SOUTHERN CALIFORNIA EDISON (SCE)

Non-SCE Antennas Placed on SCE Poles

External Manual

April 2020
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7.0 Contact Information
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1.0 Introduction

The following is a guide to be used by any entity seeking to purchase or lease space from SCE for the purpose of installing an antenna(s) on distribution poles supporting energized conductors (up to 33 kV). New or additional attachments to SCE poles (either solely or jointly owned) by a Foreign Utility such as an Owner/Member of the Southern California Joint Pole Committee (SCJPC), the Tenant of a Foreign Utility, an SCE Tenant, or any other entity, shall not be made except when permission is granted by an authorized SCE representative.

1.1 The terms “antenna(s)” and “antenna site” mean one device, or a combination of devices, including ancillary equipment, that does not emit and/or receive Radio Frequency (RF) energy in excess of the Federal Communications Commission (FCC) General Population/Uncontrolled Exposure limits, as set forth in 47 Code of the Federal Regulation (C.F.R.) and described in Office of Engineering and Technology (OET) Bulletin 65.

1.2 The term “attachment(s)" is to be used for all antenna(s) that will be located within the climbing space and working space as defined in California’s General Order 95, Rule 94. Should an SCE standard and a G.O. 95 rule conflict, the more stringent of the two requirements shall be applied.

Note(s): Microwave antenna(s) are prohibited on all distribution and sub-transmission poles.

2.0 Application Process

Southern California Edison’s Joint Pole Organization (JPO) assists with the execution of Pole License Agreements for Commercial Mobile Radio Service (PLA-CMRS) and Pole License Agreements for Competitive Local Exchange Carriers (PLA-CLEC) as well as processes all Joint Pole Authorizations (JPA), Requests for Access (RFA), Requests for Access-Commercial Mobile Radio Service (RFA-CMRS) and Request for Access-Competitive Local Exchange Carrier (RFA-CLEC) applications.

Contact: Southern California Joint Pole Organization
14005 Benson Ave.
Chino, California 91710-7026
JPAs: ForeignJPAreviewforms@sce.com
RFAs: JPORFAINbox@sce.com

2.1 Members of the SCJPC wishing to install antenna(s) below SCE facilities (for example, lines, equipment, guys) will abide by the requirements established in the SCJPC Agreement and Routine Handbook and will submit the following to ForeignJPA Review Forms@sce.com:

1. A completed JPA, J.P. Form 2-1, one pole per JPA.
3. A power service option letter signed by appropriate permitting agency.
4. An engineered site plan and construction drawings, approved by appropriate permitting agency.
5. Pole loading calculations, including all SCE attachments.
6. A completed Antenna Information Form (AIF).
2.2 CMRS or CLEC providers wishing to install antenna(s) located *above or between* SCE equipment (e.g. lines or guys) in space owned by SCE must have an executed licence agreement. CLEC providers that are not members of the SCJPC who wish to install antenna(s) located below SCE equipment (e.g. lines or guys) in space owned by SCE must also have an executed agreement. Prior to obtaining a copy of the license agreement, the provider must:

A. Submit antenna equipment to IMS for pre-vetting and catalog inventory process.

B. Provide a completed Declaration Letter, signed and dated by a company representative, demonstrating they are a recognized by the CPUC per D16.01-046 or D.18-04-007. The Declaration Letter should also include:
   • Wireless Identification Registration (WIR) and/or
   • Certificate of Public Convenience and Necessity (CPCN)

2.3 The completed declaration letter and attached forms may be emailed to JPORFAInbox@sce.com with the subject line: PLA-CMRS or CLEC REQUEST-your company name.

2.4 Documents are reviewed by an SCE representative who will contact the requestor and provide a non-executable copy of the Pole License Agreement for either CMRS or CLEC providers. Also included will be detailed instructions and requirements in order to execute the Pole License Agreement.

2.5 Once the Pole License Agreement is fully executed, the SCE representative will provide the requestor with the Request For Access Forms.

2.6 CMRS or CLEC Licensees must abide by the requirements established in the fully executed Pole License Agreement as well as the Request for Access Guidelines and Procedures.

2.7 CMRS or CLEC Licensees wishing to make application will follow the directions set in the Request for Access Guidelines and Procedures. The below outlines what is required:

A. A completed the RFA-CMRS or RFA-CLEC application, one pole per RFA application

B. A completed IMA Customer Information Form

C. A signed power service option letter from permitting agency

D. An engineered site plan and construction drawings, approved by appropriate permitting agency

E. Pole loading calculations, including all SCE attachments.
2.8 IMS manages all non-SCE antenna attachments on distribution poles and sub-transmission poles.

A. IMS receives application from JPO (either JPA or RFA), and confirms application with Applicant.

B. IMS prepares the Preliminary Design Work Order Package (Submittal Package).

C. IMS creates and sends Engineering Advance invoice (if applicable) to Applicant.

D. IMS forwards completed Submittal Package to Design Resource (DR).
   1. DR confirms Submittal Package with Applicant.
   2. DR arranges for a pre-design field meet with IMS and Applicant to determine method of service and if attachment location is accessible without entering or working in the Electrical Zone.
   3. DR, IMS, and Applicant meet in field to determine if preliminary design is constructible.

**Note:**
- The Electrical Zone, on poles supporting energized conductors 120 V to 33,000 V, is defined as the pole space, measured vertically, starting 3 feet below the lowest conductor level up to 3 feet above the uppermost conductor level.
- The licensee (or their contractor) is prohibited from accessing the electrical zone.
- Only SCE, or authorized contractors working for SCE, and only when contracted directly by SCE will have access to the electrical zone.
- Only SCE or its authorized contractors will perform all installation work for equipment attached to the pole in and above the electrical zone.
- Licensee has the option of using SCE authorized contractor (under separate contract) or their own for installing antennas outside the electrical zone.
- Licensee is granted access only to the leased space, provided it can be accessed without encroachment into the electrical zone and they maintain all G.O. 95 minimum clearances or clearances as required by SCE.

2.9 IMS receives approved Submittal Package and submits invoice to Licensee.
2.10 Location Selection

A. Choose the shortest pole possible that will allow operation of the antenna while minimizing visual impact.

B. When possible, select a pole supporting only secondary voltage and communications conductors.

C. When a pole that supports primary voltage (2.4 kV to 33 kV) will be selected, consider poles carrying small diameter wires built on a single cross-arm in tangent configuration (that is, no dead-ends, guy wires, or corner poles).

D. For antennas to be placed above or between SCE lines, the pole should not support other SCE equipment, such as fused cutouts, switches, capacitors, transformers, and so forth.

E. Ease of access to the proposed antenna location is highly desirable to allow for the maintenance and repair of equipment. Locations along streets or alleys are best. Back yards should be avoided when possible, as well as locations adjacent to fences, landscaping, or other obstructions.

3.0 Antenna Installation

3.1 IMS to coordinate installation of attachment and schedule the work.

3.2 IMS notifies Licensee of scheduled installation date.

A. If Licensee is performing antenna installation outside the Electrical Zone, then Licensee shall give SCE 30-days written notice and a call 48 hours after approval before antenna is installed.

B. SCE’s crews or approved contract crew to work with Licensee’s contractors for Passive Intermodulation Testing (PIM) for antennas or equivalent.
4.0 Inspection — Maintenance

Joint Owners and Licensees are responsible for inspecting and maintaining their antennas and associated facilities.

4.1 SCE reserves the right to inspect non-SCE antenna installations and notify the Owner/Licensee at any time of unsafe work conditions and/or construction that is not compliant with SCE standards or G.O. 95 Requirements.

4.2 Entities failing to correct unsafe conditions in a timely manner may be reported to the California Public Utilities Commission Safety and Enforcement Division, and/or billed for the necessary action undertaken by SCE.

4.3 Owners/Licensees shall perform all routine maintenance outside of the Electrical Zone and shall not cause any interruption of SCE’s utility or other services. SCE’s crews or SCE’s approved Contract crew will perform all maintenance where access is not assessable without going in or through the Electrical Zone. Written notification by Licensee will be given no less than 30 days of when SCE is requested to perform maintenance.
5.0 Design Specifications — Exhibit “A”

5.1 General Information

A. This standard applies to non-SCE antennas affixed to poles supporting SCE lines, streetlights, secondary risers, and guys.

B. This is a design standard and is not intended to endorse or assure the installation of antennas on SCE poles.

C. This standard, including the Attachments and Notes, supplement the minimum requirements established in G.O. 95, including Rule 94 and all other applicable rules. Should this manual and a G.O. 95 rule conflict, the more stringent of the two requirements shall be applied.

5.2 Support Elements

A. Cables, messengers, ground bond wires, and incidental wiring associated with antennas shall meet the requirements for Class C circuits as specified in G.O. 95, except as modified by this standard.

B. Incidental wiring and miscellaneous equipment associated with antennas shall be installed in a workman-like fashion so as to not interfere with workers ascending or descending the pole, or nearby communication and/or SCE facilities.

C. Hardware (for example, brackets, cross-arms, braces) associated with Antennas affixed above SCE facilities shall (at a minimum) meet the material strength requirements and safety factors for Grade “A” construction as specified in Section IV of G.O. 95.

1. Cross-arms supporting antennas above 2.4–33 kV lines are prohibited.

2. Cross-arms supporting antennas above 120–480 V lines and guys shall extend no more than 5 feet horizontally from the centerline of the support pole.
   • The maximum allowable cross-arm length is 10 feet.

D. Hardware associated with antenna affixed below distribution facilities shall (at a minimum) meet the material strength requirements and safety factors for Grade “C” construction as specified in Section IV of G.O. 95.

E. Pole-top extensions meeting the requirements of the Distribution Overhead Construction Standards, DOH PO 150 may be utilized to support antennas above 120–480 V lines and atop Distribution guy poles.

   1. Where a pole-top extension is intended for use, a soil strength calculation for the support pole must be submitted with other required pole load calculations.

HARDWARE ASSOCIATED WITH POLE-MOUNTED ANTENNAS SHALL BE REVIEWED AND APPROVED BY SCE PRIOR TO CONSTRUCTION.
F. Pull boxes, hand-holes, and other subsurface enclosures shall be situated so as to not interfere with down guys, guy anchors, vehicle and pedestrian traffic.

G. Pedestals and above ground equipment shall be situated so as to not interfere with down guys, guy anchors, vehicle and pedestrian traffic.

5.3 Clearances

A. Attachments 1, 2, 3, 4, and 5 specify the required minimum vertical, horizontal, and/or radial clearances.

B. Antennas attach either above or below lines or guys shall maintain clearances from unattached electrical and communication lines in accordance with G.O. 95, Rule 38, Table 2, Case 3, and Columns A–K.
   1. Pole-top antennas placed on distribution poles up to 33 kV lines are addressed by this standard.
   2. Pole-top antennas above 33 kV transmission lines are prohibited.

C. Antennas affixed below the lines shall not be installed directly below pole mounted streetlight fixtures nor interfere with the intended illumination pattern.

D. Approved antenna equipment (for example, light wave converters, amplifiers, grounding devices, batteries) affixed to the support pole shall meet the following requirements:
   1. Vertical clearances above the ground line (lowest part) shall be no less than 8 feet.
   2. Vertical clearances above the ground line (upper most part) shall be no more than 16 feet.
   3. Maximum dimensions of equipment (separate or combined) shall be no more than 72" (L) × 30" (W) × 18" (H).
   4. Weight of equipment: No maximum is prescribed, however, vertical loading factors must be calculated and the support pole appropriately sized.
   5. Equipment measuring 36" (L) × 30" (W) × 18" (H) or larger, (separately or combined) shall be installed with one or more bracket(s) and provide at least 6 inches of horizontal separation (measured from the surface of the pole to the nearest part of the equipment) to provide adequate space for workers ascending and descending the pole to place their hands or safety straps.

E. Antenna owner/operators shall provide, and update as necessary, information regarding compliance with the Federal Communication Commission’s Maximum Permissible Exposure (MPE) limits as set forth in Title 47 of the Code of Federal Regulations (CFR) for each antenna site.

F. Antenna owner/operators shall install signs or decals made of weather, corrosion, and Ultraviolet (UV) resistant materials. At a minimum, each sign or decal shall indicate the antenna owner/operator’s name, emergency 24-hour contact number, unique identifier for that antenna site, and SCE equipment catalog number (for pole top installations).
G. Affix required signs/decals at two locations on the support structure so they are clearly visible:
   1. Install 3–4 feet below the antenna (measured from the top of the sign).
   2. Install 8–10 feet above the ground (measured from the bottom of the sign).

H. When modifying an existing antenna site that requires the replacement or modification of existing markings the antenna owner/operator shall:
   1. Notify SCE and all other pole occupants in writing and place new signs/decals that include the information listed above in 5.4 (B) and as listed below:
      i. The applicable FCC exposure category
         (General Population/Uncontrolled or Occupation)
      ii. FCC’s recommended minimum approach distance

5.4 Climbing Space

A. Where antennas are installed above lines or guys, climbing space shall be established and maintained in accordance with G.O. 95, Rule 54.7-A from the ground line to the bottom of the hardware.

B. Where antennas are installed below distribution lines or guys, climbing space shall be established and maintained in accordance with G.O. 95, Rule 84.7-A from the ground line to within 6 feet of the nearest line or guy.

C. Directional antennas shall be installed and oriented in a manner that limits RF energy within the climbing space.

5.5 Cable Risers and Grounds

A. Where antennas are installed above lines and guys atop wood or other nonmetallic poles, associated cable risers and vertical grounds shall be:
   1. Adequately supported
   2. Encased in Schedule 40 PVC conduit
   3. Installed outside the climbing space and
   4. Meet the requirements of G.O. 95 Rule 54.6-D 1, 2, 3 and 5.

B. On wood poles, where one riser is present, one additional cable riser may be affixed directly to the pole, provided the climbing space is not impaired.
   1. Appropriately sized galvanized pipe straps (with no less than three straps per each 10 feet length of conduit) and size 16D nails or equivalent lags shall be utilized.

C. On wood poles where two or more risers are present, any additional risers shall be installed with unistrut or power-strut riser supports in accordance with Distribution Underground Construction Standards, DUG CR 110.2.
D. On Light Weight Steel poles where antennas are installed, unistrut or power strut supports shall be utilized in accordance with Distribution Underground Construction Standards, DUG CR 141.

E. Cables emanating from a pole top antenna riser or transiting from a vertical run that extends to an adjacent pole or building shall be:
   1. Bonded to the support pole’s existing communication cables and messengers.
   2. Effectively grounded in accordance with G.O. 95 Rule 83.4.
   3. Marked in accordance with G.O. 95 Rule 91.5.
   4. Where a guard arm is present, the bottom of the riser shall extend at least one foot below the guard arm.

F. Unprotected (bare) ground wires, connectors, and associated grounding equipment installed on nonmetallic poles shall be installed outside the climbing space.
   1. Unprotected (bare) ground wires installed on wood poles shall be covered with Schedule 40 PVC conduit or its equivalent wood or PVC molding.

5.6 Stepping

A. On joint use wood poles, stepping is not required.

B. On joint use composite or light weight steel poles, where risers (of any kind) are present, the use of permanent pole steps shall be considered on a case-by-case basis.

5.7 Cable / Messenger Mounted

A. Cable/Messenger mounted antennas shall be installed with at least:
   1. Six (6) feet of horizontal clearance (measured from the nearest part of the antenna to the surface of the pole).
   2. Four (4) feet of vertical clearance below 120–480 V lines.
   3. Ten (10) feet of vertical clearance below 2.4–33 kV lines (where no 120–480 V lines are present).
   4. Six (6) feet of horizontal clearance from self-supporting streetlights.

B. The maximum length of a Cable/Messenger mounted antenna is 3 feet.

C. Cable/Messenger mounted antennas shall not be installed below pole mounted streetlight fixtures, nor interfere with intended illumination pattern.
5.8 Emergency RF / Power Shut-Off Device

A. Antennas affixed to poles supporting lines and/or guys shall be installed with a device that disconnects all RF energy.

1. This device maybe affixed to the support pole, above ground communication equipment, or contained in a subsurface enclosure, but must be located no more than 20 feet from the pole supporting the antenna within line of sight.

2. Devices shall be permanently marked with a weather and UV resistant sign or decal that reads: SCE RF/Power Shut-Off Switch.
6.0 Attachments

Attachment 1: Typical High Voltage Distribution Pole with Non-SCE Antenna

Note(s):
1. Antenna markings shall be affixed so as to be clearly visible, at two locations on the support structure, 3–4 feet below the antenna (measured from the top of the sign), and 8–10 feet above the ground (measured from the bottom of the sign).
2. On wood poles, where two or more risers are present, any additional riser shall be installed with unistrut or power-strut supports in accordance with DUG CR 110.2.
3. Antennas atop HV distribution poles — no specified horizontal clearance between the pole and antenna.
4. The preferred location of RF/Power Shut-Off Switch is the customer’s pedestal; however, at SCE’s discretion the device may be affixed on the antenna pole (for non-metered cellular service equipment details, see AP 800).
5. Clearance dimensions shown are the required minimum vertical, horizontal, and/or radial clearances.
Attachment 2: Typical Low Voltage Distribution Pole with Non-SCE Antenna

Note(s):
1. Antenna markings shall be affixed so as to be clearly visible, at two locations on the support structure. 3–4 feet below the antenna (measured from the top of the sign), and 8–10 feet above the ground (measured from the bottom of the sign).
2. On wood poles, where two or more risers are present, any additional riser shall be installed with unistrut or power-strut supports in accordance with DUG CR 110.2.
3. Antennas atop LV distribution poles — no specified horizontal clearance between the pole and antenna.
4. The preferred location of RF/Power Shut-Off Switch is the customer’s pedestal; however, at SCE’s discretion the device may be affixed on the antenna pole (for non-metered cellular service equipment details, see AP 800).
5. Clearance dimensions shown are the required minimum vertical, horizontal, and/or radial clearances.
Attachment 3: Typical Guy Pole with Non-SCE Antenna

Note(s):
1. Antenna markings shall be affixed so as to be clearly visible, at two locations on the support structure. 3–4 feet below the antenna (measured from the top of the sign), and 8–10 feet above the ground (measured from the bottom of the sign).
2. On wood poles, where two or more risers are present, any additional riser shall be installed with unistrut or power-strut supports in accordance with DUG CR 110.2.
3. Antennas atop guy poles — no specified horizontal clearance between the pole and antenna.
4. The preferred location of RF/Power Shut-Off Switch is the customer’s pedestal; however, at SCE’s discretion the device may be affixed on the antenna pole (for non-metered cellular service equipment details, see AP 800).
5. Clearance dimensions shown are the required minimum vertical, horizontal, and/or radial clearances.
6. Antennas may only be affixed at the top, under a pole license agreement.
Attachment 4: Typical High Voltage Distribution Pole with Non-SCE Cable/Strand Mounted Omni Antenna

Note(s):

1. Antenna markings shall be affixed so as to be clearly visible, at two locations on the support structure. 3–4 feet below the antenna (measured from the top of the sign), and 8–10 feet above the ground (measured from the bottom of the sign).

2. On wood poles, where two or more risers are present, any additional riser shall be installed with unistrut or power-strut supports in accordance with DUG CR 110.2.

3. Unguarded communication cables below distribution lines (120–480 V) require 6 feet vertical clearance (measured from centerline of conductor to centerline of nearest communication cable).

4. Guarded communication cables below distribution lines (120–480 V) require 4 feet vertical clearance (measured from centerline of conductor to centerline of nearest communication cable).

5. The preferred location of RF/Power Shut-Off Switch is the customer’s pedestal; however, at SCE’s discretion the device may be affixed on the antenna pole (for non-metered cellular service equipment details, see AP 800).

6. Clearance dimensions shown are the required minimum vertical, horizontal, and/or radial clearances.

7. Cable/strand mounted antennas: Maximum length is 3 feet.
Non-SCE Antennas Placed on SCE Poles

Attachment 5: Non-SCE Directional Antenna Between Transmission and Distribution Lines

Note(s):
1. All noted clearances are shown as minimums unless otherwise noted.
2. Antenna markings shall be affixed so as to be clearly visible, at two locations on the support structure; 3–4 feet below the antenna (measured from the top of the sign), and 8–10 feet above the ground (measured from the bottom of the sign).
3. On wood poles, where two or more risers are present, any additional riser shall be installed with stand-off brackets.
4. The top riser opening shall maintain a minimum distance of one (1) foot from guy attachments and a minimum distance of 6 feet from any distribution conductor below it.
5. The preferred location of the Power Shut-Off Switch is the customer's pedestal; however, at SCE’s discretion, the device may be affixed on the antenna pole. (For non-metered cellular service equipment details, refer to DOH AP 800.)
6. Antennas shall maintain a minimum distance of 4 feet from guy attachments and a minimum distance of 6 feet from any distribution conductor above or below it.
Attachment 6: Emergency RF/Power Shut-Off Switch

Attachment 7: Omni-Directional Antenna and Directional Antenna

Omni-Directional Antenna

Directional Antenna
Attachment 8: Example of Non-SCE Cable/Strand Mounted Omni Antenna Attached to Communication Cables

Note(s):
1. For Non-SCE Cable/Strand Mounted Omni Antenna’s minimum clearance requirements, refer to Attachment 4:.
7.0  Contact Information

Manual Access Information
The External Manual for Non-SCE Antennas Placed on Distribution Pole can be accessed and downloaded from the following SCE website:

http://www.sce.com/AboutSCE/Regulatory/distributionmanuals/

Getting Help
If you have any comments, questions, or suggestions concerning this manual, please contact Joint Pole Organization at:

JPORFAinbox@sce.com