

City of Tucson Wireless in the ROW Standard Designs and Concepts

City of Tucson Standard Design Requirements Small Wireless Facility on Existing Streetlight Poles

The following design standards shall apply, in addition to the *Common Standards Design Concepts, Requirements and Details* that is included in this document, to a Small Wireless Facility (SWF) proposed for a location with an existing city-owned or third party-owned streetlight in the City of Tucson Right-of-Way (ROW). These design standards are not exhaustive and the City, as the owner, keeper and manager of the ROW retains the right to modify or adjust the requirements on a case-by-case basis.

A. Pole Criteria:

1. *Purpose of Streetlight Pole:* The primary purpose of the pole shall remain as a pole structure supporting a streetlight luminaire and related streetlight fixtures used to provide lighting to the City ROW. The attachment of wireless equipment to an existing streetlight pole or to a replacement pole that impedes this primary purpose will not be approved.
2. *General Requirement:*
 - a) An SWF shall be designed to blend in with the surrounding streetscape with minimal, if any, visual impact.
 - b) A replacement pole shall match the existing City of Tucson streetlight pole as closely as possible, subject to more specific criteria below.
 - c) Poles shall be engineered to support a luminaire and mast arm of length equal to that of the existing pole or of a length specified by the City based on the location of the new or replacement pole; and to support the largest antenna and ancillary equipment that may be installed on the pole.
 - d) For each individual pole type or style used to support the wireless equipment, one spare replacement pole shall be procured and stored by the wireless provider so the pole and city owned equipment can be replaced by the wireless provider within seven calendar days in case of a knockdown.
 - e) All plans shall be signed and sealed by a Professional Civil and Electrical Engineer.
 - f) All other details in the current edition of the Pima Association of Governments Standard Specifications for Public Improvements Volume 1 and Standard Specifications for Public Improvements Details Volume 2 shall apply.

3. *Specific Criteria:*

a) New or Replacement Pole Height

A new or replacement pole may be installed without zoning review if one of the two height requirements is met:

1) Up to a ten (10) foot increase, not to exceed fifty (50) feet total (whichever is less), per A.R.S. §9-592(I); or

2) Up to forty (40) feet above ground level, per A.R.S. §9-592(J)

b) Overall Height of Replacement Pole

1) The “base” height of an existing streetlight pole shall be the height of the vertical pole section from the existing grade. The height of the luminaire mast arm, if higher than the vertical pole section, shall not be used to determine the new overall height of the replacement pole.

2) If the antennas are the highest vertical element of the site, then the new overall height of the replacement pole is measured from the existing grade to the top of the canister or the top of the panel antenna.

c) Increase in Outside Diameter (OD) of Pole

The non-tapered replacement pole outside diameter (OD) of the base section shall be equal to the top section, and the OD shall not exceed eight and five-eighths (8-5/8) inches (the pole manufacturing industry standard OD for an 8 inch diameter pole) or a 100% increase in diameter of the original pole, whichever is less.

d) Luminaire Mast Arms

1) All luminaire mast arms shall be the same length as the original luminaire arm, unless the City requires the mast arm to be different (longer or shorter) based upon the location of the replacement pole.

2) Unless otherwise approved, all luminaire mast arms shall match the arc (if applicable) and style of the original luminaire arm.

3) The replacement luminaire mast arm shall be at the same height above the ground as the existing luminaire.

e) Light Fixtures

- 1) All replacement poles shall have a new light-emitting diode (LED) light fixture of the same manufacturer, model and light output of the removed fixture installed.
- 2) All replacement light fixtures shall be equipped with a new 7-pin photocell receptacle and ROAM node as specified by the City.
- 3) Replacement light fixtures shall carry five (5) year manufacturer's full-replacement warranty.

f) Pole Foundation

- 1) All pole foundations shall conform to the City's adopted standards and specifications on streetlight design and shall be modified for wireless communications equipment and cables.
 - a) Foundations shall be engineered to support the pole, mast arm and luminaire, and the largest antenna that may be mounted on the pole.
 - b) All plans shall be signed and sealed by a Professional Civil Engineer.
- 2) The City, in its sole discretion, may allow the pole foundation design to be "worst case" for all soil conditions.
- 3) A separate, two-inch diameter conduit shall be installed in the pole foundation for the City's luminaire wire and any additional City wires or cables. The City's conduit shall be trimmed to three (3) inches above the top of the caisson.
 - a) A separate appropriately sized conduit shall be installed in the pole foundation for use by the SWF. This conduit shall continue unbroken within the pole from the foundation to the point at which the SWF wiring exits the pole. This conduit shall not exceed 30% of the interior diameter of the pole. Street lighting and SWF circuits shall not co-mingle within the street light pole, conduits, or pull boxes.
- 4) The height of the pole foundation shall match finished grade. If the pole foundation encroaches into any portion of the sidewalk, then the pole cap shall be flush with the sidewalk.
- 5) Shrouds for the streetlight pole mounting bolts may be required for the replacement pole.
- 6) Pole Foundation Clearance requirements for Water Mains

- a) For Tucson Water (TW) distribution mains (12" diameter or smaller) the horizontal separation shall be a minimum of five (5) feet from the outside wall of the water main to the outside of the pole foundation. For TW transmission mains (>12" diameter) the horizontal separation shall be a minimum of ten (10) feet from outside wall of water main to outside of pole foundation.
 - b) Potholing is suggested for best accuracy for locating existing TW facilities.
 - c) TW maps and record drawings are available by contacting TW Mapping Section at 520-791-2658 or TWMapInfo@tucsonaz.gov. In your request, provide township, range, section and quarter section.
 - d) Show all TW facilities within the project limits on the project plans. Label existing water mains size, material, and as-built plan number.
 - e) If any project-related work is to be completed within ten (10) feet horizontally or will be crossing an existing 16" or larger diameter water main, plans must be submitted to TW Distribution Design for review and comment, prior to submitting an application.
 - f) The minimum vertical separation at a crossing between existing water mains and new utility lines (conduits, electric, Fiber optic, etc.) shall be twelve (12) inches.
 - g) Water Modifications plans shall be required and prepared by the design engineer if it is determined that there is a conflict with existing TW facilities and proposed small cell company improvements. Cost for relocation of existing water facilities shall be the responsibility of the small cell company.
 - h) Review and approval of Water Modifications plans shall be at the sole discretion of TW and the City. Please see TW website for additional information: <https://www.tucsonaz.gov/water/contractors-developers-and-engineers>
- g) Painting of Replacement Pole
- 1) If the replacement pole is an unpainted galvanized pole, the pole shall not be painted or have a finish unless otherwise specified by the City.
 - 2) For powder coated or painted poles, the wireless provider shall replace with powder coated or painted color and/or color combination to match existing neighboring poles as directed by the City.
- h) Painting Antennas and Mounting Equipment

- 1) All antenna mounting brackets and hardware, antenna mounting posts, cables, shrouds and other equipment mounted on a new or replacement unpainted galvanized pole shall be painted Sherwin Williams "Web Grey" (SW7075) color or equivalent, unless specified otherwise by the City.
- 2) All antenna mounting brackets and hardware, antenna mounting posts, cables, shrouds and all other equipment mounted on a painted new or replacement pole shall be painted a color specified by the City
- i) Wireless provider shall install pole numbers on each replacement pole (to match the number on the existing streetlight pole being replaced) per City of Tucson requirements.

City of Tucson
Standard Design Requirements
Small Wireless Facility on Existing Traffic Signal Poles

The following design standards shall apply, in addition to the *Common Standards Design Concepts, Requirements and Details* included in this document, to a Small Wireless Facility (SWF) proposed for a location with an existing City-owned traffic signal in the City of Tucson Right-of-Way (ROW). These design standards are not exhaustive and the City, as the owner and manager of the ROW retains the right to modify or adjust the requirements on a case-by-case basis.

A. Pole Criteria:

1. *Purpose of Traffic Signal Pole:* The primary purpose of the traffic signal pole shall remain as a pole structure supporting a traffic signal and related streetlight fixtures used to provide traffic control and lighting to the City ROW. The attachment of wireless equipment to a new or replacement traffic signal pole that impedes this primary purpose will not be approved.
2. *General Requirement:*
 - a) An SWF shall be designed to blend in with the surrounding streetscape with minimal, if any, visual impact.
 - b) A replacement pole shall match the existing City of Tucson traffic signal pole, as closely as possible, subject to more specific criteria below.
 - c) For each individual pole type or style used to support the wireless equipment, one spare replacement pole shall be procured and stored by the wireless provider so the pole can be replaced within forty-eight (48) hours, exclusive of required concrete cure time, by the wireless provider in case of a knockdown.

- d) Poles shall be engineered to support a luminaire mast arm of equal to that of the existing pole, or of a length specified by the City based on the location of the new or replacement pole; and to support the largest antenna that may be installed on the pole.
- e) All plans shall be signed and sealed by a Professional Civil Engineer.
- f) All other details in the current edition of the Pima Association of Governments Standard Specifications for Public Improvements Volume 1 and Standard Specifications for Public Improvements Details Volume 2 shall apply.

3. *Specific Criteria:*

a) New or Replacement Pole Height

A new or replacement pole may be installed without zoning review if one of the two height requirements is met:

- 1) Up to a ten (10) foot increase, not to exceed fifty (50) feet total (whichever is less), per A.R.S. §9-592(I); or
- 2) Up to forty (40) feet above ground level, per A.R.S. §9-592(J).

b) Overall Height of Replacement Pole

The height of the replacement pole is measured from grade to the top of the antenna canister or the top of the panel antennas if the antennas are the highest elements.

c) Increase in Outside Diameter (OD) of Pole:

- 1) If the replacement pole is a taper design, the diameter of the base section of the replacement pole OD shall not exceed thirteen and one-half (13.5) inches or a 100% increase in the OD of the base section, whichever is less.
- 2) If the replacement pole is non-tapered, then the diameter of the base section shall be equal to the top section and the OD shall not exceed twelve (12) inches or a 100% increase, whichever is less.

d) Signal Head Mast Arms

- 1) The traffic signal head mast arms shall be the same length as the original signal head mast arm unless the City requires the mast arm to be different (longer or shorter) based upon the location of the replacement pole.

- 2) All signal head mast arms shall match the arc (if applicable) and style of the original signal head mast arm.

e) Luminaire Mast Arms

- 1) All luminaire mast arms shall be the same length as the original luminaire arm unless the City requires the mast arm to be different (longer or shorter) based upon the location of the replacement pole.
- 2) All luminaire mast arms shall match the arc (if applicable) and style of the original luminaire arm.

f) Signal Heads

- 1) All existing signal heads and mounts shall be replaced, at no cost to City, with new light-emitting diode (LED) signal heads, defined in the current edition of the Pima Association of Governments Standard Specifications for Public Improvements Volume 1 and Standard Specifications for Public Improvements Details Volume 2
- 2) All signal heads shall be procured from a City approved signal heads supplier or manufacturer.
- 3) Signals mounted on mast arms shall be metal.

g) Light Fixtures

- 1) All replacement poles shall have a new light-emitting diode (LED) light fixture of the same manufacturer, model, and light output of the removed fixture.
- 2) All replacement light fixture shall be equipped with a new 7-pin photocell receptacle and ROAM node specified by the City.

h) Other City Elements on Signal Mast Arm or Pole

All existing emergency vehicle detection units, video detection cameras, video cameras, cross walk service buttons, cross walk signals, and any other pedestrian or traffic devices shall be replaced with new units by wireless provider and installed at no cost to the City. All equipment shall be the same model and manufacturer of the existing equipment. If identical equipment is not available, the City shall specify an acceptable alternate model, design, or manufacturer. All equipment shall be procured from a list of City approved suppliers.

i) Signs and Other Misc.

All street name plates or signs, directional signs and any other City approved signs shall be replaced with new signs at no cost to the City. All signs and attachments shall be of the same type as existing devices and shall be procured from a list of City approved suppliers.

j) Traffic Signal Pole Foundation

1) All pole foundations shall conform to the City's standards and specifications on traffic signal pole design and shall be modified for wireless communications equipment, hand holes and cables.

a) Foundations shall be engineered to support the pole, mast arms, signal heads, luminaire, and all other equipment and hardware necessary to operate the traffic signal, and the largest antenna and associated ancillary equipment that may be mounted on the pole.

2) The wireless provider shall install a three (3) inch diameter (OD) conduit through the pole foundation for the City's cables and wires for the signal heads, luminaire and devices on the signal mast arm and luminaire mast arm. The City's conduit shall be trimmed to three (3) inches above the top of the pole foundation.

3) In addition to the conduit for the City's use into the pole, the wireless provider shall install a separate appropriately-sized conduit for the SWF cables and conductors. This conduit shall not exceed 30% of the inner diameter of the traffic signal pole. This conduit shall run unbroken from the pole foundation to the point at which the SWF cables exit the traffic signal pole. Traffic signal and SWF circuits shall not co-mingle within the traffic signal pole, conduits, or pull boxes.

4) Pole Foundation – Height above Ground Level

a) If the pole foundation is in a landscaped or unimproved area, the height of the caisson shall match finished grade. However, if the pole foundation is adjacent to or within a sidewalk or ramp, the height of the pole cap shall be flush with the surface of the immediate area.

b) Shrouds for the traffic signal pole mounting bolts may be required for the replacement pole.

k) Painting of Pole, Antennas and Mounting Equipment

- 1) Specifications on paint color and painting process shall be provided by the City of Tucson when required.
 - 2) For powder-coated traffic signal poles, the wireless provider shall replace with same powder-coated color and/or color combination.
- l) Construction of Traffic Signal
- 1) The installation work of the replacement traffic signal pole, including mast arms, signal heads and devices, must be performed by a AZ licensed Traffic Signal Contractor with a minimum of five (5) years of experience installing traffic signals that is familiar with City of Tucson Streets and Traffic Maintenance (Electric Shop) standards .
 - 2) Not less than one International Municipal Signal Association certified Traffic Signal Technician Level II (Field or Construction) worker shall be on site while any traffic signal work is taking place.

City of Tucson
Standard Design Requirements
Small Wireless Facility on New Poles in ROW

The following design standards, in addition to the *Common Standards Design Concepts, Requirements and Details* that are included in this document, shall apply to a Small Wireless Facility (SWF) that a wireless provider may install in the ROW that is not either:

- 1) a replacement pole for an existing streetlight, or
- 2) a replacement pole for an existing traffic signal.

A new wireless support structure, including a monopole that is up to forty (40) inches in outside diameter (OD), shall incorporate the highest level of stealth and concealment of the antennas and wireless equipment in order to minimize the visual impact of the site to the public.

A. Pole Criteria:

1. *Purpose of Wireless Support Structure:* The sole purpose of a new vertical element or wireless support structure is to attach antennas for the provision of wireless services by a wireless provider in the City's right-of-way.
2. *General Requirement:*

- a) A new wireless support structure shall be designed to minimize the visual and aesthetic impact of the new vertical element and associated equipment upon the look, feel, theme, and use of the surrounding area.
- b) An SWF shall be designed to blend in with the surrounding streetscape with minimal, if any, visual impact.
- c) The new wireless support structure shall be architecturally integrated and compatible with the use of the surrounding area.
- d) The height of the new wireless support structure cannot exceed the maximum allowed height of the zoning district that the site is proposed.
- e) All plans shall be signed and sealed by a Professional Civil Engineer.

3. *Specific Criteria:*

a) New Pole Height

A new wireless support structure may be installed without zoning review if one of the two height requirements are met, see A.R.S. §9-592(I) and A.R.S. §9-592(J):

- 1) Up to a ten (10) foot increase, not to exceed fifty (50) feet total (whichever is less), per A.R.S. §9-592(I); or
- 2) Up to forty (40) feet above ground level, per A.R.S. §9-592(J).

b) Overall Height of New Pole

The height of the new wireless support structure is measured from grade to top of the antenna canister, or the top of the panel antenna if the antennas are the highest elements of the site. Otherwise, the measured height shall be from existing grade to the highest point of the wireless support structure.

c) Outside Diameter of Monopole

The maximum outside diameter of a monopole, as defined in A.R.S. §9-591(13), shall not exceed forty (40) inches.

d) Stealth and Concealment Elements

As part of the stealth and concealment elements of the wireless support structure, the City may require the wireless provider to provide and install street name plates, directional signs, and other decorative signs or artistic elements on the structure.

- 1) The wireless provider is solely responsible for the cost of all stealth and concealment elements and the installation of other elements required by the City.
 - 2) The wireless provider is responsible for the performance of and any costs incurred for regular upkeep, maintenance and replacement (if necessary) of these stealth and concealment elements.
- e) Architectural Integration with Surrounding Area
- 1) The new wireless support structure shall be designed in consultation with various internal City stakeholders and may include external stakeholders.
 - 2) No new wireless support structure shall be constructed without the consent and simple majority approval of the key stakeholders.
 - 3) The City may require the new wireless support structure to be constructed of a specific material that will enhance the stealth and concealment of the site.
- f) Pole Foundation
- 1) The pole foundation for the wireless support structure, if required, shall conform to civil and structural engineering standards acceptable to the City, with design modifications for wireless communications equipment and cables.
 - 2) The height of the pole foundation shall be flush with the finished grade. However, if the pole foundation is adjacent to or within a sidewalk or ramp, the height of the pole cap shall be flush with the surface of the immediate area.
 - 3) Shrouds for the pole mounting bolts may be required.
- g) Painting of Wireless Support Structure, Antennas and Mounting Equipment
- 1) The City shall identify the paint colors, location of paint and any decorative work that may be painted onto the new wireless support structure.
 - 2) The City shall identify the paint colors for the antennas, antenna mounting brackets and posts, antenna shrouds, and cables.
 - 3) The City may require the new wireless support structure to be painted using a powder-coat process.

h) Ground Mounted Equipment

The City may require the ground-mounted wireless equipment to be screened or concealed to reduce the visual impact to the surrounding area. The screening or concealment shall take into account the location of the site, the use of the immediate area, and the existing aesthetic elements surrounding the site.

City of Tucson
Standard Design Requirements
Common Standard Design Concepts, Requirements and Details

The following standard design requirements shall be applied to all new small wireless facilities in the ROW, whether for a small wireless facility to be installed on an existing or replacement streetlight pole, an existing or replacement traffic signal pole, or on a new wireless support structure.

A. Pole Design & Installation

1. Replacement Pole Clearances – Underground Utilities All ground-mounted electrical equipment shall maintain minimum horizontal clearance from underground utilities.
 - Horizontal clearance from water lines shall be at least five (5) feet. Vertical clearance shall be at least one (1) foot.
 - Clearance from sanitary sewer lines shall be at least five (5) feet
 - Clearance from telecommunications shall be at least one (1) foot
 - Clearance from cable television lines shall be at least one (1) foot
 - Clearance from all other types of underground infrastructure shall be at least five (5) feet
- a) The City, in its sole discretion, may grant a variance, upon approval by the City Engineer, from these horizontal separation distances on a case-by-case basis. The approval of a variance is dependent factors specific to the site.
- b) In the case where there is an issue with horizontal separation from other underground utilities, the wireless provider may elect to work with the impacted utility to have lines, pipes or property moved so that minimum clearance is achieved. All relocation of City owned or a privately-owned utility shall be at the sole expense of the wireless provider.

2. Calculating the Base Height of an Existing Pole

The base height, from which the calculation of the “increase in pole height” is referenced for determining the overall pole height, shall be calculated as follows:

a) Streetlight Pole (*see Exhibit A1 and A2*)

- i. A streetlight with a separate luminaire mast arm mounted to the vertical pole shall use the top of the vertical pole as the base height.
- ii. A streetlight, with the luminaire mast arm integrated (e.g. telescopic style pole) into the top vertical section of the pole, shall use the point on the pole where the mast arm is connected plus twenty-four (24) inches as the base height.

b) Traffic Signal Pole (*see Exhibit B*)

- i. A traffic signal pole with a luminaire mast arm that is mounted above the signal head mast arm to the pole shall use the top of the vertical portion of the pole as the base height.

3. Replacement Pole Clearance – Original Streetlight Pole or Traffic Signal Pole

The minimum distance of the replacement pole from the original pole location shall be sixty (60) inches or more so that construction can occur safely. The City may change this minimum distance on a case-by-case basis.

4. Replacement Pole Clearances – Sidewalks

The new or replacement pole shall maintain twelve (12) inch minimum clearance distance from sidewalks. The City, in its sole discretion, may increase that minimum clearance on a case-by-case basis to ensure the safe use of the sidewalk and adjacent area.

5. Sight Distance Easements (SDE) and Sight Visibility Triangles (SVT) All new and replacement poles shall be installed in a location that does not impair or interfere with SDE or SVT safety requirements.

6. Cables, Wires and Jumpers

- a) All cables for the wireless equipment and antennas – except where such cables or wires attach to the ports in the antenna – shall be located inside a conduit, inside the caisson and pole. There shall not be any “dog house” or externally visible conduit or entry point of the cables.

- b) All electrical wires for the streetlight luminaire, traffic signal heads, and any City device on the pole shall be new and connected to the existing power source.

7. Hand-holes

- a) All hand-hole locations shall be called out on the plans.
- b) All hand-holes near antennas shall have the top of the hand-hole no lower than the bottom height of the antennas
- c) The bottom of the hand-hole should not exceed six (6) inches below the bottom of the antenna.

8. Wireless Facility Identification Information

- a) A four (4) inch by six (6) inch Radio Frequency Safety Sticker may be mounted no less than twenty-four (24) inches from the bottom of the antenna, facing away from traffic.
- b) The wireless provider may place a discreet site identification or number. The size, color and location of this identifier shall be determined by the City.
- c) No wireless provider signs may be placed on a streetlight pole including a replacement pole except to the extent required by local, state or federal law or regulations.

9. Interference with City Wireless Network

The City has certain wireless devices in a network that connects traffic signals, community centers, water sites, and other locations for the City's proprietary use. The selection of a location for a wireless site shall consider the potential interference of the City's wireless network with RF from a wireless provider's proposed site.

- a) The City, in its sole discretion, after researching the proposed site, radio frequencies, line of sight to other wireless locations in the City's network, and other technical factors may allow a wireless provider to install a site in the ROW.

B. Removal of Original Pole, Equipment and Pole Foundation

1. Removal of Original Signal Pole, Mast Arm, Signal Heads and Luminaire

- a) The City shall determine what original components, (e.g., original pole, mast arm(s), signal heads and luminaire, etc.), shall be delivered at no cost to the City's Streets and Traffic Maintenance Facility by the wireless provider.
 - b) If the City declines to accept some or all of the original components, then only those components the City wants to retain shall be delivered by the wireless company to the City Streets and Traffic Maintenance Facility and the remaining components shall be discarded by the wireless provider.
2. Removal of Original Streetlight or Traffic Signal Pole Foundation The concrete pole foundation for the original streetlight or traffic signal pole shall be completely removed by the wireless provider as instructed by the City:

a) Complete Removal

The entire original pole foundation shall be removed, and all materials (concrete, rebar, metals, bolts, etc.) shall be removed by the SWF provider at no expense to the City. The City's Inspector shall determine, on a case-by-case basis, the type of backfill material and compaction required – ranging from native soil that is compacted to a half (1/2) sack slurry for the entire depth, or a combination of native soil and slurry.

C. Antennas, RRH/RRU, Cables and Mounting on Pole:

1. *General Requirement:* All antennas shall be installed in a manner that minimizes the visual impact to the general public. All work shall be performed in a professional manner that is consistent with the highest standards of workmanship.
2. *Specific Criteria:*
 - a) Antenna Mounting Posts and Brackets
 - 1) All panel antennas shall be mounted directly to the pole or onto a mounting pole so that the distance from the "face" of the streetlight pole to the back of the antenna does not exceed nine (9) inches.
 - 2) All mounting posts shall be trimmed so that the poles do not extend higher than the top of the antenna or protrude lower than the antenna unless necessary to install the shroud.
 - 3) All pole attached wireless equipment must be a minimum ten (10) feet from the sidewalk elevation.

b) Panel Antennas

- 1) All panel antennas for a small cell site shall fit within an imaginary enclosure of not more than six (6) cubic feet in volume in accordance with A.R.S. §9-591(19)(a).
(NOTE: This volume does not include antenna cable shrouds when required.)
- 2) All panel antennas with exposed cables from the bottom of the antenna shall have a shroud installed on the antenna or antenna mounting posts to conceal the cables.
(see Exhibits C1 and C2)
 - a. The type of shroud may be a forty-five (45) degree angle (away from the bottom of the antenna; toward the pole) or a ninety (90) degree angle (parallel to the bottom of the antenna) depending on the location of the site.
 - b. The shroud shall extend from the bottom of the antenna to two (2) inches below the bottom of the nearest hand-hole.

c) Canister Antennas

- 1) All canister antennas shall fit within an imaginary enclosure of not more than six (6) cubic feet in volume. (Note: This volume does not include the canister as it is a stealth device and not the antenna.)
- 2) The canister shall be no larger than eighteen (18) inches in diameter.
- 3) All canister antennas shall be located in a canister that is mounted to a base plate at the top of the vertical section of the replacement pole.
- 4) All cables protruding from the canister shall be concealed within the canister or by a shroud at the point where the canister is mounted to the base plate.

d) Remote Radio Heads (RRH) / Remote Radio Units (RRU)

Under State Law §9-591(19)(a), the RRH/RRU is not considered part of the antenna. If allowed, the RRH/RRU shall be calculated as part of "All other wireless equipment associated with this facility..." in A.R.S. §9-591(19)(b) that is subject to the twenty-eight (28) cubic feet maximum size for small cell sites.

- 1) On a case-by-case basis, the City in its sole discretion and – upon reviewing the landscape in the immediate surrounding area, the location of

the pole, and stealth options, may allow a site to have an RRH/RRU installed on the pole.

D. Ground-mounted Equipment:

1. *General requirement:* All ground-mounted equipment shall be installed in a manner that minimizes the visual and ingress/egress impact to the general public. Under no conditions shall ground mounted equipment violate the Americans with Disabilities Act (ADA); nor shall ground mounted equipment cause a violation of the ADA that would not otherwise have existed but for the installation of said equipment. All work shall be performed in a professional manner that is consistent with the highest standards of workmanship.

2. *Specific criteria:*

a) Sight Distance Easements (SDE) and Sight Visibility Triangles (SVT):

All ground-based wireless equipment shall be installed in a location that does not impair or interfere with SDE or SVT safety requirements. To ensure proper sight distance, City of Tucson Development Standards No. 3-01-0 shall apply. The City, in its sole discretion, may grant a variance upon approval from the City Traffic Engineer, however, under no circumstances shall any sight triangle be permitted that is less than that specified in the current edition of the AASHTO Policy on Geometric Design of Highways and Streets.

b) Ground Equipment Location – Generally

All ground-based wireless equipment, including but not limited to equipment cabinets or power pedestals, shall be placed as far as practical to the back of the ROW while maintaining at least three (3) feet of ingress/egress in the ROW or public utility easement (PUE) around the equipment.

c) Ground Equipment Clearances—Underground Utilities

1) All ground-mounted electrical equipment shall maintain minimum horizontal clearance from below-ground utilities:

a) Pole Foundation Clearance requirements for Water Mains

- a) For Tucson Water (TW) distribution mains (12" diameter or smaller) the horizontal separation shall be a minimum of five (5) feet from the outside wall of the water main to the outside of the pole foundation. For TW transmission mains (>12" diameter) the

horizontal separation shall be a minimum of ten (10) feet from outside wall of water main to outside of pole foundation.

- b) Potholing is suggested for best accuracy for locating existing TW facilities.
- c) TW maps and record drawings are available by contacting TW Mapping Section at 520-791-2658 or TWMapInfo@tucsonaz.gov. In your request, provide township, range, section and quarter section.
- d) Show all TW facilities within the project limits on the project plans. Label existing water mains size, material, and as-built plan number.
- e) If any project-related work is to be completed within ten (10) feet horizontally or will be crossing an existing 16" or larger diameter water main, plans must be submitted to TW Distribution Design for review and comment, prior to submitting an application.
- f) The minimum vertical separation at a crossing between existing water mains and new utility lines (conduits, electric, Fiber optic, etc.) shall be twelve (12) inches.
- g) Water Modifications plans shall be required and prepared by the design engineer if it is determined that there is a conflict with existing TW facilities and proposed small cell company improvements. Cost for relocation of existing water facilities shall be the responsibility of the small cell company.
- h) Review and approval of Water Modifications plans shall be at the sole discretion of TW and the City. Please see TW website for additional information: <https://www.tucsonaz.gov/water/contractors-developers-and-engineers>

b) Clearance from sewer lines shall be at least five (5) feet

c) Clearance from telecommunications shall be at least one (1) foot

d) Clearance from cable television lines shall be at least one (1) foot

e) Clearance from all other types of underground infrastructure shall be at least five (5) feet

2) The City, in its sole discretion, may grant a variance upon approval from the City Engineer, from these horizontal separation distances on a case-by-case basis. The approval of a variance is dependent on factors specific to the site.

3) In the case where there is an issue with horizontal separation from other underground utilities, the wireless provider may elect to work with the impacted utility to have its lines, pipes or property moved so that minimum

clearance is achieved. All relocation work of City-owned or a privately-owned utility shall be at the sole expense of the wireless provider.

d) Ground Equipment Clearance – Sidewalks

The ground equipment shall maintain a minimum twelve (12) inch clearance distance from sidewalks. The City, in its sole discretion, may increase the minimum clearance on a case-by-case basis to ensure the safe use of the sidewalk and adjacent area.

e) Compliance with Height Requirements

Evidence or documentation that, where the above-ground structure is over thirty-six (36) inches in height, given its proposed location, the structure will comply or be in compliance with applicable City of Tucson planning and zoning ordinances. The Zoning ordinance can be found at <https://www.tucsonaz.gov/pdsd/all-codes-plans-determinations>

f) Screening of Ground Equipment

The City, in its sole discretion, may require the ground-mounted equipment to be screened; the type of screening materials and design will be addressed on a case-by-case basis.

- 1) In cases when screening is not required, the City may specify the paint color of the ground-mounted equipment.

g) Decals and Labels

- 1) All equipment manufacturers' decals, logos and other identification information shall be removed unless required for warranty purposes.
- 2) The wireless provider of the site may place an "Emergency Contact" decal or emblem on the ground equipment.
- 3) The ground-mounted equipment shall not have any flashing lights, sirens or regular noise other than a cooling fan that may run intermittently.

h) Equipment Cabinets on Residential Property

1) Residential Single-Family Lot

The Wireless Equipment and Ancillary Equipment listed in A.R.S. §9-591(19)(b) shall not exceed thirty-six (36) inches in height in the front yard of a residential single-family zoned property.

2) Air-conditioning Units

Unless otherwise specified by the City, a wireless equipment cabinet with air-conditioning (not a fan only) shall be enclosed by walls and setback a minimum of fifteen (15) feet from lots where the existing or planned primary use is a residential single-family dwelling.

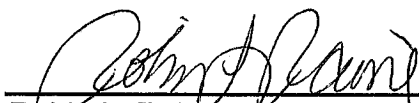
i) Electric Company Meter

- 1) All electric company meters shall be installed in the ROW or PUE. The location of the meter equipment shall have minimum ingress and egress clearance from private property lines and driveways.
- 2) All electric company meters shall maintain minimum clearance from above-ground utility cabinets and below-ground utilities.
- 3) All electric company meters shall be installed in a location that does not impair or interfere with the SDE or SVT safety requirements of the City.
- 4) The electric company meters shall be screened or contained within a "Myers-type" or "Milbank-type" pedestal cabinet that is painted to match the ground equipment or as specified by the City. (see *Exhibit D*)
- 5) In the case where screening is not required, the City may specify the paint color of the electric company meter cabinet on a case-by-case basis.

City of Tucson Contacts

For questions regarding the 2018 City of Tucson Design Standards, Concepts & Requirements for Wireless Facilities in the Right-of-Way, contact:

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