

# Anne Arundel County Guide to Technical and Aesthetic Standards for Small Wireless Facility Siting



## “Small Cell”

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## 1. Purpose

Anne Arundel County has established these technical and aesthetic standards (Standards) to govern access to and use of the public right-of-way and County 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 Wireless Facilities” and associated equipment (commonly called “small cells”), as defined by the U.S. Federal Communications Commission.

These Standards are intended to ensure public safety and County employee safety, and to protect the community’s aesthetic standards.

These Standards are part of an evolving process that considers the ongoing development of communications technologies as well as a recent FCC order entitled “Accelerating Wireline Broadband Deployment by Removing Barriers to Infrastructure Investment” (the Order).<sup>1</sup> The Standards may be amended to accommodate future technological and regulatory changes.

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. This Guide uses national safety standards and federal rules as a foundation, but the County’s unique operational requirements, as well as local aesthetic requirements, also inform these Standards.

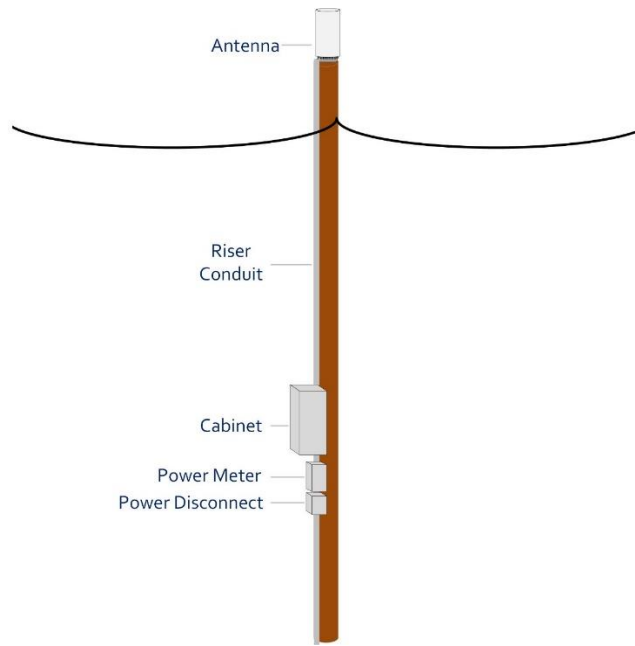
As of the date of this version of the Standards, typical pole-mounted small cell equipment comprises:

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)

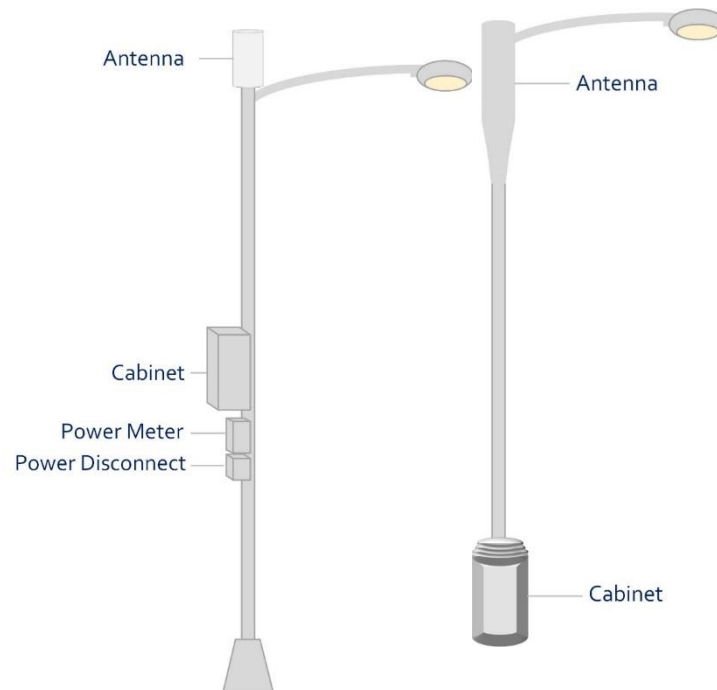
Figure 1 is an example of a small cell on a utility pole. Figure 2 illustrates a small cell on a light pole, both with and without exposed enclosures. Figure 1 and Figure 2 are conceptual drawings intended to demonstrate the basic elements of a small cell attachment and how they typically fit together; the drawings are not to scale or representative of actual structures. County-specific designs are provided later in this guide.

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<sup>1</sup> In the Matter of Accelerating Wireless Broadband Deployment by Removing Barriers to Infrastructure Investment, Declaratory Ruling and Third Report and Order, WT Docket No. 17-79, WC Docket No. 17-84, 2018 WL 4678555, (rel. September 27, 2018) (“Order”), <https://docs.fcc.gov/public/attachments/FCC-18-133A1.pdf>.



**Figure 1: Small Cell on a Utility Pole**



**Figure 2: Small Cell on a Light Pole With and Without Concealed Cabinet**

## 2. Review Process

- Small Cell installations on Private Property are subject to Article 18. Zoning and Article 17. Subdivision and Development and should apply for permits through the [Anne Arundel County Department of Inspections & Permits](#)
- Small Cell installations on State Roads should apply for applicable permits through the [Anne Arundel County Department of Inspections & Permits](#)
- Small Cell installations in the public right-of-way require a **Right-Of-Way Permit** for small wireless facilities from the Department of Public Works (DPW). The Department has created a PDF Form Application available at [Small Wireless Facility Permit](#)
- The Anne Arundel County Guide to Technical and Aesthetic Standards for Small Wireless Facility Siting is also available at [Small Wireless Facility Permit](#) A detailed application checklist is provided within this guide. All applications will require review to ensure adherence to these guidelines and all other applicable standards, law and regulation.
- Prior to any Small Cell installations in the public right-of-way, a **Right-of-Way Agreement (ROWA)** must be on file with the Office of Information Technology. The County will not consider an application submitted until such time as the ROWA is fully executed and the Applicant's annual plan is filed. In addition, any contractor used by the Applicant must be approved by the Department of Public Works Right-of-Way Permit Office and must obtain the required orientation and training from the Department prior to performing construction work within the right-of-way.
- If the application is for an attachment to a County pole, an executed **Master License Agreement (MLA)** for attachments to County poles and/or infrastructure must be on file with the Department of Public Works.
- Applicable building and electrical permits are issued by the Department of Inspections and Permits. Further information on these permits may be found at [Anne Arundel County Department of Inspections & Permits](#)
- Wireless Facilities shall not be placed where they conflict with County capital projects. Applicants can access and view all current capital projects at [https://www.aacounty.org/departments/public-works/engineering/Capital\\_Projects](https://www.aacounty.org/departments/public-works/engineering/Capital_Projects). All inquiries into future capital projects will be addressed by DPW Customer Relations at: (410) 222-7500.

### 3. General Guidelines

**Location:** Wireless Facilities shall be attached to a pre-existing support structure or on a like structure replacing an existing structure. However, if the Applicant can demonstrate that no colocation opportunities exist in the area where it demonstrates a need for a Wireless Facility, the Applicant may propose that a new pole or other support structure be constructed for purposes of installing the Wireless Facility. In addition:

- No Wireless Facilities shall be installed in a park or in a right-of-way within 250 feet of a park.
- Wireless Facility poles shall be installed with a minimum 30-foot setback from residential buildings and a minimum 20-foot setback from commercial buildings.
- A single Applicant's Wireless Facilities shall be installed with a minimum spacing of 600 feet in residential areas.
- Up to two Wireless Facilities may be installed at an intersection, each on a different corner. Two Wireless Facilities at an intersection may not be operated by the same Applicant.
- Outside town center areas, cabinets may either be mounted on a pole or on a concrete slab within 50 feet of the pole where the Wireless Facility 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).
- In town center areas Wireless Facilities shall be installed with a minimum spacing of 300 feet. The exception shall be that up to two Wireless Facilities can be installed at an intersection, each on a different corner. Two Wireless Facilities at an intersection may not be operated by the same Applicant.

**Preference of Location & Methods:** The County has established an order of preference for Wireless Facility installation types (Table 1). The most preferred types are those that have the lowest incremental impact and use existing resources. Therefore, a mid-span microcell (described in Section 7), which can be placed on strand between existing utility poles, is the most preferred installation type. The County's three standard designs for replacement streetlights (see Appendix A) ordered from smallest to largest are the next most preferred installation types. Small cells on wooden utility poles (which are less easily concealed) are next, followed by replacement of a decorative pole (post-top pole typically with height of 20 feet or less, replacement of which can disrupt a finely tuned aesthetic environment) and, finally, a new pole.

**Table 1: Installation Type Preference**

Installation Type Preference (Most to Least Preferred)
1. Mid-span microcell
2. Design 1: Replacement streetlight (non-decorative)
3. Design 2: Replacement streetlight (non-decorative)
4. Design 3: Replacement streetlight (non-decorative)
5. Wooden utility pole
6. Replacement streetlight (decorative)
7. New pole

**Third-Party Structure:** If the Applicant is attaching a Wireless Facility 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 County and the owner of the structure and apply to the County to place the Wireless Facility in the right-of-way. As part of the application to the County, the Applicant shall provide a letter confirming it has applied to the third-party owner to use its structure.

The County prefers a mid-span installation to a pole-mounted installation. Microcell wireless equipment can be attached to existing or proposed wireline installations. All mid-span installations shall comply with the requirements of the owners of the adjacent utility poles. Each individual piece of equipment shall not exceed 18 inches in length, 10 inches in height, and 10 inches in depth. The Attaching Entity shall provide engineering design and pole loading analysis (PLA) calculations to justify the use of both adjacent poles. A clearly identified power disconnect shall be located on one of the strand-mounted components.

**Replacement Streetlight Pole:** County streetlight poles are not designed to support Wireless Facilities. The Applicant is required to replace an existing County streetlight pole with a pole that provides the functionality of the existing pole and that is designed to support a Wireless Facility. The replacement pole shall be a BGE approved and stocked model of pole compatible with the County’s Street Light Maintenance Program. The light fixture on any replacement decorative pole must always be 14ft above ground level (measured at the top of the light fixture).

**New Standalone Poles:** These non-County owned or maintained poles shall use one of the standard designs included in this Guide. The County prefers no aerial wires to new poles. In the case of the Applicant installing a new, non-decorative pole, the preference is to use Design 1 if it provides the technical capability required by the Applicant. If the Applicant can demonstrate that Design 1 cannot provide the required technical capability, it shall use Design 2. If Design 2 cannot be used in the proposed environment due to Americans with Disabilities Act (ADA) requirements or space restrictions in the right-of-way, the Applicant shall use Design 3. New wooden poles, except as a replacement for an existing utility pole, are prohibited. In an area with decorative poles, (e.g. a Town Center) the Applicant shall use the pole type designated for that area (Design 4). Aerial wires to new poles are prohibited. Any connection to a new pole shall be underground. Under extenuating circumstances the Applicant may propose an alternative design.

**Multiple Attaching Entities for the Same Pole:** The County 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 County may reject the application and accept other applications for that pole. If the County receives a subsequent application from a second prospective Attaching Entity following acceptance of a complete application and prior to completing make-ready electrical construction or issuing a Notice to Proceed on the first application for a pole, the County 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 County will reconsider the rejected application if it is revised and resubmitted to eliminate the conflict with the first-in-time application previously approved.

#### **4. Guidelines Applicable to Existing County Streetlight Poles**

- The County does not allow the installation of new County streetlights for the purpose of facilitating SWF installations.
- The County does not allow the use of any streetlight pole located on bridges, tunnels, overpasses, or elevated roadways.
- Any Applicant intending to locate a Wireless Facility on a County streetlight pole must, in most cases, replace an existing County streetlight pole. The replacement pole must be substantially the same in outward appearance, while having increased structural strength to support the additional equipment.
- The County requires an engineer-stamped plan showing the details of any replacement pole intended to support a new Wireless Facility and an existing County Streetlight.
- A replacement streetlight pole shall be installed in approximately the same location as the original pole location, as close as possible to the lot line between 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 Wireless Facility. The pre-existing pole must be removed within 90 days after installation of the replacement pole.
- In limited cases, the County may allow attachments to certain existing poles. These include metal poles on a concrete foundation with adequate structural strength to support the additional equipment.
- At no time shall Licensee utilize energy designated to power the Luminaire or other essential functions of a County Streetlight in order to power the Applicant’s Equipment.



Street Light Pole replacements shall utilize a BGE approved and stocked model of street light pole consistent with 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.

- 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

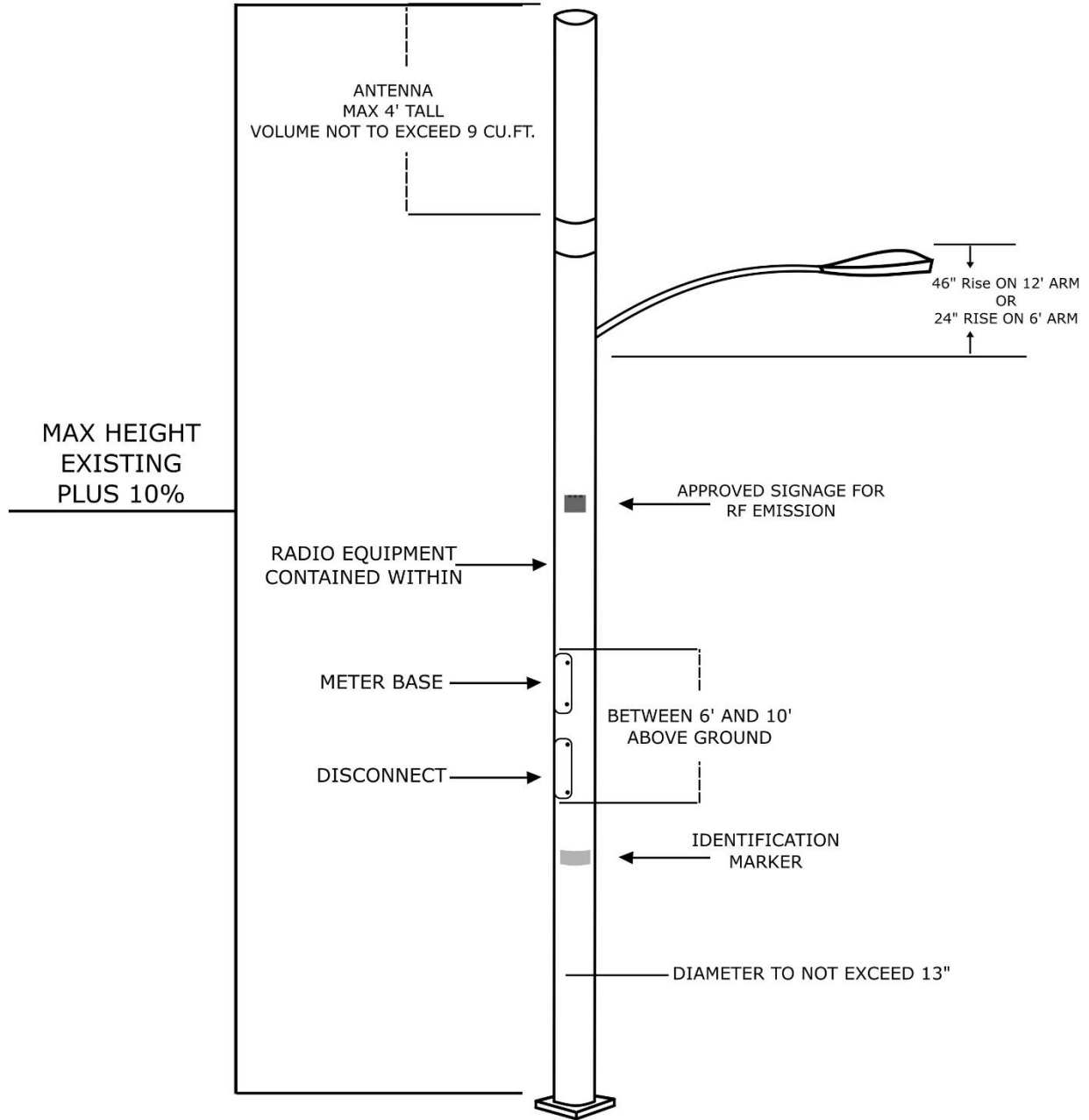
In addition to following the standard designs, the wireless facility should adhere to the Conduit standards as shown in the Conduit Typical.

If the Applicant can prove that that it is not technically feasible to use one of the standard designs, it may propose an alternative pole design. If the Applicant opts to deviate from a standard design, it must submit evidence that the standard designs will not accommodate the proposed facility. A proposed design and a structural analysis shall accompany the application.

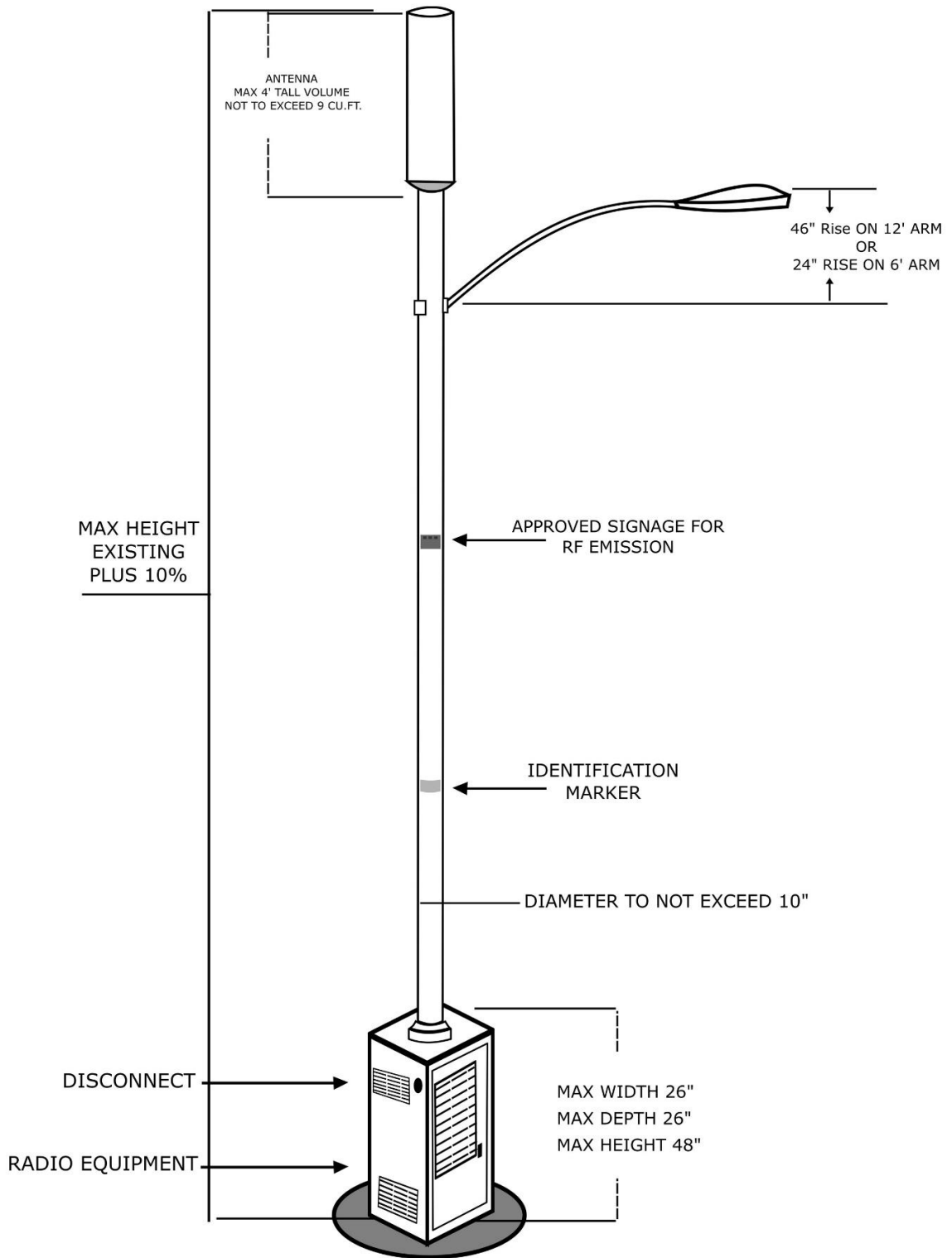
The County will conduct an additional review of the application for an alternative structure to determine:

- The demonstrated need for an alternative design at the requested location and geographic area in order to deliver or enhance service, and that the Applicant has 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 Applicant's technical objectives and whether the Applicant should use available or previously unconsidered alternative locations to place the Wireless Facility.
- The County may seek public comments or require a public hearing as part of the review. The alternative design must comply with the technical and aesthetic standards in this guide.

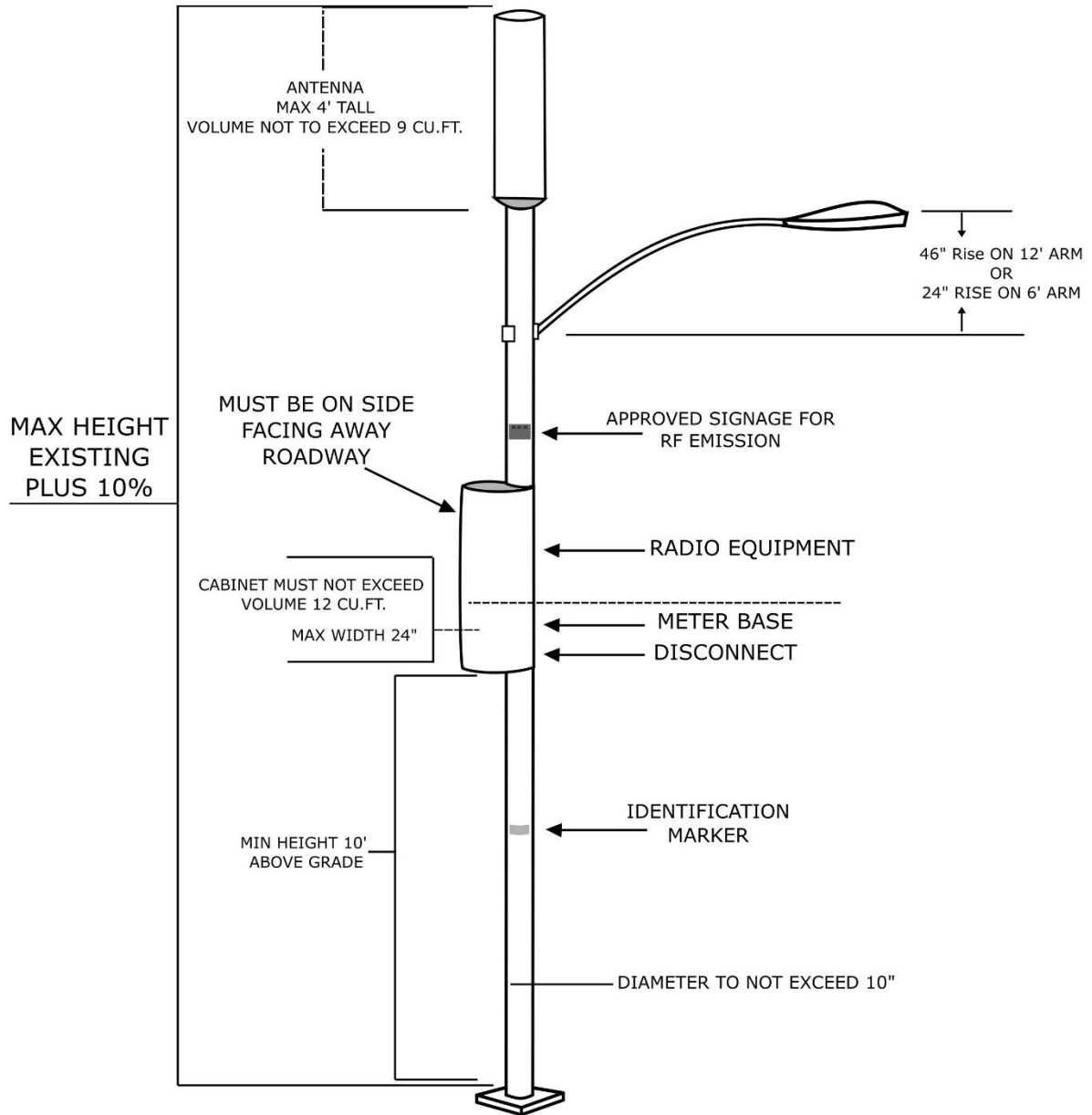
### Design 1 – Smooth, Cylindrical Streetlight



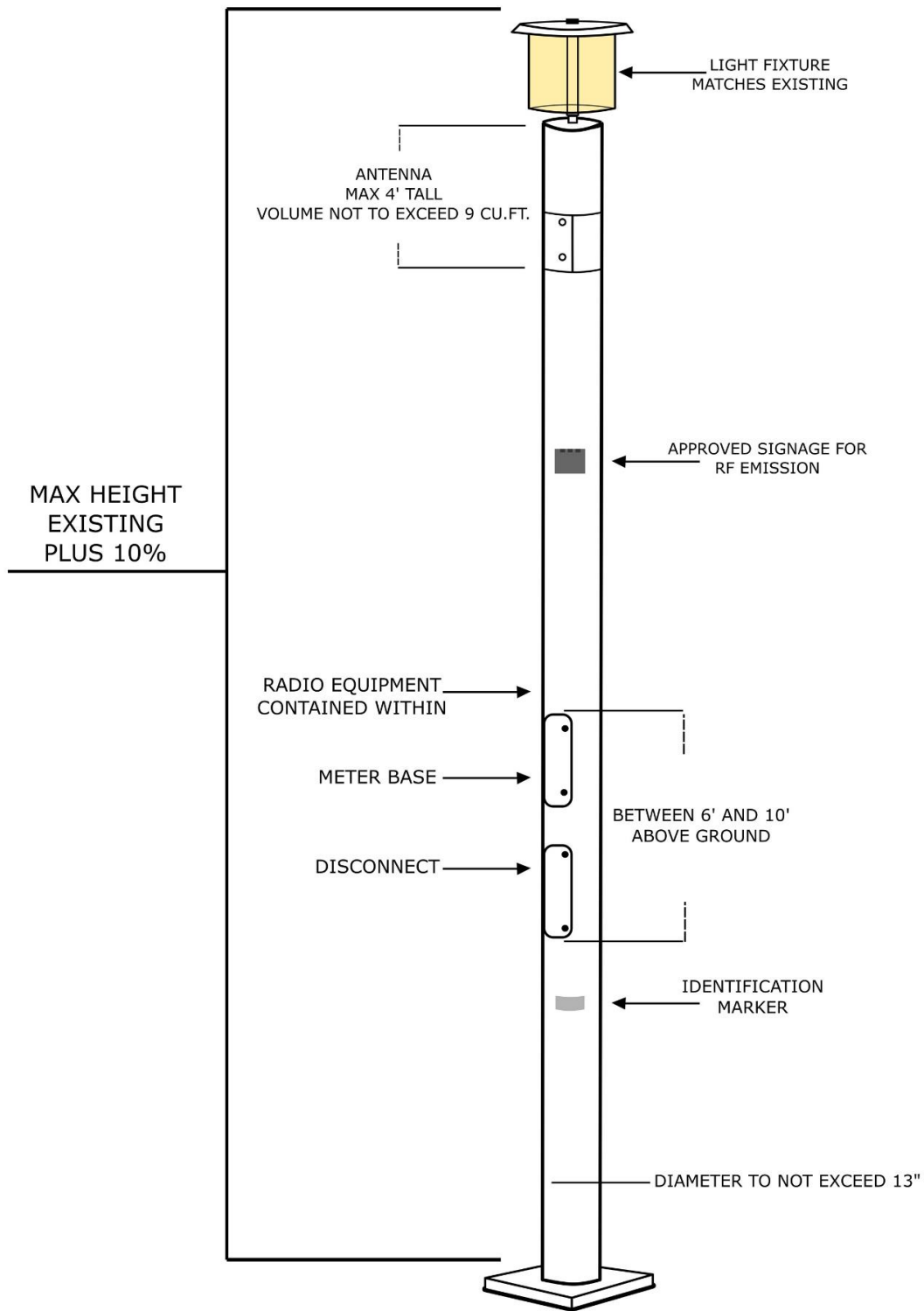
### Design 2 – Streetlight with Equipment in Base



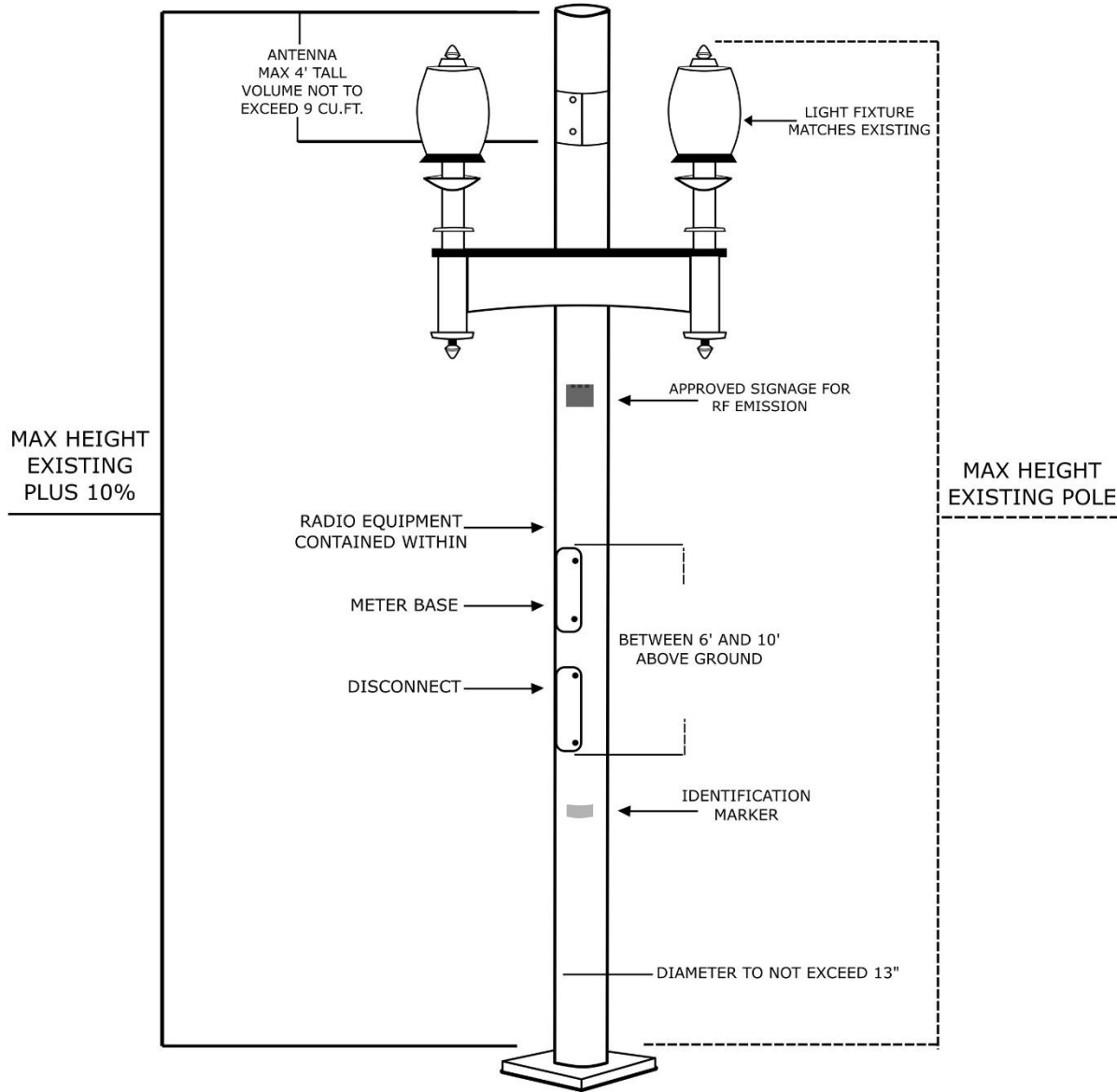
### Design 3 – Streetlight with Equipment in Cabinet



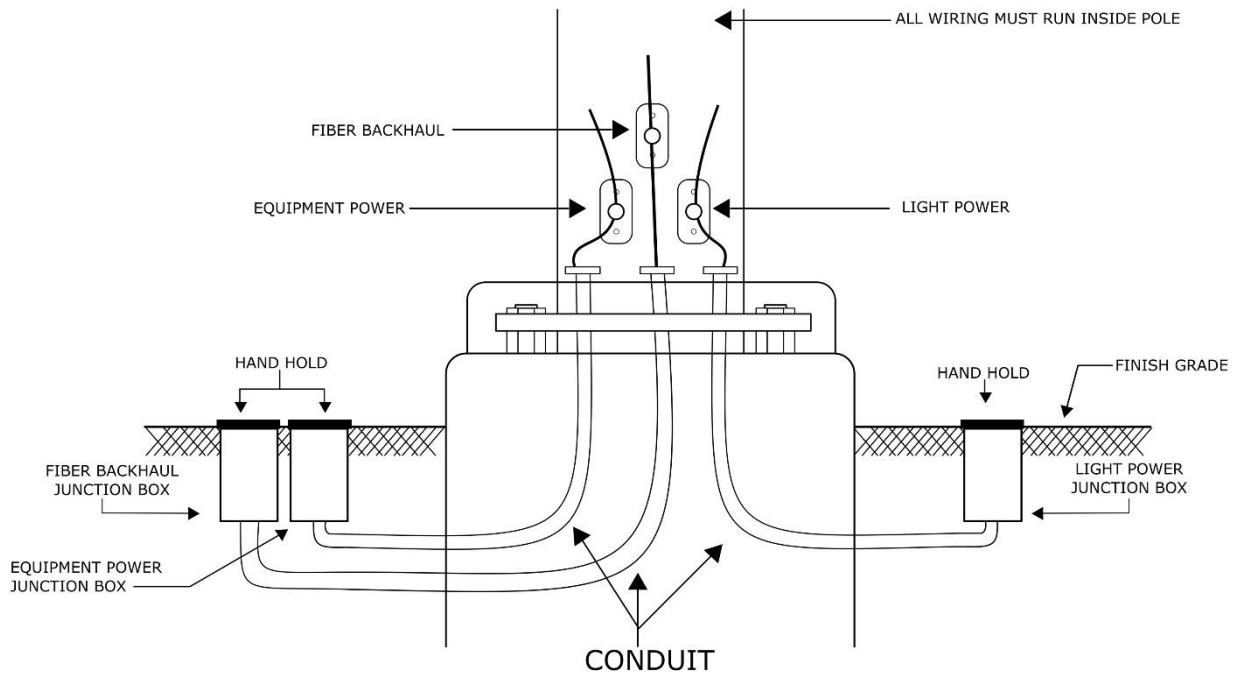
### Design 4A – Decorative Streetlight



### Design 4B – Decorative Streetlight



### Conduit Typical



## 5. Guidelines for New Standalone Poles to Support a Wireless Facility.

- Justification for why the site was selected. Describe the purpose of the site and, if applicable, why it is not being colocated. List all existing colocation choices within 1,000 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.
- Data for any drive tests that were performed (and a note that the results are attached).
- RF propagation contour maps (if the justification is coverage-oriented) showing the site with and without the Wireless Facility. The maps should show calculated signal levels in color at the target signal level and plus and minus 5 dB. Include a legend indicating the signal levels represented by each color. Include maps showing coverage at the proposed antenna elevation and at 10 feet below the proposed elevation. The maps must be legible and in sufficient detail to show neighborhood streets around the proposed site and adjacent sites.
- Evidence of capacity exhaustion of the current serving site (if the justification is capacity-oriented). The evidence must demonstrate that the capacity at the serving site will be diminished within 18 months of the application such that it will have a negative impact on the users within the area if new capacity is not added. Examples of this may be time-of-day download speeds, utilization over time, or cumulative key performance indicator (KPI) reports from the serving site.
- In all cases, Wireless Facilities 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 County determines that a proposed location would present any such hazards, the County shall require the Applicant to choose an alternate site.
- The County will conduct an additional review of the application for a new structure to determine:
  - i. 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 technological means for delivering the service.
  - ii. The impact of placing a new structure or facility in the subject area.
  - iii. The character of the area in which the structure is requested, including surrounding buildings, properties, and uses.
  - iv. Whether the appearance and placement of the requested structure is aesthetically consistent with the immediate area.
  - v. The Applicant's technical objectives and whether the Applicant should use available or previously unconsidered alternate locations to place the support structure or Wireless Facility
  - vi. The County may seek public comments or require a public hearing as part of the review.



## 6. Guidelines Applicable to Existing Utility Poles

- Poles owned by a third party (i.e. poles installed in the public right-of-way by entities other than the County) are typically wood utility poles and are located throughout Anne Arundel County's rights-of-way and alleyways.
- With the consent of the pole owner, Small Cell providers may submit applications to install infrastructure attached to these poles.
- Any application must clearly indicate that the installation is on an existing third party pole or replacement third party pole.
- All Small Cell equipment on third party poles, including antennas, antenna related equipment, cabinets, shrouds, conduit, and mounting hardware shall be a grey powder coated finish or as specified by the third party owner.
- Replacement poles shall be installed within 2 feet of the original pole location, or as close as possible to the line between 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 Wireless Facility.
- A pre-existing utility pole shall be removed within 90 days after a replacement utility pole is installed.
- The technical standards of the utility pole owner apply. In addition, the County requires the following:
  - i. Riser Cable: Riser cables to connect antennas and antenna accessory equipment, backhaul services, and power lines on wooden utility poles shall be in conduit on the side of the pole facing away from the roadway.
  - ii. Conduit Requirements: Conduit shall be a grey or a color matching the pole. No riser cable slack shall be stored externally. All slack shall be stored in junction boxes or equipment cabinets or on snowshoes on the aerial cable.
  - iii. Cabinets: Cabinets are allowed on the side of wooden utility poles facing away from the roadway.

## 7. Guidelines Applicable to Appearance

In all cases, the placement of small cells shall be consistent with existing structures and aesthetics, in harmony with the surroundings, and as unobtrusive as possible.

- 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 County.
- On non-wooden poles, all cables shall be placed inside and not visible on the outside.
- 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). No separately mounted antennas will be allowed on a single installation (for example, physically separate panel antennas for each sector).
- All Wireless Facilities shall utilize stealth and concealment methods to limit their visual impact when 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 grey or 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. The County shall have access to the power meter and power disconnect switch in the event that emergency services need to have access, according to a process pre-approved by the County.
- The County prefers the use of stealth design elements, such as shapes and colors that match surrounding infrastructure and minimize adverse visual impacts.
- The County prefers the use of tapered shapes that smoothly integrate into structures (avoiding, for example, new rectangular boxes).
- The Applicant shall minimize the size and aesthetic difference between a replacement structure and the original pole or structure.
- 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.
- Within Odenton Town Center, hanging baskets and planter boxes shall be placed on light poles and building fronts whenever possible. Hanging baskets and planter boxes shall have a vertical clearance of 7 feet. Lighting fixtures shall be selected to coordinate with the acorn fixture styles specified by BGE as used at the MTA station and along MD 175.
- Wireless Facilities shall use banners and coloring to match surrounding light poles and fixtures.
- Poles and light fixtures are to match or complement an existing precedent. For example, in Parole, that standard might be the streetlights along Towne Centre Blvd. in the Annapolis Towne Centre.

## **8. Technical Requirements**

- A distinct marker (tag) shall be placed on Wireless Facilities 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 Wireless Facilities shall extend over the roadway.

- A replacement pole elevation is limited to a one-time, 10 percent maximum 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:
  - i. Small antennas enclosed in a canister with a combined maximum height of 4 feet and a maximum total volume of 9 cubic feet.
  - ii. 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.
- Any equipment cabinet:
  - i. Must not exceed a maximum volume of 20 cubic feet, a maximum width of 26 inches and a maximum height of 48 inches.
  - ii. Must be painted or screened to be the same color or design of the pre-existing structure.
  - iii. 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.
- Pole mounted equipment:
  - i. Shall use a tapered design, instead of a rectangular box shape.
  - ii. Must be flush-mounted to the pole.
  - iii. Must not exceed a maximum volume of 12 cubic feet and a maximum width of 2 feet; cabinets that are non-rectangular in shape must be comparable or less in volume and visual impact.
  - iv. Must be a minimum of 10 feet above ground level.
  - v. Must be on the side of the pole facing away from the roadway.
- The Wireless Facility 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.
- 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.
- No lighting is allowed on Wireless Facilities; if there are lights on the supplied equipment, they must be covered, removed, or deactivated.
- Wireless Facilities may not create noise greater than 50 dB measured at 20 feet from the device.
- Antennas and equipment shall be passively cooled, unless otherwise approved.
- Applicants are required to incorporate noise-suppression measures or place equipment in locations where noise is less likely to impact adjacent residences or businesses to ensure compliance with all applicable noise regulations.
- The Applicant shall provide the County 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 Wireless Facility. 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 County's written consent.

- Wireless Facilities shall not be installed on poles containing controls such as fire alarms, police signals, or traffic signals.
- 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.
- Advertising on support structure or equipment is prohibited.

## **9. 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. In all cases, Applicants shall submit a report certifying FCC OET 65 compliance for each Wireless Facility installation. Applicants are responsible for addressing all potential questions/complaints about RF that may be brought forth by residents. In all cases, the Applicant shall provide a routine environmental evaluation for RF exposure for each Wireless Facility application. 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 Wireless Facility installation
- Applicant's site or identification number for the Wireless Facility installation
- GPS coordinates of the proposed pole
- Calculation of RF power at the radios or other electronics
- Calculation of RF power at the antennas
- Calculation of RF power within 6 feet of ground level and at ground level
- Calculation of RF power at windows of residences and businesses in closest proximity to the Wireless Facility
- Location of the applicable signage with above-ground-level height listed

Upon request by the County, the Applicant shall perform RF field tests while the Wireless Facility is in operation, supervised by the County, to demonstrate compliance with FCC OET 65.

### **RF Signage Requirements**

Approved signage compliant with FCC OET Bulletin 65 shall be posted at each pole or streetlight pole hosting a Wireless Facility, 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 3: RF Signage



### Emergency RF/ Power Shut-Off

Each approved Wireless Facility 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 County determines that the Wireless Facility is interfering with public safety communications, the County at its sole discretion may shut it off using the power shut-off and notify the owner. In addition, if the County determines that the Wireless Facility may pose a hazard to occupational workers servicing adjacent public infrastructure, the County at its sole discretion may shut it off using the power shut-off and notify the owner.

### 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 Wireless Facility, the Applicant shall notify the County 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 County.

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

## 10. Wireless Siting Application Design Documentation Standards

### General

All design documentation shall be submitted electronically with an application and shall fully depict the scope of work to be performed by the Applicant (e.g., a wireless provider applying for a lease to place a Wireless Facility in the public right-of-way).

The Applicant shall indicate the design of the support pole, the Wireless Facility, and any other attachments (such as 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 Wireless Facility and illustrate how the backhaul and power will interconnect with the Wireless Facility.

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 County 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

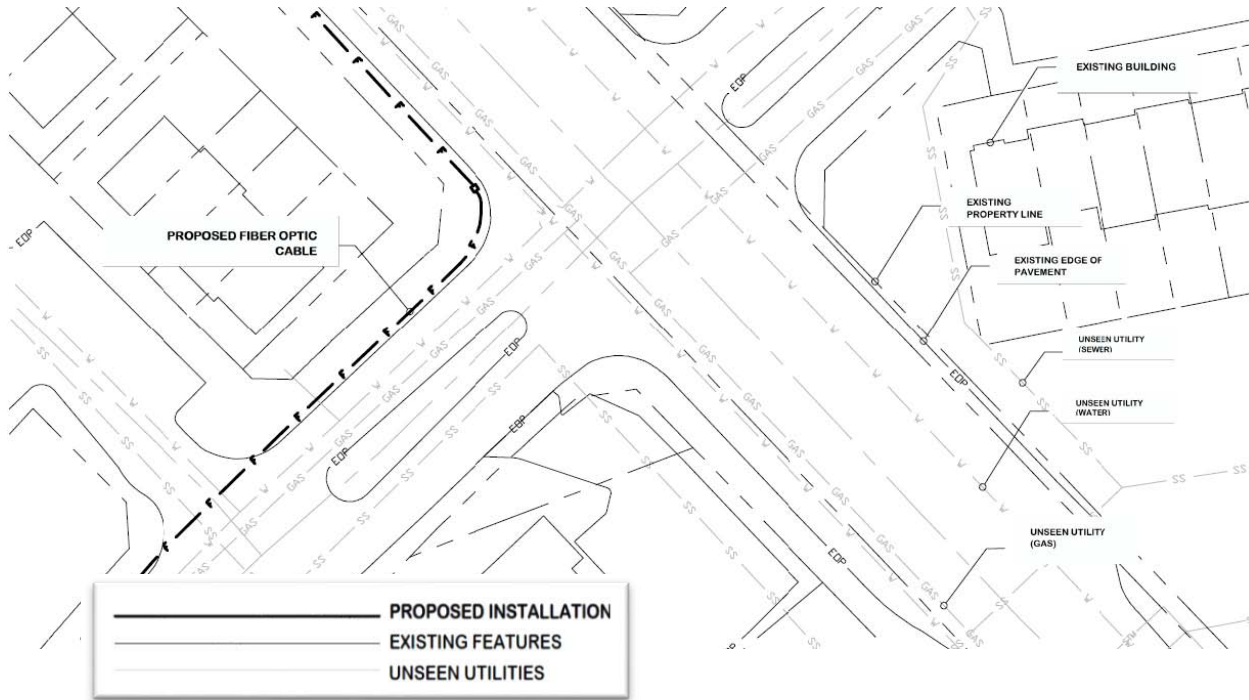
All annotations, call-outs, notes, and descriptive text shall be in plain language. If abbreviations are used to promote clarity in the design documentation, the Applicant shall follow the County's Department of Public Works engineering design manual.

### 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 Wireless Facility—as opposed to existing conditions—shall have a consistent, heavier line weight than existing aboveground features. All annotations for the proposed Wireless Facility shall be bolded and noticeably heavier than other annotations on the plan and profile sheets.

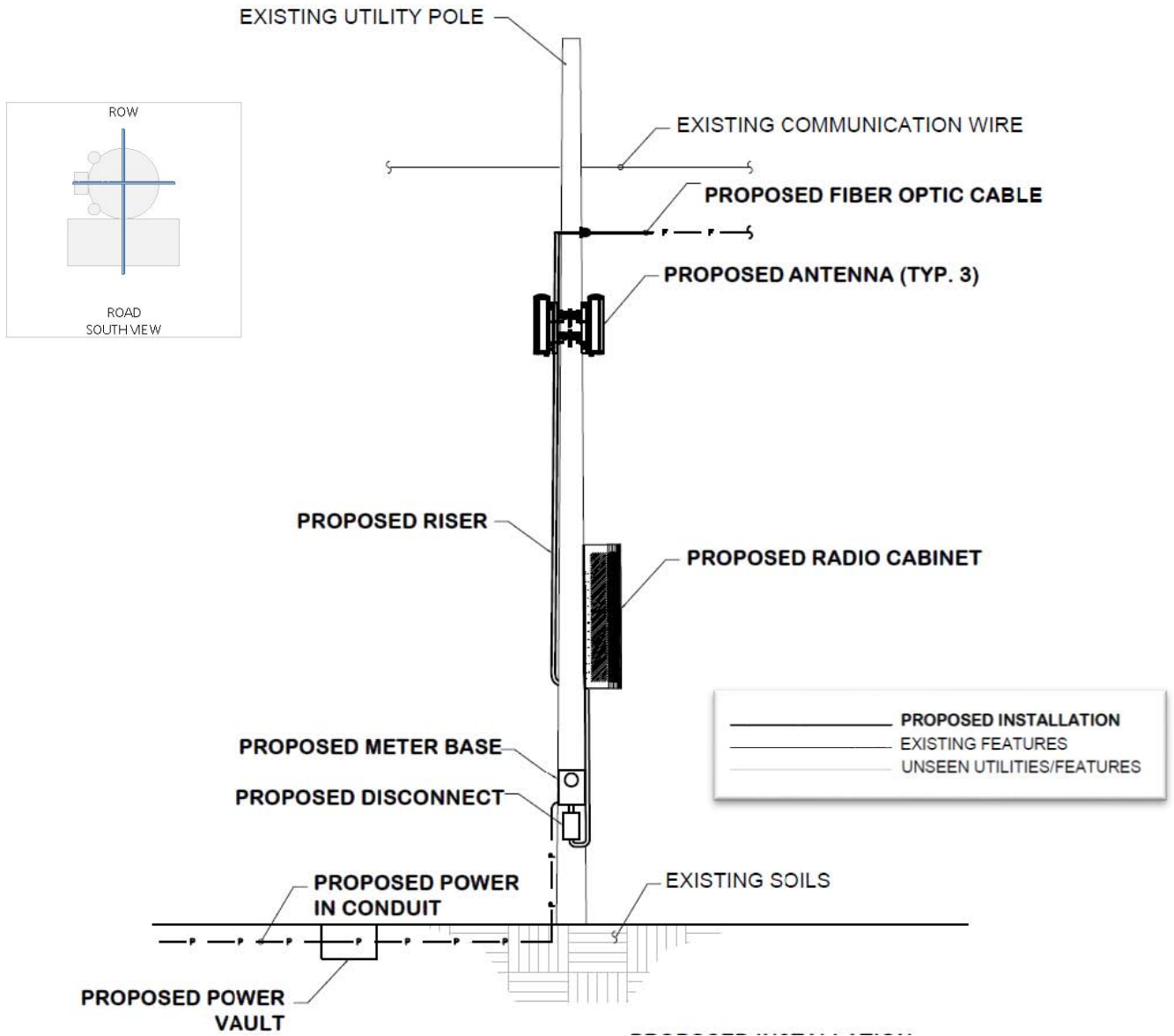
A plan sheet example with suitable line weights and annotations is shown in Figure 4. A sample profile sheet with suitable line weights and annotations is shown in Figure 5 (below).

**Figure 4: Sample Plan Sheet with Suitable Line Weights and Annotation<sup>2</sup>**



<sup>2</sup> Annotations for travel lanes, road names numbers, clear zone, and right-of-way were omitted for clarity.

**Figure 5: 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 Wireless Facility removal:

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



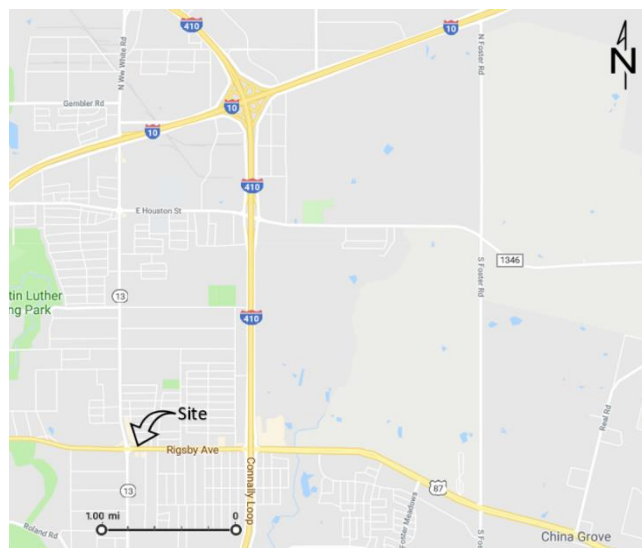
Applications to remove a Wireless Facility shall include a title sheet, a list of items that will be removed, traffic control plans, and a description of proposed restoration.

### Title Sheet Requirements

The title sheet shall include the following items:

- Road name and number
- Applicant name
- Contractor name or names
- Pole owner name or names
- Equipment owner
- Applicant's site name and/or identifier number
- Full address of proposed Wireless Facility 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  $\pm 1$  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 6)
- 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:

**Figure 6: Sample 5-Square-Mile Area Map**



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)
- County and municipal roads (name)
- Toll roads (name)
- Private roads
- Travel lanes with traffic direction arrows
- Clear zones
- County 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 County rights-of-way
- Property addresses for parcels abutting the County 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
- Limits/boundary of construction
- Notes to identify method of construction (if not explained on a typical sheet)
- Reference to any applicable detail illustrations on the plan sheet or a separate typical sheet
- Any structure proposed to be installed or replaced
- A color photo of the proposed Wireless Facility location (with approximate placement identified) taken during a field survey 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 Wireless Facility. Dimensioning should include but not be limited to:

- Road and County right-of-way widths
- Distance from existing and proposed underground facilities to the County right-of-way and edge of pavement
- Distance from hydrology and flood plains to proposed facilities
- Clear zone width and offset 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 Wireless Facility 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 Wireless Facility 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 County right-of-way line to power

All the following items shall be dimensioned:

- Antenna height above pole
- Pole dimension at the base
- Distance from County 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

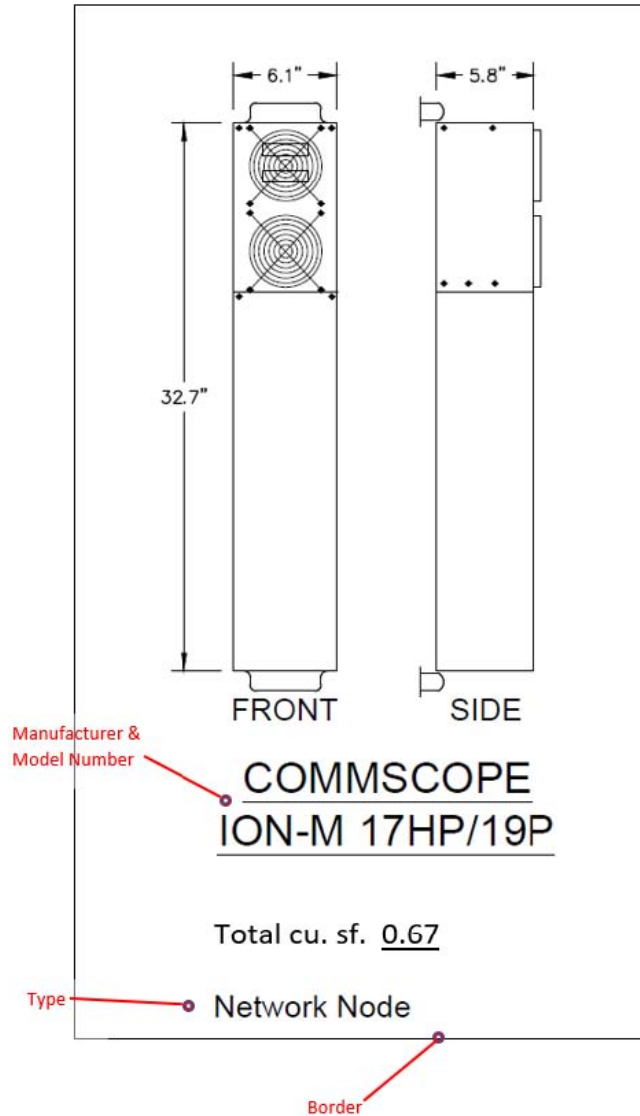
### **Equipment Sheet Requirements**

Equipment sheets are specialized typical detail sheets that tabulate cubic volume for a Wireless Facility. 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 Wireless Facility, 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 7.

Figure 7: Sample Typical Detail (Wireless Facility)



In addition to the individual component typical detail, each equipment sheet shall include a separate note box that identifies the total Wireless Facility volume, in cubic feet, as shown in Figure 8. The total cubic feet note shall be in bold type, located in the lower right-hand quadrant of the equipment sheet.

Figure 8: Sample “Total Cubic Feet” Note

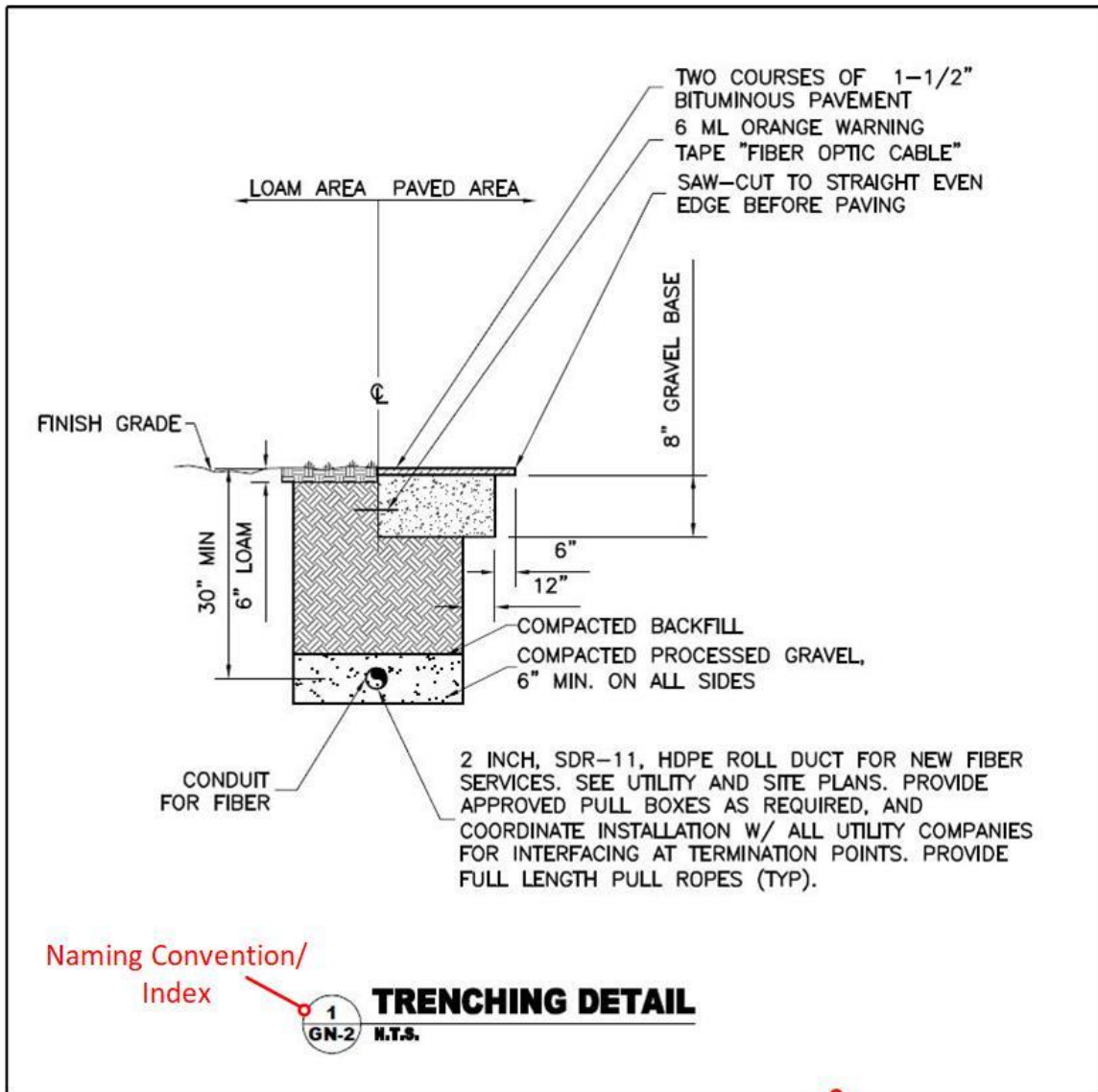
**TOTAL WIRELESS FACILITY CUBIC VOLUME (cu. sf.):**  
**TOTAL ANTENNA CUBIC VOLUME (cu. sf.):**  
**TOTAL ANCILLARY EQUIPMENT CUBIC VOLUME (cu. sf.):**

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.

**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 9).

Figure 9: Typical Detail



**Documentation of Demarcation**

The County 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 Wireless Facility and another entity may build and own the backhaul. In others, it may obtain backhaul from the County.

The application shall clearly indicate the demarcation between the backhaul and the Wireless Facility.

If Wireless Facility 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 Wireless Facility equipment is the demarcation point. The following figures illustrate physical demarcations between the backhaul and the Wireless Facility at a line interface unit (LIU) also known as the network interface device (NID).

Figure 10 illustrates a scenario in which the backhaul (dotted line) is delivered aurally. 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 10: Example Aerial Equipment Communications Demarcation Point**

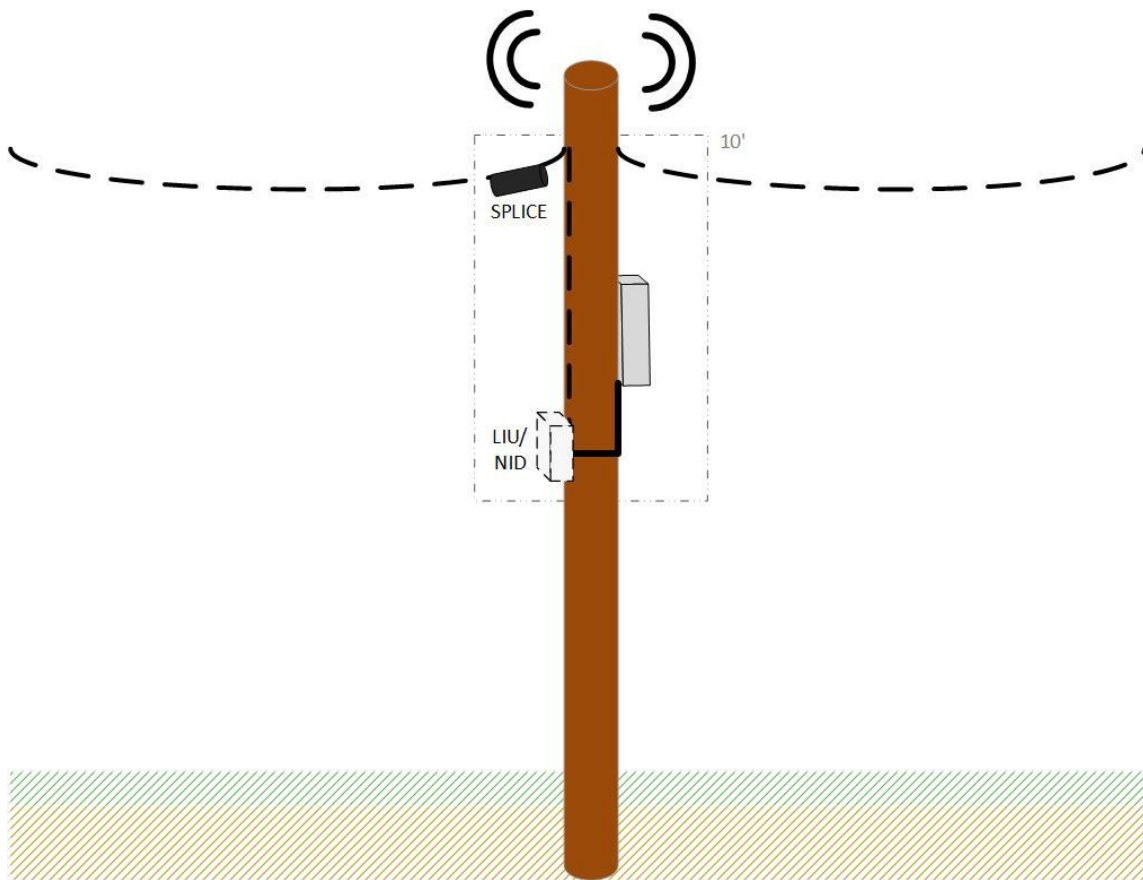
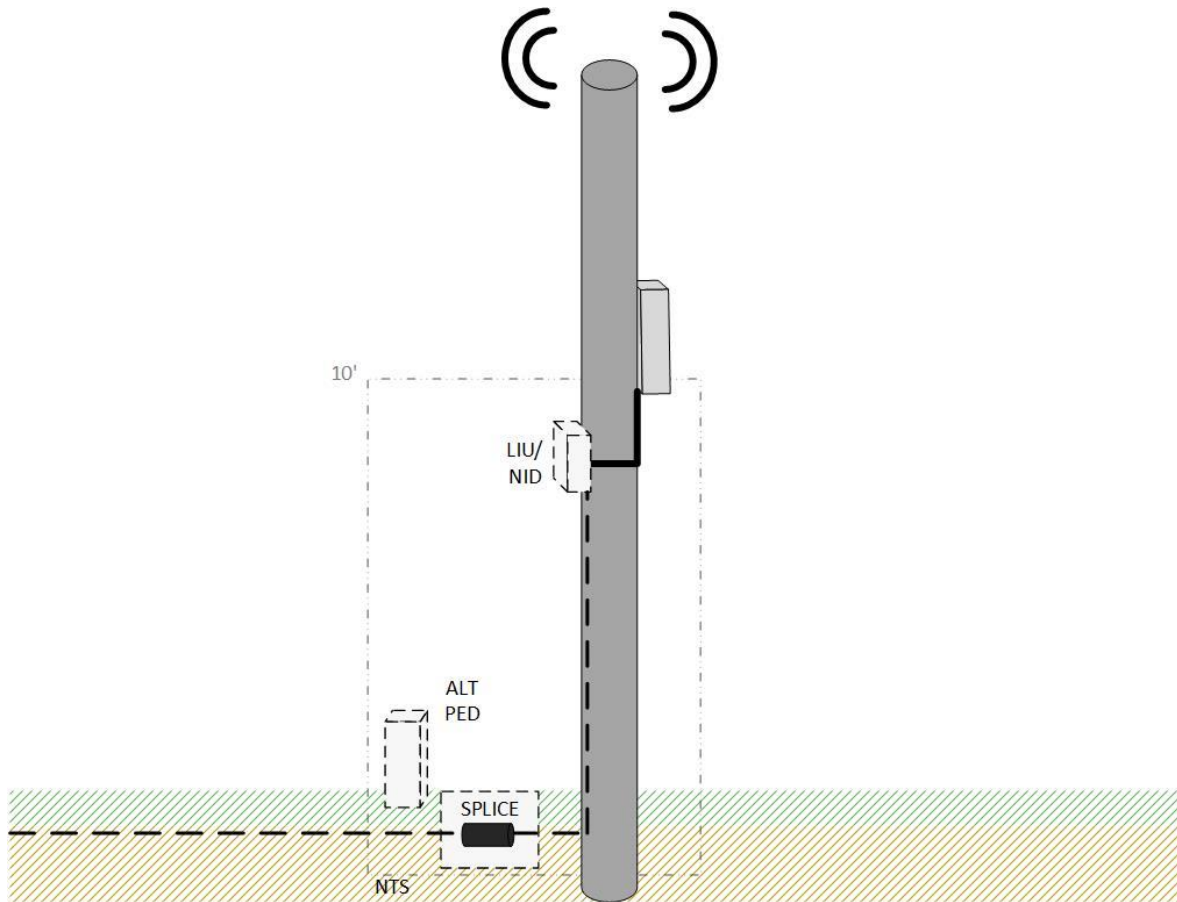


Figure 11 illustrates a scenario in which the backhaul (dotted line) is delivered underground. The backhaul provider typically builds a handhole containing the transport cable for the Wireless Facility connection. It is recommended that the handhole be located within 10 feet of the pole. The demarcation point is where the backhaul connects to the LIU/NID.



Figure 11: Example Underground Communications Demarcation Point



Appendix I.  
Application Checklist

Small Wireless Facility (SWF) Applications must provide the following information, as applicable:

- Request Type (New Site, Replacement, Minor Modification, Colocation)
- Carrier Name
- Is this an existing site?
- Is this a small wireless facility?
- Is this site located in a public right of way?
- Does this qualify as a 6409 application?
- If this application is part of a batch, list the unique identifier of the batch.
- What is the common name or ID identifier of the site that the wireless service provider uses?
- Provide a general description of work to be performed that matches all supporting documents to be submitted.
- What type of solution is this for (Macro, Small Cell, DAS)?
- Is the contractor used by the applicant approved by Department of Public Works ROW Permit Office?
- Describe the area to be served by the proposed installation. Identify the number of additional carriers the facility is capable of accommodating.
- Is Master License Agreement in place, if siting on a County pole?
- Provide a description of any make-ready work being performed by the developer.
- What is the Jurisdiction's name for this site? If this is a new site, please enter a suggested natural language name.
- Carrier Site Name
- What is the street address of this site (Street, City, Zone)?
- What is the name of the property owner of this site?
- What is the name of the owner of this structure?
- Latitude of site
- Longitude of site
- What type of structure is this (Tower, Monopole, Building, Water Tank, Light Pole, Utility Pole)?
- Does the structure require an antenna structure registration under FCC Title 47 part 17?
- Zoning of the site as defined by jurisdiction
- Structure Height
- Ground Elevation
- Site Justification
- Nearby Alternative Sites within 1000' radius
- Screening Considerations

- Will this site be used to support government telecommunications facilities or other equipment for government use? If so, please describe.
- What is the distance to the nearest residential premises in feet?
- What is the distance to the nearest commercial premises in feet?
- Will the new structure be within 2 feet of the original structure?
- Is the spacing between wireless facilities greater than 600' in residential area?
- If town centers area then is the spacing between wireless facilities greater than 300'?
- Is the structure 10% taller than adjacent structures?
- Please list any adjacent structure heights.
- If replacement structure, will the structure height increase by more than 5'?
- What is the pole number of the owner of the structure?
- Please enter the Above Ground Level (AGL) in feet.
- What is the status of the lease agreement permitting the carrier to operate at the site?
- Has a new or updated plan been filed with the County within the last year?
- Will the wireless facility follow a county's standard design?
- If not following a County standard design, please provide a justification needed why it is not technically feasible to use one of the standard designs.
- Is the proposed new design aesthetically consistent with the neighborhood?
- Is this site on the annual plan?
- Is the wireless facility installed on poles containing controls such as fire alarms, police signals, or traffic signals or on poles where they conflict county's capital projects?
- If the facility will be located on a County structure, do you have a signed MLA on file with the County?
- Equipment Cumulative Volume
- Will the proposed installation increase the height of the structure by: (a) more than 10% or (b) more than 10 feet?
- Will the proposed installation increase the width by adding appurtenance to the body of the structure that would protrude from the edge of the structure by more than 6 feet?
- Will the proposed installation require excavation or expansion outside the current boundaries of the site?
- Does the structure or current installation have concealment elements/measures? If yes please describe the proposed concealment elements/measures. If this is a modification or co-location describe how the proposed installation does not defeat the existing concealment.
- Will the proposed installation require more than the standard number of new equipment cabinets for the technology involved? (Note: The installation must not to exceed four cabinets)
- How many radios will be removed?

- How many radios will be added?
- How many equipment cabinets will be added?
- How many other items will be added?
- Is the structure on tribal lands?
- What is the overall height of the structure, including the antenna?
- What is the cumulative volume of the proposed antenna(s) exclusive of equipment? Provide the answer in cubic feet (feet/decimal) to the nearest 10th.
- What is the width of the public right of way measured from the centerline of the structure?
- Who owns the public right of way?
- Will this antenna be located on a rooftop?
- If antennas will be located on a rooftop, please attach a description of any steps that have been or will be taken to prevent the aggregate RF from exceeding exposure limits.
- Will the cumulative antenna installation be in compliance with the maximum permissible RF exposure limits set forth in 47 CFR § 1.1310 of the FCC Rules and Regulations?
- What type of compliance study is required under §1.1307 of the FCC Rules and Regulations?
- Please upload construction drawings of the planned build site.
- Upload the manufacturer's cut sheet for all proposed antennas and accessories listed.
- If the justification is capacity oriented, submit evidence of capacity exhaustion of the current serving site. The evidence must demonstrate that the capacity at the serving site will be diminished within 18 months of the application such that it will have a negative impact on service.
- If any drive tests were performed, provide copies of the data with the application and make note that they are attached.
- Attach property owner consent form
- Report to certify FCC OET 65 compliance for each Wireless Facilities installation
- Attach Structural Analysis
- Upload documents or maps verifying whose ROW the structure is located on (i.e municipality, state, county, etc)
- Upload engineering design and specification drawings demonstrating compliance with the ADA.
- Upload pre-construction survey with time-stamped photos of structure, surroundings, and nearby like structures.
- Upload certification from a consultant that the system or use of the facility will not degrade or interfere with the County's public safety systems.
- Upload the proposed schedule for completion, certified by a professional engineer.
- Optional additional documentation.