



Northeast Site Solutions
Victoria Masse
420 Main Street #2, Sturbridge, MA 01566
860-306-2326
victoria@northeastsitesolutions.com

August 31, 2022

Members of the Siting Council
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
701 Bartholomew Street, Pole # 14027, Middletown, CT 06457
Latitude: 41.52074953
Longitude: -72.60831210
T-Mobile Site#: CT11832C_L600

Dear Ms. Bachman:

T-Mobile currently maintains six (6) antennas at the 83-foot level of the existing 90-foot utility pole (pole # 14027) located at 701 Bartholomew Street, Middletown, CT 06457. The tower and property are owned by CL&P d/b/a Eversource. T-Mobile now intends to relocate all existing equipment to the new pole (pole # 14027) per Petition No. 1576. T-Mobile also intends to remove six (6) existing antenna and replace them with three (3) new 600/700/1900/2100 MHz antenna. The new antennas would be installed at the 83-foot level of the new utility pole. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable.

T-Mobile Planned Modifications:

Remove:

(3) EMS RR90-17-02DP Antenna
(12) Coax Line

Remove and Replace:

(3) Andrew LNX-6515DS Antenna (Remove) – (3) RFS APXVAALL18 600/700/1900/2100 MHz Antenna (Replace)
(1) Existing Antenna Mount (Remove) – (1) Antenna Platform Mount RMQLP-496-HK (Replace)

Install New:

(3) Radio 4480 B71+B85
(3) Radio 4460 B25+B66
(3) Smart Bias-T (Commscope: ATSBT-TOP-MF-4G)
(24) Coax Line

Existing to Remain: NONE



This facility was originally approved by the Connecticut Siting Council on March 11, 2003 Petition No. 606. This pole is being replaced by Eversource with Petition No. 1576. This petition was approved on September 1, 2023.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Benjamin D. Florsheim, Mayor and Bobbye Knoll Peterson, Acting Director of Economic and Community Development, as well as the property owner and the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require the extension of the site boundary.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above referenced telecommunications facility constitute an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Victoria Masse

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 2, Sturbridge MA 01566
Email: victoria@northeastitesolutions.com



NSS **NORTHEAST**
SITE SOLUTIONS
Turnkey Wireless Development

Attachments:

cc: The Honorable Benjamin D. Florsheim, Mayor
245 DeKoven Drive
Room 209
Middletown, CT 06457

Bobbye Knoll Peterson, Acting Director of Economic and Community Development
245 DeKoven Drive
Suite 202
Middletown, CT 06457

Eversource Energy, as tower owner and property owner
107 Selden Street
Berlin, CT 06037

Eversource Energy, as tower owner and property owner
PO BOX 270
Hartford, CT 06141

Exhibit A

Original Facility Approval

Petition No. 606
AT&T Wireless PCS, Inc.
Staff Report
March 11, 2003

On February 6, 2003, Connecticut Siting Council (Council) member Ed Wilensky and Christina Lepage of the Council staff met with AT&T Wireless PCS, Inc. (AT&T) representative Christopher Fisher at Bartholomew Road, Middletown, Connecticut for the inspection of an electric transmission structure. The structure is owned by Connecticut Light and Power (CL&P). AT&T, with the agreement of CL&P, proposes to replace an existing transmission tower and install antennas and associated equipment for telecommunications use and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification.

AT&T proposes to replace an existing 48-foot wood monopole with a 95-foot wood monopole. The proposed site is immediately adjacent to Route 9 and the surrounding area consists of some residences. AT&T is proposing to install six panel antennas at the 93-foot level of the structure, with space available at the 83 foot level for a future carrier.

The proposed equipment would be installed on a 10-foot by 6-foot 6-inch concrete pad that would be located at the base of the proposed structure. An 8-foot high chain link fence would surround the equipment compound.

Access to the site would be via an existing dirt access road, which would be extended for direct access to the equipment compound. An underground conduit from an existing utility pole will provide power and telephone service to the site.

The proposed site is zoned R-60 (residential). The nearest residence to the proposed site is approximately 300 feet to the south. Visibility of the base of the structure would be screened by the topography of the area and existing vegetation.

The calculated cumulative worst case power density would not exceed the applicable standard.

AT&T provided computer simulated photographs depicting the replacement of the utility pole, equipment and their antennas. Views of the proposed site were taken from Bartholomew Road, near residences to the west and southwest of the site. The proposed replacement pole would be slightly visible through the existing vegetation.

AT&T contends that they would not have the need to construct a telecommunications tower to provide coverage to this area of Middletown, and would not cause a substantial adverse environmental effect.

On February 20, 2003, AT&T sent photo simulations of the proposed replacement structure to the two adjacent residents of the site and the City of Middletown, requesting that comments be forwarded to the Council by March 5, 2003. To date, the Council has not received comments from the abutting residents or the City of Middletown.



STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

Web Site: portal.ct.gov/csc

**VIA ELECTRONIC MAIL & CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

September 1, 2023

Deborah Denfeld
Team Lead – Transmission Siting
Eversource Energy
P.O. Box 270
Hartford, CT 06141
Phone: (860) 728-4654
deborah.denfeld@eversource.com

RE: **PETITION NO. 1576** - The Connecticut Light and Power Company d/b/a Eversource Energy petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed Middletown Substation to Oxbow Junction Upgrade Project consisting of the replacement of electric transmission line structures along approximately 5.5 miles of its existing No. 1620 115-kilovolt (kV) electric transmission line right of way between Middletown Substation in Middletown and Oxbow Junction in Haddam, Connecticut, and related electric transmission line and substation improvements.

Dear Deborah Denfeld:

At a public meeting held on August 31, 2023, the Connecticut Siting Council (Council) considered and ruled that the above-referenced proposal would not have a substantial adverse environmental effect, and pursuant to Connecticut General Statutes § 16-50k, would not require a Certificate of Environmental Compatibility and Public Need with the following conditions:

1. Approval of any project changes be delegated to Council staff;
2. Submit a copy of the DEEP Stormwater Permit prior to commencement of construction;
3. Submit a copy of the DEEP NDDDB determination letter prior to commencement of construction;
4. Incorporate pollinator habitat in the restoration of disturbed areas consistent with CGS §16-50hh, where feasible;
5. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed within three years from the date of the mailing of the Council's decision, this decision shall be void, and the facility owner/operator shall dismantle the facility and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The facility owner/operator shall provide written notice to the Executive Director of any schedule changes as soon as is practicable;
6. The Council shall be notified in writing at least two weeks prior to the commencement of site construction activities;

7. Any request for extension of the time period to fully construct the facility shall be filed with the Council not later than 60 days prior to the expiration date of this decision and shall be served on all parties and intervenors, if applicable, and the City of Middletown and Town of Haddam;
8. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed **along with a representative photograph of the project.**
9. The facility owner/operator shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v; and
10. This Declaratory Ruling may be transferred or partially transferred, provided both the facility owner/operator/transferor and the transferee are current with payments to the Council for their respective annual assessments and invoices under Conn. Gen. Stat. §16-50v. The Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the facility within 30 days of the sale and/or transfer. Both the facility owner/operator/transferor and the transferee shall provide the Council with a written agreement as to the entity responsible for any quarterly assessment charges under Conn. Gen. Stat. §16-50v(b)(2) that may be associated with this facility, including contact information for the individual acting on behalf of the transferee.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the petition dated May 24, 2023, and additional information dated July 19, 2023.

Enclosed for your information is a copy of the staff report on this project.

Sincerely,



Melanie A. Bachman
Executive Director

MAB/RDM/dll

Enclosure: Staff Report dated August 31, 2023

- c: Mayor, Benjamin Florsheim, Town of Middletown (mayor@middletownct.gov)
First Selectperson, Robert McGary, Town of Haddam (selectasst@haddam.org)
Kathleen M. Shanley, Eversource Energy (Kathleen.shanley@eversource.com)

STATE OF CONNECTICUT)

: ss. Southington, Connecticut September 1, 2023

COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the Decision and Staff Report in Petition No. 1576 issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:



Melanie A. Bachman
Executive Director
Connecticut Siting Council

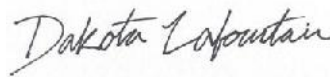
STATE OF CONNECTICUT)

: ss. New Britain, Connecticut September 1, 2023

COUNTY OF HARTFORD)

I certify that a copy of the Connecticut Siting Council Decision and Staff Report in Petition No. 1576 has been forwarded by Certified First Class Return Receipt Requested mail, on September 1, 2023, to each party and intervenor, or its authorized representative, as listed on the attached service list, dated May 25, 2023.

ATTEST:



Dakota LaFountain
Clerk Typist
Connecticut Siting Council

**LIST OF PARTIES AND INTERVENORS
SERVICE LIST**

Status Granted	Document Service	Status Holder (name, address & phone number)	Representative (name, address & phone number)
Petitioner	<input checked="" type="checkbox"/> E-mail	The Connecticut Light and Power Company d/b/a Eversource Energy	Deborah Denfeld Team Lead – Transmission Siting Eversource Energy P.O. Box 270 Hartford, CT 06141 Phone: (860) 728-4654 deborah.denfeld@eversource.com



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Petition No. 1576

**The Connecticut Light and Power Company d/b/a Eversource Energy
Middletown Substation to Oxbow Junction Upgrade Project
Middletown and Haddam**

**Staff Report
August 31, 2023**

Introduction

On May 24, 2023, the Connecticut Siting Council (Council) received a petition from The Connecticut Light and Power Company d/b/a Eversource Energy (Eversource) for a declaratory ruling pursuant to Connecticut General Statutes (CGS) §4-176 and §16-50k, for the Middletown Substation to Oxbow Junction Upgrade Project (Petition or Project) within existing Eversource electric transmission line right-of-way (ROW) in the Town of Haddam and the City of Middletown (municipalities).

The Project consists of the replacement of electric transmission line structures and the replacement of shield wire with optical ground wire (OPGW) on the 115-kV 1620 Line along approximately 5.5 miles of existing ROW between Middletown Substation in Middletown and Oxbow Junction in Haddam, and related electric transmission line and substation improvements.

On May 19, 2023, in compliance with Regulations of Connecticut State Agencies (RCSA) §16-50j-40, Eversource provided notice of the proposed Project to the municipalities and abutting property owners.

On May 30, 2023, the Council sent correspondence to the municipalities stating that the Council has received the Petition and invited the municipalities to contact the Council with any questions or comments by June 23, 2023. No comments were received from any of the municipalities.

Under RCSA §16-50j-40, neither Eversource nor the Council is required to provide notice to the state agencies listed in CGS §16-50j(g) when a petition for a declaratory ruling for modifications to an *existing facility* is submitted to the Council. On June 29, 2023, the Council on Environmental Quality submitted comments on the Project.¹

Under CGS §16-50x, the Council retains exclusive jurisdiction over the existing electric transmission line and substation facility sites. Under RCSA §16-50j-2a(29), “site” means a contiguous parcel of property with specified boundaries, including, but not limited to, the leased area, right-of-way, access and easements on which a facility and associated equipment is located, shall be located or is proposed to be located. The Council cannot delegate its statutory authority to any other entity and it is not required to abide by comments from state agencies.²

The Council submitted interrogatories to Eversource on June 29, 2023. Eversource submitted responses to the interrogatories on July 19, 2023.

¹ https://portal.ct.gov/-/media/CSC/3_Petitions-medialibrary/Petitions_MediaLibrary/MediaPetitionNos1501-1600/PE1576/ProceduralCorrespondence/PE1576-SACRCDEI_CEQ-a.pdf

² *Corcoran v. Connecticut Siting Council*, 284 Conn. 455 (2007)

Pursuant to CGS §4-176(e) of the Uniform Administrative Procedure Act, an administrative agency is required to take action on a petition within 60 days of receipt. On July 20, 2023 pursuant to CGS §4-176(e), the Council voted to set the date by which to render a decision on the Petition as no later than November 20, 2023, which is the 180-day statutory deadline for a final decision under CGS §4-176(i).

Notice and Community Outreach

Eversource initiated outreach to the municipalities in February 2023. None of the municipalities commented on the Project.

Eversource initiated outreach to property owners along the Project route in January and February 2023. All abutting property owners were notified of the Project and provided information on how to obtain additional information, as well as how to submit comments to the Council. During the construction phase of the Project, Eversource would maintain contact with the municipalities and abutting property owners to inform them of construction activities. None of the abutting property owners commented on the Project.

Existing Facility Site

The existing facility site includes approximately 5.5 miles of Eversource ROW, partially on Eversource owned property, through rural residential, state forest, agricultural and undeveloped land. It also crosses State Route 9, a divided four-lane highway. Approximately 0.4 miles of the ROW is between Middletown Substation and Middletown Junction, approximately 3.1 miles of the ROW is between Middletown Substation and Chestnut Junction and 2.0 miles of the ROW is between Chestnut Junction and Oxbow Junction.

The ROW was established in 1958. The approximate 3.1-mile segment of the ROW between Middletown Junction and Chestnut Junction is occupied by the 115-kV 1050 line.

Eversource's easements for the existing ROW grant Eversource rights to enter and travel upon and transport materials over and across the right of way and to erect, construct, repair, maintain, replace, relocate, inspect, operate and remove upon, infrastructure related to the conduction of electricity. The easements also grant rights to trim, cut, and remove vegetation within the ROW.

The Project ROW is approximately 185 feet to 400 feet wide. It is maintained over its entire width.³ No expansion of the ROW is proposed.

Telecommunications antennas are collocated on Structure 14027. Equipment would be relocated to the replacement structure by the telecommunications carrier.

Vegetation management was last performed in the Project ROW in October 2021.

Project Development

The purpose of the proposed Project is to improve system reliability on the 1620 Line by replacing electric transmission line structures that are deteriorated as well as obsolete copper shield wire and to meet National Electrical Safety Code (NESC) standards.

Prior to submitting this Petition, Eversource performed limited work on the subject transmission line segment in Sub-Petition No. 1293-HM-01 in the municipalities, approved by the Council on December 10, 2018 to

³ According to the Federal Energy Regulatory Commission, "full right-of-way" means the portion of land for which a utility has documented legal rights to build and maintain transmission facilities. Managing a narrower maintained right-of-way, rather than the full right-of-way, is a relatively common industry practice, though not a best practice.

replace 41 structures on the 1620 Line, among others. Once the Project is complete, a total of 13 structures would remain on the 1620 Line that were not replaced as part of the Project or Sub-Petition No. 1293-HM-01.

The Project is identified in the 2023 Eversource Forecast of Loads and Resources Report and in the June 2023 Independent System Operator New England, Inc. (ISO-NE) Regional System Plan Asset Condition List.⁴ There are no generation facilities listed on the ISO-NE interconnection queue associated with the proposed Project.

Cost

The total estimated cost of the Project is approximately \$7.32M. The entire Project cost would be eligible for regional cost allocation as it is associated with Pool Transmission Facilities.⁵ Pending a final determination from ISO-NE, total costs are expected to be allocated⁶ as follows:

Eversource Connecticut ratepayers ⁷	19.2%	(\$1.41M)
Other Connecticut ratepayers ⁸	6.0%	(\$0.44M)
<u>Other New England ratepayers⁹</u>	<u>74.8%</u>	<u>(\$5.47M)</u>

Cost Total 100% (\$7.32M)

Proposed Project

The Project is proposed to address identified asset condition deficiencies by replacement of deteriorated structures that are approaching the end of their service life, and structures that cannot structurally support the new OPGW. It includes the replacement of six wood structures and with six weathering steel structures.

The Project requires taller structures to meet NESC standards, including, but not limited to, conductor clearance requirements. The NESC is the authoritative code for ensuring the continued practical safeguarding of persons and utility facilities during the installation, operation and maintenance of electric power and communications utility systems, including substations, overhead lines and underground lines.

NESC clearance requirements for conductor sway due to wind (blowout) are based on established horizontal clearance requirements during specific wind events to buildings (9.1 feet of clearance to the ROW edge for 115-kV conductors). Transmission lines are designed with the assumption that a building could be erected at any location along the ROW edge. To provide a buffer for construction tolerance, Eversource typically designs transmission corridors to have 11 feet of clearance to the ROW edge during specific wind events.¹⁰

NESC clearance requirements for conductor uplift and insulator swing were factored into the transmission line design. Conductor uplift is a condition where wire on a structure pulls up on the hardware instead of hanging down vertically. It typically occurs in spans where structures are located at different ground levels or have different heights. The amount of insulator swing on a transmission line depends on conductor tension, temperature, wind velocity, insulator weight, ratio of weight span to wind span, and line angle. These issues can be mitigated by taller structures in certain locations to increase the load tension of the insulators and the span weight load of the conductors.

⁴ Entry #378.

⁵ ISO-NE defines Pool Transmission Facilities as facilities rated 69-kV or above owned by the participating transmission owners over which ISO-NE has operating authority in accordance with the terms set forth in the Transmission Operating Agreements.

⁶ These allocations are estimates based on 2022 actual loads.

⁷ Electrical service customers of Eversource and located within Connecticut.

⁸ Electrical service customers located within Connecticut but outside of Eversource's service territory.

⁹ Electrical service customers located within New England but outside of Connecticut.

¹⁰ Petition 1527, response to Council interrogatory 19

1620 Line - Oxbow Junction to Middletown Substation

The 1620 Line is a 115-kV line supported by a mix of wood and weathering steel structures installed in 1958. The 1620 Line consists of 556 “Dove” Aluminum Conductor Steel Reinforced (ACSR) and 3/8-inch copperweld type static wire. The conductors were installed in 1958 and have a life span of approximately 70 years, and thus would not be replaced at this time.

Project work consists of the following:

- a) Replace five three-pole wood angle structures with five three-pole weathering steel angle structures;
- b) Replace one wood H-frame structure with two single-circuit weathering steel monopoles;
- c) Replace copperweld shield wire with OPGW; and,
- d) Install four poles to support all dielectric self-supporting cable (ADSS).

Project Construction

Eversource would establish a temporary equipment staging area at 2175 South Main Street in Middletown. The Project staging area is currently being utilized by Eversource as a staging area for general maintenance-related work on the transmission system.

Eversource would utilize existing ROW access roads to the extent possible during construction. Existing access roads would be improved, as necessary. Multiple access roads are required so that equipment can access various construction zones along the ROW without relying on one point of access for long ROW segments. Construction matting would be utilized to install temporary access roads to protect sensitive areas (e.g. wetlands, lawn, meadow) to reach certain structure locations.

Eversource would obtain a Department of Transportation Encroachment Permit to pull OPGW over Route 9. Eversource would obtain an encroachment permit from Genessee and Wyoming Railroad to pull OPGW over the railroad in Middletown.

Construction areas would be isolated by establishing erosion and sedimentation (E&S) controls in accordance with the *2002 Connecticut Guidelines for Soil Erosion and Sediment Control* and Eversource’s April 2022 Best Management Practices Manual for Massachusetts and Connecticut (BMPs).¹¹ Typical E&S control measures include, but are not limited to, straw blankets, hay bales, silt fencing, gravel anti-tracking pads, soil and slope protection, water bars, check dams, berms, swales, plunge pools, and sediment basins.

A project-specific Stormwater Pollution Control Plan (SWPCP) would be developed for registration under a DEEP Stormwater Permit. The Stormwater Permit requires the designing qualified professional to conduct the SWPCP Implementation Inspection that confirms compliance with the Stormwater Permit and the initial implementation of all SWPCP control measures for the initial phase of construction. The SWPCP also requires a qualified inspector to inspect the work areas at least once per week and within 24-hours after a rain event that meets certain permit criteria.

The Project is eligible for certification through the U.S. Army Corps of Engineers (USACE)/DEEP Self-Verification Notification process in regard to wetland impact. The self-verification notification forms would be submitted to the USACE - New England District and DEEP prior to the start of Project construction, as required by the SWPCP.

¹¹ [2022 Eversource Best Management Practices MA_CT](#)

At each transmission line structure location, a work pad would be constructed, if necessary, to stage material for final on-site assembly and/or removal of structures, to pull conductors and to provide a safe, level work base for construction equipment. Work pad dimensions would vary based on site specific conditions such as terrain, proximity to the existing and replacement structures, and the type of construction activities. Where practical, Eversource would combine work pads if structure replacement work is in close proximity to another structure replacement.

Work pads for the Project would typically be 100 feet by 100 feet for a single structure but could be larger in areas where work pads are combined for multiple structure replacement or where topographic conditions require a larger area. Existing gravel areas along the ROW would be used to pull OPGW. In areas where gravel is not present, temporary matting would be used to establish the pull pad. Additional pull pads specific to OPGW would not be necessary. Temporary work pads would be used in sensitive areas such as wetlands, habitat areas, lawns and agricultural land.

The proposed structures would be supported by concrete foundations or direct-embed foundations depending on location. Foundation installation work would require the use of equipment such as drill rigs, pneumatic hammers, augers, dump trucks, concrete trucks, grapple trucks, and light duty trucks. If groundwater is encountered, pumping trucks or other equipment would be utilized. The water would then be discharged in accordance with local, state and federal requirements. New structure sections, components and hardware would be delivered by flatbed truck to the structure locations for assembly by crane and bucket trucks.

After the new structures are installed, existing conductor to remain would be transferred from the old structures to the new structures. Conductor and OPGW work would be conducted using pulling and tensioning rigs, reel trailers, cranes and side booms.

The existing structures would be removed after the conductors/OPGW are installed. The wood poles would be removed and properly disposed at an off-site location. None of the wood pole structures to be replaced occur in wetlands.

After the new structures/conductors/OPGW are installed and the existing structures are removed, ROW restoration activities would commence. Restoration work would include the removal of construction debris, signage, flagging, temporary fencing, and construction mats and work pads that are designated for removal or mitigation. Affected areas would be re-graded as practical and stabilized via revegetation or other measures before removing temporary E&S controls. ROW restoration would be performed in accordance with Eversource BMPs and in consultation with affected property owners.

Upon completion of the Project, access roads and work pads located in uplands would be left in place to facilitate future transmission line maintenance. If a property owner requests their removal, Eversource would discuss mitigation options with the landowner. Access roads and work pads located within improved areas (such as lawns) would typically be removed and the impacted area restored.

Except for concrete trucks, no construction equipment or vehicle washing would be allowed in the ROW. In accordance with Eversource's BMPs, concrete truck wash-out would occur only in upland areas of the ROW (a minimum of 50 feet from wetlands) to avoid or minimize the potential for impacts to water resources. All wash-out areas would include measures to control and contain wash-water and collect the cement wash-off for off-site disposal.

Project-related traffic would be expected to be temporary and highly localized in the vicinity of ROW access points along public roads and at the staging area. Due to the phasing of construction work, Project-related traffic is not expected to significantly affect transportation patterns or levels of service on public roads. Construction warning signs along public roads would be installed near work sites and flaggers or police personnel would be used to direct traffic, if necessary.

Environmental Effects and Mitigation Measures

Work would occur within a maintained ROW and no tree clearing is required. Tree trimming, minor vegetation removal and/or mowing within the managed transmission line ROW corridor may be required to improve work site access, and to develop and/or restore off-ROW access roads and to meet NESC and Eversource conductor clearance standards. Vegetation in the work areas would be cut to an above ground height of 6-8 inches to limit soil disturbance.

Vegetation removal/tree trimming would be accomplished using mechanical methods using flat-bed trucks, brush hogs or other types of mowing equipment, skidders, forwarders, bucket trucks for canopy trimming, and chippers. Vegetation removal activities would be performed in accordance with Eversource BMPs.

A total of 63 wetland areas, 20 watercourses, and 5 waterbodies occur along the ROW or in adjacent off-ROW areas. No permanent effects to wetlands would occur.

Temporary wetland impacts related to construction matting for work pads and/or temporary access within three wetlands and across one watercourse would total approximately 7,863 square feet (0.18-acre). Construction activities within wetlands and across watercourses would be conducted in accordance with Eversource's BMPs.

Three vernal pools (VP) were identified in the Project ROW. No VPs would be directly affected by the Project. Temporary matting is proposed within the vernal pool envelopes (within 100 feet of the VP edge) of two VPs for one access road and one work pad.

The DEEP-approved SWPCP would contain details regarding the E&S control measures that would be implemented to protect wetlands and vernal pools. E&S controls would also be inspected weekly by a qualified inspector, as required by the SWPCP. The Project would comply with the SWPCP, USACE self-verification procedures, and Eversource's BMPs. An Environmental Monitor will conduct weekly inspections of resource areas for the duration of Project construction. In addition, a qualified individual would be on-site to monitor environmental resource protections recommended by the DEEP Natural Diversity Database (NDDDB) Determination letter.

Invasive species mitigation measures would be conducted in accordance with Eversource's BMPs. Measures include the cleaning of temporary mats to prevent the introduction of invasive species into wetlands, the cleaning of vehicles, equipment, materials, gear, footwear or clothing of all visible soil and plant material on site known to contain invasives or as near as practical to the invasive area, prior to leaving the Project site.

None of the structure replacements are within a 100-year Federal Emergency Management Agency-designated flood zone.

A portion of the ROW is within a Public Water Supply Watershed in Middletown but no replacement work would occur within the watershed boundary. None of the structure replacements are within a designated Aquifer Protection Area.

To protect subsurface water quality, Eversource would conduct work in accordance with its BMPs which include provisions for the proper storage, secondary containment, and handling of diesel fuel, motor oil, grease and other lubricants.

A DEEP NDDDB Determination letter was issued for the Project on February 27, 2023. Eversource would implement DEEP recommended species-specific protection measures during construction, which include, but are not limited to, providing contractor training, time of year best management practices, monitoring, and installation of exclusionary fencing.

Eversource also consulted with the U.S. Fish & Wildlife Service's (USFWS) Information, Planning and Consultation (IPaC) service regarding federally-listed species that may be present within the Project area. The IPaC report identified the northern long-eared bat (NLEB), a federally-listed and state-listed Endangered Species, as occurring in the area. According to the DEEP NLEB database, there are no known NLEB maternity roost trees within 150 feet of the Project area, and no known NLEB hibernaculum is located within the municipalities. Notwithstanding, Eversource would perform additional consultation with USFWS as part of its federal regulatory permitting process and would employ NLEB protective measures recommended by USFWS.

One structure in Middletown was identified as having a potential osprey nest. Eversource would conduct replacement work on this structure in the off-season to avoid nesting impacts.

A Phase 1A Cultural Resources Assessment (Phase 1A) determined that no properties listed, or eligible for listing, on the National Register of Historic Places are located within 500 feet of the Project ROW. One structure work area possessed a potential for moderate to high archaeological sensitivity. Subsequent field evaluations of this area found no evidence of archaeological significance and no further action was recommended.

The State Historic Preservation Office issued a letter dated March 28, 2023 that confirmed no historic properties would be affected by the Project and further concluded that no additional archaeological investigation is warranted.

A portion of the Project ROW traverses Cockaponset State Forest and is crossed by the Mattabesett Trail, a blue-blazed hiking trail maintained by the Connecticut Forest and Parks Association (CFPA). Eversource would coordinate activities with the DEEP and the CFPA regarding necessary temporary trail relocations and implement safety measures, such as notification, signage, barriers to alert trail users of construction.

Disturbed areas would be stabilized using temporary E&S controls such as straw mulch, compost filters, and biodegradable erosion control blankets until final stabilization has been achieved. Seed mixes would be applied in uplands to revegetate disturbed areas. In accordance with Eversource's BMPs, different seed mixes would be used depending on the terrain and soil type of the disturbed areas and may consist of grasses and pollinator habitat.

In accordance with the SWPCP, monthly inspections would be conducted to monitor stabilization measures. A qualified inspector or a qualified professional engineer would inspect the areas and confirm compliance with the post-construction stormwater management requirements.

The Project would require increasing the height of the replacement structures to meet NESC clearance requirements within the existing ROW. The heights of the six existing structures to be replaced range from approximately 47.5 feet to 56.5 feet. Five of the new structures will have a height increase of 4.5 feet, and the remaining structure would have a height increase of 9.5 feet (Structure 14027).¹²

Due to the increase in structure heights to comply with NESC clearance criteria, there would be indirect visual impacts to the surrounding area. The weathering steel replacement structures would be similar in appearance to the existing wood structures.

¹² Structure 14027 hosts a telecommunications carrier. The carrier would submit a filing to the Council for relocation of its telecommunication facility onto the new structure.

Public Safety

There would be no permanent changes to existing ROW sound levels after completion of the Project. Noise associated with construction activities is exempt from DEEP Noise Control Regulations. Notwithstanding, any construction-related noise would be short-term and localized in the vicinity of work sites.

There are no existing structures with Federal Aviation Administration marking/lighting. Lighting/marketing of any of the replacement structure is not required.

Electric fields (EF) are produced whenever voltage is applied to electrical conductors and equipment. Electric fields are typically measured in units of kilovolts/meter (kV/m). As the weight of scientific evidence indicates that exposure to electric fields, beyond levels traditionally established for safety, does not cause adverse health effects, and as safety concerns for electric fields are sufficiently addressed by adherence to the NESC, as amended, health concerns regarding Electric and Magnetic Fields (EMF) focus on MF rather than EF. The International Commission on Non-Ionizing Radiation Protection (ICNIRP) has established a guideline of 4.2 kV/m.

The Project route contains an existing transmission line that emits magnetic fields (MF). In the United States, no state or federal exposure standards for 60-Hertz MF based on demonstrated health effects have been established, nor are there any such standards established worldwide. However, the ICNIRP has established a level of 2,000 milliGauss (mG), based on extrapolation from scientific experimentation, and the International Committee on Electromagnetic Safety (ICES) has calculated a guideline of 9,040 mG for exposure to workers and the general public, and recognized in the Council's *Electric and Magnetic Field Best Management Practices for the Construction of Electric Transmission Lines in Connecticut*.

The Project will not alter the configuration of the conductors and thus, as a result, electric and magnetic fields would change only slightly directly underneath the replacement structures.

Construction Schedule

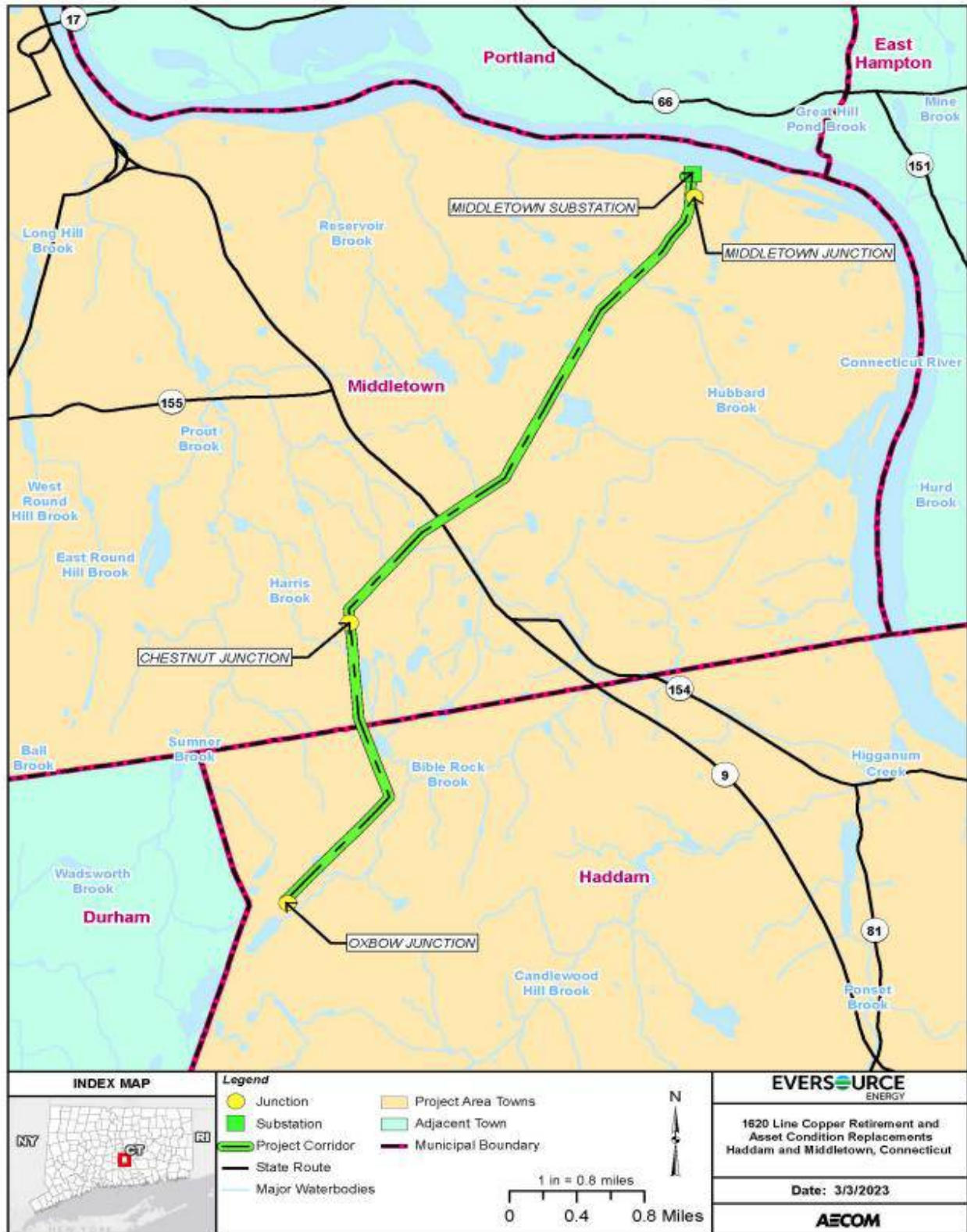
Construction is expected to begin in the fourth quarter of 2023 with an anticipated completion by the end of the second quarter 2024. Normal work hours would be Monday through Saturday from 7:00 a.m. to 7:00 p.m. Sunday work hours or evening work (i.e. after 7:00 p.m.) may be necessary due to unforeseen circumstances, delays caused by inclement weather and/or outage constraints.

Conclusion

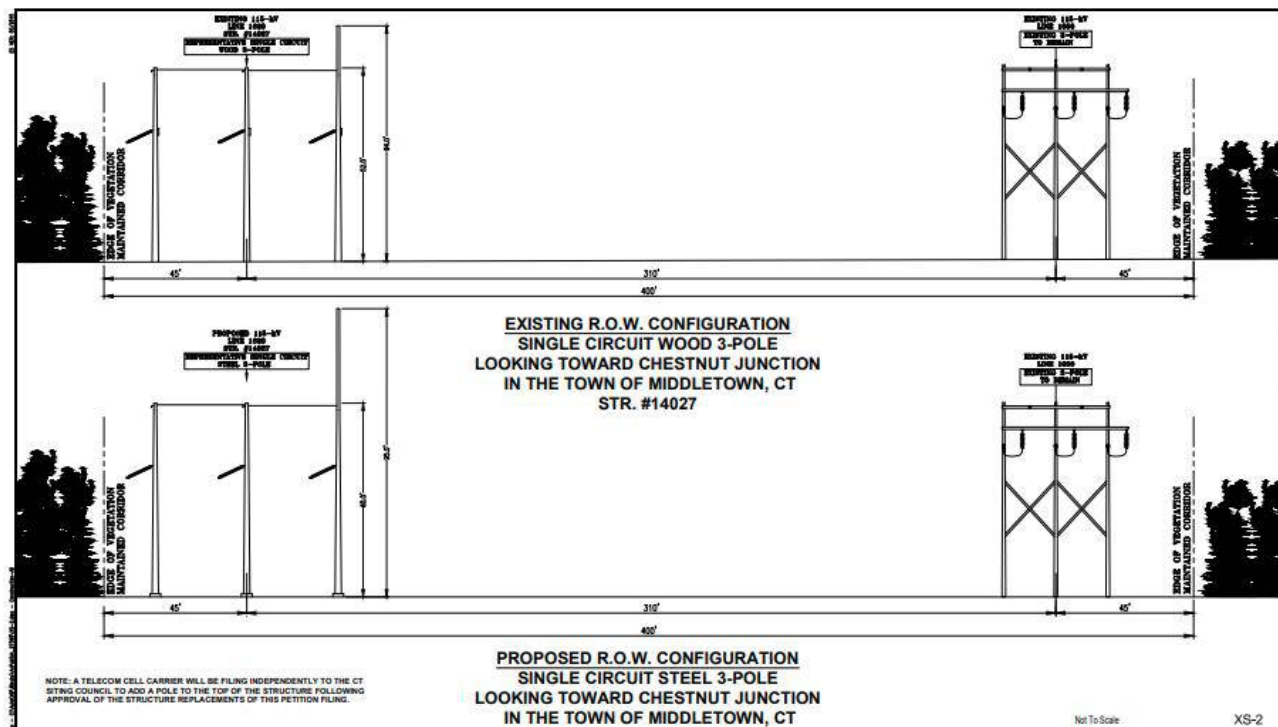
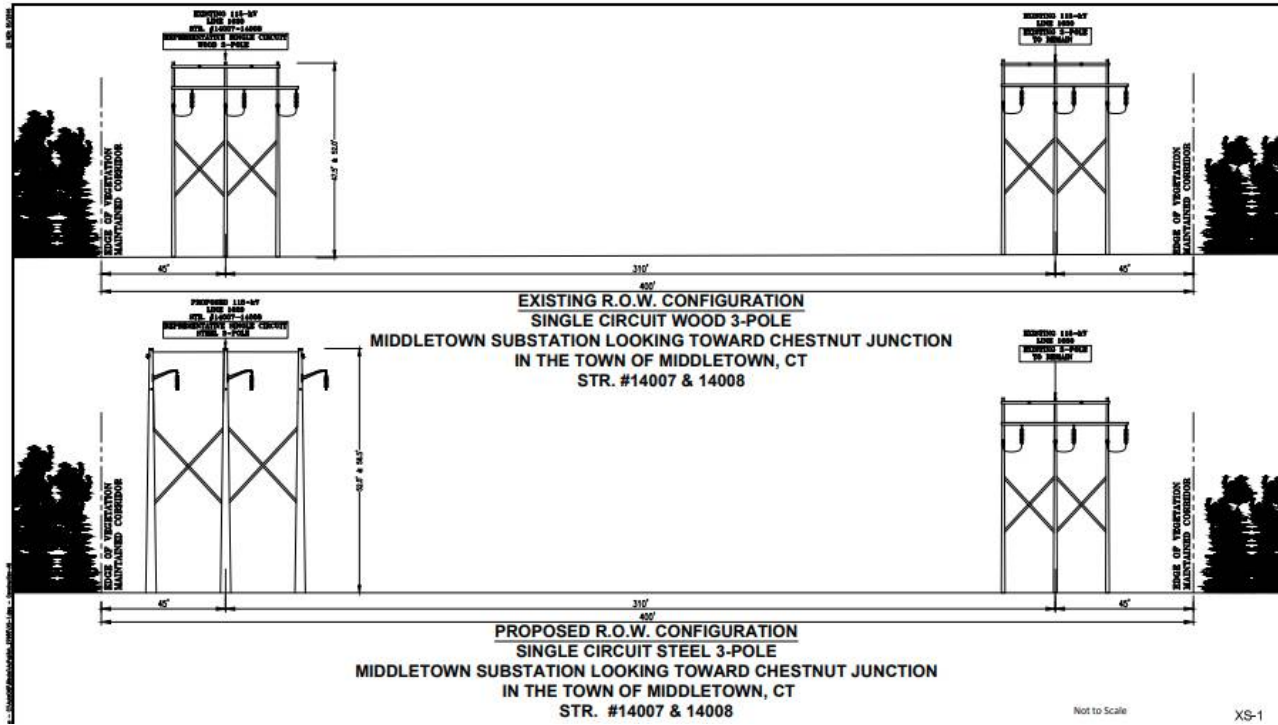
If approved, staff recommends the following conditions:

1. Approval of any project changes be delegated to Council staff;
2. Submit a copy of the DEEP Stormwater Permit prior to commencement of construction;
3. Submit a copy of the DEEP NDDDB determination letter prior to commencement of construction; and
4. Incorporate pollinator habitat in the restoration of disturbed areas consistent with CGS §16-50hh, where feasible.

Project Location



Project ROW Profiles



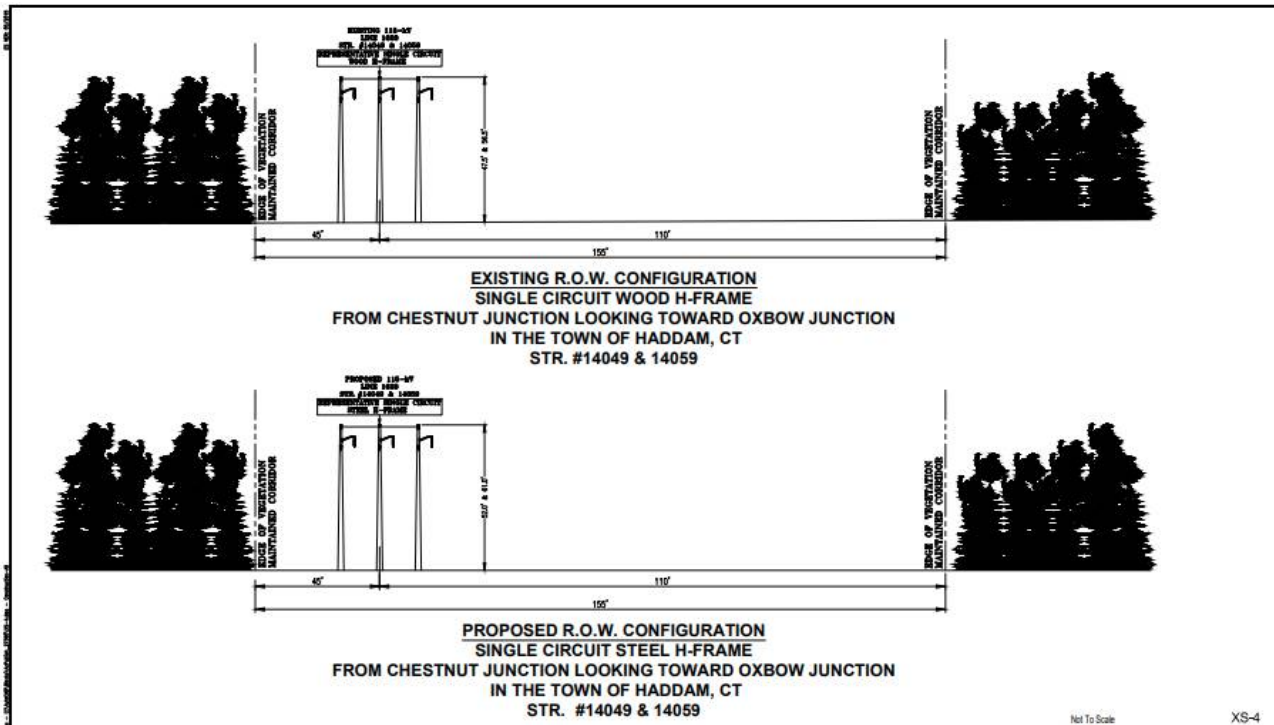
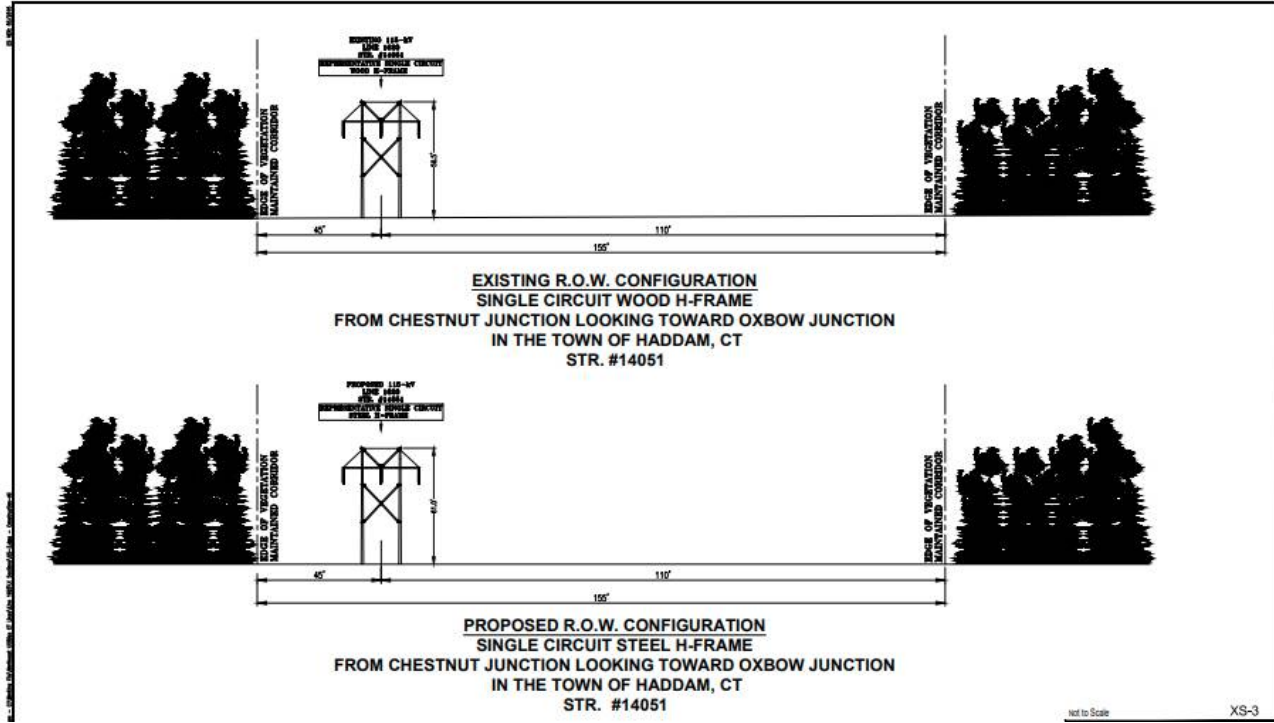


Exhibit B

Property Card

245 DEKOVEN DR

Location 245 DEKOVEN DR

Map-Lot 22 / 0586 /

Acct# E30087

Owner CITY OF MIDDLETOWN

Municipality

Assessment \$3,337,290

Appraisal \$4,767,550

PID 46

Building Count 1

Assessing District

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2018	\$4,284,550	\$483,000	\$4,767,550

Assessment			
Valuation Year	Improvements	Land	Total
2018	\$2,999,190	\$338,100	\$3,337,290

Parcel Addresses

Additional Addresses
No Additional Addresses available for this parcel

Owner of Record

Owner	CITY OF MIDDLETOWN	Sale Price	\$0
Co-Owner	CITY HALL	Certificate	
Address	245 DEKOVEN DR MIDDLETOWN, CT 06457	Book & Page	0000/0000
		Sale Date	01/01/1990
		Instrument	29

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
CITY OF MIDDLETOWN	\$0		0000/0000	29	01/01/1990

Building Information

Building 1 : Section 1

Year Built: 1958
Living Area: 35,866
Replacement Cost: \$5,971,191
Building Percent Good: 71
Replacement Cost Less Depreciation: \$4,239,550

Building Attributes

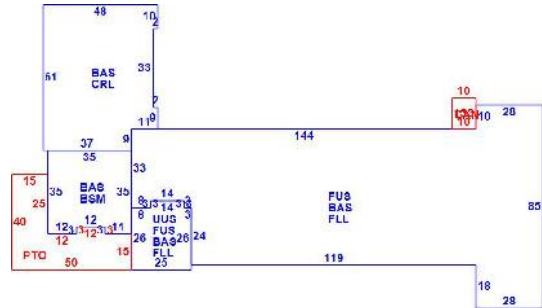
Field	Description
Style	City/Town Hall
Model	Commercial
Grade	B
Stories	2
Occupancy	1.00
Exterior Wall 1	Brick Veneer
Exterior Wall 2	Glass/Thermo.
Roof Structure	Flat
Roof Cover	Tar and Gravel
Interior Wall 1	Minimum
Interior Wall 2	Drywall
Interior Floor 1	Carpet
Interior Floor 2	Linoleum
Heating Fuel	Gas
Heating Type	Forced Air
AC Type	Central
Struct Class	
Bldg Use	Mun Bldg Com
Cov Parking	
Uncov Parking	
Percent Fin	
1st Floor Use	
Heat/AC	Heat/AC Pkg
Frame Type	Reinforced Cnc
Baths/Plumbing	Average
Ceiling/Walls	Sus Ceil & Wal
Rooms/Prtns	Average
Wall Height	8.00

Building Photo



(<http://images.vgsi.com/photos/MiddletownCTPhotos/A00\02\74\68.jpg>)

Building Layout



(ParcelSketch.aspx?pid=46&bid=46)

Building Sub-Areas (sq ft)

Building Sub-Areas (sq ft)			Legend
Code	Description	Gross Area	Living Area
BAS	First Floor	14,590	14,590
FLL	Finished LL	10,638	10,638
FUS	Finished Upper Story	10,638	10,638
BSM	Basement	1,189	0
CAN	Canopy	130	0
CRL	Crawl	2,763	0
PTO	Patio	1,161	0
UUS	Unfinished Upper Story	692	0
		41,801	35,866

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #

ELV1	Elevator - Passenger	3.00 STOPS	\$30,600	1
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Land

Land Use

Use Code 922
Description Mun Bldg Com
Zone B-1
Neighborhood 3150
Alt Land Appr No
Category

Land Line Valuation

Size (Acres) 1.61
Assessed Value \$338,100
Appraised Value \$483,000

Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
PAV1	Paving	AS	Asphalt	12800.00 UNITS	\$14,400	1

Valuation History

Appraisal				
Valuation Year	Improvements	Land	Total	
2020	\$4,284,550	\$483,000	\$4,767,550	
2019	\$4,284,550	\$483,000	\$4,767,550	
2018	\$4,284,550	\$483,000	\$4,767,550	

Assessment				
Valuation Year	Improvements	Land	Total	
2020	\$2,999,190	\$338,100	\$3,337,290	
2019	\$2,999,190	\$338,100	\$3,337,290	
2018	\$2,999,190	\$338,100	\$3,337,290	

22/0613
E30564

1.21 AC

22/0613
E30213

0.95 AC

240.0'

91'
32.43'
21.68'

Memor Plaza

Deeroven Drive

22/0586
E30087
#245
1.61 AC

City Hall

104.2'

22/0588
E30077

1.67 AC

22/0587
R05497
#74
0.45 AC

233.4'

Court Street

118.37'
39.62'

46.75'

22/0701
R01303
#1
0.56 AC

Exhibit C

Construction Drawings

T-Mobile

SITE NAME: CT832/CL&P MIDDLETOWN

SITE ID: CT11832C

NEW EVERSOURCE STRUCT. NO. #14027

701 BARTHOLOMEW ST
MIDDLETOWN, CT 06457

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)

67E95F ODE+6160

T-MOBILE A+L TEMPLATE (PROVIDED BY RFDS)

67D95F_IOP

GENERAL NOTES

- ALL WORK SHALL BE IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2022 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "H" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2022 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
- SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
- CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
- BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
- ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
- AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
- CONTRACTOR SHALL PROVIDE A COMPLETE BUILD-OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
- CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
- CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
- CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN "AS-BUILT" SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
- LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
- THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
- ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
- DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
- ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
- ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
- ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T-MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
- CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
- THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
- COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK.
- ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
- THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
- CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
- THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
- THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.
- PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

SITE LOCATION MAP

N.T.S.



VICINITY MAP

N.T.S.



COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH.

SITE COORDINATES: LATITUDE: 41°-31'-14.94" N
LONGITUDE: 72°-36'-29.42" W
GROUND ELEVATION: ±504' AMSL



PROJECT SUMMARY

- THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
- REMOVAL OF EXISTING UTILITY TOWER AND INSTALLATION OF NEW 95' TOWER #14027 TO BE COMPLETED BY OTHERS
 - REMOVE EXISTING EMS: RR90-17-02DP ANTENNA, TYP. (1) PER SECTOR; TOTAL OF (3)
 - REMOVE EXISTING ANDREW: LNX-6515DS-A1M ANTENNA, TYP. (1) PER SECTOR; TOTAL OF (3)
 - REMOVE EXISTING TMA_s AND DIPLEXERS
 - REMOVE EXISTING ANTENNA MOUNTS
 - INSTALL (8) 1-5/8" COAX CABLES PER SECTOR; TOTAL OF (24)
 - INSTALL RFS: APXVAALL18_43-U-NA20 ANTENNA, TYP. (1) PER SECTOR; TOTAL OF (3)
 - INSTALL ERICSSON: RADIO 4460 B25+B66, TYP. (1) PER SECTOR; TOTAL (3) AT_GRADE
 - INSTALL ERICSSON: RADIO 4480 B71+B85, TYP. (1) PER SECTOR; TOTAL (3) AT_GRADE
 - INSTALL SMART BIAS-T: ATSBT-TOP-MF-4G TMA, TYP. (1) PER SECTOR; TOTAL OF (3)
 - INSTALL SITE PRO: RMQLP-496-HK ANTENNA MOUNT PLATFORM
 - INSTALL NEW UNISTRUTS AND POST FOR PROPOSED RADIO INSTALLATION

PROJECT INFORMATION

SITE NAME:	CT832/CL&P MIDDLETOWN
SITE ID:	CT11832C
SITE ADDRESS:	701 BARTHOLOMEW ST MIDDLETOWN, CT 06457
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT. 06002
CONTACT PERSON:	MATT BUNDLE (PROJECT MANAGER) NORTHEAST SITE SOLUTIONS (508) 642-8801
ENGINEER OF RECORD:	CEN TEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT. 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
SITE COORDINATES:	LATITUDE: 41°-31'-14.94" N LONGITUDE: 72°-36'-29.42" W GROUND ELEVATION: ±504' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES, ANT. SCHEDULE, AND SPECIFICATIONS	0
C-1	COMPOUND PLAN, EQUIPMENT PLANS, AND ELEVATION	0
C-2	ANTENNA PLANS AND ELEVATIONS	0
C-3	TYPICAL EQUIPMENT DETAILS	0
C-4	TYPICAL EQUIPMENT DETAILS	0
E-1	ELECTRICAL COMPOUND PLAN	0
E-2	ELECTRICAL SCHEMATIC DIAGRAM	0
E-3	ELECTRICAL GROUNDING PLANS	0
E-4	TYPICAL ELECTRICAL DETAILS	0
E-5	TYPICAL GROUNDING DETAILS	0
E-6	ELECTRICAL SPECIFICATIONS	0

CONSTRUCTION DRAWINGS — ISSUED FOR CONSTRUCTION
CONSTRUCTION DRAWINGS — ISSUED FOR CLIENT REVIEW
CONSTRUCTION DRAWINGS — ISSUED FOR CLIENT REVIEW

TUR
TUR
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DATE
DRAWN BY
CHECKED BY
REV.

06/21/23
09/19/23
10/28/22

PROFESSIONAL ENGINEER SEAL

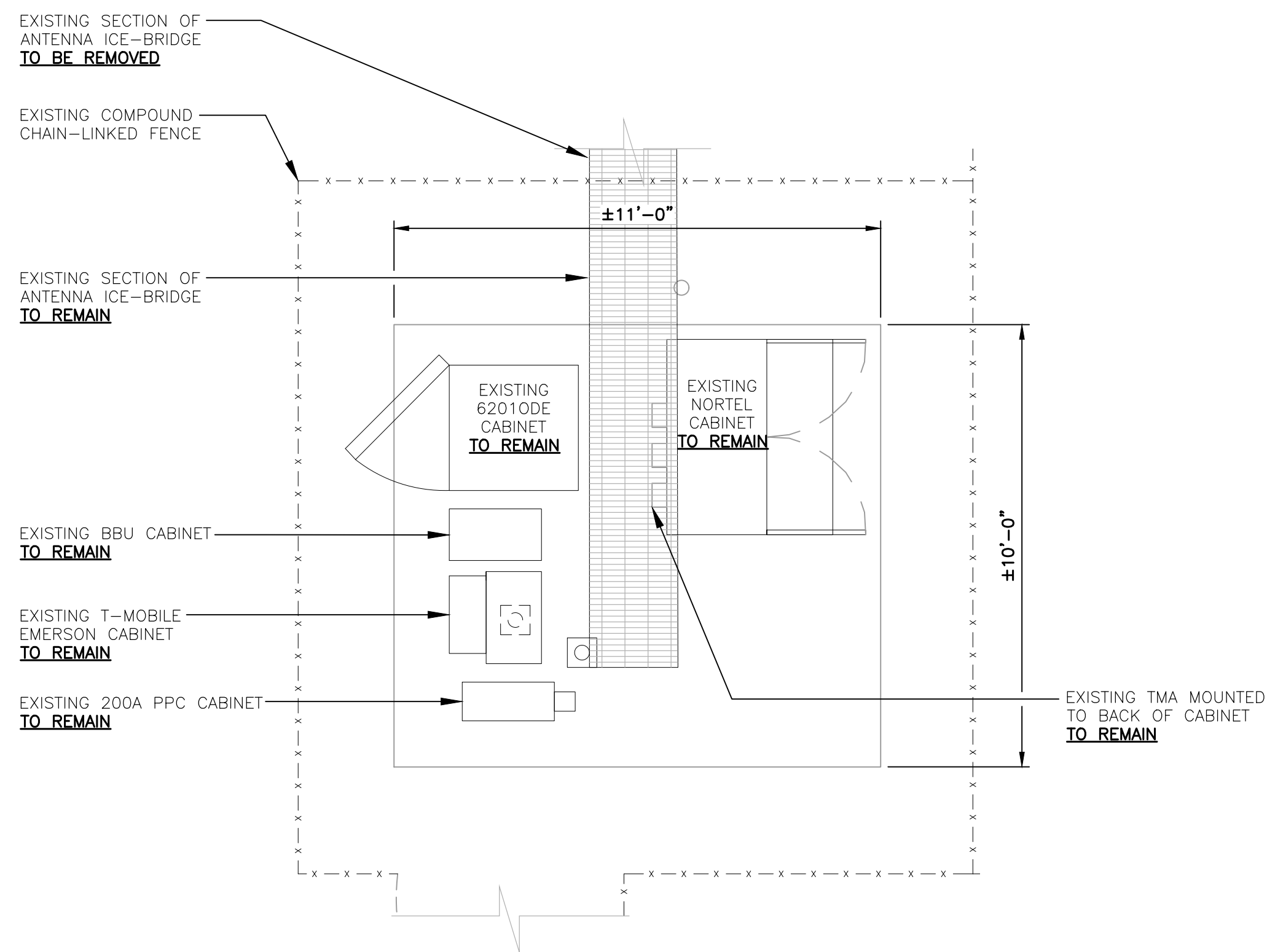
CEN TEK engineering
Centek on Solutions™
203) 488-0580
203) 488-8387 fax
63-2 North Branford Road
Bloomfield, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC
SITE NAME: CT832/CLP MIDDLETOWN
SITE ID: CT11832C
701 BARTHOLOMEW ST
MIDDLETOWN, CT 06457

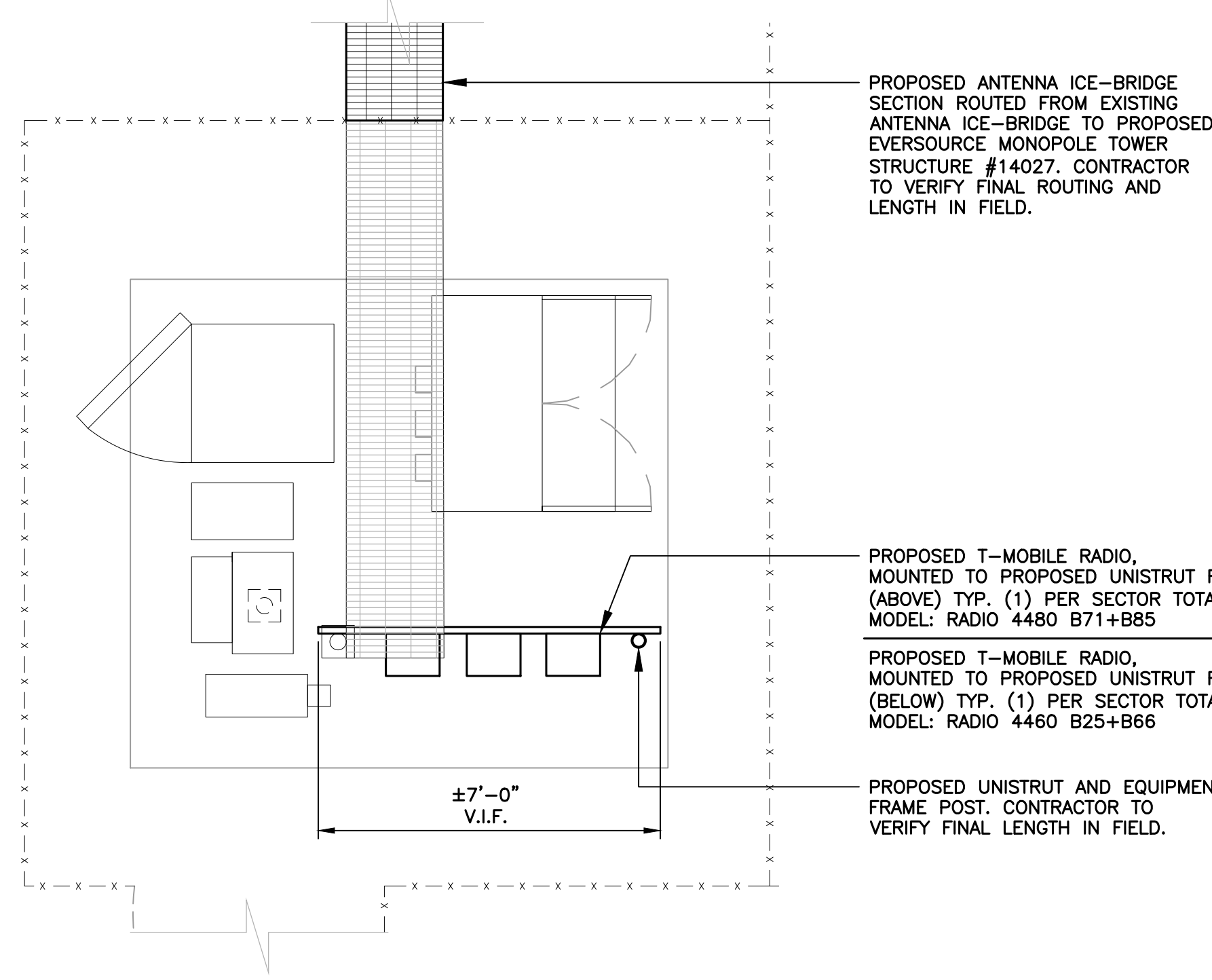
DATE: 10/28/22
SCALE: AS NOTED
JOB NO. 22073.04

TITLE SHEET

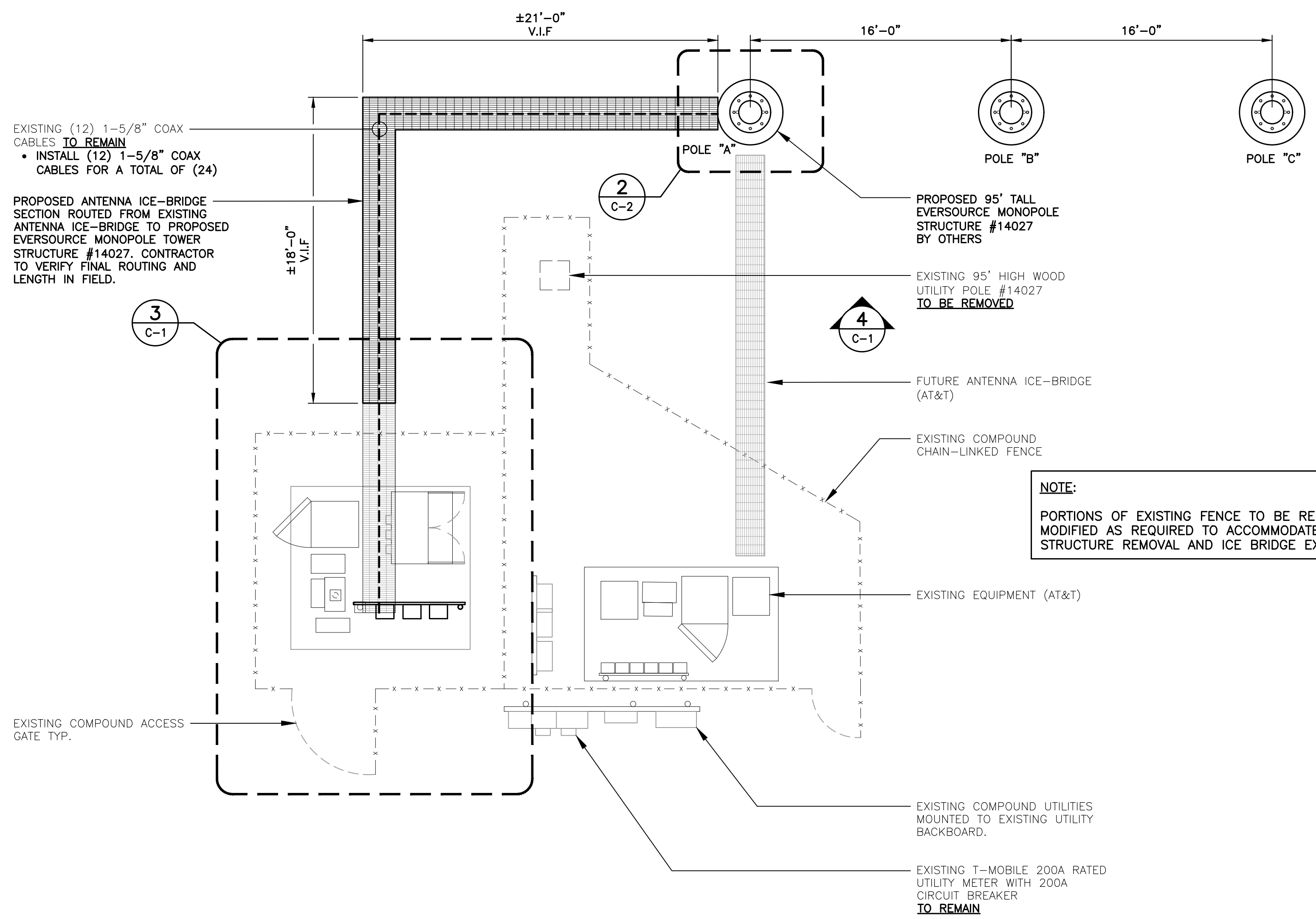
T-1
SHEET NO. 1 OF 12



2 EQUIPMENT PLAN - EXISTING
C-1 SCALE: 3/8" = 1' TRUE NORTH



3 EQUIPMENT PLAN - PROPOSED
C-1 SCALE: 3/8" = 1' TRUE NORTH



1 COMPOUND PLAN - PROPOSED
C-1 SCALE: 1" = 4' TRUE NORTH

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING..

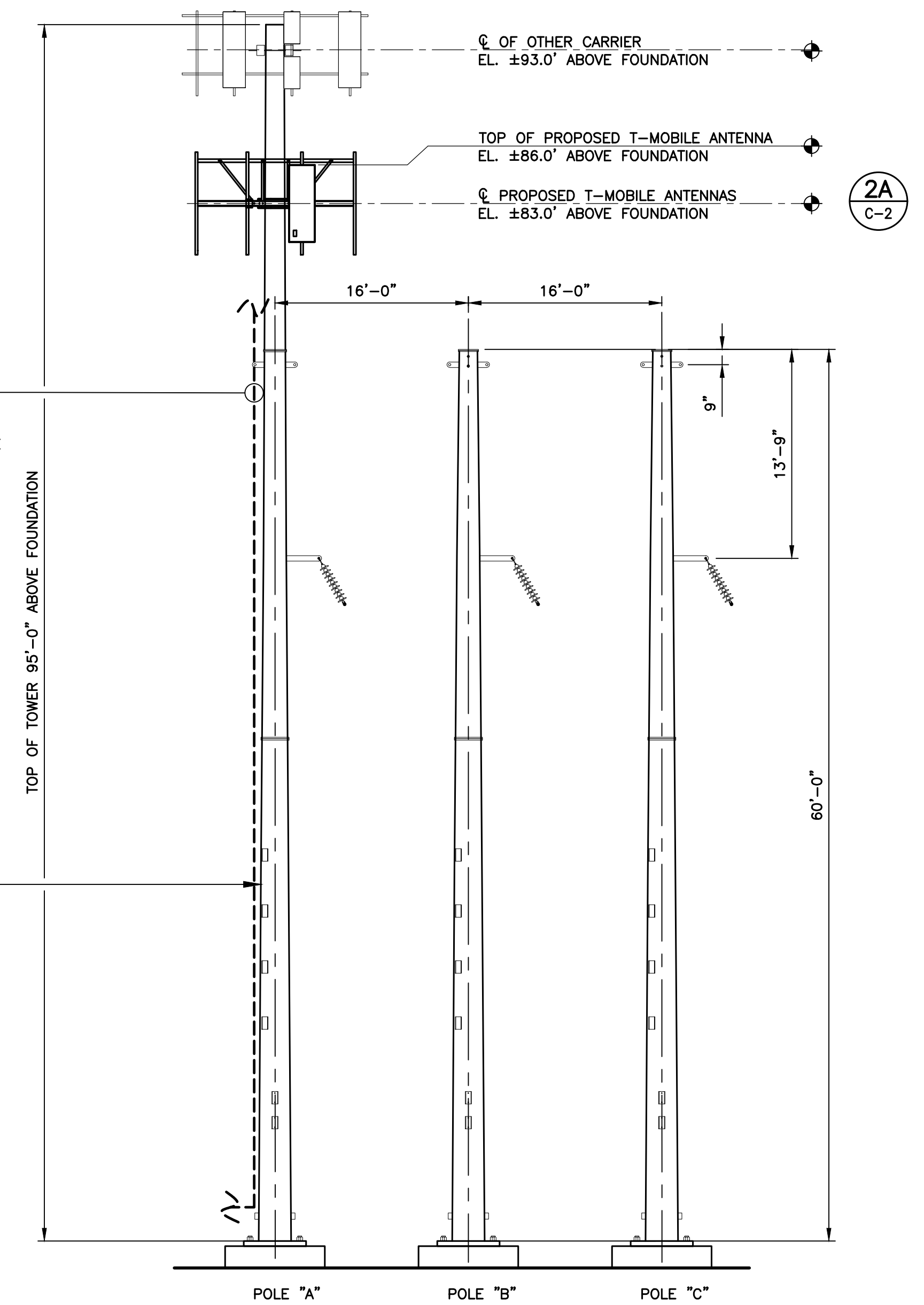
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22073.04) DATED 05/18/23 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22073.04, Rev1) DATED 04/05/23 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



4 TOWER ELEVATION - PROPOSED
C-1 SCALE: 1" = 8'

PROFESSIONAL ENGINEER SEAL

CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

REV. DATE DRAWN BY CHECKED BY DESCRIPTION

0 06/21/23 ASC

1 04/19/23 ASC

2 10/28/22 RTS

TJR

TJR

TJR

www.CentekEng.com

T-Mobile

NSS

Centek engineering

Centek on Solutions™

(203) 488-0580

(203) 488-8387 Fax

632 North Branford Road

Branford, CT 06405

T-MOBILE NORTHEAST LLC

SITE NAME: CT832/CLP MIDDLETOWN

SITE ID: CT1832C

701 BARTHOLOMEW ST

MIDDLETOWN, CT 06457

DATE: 10/28/22

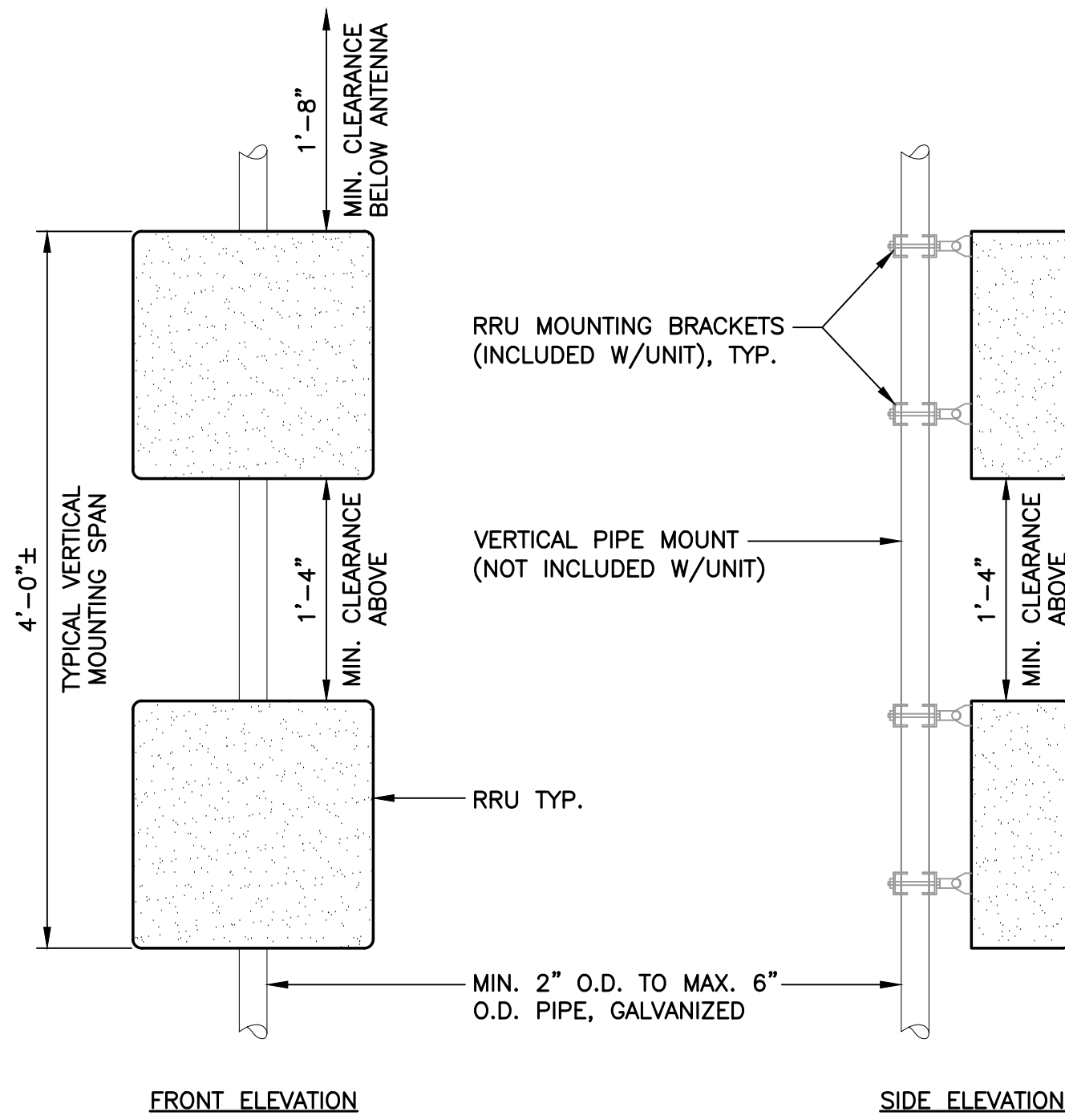
SCALE: AS NOTED

JOB NO. 22073.04

COMPOUND PLAN, EQUIPMENT PLANS, AND ELEVATION

C-1

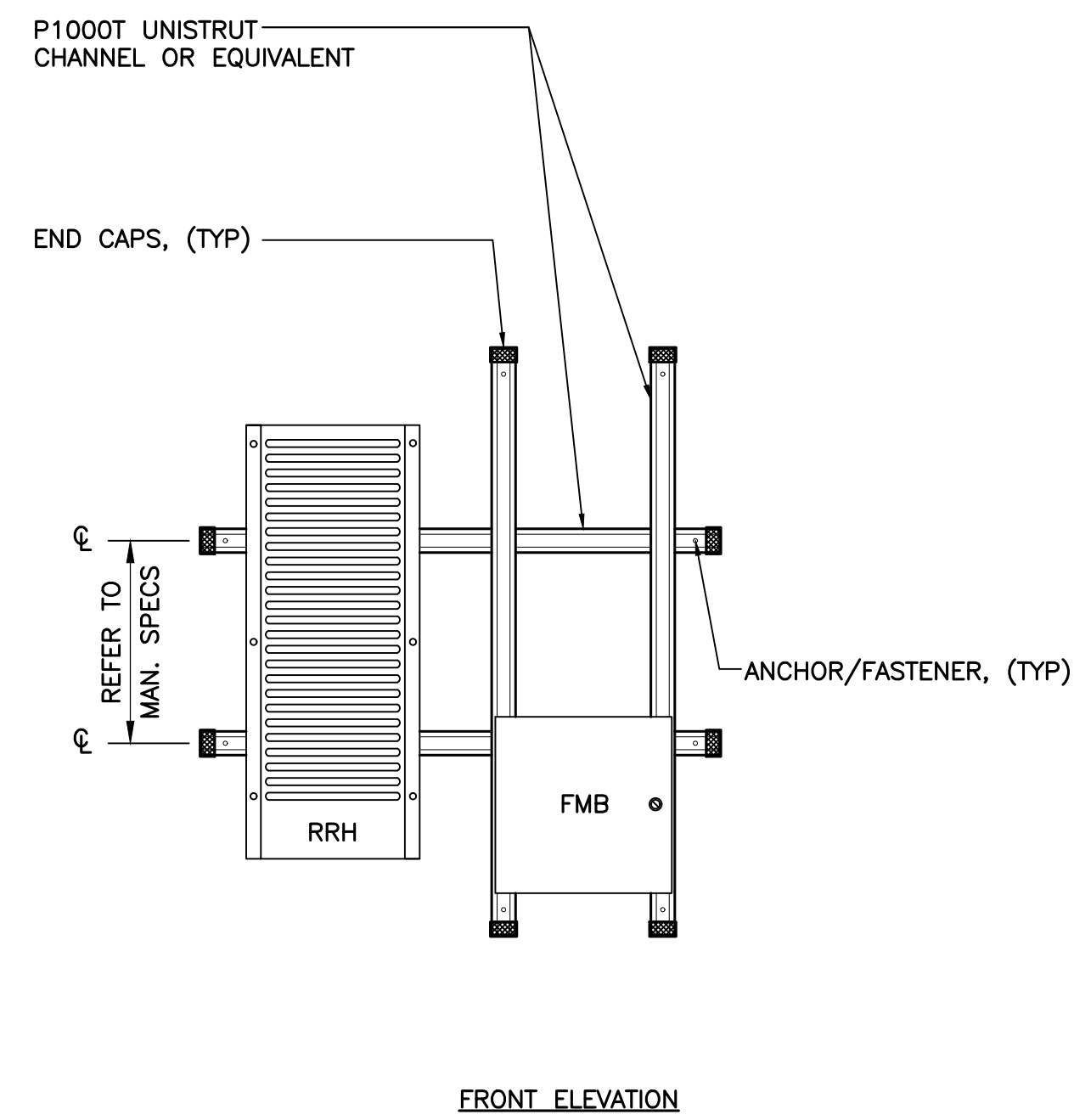
SHEET NO. 3 OF 12



NOTES: (PIPE MOUNTING)

1. T-MOBILE SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 TYPICAL RRU MOUNTING DETAILS
C-3 SCALE: NOT TO SCALE



NOTES: (UNISTRUT MOUNTING)

1. INSTALL A MINIMUM OF (2) ANCHORS PER UNISTRUT ($\pm 16^\circ$ o/c MIN).
2. MOUNT RRU TO UNISTRUT WITH 3/8" UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

2 PROPOSED ANTENNA DETAIL
C-3 SCALE: NOT TO SCALE



APXVAALL18 43-U-NA20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAALL18_43-U-NA20	72"L x 24.0"W x 8.5"D	±139 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.



RADIO 4460 B25+B66



RADIO 4480 B71+B85

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4460 B25+B66	19.6"L x 15.7"W x 12.1"D	±109 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4480 B71+B85	21.8"L x 15.7"W x 7.5"D	±84 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

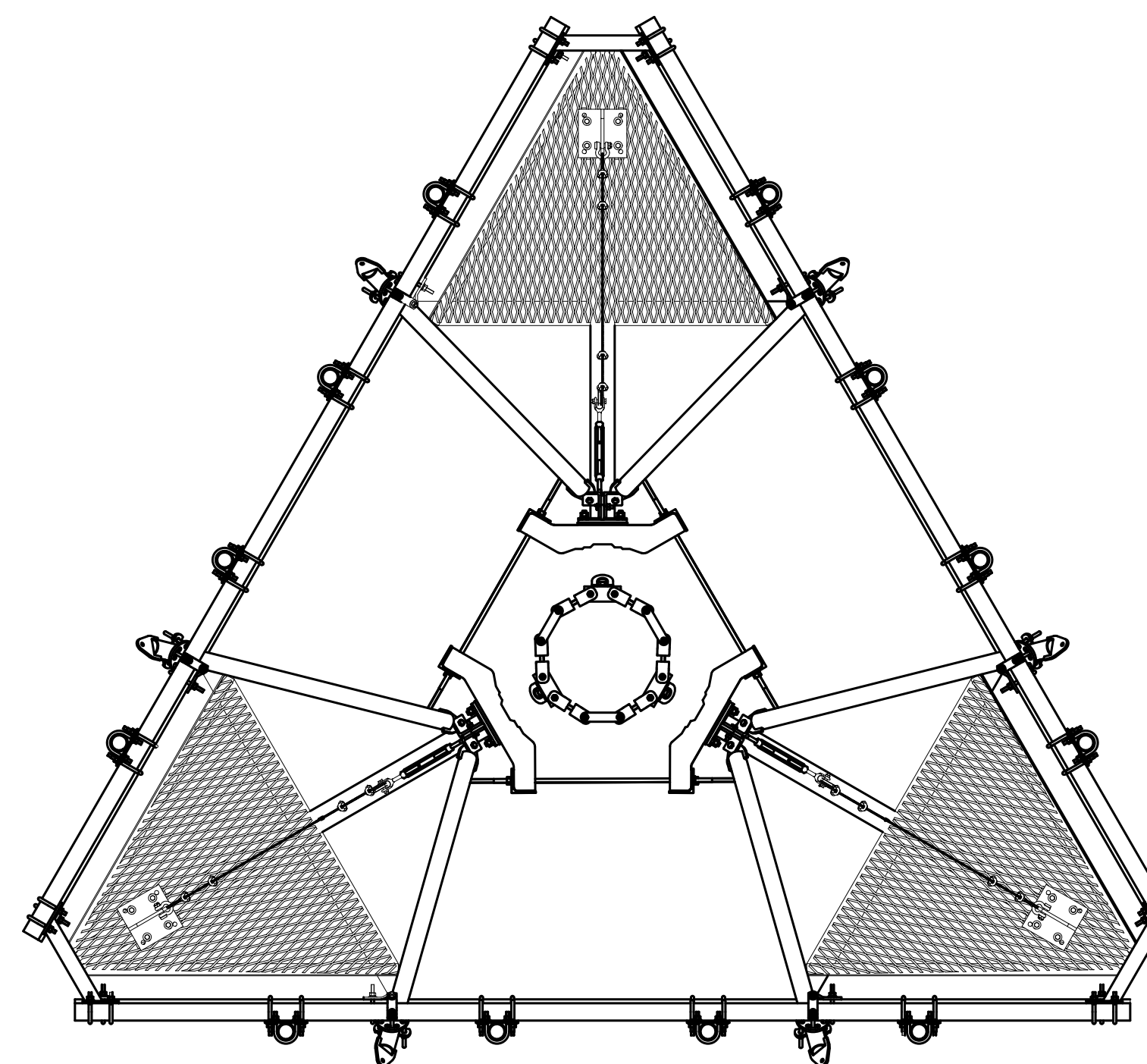
3 PROPOSED RRU DETAIL
C-3 SCALE: NOT TO SCALE



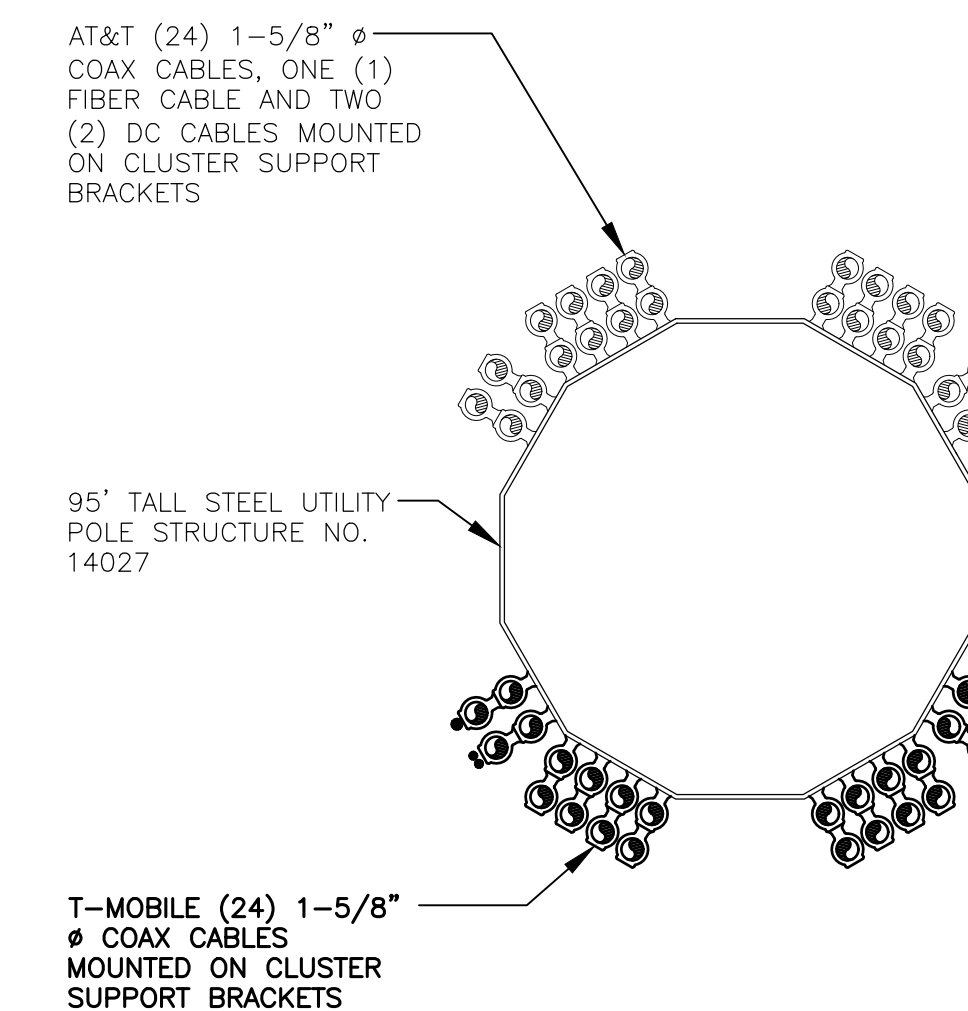
ANDREW SMART BIAS-T		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: ATSBT-TOP-MF-4G	5.63"L x 3.7"W x 2"D	±1.7 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

4 PROPOSED BIAS-T DETAIL
C-3 SCALE: NOT TO SCALE



5 PLATFORM ANTENNA MOUNT DETAIL
C-3 SCALE: NOT TO SCALE



6 COAX CABLE PLAN
C-3 SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
0	06/21/23	ASC	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
1	04/19/23	ASC	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW
2	10/28/22	RTS	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

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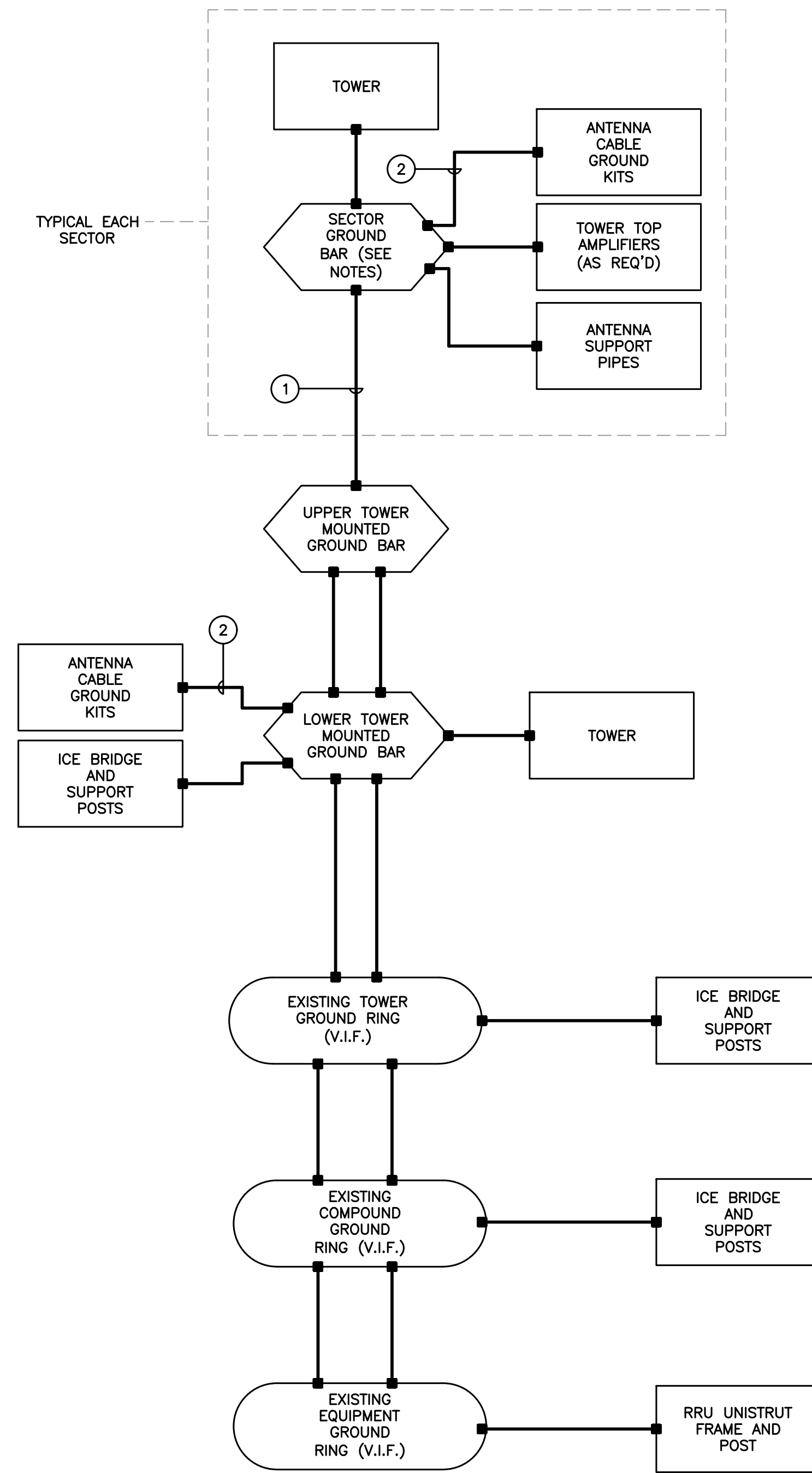
T-MOBILE NORTHEAST LLC
SITE NAME: CT832/CLP MIDDLETOWN
SITE ID: CT1832C
701 BARTHLOMEW ST
MIDDLETOWN, CT 06457

DATE: 10/28/22
SCALE: AS NOTED
JOB NO. 22073.04

TYPICAL EQUIPMENT DETAILS

C-3

SHEET NO. 5 OF 12



TYPICAL EACH SECTOR

1 ELECTRICAL SCHEMATIC DIAGRAM
 E-2 SCALE: NOT TO SCALE

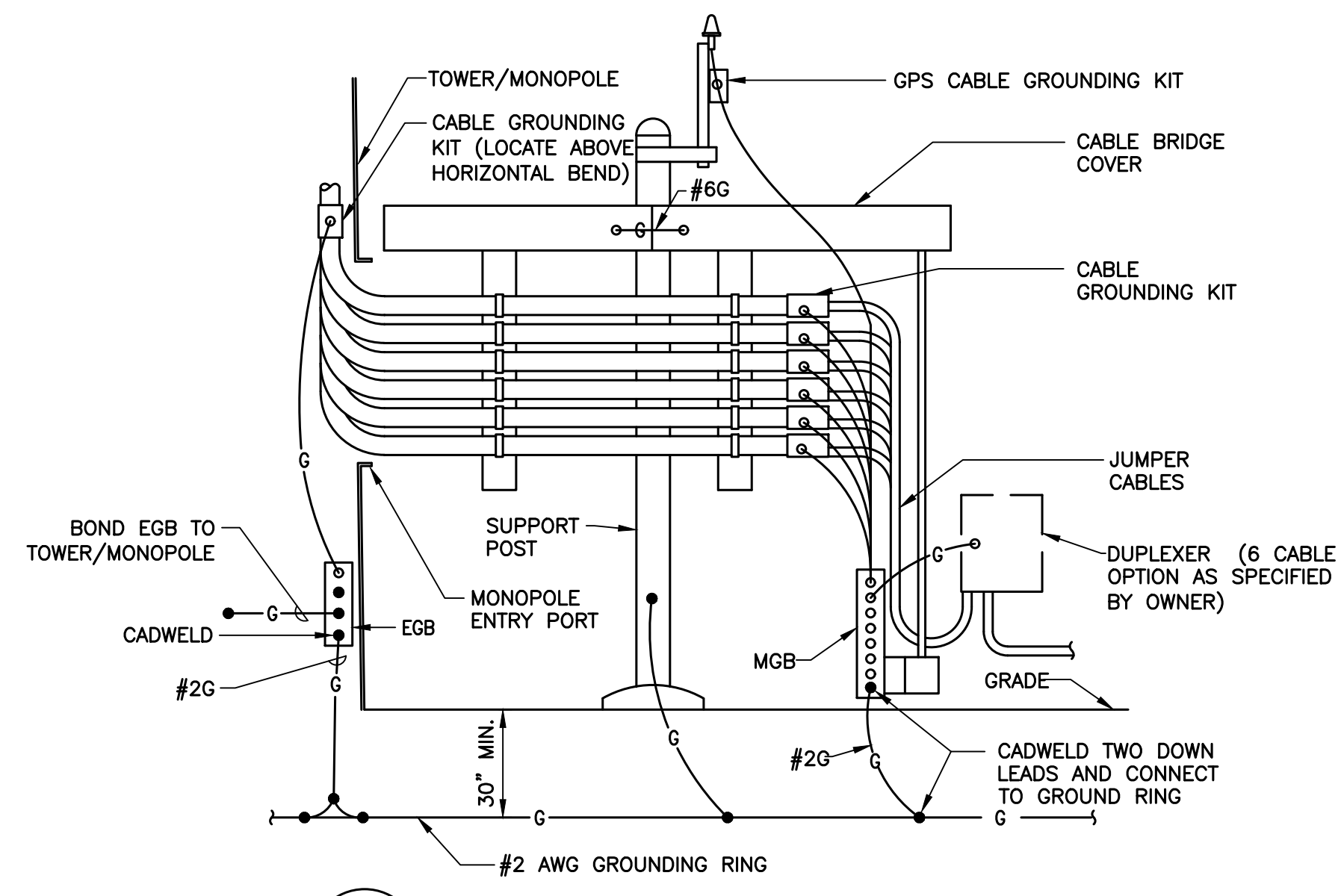
GROUNDING SCHEMATIC NOTES

- ① #2/0 GREEN INSULATED
- ② #6 AWG

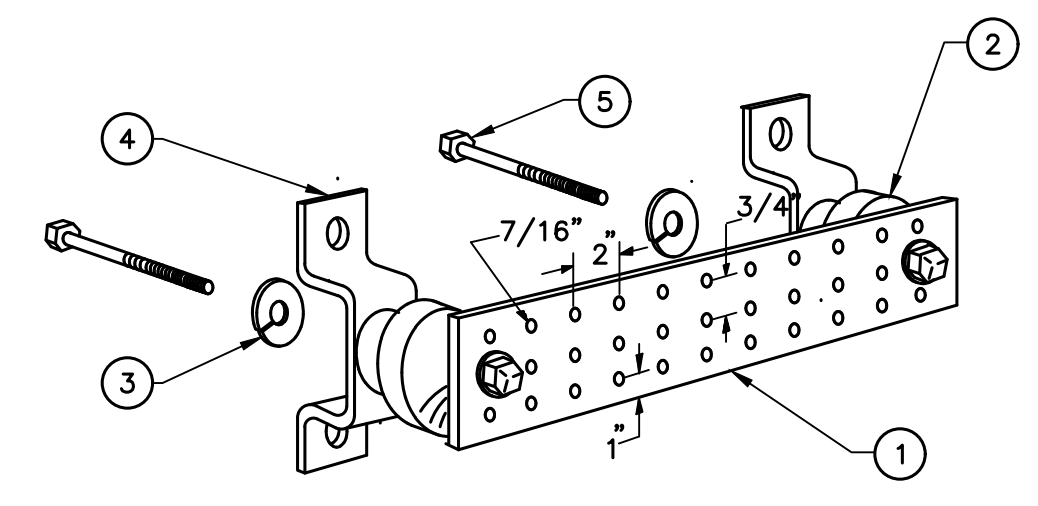
GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW - EXTERIOR; STRANDED GREEN INSULATED - INTERIOR).
3. BOND CABLE TRAY AND ICE BRIDGE SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. ALL BONDS TO TOWER SHALL BE MADE IN STRICT ACCORDANCE WITH SPECIFICATIONS OF TOWER MANUFACTURER OR STRUCTURAL ENGINEER.
7. REFER TO GROUNDING PLAN FOR LOCATION OF GROUNDING DEVICES.
8. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
9. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
10. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
11. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.
12. COORDINATE WITH EVERSOURCE TRANSMISSION DEPARTMENT REPRESENTATIVE TO DETERMINE ADDITIONAL GROUNDING REQUIREMENTS. PROVIDE ALL REQUIRED ELEMENTS TO MEET EVERSOURCE APPROVAL.
13. COORDINATE WITH TOWER OWNER BEFORE INSTALLING ANY GROUNDING ELEMENTS ON TOWER OR BONDING TO EXISTING TOWER GROUND RING.

	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>CONSTRUCTION DRAWINGS</td> <td>ISSUED FOR CONSTRUCTION</td> </tr> <tr> <td>CONSTRUCTION DRAWINGS</td> <td>ISSUED FOR CLIENT REVIEW</td> </tr> <tr> <td>CONSTRUCTION DRAWINGS</td> <td>ISSUED FOR CLIENT REVIEW</td> </tr> </table>	CONSTRUCTION DRAWINGS	ISSUED FOR CONSTRUCTION	CONSTRUCTION DRAWINGS	ISSUED FOR CLIENT REVIEW	CONSTRUCTION DRAWINGS	ISSUED FOR CLIENT REVIEW
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CONSTRUCTION DRAWINGS	ISSUED FOR CLIENT REVIEW						
CONSTRUCTION DRAWINGS	ISSUED FOR CLIENT REVIEW						
<p>Centek on Solutions™ [203] 488-0580 [203] 488-8387 Fax 63-2 North Branford Road Branford, CT 06405 www.CentekEng.com</p>	<p>T-MOBILE NORTHEAST LLC SITE NAME: CT832/CLP MIDDLETOWN SITE ID: CT1832C 701 BARTHOLOMEW ST MIDDLETOWN, CT 06457</p>						
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>DATE:</td> <td>10/28/22</td> </tr> <tr> <td>SCALE:</td> <td>AS NOTED</td> </tr> <tr> <td>JOB NO.</td> <td>22073.04</td> </tr> </table>		DATE:	10/28/22	SCALE:	AS NOTED	JOB NO.	22073.04
DATE:	10/28/22						
SCALE:	AS NOTED						
JOB NO.	22073.04						
<p>ELECTRICAL SCHEMATIC DIAGRAM</p>							
<p>E-2</p>							
<p>SHEET NO. 8 OF 12</p>							

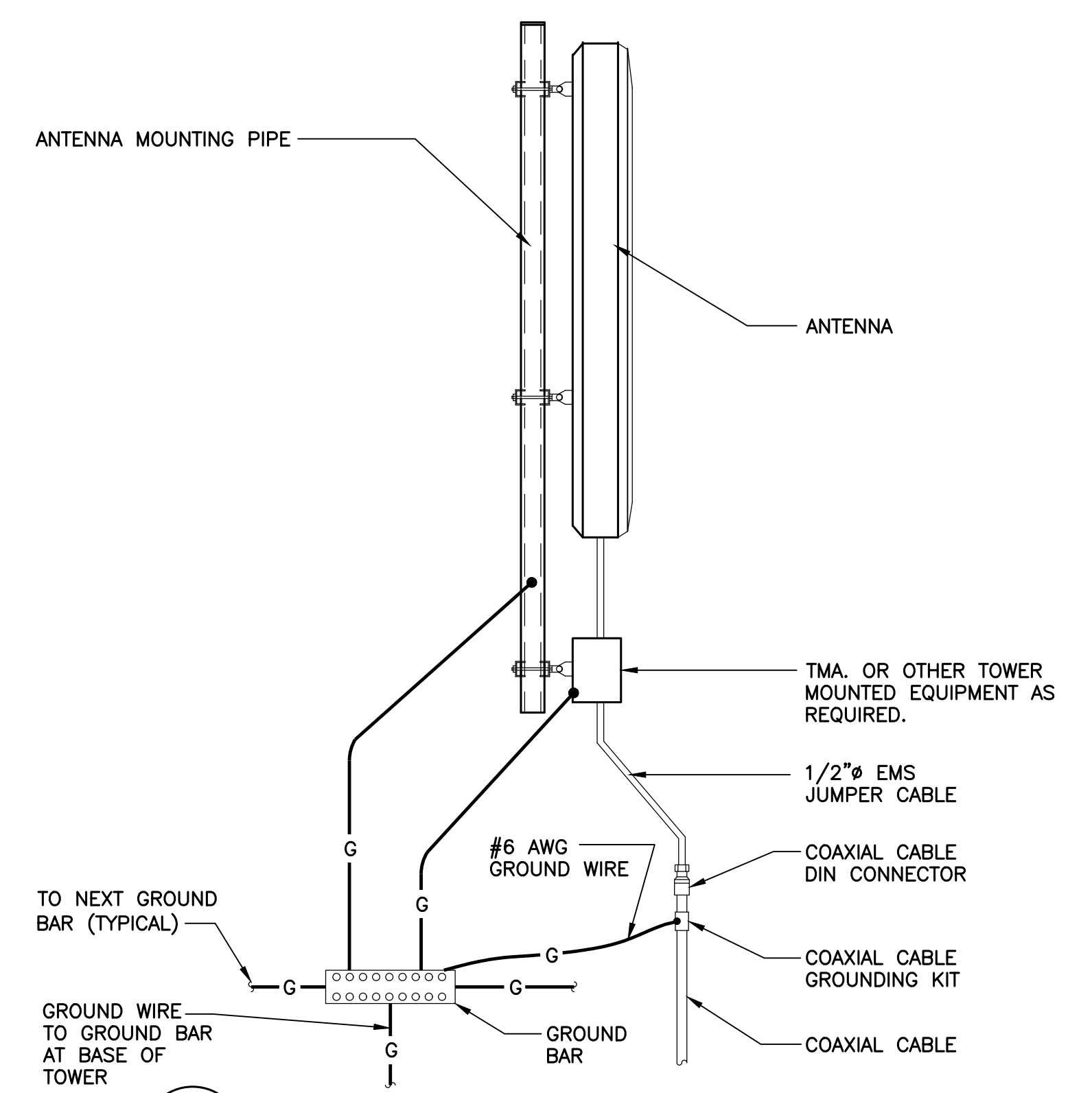


1 CABLE BRIDGE GROUNDING DIAGRAM
E-5 SCALE: NOT TO SCALE

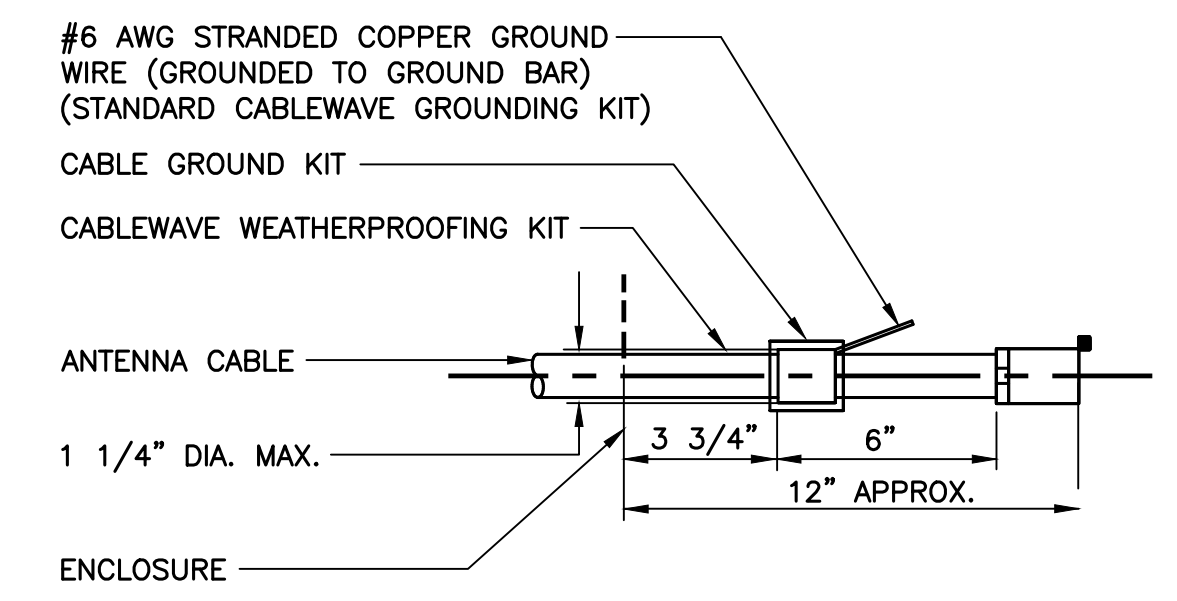


- NOTES**
- ① TINNY COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
 - ② INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
 - ③ 5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
 - ④ WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
 - ⑤ 5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

2 GROUND BAR DETAIL
E-5 SCALE: NOT TO SCALE

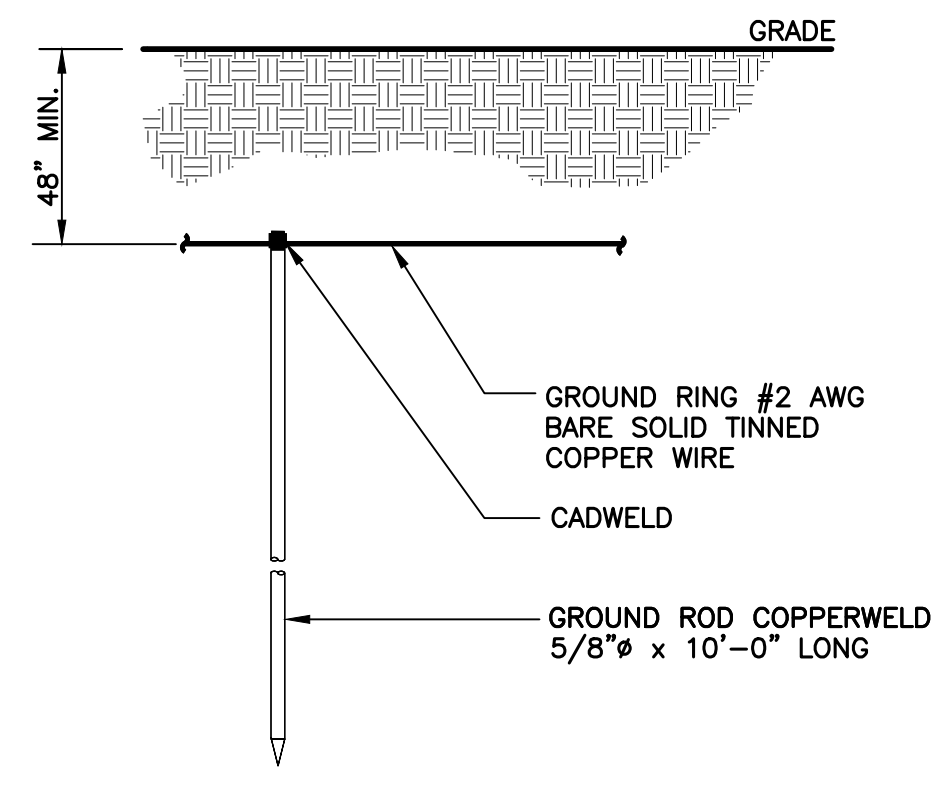


3 TYPICAL ANTENNA GROUNDING DETAIL
E-5 SCALE: NOT TO SCALE



- NOTES:**
1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.

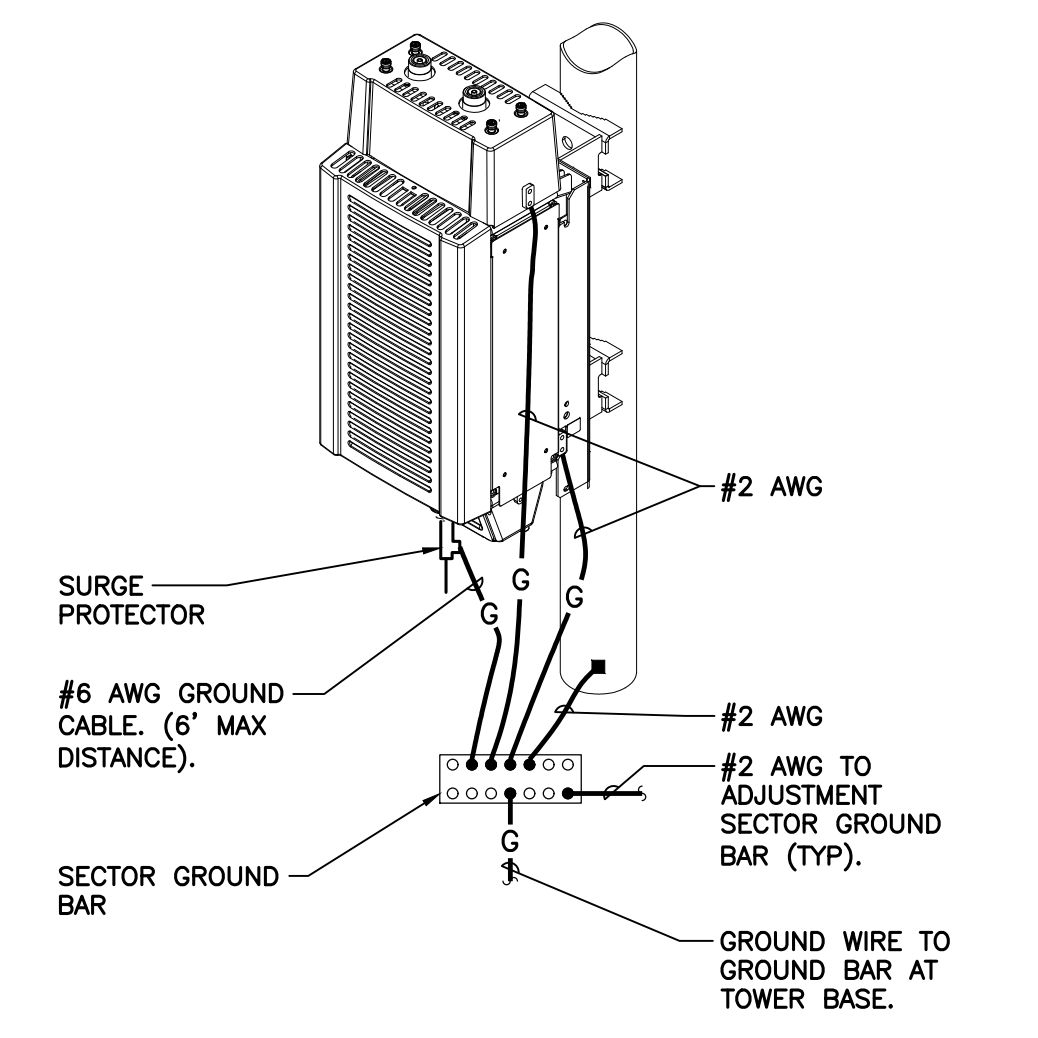
4 ANTENNA CABLE GROUNDING DETAIL
E-5 SCALE: NOT TO SCALE



- NOTES:**
1. USE GROUND PLATE DETAIL IF 10 FT. GROUND ROD DEPTH CANNOT BE ACHIEVED DUE TO LEDGE CONDITION OR IF EXISTING TOWER FOUNDATION IS ENCOUNTERED.

5 GROUND ROD DETAIL
E-5 SCALE: NOT TO SCALE

EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:
1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



6 RRH POLE MOUNT GROUNDING
E-5 SCALE: NOT TO SCALE

CONSTRUCTION DRAWINGS — ISSUED FOR CONSTRUCTION
CONSTRUCTION DRAWINGS — ISSUED FOR CLIENT REVIEW
CONSTRUCTION DRAWINGS — ISSUED FOR CLIENT REVIEW

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DATE: 10/28/22
DRAWN BY: [Signature]
CHECKED BY: [Signature]

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T-MOBILE NORTHEAST LLC
SITE NAME: CT832/CLP MIDDLETOWN
SITE ID: CT1832C
701 BARTHLOMEW ST
MIDDLETOWN, CT 06457

DATE: 10/28/22
SCALE: AS NOTED
JOB NO. 22073.04

TYPICAL GROUNDING DETAILS

E-5
SHEET NO. 11 OF 12

Exhibit D

Structural Analysis Report

Structural Analysis of
Utility Pole

T-Mobile Site Ref: CT11832C

Eversource Structure No. 14027
95' Tall Electric Transmission Pole

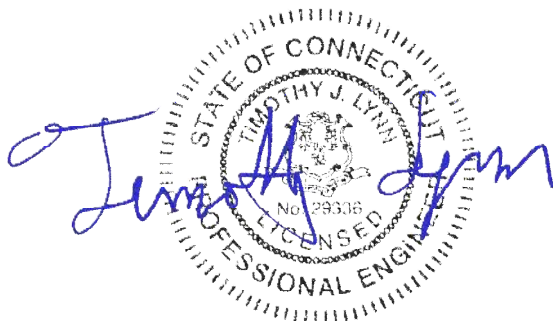
701 Bartholomew Street
Middletown, CT

CEN TEK Project No. 22073.04

~~*Date: March 14, 2023*~~

Rev 1: April 5, 2023

Max Stress Ratio = 82.8%



Prepared for:
T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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- ANALYSIS
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Introduction

The purpose of this report is to analyze the 95' utility pole located in Middletown, CT for the proposed antenna and equipment upgrade by T-Mobile.

The loads consist of the following:

- **AT&T (Final Configuration):**
Antennas: Six (6) CCI TPA65R-BU6D panel antennas, three (3) Ericsson AIR6419 panel antennas, three (3) Ericsson AIR6449 panel antennas, twelve (12) Commscope TMAT192123B68-31 TMAs and one (1) DC6 surge arrestor mounted on one (1) Platform (SitePro p/n RMQLP-4120-H10) to the utility pole with a RAD center elevation of 93-ft above grade.
Cables: Twenty-four (24) 1-5/8" Ø coax cables, one (1) fiber cable and two (2) DC cables mounted to the outside of the pole as indicated in Section 4 of this report.
- **T-MOBILE (Final Configuration):**
Antennas: Three (3) RFS APXVAALL18_43 panel antennas and three (3) Commscope ATSBT-TOP-MF-4G Bias Tees mounted on one (1) Platform (SitePro p/n RMQLP-496-HK) to the utility pole with a RAD center elevation of 83-ft above grade.
Cables: Twenty-four (24) 1-5/8" Ø coax cables mounted to the outside of the pole as indicated in Section 4 of this report.

Primary assumptions used in the analysis

- Design steel stresses are defined by AISC-LRFD 14th edition for design of the antenna Mast and antenna supporting elements.
- ASCE Manual No. 48-19, "Design of Steel Transmission Pole Structures", defines allowable steel stresses for evaluation of the utility pole.
- All utility pole members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- Pipe mast will be properly installed and maintained.
- No residual stresses exist due to incorrect pole erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Pipe mast and utility pole will be in plumb condition.
- Utility pole was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

A n a l y s i s

Structural analysis of the utility pole was independently completed using the current version of PLSPole computer program licensed to CENTEK Engineering, Inc.

NESC prescribed loads for the proposed wireless equipment were calculated to analyze the utility tower. Section 5 of this report details these loads.

D e s i g n B a s i s

Our analysis was performed in accordance with ASCE 48-19, “Design of Steel Transmission Pole Structures”, NESC C2-2023 and Eversource Design Criteria.

- **UTILITY POLE ANALYSIS**

The purpose of this analysis is to determine the adequacy of the existing utility pole to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the Eversource Design Criteria Table, NESC C2-2023 ~ Construction Grade B, and ASCE Manual No. 48-19.

Load cases considered:

Load Case 1: NESC Heavy Wind

Wind Pressure.....	4.0 psf
Radial Ice Thickness.....	0.5”
Vertical Overload Capacity Factor.....	1.50
Wind Overload Capacity Factor.....	2.50
Wire Tension Overload Capacity Factor.....	1.65

Load Case 2: NESC Extreme Wind

Wind Speed.....	110 mph ⁽¹⁾
Radial Ice Thickness.....	0”

Load Case 3: NESC Extreme Ice w/ Wind

Wind Pressure.....	6.4 psf
Radial Ice Thickness.....	0.75”
Vertical Overload Capacity Factor.....	1.0
Wind Overload Capacity Factor.....	1.0

Note 1: NESC C2-2023, Section 25, Rule 250C: Extreme Wind Loading,
1.25 x Gust Response Factor (wind speed: 3-second gust)

Results

▪ UTILITY POLE

This analysis finds that the subject utility pole is adequate to support the proposed antenna mast and related appurtenances. The pole stresses meet the requirements set forth by the ASCE Manual No. 48-19, "Design of Steel Transmission Pole Structures", for the applied NESC Heavy and Hi-Wind load cases. The detailed analysis results are provided in Section 6 of this report. The analysis results are summarized as follows:

A maximum usage of 59.37% occurs in the utility pole base plate under the **NESC Extreme** loading condition.

POLE SECTION:

The utility pole was found to be within allowable limits.

Tower Section	Elevation	Stress Ratio (% of capacity)	Result
Section 3	0.00' -40.00' (AGL)	43.09%	PASS

BASE PLATE:

The base plate was found to be within allowable limits from the PLS output.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Base Plate	Bending	59.40%	PASS

FLANGE:

The flange bolts and flange plate were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
Flange Bolts	Tension	40.12%	PASS
Flange Plate	Bending	42.00%	PASS

▪ FOUNDATION AND ANCHORS

The base of the tower is connected to the foundation by means of (20) 2.25"Ø, ASTM A615-75 anchor bolts embedded into the concrete foundation structure. Review of the foundation consisted of a comparison of the base reactions obtained from the proposed tower analysis and the original foundation design.

BASE REACTIONS:

From PLS-Pole analysis of utility pole based on NESC/NU prescribed loads.

Load Case	Shear	Axial	Moment
NESC Heavy Wind	36.07 kips	85.01 kips	1925.20 ft-kips
NESC Extreme Wind	55.43 kips	41.65 kips	3025.46 ft-kips
NESC Extreme Ice w/ Wind	29.49 kips	73.99 kips	1603.80 ft-kips

Note 1 – 10% increase to be applied to tower base reactions for foundation verification per OTRM 051

ANCHOR BOLTS:

The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
Anchor Bolts	Tension	48.46%	PASS

FOUNDATION:

Force	Original Design Loading	Proposed Loading	Result
Moment	4,795 ft-kips	3,328 ft-kips	PASS
Shear	73.7 kips	61.0 kips	PASS
Axial	91.7 kips	45.8 kips	PASS

Note 1: Taken from Sabre design drawing 23-23807-001 dated 1/30/23.

Conclusion

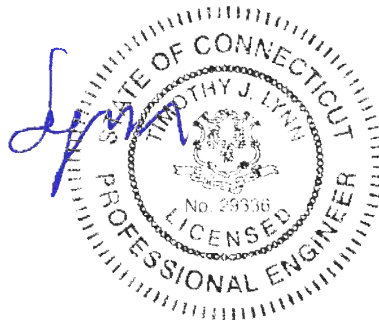
This analysis shows that the subject utility pole **is adequate** to support the proposed equipment upgrade.

The analysis is based, in part on the information provided to this office by Eversource and T-Mobile. If the existing conditions are different than the information in this report, CENTEK engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Timothy J. Lynn, PE
 Structural Engineer



STANDARD CONDITIONS FOR FURNISHING OF
PROFESSIONAL ENGINEERING SERVICES ON
EXISTING STRUCTURES

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to CENTEK engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222.
- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-POLE

PLS-POLE provides all of the capabilities a structural engineer requires to design transmission, substation or communications structures. It does so using a simple easy to use graphical interface that rests upon our time tested finite element engine. Regardless of whether you want to model a simple wood pole or a guyed steel X-Frame; PLS-POLE can handle the job simply, reliably and efficiently.

Modeling Features:

- Structures are made of standard reusable components that are available in libraries. You can easily create your own libraries or get them from a manufacturer
- Structure models are built interactively using interactive menus and graphical commands
- Automatic generation of underlying finite element model of structure
- Steel poles can have circular, 4, 6, 8, 12, 16, or 18-sided, regular, elliptical or user input cross sections (flat-to-flat or tip-to-tip orientations)
- Steel and concrete poles can be selected from standard sizes available from manufacturers
- Automatic pole class selection
- Cross brace position optimizer
- Capability to specify pole ground line rotations
- Capability to model foundation displacements
- Can optionally model foundation stiffness
- Guys are easily handled (modeled as exact cable elements in nonlinear analysis)
- Powerful graphics module (members color-coded by stress usage)
- Graphical selection of joints and components allows graphical editing and checking
- Poles can be shown as lines, wire frames or can be rendered as 3-d polygon surfaces

Analysis Features:

- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Design checks for ASCE, ANSI/TIA/EIA 222 (Revisions F and G) or other requirements
- Automatic calculation of dead and wind loads
- Automated loading on structure (wind, ice and drag coefficients) according to:
 - ASCE 74-1991
 - NESC 2002
 - NESC 2007
 - IEC 60826:2003
 - EN50341-1:2001 (CENELEC)
 - EN50341-3-9:2001 (UK NNA)
 - EN50341-3-17:2001 (Portugal NNA)
 - ESAA C(b)1-2003 (Australia)
 - TPNZ (New Zealand)
 - REE (Spain)
 - EIA/TIA 222-F
 - ANSI/TIA 222-G
 - CSA S37-01
- Automated microwave antenna loading as per EIA/TIA 222-F and ANSI/TIA 222-G
- Detects buckling by nonlinear analysis

Results Features:

- Detects buckling by nonlinear analysis
- Easy to interpret text, spreadsheet and graphics design summaries
- Automatic determination of allowable wind and weight spans
- Automatic determination of interaction diagrams between allowable wind and weight spans
- Automatic tracking of part numbers and costs

*Criteria for Design of PCS Facilities On or
Extending Above Metal Electric Transmission
Towers & Analysis of Transmission Towers
Supporting PCS Masts* ⁽¹⁾

Introduction

This criteria is the result from an evaluation of the methods and loadings specified by the separate standards, which are used in designing telecommunications towers and electric transmission towers. That evaluation is detailed elsewhere, but in summary; the methods and loadings are significantly different. This criteria specifies the manner in which the appropriate standard is used to design PCS facilities including masts and brackets (hereafter referred to as “masts”), and to evaluate the electric transmission towers to support PCS masts. The intent is to achieve an equivalent level of safety and security under the extreme design conditions expected in Connecticut and Massachusetts.

ANSI Standard TIA-222 covering the design of telecommunications structures specifies a limit state design approach. This approach applies the loads from extreme weather loading conditions, and designs the structure so that the design strength exceeds the required strength.

ANSI Standard C2-2023 (National Electrical Safety Code) covering the design of electric transmission metal structures is based upon an ultimate strength/yield stress design approach. This approach applies a multiplier (overload capacity factor) to the loads possible from extreme weather loading conditions, and designs the structure so that it does not exceed its ultimate strength (yield stress).

Each standard defines the details of how loads are to be calculated differently. Most of the NU effort in “unifying” both codes was to establish what level of strength each approach would provide, and then increasing the appropriate elements of each to achieve a similar level of security under extreme weather loadings.

Two extreme weather conditions are considered. The first is an extreme wind condition (hurricane) based upon a 50-year recurrence (2% annual probability). The second is a winter condition combining wind and ice loadings.

The following sections describe the design criteria for any PCS mast extending above the top of an electric transmission tower, and the analysis criteria for evaluating the loads on the transmission tower from such a mast from the lower portions of such a mast, and loads on the pre-existing electric lower portions of such a mast, and loads on the pre-existing electric transmission tower and the conductors it supports.

| Note 1: Prepared from documentation provide from Northeast Utilities.

P C S M a s t

The PCS facility (mast, external cable/trays, including the initial and any planned future support platforms, antennas, etc. extending the full height above the top level of the electric transmission structure) shall be designed in accordance with the provisions of TIA 222-H:

E L E C T R I C T R A N S M I S S I O N T O W E R

The electric transmission tower shall be analyzed using yield stress theory in accordance with the attached table titled “Eversource Design Criteria”. This specifies uniform loadings (different from the TIA loadings) on the each of the following components of the installed facility:

- PCS mast for its total height above ground level, including the initial and planned future support platforms, antennas, etc. above the top of an electric transmission structure.
- Conductors are related devices and hardware.
- Electric transmission structure. The loads from the PCS facility and from the electric conductors shall be applied to the structure at conductor and PCS mast attachment points, where those load transfer to the tower.

The uniform loadings and factors specified for the above components in the table are based upon the National Electrical Safety Code 2023 Edition Extreme Wind (Rule 250C), Combined Ice and Wind (Rule 250B-Heavy) and Extreme Ice w/ Wind (Rule 250D) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

In the event that the electric transmission tower is not sufficient to support the additional loadings of the PCS mast, reinforcement will be necessary to upgrade the strength of the overstressed members.

Overhead Transmission Standards

Attachment A
Eversource Design Criteria

		Attachment A ES Design Criteria	Basic Wind Speed	Pressure	Height Factor	Gust Factor	Load or Stress Factor	Force Coef. - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (0.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
	Conductors:		Conductor Loads Provided by ES					
High Wind Condition	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
	Conductors:		Conductor Loads Provided by ES					
NESC Extreme Ice with Wind Condition*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load 1.25 x Gust Response Factor Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
	Conductors:		Conductor Loads Provided by ES					

*Only for structures installed after 2007

Communication Antennas on Transmission Structures

Eversource Approved by: CPS (CT/WMA) JCC (NH/EMA)	Design	OTRM 059	Rev. 1 11/19/2018
		Page 8 of 10	

Overhead Transmission Standards

determined from NESC applied loading conditions (not TIA Loads) on the structure and mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The strength reduction factor obtained from the field investigation shall be applied to the members or connections that are showing signs of deterioration from their original condition. With the written approval of Eversource Transmission Line Engineering on a case by case the existing structures may be analyzed initially using the current NESC code, then it is permitted to use the original design code with the original conductor load should the existing tower fail the current NESC code.

The structure shall be analyzed using yield stress theory in accordance with Attachment A, "Eversource Design Criteria." This specifies uniform loadings (different from the TIA loadings) on each of the following components of the installed facility:

- a) Wireless communication mast for its total height above ground level, including the initial and any planned future equipment (Support Platforms, Antennas, TMA's etc.) above the top of an electric transmission structure.
- b) Conductors and related devices and hardware (wire loads will be provided by Eversource).
- c) Electric Transmission Structure

- i) The loads from the wireless communication equipment components based on NESC and Eversource Criteria in Attachment A, and from the electric conductors shall be applied to the structure at conductor and wireless communication mast attachment points, where those loads transfer to the tower. ii)
- ii) Shape Factor Multiplier:

NESC Structure Shape	Cd
Polyround (for polygonal steel poles)	1.3
Flat	1.6
Open Lattice	3.2
Pole with Coaxial Cable	See Below Table

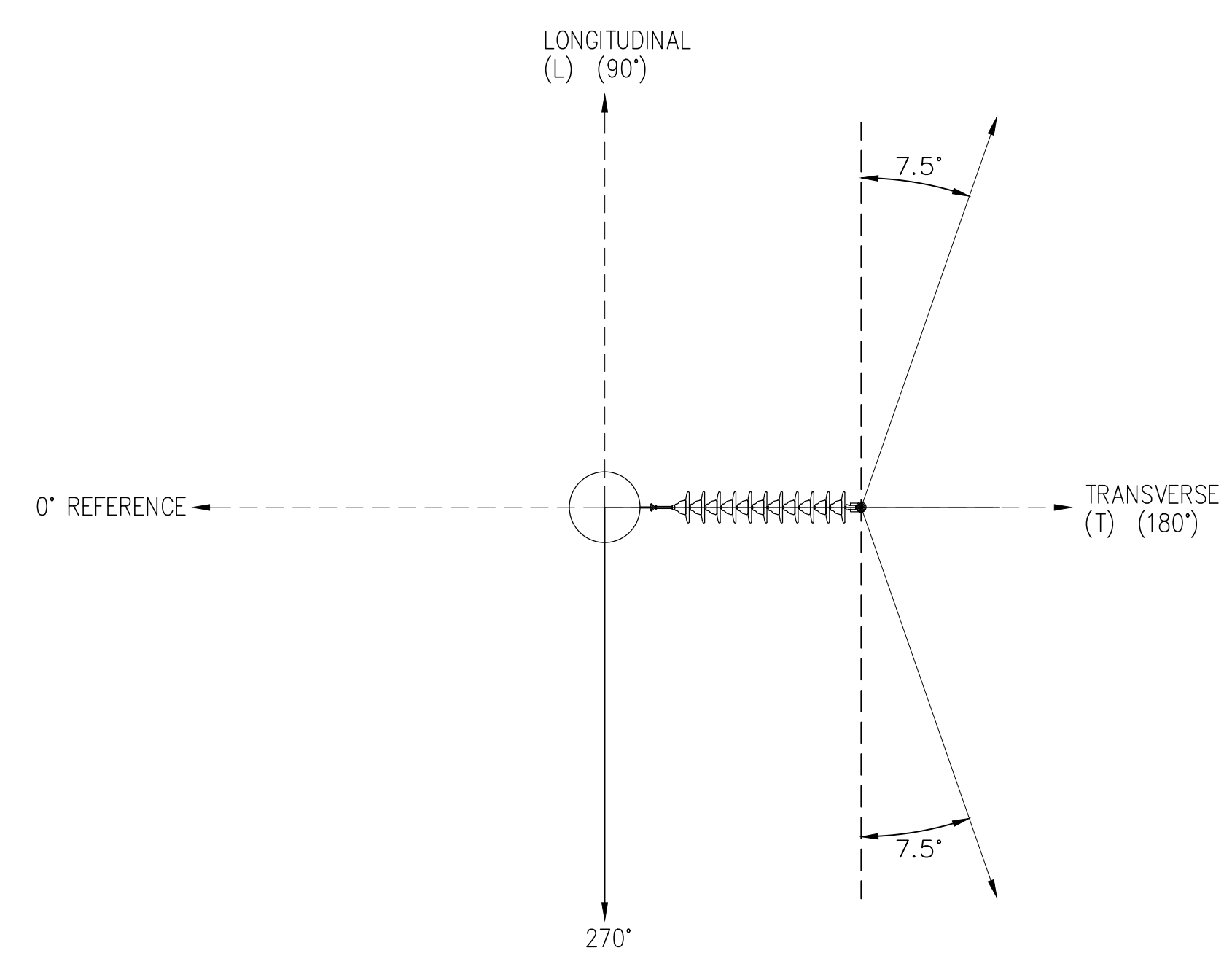
- iii) When Coaxial Cables are mounted alongside the pole structure, the shape multiplier shall be:

Mount Type	Cable Cd	Pole Cd
Coaxial Cables on outside periphery (One layer)	1.45	1.45
Coaxial Cables mounted on stand offs	1.6	1.6

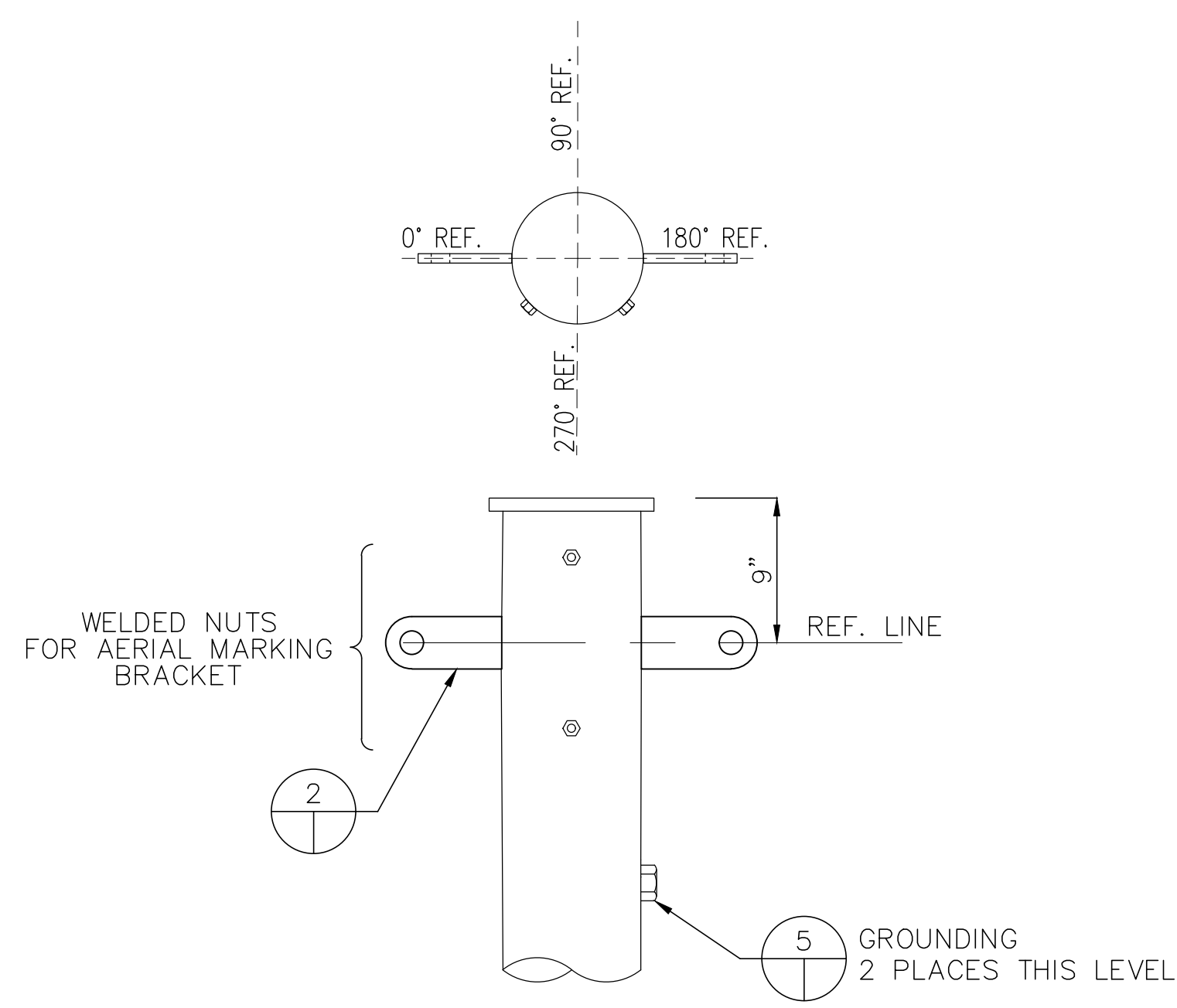
- d) The uniform loadings and factors specified for the above components in Attachment A, "Eversource Design Criteria" are based upon the National Electric Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to the TIA and its loads and factors with the exceptions noted above.

Communication Antennas on Transmission Structures			
Eversource Approved by: CPS (CT/WMA) JCC (NH/EMA)	Design	OTRM 059	Rev. 1 11/19/2018
		Page 3 of 10	

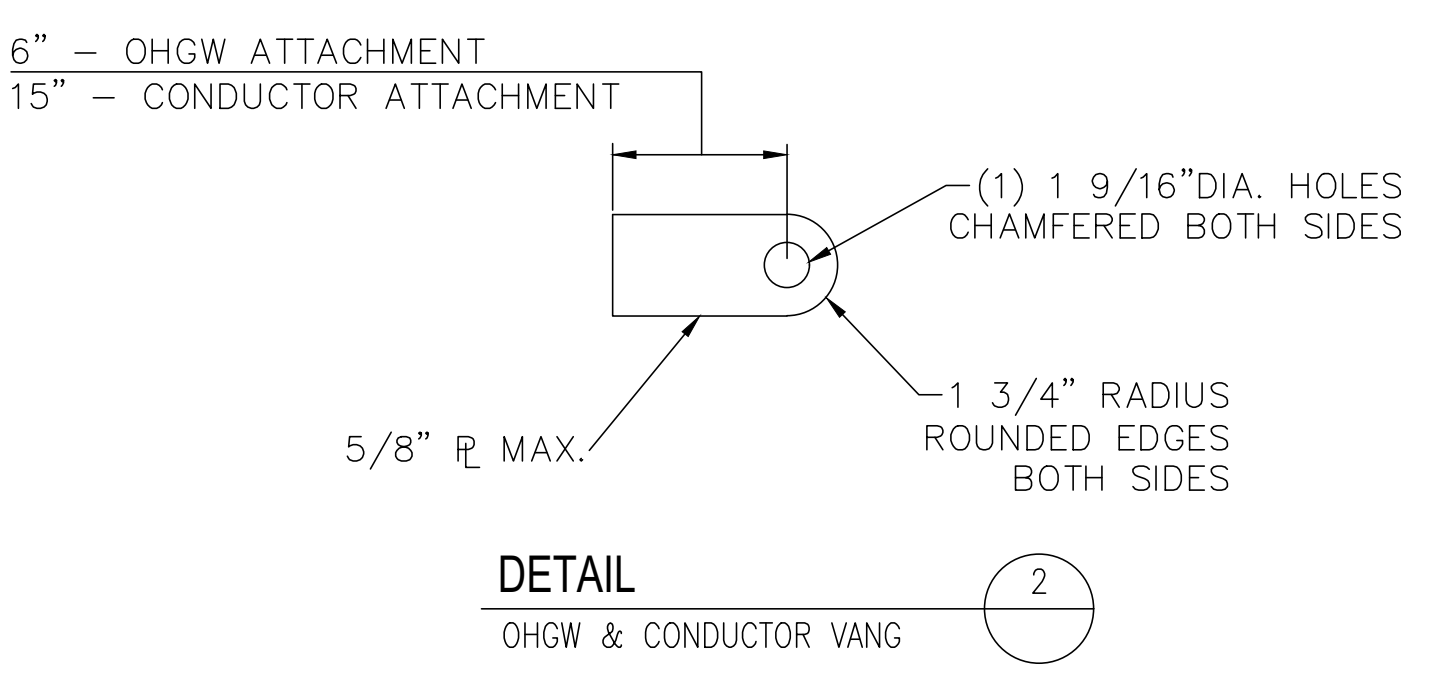
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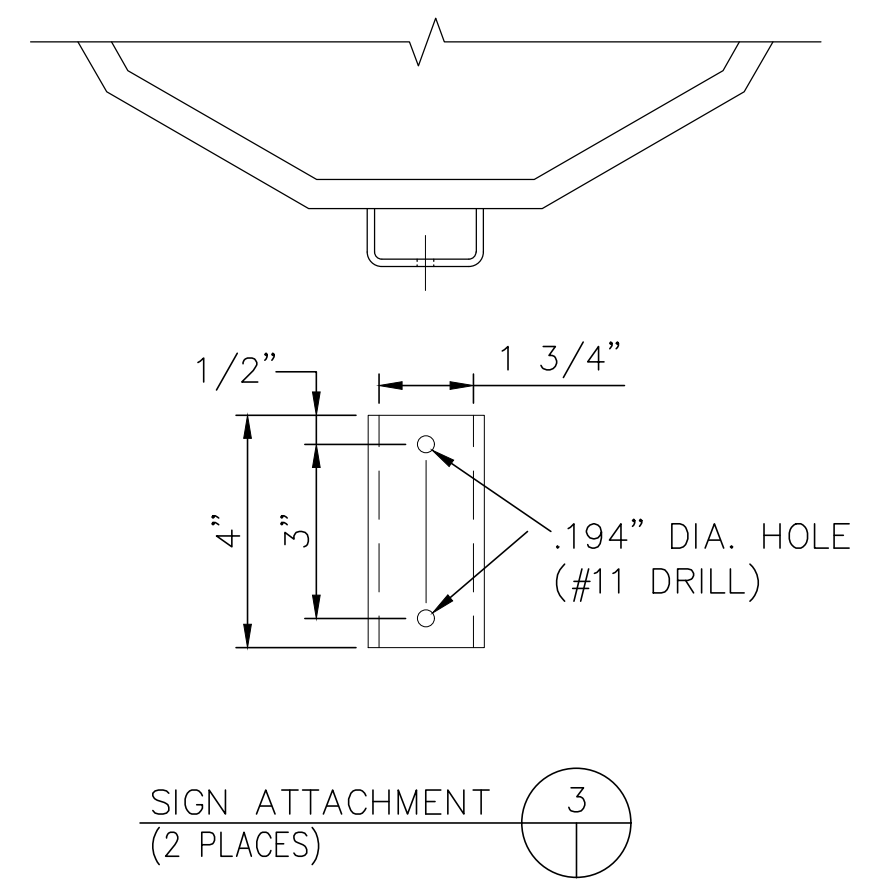
TRANSMISSION PLAN VIEW



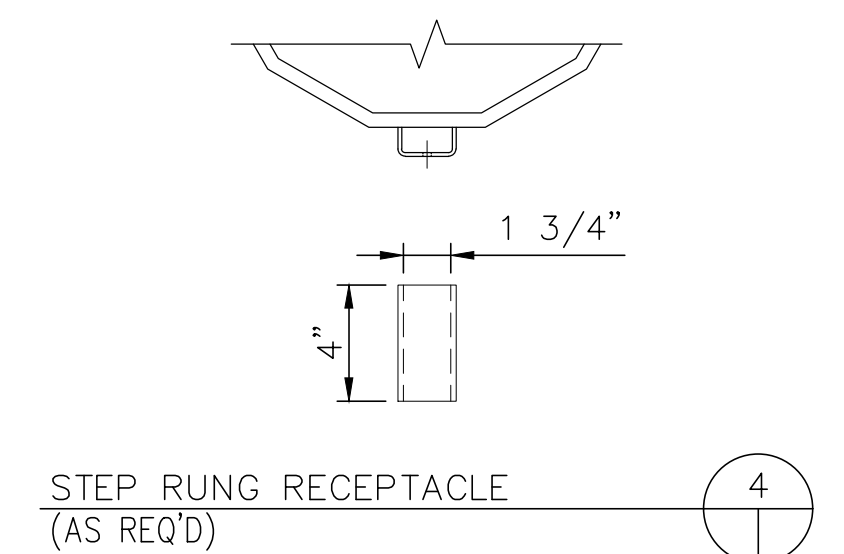
DETAIL
AERIAL MARKER ATTACH & OHGW TAN (3 PLACE)



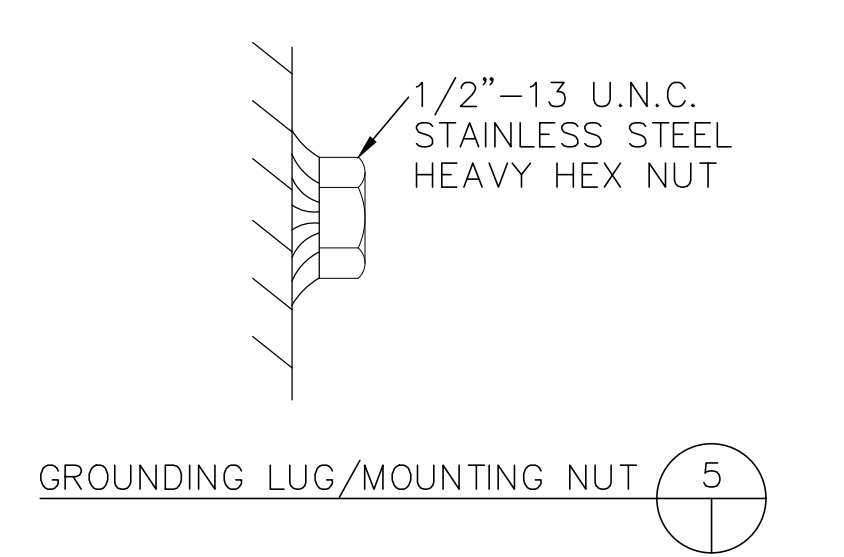
DETAIL
OHGW & CONDUCTOR VANG



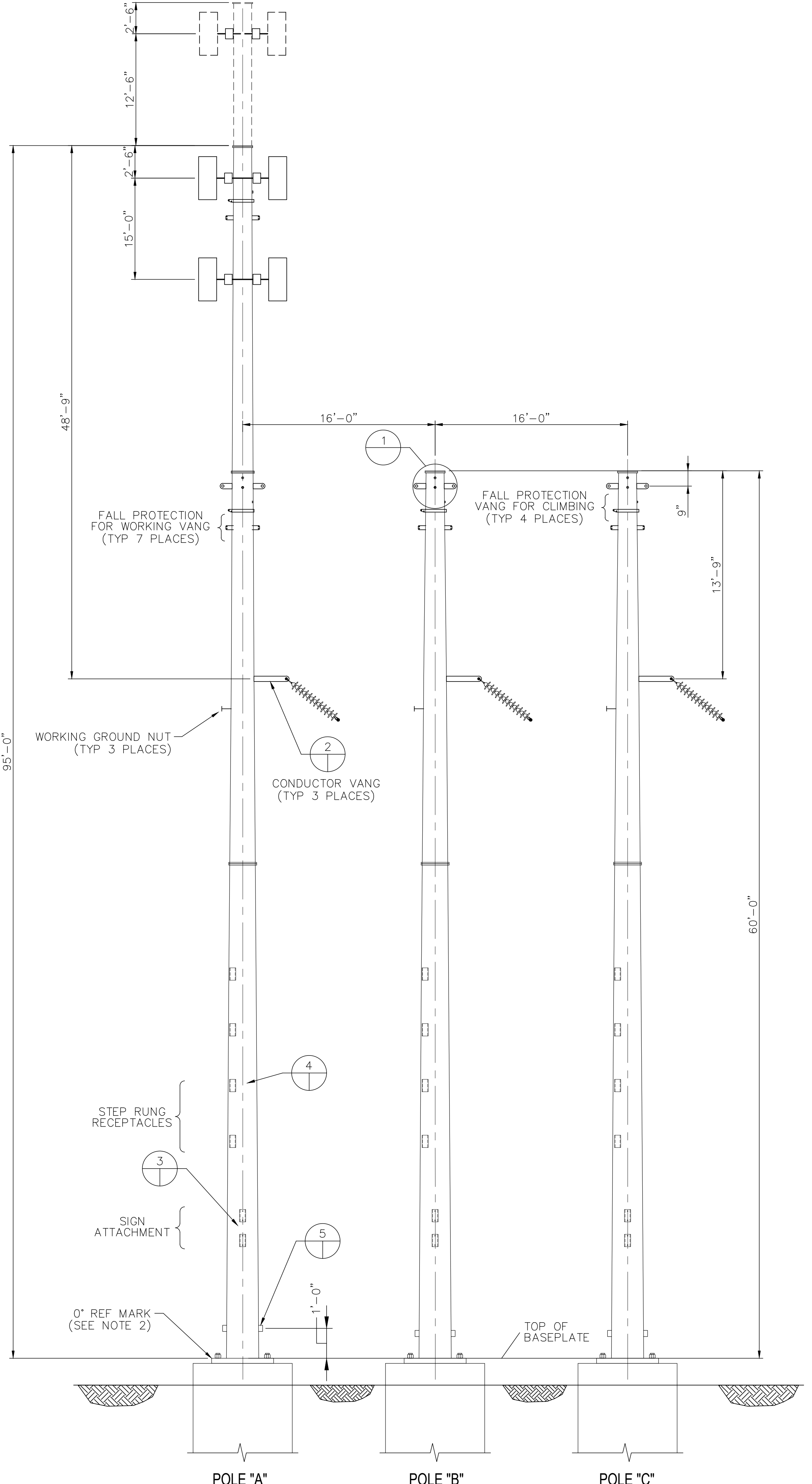
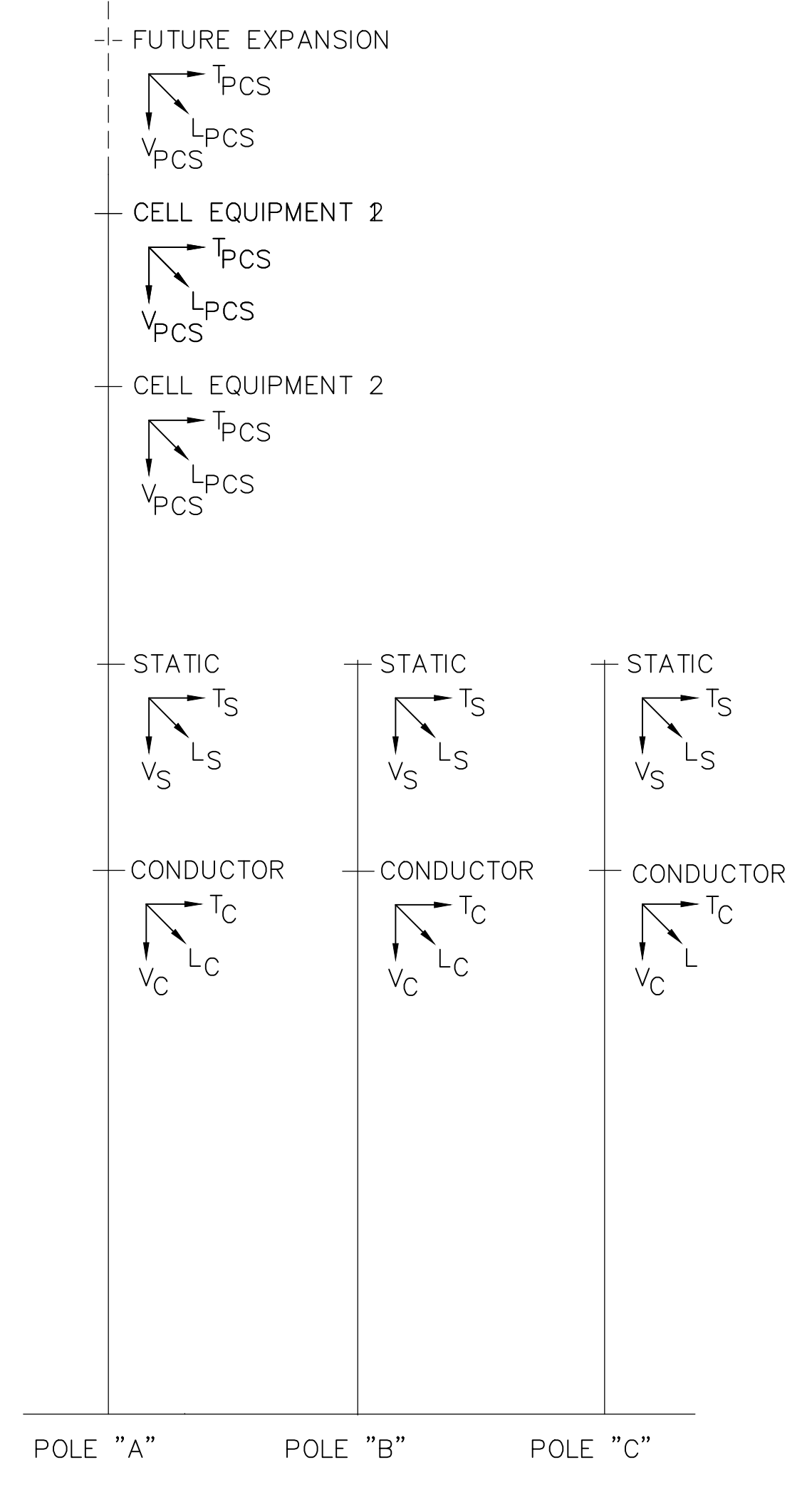
DETAIL
SIGN ATTACHMENT (2 PLACES)



DETAIL
STEP RUNG RECEPTACLE (AS REQ'D)



DETAIL
GROUNDING LUG/MOUNTING NUT



ELEVATION

WIRE	TYPE	CABLE DIA. (IN)	WEIGHT/1000 (FT)
OPGW 48F INCAB	OPGW	0.646	490
1590 kcmil 54/19 ACSS "FALCON"	CONDUCTOR	1.544	1.96

STR. #	QTY.	HEIGHT POLE A-B-C	WIND SPAN	WEIGHT SPAN (FT)	LINE ANGLE Θ
14027	1	95'-60'-60'	1300	1200	13°

NO	DESCRIPTION	LOADING CASE			CONDUCTOR			STATIC WIRE		
		TEMP F	ICE R-IN	WIND MPH	V	T	L	V	T	L
1	NESC HEAVY (250B)	0	0.5	40	16800	21800	0	2200	4000	0
2	NESC EXT. WIND (250C)	60	0	110	3000	27900	0	800	3900	0
3	NESC EXT. WIND (250C) LONGITUDINAL ON POLE ONLY	60	0	110	8000	7100	0	600	1000	0
4	NESC EXT. ICE (250D)	15	1	40	16400	18700	0	3100	3600	0
5	NESC HEAVY (250B) NO OLF	0	1	40	12600	19300	0	1500	2700	0
6	DEFLECTION	60	0	0	8000	7100	0	800	1000	0
7a	NESC RULE 250B/250C BROKEN WIRE CASE (BROKEN SW AND CORE)	0	0.5	40	17700	17900	-12500	1300	1900	-6200
7b	NESC RULE 250B/250C BROKEN WIRE CASE (BROKEN SW OR CORE)	0	0.5	40	10600	10950	-37500	1300	1900	-6200

NO	DESCRIPTION	LOADING CASE			PCS EQUIPMENT LOADS		
		TEMP F	ICE R-IN	WIND MPH	V	T	L
1	NESC HEAVY (250B)	0	0.5	40	35000	2000	2000
2 & 3	NESC EXT. WIND (250C)	60	0	100	32000	11000	11000
4	NESC EXT. ICE (250D)	15	1.0	40	38000	2000	2000
5	NESC HEAVY (250B) NO OLF	0	0.5	40	35000	2000	2000
6	DEFLECTION	60	0	0	32000	0	0

- NOTES:**
- DESIGN SHALL COMPLY WITH ALL PROVISIONS OF N.U. OTRM 160 REV. 7 MAY 2, 2016 EXCEPT FOR THE STRUCTURAL LOAD CRITERIA AS STATED HERE.
 - TOP OF BASEPLATE, BOTH TOP AND BOTTOM ANCHOR BOLT TEMPLATES SHALL BE MARKED WITH A 0° REFERENCE ORIENTATION MARK BY BEAD WELD.
 - POLES AND HARDWARE SHALL BE WEATHERING STEEL AS SPECIFIED. POLES TO BE FLANGE JOINTED.
 - QUANTITIES OF BOLTS AS REQUIRED BY SPECIFICATIONS.
 - VANG AND VANG CONNECTION TO POLE SHALL BE DESIGNED TO WITHSTAND THE RESULTANT LOAD +/- 10 DEGREES EITHER SIDE OF INDICATED LINE ANGLES.
 - VANGS SHALL BE DESIGNED SUCH THAT THEY ARE WITHIN 5 DEGREES OF LINE DEPARTURE ANGLE.
 - CLIMBING VANGS SHALL BE INSTALLED SUCH THAT THERE ARE NO OBSTACLES ALONG THE CLIMBING ROUTE.
 - PERMISSIBLE VARIATION FROM THIS 12" DESIGN DIMENSION SHALL BE INDICATED IN FINAL DESIGN AND ERECTION DRAWING.
 - ALL TENSIONS INCLUDE OVERLOAD FACTORS.
 - ALL LOAD CASES SHALL CONSIDER ADDITIONAL ECCENTRIC MOMENTS DUE TO DEFLECTED STRUCTURES (NON-LINEAR ANALYSIS).
 - STRUCTURE TO BE DESIGNED FOR FULL DEAD END. ALL PHASE CONDUCTORS AND STATIC WIRES CUT ON ONE SIDE.
 - POLE DESIGNED FOR ±4 DEGREE ANGLE.
 - POLES "B" & "C" TO BE DESIGNED WITH FLANGE JOINTS AT POLE TOPS. POLES TO BE DESIGNED WITH THE SAME LOAD CAPACITY AND ANCHOR BOLT DESIGN AS POLE "A". ALL POLES NEED TO BE ABLE TO ACCOMMODATE THE PCS EQUIPMENT.
 - POLE "A" TO BE DESIGNED FOR TWO PLATFORMS OF PCS EQUIPMENT PLUS AN ADDITIONAL 15' POLE EXTENSION WITH AN ADDITIONAL PLATFORM OF PCS EQUIPMENT TO PERMIT FUTURE EXPANSION. POLE DESIGNED FOR A 15' SPACING BETWEEN PCS PLATFORMS.

- REFERENCE DWGS:**
- CORROSION PROTECTION: N.U. OTRM 160 - SEC. 16+21
 - CLIMBING LADDER DETAIL, SEE: N.U. OTRM 160 - SKETCH B, REV 7; N.U. OTRM 160 - SKETCH C, REV 7; N.U. OTRM 160 - SKETCH D, REV 7; N.U. OTRM 160 - SKETCH E, REV 7; N.U. OTRM 160 - SKETCH L, REV 7
 - LIFTING VANG PROVISIONS DETAIL, SEE: N.U. OTRM 160 - SKETCH K, REV 7
 - FALL PROTECTION VANGS DETAILS, SEE: N.U. OTRM 160 - SKETCH N, REV 7; N.U. OTRM 160 - SKETCH O, REV 7
 - GROUNDING NUT DETAILS, SEE: N.U. OTRM 160 - SKETCH B, REV 7, SEC. C-C; N.U. OTRM 160 - SKETCH F, REV 7, DETAIL B
 - SIGN ATTACHMENT DETAIL, SEE: N.U. OTRM 160 - SKETCH F, REV 7
 - AERIAL MARKING BRACKET SEE: N.U. OTRM 160 - SKETCH F, REV 7
 - END R AND CURVATURE DETAIL SEE: N.U. OTRM 160 - SKETCH G, REV 7
 - JACKING PROVISIONS SEE: N.U. OTRM 160 - SKETCH K, REV 7

REVISIONS DURING CONSTRUCTION				
NO.	DATE	AS BUILT REVISIONS	BY	CHK APP
A	9/23/22	ISSUED FOR 70% REVIEW WO #80184053	MMM	JLB BRK

EVERSOURCE ENERGY

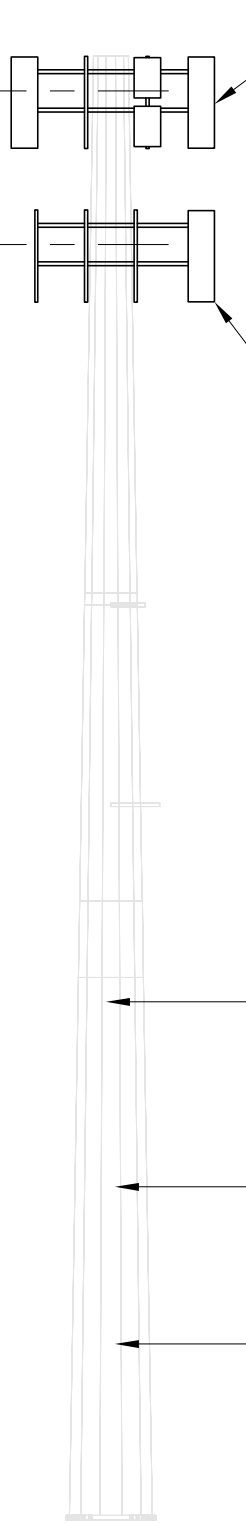
MIDDLETOWN JCT. - CHESTNUT JCT.
115-kV TRANSMISSION LINE
STR. 14027, LOADING TREE
MIDDLETOWN, CONNECTICUT

NO.	DATE	AS BUILT REVISIONS	BY	CHK	APP	APP
BY	MM/YY	CHK	JLB/TRC	APP	BRK/TRC	APP
DATE	9/14/22	DATE	9/16/22	DATE	9/20/22	DATE
H-SCALE	N.T.S.	SIZE	E	FIELD BOOK & PAGES		
V-SCALE	N.T.S.	VS.		REV. DWG		

FILE PROJ. NUMBER: 80184053 DWG NO.: 01190-400XXp00x

⊕ AT&T ANTENNAS
EL. ±93'-0" AGL

⊕ T-MOBILE ANTENNAS
EL. ±83'-0" AGL



AT&T (FINAL CONFIG.):
SIX (6) CCI TPA65R-BU6DA PANEL ANTENNAS, THREE (3) ERICSSON AIR6419 PANEL ANTENNAS, THREE (3) ERICSSON AIR6449 PANEL ANTENNAS, TWELVE (12) TMAT192123B68-31 TMAs AND ONE (1) DC6 SURGE ARRESTOR MOUNTED ON SITEPRO RMQLP-4120-H10 PLATFORM.

T-MOBILE (FINAL CONFIG.):
THREE (3) RFS APXVAALL18_43 PANEL ANTENNAS AND THREE (3) COMMSCOPE ATSBT-TOP-MF-4G BIA TEES MOUNTED ON SITEPRO RMQLP-496-HK PLATFORM.

95' TALL STEEL UTILITY POLE STRUCTURE NO. 14027

AT&T (24) 1-5/8" ϕ COAX CABLES, ONE (1) FIBER CABLE AND TWO (2) DC CABLES MOUNTED ON CLUSTER SUPPORT BRACKETS

T-MOBILE (24) 1-5/8" ϕ COAX CABLES MOUNTED ON CLUSTER SUPPORT BRACKETS

1
SK-1

TOWER ELEVATION

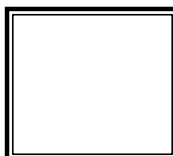
SCALE: NOT TO SCALE

REVISIONS		
00	3/14/23	ISSUED FOR REVIEW
01	4/5/23	CONSTRUCTION

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www.CentekEng.com
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

CT11832C
STRUCTURE 14027
701 BARTHOLOMEW STREET
MIDDLETOWN, CT

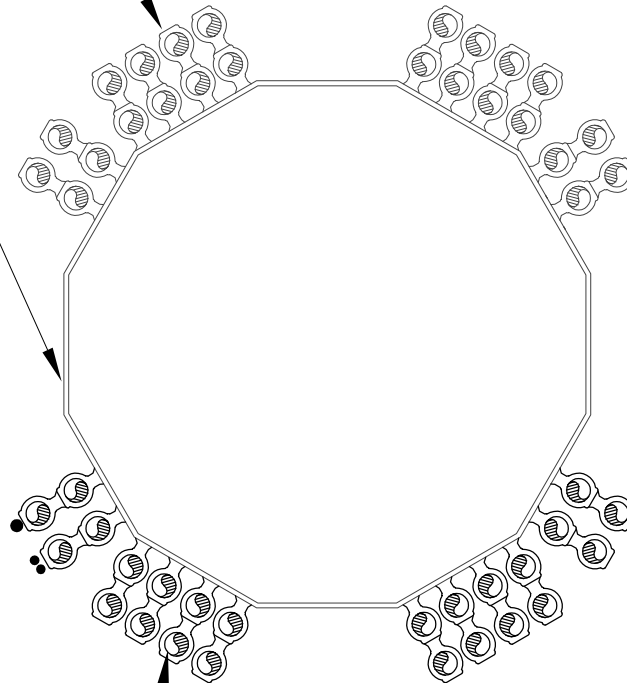
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DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	3/8/23



TOWER ELEVATION
SK-1
DWG. 1 OF 2

AT&T (24) 1-5/8" ϕ
 COAX CABLES, ONE (1)
 FIBER CABLE AND TWO
 (2) DC CABLES MOUNTED
 ON CLUSTER SUPPORT
 BRACKETS

95' TALL STEEL UTILITY
 POLE STRUCTURE NO.
 14027



T-MOBILE (24) 1-5/8" ϕ
 COAX CABLES
 MOUNTED ON CLUSTER
 SUPPORT BRACKETS

1
COAX CABLE PLAN
SK-2
SCALE: NOT TO SCALE

REVISIONS		
00	3/14/23	ISSUED FOR REVIEW
01	4/5/23	CONSTRUCTION

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 STRUCTURE 14027
701 BARTHOLOMEW STREET
MIDDLETOWN, CT

PROJECT NO:	22073.04
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	3/8/23



FEELINE
 PLAN
SK-2
 DWG. 2 OF 2

RAN Template: 67E95F ODE+6160	A&L Template: 67D95F_10P
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Section 1 - Site Information

Site ID: CT11832C	Site Name: CT832/CL&P Middletown	Latitude: 41.52074953
Status: Final	Site Class: Utility Pole	Longitude: -72.6083121
Version: 4	Site Type: Structure Non Building	Address: 701 Bartholomew Street
Project Type: L600	Plan Year:	City, State: Middletown, CT
Approved: 03/08/2023 3:04:21 PM	Market: CONNECTICUT CT	Region: NORTHEAST
Approved By: Michael.Lucey@T-Mobile.com	Vendor: Ericsson	
Last Modified: 03/08/2023 3:04:21 PM	Landlord: Northeast Utilities	
Last Modified By: Michael.Lucey@T-Mobile.com		

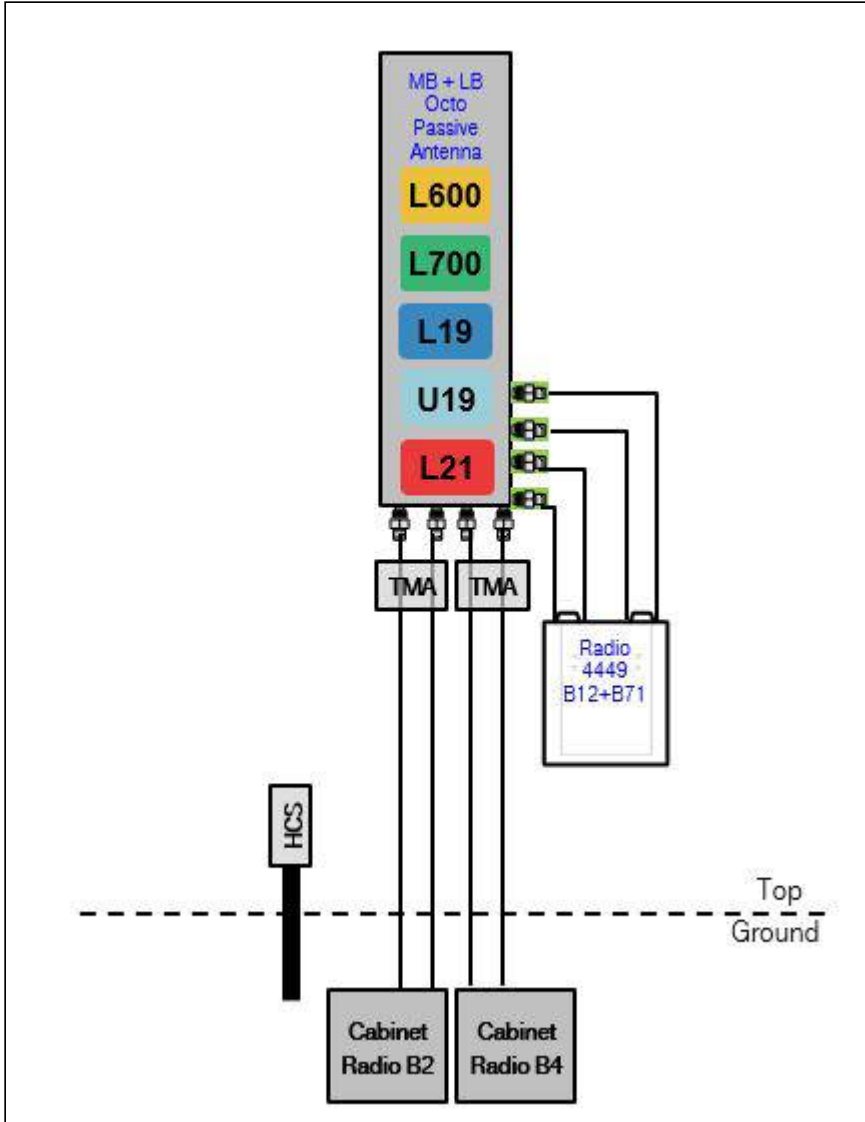
RAN Template: 67E95F ODE+6160		AL Template: 67D95F_10P		
Sector Count: 3	Antenna Count: 3	Coax Line Count: 24	TMA Count: 0	RRU Count: 6

Section 2 - Existing Template Images

----- This section is intentionally blank. -----

Section 3 - Proposed Template Images

67D95F_10P.JPG



Notes:

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

RAN Template: 67E95F ODE+6160	A&L Template: 67D95F_10P
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Section 5 - RAN Equipment

Existing RAN Equipment

Template: 704G

Enclosure	1		
Enclosure Type	RBS 6201		
Radio	RUS01 B12 (x6) L700	RUS01 B2 (x3) L1900 G1900	RUS01 B2 (x3) L1900
Baseband	BB 6630 L700 L1900	DUG20 G1900	

Proposed RAN Equipment

Template: 67E95F ODE+6160

Enclosure	1		
Enclosure Type	RBS 6201 ODE		
Baseband	DUG20 G1900	RP 6651 N600 N1900 L600 L700 L1900 L2100	
Multiplexer	XMU		

RAN Scope of Work:

Replace (1) DUS41 with (1) BB6648 for LTE.
 Install (1) BB6648 for future 5G N600.
 Remove all (6) RUS01 B12 for L700 from cabinet.
 Existing: (12) Coaxial Lines
 Add (12) Coaxial Lines for new total of (24).

RAN Template: 67E95F ODE+6160	A&L Template: 67D95F_10P
---	--

Section 6 - A&L Equipment

Existing Template: 704G
Proposed Template: 67D95F_10P

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro				
Antenna	1	2	3	4	
Antenna Model	EMS - RR90-17-XXDP (Dual)	Empty Antenna Mount (Empty mount)	Empty Antenna Mount (Empty mount)	Andrew - LNX-6515DS-A1M (Dual)	
Azimuth	90			90	
M. Tilt	0			0	
Height (ft)	83			83	
Ports	P1			P2	
Active Tech	L1900 G1900			L700	
Dark Tech					
Restricted Tech					
Decomm. Tech					
E. Tilt	2			2	
Cables	1-5/8" Coax (At Antenna) (x2)			1-5/8" Coax (At Antenna) (x2)	
TMA's	Generic Twin Style 1A - PCS (At Antenna)				
Diplexer / Combiners					
Radio					
Sector Equipment					

Unconnected Equipment:

Scope of Work:

*** Existing Position 1 EMS; Empty Position 2; Empty Position 3; LNX in Position 4 ***
*** TMA's are Ground Mounted ***

RAN Template: 67E95F ODE+6160	A&L Template: 67D95F_1OP
---	--

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro				
Antenna	1	2		3	4
Antenna Model	Empty Antenna Mount (Empty mount)	RFS - APXVAALL18_43-U-NA20 (Octo)		Empty Antenna Mount (Empty mount)	Empty Antenna Mount (Empty mount)
Azimuth		90			
M. Tilt		0			
Height (ft)		83			
Ports		P1	P2	P3	P4
Active Tech		L700 L600 N600	L700 L600 N600	G1900 L2100 L1900 N1900	G1900 L2100 L1900 N1900
Dark Tech					
Restricted Tech					
Decomm. Tech					
E. Tilt		2	2	2	2
Cables		1- 5/8" Coax (x2)	1- 5/8" Coax (x2)	1- 5/8" Coax (x2)	1- 5/8" Coax (x2)
TMA's					
Diplexer / Combiners					
Radio		Radio 4480 B71+B85 (At Cabinet)	Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)
Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)			

Unconnected Equipment:

Scope of Work:

*** Existing Position 1 EMS; Empty Position 2; Empty Position 3; LNX in Position 4 ***
 *** TMA's are Ground Mounted ***

Remove EMS Antenna in Position 1.
 Replace LB Dual in Position 4 with (1) LB/MB Octo in Position 2.
 Add (1) Radio 4480 B71+B12 to Position 2 for L600 and L700. Radio 4460 will be mounted at Ground Level.
 Add (4) Coaxial Lines to Position 2, and connect them to Low-Band ports of LB/MB Octo.
 Move Coaxial Lines and PCS TMA in Position 1 to two Mid-Band Ports of LB/MB Octo in Position 2.
 Add (1) AWS TMA to Position 2 at Ground Level.
 Move Coaxial Lines from Position 4 to Position 2 and connect them and AWS TMA to other two Mid-Band Ports of LB/MB Octo.
 Add Smart Bias-Ts for RET control. Daisy Chain all RETs.

*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

RAN Template: 67E95F ODE+6160	A&L Template: 67D95F_10P
---	--

Sector 2 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1	2	3	4
Antenna Model	EMS - RR90-17-XXDP (Dual)	Empty Antenna Mount (Empty mount)	Empty Antenna Mount (Empty mount)	Andrew - LNX-6515DS-A1M (Dual)
Azimuth	210			210
M. Tilt	0			0
Height (ft)	83			83
Ports	P1			P2
Active Tech	L1900 G1900			L700
Dark Tech				
Restricted Tech				
Decomm. Tech				
E. Tilt	2			2
Cables	1-5/8" Coax (At Antenna) (x2)			1-5/8" Coax (At Antenna) (x2)
TMA	Generic Twin Style 1A - PCS (At Antenna)			
Diplexer / Combiners				
Radio				
Sector Equipment				
Unconnected Equipment:				
Scope of Work:				
*** Existing Position 1 EMS; Empty Position 2; Empty Position 3; LNX in Position 4 *** *** TMAs are Ground Mounted ***				

RAN Template: 67E95F ODE+6160	A&L Template: 67D95F_1OP
---	--

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro				
Antenna	1	2	3	4	
Antenna Model	Empty Antenna Mount (Empty mount)	RFS - APXVAALL18_43-U-NA20 (Octo)	Empty Antenna Mount (Empty mount)	Empty Antenna Mount (Empty mount)	
Azimuth		210			
M. Tilt		0			
Height (ft)		83			
Ports		P1	P2	P3	P4
Active Tech		L700 L600 N600	L700 L600 N600	G1900 N1900 L1900 L2100	L2100 N1900 L1900 G1900
Dark Tech					
Restricted Tech					
Decomm. Tech					
E. Tilt		2	2	2	2
Cables		1- 5/8" Coax (x2)	1- 5/8" Coax (x2)	1- 5/8" Coax (x2)	1- 5/8" Coax (x2)
TMA's					
Diplexer / Combiners					
Radio		Radio 4480 B71+B85 (At Cabinet)	Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)
Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)			

Unconnected Equipment:

Scope of Work:

*** Existing Position 1 EMS; Empty Position 2; Empty Position 3; LNX in Position 4 ***
 *** TMAs are Ground Mounted ***

Remove EMS Antenna in Position 1.
 Replace LB Dual in Position 4 with (1) LB/MB Octo in Position 2.
 Add (1) Radio 4480 B71+B12 to Position 2 for L600 and L700. Radio 4460 will be mounted at Ground Level.
 Add (4) Coaxial Lines to Position 2, and connect them to Low-Band ports of LB/MB Octo.
 Move Coaxial Lines and PCS TMA in Position 1 to two Mid-Band Ports of LB/MB Octo in Position 2.
 Add (1) AWS TMA to Position 2 at Ground Level.
 Move Coaxial Lines from Position 4 to Position 2 and connect them and AWS TMA to other two Mid-Band Ports of LB/MB Octo.
 Add Smart Bias-Ts for RET control. Daisy Chain all RETs.

*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

RAN Template: 67E95F ODE+6160	A&L Template: 67D95F_10P
---	--

Sector 3 (Existing) view from behind				
Coverage Type	A - Outdoor Macro			
Antenna	1	2	3	4
Antenna Model	EMS - RR90-17-XXDP (Dual)	Empty Antenna Mount (Empty mount)	Empty Antenna Mount (Empty mount)	Andrew - LNX-6515DS-A1M (Dual)
Azimuth	330			330
M. Tilt	0			0
Height (ft)	83			83
Ports	P1			P2
Active Tech	L1900 G1900			L700
Dark Tech				
Restricted Tech				
Decomm. Tech				
E. Tilt	2			2
Cables	1-5/8" Coax (At Antenna) (x2)			1-5/8" Coax (At Antenna) (x2)
TMA	Generic Twin Style 1A - PCS (At Antenna)			
Diplexer / Combiners				
Radio				
Sector Equipment				
Unconnected Equipment:				
Scope of Work:				
*** Existing Position 1 EMS; Empty Position 2; Empty Position 3; LNX in Position 4 *** *** TMA's are Ground Mounted ***				

RAN Template: 67E95F ODE+6160	A&L Template: 67D95F_1OP
---	--

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro				
Antenna	1	2		3	4
Antenna Model	Empty Antenna Mount (Empty mount)	RFS - APXVAALL18_43-U-NA20 (Octo)		Empty Antenna Mount (Empty mount)	Empty Antenna Mount (Empty mount)
Azimuth		330			
M. Tilt		0			
Height (ft)		83			
Ports		P1	P2	P3	P4
Active Tech		L700 L600 N600	L700 L600 N600	N1900 L1900 G1900 L2100	L2100 N1900 L1900 G1900
Dark Tech					
Restricted Tech					
Decomm. Tech					
E. Tilt		2	2	2	2
Cables		1- 5/8" Coax (x2)	1- 5/8" Coax (x2)	1- 5/8" Coax (x2)	1- 5/8" Coax (x2)
TMA's					
Diplexer / Combiners					
Radio		Radio 4480 B71+B85 (At Cabinet)	Radio 4480 B71+B85 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)	Radio 4460 B25+B66 (At Cabinet)
Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)			

Unconnected Equipment:

Scope of Work:

*** Existing Position 1 EMS; Empty Position 2; Empty Position 3; LNX in Position 4 ***
 *** TMA's are Ground Mounted ***

Remove EMS Antenna in Position 1.
 Replace LB Dual in Position 4 with (1) LB/MB Octo in Position 2.
 Add (1) Radio 4480 B71+B12 to Position 2 for L600 and L700. Radio 4460 will be mounted at Ground Level.
 Add (4) Coaxial Lines to Position 2, and connect them to Low-Band ports of LB/MB Octo.
 Move Coaxial Lines and PCS TMA in Position 1 to two Mid-Band Ports of LB/MB Octo in Position 2.
 Add (1) AWS TMA to Position 2 at Ground Level.
 Move Coaxial Lines from Position 4 to Position 2 and connect them and AWS TMA to other two Mid-Band Ports of LB/MB Octo.
 Add Smart Bias-Ts for RET control. Daisy Chain all RETs.

*A dashed border indicates shared connected equipment. Any shared equipment, besides the first, is denoted with the SHARED keyword.

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-894/617-894/1695-2690/1695-2690MHz, 65deg, 15.0/14.6/18.4/18.3dBi, 1.8m (6ft), RET, 2-12°/2-12°/2-12°/2-12°

FEATURES / BENEFITS

This antenna provides a 8 Port multi-band flexible platform for advanced use for flexible use in deployment scenarios for encompassing 600, 700, 800, AWS, PCS & BRS applications.

- ➔ 24 Inch Width For Easier Zoning
- ➔ Field Replaceable (Integrated) AISG RET platform for reduced environmental exposure and long lasting quality
- ➔ Superior elevation pattern performance across the entire electrical down tilt range
- ➔ Includes three AISG RET motors - Includes 0.5m AISG jumper for optional daisy chain of two high band RET motors for one single AISG point of high band tilt control.
- ➔ Low band arrays driven by a single RET motor



Technical Features

LOW BAND LEFT ARRAY (617-894 MHZ) [R1]

Frequency Band	MHz	617-698	698-746	746-806	806-894
Gain Typical	dBi	14.3	15.0	14.8	15.0
Gain Over All Tilts	dBi	13.8+/-0.5	14.5+/-0.5	14.3+/-0.5	14.6+/-0.4
Horizontal Beamwidth @3dB	Deg	65+/-2	64+/-2	66+/-2	62+/-5
Vertical Beamwidth @3dB	Deg	14+/-1	13+/-0.9	12+/-0.7	11+/-0.9
Electrical Downtilt Range	Deg	2 to 12			
Upper Side Lobe Suppression Peak to +20	dB	15	15	15	14
Front-to-Back, at +/-30°, Copolar	dB	22	22	24	27
Cross Polar Discrimination (XPD) @ Boresight	dB	18	18	16	15
Cross Polar Discrimination (XPD) @ +/-60	dB	4	3	7	5
3rd Order PIM 2 x 43dBm	dBc	-153			
VSWR	-	1.5:1			
Cross Polar Isolation	dB	25			
Maximum Effective Power per Port	Watt	400			



Dual Slant Polarized Quad Band (8 Port) Antenna, 617-894/617-894/1695-2690/1695-2690MHz, 65deg, 15.0/14.6/18.4/18.3dBi, 1.8m (6ft), RET, 2-12°/2-12°/2-12°/2-12°

HIGH BAND RIGHT ARRAY (1695-2690 MHZ) [Y2]

Frequency Band	MHz	1695-1880	1850-1990	1920-2200	2200-2490	2490-2690
Gain Typical	dBi	17.5	17.8	18.3	18.1	17.9
Gain Over All Tilts	dBi	17+/-0.5	17.3+/-0.5	17.6+/-0.7	17.4+/-0.7	17.1+/-0.8
Horizontal Beamwidth @3dB	Deg	66+/-6	64+/-5	64+/-7	62+/-4	61+/-7
Vertical Beamwidth @3dB	Deg	5.5+/-0.3	5.1+/-0.2	4.9+/-0.3	4.4+/-0.3	4+/-0.3
Electrical Downtilt Range	Deg	2 to 12				
Upper Side Lobe Suppression Peak to +20	dB	14	16	15	14	13
Front-to-Back, at +/-30°, Copolar	dB	25	23	23	23	20
Cross Polar Discrimination (XPD) @ Boresight	dB	22	17	16	17	17
Cross Polar Discrimination (XPD) @ +/-60	dB	8	8	9	4	1
3rd Order PIM 2 x 43dBm	dBc	-153				
VSWR	-	1.5:1				
Cross Polar Isolation	dB	25				
Maximum Effective Power per Port	Watt	300				

ELECTRICAL SPECIFICATIONS

Impedance	Ohm	50.0
Polarization	Deg	±45°

MECHANICAL SPECIFICATIONS

Dimensions - H x W x D	mm (in)	1829 x 609 x 215 (72 x 24 x 8.5)
Weight (Antenna Only)	kg (lb)	42 (92.6)
Weight (Mounting Hardware only)	kg (lb)	11.5 (25.3)
Shipping Weight	kg (lb)	63 (138.9)
Connector type		8 x 4.3-10 female at bottom
Radome Material / Color		Fiber Glass / Light Grey RAL7035

TESTING AND ENVIRONMENTAL

Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Lightning protection		Direct Ground
Survival/Rated Wind Velocity	km/h	240 (150)
Wind Load @Rated Wind Front	N	1072.0
Wind Load @Rated Wind Side	N	326.0
Wind Load @Rated Wind Rear	N	1160.0

ATSBT-TOP-MF-4G



Top Smart Bias Tee

- Reduces cable and site lease costs by eliminating the need for AISG home run cables
- AISG 1.1 and 2.0 compliant
- Operates at 10-30 Vdc
- Weatherproof AISG connectors
- Intuitive schematics simplify and ensure proper installation
- Enhanced lightning protection plus grounding stud for additional surge protection
- 7-16 DIN female connector (ANT)
- 7-16 DIN male connector (BTS)

Product Classification

Product Type RET bias tee

General Specifications

AISG Input Connector 8-pin DIN Female

Antenna Interface 7-16 DIN Female

Antenna Interface Signal RF | dc Blocked

BTS Interface 7-16 DIN Male

BTS Interface Signal AISG data | RF | dc

Color Silver

EU Certification CE

Grounding Lug Thread Size M8

Smart Bias Tee Type 10–30 V Top

Dimensions

Height 143 mm | 5.63 in

Width 94 mm | 3.701 in

Depth 50 mm | 1.969 in

Electrical Specifications

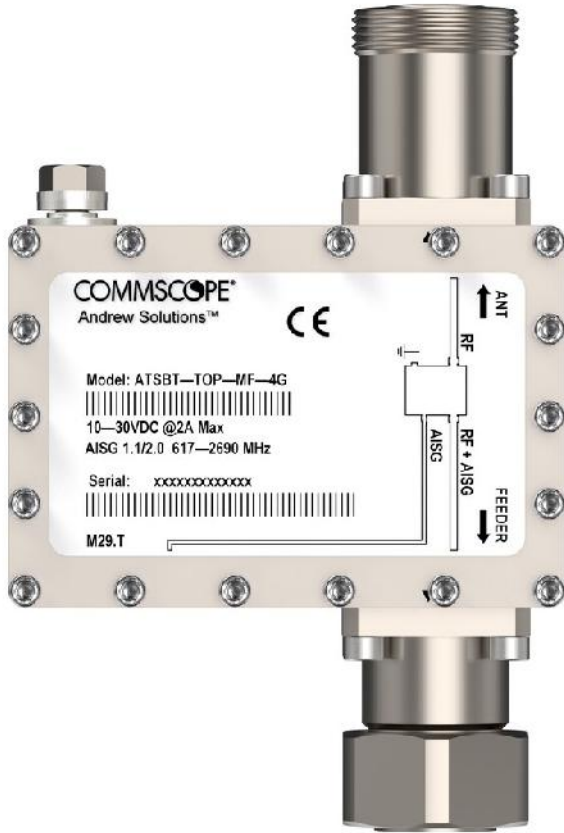
3rd Order IMD -158 dBc

3rd Order IMD Test Method Two +43 dBm carriers

Insertion Loss, typical 0.1 dB

Electromagnetic Compatibility (EMC) CFR 47 Part 15, Subpart B, Class B | EN 55022, Class B | ICES-003 Issue 4 CAN

ATSBT-TOP-MF-4G



Material Specifications

Material Type Aluminum

Environmental Specifications

Operating Temperature -40 °C to +70 °C (-40 °F to +158 °F)

Ingress Protection Test Method IEC 60529:2001, IP66

Packaging and Weights

Weight, net 0.8 kg | 1.764 lb

Regulatory Compliance/Certifications

Agency	Classification
--------	----------------



A valmont COMPANY

1545 Pidco Drive
Plymouth, IN 46553
Phone: 574.936.4221
Fax: 574.936.8925
Email: SP1Engineering@valmont.com
www.sitepro1.com

June 15, 2020

Site Pro 1 / Valmont Mounting System:

Part Number = RMQLP-xxx-HK / RMQLP-xxx + PRK-1245L + HRK14
Part Description = 14' Low Pro-Platform with Reinforcement and Handrail System

Mount EPA (no antenna pipes, walkway included, (0.67*EPA)):

EPA _N = 39.24(26.29) sq-Ft	EPA _N (0.5" Ice) = 48.14(32.25) sq-Ft	EPA _N (1" Ice) = 56.69(37.98) sq-Ft
EPA _T = 38.48(25.78) sq-Ft	EPA _T (0.5" Ice) = 47.60(31.89) sq-Ft	EPA _T (1" Ice) = 56.46(37.82) sq-Ft
Weight = 2130 lb	Weight(0.5" Ice) = 2580 lb	Weight(1" Ice) = 3165 lb

Classification Rating:

Heavy 10

Design Standards

- ANSI/TIA-222-G-2012
- ANSI/TIA-222-H-2018
- ASCE 7-16
- AT&T Mount Classification
- International Building Code 2018
- TIA-5053

Analysis and Modeling Technique

An elastic, three-dimensional, frame, truss model was developed to examine the structural behavior of the mount. All orientations in the engineering model correspond with the assembly drawing constraints. The mount was analyzed with four (4) mounting locations (antenna, mount pipe, radio, dish, and any other appurtenance) evenly spaced across the face of the mount, with no vertical eccentricity. Wind directions considered were perpendicular (normal) to the face of the frame and at 30 degree increments up to 90 degrees (tangential) to the face of the frame. Wind, dead weight and ice weight on the mount was also included in the model.

Modeling Software

- Autodesk Inventor
- RISA-3D
- ANSYS Workbench

Exhibit E

Mount Analysis

Antenna Mount Analysis
Report

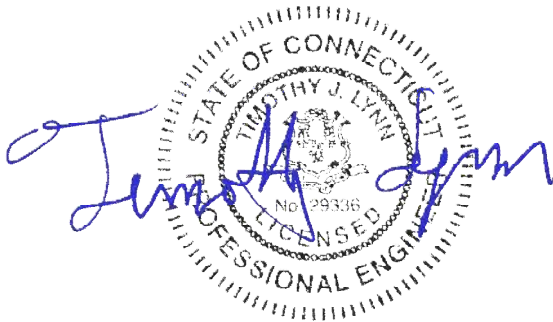
Site Ref: CT11832C

701 Bartholomew Street
Middletown, CT

Centek Project No. 22073.04

Date: May 18, 2023

Max Stress Ratio = 31%



Prepared for:
T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

CENTEK Engineering, Inc.
Mount Analysis
T-Mobile Site Ref. ~ CT11832C
Middletown, CT
May 18, 2023

Table of Contents

SECTION 1 – REPORT

- ANTENNA AND APPURTENANCE SUMMARY
- STRUCTURE LOADING
- CONCLUSION

SECTION 2 – CALCULATIONS

- WIND LOAD ON APPURTENANCES
- RISA3D OUTPUT REPORT
- CONNECTION

SECTION 3 – REFERENCE MATERIALS

- RF DATA SHEET

May 18, 2023

Mr. Matthew Bandle
Northeast Site Solutions
1053 Farmington Ave, Unit G
Farmington, CT 06032

Re: *Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11832C
701 Bartholomew Street
Middletown, CT*

Centek Project No. 22073.04

Dear Mr. Bandle,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the proposed mount, consisting of one (1) platform mount (SitePro P/N: RMQLP-496-HK) to support the proposed equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2021 International Building Code as modified by the 2022 Connecticut State Building Code (CTBC) including ASCE 7-16 and ANSI/TIA-222-H *Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
Platform: Three (3) RFS APXVAALL18_43 panel antennas and three (3) Commscope ATSBT-TOP-MF-4G Bias Tees mounted on one (1) Platform to the utility pole with a RAD center elevation of 83-ft above grade.

The antenna mount was analyzed per the requirements of the 2021 International Building Code as modified by the 2022 Connecticut State Building Code considering a Ultimate design wind speed of 130 mph for Middletown as required in Appendix P of the 2022 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the subject antenna mount has sufficient capacity to support the aforementioned antenna configuration.

If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

Exhibit F

Power Density/RF Emissions Report



FOX HILL TELECOM

Radio Frequency Emissions Analysis Report

T Mobile™

Site ID: CT11832C

CT832/CL&P Middletown
701 Bartholomew Street
Middletown, CT 06457

May 16, 2023

Fox Hill Telecom Project Number: 230533

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	15.70 %



May 16, 2023

T-MOBILE
Attn: RF Manager
35 Griffin Road South
Bloomfield, CT 06009

Emissions Analysis for Site: **CT11832C – CT832/CL&P Middletown**

Fox Hill Telecom, Inc (“Fox Hill”) was directed to analyze the proposed upgrades to the T-MOBILE facility located at **701 Bartholomew Street, Middletown, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

General population exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limits for the 600 MHz & 700 MHz bands are approximately $400 \mu\text{W}/\text{cm}^2$ and $467 \mu\text{W}/\text{cm}^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands is $1000 \mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.



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Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.



CALCULATIONS

Calculations were performed for the proposed upgrades to the T-MOBILE antenna facility located at **701 Bartholomew Street, Middletown, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65 for far field modeling calculations.

In OET-65, plane wave power densities in the Far Field of an antenna are calculated by considering antenna gain and reflective waves that would contribute to exposure.

Since the radiation pattern of an antenna has developed in the **Far Field** region the power gain in specific directions needs to be considered in exposure predictions to yield an Effective Radiated Power (ERP) in each specific direction from the antenna. Also, since the vertical radiation pattern of the antenna is considered, the exposure calculations would most likely be reduced significantly at ground level, resulting in a more realistic estimate of the actual exposure levels. To determine a worst-case scenario at each point along the calculation radials, each point was calculated using the antenna gain value at each angle of incident and compared against the result using an isotropic radiator at the antenna height with the greater of the two used to yield the more pessimistic far field value for each point along the calculation radial.

Additionally, to model a truly "worst case" prediction of exposure levels at or near a surface, such as at ground-level or on a rooftop, reflection off the surface of antenna radiation power can be assumed, resulting in a potential 1.6 times increase in power density in calculating far field power density values.

With these factors Considered, the worst case **Far Field prediction model** utilized in this analysis is determined by the following equation:

Equation 9 per FCC OET65 for Far Field Modeling

$$S = \frac{33.4 \text{ ERP}}{R^2}$$

S = Power Density (in $\mu\text{w}/\text{cm}^2$)

ERP = Effective Radiated Power from antenna (watts)

R = Distance from the antenna (meters)

Predicted far field power density values for all carriers identified in this report were calculated 6 feet above the ground level and are displayed as a percentage of the applicable FCC standards. All emissions values for other carriers were calculated using the same Far Field model outlined above, using industry standard radio configurations and frequency band selection based upon available licenses in this geographic area for emissions contribution estimates.



FOX HILL TELECOM

For each T-Mobile sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20
LTE / 5G NR	1900 MHz (PCS)	4	40
GSM	1900 MHz (PCS)	1	15
LTE	2100 MHz (AWS)	4	40

Table 1: Channel Data Table



FOX HILL TELECOM

The following T-Mobile antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAALL24_43-U-NA20	83
B	1	RFS APXVAALL24_43-U-NA20	83
C	1	RFS APXVAALL24_43-U-NA20	83

Table 2: Antenna Data

All calculations were done with respect to uncontrolled / general population threshold limits.



RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC’s allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	13.65 / 13.85 / 16.65 / 16.95	13	455	18,843.43	3.76
Sector A Composite MPE%							3.76
Antenna B1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	13.65 / 13.85 / 16.65 / 16.95	13	455	18,843.43	3.76
Sector B Composite MPE%							3.76
Antenna C1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz / 1900 MHz (PCS) / 2100 MHz (AWS)	13.65 / 13.85 / 16.65 / 16.95	13	455	18,843.43	3.76
Sector C Composite MPE%							3.76

Table 3: T-MOBILE Emissions Levels



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The Following table (*table 4*) shows all additional identified carriers on site and their emissions contribution estimates, along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three T-Mobile sectors have the same configuration yielding the same results for all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite estimated MPE value for the site.

Site Composite MPE%	
Carrier	MPE%
T-MOBILE – Max Per Sector Value	3.76 %
AT&T	11.94 %
Site Total MPE %:	15.70 %

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	3.76 %
T-MOBILE Sector B Total:	3.76 %
T-MOBILE Sector C Total:	3.76 %
Site Total:	15.70 %

Table 5: Site MPE Summary



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Table 6 below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three T-Mobile sectors have the same configuration yielding the same results for all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu\text{W}/\text{cm}^2$)	Frequency (MHz)	Allowable MPE ($\mu\text{W}/\text{cm}^2$)	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	2	926.96	83	4.84	600 MHz	400	1.21%
T-Mobile 700 MHz LTE	2	485.32	83	2.43	700 MHz	467	0.52%
T-Mobile 1900 MHz (PCS) LTE / 5G NR	4	1,849.52	83	9.70	1900 MHz (PCS)	1000	0.97%
T-Mobile 1900 MHz (PCS) GSM	1	693.57	83	0.90	1900 MHz (PCS)	1000	0.09%
T-Mobile 2100 MHz (AWS) LTE	4	1,981.80	83	9.70	2100 MHz (AWS)	1000	0.97%
						Total:	3.76 %

Table 6: T-MOBILE Maximum Sector MPE Power Values



Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the T-MOBILE facility as well as the site composite emissions estimates value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-MOBILE Sector	Power Density Value (%)
Sector A:	3.76 %
Sector B:	3.76 %
Sector C:	3.76 %
T-MOBILE Maximum Total (per sector):	3.76 %
Site Total:	15.70 %
Site Compliance Status:	COMPLIANT

The estimated composite MPE value for this site assuming all carriers present is **15.70 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon the far field calculations performed for all carriers identified in this report.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite estimated values calculated were well within the allowable 100% threshold standard per the federal government.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Worcester, MA 01609
(978)660-3998

Exhibit G

Letter of Authorization



56 Prospect Street,
Hartford, CT 06103

P.O. Box 270
Hartford, CT 06141-0270
(860) 665-5000

June 26, 2023

Ms. Amanda Olsen
Northeast Site Solutions
420 Main St,
Sturbridge, MA 01566

RE: T-Mobile Antenna Site CT11832C, Bartholomew Rd, Middletown, CT, Eversource Structure 14027

Ms. Olsen:

Based on our reviews of the site drawings, the structural analysis and foundation review provided by Centek Engineering, along with a third-party review performed by Paul J. Ford and Company, we accept the proposed modification.

Please work with Christopher Gelinias of Eversource Real Estate to process the site lease amendment. Please do not hesitate to contact us with questions or concerns. Christopher can be contacted at 860-665-2008, and I can be contacted at (203) 623-0409.

Sincerely,


Richard Badon

Richard Badon
Transmission Line Engineering

Ref: 2023-0405 - CT11832C - Structural Analysis Rev1 (22073.04)
2023-0518 - CT11832C - Mount Analysis Rev0 (22073.04)
2023-0621_22073.04 CT11832C - Rev0 CDs (S&S)

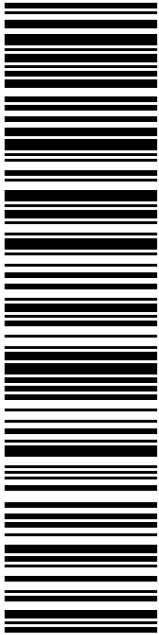
Exhibit :

Recipient Mailings



EVERSOURCE
107 SELDEN ST
BERLIN CT 06037-1616

USPS TRACKING #



9405 5036 9930 0596 6301 47

P

USPS.com 9405 5036 9930 0596 6301 47 0096 5000 0020 6037
US POSTAGE
 Flat Rate Env
 08/30/2023

U.S. POSTAGE PAID

Mailed from 01566 986748613135984

PRIORITY MAIL®

Expected Delivery Date: 09/01/23 Ref#: CT11832C
0001

C015



Cut on dotted line.

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1. Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.
2. Place your label so it does not wrap around the edge of the package.
3. Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.
4. To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.
5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0596 6301 47

Trans. #: 594256568	Priority Mail® Postage: \$9.65
Print Date: 08/30/2023	Total: \$9.65
Ship Date: 08/30/2023	
Expected Delivery Date: 09/01/2023	

From: DEBORAH CHASE
 NORTHEAST SITE SOLUTIONS
 STE 1
 420 MAIN ST
 STURBRIDGE MA 01566-1359


To: EVERSOURCE
 107 SELDEN ST
 BERLIN CT 06037-1616

Ref#: CT11832C

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

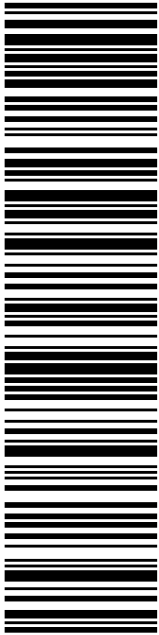


Thank you for shipping with the United States Postal Service!
 Check the status of your shipment on the USPS Tracking® page at usps.com



BENJAMIN D FLORSHEIM
MAYOR- MIDDLETOWN
245 DEKOVEN DR
MIDDLETOWN CT 06457-3460

USPS TRACKING #



9405 5036 9930 0596 6301 61

DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

PRIORITY MAIL®

Expected Delivery Date: 09/01/23
Ref#: CT11832C
0001


C002


P

USPS.com 9405 5036 9930 0596 6301 61 0096 5000 0020 6457
US POSTAGE \$9.65
Flat Rate Env


08/30/2023

Mailed from 01566 986748613135613






Electronic Rate Approved #038555749



Click-N-Ship®



UNITED STATES
POSTAL SERVICE®



Cut on dotted line.

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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0596 6301 61

Trans. #: 594256568	Priority Mail® Postage: \$9.65
Print Date: 08/30/2023	Total: \$9.65
Ship Date: 08/30/2023	
Expected Delivery Date: 09/01/2023	


From: DEBORAH CHASE Ref#: CT11832C
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

To: BENJAMIN D FLORSHEIM
MAYOR- MIDDLETOWN
245 DEKOVEN DR
MIDDLETOWN CT 06457-3460

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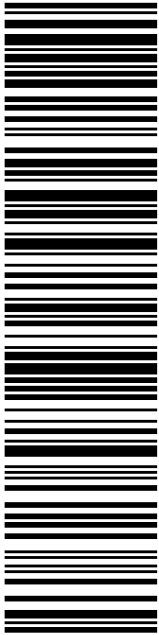


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BOBBYE KNOLL PETERSON
ACTING DIRECTOR OF ECONOMIC &
245 DEKOVEN DR
MIDDLETOWN CT 06457-3460

USPS TRACKING #



9405 5036 9930 0596 6301 78

DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359

C002

USPS.com 9405 5036 9930 0596 6301 78 0096 5000 0020 6457
US POSTAGE Flat Rate Env
 Mailed from 01566 986748613133867

P


08/30/2023

PRIORITY MAIL®


Expected Delivery Date: 09/01/23
Ref#: CT11832C
0001

UNITED STATES POSTAL SERVICE® **Click-N-Ship®**

U.S. POSTAGE PAID



Electronic Rate Approved #038555749





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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0596 6301 78

Trans. #:	594256568	Priority Mail® Postage:	\$9.65
Print Date:	08/30/2023	Total:	\$9.65
Ship Date:	08/30/2023		
Expected			
Delivery Date:	09/01/2023		


From: DEBORAH CHASE Ref#: CT11832C
 NORTHEAST SITE SOLUTIONS
 STE 1
 420 MAIN ST
 STURBRIDGE MA 01566-1359

To: BOBBYE KNOLL PETERSON
 ACTING DIRECTOR OF ECONOMIC & COMMUNITY
 DEVELOPMEN
 245 DEKOVEN DR
 MIDDLETOWN CT 06457-3460

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

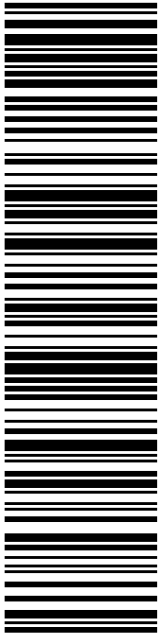


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EVERSOURCE ENERGY
PO BOX 270
HARTFORD CT 06141-0270


USPS TRACKING #



9405 5036 9930 0597 5163 27

P

usps.com 9405 5036 9930 0597 5163 27 0096 5000 0010 6141
\$9.65
US POSTAGE
 Flat Rate Envoy



08/31/2023 Mailed from 01566 986748445179512

PRIORITY MAIL®

Expected Delivery Date: 09/02/23 Ref#: CT11832C
0001

B060



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5. Mail your package on the "Ship Date" you selected when creating this label.

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0597 5163 27

Trans. #: 594369612	Priority Mail® Postage: \$9.65
Print Date: 08/31/2023	Total: \$9.65
Ship Date: 08/31/2023	
Expected Delivery Date: 09/02/2023	

From: DEBORAH CHASE Ref#: CT11832C
 NORTHEAST SITE SOLUTIONS
 STE 1
 420 MAIN ST
 STURBRIDGE MA 01566-1359

To: EVERSOURCE ENERGY
 PO BOX 270
 HARTFORD CT 06141-0270

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FISKDALE
458 MAIN ST
FISKDALE, MA 01518-9998
(800)275-8777

09/06/2023

11:46 AM

Product	Qty	Unit Price	Price
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Prepaid Mail	1		\$0.00
Hartford, CT 06141			
Weight: 1 lb 1.40 oz			
Acceptance Date:			
Wed 09/06/2023			
Tracking #:			
9405 5036 9930 0597 5163 27			

Prepaid Mail	1		\$0.00
Middletown, CT 06457			
Weight: 1 lb 1.50 oz			
Acceptance Date:			
Wed 09/06/2023			
Tracking #:			
9405 5036 9930 0596 6301 78			

Prepaid Mail	1		\$0.00
Middletown, CT 06457			
Weight: 1 lb 0.60 oz			
Acceptance Date:			
Wed 09/06/2023			
Tracking #:			
9405 5036 9930 0596 6301 61			

Prepaid Mail	1		\$0.00
Berlin, CT 06037			
Weight: 1 lb 1.20 oz			
Acceptance Date:			
Wed 09/06/2023			
Tracking #:			
9405 5036 9930 0596 6301 47			

Grand Total:			\$0.00
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Text your tracking number to 28777 (2USPS) to get the latest status. Standard Message and Data rates may apply. You may also visit www.usps.com USPS Tracking or call 1-800-222-1811.

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Refunds for guaranteed services only.
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UFN: 242703-0518
Receipt #: 840-50180227-2-3274094-1
Clerk: 5