



KANSAS CITY, KANSAS
SMALL CELL INFRASTRUCTURE
DESIGN GUIDELINES

1

BACKGROUND AND PURPOSE

1.1 INTRODUCTION

Pursuant to Kansas Statute 66-2019, effective October 1, 2016, wireless service providers and wireless infrastructure providers are permitted to locate small wireless facilities in the public right-of-way. This network of low-powered micro antennas provides cellular and data coverage to supplement the provider's macro-cellular network. New small cell installations will improve the providers' ability to meet current and future consumer cellular and data needs.

These design standards provide design and aesthetic requirements and specifications that all small wireless facilities installed within the ROW must meet prior to installation within City boundaries. Small cells installed within the ROW are bound to these design standards.

Providers shall consider the aesthetics of the existing street lights and other City infrastructure near proposed small cell locations, with special attention given to the details of neighborhoods with unique street light assemblies. Unique assemblies may include mast arms, decorative pole bases, architectural luminaires, mounting heights, pole colors, etc.

THERE ARE SEVERAL DIFFERENT SMALL CELL INSTALLATIONS ARE PERMITTED WITHIN KANSAS CITY AND WYANDOTTE COUNTY:

- Attachments to streetlights on new small cell poles with luminaires (Type A pole)
- New freestanding installations, i.e. monopoles (Type B poles)

1.2 DEFINITIONS

- **City, Kansas City, or UG** means the Unified Government of Wyandotte County/Kansas City, Kansas.
- **Design Standards** or **Standards** means these design standards adopted by the UG.
- **FCC** means the Federal Communications Commission of the United States.
- **Monopole** means a new freestanding pole installation for the primary purpose of supporting a small cell. May also be used for lighting or signage as required by the City. Defined as "Type B Small Cell Pole" by the UG/BPU Standards Diagrams.
- **Pole with luminaire arm** means a new or pre-existing pole with an extended arm with a luminaire installed for the primary purpose of providing illumination to a public space or ROW, and a secondary purpose of supporting a small cell. Defined as "Type A Small Cell Pole" by the UG/BPU Standards Diagram.
- **Provider** means a wireless service provider or wireless infrastructure provider.
- **Small cell** means the wireless facilities and equipment as defined in Code of Ordinances Section 27-593(a)(31)(c), or its successor.
- **ROW** means the public way as defined in Code of Ordinances Section 27-245.
- **BPU** means Kansas City Board of Public Utilities or its successor.
- **RF** means radio frequency.
- **Utility Pole** means, for purposes of these design standards, a utility pole owned by a third-party utility company, such as BPU.

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GENERAL STANDARDS TABLE

2.1 SMALL CELL EQUIPMENT

AESTHETICS	Equipment should match the aesthetics of the area and surrounding poles.
INTERNAL INSTALLS	Equipment shall be installed within an existing pole when technologically feasible. Any equipment installed within a pole may not protrude from the pole except to the extent reasonably necessary to connect to power or a related wireline.
EXTERNAL SHROUDING	The antenna shall be contained in a cantenna and any other equipment shall be contained in an equipment cabinet, unless the visual impact can otherwise be reduced by its location on the pole.
ELECTRICAL SERVICE	Requirements per BPU.
WIDTH	May not exceed in width the diameter of the pole by more than 6 inches in total diameter and no more than 3 inches on either side.
SIDEARM (OFF-SET) INSTALLS	If permitted, may not allow the furthest point of the enclosure to extend more than 18 inches from the pole.
CONDUITS	All cables are required to be installed inside the pole.
HARDWARE ATTACHMENTS	All hardware attachments should be hidden. Welding onto existing equipment is not permitted.
COLOR	All equipment should be painted to match pole aesthetics. Paint should be powder coated over zinc paint.
EQUIPMENT CABINET ACCESS DOORS	Lockable access door sized to install, maintain, and remove all small cell equipment as needed shall meet provider's requirements. Utility access shall be per BPU requirements.
CABLES	All cables should be clearly labeled for future identification.
CANTENNAS	Cantenna must be mounted directly on top of the pole, unless a side arm installation is required by a pole owner. A tapered transition between the upper pole and cantenna is required.
EQUIPMENT CABINET	Cantenna should be maximum of 14-inch diameter, and no more than 3 cubic feet, unless granted an exemption by the UG

STICKERS	Any on-pole cabinet and ground mounted utility box should be labeled a (1) RF warning sticker, background to match pole color, no larger than 4 x 6 inches, and facing to the street near the elevation of the antennae, (2) 4-inch by 6-inch (maximum) plate with the provider's name, location identifying information, and 24-hour emergency telephone number, and (3) No advertising, logos, or decals.
LIGHTS	There shall be lights on the equipment unless prohibited by state or federal law.
GROUND MOUNTED EQUIPMENT BOX	Must meet and follow existing UG ordinances for ground mounted utility boxes and be attached to a concrete foundation. All equipment, if on the pole or on the ground, must be concealed in a box or boxes with a total area no greater than 17 cubic feet, unless provided an exemption. Regardless, no total equipment box or boxes area shall exceed 28 cubic feet.
HEIGHT OF EQUIPMENT ON POLE	The lowest point of the equipment may not be lower than 10 feet from the grade directly below the equipment enclosure.
POWER METER	As required by BPU and in a location that (1) minimizes its interference with other users of the City's right-of-way including, but not limited to, pedestrians, motorists, and other entities with equipment in the right-of-way, and (2) minimizes its aesthetic impact.

2.2 NEW AND REPLACEMENT METAL POLES

POLE STYLE	Pole should be round and match aesthetics of surrounding street lights and the neighborhood. Pole extension on traffic signal pole should match the rest of the pole.
POLE CONNECTION	Attachments to the side of a pole must be placed perpendicular to the street away from the vehicular traffic.
COLOR	<p>A pole and pole extension shall be galvanized in accordance with AASHTOM 111, or in accordance with UG engineering standards, whichever is more restrictive.</p> <p>A pole and pole extension shall be painted to match existing street light aesthetics. Paint shall be powder coated over zinc paint. If the pole is wooden, the equipment should be painted a light brown color.</p>
HEIGHT	Any pole with a collocated small cell shall not exceed 35 feet including the equipment, unless provided an exemption by the UG. Pole shall be measured from the top of the foundation to the top of the antenna.
DESIGN WIND VELOCITY	All structural components of small cell pole, standard, base, equipment cabinet, couplers, anchor bolts, luminaires, antenna, and other attachments to be used shall be designed for a minimum of 115 MPH wind velocity, in accordance with AASHTO's Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, TIA-222 rev G and ASC 710 with IBC 2012 (or latest standard), plus amendment for snow loading and other local conditions, or in accordance with UG engineering standards, whichever is restrictive. Any pole not meeting these requirements may not be used for a small cell attachment or must be replaced to fulfill these requirements.
CONDUITS	All cables shall be in conduits and shall be flush with the pole unless required to be installed inside the pole.
STICKERS	On each pole, a (1) RF warning sticker, background to match pole color, no larger than 4 x 6 inches. Facing to the street near the elevation of the antennae, (2) 4-inch by 6-inch (maximum) plate with the provider's name, location identifying information, and 24-hour emergency telephone number, and (3) No advertising, logos or decals.
TYPE A SMALL CELL POLE	Street light pole with luminaire. Refer to the UG/BPU standard small cell pole diagram for full design requirements and specifications
TYPE B SMALL CELL POLE	Monopole with or without luminaire arm (subject to UG requirements). Refer to the UG/BPU standard small cell pole diagram for full design requirements and specifications

2.3 GENERALLY APPLICABLE REQUIREMENTS

Any small cell that is collocated on a pole must comply with the following requirements:

- So as not to significantly create a new obstruction to property sight lines.
- At the intersection of property lines, or along secondary property street facing.
- With appropriate clearance from existing utilities.
- Preferably equidistant from adjacent poles.
- In a single-family neighborhood, noise limit to be 5dBA above ambient sound, not to exceed 30 dBA as measured at a property line. Other noise regulations may apply. If the facility does not generate noise, include this information in the submittal so information can be shared with neighborhood.
- Providers shall consider the aesthetics of existing street lights and street furniture in the neighborhood of the proposed small cell locations.
- These aesthetic considerations and accommodations are to be included in the application submittal.
- All equipment located within the public ROW shall be located such that it meets ADA requirements and does not obstruct, impede, or hinder usual pedestrian or vehicular travel or interferes with the operation and maintenance of signal lights, signage, street lights, street furniture, fire hydrants, or business district maintenance. Regardless, no poles or equipment shall be located on a public sidewalk.
- Minimize impact to the aesthetics of the excising poles.
- New poles should match aesthetics of adjacent poles.

ORDER OF LOCATION PREFERENCES:

- Attachment to metal street lights (Type A pole)*
- Installation of monopoles (Type B pole)*

PROHIBITED LOCATIONS:

- Attachments to utility poles
- Attachment to traffic signal poles
- Attachment to enhanced service area street lights
- Attachment to plain wood pole

*Refer to the UG/BPU Small Cell Pole Standards Drawings

SMALL CELL EQUIPMENT SHALL BE MOUNTED ON OR HIDDEN INSIDE THE POLE AS FOLLOWS:

- Antenna: Inside a round and tapered cantenna.
- Monopoles: all equipment inside monopole in base cabinet.
- Utility poles: All equipment located on poles if allowed by pole owner, and anything not on the pole to be located in a ground mounted utility box. Fiber in conduits flush with pole.
- Traffic signal poles: All equipment in ground mounted utility box. Fiber inside pole in a conduit. If conduit is not available, pole cannot be used).
- New/replacement metal streetlight poles: all equipment inside pole in round base cabinet.
- Decorative street lights: replace with equipment inside pole. Reusable deviations from these standards shall be approved by the UG prior to installation.
- Enhanced service area street lights: Replace existing street light with matching street light and all equipment inside pole.
- Deviations from this guide may be approved if reasonable on a case-by-case basis by the UG prior to installation.
- The specifications provided in this chapter are for single carrier with single technology installations within the ROW only. Dual carrier, dual technology installations, or small cell locations not in the public ROW may vary from these guidelines with UG approval.
- Placed so as not to interfere with normal operation and maintenance of street light or other street appurtenances.
- Radiation certified to be at safe levels by A non-ionizing radiation electromagnetic radiation report (NIER) shall be submitted to the pole owner and retained on file for equipment type and model.
- The NIER report shall be endorsed by qualified professional, licensed or certified in the State of Kansas. It shall specify minimum approach distances to the general public as well as electrical and communication workers that are not trained for working in an RF environment (uncontrolled) when accessing the pole by climbing or by bucket.
- City workers and contractors to have ability to easily shut off radio signals and power while working on pole. (And we have the right to turn off or disconnect for necessary operations).
- Attachments to a pole or any new or replacement pole should have a smooth transition between the small cell and the pole and (except for the top of a cantenna) shall not have any flat surface of more than 1.5 inches to prevent creation of a ledge.
- New small cell facility must be encased in a separate conduit than any UG electronics.

POWER AND GROUND MOUNTED UTILITY BOXES

- Back up batteries must be in a ground mounted utility box, or underground where possible.
- The UG encourages all utility equipment that could be placed in a ground-mounted utility box to be buried underground.
- A separate meter and disconnect is required for both the power and the cell signal that can be accessed and operated by street lighting maintenance personnel.
- Must have metered power.

STANDARDS FOR SMALL CELL FACILITIES WITHIN A LOCAL HISTORIC DISTRICT OR ADJACENT TO A LOCAL LANDMARK SITE.

In order to maintain the character of a historic district or conservation district, each as contemplated in the Unified Government Code of Ordinances Chapter 27, Article IV of this code, all wireless facilities and new structures in a historic district or a character conservation district must employ screening, concealment, camouflage, or other stealth techniques to minimize visual impacts. The placement of small wireless facilities on existing structures or new poles shall be subject to the following:

- Installation of small cell facilities within a local historic district or adjacent to a local landmark site shall require a Certificate of Appropriateness subject to the procedures and standards found in the UG Ordinances, Section 27-149. Such an installation may be considered for an administrative approval as a minor alteration.
- New and replacement structures must be of a metal monopole design. Lattice structures and wooden structures will not be permitted.
- Small cell facilities will only be installed on new or replacement poles in the rear easement of any historical building and of all buildings in a historical district.
- The design of wireless facilities and related new structures must be integrated with existing buildings, structures and landscaping, including considerations of height, color, style, placement, design and shape.

Also see Technical Specifications in Chapter 6.

3

ATTACHMENTS TO STREET LIGHTS



3.1 PURPOSE

This chapter governs small cell attachments to a street light. Two types of small cell installations are permitted on street lights, including:

- New installation of metal street light poles (Type A pole).
- New metal pole so that small cell equipment can be attached (Type B pole).

3.2 STANDARDS

All provider equipment shall be housed internal to the equipment cabinet or hidden by the cantenna. No provider equipment shall be left exposed the outside of the pole.

On an existing pole, the equipment excluding the antenna shall be shrouded in an equipment cabinet if on the pole, hidden within the cantenna, or contained in a ground mounted utility box.

On a new street light, the provider may house the equipment inside the pole structure in an equipment cabinet as shown in the UG/BPU standard drawings.

A base equipment shall be round with a preferred diameter of a base cabinet 16-inch with a maximum 20-inch diameter.

The meter shall be contained in a ground mounted utility box, unless permitted to be inside an equipment cabinet as approved by BPU.

New street lights or replacement street lights shall comply with the all relevant county ordinances and applicable master plans that provide guidance on luminaire design aesthetics, lighting level criteria, typical street light spacing, and street light details.

- All equipment height shall be above the ground at least 10 feet. If the small cell equipment orients toward the street, then the attachment shall be installed no less than 16 feet above the ground.
- Equipment should be oriented away from the street.
- The size of small cells should be minimized as possible to minimize visual impact without interfering with the small cell operation.
- Equipment may not block visibility of street light banners.
- Attachments to an enhanced service area light pole cannot change overall character of light or proportion of the luminaires with the placement of a cantenna. The lighting level of service cannot be decreased.
- All new luminaires shall be the same height as adjacent street lights.
- City may require a new street light in lieu of a monopole.

An example of an unacceptable small cell installation, and acceptable installation can be found in **Figures 3-1** and **4-2**.

Figure 3-1: Unacceptable



Conduit, mounting bracket, and other hardware must be hidden from view.

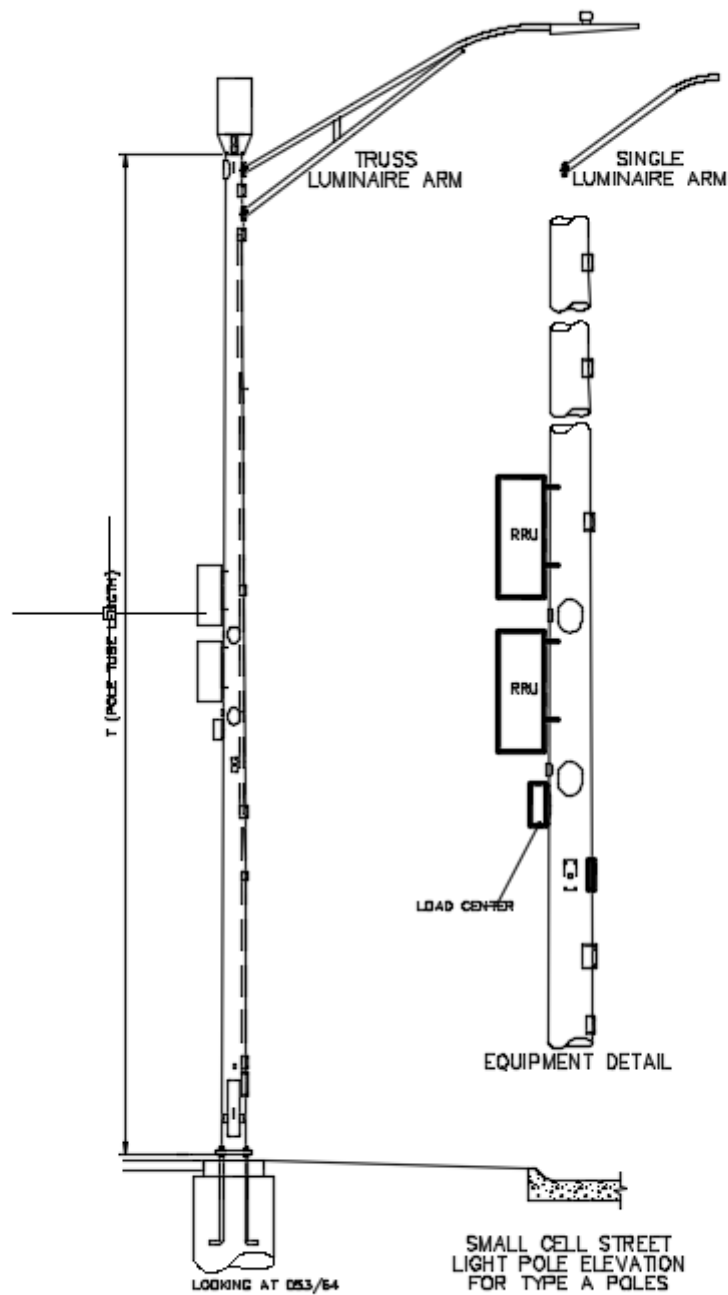
Cantenna must include a smooth transition between upper pole and cantenna attachment.

Figure 3-2: Acceptable



Upper pole shall be smooth and straight, with 1.5- inch (max.) of flat surface where mounted to the equipment cabinet.

Figure 3-3: Type “A” Small Cell Pole: Pole with Luminaire Arm and Cantenna and Equipment Shroud



4

INSTALLATION OF MONOPOLES



4.1 PURPOSE

This chapter of the Standards is to be used when installing a freestanding small cell installation, referred to as a monopole.

4.2 STANDARDS

All small cell carrier equipment excluding the antenna shall be housed internal to an equipment cabinet or hidden behind the cantenna, per UG/BPU standard drawings.

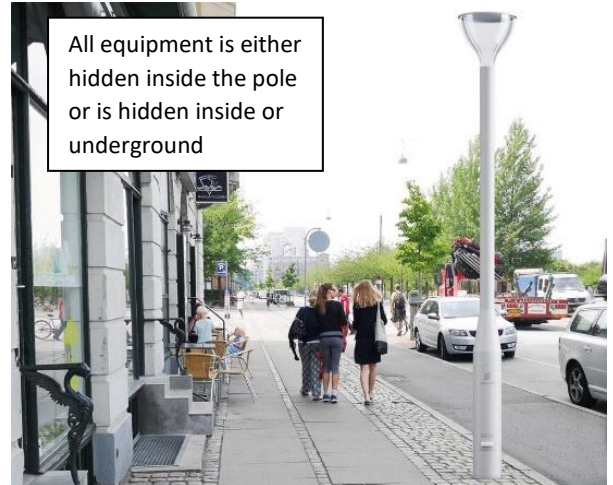
- Monopoles to coordinate with neighborhood pole style and material type.
- New monopoles must conform to UG/BPU technical standards drawings.
- Ownership of monopoles is to remain with the provider. The UG reserves the right to attach any sign (such as a no parking sign) or a banner on the monopole.
- Design structural capacity shall be reserved for future City installations, such as cameras or other items.
- All new poles must have appropriate clearance from existing utilities
- Shall not be placed within the sight of triangle of an intersection or with the sidewalk path of pedestrians, or on a pedestrian curb ramp.

Figure 4-1: Unacceptable Monopole Installation



Monopole has a large square base that takes up much of the narrow sidewalk

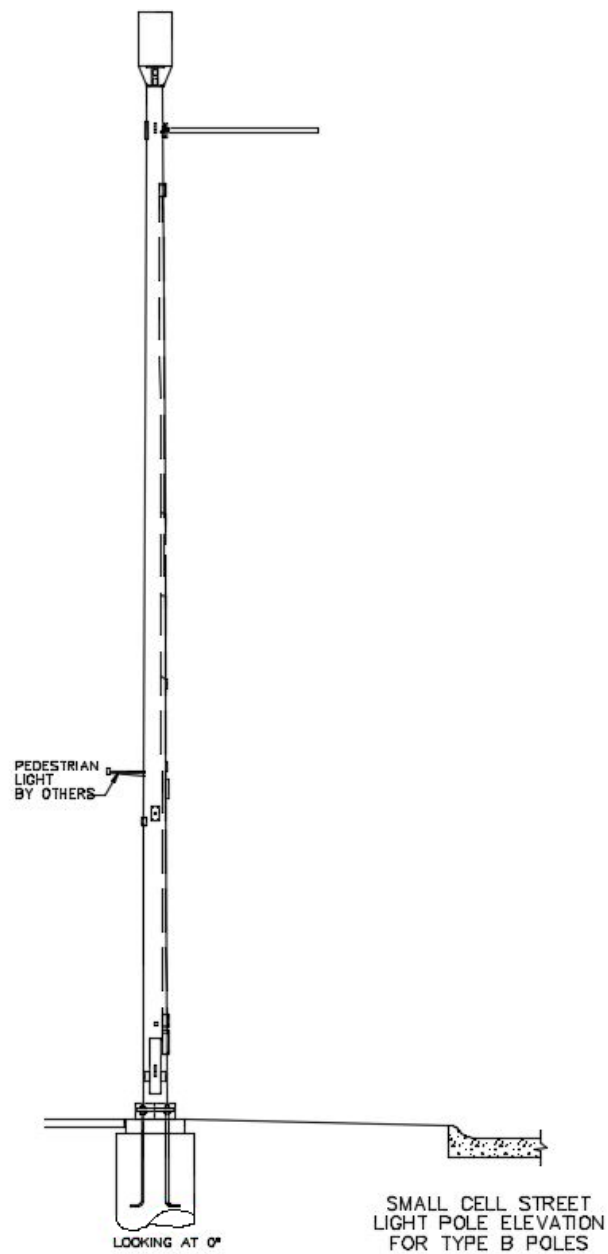
Figure 4-2: Acceptable Monopole Installation



All equipment is either hidden inside the pole or is hidden inside or underground

Freestanding small cell pole components include the foundation, equipment cabinet, upper pole, antenna, and all hardware and electrical equipment necessary for a complete assembly, as shown in **Figure 4-3**.

Figure 4-3: Type “B” Small Cell Pole: Monopole (with Luminaire Extension)



4.3 PLACEMENT REQUIREMENTS

All monopoles shall be publicly owned and must be permitted by UG engineering via the ROW Permit requirements as outlined in the Right of Way Permit to Work.

- Preferred location for new pole is generally on property line for the purpose of avoiding interference with building face, views, business signage, pedestrian flow, etc.
- In a manner that does not impede, obstruct, or hinder pedestrian or vehicular travel.
- So as not to be located along the frontage of a Historic building, deemed historic on a federal, state, or local level.
- So as not to significantly create a new obstruction to property sight lines.
- At the intersection of property lines, or along secondary property street facing.
- Within the street amenity zone whenever possible.
- In alignment with existing trees, utility poles, and street lights.
- Equal distance between trees and other poles when possible, with a minimum of 15 feet separation such that no proposed disturbance shall occur within the critical root zone of any tree.
- With the appropriate clearance of at least 10 feet from existing utilities.
- Outside of the 20-foot equipment clear zone (for base cabinets less than 18-inches in diameter) or the sight distance triangle (for base cabinets equal to or greater than 18-inches in diameter) at intersection corners as shown in Figure 6-6.
- 10 feet away from the triangle extension of an alley way flare.
- Shall not be located within 100 feet of the apron of a fire station or other adjacent emergency service facility.

STANDARDS FOR MONOPOLES RESIDENTIAL STREETS LESS THAN 60 FEET WIDE:

Residential zones: A wireless provider may not install a new utility pole in a publicway adjacent to a residential zone, if the curb-to-curb measurement of the street is 60 feet wide or less as depicted on the official plat records or other measurement provided with the application, unless the City has given prior written consent based on evidence provided that demonstrates:

- There is insufficient wireless service to meet the demand in the immediate vicinity, and
- There are no other feasible options to provide adequate service along the residential street, and
- The utility pole will be located between curb and sidewalk in park strip. If no park strip is available, a corner installation must be considered before any installation on a lawn, as permitted by the UG.

Figure 4-4 shows freestanding small cells which is preferred to be a minimum of 250 feet apart radially. This radius extends around corners and into alleys. They shall be located in line with trees, existing street lights, utility poles, and other furniture located in the amenity zone, as shown in **Figure 4-5**.

Figure 4-4: Freestanding Small Cell spacing radius

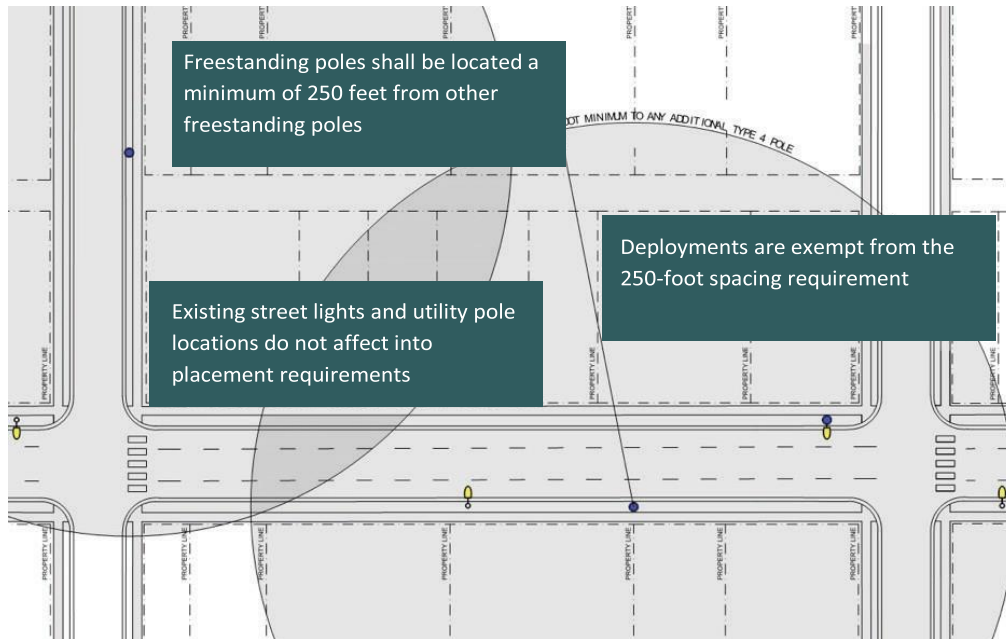
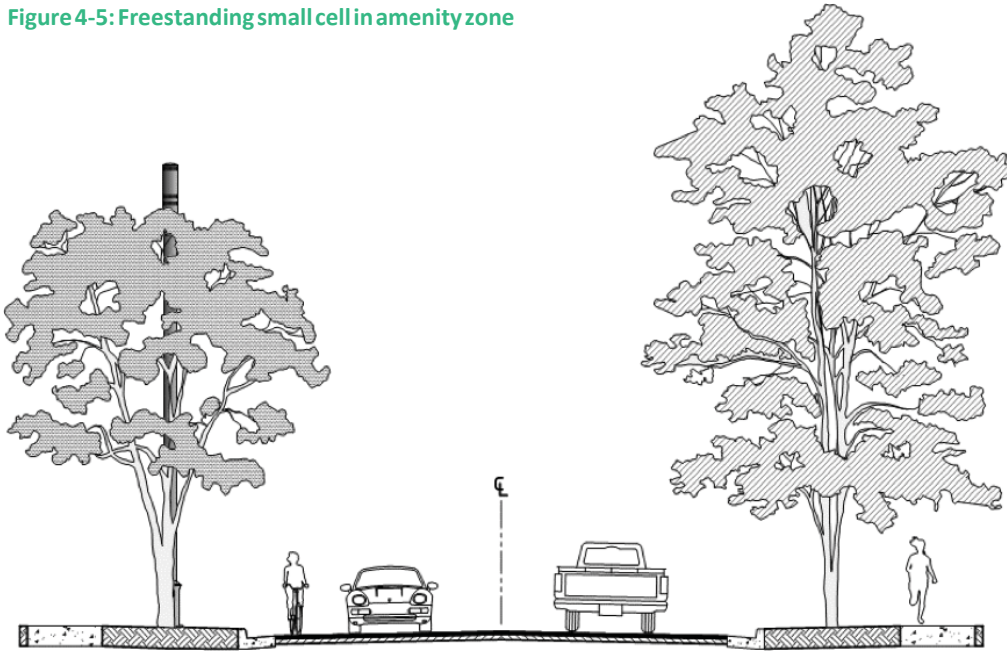


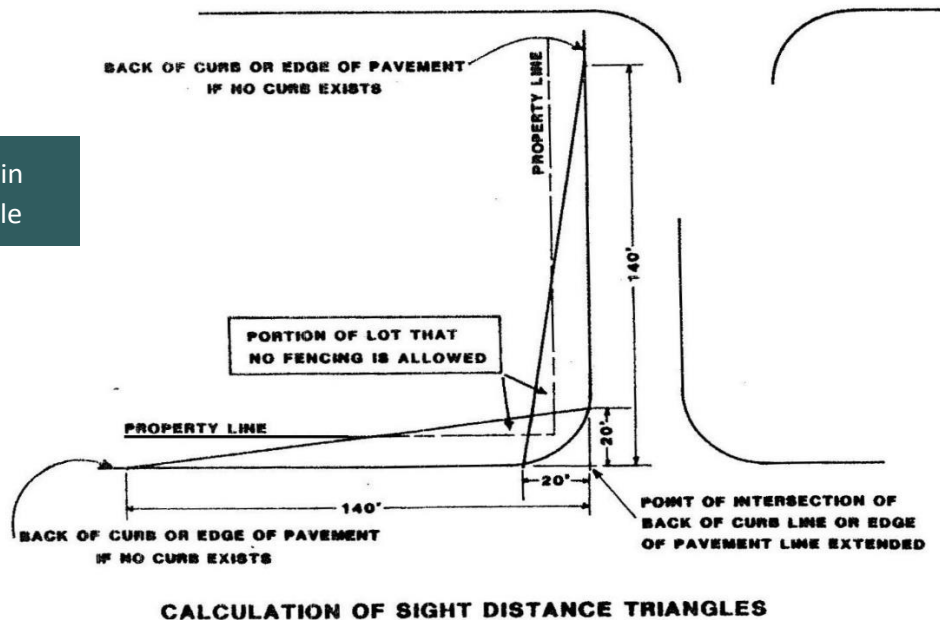
Figure 4-5: Freestanding small cell in amenity zone



Freestanding small cells shall be located such that they in no way impede, obstruct, or hinder the usual pedestrian or vehicular travel, affect public safety, obstruct the legal access to or use of the public ROW (including sidewalks), violate applicable law, violate or conflict with public ROW design standards, specifications, or design district requirements, violate the Federal Americans with Disabilities Act of 1990, or in any way create a risk to public health, safety, or welfare.

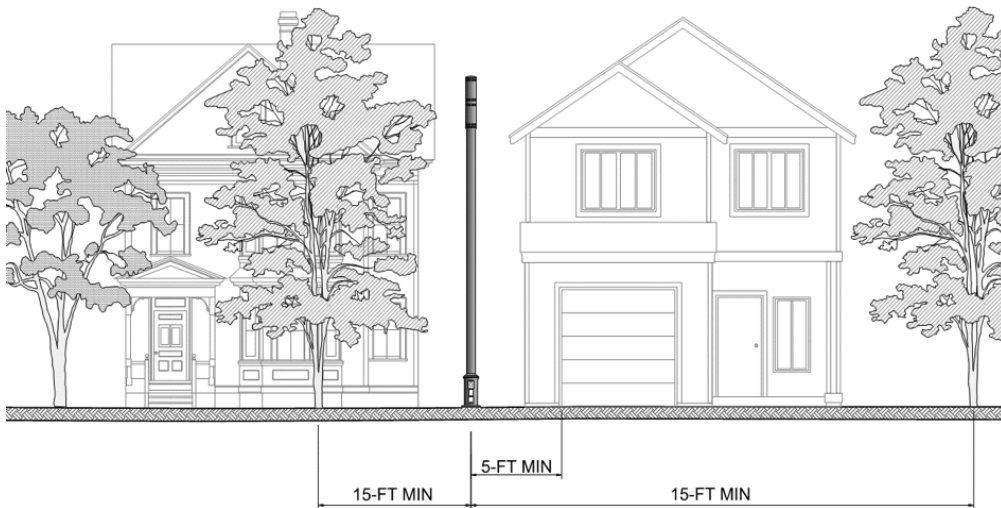
Free standing small cells shall be located within the ROW and off set from the sidewalk as shown in [Figure 4-6](#).

Do not locate small cell in intersection sight triangle



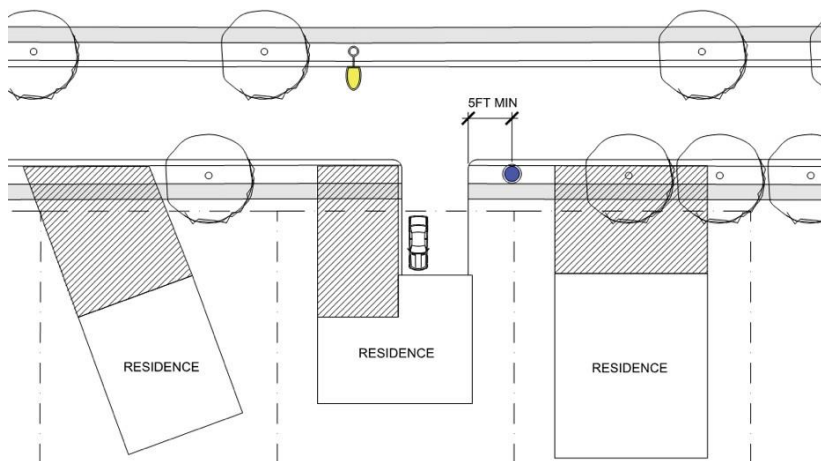
Freestanding small cells shall be located at intersecting property lines as much as possible. Whenever possible, the freestanding small cell shall be located on the secondary street. Small cells shall also be located a minimum of 15 feet away from trees to prevent disturbance within the critical root zone of any tree, as shown in **Figure 5-7**.

Figure 4-7: Freestanding small cell location between property and trees



The small cells shall not be installed between the perpendicular extension of the primary street-facing wall plane of any single or two-family residence as shown in **Figure 4-8**.

Figure 4-8: Freestanding Small Cell between property lines



Do not locate small cell in the perpendicular extension of the primary street-facing wall plane

Do not locate small cell in front of driveways, entrances, or walkways

When located adjacent to a commercial establishment, such as a shop or restaurant, care should be taken to locate the small cell such that it does not negatively impact the business. Small cells shall not be located in front of storefront windows, primary walkways, primary entrances or exits, or in such a way that it would impede a delivery to the building. Small cells should be located between properties as much as possible as shown in **Figure 4-9**.

Figure 4-9: Small Cell in Commercial Area

