Small Wireless Facilities on Wood Poles

1. Scope

This standard covers the information necessary to install small wireless facilities (SWF) on wood distribution poles between the primary and the common neutral.

2. Application

This standard is used by SCL engineers, crews, customers, and approved contractors for the installation of SWFs on wood distribution poles between the primary and the common neutral.

Refer to SCL 0093.12 for additional requirements regarding identification and labeling of pole attachments.

For working in the vicinity of wireless communications antennas, see SCL 0095.04.

For pole top installation of SWF on wood poles, see SCL 0095.20.

For installation of Advanced Metering Infrastructure (AMI) antenna equipment, see SCL 0095.17.

3. Requirements

3.1 Codes, Permits, and Approvals

All necessary permits shall be obtained by the antenna customer.

Only one antenna customer shall be allowed per pole location.

All work in the electrical supply space shall be performed by SCL crews or its approved contractors.

Installation shall not be allowed on poles where no adequate clearance is available. This includes poles with transformers, capacitors, primary cable terminations, primary switches, or primary metering equipment.

As a rule, installation shall not be allowed on primary corner poles. However, these poles may be allowed on a case-by-case basis with approval by Joint Use Engineering.

Permits and applications for all proposed work, which includes installations, modifications, or relocations shall be reviewed and approved by SCL 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. This may result in a pole replacement to accommodate the installation of the added antenna and its associated equipment.

All installations shall comply with the wireless permitting requirements of the Authority Having Jurisdiction (AHJ).

All electrical service to provide power to the SWF shall meet all applicable sections of the National Electrical Code (NEC).

Each installation or modification location shall require a Non-Ionizing Electromagnetic Radiation (NIER) report be submitted to the pole owner(s) and retained on file for each equipment type/model per SCL 0095.06.

3.2 Electric Service Requirements

Single-phase 120/240 V service voltage will be provided to the SWF, except in cases where only a single-phase 120 V service is available.

Service fuses shall be required at each service installation per SCL 0094.17.

Customer shall be responsible for ensuring their equipment is compatible with SCL fuses.

A triplex service wire shall be used, with one wire serving as the messenger. The messenger shall be grounded per Section 3.3.

All service connections shall be made using a parallel connector clamp.

An external disconnect switch shall be required (FCC OET Bulletin 65; WAC 296-62-09005) to allow the antenna to be de-energized before work can be performed within the area designated by the RF caution signs described in Section 3.6. The service disconnect switch shall isolate all electric services including any battery backups. The service disconnect switch shall be either mounted to the communication equipment enclosure or just below it, per Section 3.6.

SCL will make every reasonable effort to notify the antenna customer of outages 24 hours in advance when possible. However, SCL reserves the right to disconnect power to the installation without prior notice when necessary.

3.3 Grounding and Bonding

All conductive parts of the antenna installation on the pole shall be bonded together and grounded to the pole ground or system neutral. See NESC 092C3a and b.

All messengers shall be bonded together and grounded to the pole ground or system neutral.

A copper ground wire, #4 AWG minimum size, shall be installed from the base of the antenna bracket to a ground rod(s) at the base of the pole. The ground wire shall be permanently connected to the ground rod.

In cases where a pole ground rod and ground wire are not present, the Customer shall install them to meet or exceed the requirements of SCL 0451.01.

In cases where SCL and communications ground rods are present, all ground rods shall be bonded together using #4 AWG copper wire.

3.4 Conduit Risers

Only one riser installation set shall be allowed on the pole.

Risers at the base of the pole shall be constructed per SCL 0224.34.

Riser extensions up the pole shall be constructed per SCL 0126.04.

All conduits shall be installed on standoff brackets.

Standoff brackets shall be Stock Nos. 686796 and 686790 or preapproved equivalent. See SCL 6867.50.

All conduit running from the equipment enclosure box to the SWF shall be on the face of the pole or match existing conduit risers.

Conduits and standoff brackets at the base of the pole shall not be readily climbable up to 8 feet above the ground line.

Conduits shall be painted to the requirements of Section 3.8.

The maximum number of conduits allowed on the standoff bracket is shown in Table 3.4.

Table 3.4. Maximum Allowable Conduit Quantities

Conduit Quantity	Conduit Size (in)	Type
3	4	Antenna coax and fiber
2	3	Electrical service

3.5 Clearances

Clearances shall be maintained as shown in Table 3.5 and figures 3.6a and 3.6b.

Minimum horizontal clearance from the surface of the pole to the antenna panels and pole-mounted equipment shall be 4-1/2 inches.

Table 3.5. Clearances

Description	Clearances
Street-side pole mounted equipment	▪ Equipment enclosure shall be a minimum of 15'-6" above ground. ▪ Power disconnect switch shall be a minimum of 13'-6" above ground or mounted to the enclosure.
Field-side pole mounted equipment	▪ Equipment enclosure shall be a minimum of 14'-0" above ground. ▪ Power disconnect switch shall be a minimum of 12'-0" above ground or mounted to the enclosure.
Primary distribution poles	▪ A minimum vertical clearance of 36 inches shall be maintained between the top of the antenna and the primary conductor above. ▪ A minimum vertical clearance of 12 inches shall be maintained between the bottom of the antenna and the neutral, secondary service conductor, or SCL fiber below. ▪ The minimum horizontal and/or slant clearance of 36 inches shall be maintained between all conductors energized at primary voltage and all parts of the antenna.
Secondary and guy stub poles	▪ A minimum vertical clearance of 12 inches shall be maintained between the top of the antenna and the lowest span guy bracket attachment. ▪ A minimum vertical clearance of 12 inches shall be maintained between the bottom of the antenna and the secondary service conductor below. ▪ The antenna shall be oriented, positioned, or offset to optimize clearance to the down guys.
Antenna Owner ID and RF Caution Tags	▪ Tags shall be a minimum of 15'-6" above ground.

3.6 Equipment Mounting

SWF shall be installed to meet the clearance requirements stated in Section 3.5.

Only one pole-mounted communication equipment enclosure shall be allowed per pole. The maximum dimensions and weight of the enclosure shall comply with SCL 0094.01.

All communication equipment shall be mounted in a configuration that preserves the climbing space on the pole.

Single-arm brackets shall be used to mount multiple antennas or associated equipment below the primary to preserve the climbing space.

The power disconnect switch shall be mounted on the same side as the equipment enclosure. It may be mounted directly to the enclosure or below the enclosure. See Section 3.5 for clearance requirements.

All power wires must be enclosed. The service wire entering the disconnect must be in rigid conduit, while the power between the disconnect and the enclosure may be in flex conduit.

The communication enclosure may be pad mounted, provided no equipment is located closer than 10 ft from the pole.

Figure 3.6a. SWF on a Distribution Pole

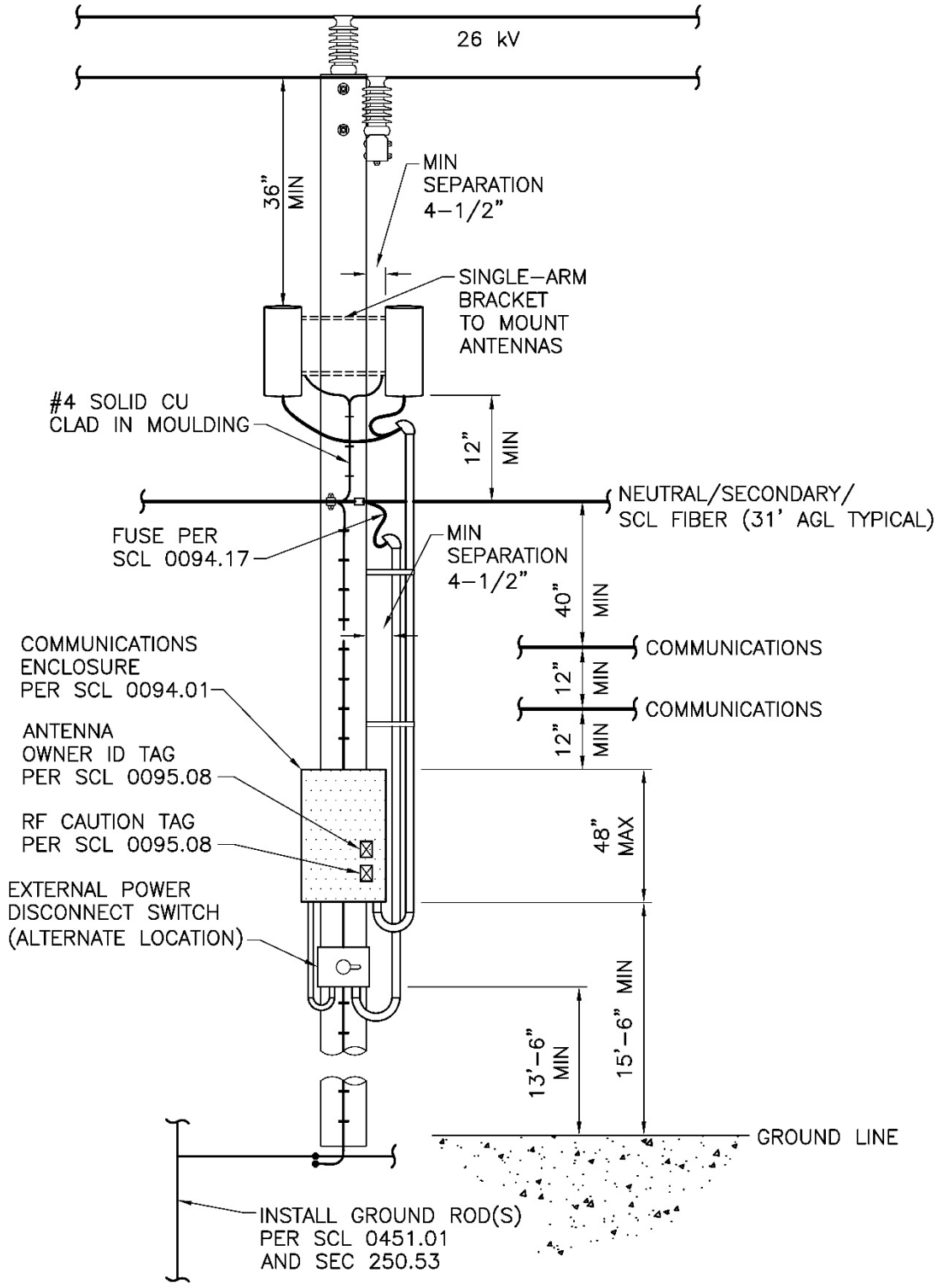
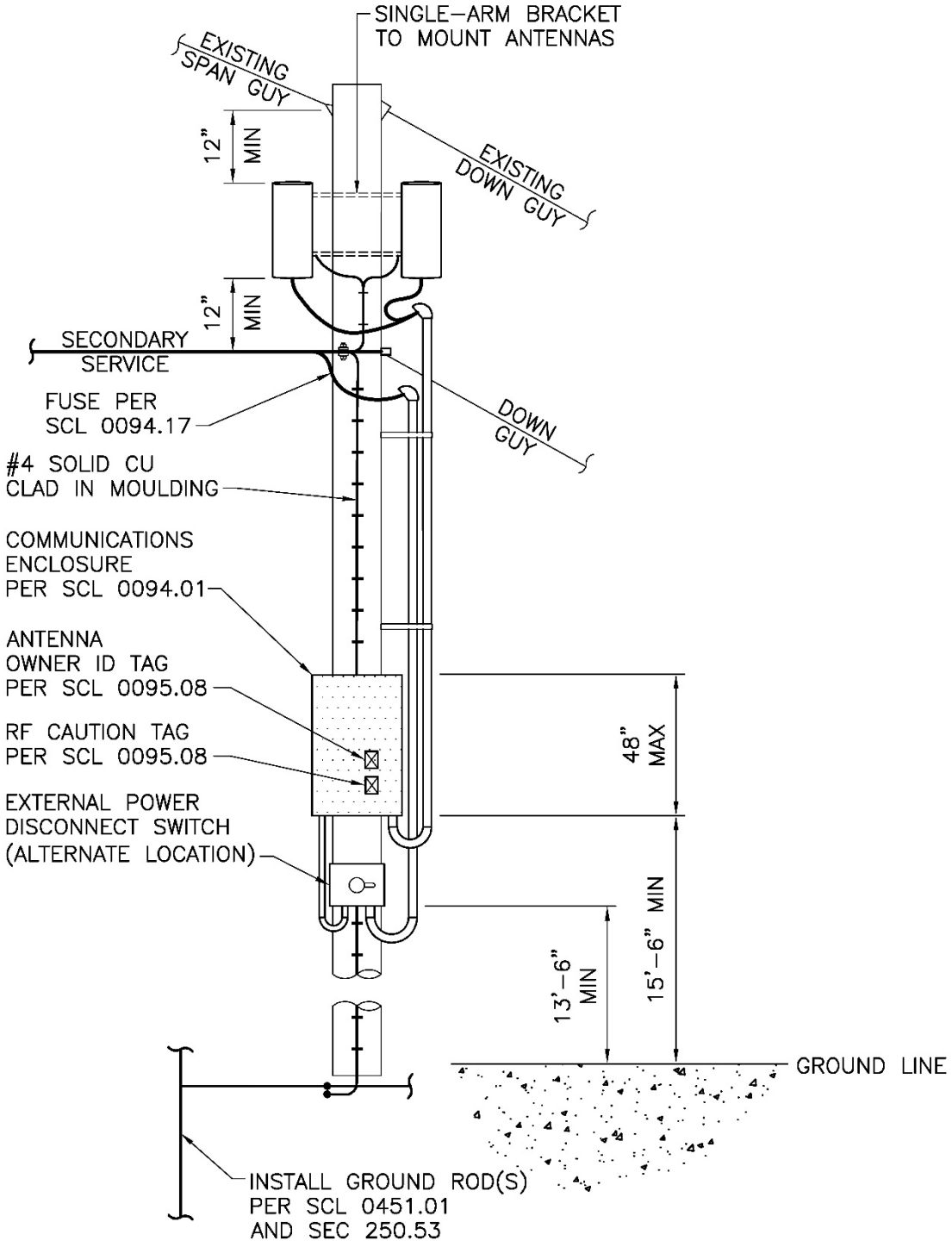


Figure 3.6b. SWF on a Guy Stub Pole



3.7 Labeling and Tag Installation

Antenna customer ID and radio frequency (RF) caution tags shall meet the requirements of SCL 0095.08.

Tags shall be installed on the pole-mounted communications enclosures as shown in Figure 3.6a and Figure 3.6b. If an enclosure does not exist, tags shall be installed on the pole.

3.8 Aesthetics and Inspection

Antennas and associated equipment shall be installed in a manner that allows for maintenance and climbing of the pole by all parties.

Antenna cables shall be installed in a manner that minimizes excess cabling.

The antenna and conduits shall be painted Sherwin Williams Fairfax Brown SW2856.

3.9 Community Notification and Disputes

All required community notifications shall be the responsibility of the antenna customer.

All questions and inquiries resulting from the antenna installation shall be resolved by the antenna customer.

The antenna customer shall provide the SCL Joint Use Engineering with a current phone number for referral of citizen inquiries.

4. Construction Notes

Secure (with nylon zip ties) all loose wires and jumpers to minimize flapping and entanglement.

If available, see the manufacturer installation and user's guide for each type of installation for more information.

5. Materials

All materials shall be provided by the antenna customer. These materials shall meet or exceed SCL specifications where SCL specifications exist. If needed, specialized tools, and training for those tools, shall be provided to SCL as required to assist with antenna installation.

6. References

Federal Communication Commission Office of Engineering and Technology (FCC OET); "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields"; OET Bulletin 65 Edition 97-01, August 1997

National Electrical Safety Code (NESC) C2-2017 Edition; Institute of Electrical and Electronics Engineers (IEEE), 2017

NFPA-70, National Electric Code (NEC); 2011 Edition, National Fire Protection Association, Quincy, MA, 2010

SCL Construction Standard 0093.12; "Pole Attachments, Identification and Tagging"

SCL Construction Standard 0094.01; "Communications Enclosures on Wood Poles"

SCL Construction Standard 0094.17; "Fusing Schedule, Wireless and Wireline Communications Systems"

SCL Construction Standard 0095.06; "Non-Ionizing Electromagnetic Radiation (NIER) Report Requirements"

SCL Construction Standard 0095.08; "Wireless Communications Antenna Tags"

SCL Construction Standard 0095.17, "AMI Repeater Antennas"

SCL Construction Standard 0095.20; "Wireless Communications Antennas on Wood Pole Tops"

SCL Construction Standard 0126.04; "Riser Extensions"

SCL Construction Standard 0224.34; "Steel Conduit Risers"

SCL Construction Standard 0451.01; "Grounding Electrodes for Distribution Poles"

SCL Material Standard 6867.50; "Bracket, For Pole Riser Conduit"

SCL Work Practice 0095.04; "Working in the Vicinity of Wireless Communications Antennas"

SEC 250.53; "Grounding Electrode System Installation"

WAC 296-62-09005; "Nonionizing Radiation"

7. Sources

Federal Communication Commission; FCC Order 11-50

Haberman, Douglas; SCL Joint Use Strategic Advisor; subject matter expert for 0095.15

Neuansourinh, Ponet; SCL Standards Engineer and originator for 0095.15

RCW 80.36.375; "Personal Wireless Services – Siting Microcells, Minor Facilities, or a Small Cell Network – Definitions"

SCL 0095.05 (canceled); "Pole Attachments, Automated Meter Reading and Cellular Phone Antennas"

SEC 230.43; "Wiring Methods for 1000 Volts, Nominal, or Less"