

## **TRN-10.44 - Vertical Infrastructure in the Public Right of Way**

*Interim Administrative Rule Adopted by Bureau of Transportation*

*Pursuant to PCC 3.12.010*

### **I. Purpose**

The City of Portland is in the midst of a transition to the next generation of wireless services, known as 5G. Supporting the deployment of 5G and other next-generation wireless services through smart infrastructure policy is critical. This interim rule seeks to promote infrastructure deployment while balancing the needs of City residents for a safe, accessible and aesthetically pleasing right of way. The right of way is the City's largest physical asset. City residents have invested millions of dollars to acquire and maintain this asset, and the vast majority of residents use the public right of way on a daily basis.

Because the technology to deploy wireless services is changing rapidly, the City will continue to seek input from affected parties before finalizing this interim rule. The City will also routinely revisit the rule to ensure technological advances and the needs of City residents continue to be appropriately balanced.

### **II. Definitions**

- A. "3<sup>rd</sup> Party Asset" is any non-Portland Bureau of Transportation (PBOT) asset. 3<sup>rd</sup> party transit-supporting infrastructure is not allowed as an attachable asset under this rule. Some common examples of 3<sup>rd</sup> Party Assets include, but are not limited to, electrical or telecommunications poles owned by a franchised or public utility with the right to provide a commodity or service, such as electricity or telecommunications, to the public within the City of Portland.
- B. "Macro Wireless Facility" or "Macro Site" is any Wireless Communications Facility that is not a Small Wireless Facility. For Macro Wireless Facility requirements, please refer to the [Office for Community Technology \(OCT\) website](#).
- C. "PBOT Asset" is any PBOT owned vertical infrastructure that could accommodate an attachment, such as a traffic signal or street light pole, Portland City Streetcar catenary pole, etc.
- D. "Small Wireless Facility" (SWF) or "Small Cell" is any Wireless Communications Facility that meets each of the following conditions:
  - 1. The facilities—
    - a. are mounted on structures 50 feet or less in height including their antennas, or

- b. are mounted on structures no more than 10 percent taller than other adjacent structures, or
    - c. do not extend existing structures on which they are located to a height of more than 50 feet or by more than 10 percent, whichever is greater;
  - 2. Each antenna associated with the deployment, excluding associated antenna equipment, is no more than three cubic feet in volume;
  - 3. All other wireless equipment associated with the structure, including the wireless equipment associated with the antenna and any pre-existing associated equipment on the structure, is no more than 28 cubic feet in volume;
  - 4. The facilities do not require antenna structure registration under federal law;
  - 5. The facilities are not located on Tribal lands, as defined under 36 CFR 800.16(x); and
  - 6. The facilities do not result in human exposure to radiofrequency radiation in excess of the applicable safety standards specified under federal law.
- E. "Vertical Infrastructure" (VI) is defined as an attachment such as wires, cables, appliances or apparatus of any kind to an existing pole, art structure, street furniture, or a building that is set on a property line with a proposed attachment that will encroach into the public right of way, through or by means of which electrical current, communications or data are transmitted or used. The approval criteria for obtaining a permit for an attachment depends on whether the attachment will attach to a PBOT Asset or a 3<sup>rd</sup> Party Asset.
- F. "Wireless Communications Facility" means the equipment, and associated structures, needed to transmit and/or receive electromagnetic signals. A Wireless Communications Facility typically includes antennas, supporting structures, enclosures and/or cabinets housing associated equipment or cable and may be attached to utility or City-owned structures or poles in the public right-of-way. Wireless Communications Facilities does not include equipment Installed for City purposes, including but not limited to air quality sensors or earthquake sensors.

### **III. Small Wireless Facilities: General Requirements**

- A. All SWF must be permitted to be allowed in the right of way, subject to this rule. PBOT shall apply this rule to all utilities in a nondiscriminatory manner.
- B. All SWF shall be subject to Portland City Code requirements for relocation and removal of facilities.
- C. All SWF must meet federal, state and City of Portland ADA standards.

- D. PBOT will review SWF applications for completeness at an in-person completeness-check meeting. Only one location will be reviewed per meeting. The pole owner does not need to attend the meeting; however, the SWF application must include a street opening permit application for any modifications to a specified location (pole).
- E. Temporary Street Use permits are required as a part of make-ready construction and attachment. See Transportation Administrative Rule TRN-2.08 (Temporary Traffic Control Plan Procedures) and TRN-8.12 (Safe Accommodation for Pedestrians and Cyclists in and around Work Zones), among others, for additional details.
- F. If PBOT determines that a pole must be replaced and such replacement triggers ADA requirements, ramp design and construction will be necessary as part of the project, at the applicant's expense.
- G. Public Outreach
  - 1. Applicants will conduct public outreach prior to construction and submit any public comments to the City. Public outreach is intended to provide notification to stakeholders and solicit input to inform City processes over time. Public outreach is not intended to conflict with applicable provisions of existing agreements, federal laws, or rules promulgated by the Federal Communications Commission. SWF applications will be reviewed and evaluated based on criteria identified in City Code and Administrative Rules.
    - a. Comment period will be a minimum of two weeks and must occur prior to construction.
    - b. The notification will be on applicant's letterhead.
    - c. The applicant will mail the notification to all properties and owners of properties within 200' of the proposed site at least 3 days prior to the comment period.
    - d. The notification will contain a deadline for comments, description of the installation, a map of the location labeled with street names, and before and after photo simulations of the site.
    - e. The notification will include the name, direct telephone number, and email address of an applicant contact. The notification will direct the public to submit or direct any comments to the applicant contact. The applicant contact must be an employee of the applicant and must be available to answer questions, orally and in writing, from the public. The applicant may designate a consultant knowledgeable with the project to answer questions so long as the employee is copied on written communications.

- f. Within 2 months of installation, a consolidated log of received comments and complaints must be submitted to the City.
- g. Documentation of the outreach process must be kept for one year after construction of the site and must be made available upon City request.

#### **IV. Small Wireless Facilities: Requirements for PBOT Assets**

##### A. Traffic Signal Poles

The current intent is to have similar design requirements as street light poles. New poles and foundations are required to safely support multiple electrical systems and increased structural loads.

This section will be updated or replaced with requirements specific to traffic signal poles that are currently in development.

##### B. Street Light Poles

Current PBOT street light poles and foundations are not suitable for attaching SWF. New poles and foundations are required to safely support multiple electrical systems and increased structural loads.

This section will be updated or replaced based on engineered standard drawings and specifications that are currently in development.

##### 1. Design intent

- a. Existing PBOT poles and foundations that are not designed to accommodate additional equipment or 3<sup>rd</sup> party electrical systems will need to be replaced.
- b. New poles and foundations will share common design features and key dimensions to ensure compatibility for a variety of equipment and future flexibility. Key dimensions are at pole interfaces with foundation and luminaire arm, such as: base plate thickness, number of anchor bolts, size and ratings of anchor bolts, bolt circle diameter, raceway sizes and positions.
- c. Comply with 2010 City of Portland Standard Construction Specifications and current 2010 City of Portland Special Provisions ([Web Link](#))

##### 2. Height

- a. Pole heights will be dependent on street lighting requirements and will be at nominal 30, 35, or 40 feet above grade.
  - b. Existing sites should match current luminaire type, luminaire height above roadway, luminaire arm length, lumen output, and light distribution. Use only pre-qualified luminaires on City of Portland Electrical Equipment & Materials List ([Web Link](#)). Provide photometric model in AGI32 file format. City may require adjustments to proposed luminaire, luminaire arm length, or mounting position.
  - c. Carrier must mount all equipment cabinet and antennas no lower than 22 feet above grade, except service cabinet and maintenance disconnect.
  - d. Carriers may install canister antenna array and shroud only on top of the pole; mid-pole canister installations are not permitted. Top of antennas should not to exceed more than 4 feet above the top of pole or luminaire height, whichever is higher. Street light luminaires and luminaire arms may extend above top of pole elevation by up to 2 feet.
3. Carrier Equipment
- a. Individual antenna volumes will not exceed 3 cubic feet and 35 pounds each.
    - i. Maximum of one shrouded canister antenna array at top of pole. Canister antenna array should not exceed 2 feet in height. Canister shroud and equipment should not exceed 150 pounds.
    - ii. In addition to a canister antenna, a maximum of three external flat panel antenna arrays per pole, installed below street light mast except as permitted. Mount antennas as close to the pole as feasible, not to exceed 12 inches from surface of pole to back of antenna. All flat panel antenna arrays must be installed at the same nominal elevation.
  - b. General equipment and mounting components must be the smallest technically feasible. The City expects the dimensions to not exceed:
    - i. Maximum 7.5 cubic feet in total volume and 150 pounds on poles 30 feet or less.
    - ii. Maximum 11 cubic feet in total volume and 300 pounds on pole 35 feet or more.
    - iii. Maximum of one consolidated equipment cabinet per pole.
  - c. Replacement poles must be designed to accommodate future City equipment and signing.
4. Equipment mounting
- a. All equipment must be attached to the pole without drilling, cutting, or welding.

- b. Top of pole: bolt to provided top tenon mounting plate.
  - c. On pole: use appropriately sized stainless-steel banding and pole brackets.
  - d. No carrier antennas or equipment will be allowed on the luminaire arm.
  - e. Use existing pole access: top of pole, various pre-fabricated threaded outlets/ports throughout pole length, and handholes.
  - f. Equipment cabinets should be on the street side of poles where feasible.
5. Separation of facilities
- a. All carrier equipment and antennas must maintain minimum 12-inch clear space from city equipment, including street light mast.
  - b. Within pole and foundation: use discrete internal conduit to separate wiring for electrical service, street lighting, and carrier systems. Below street lighting mast, all open space within the pole is reserved for City use.
  - c. In foundation: install two 1-inch conduit and two 2-inch conduit. Connect conduit risers to internal pole conduit with flexible conduit sections unless otherwise specified.
    - i. Install two 1-inch conduit to junction box and adjacent utility junction box for electrical service per PGE/PPL requirements.
    - ii. Install one 2-inch conduit to separate junction box adjacent to foundation for street lighting and traffic signal use.
    - iii. Install one 2-inch conduit to separate junction box for carrier communications use.
  - d. Aerial connections such as overhead electrical service or communications spans are not allowed.
6. Electrical service
- a. Provide dual-gang service infrastructure with maintenance shut-off switch. City street lighting does not require meter. Service infrastructure must be incorporated into the pole or in a below grade vault.
  - b. Post instructions at shut-off switch for maintenance crews to notify carrier operations when working in proximity to antennas or other equipment.
  - c. Backup battery systems are not permitted downstream of shut-off switch.
  - d. Service cabinets shall not impact pedestrian accessibility, ADA clearances, or extend into sidewalks.

### C. Structural Design Criteria

## 1. General

- a. A complete site-specific pole and foundation design, stamped and signed by a Professional Engineer licensed in Oregon, shall be submitted for each proposed pole installation.
- b. All proposed pole details shall conform to the Notes, shapes, orientations, & layouts shown on PBOT Standard Drawings, including, but not limited to the following standard drawings, as applicable:
  - P-601 Single Mast Arm Pole & Weld Details
  - P-602 Combination Mast Arm Pole Details
  - P-603 Dual Mast Arm Pole Details
  - P-604(A) Mast Arm Pole Flange Plate Details
  - P-604(B) Mast Arm Pole Base Plate Details
  - P-604(C) Mast Arm Pole Base Plate Details
  - P-605 Mast Arm Pipe Tenon Attachment and Luminaire Arm Details
  - P-606 Signal Pole Footing & Anchor Bolts Type 1
  - P-607 Signal Pole Footing & Anchor Bolts Type 2 & 3
  - P-608 Signal Pole Footing Frangible Base
  - P-651 Street Lighting Cobra-Head Pole Details
  - P-660 Street Lighting Standard Street Light Standard Pole Footing
  - P-670 Street Lighting Pole-Mounted Panel Details
  - P-671 Street Lighting Service Cabinet Details
- c. The standard drawings do not constitute a site-specific design and shall only be used as a reference for the basis of each site-specific pole design, fabrication, materials and workmanship, as presented on the drawings.

## 2. Applicable Design Codes and References

The following design codes and references shall be used for the load calculations, design and detailing of the street light poles and foundations to accommodate SWF:

- a. AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Edition, 2013
- b. ODOT Traffic Structures design Manual, May 2015
- c. PBOT Existing Standard Drawings

## 3. Material Specifications

Material specification for the street light poles shall be in conformance with City of Portland Standard Construction Specifications 2010 Section 00962.10 Materials and as follows:

- Steel used in base plates, flange plates and gusset plates shall conform to ASTM A572 Gr 50. Silicon content of the base metal shall be 0.0% to 0.04% or 0.15% to 0.25%.
- Anchor bolts: ASTM F1554 Gr 36 and Gr 55.
- Nuts: ASTM A563 Gr. DH Heavy Hex.
- Hex head bolts: ASTM F3125, Grade A325 (1.25-1.50 Inch diameter)
- ASTM A354BC (1.75 in. and larger diameter)
- Washers: ASTM F436 Type 1.
- Pipe Tenons and Wire Guides: ASTM A53 Gr. B.
- Handhole Covers: ASTM A1011 Gr. 50.
- Galvanizing: ASTM A123 and A153
- Sheet steel for poles and arms shall conform to A572 Gr. 50 or A595 Gr. A or B.
- Concrete: Structural grade concrete or drilled shaft concrete -3000 psi compressive strength at 28 days, 4-7% air entrainment.
- Grout: non-shrink high early strength grout (non-ferrous) with a minimum design dry-pack compressive strength of 5000 psi at 24 hours.
- Reinforcing steel shall conform to AASHTO M31 (ASTM A615) grade 60.

#### 4. Design Loads and Analysis

The following loads will be considered for the design of street light poles:

- a. Dead load: The dead load shall consist of the total weight of the structural pole, luminaire arm, luminaires, cabinets, antenna canister, transition shroud, exterior antennas, and other appurtenances permanently attached to and supported by the structure. The points of application of the weights shall be their respective centers of gravity. Dead loads will be the major axial force on the foundation.
- b. Ice load: An ice load of 3 psf shall be applied around all the surfaces of the structural supports, luminaires and horizontal luminaire arm. Ice load on the new SWF will also be considered.
- c. Wind load: Wind load shall be the pressure of the wind acting horizontally on the structural supports, luminaire, cabinets, SWF and other appurtenances. Wind speed of 100 mph, 3 sec Gust with a Gust Factor of 1.14. A wind importance factor  $I_r$  of 1.00 for a Recurrence interval of 50 years shall be used to calculate the design wind pressure. Wind drag coefficient shall be calculated according to Table 3.8.6.1 of the Standard Specifications for Structural supports for Highway Signs, Luminaires, and Traffic Signals, Sixth Edition.

#### 5. Foundation Design Criteria

- a. Foundations shall be designed to resist the total axial force, moment and shear force resulting from all the applied loads. Foundation shafts shall be round shaped. Deflection at the top of the foundation shaft shall be limited to half an inch. The top portion of the round foundations shall be integrated into sidewalk or poured as a square pad, large enough to support the pole base plate and nut covers.
  - b. All proposed pole installation locations require a site-specific foundation design to be provided by Applicant's qualified geotechnical engineer. All special foundation designs require at least one geotechnical boring and soil analysis for each proposed pole location.
6. Analysis and Safety Factors
- a. Broms' approximate procedures for the estimation of embedment as outlined in Chapter 13 of the Standard specifications (2013) shall be used to design the street light poles for overturning. An under-capacity factor of 0.7, minimum overload factor of 2, and a stress increase factor equal to 1.33 shall be applied which results in the minimum safety factor equal to 2.15. All demands at the base of the pole shall be amplified by the factor of 2.15 for overturning design of the shaft. The shaft length obtained using Broms' method to resist the overturning moment and shear force is assumed to provide adequate resistance for applied torsional loads.
  - b. Foundation shafts shall also be designed to limit the deflection at the top of the shaft. The top of shaft deflection of half an inch or less shall be maintained under working load analysis. L-Pile software shall be used to evaluate shaft head deflections.
7. Anchorage Design shall be in conformance with City of Portland Standard Construction Specifications 2010 Section 00962 Metal Illumination and Traffic Signal Supports and as follows:
- a. Cast-in-place anchor bolts shall be used. Anchor bolts material, unless otherwise specified, shall conform to the requirements of ASTM F1554.
  - b. The anchor bolts and their anchorage shall be designed to transmit loads from the attachment into the concrete support or foundation by means of tension, bearing, and shear, or any combination thereof. Building Code Requirements for Structural Concrete and Commentary (ACI 318-08, Appendix D) or newer version shall be used for the design of anchorage to concrete.
  - c. The following modes of failure shall be considered in the anchorage design:
    - i. bolt failure,
    - ii. load transfer from the anchor to the concrete,

- iii. tensile strength of concrete,
    - iv. lateral bursting of concrete, and
    - v. base plate failure.
  - d. The design strength of an anchor bolt connection shall be equal to or greater than the effect of the design loads on the connection. The design strength of an anchor bolt connection shall be calculated from equilibrium and deformation compatibility.
- 8. Design Base Reactions
  - a. For analysis related to the adequacy of the foundation for future attachments, the design capacity of the proposed foundation is required. Pole base reactions used in the design of the pole foundation shall be included on the foundation Plan Sheets. Base reactions shall include moment, shear, and torsion.

#### D. General Permitting Requirements

Both a franchise (through the Office for Community Technology) and a Master Lease Agreement with PBOT must be in effect prior to a site walk, reservation, make-ready, or application process initiation for a SWF. Any SWF proposed within a City capital or developer driven frontage improvement project will require coordination with the construction activities of the project.

Any and all plans, specifications, survey notes or other original documents as required by the Director of the Bureau of Transportation that were either prepared for or produced during the design or construction of a public improvement, become the property of the City.

Requests for any of the below processes may be initiated here: ([Web Link](#))

#### E. Conditions for Attachment

1. PBOT Assets which do not meet current standards will require replacement and potentially relocation prior to SWF attachment. This will be addressed below in the make-ready process.
2. PBOT Assets which can be attached to are visible in a web map accessible here: ([Web Link](#))
3. VOLUNTARY Site Walk – Any applicant may request a site walk with PBOT prior to application for a SWF attachment. Requests for a site walk may be made here: ([Web Link](#))

- a. Fees associated with the site walk are for cost recovery purposes only and are shown on PBOT's fee schedule.
  - b. Site walk fees shall be paid prior to the site walk.
  - c. Once the site walk fees are paid and the site walk is scheduled, a "Pending Reservation" flag will be placed on the PBOT Asset until after the site walk is performed. This hold will ensure that the applicant has an opportunity to voluntarily reserve the PBOT Asset once the site walk report is delivered before another entity can voluntarily reserve it.
  - d. A representative from the Vertical Infrastructure staff will attend all site walks.
  - e. Site walks will require preliminary research and consequently a Vertical Infrastructure technician will schedule the site walk a minimum of five business days after the request is made.
  - f. A post site walk report will be generated and delivered electronically to the applicant within five business days of the site walk. The report will include a summary of research gathered by the Vertical Infrastructure technician as well as a summary of the items discussed during the site walk.
  - g. All information provided by PBOT in the site walk report is for the benefit of the applicant. Due diligence for any information necessary for the successful permitting, design, or construction of a pole or a SWF is the responsibility of the applicant. The applicant will hold PBOT harmless for any information discovered after the site walk report is generated which may impact the project.
  - h. The site walk report becomes public record and will be made available to future site walk requestors if the site has not been reserved.
  - i. Applicants will have five business days from the date the site walk report was sent to the applicant to voluntarily reserve the PBOT Asset. If the applicant chooses not to reserve, the PBOT Asset will have the "Pending Reservation" flag removed and become available for another entity to voluntarily reserve.
4. VOLUNTARY Reservation – Any applicant may choose to voluntarily reserve a PBOT Asset.
- a. PBOT Assets available for reservation may be viewed on the above linked web map.
  - b. Only one reservation per PBOT Asset will be allowed.
  - c. By reserving a PBOT Asset, the applicant agrees to toll the shot clock associated with SWF at the site requested.
  - d. Reservation requests may be made by filling out the request form here: [\(Web Link\)](#)

- e. Reservation requests will be processed on a first-come first-served basis.
- f. Fees associated with a reservation are shown on PBOT's fee schedule.
- g. Fees must be paid within two business days of fee notification to the applicant.
- h. Reservation of a PBOT Asset will hold the asset for a period of one year from the date of reservation request. No other entity will be allowed to apply for a SWF on a reserved PBOT Asset during this period.
- i. The City requires that an applicant who reserves a PBOT Asset will utilize the one-year period to work through an iterative make-ready permitting process with PBOT to ensure all civil, structural and electrical designs are approvable at the time of SWF application.
- j. Costs associated with the make-ready process are for cost recovery purposes only.
- k. At the end of the reservation period, if an application for attachment has not been accepted by the City, the reservation flag will be removed from the PBOT asset and the PBOT asset will become available for a new reservation.

## 5. Iterative Make-Ready Permitting Process

Existing PBOT Assets are typically not suitable for attachment because the Assets were not designed to support SWF. PBOT has therefore created a make-ready review process to assist applicants through the engineering review required to replace an existing PBOT Asset with a PBOT Asset that can safely support SWF. This process will not apply if the requested pole meets current PBOT standards for pole location and attachment at the time of application.

The process to make a PBOT Asset suitable for SWF will require joint agreement between the applicant and PBOT to toll the shot clock.

Requests to enter the make-ready process may be made here: ([Web Link](#))

- a. Upon request, a pre-design meeting will be set up by a VI technician.
  - i. This meeting will be staffed by a VI Tech, SSL, STR and Civil engineers.
  - ii. At the end of the meeting, the VI Tech will provide a site-specific checklist ([Checklist](#)) to include all requirements the applicant needs to provide for a reviewable application.

- iii. Upon completion of the pre-design meeting, a design review estimate will be provided by the VI Tech.
  - b. The applicant will submit engineered design plans to PBOT. PBOT will do a cursory review of the Checklist to ensure all items are included in the application.
    - i. A deposit in the amount of the design estimate must be provided at the time of submittal.
    - ii. Once the submittal and deposit have been received and the Checklist verified, the submittal will be sent to the Civil Tech for iterative review of design elements.
      - 1. This iterative review will include comments from SSL, STR and any additional requirements set by the VI Tech.
  - c. Once the submittal and design are at a point where they can be approved by PBOT, the applicant will be notified that the plans are approved for signatures.
  - d. A construction estimate will be provided to the applicant to collect construction fees.
  - e. The VI Tech will collect the appropriate signatures and reconcile the design review fees.
  - f. All fees for the make-ready design process must be paid prior to the signed plans being returned.
- 6. Application for Attachment to PBOT Asset
  - a. Applications must be submitted in person with representatives of the Vertical Infrastructure team.
    - i. Meeting requests may be made by filling out the request form here: [\(Web Link\)](#)
    - ii. Fees associated with the application meeting are for cost recovery purposes only and are shown on PBOT's fee schedule.
    - iii. Application meeting fees shall be paid prior to the meeting.
    - iv. Application meetings will be scheduled a minimum of five business days after payment is received.
  - b. SWF applications must include all items detailed in the checklist here: [\(Web link\)](#)
  - c. Any application with missing or incomplete information could be cause for rejection of the application.
  - d. The City has 10 days after application submission to review the application for missing or incomplete information. If information is incomplete, the City must then notify the applicant and the shot clock is automatically tolled (and reset) when the applicant submits additional information.

- e. After application acceptance and initial review by the City, the Right of Way Acquisition team will be notified by the Vertical Infrastructure team to process the applicant's Master Lease Agreement supplement in parallel with comprehensive application review.
  - f. After application acceptance and initial review by the City, when make-ready is necessary, the VI tech will provide a construction estimate to the applicant for inspection of the required improvements.
  - g. Construction fees associated with the make-ready process must be deposited prior to permit issuance in the amount identified by the construction estimate.
  - h. At the completion of the comprehensive review process, once the plans are deemed acceptable, PBOT will issue a permit to the franchised entity represented by the applicant.
7. Construction & Inspection
- a. Construction may not occur until an approved permit has been issued by PBOT.
  - b. An estimate for construction costs shall be provided to the applicant during the permitting phase, after the application is accepted by the City.
    - i. Costs shall be collected prior to permit issuance
    - ii. Costs shall be at full cost recovery.
  - c. The applicant will fund a project specific account in the amount of the estimate provided by City staff.
  - d. Civil and Electrical public works engineers, inspectors and technicians will direct bill the project account until the project is completed.
  - e. Funds left in the account after construction is completed will be released to the applicant once final accounting has been completed by the City.
  - f. In the event that the account runs low on funds prior to project completion, additional funds must be deposited by the applicant upon City request.
  - g. Once the applicant/contractor finds the project to be substantially complete, the contractor must request a final walkthrough.
    - i. The Civil Tech will schedule the final walkthrough with SSL, STR, Civil Engineer, and the Civil Inspector.
      - 1. If items for correction are identified, a punch list will be generated and sent to the applicant. Once all items are approved by inspection, substantial completion will be granted.

2. If no items for correction are identified, substantial completion will be granted.
  - h. When the substantial completion is issued, a 2-year warranty phase on any replacement pole begins.
  - i. SWF cannot be attached until such time as substantial completion has been issued by the City.
  - j. Approximately 3-months after substantial completion, the Civil Tech will reconcile fees and either issue an invoice for additional payment or issue a refund.
8. 2-Year Warranty
- a. Three months prior to the 2-year warranty phase being completed, the Civil Tech schedules a 2-year warranty walkthrough with the SSL, STR, and Civil Inspector.

The Civil Tech will collect all the comments from each of the groups and produce a warranty punch list of items that need to be completed prior to the completion of the 2-year warranty phase.

## **V. Small Wireless Facilities: Requirements for 3<sup>rd</sup> Party Assets**

### **A. Design Criteria**

1. Scope
  - a. This section applies to all 3<sup>rd</sup> Party Assets.
2. Height
  - a. Pole heights will be limited to the maximum allowed by the SWF definition above.
  - b. Modifications or replacement of existing poles should not prohibit existing pole attachment heights and uses such as telecommunications or street lighting, as directed by the pole owner.
3. Equipment requirements
  - a. Individual antenna array volumes will not exceed 3 cubic feet each.
    - i. Maximum of one shrouded canister antenna array per pole.
    - ii. Maximum of three external flat panel antenna arrays per pole. Do not exceed 12 inches from surface of pole to back of antenna. All flat panel antenna arrays must be installed at the same nominal elevation.
  - b. General equipment and mounting components must be the smallest technically feasible. The City expects the dimensions to not exceed:
    - i. Maximum 7.5 cubic feet in total volume on poles 30 feet or less.

- ii. Maximum 11 cubic feet in total volume on poles greater than 30 feet.
    - iii. Maximum of one consolidated equipment cabinet per pole.
  - 4. Equipment mounting
    - a. Equipment cabinets should be on the street side of poles where feasible.
    - b. Do not have static or flashing lights that are visible more than 10 feet from base of pole when equipment enclosures are closed.
    - c. Do not obstruct pole climbing space.
  - 5. Separation of facilities
    - a. Maintain separation of equipment and wiring as required per code.
  - 6. Electrical service
    - a. Provide maintenance shut-off switch.
    - b. Post instructions at shut-off switch for maintenance crews to notify carrier operations when working in proximity to antennas or other equipment.
    - c. Backup battery systems are not permitted downstream of shut-off switch.
    - d. Any associated meter must be located in a below grade vault or recessed within the pole.
- B. Conditions for Attachment
  - 1. VOLUNTARY Site Walk – Any applicant may request a site walk with PBOT prior to an application for a SWF. Requests for a site walk may be made here: [\(Web Link\)](#)
    - a. Fees associated with the site walk are for cost recovery purposes only and are shown on PBOT's fee schedule.
    - b. Site walk fees shall be paid prior to the site walk.
    - c. A representative from the Vertical Infrastructure staff will attend all site walks.
    - d. Site walks will require preliminary research and consequently a Vertical Infrastructure technician will schedule the site walk a minimum of five business days after the request is made.
    - e. A post site walk report will be generated and delivered electronically to the applicant within two business days of the site walk. The report will include a summary of research gathered by the Vertical Infrastructure technician as well as a summary of the items discussed at the site walk.
    - f. All information provided by PBOT in the site walk report is for the benefit of the applicant. Due diligence for any information necessary for the successful permitting, design, or construction of a pole or a SWF is the responsibility of the applicant. The applicant will hold PBOT

- harmless for any information discovered after the site walk report is generated which may impact the project.
- g. The site walk report becomes public record and will be made available to future site walk requestors.
2. Application for Attachment
    - a. Applications must be submitted in person with representatives of the Vertical Infrastructure team.
      - i. Meeting requests may be made by filling out the request form here: ([Web Link](#))
      - ii. Fees associated with the application meeting are for cost recovery purposes only and are shown on PBOT's fee schedule.
      - iii. Application meeting fees shall be paid prior to the meeting.
      - iv. Application meetings will be scheduled a minimum of five business days after payment is received.
    - b. SWF applications must include all items detailed in the checklist here: ([Web link](#))
    - c. SWF applications for attachment to a 3<sup>rd</sup> Party Asset must include any plan sets from the Asset owner associated with the replacement and/or relocation of the pole, including conduit/vault needs.
      - i. Plan set will be used to facilitate the Street Opening permit process in parallel with the SWF application review.
      - ii. Plan set will require concurrence from 3<sup>rd</sup> Party Asset owner.
    - d. Ramp Assessments
      - i. Any pole replacements within an intersection corner or adjacent to a mid-block ramp will require a ramp assessment.
      - ii. Ramp assessment forms can be found here: ([Web Link](#))
    - e. Any application with missing or incomplete information may be cause for rejection of the application.
    - f. The City has 10 days after application submission to review the application for missing or incomplete information. If information is incomplete, the City must then notify the applicant and the shot clock is automatically tolled (and re-set) when the applicant submits additional information.
    - g. At the completion of the comprehensive review process, once the plans are deemed acceptable, PBOT will issue a permit to the franchised entity represented by the applicant.
    - h. All fees associated with the issuance of the SWF permit and/or Street Opening permit are shown on PBOT's fee schedule.

## **VI. Vertical Infrastructure: Aesthetic Requirements**

## A. Purpose

Ensure that the transition to the next generation of wireless services, which will require substantially more Vertical Infrastructure than has historically been placed in the public right of way, avoids the intangible public harm of unsightly or out-of-character deployments.

## B. General Requirements

### 1. General Design

- a. Conceal all wiring within pole or conduit, except for bonding conductors and antenna cables, to the extent technically feasible. Any wiring or conduit not able to be placed within the pole must be shrouded.
- b. Equipment-related features, for example cooling system fans, shall not exceed sound limits as per Portland City Code Chapter 18.10 (Maximum Permissible Sound Levels).
- c. General equipment and mounting components must be the smallest technically feasible.

### 2. Equipment Color (as per City of Portland Standard Construction Specifications 2010 Section 00962.48 Coating)

- a. New pole – Match nominal pole color.
- b. Existing pole - Gray or match nominal pole color.
  - i. On PBOT Asset, match nominal color
- c. Shrouding to match per above.

### 3. Signage/Advertising (as per TRN-10.19 – Utility Permits in the Right-of-Way)

- a. Remove all manufacturer and provider decals.
- b. Signs allowed only as required by law or by the pole owner. No additional signage allowed.
- c. Utilize the smallest and lowest visibility signs required by applicable law, standards or utility regulations. See TRN- 10.19 – Subsection: Above Ground Structures.
  - i. Place required signs as close to the related facility/equipment as possible facing the climbing space or directly out toward the street.
- d. Provider shall post name, identifying information, and 24-hour emergency telephone number on carrier equipment in an area that is visible to the public.

## VII. Macro Wireless Facilities

For Macro Wireless Facility requirements, please refer to the [Office for Community Technology \(OCT\) Website](#).