Small Cell Infrastructure Design-Policy Guidelines

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1

Background and Purpose

The Purpose of this document is to establish guidelines for installing small cell equipment and poles in the City of Memphis right of way.

1 Background and Purpose

Numerous wireless providers and wireless infrastructure companies have been contacting the City of Memphis (COM) with requests to locate Small Cell facilities in the public rights-of-way (ROW). These low-powered antennas provide cellular and data coverage to supplement the provider's cellular network. New Small Cell towers will improve the provider's ability to meet current and future cellular needs.

These Small Cell Policy-Design Guidelines provide aesthetic requirements and specifications that all Small Cell towers installed within the public ROW must meet prior to installation in the City of Memphis. Small Cells not installed within the public ROW are not bound to the requirements of this guide; although, the public ROW Small Cell guidelines may inform these installations.

Network Providers shall consider the aesthetics of the existing streetlights and neighborhoods adjacent to proposed Small Cell locations prior to submitting an application to Memphis Light Gas & Water Division (MLGW) and/or COM. New Small Cells shall match the existing streetlight aesthetics when installed in a Special District or neighborhood with unique streetlight assemblies. Unique assemblies may include mast arms, decorative pole bases, architectural luminaires, mounting heights, pole colors, etc. that deviate from these guidelines. An example of a unique streetlight can be found in Figure 1.1. MLGW and/or COM must approve all Small Cell installations that deviate from these guidelines.

Figure 1.1:
Unique streetlight assembly using a photo simulation.

Four different types of Small Cell installations are permitted within the COM rights-of-way. These types include attachments to utility poles within the communication space (comm), attachments to and/or replace wood streetlight poles, removal and replacement of existing streetlights (concrete or steel), and new freestanding installations. An overview of each type is shown in Sections 1.1 through 1.4. Deviations from this Guide shall be approved by MLGW and/or COM prior to installation.

1.1 Type 1 Attachments to Utility Poles

The Attachments to Utility Poles chapter establishes the specification requirements and design guidelines for Small Cell equipment that will be attached to existing wooden utility poles located in the COM's Right of Way.

All Type 1 poles shall require a meter to be installed externally on the replacement pole. The meter center shall be installed opposite of the flow of traffic. Only one carrier may be installed per pole. All equipment and shrouds must be of like color of existing pole. All replacement poles shall not violate ADA requirements and must be approved by MLGW prior to installation. Any deviation must be approved by COM prior to installation.

1.2 Type 2 Small Cell on Wood Pole with Streetlight

The Attachments to Wood Streetlight Pole chapter establishes the specification requirements and design guidelines for Small Cell equipment that will be attached to wooden streetlight poles within the public ROW.

All Type 2 poles shall require a meter to be installed externally on the replacement pole. The meter center shall be installed opposite of the flow of traffic. Only one carrier may be installed per pole. All equipment and shrouds must be of like color of existing streetlight pole. All replacement poles shall not violate ADA requirements. Any deviation must be approved by COM prior to installation.

1.3 Type 3 MLGW Concrete and Steel Pole Replacements

The Concrete and Steel Pole Replacement chapter establishes requirements when removing existing concrete and steel streetlight poles in the public ROW.

All Type 3 poles shall require a meter to be installed externally on the replacement pole. The meter center shall be installed opposite of the flow of traffic. Only one carrier may be installed per pole. All equipment and shrouds must be of like color of existing streetlight pole. All replacement poles shall not violate ADA requirements. Any deviation must be approved by COM prior to installation.

1.4 Type 4 Freestanding Small Cell, MATA and COM owned Traffic Signal Poles

The Freestanding Small Cell chapter establishes specification requirements and design guidelines for installing privately-owned freestanding Small Cell poles or the replacement of existing COM Traffic Signal Poles.

All Type 4 poles shall require a meter to be installed externally on the replacement pole. The meter center shall be installed opposite of the flow of traffic. Only one carrier may be installed per pole. All replacement poles shall not violate ADA requirements. Any deviation must be approved by COM prior to installation.

1.5 Placement of Small Cell on City owned Building

In an effort for City to prevent addition of new poles in Right of Way, the City will consider the proposal to attach on City owned building and other facilities. This small cell attachment would be reviewed and approved on a case-by-case basis.

Chapter

2

Attachment to Utility Poles

This section provides the detailed definitions of terms used throughout the document.

2 Attachment to Utility Poles

2.1 Purpose

This chapter of the Guide is to be used when locating Small Cell attachments on existing utility poles. Refer to Chapter 3 for projects involving locating Small Cell attachments on existing wooden streetlight poles.

2.2 General Guidance

All attachments to utility poles shall be approved by pole owner (i.e. MLGW, AT&T and COM) prior to installation. All equipment shall meet MLGW's standard requirements and COM's *Freestanding Small Cell Infrastructure ROW Permit Entrance Requirements*. All equipment shall be installed within the comm space.

No ground mounted enclosures, including backup power supply, shall be allowed. 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. All meters shall face away from incoming traffic.

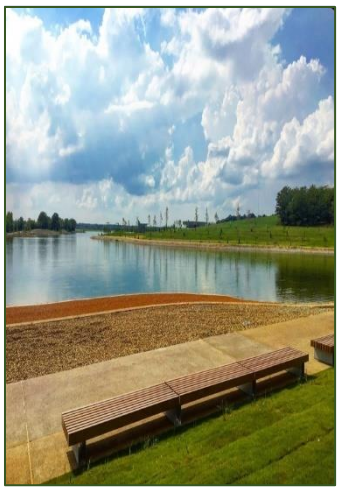


Figure 2.1: Memphis is home to many beautiful parks and open spaces. Each adds uniquely to the quality and character of our community.

All carrier equipment shall be removed and relocated at no cost to COM and MLGW if COM or MLGW decides to underground the utility lines in the future. The equipment must be removed within a reasonable time frame determined by MLGW. A reasonable time frame refers to a period of time that does not delay the removal of the utility poles and lines. Failure to do so will result in removal of equipment at zero liability to MLGW.

No strand-mounted Small Cell devices shall be installed on utility poles. Deviations from this guide shall be approved on a case-by-case basis by MLGW prior to installation.

2.3 Utility Pole Small Cell Attachments Specification Overview

Prior to submitting a permitting application, the pole owner shall ensure the supporting poles are appropriately sized and have sufficient strength to accommodate the additional Small Cell equipment loads. The Small Cell equipment loads shall be provided by the network provider. If the existing utility pole does not have sufficient strength structurally to support the Small Cell equipment loading, the pole will be replaced at the cost of the network provider as determined by MLGW.

A non-ionizing radiation electromagnetic radiation report (NEIR) shall be submitted to the pole owner and retained on file for equipment type and model. The NEIR report shall be endorsed by an RF PE licensed in the State of Tennessee. 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 bucket.

All installations shall meet or exceed all applicable structural standards, clearance standards, and provisions of the latest National Electrical Safety Code (NESC), applicable COM construction standards and MLGW requirements. In case of conflict, the most stringent requirements shall prevail. All necessary permits shall be obtained by the wireless carrier owner and provided to the pole owner and COM.

Small Cell equipment will be allowed on a case-by-case basis on poles with existing electronic attachments. These attachments include but are not limited to: Security Cameras, Advanced Metering Infrastructure Equipment and Electric Holiday Decorations.

Figure 2.2: Utility Pole Attachment

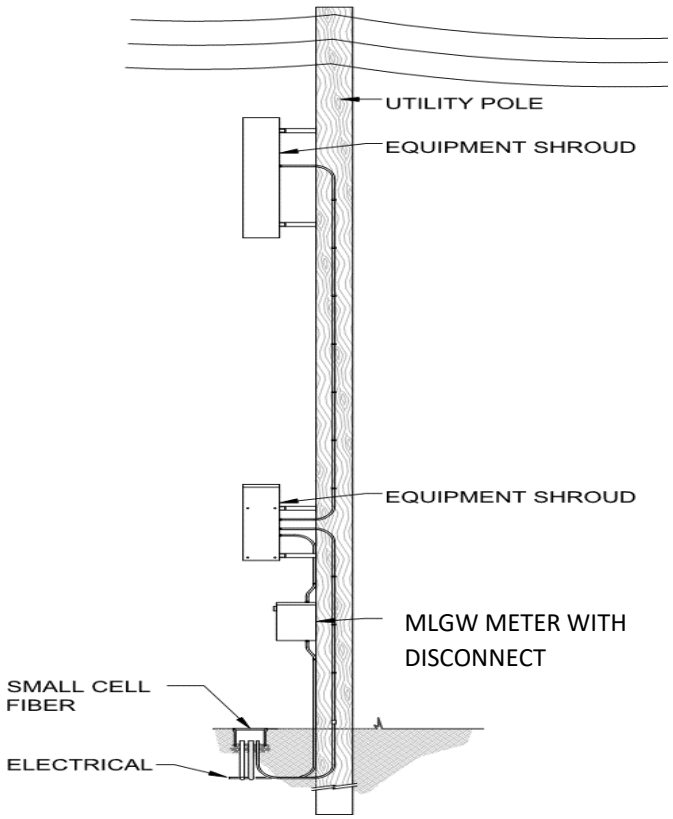


Table 1 Small Cell Attachments to Utility Pole Specification Overview

Utility Pole and Strand Mount Specification Overview	
Electrical Service	Per MLGW's requirements
Grounding	Per MLGW's requirements
Separation of Service	All new electrical conduit and fiber shall be separated by Owner
Utility Equipment	Per MLGW's requirements
Equipment Color	Visible attachments and hardware shall be colored to match pole, or colored gray (7047) or brown if located on a wooden pole.
RF Equipment Disconnect	Radio frequency equipment shall have a disconnect that meets or exceeds MLGW's requirements. Backup batteries will not be permitted.
Pole Mounted Warning Label	Radio frequency warning labels shall be mounted exterior to Carrier's equipment.
Strand Mounted Warning Label	Radio frequency warning labels shall be mounted on the equipment, and clearly mark both sides of the enclosure and be visible from the ground, roadside, and field side.
Owner Identification	A plate with the Carrier's name, location identifying information, and MLGW and Carrier emergency telephone numbers shall be permanently fixed to the shroud.

2.4 Strand Mounted Small Cell Attachments Specification Overview

Any wooden pole submitted for attachment shall be evaluated by MLGW to determine if the pole's appropriate size and sufficient strength to accommodate the installation of their equipment. If the existing utility pole does not have sufficient strength structurally to support the Small Cell equipment loading, the pole will be replaced at the cost of the network provider as determined by MLGW.

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 an PE licensed in the State of Tennessee. 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 bucket truck.

All installations shall meet or exceed all applicable structural standards, clearance standards, and provisions of the latest NESC, COM construction standards and MLGW requirements. In case of conflict, the most stringent requirements shall prevail. All necessary permits shall be obtained by the wireless carrier owner and provided to the utility owner and COM.

Aerial fiber and overhead power service installations are allowed even though Figure 2.3 shows an example of an undergrounded fiber and power installation.

Figure 2.3: Strand Mounted Attachment

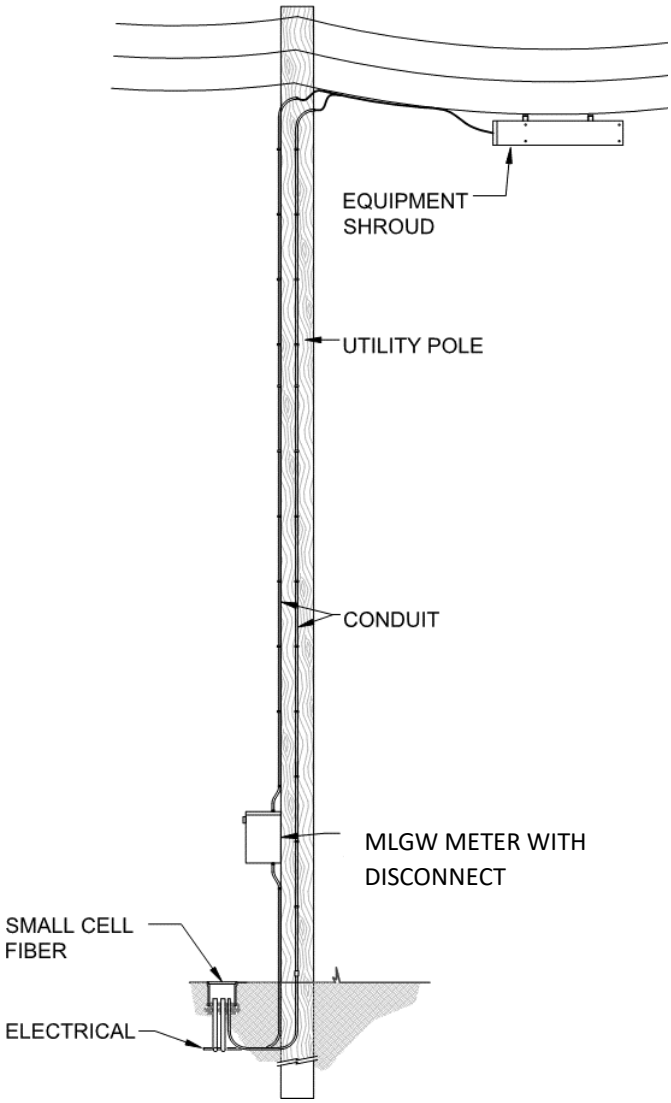


Figure 2.4: Unacceptable Strand Mount

Figure 2.5: Acceptable Strand Mount

Strand mount installations are required to be professional and reflect high standards of professional workmanship. This includes no excess wire beyond what is necessary for service loops, and all service loops should be appropriately sized and secured to the hanging cable

Table 2 Small Cell Attachments to Utility Pole and Utility Lines Specification Overview

Utility Pole and Strand Mount Specification Overview	
Electrical Service	Per MLGW 's requirements.
Grounding	Per MLGW's requirements
Separation of Service	All new electrical conduit and fiber shall be segregated by Owner
Utility Equipment	Per MLGW's requirements.
Equipment Color	Visible attachments and hardware shall be colored gray (RAL 7047) or brown.
Strand Mount Equipment Shroud	5.5 cubic feet maximum strand mount equipment shroud, per COM Only one equipment shroud shall be installed per permit location.
RF Equipment Disconnect	Radio frequency equipment shall have a disconnect that meets or exceeds MLGW's requirements. Backup batteries will not be permitted.
Pole Mounted Warning Label	Radio frequency warning labels shall be mounted exterior to Carrier's equipment.
Strand Mounted Warning Label	Radio frequency warning labels shall be mounted on the equipment, and clearly mark both sides of the enclosure and be visible from the ground, roadside, and field side.
Owner Identification	A 4-inch by 6-inch (maximum) plate with the Carrier's name, location identifying information, and MLGW and Carrier emergency telephone numbers shall be permanently fixed to the shroud.

2.5 Small Cell Attachments to Utility Poles and Utility Lines Placement Requirements

Small Cell shall be located such that all new equipment, including but not limited to Network Provider's Small Cell equipment and MLGW equipment, meets ADA requirements. MLGW will approve all power source locations prior to installations. COM shall approve all fiber locations and routing.

Chapter

3

Attachment to Wooden Streetlight Poles

The purpose of this document is to establish guidelines for installing small cell equipment and poles in the City of Memphis.

3 Attachments to Wooden Streetlight Poles

3.1 Purpose

This chapter of the Guide is to be used when locating Small Cell equipment on existing wooden streetlight poles.

3.2 General Guidance

All attachments to wooden streetlights poles shall be approved by MLGW prior to installation. All equipment shall meet MLGW's standard requirements. 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.

No ground mounted equipment, including backup power supply, shall be allowed. No Small Cell devices shall be installed without confirming that the intended installation has no impact on the streetlight's operational performance.

All carrier equipment shall be removed and relocated at no cost to COM and MLGW if COM or MLGW decides to remove the wooden pole and streetlight in the future. The equipment must be removed within a reasonable timeframe determined by MLGW. A reasonable time frame refers to a period of time that does not delay the removal of the utility poles and lines. Failure to do so will result in removal of equipment at zero liability to MLGW.

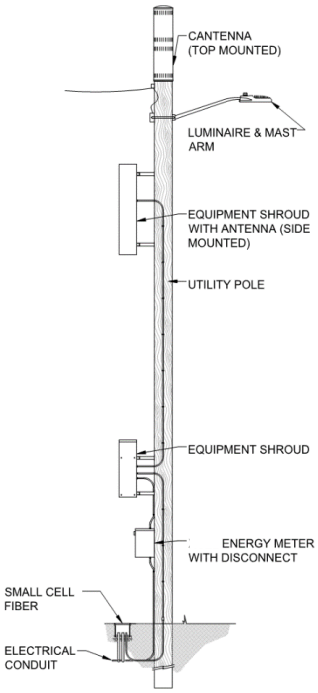


Figure 3.1: Attachment to Wooden Streetlight Pole

3.3 Wooden Streetlight with Small Cell Specification Overview

Any wooden pole submitted for attachment shall be evaluated by MLGW to determine if the pole's appropriate size and sufficient strength to accommodate the installation of their equipment. If the existing utility pole does not have sufficient strength structurally to support the Small Cell equipment loading, the pole will be replaced at the cost of the network provider as determined by MLGW. All installations shall meet or exceed all applicable structural standards, clearance standards, and provisions of the latest NESC or MLGW

construction standards. In case of conflict, the most stringent requirements shall prevail. All necessary permits shall be obtained by the wireless carrier owner and provided to the pole owner, MLGW and/or COM.

A non-ionizing radiation electromagnetic radiation report (NEIR) shall be submitted to the pole owner and retained on file for equipment type and model. The NIER report shall be endorsed by an RF PE licensed in the State of Tennessee. 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 bucket truck.

Small Cell equipment will not be allowed on poles with existing electronic attachments. These attachments include but are not limited to: Security Cameras, MLGW Automated Metering Infrastructure and Electric Holiday Decorations.

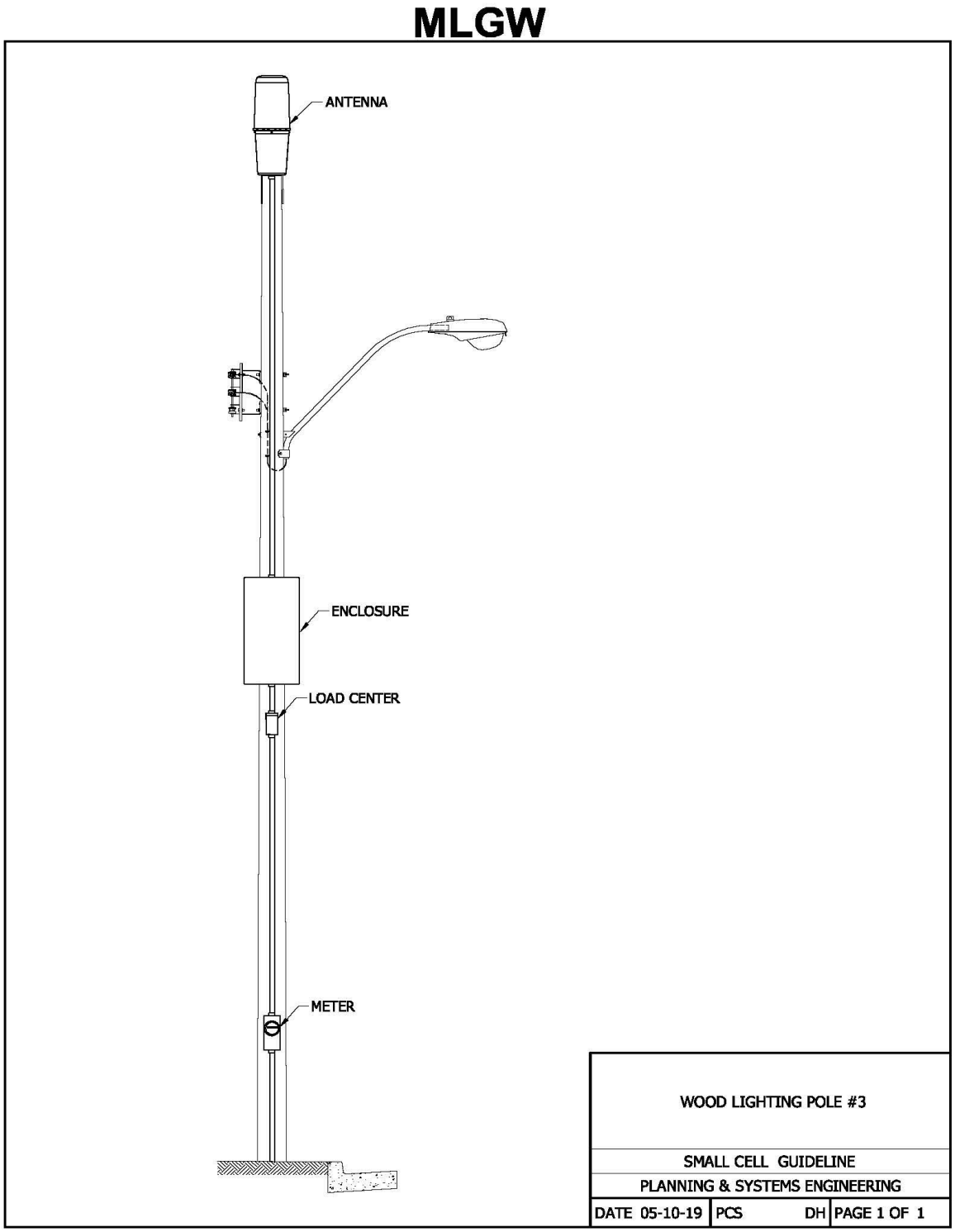
Table 3 Wooden Streetlight Attachments Specification Overview

General Specification Overview	
Luminaire	Per MLGW's lighting standards
Luminaire Mast Arm	Per MLGW's lighting standards
Luminaire Mounting Height	All luminaires shall be the same height as surrounding streetlights
Electrical Service	Per MLGW's requirements
Grounding	Per MLGW's requirements
Separation of Service	All new electrical conduit and fiber shall be segregated by Owner, in pull/splice boxes located adjacent to the wooden streetlight pole.
Utility Equipment	Per MLGW's requirements
Color	Small Cell equipment shall be painted same color as pole.
Equipment Shroud	49"H x 19"W x 13"D maximum, per COM.
Cantenna	If a cantenna is located on top of the pole the outer diameter shall be 14" maximum and the cantenna shall be no more than 5 feet tall, including antenna, radio head, mounting bracket, and all other hardware necessary for a complete installation. If the antenna is mounted to the side of the pole it shall be located inside a maximum shroud of 5.5 cubic feet with 16" width (maximum), per COM.
RF Equipment Disconnect	Radio frequency equipment shall have a disconnect that meets or exceeds MLGW's requirements. Backup batteries will not be permitted.
Warning Label	Radio frequency warning labels shall be mounted on the equipment and clearly mark both sides of the enclosure and be visible from the ground, roadside, and field side.
Owner Identification	A 4-inch by 6-inch (maximum) plate with the Carrier's name, location identifying information, and MLGW and Carrier emergency telephone numbers shall be permanently fixed to the equipment.

3.4 Wooden Streetlight Pole with Small Cell Placement Requirements

Small Cell shall be located such that all new equipment, including but not limited to new Network Provider Small Cell equipment and new MLGW equipment, meets ADA requirements.

Figure 3.2 : Acceptable Installation Wood



Chapter

4

MLGW Concrete & Steel Streetlight Small Cell Poles including MATA poles

4 MLGW Concrete or Steel Streetlight Pole including MATA poles

The City has built its small cell program on a series of principles.

4.1 Purpose

This chapter of the Guide is to be used when replacing an existing concrete or steel streetlight pole. These Type 3 poles will be removed and replaced.

A Type 3 Small Cell pole shall in all instances be removed and replaced with a pole of like color and material as approved by MLGW prior to all installations. In every case, these poles will be “like for like” replacements. Existing streetlight poles are typically owned by MLGW; MLGW owned Type 3 poles that replace existing streetlights shall meet MLGW’s requirements. Any poles not owned by MLGW will require permission from COM or MATA prior to installations.

4.2 General Guidance

Type 3 pole applications and aesthetics shall be approved by MLGW prior to installation. All equipment shall meet MLGW’s utility requirements. The same Small Cell pole aesthetic is to be used in the same area to maintain a cohesive appearance.

All Small Cell carrier equipment shall be installed external to the pole and all conduit/cabling shall be installed within the pole. Deviations from this guide shall be approved on a case-by-case basis by MLGW prior to installation.

4.3 Basis of Design

The following pages describe the Small Cell requirements for installation in the City of Memphis's public right of way. The concrete and steel pole design shall match the aesthetics of existing streetlights adjacent to the pole or as directed by MLGW. The Carrier shall perform a visual inspection (Online street images are considered sufficient unless the pole standards were updated after the images were published) prior to submitting a permitting application to determine existing aesthetics.

4.3.1 Concrete Street Light Pole

The Concrete Street Light Pole is composed of an equipment cabinet, pole, streetlight and antenna. See Specifications:

Figure 4.1 : Acceptable Installation Concrete

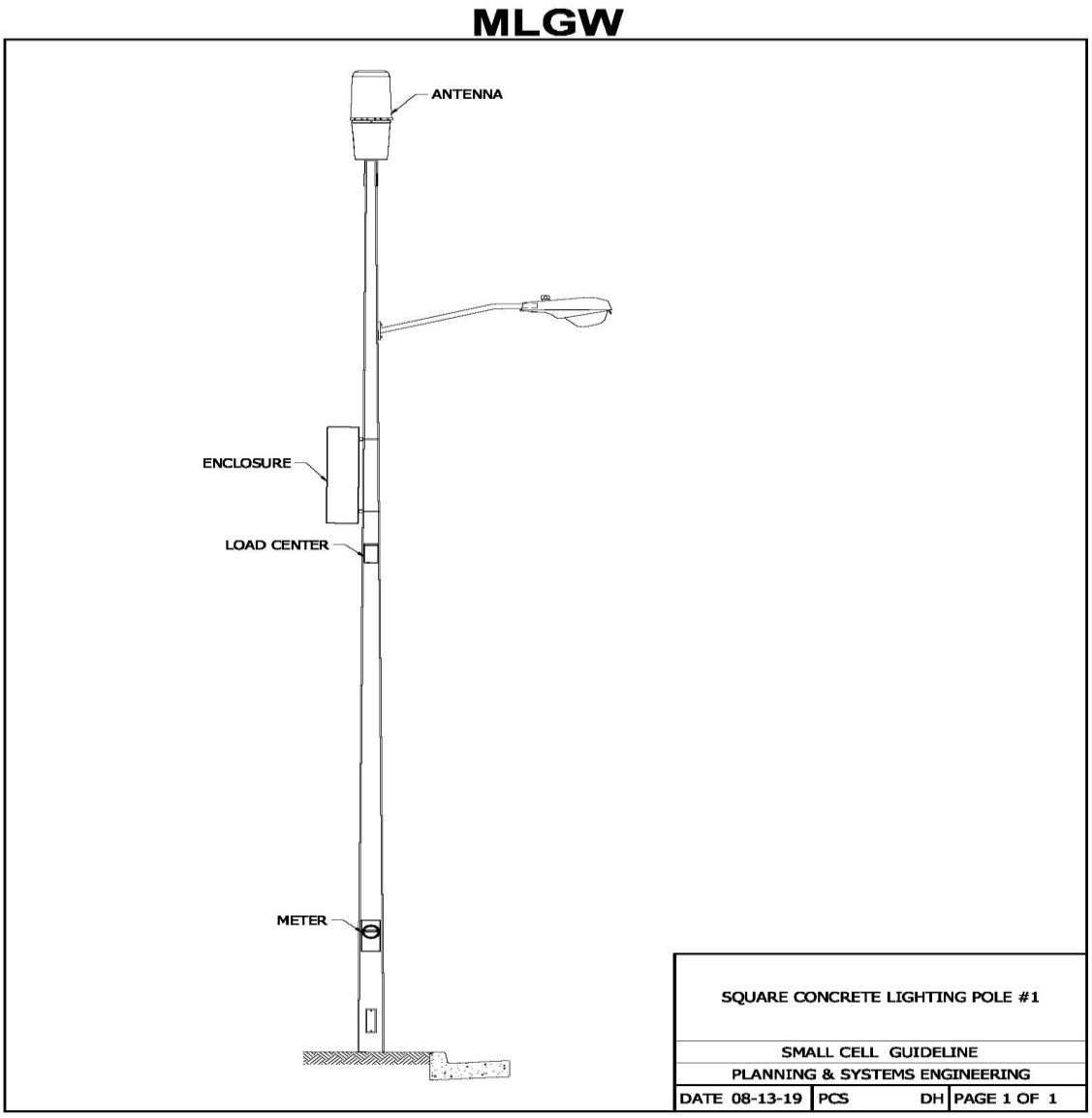


Figure 4.2 : Acceptable Type 3 Installation Concrete

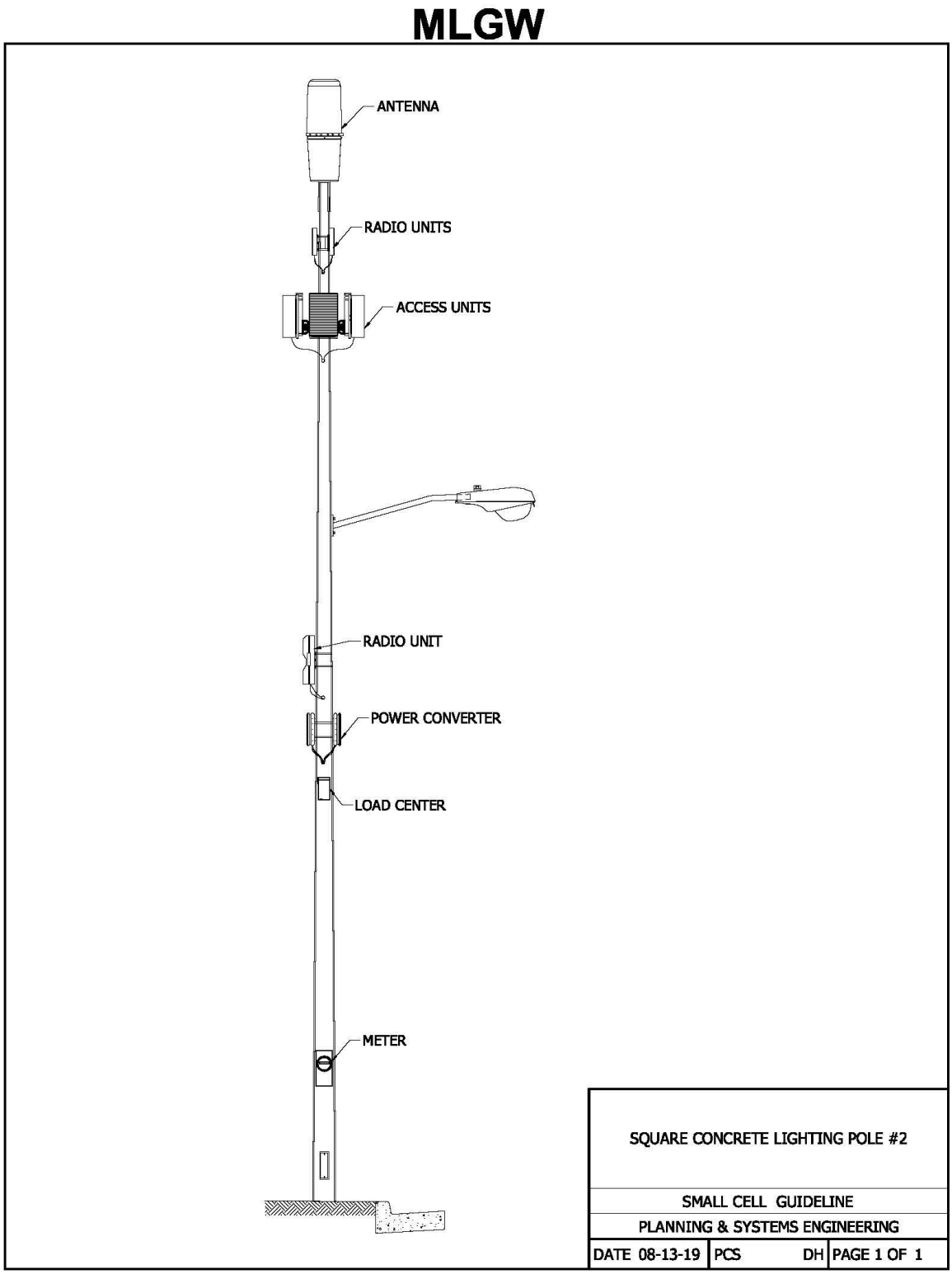


Figure 4.3 : Acceptable Type 3 Installation Concrete

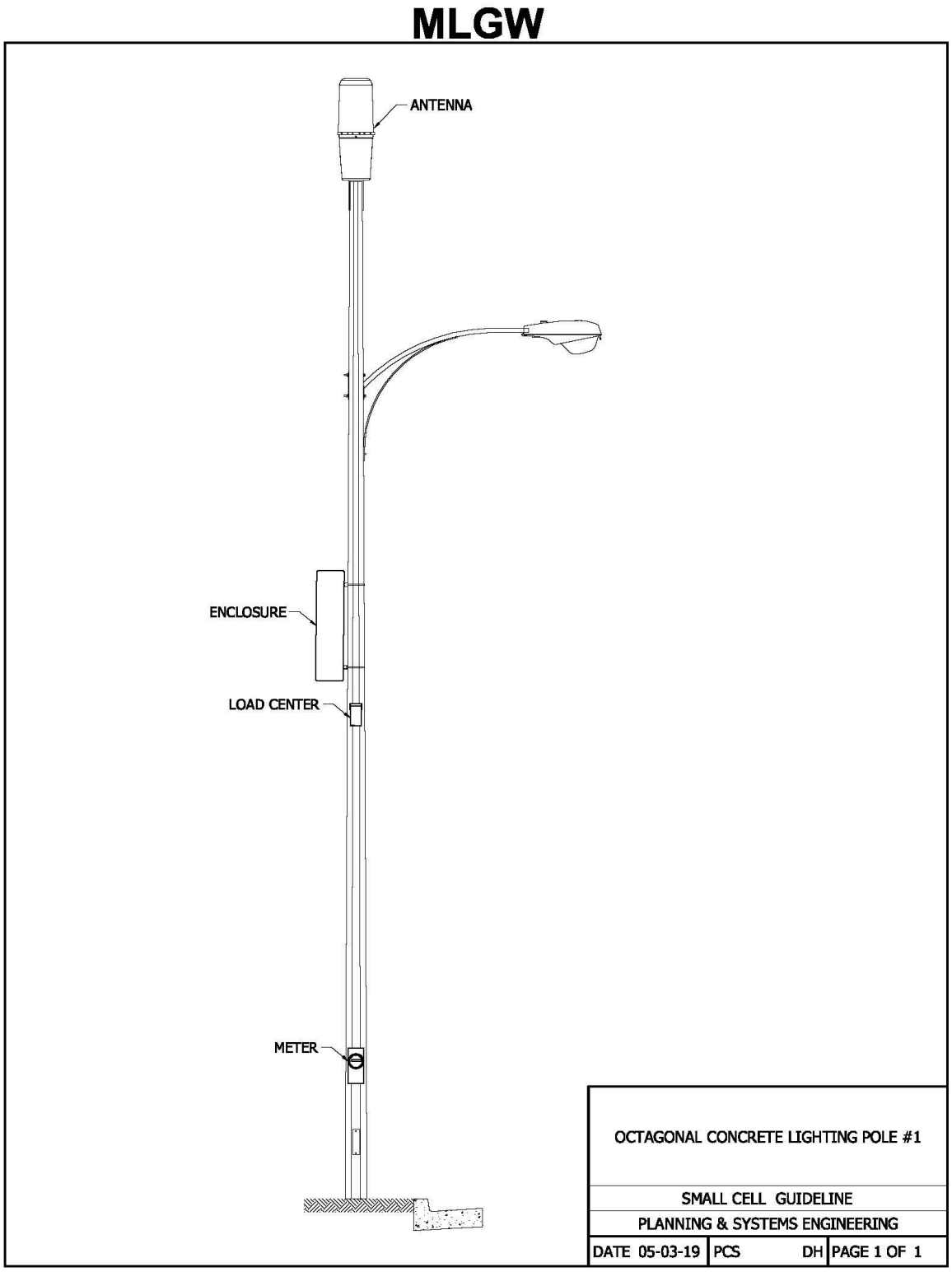
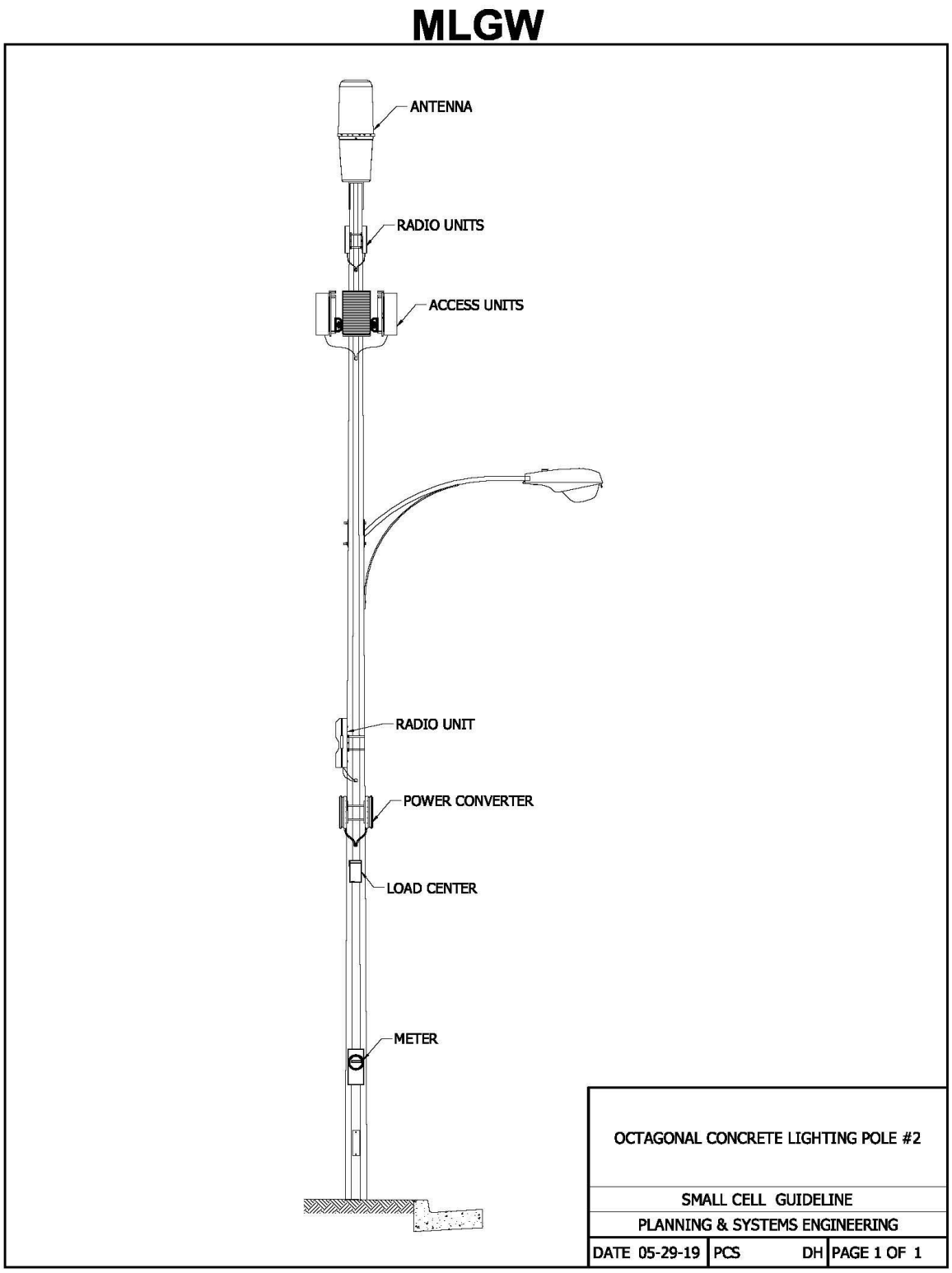


Figure 4.4 : Acceptable Type 3 Installation Concrete



4.3.2 Steel Street Light Pole

The Steel Street Light Pole is composed of an equipment cabinet, pole, streetlight, and antenna. See Specifications.

4.4 MLGW Concrete and Steel Small Cell and Streetlight Specification Overview

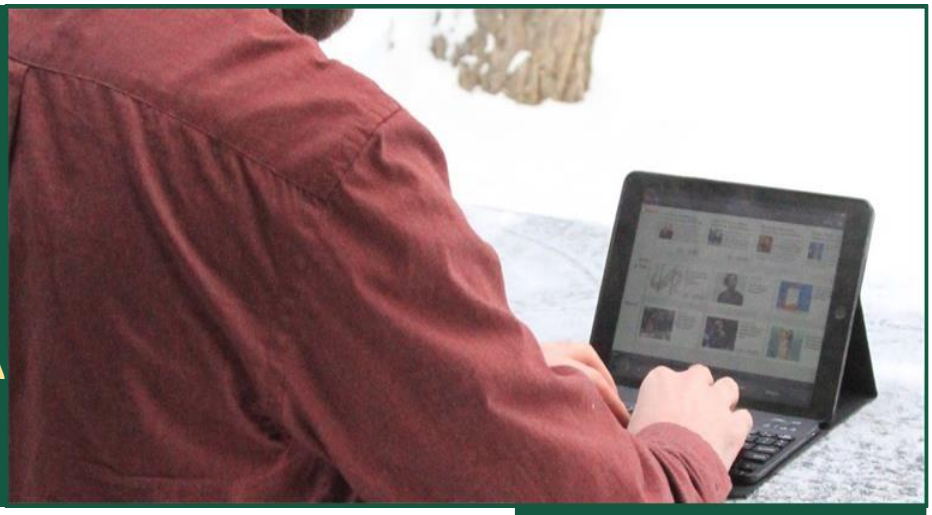
Table 4 Streetlight Specification Overview

General Specification Overview	
Luminaire	Per MLGW's requirements; All luminaires shall be the same height as adjacent streetlights.
Luminaire Mast Arm	Per MLGW's requirements
Electrical Service	Per MLGW's requirements
Pole Type	Square or Octagonal
Pole Color	Per MLGW's requirements
Design Wind Velocity	Per MLGW's requirements
Conduit Electrical Separation	Carrier and MLGW conduit/cabling shall be segregated/separated within the pole.
Bolt Circle	Per MLGW's requirements
Anchor Bolt Shroud	Anchor bolts shall either be hidden from view, preferred, or treated and painted to match the pole color with MLGW approval.

Chapter

5

Freestanding Small Cell, MATA and T/S poles



Use this chapter of this Guide when contemplating attachments to existing structures.

5 Freestanding Small Cell Infrastructure

5.1 Purpose

This chapter of the Guide is to be used when installing a freestanding Small Cell. Refer to Chapter 4 for projects involving combination Small Cell installations.

5.2 General Guidance

The City encourages the attachment of new Small Cell facilities to existing infrastructure. This approach has been reviewed and is consistent with the City's strategy to maintaining the quality and character of the community.

Applicants should consider existing infrastructure for add-on attachments prior to attempting a proposal for new freestanding pole. Existing infrastructure includes, (a) traffic signals, (b) streetlights, and (c) new freestanding poles.

The specifications provided in this chapter are for single carrier with single technology installations within the public ROW only. Dual carrier, dual technology installations, or Small Cell locations not in the public ROW may vary from these guidelines with COM approval.

Figure 5. 1: Freestanding Pole adjacent to existing light pole.

All freestanding Small Cell permitting applications shall be approved by COM prior to installation. All equipment shall meet MLGW's utility requirements and the City of Memphis's design aesthetics.

The same Small Cell pole aesthetic is to be used along adjacent blocks to maintain a cohesive appearance. Freestanding Small Cell aesthetics and proposed locations shall meet the City of Memphis's Freestanding Small Cell Infrastructure ROW Permit Entrance Requirements.

All Small Cell carrier equipment shall be housed internal to the equipment cabinet or hidden behind the cantenna. No network provider equipment shall be strapped to the outside of the pole. If a dual-carrier pole is approved by the COM, all the network provider equipment shall be located internal to the pole and cantenna.

Deviations from this guide shall be approved on a case-by-case basis by COM prior to installation.

5.3 Basis of Design

The following pages describe the Small Cell requirements for installation in the City of Memphis public rights-of-way. The pole design shall match the aesthetics of existing streetlights installed adjacent to the pole. The Carrier shall perform a visual inspection (Online street images are considered sufficient unless the pole standards were updated after the images were published) prior to submitting a permitting application to determine existing aesthetics.

The Small Cell components shall be sized to be visually pleasing. For a pole to be considered visually pleasing, the transition between the equipment cabinet and upper pole should be considered. A decorative transition shall be installed over the equipment cabinet upper bolts, or decorative base cover shall be installed to match the equipment cabinet size. The upper pole shall be scaled to 0.5 to 0.75 the size of the equipment cabinet, with a 10-inch minimum outer diameter. All hardware connections shall be hidden from view. No horizontal flat spaces greater than 1.5 inches shall exist on the equipment cabinet to prevent cups, trash, and other objects from being placed on the equipment cabinet. Each pole component shall be architecturally compatible to create a cohesive aesthetic. An example of an unacceptable Small Cell installation, and acceptable installation can be found in Figures 5.2 and 5.3.

Figure 5. 2: Unacceptable Type 4 Installation

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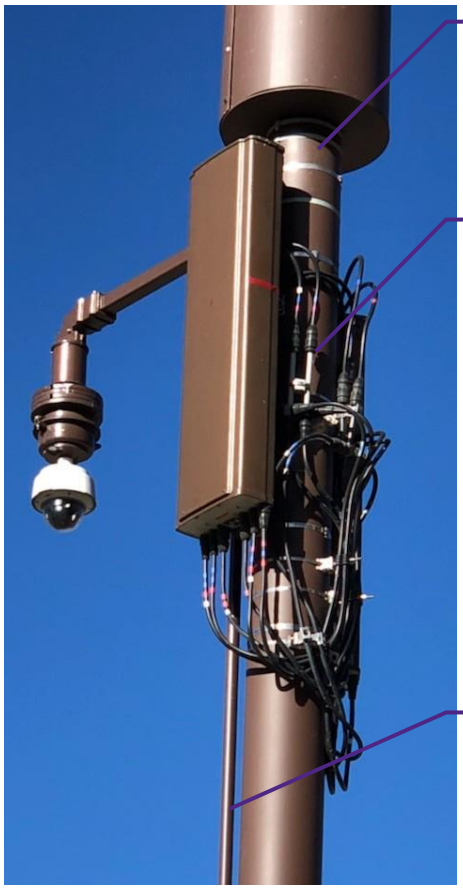
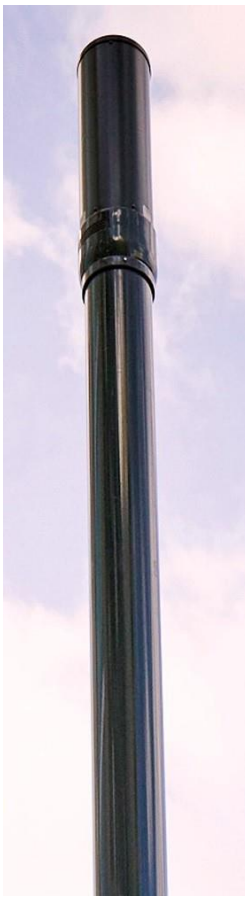
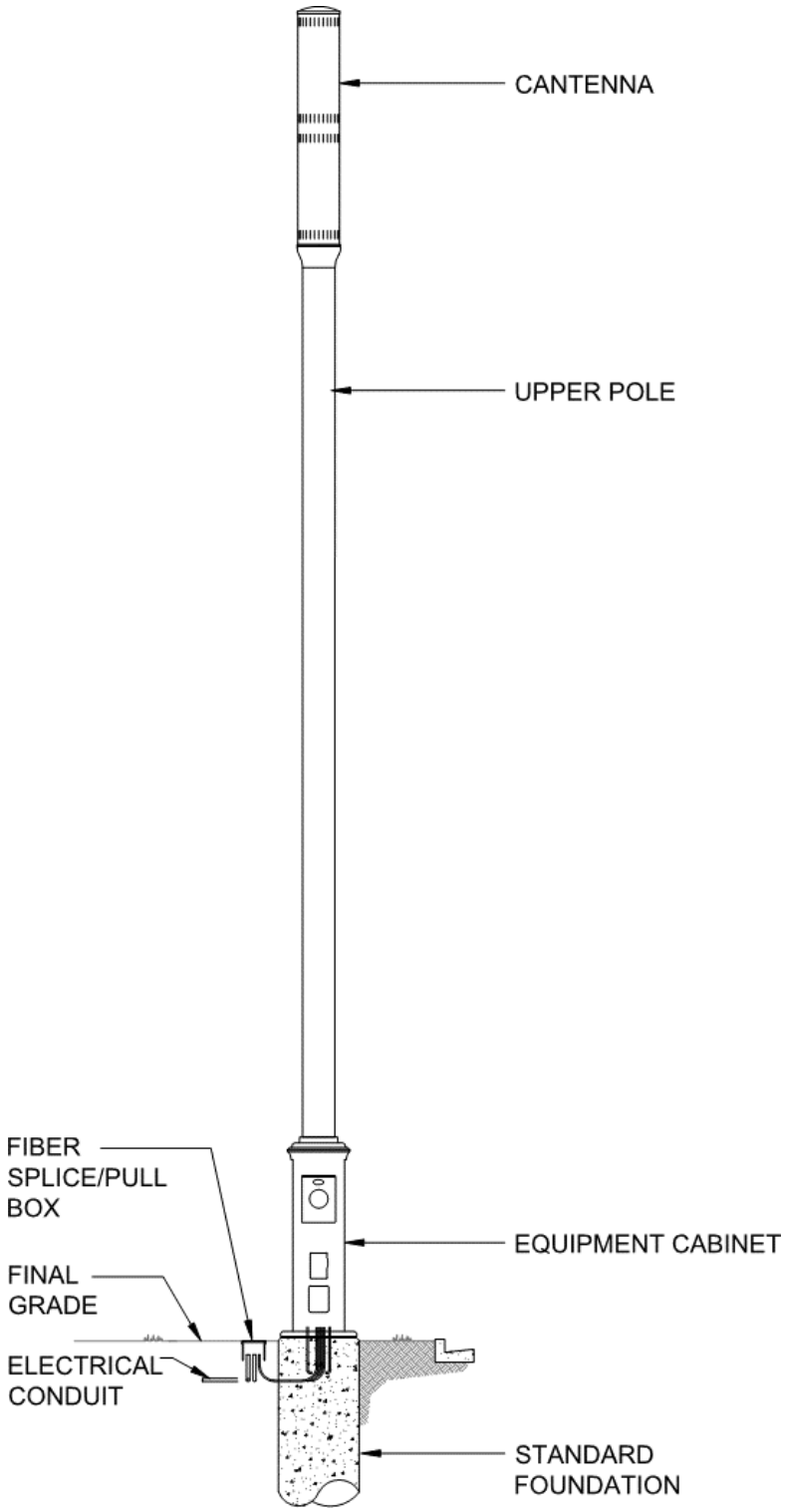


Figure 5. 3: Acceptable Type 4 Installation



Freestanding Small Cell pole components include the foundation, equipment cabinet, upper pole, cantenna, and all hardware and electrical equipment necessary for a complete assembly, as shown in Figure 5.4.

Figure 5. 4: Freestanding Small Cell Assembly



5.4 Freestanding Small Cell Specification Overview

Table 5 Freestanding Small Cell Infrastructure Specification Overview

General Specification Overview		
Electrical Service	Per MLGW's requirements	
Pole Type	Round, straight, galvanized steel	
Pole Color	Equipment cabinet and pole shall be galvanized in accordance with AASHTO M 111. If the pole is painted to match existing streetlight aesthetics, paint shall be powder coated over zinc paint (Pole and equipment cabinet shall still be galvanized).	
Pole Height	The freestanding Small Cell shall not exceed 30 feet. Pole shall be measured from the top of the foundation to the top of the cantenna.	
Design Wind Velocity	115 mph minimum per TIA-222 rev G, IBC 2012 with ASC 710, and amendments for local conditions.	
Foundation	Precast concrete or cast-in-place pole foundations shall be designed per COM standard to meet ACI 318. While COM accepts cast-in-place foundations, precast concrete foundations are preferred and should be installed whenever possible.	
Conduit Sweeps in Foundation	Eight (8) 2" PVC conduit sweeps shall be required. Conduit shall accommodate Small Cell carrier electrical and fiber with up to four (4) spare sweeps for future service.	
Bolt Circle	19.5-inch bolt circle when installing a 16-inch equipment cabinet. 23.5-inch bolt circle when installing a 20-inch equipment cabinet.	
Anchor Bolt Shroud	Anchor bolts shall either be hidden from view, preferred, or treated and painted to match the pole color with COM approval.	
Equipment Cabinet Style	Round to match diameter below. COM shall approve other shapes.	
Equipment Cabinet Diameter	16 inches is preferred, 20 inches maximum.	
Equipment Cabinet Height	5'-8" maximum	
Equipment Cabinet Shroud/Cover	All hardware attachments shall be hidden. Equipment cabinet and equipment cabinet cover shall not have a flat, horizontal surface larger than 1.5 inches.	
Equipment Cabinet Access Doors	Lockable access door sized to install, maintain, and remove all Small Cell equipment as needed shall meet Carrier's requirements. Utility access shall be per MLGW's requirements. The meter shall be recessed into the pole base	
Equipment Cabinet Required Equipment	All equipment shall be located internal to the equipment cabinet or recessed as much as possible in the equipment cabinet to meet Utility requirements. All equipment shall be mounted per the Owner's requirements. Pole bases shall be sized to handle the listed equipment and all other equipment required by the Owner.	
	Utility Equipment	Carrier Equipment
	Per MLGW requirements	Per Small Cell carrier requirements
Ventilation	Passive louvers and/or other passive ventilation systems shall be provided as the primary means of temperature control.	

General Specification Overview	
Motorized Ventilation	If required, fan(s) shall not emit noise greater than 30dBa at one meter (3.28 feet).
Upper Pole Diameter	The upper pole shall be scaled to 0.5 to 0.75 times the size of the equipment cabinet with 10" minimum outer diameter. COM prefers a 10" upper pole diameter. The pole diameter shall be scaled such that no flat, horizontal surface larger than 1.5 inches exists between the equipment cabinet and upper pole.
Cantenna	Antenna and pole attachment shall be shrouded to meet COM aesthetics. A tapered transition between the upper pole and cantenna shall be included.
Cantenna Diameter	14-inch maximum outer diameter with shroud.
Cantenna Height	The cantenna height - including antenna, radio equipment, brackets, transition shroud, and all other hardware required for a complete installation - to the pole shall not exceed 5'-8".
Cantenna Color	Antenna shroud shall be colored to match pole.
Warning Label	If required, radio frequency warning labels shall be mounted exterior to the pole.
Owner Identification	A 4-inch by 6-inch (maximum) plate with the Carrier's name, location identifying information, and emergency telephone number shall be permanently fixed to the pole.

5.5 Placement Requirements

All Type 4 freestanding Small Cell poles shall be privately owned and must be permitted by COM via the

Freestanding Small Cell Infrastructure ROW Permit Entrance Requirements.

- 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 streetlights.
- Equal distance between trees 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 appropriate clearance from existing utilities.
- Outside of the 20-foot equipment clear zone (for base cabinets less than 18-inches in diameter) or 30-foot clear sight triangle (for base cabinets equal to or greater than 18-inches in diameter) at intersection corners as shown in Figure 5.7.
- 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.
- No closer than 250 feet away, radially, from another privately-owned Type 4 freestanding Small Cell.

Figure 5.5: Freestanding Small Cell spacing radius

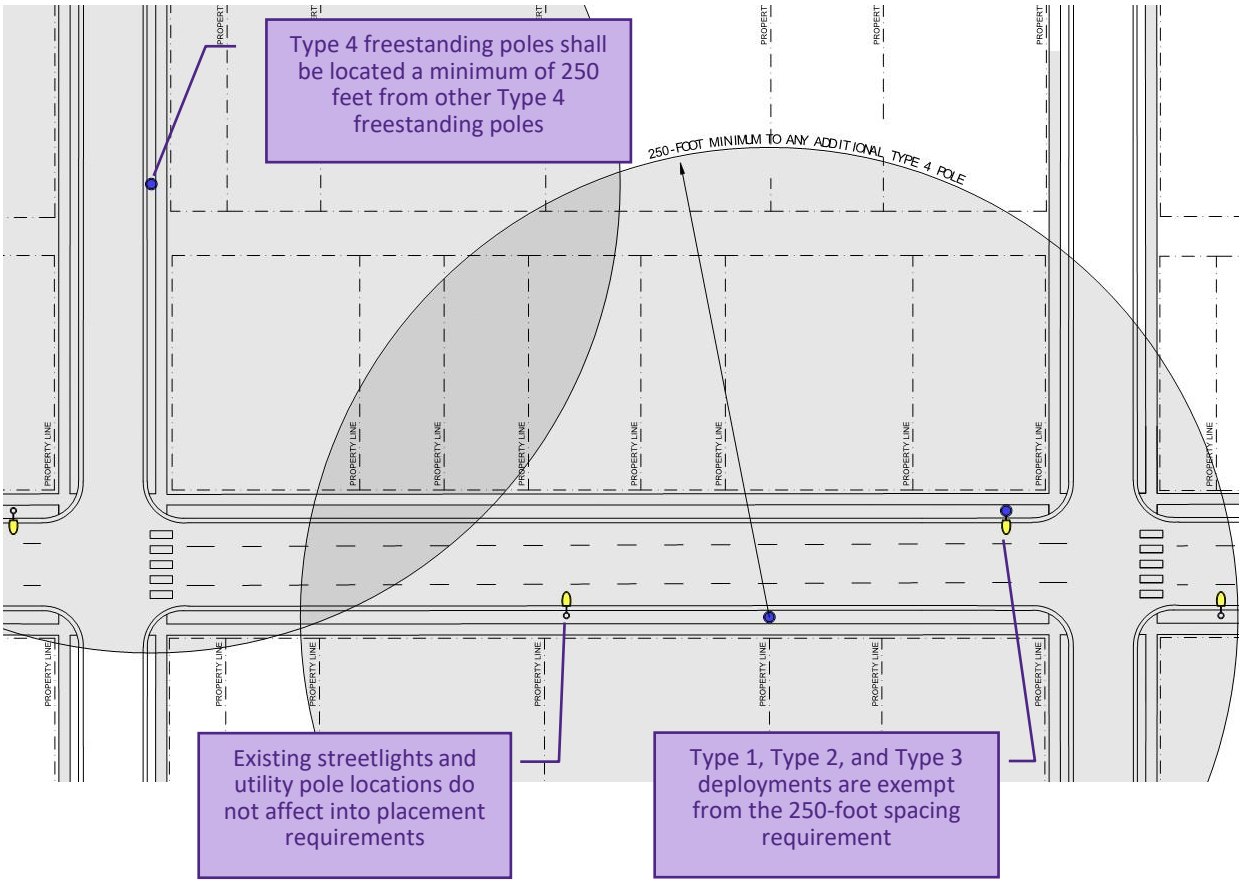
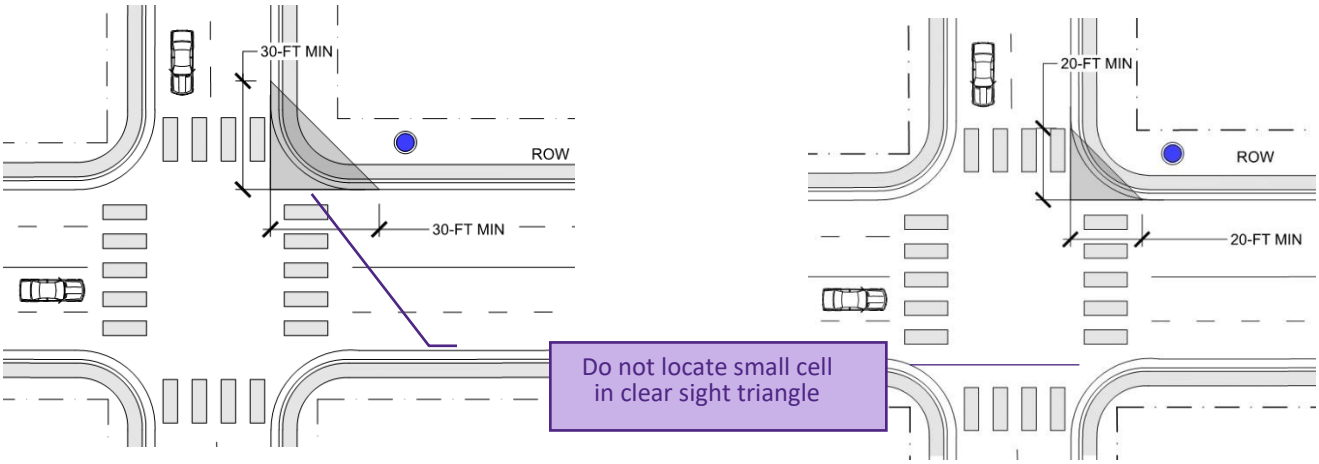


Figure 5. 5: shows freestanding Small Cells which shall be a minimum of 250 feet apart radially. This radius extends around corners and into alleys. They shall be located in line with trees, existing streetlights, utility poles, and other furniture located in the amenity zone, as shown in Figure 5.6.

Figure 5. 6: Freestanding Small Cell in an 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, 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 5.7.

Figure 5. 7: Standalone Small Cell sight-line requirements.



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 5.8.
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 5.9.

Figure 5. 8: Freestanding Small Cell location between property and trees

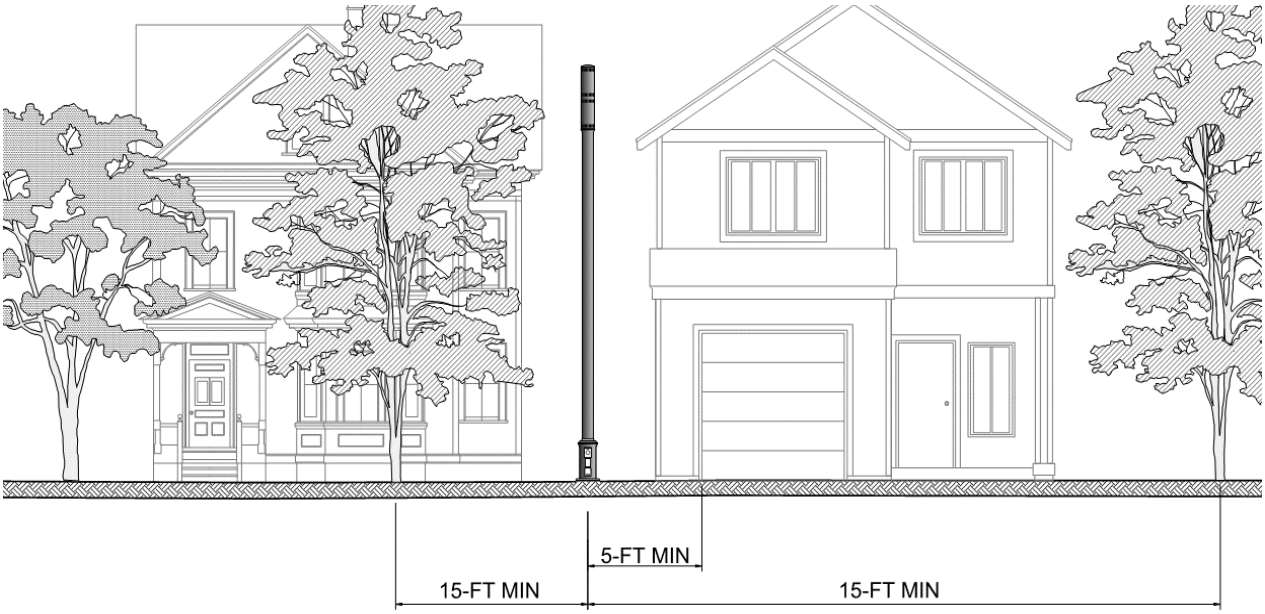


Figure 5. 40: Freestanding Small Cell between property lines

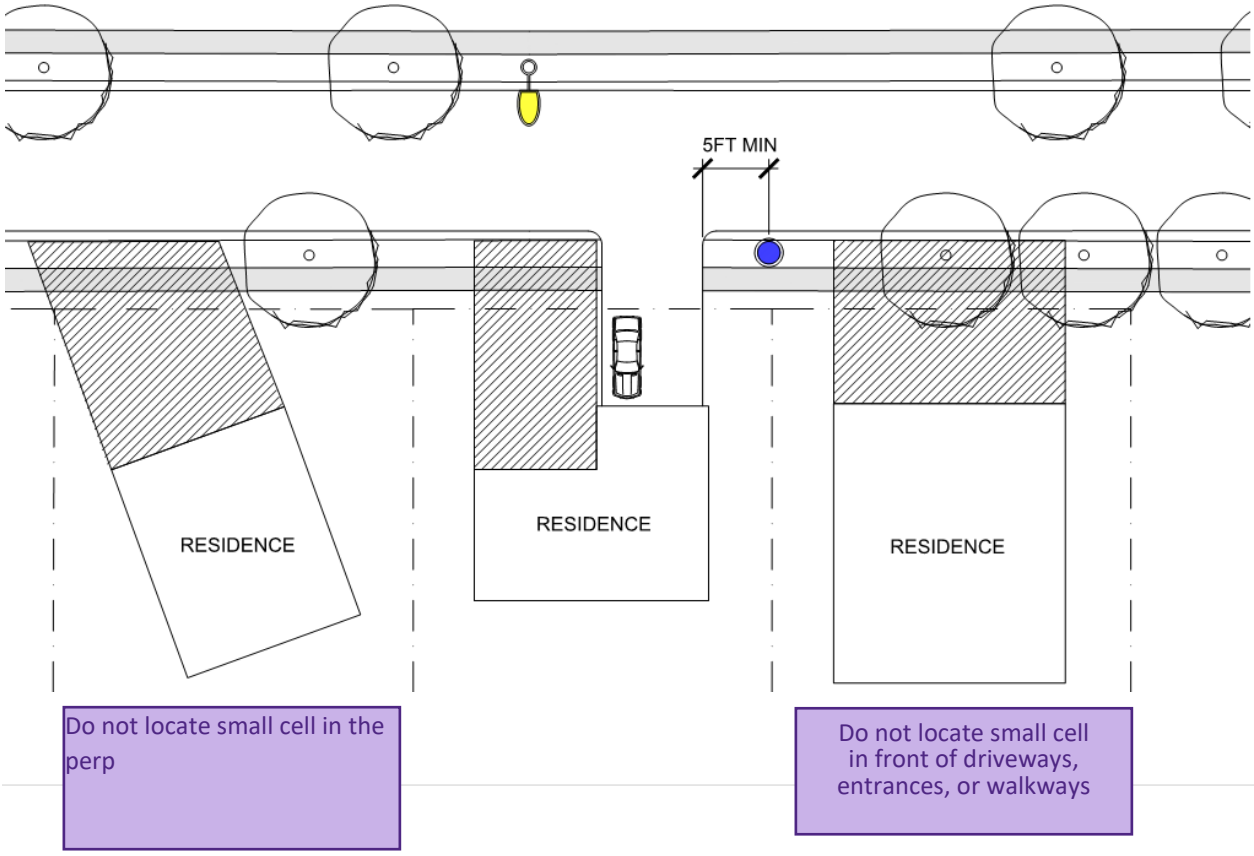


Figure 5. 92: Site identification plaques

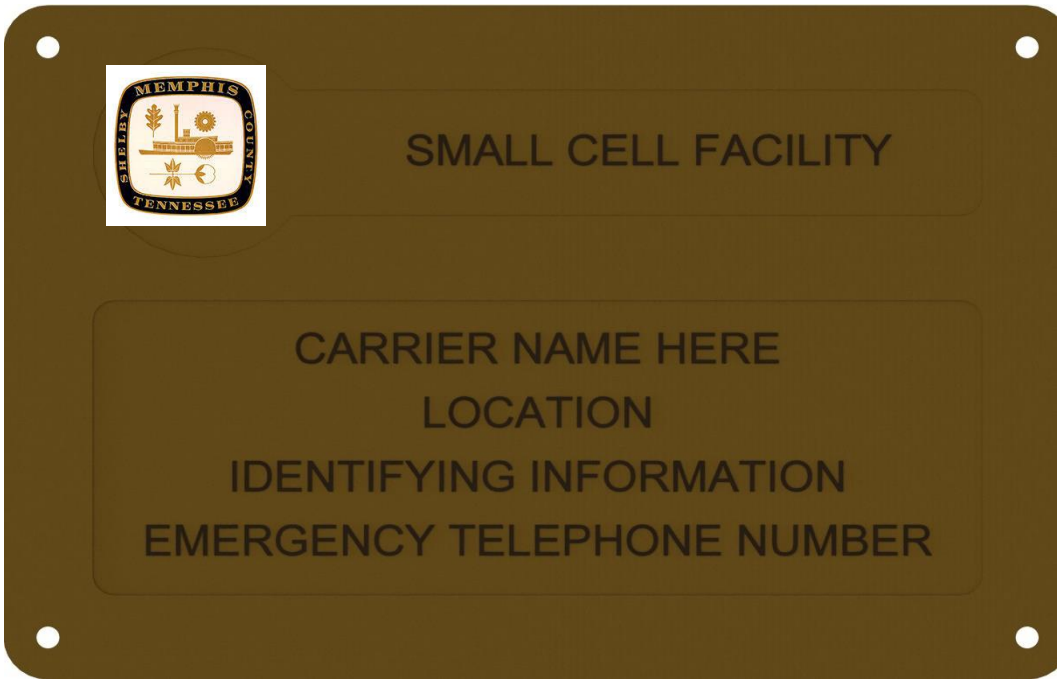


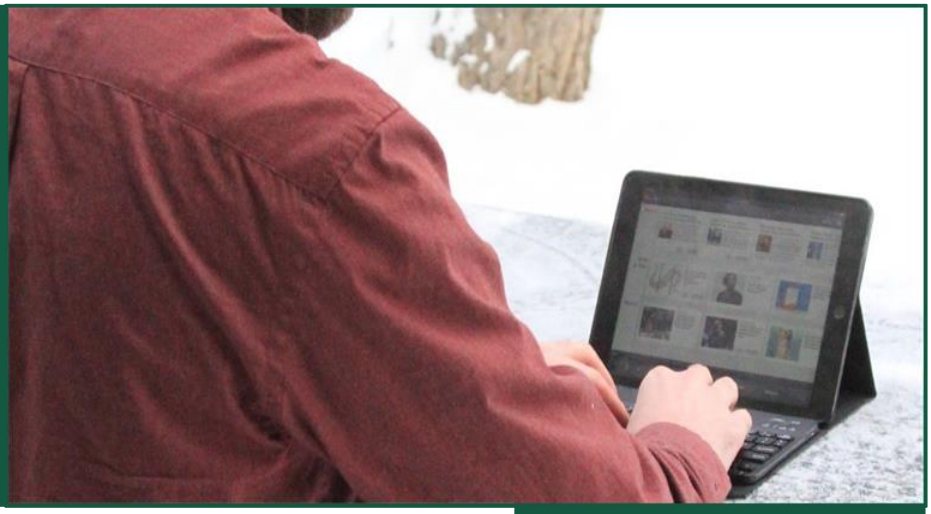
Figure 5.10 (Above) and Figure 5.11 Below – Site identification plaques and RF warnings shall comply with applicable OSHA and City standards. The Small Cell facility shall be identified with a permanent plaque affixed to the pole and placed where it is visible to technicians but generally not visible to the general public. The plaque should be made of a high-quality material, such as brass, and contain the City of Memphis logo as illustrated. RF labels should be less than 5" in their largest dimension and consistently applied throughout the City.

Figure 5. 100: RF warnings

Chapter

6

Community Considerations



Special considerations when preparing for installations in the right-of-way.

6 Community Considerations

6.1 Purpose

This chapter of the Guide is to be used when preparing small cell installation and construction considerations. In order to minimize the creation of visual clutter in the community, the City has addressed the use of poles in the right-of-way, and this chapter addresses other considerations, such as the marking and termination of fiber routes in the right-of-way.

6.2 Identifying Fiber Route

When identifying and marking fiber routes in the right-of-way, the City requires fiber routes be marked with surface markers. The use of a marker post is unacceptable in residential and developed areas of the City. Placement of fiber markers:

Figure 6.1: Unacceptable Fiber Route Marker

Figure 6.3: Acceptable Fiber Route Marker

6.3 Acceptable Methods of Fiber Route Termination

Fiber conduits shall terminate in a pull box and not left protruding from the ground.

Figure 6.3: Examples of Unacceptable Fiber Route Termination