Annapolis Small Cell System Guidelines

The City of Annapolis has established technical and aesthetic standards (Standards) to govern access to and use of the public right-of-way and City structures in the right-of-way by wireless carriers, infrastructure companies, or others (collectively referred to as "Attaching Entities" or "Applicants") for installation of small cell systems or "small wireless facilities" and associated equipment, as defined by the U.S. Federal Communications Commission.

These Standards are intended to ensure public safely and City employee safety, and to protect the community's aesthetic standards.

All Attaching Entities must follow the most current version of the National Electrical Safety Code (NESC) and all other applicable engineering standards, FCC standards, and other federal, state, and local standards and codes. Attaching Entities must also meet the City's operational requirements, as well as local aesthetic requirements.

PURPOSE

Annapolis Small Cell System Guidelines establish requirements for the placement and general design of wireless infrastructure and associated facilities within the City of Annapolis to address safety, streetscape, and potential engineering concerns.
Goals include:

- Mitigating visual and physical impacts within the streetscape across the City;
- Minimizing the impact on the character of public spaces, especially historic districts;
- Avoiding impacts to important view sheds, vistas, and landmarks.
- Protecting access and circulation to public open spaces.

DEFINITIONS

Streetlight pole. A streetlight pole is a structure owned, operated, or owned and operated by a public utility, the City, or the State of Maryland designed specifically to support a streetlight, that lights the public right of way. Historically such fixtures were called lamp posts.

Utility pole. A Utility pole is a structure owned, operated, or owned and operated by a public utility, the City, or the State of Maryland designed specifically for and used to carry lines, cables, or wires for communications, cable television, or electricity.

Cobra head fixture. A Cobra head fixture is a standard lighting fixture, typically attached to a pendant pole, wood pole or 5A pole.

Standalone poles. Standalone poles are independent poles that antennas are attached to for the purpose of transmitting wireless signals.

Streetscape elements. Streetscape elements are components that make up the city street, such as trees, light poles, bicycle racks, traffic cabinets, parking meters, signs, sculptures, and street furniture.

Third-party pole. A third-party pole is an existing pole in public space owned by a party other than the City or the cellular provider installed to provide public utilities and that can accommodate Small Cell infrastructure equipment.

Traffic signal pole. A traffic signal pole is any type of pole to which a traffic or pedestrian signal or other traffic right of way regulating equipment is attached. This includes Stop, Yield, and similar signage. It does not include street name, parking regulation, or similar signage.

DESCRIPTION OF POLE-MOUNTED SMALL CELL EQUIPMENT

As of the date of this version of the Standards, typical pole-mounted small cell equipment comprises:

1. Antennas on the upper part of pole
2. Radios, fiber terminations, and other equipment located in enclosures or cabinets or within the pole
3. A power meter and power disconnect switch, located in two separate, smaller enclosures or within the pole (and outside areas that exceed RF exposure limits, per the FCC)

Figure 1 through Figure 3 are conceptual drawings intended to demonstrate the basic elements of a small cell system attachment and how they typically fit together; the drawings are not to scale or representative of actual structures.

Figure 1 is an example of a small cell on a utility pole. Figure 2 illustrates a small cell on a light pole. Figure 3 shows a small cell on a customized light pole designed to conceal the cabinet.

Figure 1: Conceptual Drawing of a Small Cell on a Utility Pole

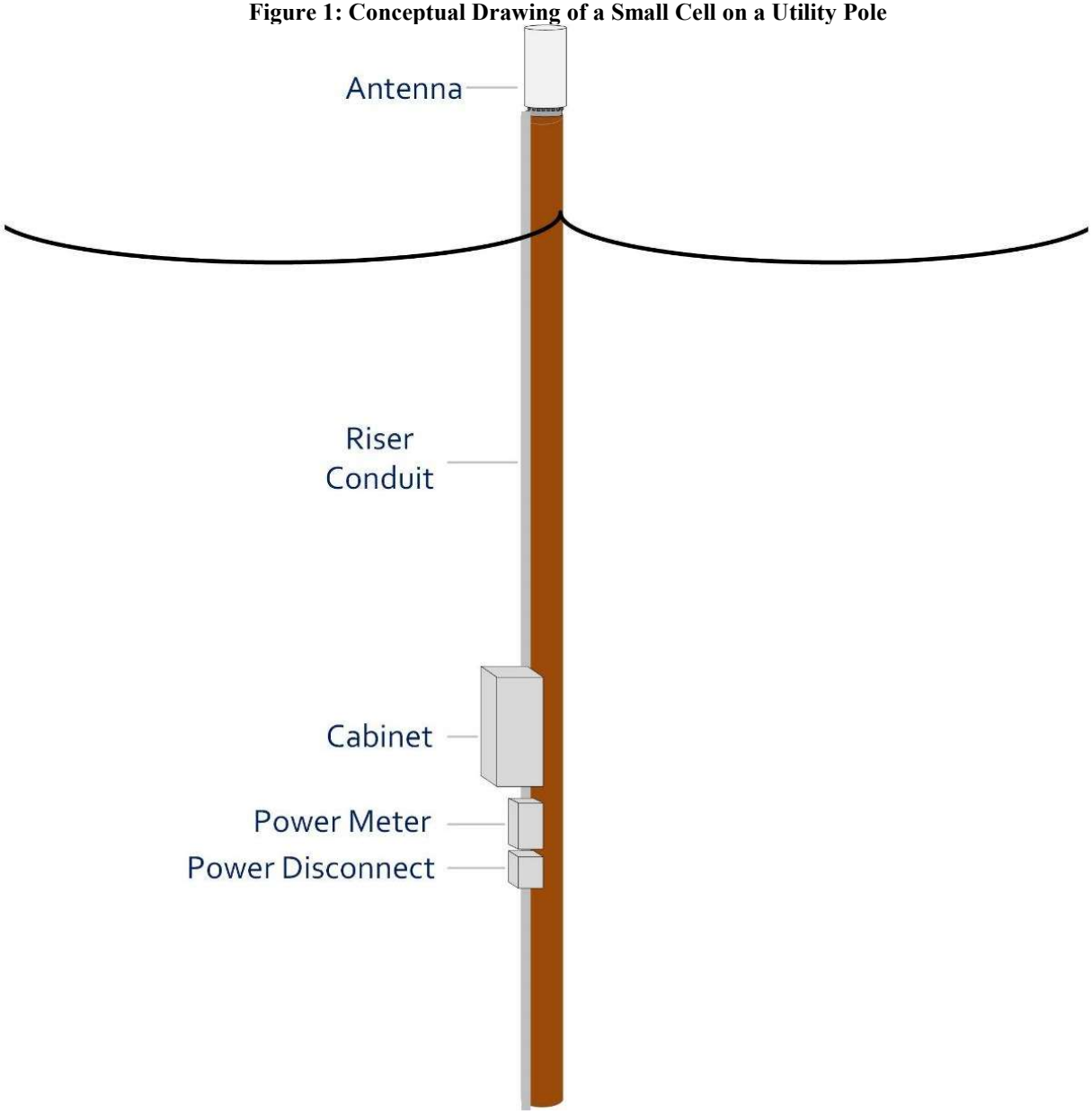


Figure 2: Conceptual Drawing of a Small Cell on a Light Pole

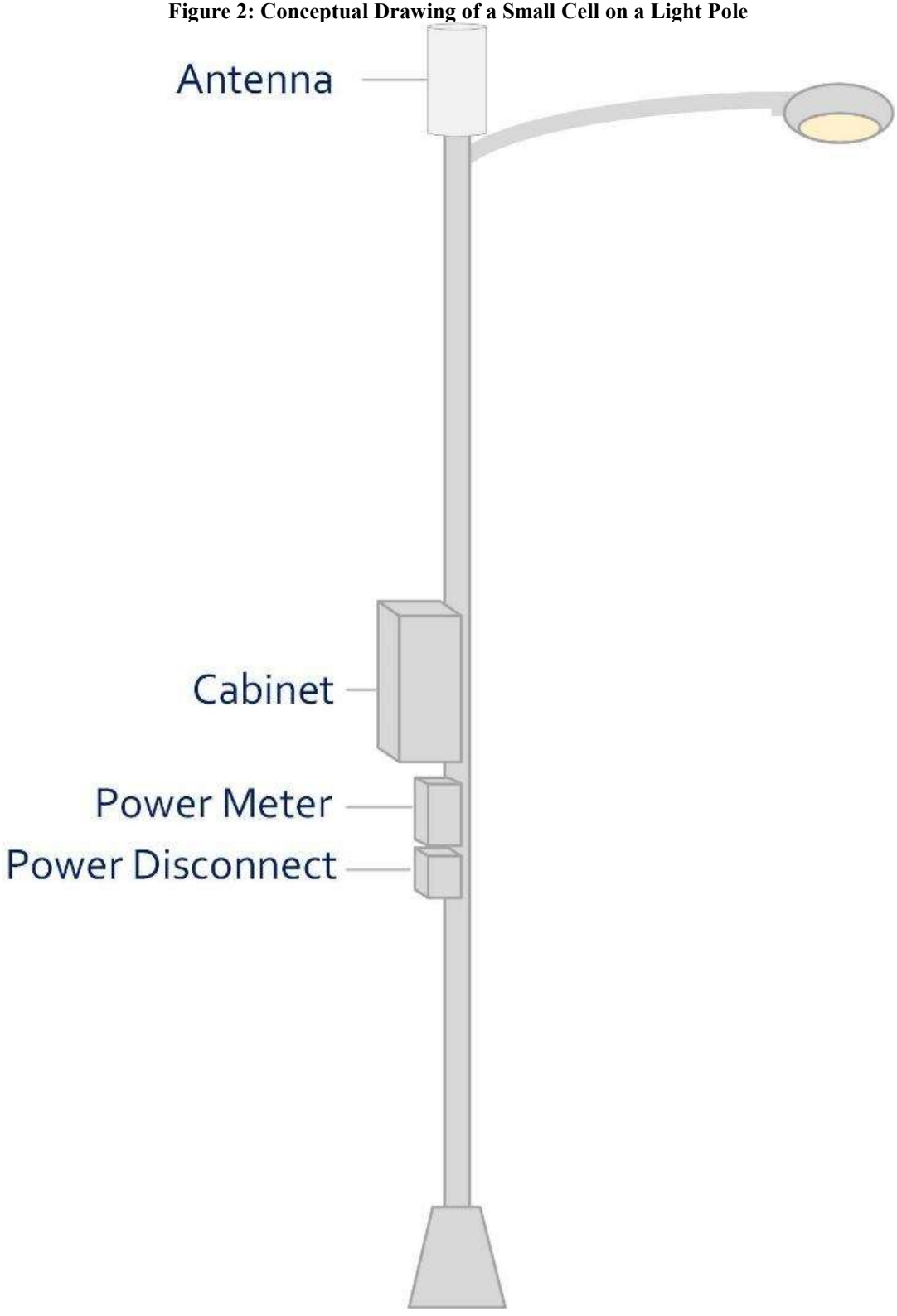
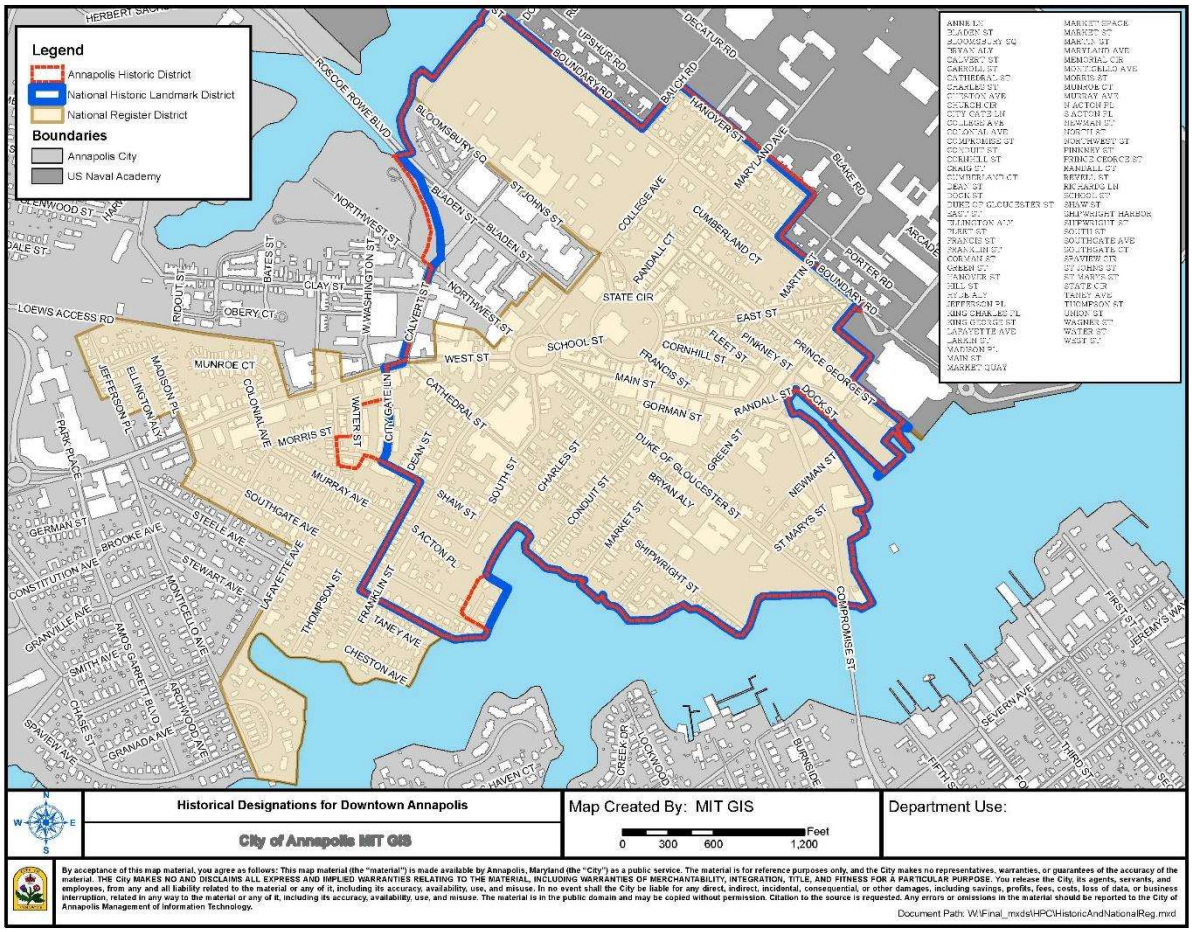


Figure 3: Conceptual Drawing of a Small Cell on a Light Pole with Concealed Cabinet

HISTORIC PRESERVATION ADDITIONAL REQUIREMENTS

In the Historic District, additional design guidelines apply for the installation of small cell systems.

Map of the Historic District Boundaries



The architectural and historic significance of Annapolis has been recognized both locally and nationally. Based upon its "exceptional value or quality in illustrating or interpreting the heritage of the United States," the Colonial Annapolis Historic District was designated one of forty-three National Historic Landmark Districts in 1965 by the U.S. Department of the Interior's National Park Service. In recognition of the superior preservation of its significant eighteenth, nineteenth and early twentieth century structures, an enlarged historic district was placed on the National Register of Historic Places in 1984.

Proposed projects in the Historic District require review and approval by the Historic Preservation Commission (HPC) prior to other permits. City Ordinance 21.56 may supersede the general guidelines below. A preliminary meeting is required with the Chief of Historic Preservation prior to the formal application process.

Should the project be determined to be feasible, a hearing before the Historic Preservation Commission may be required. Once an HPC Certificate of Approval is provided, then application can be submitted for other permits.

See the following link to all Historic Preservation requirements and forms:
https://www.annapolis.gov/876/Historic-Preservation-Division

NAVAL SUPPORT ACTIVITY ANNAPOLIS REVIEW REQUIREMENTS

There shall be notice in writing of installation to abutting property owners and Naval Support Activity sent as part of the application. This notice should include manufacturer, make, and model number of all equipment and subcomponents. The carrier network should include a detailed list of specifics.

In the event the Applicant wishes to add another carrier or change the carrier network using the small cell system, the Applicant shall notify the City and Naval Support Activity Annapolis in writing of the change in carrier and frequencies. Frequency bands listed by the FCC as unlicensed and available for open use may be transmitted or received as long as they do not cause interference with another Attaching Entity, FCC-licensed entity, or the City, Naval Support Activity Annapolis or the United States Naval Academy.

GENERAL TECHNICAL AND AESTHETIC REQUIREMENTS

This section describes the City's technical and aesthetic requirements for small cell systems. To the extent technically feasible, these include the following:

- In all cases, the placement of small cell systems shall be consistent with existing structures and aesthetics, in harmony with the surroundings, and as unobtrusive as possible.
- There shall be notice in writing of installation to abutting property owners sent as part of the application.
- Systems that are no longer operable must be removed within one month of decommissioning.
- Any contractor conducting work in the public right-of-way must be approved by the Department of Public Works and must coordinate with the Department prior to performing construction and maintenance of poles.
- Small cell systems shall not be installed on poles containing controls such as fire alarms, or police signals.
- The City prefers that small cell systems not be located on streetlight poles with traffic signs mounted on them. If an Applicant submits an application for attaching to a streetlight pole with a traffic sign, it must prove that it is not technically possible to use another pole.
- A single Applicant's small cell system shall be installed with a minimum spacing of 600 feet in residential areas.
- Up to two small cell systems may be installed at an intersection, each on a different corner.
- Two small cell systems at an intersection may not be operated by the same Applicant.

- Small cell systems shall use banners and coloring to match surrounding light poles and fixtures.
- Poles and light fixtures are to match or complement an existing precedent.
- Advertising on support structures or equipment is prohibited.
- Signs or illumination on the antennas or support structure are prohibited unless required by the FCC, the Federal Aviation Administration, or the City.
- A distinct marker (tag) shall be placed on a small cell systems that will allow for ready identification of the type of attachment, its owner, and contact information. The marker shall be limited to a 3-inch by 2-inch plate.
- No small cell systems shall extend over the roadway.
- On non-wooden poles, all cables shall be placed inside a housing or conduit and not visible on the outside from ground level.
- All antennas must be placed in-line or be flush-mounted with the pole.
- When antennas are placed in-line with the pole, antennas must have a smooth cylindrical shape (ideally, a single canister, or multiple separate antennas placed inside sheeting that is flush with the pole, or a form factor in which multiple antennas merge into a single smooth shape. For example, physically separate panel antennas for each sector).
- All small cell systems shall utilize stealth and concealment methods to limit their visual impact where feasible. Stealthing features should include blending with the environment, concealing the equipment and antennas, and limiting the overall size including the height.
- Panel antennas must be flush-mounted with the pole.
- Antennas on light poles must be the same color as the pole. Antennas on wooden utility poles must be a neutral, unobtrusive color (e.g., black, brown, dark green).
- On a non-wooden pole, the power meter and power disconnect switch must be located inside the pole unless not allowed by the utility provider.
- The City prefers the use of tapered shapes that smoothly integrate into structures (avoiding, for example, new rectangular boxes).
- A replacement pole elevation is limited to a one-time, 10-foot increase from the pre-existing original pole (i.e., top of existing structure to top of proposed structure). Height increase can only be used one time per location.
- Antenna attachments are limited to the following types and dimensions:
    - Small antennas enclosed in a canister with a combined maximum height of 4 feet and a maximum total volume of 9 cubic feet.
    - Small antennas enclosed in a panel with a combined maximum height of 2.5 feet and a maximum total volume of 2.5 cubic feet.
    - Small antenna circling the structure with a maximum total volume of 2 cubic feet.
- The owner of system that is located within the Historic District shall mitigate any adverse visual impact of the system in the manner determined by the Department of Planning and Zoning and the Historic Preservation Commission pursuant to Chapter 21.56.
- A system may be located on the rooftop of an existing nonresidential structure or multifamily dwelling structure with more than 10 units, but the system may not extend above the existing roof height by more than 15 feet.

- A system attached to a transmission line pole or tower may not laterally project more than 15 feet beyond the cross arms or other support extensions affixed to the pole or tower and may not project above the top of the pole or tower by more than 15 feet if the pole or tower is to support one provider or 25 feet if the pole or tower is to support more than one provider. The pole or tower, including all projections, may not exceed 10% of the existing height. All accessory structures shall be underneath the transmission line within the drip line of the outermost lines or located from the edge of the transmission line right-of-way by a distance no less than the minimum setback required for accessory structures in the zoning district in which the facility is located.
- Before any new work is completed, all new and existing lines shall be secured in a way that is not visibly obtrusive,

Equipment Cabinets

Any equipment cabinet:

- Shall use a tapered design, instead of a rectangular box shape.
- Must not exceed a maximum volume of 12 cubic feet and a maximum width of 30 inches; cabinets that are non-rectangular in shape must be comparable or less in volume and visual impact.
- Must be painted or screened to be the same color or design of the pre-existing structure.
- Must be flush-mounted to the pole or in line with the top of the pole and the antenna. If not, it must not extend beyond the diameter of the pole below to prevent pedestrian head injuries.
- Must not protrude from the surface of the pole by more than 6 inches in any direction.
- Any protrusion must be at a height of at least 10 feet.
- Must be on the side of the pole facing away from the roadway.
- May be placed inside the pole, such as in the base of the pole in a way that integrates with the design of the pole.
- Cabinets may either be mounted on a pole or on a concrete slab within 50 feet of the pole where the small cell systems is mounted.
- Surface-mounted cabinets must be on a concrete slab, and where possible must be placed next to existing pedestals and cabinets (for example, near a traffic signal).
- Surface-mounted cabinets must be the same color as other nearby pedestals or cabinets. Where there are no other nearby pedestals or cabinets, the cabinets should be the same color as the pole housing the antenna.

Signs

Advertising on support structures or equipment is prohibited.

- Signs or illumination on the antennas or support structure are prohibited unless required by the FCC, the Federal Aviation Administration, or the City.
- A distinct marker (tag) shall be placed on small cell systems that will allow for ready identification of the type of attachment, its owner, and contact information. The marker shall be limited to a 3-inch by 2-inch plate.

Approved signage compliant with FCC OET Bulletin 65 shall be posted at each pole or streetlight pole hosting a small cell systems, and/or at multiple locations on such pole structure as required by FCC OET 65. The RF signage shall comply with the appropriate and predetermined exposure level applicable to the "General Public," "Occupational Worker[s]," and "Specialized Worker[s]" as shown in Figure 4 below. All signage shall be 8 inches x 12 inches and made of weather-, corrosion-, and ultraviolet- (UV) resistant materials.

RF Exposure

Applicants shall comply with all provisions and guidelines of the FCC's OET Bulletin 65, as may be amended from time to time. Upon request, Applicants shall submit a report certifying FCC OET 65 compliance for each small cell system installation. Applicants are responsible for addressing all potential questions/complaints about RF that may be brought forth by residents. If, during a modification to a small wireless facility the effective radiated power of an antenna is increased, the Applicant shall provide an environmental evaluation for RF exposure. The following elements, at a minimum, must be contained within the report:

- A statement of compliance
- Date of the report
- Date of statement of compliance
- Pole number proposed for the small cell systems installation
- Applicant's site or identification number for the small cell systems installation
- GPS coordinates of the proposed pole
- Calculation of RF power at the antennas
- Calculation of RF power within 6 feet of ground level and at ground level
- Location of the applicable signage with above-ground-level height listed.

Upon request by the City, the Applicant shall perform RF field tests while the small cell system is in operation, supervised by the City, to demonstrate compliance with FCC OET 65.

Approved signage compliant with FCC OET Bulletin 65 shall be posted at each pole or streetlight pole hosting a small cell system, and/or at multiple locations on such pole structure as required by FCC OET 65.

The RF signage shall comply with the appropriate and predetermined exposure level applicable to the “General Public,” “Occupational Worker[s],” and “Specialized Worker[s]” as shown in Figure 4 below. All signage shall be 8 inches x 12 inches and made of weather-, corrosion-, and ultraviolet- (UV) resistant materials.

Figure 4: RF Signage

Each approved small cell system shall have a clearly marked disconnect switch adjacent to the electronics cabinet and located outside areas that exceed RF exposure limits. Once the shut-off switch is placed in the open position, the electronics equipment related to the installation shall not be energized. Additionally, no RF transmissions shall be emitted by any antenna related to the installation.

If the City determines that the small cell system is interfering with public safety communications, the City at its sole discretion may shut it off using the power shut-off and notify the owner if necessary.

Spacing among Streetscape Elements

- Excavation or installation of small cell systems may damage an existing tree's critical root zone or canopy. Trees shall not be removed or have their critical root zones or canopy damaged for the installation of Small Cell infrastructure, regardless of whether the application is for a standalone pole or to replace an existing City streetlight or 3rd party pole. The protected zone shall be equal to one foot for each inch of the tree's diameter, as measured at 4.5 feet above ground, or a minimum of 15 feet, whichever is greater. The protected zone shall be measured from the outside of the tree to protect root growth and should be marked with a fence or barrier.
- Poles shall not be placed where they limit the ability of City staff to plant a street tree in the future, regardless of whether the City plans to plant a tree in that location at the time the application is submitted.

The following table shows preferred installation interval lengths.

Table 1: Permissible Installation Interval Lengths

Blockface Length Intervals[1]	Number of Small Cell Facilities Permitted per Blockface[2] outside of the Historic District	Number of Small Cell Facilities Permitted per Blockface within the Historic District	Minimum Distance between Facilities on same Blockface[3]	Minimum Distance between Facilities on Same Blockface within the Historic District	Limit per Carrier per Block[4]
0'-150'	1	1	N/A	N/A	1
151'-300'	2	1	60'	60'	1
301'-450'	3	3	60'	75'	1
451'-600'	4	4	60'	90'	1
601'-750'	5	5	60'	150'	2
Over 750'	6	6	60'	120'	2

[1]Block lengths should be measured along the edge of curb between the edge line extended of adjacent intersection streets.
[2]This is inclusive of all types of installations and regardless of carrier.
[3]The minimum distance between two facilities sharing the same side of the block. Distance should be measured in a linear fashion along the edge of curb between the two facilities' center points.
[4]A block is identified as two opposing blockfaces.

Licensed Frequencies
Antennas shall only transmit or receive frequencies that are licensed by the FCC to the Applicant or to the carrier the Applicant represents. In the event the Applicant wishes to add another carrier or change the carrier network using the small cell system, the Applicant shall notify the City in writing of the change in carrier and frequencies.

Frequency bands listed by the FCC as unlicensed and available for open use may be transmitted or received, as long as they do not cause interference with another Attaching Entity, FCC-licensed entity, or the City.

If the City experiences interference, the Applicant or its successor shall pay for an expert third-party review and to remediate the interference. The City reserves the right to remove the small cell system if the interference is not corrected.

Wireless Backhaul
The small cell system may be connected via wireless backhaul services. The volume and height of any antenna used for wireless backhaul services is counted toward the total antenna size.

Backup Power
Battery backup power devices shall be installed with a transfer switch to prevent back-feeding into the electrical system. No other types of backup power shall be permitted.

APPLICATION DESIGN DOCUMENTATION STANDARDS

The Applicant must have a current, executed Right-of-Way Agreement on file with the City. The City will not consider an application submitted until the Right-of-Way Agreement is executed, the Applicant's annual plan is filed, and the annual plan fee is paid. If the application is for an attachment to a City pole, an executed Master License Agreement for attachments to City poles must also be on file with the City.

Small cell systems should be attached to a pre-existing support structure or a like structure replacing an existing structure. However, if the Applicant can demonstrate that no co-location opportunities exist in the area where it demonstrates a need for a small cell system, the Applicant may propose that a new pole or other support structure be constructed for purposes of installing the small cell system.

The City has established an order of preference for small cell system installation types (Table 2). The most preferred types are those that have the lowest incremental impact and use existing resources. Therefore, a mid-span microcell is the most preferred installation type.

Table 2: Installation Type Preference

From Most to Least Preferred
1. Mid-span microcell
2. Replacement pole
3. Wooden utility pole
4. New pole

The next most preferred installation type is a replacement pole, followed by a wooden utility pole (which are less easily concealed), followed by a new pole.

The following sections describe applications for a) a new pole, b) replacing a pole with a like structure; c) user of a third-party pole, and d) multiple attaching entities for the same pole.

a. Application for a New Pole

The new pole should use one of standard designs in Appendix A. The applicant should follow the preference order shown in Table 1 and only proceed to the next option if it can be demonstrated that the preferred design cannot provide the required technical capability.

In an area outside of the Historic District with decorative poles, the Applicant shall use the pole type designated for that area, if there is a designated type.

Under circumstances discussed below, the Applicant may propose an alternative design.

To apply to place a new pole, the Applicant shall provide:

- Justification for why the site was selected. Describe the purpose of the site and, if applicable, why it is not being co-located. List all existing co-location choices within 500 feet and describe why they cannot be utilized.

- A photographic simulation of the structure and equipment from at least two different directions and approximately one-fourth mile away. If the new structure is visible from adjoining parcels, include views from the adjoining parcels.
- Engineering design and specification drawings in compliance with the most recent version of the City's Department of Public Works engineering design manual.

In all cases, small cell systems and associated support structures shall be located to avoid any physical or visual obstruction to pedestrian or vehicular traffic or any other safety hazards to pedestrians, cyclists, or motorists. If the City determines that a proposed location would present any such hazards, the City shall require the Applicant to choose an alternate site.

The City will conduct an additional review of the application for a new structure to determine:

- The demonstrated need for placing the structure at the requested location in order to deliver or enhance service, and that the Applicant has demonstrated that there are no other effective tech no logical means for delivering the service
- The impact of placing a new structure or facility in the subject area
- The character of the area in which the structure is requested, including surrounding buildings, properties, and uses
- Whether the appearance and placement of the requested structure is aesthetically consistent with the immediate area
- The Applicant's technical objectives and whether the Applicant should use available or previously unconsidered alternate locations to place the support structure or small cell system
- The City may seek public comments or require a public hearing as part of the review.

b. Application for a Replacement Pole

City streetlight poles are not designed to support small cell systems. The Applicant is required to replace an existing City streetlight pole with a pole that provides the functionality of the existing pole and that is designed to support a small cell system.

The replacement pole should use one of standard designs in Appendix A. The applicant should follow the preference order shown in Table 1 and only proceed to the next option if the preferred design cannot provide the required technical capability.

In the case of the Applicant replacing a decorative pole, the Applicant shall use a design consistent with the existing decorative light poles.

c. Application for a Third-Party Structure

If the Applicant is attaching a small cell system to a third-party structure in the right-of-way, such as installing a mid-span microcell or attaching to a wooden utility pole or streetlight owned by the power utility, the Applicant shall comply with the standards, processes, and permitting requirements of the City and the owner of the structure and apply to the City to place the small cell system in the right-of-way.

As part of the application to the City, the Applicant shall provide a letter on applicant letterhead confirming it has applied to the third-party owner to use its structure.

d. Applications from Multiple Attaching Entities for the Same Pole
The City will consider complete applications received from multiple Attaching Entities to attach to the same pole on a "first-come, first-served," non-discriminatory basis.

In the event the Attaching Entity fails to pay its application fee and perform construction within the timeline in the agreement, the City may reject the application and accept other applications for that pole. If the City receives a subsequent application from a second prospective Attaching Entity following acceptance of a complete application and prior to completing electrical construction or issuing a Notice to Proceed on the first application for a pole, the City shall reject the second application and any subsequent applications for the same pole if there was no coordination with the Applicant that submitted the first application.

The City will reconsider the rejected application if it is revised and resubmitted to eliminate the conflict with the first-in-time application previously approved.

Use of Alternative Pole Design
Small cell system on replacement poles shall follow one of the standard designs in Appendix A, which establish minimum standards, expedite the review process, establish consistency in the types of poles, and provide the Applicant with the flexibility of a wide range of configurations and potential equipment suppliers.

However, if the Applicants can prove that that it is not technically feasible to use one of the standard designs, they may propose an alternative pole design. If the Applicants opt to deviate from a standard design (see Appendix A), they must submit evidence that the standard designs will not accommodate the proposed facility. A proposed design and a structural analysis shall accompany the application.

The City will conduct an additional review of the application for an alternative structure to determine:

- The demonstrated need for an alternative design at the requested location and geographic area in order to deliver or enhance service, and that the Applicants have demonstrated that there are no other effective technological means for delivering the service with a standard design
- The impact of placing the proposed structure or facility in the subject area
- The character of the area in which the structure is requested, including surrounding buildings, properties, and uses
- Whether the appearance and placement of the requested structure is aesthetically consistent with the immediate area
- The Applicants' technical objectives and whether the Applicants should use available or previously unconsidered alternative locations to place the small cell system.

The City may seek public comments or require a public hearing as part of the review.

Attaching to Existing Utility and Cobra Streetlight Poles

The following are applicable when locating small cell system on existing utility and streetlight poles within the public right of way:

- Any installation on existing poles must comply with City Code.
- All small cell systems and associated equipment located within the public right of way shall be located such that they meet ADA requirements and do not hinder, obstruct, impede usual pedestrian and vehicular travel.
- Small cell systems must be shrouded, enclosing wires and equipment. Any separate ground mounted equipment, including backup power supply, in the public right of way also needs to be included in the application.
- Small cell system attachments and hardware shall be colored to match the existing pole or colored to match similar infrastructure along the block face. If located on a wooden pole, attachments shall be colored to match the color of the pole or a similar earth tone color.
- The attachment of small cell systems to the reproduction historic lamp posts is not allowed.

Replacement of Existing Utility and Streetlight Poles

A replacement streetlight pole shall be installed in the same location as the original pole location, as close as possible to the line between the residential or business lots. It shall serve the purpose of the original pole (i.e., lighting) while also serving as a supporting structure for the small cell system.

The following are applicable when locating small cell systems on replacement utility and streetlight poles within the public right of way:

- Any installations on replacement poles must comply with City Code.
- Increases in pole height needed to meet utility safety requirements are not to exceed 10 feet greater than the existing pole to be replaced. Increases in pole height should be minimized to the greatest extent possible. No pole shall exceed by more than 10% the height of existing poles.
- Replacement poles must be in the same general location of the existing pole or a comparable location in the public right of way.
- Replacement poles shall be located such that they meet ADA requirements and do not obstruct, impede, or hinder usual pedestrian or vehicular travel.
- Small cell systems must be shrouded, enclosing wires and equipment. No separate ground mounted equipment, including backup power supply, shall be allowed within the public right of way.
- Small cell systems shall be colored to match similar infrastructure along the block face. If located on a wooden pole, small cell systems shall be colored to match the color of the pole or a similar earth tone color.

New Standalone Structures within the Public Right-of-Way or other Public Property

The guidelines provided are for single or multi-carrier installations of new standalone structures. The following are applicable when locating, small cell systems on new standalone structures:

- Any installations on new standalone poles must comply City Code.
- New standalone structures shall be located such that they meet ADA requirements and do hinder, obstruct, impede usual pedestrian and vehicular travel.

- New standalone structures, to the greatest extent possible, shall be in alignment with existing trees, utility poles, and streetlights.
- All small cell systems shall be internally contained to the pole and or concealed by an exterior shroud. No separate ground mounted equipment, including backup power supply, shall be allowed within the public right of way.
- New standalone structures shall be cylindrical, straight, and colored to match similar infrastructure along the block face.
- No new standalone pole shall exceed more than 10% the height of existing poles without additional context study.

Small Cell Systems Outside of the Public Right of Way

The following are applicable when locating small cell systems outside of the public right of way:

- New standalone structures outside of the public right of way must comply with City Code.
- Small cell systems should avoid the creation of clutter and be placed to blend with existing structures.
- Building rooftop small cell systems should be either flush mounted to surface walls, camouflaged, screened or placed to not be visible from the surrounding area.
- New standalone structures shall be located such that they meet ADA requirements and do not hinder, obstruct, impede usual pedestrian and vehicular travel.
- New standalone structures, to the greatest extent possible, shall be in alignment with existing trees, utility poles, and streetlights.
- All standalone structures shall be internally contained within the structure and/or concealed by an exterior shroud. No separate ground mounted equipment, including backup power supply, shall be allowed.
- New standalone structures shall be cylindrical, straight, and colored to match its surroundings.
- No new standalone pole shall exceed more than 10% the height of existing poles without additional context study.

Documentation

The Applicant shall indicate the design of the support pole, the small cell system, and any other attachments (such as wind load, fiber demarcations, battery backup, and power meters) in the design documentation. Design documentation shall include any handholes, manholes, pedestals, demarcation enclosures, splice cases, and duct surrounding the small cell system and illustrate how the backhaul and power will interconnect with the small cell system.

Design documentation shall be specific to the design with no handwritten or superimposed annotations other than the Professional Engineer's signature and stamp where required. Design documentation containing strictly generic typicals will not be accepted. Design documentation shall be original plotted digital renderings created with computer-aided design software and presented in PDF file format. No individual document may be larger than 5 MB in size. Design documentation of poor visual quality (as determined by the City reviewer) may not be accepted.

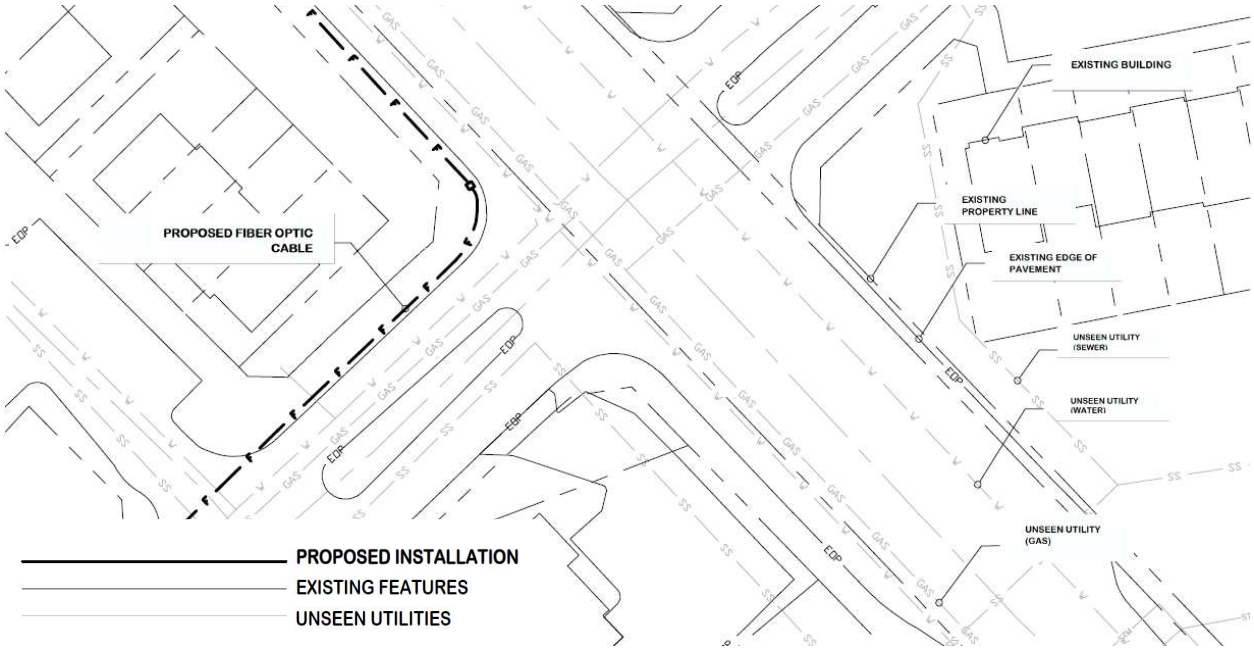
Paper Size
All design documentation shall be legible when printed according to the ANSI B standard for 11 inches x 17 inches. Drawings may be submitted in a larger, ANSI D format (i.e., 22 inches x 34 inches) but must contain an accurate alternate scale when printed at 11 inches x 17 inches. Architectural sizes (i.e., ANSI A and ANSI C) are not acceptable size formats.

Abbreviations
All annotations, call-outs, notes, and descriptive text shall be in plain language. If abbreviations are used to promote clarity in the design documentation, the Applicant shall follow the City's Department of Public Works engineering design manual.

Line Weights and Annotations
Descriptions of existing aboveground features on plan view and profile view sheets shall have a consistent line weight. Descriptions of existing belowground utilities and features shall have a consistent line weight that is lighter than existing aboveground features. All features and components of the proposed small cell system—as opposed to existing conditions—shall have a consistent, heavier line weight than existing aboveground features. All annotations for the proposed small cell system shall be bolded and noticeably heavier than other annotations on the plan and profile sheets.

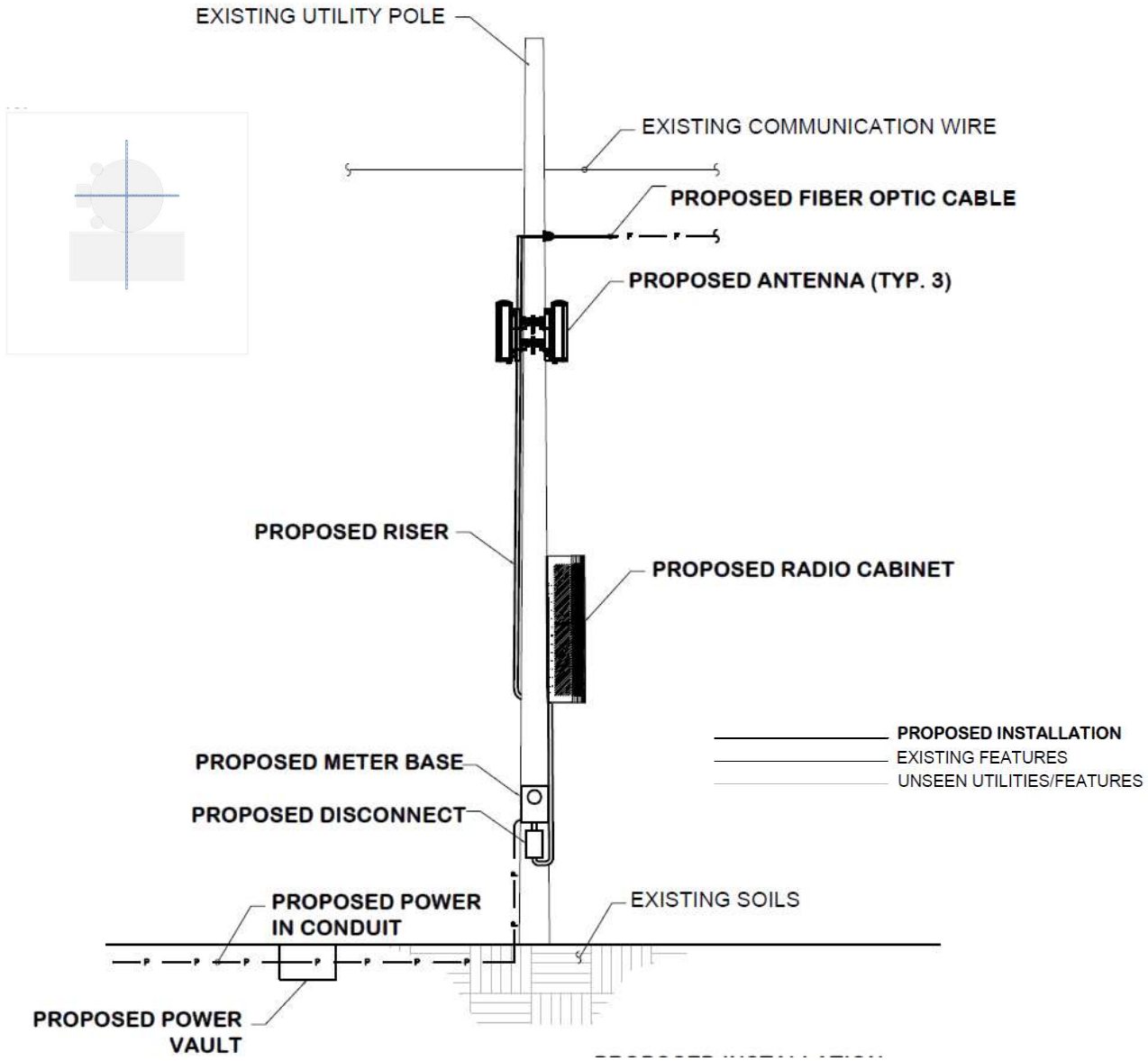
A plan sheet example with suitable line weights and annotations is shown in Figure 5. A sample profile sheet with suitable line weights and annotations is shown in Figure 6 (below).

Figure 5: Sample Plan Sheet with Suitable Line Weights and Annotation[1]



[1] Annotations for travel lanes, road names numbers, clear zone, and right-of-way were omitted for clarity.

Figure 6: Sample Profile Sheet with Suitable Line Weights and Annotation



Required Sheets and Information

Design documentation shall include, at a minimum, the following sheets for all types of applications except for small cell system removal:

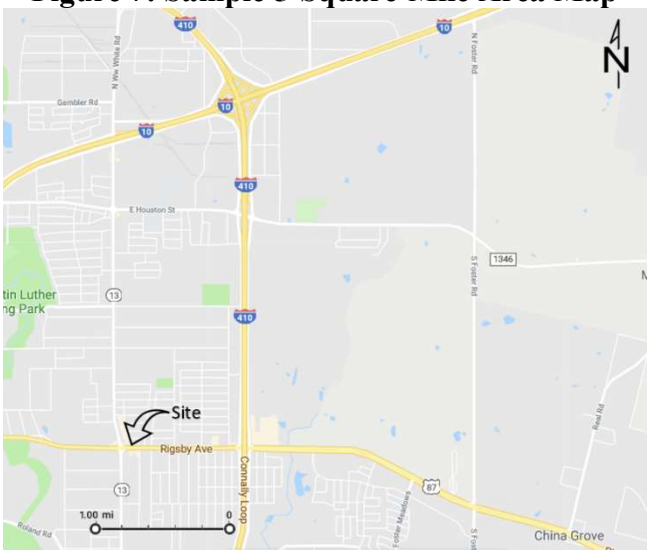
- Title
- Plan
- Profile
- Equipment
- Traffic control plan
- Typicals (optional)

Applications to remove a small cell system shall include a title sheet, a list of items that will be removed, traffic control plans, and a description of proposed restoration.

Title Sheet Requirements
The title sheet shall include the following items:

- Road name and number
- Applicant's site name and/or identifier number
- Full address of proposed small cell system location (if none available, use closest address to assist the reviewer in finding the site)
- Historic district name, if applicable
- Latitude and longitude expressed in degree/decimal format (e.g., XX.XXXXXX) to the NAD83 standard and accurate to ±1 meter.
- Email and phone number for the Applicant's engineer
- Email and phone number for the Applicant's single point of contact
- 5-square-mile map of the area for orientation purposes (see Figure 7)

Figure 7: Sample 5-Square-Mile Area Map



- A list of applicable codes and applicable engineering standards (most recent version) with which the application complies
- Sheet index (table of contents) listing only submitted sheets
- Seal and signature from a State of Maryland-certified Professional Engineer (P.E.)
- P.E.'s statement with the following signature line placed in the lower right-hand quadrant of the title page:

I, _____, a registered Professional Engineer in the State of Maryland, do hereby certify that this drawing was prepared by me, or under my direct supervision, and that all information contained herein regarding safety is in accordance with the listed applicable codes and applicable engineering standards, without exception or exclusion, stated or otherwise.

_____
PE Signature

Requirements for Plan Sheets
The Plan sheets shall accurately depict existing features that apply, such as:

- State roads and interstates (name and number)

- Local roads (name)
- Private roads
- Public rights-of-way and other rights-of-way and property lines
- Sidewalks and accessibility ramps
- Bike trails/lanes/paths
- All existing visible features, street furniture, and structures within the City rights-of-way
- Property addresses for parcels abutting the City rights-of-way
- Area zoning boundaries and indication of the zone type, if any (e.g., residential, mixed-use, commercial, industrial)
- Premises outlines with address numbers, if applicable
- Existing underground utilities
- Visible underground utility appurtenances (e.g., valves, fire hydrants)
- Annotation to identify surface type (e.g., pavement, grass, bituminous)
- Hydrology/flood plains
- Stormwater management and culverts
- North arrow indication
- Recorded easements (for new poles)
- Limits/boundary of construction
- Notes to identify method of construction (if not explained on a typicals sheet)
- Reference to any applicable detail illustrations on the plan sheet or a separate typicals sheet
- Any structure proposed to be installed or replaced
- A color photo of the proposed small cell system location and adjacent streetscape (with approximate placement identified) taken during a field visit conducted within 60 days of the date of the application submittal; internet street-view photos are not acceptable, and the size of the photo shall be no less than 3 x 4 inches when printed on an 11 x 17-inch sheet

Plan sheets may have aerial imagery as the base layer. The Applicant's P.E. shall confirm that the aerial imagery is suitable to depict current conditions as related to the application. If a plan sheet with aerial imagery is used, an additional plan sheet of the same perspective, orientation, scale, and detail will be required without the imagery.

Plan sheets shall include the dimensions of all setbacks, offsets, and road widths related to the proposed small cell system. Dimensioning should include but not be limited to:

- Road and City right-of-way widths
- Distance from existing and proposed underground facilities to the City right-of-way and edge of pavement (for new poles)
- Distance from hydrology and flood plains to proposed facilities
- Widths of sidewalks, accessibility ramps, bike trails, bike lanes, and bike paths
- Setback to premises

Plan sheet features shall be drawn to scale except for symbols. Symbols are only to be used to preserve clarity (i.e., an existing 8-inch water line does not need to be drawn to scale). The main plan sheet scale must be in the range from 1: 30 (inch: foot) to 1: 50. Detailed illustrations can be added to show greater clarity using a larger scale (e.g., 1: 10 or 1: 5).

Profile Sheet Requirements
A profile sheet shall accurately depict the following items:

- View direction (facing)
- The entire dimension of the pole (new/proposed/existing)
- Existing structure view, if the proposed small cell system will replace an existing structure
- Proposed structure view, or two different adjoining views (e.g., north and west) if it is a new structure
- All attached small cell system equipment (e.g., antenna, ancillary equipment)
- Foundation view or reference to typical sheet for proposed foundations
- Buried pole depth for new or replaced pole without foundation
- Proposed hand boxes, vaults, and hand holes
- Proposed underground conduits (within 10 feet of the network support structure)
- Grounding detail or reference to typical page
- Proposed ground-based enclosure
- Roadway features, including driveways, ramps, and sidewalks, to verify pole location will not interfere with proposed Improvements
- Minimum depth of cover for proposed power and communications conduit
- Offset from City right-of-way line to power

All the following items shall be dimensioned:

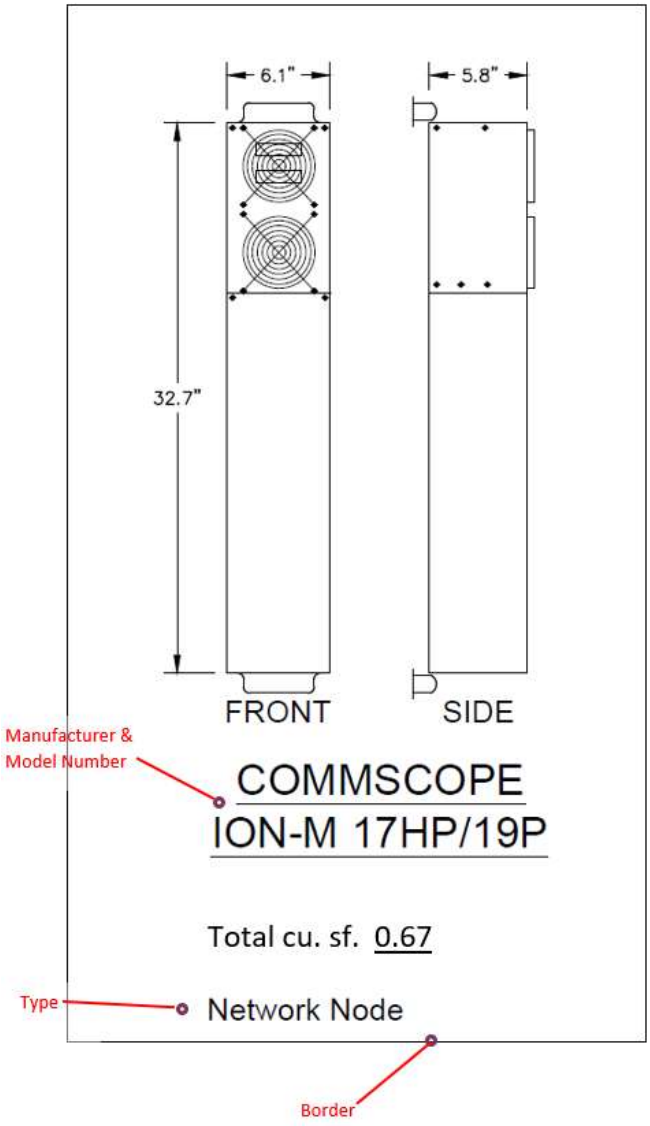
- Antenna height above pole
- Pole dimension at the base
- Distance from City right-of-way line
- Antenna and cabinet offset from pole
- Overall height of the pole above grade
- Vertical clearance of any adjacent overhanging roadway
- Ground-based enclosures and height above grade
- Pole-mounted enclosures and height above grade

Equipment Sheet Requirements
Equipment sheets are specialized typical detail sheets that tabulate cubic volume for a small cell system. An equipment sheet shall accurately include each of the following that apply:

- Plan view and profile view, or multiple profile views, or combined plan view and profile view (isometric) of any visible component with a measurement greater than 6 inches
- List of external components separately in typical detail
- Length, width, and depth in inches or feet and inches for any length greater than 10 feet
- Manufacturer and model number
- Total cubic feet

Each component shall be identified as an antenna, a small cell system, or ancillary equipment. Each typical detail on the equipment sheet shall be numbered and labelled to reference the typical sheet. The use of borders around details is required. See Figure 8.

Figure 8: Sample Typical Detail (Small Cell System)



In addition to the individual component typical detail, each equipment sheet shall include a separate note box that identifies the total small cell system volume, in cubic feet, as shown in Figure 9. The total cubic feet note shall be in bold type, located in the lower right-hand quadrant of the equipment sheet.

Figure 9: Sample "Total Cubic Feet" Note

TOTAL SMALL CELL SYSTEM CUBIC VOLUME (cu. sf.): **TOTAL ANTENNA CUBIC VOLUME (cu. sf.):** **TOTAL ANCILLARY EQUIPMENT CUBIC VOLUME (cu. sf.):**

Line work and annotations shall be drafted using computer-aided design software. Scanned or cropped images are not acceptable. Equipment shall be drawn to the scale in the plan view and profile view sheets.

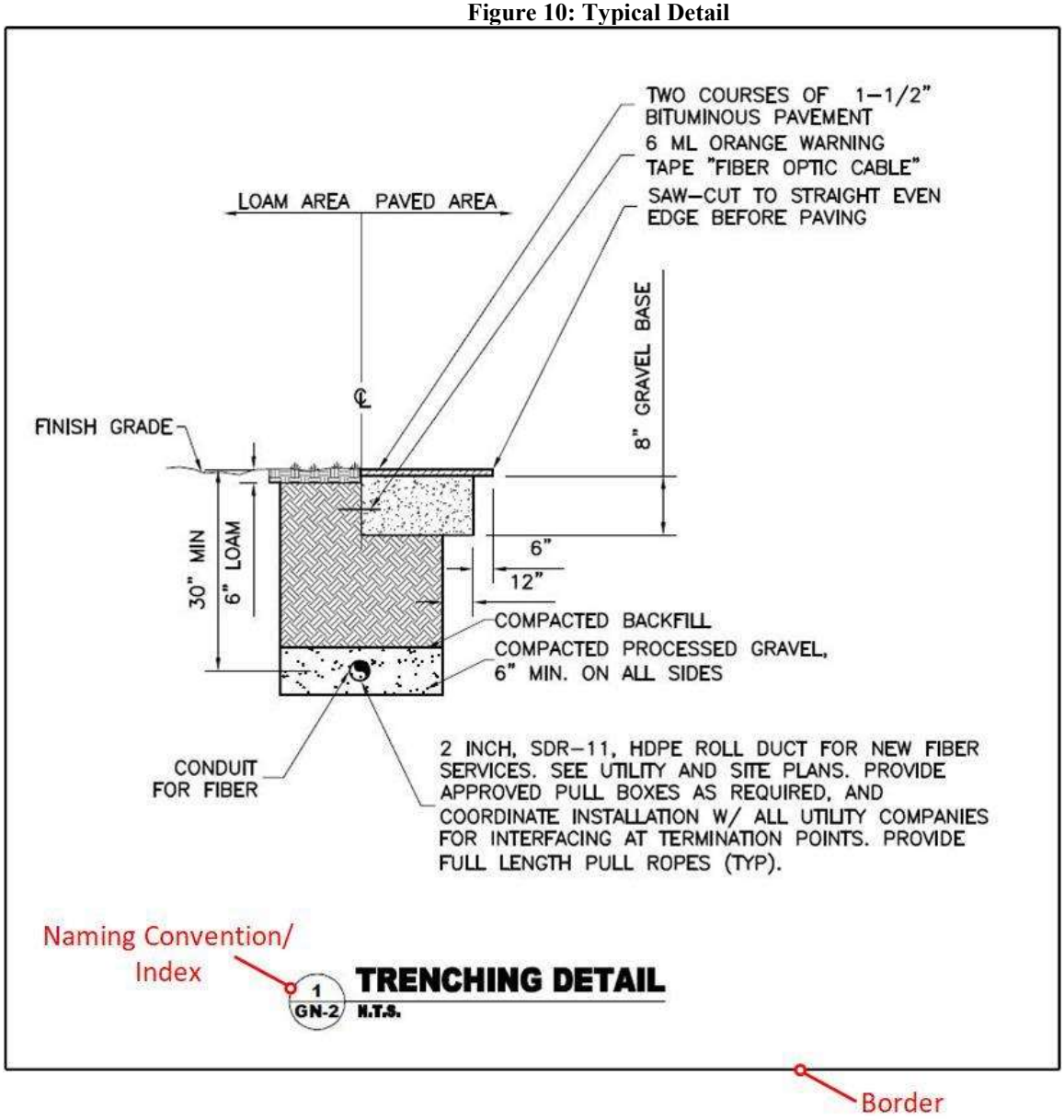
Traffic Control Plans

The Applicant shall provide the City with a set of traffic control plans that fully detail the regulation of traffic on the adjacent roadway. The plans shall specify how traffic will be regulated before, during, and after any planned construction or maintenance related to the small cell system. The traffic control plans shall conform to the safety and design standards set out in the current version of the Maryland Manual on Uniform Traffic Control Devices (issued by the State Highway Administration) and may not be amended without the City's written consent.

Typical Sheet Requirements

A sheet of typical details can be part of the design documentation. Only one typical sheet shall be included per design documentation, and each typical sheet shall contain no more than eight individual details or illustrations to depict the scope of work related to the plan and profile sheets. Each typical detail shall be numbered and labeled to reference the typical sheet and specific individual details. The use of borders around typical details is required (see Figure 10).

Figure 10: Typical Detail



Documentation of Demarcation

The City understands that different Applicants, and different applications by an Applicant, may take different approaches to backhaul. In some cases, the Applicant may propose to build and own the backhaul. In others, it may build and own the small cell system and another entity may build and own the backhaul.

The application shall clearly indicate the demarcation between the backhaul and the small cell system.

If small cell system equipment is to be located on the pole itself or on the ground in close proximity to the pole, the vault or pedestal containing the small cell system equipment is the demarcation point. The following figures illustrate physical demarcations between the backhaul

and the small cell system at a line interface unit (LIU) also known as the network interface device (NID).

Figure 11 illustrates a scenario in which the backhaul (dotted line) is delivered aerially. The LIU/NID shown is located on the pole (it could also be in a nearby handhole if the cabinet is on the ground, or within the cabinet). The backhaul provider provides transport from a splice point and drops the line to the NID.

Figure 11: Example Aerial Equipment Communications Demarcation Point

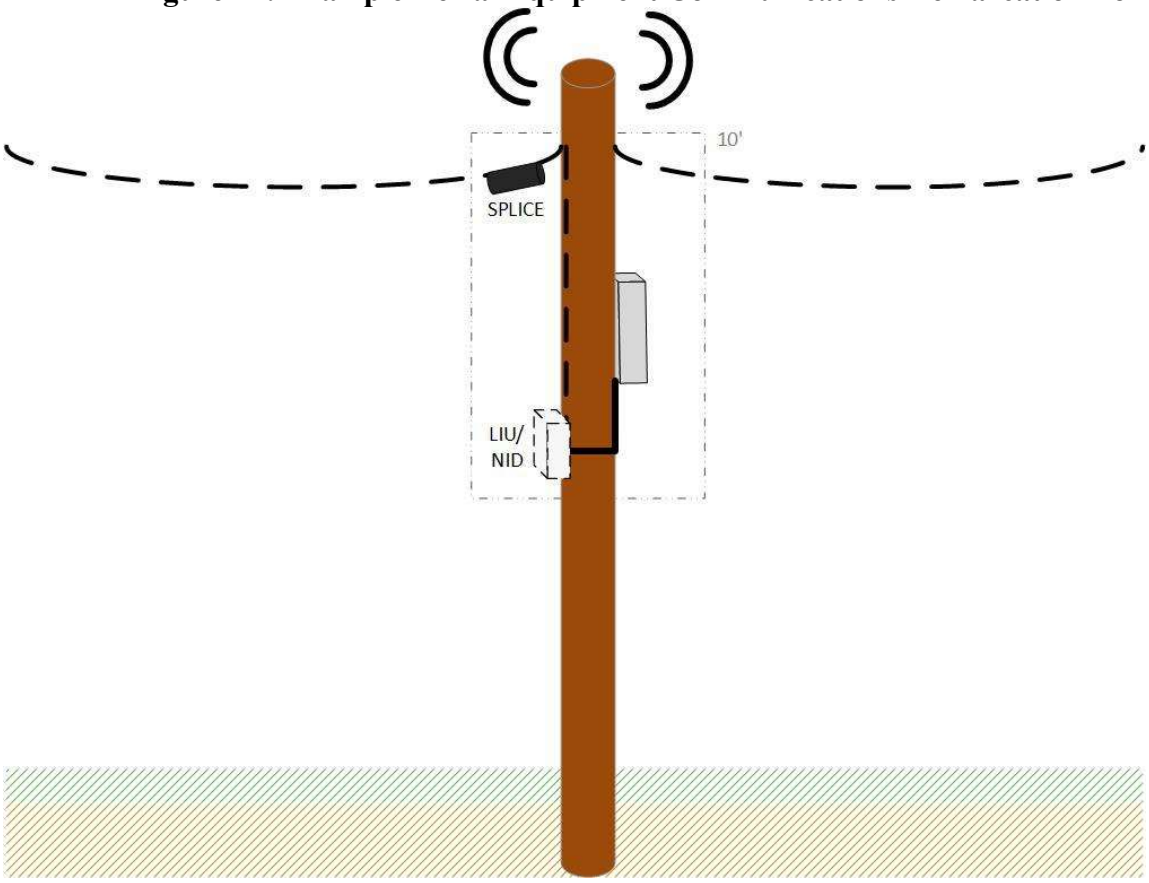
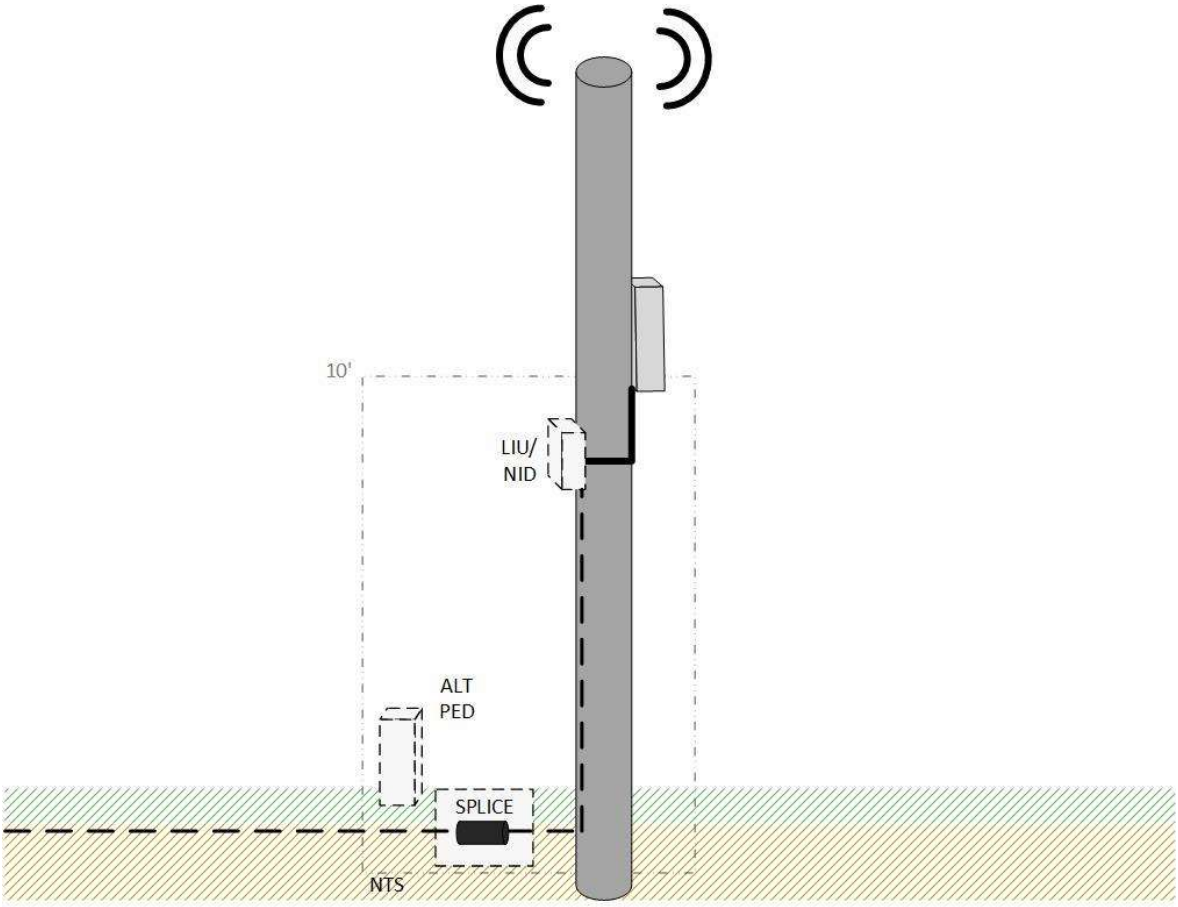


Figure 12 illustrates a scenario in which the backhaul (dotted line) is delivered underground. The backhaul provider typically builds a handhole containing the transport cable for the small cell system connection. It is recommended that the handhole be located within 10 feet of the pole. The demarcation point is where the backhaul connects to the LIU/NID.

Figure 12: Example Underground Communications Demarcation Point

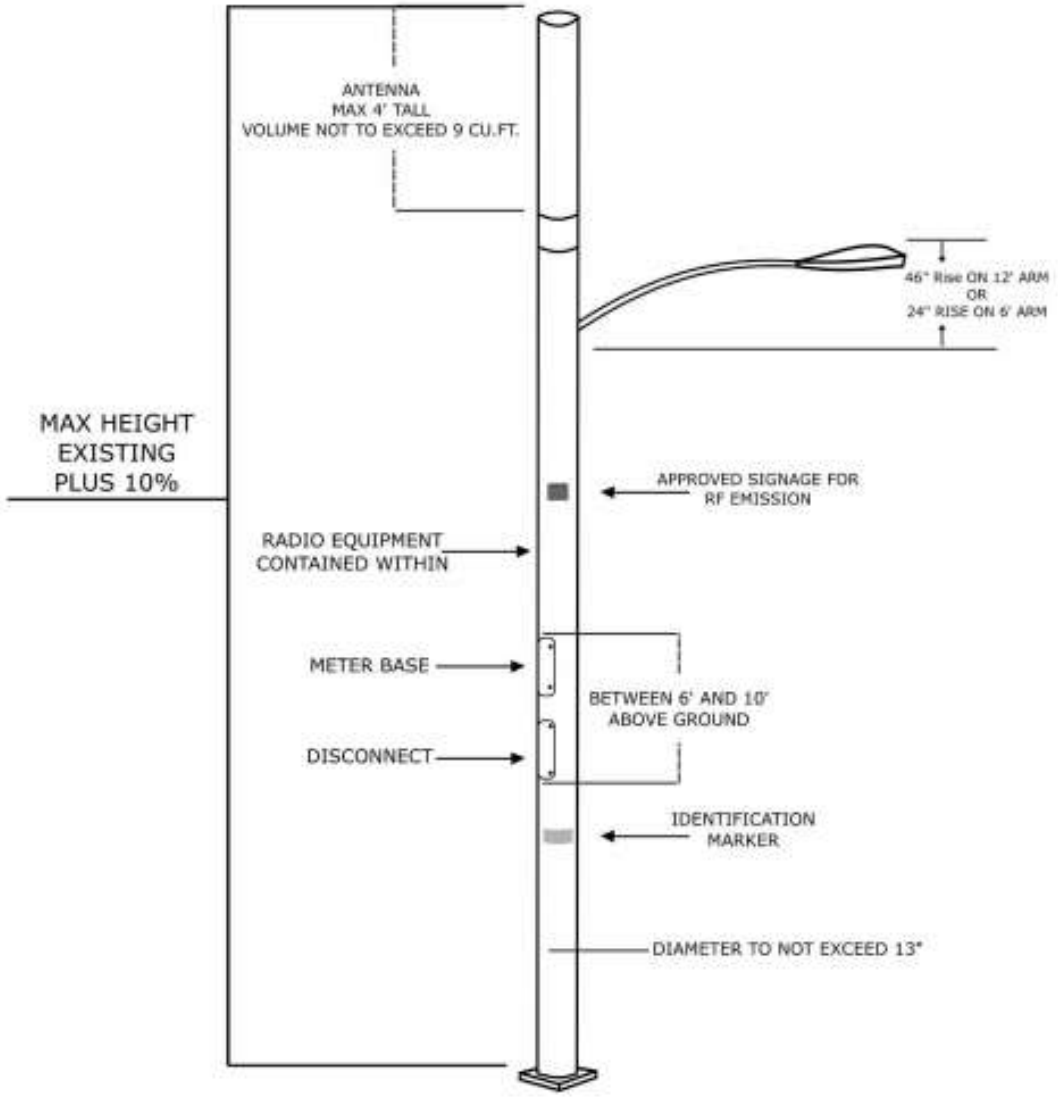


Appendix A: Standard Designs

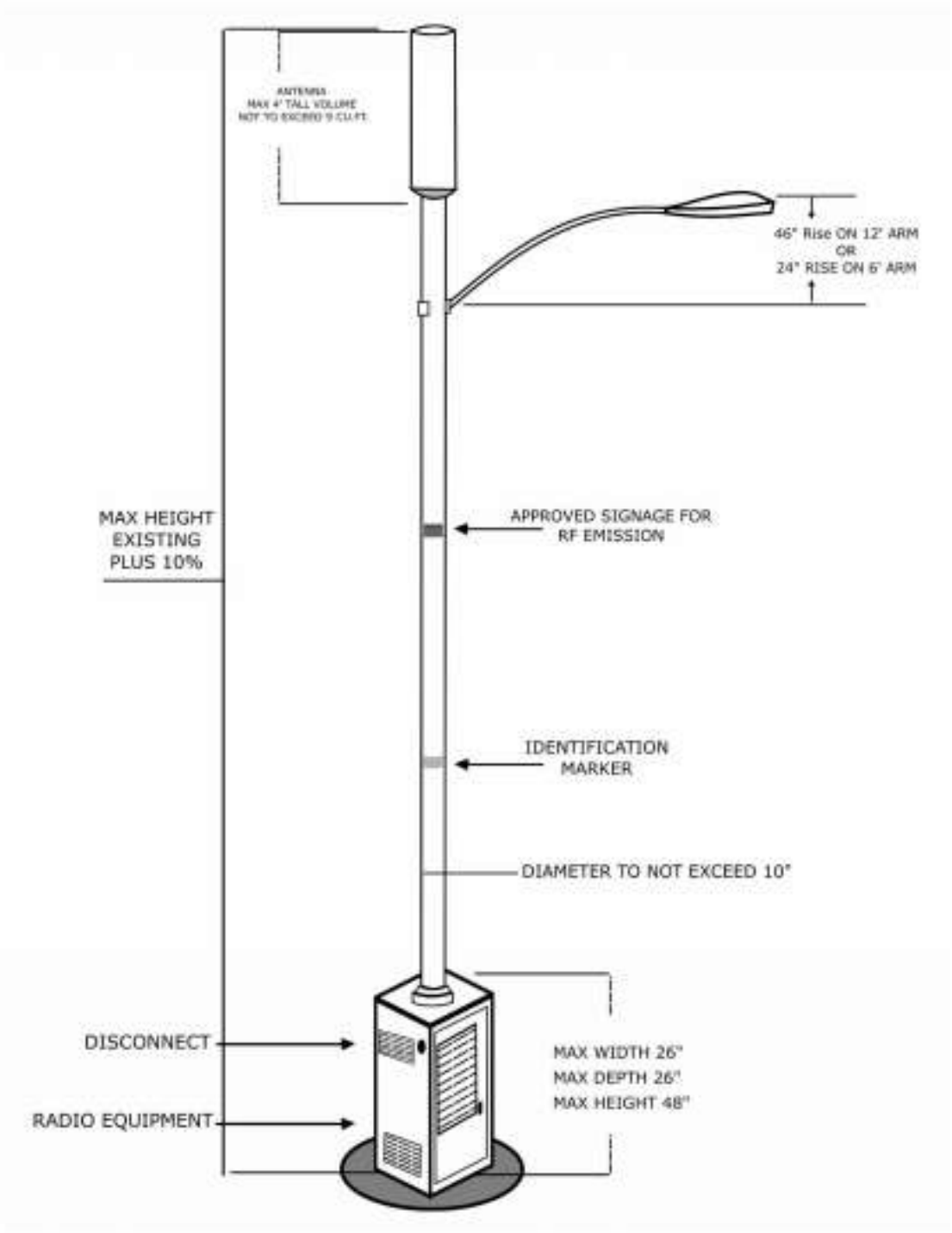
Small cell system shall follow one of the following standard designs, which establish minimum standards, expedite the review process, establish consistency in the types of poles, and provide the Applicant with the flexibility of a wide range of configurations and potential equipment suppliers.

Typical designs and specifications are provided below.

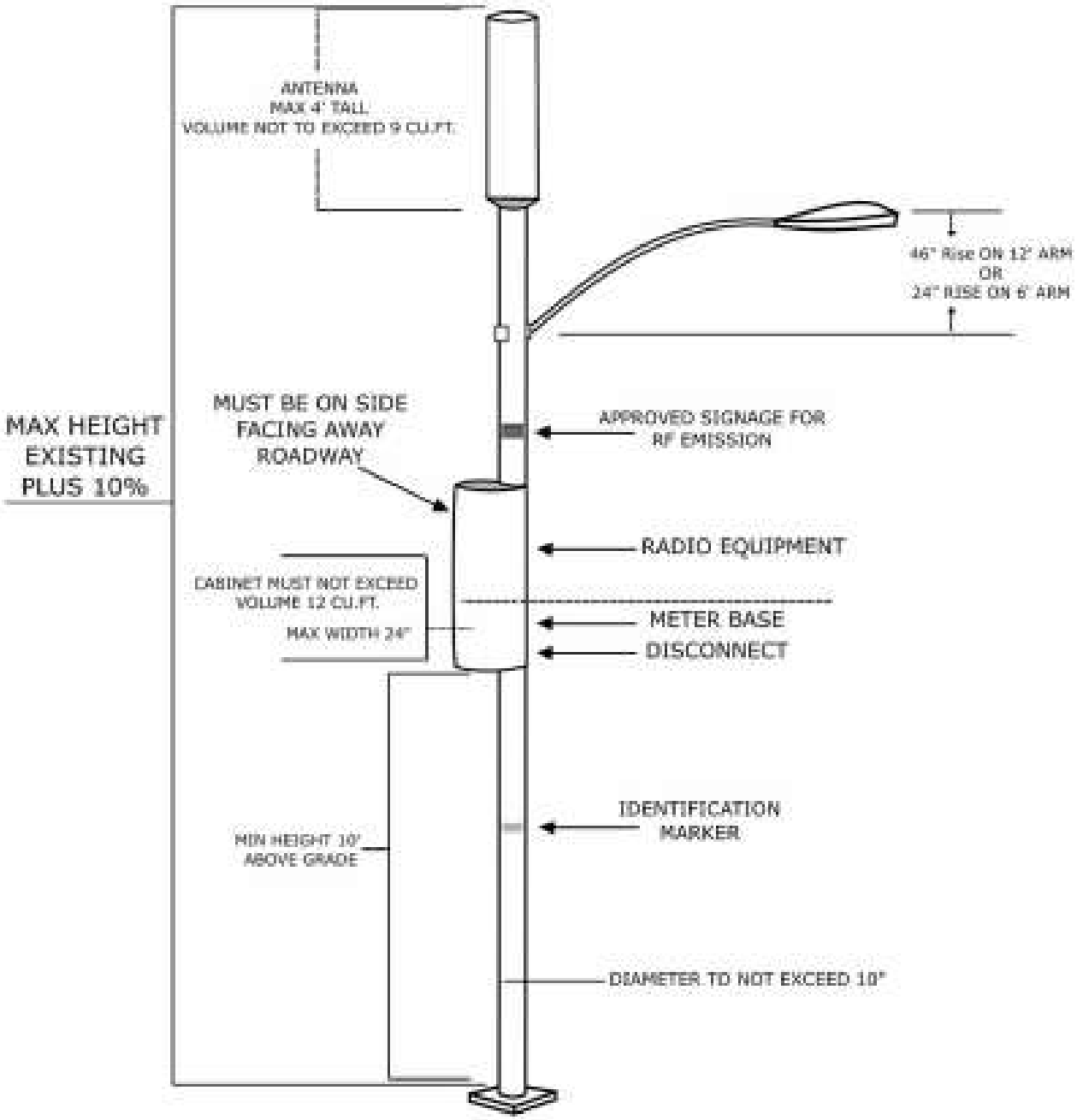
Design 1 – Smooth, Cylindrical Streetlight



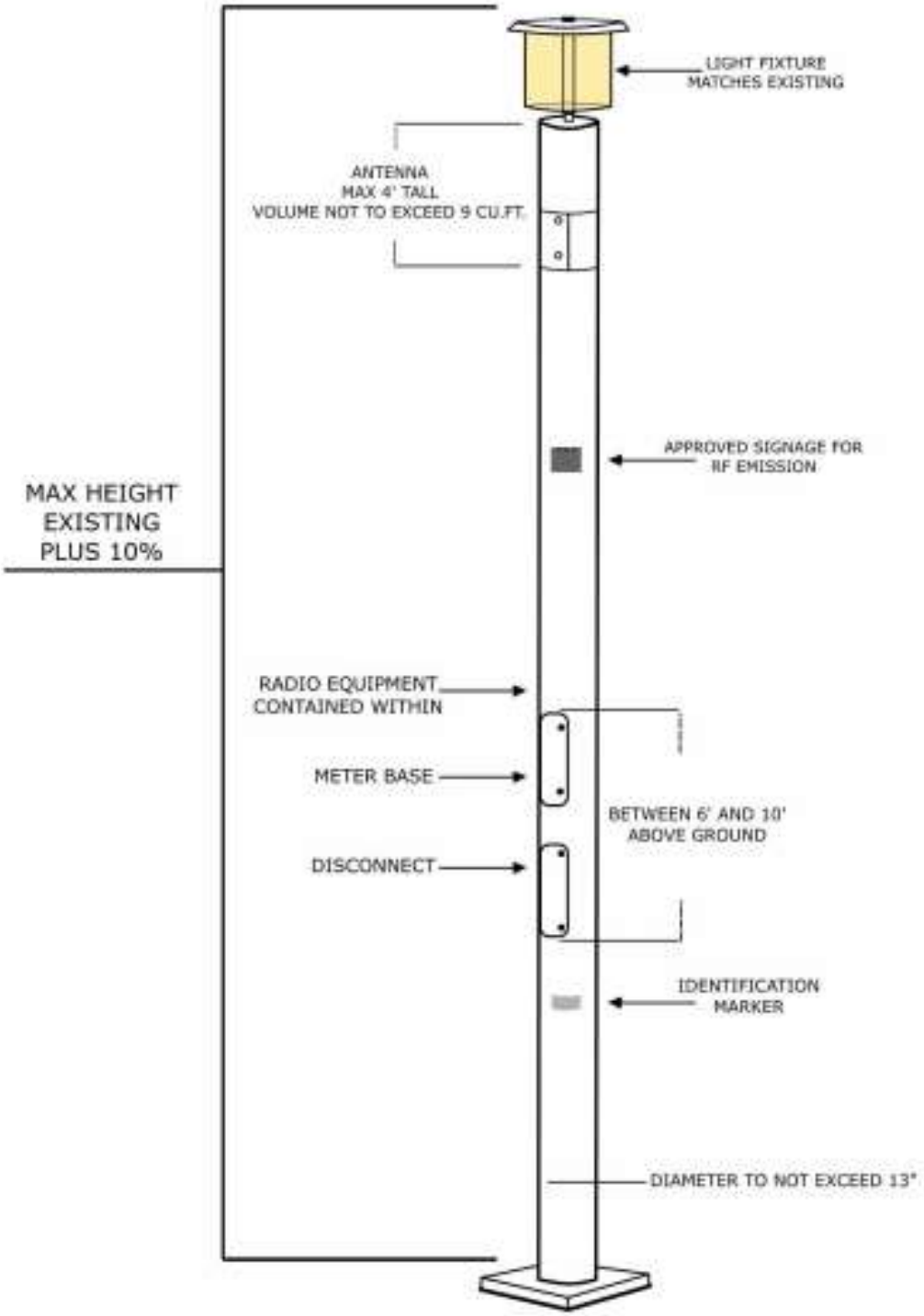
Design 2 – Streetlight with Equipment in Base



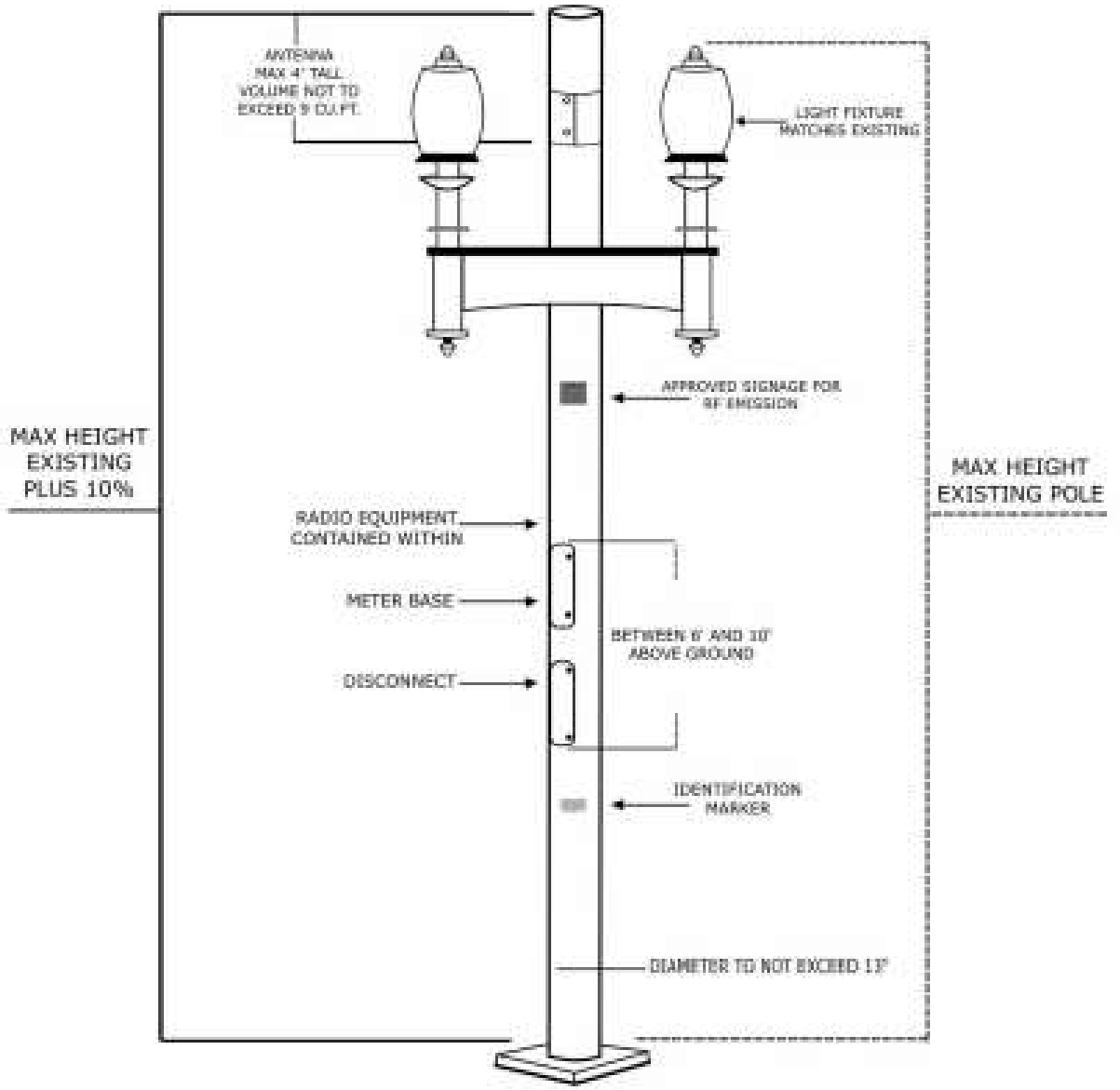
Design 3 – Streetlight with Equipment in Cabinet



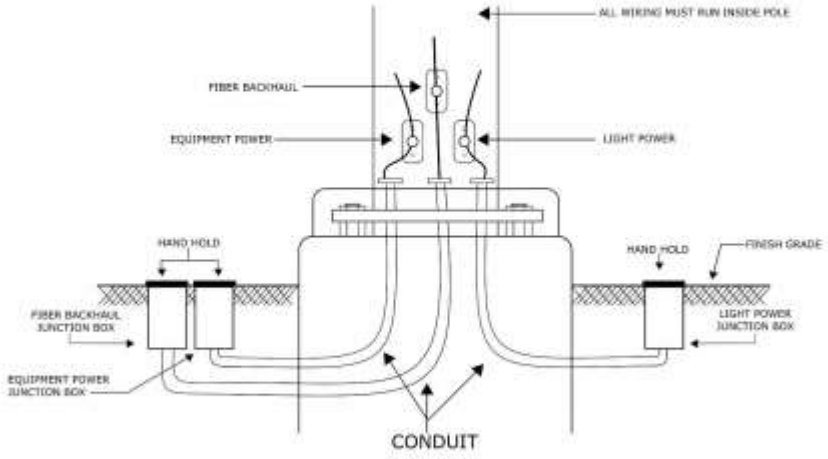
Design 4A – Decorative Streetlight



Design 4B – Decorative Streetlight



Conduit Typical



Not Acceptable

Acceptable