

Wireless Antenna Installation and Clearance Requirements

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T & D Standard

LC12010-PUB

IMPORTANT: <u>Do not</u> use this document until you verify that it's the version with the most recent date.

Purpose

Standard LC12010—*Wireless Antenna Installation and Clearance Requirements*—provides information on the typical installation and clearance requirements for wireless antennas and PGE conductors used on a joint-use wood pole.

The Utility Asset Management (UAM) group manages the installation requirements and locations, and contracts with the various wireless communication providers.

References

IEEE National Electrical Safety Code (NESC)

Guidelines

IMPORTANT: If an emergency repair is required on a pole that has wireless equipment, PGE will shut off all power to the radio components as part of restoration and notify the Network Operations Center of the repair.

The wireless carrier is responsible for removing all radio components before disposal of the pole.

Follow these installation guidelines when installing wireless antennas and PGE electrical conductors on a pole that is shared with wireless communication providers.

- PGE line crews or PGE-approved contractors are responsible for installing all antennas, equipment, conduits, and conduit brackets that are not in the communications space.
- PGE is responsible for installing metering equipment, including current transformers, conduit, and meter bases.
- Conduits and 18-inch brackets should be mounted directly above equipment cabinets on the street side of the pole to accommodate up to three 4-inch conduits. If needed, these components can be rotated on the pole to ensure that existing communications cables are not trapped, and that proper climbing space is maintained. Replace an existing 8-foot primary distribution crossarm with a 10-foot crossarm to allow for additional conduit clearance.
- Preserve climbing space on the field side of the pole.
- Bond wireless communications equipment grounding to the PGE pole ground according to NESC requirements.
- The wireless communications provider is responsible for installing a label on the pole that shows the provider's company name and phone number.
- The wireless communications provider is responsible for installing the wireless antennas and all associated equipment.
 - *Note:* All work in the supply space will be performed by qualified personnel under the direction of PGE.
- If more than one wireless antenna is mounted, the antennas must be at least 3 feet from the pole. If only one wireless antenna is mounted, the distance may be reduced to 5 inches.

• To ensure adequate climbing space, a minimum of 5 inches is required between the face of the pole and the back of the grounded equipment cabinet or wire bundles (whichever is closer to the pole).

Figure 1 shows a typical transmission pole with wireless antennas installed below the transmission lines.

Figure 2 shows a typical transmission pole with wireless antennas installed above the transmission lines. In this installation, the area between the transmission line and the antenna is not climbable.

Figure 3 shows a typical distribution pole with wireless antennas installed above the primary lines.

Note: In **Figure 1**, **Figure 2**, and **Figure 3**, the minimum distance between the conductor and the antenna represents the safety zone for the lineman.

Figure 4 shows a typical distribution pole with wireless antennas installed below the primary lines, in the communications space.

Figure 5 shows the clearance required between the equipment cabinet's bracket and the top of the cabinet to the lowest communication line on the pole.











Figure 3: Distribution Pole with Antennas

Notes for Figure 3:

- 1. A minimum 5-foot clearance is required between the bottom of the antenna and secondary power. The term *antenna* includes all components associated with the antenna structure, including mounting brackets, wiring, and wiring harnesses.
- 2. The antenna's ground wire must be insulated and in conduit.
- 3. A minimum 3-foot clearance is required between the top of the primary insulators and the opening of the antenna conduit.
- 4. The bottom of the equipment shelf on a distribution pole must be at least 10 feet above pedestrian sidewalks or restricted-traffic roads, and at least 16 feet over roads, streets, and alleys.



Figure 4: Minimum Clearances on a Pole with Antennas

Notes for Figure 4:

- 1. If a secondary drip loop exists and is the lowest supply conductor, there must be at least a 40-inch clearance between the bottom of the loop and the top of an antenna (or the highest communication line, if no antenna exists).
- The distance between the top of the antenna and bottom of the drip loop is 3 inches only if the power conductor is covered with a non-metallic sleeve. If the conductor is *not* covered, a minimum 40-inch clearance is required.
- 3. If only one antenna mount is attached the pole, this distance can be reduced to 5 inches.
- 4. The term *antenna* includes all components associated with the antenna structure, including mounting brackets, wiring, and wiring harnesses.



Figure 5: Clearances Between Equipment Cabinet and Lowest Communication Line

AC, DC, and RF Disconnects

Each wireless site in the PGE service territory must have a means to remove all RF hazards. This includes removing the hazards associated with electrical backup systems including battery backup, external generators, or anything else that could be a source of electrical energy used to generate RF radiation.

Note: Some wireless sites built before 2010 may not have a readily accessible means to remove RF hazards. When a wireless communication provider applies for an upgrade to an existing site, PGE requires them to either install or provide access to a switch that interrupts power to the radio unit that generates the RF signal.

Before shutting down a wireless site, PGE will alert the Network Operation Center (NOC) about the shutdown. NOC contact information is posted on a sign on the wireless equipment cabinet (see **Figure 11**).

The first two of the figures below show a dc disconnect:

- Figure 6 shows the location of a the disconnect on pad-mounted equipment.
- Figure 7 shows a close-up of the disconnect.

Figure 8 shows a dc switch inside a disconnect panel.

The last two figures show an ac disconnect switch:

- Figure 9 shows the location of an ac disconnect switch on pole-mounted equipment.
- Figure 10 shows a close-up of the switch.



Figure 6: DC Disconnect on Pad-Mounted Equipment



Figure 7: Close-Up of DC Disconnect









Figure 9: AC Disconnect Switch on Pole-Mounted Equipment



Figure 10: Close-Up of AC Disconnect Switch



Required Network Operations Center and RF Safety Signs

Network Operations Center (NOC) information and RF safety signs must be placed on the wireless equipment cabinet on the same side as the disconnect switch (as shown in **Figure 11**).

If the NOC information cannot be read from ground level without an optical aid, then an additional NOC sign must be mounted 8 feet above ground level. Consult with the PGE Wireless Project Manager to determine the best location for the sign and the appropriate materials and methods for use when attaching it.



Figure 11: NOC Information and RF Safety Signs on Wireless Equipment Cabinet