



Broadband Accommodation Process

Right of Way Division

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1. Purpose of Broadband Accommodation Process

This document will prescribe minimum design standards for the accommodation, method, materials, and location for the installation, adjustment, and maintenance of broadband facilities under the accommodation process. The Installation Owner is intended to ensure the safety of the general public as well as those who will work on or in proximity to the Broadband equipment.

These Design Standards are governed by the terms and conditions found in applicable sections of the latest versions of the following documents:

- The Texas Administrative Code (TAC), Title 43, Chapter 21, Subchapter C¹
- The TxDOT ROW Utilities Manual²
- The TxDOT Use of Right of Way by Others Manual,³ including the Utility Installation Request (UIR) form/system
- The TxDOT Landscape and Aesthetics Design Manual⁴
- The TxDOT Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges⁵
- Poles shall be designed in accordance with *The Standard Specifications for Structural Supports for Highway Signs Luminaires and Traffic Signals, 6th Edition, 2013 (LTS-6)* considering the pressure on the Effective Project Area (EPA) of the pole and each attachment. Calculations shall be submitted by a Texas licensed engineer, shall be concise, and shall not consist simply of computer output where numbers are shown but not defined/labelled. Unreinforced concrete foundations shall not be allowed. A reinforced concrete foundation (either concrete drilled shaft foundations

¹ "Texas Administrative Code," <https://www.sos.state.tx.us/tac/index.shtml>

² "ROW Utilities Manual," TxDOT, <http://onlinemanuals.txdot.gov/txdotmanuals/uti/uti.pdf>

³ "Use of Right of Way by Others Manual," TxDOT <http://onlinemanuals.txdot.gov/txdotmanuals/use/use.pdf>

⁴ "Landscape and Aesthetic Design Manual," TxDOT <http://onlinemanuals.txdot.gov/txdotmanuals/lad/lad.pdf>

⁵ "Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges", Nov. 2014, <http://ftp.dot.state.tx.us/pub/txdot-info/des/spec-book-1.114.pdf>

or footings) shall consist of concrete having longitudinal internal reinforcing bars and transverse spiral or tie reinforcement.

Amending the Design Standards

The Department reserves the right to revise the Design Standards in accordance with the terms of Title 43, Texas Administrative Code. Any amendment to the Design Standards shall apply prospectively, except to the extent required by federal, state, or local law.

Additional Requirements

In addition to the requirements of the Design Standards, Installation Owners may also be subject to other regulatory obligations, including requirements established by the TxDOT District in which the site will be located. Installation Owners are responsible for compliance with all additional or updated TxDOT requirements.

2. Definitions

The following words, terms, and phrases, when used in these Design Standards, shall have the meanings ascribed to them in this section except where the context indicates a different meaning.

Antenna means communications equipment that transmits or receives electromagnetic radio frequency signals used in the provision of Wireless Services.

Applicable Codes means:

- (1) Uniform building, fire, electrical, plumbing, or mechanical codes adopted by a recognized national code organization, including without limitation the National Electric Code, the National Electric Safety Code, American National Standards Institute & Telecommunications Industry Association (“ANSI/TIA”) Structural Standards, National Fire Protection Association (“NFPA”) standards, and the International Building Code; and
- (2) Federal, state, or local law applicable to activities undertaken pursuant to the Utility Permit

Applicable Engineering Standards means all engineering or safety standards governing the Broadband Installation, maintenance and operation of facilities, and the performance of all work in or around Department Facilities, including without limitation the Department’s (or other relevant authorities’) clearance standards, the National Electric Safety Code (“NESC”), the National Electrical Code (“NEC”), the Texas Health & Safety Code, Chapter 752 (Vernon 1992), and any subsequent amendments that relate to the maintenance of proper clearances and related safety issues, the regulations of the Occupational Safety and Health Act (“OSHA”), applicable regulations of the Federal Communications Commission (“FCC”), applicable regulations of the Environmental Protection Agency (“EPA”), or other requirements of the Department, including as-yet-unadopted local, state, or national standards that are non-discriminatory to the installation owner as compared to all other similarly situated persons and types of facilities, provided, however, that new or revised engineering standards will not apply retroactively unless required by law.

Attachment means a Broadband Installation on a Department Service Structure or third-party Pole.

Broadband Installation means and includes a Network Provider’s installation of a Network Node attached to a Department Service Structure or other Pole in Department Rights-of-Way including, without limitation, a Node Support Pole, together with any broadband facilities installed in Department Rights-of-Way in conjunction with a Network Node.

Broadband Service means internet service with the capability of providing a download speed of 25 megabits per second or faster and upload speed of 3 megabits per second or faster.

Broadband Service Provider is an entity that exclusively provides Broadband Service.

Collocate and **Collocation** means the installation, mounting, maintenance, modification, operation, or replacement of Network Nodes in a Department Right-of-Way on or adjacent to a Pole or Department Service Structure.

Concealment Elements means physical designs or treatments that minimize adverse aesthetic and visual impacts on the view from land, property, buildings, and other facilities adjacent to, surrounding, and in generally the same area as the requested location of a Broadband Installation, including a Network Node or Node Support Pole, which shall mean the least visually and physically intrusive facility, and that is not technologically or commercially impracticable under the facts and circumstances.

Cubic Volume means the total measure of all the Network Node equipment (antenna and ancillary). For any Network Node equipment that is irregular in shape, the greatest length, width, and depth will be used. Dimensions will be listed in inches for calculating cubic volume. Volume shall be listed in cubic feet.

Decorative Pole means a Pole specially designed and placed for aesthetic purposes and on which no appurtenances or attachments, other than specially designed informational or directional signage or temporary holiday or special event attachments, have been placed or are permitted to be placed according to non-discriminatory municipal codes.

The Department means and includes the Texas Department of Transportation, its successors and assigns, and its authorized agents, representatives, employees, or contractors.

Department Facilities means and includes Department-owned or managed property of all kinds, including without limitation Department Service Structures, Department Rights-of-Way, and appurtenances the Department may place in the Department Rights-of-Way.

Department Right-of-Way or **Department Rights-of-Way** means the area or areas on, below, above, or adjacent to public roadways, highways, or streets or public sidewalks, alleys, waterways, or utility easements the Department administers. The term does not include:

- (1) a Private Easement; or
- (2) the airwaves above a Department Right-of-Way with regard to Broadband telecommunications.

Design District means an area, including an overlay district, that is zoned or otherwise designated by local municipal codes or regulations for which an affected municipality maintains and enforces unique design and aesthetic standards which are reasonable, objective, published in advance, and applied on a uniform and non-discriminatory basis.

Design Documentation means all documentation required for a complete Utility Permit application as defined in these Design Standards.

District Engineer means the Department's District Engineer for the location where the Individual Site(s) are situated or his or her delegate.

Highway Facility means any present or future physical roadway improvements within existing or future Department Rights-of-Way, including, but not limited to, duct banks installed by the Department, bridges, embankments, drainage areas, traffic signals, signs, and roadway surfaces as well as structures and facilities not physically located within the highway right of way that are used in the construction, maintenance, or operation of a highway, including, but not limited to, warehouses, storage areas, maintenance sites, roadside parks, administration buildings, and parking lots, except for improvements constructed or placed on an Individual Site or permitted facility by Installation Owner.

Historic District means an area that is zoned or otherwise designated as a historical preservation district under local, state, or federal law.

Improvements mean all Network Nodes, Node Support Poles, Node Transport Facilities, or related facilities Installation Owner constructs according to the permissions granted in the Utility Permit.

Installation Owner means a Network Provider that desires to install, own, maintain, repair, or operate Network Nodes providing Broadband Services on or supported by Department-owned Service Structures or other Poles in the Department Rights-of-Way.

Joint Use Structure means a pole or other structure supporting a small cell antenna owned or operated by more than one carrier.

Law means applicable common law or a federal, state, or local law, statute, code, rule, regulation, order, or ordinance.

Macro Tower means a guyed or self-supported pole, monopole, lattice tower, or guyed towers supporting a broadband installation within the Department Rights-of-Way.

Make-Ready Charges means the cost of all work that is required to accommodate or accomplish Make-Ready Construction.

Make-Ready Construction means all work that is required to accommodate Installation Owner's Broadband Installation on a Service Structure in compliance with the Applicable Engineering Standards and these Design Standards. Make-Ready Construction may include but is not limited to, engineering design, pole loading analysis, electrical construction, communications construction, Broadband Installation construction, Service Structure replacement, where applicable, and a post-construction inspection.

Network Node means equipment at a fixed location that enables broadband communications between the user equipment and a communications network. The term:

- (1) includes:
 - (A) equipment associated with broadband communications;
 - (B) a radio transceiver, an antenna, a battery-only backup power supply, and comparable equipment, regardless of technological configuration; and
 - (C) a coaxial or fiber-optic cable that is immediately adjacent to and directly associated with a particular collocation; and
- (2) does not include:
 - (A) an electric generator;
 - (B) a Service Structure;
 - (C) a Pole; or
 - (D) a Macro Tower.

Network Provider means:

- (1) a Broadband Service Provider; or
- (2) a person that does not provide Broadband Service and that is not an electric utility but builds or installs on behalf of a Broadband Service Provider:
 - (A) Network Nodes; or
 - (B) Node Support Poles or any other structure that supports or is capable of supporting a Network Node.

Node Position Key means an annotated cross-section schematic showing the reference of the Attachment on the horizontal plane.

Node Support Pole means a pole installed by a Network Provider for the primary purpose of supporting a Network Node.

Node Transport Facility or **Node Transport Facilities** means the transmission path or paths within the Department Rights-of-Way from a Network Node directly to the network fiber, for the purpose of providing backhaul for Network Nodes.

Plan View or **Plan** means a top view of a three-dimensional object.

Pole means a vertical, wood or metal, support structure, including a Node Support Pole, or a Utility Pole.

Profile View or **Profile** means a side view of a three-dimensional object.

Service Structure means a Department-owned or operated, vertical, wood or metal, support structure located in a Department Right-of-Way, including a similar structure that is owned or operated by the Department and that the Department specifies in these Design Standards as being available for the support of Network Nodes.

Typical Detail or **Typical** means an annotated depiction of a certain installation or universal to many installations.

Unauthorized Broadband Installation means a Broadband Installation made on a Department Service Structure or in Department Rights-of-Way without an approved Utility Permit or otherwise not in compliance with an effective Utility Permit.

Utility means any entity owning a utility facility. Defined in Title 43, Texas Administrative Code, Rule §21.31, Definitions.

Utility Installation Review or **UIR** system is a TxDOT online application system used to apply for permits/leases in the Department's Rights-of-Way.

Utility Permit is TxDOT approval allowing the installation of a utility's infrastructure in TxDOT Right of Way.

Utility Pole means a Pole that provides:

- (1) electric distribution with a voltage rating of not more than 34.5 kilovolts phase-to-phase; and/or
- (2) services of a telecommunications provider, as defined by Section 51.002, Utilities Code.

Wireless Service means any service using licensed or unlicensed wireless spectrum, including the use of Wi-Fi, whether at a fixed location or mobile, provided to the public using a Network Node.

3. Utility Installation Review Permit Design Documentation Standards

General

All design criteria must conform with Title 43, Texas Administrative Code, Rule §21.37, Design. The location and manner in which a utility facility installation, adjustment, or relocation work will be performed within the right of way must be reviewed and approved by the Department. Measures must be taken to preserve the safety and free flow of traffic, the structural integrity of the highway or highway structure, ease of highway maintenance, the appearance of the highway, and the integrity of the utility facility.

All Design Documentation shall be submitted electronically with a Utility permit request and shall fully depict the scope of work to be performed by the Utility Installation Owner.

For Broadband Installations, the Utility Installation Owner shall indicate the design of the Node Support Pole, the Network Node, 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 ducts surrounding the installation and illustrate how the Node Transport Facility and power will interconnect with the Network Node.

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 standards 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. Scanned Design Documentation or Design Documentation of poor visual quality (as determined by the Department 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 formats.

Abbreviations

All annotations, callouts, 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 TxDOT Style Guide for Construction and Maintenance Specifications.⁶

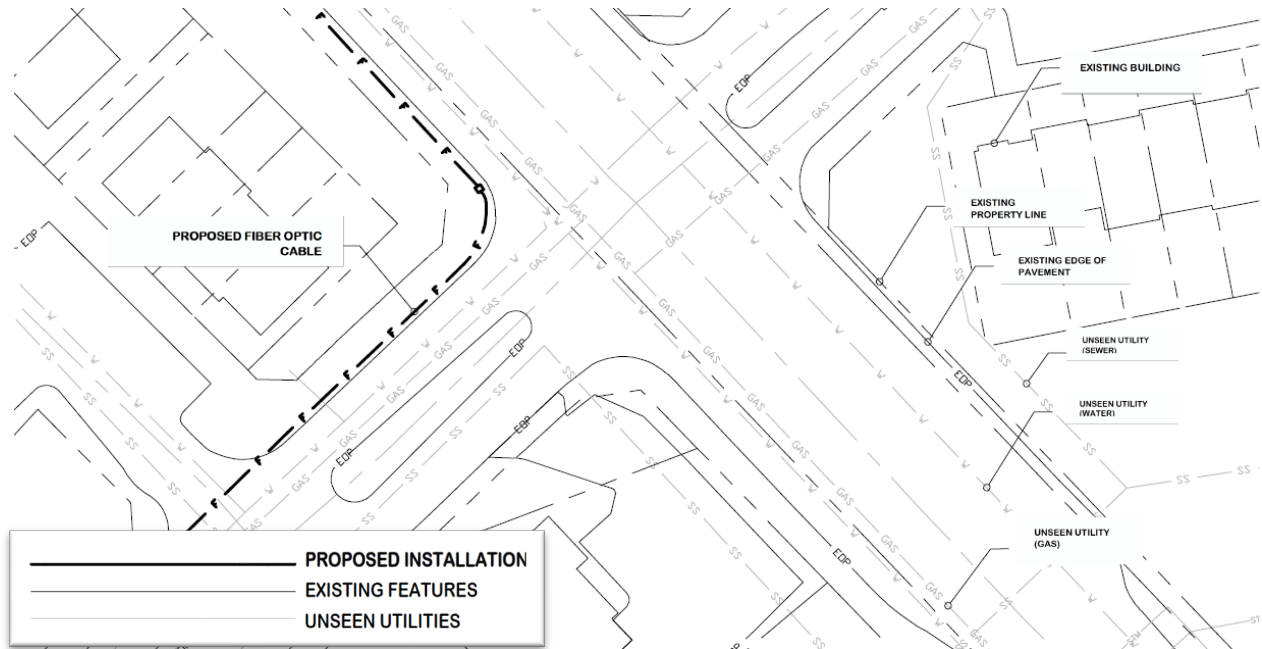
Line Weights and Annotations

Descriptions of existing above-ground features on Plan View and Profile View sheets shall have a consistent line weight. Descriptions of existing below-ground utilities and features shall have a consistent line weight that is lighter than existing above-ground features. All features and components of the proposed installation—as opposed to existing conditions—shall have a consistent, heavier line weight than existing above-ground features. All annotations for the proposed installation 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 Detail A. A sample Profile sheet with suitable line weights and annotations is shown in Detail B.

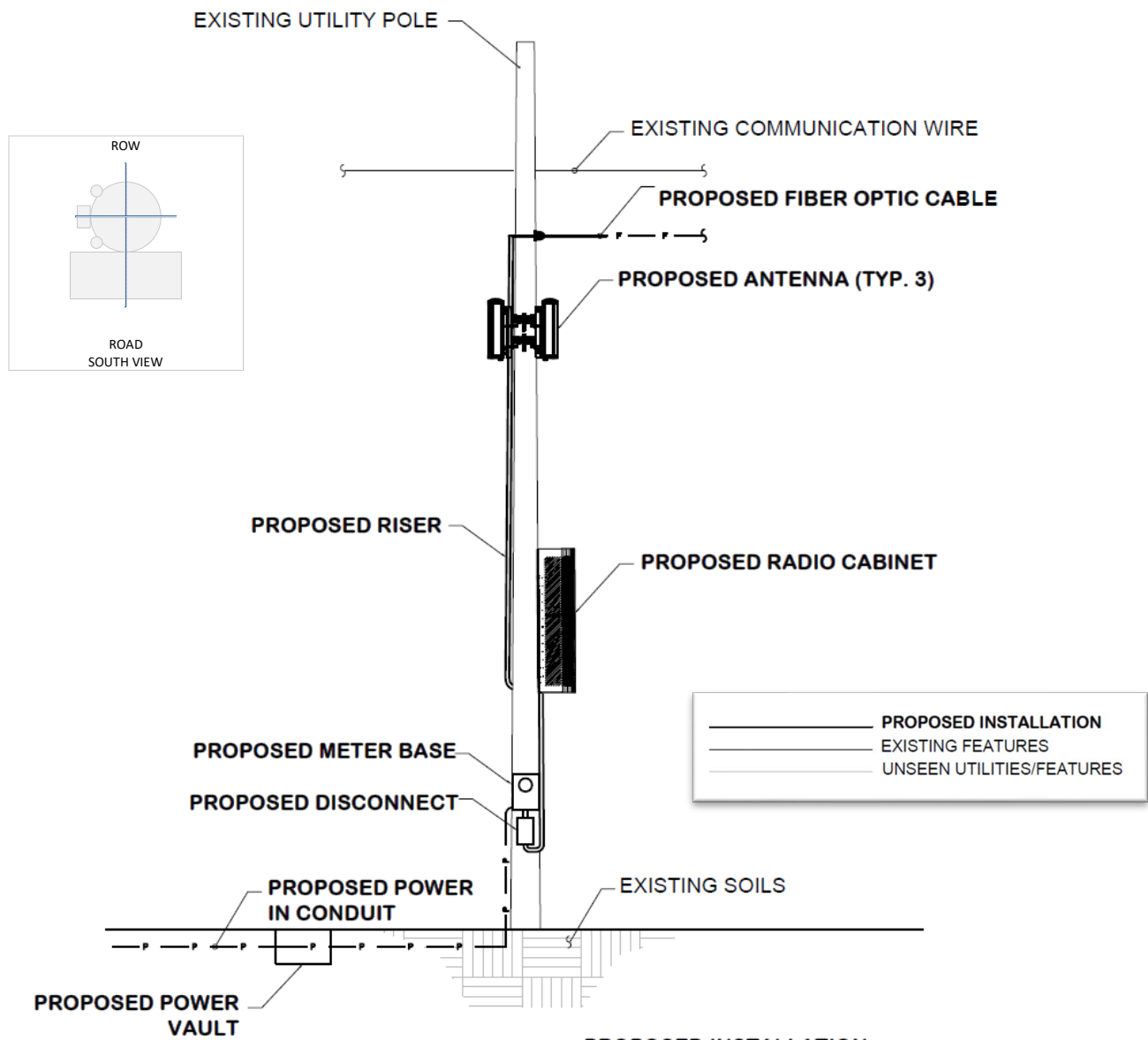
⁶ “Style Guide for Construction and Maintenance Specifications,” TxDOT, Oct. 2013, <https://ftp.dot.state.tx.us/pub/txdot-info/des/specs/2014-construction-maintenance-styleguide.pdf>

Detail A: Sample Plan Sheet with Suitable Line Weights and Annotation⁷



⁷ Annotations for travel lanes, road names, numbers, clear zone, and ROW were omitted for clarity.

Detail B: Sample Profile Sheet with Suitable Line Weights and Annotation (South View)



Required Sheets and Information

Design Documentation shall include, at a minimum, the following sheets for all types of applications except for Broadband Installation removal:

- Title Sheet

- Plan
- Profile
- Equipment
- Traffic Control Plan
- Standards (optional)

Applications to remove a Broadband Installation shall include:

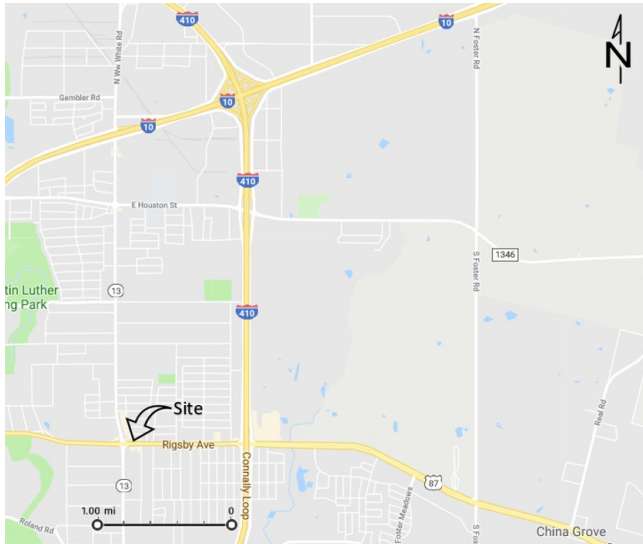
- A title sheet
- A list of items that will be removed
- Traffic Control Plans, and
- A description of the proposed restoration

Title Sheet Requirements

The title sheet shall include the following items:

- State road (name and number)
- TxDOT District (name and number)
- Network Provider’s site name and/or identifier number (e.g., “Abilene – North,” “TX3449859”)
- Full address of proposed Broadband Installation location (if none available, use the closest address to assist the reviewer in finding the site)
- Historic or Design District name, if applicable
- Latitude and longitude are expressed in degree/decimal format (e.g., XX.XXXXXX) to the NAD83 standard and accurate to ± 1 meter.
- Email and phone number for the applicant’s engineer
- Email and phone number for the applicant’s single point of contact
- 5-square-mile map of the area for orientation purposes (see Detail C)

Detail C: Sample 5-Square-Mile Area Map



- A list of Applicable Codes and Applicable Engineering Standards (most recent version) with which the application complies
- Sheet index (table of contents) listing only submitted sheets
- Seal and signature from a State of Texas-certified Professional Engineer (P.E.)
- Professional Engineer’s statement with the following signature line placed in the lower right-hand quadrant of the title page:

I, _____, a registered Professional Engineer in the State of Texas, 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)

- Municipal roads (name)
- Toll roads (name)
- Private roads
- Travel lanes with traffic direction arrows
- Clear zones
- Distance from proposed installation to the right of way line
- Right of way width
- Department 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 Department Rights-of-Way
- Property addresses for parcels abutting the Department Rights-of-Way
- Area zoning boundaries and an indication of the zone type, if any (e.g., residential, mixed-use, commercial, industrial)
- Premises outlines with address numbers, if applicable
- Existing underground utilities if available from the municipal GIS source(s)
- Visible underground utility appurtenances (e.g., valves, fire hydrants)
- Annotation to identify the 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 the method of construction (if not explained on a standards sheet)
- Reference to any applicable detail illustrations on the plan sheet or a separate standards sheet

- Any structure proposed to be installed or replaced
- A color photo of the proposed Broadband Installation 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 Professional Engineer 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 Broadband Installation. Dimensioning should include but not be limited to:

- Road and Department Right-of-Way widths
- Distance from existing and proposed underground facilities to the Department 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
- Length of Node Transport Facilities

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:

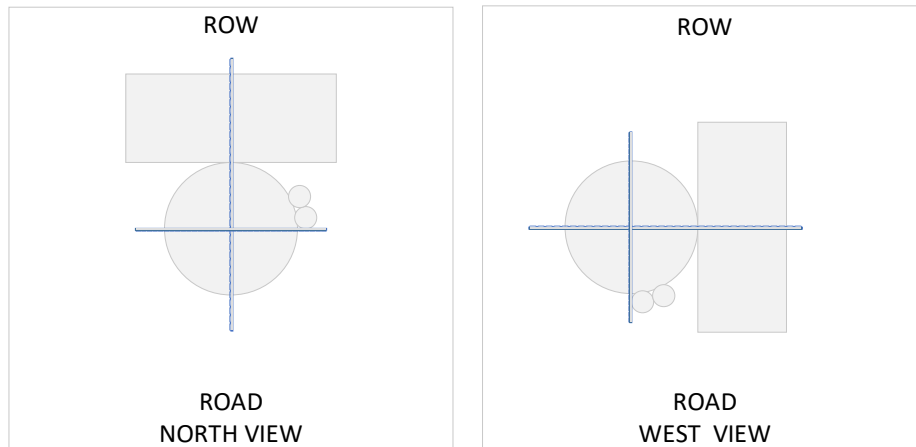
- View direction (facing)
- The entire dimension of the Pole or Service Structure (new/proposed/existing)
- Existing structure view, if the proposed Broadband Installation will replace or be attached to an existing structure

- Proposed structure view, or two different adjoining views (e.g., north and west) if it is a new structure
- All attached Network Node equipment (e.g., antenna, Network Node, ancillary equipment)
- Node Transport Facility location and depth (if part of the application)
- Foundation view or reference to Typical sheet for proposed foundations
- Buried pole depth for new or replaced Pole or Service Structure without foundation
- Proposed hand boxes, vaults, and hand holes
- Proposed underground conduits (within 10' of the network support structure)
- Grounding detail or reference to Typical page
- Proposed ground-based enclosure
- Node Position Key to Department Right-of-Way and road alignment for each Profile View (see Detail D). This detail does not have to be to scale but must show alignment on a quadrant and reference the street and the ROW perspectives.
- 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 Department Right-of-Way line to power

All the following items shall be dimensioned:

- Antenna height above Pole or Service Structure
- Pole or Service Structure dimension at the base
- Distance from Department Right-of-Way line
- Antenna and cabinet offset from Pole or Service Structure
- Overall height of the Pole or Service Structure above grade
- The vertical clearance of any adjacent overhanging roadway
- Ground-based enclosures and height above grade
- Pole-mounted or Service Structure-mounted enclosures and height above grade

Detail D: Node Position Key



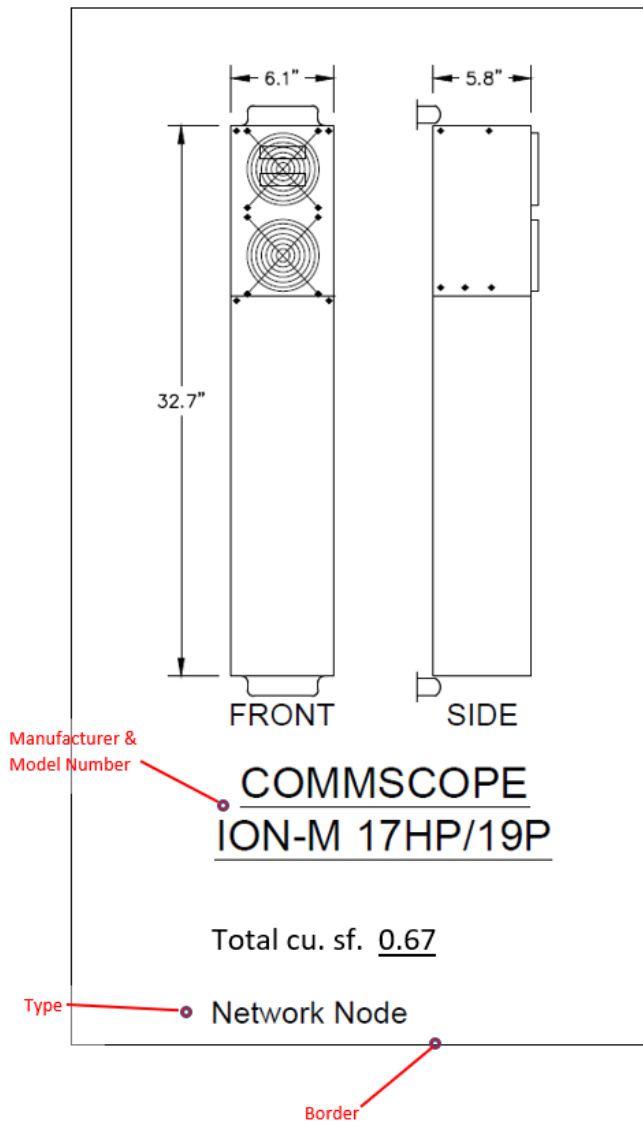
Equipment Sheet Requirements

Equipment sheets are specialized Typical Detail sheets that tabulate Cubic Volume for a Broadband Installation. An equipment sheet shall accurately include each of the following that applies:

- 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"
- List of external components separately in Typical Detail
- Length, width, and depth in inches or feet and inches for any length greater than 10'
- Manufacturer and model number
- Total cubic feet

Each component shall be identified as an antenna, a Network Node, or ancillary equipment. Each Typical Detail on the equipment sheet shall be numbered and labeled to reference the Typical sheet. The use of borders around details is required. See Detail E.

Detail E: Sample Typical Detail (Network Node)



In addition to the individual component Typical Detail, each equipment sheet shall include a separate note box that identifies the total Broadband Installation volume, in cubic feet, as shown in Detail F. The total cubic feet note shall be in bold type, located in the lower right-hand quadrant of the equipment sheet.

Detail F: Sample "Total Cubic Feet" Note

<p>TOTAL BROADBAND INSTALLATION CUBIC VOLUME (cu. ft.):</p> <p>TOTAL ANTENNA CUBIC VOLUME (cu. ft.):</p> <p>TOTAL NETWORK NODE EQUIPMENT CUBIC VOLUME (cu. ft.):</p>

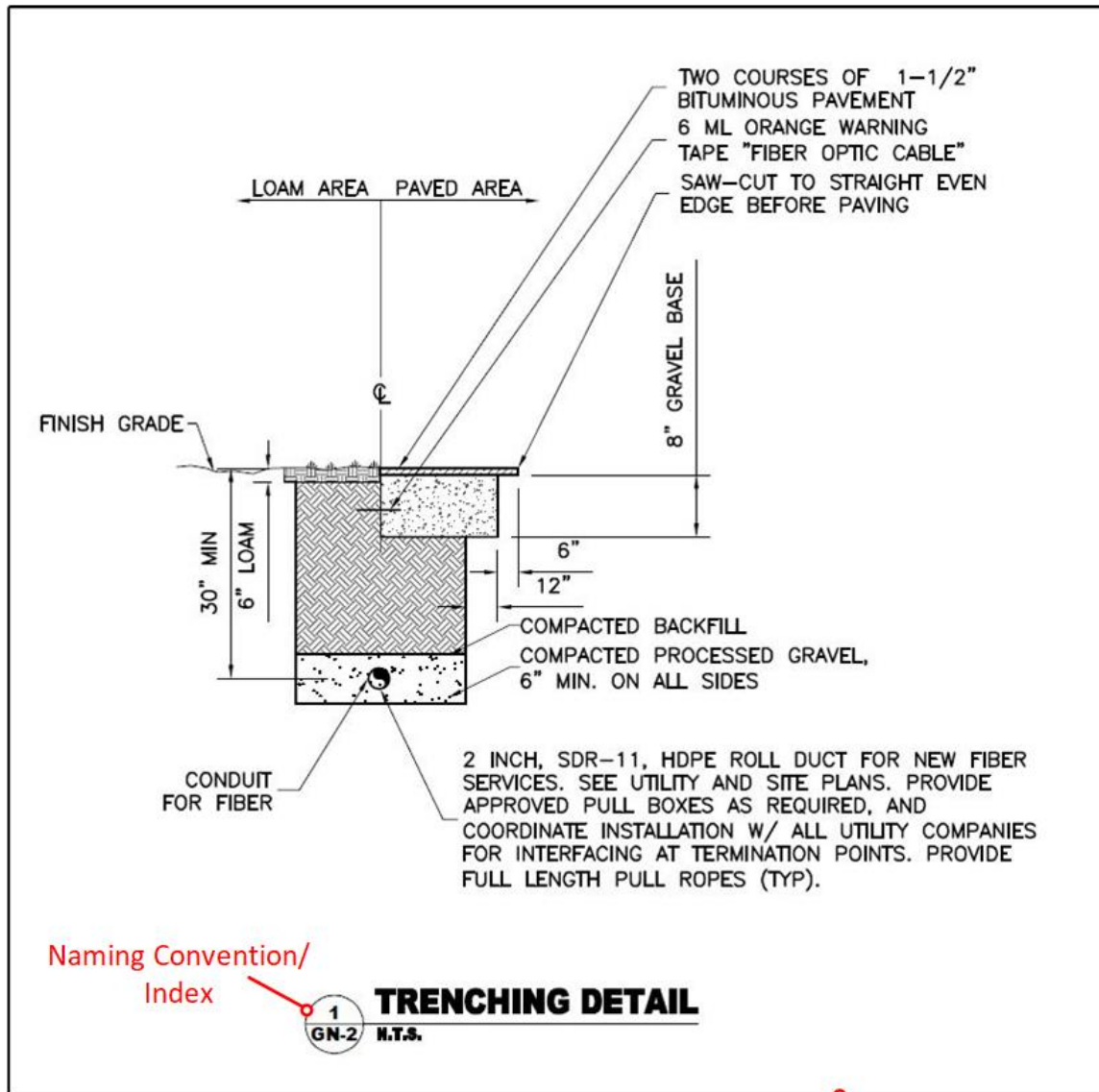
Linework and annotations shall be drafted using computer-aided design software. Scanned or cropped images are not acceptable. Equipment shall be drawn to the scale in the Plan View and Profile View sheets.

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 Detail G). Only Typical Details referenced in the Plan or Profile sheets shall be included on the Typical sheet. Examples of Typical Details include:

- Antenna mounting
- Cabinet Mounting
- Break-away fabrication
- Concealment
- Concrete pad
- Foundation
- Hand box/vault/ hand hole
- Riser
- Trench/conduit

Detail G: Typical Detail



Documentation of Demarcation

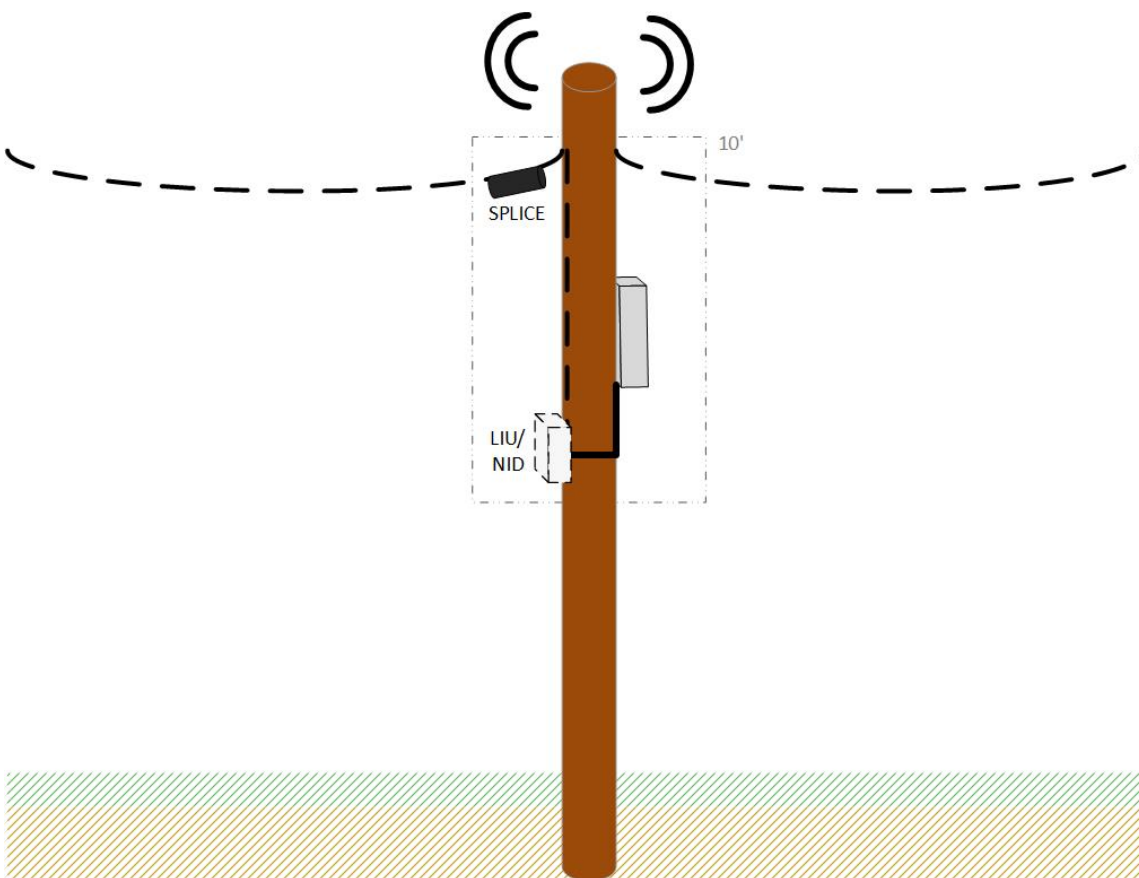
The Department understands that different Installation owner, and different applications by an Installation Owner may take different business approaches. In some cases, the Installation Owner may propose to build and own the Node Transport Facility. In others, it may build and own the Network Node and another entity may build and own the Node Transport Facility.

The application shall indicate the demarcation between the Node Transport Facility and the Broadband Installation.

If Network Node equipment is to be located on the Pole or Service Structure itself or the ground in close proximity to the Pole or Service Structure, the handoff from the Node Transport Facility to the Broadband Installation is the demarcation point. The following figures illustrate physical demarcations between the Node Transport Facility and the Network Node at a line interface unit (LIU) also known as the network interface device (NID).

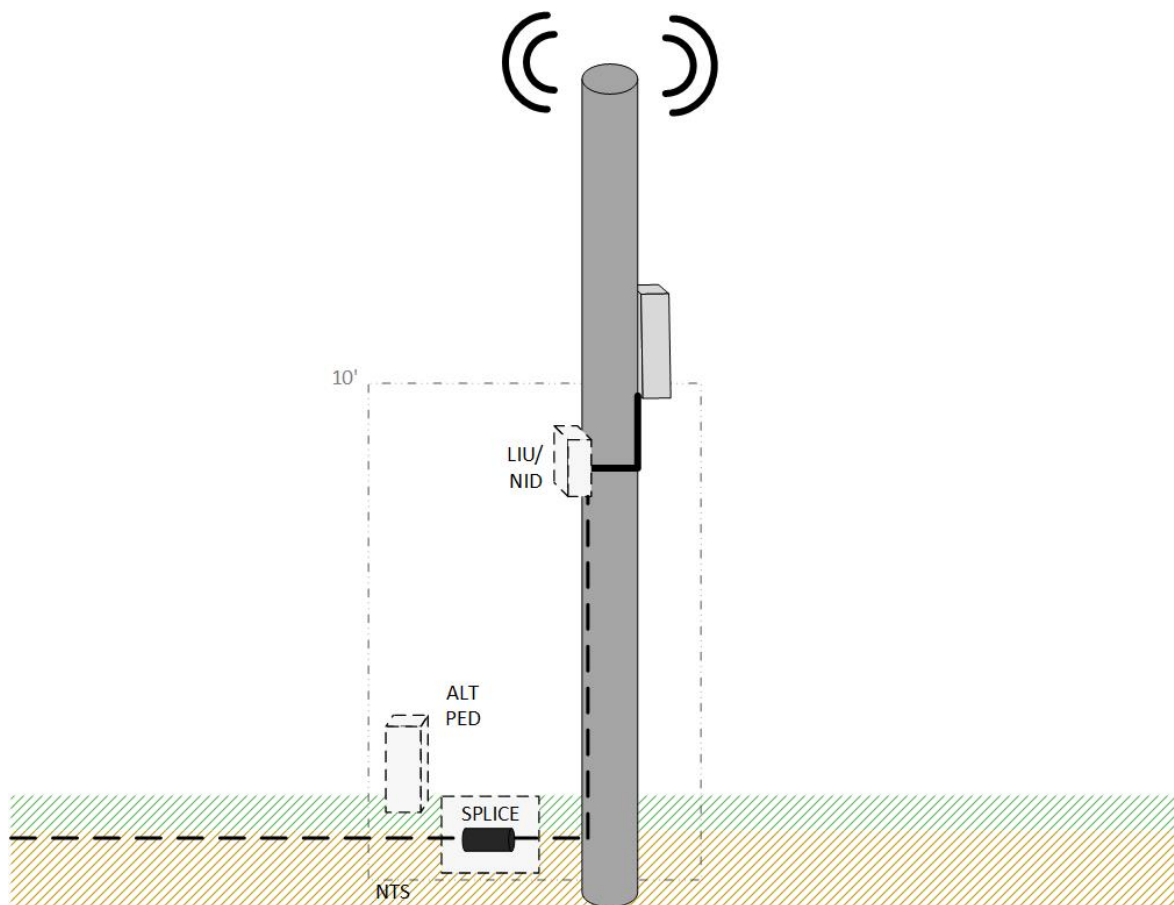
Detail H illustrates a typical scenario in which the Node Transport Facility (dotted line) is delivered aurally. The LIU/NID shown is located on the Pole (it could also be in a nearby handhole if the cabinet is on the ground). The Node Transport Facility provider provides transport from a splice point and drops the line to the NID.

Detail H: Example Aerial Node Transport Facility/Network Node Equipment Demarcation Point



Detail I illustrates a typical scenario in which the Node Transport Facility (dotted line) is delivered underground. The Node Transport Facility provider typically builds a handhole containing the transport cable for the Network Node connection. It is recommended that the handhole be located within 10' of the Pole. The demarcation point is where the Node Transport Facility connects to the Broadband Installation.

Detail I: Example Underground Node Transport Facility/Network Node Demarcation Point



A Node Transport Facility may be delivered wirelessly as well. In that case, a backhaul antenna may be installed on the Pole or Service Structure, and the LIU/NID would contain the RF equipment used to provide backhaul to the Network Node.

4. Broadband Technical Specifications

The following technical specifications apply to proposed and installed Broadband Installations within the Department Rights-of-Way. Underground facilities within the highway right of way must comply with Title 43, Texas Administrative Code, Rule §21.40, Underground Utilities, Overhead Facilities, and Communication Lines must comply with Title 43, Texas Administrative Code, Rule §21.41, Overhead Electric and Communication Lines.

Locations and Structures

If a new antenna site installation requires the replacement of an existing pole, the installation owner must coordinate with the pole owner. If a new antenna site installation of a new pole is in an existing pole line, a replacement will not be allowed without an exception approved by TxDOT. Joint use must be considered, as indicated by Rule 222 of Part 2 of the National Electrical Safety Code (NESC). Broadband Installations may be installed on new or existing third-party Poles within the Department Rights-of-Way. An Installation Owner shall obtain permission for use of existing third-party Poles from the structure owner and provide such documentation with its applications.

A utility facility that crosses railroad right of way shall provide a copy of the fully executed permit to install the utility facility within the railroad right of way from the railroad to the department prior to installation of the utility facility within department right-of-way.

No Broadband Installation's measurements may exceed the dimensions set forth in this document or 43 TAC § 21.31-21.56 without the Department's approval.

Broadband Installations may be installed on the following Department Service Structures at the discretion of the District Engineer:

- Illumination Pole that does not have a maintenance mechanism that traverses the height of the Illumination Pole
- Sign Structure includes cantilevered overhead sign supports and sign bridges.
- Include applicable TxDOT Standard Sheets in the plan set

The Department prefers that a Network Provider shall install its Broadband Installations on allowable structures other than Department Service Structures whenever technically feasible. If a Broadband Installation is proposed to be attached to a Department-owned Illumination Pole, at TxDOT's request, the Network Provider shall replace the Illumination Pole. The new Illumination Pole must comply with all relevant TxDOT standards and the following:

- The weight of the proposed attachment and hardware necessary to mount it must be provided.
- The mounting height of the proposed attachment must be provided.
- The distance from the edge of the pole to where the proposed attachment will be mounted must be provided.
- The Effective Projected Area (EPA) of the proposed attachment must be provided.
- The resulting increase in forces on the pole and the resulting total combined stress ratio at the pole base must be computed and accounted for.

The Network Provider must demonstrate to the Department's satisfaction in the Department's sole discretion that the replacement Illumination Pole will support both the original function and all Improvements.

The Network Provider shall provide a structural analysis of the Broadband Installation on the proposed Pole or Service Structure signed by a Texas Professional Engineer. Acceptable software for structural analysis calculations shall be a commercially available product with general industry acceptance. Should the Installation Owner or its contractor use a commercially available software application that the Department does not possess, the Installation Owner shall, if requested, make available to the Department at least one software license.

No placement shall be made which obstructs the line of sight and the beam or wave detection zone of any fixed TxDOT, Texas Department of Motor Vehicles, or public safety equipment the operation of which is the line of sight, video, or radar detection dependent.

Additionally, any Node Support Pole shall comply with the following:

- Any proposed Node Support Pole shall be located as near as possible to the Department Right-of-Way line furthest from traffic, but no more than 3' from the Department Right-of-Way line furthest from traffic.
- The Pole location shall not be within a horizontal clear zone, any poles located in the clear zone shall comply with breakaway specifications.
- Unless otherwise approved by the Department, a proposed Broadband Installation shall be at least 300' from any current Broadband Installation. Additional spacing may be required for any of the following reasons:
 - o Traffic safety

- o Visual sightlines
- o Conflicts with TxDOT structures (existing, proposed, and planned)
- o Maintenance of the travel ways or Department Rights-of-Way
- o The Department's purposes

Strand-mounted, mid-span broadband equipment may be attached to or supported by existing or new Poles with approval from Pole owners on either side of the proposed equipment. Each piece of equipment shall not exceed 24" in length, 12" in height, and 15" in depth. The Installation Owner shall provide engineering design and pole loading analysis (PLA) calculations to justify the use of both adjacent poles. The Network Provider shall deactivate the strand-mounted installation within 15 minutes of a request from the Department.

Broadband Installations shall comply with applicable municipal ordinances, which may include specific requirements related to Historic Districts, Design Districts, proximity to parks, noise, and others.

Aesthetics

The Department desires to promote safe, cleanly organized, and aesthetically acceptable facilities using the smallest and least intrusive means available to provide broadband services to the community. As such, broadband facilities in the Department Right-of-Way shall comply with the reasonable provisions in this document. These standards are no more burdensome than those applied to other types of infrastructure deployments in the Department's ROW.

The Department desires and encourages collocations among limited numbers of Broadband Service Providers on the same support structure whenever technically feasible. If the Utility Installation Owner chooses not to collocate when options for collocation appear to be technically feasible, Installation Owner shall demonstrate to the Department's satisfaction in its sole discretion why collocation is not feasible.

The Department desires and encourages Utility Installation Owner to incorporate Concealment Elements into their proposed designs. Concealment Elements include techniques such as camouflage or shrouding.

All Broadband Installations shall comply with the following:

- Minimal exposed wiring is permitted, provided the Department approves the wiring and the wires are entirely contained within a flex shrouding.
- Advertising, flashing lights, decals, and stickers are prohibited unless installed to comply with federal or state law.

- Graffiti shall be removed as soon as possible, but in no event longer than 21 days after notification.
- New or replacement Poles shall be consistent in size, color, and material with other adjacent Poles of similar classification and use.
- All Network Node and ancillary equipment shall match the color of any Decorative Pole on which it is attached to the extent reasonably possible.
- Flex shrouding shall match the color of the Pole.

Cabinets and Enclosures

Cabinets and enclosures, including exposed remote radio heads and radio Broadband Installations, may be flush-mounted on a support structure or installed at ground level within a 10-foot radius of the support structure. All cabinets and associated equipment shall be mounted or placed in a manner that does not interfere with any of the following:

- Pedestrian safety
- Americans with Disabilities Act (ADA) compliance
- Vehicular safety and sightlines
- Residential views
- Highway maintenance purposes

Riser cables used to connect antennas and antenna accessory equipment, backhaul services, or power lines shall be installed in conduit on the side of a Pole or Department Service Structure furthest from lanes of traffic with topside weather heads. Power cables transporting AC power shall be installed in separate conduit from DC power or telecommunications cable.

All conduits affixed to Poles consist of Schedule 40 PVC or equivalent material. Any conduit passing through the power space shall consist of non-metallic and non-conductive material and be painted to match the Pole. These conduits shall not exceed a diameter of 4". A utility shall install no more conduit than is necessary for the proposed Broadband Installation. No exposed 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. No cables shall be visible on the exterior of a Department Service Structure.

Conduit transitions to above ground shall be contained in schedule 40 RGS conduit with galvanized finish. All coupling points shall consist of threaded mechanical or solvent-welded materials and be watertight.

Antennas and Other Equipment

Consistent with Texas Local Government Code, Chapter 284⁸, and the FCC regulations:⁹

- (1) Each Antenna that does not have exposed elements and is attached to an existing Pole or Department Service Structure:
 - (A) must be located inside an enclosure of no more than six cubic feet in volume;
 - (B) unless otherwise approved by the Department, may not exceed a height of 3' above the existing structure or pole and may not be more than 10 percent taller than other adjacent structures and may not be extended to a height of more than 10 percent above its preexisting height as a result of the collocation of new antenna facilities; and
 - (C) may not protrude from the outer circumference of the existing structure or pole by more than 2'.
- (2) If an Antenna has exposed elements and is attached to an existing Pole or Department Service Structure, then, unless otherwise approved by the Department, the Antenna and all of the Antenna's exposed elements:
 - (A) must fit within an imaginary enclosure of not more than 6 cubic feet;
 - (B) may not exceed a height of 3' above the existing structure or pole and may not be more than 10 percent taller than other adjacent structures; and
 - (C) may not protrude from the outer circumference of the existing structure or pole by more than 2'.
- (3) The cumulative size of other broadband equipment associated with the Network Node attached to an existing Pole or Department Service Structure may not:
 - (A) be more than 28 cubic feet in volume; or

⁸ "Local Government Code," <https://statutes.capitol.texas.gov/Docs/LG/htm/LG.284.htm>

⁹ See *Generally 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, FCC 18-133 (released September 27, 2018).

- (B) protrude from the outer circumference of the existing structure or pole by more than 2’;
 - (C) Ground-based enclosures, separate from the Pole or Department Service Structure, may not be higher than 3’ 6” from grade, wider than 3’ 6”, or deeper than 3’ 6”; and
 - (D) Pole-mounted enclosures may not be taller than 5’.
- (4) The following types of associated ancillary equipment are not included in the calculation of equipment volume under Subsection (3)(A):
- (A) electric meters;
 - (B) Concealment Elements;
 - (C) telecommunications demarcation boxes;
 - (D) grounding equipment;
 - (E) power transfer switches;
 - (F) cut-off switches; and
 - (G) vertical cable runs for the connection of power and other services.
- (5) Equipment attached to a Utility Pole must be installed per the National Electrical Safety Code, subject to Applicable Codes, and the Utility Pole owner’s construction standards.
- (6) The facility is not located on tribal lands, as defined under 36 C.F.R. § 800.16(x).

Node Transport Facilities

Wireline Node Transport Facilities included in a Utility Permit must be shown to connect to one or more Network Nodes, whether located within the Department Rights-of-Way or not. Wireline Node Transport Facilities consist of the physical facilities extending from one or more Network Nodes to a splice enclosure or tap where the Node Transport Facilities connect to the higher-count cable of the transport network, which serves multiple facilities or provides services to multiple customers in addition to the owner, utility, or licensee of the Network Node or the Node Transport Facility made the basis of the Utility Permit.

The volume and height of any antenna used for broadband Node Transport Facilities are included within the maximum total antenna size permitted in these Design Standards.

Power

New sources of electric power or new Node Transport Facilities shall be installed underground for any standalone Network Node. Broadband Installations on existing Poles or Service Structures may be served with power and/or communications facilities from above-ground sources. All conduits for electrical power or Node Transport Facilities shall be color-coded per Applicable Engineering Standards. The utility's cables shall not share the Department's conduits, junction boxes, or raceways. The Department's electrical service shall not serve as a Network Node's supply.

Network Nodes containing battery backup shall be installed with a transfer switch to prevent back-feeding into the electrical system. No other types of backup power shall be permitted. (e.g., generator).

All Network Node equipment shall have a visible and accessible safety switch within 10' of the Pole or Service Structure such that power to the Network Node equipment can be turned off in the event of an emergency or when unscheduled work on the structure or within the RF exposure area is required. The safety switch shall have visible identification.

Each Network Node installation shall have a marked disconnect switch adjacent to the electronics cabinet and located outside areas that exceed RF exposure limits. The shut-off switch shall be configured such that when it is placed in the open position, the electronics equipment related to the installation is neither energized nor emitting RF radiation.

For strand-mounted, mid-span installations, the power disconnect shall be located within 3' of one of the poles or on one of the poles at a height no greater than 5'.

Interference and RF Radiation Exposure

A utility owner shall operate Network Nodes under all applicable Laws, including regulations adopted by the FCC.

Antennas shall only transmit or receive frequencies that are licensed by the FCC to the Installation Owner or to the carrier the Installation Owner represents CBRS GAA frequencies or unlicensed frequencies. In the event the Installation Owner wishes to add another carrier or change the carrier network using the Network Node, the Installation Owner shall notify the Department in writing of the change in carrier.

A broadband service provider shall ensure that the operation of a Network Node does not cause any harmful radio frequency interference to an FCC-authorized telecommunications device or any Department or other Texas State agency traffic, public safety, or other communications signal equipment within the proximity of the proposed Network Node that

was installed and operating at the time the Network Node was initially installed or constructed. On receiving written notice, a broadband service provider shall take all steps reasonably necessary to remedy any harmful interference.

A broadband service provider shall comply with all provisions and guidelines of the FCC OET Bulletin 65,¹⁰ as may be amended from time to time, as well as any successor FCC RF regulations, and shall submit a report if requested, certifying FCC OET 65 compliance for each Network Node installation. Broadband Service Providers are responsible for addressing all potential questions/complaints about RF emissions that may be brought forth. The following elements, at a minimum, must be contained within the report:

- A statement of compliance (or non-compliance);
- Date of the report;
- Date of the statement of compliance;
- Location of the applicable signage with an above ground level height listed.

Upon request by the Department, which request shall not occur more frequently than once a year, the broadband service provider shall perform RF emissions field tests while the Network Node is in operation, supervised by the Department, to demonstrate compliance with FCC OET 65.

The Network Node shall accept, and the Department shall have no liability for or obligation to abate, low power interference received from Department devices and other Texas State agencies' devices and/or roadside communications operational now and in the future. This will include roadside electronic equipment, roadside to vehicle communications, vehicle to vehicle communications, and vehicle to roadside communications.

Signage

Identifying signage shall be affixed to and permanently maintained on the Broadband Installation. If the Network Node equipment is separate from the support structure, separate signs shall be affixed to both the support structure and the equipment cabinet. Typical signage shall include, at a minimum:

¹⁰ OET Bulletin 65 Edition 97-01 August 1997; "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields";
<https://transition.fcc.gov/bureaus/oet/info/documents/bulletins/oet65/oet65.pdf>

- The Installation Owner's site name and identifier number
- RF emissions tagging as required by the FCC, OSHA, and/or TxDOT
- A 24-hour telephone number for emergency contact or other inquiries

5. Macro Tower Technical Specifications

Longitudinal lines on the right of way shall be limited to single pole construction as referenced in Title 43, Texas Administrative Code, Rule §21.41 (d) (7), Overhead Electric and Communication Lines. Where an existing or proposed utility facility is supported by “H” frames, the same type of structures may be utilized for the crossing provided all other requirements in Title 43, Texas Administrative Code, Rule §21.41, Overhead Electric, and Communication Lines, are met.

Under Title 43, Texas Administrative Code, Rule §21.41 (d) (1), Macro Tower Poles shall be located within three (3) feet of the right of way line, except that, at the option of the department, this distance may be varied at short breaks in the right of way line. Pole and guy wire installations must not encroach upon current American with Disabilities Act (ADA) clearances. Poles with widths measured at the widest location of the pole bases greater than thirty-six (36) inches in diameter shall not be placed within the right of way.

All telecommunication equipment mounted on Macro Towers shall conform with the requirements outlined in this document.

6. Required Process Steps Before Submitting a Utility Installation Review Permit

The Installation Owner shall establish an account in the UIR system¹¹ in *each* District to which Utility Permits will be submitted. Accounts can be set up at the following website <https://apps3.dot.state.tx.us/apps/UIRPROV2/default.asp>. To access the UIR, use Internet Explorer. To ensure compatibility, select Menu Bar TOOLS, choose Compatibility View Settings, and add the state.tx.us URL.

Approvals

The Installation Owner shall acquire approval to attach to a non-Department-owned Pole from the structure owner prior to submitting a Utility Permit and provide proof in the permit, as applicable.

Note that individual Districts may have additional requirements that will be included as a Special Provisions document upon application approval. The Installation Owner must comply with the Special Provisions and submit with its application information demonstrating such compliance.

If the proposed location is within a municipal boundary, the Installation Owner shall take notice of and conform its activities to the applicable standards, policies, or requirements.

¹¹ "ROW Utilities Manual," TxDOT, http://onlinemanuals.txdot.gov/txdotmanuals/utl/new_utility_installations_in_existing_right_of_way.htm

7. Utility Permit

Separate Utility Permits are required for each of the following. The type of permit will be indicated in the permit application Form.

- Broadband Installations on a new Service Structure or Pole
- Broadband Installations on an existing Service Structure or Pole (a Collocation)
- Broadband Installations on a replacement Service Structure or Pole
- Modifications to an existing Broadband Installation with an active or utility permit

8. Application Processing Shot Clocks

FCC regulations impose Broadband Installation application processing shot clocks of 60 days for Network Nodes collocated on existing structures and 90 days for deployment on new structures. The Department's Utility Permitting process strives to streamline the application, review, and approval of a Utility Permit for a Network Node to meet the FCC's requirements.

A unique shot clock for a Utility Permit starts when the application for the Utility Permit is received by the Department through the UIR system.

The shot clock will stop upon submission from the Department through the UIR system of a request for additional information regarding a Utility Permit from the Installation Owner provided the Department sends its request for information within 10 days of Utility Permit submission. If the Department sends subsequent requests for information related to the initial request for information, the shot clock will not be tolled.

If the Installation Owner does not respond to a request for information within 30 days, the Department shall consider the Utility Permit withdrawn and will notify the Installation Owner.

9. Construction and Maintenance

All construction and maintenance protocols must conform with Title 43, Texas Administrative Code, Rule §21.37, Design, and Texas Administrative Code, Rule §21.38 Construction, Maintenance, and Inspection.

10. Inspections

Inspection Allowances

The Department and its authorized representatives must have access to Network Nodes and Broadband Installations at any time and may inspect, maintain, or reconstruct Highway Facilities and Service Structures as necessary.

The Department may conduct at least 3 separate inspections:

- Before Network Node installation;
- Immediately after Network Node installation or modification; and
- After removal of Network Node.

The Department retains the right to conduct RF exposure and interference studies in the area surrounding the Network Node at any time.

Unauthorized Broadband Installations

The installation of Unauthorized Broadband Installations poses an increased risk to Department personnel, the public, and legitimate Broadband Installations.

11. As-Built Documentation

All as-built criteria must conform with Title 43, Texas Administrative Code, Rule §21.37, as-built documentation may be needed to close out the permit.