-Located Pole Foundation Sizes

Pole Type	Standard Reference	Bolt Circle Diameter (in)
Chief Seattle		
26 ft	SCL 1716.38	15-3/4
31 ft	"	"
Standard		
23 ft	City of Seattle Standard Plans for Municipal Construction 543a	11-1/2
33 ft	"	"

5.7 Equipment Enclosure

Only one communications enclosure shall be allowed on each pole.

The maximum allowable dimensions for the enclosure shall be 16 in (W) by 48 in (L) by 16 in (D).

The enclosure shall have a maximum weight of 725 lb.

5.8 Labeling and Tags

Streetlight poles shall be labeled with the appropriate 7-digit asset tag. Contact SCL Joint Use or Streetlight Engineering.

Antenna owner shall affix small wireless facility tags as appropriate to equipment and/or poles associated with each co-located streetlight system as described in SCL 0095.08.

Streetlight circuit wires shall be labeled as described in SCL 1714.10.

5.9 Aesthetics

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

5.10 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 #4 AWG ground wire, before cover
- Handholes, before cover
- Conduit mandrel, before wire installation
- Grounding and bonding inspection and test
- Handhole and fixture wiring
- Foundations, poles, and fixtures
- Equipment installation and clearances

6. References

City of Seattle Right-of-Way Improvements Manual; www.streetsillustrated.seattle.gov

City of Seattle Standard Specifications for Road, Bridge and Municipal Construction; 2017 Edition

City of Seattle Standard Plans for Municipal Construction; 2017 Edition

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 0093.12**; “Pole Attachments, Identification and Tagging”
- SCL Construction Standard 0095.06**; “Non-Ionizing Electromagnetic Radiation (NIER) Report Requirements”
- SCL Construction Standard 0095.08**; “Wireless Communications Antenna Tags”
- SCL Construction Standard 0214.00**; “Clearances between SCL Underground Structures and Other Structures”
- SCL Construction Standard 1714.10**; “Streetlight Circuit Tagging and Identification System”
- SCL Construction Standard 1714.50**; “Underground Streetlight Systems”
- SCL Construction Standard 1716.07**; “Streetlight Handhole and Conduit Requirements”
- SCL Construction Standard 1716.38**; “Streetlight Poles, Chief Seattle, Foundation, Base, and Collar Installation”
- SCL Construction Standard 1730.00**; “Streetlight Fusing Schedule, Individual”
- SCL Material Standard 6780.46**; “Connectors, Underground, Multi-Tap, 600 Volt”
- SCL Material Standard 6855.55**; “Fuse, Rejection-Type, Fast-Acting, Current-Limiting, 600 V”

7. Sources

- FCC Office of Engineering and Technology (OET) Bulletin 65**; Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnet Fields, Edition 97-01, August 1997
- Neuansourinh, Ponet**; SCL Standards Engineer and originator for 0095.60
- Nsiiro, Julius**; SCL Streetlight Engineer and subject matter expert for 0095.60
- Rice, Morgan**; SCL Network Streetlight Crew Chief and subject matter expert for 0095.60
- Revised Code of Washington (RCW) 80.36.375**; “Personal wireless services—Siting microcells, minor facilities, or a small cell network—Definitions”
- Revised Code of Washington (RCW) 35A.11.020**; “Powers vested in legislative bodies of non-charter and charter code cities”
- Revised Code of Washington (RCW) 35A.47.040**; “Franchises and permits—Streets and public ways”
- Revised Code of Washington (RCW) 43.21C.0384**; “Application of RCW 43.21C.030(2)(c) to wireless services facilities—Reporting requirement—Definitions”
- WAC 296-62-09005**; “Nonionizing radiation”