

AMP CONSTRUCTION STANDARDS FOR WIRELESS ATTACHMENTS ON MUNICIPAL ELECTRIC DISTRIBUTION POLES AND NON-UTILITY POLES

The following construction guidelines apply when co-locating wireless antennas, Small Cell, DAS, Wi-Fi, and other wireless technologies on Municipality's Electric Distribution Poles or non-utility poles.

- Wireless antenna colocation shall be located at the top of the pole.
 - Only one antenna array per pole is allowed.
 - A minimum 40" clearance or more as necessitated by the present electric voltage for NESC is required. The required clearance is measured from the bottom of the wireless antenna to the highest electric conductor. In most cases this will require the use of an antenna extension arm or replacement of the pole.
 - All antenna designs and pole requirements and locations shall be approved by the Municipal utility and meet all applicable code requirements. In case of conflict the most stringent requirement will prevail.
 - Electrical services associated with installation shall meet all applicable provisions of the latest revision of the National Electrical Code (NEC). In particular, services with provision for alternative power sources shall be designed to eliminate any possibility of backfeed into the commercial power system.
 - Federal Aviation Agency (FAA) permits shall be obtained by the applicant for the antenna installation where required.
 - All required community notifications, easements, overhangs, and tree trimming must be obtained by the antenna owner from the property owner before construction.
 - Antenna / cable must bond to an Municipal ground at neutral position and at grade per the National Electrical Safety Code (NESC) and the NEC. A copper ground wire, #4 AWG minimum size, shall be installed from equipment to the pole ground using an irreversible connection. Where a pole ground does not exist, one shall be installed at the base of the pole. Additional grounding and lightning requirements may be required. Any cabinets or associated equipment will need to be grounded with an additional ground rod. All conductive equipment attached to the pole shall be properly grounded and bonded. Ground bus bars installed on the poles shall not exceed 12 inches and shall be covered and protected.
 - The maximum number of conduits allowed on the pole shall be:
 - Four 4-in conduits for RF transmission lines. Alternatively, four 6-in conduits may be allowed upon special approval by the Municipality.
 - And a conduit 3 inches or smaller for electrical service to either the pole mounted box (shown in the illustrations of this guideline) or to the padmounted equipment.
 - And a 2 inch or smaller conduit for telephone to the padmounted equipment.
- All conduits and/or feed lines shall be mounted on the face of the pole.



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05/04/17		

- All conduits and/or feed lines over 2 inches in nominal diameter shall be installed on standoff brackets. The minimum space between the pole and the closest part of the conduit shall be 4-1/2 inches (for climbing).
- One standoff bracket shall be used for all installed conduits. The lowest point of the lowest bracket on the pole shall be located a minimum of 8 feet above grade. The lowest bracket on a pole shall be a braced bracket.
- Conduit risers and equipment at the base of the structure shall not be readily climbable up to 8 ft. above finish grade.
- Conduits shall be electrical grade Schedule 40 PVC, minimum.
- Conduits between 2 feet below the ground line to 8 feet above the ground line shall meet the requirements above; however, code and/or permit conditions may require a thicker wall conduit or different material.
- Polyethylene and CPVC conduits are not acceptable.
- Installation requirements:
 - PVC pipe wrap shall be wrapped around the conduit starting 8 inches below the ground level to 8 inches above the ground level.
 - An end cap shall be installed on all spare conduits.
 - All conduit located above grade shall be vertical.
 - During installation, the pole may need to be temporarily guyed or held during excavation at the bottom of the pole. After installation, any temporary installed guys must be removed.
 - Backfill around conduit and poles shall be clean native soil.
- All antennas, excluding mounting bracket, shall have a minimum clearance of 7 foot 1 inch from all conductors energized between 2,000 V and 69,000 V.
- Antenna owner shall install an RF warning sign on the pole where the safe approach distance ends for FCC Occupational Controlled Class Limits. Warning signs will state: "Warning - Antenna Radiation. Minimal Approach Distance is 3 Feet." An RF disconnect switch shall be located at the base of the pole.
- Poles with equipment (transformers, fuses, capacitors, reclosers, underground risers, poles with multiple primary voltages, etc.) will not be available for wireless collocation.
- Electric service for the wireless installation will comply with the Municipality's Electric Service Rules and Regulations. All installations will require an electric meter to measure electric consumption. A non-metered account will need to be reviewed and approved by Municipality.



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- Utilizing a streetlight electric circuit to power the wireless installation may experience electric outages. Streetlight circuits are the lowest priority for restoration in the Municipality outage system.
- A structural analysis stamped by an Ohio Registered Professional Engineer is required for every pole that is being requested for colocation. The structural analysis will utilize the National Electric Safety Code and all other applicable standards including the Ohio Building Code, as appropriate.
- Construction and or maintenance may require use of Municipality's Electric Crews on Municipal electric utility assets.
 - Installation and maintenance of the antenna system above the communication zone of the pole will require the use of Municipality's Electric Crews.
 - Ground work can be completed by the Wireless Provider or Provider's contractor.
- Municipality's priority is to Electric, Natural Gas, Water, and Sewer Services. If a pole is damaged, Municipality's Utility Services are paramount and will be restored first. Municipality is not responsible for the loss of service for the Wireless Provider.
- Municipality will disconnect power to any wireless colocation before a working on pole.
- If Municipality requires additional equipment (transformers, fuses, underground risers, etc.) the Wireless Provider will relocate at Municipality's discretion. Any relocation is at the expense of the Wireless Provider.
- Municipality reserves the right to modify the work rules or guidelines for Wireless installations on Distribution Poles to ensure safety of persons and reliability of the Electrical system.
- The number of installations and quantity of equipment and antennas will be limited to the space available on the existing or replaced pole. Antenna installations will not be allowed on primary corner poles, poles with transformers, capacitors, reclosers, primary cable terminations, primary switches, or primary metering. More than one rad center may be allowed on a pole, although no more than three antennas may be allowed at a rad center. Only collar mounts are allowed. Goal post mounts are not allowed.
- Only one wireless carrier or DAS provider serving multiple carriers may have equipment on any given pole
- No service entrance equipment will be allowed on the pole.
- Load or other cabinets will be allowed on the pole only if they comply with the maximum size allowed by Municipality. **Note:** The cabinet shown on the illustrations of this guideline are not necessarily used on every installation. For instance, some installations may use padmount equipment.




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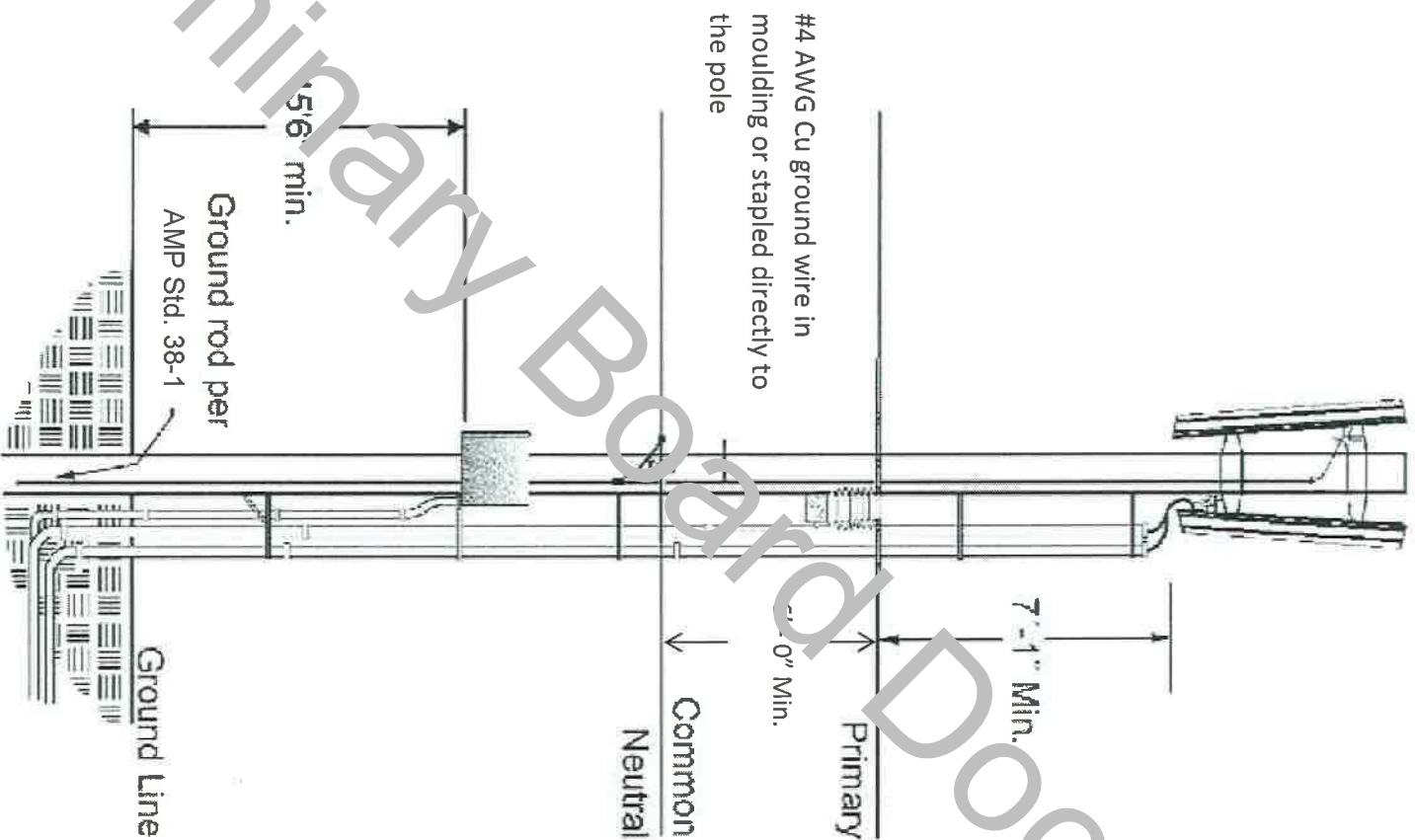
- Only one pole mounted box per pole will be allowed.
- The above types of equipment may be padmounted provided that no equipment is located closer than 10 ft from the pole.
 - All proposed equipment mounting shall be reviewed by the Municipality. Any variance for equipment mounted on the pole shall require approval from Municipality. The Wireless Provider shall be responsible for all mitigation.
 - The antenna related box (if any) shall be mounted on the street side of the pole and shall be located high enough so that it will not be damaged by passing traffic.
- Conduit running up to secondary conductors or antenna cables running up to a box shall be on the face of the pole. All conduit running from the box to the antenna shall also be on the face of the pole.
- Antennas and cabinets shall be painted to match the pole or as required by agreements, the easement, or the permitting agency.
- These materials shall meet or exceed Municipality specifications when such specifications exist. If needed, specialized tools, and training for those tools, shall be provided to Municipality as required to assist with antenna installation.
- Antenna installations shall be as aesthetically pleasing as is reasonably possible.
- The Wireless Provider owning the antenna installation shall provide the Municipality with a current phone number for assistance in the repair of storm or third party damage or Municipality maintenance.
- The Wireless Provider owning the antenna installation shall provide Municipality with a current phone number for referral of other inquiries.

Preliminary

		
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WIRELESS ANTENNA POLE ATTACHMENTS ABOVE PRIMARY CONDUCTORS ON DISTRIBUTION POLE
WITH UNDERGROUND SERVICE

(NOT TO SCALE)

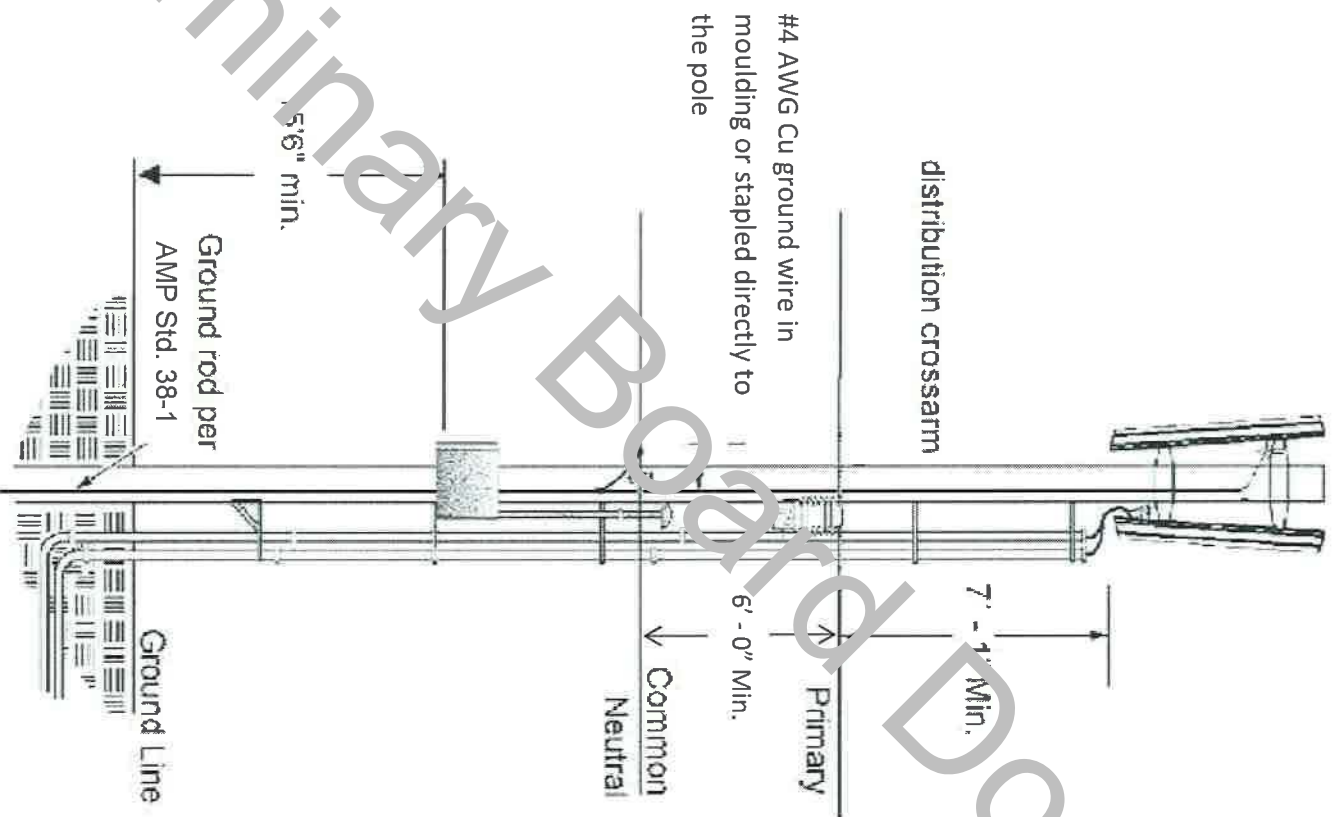


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WIRELESS ANTENNA POLE ATTACHMENTS ABOVE PRIMARY CONDUCTORS ON DISTRIBUTION POLE
WITH OVERHEAD SERVICE

(NOT TO SCALE)



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