NORTHEAST SITE SOLUTIONS

Turnkey Wireless Development

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

September 14, 2023

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

RE: Notice of Exempt Modification
144 Chestnut Hill Road (Pole #19800), Wilton CT 06897
Latitude: 41.52074953
Longitude: -72.60831210
T-Mobile Site#: CT11296A_L600

Dear Ms. Bachman:

T-Mobile currently maintains three (3) antennas at the 97.3-foot level of the existing 91-foot transmission tower (pole #19800) located at 144 Chestnut Hill Road, Wilton CT 06897. 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 #19800) per Petition No. 1567. T-Mobile also intends to remove three (3) existing antenna and replace them with six (6) new 600/700/1900/2100 MHz antenna. The new antennas would be installed at the 120-foot level of the new 136-foot transmission tower. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable.

T-Mobile Planned Modifications:
Remove:

Remove and Replace:
(3) RR90-17-02DP Antenna (Remove) – (3) RFS APXVAARR24 600/700/1900/2100 MHz Antenna (Replace)
(1) Existing Antenna Mount (Remove) – (1) Antenna Platform Mount RMQLP-496-HK (Replace)

Install New:
(3) RFS APX16DWVAntenna
(3) Radio 4449 B71+B85
(6) Smart Bias-T
(24) Coax Line

Existing to Remain: NONE

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

This facility was originally approved by the Connecticut Siting Council on July 15, 1999 Petition No. 419. This pole is being replaced by Eversource with Petition No. 1567. This petition is on the calendar for September 14, 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 Lynne Vanderslice, First Selectwoman, Michael Wrinn, Director of Planning & Land Use Management/Town Planner, 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@northeastsitesolutions.com

Attachments:

cc: Lynne Vanderslice, First Selectwoman
Town Hall
238 Danbury Road
Wilton, CT 06897

Michael Wrinn, Director of Planning & Land Use Management/Town Planner
Town Annex
238 Danbury Road
Wilton, CT 06897

CL&P d/b/a Eversource Energy, as tower owner and property owner
PO BOX 270
Hartford, CT 06141

Exhibit A

Original Facility Approval

Petition No. 419
Omnipoint Communications
Wilton, CT
Staff Report
July 15, 1999

On July 7, 1999, Connecticut Siting Council (Council) member Edward S. Wilensky and Executive Director Joel M. Rinebold met with J. Brendan Sharkey, Mark Finley, Brian Ragazzine, and Cheatan Dhaduk of Omnipoint Communications, Inc. (Omnipoint) for a field review in the Town of Wilton, Connecticut. Omnipoint is petitioning the Council for a determination that no Certificate of Environmental Compatibility and Public Need (Certificate) would be required for modifications to an existing Connecticut Light and Power Company (CL&P) electric transmission line facility in Wilton. Omnipoint submits no Certificate would be required because the addition of three antennas and associated equipment would not have a substantial adverse environmental effect.

Omnipoint proposes to attach three PCS antennas to existing CL&P transmission line structure number 937, located east of Chestnut Hill Road in Wilton, Connecticut. Access would be from Chestnut Hill Road. A temporary staging area would be established adjacent to the transmission line structure in the right-of-way. The top of the antenna assembly would extend approximately 10 feet above the top of the existing 100-foot transmission line structure. The proposed antennas are 56 inches in length, 8 inches in width, and 2.75 inches in diameter, and weigh 18 lbs. The antennas would be placed on top of the existing tower structure and no compression post would be required. The communications equipment would be installed upon an eight-foot by 3.75–foot concrete slab, to be placed at the southeast corner of the tower base. Existing vegetation provides sufficient screening. Omnipoint has agreed to minimize clearing, replace the existing fence or install a gate, and to not remove existing vines on the west side of the tower.

The total calculated radio frequency power density at the base of the tower would be 0.0179 mw/cm^2, which is 1.79 percent of the maximum permissible exposure for uncontrolled environments based on Federal Communications Commission (FCC) Bulletin 65, August 1997.

EVERSOURCE ENERGY

56 Prospect Street
P.O. Box 270
Hartford, CT 06103

Deborah Denfeld
Team Lead – Transmission Siting
Tel: (860) 728-4654

April 12, 2023

Melanie Bachman, Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Re: <u>1637/1720 Lines Rebuild Project</u>

Dear Ms. Bachman:

The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") is requesting a Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need is required for the proposed modifications to two existing 115-kilovolt transmission lines, ("1637/1720 Lines Rebuild Project" or "Project") in the City of Norwalk and the Towns of Wilton and Weston, Connecticut ("Petition").

Prior to submitting this Petition, representatives from Eversource briefed municipal officials about the Project. Eversource provided written notice of the proposed work to all abutters and this Petition filing to Project abutters. Maps and line lists identifying the abutting property owners who were notified of the Project are provided in the Petition at Attachment B – 1637/1720 Lines Rebuild Project – Petition Map Set.

Eversource is submitting this filing electronically and will deliver an original and 15 copies, along with a check for the $625 filing, to the Council.

Sincerely,

Deborah Denfeld

Deborah Denfeld

Enclosure

cc: Samantha Nestor, First Selectwoman, Town of Weston
Lynne A. Vanderslice, First Selectwoman, Town of Wilton
Honorable Harry. W. Rilling, Mayor, City of Norwalk

THE CONNECTICUT LIGHT AND POWER COMPANY

doing business as

EVERSOURCE ENERGY

PETITION TO THE CONNECTICUT SITING COUNCIL
FOR A DECLARATORY RULING OF
NO SUBSTANTIAL ADVERSE ENVIRONMENTAL EFFECT
FOR THE PROPOSED MODIFICATIONS TO THE EXISTING
1637 and 1720 LINES IN THE MUNICIPALITIES OF
NORWALK, WILTON AND WESTON, CONNECTICUT

1. Introduction

The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource" or the "Company") hereby petitions the Connecticut Siting Council ("Council") for a Declaratory Ruling that no Certificate of Environmental Compatibility and Public Need ("Certificate") is required pursuant to Section 16-50g et seq. of the Connecticut General Statutes for the modifications to the 1637 and 1720 Lines, 115-kilovolt ("kV") transmission lines, located within existing transmission rights-of-way ("ROWs") and on Eversource owned property in the City of Norwalk and the Towns of Wilton and Weston, Connecticut ("Municipalities"). These modifications are collectively referred to as the "1637/1720 Lines Rebuild Project" ("Project"). Eversource submits that a Certificate is not required because the proposed modifications would not have a substantial adverse environmental effect.

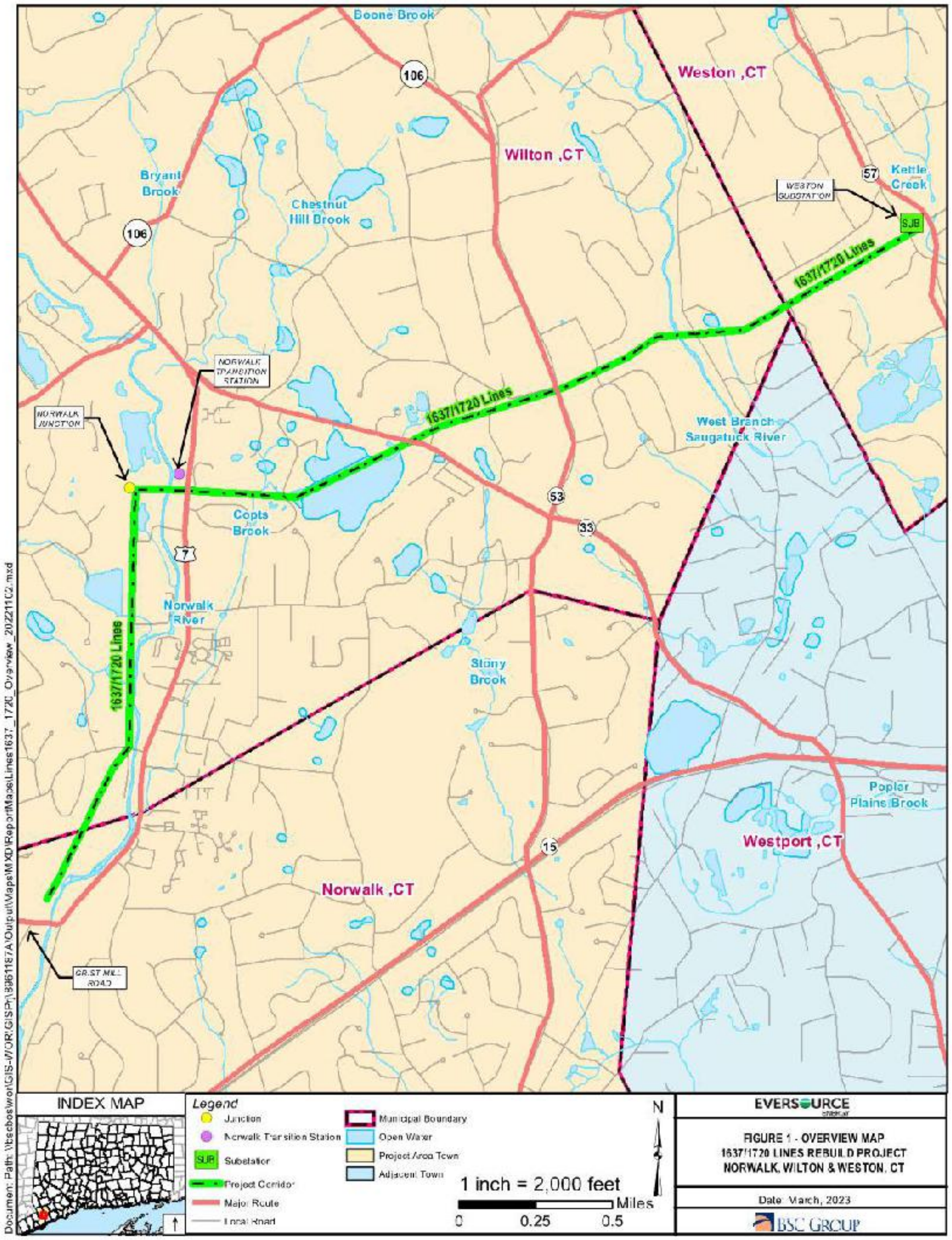
2. Purpose of the Project

The purpose of the proposed Project is to reduce the risk of age-related failures of deteriorating lattice tower structures and to replace conductor across approximately 4.0 miles of both the 1637 and 1720 115-kV transmission lines ("1637/1720 Lines"). The Project will include replacement of

34 existing structures with 40 new structures in addition to adding 3 new mid-span structures[1], extending from Grist Mill Road (Norwalk) to Norwalk Junction (Wilton), and then to Weston Substation (Weston). New optical ground wire ("OPGW"), for improved lightning protection and communication capability, is proposed for the 1637 Line south of Norwalk Junction while existing OPGW elsewhere in the Project area will be transferred to the proposed structures.

Figure 1: Project Overview Map illustrates the general location of the proposed Project.

[1] Three of the midspans are located within Eversource ROW and one is located on Eversource fee owned property.



3. Project Area Description

As shown on Attachment B, 1637/1720 Lines Rebuild Project Petition Map Set, the 1637/1720 Lines share the same structures within the 4.0-mile portion of Eversource's ROW from Grist Mill

Road in Norwalk north to Norwalk Junction, (located adjacent to Danbury Road in Wilton) and east to Weston Substation, located at 85 Weston Road in Weston.

Within the Project area, the 1637/1720 Lines are supported on a total of 40 structures (32 double-circuit lattice towers and eight single-circuit steel monopoles). During recent inspection, some lattice towers, most of which are approximately 74 years old, displayed signs of aging and significant deterioration, as shown in the photographs in Attachment A. Structure modelling has been completed showed that other lattice structures have a significant risk of failure during extreme weather events. As a result, 32 of the double-circuit lattice structures will be replaced.

The existing conductors are approximately 50 years old and consist of 556-kcmil aluminum conductor steel reinforced ("ACSR") conductor. The conductor also will be replaced with new 1590 kcmil Aluminum Conductor Steel Supported ("ACSS") conductor, which is stronger and more durable than ACSR.

The Project ROW traverses residential and commercial properties, State of Connecticut Department of Transportation ("CTDOT") railroad corridor in Norwalk and Wilton, the Norwalk River (Wilton) and the West Branch Saugatuck River (Wilton). The ROW crosses Route 7, Route 33, Route 53, and local roads. This ROW was established via original easements dated 1923, with later easements dated 1941, 1947, 1959, 1972 and 1973. No expansion of the existing ROW is proposed for the Project.

Existing ROW: Grist Mill Road to Norwalk Junction

From Grist Mill Road north to Norwalk Junction, the ROW, maintained edge to edge, varies in width from 150 to approximately 240 feet. This ROW was established in 1923 and is approximately 1.4 miles long. The ROW from north of Grist Mill Road to south of Kent Road (Wilton) includes the 3403 Line (345-kV) and the 1637/1720 Lines (115-kV) on the west side of the railroad tracks[2]. The 1637/1720 Lines are supported on mostly double circuit lattice tower structures but there are paired single circuit steel poles supporting spans across CTDOT's railroad corridor and Kent Road. From there, the 1637/1720 Lines continue on the east side of the railroad corridor to Norwalk Junction.

In this segment, the 1637/1720 Lines are supported on structures that were erected in approximately 1949. The conductor was installed in approximately 1973. The four existing weathering steel poles on either side of the Kent Road crossing were installed in 2021. Two of the four poles are proposed for replacement due to lack of available easement space to install appropriate additional guying required by the proposed conductor and OPGW work.

Existing ROW: Norwalk Junction to Weston Substation

At Norwalk Junction, the 1637/1720 Lines make a right angle and proceed across Route 7 (Danbury Road). The width of the existing ROW, from Norwalk Junction to Weston Substation is approximately 80 feet over its approximate 2.6-mile length, except for one short section west of Weston Substation (in which proposed replacement structure 19791 would be located) where the ROW is approximately 165 feet wide. The 80-feet wide ROW section in this segment of the Project is maintained edge to edge, except for the 165 feet wide ROW section, where limited tree removal will occur beyond the 80 feet width[3]. The 1637/1720 Lines in this segment are supported on mostly double circuit lattice tower structures and on paired single circuit steel poles at the bend in the ROW west of the West Branch Saugatuck River crossing. In this segment, the existing line structures were erected around 1949. The conductor was installed in approximately 1973. The existing OPGW on the 1720 circuit was installed around 1998. The existing OPGW on the 1637

[2] The Project work does not include replacement of the existing single-circuit steel monopoles that support the 345-kV 3403 Line.

[3] Refer to Tree Removal and Vegetation Management in Section 5 for detail on the limited tree removal.

circuit was installed in 2021. The existing OPGW will be transferred to the proposed replacement structures.

4. Project Description

The Project includes the replacement of 32 double-circuit steel lattice towers and two single-circuit steel pole structures with new galvanized or weathering steel structures. Six of the 32 double-circuit steel lattice towers will be replaced with paired single-circuit steel poles. The replacement of some double-circuit structures with two single-circuit structures is necessary to provide more rigid structures for conductor sagging along bends in the ROW. Additionally, three new mid-span structures will be installed at locations where long spans between structures are now present. (Attachment D – List of Replacement and New Structures). Of the 43 proposed structures, 38 are engineered poles with caisson foundations and 5 are standard poles, which will be direct-embedded.

The Project scope consists of structure, conductor, and static wire replacements for the 1637/1720 Lines within an approximately 4.0-mile ROW between Structure 962/962A near Grist Mill Road in Norwalk and Eversource's Weston Substation. All replacement and new midspan structures between Weston Substation and Norwalk Junction will be engineered weathering steel poles. New structures between Norwalk Junction and Grist Mill Road will be a mix of engineered and direct-embedded poles of galvanized steel to match those of the adjacent 3403 Line and the existing monopoles supporting the 1637/1720 Lines south of Grist Mill Road. The existing ACSR conductor will be replaced with larger and more durable ACSS conductor. The existing OPGW will be transferred to the new structures upon their completion. Between Norwalk Junction and Kent Road, one additional OPGW will be installed over the 1637 circuit for improved shielding from lightning and for communication purposes. Currently, the 1637 and 1720 circuits are both shielded by only a single OPGW wire.

In addition to the above, south of Norwalk Junction, 10 double circuit lattice towers and one double circuit wood pole currently supporting a de-energized transmission circuit and a distribution circuit will be removed as part of the Project. The distribution facilities will be relocated on a line of dedicated distribution poles within the ROW[4].

The height of the existing structures ranges from 61 feet to 101 feet. The replacement structures would range in height from 84 feet to 131.5 feet with proposed structure height increases from approximately 10.5 feet to 39.5 feet above the heights of the corresponding existing structures with an average height increase of 24.7 feet. The height of the new mid-span structures would be 111.5, 121.5 and 157 feet.

Design considerations for structure heights and spacing consider multiple conditions, such as the need to meet current clearance requirements, span length to mitigate conductor swing and uplift, distribution line crossings and the need to maintain appropriate clearance to the parallel distribution line that shares this ROW. In addition, there may be adjustments for steep topography with gradual span changes ahead and back (as incorporated within the design for proposed 157 feet tall mid-span Structure 19796A)[5].

A summary of the existing structure and proposed replacement structure and mid-span structure heights is included as Attachment D.

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[4] De-energized lattice structures adjacent to the 115-kV 1637/1720 Lines and slated for removal include Structure Nos. 3016, 3017, 3018, 3019, 3020, 3021, 3022, 3023, 3024, and 3025. Eversource does not have a recorded structure number for the double circuit wood pole also to be removed.

[5] This structure is located on a steep downward slope and the ground elevation at this structure is significantly lower than that at adjacent Structures 19797 and 19797A.

Summaries of the proposed work elements for each section of the Project are provided below:

<u>1637/1720 Lines (Grist Mill Road to Norwalk Junction)</u>

- Replace 11 double-circuit steel lattice structures with 11 new double-circuit galvanized steel monopoles.
- Replace two double-circuit steel lattice structures with four single-circuit steel monopoles (single circuit poles to be installed in pairs side by side in the ROW).
- Replace two single circuit weathering steel poles with two single circuit galvanized steel poles to match the adjacent 3403 Line.
- Install one new mid-span double-circuit galvanized steel monopole.
- Replace existing 556-kcmil ACSR conductor with 1590-kcmil ACSS conductor.
- Transfer the existing OPGW on the 1720 circuit to the replacement structures.
- Install new OPGW on the 1637 circuit.
- Remove ten double-circuit lattice towers and one wood pole currently supporting a de-energized circuit and a distribution circuit.

<u>1637/1720 Lines (Norwalk Junction to Weston Substation)</u>

- Replace 15 existing double-circuit steel lattice structures with 15 new double-circuit weathering steel monopoles.
- Replace 4 existing double-circuit steel lattice structures with 8 new single-circuit weathering steel monopoles (single circuit poles to be installed in pairs side by side in the ROW).

- Install 2 new double-circuit weathering steel monopoles.
- Replace existing 556-kcmil ACSR conductor with 1590-kcmil ACSS conductor.
- Transfer existing OPGW to the replacement structures.
- No work is proposed at the Weston Substation.

In addition to the work described above, existing lightning arrestors would be transferred to the replacement structures. Additional new lightning arrestors are proposed for installation on selected structures such that arrestors would be present on approximately every fifth structure. As part of the Project, new hardware and insulators are proposed on all structures. Counterpoise is proposed for installation as needed.

Attachment B contains maps that depict the locations of existing and proposed structures as well as the approximate location and configuration of work pads and pull pads to be used for the Project, access roads, ROW features and other Project elements. The cross-section drawings provided in Attachment C depict typical views along the ROW of the existing and proposed structures.

5. Existing Environment, Environmental Effects and Mitigation

The Project would be constructed within the existing transmission ROW starting at Grist Mill Road and continuing north to Norwalk Junction and then continuing east to Weston Substation. No physical expansion of the existing ROW is proposed for the Project. The Project would not have a substantial adverse environmental effect, for the reasons explained more fully below.

<u>Land Use</u>

The Project area is located within the municipalities of Norwalk, Wilton and Weston.

Land use within and surrounding the Project area is primarily commercial and residential mixed with a few areas of undeveloped lands with more densely populated areas becoming more prevalent towards the southern portion of the ROW. Notable water features within the Project area are the Norwalk River, Copts Brook, and the West Branch of the Saugatuck River (Wilton). See Attachment B: 1637/1720 Lines Rebuild Project – Petition Map Set for further details.

The Project would have minimal impacts on adjacent land uses. Construction activities would mainly be confined to the Eversource ROW except for the use of the existing access to the ROW from Grist Mill Road (Map Sheet 1), the proposed off access to the ROW off Cardinal Lane (Map Sheet 6) and the existing off ROW access from Old Weston Road (Map Sheet 8). No construction activities are proposed at the Weston Substation.

Tree Removal and Vegetation Management

The 80 feet wide portions of ROW between Weston Substation and the Norwalk Junction are generally maintained edge to edge through Eversource's cyclical vegetation management program that favors low growing scrub-shrub habitat in areas that are not residential lawn areas. An exception to the fully maintained ROW occurs at Structure 19791 where additional limited tree removal work would be done within the 165-foot ROW (see Map Sheet 8 of 8 in Attachment B – Petition Map Set). Only a portion of the Eversource fee owned property located to the west of the West Branch Saugatuck River is maintained to an 80-foot width consistent with the maintained ROW to the east of this property (see Map Sheet 7 of 8 in Attachment B – Petition Map Set). From Norwalk Transition Station south to Kent Road, the Project area extends between the CTDOT Danbury Branch Railroad corridor and the eastern edge of the ROW, which is currently fully maintained. From Kent Road to Grist Mill Road, the ROW is currently maintained from the eastern edge of ROW to the adjacent 3403 circuit ROW edge. The Project construction would be within the currently maintained ROW areas, though select edge of ROW side tree trimming would be necessary in some areas and brush mowing would be required to accommodate access road/work pad installation and improvements in the ROW. Incompatible vegetation within the ROW would also need to be removed in select locations.

Select tree removal/vegetation management would be accomplished using mechanical methods. This work typically requires the use of flat-bed trucks, mowers, brush hogs or other types of mowing equipment, skidders, forwarders, bucket trucks for canopy trimming, and chippers. Where off-ROW access roads are utilized, some tree trimming/vegetation management may be required.

In sensitive resource areas, Eversource would require the contractor to use low-impact methods to remove brush vegetation to protect wetlands and watercourses. Low impact methods incorporate a variety of approaches, techniques, and equipment to minimize site disturbance.

Eversource would require the contractor to use some or all the following low impact methods, depending on the specific settings and situations:

- Consider soil and weather conditions when scheduling vegetation removal activities, such as during periods of heavy rainfall;
- Maximize the use of uplands for clearing access routes;
- Utilize hand clearing methods for vegetation removal work within sensitive wetland and vernal pool areas;
- Use appropriately sized equipment for site conditions, where possible, to minimize impacts; and,
- Where practical, cut brush close to the ground, leaving root systems and stumps, to retain soil stability.

Temporary construction mats would be used to provide a stable base for equipment to cross watercourses or wetlands where hand clearing work is not feasible. Such temporary support would minimize disturbances to wetland soils, and the mats would be removed after the work activities are complete. Work activities in wetlands, including the proposed tree trimming/vegetation management work, would be conducted in accordance with Eversource's April 2022 *Construction & Maintenance Environmental Requirements, Best Management Practices Manual for Massachusetts, and Connecticut* ("BMPs" or "BMP Manual") and with Project permits and approvals.

Scenic, Recreational and Cultural Resources

The Project is not anticipated to have a substantial adverse effect on scenic, recreational, and cultural resources. The Project area contains one state designated scenic roadway[6].

- Route 33 (Westport Road) in Wilton between Old Ridgefield Road and the Ridgefield-Wilton town line (approximately 4.8 miles). However, the Project is not expected to have a substantial adverse effect on this resource as the ROW already crosses this state listed scenic road in the vicinity of Structure 19805. (See Attachment B: Map Sheet 5) where the existing lattice structure will be replaced with a steel monopole.

A desktop review of the Connecticut Department of Energy and Environmental Protection's ("CT DEEP") GIS and field investigations data was conducted by Eversource to identify where portions of the ROW traverse or are adjacent to public recreational space property or trails. No recreational open space property or trails are located adjacent to or within the ROW.

[6] Connecticut Department of Transportation (CTDOT), December 31, 2020, Connecticut State Scenic Roads. Accessed December 5, 2022. Available URL: https://portal.ct.gov/DOT/Programs/Connecticut-Scenic-Roads. The Town of Weston and the City of Norwalk do not have any listed scenic roads.

A Phase 1A Cultural Resources Assessment Survey (“Phase 1A”) review was conducted by Heritage Consultants, LLC (“Heritage”) in October of 2022 to evaluate the potential presence of archaeological and historic resources within or proximate to the Project area. This assessment included a review of previously recorded cultural resources on file with the Connecticut State Historic Preservation Office (“SHPO”). The Phase 1A identified no previously inventoried standing structures within the Project limits; however, one State Register of Historic Places property (Betts House) and a single National Register of Historic Places (“NRHP”) district (Kettle Creek Historic District) are located within 500 feet of the Project Area. Heritage determined that the Project would not directly or indirectly impact these historic resources.

The Phase 1A also identified two known archaeological sites. However, both sites are located outside of the Project area, and they will not be impacted by the Project. Heritage further identified six work area locations within the ROW as having a moderate to high potential for archaeological sensitivity, prompting further investigation via a pedestrian survey in October 2022. That survey concluded that these six work locations could be reclassified as retaining no/low sensitivity for cultural resources based on the presence of poor drainage characteristics, moderate/steep slopes, and/or previous signs of ground disturbances. Based on the results of the pedestrian survey, Heritage determined that “no additional archaeological investigations within the Project area are recommended and no impacts to significant cultural resources are anticipated by the proposed Project”. The results of the Phase 1A and pedestrian survey was provided to the SHPO and the Tribal Historic Preservation Offices (“THPO”) for review. The SHPO agreed with Heritage’s findings in a response letter agreeing that the Project will have no adverse effect to historic properties. A response from the THPO is pending.

Wetlands, Watercourses, Waterbodies, Flood Zones and Aquifer Protection Areas

Eversource identified and delineated water resources within the Project area in March of 2022 (see Attachment E: Wetlands and Watercourses Report). The map sheets provided in Attachment B depict these water resources, which include inland wetlands, watercourses (perennial and intermittent streams), a pond, vernal pools, Federal Emergency Management Agency ("FEMA") Flood Zones and an Aquifer Protection Area. All work in or near these areas would be conducted in accordance with Eversource's BMPs and the Stormwater Pollution Prevention Plan (SWPCP) that Eversource would develop for the Project under a CT DEEP General Permit (for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities) as well as applicable conditions imposed by regulatory agencies in permit conditions and approvals including the Department of the Army Regional General Permits for the State of Connecticut. Details regarding each of these resource areas are summarized below.

Wetlands

Wetlands in the Project area were identified and delineated in accordance with industry standard methodology. A total of 20 wetlands were identified in the Project area. Three lattice structures (Structures 943, 942 & 941) are currently located within wetlands and will be replaced with weathering steel monopole structures within their respective wetlands. Structure 943 will be replaced by two (2) steel monopole single circuit structures (Structure 19808 and 19808A) and structures 942 and 941 will be replaced by steel monopole double circuit structures, structures 19807 and 19806, respectively. One (1) existing structure[7] currently

[7] This structure is currently labelled at Structure 940 and the proposed replacement structure will have the new number Structure 19805.

located in a wetland will be replaced by a new steel monopole structure in an upland area. One upland structure (Structure 959) will be replaced by a structure in a wetland to reduce span widths and meet clearance requirements.

The five structures installed in wetlands would result in a total of approximately 400 square feet of permanent wetland effects.

The Project would also result in approximately 2.64 acres of temporary effects to wetlands due to the placement of construction mats for access roads and work pads. All matting would be promptly removed upon Project completion and wetland areas would be restored in accordance with Eversource's BMPs.

Anticipated effects to wetlands from the Project are detailed on Table W-1 below.

Exhibit B

Property Card

Town of Wilton, CT

Property Listing Report

Map Block Lot	29-81	Building #	1	PID	1347	Account	001048

Property Information

Property Location	144 CHESTNUT HILL RD
Owner	CONN LIGHT & POWER CO THE
Co-Owner	na
Mailing Address	P O BOX 270 HARTFORD CT 06141
Land Use	4-1V Pub Utilit MDL-00
Land Class	I
Zoning Code	R-2
Census Tract	1

Neighborhood	05
Acreage	1.2
Utilities	UNKNOWN
Lot Setting/Desc	UNKNOWN Rolling
Book / Page	0035/0121
Additional Info	

Photo

No Photo Available

Sketch

No Photo Available

Primary Construction Details

Year Built	0
Building Desc.	Pub Utilit MDL-00
Building Style	UNKNOWN
Building Grade	
Stories	0
Occupancy	
Exterior Walls	
Exterior Walls 2	NA
Roof Style	
Roof Cover	
Interior Walls	
Interior Walls 2	NA
Interior Floors 1	
Interior Floors 2	NA

Heating Fuel	
Heating Type	
AC %	
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	NA
Kitchen Style	NA
Fin Bsmt Area	
Fin Bsmt Quality	
Bsmt Gar	
Fireplaces	0

(*Industrial / Commercial Details)

Building Use	Vacant
Building Condition	
Sprinkler %	NA
Heat / AC	NA
Frame Type	NA
Baths / Plumbing	NA
Ceiling / Wall	NA
Rooms / Prtns	NA
Wall Height	NA
First Floor Use	NA
Foundation	NA

Report Created On 9/6/2023

Town of Wilton, CT

Property Listing Report | Map Block Lot 29-81 | Building # 1 | PID 1347 | Account 001048

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Improvements	0	0
Outbuildings	0	0
Land	0	0
Total	160800	112560

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	0	0

Outbuilding and Extra Features

Type	Description

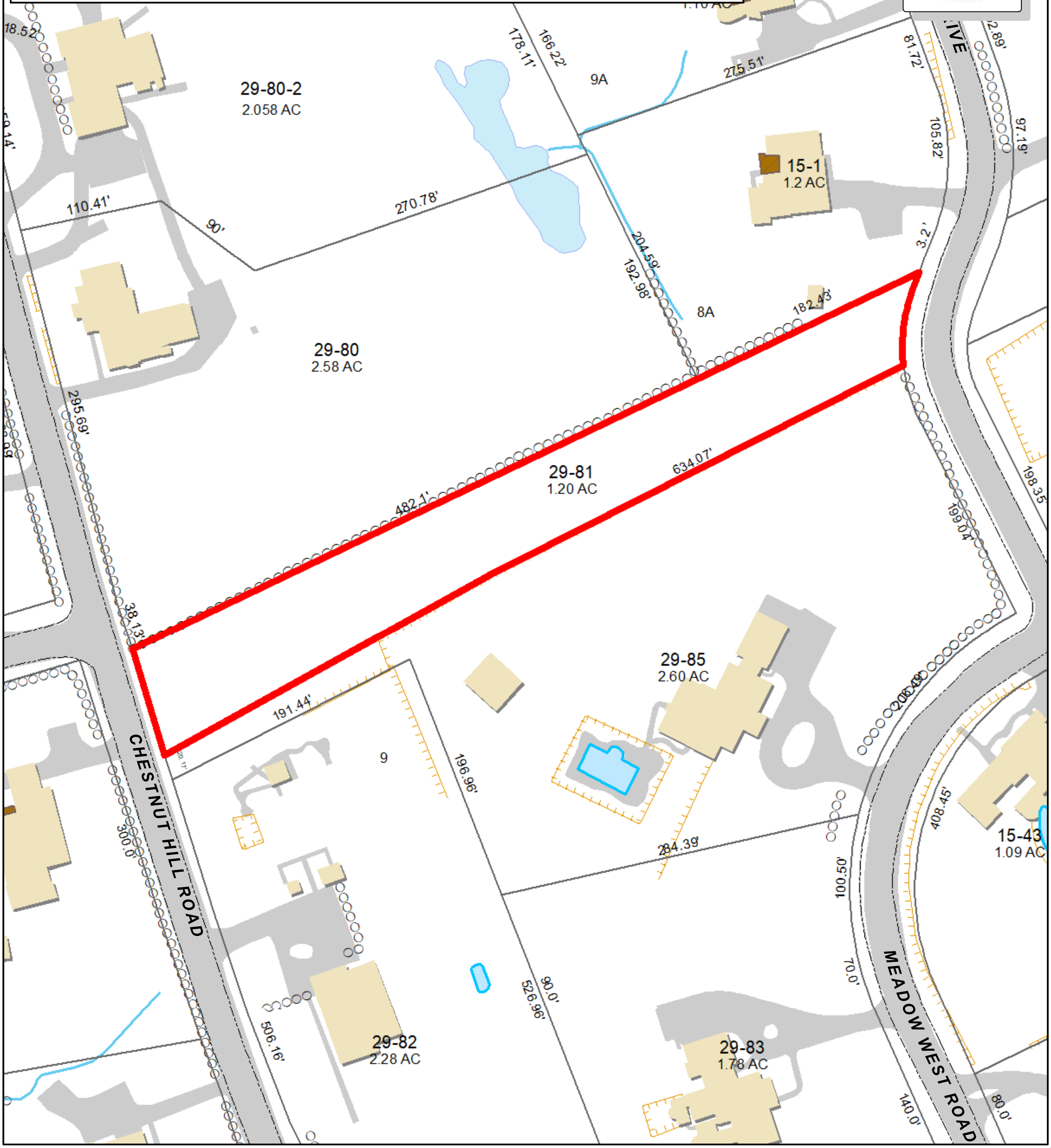
Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CONN LIGHT & POWER CO THE	0035/0121	03/22/1923	0

Report Created On 9/6/2023

Town of Wilton, Connecticut - Assessment Parcel Map

MBL: 29-81 **Address:** 144 CHESTNUT HILL RD



Approximate Scale:

1 inch = 100 feet

Disclaimer:
This map is for informational purposes only.
All information is subject to verification by any user.
The Town of Wilton and its mapping contractors
assume no legal responsibility for the information contained herein.

Map Grand List Date: Oct 2017

0 50 100 150 Feet

Exhibit C

Construction Drawings

T-Mobile

SITE NAME: WILTON/RT 33
SITE ID: CT11296A
NEW E. SOURCE STRUCT. #19800
144 CHESTNUT HILL RD (RTE-53)
WILTON, CT 06897

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)
67D94B OUTDOOR

T-MOBILE A+L TEMPLATE (PROVIDED BY RFDS)
67D94B_1DP+1QP+1OP

GENERAL NOTES

1. 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.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. 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.
4. 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.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
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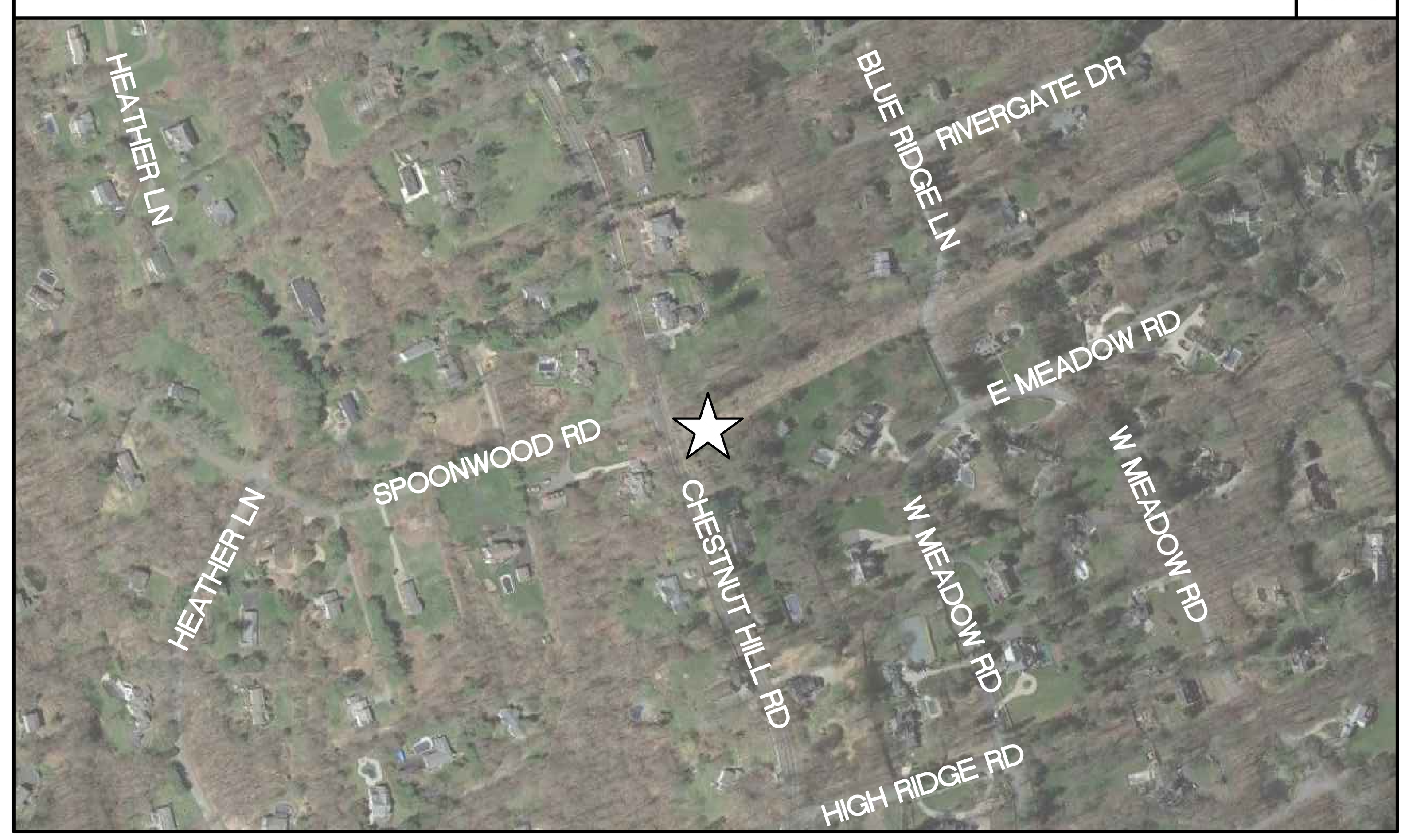
18. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
19. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
20. 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.
21. 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
22. 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.
23. 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.
24. 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.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. 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.
27. 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.

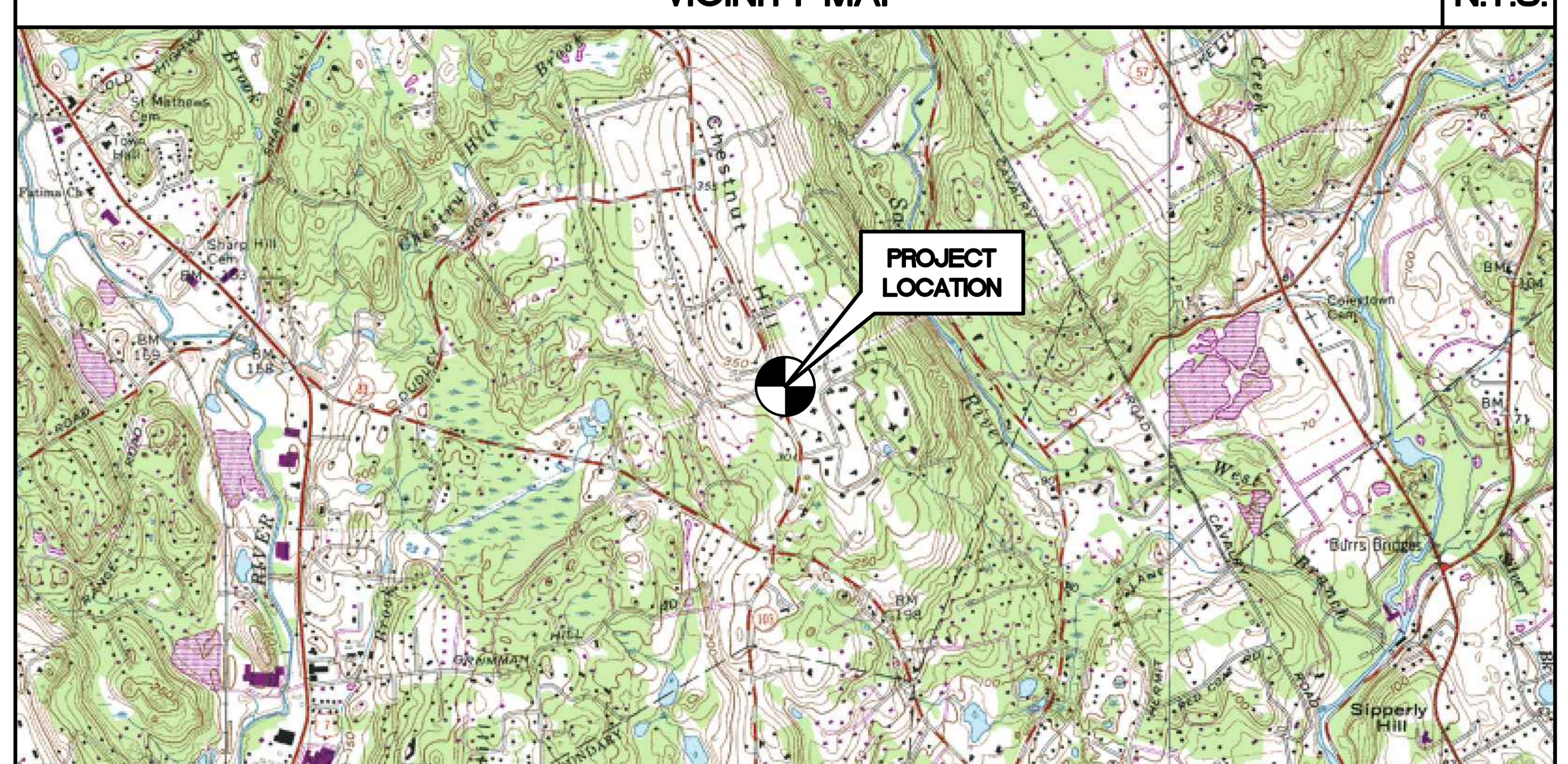
SITE LOCATION MAP

N.T.S.



VICINITY MAP

N.T.S.



COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH.

SITE COORDINATES: LATITUDE: 41°-10'-52" N
LONGITUDE: 73°-23'-35" W
GROUND ELEVATION: ±331' AMSL

NORTH

PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

1. REMOVAL OF EXISTING UTILITY TOWER AND INSTALLATION OF NEW TOWER TO BE DONE (BY OTHERS)
2. REMOVE EXISTING EMS: RR90-17-02DP ANTENNA, TYP. (1) PER SECTOR; TOTAL OF (3)
3. REMOVE EXISTING AWS AND COMMSCOPE BTS
4. REMOVE EXISTING CABLE ICE-BRIDGE
5. REMOVE EXISTING ANTENNA MOUNTS
6. INSTALL (3) HYBRID CABLES AT GRADE
7. INSTALL (8) 7/8 COAX CABLES PER SECTOR; TOTAL OF (24)
8. INSTALL RFS: APXVAARR24_43-U-NA20 ANTENNA, TYP. (1) PER SECTOR; TOTAL OF (3)
9. INSTALL RFS: APX16DWV-16DWV-S-E-A20 ANTENNA, TYP. (1) PER SECTOR; TOTAL OF (3)
10. INSTALL ERICSSON: RADIO 4449 B71+B85, TYP. (1) PER SECTOR; TOTAL (3) AT GRADE
11. INSTALL SMART BIAS-T: ATSBT-TOP-MF-4G TMA, TYP. (2) PER SECTOR; TOTAL OF (6)
12. INSTALL RFS: ATMAP4DBP-1A20 TMA, TOTAL OF (3) AT GRADE
13. INSTALL ERICSSON: TWIN STYLE 1B KRY 112 144/1 TMA, TOTAL (3) AT GRADE
14. INSTALL RFS: FDAP5002/1A20 DIPLEXER, TOTAL (3) AT GRADE
15. INSTALL SITE PRO: RMQLP-496-HK ANTENNA MOUNT
16. INSTALL NEW CABLE ICE-BRIDGE

PROJECT INFORMATION

SITE NAME:	WESTPORT/RT 136
SITE ID:	CT11296A
SITE ADDRESS:	144 CHESTNUT HILL RD WILTON, CT 06897
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT. 06002
CONTACT PERSON:	MATT BANDLE (PROJECT MANAGER) NORTHEAST SITE SOLUTIONS (508) 642-8801
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT. 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
SITE COORDINATES:	LATITUDE: 41°-10'-52" N LONGITUDE: 73°-23'-35" W GROUND ELEVATION: ±331' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

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C-2	ANTENNA PLANS AND ELEVATIONS	1
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C-4	TYPICAL EQUIPMENT DETAILS	1
E-1	ELECTRICAL COMPOUND PLAN	1
E-2	ELECTRICAL SCHEMATIC DIAGRAM	1
E-3	ELECTRICAL GROUNDING PLANS	1
E-4	TYPICAL ELECTRICAL DETAILS	1
E-5	TYPICAL ELECTRICAL DETAILS	1
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REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
1	07/05/23	ASC	TJR	CONSTRUCTION DRAWINGS – REVISED PER EVERSOURCE COMMENTS
0	06/21/23	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
B	04/14/23	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CLIENT REVIEW
A	08/10/22	JLD	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT · CARLO F. CENTORE · No. 16894 · PROFESSIONAL ENGINEER

T-Mobile

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

T-MOBILE NORTHEAST LLC
SITE NAME: WILTON/RT 33
SITE ID: CT11296A
144 CHESTNUT HILL RD (RTE-53)
WILTON, CT 06897

DATE:	08/10/22
SCALE:	AS NOTED
JOB NO.	22073.01

TITLE SHEET

T-1

SHEET NO. 1 OF 11

NOTES AND SPECIFICATIONS:

DESIGN BASIS:

GOVERNING CODE: 2021 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2022 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED: 97 MPH (Vult)
  (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

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STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS---ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

ANTENNA/APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA – AT TOWER	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY) – AT CABINET	(E/P) DIPLEXER (QTY) – AT CABINET	(E/P) TMA (QTY) – AT CABINET	(E/P) BIAS T (QTY) – AT TOWER	(QTY) HYBRID/COAX
A1	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	120'	30°		(P) (RFS: AWS/PCS – FDAP5002/1A20) (1)	(P) (RFS: TWIN STYLE 3CX-ATMA4P4DBP-1A20) (1) (P) (ERICSSON: TWIN STYLE 1B-KRY 112 144/1) (1)	(P) (SMART BIAST-ATSBT-TOP-MF-4G) (1)	(8) 7/8" COAX CABLES (TOWER) (1) 6/24 HYBRID CABLE (GRADE)
A2	PROPOSED	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	120'	30°	(P) RADIO 4449 B71+B85 (1)			(P) (SMART BIAST-ATSBT-TOP-MF-4G) (1)	
B1	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	120'	150°		(P) (RFS: AWS/PCS – FDAP5002/1A20) (1)	(P) (RFS: TWIN STYLE 3CX-ATMA4P4DBP-1A20) (1) (P) (ERICSSON: TWIN STYLE 1B-KRY 112 144/1) (1)	(P) (SMART BIAST-ATSBT-TOP-MF-4G) (1)	(8) 7/8" COAX CABLES (TOWER) (1) 6/24 HYBRID CABLE (GRADE)
B2	PROPOSED	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	120'	150°	(P) RADIO 4449 B71+B85 (1)			(P) (SMART BIAST-ATSBT-TOP-MF-4G) (1)	
C1	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	120'	270°		(P) (RFS: AWS/PCS – FDAP5002/1A20) (1)	(P) (RFS: TWIN STYLE 3CX-ATMA4P4DBP-1A20) (1) (P) (ERICSSON: TWIN STYLE 1B-KRY 112 144/1) (1)	(P) (SMART BIAST-ATSBT-TOP-MF-4G) (1)	(8) 7/8" COAX CABLES (TOWER) (1) 6/24 HYBRID CABLE (GRADE)
C2	PROPOSED	RFS (APXVAARR24_43-U_NA20)	95.9 x 24 x 8.7	120'	270°	(P) RADIO 4449 B71+B85 (1)			(P) (SMART BIAST-ATSBT-TOP-MF-4G) (1)	

NOTE:
ALL HYBRID/COAX LENGTHS TO BE MEASURED AND VERIFIED IN FIELD BEFORE ORDERING

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0	06/21/23	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
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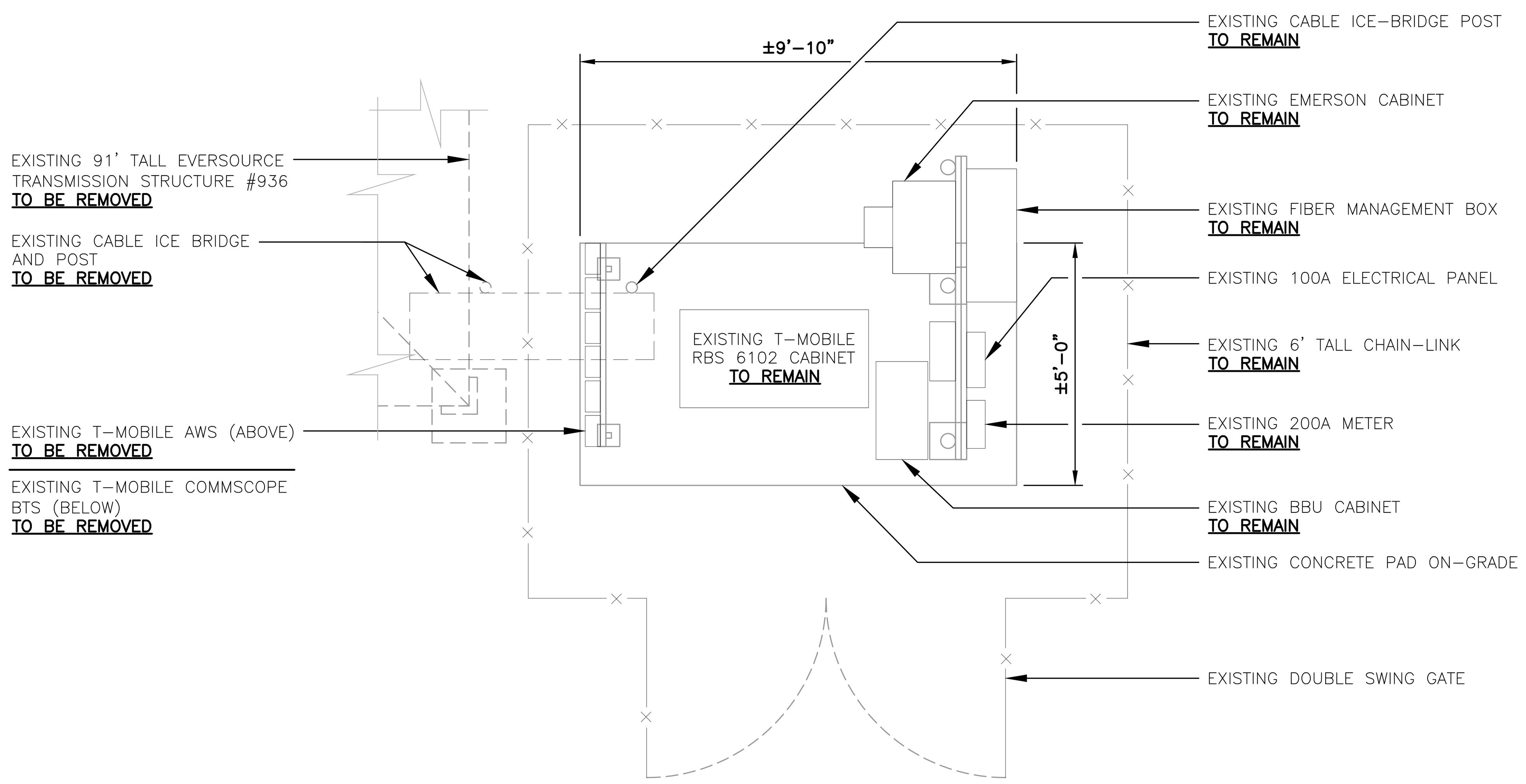
SITE ID: CT11296A
144 CHESTNUT HILL RD (RTE-53)
WILTON, CT 06897

DATE: 08/10/22
SCALE: AS NOTED
JOB NO. 22073.01

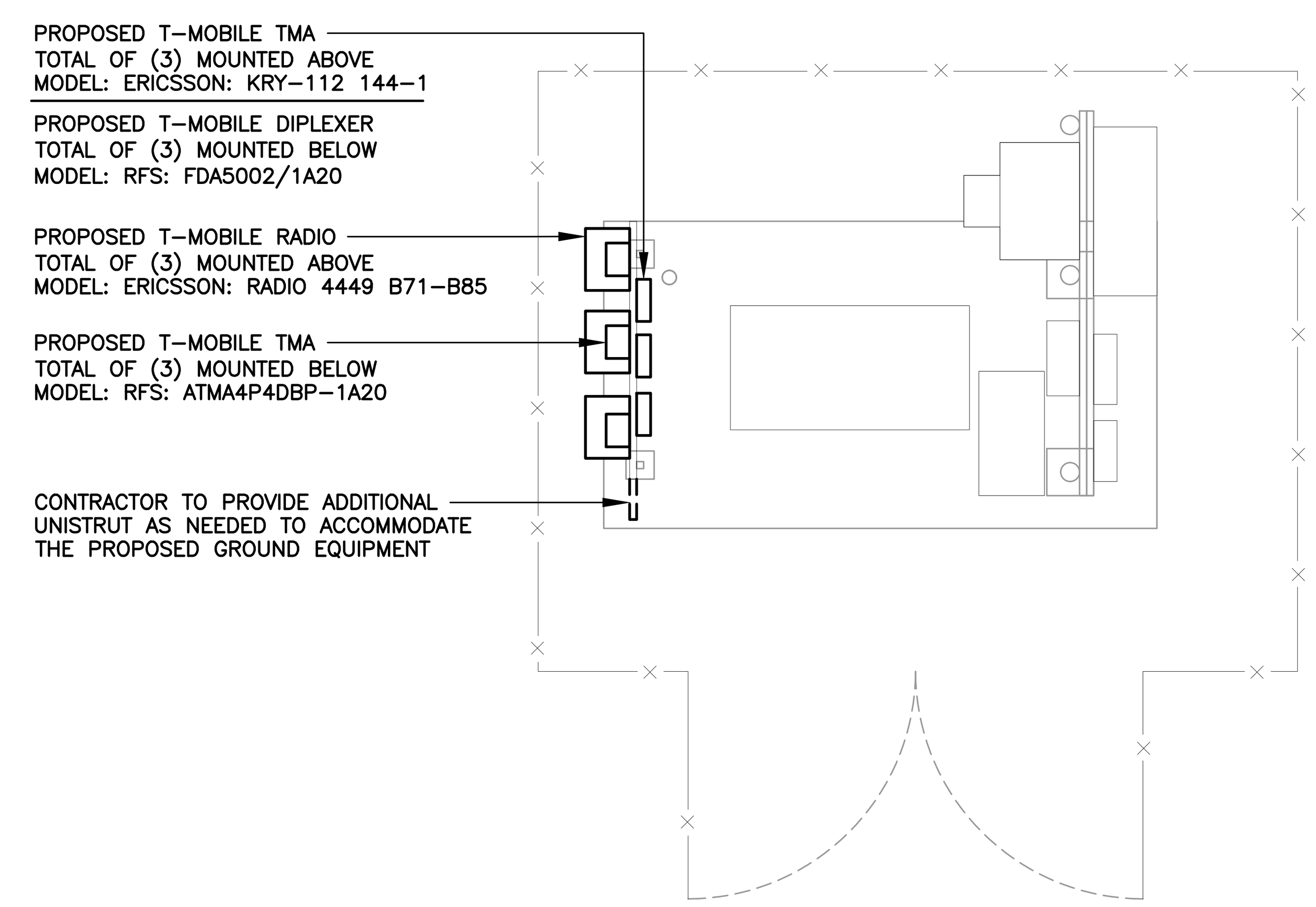
NOTES, SPECIFICATIONS, & ANT. SCHEDULE

N-1

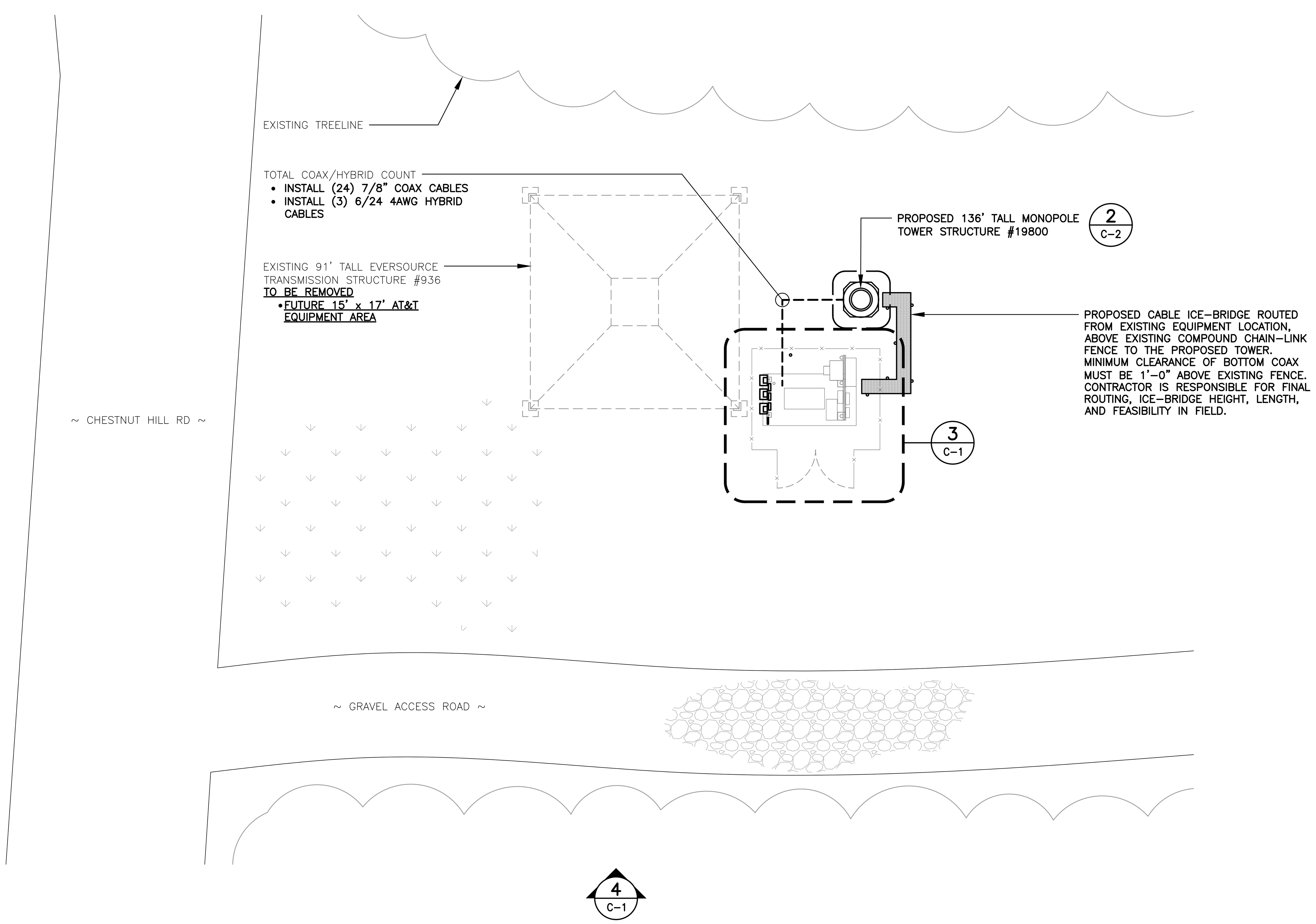
STRUCTURAL COMPLIANCE
ANTENNA MOUNTS A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.. REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22073.01) 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 # 22073.01_Rev2) DATED 06/02/23 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.



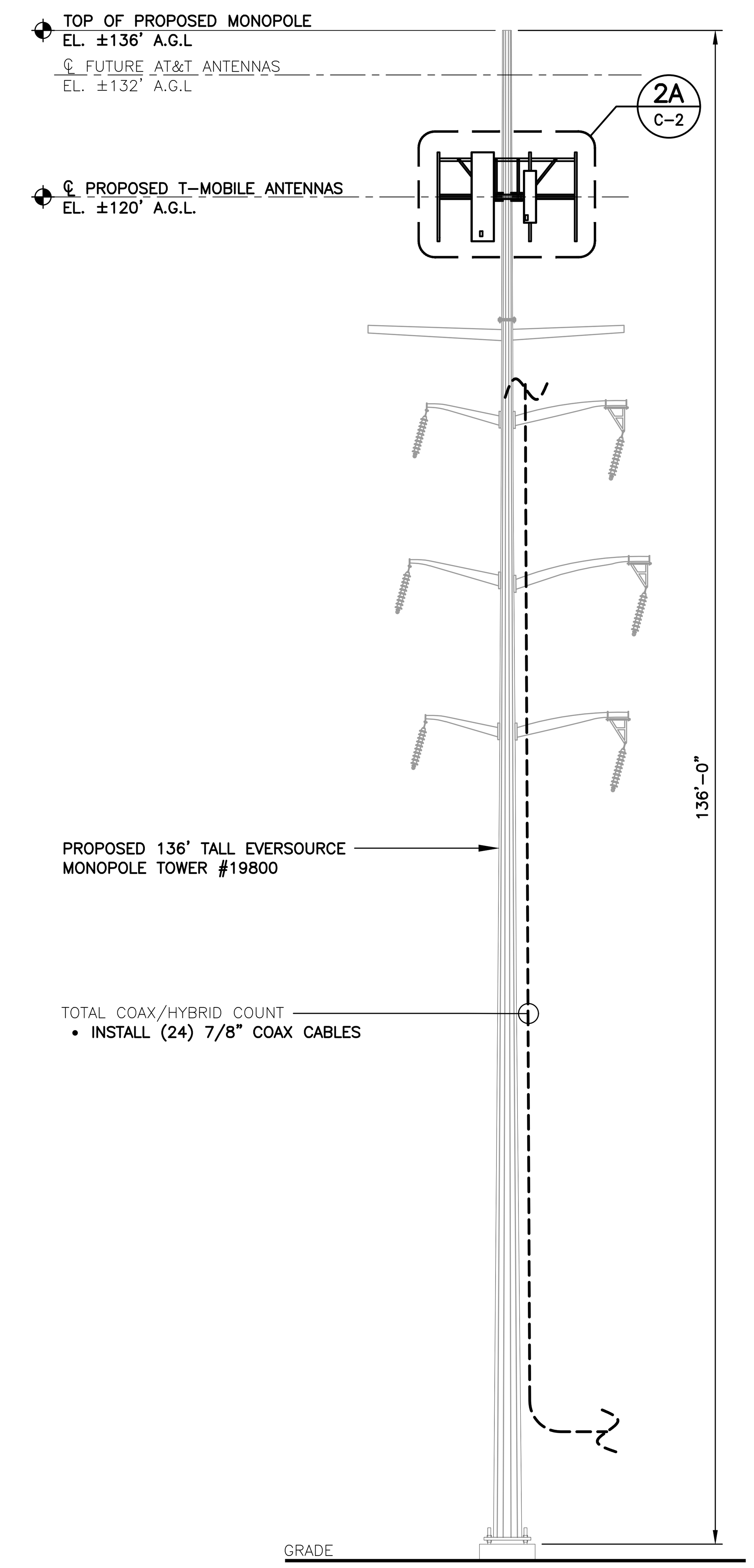
2 C-1 EQUIPMENT PLAN - EXISTING
SCALE: 3/8" = 1'



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



1 C-1 COMPOUND PLAN - PROPOSED
SCALE: 1" = 8'



4 C-1 TOWER ELEVATION - PROPOSED
SCALE: 1" = 10'

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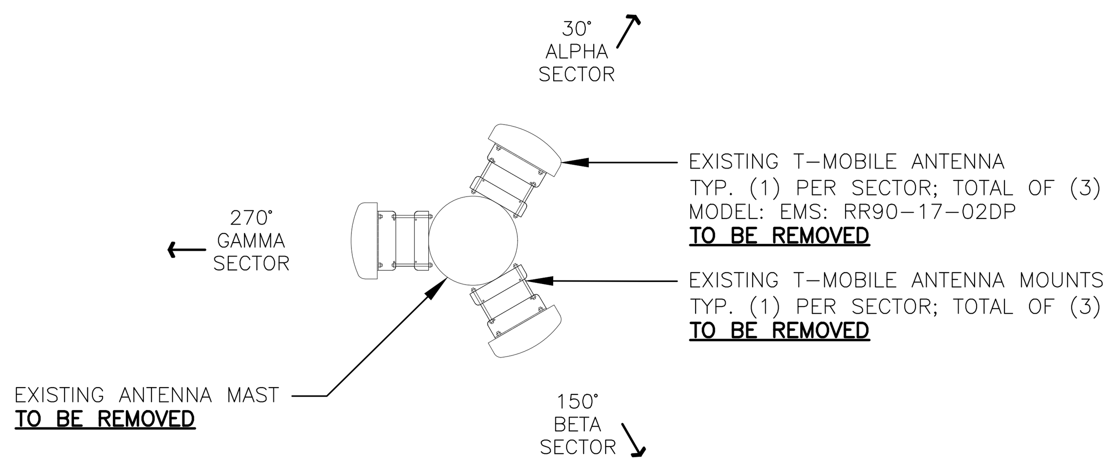
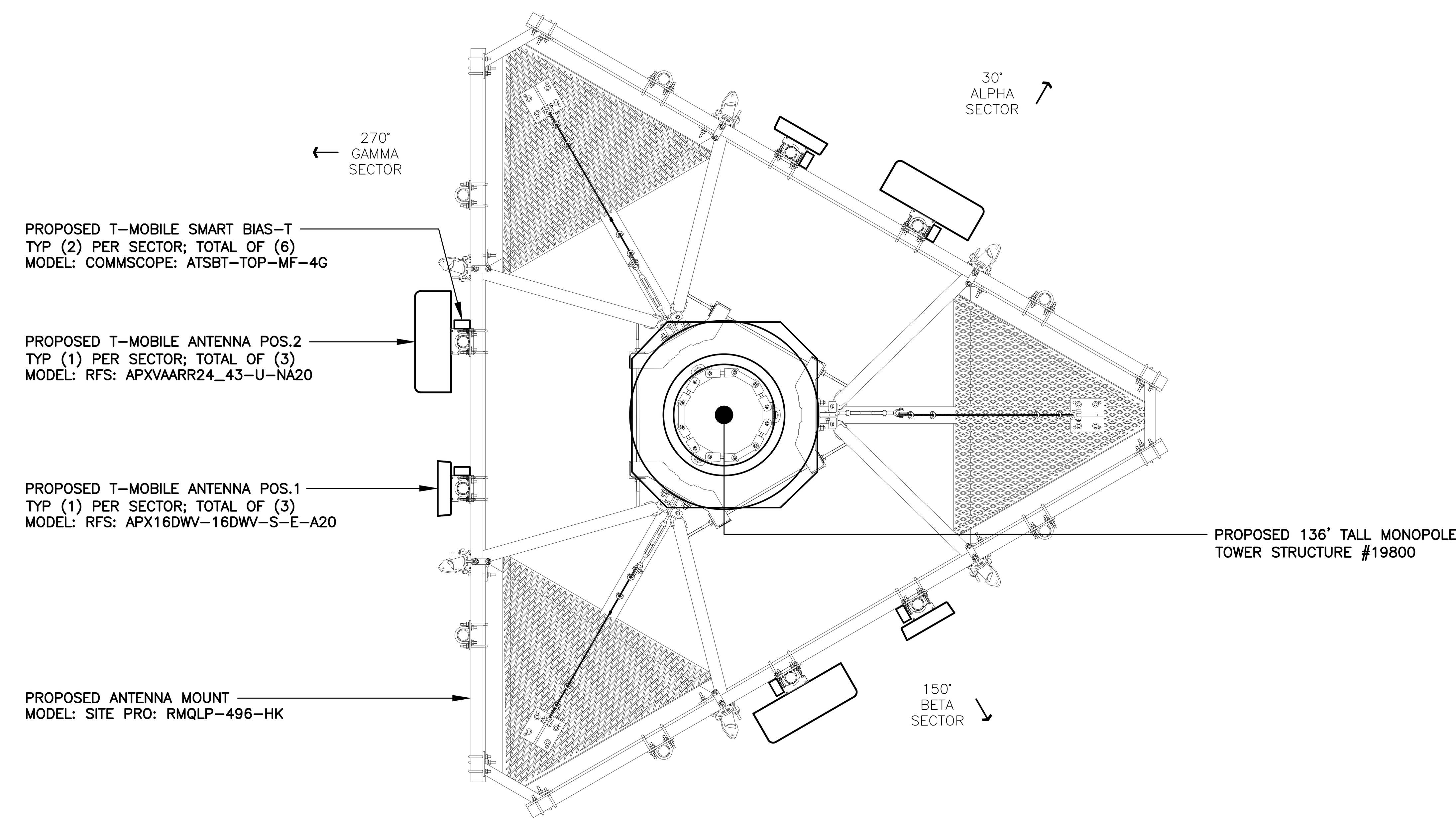
COMPOUND PLAN, EQUIPMENT PLANS, AND ELEVATION

C-1

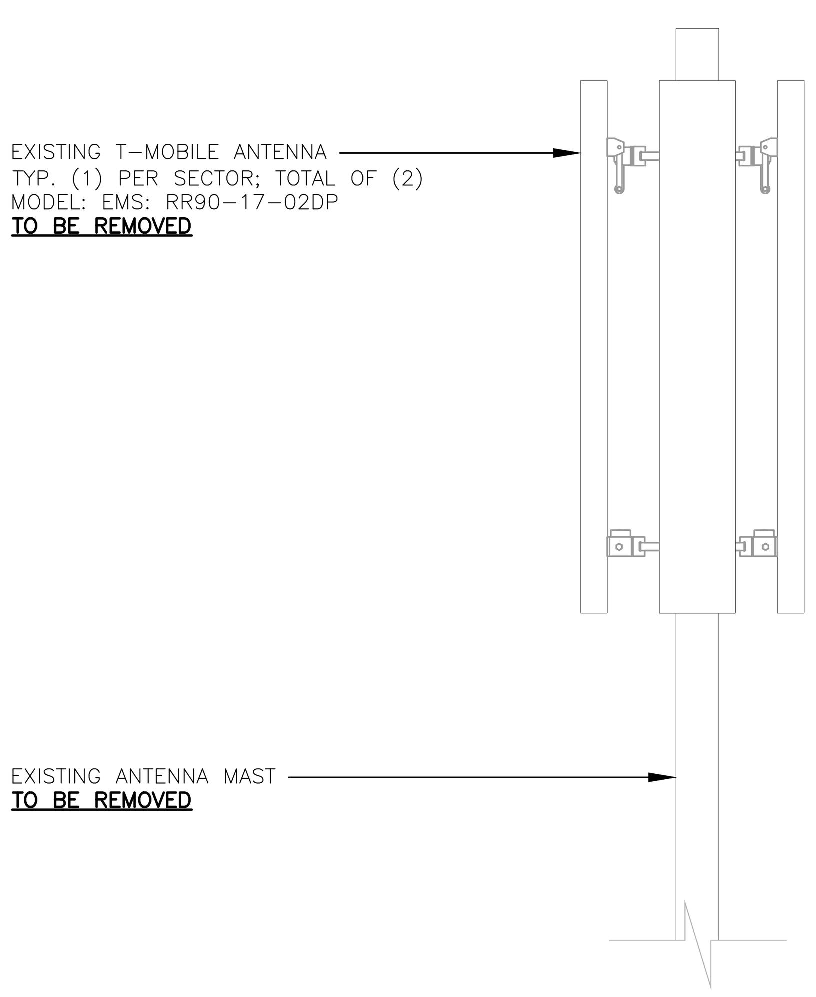
SHEET NO. 3 OF 11



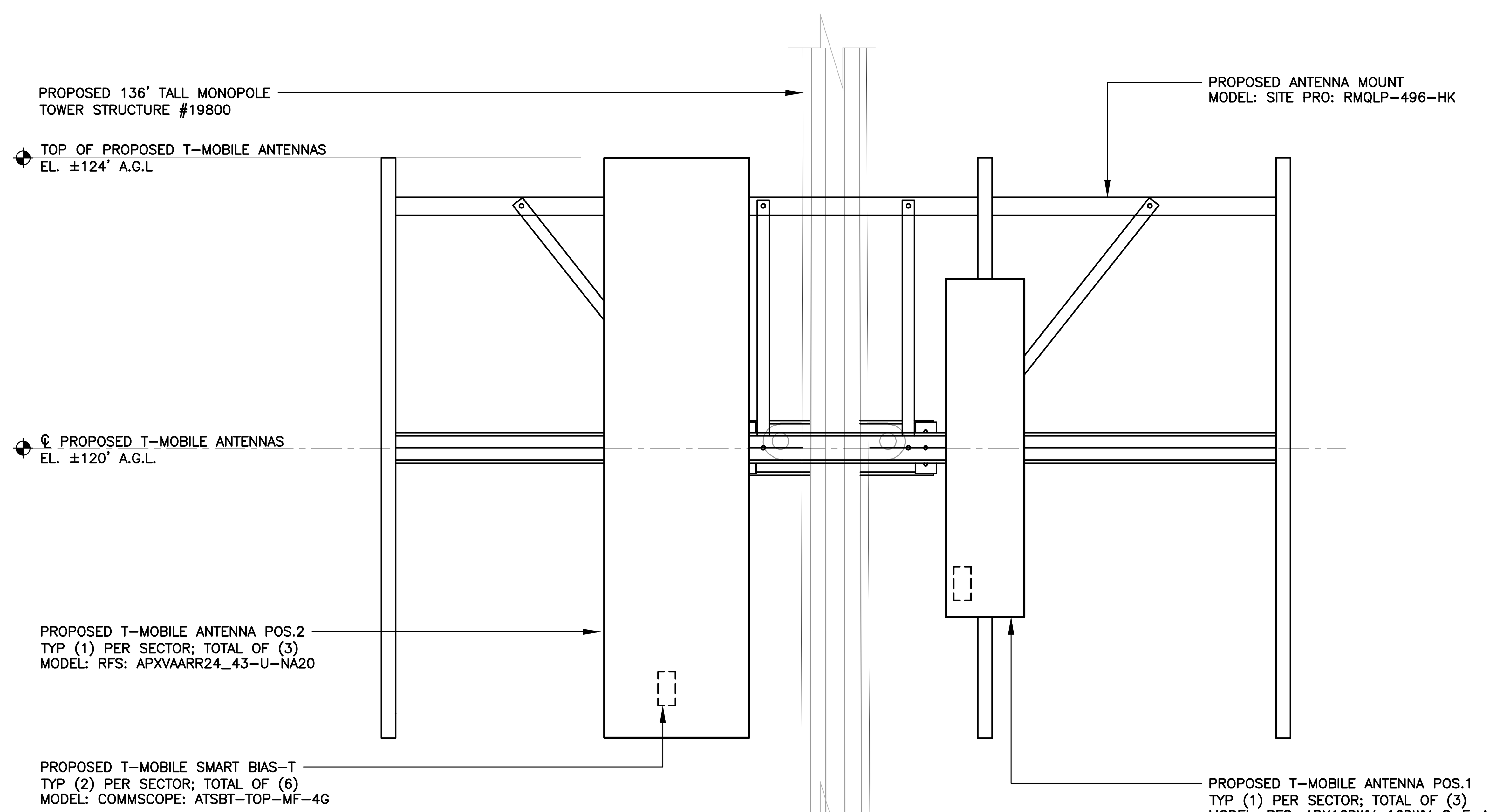
1 / C-2 ANTENNA PLAN - EXISTING (OLD TOWER)
SCALE: 3/4" = 1'
TRUE NORTH



2 / C-2 ANTENNA PLAN - PROPOSED (NEW TOWER)
SCALE: 1/2" = 1'
TRUE NORTH



1A / C-2 ANTENNA ELEVATION - EXISTING (OLD TOWER)
SCALE: 3/4" = 1'



2A / C-2 ANTENNA ELEVATION - PROPOSED (NEW TOWER)
SCALE: 3/4" = 1'

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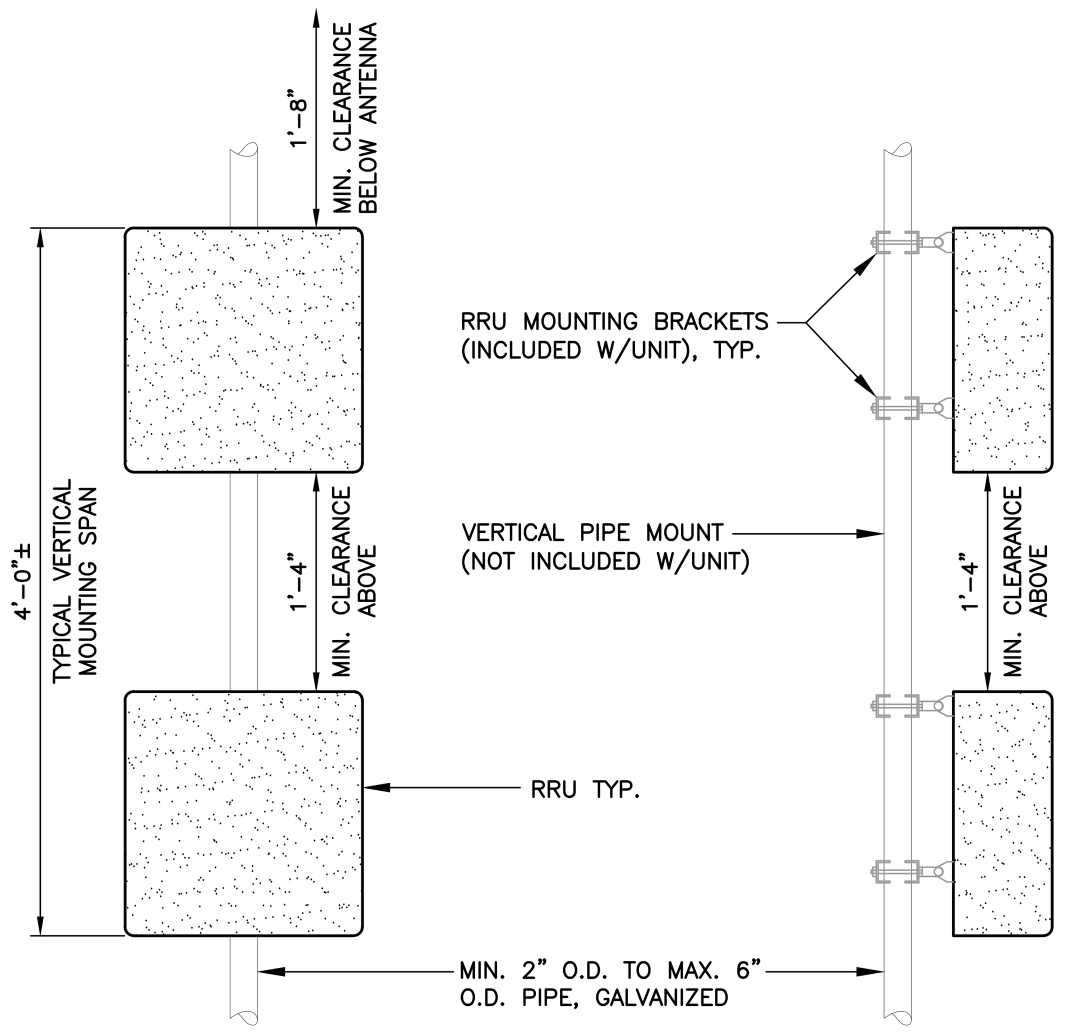
ANTENNA PLANS AND ELEVATIONS

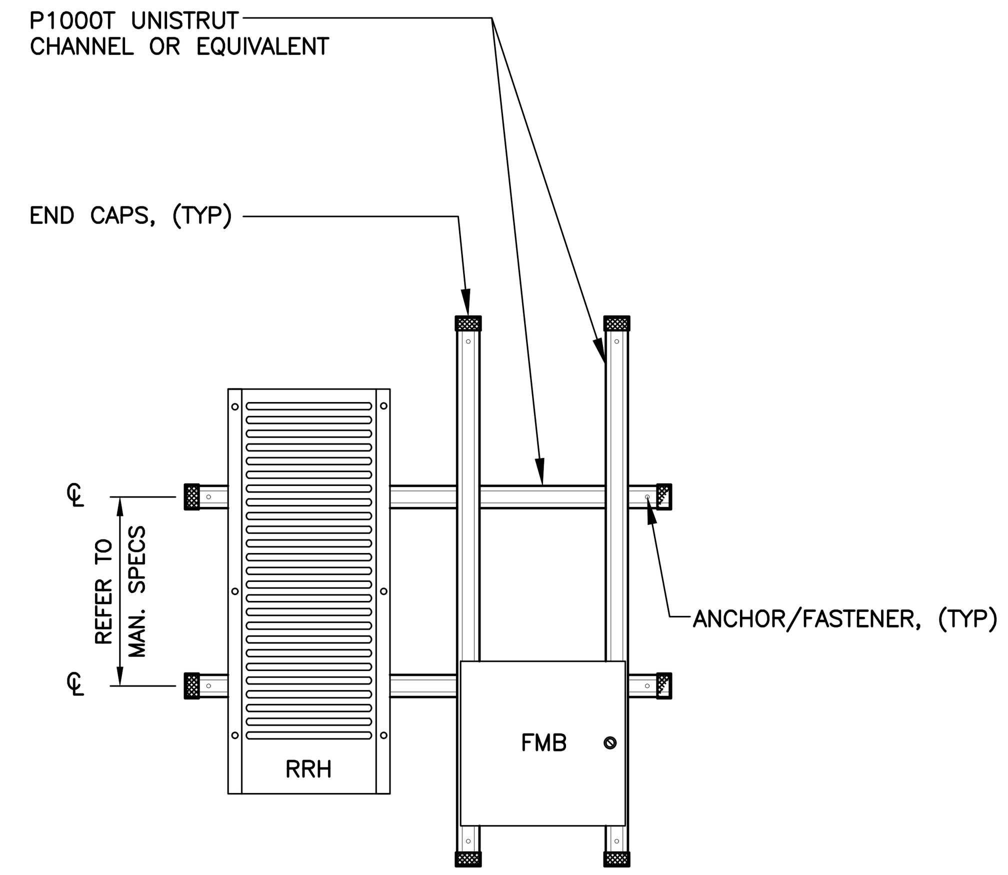
C-2

SHEET NO. 4 OF 11



FRONT ELEVATION

SIDE ELEVATION



FRONT ELEVATION

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.

NOTES: (UNISTRUT MOUNTING)

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

1 C-3 TYPICAL RRU MOUNTING DETAILS

SCALE: NOT TO SCALE

APXVAARR24_43-U-NA20

APX16DWV-16DWV-S-E-A20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAARR24_43-U-NA20	95.9"L x 24"W x 8.7"D	±128 LBS.
MAKE: RFS MODEL: APX16DWV-16DWV-S-E-A20	55.9"L x 13.0"W x 3.15"D	±40 LBS.

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

2 C-3 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

RADIO 4449 B71+B85

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4449 B71+B85	17.9"L x 13.2"W x 9.5"D	±75 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 C-4 PROPOSED RRU DETAIL

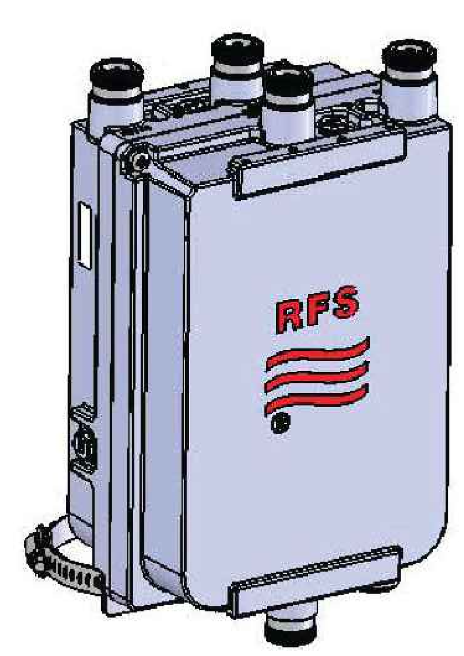
SCALE: NOT TO SCALE

DIPLEXER			
EQUIPMENT	DESCRIPTION	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: KRY-112 144/1	TWIN STYLE 1B	12.5"H x 5.6"W x 3.7"D	13.2 LBS.

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

4 C-3 TMA DETAIL

SCALE: NOT TO SCALE

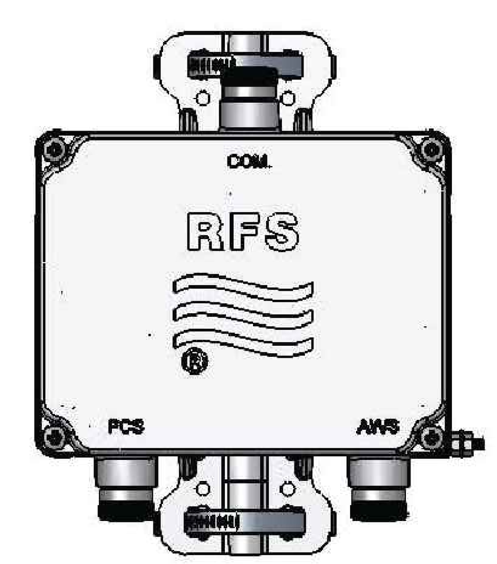


TMA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: ATMA4P4DBP-1A20	13.7"H x 7.98"D x 5.42"W	10 LBS.

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

5 C-3 TMA DETAIL

SCALE: NOT TO SCALE



DIPLEXER			
EQUIPMENT	DESCRIPTION	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: FDAP5002/1A20	DIPLEXER PCS/AWS	4.3"H x 9.4"W x 3.5"D	9.7 LBS.

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

6 C-3 DIPLEXER DETAIL

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.

7 C-3 PROPOSED BIAS-T DETAIL

SCALE: NOT TO SCALE

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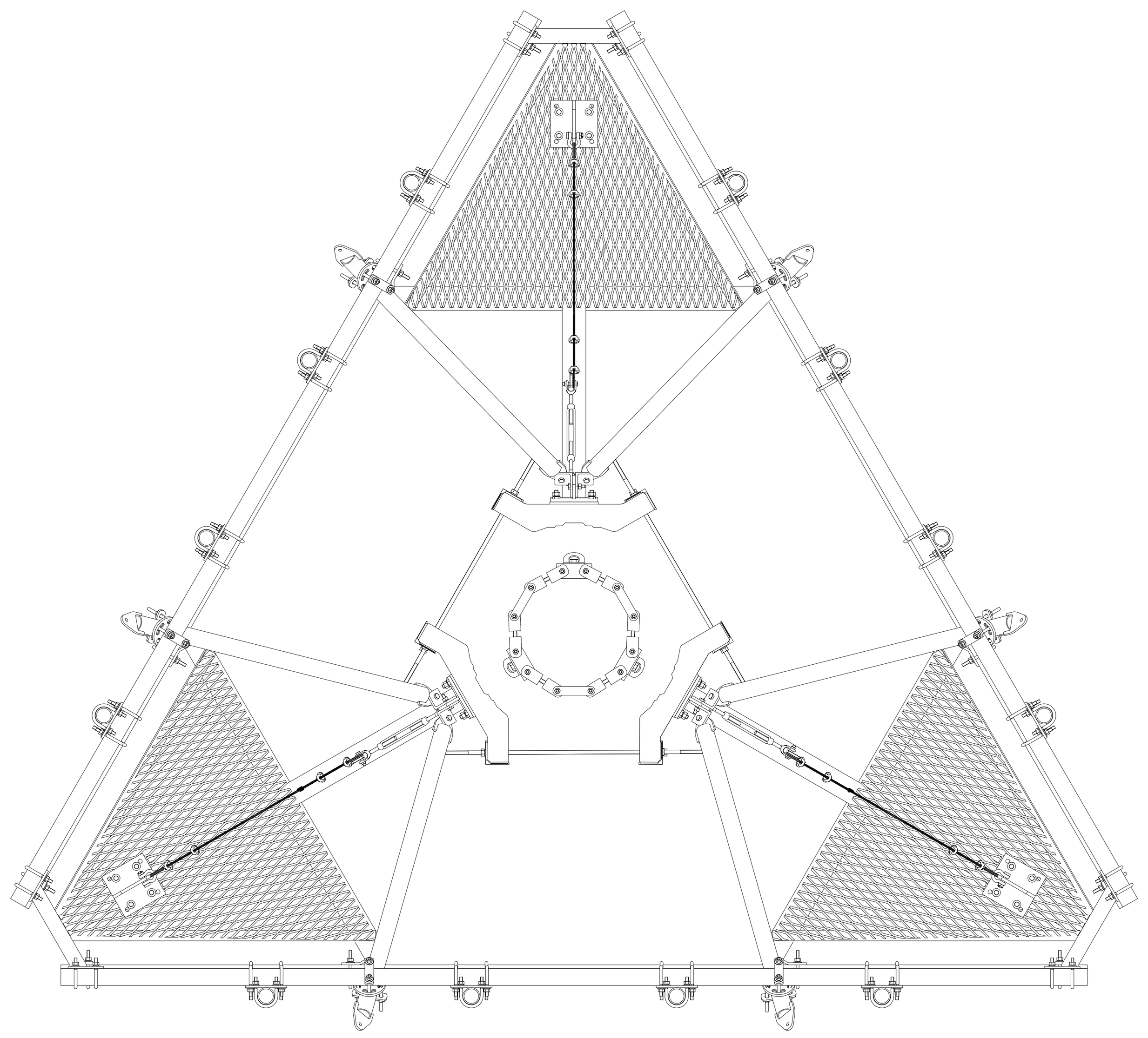
TYPICAL EQUIPMENT DETAILS

C-3

SHEET NO. 5 OF 11

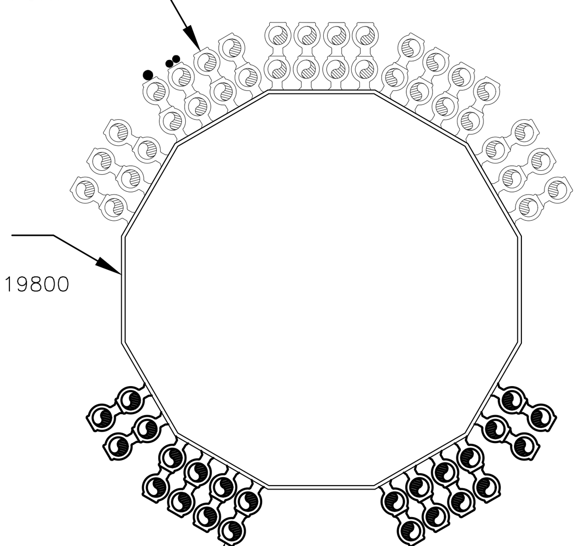


SITEPRO1:
RMQLP-496-HK

1 (C-4) PLATFORM ANTENNA MOUNT DETAIL
SCALE: NOT SCALE

AT&T (36) 1-5/8" ø COAX CABLES, ONE (1) FIBER CABLE AND TWO (2) DC CABLES MOUNTED ON CLUSTER SUPPORT BRACKETS

136' TALL STEEL UTILITY POLE STRUCTURE NO. 19800



T-MOBILE (24) 7/8" ø COAX CABLES MOUNTED ON CLUSTER SUPPORT BRACKETS

2 (C-4) COAX CABLE PLAN
SCALE: NOT TO SCALE

SITE PRO UNIVERSAL CANTILEVER & GRIP STRUT BRIDGE CHANNEL CUT TO LENGTH

ANTENNA CABLES. ARRANGEMENT BY CONTRACTOR.

SITE PRO UNIVERSAL VERTICAL TRAPEZE KIT, MAXIMUM CABLE SPAN = 3'-0". TYPICAL.

ICE BRIDGE SUPPORT POST. CUT POST LENGTH IN FIELD BY REMOVING UNCAPPED END. REFER TO SITE PRO FOR RECOMMENDED POST SPACING & SPECIFICATIONS.

1" CHAMFER (TYP.)

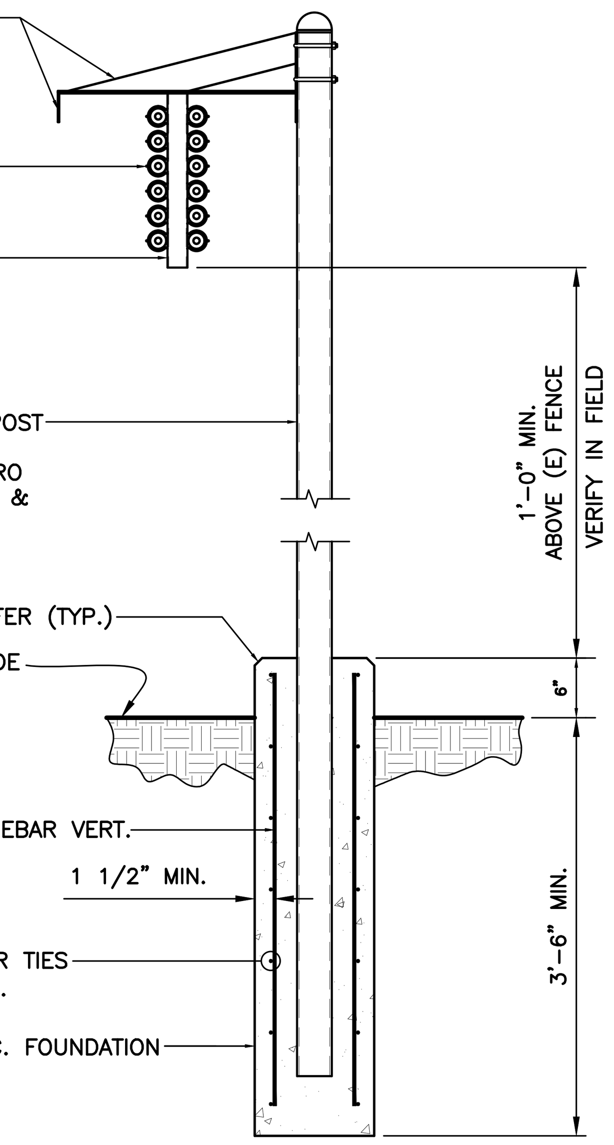
FIN. GRADE

(6) #4 REBAR VERT.

1 1/2" MIN.

#3 REBAR TIES @ 8" o.c.

12" CONC. FOUNDATION (TYP.)



3 (C-4) TYPICAL ICE-BRIDGE DETAIL
SCALE: NOT TO SCALE

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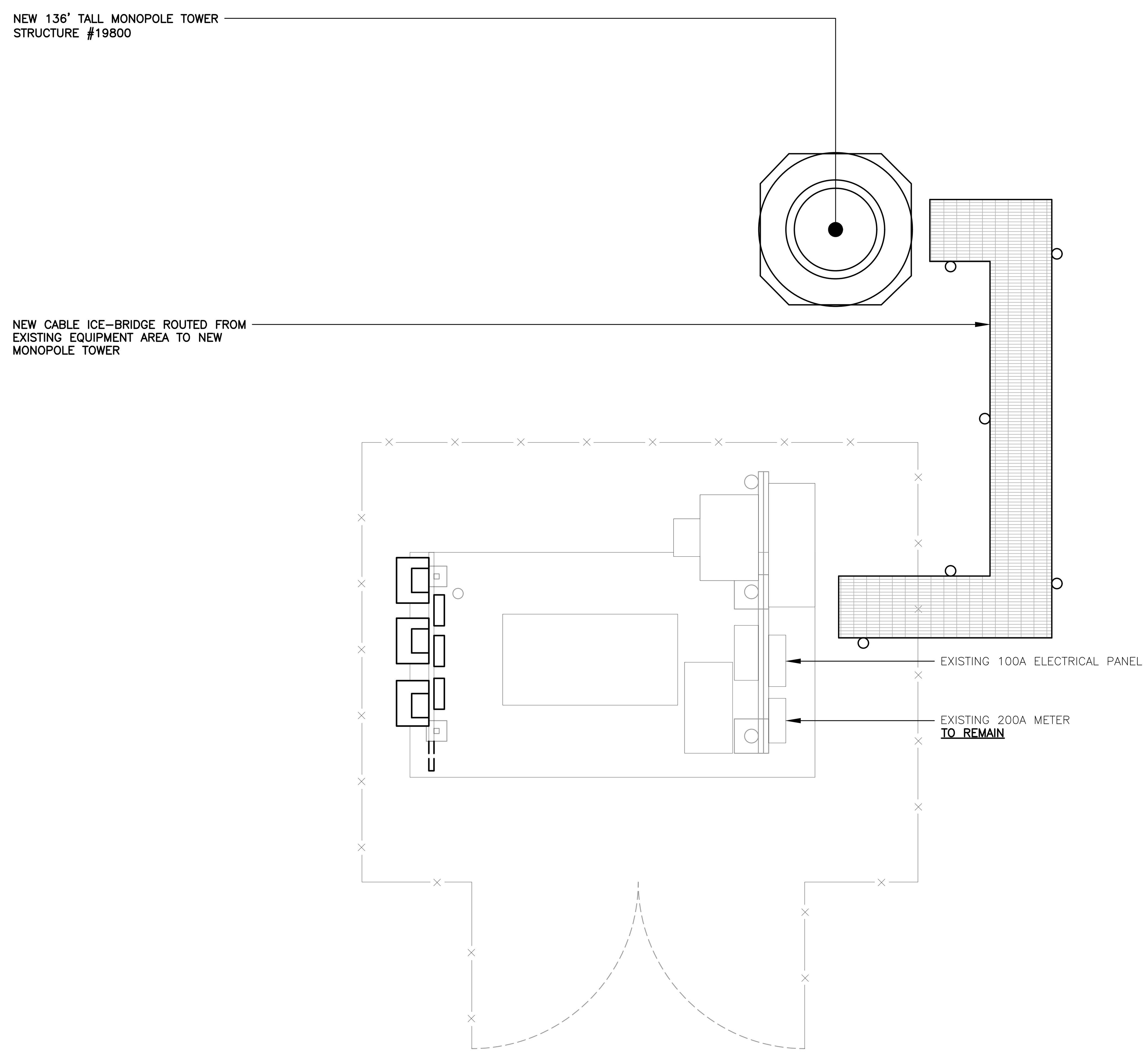
TYPICAL EQUIPMENT DETAILS

C-4

SHEET NO. 5 OF 11



1 / E-1 **ELECTRICAL COMPOUND PLAN**

SCALE: NOT SCALE

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ELECTRICAL COMPOUND PLAN

E-1

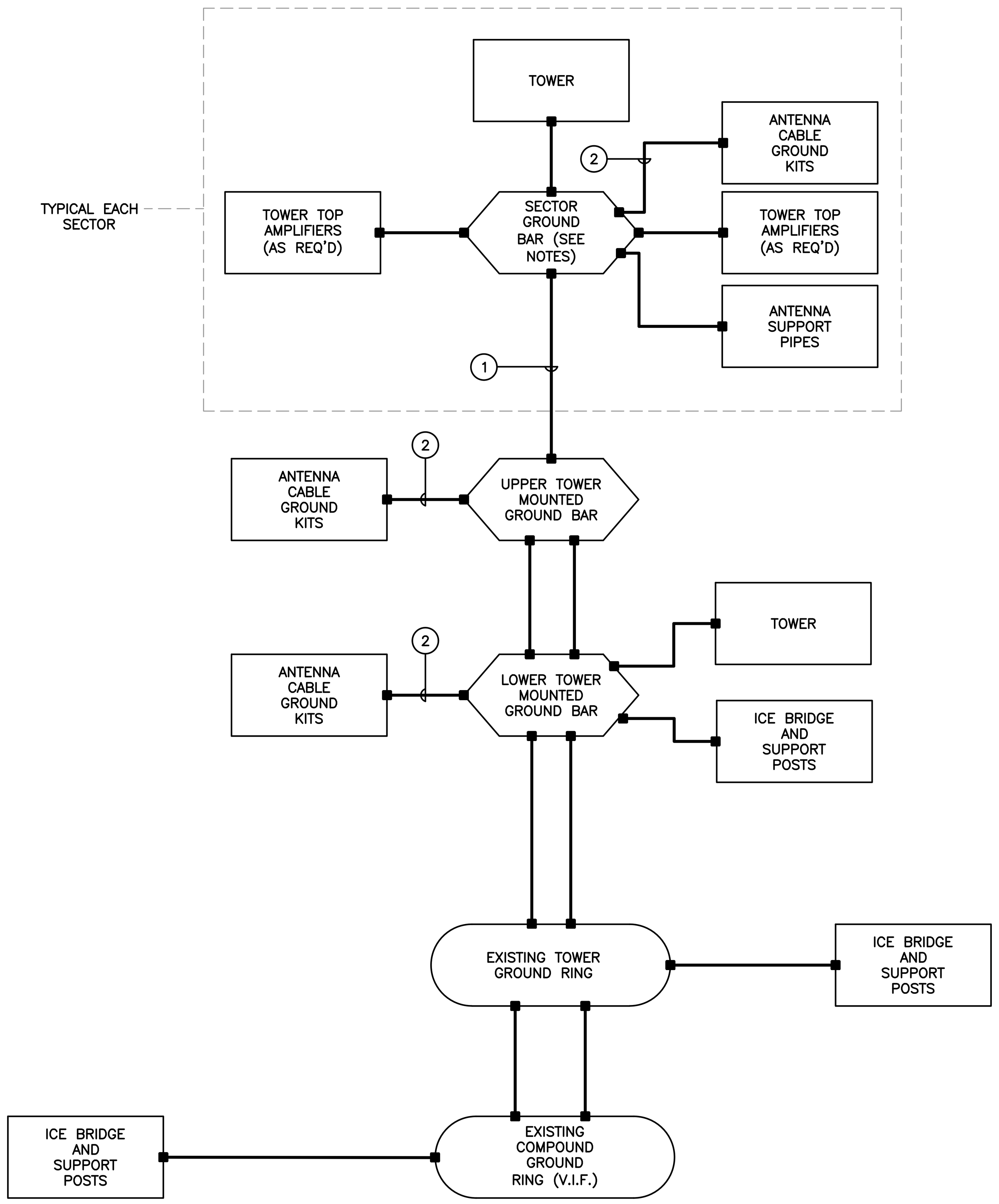
SHEET NO. 6 OF 11

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.



1 / E-2 ELECTRICAL GROUNDING SCHEMATIC
SCALE: NOT TO SCALE

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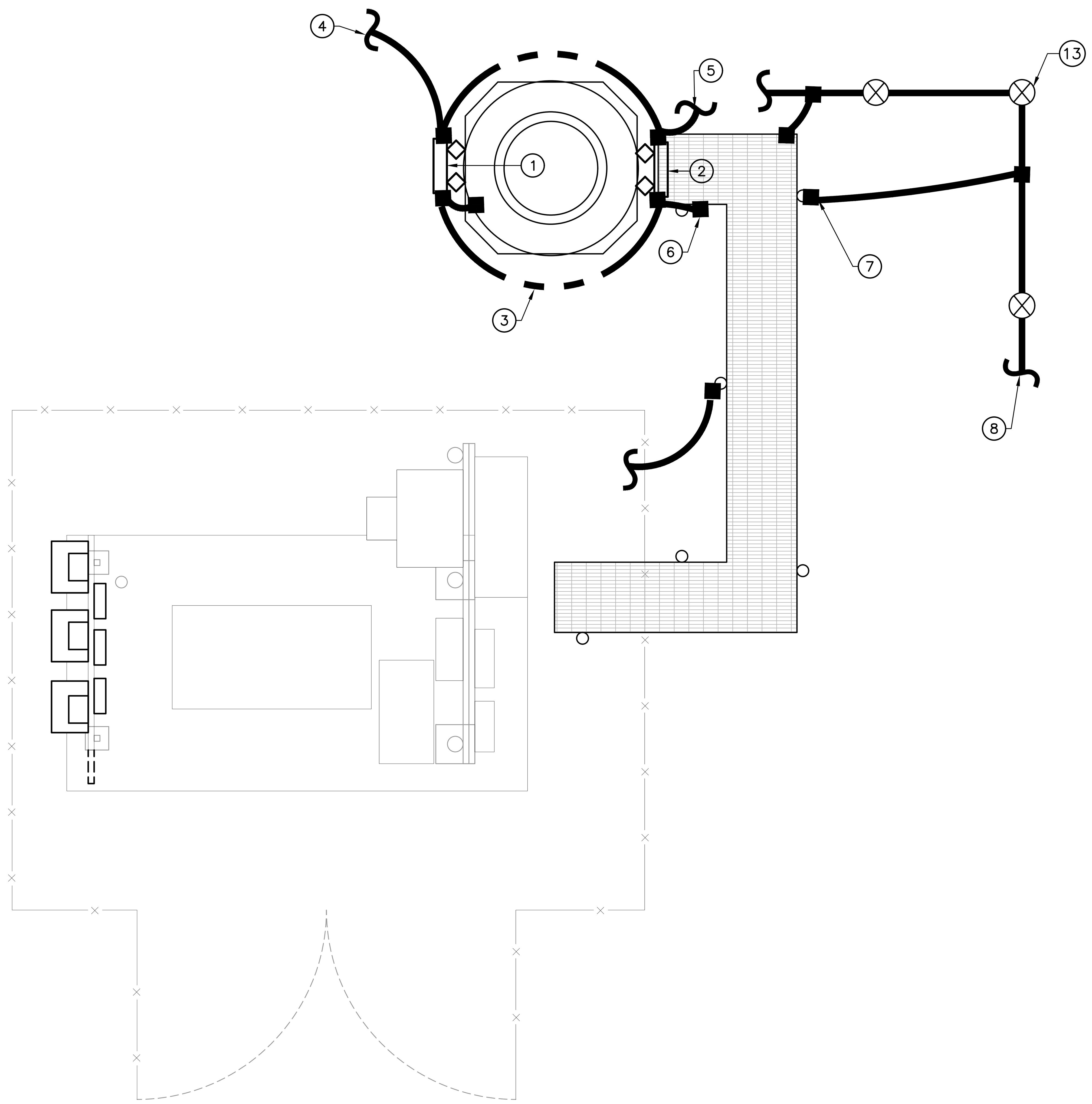
ELECTRICAL SCHEMATIC DIAGRAM

E-2

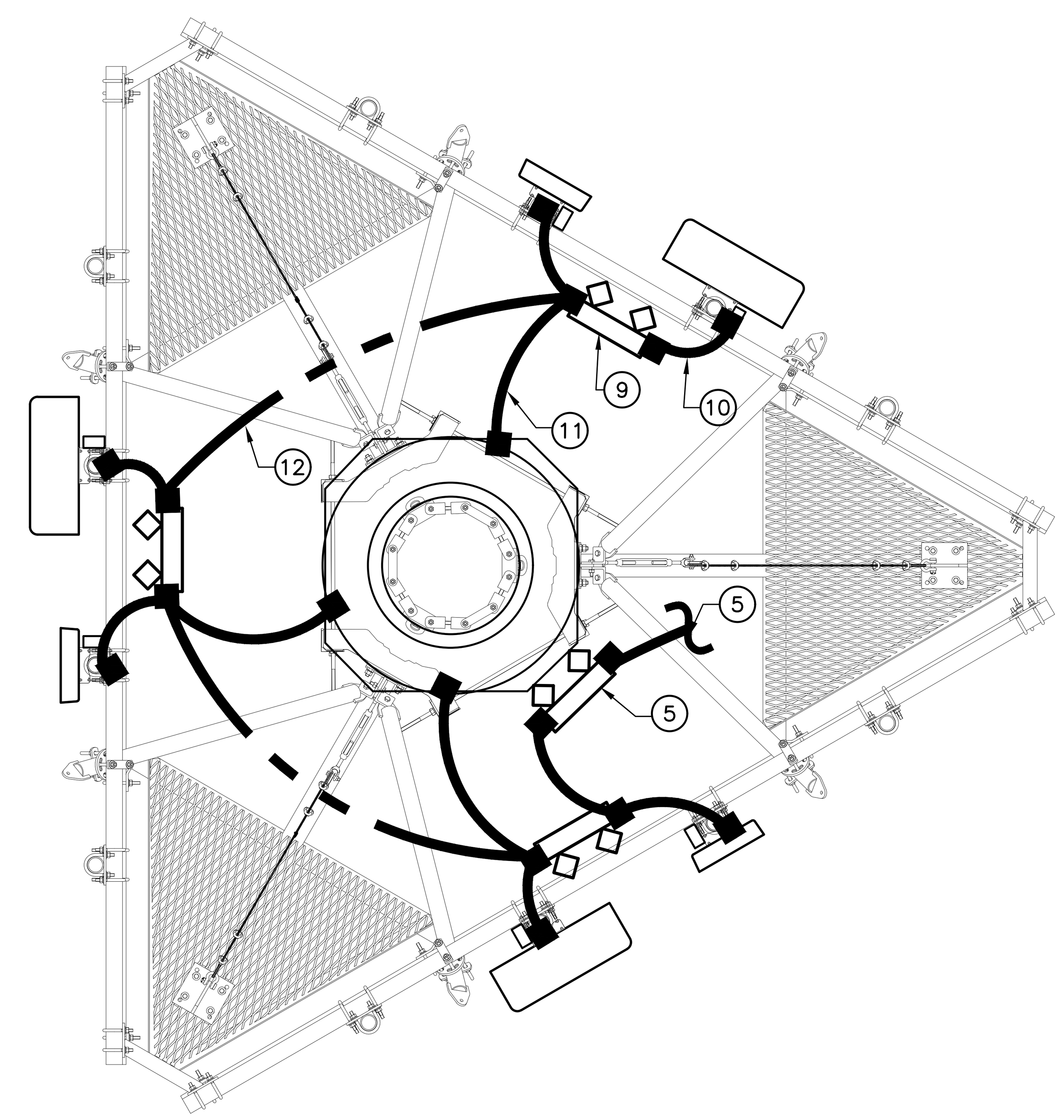
SHEET NO. 7 OF 11

GROUNDING PLAN NOTES

1. LOWER TOWER MOUNTED GROUND BAR TYP.
2. UPPER TOWER MOUNTED GROUND BAR TYP.
3. BOND UPPER TOWER MOUNTED GROUND BAR TO LOWER TOWER MOUNTED GROUND BAR TYP. 2 GROUND LEADS.
4. BOND LOWER TOWER MOUNTED GROUND BAR TO EXISTING TOWER GROUND RING TYP. 2 LEADS
5. BOND UPPER TOWER MOUNTED GROUND BAR TO SECTOR GROUND BAR TYP.
6. BOND GROUND BAR TO ICE-BRIDGE TYP.
7. ICE BRIDGE POST AND COVER. BOND EACH SECTION AND SUPPORT TO GROUND RING.
8. BOND TOWER GROUND RING TO EXISTING COMPOUND GROUND RING WITH #2 AWG BCW TYP. 2. VERIFY LOCATION OF EXISTING GROUND RING IN FIELD.
9. SECTOR GROUND BAR TYP.
10. BOND ANTENNA MOUNTING PIPES TO SECTOR GROUND BAR. (TYPICAL)
11. BOND SECTOR GROUND BAR TO TOWER STEEL.
12. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
13. GROUND ROD TYP.



2 E-3 **ELECTRICAL GROUNDING PLAN - TOWER**
SCALE: NOT TO SCALE



1 E-3 **ELECTRICAL GROUNDING PLAN - ANTENNA**
SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
1	07/05/23	ASC	TJR	CONSTRUCTION DRAWINGS – REVISED PER EVERSOURCE COMMENTS
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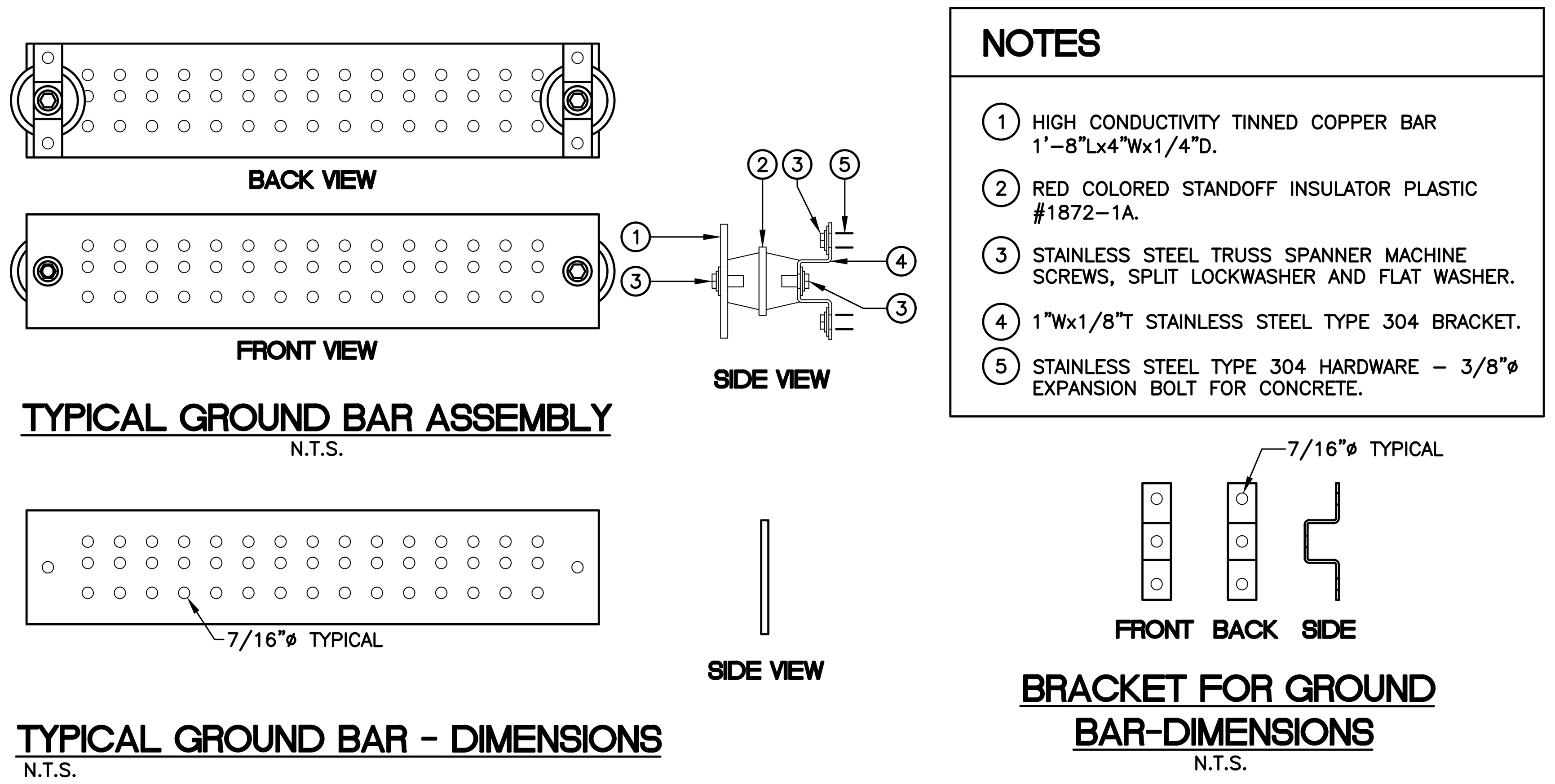
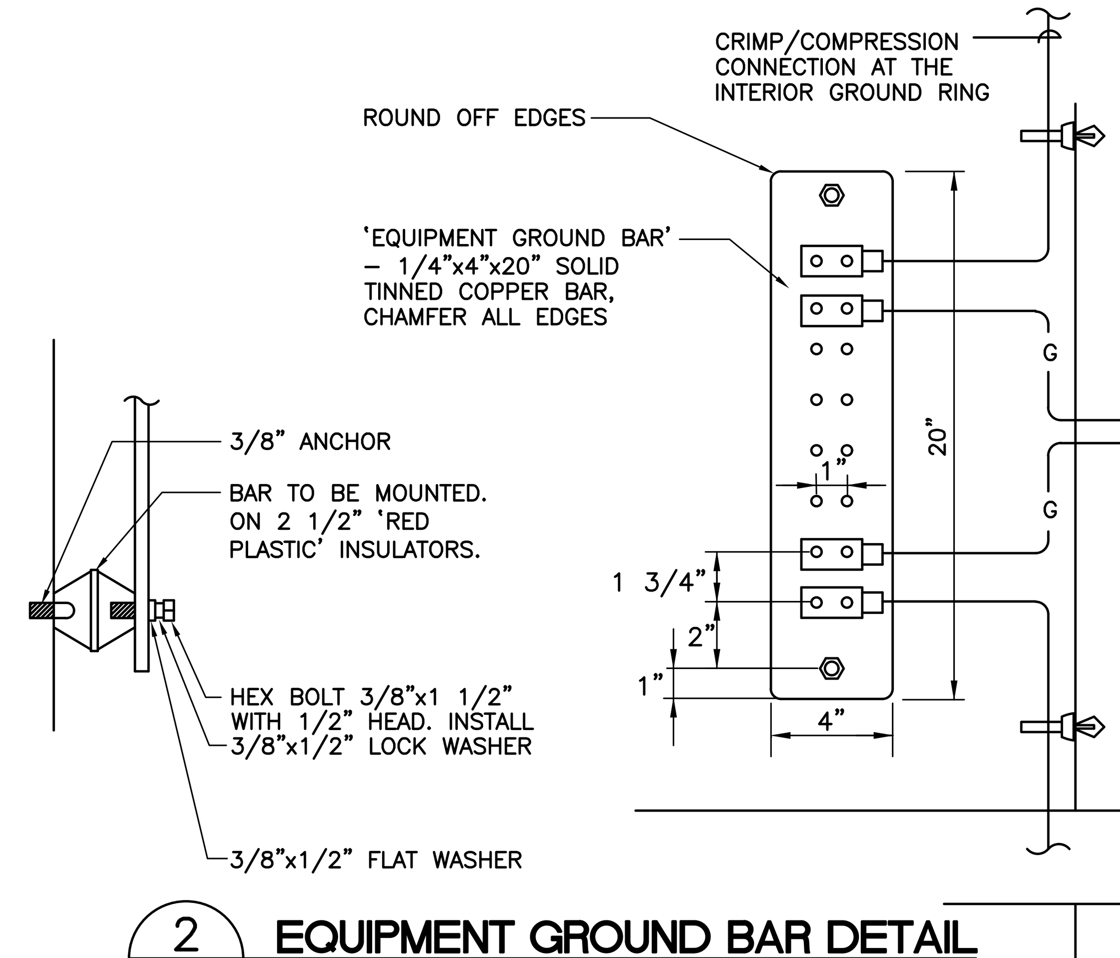
ELECTRICAL GROUNDING PLANS

E-3

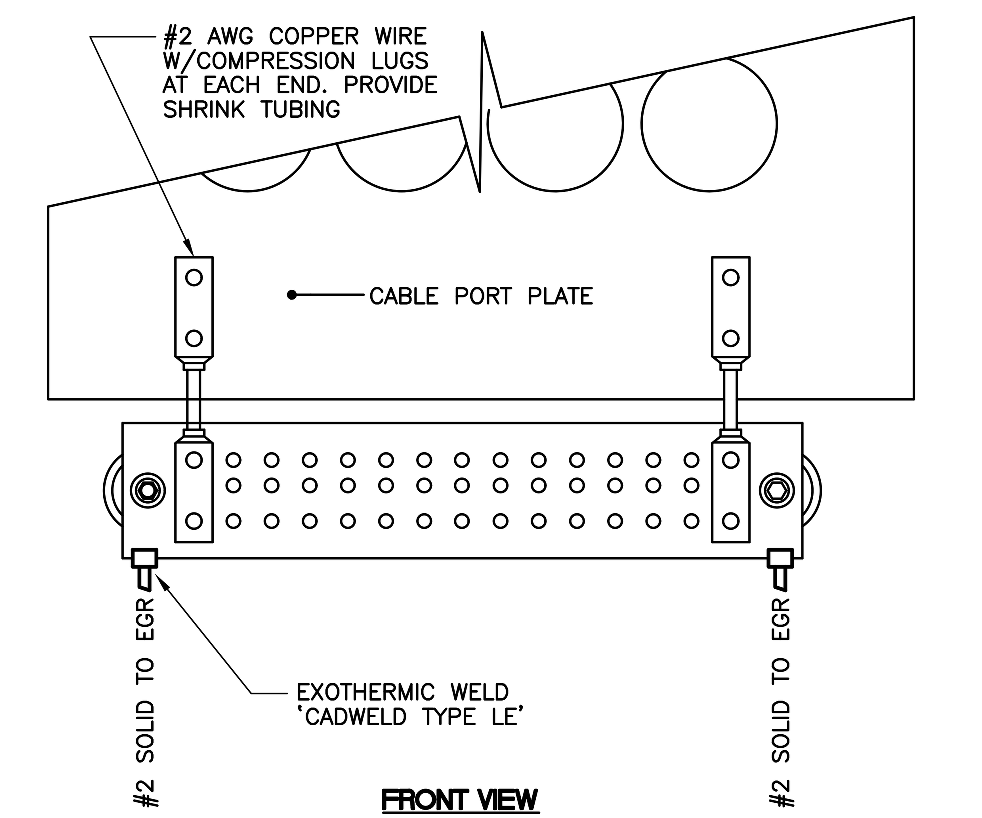
SHEET NO. 8 OF 11



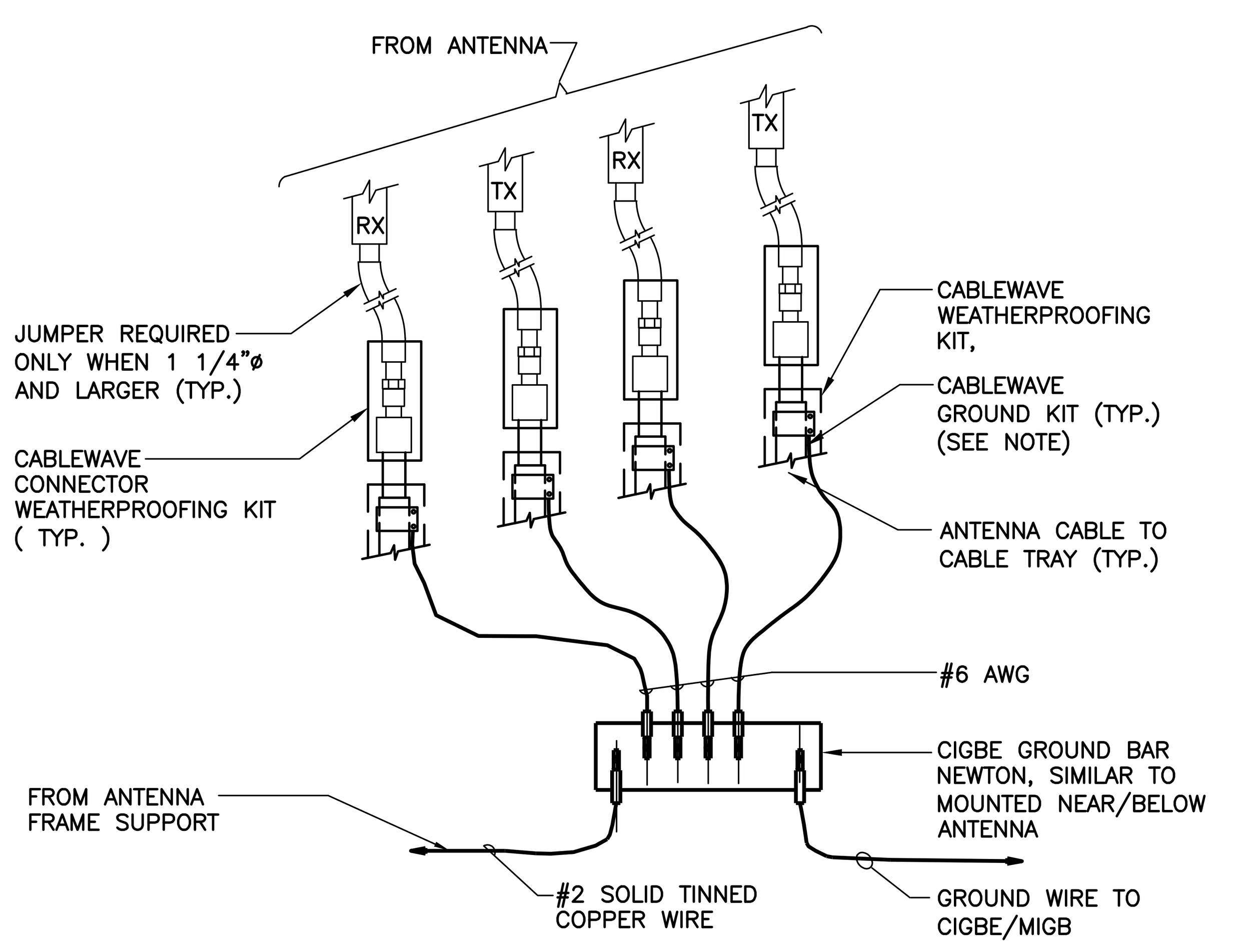
1 E-4 **MASTER/EQUIPMENT GROUND BAR DETAILS**
SCALE: NOT TO SCALE



2 E-4 **EQUIPMENT GROUND BAR DETAIL**
SCALE: NOT TO SCALE



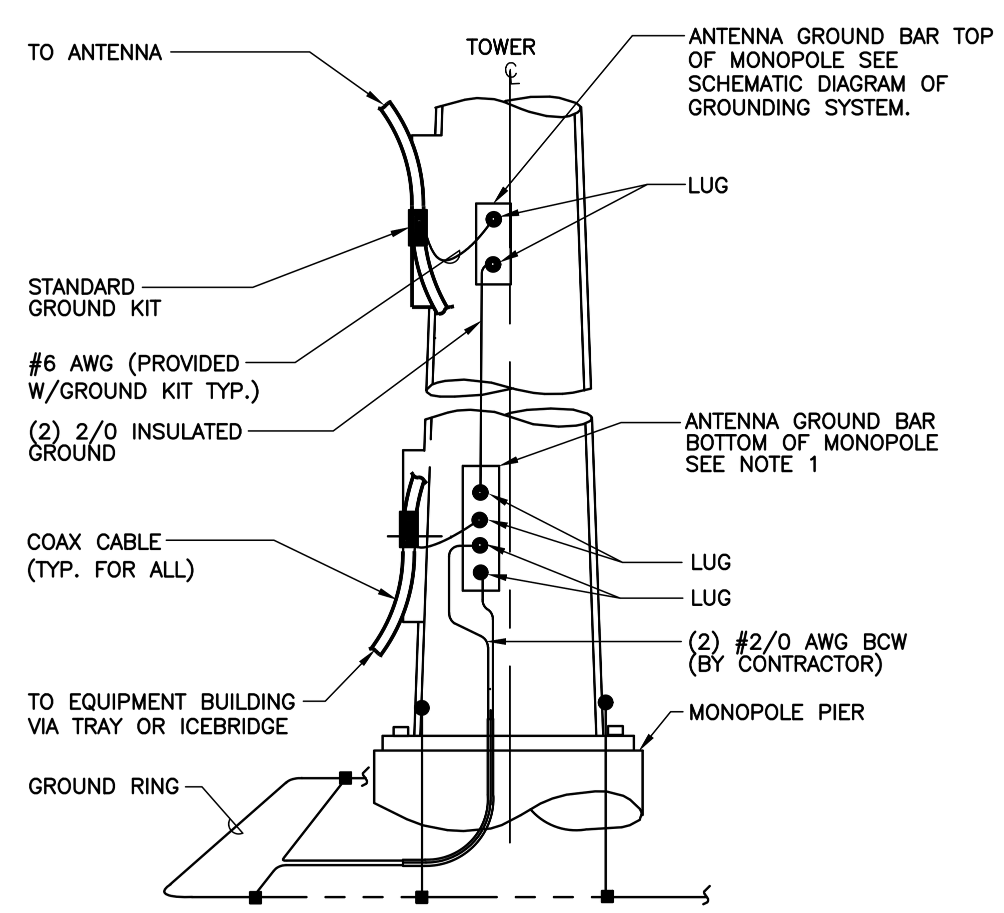
3 E-4 **CABLEPORT GROUND BAR LUG CONNECTION**
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE

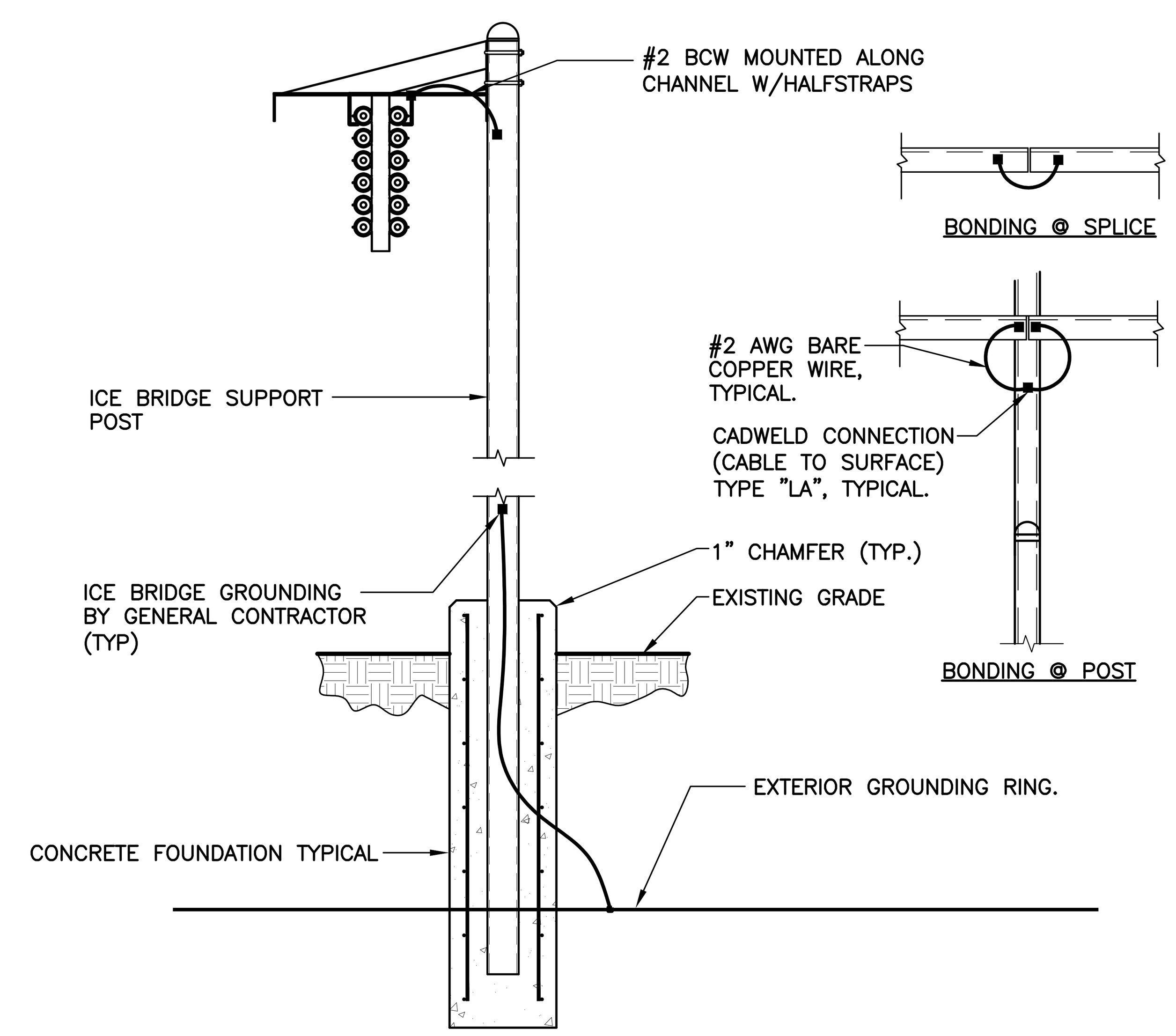
4 E-4 **CONNECTION OF GROUND WIRES TO GROUND BAR**
SCALE: NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER, LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS ANTENNA IF REQUIRED.

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



6 E-4 **ICE BRIDGE BONDING DETAIL**
SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-4

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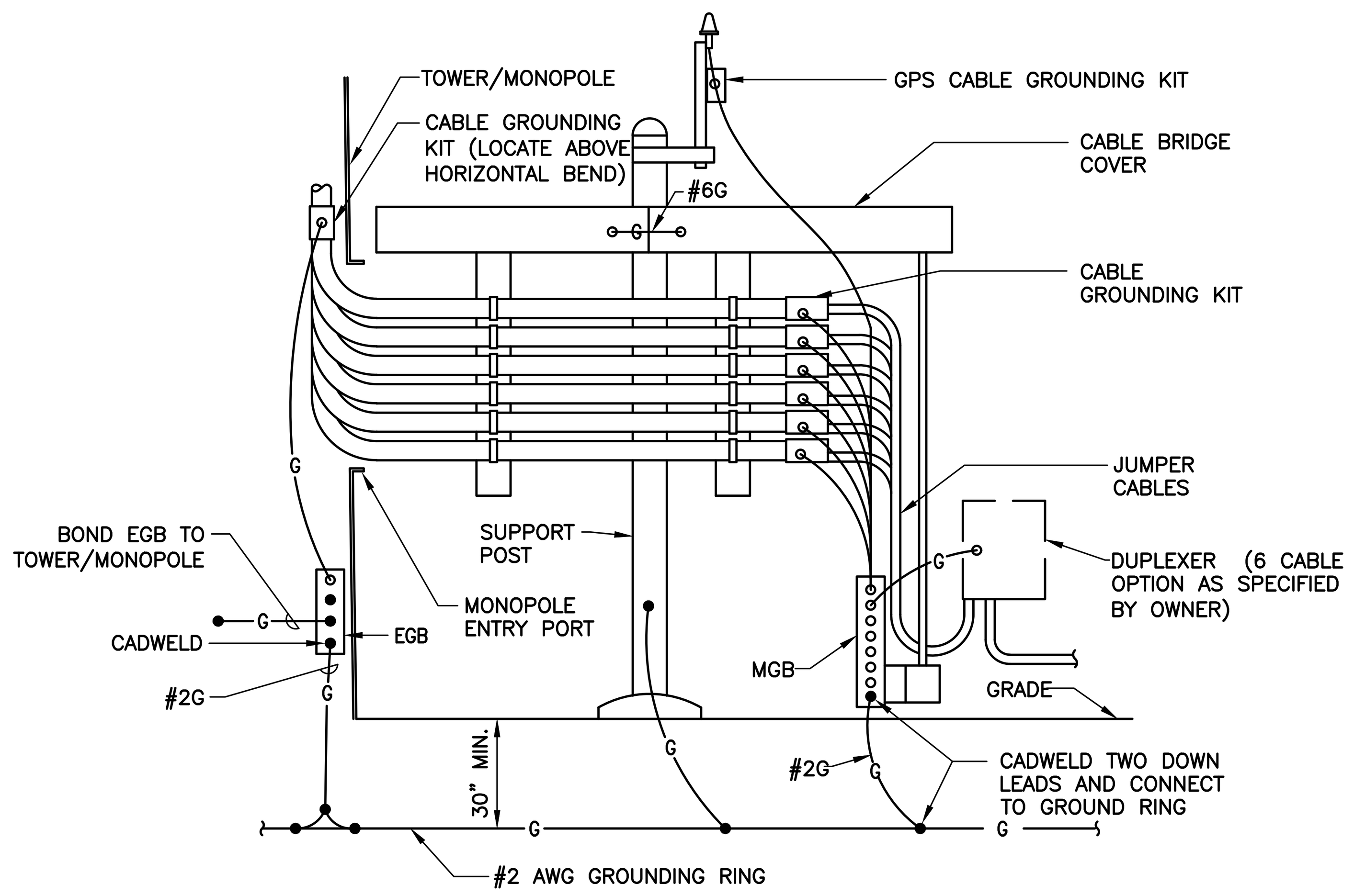
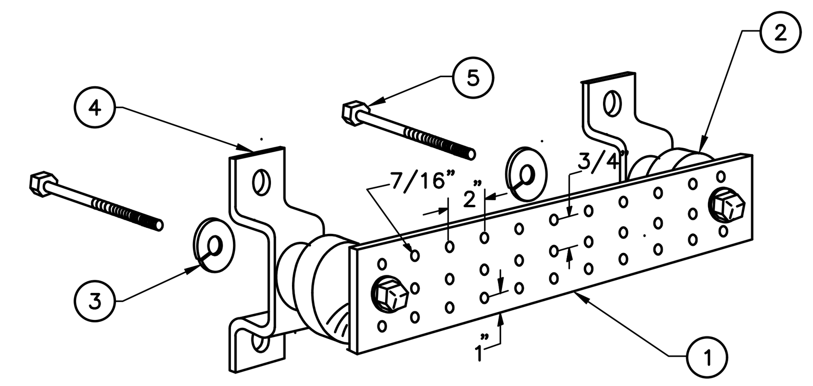


1 / E-5 **CABLE BRIDGE GROUNDING DIAGRAM**

SCALE: NOT TO SCALE

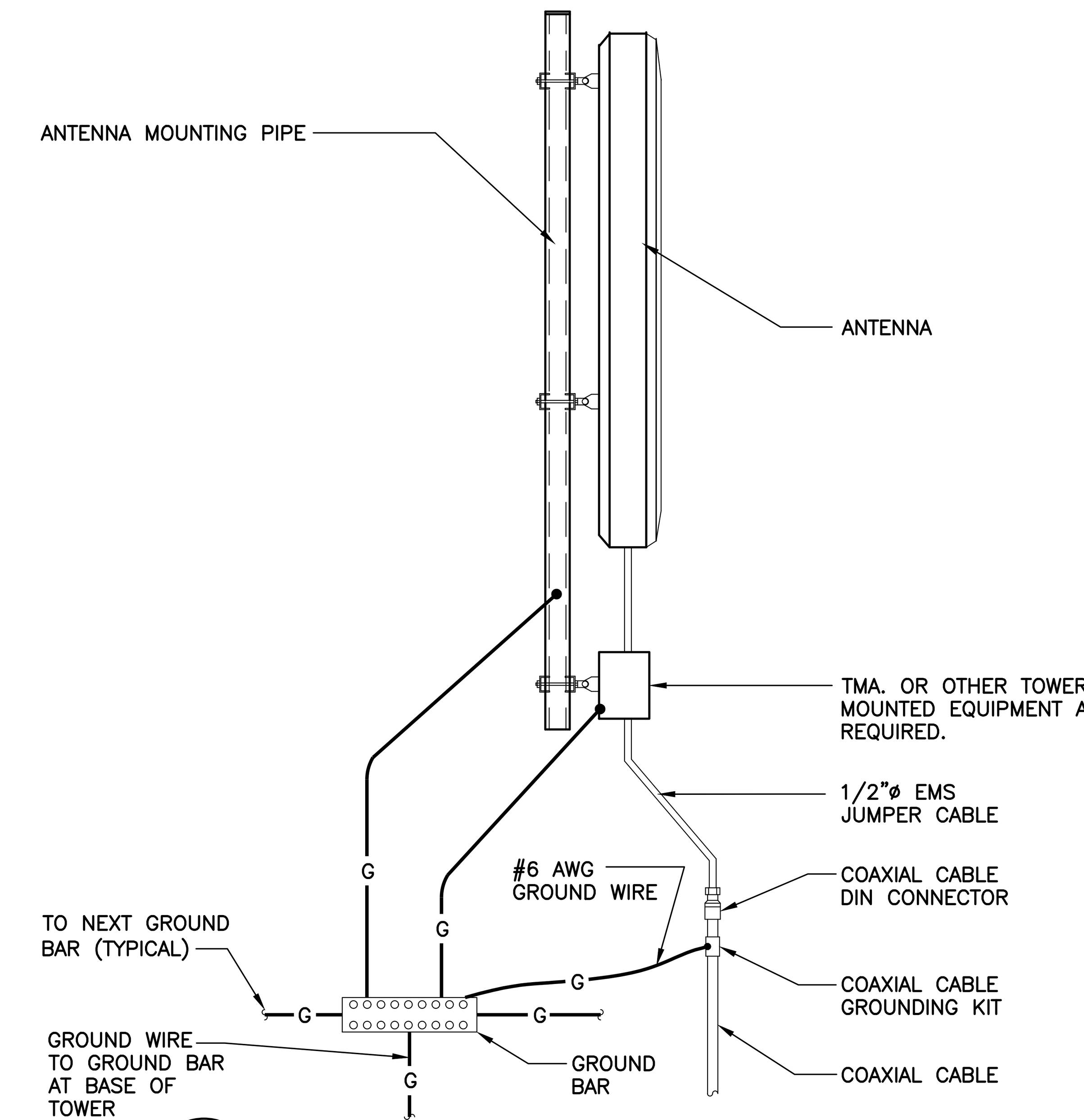


NOTES

1. TINNED 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.

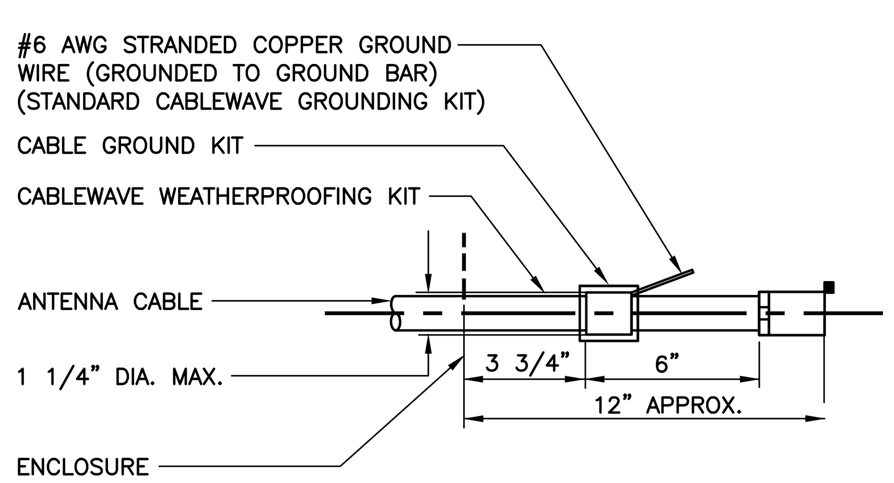
2 / E-5 **GROUND BAR DETAIL**

SCALE: NOT TO SCALE



3 / E-5 **TYPICAL ANTENNA GROUNDING DETAIL**

SCALE: NOT TO SCALE



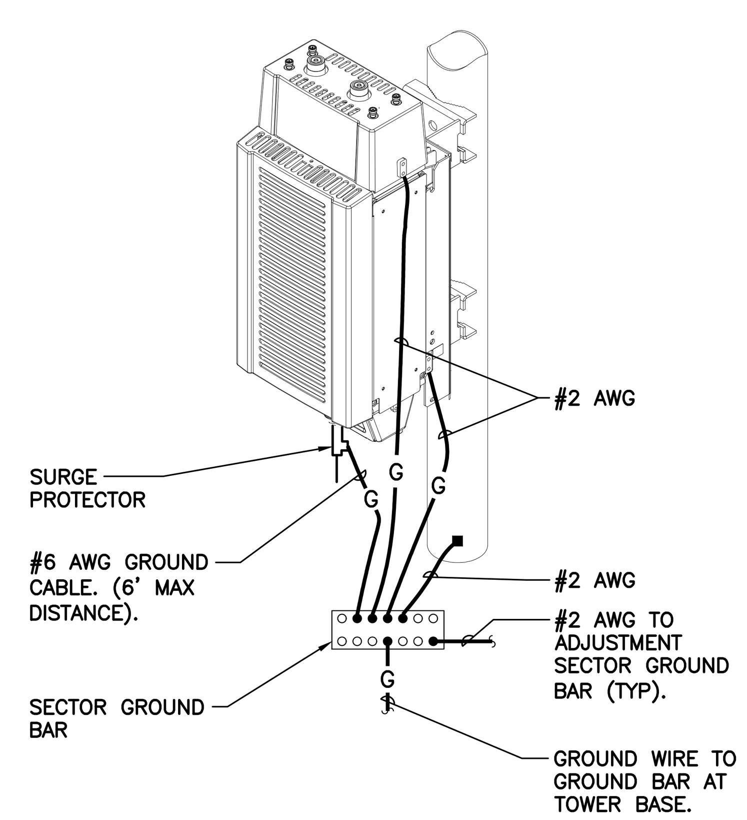
NOTES:

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

4 / E-5 **ANTENNA CABLE GROUNDING DETAIL**

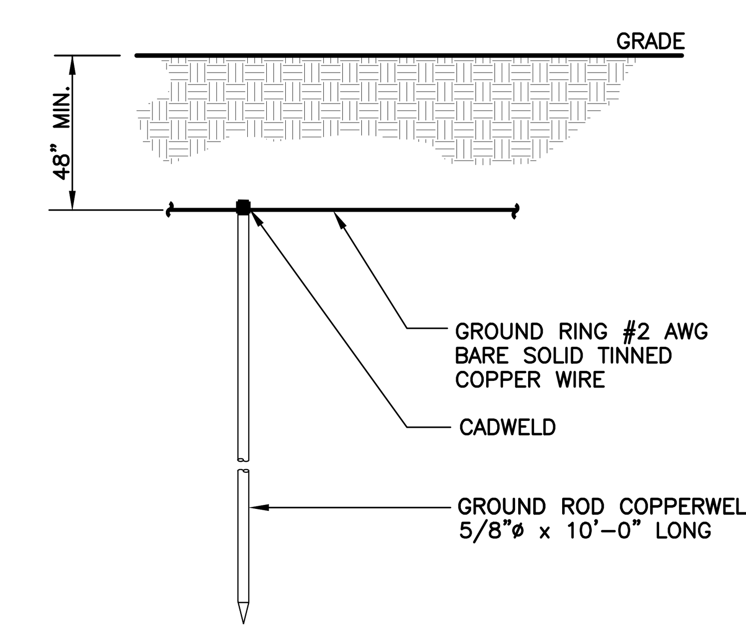
SCALE: NOT TO SCALE

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



5 / E-5 **RRH POLE MOUNT GROUNDING**

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.

6 / E-5 **GROUND ROD DETAIL**

SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-5

SHEET NO. 10 OF 11

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

F. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

G. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

H. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

I. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

J. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

K. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

L. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

M. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.

2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

N. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUITS

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH (PER NEC TABLE 300.5) [2,3]
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH – INTERMATIC #FF15M (INTERIOR LIGHTS)

2. DUPLEX RECEPTACLE – P&S #2095 (GFCI) SPECIFICATION GRADE

3. SINGLE POLE SWITCH – P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE

4. DUPLEX RECEPTACLE – P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES – ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.

2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.

2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.

3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS

2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).

3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.

2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.

3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE CONNECTED TO THE PANELBOARDS SO THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
1	07/05/23	ASC	TJR	CONSTRUCTION DRAWINGS – REVISED PER EVERSOURCE COMMENTS
0	06/21/23	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION
B	04/14/23	ASC	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CLIENT REVIEW
A	08/10/22	JLD	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

STATE OF CONNECTICUT
CARLO F. CENTORE
No. 16694
LICENSED
PROFESSIONAL ENGINEER

T-Mobile

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T-MOBILE NORTHEAST LLC

SITE NAME: WILTON/RT 33
SITE ID: CT11296A
144 CHESTNUT HILL RD (RTE-53)
WILTON, CT 06897

DATE: 08/10/22
SCALE: AS NOTED
JOB NO. 22073.01

ELECTRICAL SPECIFICATIONS

E-6

Exhibit D

Structural Analysis Report

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Utility Pole

T-Mobile Site Ref: CT11296A

Eversource Structure No. 19800
136' Tall Electric Transmission Pole

144 Chestnut Hill Road
Wilton, CT

CENTEK Project No. 22073.01

~~Date: April 5, 2023~~
Rev 2: June 2, 2023

Max Stress Ratio = 91.3%

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29536
LICENSED
PROFESSIONAL ENGINEER

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

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

Introduction

The purpose of this report is to analyze the 136' utility pole located in Wilton, CT for the proposed antenna and equipment upgrade by T-Mobile.

The loads consist of the following:

- AT&T (Final Configuration):
  Antennas: Three (3) CCI TPA65R-BU8D panel antennas, three (3) Ericsson AIR6419 panel antennas (FUTURE), three (3) Ericsson AIR6449 panel antennas, three (3) CCI OPA65R-BU8D panel antennas, eighteen (18) CCI TMABPD7823VG12A TMAs and one (1) DC9 surge arrestor mounted on one (1) Platform (SitePro p/n RMQLP-4120-H10) to the utility pole with a RAD center elevation of 132-ft above grade.
  Cables: Thirty-six (36) 1-5/8" ∅ 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 APXVAARR24_43 panel antennas, three (3) RFS APX16DWV-16DWVS panel antennas and six (6) 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 120-ft above grade.
  Cables: Twenty-four (24) 7/8" ∅ 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.

Analysis

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.

Design Basis

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, Section25, 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 **87.10%** occurs in the utility pole shaft 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	69.00' -110.00' (AGL)	87.10%	**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	85.60%	**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	85.9%	**PASS**
Flange Plate	Bending	75.6%	**PASS**

- FOUNDATION AND ANCHORS

The base of the tower is connected to the foundation by means of (36) 2.25"∅, 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	99.22 kips	139.84 kips	8988.63 ft-kips
NESC Extreme Wind	128.52 kips	72.97 kips	11573.57 ft-kips
NESC Extreme Ice w/ Wind	99.14 kips	115.87 kips	9026.19 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	73.5%	**PASS**

FOUNDATION:

Force	Original Design Loading	Proposed Loading	Result
Moment	13,944 ft-kips	12,732 ft-kips	**PASS**
Shear	167.2 kips	141.4 kips	**PASS**

Note 1: Taken from Sabre design calculations.
Note 2: 10% increase applied to PLS base reactions used in foundation verification per OTRM 051.

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.

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
Ice Condition	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
Ice Condition	NESC Heavy	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
Ice Condition	NESC Heavy	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
High Wind Condition	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
High Wind Condition	NESC Extreme Wind	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
High Wind Condition	NESC Extreme Wind	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
NESC Extreme Ice with Wind Condition*		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
NESC Extreme Ice with Wind Condition*		Conductors:	Conductor Loads Provided by ES					
NESC Extreme Ice with Wind Condition*		*Only for structures installed after 2007						

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.

Northeast Utilities System

Wire Loads

Project Name	1637/1720 Line Rebuild		
Work Order	80138960		
Structure #	PCS-1 (See Structure Drawing 01002-40011)		
Line #	1637/1720		
Prepared By	GJG	Date	9/12/2022
Checked By	JFAP	Date	9/12/2022

Structure Data			
Structure Height (AGL)	136	Load Zone	Central CT
# of Circuits	2	Insulation Type	Suspension (Concrete Foundation
Insulator Weight	150	Broken Wire Side	Back
Broken Wire Side	Left	Structure Type	Double Circuit Steel Pole

Wire Data		
Circuit #	Left	Right
Shield Wire	FOCAS-120	FOCAS-120
Conductor	FALCON/ACSS	FALCON/ACSS
# of Conductors	1	1

Line Geometry	Circuit 1			Circuit 2		
	Ahead	Back	Total	Ahead	Back	Total
Wind Span	350	350	700	350	350	700
Weight Span	400	400	800	400	400	800
Minimum Line Angle	3	3	6	3	3	6
Maximum Line Angle	20	20	40	20	20	40

Wire Tensions	Left Circuit		Right Circuit		
	Ahead	Back	Ahead	Back	
NESC Rule 250B	14000	14000	14000	14000	Conductor
NESC Rule 250C	13749	13749	13749	13749	Conductor
NESC Rule 250D	17458	17458	17458	17458	Conductor
60°F, No wind or ice	7363	7363	7363	7363	Conductor
NESC Rule 250B	6000	6000	6000	6000	Shield Wire
NESC Rule 250C	6349	6349	6349	6349	Shield Wire
NESC Rule 250D	7976	7976	7976	7976	Shield Wire
60°F, No wind or ice	2304	2304	2304	2304	Shield Wire

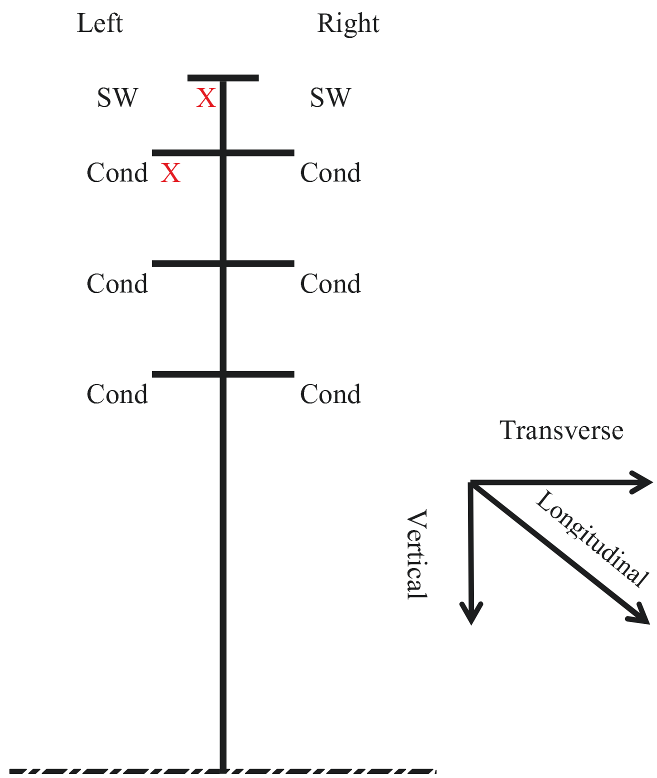
All Loads include Overload Factors but not Pole Shape Factors

Load Case	Description
1	NESC Rule 250B; 0°F, ½" of ice, 4 psf wind
2	NESC Rule 250C; (Extreme Wind Loading)
3	NESC Rule 250C; Extreme Wind Longtitudinal On The Pole Only
4	NESC Rule 250D; 15°F 1" of ice, 4 psf or NU Ice Case; 32°F 1" Ice
5	NESC Rule 250B with no OLFs (Service Load)
6	60°F, No wind or Ice (Deflection)
7a	NESC Rule 250B/261C Broken Wire Case (Broken SW and Borken Conductor)
7b	NESC Rule 250B/261C Broken Wire Case (Broken SW or Broken Phase)

Northeast Utilities System

Wire Loads Load Tree

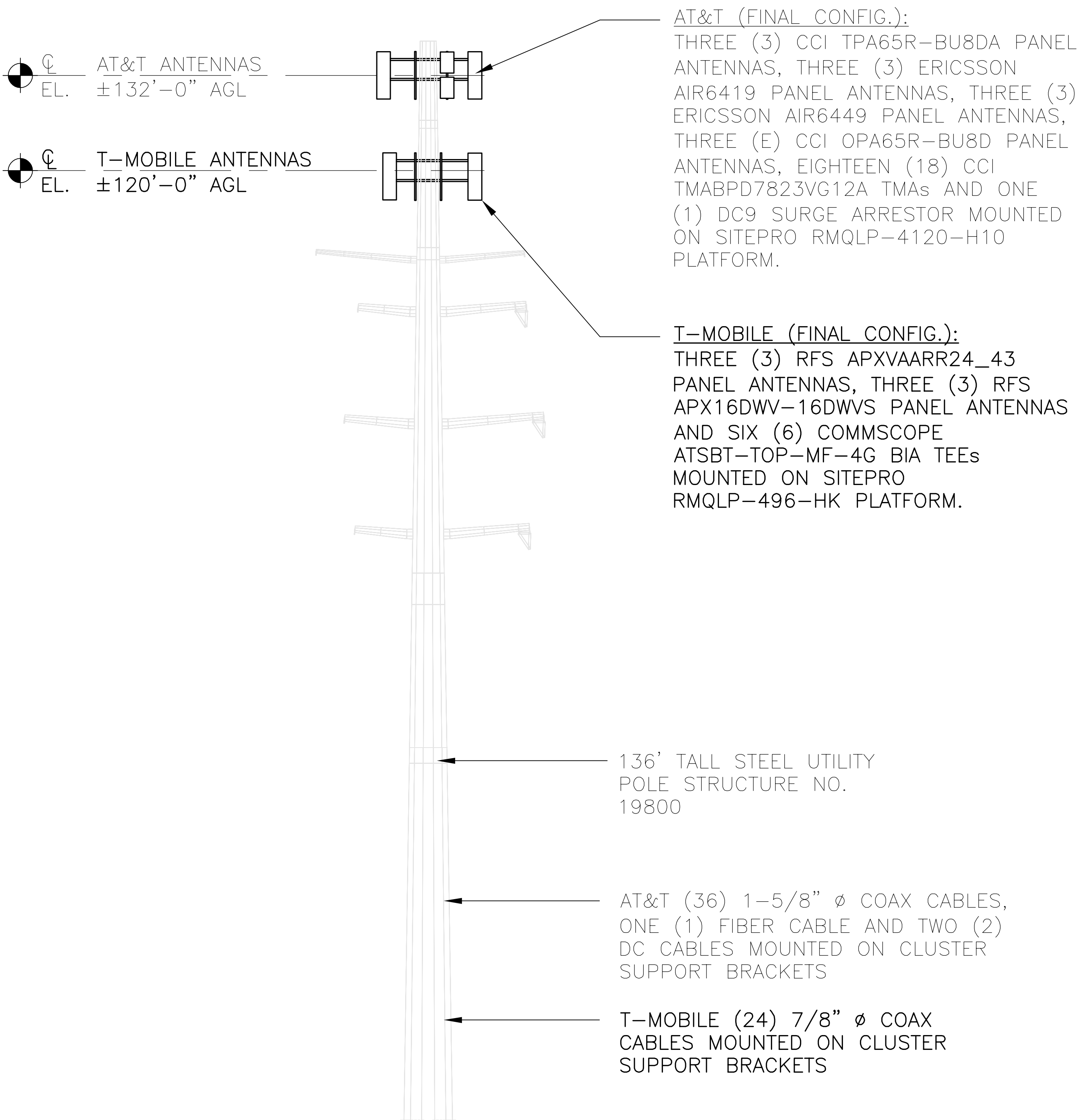
Project Number	
1637/1720 Line Rebuild	
Structure Number	
PCS-1 (See Structure Dr	
Line Number	
1637/1720	



Double Circuit Steel Pole Configuration
X Denotes Broken Wire Location. This attachment receives case 7 loads. All others receive Case 1 Loads for Case 7

	Left Circuit				Right Circuit			
	Case	Vertical	Transverse	Longitudinal	Case	Vertical	Transverse	Longitudinal
Conductor	1	4426.068	12118.804	0	1	4426.068	12118.804	0
	2	1933.12	12608.87	0	2	1933.12	12608.87	0
	3	1933.12	5036.5886	0	3	1933.12	5036.5886	0
	4	4465.904	12809.142	0	4	4465.904	12809.142	0
	5	2950.712	10210.397	0	5	2950.712	10210.397	0
	6	1933.12	5036.5886	0	6	1933.12	5036.5886	0
	7a	2213.034	6059.4019	15378.895	7a	2213.034	6059.4019	15378.895
	7b	2213.034	6059.4019	15378.895	7b	2213.034	6059.4019	15378.895
	Case	Vertical	Transverse	Longitudinal	Case	Vertical	Transverse	Longitudinal
Shield Wire	1	1545.6432	5528.4992	0	1	1545.6432	5528.4992	-388.9836
	2	414.4	5720.5718	0	2	414.4	5720.5718	-374.1905
	3	414.4	1576.0288	0	3	414.4	1576.0288	-135.7906
	4	2144.0576	6094.772	0	4	2144.0576	6094.772	-470.0808
	5	1030.4288	4509.7751	0	5	1030.4288	4509.7751	-353.6215
	6	414.4	1576.0288	0	6	414.4	1576.0288	-135.7906
	7a	772.8216	2764.2496	6590.9549	7a	772.8216	2764.2496	6201.9713
	7b	772.8216	2764.2496	6590.9549	7b	772.8216	2764.2496	6201.9713

**Conductor Load Case 8: Apply a strictly vertical point load of 25 kips at the conductor and arm interface of one string to quantify the impact of a tree strike. A 60 degree, no wind or ice wire loading with an overload factor of 1.0 is to be applied to all other arms.



1
SK–1

TOWER ELEVATION

SCALE: NOT TO SCALE

REVISIONS		
00	4/5/23	ISSUED FOR REVIEW
01	4/17/23	ISSUED FOR REVIEW
02	6/3/23	CONSTRUCTION

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CT11296A
STRUCTURE 19800

144 CHESTNUT HILL ROAD
WILTON, CT

PROJECT NO:	22073.01
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	4/5/23

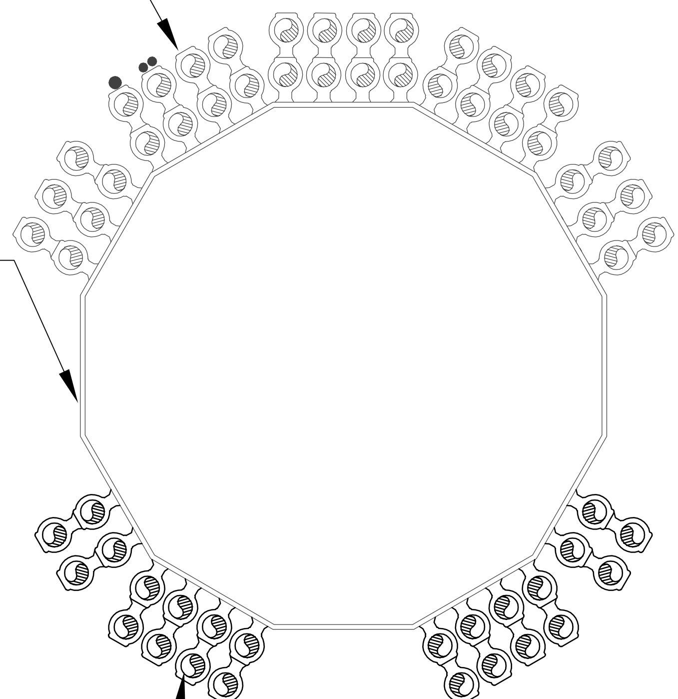
TOWER ELEVATION

SK-1

DWG. 1 OF 2

AT&T (36) 1-5/8" ø COAX CABLES, ONE (1) FIBER CABLE AND TWO (2) DC CABLES MOUNTED ON CLUSTER SUPPORT BRACKETS

136' TALL STEEL UTILITY POLE STRUCTURE NO. 19800



T-MOBILE (24) 7/8" ø COAX CABLES MOUNTED ON CLUSTER SUPPORT BRACKETS

1 / SK-2 COAX CABLE PLAN

SCALE: NOT TO SCALE

REVISIONS		
00	4/5/23	ISSUED FOR REVIEW
01	4/17/23	ISSUED FOR REVIEW
02	6/3/23	CONSTRUCTION

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CT11296A
STRUCTURE 19800

144 CHESTNUT HILL ROAD
WILTON, CT

PROJECT NO:	22073.01
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	4/5/23

FEELINE PLAN

SK-2

DWG. 2 OF 2

Basic Components

Heavy Wind Pressure =	$p := 4.00 \cdot psf$	(User Input NESC 2023 Figure 250-1 & Table 250-1)
Basic Windspeed =	$V := 110$ mph	(User Input)
Radial Ice Thickness =	$Ir := 0.50 \cdot in$	(User Input NESC 2023 Figure 250-1 & Table 250-1)
Radial Ice Density =	$Id := 56.0 \cdot pcf$	(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of Mast Above Grade = $TME := 136$ ft (User Input)

Multiplier Gust Response Factor = $m := 1.25$ (User Input - Only for NESC Extreme wind case)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.35$ (NESC 2023 Table 250-2)

Turbulence Intensity Constant = $C_{exp} := 0.2$ (NESC 2023 Table 250-3)

Integral Length Scale of Turbulence Constant = $L_s := 220$ (NESC 2023 Table 250-3)

Effective Height = $z_s := 0.67 \cdot TME = 91.12$ (NESC 2023 Table 250-3)

Turbulence Intensity = $I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.169$ (NESC 2023 Table 250-3)

Response Term = $B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.901$ (NESC 2023 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.838$ (NESC 2023 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot psf = 35.1 \cdot psf$ (NESC 2023 Section 250.C.1)

NESC Extreme Ice w/ Wind Components

Heavy Wind Pressure =	$p_{ex} := 6.4 \cdot psf$	(User Input NESC 2023 Figure 250-3 & Table 250-4)
Radial Ice Thickness =	$Ir_{ex} := 0.75 \cdot in$	(User Input NESC 2023 Figure 250-3)

Shape Factors

Shape Factor for Round Members =	$Cd_R := 1.3$	(User Input)
Shape Factor for Flat Members =	$Cd_F := 1.6$	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	$Cd_{coax} := 1.6$	(User Input)

Overload Factors

Overload Factors for Wind Loads:

NESC Heavy Loading =	**2.5**	(User Input)
NESC Extreme Loading =	**1.0**	(User Input)
NESC Extreme Ice with Wind Loading =	**1.0**	(User Input)

Overload Factors for Vertical Loads:

NESC Heavy Loading =	**1.5**	(User Input)
NESC Extreme Loading =	**1.0**	(User Input)
NESC Extreme Ice with Wind Loading =	**1.0**	(User Input)

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model = CCI TPA65-BU8D

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 96 \cdot in$ (User Input)

Antenna Width = $W_{ant} := 20.7 \cdot in$ (User Input)

Antenna Thickness = $T_{ant} := 7.7 \cdot in$ (User Input)

Antenna Weight = $WT_{ant} := 90 \cdot lb$ (User Input)

Number of Antennas = $N_{ant} := 3$ (User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant1} := WT_{ant} \cdot N_{ant} = 270 lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 15301 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 3011 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 98 lb$

Weight of Ice on All Antennas = $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 293 lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 4612 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 149 lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant1} := W_{ICE.exant} \cdot N_{ant} = 448 lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 14.6 ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 43.9 ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 281 lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 13.8 ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 41.4 ft^2$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 2902 lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 15 ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 45.1 ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant1} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} = 462 lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	Ericsson AIR6419 (Future)	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 31.1 \cdot in$	(User Input)
Antenna Width =	$W_{ant} := 16.1 \cdot in$	(User Input)
Antenna Thickness =	$T_{ant} := 7.3 \cdot in$	(User Input)
Antenna Weight =	$WT_{ant} := 56 \cdot lb$	(User Input)
Number of Antennas =	$N_{ant} := 3$	(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant2} := WT_{ant} \cdot N_{ant} = 168\,lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3655 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 901 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 29\,lb$

Weight of Ice on All Antennas = $Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 88\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 1394 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 45\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant2} := W_{ICE.exant} \cdot N_{ant} = 136\,lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 3.8\,ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 11.4\,ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 73\,lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 3.5\,ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 10.4\,ft^2$

Total Antenna Wind Force = $F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 731\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 4\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 12\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant2} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} = 122\,lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model = Ericsson AIR6449

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 30.6 \cdot in$ (User Input)

Antenna Width = $W_{ant} := 15.9 \cdot in$ (User Input)

Antenna Thickness = $T_{ant} := 10.6 \cdot in$ (User Input)

Antenna Weight = $WT_{ant} := 96 \cdot lb$ (User Input)

Number of Antennas = $N_{ant} := 3$ (User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant3} := WT_{ant} \cdot N_{ant} = 288 lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5157 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 1038 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 34 lb$

Weight of Ice on All Antennas = $Wt_{ice.ant3} := W_{ICEant} \cdot N_{ant} = 101 lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 1601 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 52 lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant3} := W_{ICE.exant} \cdot N_{ant} = 156 lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 3.7 ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 11.1 ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant3} := p \cdot Cd_F \cdot A_{ICEant} = 71 lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 3.4 ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 10.1 ft^2$

Total Antenna Wind Force = $F_{ant3} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 711 lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 3.9 ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 11.6 ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant3} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} = 119 lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	CCI OPA65-BU8D	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 96 \cdot in$	(User Input)
Antenna Width =	$W_{ant} := 21 \cdot in$	(User Input)
Antenna Thickness =	$T_{ant} := 7.8 \cdot in$	(User Input)
Antenna Weight =	$WT_{ant} := 80 \cdot lb$	(User Input)
Number of Antennas =	$N_{ant} := 3$	(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant4} := WT_{ant} \cdot N_{ant} = 240\, lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 15725 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 3054 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 99\, lb$

Weight of Ice on All Antennas = $Wt_{ice.ant4} := W_{ICEant} \cdot N_{ant} = 297\, lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 4677 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 152\, lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant4} := W_{ICE.exant} \cdot N_{ant} = 455\, lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 14.8\, ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 44.5\, ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant4} := p \cdot Cd_F \cdot A_{ICEant} = 285\, lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 14\, ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 42\, ft^2$

Total Antenna Wind Force = $F_{ant4} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 2944\, lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 15.2\, ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 45.7\, ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant4} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} = 468\, lb$

Development of Wind & Ice Load on Antennas

Antenna Data:	(AT&T)	
Antenna Model =	CCI TMABPD7823VG12A	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 14.25 \cdot in$	(User Input)
Antenna Width =	$W_{ant} := 11.024 \cdot in$	(User Input)
Antenna Thickness =	$T_{ant} := 4.11 \cdot in$	(User Input)
Antenna Weight =	$WT_{ant} := 23 \cdot lb$	(User Input)
Number of Antennas =	$N_{ant} := 18$	(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant5} := WT_{ant} \cdot N_{ant} = 414\,lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 646 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 291 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 9\,lb$

Weight of Ice on All Antennas = $Wt_{ice.ant5} := W_{ICEant} \cdot N_{ant} = 170\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 461 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 15\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant5} := W_{ICE.exant} \cdot N_{ant} = 269\,lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 1.3\,ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 22.9\,ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant5} := p \cdot Cd_F \cdot A_{ICEant} = 147\,lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 1.1\,ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 19.6\,ft^2$

Total Antenna Wind Force = $F_{ant5} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1377\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 1.4\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 24.7\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant5} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} = 252\,lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model = Raycap DC9-48-60-24

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 16.34 \cdot in$ in (User Input)

Antenna Width = $W_{ant} := 16.57 \cdot in$ in (User Input)

Antenna Thickness = $T_{ant} := 8.19 \cdot in$ in (User Input)

Antenna Weight = $WT_{ant} := 35 \cdot lb$ lbs (User Input)

Number of Antennas = $N_{ant} := 1$ (User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant6} := WT_{ant} \cdot N_{ant} = 35\,lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2217 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 582 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 19\,lb$

Weight of Ice on All Antennas = $Wt_{ice.ant6} := W_{ICEant} \cdot N_{ant} = 19\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 906 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 29\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant6} := W_{ICE.exant} \cdot N_{ant} = 29\,lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 2.1\,ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.1\,ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant6} := p \cdot Cd_F \cdot A_{ICEant} = 14\,lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 1.9\,ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 1.9\,ft^2$

Total Antenna Wind Force = $F_{ant6} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 132\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 2.2\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 2.2\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant6} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} = 23\,lb$

Development of Wind & Ice Load on Mounts

Mount Data: (AT&T)

Mount Type: SitePro RMQLP-4120-H10

Mount EPA (no ice) = $EPA := 28.15 \cdot ft^2$ (User Input from SitePro Document)

Mount EPA (0.5" ice) = $EPA_{ice} := 34.10 \cdot ft^2$ (User Input from SitePro Document)

Mount EPA (0.75" ice) = $EPA_{ice.ex} := 37.10 \cdot ft^2$ (User Input from SitePro Document/Interpolation)

Weight (no ice) = $W := 3265 \cdot lb$ (User Input from SitePro Document)

Weight (0.5" ice) = $W_{ice} := 3657 \cdot lb$ (User Input from SitePro Document)

Weight (0.75" ice) = $W_{ice.ex} := 3920 \cdot lb$ (User Input from SitePro Document/Interpolation)

Weight 0.5" ice on Antenna Pipes = $Wap_{ice} := \left[\left[(3.375)^2 - (2.375)^2\right] \cdot 120 \cdot 12\right] \cdot in^3 \cdot \frac{\pi}{4} \cdot (Id) = 211 \cdot lb$

Weight 0.75" ice on Antenna Pipes = $Wap_{ice.ex} := \left[\left[(3.875)^2 - (2.375)^2\right] \cdot 120 \cdot 12\right] \cdot in^3 \cdot \frac{\pi}{4} \cdot (Id) = 344 \cdot lb$

Total Pipe Length = $TPL := 12 \cdot 10 \cdot ft = 120 ft$

Total Antenna Length = $TAL := 96 \cdot in \cdot 6 + 31.1 \cdot in \cdot 3 + 30.6 \cdot in \cdot 3 = 63.425 ft$

Exposed Pipe Area = $ExPA := (TPL - TAL)2.375 \cdot in = 11.197 ft^2$

Exposed Pipe Area (0.5" Ice) = $ExPA_{ice} := (TPL - TAL)3.375 \cdot in = 15.912 ft^2$

Exposed Pipe Area (0.75" Ice) = $ExPA_{ice.ex} := (TPL - TAL)3.875 \cdot in = 18.269 ft^2$

Mount Projected Surface Area = $CdAa := 1.3 \cdot ExPA + EPA = 42.7 ft^2$

Mount Projected Surface Area w/ Ice = $CdAa_{ice} := 1.3 \cdot ExPA_{ice} + EPA_{ice} = 54.8 ft^2$

Mount Projected Surface Area w/ Extreme Ice = $CdAa_{ice.ex} := 1.3 \cdot ExPA_{ice.ex} + EPA_{ice.ex} = 60.8 ft^2$

Gravity Loads (without ice)

Weight of All Mounts = $Wt_{mnt1} := W = 3265 lb$

Gravity Load (ice only)

Weight of Ice on All Mounts = $Wt_{ice.mnt1} := W_{ice} - W + Wap_{ice} = 603 lb$

Gravity Load (extreme ice only)

Weight of Ice on All Mounts = $Wt_{ice.ex.mnt1} := W_{ice.ex} - W + Wap_{ice.ex} = 999 lb$

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt1} := p \cdot CdAa_{ice} = 219 lb$

Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt1} := qz \cdot CdAa \cdot m = 1871 lb$

Wind Load (NESC Extreme Ice w/ Wind)

Total Mount Wind Force w/ Extreme Ice = $Fi_{ex.mnt1} := p_{ex} \cdot CdAa_{ice.ex} = 389 lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (T-Mobile)

Antenna Model = RFSAPXVAARR24_43

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 95.9 \cdot in$ (User Input)

Antenna Width = $W_{ant} := 24 \cdot in$ (User Input)

Antenna Thickness = $T_{ant} := 8.7 \cdot in$ (User Input)

Antenna Weight = $WT_{ant} := 154 \cdot lb$ (User Input)

Number of Antennas = $N_{ant} := 3$ (User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant7} := WT_{ant} \cdot N_{ant} = 462 lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 20024 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 3474 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 113 lb$

Weight of Ice on All Antennas = $Wt_{ice.ant7} := W_{ICEant} \cdot N_{ant} = 338 lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 5310 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 172 lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant7} := W_{ICE.exant} \cdot N_{ant} = 516 lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 16.8 ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 50.5 ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant7} := p \cdot Cd_F \cdot A_{ICEant} = 323 lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 16 ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 47.9 ft^2$

Total Antenna Wind Force = $F_{ant7} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 3362 lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 17.2 ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 51.7 ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant7} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} = 530 lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (T-Mobile)

Antenna Model = RFSAPX16DWV-16DWVS

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 55.9 \cdot in$ (User Input)

Antenna Width = $W_{ant} := 13 \cdot in$ (User Input)

Antenna Thickness = $T_{ant} := 3.15 \cdot in$ (User Input)

Antenna Weight = $WT_{ant} := 45 \cdot lb$ (User Input)

Number of Antennas = $N_{ant} := 3$ (User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant8} := WT_{ant} \cdot N_{ant} = 135 lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 1017 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 33 lb$

Weight of Ice on All Antennas = $Wt_{ice.ant8} := W_{ICEant} \cdot N_{ant} = 99 lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 1581 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 51 lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant8} := W_{ICE.exant} \cdot N_{ant} = 154 lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 5.5 ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 16.6 ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant8} := p \cdot Cd_F \cdot A_{ICEant} = 106 lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 5 ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 15.1 ft^2$

Total Antenna Wind Force = $F_{ant8} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1061 lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 5.8 ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 17.3 ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant8} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} = 178 lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (T-Mobile)

Antenna Model = Commscope ATSBT-TOP-MF-4G

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 5.63 \cdot in$ (User Input)

Antenna Width = $W_{ant} := 3.701 \cdot in$ (User Input)

Antenna Thickness = $T_{ant} := 1.969 \cdot in$ (User Input)

Antenna Weight = $WT_{ant} := 2 \cdot lb$ (User Input)

Number of Antennas = $N_{ant} := 6$ (User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant9} := WT_{ant} \cdot N_{ant} = 12\,lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 41 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 52 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 2\,lb$

Weight of Ice on All Antennas = $Wt_{ice.ant9} := W_{ICEant} \cdot N_{ant} = 10\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 88 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 3\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant9} := W_{ICE.exant} \cdot N_{ant} = 17\,lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 0.2\,ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.3\,ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant9} := p \cdot Cd_F \cdot A_{ICEant} = 8\,lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 0.1\,ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 0.9\,ft^2$

Total Antenna Wind Force = $F_{ant9} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 61\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 0.3\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 1.5\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant9} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} = 16\,lb$

Development of Wind & Ice Load on Mounts

Mount Data:	(T-Mobile)	
Mount Type:	SitePro RMQLP-496-HK	
Mount EPA (no ice) =	$EPA := 26.29 \cdot ft^2$	(User Input from SitePro Document)
Mount EPA (0.5" ice) =	$EPA_{ice} := 32.25 \cdot ft^2$	(User Input from SitePro Document)
Mount EPA (0.75" ice) =	$EPA_{ice.ex} := 35.12 \cdot ft^2$	(User Input from SitePro Document/Interpolation)
Weight (no ice) =	$W := 2130 \cdot lb$	(User Input from SitePro Document)
Weight (0.5" ice) =	$W_{ice} := 2580 \cdot lb$	(User Input from SitePro Document)
Weight (0.75" ice) =	$W_{ice.ex} := 2873 \cdot lb$	(User Input from SitePro Document/Interpolation)
Weight 0.5" ice on Antenna Pipes =	$Wap_{ice} := \left[\left[(3.375)^2 - (2.375)^2\right] \cdot 96 \cdot 12\right] \cdot in^3 \cdot \frac{\pi}{4} \cdot (Id) = 169 \cdot lb$	
Weight 0.75" ice on Antenna Pipes =	$Wap_{ice.ex} := \left[\left[(3.875)^2 - (2.375)^2\right] \cdot 96 \cdot 12\right] \cdot in^3 \cdot \frac{\pi}{4} \cdot (Id) = 275 \cdot lb$	
Total Pipe Length =	$TPL := 12 \cdot 8 \cdot ft = 96\,ft$	
Total Antenna Length =	$TAL := 95.9 \cdot in \cdot 3 + 55.9 \cdot in \cdot 3 = 37.95\,ft$	
Exposed Pipe Area =	$ExPA := (TPL - TAL)2.375 \cdot in = 11.489\,ft^2$	
Exposed Pipe Area (0.5" Ice) =	$ExPA_{ice} := (TPL - TAL)3.375 \cdot in = 16.327\,ft^2$	
Exposed Pipe Area (0.75" Ice) =	$ExPA_{ice.ex} := (TPL - TAL)3.875 \cdot in = 18.745\,ft^2$	
Mount Projected Surface Area =	$CdAa := 1.3 \cdot ExPA + EPA = 41.2\,ft^2$	
Mount Projected Surface Area w/ Ice =	$CdAa_{ice} := 1.3 \cdot ExPA_{ice} + EPA_{ice} = 53.5\,ft^2$	
Mount Projected Surface Area w/ Extreme Ice =	$CdAa_{ice.ex} := 1.3 \cdot ExPA_{ice.ex} + EPA_{ice.ex} = 59.5\,ft^2$	

Gravity Loads (without ice)

Weight of All Mounts = $Wt_{mnt2} := W = 2130\,lb$

Gravity Load (ice only)

Weight of Ice on All Mounts = $Wt_{ice.mnt2} := W_{ice} - W + Wap_{ice} = 619\,lb$

Gravity Load (extreme ice only)

Weight of Ice on All Mounts = $Wt_{ice.ex.mnt2} := W_{ice.ex} - W + Wap_{ice.ex} = 1018\,lb$

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt2} := p \cdot CdAa_{ice} = 214\,lb$

Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt2} := qz \cdot CdAa \cdot m = 1806\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Total Mount Wind Force w/ Extreme Ice = $Fi_{ex.mnt2} := p_{ex} \cdot CdAa_{ice.ex} = 381\,lb$

Total Equipment Loads:

AT&T Loads:

NESC Heavy Wind Vertical =

$$Wt_{tot} := \left(Wt_{ant1} + Wt_{ant2} + Wt_{ant3} + Wt_{ant4} + Wt_{ant5} + Wt_{ant6} + Wt_{mnt1}\right) = 4680\,lb$$

$$Wt_{ice.tot} := \left(Wt_{ice.ant1} + Wt_{ice.ant2} + Wt_{ice.ant3} + Wt_{ice.ant4} + Wt_{ice.ant5} + Wt_{ice.ant6} + Wt_{ice.mnt1}\right) = 1570\,lb$$

$$\left(Wt_{tot} + Wt_{ice.tot}\right)\cdot 1.5 = 9375\,lb$$

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant1} + Fi_{ant2} + Fi_{ant3} + Fi_{ant4} + Fi_{ant5} + Fi_{ant6} + Fi_{mnt1}\right)\cdot 2.5 = 2722\,lb$

NESC Extreme Wind Vertical = $\left(Wt_{ant1} + Wt_{ant2} + Wt_{ant3} + Wt_{ant4} + Wt_{ant5} + Wt_{ant6} + Wt_{mnt1}\right) = 4680\,lb$

NESC Extreme Wind Trasnsverse = $\left(F_{ant1} + F_{ant2} + F_{ant3} + F_{ant4} + F_{ant5} + F_{ant6} + F_{mnt1}\right) = 10669\,lb$

NESC Extreme Ice w/ Wind Vertical =

$$Wt_{ice.ex.tot} := \left(Wt_{ice.ex.ant1} + Wt_{ice.ex.ant2} + Wt_{ice.ex.ant3} + Wt_{ice.ex.ant4} + Wt_{ice.ex.ant5} + Wt_{ice.ex.ant6} + Wt_{ice.ex.mnt1}\right) = 2491\,lb$$

$$\left(Wt_{tot} + Wt_{ice.ex.tot}\right) = 7171\,lb$$

NESC Extreme Ice w/ Wind Transverse = $\left(Fi_{ex.ant1} + Fi_{ex.ant2} + Fi_{ex.ant3} + Fi_{ex.ant4} + Fi_{ex.ant5} + Fi_{ex.ant6} + Fi_{ex.mnt1}\right) = 1836\,lb$

T-Mobile Loads:

NESC Heavy Wind Vertical =

$$Wt_{tot} := \left(Wt_{ant7} + Wt_{ant8} + Wt_{ant9} + Wt_{mnt2}\right) = 2739\,lb$$

$$Wt_{ice.tot} := \left(Wt_{ice.ant7} + Wt_{ice.ant8} + Wt_{ice.ant9} + Wt_{ice.mnt2}\right) = 1065\,lb$$

$$\left(Wt_{tot} + Wt_{ice.tot}\right)\cdot 1.5 = 5706\,lb$$

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant7} + Fi_{ant8} + Fi_{ant9} + Fi_{mnt2}\right)\cdot 2.5 = 1629\,lb$

NESC Extreme Wind Vertical = $\left(Wt_{ant7} + Wt_{ant8} + Wt_{ant9} + Wt_{mnt2}\right) = 2739\,lb$

NESC Extreme Wind Trasnsverse = $\left(F_{ant7} + F_{ant8} + F_{ant9} + F_{mnt2}\right) = 6290\,lb$

NESC Extreme Ice w/ Wind Vertical =

$$Wt_{ice.ex.tot} := \left(Wt_{ice.ex.ant7} + Wt_{ice.ex.ant8} + Wt_{ice.ex.ant9} + Wt_{ice.ex.mnt2}\right) = 1705\,lb$$

$$\left(Wt_{tot} + Wt_{ice.ex.tot}\right) = 4444\,lb$$

NESC Extreme Ice w/ Wind Transverse = $\left(Fi_{ex.ant7} + Fi_{ex.ant8} + Fi_{ex.ant9} + Fi_{ex.mnt2}\right) = 1104\,lb$

Coax Cable on CL&P Pole

Coaxial Cable Span	$Coax_{Span} := 10ft$		*(User Input)*
Heavy Wind Pressure =	$p := 4 \cdot psf$		*(User Input)*
Radial Ice Thickness =	$Ir := 0.5 \cdot in$		*(User Input)*
Radial Ice Density =	$Id := 56 \cdot pcf$		*(User Input)*
Extreme Ice w/ Wind Pressure =	$p_{ex} := 6.4 \cdot psf$		*(User Input)*
Extreme Radial Ice Thickness =	$Ir_{ex} := 0.75 \cdot in$		*(User Input)*
Basic Windspeed =	$V := 110$	mph	(User Input)
Height to Top of Coax Above Grade =	$TC := 130$	ft	(User Input)
Multiplier Gust Response Factor =	$m := 1.00$		(User Input - Only for NESC Extreme wind case)

Velocity Pressure Coefficient =	$Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.229$	(NESC 2023 Table 250-2)
Turbulence Intensity Constant =	$C_{exp} := 0.2$	(NESC 2023 Table 250-3)
Integral Length Scale of Turbulence Constant =	$L_s := 220$	(NESC 2023 Table 250-3)
Effective Height =	$z_s := 0.67 \cdot TC = 87.1$	(NESC 2023 Table 250-3)
Turbulence Intensity =	$I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.17$	(NESC 2023 Table 250-3)
Response Term =	$B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.905$	(NESC 2023 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.839$	(NESC 2023 Table 250-3)
Wind Pressure =	$qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf = 31.9$ psf	(NESC 2023 Section 250.C.1)

Diameter of Coax Cable =	$D_{coax} := 1.98 \cdot in$	*(User Input)*	
Weight of Coax Cable =	$W_{coax} := 1.04 \cdot plf$	*(User Input)*	
Number of Coax Cables =	$N_{coax} := 63$	*(User Input)*	(36) AT&T Coax Cables (1) AT&T Fiber Cable (2) AT&T DC Cables (24) T-Mobile Coax Cables {1-5/8 size conservatively used for all}
Number of Projected Coax Cables =	$NP_{coax} := 6$	*(User Input)*	

Shape Factor = $Cd_{coax} := 1.6$ *(User Input)*

Overload Factor for NESC Heavy Wind Transverse Load = $OF_{HWT} := 2.5$ *(User Input)*

Overload Factor for NESC Heavy Wind Vertical Load = $OF_{HWV} := 1.5$ *(User Input)*

Overload Factor for NESC Extreme Wind Transverse Load = $OF_{EWT} := 1.0$ *(User Input)*

Overload Factor for NESC Extreme Wind Vertical Load = $OF_{EWV} := 1.0$ *(User Input)*

Overload Factor for NESC Extreme Ice w/ Wind Transverse Load = $OF_{EIT} := 1.0$ *(User Input)*

Overload Factor for NESC Extreme Ice w/ Wind Vertical Load = $OF_{EIV} := 1.0$ *(User Input)*

Wind Area without Ice = $A := \left(NP_{coax} \cdot D_{coax}\right) = 11.88 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 12.88 \cdot in$

Wind Area with Extreme Ice = $A_{ice.ex} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir_{ex}\right) = 13.38 \cdot in$

Ice Area per Liner Ft = $Ai_{coax} := \frac{\pi}{4} \cdot \left[\left(D_{coax} + 2 \cdot Ir\right)^2 - D_{coax}{}^2\right] = 0.027\,ft^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 95.442 \cdot plf$

Extreme Ice Area per Liner Ft = $Ai_{coax.ex} := \frac{\pi}{4} \cdot \left[\left(D_{coax} + 2 \cdot Ir_{ex}\right)^2 - D_{coax}{}^2\right] = 0.045\,ft^2$

Weight of Extreme Ice on All Coax Cables = $W_{ice.ex} := Ai_{coax.ex} \cdot Id \cdot N_{coax} = 157.594 \cdot plf$

Heavy Wind Vertical Load =

$$Heavy\_WInd_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax} + W_{ice}\right) \cdot Coax_{Span} \cdot OF_{HWV}\right]}$$

Heavy Wind Transverse Load =

$$Heavy\_Wind_{Trans} := \overrightarrow{\left(p \cdot A_{ice} \cdot Cd_{coax} \cdot Coax_{Span} \cdot OF_{HWT}\right)}$$

$Heavy\_WInd_{Vert} = 2414\,lb$ $Heavy\_Wind_{Trans} = 172\,lb$

Extreme Wind Vertical Load =

$$Extreme\_Wind_{Vert} := \overrightarrow{\left(N_{coax} \cdot W_{coax} \cdot Coax_{Span} \cdot OF_{EWV}\right)}$$

Extreme Wind Transverse Load =

$$Extreme\_Wind_{Trans} := \overrightarrow{\left[\left(qz \cdot psf \cdot A \cdot Cd_{coax}\right) \cdot Coax_{Span} \cdot OF_{EWT}\right]}$$

$Extreme\_Wind_{Vert} = 655\,lb$ $Extreme\_Wind_{Trans} = 506\,lb$

Extreme Ice w/ Wind Vertical Load =

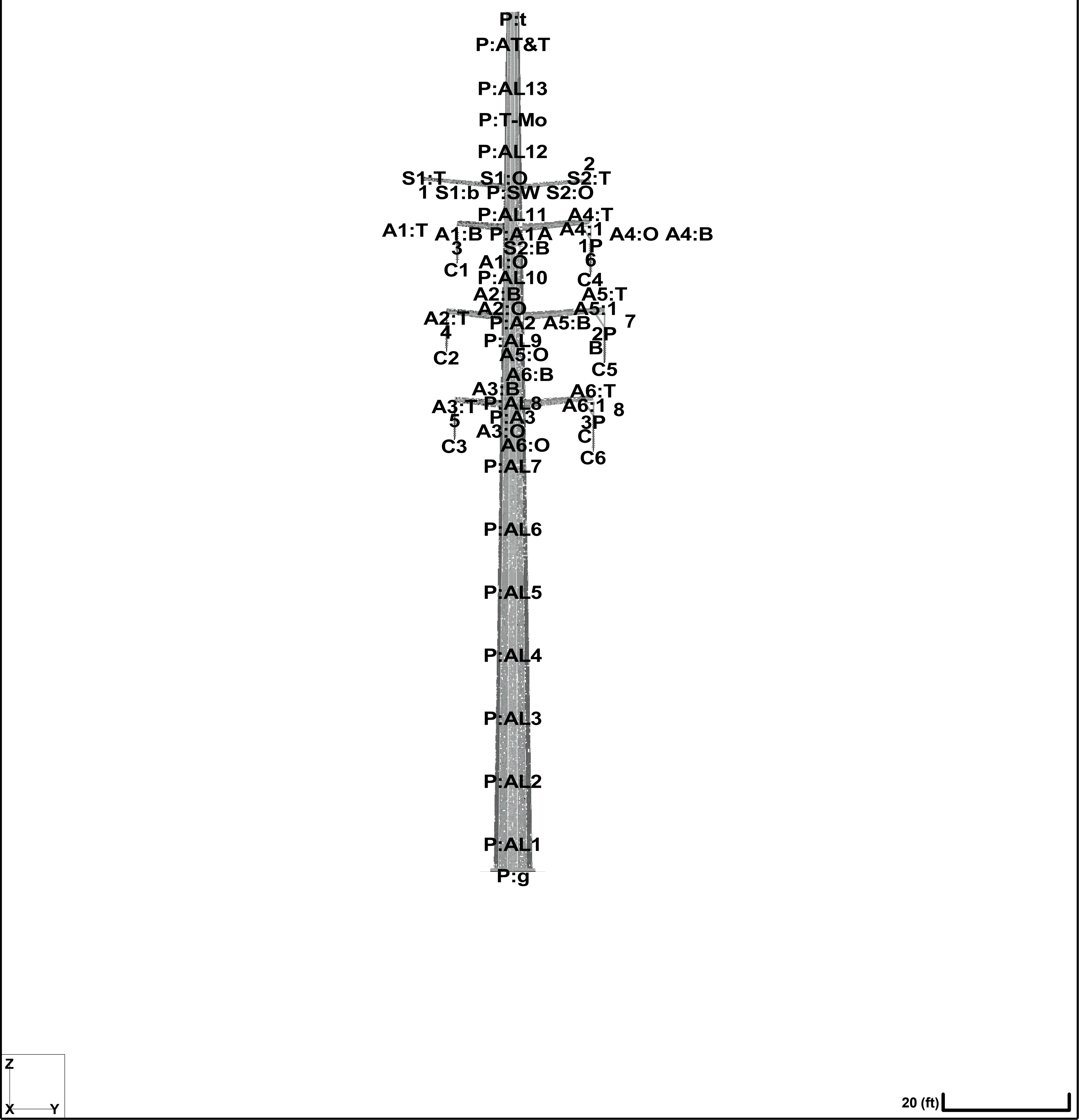
$$Extreme\_Ice_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax} + W_{ice.ex}\right) \cdot Coax_{Span} \cdot OF_{EIV}\right]}$$

Extreme Ice w/ Wind Transverse Load =

$$Extreme\_Ice_{Trans} := \overrightarrow{\left(p_{ex} \cdot A_{ice.ex} \cdot Cd_{coax} \cdot Coax_{Span} \cdot OF_{EIT}\right)}$$

$Extreme\_Ice_{Vert} = 2231\,lb$ $Extreme\_Ice_{Trans} = 114\,lb$

Centek Engineering Inc, Project: "005-23-23570-136FT"
PLS-POLE Version 17.50, 11:40:01 AM Friday, June 02, 2023
Undeformed geometry displayed



Project Name : 22073.01 - Wilton, CT
Project Notes: Structur # 19800 / T-Mobile CT11296A
Project File : J:\Jobs\2207300.WI\01_CT11296A\05_Structural\Tower Analysis\Backup Documentation\Rev (2)\Calcs\PLS-Pole\005-23-23570-136FT.POL
Date run : 11:39:24 AM Friday, June 02, 2023
by : PLS-POLE Version 17.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

Load case 'RULE 250C' uses loading method NESC 2023 which is still being tested and/or is a draft. Carefully check your results. ??
The model has 1 warning. ??

Loads from file: J:\Jobs\2207300.WI\01_CT11296A\05_Structural\Tower Analysis\Backup Documentation\Rev (2)\Calcs\PLS-Pole\19800.lca

*** Analysis Results:

Maximum element usage is 87.10% for Steel Pole "P" in load case "RULE 250C"
Maximum insulator usage is 45.22% for Suspension "C1" in load case "RULE 250D"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Resultant Force (kips)	Bending Moment (ft-k)	Foundation Usage %
RULE 250B	P:g	139.84	99.22	171.47	8988.63	0.00
RULE 250C	P:g	72.97	128.52	147.79	11573.57	0.00
RULE 250D	P:g	115.87	99.14	152.49	9026.19	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
RULE 250B	P:g	-0.62	-99.22	-139.84	99.22	8988.45	-56.96	8988.63	4.62	0.00
RULE 250C	P:g	-0.37	-128.51	-72.97	128.52	11573.49	-40.90	11573.57	4.46	0.00
RULE 250D	P:g	-0.56	-99.14	-115.87	99.14	9026.01	-57.57	9026.19	5.57	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
RULE 250B	P:t	0.39	52.07	-1.12	52.09	0.02	-2.97	-0.01
RULE 250C	P:t	0.30	71.43	-2.09	71.46	0.02	-4.35	-0.01
RULE 250D	P:t	0.41	51.60	-1.09	51.61	0.02	-2.89	-0.01

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)

P	1	705	RULE 250C	8.65	69.63
P	2	1666	RULE 250C	22.97	344.33
P	3	6834	RULE 250C	87.10	3177.26
P	4	6249	RULE 250C	84.38	5755.77
P	5	20662	RULE 250C	80.21	11573.57

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
P	87.10	RULE 250C	70.1	19	41171.8

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
S1	21.26	RULE 250D	107.1	1	277.8
S2	30.93	RULE 250D	107.1	1	176.8
A1	13.45	RULE 250B	100.5	1	252.6
A2	15.55	RULE 250B	86.4	1	304.6
A3	13.85	RULE 250B	72.5	1	252.6
A4	23.11	RULE 250C	101.1	3	465.1
A5	19.85	RULE 250C	87.2	4	658.2
A6	22.83	RULE 250C	73.1	3	465.1

Summary of Brace Usages:

Brace Label	Maximum Usage %	Load Case	Weight (lbs)
B1	22.70	RULE 250B	0.0
B2	8.30	RULE 250C	0.0
B3	44.58	RULE 250C	0.0
B4	22.70	RULE 250B	0.0
B5	7.68	RULE 250C	0.0
B6	44.25	RULE 250C	0.0
B7	22.68	RULE 250B	0.0
B8	8.02	RULE 250C	0.0
B9	43.80	RULE 250C	0.0

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
RULE 250B	67.79	P	Base Plate
RULE 250C	87.10	P	Steel Pole
RULE 250D	67.71	P	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Height AGL (ft)	Segment Number
RULE 250B	65.38	P	47.6	24
RULE 250C	87.10	P	70.1	19
RULE 250D	65.29	P	47.6	24

Summary of Base Plate Usages by Load Case:

Load Case	Pole Label	Bend Line #	Length (in)	Vertical Load (kips)	X Moment (ft-k)	Y Moment (ft-k)	Bending Stress (ksi)	Bolt Moment Sum (ft-k)	# Bolts Acting On Bend Line	Max Bolt Load For Bend Line (kips)	Minimum Plate Thickness (in)	Usage %
RULE 250B	P	2	19.627	134.786	8988.453	-56.971	33.893	147.830	3.5	141.594	3.293	67.79
RULE 250C	P	2	19.627	67.917	11573.494	-40.902	42.801	186.680	3.5	179.203	3.701	85.60
RULE 250D	P	2	19.627	110.812	9026.010	-57.582	33.857	147.670	3.5	141.506	3.292	67.71

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Height AGL (ft)	Segment Number
RULE 250B	23.47	S2	107.1	1
RULE 250C	23.11	A4	101.1	3
RULE 250D	30.93	S2	107.1	1

Summary of Brace Usages by Load Case:

Load Case	Maximum Usage %	Brace Label
RULE 250B	42.15	B3
RULE 250C	44.58	B3
RULE 250D	29.27	B3

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	0.00	RULE 250B	0.0
2	Clamp	0.00	RULE 250B	0.0
3	Clamp	0.00	RULE 250B	0.0
4	Clamp	0.00	RULE 250B	0.0
5	Clamp	0.00	RULE 250B	0.0
6	Clamp	0.00	RULE 250B	0.0
7	Clamp	0.00	RULE 250B	0.0
8	Clamp	0.00	RULE 250B	0.0
9	Clamp	4.47	RULE 250D	0.0
10	Clamp	4.47	RULE 250D	0.0
11	Clamp	4.47	RULE 250D	0.0
12	Clamp	4.47	RULE 250D	0.0
13	Clamp	4.47	RULE 250D	0.0
14	Clamp	4.47	RULE 250D	0.0
15	Clamp	4.47	RULE 250D	0.0
16	Clamp	4.47	RULE 250D	0.0

17	Clamp	4.47	RULE 250D	0.0
18	Clamp	4.47	RULE 250D	0.0
19	Clamp	4.47	RULE 250D	0.0
20	Clamp	14.80	RULE 250D	0.0
21	Clamp	9.16	RULE 250D	0.0
24	Clamp	4.47	RULE 250D	0.0
25	Clamp	4.47	RULE 250D	0.0
SW1	Clamp	12.92	RULE 250D	0.0
SW2	Clamp	12.96	RULE 250D	0.0
C1	Suspension	45.22	RULE 250D	150.0
C2	Suspension	45.22	RULE 250D	150.0
C3	Suspension	45.22	RULE 250D	150.0
C4	Suspension	45.22	RULE 250D	150.0
C5	Suspension	45.22	RULE 250D	150.0
C6	Suspension	45.22	RULE 250D	150.0

*** Weight of structure (lbs):

Weight of Tubular Davit Arms:	2852.8
Weight of Steel Poles:	41171.8
Weight of Suspensions:	900.0
Total:	44924.6

*** End of Report

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*************************************************************************
*                                                                       *
*                               PLS-POLE                                *
*                   POLE AND FRAME ANALYSIS AND DESIGN                  *
*              Copyright Power Line Systems 1999-2022                   *
*                                                                       *
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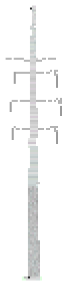
Project Name : 22073.01 - Wilton, CT
Project Notes: Structur # 19800 / T-Mobile CT11296A
Project File : J:\Jobs\2207300.WI\01_CT11296A\05_Structural\Tower Analysis\Backup Documentation\Rev (2)\Calcs\PLS-Pole\005-23-23570-136FT.POL
Date run   : 11:39:23 AM Friday, June 02, 2023
by   : PLS-POLE Version 17.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

Load case 'RULE 250C' uses loading method NESC 2023 which is still being tested and/or is a draft. Carefully check your results. ??
The model has 1 warning. ??



Modeling options:
  Offset Arms from Pole/Mast: Yes
  Offset Braces from Pole/Mast: Yes
  Offset Guys from Pole/Mast: Yes
  Offset Posts from Pole/Mast: Yes
  Offset Strains from Pole/Mast: Yes
  Use Alternate Convergence Process: No
  Steel poles and tubular arms checked with ASCE/SEI 48-19

Joints Geometry:

Joint Label	Symmetry Code	X Coord. (ft)	Y Coord. (ft)	Z Coord. (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
1P	None	0	12.3	99.99	Free	Free	Free	Free	Free	Free
2P	None	0	14.53	86.03	Free	Free	Free	Free	Free	Free
3P	None	0	12.74	71.99	Free	Free	Free	Free	Free	Free

Vang Connectivity:

Vang Label	Attach Label	Tip Label	Azimuth (deg)	Length (ft)	Measured Relative To
SW1	S1:T	1	0	0.25	Face
SW2	S2:T	2	0	0.25	Face
3	A1:T	3	0	0.25	Face
4	A2:T	4	0	0.25	Face
5	A3:T	5	0	0.25	Face
6	A4:T	6	0	0.39	Face
7	A5:T	7	0	0.39	Face
8	A6:T	8	0	0.39	Face
A	A4:1	A	0	0.25	Face
B	A5:1	B	0	0.25	Face
C	A6:1	C	0	0.25	Face

Default Modulus of Elasticity for Steel = 29000.00 (ksi)
Default Weight Density for Steel = 490.00 (lbs/ft^3)

Steel Pole Properties:

Steel Pole Property Label	Stock Number	Length (ft)	Default Embedded Length (ft)	Base Plate	Shape	Tip Diameter (in)	Base Diameter (in)	Taper (in/ft)	Default Drag Coef.	Tubes	Modulus of Elasticity Override (ksi)	Weight Density Override (lbs/ft^3)	Shape At Base	Strength Check Type	Distance From Tip (ft)	Ultimate Trans. Load (kips)	Ultimate Long. Load (kips)	Texture
005-23-23570-136FT		136.00	0	Yes	12F	24.25	73.25	0	1.6	5 tubes	0	0		Calculated	0.000	0.0000	0.0000	

Steel Tubes Properties:

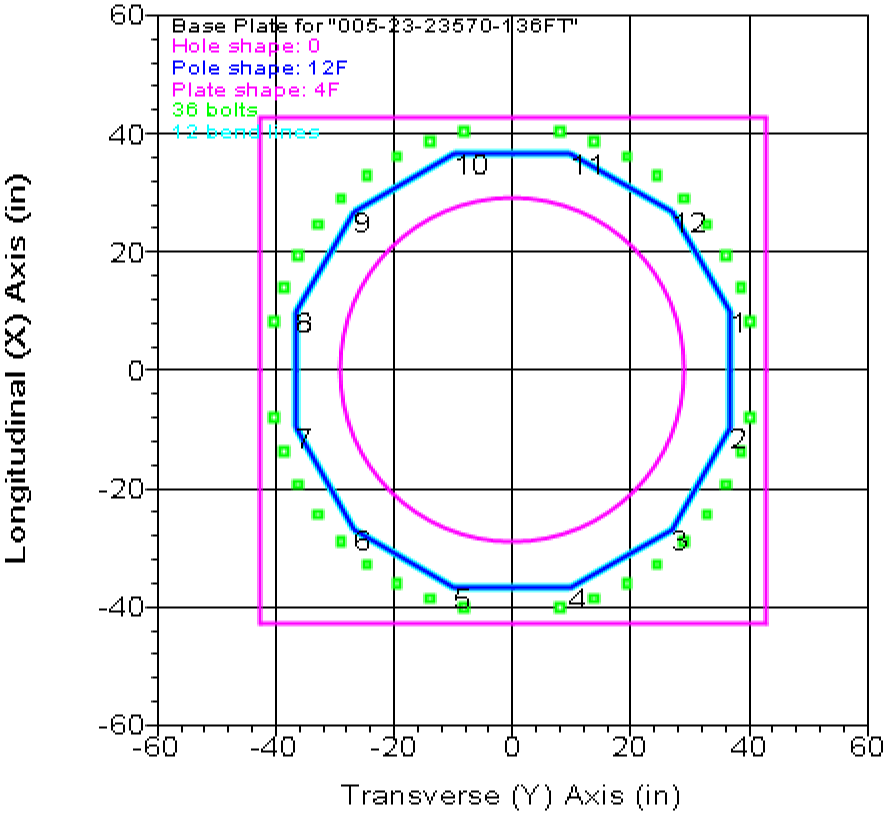
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Gap or Butt Offset (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Diam. Lap Length (ft)	Actual Overlap (ft)
005-23-23570-136FT	1	10	0.25	0.000	0.000	0.000	65.000	0.000	705	5.11	0.35478	24.25	27.80	3.412	0.000
005-23-23570-136FT	2	16	0.3125	0.000	0.000	0.000	65.000	0.000	1666	8.25	0.35478	27.92	33.60	4.122	0.000
005-23-23570-136FT	3	41	0.375	0.000	0.000	0.000	65.000	0.000	6834	21.72	0.35478	33.72	48.27	5.940	0.000
005-23-23570-136FT	4	22	0.5	0.000	0.000	0.000	65.000	0.000	6249	11.28	0.35478	48.52	56.33	6.916	0.000
005-23-23570-136FT	5	47	0.625	0.000	0.000	0.000	65.000	0.000	20662	24.52	0.35478	56.58	73.25	0.000	0.000

Base Plate Properties:

Pole Property	Plate Diam. (in)	Plate Shape	Plate Thick. (in)	Plate Weight (lbs)	Bend Line Length Override (in)	Hole Diam. (in)	Hole Shape	Steel Density (lbs/ft^3)	Steel Yield Stress (ksi)	Bolt Diam. (in)	Bolt Pattern Diam. (in)	Num. Of Bolts	Bolt Cage X Inertia (in^4)	Bolt Cage Y Inertia (in^4)
005-23-23570-136FT	85.375	4F	4.000	5056	0.000	58.500	0	490.00	50.000	2.250	82.000	36	120443.33	120443.33

Base Plate Bolt Coordinates for Property "005-23-23570-136FT":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0.1982	0.9817	0
0.3384	0.9421	0
0.4726	0.8811	0
0.5976	0.8018	0
0.7073	0.7073	0
0.8018	0.5976	0
0.8811	0.4726	0
0.9421	0.3384	0
0.9817	0.1982	0



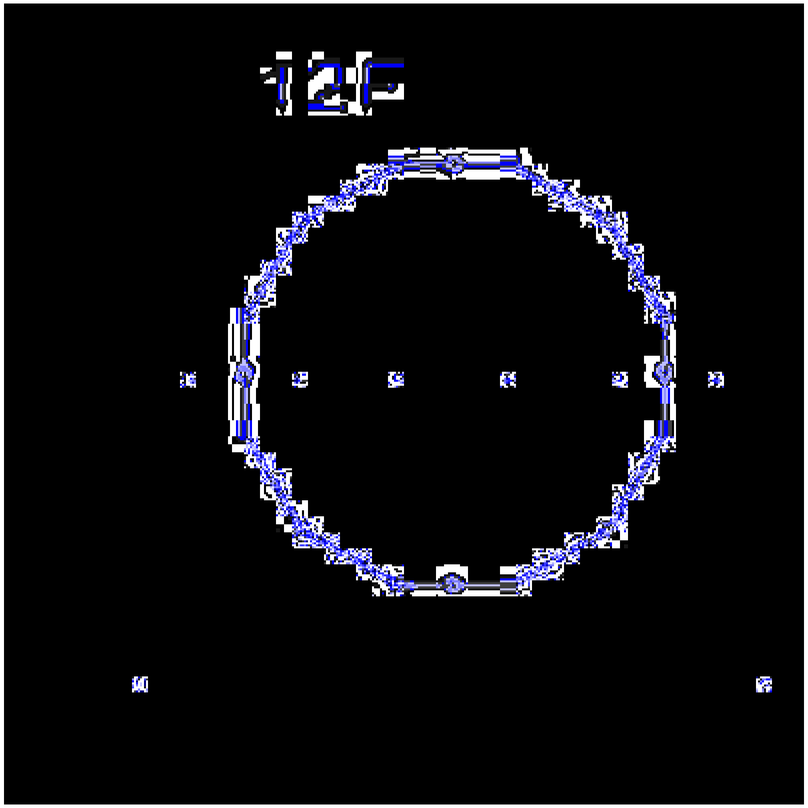
Steel Pole Connectivity:

Pole Label	Tip Joint	Base Joint	X of Base (ft)	Y of Base (ft)	Z of Base (ft)	Inclin. About X (deg)	Inclin. About Y (deg)	Property Set	Attach. Labels	Base Connect	Embed Override	% Embed C. Override (ft)
P			0	0	0	0	0	005-23-23570-136FT	19 labels		0.00	0

Relative Attachment Labels for Steel Pole "P":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
P:AT&T	4.00	0.00
P:T-Mo	16.00	0.00
P:AL13	11.00	0.00
P:AL12	21.00	0.00
P:AL11	31.00	0.00

P:AL10	41.00	0.00
P:AL9	51.00	0.00
P:AL8	61.00	0.00
P:AL7	71.00	0.00
P:AL6	81.00	0.00
P:AL5	91.00	0.00
P:AL4	101.00	0.00
P:AL3	111.00	0.00
P:AL2	121.00	0.00
P:AL1	131.00	0.00
P:SW	27.56	0.00
P:A1	34.11	0.00
P:A2	48.23	0.00
P:A3	62.11	0.00



Pole Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	T-Moment Inertia (in^4)	L-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	T-Moment Capacity (ft-k)	L-Moment Capacity (ft-k)
P	P:t	P:t Ori	0.00	24.25	19.29	1422.44	1422.44	0.00	23.3	65.00	65.00	635.45	635.45
P	P:AT&T	P:AT&T End	4.00	25.67	20.43	1689.96	1689.96	0.00	24.8	65.00	65.00	713.23	713.23
P	P:AT&T	P:AT&T Ori	4.00	25.67	20.43	1689.96	1689.96	0.00	24.8	65.00	65.00	713.23	713.23

P	#P:0	Tube 1	End	7.00	26.73	21.29	1911.25	1911.25	0.00	26.0	65.00	65.00	774.50	774.50
P	#P:0	Tube 1	Ori	7.00	26.73	21.29	1911.25	1911.25	0.00	26.0	65.00	65.00	774.50	774.50
P	#P:1	SpliceT	End	10.00	27.80	22.14	2151.05	2151.05	0.00	27.1	65.00	65.00	838.30	838.30
P	#P:1	SpliceT	Ori	10.00	27.92	27.74	2707.28	2707.28	0.00	21.3	65.00	65.00	1050.35	1050.35
P	P:AL13	P:AL13	End	11.00	28.28	28.10	2812.97	2812.97	0.00	21.6	65.00	65.00	1077.67	1077.67
P	P:AL13	P:AL13	Ori	11.00	28.28	28.10	2812.97	2812.97	0.00	21.6	65.00	65.00	1077.67	1077.67
P	P:T-Mo	P:T-Mo	End	16.00	30.05	29.88	3382.90	3382.90	0.00	23.1	65.00	65.00	1219.51	1219.51
P	P:T-Mo	P:T-Mo	Ori	16.00	30.05	29.88	3382.90	3382.90	0.00	23.1	65.00	65.00	1219.51	1219.51
P	P:AL12	P:AL12	End	21.00	31.83	31.66	4025.04	4025.04	0.00	24.6	65.00	65.00	1370.12	1370.12
P	P:AL12	P:AL12	Ori	21.00	31.83	31.66	4025.04	4025.04	0.00	24.6	65.00	65.00	1370.12	1370.12
P	#P:2	SpliceT	End	26.00	33.60	33.45	4743.70	4743.70	0.00	26.1	65.00	65.00	1529.50	1529.50
P	#P:2	SpliceT	Ori	26.00	33.72	40.21	5724.78	5724.78	0.00	21.4	65.00	65.00	1838.98	1838.98
P	P:SW	P:SW	End	27.56	34.28	40.88	6014.53	6014.53	0.00	21.8	65.00	65.00	1900.86	1900.86
P	P:SW	P:SW	Ori	27.56	34.28	40.88	6014.53	6014.53	0.00	21.8	65.00	65.00	1900.86	1900.86
P	P:AL11	P:AL11	End	31.00	35.50	42.35	6687.68	6687.68	0.00	22.7	65.00	65.00	2040.94	2040.94
P	P:AL11	P:AL11	Ori	31.00	35.50	42.35	6687.68	6687.68	0.00	22.7	65.00	65.00	2040.94	2040.94
P	P:A1	P:A1	End	34.11	36.60	43.68	7336.95	7336.95	0.00	23.5	65.00	65.00	2171.68	2171.68
P	P:A1	P:A1	Ori	34.11	36.60	43.68	7336.95	7336.95	0.00	23.5	65.00	65.00	2171.68	2171.68
P	#P:3	Tube 3	End	37.55	37.82	45.15	8105.37	8105.37	0.00	24.3	65.00	65.00	2321.56	2321.56
P	#P:3	Tube 3	Ori	37.55	37.82	45.15	8105.38	8105.38	0.00	24.3	65.00	65.00	2321.56	2321.56
P	P:AL10	P:AL10	End	41.00	39.05	46.63	8925.67	8925.67	0.00	25.2	65.00	65.00	2476.43	2476.43
P	P:AL10	P:AL10	Ori	41.00	39.05	46.63	8925.67	8925.67	0.00	25.2	65.00	65.00	2476.43	2476.43
P	#P:4	Tube 3	End	44.62	40.33	48.17	9843.53	9843.53	0.00	26.1	65.00	65.00	2644.23	2644.23
P	#P:4	Tube 3	Ori	44.62	40.33	48.17	9843.53	9843.53	0.00	26.1	65.00	65.00	2644.23	2644.23
P	P:A2	P:A2	End	48.23	41.61	49.72	10822.25	10822.25	0.00	27.1	65.00	65.00	2817.53	2817.53
P	P:A2	P:A2	Ori	48.23	41.61	49.72	10822.26	10822.26	0.00	27.1	65.00	65.00	2817.53	2817.53
P	P:AL9	P:AL9	End	51.00	42.59	50.91	11614.37	11614.37	0.00	27.8	65.00	65.00	2954.01	2954.01
P	P:AL9	P:AL9	Ori	51.00	42.59	50.91	11614.37	11614.37	0.00	27.8	65.00	65.00	2954.01	2954.01
P	#P:5	Tube 3	End	56.00	44.37	53.05	13140.66	13140.66	0.00	29.0	65.00	65.00	3208.58	3208.58
P	#P:5	Tube 3	Ori	56.00	44.37	53.05	13140.66	13140.66	0.00	29.0	65.00	65.00	3208.58	3208.58
P	P:AL8	P:AL8	End	61.00	46.14	55.18	14795.14	14795.14	0.00	30.3	65.00	64.52	3447.77	3447.77
P	P:AL8	P:AL8	Ori	61.00	46.14	55.18	14795.14	14795.14	0.00	30.3	65.00	64.52	3447.77	3447.77
P	P:A3	P:A3	End	62.11	46.53	55.66	15178.79	15178.79	0.00	30.6	65.00	64.24	3492.40	3492.40
P	P:A3	P:A3	Ori	62.11	46.53	55.66	15178.79	15178.79	0.00	30.6	65.00	64.24	3492.40	3492.40
P	#P:6	SpliceT	End	67.00	48.27	57.75	16956.99	16956.99	0.00	31.8	65.00	63.02	3689.87	3689.87
P	#P:6	SpliceT	Ori	67.00	48.52	77.20	22787.85	22787.85	0.00	23.3	65.00	65.00	5087.94	5087.94
P	P:AL7	P:AL7	End	71.00	49.94	79.48	24868.31	24868.31	0.00	24.1	65.00	65.00	5394.67	5394.67
P	P:AL7	P:AL7	Ori	71.00	49.94	79.48	24868.31	24868.31	0.00	24.1	65.00	65.00	5394.67	5394.67
P	#P:7	Tube 4	End	76.00	51.71	82.34	27642.16	27642.16	0.00	25.0	65.00	65.00	5790.71	5790.71
P	#P:7	Tube 4	Ori	76.00	51.71	82.34	27642.16	27642.16	0.00	25.0	65.00	65.00	5790.71	5790.71
P	P:AL6	P:AL6	End	81.00	53.49	85.19	30614.98	30614.98	0.00	26.0	65.00	65.00	6200.78	6200.78
P	P:AL6	P:AL6	Ori	81.00	53.49	85.19	30614.98	30614.98	0.00	26.0	65.00	65.00	6200.78	6200.78
P	#P:8	Tube 4	End	85.00	54.91	87.47	33141.12	33141.12	0.00	26.7	65.00	65.00	6538.93	6538.93
P	#P:8	Tube 4	Ori	85.00	54.91	87.47	33141.12	33141.12	0.00	26.7	65.00	65.00	6538.93	6538.93
P	#P:9	SpliceT	End	89.00	56.33	89.75	35802.53	35802.53	0.00	27.5	65.00	65.00	6886.07	6886.07
P	#P:9	SpliceT	Ori	89.00	56.58	112.44	45056.42	45056.42	0.00	21.6	65.00	65.00	8627.62	8627.62
P	P:AL5	P:AL5	End	91.00	57.28	113.86	46792.32	46792.32	0.00	21.9	65.00	65.00	8849.03	8849.03
P	P:AL5	P:AL5	Ori	91.00	57.28	113.86	46792.32	46792.32	0.00	21.9	65.00	65.00	8849.03	8849.03
P	#P:10	Tube 5	End	96.00	59.06	117.43	51325.87	51325.87	0.00	22.6	65.00	65.00	9414.84	9414.84
P	#P:10	Tube 5	Ori	96.00	59.06	117.43	51325.88	51325.88	0.00	22.6	65.00	65.00	9414.84	9414.84
P	P:AL4	P:AL4	End	101.00	60.83	120.99	56143.20	56143.20	0.00	23.4	65.00	65.00	9998.19	9998.19
P	P:AL4	P:AL4	Ori	101.00	60.83	120.99	56143.21	56143.21	0.00	23.4	65.00	65.00	9998.19	9998.19
P	#P:11	Tube 5	End	106.00	62.61	124.56	61252.92	61252.92	0.00	24.2	65.00	65.00	10599.08	10599.08
P	#P:11	Tube 5	Ori	106.00	62.61	124.56	61252.92	61252.92	0.00	24.2	65.00	65.00	10599.08	10599.08
P	P:AL3	P:AL3	End	111.00	64.38	128.12	66663.63	66663.63	0.00	24.9	65.00	65.00	11217.50	11217.50
P	P:AL3	P:AL3	Ori	111.00	64.38	128.12	66663.64	66663.64	0.00	24.9	65.00	65.00	11217.50	11217.50
P	#P:12	Tube 5	End	116.00	66.15	131.69	72383.96	72383.96	0.00	25.7	65.00	65.00	11853.46	11853.46
P	#P:12	Tube 5	Ori	116.00	66.15	131.69	72383.97	72383.97	0.00	25.7	65.00	65.00	11853.46	11853.46
P	P:AL2	P:AL2	End	121.00	67.93	135.25	78422.51	78422.51	0.00	26.4	65.00	65.00	12506.95	12506.95

P	P:AL2	P:AL2	Ori	121.00	67.93	135.25	78422.52	78422.52	0.00	26.4	65.00	65.00	12506.95	12506.95
P	#P:13	Tube 5	End	126.00	69.70	138.82	84787.91	84787.91	0.00	27.2	65.00	65.00	13177.98	13177.98
P	#P:13	Tube 5	Ori	126.00	69.70	138.82	84787.92	84787.92	0.00	27.2	65.00	65.00	13177.98	13177.98
P	P:AL1	P:AL1	End	131.00	71.48	142.38	91488.77	91488.77	0.00	28.0	65.00	65.00	13866.55	13866.55
P	P:AL1	P:AL1	Ori	131.00	71.48	142.38	91488.78	91488.78	0.00	28.0	65.00	65.00	13866.55	13866.55
P	P:g	P:g	End	136.00	73.25	145.95	98533.70	98533.70	0.00	28.7	65.00	65.00	14572.65	14572.65

Brace Properties:

Brace Property Label	Stock Number	Cross Section Area (in^2)	Length (ft)	Depth (in)	Width (in)	Weight (lbs)	Unit Wt. (If Length Unknown) (lbs/ft)	Modulus of Elasticity (ksi)	Drag Coef.	Strength Check Type	Use Steel S.F.	Tension Capacity (lbs)	Compres. Capacity (lbs)	Net Area (in^2)	Design Normal Stress (ksi)	X-Moment Of Inertia (in^4)	Z-Moment Of Inertia (in^4)	Unbraced Length Ratio-X	Unbraced Length Ratio-Z	Texture
P 3"X0.75"		2.25	0	3	0.75	0.638	0	29000	1.6	Calculated	No	0	0	2.25	65	1.575	0.105	1	1	
P 0.75"X0.3"		2.25	0	0.75	3	0.638	0	29000	1.6	Calculated	No	0	0	2.25	65	0.105	1.575	1	1	

Brace Connectivity:

Brace Label	Origin Label	End Label	Brace Property Set	Element Type
B1	A	1P	P 3"X0.75"	Standard
B2	A	6	P 3"X0.75"	Standard
B3	1P	6	P 0.75"X0.3"	Standard
B4	B	2P	P 3"X0.75"	Standard
B5	B	7	P 3"X0.75"	Standard
B6	2P	7	P 0.75"X0.3"	Standard
B7	C	3P	P 3"X0.75"	Standard
B8	C	8	P 3"X0.75"	Standard
B9	3P	8	P 0.75"X0.3"	Standard

Tubular Davit Properties:

Davit Property Label	Stock Number	Steel Shape	Thickness (in)	Base Diameter or Depth (in)	Tip Diameter or Depth (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry	Strength Check Type	Vertical Capacity (lbs)	Tension Capacity (lbs)	Compres. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress Override (ksi)	Weight Density At End (lbs/ft^3)	Steel Texture Shape
005-8FT DVT ARM		8F	0.25	15	10	0	1.4	29000	2 points	Calculated	0	0	0	0	65	0	
005-6.5FT COND ARM		8F	0.25	15	10	0	1.3	29000	2 points	Calculated	0	0	0	0	65	0	
005-10FT CONDUCTOR ARM		8F	0.3125	15	10	0	1.3	29000	3 points	Calculated	0	0	0	0	65	0	
005-12FT CONDUCTOR ARM		8F	0.375	15	10	0	1.3	29000	3 points	Calculated	0	0	0	0			

														65	0
005-12FT SW ARM	8F	0.25	10	6	0	1.3	29000	2 points	Calculated	0	0	0	0	65	0
005-10FT SW ARM	8F	0.1875	10	6	0	1.3	29000	2 points	Calculated	0	0	0	0	65	0

Intermediate Joints for Davit Property "005-8FT DVT ARM":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
B	0.767	0
T	8.787	-0.73225

Intermediate Joints for Davit Property "005-6.5FT COND ARM":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
B	0.767	0
T	7.287	-0.60725

Intermediate Joints for Davit Property "005-10FT CONDUCTOR ARM":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
B	0.77	0
1	9.415	-0.78458
T	10.79	-0.8975

Intermediate Joints for Davit Property "005-12FT CONDUCTOR ARM":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
B	0.77	0
1	11.415	-0.95125
T	12.79	-1.0658

Intermediate Joints for Davit Property "005-12FT SW ARM":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
b	0.767	0
T	12.667	-1.06

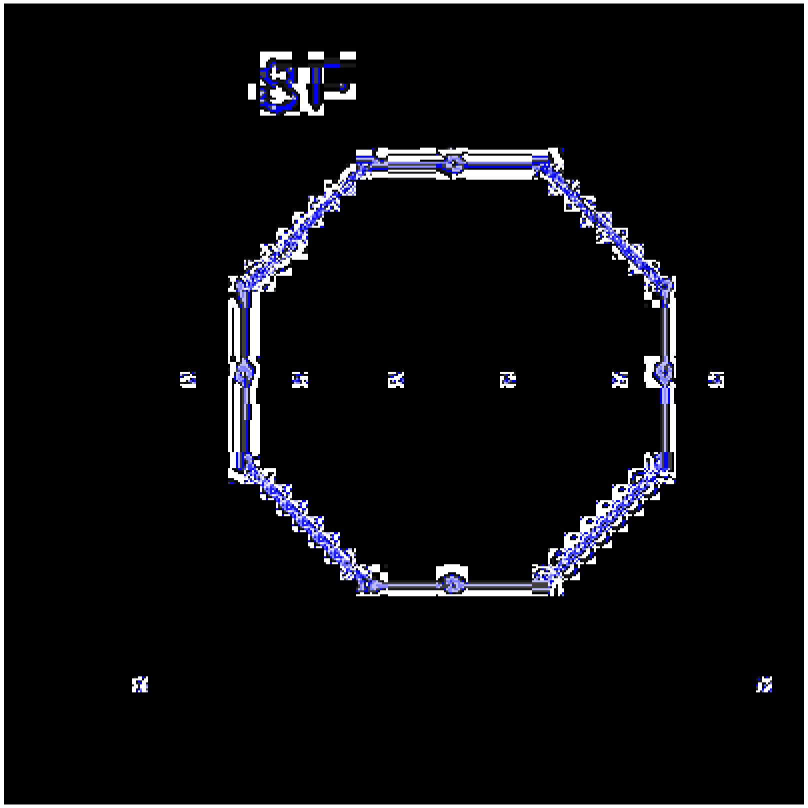
Intermediate Joints for Davit Property "005-10FT SW ARM":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)

B	0.767	0
T	10.667	-0.89

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
S1	P:SW	005-12FT SW ARM	180
S2	P:SW	005-10FT SW ARM	0
A1	P:A1	005-6.5FT COND ARM	180
A2	P:A2	005-8FT DVT ARM	180
A3	P:A3	005-6.5FT COND ARM	180
A4	P:A1	005-10FT CONDUCTOR ARM	0
A5	P:A2	005-12FT CONDUCTOR ARM	0
A6	P:A3	005-10FT CONDUCTOR ARM	0



Tubular Davit Arm Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	V-Moment Inertia (in^4)	H-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	V-Moment Capacity (ft-k)	H-Moment Capacity (ft-k)

S1	S1:O	Origin	0.00	10.00	8.08	101.53	101.53	0.00	12.4	65.00	65.00	110.00	110.00
S1	S1:b	End	0.77	9.76	7.88	94.18	94.18	0.00	12.0	65.00	65.00	104.56	104.56
S1	S1:b	Origin	0.77	9.76	7.88	94.18	94.18	0.00	12.0	65.00	65.00	104.56	104.56
S1	#S1:0	End	5.77	8.19	6.57	54.76	54.76	0.00	9.4	65.00	65.00	72.48	72.48
S1	#S1:0	Origin	5.77	8.19	6.57	54.76	54.76	0.00	9.4	65.00	65.00	72.48	72.48
S1	#S1:1	End	9.24	7.09	5.67	35.12	35.12	0.00	7.6	65.00	65.00	53.65	53.65
S1	#S1:1	Origin	9.24	7.09	5.67	35.12	35.12	0.00	7.6	65.00	65.00	53.65	53.65
S1	S1:T	End	12.71	6.00	4.76	20.85	20.85	0.00	5.8	65.00	65.00	37.65	37.65
S2	S2:O	Origin	0.00	10.00	6.10	77.60	77.60	0.00	17.9	65.00	65.00	84.07	84.07
S2	S2:B	End	0.77	9.71	5.92	71.00	71.00	0.00	17.3	65.00	65.00	79.19	79.19
S2	S2:B	Origin	0.77	9.71	5.92	71.00	71.00	0.00	17.3	65.00	65.00	79.19	79.19
S2	#S2:0	End	5.74	7.86	4.77	37.06	37.06	0.00	13.2	65.00	65.00	51.10	51.10
S2	#S2:0	Origin	5.74	7.86	4.77	37.06	37.06	0.00	13.2	65.00	65.00	51.10	51.10
S2	S2:T	End	10.71	6.00	3.61	16.14	16.14	0.00	9.1	65.00	65.00	29.14	29.14
A1	A1:O	Origin	0.00	15.00	12.22	351.41	351.41	0.00	20.7	65.00	65.00	253.80	253.80
A1	A1:B	End	0.77	14.48	11.78	315.26	315.26	0.00	19.8	65.00	65.00	235.94	235.94
A1	A1:B	Origin	0.77	14.48	11.78	315.26	315.26	0.00	19.8	65.00	65.00	235.94	235.94
A1	#A1:0	End	4.04	12.24	9.93	188.68	188.68	0.00	16.1	65.00	65.00	167.03	167.03
A1	#A1:0	Origin	4.04	12.24	9.93	188.68	188.68	0.00	16.1	65.00	65.00	167.03	167.03
A1	A1:T	End	7.32	10.00	8.08	101.53	101.53	0.00	12.4	65.00	65.00	110.00	110.00
A2	A2:O	Origin	0.00	15.00	12.22	351.41	351.41	0.00	20.7	65.00	65.00	253.80	253.80
A2	A2:B	End	0.77	14.57	11.86	321.25	321.25	0.00	20.0	65.00	65.00	238.94	238.94
A2	A2:B	Origin	0.77	14.57	11.86	321.25	321.25	0.00	20.0	65.00	65.00	238.94	238.94
A2	#A2:0	End	4.79	12.28	9.97	190.80	190.80	0.00	16.2	65.00	65.00	168.29	168.29
A2	#A2:0	Origin	4.79	12.28	9.97	190.80	190.80	0.00	16.2	65.00	65.00	168.29	168.29
A2	A2:T	End	8.82	10.00	8.08	101.53	101.53	0.00	12.4	65.00	65.00	110.00	110.00
A3	A3:O	Origin	0.00	15.00	12.22	351.41	351.41	0.00	20.7	65.00	65.00	253.80	253.80
A3	A3:B	End	0.77	14.48	11.78	315.26	315.26	0.00	19.8	65.00	65.00	235.94	235.94
A3	A3:B	Origin	0.77	14.48	11.78	315.26	315.26	0.00	19.8	65.00	65.00	235.94	235.94
A3	#A3:0	End	4.04	12.24	9.93	188.68	188.68	0.00	16.1	65.00	65.00	167.03	167.03
A3	#A3:0	Origin	4.04	12.24	9.93	188.68	188.68	0.00	16.1	65.00	65.00	167.03	167.03
A3	A3:T	End	7.32	10.00	8.08	101.53	101.53	0.00	12.4	65.00	65.00	110.00	110.00
A4	A4:O	Origin	0.00	15.00	15.21	433.78	433.78	0.00	15.7	65.00	65.00	313.28	313.28
A4	A4:B	End	0.77	14.64	14.84	403.04	403.04	0.00	15.3	65.00	65.00	298.15	298.15
A4	A4:B	Origin	0.77	14.64	14.84	403.04	403.04	0.00	15.3	65.00	65.00	298.15	298.15
A4	#A4:0	End	5.11	12.64	12.77	256.57	256.57	0.00	12.6	65.00	65.00	219.88	219.88
A4	#A4:0	Origin	5.11	12.64	12.77	256.57	256.57	0.00	12.6	65.00	65.00	219.88	219.88
A4	A4:1	End	9.45	10.64	10.69	150.74	150.74	0.00	10.0	65.00	65.00	153.52	153.52
A4	A4:1	Origin	9.45	10.64	10.69	150.74	150.74	0.00	10.0	65.00	65.00	153.52	153.52
A4	A4:T	End	10.83	10.00	10.03	124.54	124.54	0.00	9.1	65.00	65.00	134.92	134.92
A5	A5:O	Origin	0.00	15.00	18.17	514.02	514.02	0.00	12.4	65.00	65.00	371.23	371.23
A5	A5:B	End	0.77	14.70	17.80	483.05	483.05	0.00	12.1	65.00	65.00	355.99	355.99
A5	A5:B	Origin	0.77	14.70	17.80	483.05	483.05	0.00	12.1	65.00	65.00	355.99	355.99
A5	#A5:0	End	5.77	12.75	15.38	311.68	311.68	0.00	9.9	65.00	65.00	264.77	264.77
A5	#A5:0	Origin	5.77	12.75	15.38	311.68	311.68	0.00	9.9	65.00	65.00	264.77	264.77
A5	#A5:1	End	8.61	11.65	14.00	235.32	235.32	0.00	8.7	65.00	65.00	218.92	218.92
A5	#A5:1	Origin	8.61	11.65	14.00	235.32	235.32	0.00	8.7	65.00	65.00	218.92	218.92
A5	A5:1	End	11.46	10.54	12.63	172.58	172.58	0.00	7.5	65.00	65.00	177.42	177.42
A5	A5:1	Origin	11.46	10.54	12.63	172.58	172.58	0.00	7.5	65.00	65.00	177.42	177.42
A5	A5:T	End	12.84	10.00	11.96	146.64	146.64	0.00	6.9	65.00	65.00	158.86	158.86
A6	A6:O	Origin	0.00	15.00	15.21	433.78	433.78	0.00	15.7	65.00	65.00	313.28	313.28

A6	A6:B	End	0.77	14.64	14.84	403.04	403.04	0.00	15.3	65.00	65.00	298.15	298.15
A6	A6:B	Origin	0.77	14.64	14.84	403.04	403.04	0.00	15.3	65.00	65.00	298.15	298.15
A6	#A6:0	End	5.11	12.64	12.77	256.57	256.57	0.00	12.6	65.00	65.00	219.88	219.88
A6	#A6:0	Origin	5.11	12.64	12.77	256.57	256.57	0.00	12.6	65.00	65.00	219.88	219.88
A6	A6:1	End	9.45	10.64	10.69	150.74	150.74	0.00	10.0	65.00	65.00	153.52	153.52
A6	A6:1	Origin	9.45	10.64	10.69	150.74	150.74	0.00	10.0	65.00	65.00	153.52	153.52
A6	A6:T	End	10.83	10.00	10.03	124.54	124.54	0.00	9.1	65.00	65.00	134.92	134.92

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)	Hardware Capacity (lbs)	Notes
CLAMP		5e+04	5e+04	

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
1	A1:T	CLAMP	No Limit
2	A2:T	CLAMP	No Limit
3	A3:T	CLAMP	No Limit
4	A4:T	CLAMP	No Limit
5	A5:T	CLAMP	No Limit
6	A6:T	CLAMP	No Limit
7	S1:T	CLAMP	No Limit
8	S2:T	CLAMP	No Limit
9	P:AL1	CLAMP	No Limit
10	P:AL2	CLAMP	No Limit
11	P:AL3	CLAMP	No Limit
12	P:AL4	CLAMP	No Limit
13	P:AL5	CLAMP	No Limit
14	P:AL6	CLAMP	No Limit
15	P:AL7	CLAMP	No Limit
16	P:AL8	CLAMP	No Limit
17	P:AL9	CLAMP	No Limit
18	P:AL10	CLAMP	No Limit
19	P:AL11	CLAMP	No Limit
20	P:AT&T	CLAMP	No Limit
21	P:T-Mo	CLAMP	No Limit
24	P:AL12	CLAMP	No Limit
25	P:AL13	CLAMP	No Limit
SW1	1	CLAMP	No Uplift
SW2	2	CLAMP	No Uplift

Suspension Properties:

Label	Stock Number	Length (ft)	Weight (lbs)	Wind Area (ft^2)	Tension Capacity (lbs)	Top Rect Width (ft)	Top Rect Height (ft)	Bot. Rect Width (ft)	Bot. Rect Height (ft)	Vert. Rect Width (ft)	Vert. Rect Height (ft)	Hardware Capacity (lbs)	Notes	Draw	Rigid
115kV Susp, r1		5.63	150	2	3e+04	0	0	0	0	0	0	0		Sheds	No

Suspension Insulator Connectivity:

Suspension Label	Structure Attach	Tip Label	Property Set	Cond. 1 Minimum Swing (deg)	Cond. 1 Maximum Swing (deg)	Cond. 2 Minimum Swing (deg)	Cond. 2 Maximum Swing (deg)	Cond. 3 Minimum Swing (deg)	Cond. 3 Maximum Swing (deg)	Cond. 4 Minimum Swing (deg)	Cond. 4 Maximum Swing (deg)	Min. Required Vertical Load (uplift) (lbs)
C1	3		C1 115kV Susp, r1	-90.00	23.00	-90.00	32.00	-90.00	63.00	-90.00	77.00	No Uplift
C2	4		C2 115kV Susp, r1	-90.00	25.00	-90.00	38.00	-90.00	63.00	-90.00	77.00	No Uplift
C3	5		C3 115kV Susp, r1	-90.00	23.00	-90.00	32.00	-90.00	63.00	-90.00	77.00	No Uplift
C4	1P		C4 115kV Susp, r1	-55.00	90.00	-64.00	90.00	-85.00	90.00	-90.00	90.00	No Uplift
C5	2P		C5 115kV Susp, r1	-56.00	90.00	-64.00	90.00	-86.00	90.00	-90.00	90.00	No Uplift
C6	3P		C6 115kV Susp, r1	-55.00	90.00	-64.00	90.00	-85.00	90.00	-90.00	90.00	No Uplift

PLS-CADD Link Cable Sets:

Insulator Label	Conductor Attach Label	Insulator Type	Set Number	Phase Number	Set Description	Dead End	Framing Source
1	A1:T	Clamp	0	0		No	
2	A2:T	Clamp	0	0		No	
3	A3:T	Clamp	0	0		No	
4	A4:T	Clamp	0	0		No	
5	A5:T	Clamp	0	0		No	
6	A6:T	Clamp	0	0		No	
7	S1:T	Clamp	0	0		No	
8	S2:T	Clamp	0	0		No	
9	P:AL1	Clamp	0	0		No	
10	P:AL2	Clamp	0	0		No	
11	P:AL3	Clamp	0	0		No	
12	P:AL4	Clamp	0	0		No	
13	P:AL5	Clamp	0	0		No	
14	P:AL6	Clamp	0	0		No	
C1	C1	Suspension	11	1	Suspension	No	
C2	C2	Suspension	12	1	Suspension	No	
C3	C3	Suspension	13	1	Suspension	No	
C4	C4	Suspension	14	1	Suspension	No	
C5	C5	Suspension	15	1	Suspension	No	
C6	C6	Suspension	16	1	Suspension	No	
15	P:AL7	Clamp	0	0		No	
16	P:AL8	Clamp	0	0		No	
17	P:AL9	Clamp	0	0		No	
18	P:AL10	Clamp	0	0		No	
19	P:AL11	Clamp	0	0		No	
20	P:AT&T	Clamp	0	0		No	
21	P:T-Mo	Clamp	0	0		No	
22	P:L3	Clamp	0	0		No	
23	P:L4	Clamp	0	0		No	
24	P:AL12	Clamp	0	0		No	
25	P:AL13	Clamp	0	0		No	
26	P:AL14	Clamp	0	0		No	
SW1	1	Clamp	1	1	SW1	No	
SW2	2	Clamp	2	1	SW2	No	

*** Loads Data

Loads from file: J:\Jobs\2207300.WI\01_CT11296A\05_Structural\Tower Analysis\Backup Documentation\Rev (2)\Calcs\PLS-Pole\19800.lca

Insulator dead and wind loads are already included in the point loads printed below.

Loading Method Parameters:

Structure Height Summary (used for calculating wind/ice adjust with height):
  Z of ground for wind height adjust   0.00 (ft) and structure Z coordinate that will be put on the centerline ground profile in PLS-CADD.
  Ground elevation shift   1.38 (ft)
  Z of ground with shift   -1.38 (ft)
  Z of structure top (highest joint)   136.00 (ft)
  Structure height   136.00 (ft)
  Structure height above ground   137.38 (ft)

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles Tubular Arms and Towers	SF for Wood Poles	SF for Conc. Pole Ult.	SF for Conc. Pole First Crack	SF for Conc. Zero Tens.	SF for Guys and Cables	SF for Non Tubular Arms	SF for Braces	SF for Insuls.	SF for Hardware	SF For Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	Pole Deflection Check	Pole Deflection Limit % or (ft)
RULE 250B	1.5000	2.5000	1.00000	0.6500	1.0000	0.0000	0.0000	0.9000	0.6500	0.6500	0.0000	0.0000	1.0000	23 loads	Wind on All	4	0	0.500	0.000	0.0	No Limit	0
RULE 250C	1.0000	1.0000	1.00000	0.7500	1.0000	0.0000	0.0000	0.9000	0.7500	0.7500	0.0000	0.0000	1.0000	23 loads	NESC 2023	31	0	0.000	0.000	60.0	No Limit	0
RULE 250D	1.0000	1.0000	1.00000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	23 loads	Wind on All	6.4	0	0.750	0.000	15.0	No Limit	0

Point Loads for Load Case "RULE 250B":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
1	1546	5529	0	Shield Wire
2	1546	5529	389	Shield Wire
C1	4426	12119	0	Conductor
C2	4426	12119	0	Conductor
C3	4426	12119	0	Conductor
C4	4426	12119	0	Conductor
C5	4426	12119	0	Conductor
C6	4426	12119	0	Conductor
P:AT&T	9375	2722	0	AT&T Equipment
P:T-Mo	5706	1629	0	T-Mobile Equipment
P:AL1	2414	172	0	Cables
P:AL2	2414	172	0	Cables
P:AL3	2414	172	0	Cables
P:AL4	2414	172	0	Cables

P:AL5	2414	172	0	Cables
P:AL6	2414	172	0	Cables
P:AL7	2414	172	0	Cables
P:AL8	2414	172	0	Cables
P:AL9	2414	172	0	Cables
P:AL10	2414	172	0	Cables
P:AL11	2414	172	0	Cables
P:AL12	2414	172	0	Cables
P:AL13	2414	172	0	Cables

Point Loads for Load Case "RULE 250C":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
1	414	5721	0	Shield Wire
2	414	5721	374	Shield Wire
C1	1933	12609	0	Conductor
C2	1933	12609	0	Conductor
C3	1933	12609	0	Conductor
C4	1933	12609	0	Conductor
C5	1933	12609	0	Conductor
C6	1933	12609	0	Conductor
P:AT&T	4680	10669	0	AT&T Equipment
P:T-Mo	2739	6290	0	T-Mobile Equipment
P:AL1	655	506	0	Cables
P:AL2	655	506	0	Cables
P:AL3	655	506	0	Cables
P:AL4	655	506	0	Cables
P:AL5	655	506	0	Cables
P:AL6	655	506	0	Cables
P:AL7	655	506	0	Cables
P:AL8	655	506	0	Cables
P:AL9	655	506	0	Cables
P:AL10	655	506	0	Cables
P:AL11	655	506	0	Cables
P:AL12	655	506	0	Cables
P:AL13	655	506	0	Cables

Detailed Pole Loading Data for Load Case "RULE 250C":

Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Ice Vertical Load (lbs)	Pole Ice Wind Load (lbs)	Tran. Wind Load (lbs)	Long. Wind Load (lbs)
P	P:t	P:AT&T	136.00	132.00	135.38	24.960	2.12e+06	1.000	32.27	0.00	270.35	268.49	0.00	0.00	268.49	0.00
P	P:AT&T		132.00	129.00	131.88	26.201	2.23e+06	1.000	32.27	0.00	212.95	211.38	0.00	0.00	211.38	0.00
P			129.00	126.00	128.88	27.266	2.32e+06	1.000	32.27	0.00	221.70	219.97	0.00	0.00	219.97	0.00
P		P:AL13	126.00	125.00	126.88	28.100	2.39e+06	1.000	32.27	0.00	95.01	75.57	0.00	0.00	75.57	0.00
P	P:AL13	P:T-Mo	125.00	120.00	123.88	29.165	2.48e+06	1.000	32.27	0.00	493.25	392.15	0.00	0.00	392.15	0.00
P	P:T-Mo	P:AL12	120.00	115.00	118.88	30.938	2.63e+06	1.000	32.27	0.00	523.57	416.00	0.00	0.00	416.00	0.00
P	P:AL12		115.00	110.00	113.88	32.712	2.78e+06	1.000	32.27	0.00	553.91	439.85	0.00	0.00	439.85	0.00
P		P:SW	110.00	108.44	110.60	34.001	2.89e+06	1.000	32.27	0.00	215.21	142.64	0.00	0.00	142.64	0.00
P	P:SW	P:AL11	108.44	105.00	108.10	34.888	2.97e+06	1.000	32.27	0.00	487.12	322.75	0.00	0.00	322.75	0.00

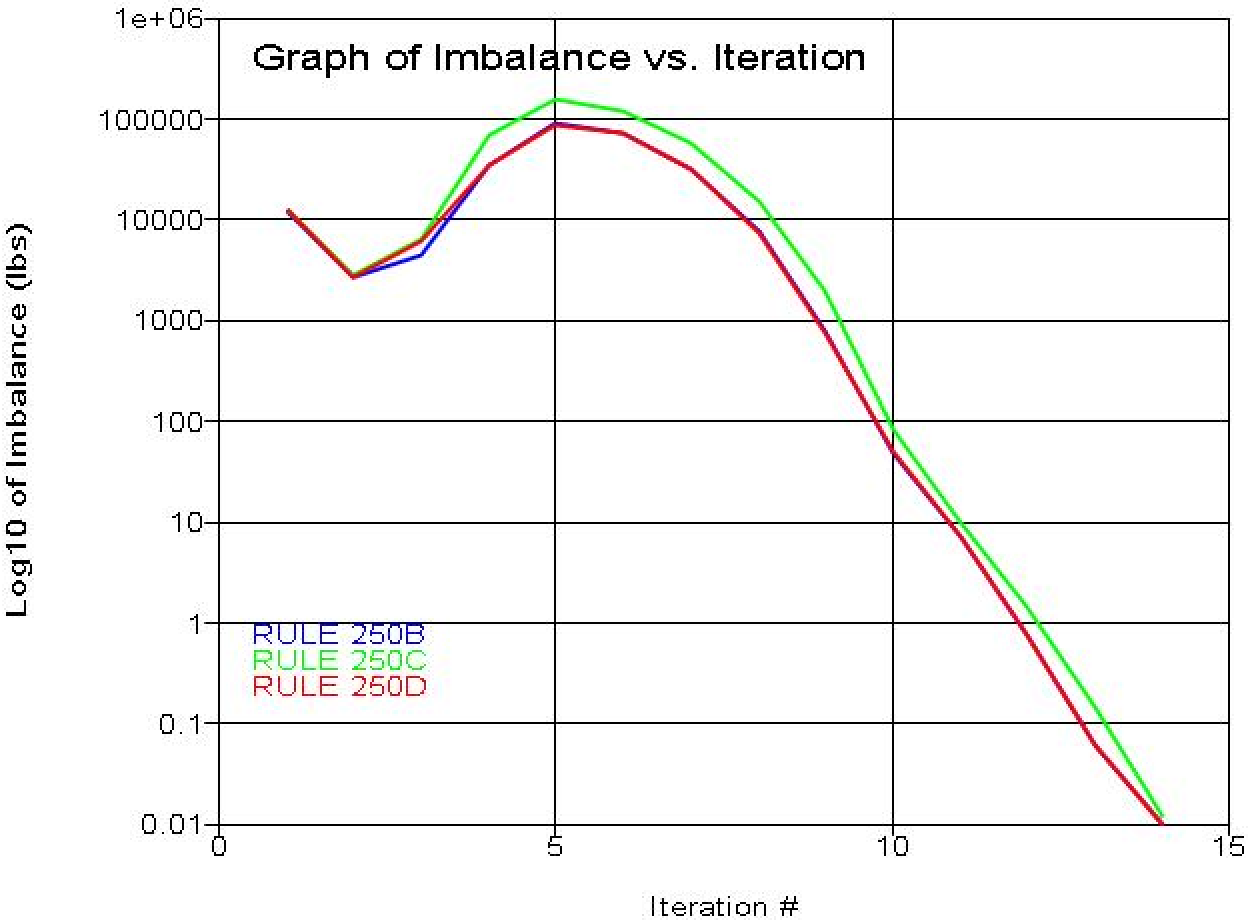
P	P:AL11	P:A1	105.00	101.89	104.83	36.049	3.07e+06	1.000	32.27	0.00	454.56	301.07	0.00	0.00	301.07	0.00
P	P:A1		101.89	98.45	101.55	37.211	3.16e+06	1.000	32.27	0.00	521.01	344.96	0.00	0.00	344.96	0.00
P		P:AL10	98.45	95.00	98.11	38.434	3.27e+06	1.000	32.27	0.00	538.31	356.30	0.00	0.00	356.30	0.00
P	P:AL10		95.00	91.38	94.57	39.687	3.38e+06	1.000	32.27	0.00	583.14	385.85	0.00	0.00	385.85	0.00
P		P:A2	91.38	87.77	90.96	40.970	3.48e+06	1.000	32.27	0.00	602.16	398.32	0.00	0.00	398.32	0.00
P	P:A2	P:AL9	87.77	85.00	87.77	42.102	3.58e+06	1.000	32.27	0.00	474.14	313.56	0.00	0.00	313.56	0.00
P	P:AL9		85.00	80.00	83.88	43.481	3.7e+06	1.000	32.27	0.00	884.31	584.65	0.00	0.00	584.65	0.00
P		P:AL8	80.00	75.00	78.88	45.255	3.85e+06	1.000	32.27	0.00	920.70	608.50	0.00	0.00	608.50	0.00
P	P:AL8	P:A3	75.00	73.89	75.83	46.338	3.94e+06	1.000	32.27	0.00	208.49	137.77	0.00	0.00	137.77	0.00
P	P:A3		73.89	69.00	72.83	47.402	4.03e+06	1.000	32.27	0.00	944.41	623.91	0.00	0.00	623.91	0.00
P		P:AL7	69.00	65.00	68.38	49.230	4.19e+06	1.000	32.27	0.00	1066.33	529.56	0.00	0.00	529.56	0.00
P	P:AL7		65.00	60.00	63.88	50.826	4.32e+06	1.000	32.27	0.00	1376.58	683.42	0.00	0.00	683.42	0.00
P		P:AL6	60.00	55.00	58.88	52.600	4.47e+06	1.000	32.27	0.00	1425.10	707.27	0.00	0.00	707.27	0.00
P	P:AL6		55.00	51.00	54.38	54.197	4.61e+06	1.000	32.27	0.00	1175.02	582.99	0.00	0.00	582.99	0.00
P			51.00	47.00	50.38	55.616	4.73e+06	1.000	32.27	0.00	1206.12	598.25	0.00	0.00	598.25	0.00
P		P:AL5	47.00	45.00	47.38	56.930	4.84e+06	1.000	32.27	0.00	770.06	306.20	0.00	0.00	306.20	0.00
P	P:AL5		45.00	40.00	43.88	58.172	4.95e+06	1.000	32.27	0.00	1967.61	782.19	0.00	0.00	782.19	0.00
P		P:AL4	40.00	35.00	38.88	59.946	5.1e+06	1.000	32.27	0.00	2028.26	806.04	0.00	0.00	806.04	0.00
P	P:AL4		35.00	30.00	33.88	61.720	5.25e+06	1.000	32.27	0.00	2088.91	829.89	0.00	0.00	829.89	0.00
P		P:AL3	30.00	25.00	28.88	63.494	5.4e+06	1.000	32.27	0.00	2149.57	853.74	0.00	0.00	853.74	0.00
P	P:AL3		25.00	20.00	23.88	65.267	5.55e+06	1.000	32.27	0.00	2210.22	877.59	0.00	0.00	877.59	0.00
P		P:AL2	20.00	15.00	18.88	67.041	5.7e+06	1.000	32.27	0.00	2270.87	901.45	0.00	0.00	901.45	0.00
P	P:AL2		15.00	10.00	13.88	68.815	5.85e+06	1.000	32.27	0.00	2331.52	925.30	0.00	0.00	925.30	0.00
P		P:AL1	10.00	5.00	8.88	70.589	6e+06	1.000	32.27	0.00	2392.17	949.15	0.00	0.00	949.15	0.00
P	P:AL1	P:g	5.00	0.00	3.88	72.363	6.15e+06	1.000	32.27	0.00	2452.83	973.00	0.00	0.00	973.00	0.00

Point Loads for Load Case "RULE 250D":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
1	2144	6095	0	Shield Wire
2	2144	6095	470	Shield Wire
C1	4466	12809	0	Conductor
C2	4466	12809	0	Conductor
C3	4466	12809	0	Conductor
C4	4466	12809	0	Conductor
C5	4466	12809	0	Conductor
C6	4466	12809	0	Conductor
P:AT&T	7171	1836	0	AT&T Equipment
P:T-Mo	4444	1104	0	T-Mobile Equipment
P:AL1	2231	114	0	Cables
P:AL2	2231	114	0	Cables
P:AL3	2231	114	0	Cables
P:AL4	2231	114	0	Cables
P:AL5	2231	114	0	Cables
P:AL6	2231	114	0	Cables
P:AL7	2231	114	0	Cables
P:AL8	2231	114	0	Cables
P:AL9	2231	114	0	Cables
P:AL10	2231	114	0	Cables
P:AL11	2231	114	0	Cables
P:AL12	2231	114	0	Cables
P:AL13	2231	114	0	Cables

*** Analysis Results:

Maximum element usage is 87.10% for Steel Pole "P" in load case "RULE 250C"
Maximum insulator usage is 45.22% for Suspension "C1" in load case "RULE 250D"



*** Analysis Results for Load Case No. 1 "RULE 250B" - Number of iterations in SAPS 14

Equilibrium Joint Positions and Rotations for Load Case "RULE 250B":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1P	0.0193	2.499	-0.652	0.0000	0.0000	0.0000	0.0193	14.8	99.34
2P	0.01395	1.84	-0.6939	0.0000	0.0000	0.0000	0.01395	16.37	85.34
3P	0.009303	1.27	-0.504	0.0000	0.0000	0.0000	0.009303	14.01	71.48

P:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
P:t	0.03247	4.339	-0.09325	-2.9652	0.0230	-0.0094	0.03247	4.339	135.9
P:AT&T	0.03083	4.133	-0.0879	-2.9651	0.0230	-0.0094	0.03083	4.133	131.9
P:AL13	0.02796	3.771	-0.07844	-2.9535	0.0230	-0.0094	0.02796	3.771	124.9
P:T-Mo	0.02591	3.514	-0.07175	-2.9375	0.0229	-0.0095	0.02591	3.514	119.9
P:AL12	0.02388	3.258	-0.06511	-2.9142	0.0228	-0.0095	0.02388	3.258	114.9
P:SW	0.02122	2.927	-0.05658	-2.8753	0.0227	-0.0095	0.02122	2.927	108.4
P:AL11	0.01979	2.755	-0.0522	-2.8517	0.0224	-0.0085	0.01979	2.755	104.9
P:A1	0.01852	2.601	-0.0483	-2.8248	0.0221	-0.0078	0.01852	2.601	101.8
P:AL10	0.01582	2.266	-0.03993	-2.7325	0.0209	-0.0063	0.01582	2.266	94.96
P:A2	0.0132	1.929	-0.03185	-2.5878	0.0192	-0.0050	0.0132	1.929	87.74
P:AL9	0.01227	1.805	-0.02898	-2.5209	0.0184	-0.0046	0.01227	1.805	84.97
P:AL8	0.009228	1.389	-0.01992	-2.2204	0.0155	-0.0032	0.009228	1.389	74.98
P:A3	0.008926	1.346	-0.01906	-2.1830	0.0152	-0.0031	0.008926	1.346	73.88
P:AL7	0.006738	1.03	-0.01307	-1.8874	0.0127	-0.0023	0.006738	1.03	64.99
P:AL6	0.004704	0.7271	-0.008136	-1.5652	0.0103	-0.0016	0.004704	0.7271	54.99
P:AL5	0.003098	0.4825	-0.0048	-1.2350	0.0080	-0.0011	0.003098	0.4825	45
P:AL4	0.001856	0.2904	-0.002665	-0.9547	0.0061	-0.0008	0.001856	0.2904	35
P:AL3	0.0009384	0.1474	-0.001343	-0.6746	0.0043	-0.0005	0.0009384	0.1474	25
P:AL2	0.0003364	0.05299	-0.0005891	-0.3991	0.0025	-0.0003	0.0003364	0.05299	15
P:AL1	3.848e-05	0.006072	-0.0001625	-0.1309	0.0008	-0.0001	3.848e-05	0.006072	5
S1:O	0.02101	2.929	0.01507	-2.8753	0.0227	-0.0095	0.02101	1.5	108.5
S1:b	0.0209	2.93	0.0533	-2.8417	0.0227	-0.0095	0.0209	0.7345	108.5
S1:T	0.01954	2.989	0.5841	-2.3006	0.0226	-0.0097	0.01954	-11.11	110.1
S2:O	0.02142	2.925	-0.1282	-2.8753	0.0227	-0.0095	0.02142	4.353	108.3
S2:B	0.02162	2.924	-0.167	-2.9230	0.0227	-0.0210	0.02162	5.119	108.3
S2:T	0.03868	2.959	-0.7197	-3.3003	0.0081	-0.1471	0.03868	15.05	108.6
A1:O	0.01834	2.603	0.02685	-2.8248	0.0221	-0.0078	0.01834	1.078	101.9
A1:B	0.01825	2.604	0.0645	-2.8061	0.0221	-0.0078	0.01825	0.3118	102
A1:T	0.01772	2.64	0.373	-2.6417	0.0221	-0.0078	0.01772	-6.172	102.9
A2:O	0.01308	1.931	0.04643	-2.5878	0.0192	-0.0050	0.01308	0.1969	87.82
A2:B	0.01302	1.931	0.08088	-2.5658	0.0192	-0.0050	0.01302	-0.5693	87.85
A2:T	0.01269	1.97	0.4221	-2.3388	0.0192	-0.0050	0.01269	-8.55	88.92
A3:O	0.008842	1.348	0.0548	-2.1830	0.0152	-0.0031	0.008842	-0.5912	73.95
A3:B	0.008808	1.348	0.08385	-2.1636	0.0152	-0.0031	0.008808	-1.358	73.98
A3:T	0.008681	1.375	0.3193	-1.9951	0.0152	-0.0031	0.008681	-7.851	74.82
A4:O	0.0187	2.599	-0.1235	-2.8248	0.0221	-0.0078	0.0187	4.124	101.8
A4:B	0.01879	2.598	-0.1615	-2.8350	0.0221	-0.0078	0.01879	4.893	101.7
A4:1	0.0201	2.627	-0.5905	-2.7561	0.0221	-0.0078	0.0201	13.57	102.1
A4:T	0.02031	2.631	-0.6563	-2.7402	0.0221	-0.0078	0.02031	14.95	102.1
A5:O	0.01333	1.927	-0.1101	-2.5878	0.0192	-0.0050	0.01333	3.661	87.66
A5:B	0.01338	1.926	-0.145	-2.6019	0.0192	-0.0050	0.01338	4.43	87.62
A5:1	0.01447	1.959	-0.6357	-2.5624	0.0192	-0.0050	0.01447	15.11	88.08
A5:T	0.01461	1.963	-0.6969	-2.5480	0.0192	-0.0050	0.01461	16.49	88.14
A6:O	0.009011	1.345	-0.09291	-2.1830	0.0152	-0.0031	0.009011	3.284	73.8
A6:B	0.009045	1.344	-0.1223	-2.1940	0.0152	-0.0031	0.009045	4.053	73.77
A6:1	0.009633	1.368	-0.4551	-2.1242	0.0152	-0.0031	0.009633	12.72	74.22
A6:T	0.009724	1.372	-0.5056	-2.1088	0.0152	-0.0031	0.009724	14.1	74.29
1	0.01934	2.969	0.5862	-2.3006	0.0226	-0.0097	0.01934	-11.17	109.6
2	0.03865	2.93	-0.7214	-3.3003	0.0081	-0.1471	0.03865	15.07	108.1
3	0.01746	2.61	0.3766	-2.6417	0.0221	-0.0078	0.01746	-6.264	102.2
4	0.01246	1.943	0.4251	-2.3388	0.0192	-0.0050	0.01246	-8.638	88.26
5	0.008501	1.352	0.3219	-1.9951	0.0152	-0.0031	0.008501	-7.936	74.16
6	0.02	2.592	-0.6585	-2.7402	0.0221	-0.0078	0.02	14.97	101.3
7	0.01434	1.927	-0.6991	-2.5480	0.0192	-0.0050	0.01434	16.52	87.33
8	0.009513	1.342	-0.5075	-2.1088	0.0152	-0.0031	0.009513	14.14	73.48
A	0.01984	2.593	-0.5927	-2.7561	0.0221	-0.0078	0.01984	13.6	101.4
B	0.01424	1.928	-0.6378	-2.5624	0.0192	-0.0050	0.01424	15.14	87.4
C	0.009452	1.343	-0.4569	-2.1242	0.0152	-0.0031	0.009452	12.76	73.53

Joint Support Reactions for Load Case "RULE 250B":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
P:g	-0.62	0.0	-99.22	0.0	0.0	-139.84	0.0	0.0	171.47	0.0	8988.45	0.0	-57.0	0.0	0.0	4.62	0.0	0.0

Detailed Steel Pole Usages for Load Case "RULE 250B":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
P	P:t	Origin	0.00	52.07	0.39	-1.12	-0.00	-0.00	0.0	-0.20	0.08	-0.00	-0.01	0.00	0.01	0.00	0.02	0.0	5
P	P:AT&T	End	4.00	49.59	0.37	-1.05	0.31	-0.01	0.0	-0.20	0.08	-0.00	-0.01	0.03	0.00	0.00	0.04	0.1	2
P	P:AT&T	Origin	4.00	49.59	0.37	-1.05	0.31	-0.01	0.0	-9.79	3.42	-0.01	-0.48	0.00	0.34	0.00	0.76	1.2	5
P	Tube 1	End	7.00	47.73	0.36	-1.01	10.56	-0.03	0.0	-9.79	3.42	-0.01	-0.46	0.89	0.08	0.00	1.35	2.1	2
P	Tube 1	Origin	7.00	47.73	0.36	-1.01	10.56	-0.03	0.0	-10.11	3.54	-0.01	-0.47	0.89	0.09	0.00	1.37	2.1	2
P	SpliceT	End	10.00	45.87	0.34	-0.96	21.18	-0.07	0.0	-10.11	3.54	-0.01	-0.46	1.64	0.08	0.00	2.11	3.2	2
P	SpliceT	Origin	10.00	45.87	0.34	-0.96	21.18	-0.07	0.0	-10.35	3.62	-0.01	-0.37	1.31	0.07	0.00	1.69	2.6	2
P	P:AL13	End	11.00	45.25	0.34	-0.94	24.81	-0.08	0.0	-10.35	3.62	-0.01	-0.37	1.50	0.07	0.00	1.87	2.9	2
P	P:AL13	Origin	11.00	45.25	0.34	-0.94	24.81	-0.08	0.0	-13.19	4.06	-0.02	-0.47	1.50	0.08	0.00	1.97	3.0	2
P	P:T-Mo	End	16.00	42.17	0.31	-0.86	45.09	-0.17	0.0	-13.19	4.06	-0.02	-0.44	2.41	0.07	0.00	2.85	4.4	2
P	P:T-Mo	Origin	16.00	42.17	0.31	-0.86	45.09	-0.17	0.0	-19.57	6.21	-0.02	-0.65	2.41	0.11	0.00	3.07	4.7	2
P	P:AL12	End	21.00	39.10	0.29	-0.78	76.14	-0.29	0.0	-19.57	6.21	-0.02	-0.62	3.62	0.10	0.00	4.24	6.5	2
P	P:AL12	Origin	21.00	39.10	0.29	-0.78	76.14	-0.29	0.0	-22.78	6.75	-0.03	-0.72	3.62	0.11	0.00	4.34	6.7	2
P	SpliceT	End	26.00	36.06	0.26	-0.70	109.88	-0.45	0.0	-22.78	6.75	-0.03	-0.68	4.67	0.11	0.00	5.36	8.2	2
P	SpliceT	Origin	26.00	36.06	0.26	-0.70	109.88	-0.45	0.0	-23.36	6.91	-0.04	-0.58	3.89	0.09	0.00	4.47	6.9	2
P	P:SW	End	27.56	35.12	0.25	-0.68	120.66	-0.50	0.0	-23.36	6.91	-0.04	-0.57	4.13	0.09	0.00	4.70	7.2	2
P	P:SW	Origin	27.56	35.12	0.25	-0.68	121.56	-0.66	-4.6	-27.10	18.28	-0.43	-0.66	4.16	0.24	0.08	4.86	7.5	2
P	P:AL11	End	31.00	33.06	0.24	-0.63	184.45	-2.13	-4.6	-27.10	18.28	-0.43	-0.64	5.89	0.23	0.08	6.55	10.1	2
P	P:AL11	Origin	31.00	33.06	0.24	-0.63	184.45	-2.13	-4.6	-30.22	18.75	-0.43	-0.71	5.89	0.24	0.08	6.63	10.2	2
P	P:A1	End	34.11	31.21	0.22	-0.58	242.67	-3.48	-4.6	-30.22	18.75	-0.43	-0.69	7.29	0.23	0.07	8.00	12.3	2
P	P:A1	Origin	34.11	31.21	0.22	-0.58	234.25	-3.48	-4.6	-39.68	43.63	-0.44	-0.91	7.04	0.53	0.07	8.02	12.3	2
P	Tube 3	End	37.55	29.18	0.21	-0.53	384.66	-5.00	-4.6	-39.68	43.63	-0.44	-0.88	10.81	0.51	0.07	11.73	18.0	2
P	Tube 3	Origin	37.55	29.18	0.21	-0.53	384.66	-4.99	-4.6	-40.51	43.81	-0.44	-0.90	10.81	0.51	0.07	11.75	18.1	2
P	P:AL10	End	41.00	27.19	0.19	-0.48	535.69	-6.53	-4.6	-40.51	43.81	-0.44	-0.87	14.11	0.50	0.06	15.01	23.1	2
P	P:AL10	Origin	41.00	27.19	0.19	-0.48	535.69	-6.53	-4.6	-43.80	44.28	-0.45	-0.94	14.11	0.50	0.06	15.08	23.2	2
P	Tube 3	End	44.62	25.14	0.17	-0.43	695.77	-8.16	-4.6	-43.80	44.28	-0.45	-0.91	17.16	0.49	0.06	18.09	27.8	2
P	Tube 3	Origin	44.62	25.14	0.17	-0.43	695.77	-8.15	-4.6	-44.75	44.46	-0.46	-0.93	17.16	0.49	0.06	18.11	27.9	2
P	P:A2	End	48.23	23.15	0.16	-0.38	856.50	-9.81	-4.6	-44.75	44.46	-0.46	-0.90	19.82	0.47	0.06	20.74	31.9	2
P	P:A2	Origin	48.23	23.15	0.16	-0.38	855.90	-9.80	-4.6	-54.80	69.30	-0.46	-1.10	19.81	0.74	0.06	20.95	32.2	2
P	P:AL9	End	51.00	21.66	0.15	-0.35	1047.81	-11.09	-4.6	-54.80	69.30	-0.46	-1.08	23.12	0.72	0.05	24.23	37.3	2
P	P:AL9	Origin	51.00	21.66	0.15	-0.35	1047.81	-11.08	-4.6	-58.35	69.74	-0.47	-1.15	23.12	0.72	0.05	24.30	37.4	2
P	Tube 3	End	56.00	19.09	0.13	-0.29	1396.51	-13.44	-4.6	-58.35	69.74	-0.47	-1.10	28.36	0.69	0.05	29.49	45.4	2
P	Tube 3	Origin	56.00	19.09	0.13	-0.29	1396.51	-13.43	-4.6	-59.88	69.94	-0.48	-1.13	28.36	0.70	0.05	29.52	45.4	2
P	P:AL8	End	61.00	16.67	0.11	-0.24	1746.19	-15.82	-4.6	-59.88	69.94	-0.48	-1.09	32.75	0.67	0.04	33.86	52.5	2
P	P:AL8	Origin	61.00	16.67	0.11	-0.24	1746.19	-15.81	-4.6	-63.26	70.31	-0.48	-1.15	32.75	0.67	0.04	33.92	52.6	2
P	P:A3	End	62.11	16.16	0.11	-0.23	1823.93	-16.35	-4.6	-63.26	70.31	-0.48	-1.14	33.63	0.67	0.04	34.79	54.2	2
P	P:A3	Origin	62.11	16.16	0.11	-0.23	1816.28	-16.34	-4.6	-73.28	95.02	-0.49	-1.32	33.49	0.90	0.04	34.84	54.2	2
P	SpliceT	End	67.00	14.00	0.09	-0.19	2281.31	-18.75	-4.6	-73.28	95.02	-0.49	-1.27	39.05	0.87	0.04	40.35	64.0	2
P	SpliceT	Origin	67.00	14.00	0.09	-0.19	2281.31	-18.73	-4.6	-75.04	95.16	-0.49	-0.97	29.21	0.65	0.03	30.20	46.5	2
P	P:AL7	End	71.00	12.36	0.08	-0.16	2661.93	-20.72	-4.6	-75.04	95.16	-0.49	-0.94	32.14	0.63	0.03	33.10	50.9	2
P	P:AL7	Origin	71.00	12.36	0.08	-0.16	2661.93	-20.71	-4.6	-79.50	95.59	-0.50	-1.00	32.14	0.64	0.03	33.16	51.0	2
P	Tube 4	End	76.00	10.46	0.07	-0.12	3139.84	-23.24	-4.6	-79.50	95.59	-0.50	-0.97	35.31	0.61	0.03	36.30	55.8	2
P	Tube 4	Origin	76.00	10.46	0.07	-0.12	3139.84	-23.22	-4.6	-81.87	95.77	-0.51	-0.99	35.31	0.61	0.03	36.33	55.9	2

P	P:AL6	End	81.00	8.72	0.06	-0.10	3618.66	-25.79	-4.6	-81.87	95.77	-0.51	-0.96	38.01	0.59	0.03	38.98	60.0	2
P	P:AL6	Origin	81.00	8.72	0.06	-0.10	3618.66	-25.77	-4.6	-86.48	96.16	-0.52	-1.02	38.01	0.60	0.03	39.04	60.1	2
P	Tube 4	End	85.00	7.46	0.05	-0.08	4003.27	-27.86	-4.6	-86.48	96.16	-0.52	-0.99	39.87	0.58	0.02	40.87	62.9	2
P	Tube 4	Origin	85.00	7.46	0.05	-0.08	4003.27	-27.85	-4.6	-88.50	96.28	-0.52	-1.01	39.87	0.58	0.02	40.89	62.9	2
P	SpliceT	End	89.00	6.32	0.04	-0.06	4388.39	-29.96	-4.6	-88.50	96.28	-0.52	-0.99	41.50	0.57	0.02	42.50	65.4	2
P	SpliceT	Origin	89.00	6.32	0.04	-0.06	4388.39	-29.95	-4.6	-90.15	96.39	-0.53	-0.80	33.12	0.45	0.02	33.93	52.2	2
P	P:AL5	End	91.00	5.79	0.04	-0.06	4581.16	-31.02	-4.6	-90.15	96.39	-0.53	-0.79	33.71	0.45	0.02	34.51	53.1	2
P	P:AL5	Origin	91.00	5.79	0.04	-0.06	4581.16	-31.01	-4.6	-94.77	96.77	-0.54	-0.83	33.71	0.45	0.02	34.55	53.2	2
P	Tube 5	End	96.00	4.56	0.03	-0.04	5064.98	-33.71	-4.6	-94.77	96.77	-0.54	-0.81	35.03	0.44	0.02	35.85	55.1	2
P	Tube 5	Origin	96.00	4.56	0.03	-0.04	5064.98	-33.70	-4.6	-98.01	96.98	-0.55	-0.83	35.03	0.44	0.02	35.87	55.2	2
P	P:AL4	End	101.00	3.49	0.02	-0.03	5549.88	-36.44	-4.6	-98.01	96.98	-0.55	-0.81	36.14	0.42	0.02	36.96	56.9	2
P	P:AL4	Origin	101.00	3.49	0.02	-0.03	5549.88	-36.43	-4.6	-103.74	97.40	-0.56	-0.86	36.14	0.43	0.02	37.01	56.9	2
P	Tube 5	End	106.00	2.55	0.02	-0.02	6036.89	-39.22	-4.6	-103.74	97.40	-0.56	-0.83	37.09	0.41	0.01	37.93	58.3	2
P	Tube 5	Origin	106.00	2.55	0.02	-0.02	6036.89	-39.21	-4.6	-107.16	97.61	-0.57	-0.86	37.09	0.41	0.01	37.95	58.4	2
P	P:AL3	End	111.00	1.77	0.01	-0.02	6524.92	-42.05	-4.6	-107.16	97.61	-0.57	-0.84	37.87	0.40	0.01	38.72	59.6	2
P	P:AL3	Origin	111.00	1.77	0.01	-0.02	6524.92	-42.04	-4.6	-113.08	98.01	-0.58	-0.88	37.87	0.40	0.01	38.76	59.6	2
P	Tube 5	End	116.00	1.13	0.01	-0.01	7014.96	-44.93	-4.6	-113.08	98.01	-0.58	-0.86	38.53	0.39	0.01	39.40	60.6	2
P	Tube 5	Origin	116.00	1.13	0.01	-0.01	7014.96	-44.92	-4.6	-116.68	98.21	-0.59	-0.89	38.53	0.39	0.01	39.43	60.7	2
P	P:AL2	End	121.00	0.64	0.00	-0.01	7505.97	-47.86	-4.6	-116.68	98.21	-0.59	-0.86	39.08	0.38	0.01	39.94	61.5	2
P	P:AL2	Origin	121.00	0.64	0.00	-0.01	7505.97	-47.85	-4.6	-122.78	98.59	-0.60	-0.91	39.08	0.39	0.01	39.99	61.5	2
P	Tube 5	End	126.00	0.28	0.00	-0.00	7998.90	-50.84	-4.6	-122.78	98.59	-0.60	-0.88	39.52	0.38	0.01	40.41	62.2	2
P	Tube 5	Origin	126.00	0.28	0.00	-0.00	7998.90	-50.83	-4.6	-126.55	98.78	-0.61	-0.91	39.52	0.38	0.01	40.44	62.2	2
P	P:AL1	End	131.00	0.07	0.00	-0.00	8492.77	-53.88	-4.6	-126.55	98.78	-0.61	-0.89	39.88	0.37	0.01	40.77	62.7	2
P	P:AL1	Origin	131.00	0.07	0.00	-0.00	8492.77	-53.87	-4.6	-132.83	99.14	-0.62	-0.93	39.88	0.37	0.01	40.82	62.8	2
P	P:g	End	136.00	0.00	0.00	0.00	8988.45	-56.97	-4.6	-132.83	99.14	-0.62	-0.91	40.16	0.36	0.01	41.08	63.2	2

Summary of Brace Forces and Usages for Load Case "RULE 250B":

Brace Label	Forces (kips)	Allowable Compression (kips)	Allowable Tension (kips)	Usage %
B1	21.58	36.72	146.25	22.70
B2	7.45	97.57	146.25	7.84
B3	-14.27	52.09	146.25	42.15
B4	21.58	36.34	146.25	22.70
B5	6.89	97.41	146.25	7.25
B6	-14.16	52.10	146.25	41.80
B7	21.56	36.20	146.25	22.68
B8	7.17	97.57	146.25	7.55
B9	-13.98	52.14	146.25	41.26

Detailed Tubular Davit Arm Usages for Load Case "RULE 250B":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
S1	S1:O	Origin	0.00	35.14	0.25	0.18	-15.72	0.00	-0.0	-5.62	1.67	-0.00	-0.70	9.29	0.17	0.00	9.99	15.4	2
S1	S1:b	End	0.77	35.16	0.25	0.64	-14.44	0.00	-0.0	-5.62	1.67	-0.00	-0.71	8.98	0.17	0.00	9.69	14.9	2
S1	S1:b	Origin	0.77	35.16	0.25	0.64	-14.44	0.00	-0.0	-5.73	1.07	-0.00	-0.73	8.98	0.11	0.00	9.71	14.9	2
S1	#S1:0	End	5.77	35.48	0.24	3.47	-9.09	0.00	-0.0	-5.73	1.07	-0.00	-0.87	8.15	0.13	0.00	9.03	13.9	2
S1	#S1:0	Origin	5.77	35.48	0.24	3.47	-9.09	0.00	-0.0	-5.70	0.94	0.00	-0.87	8.15	0.12	0.00	9.02	13.9	2
S1	#S1:1	End	9.24	35.68	0.24	5.30	-5.81	0.00	-0.0	-5.70	0.94	0.00	-1.01	7.04	0.14	0.00	8.05	12.4	2
S1	#S1:1	Origin	9.24	35.68	0.24	5.30	-5.81	0.00	-0.0	-5.69	0.86	0.00	-1.00	7.04	0.12	0.00	8.05	12.4	2
S1	S1:T	End	12.71	35.87	0.23	7.01	-2.82	0.00	-0.0	-5.69	0.86	0.00	-1.19	4.87	0.15	0.00	6.07	9.3	2
S2	S2:O	Origin	0.00	35.10	0.26	-1.54	-16.83	-4.09	0.2	5.61	1.52	0.39	0.92	14.32	0.23	0.06	15.25	23.5	2

S2	S2:B	End	0.77	35.09	0.26	-2.00	-15.67	-3.79	0.2	5.61	1.52	0.39	0.95	14.15	0.24	0.07	15.11	23.2	2
S2	S2:B	Origin	0.77	35.09	0.26	-2.00	-15.67	-3.79	-0.2	5.46	1.92	0.38	0.92	14.15	0.29	0.08	15.09	23.2	2
S2	#S2:0	End	5.74	35.29	0.33	-5.21	-6.14	-1.88	-0.2	5.46	1.92	0.38	1.15	8.80	0.36	0.13	9.99	15.4	2
S2	#S2:0	Origin	5.74	35.29	0.33	-5.21	-6.14	-1.88	-0.2	5.48	1.78	0.38	1.15	8.80	0.34	0.13	9.99	15.4	2
S2	S2:T	End	10.71	35.50	0.46	-8.64	2.68	-0.01	-0.2	5.48	1.78	0.38	1.52	6.00	0.45	0.23	7.61	11.7	2
A1	A1:O	Origin	0.00	31.23	0.22	0.32	-30.14	0.01	-0.0	-12.34	4.18	-0.00	-1.01	7.72	0.27	0.00	8.74	13.5	2
A1	A1:B	End	0.77	31.25	0.22	0.77	-26.94	0.01	-0.0	-12.34	4.18	-0.00	-1.05	7.42	0.28	0.00	8.48	13.1	2
A1	A1:B	Origin	0.77	31.25	0.22	0.77	-26.94	0.01	-0.0	-12.65	2.92	-0.00	-1.07	7.42	0.20	0.00	8.50	13.1	2
A1	#A1:0	End	4.04	31.47	0.22	2.65	-17.39	0.00	-0.0	-12.65	2.92	-0.00	-1.27	6.77	0.23	0.00	8.05	12.4	2
A1	#A1:0	Origin	4.04	31.47	0.22	2.65	-17.39	0.00	-0.0	-12.63	2.77	-0.00	-1.27	6.77	0.22	0.00	8.05	12.4	2
A1	A1:T	End	7.32	31.68	0.21	4.48	-8.32	0.00	-0.0	-12.63	2.77	-0.00	-1.56	4.92	0.28	0.00	6.50	10.0	2
A2	A2:O	Origin	0.00	23.17	0.16	0.56	-35.48	0.01	-0.0	-12.33	4.31	-0.00	-1.01	9.09	0.28	0.00	10.11	15.6	2
A2	A2:B	End	0.77	23.18	0.16	0.97	-32.18	0.01	-0.0	-12.33	4.31	-0.00	-1.04	8.75	0.29	0.00	9.81	15.1	2
A2	A2:B	Origin	0.77	23.18	0.16	0.97	-32.18	0.01	-0.0	-12.64	3.05	-0.00	-1.07	8.75	0.21	0.00	9.83	15.1	2
A2	#A2:0	End	4.79	23.42	0.15	3.07	-19.89	0.01	-0.0	-12.64	3.05	-0.00	-1.27	7.68	0.24	0.00	8.96	13.8	2
A2	#A2:0	Origin	4.79	23.42	0.15	3.07	-19.89	0.01	-0.0	-12.61	2.88	-0.00	-1.27	7.68	0.23	0.00	8.96	13.8	2
A2	A2:T	End	8.82	23.64	0.15	5.06	-8.31	0.00	-0.0	-12.61	2.88	-0.00	-1.56	4.91	0.29	0.00	6.49	10.0	2
A3	A3:O	Origin	0.00	16.17	0.11	0.66	-31.18	0.01	-0.0	-12.29	4.32	-0.00	-1.01	7.99	0.28	0.00	9.01	13.9	2
A3	A3:B	End	0.77	16.18	0.11	1.01	-27.87	0.01	-0.0	-12.29	4.32	-0.00	-1.04	7.68	0.29	0.00	8.74	13.4	2
A3	A3:B	Origin	0.77	16.18	0.11	1.01	-27.87	0.01	-0.0	-12.62	3.06	-0.00	-1.07	7.68	0.21	0.00	8.76	13.5	2
A3	#A3:0	End	4.04	16.34	0.10	2.45	-17.86	0.00	-0.0	-12.62	3.06	-0.00	-1.27	6.95	0.25	0.00	8.23	12.7	2
A3	#A3:0	Origin	4.04	16.34	0.10	2.45	-17.86	0.00	-0.0	-12.60	2.91	-0.00	-1.27	6.95	0.23	0.00	8.23	12.7	2
A3	A3:T	End	7.32	16.50	0.10	3.83	-8.32	0.00	-0.0	-12.60	2.91	-0.00	-1.56	4.92	0.29	0.00	6.49	10.0	2
A4	A4:O	Origin	0.00	31.19	0.22	-1.48	-21.24	-0.00	0.0	12.36	4.49	0.00	0.81	4.41	0.24	0.00	5.24	8.1	2
A4	A4:B	End	0.77	31.18	0.23	-1.94	-17.78	-0.00	0.0	12.36	4.49	0.00	0.83	3.88	0.24	0.00	4.73	7.3	2
A4	A4:B	Origin	0.77	31.18	0.23	-1.94	-17.78	-0.00	-0.0	11.92	5.40	0.00	0.80	3.88	0.29	0.00	4.71	7.2	2
A4	#A4:0	End	5.11	31.35	0.23	-4.53	5.64	-0.00	-0.0	11.92	5.40	0.00	0.93	1.67	0.34	0.00	2.67	4.1	2
A4	#A4:0	Origin	5.11	31.35	0.23	-4.53	5.64	-0.00	-0.0	11.93	5.12	0.00	0.93	1.67	0.32	0.00	2.66	4.1	2
A4	A4:1	End	9.45	31.52	0.24	-7.09	27.88	0.00	-0.0	11.93	5.12	0.00	1.12	11.80	0.39	0.00	12.94	19.9	2
A4	A4:1	Origin	9.45	31.52	0.24	-7.09	15.75	0.00	0.0	-5.69	-14.74	-0.00	-0.53	6.67	1.11	0.00	7.45	11.5	2
A4	A4:T	End	10.83	31.57	0.24	-7.88	-4.59	0.00	0.0	-5.69	-14.74	-0.00	-0.57	0.00	3.06	0.00	5.33	8.2	4
A5	A5:O	Origin	0.00	23.13	0.16	-1.32	-33.97	-0.01	0.0	12.36	4.82	0.00	0.68	5.95	0.21	0.00	6.64	10.2	2
A5	A5:B	End	0.77	23.12	0.16	-1.74	-30.26	-0.01	0.0	12.36	4.82	0.00	0.69	5.53	0.22	0.00	6.23	9.6	2
A5	A5:B	Origin	0.77	23.12	0.16	-1.74	-30.26	-0.01	-0.0	11.90	5.64	0.00	0.67	5.53	0.25	0.00	6.21	9.6	2
A5	#A5:0	End	5.77	23.30	0.17	-4.50	-2.03	-0.00	-0.0	11.90	5.64	0.00	0.77	0.21	0.71	0.00	1.57	2.4	3
A5	#A5:0	Origin	5.77	23.30	0.17	-4.50	-2.03	-0.00	-0.0	11.91	5.32	0.00	0.77	0.21	0.67	0.00	1.52	2.3	3
A5	#A5:1	End	8.61	23.41	0.17	-6.08	13.10	0.00	-0.0	11.91	5.32	0.00	0.85	3.89	0.31	0.00	4.77	7.3	2
A5	#A5:1	Origin	8.61	23.41	0.17	-6.08	13.10	0.00	-0.0	11.91	5.13	0.00	0.85	3.89	0.30	0.00	4.77	7.3	2
A5	A5:1	End	11.46	23.51	0.17	-7.63	27.69	0.00	-0.0	11.91	5.13	0.00	0.94	10.15	0.33	0.00	11.10	17.1	2
A5	A5:1	Origin	11.46	23.51	0.17	-7.63	15.93	0.00	0.0	-5.24	-14.61	-0.00	-0.42	5.84	0.94	0.00	6.46	9.9	2
A5	A5:T	End	12.84	23.55	0.18	-8.36	-4.23	0.00	0.0	-5.24	-14.61	-0.00	-0.44	0.00	2.55	0.00	4.44	6.8	4
A6	A6:O	Origin	0.00	16.14	0.11	-1.11	-22.91	-0.01	0.0	12.31	4.62	0.00	0.81	4.75	0.24	0.00	5.58	8.6	2
A6	A6:B	End	0.77	16.13	0.11	-1.47	-19.35	-0.01	0.0	12.31	4.62	0.00	0.83	4.22	0.25	0.00	5.07	7.8	2
A6	A6:B	Origin	0.77	16.13	0.11	-1.47	-19.35	-0.01	-0.0	11.86	5.53	0.00	0.80	4.22	0.30	0.00	5.04	7.8	2
A6	#A6:0	End	5.11	16.28	0.11	-3.48	4.65	-0.00	-0.0	11.86	5.53	0.00	0.93	1.37	0.35	0.00	2.38	3.7	2
A6	#A6:0	Origin	5.11	16.28	0.11	-3.48	4.65	-0.00	-0.0	11.87	5.25	0.00	0.93	1.37	0.33	0.00	2.37	3.7	2
A6	A6:1	End	9.45	16.42	0.12	-5.46	27.45	0.00	-0.0	11.87	5.25	0.00	1.11	11.62	0.40	0.00	12.75	19.6	2
A6	A6:1	Origin	9.45	16.42	0.12	-5.46	15.38	0.00	0.0	-5.66	-14.46	-0.00	-0.53	6.51	1.09	0.00	7.29	11.2	2
A6	A6:T	End	10.83	16.46	0.12	-6.07	-4.57	0.00	0.0	-5.66	-14.46	-0.00	-0.56	0.00	3.00	0.00	5.23	8.0	4

Summary of Clamp Capacities and Usages for Load Case "RULE 250B":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
1	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
2	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
3	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
4	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
5	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
6	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
7	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
8	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
9	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
10	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
11	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
12	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
13	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
14	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
15	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
16	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
17	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
18	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
19	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
20	9.762	50.00	0.00	0.00	50.00	0.00	0.00	0.00
21	5.934	50.00	0.00	0.00	50.00	0.00	0.00	0.00
24	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
25	2.420	50.00	0.00	0.00	50.00	0.00	0.00	0.00
SW1	5.741	50.00	0.00	0.00	50.00	0.00	0.00	0.00
SW2	5.754	50.00	0.00	0.00	50.00	0.00	0.00	0.00

Summary of Suspension Capacities and Usages for Load Case "RULE 250B":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
C1	12.902	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	12.902	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	12.902	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	12.902	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	12.902	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C6	12.902	30.00	0.00	0.00	0.00	0.00	0.00	0.00

*** Analysis Results for Load Case No. 2 "RULE 250C" - Number of iterations in SAPS 14

Equilibrium Joint Positions and Rotations for Load Case "RULE 250C":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1P	0.01304	3.3	-0.9011	0.0000	0.0000	0.0000	0.01304	15.6	99.09
2P	0.009619	2.406	-0.9141	0.0000	0.0000	0.0000	0.009619	16.93	85.12
3P	0.006463	1.65	-0.6489	0.0000	0.0000	0.0000	0.006463	14.39	71.34
P:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
P:t	0.02529	5.953	-0.1743	-4.3541	0.0176	-0.0090	0.02529	5.953	135.8
P:AT&T	0.02401	5.649	-0.1627	-4.3539	0.0176	-0.0090	0.02401	5.649	131.8
P:AL13	0.02177	5.119	-0.1426	-4.3158	0.0176	-0.0090	0.02177	5.119	124.9
P:T-Mo	0.02018	4.744	-0.1285	-4.2640	0.0176	-0.0090	0.02018	4.744	119.9
P:AL12	0.01858	4.375	-0.1148	-4.1898	0.0176	-0.0091	0.01858	4.375	114.9
P:SW	0.01649	3.903	-0.09769	-4.0675	0.0176	-0.0091	0.01649	3.903	108.3
P:AL11	0.01534	3.66	-0.08911	-4.0000	0.0175	-0.0082	0.01534	3.66	104.9
P:A1	0.01432	3.445	-0.08163	-3.9313	0.0172	-0.0075	0.01432	3.445	101.8
P:AL10	0.01217	2.982	-0.06599	-3.7430	0.0162	-0.0061	0.01217	2.982	94.93
P:A2	0.01009	2.525	-0.0514	-3.4917	0.0149	-0.0048	0.01009	2.525	87.72
P:AL9	0.009354	2.358	-0.04634	-3.3839	0.0143	-0.0044	0.009354	2.358	84.95
P:AL8	0.006975	1.804	-0.03081	-2.9330	0.0119	-0.0031	0.006975	1.804	74.97
P:A3	0.00674	1.748	-0.02936	-2.8788	0.0116	-0.0030	0.00674	1.748	73.87
P:AL7	0.005051	1.333	-0.01952	-2.4650	0.0097	-0.0022	0.005051	1.333	64.98
P:AL6	0.0035	0.9388	-0.01158	-2.0316	0.0078	-0.0016	0.0035	0.9388	54.99
P:AL5	0.002289	0.6221	-0.006396	-1.5966	0.0060	-0.0011	0.002289	0.6221	44.99
P:AL4	0.001361	0.3741	-0.003179	-1.2315	0.0045	-0.0008	0.001361	0.3741	35
P:AL3	0.0006837	0.1898	-0.00133	-0.8691	0.0032	-0.0005	0.0006837	0.1898	25
P:AL2	0.0002432	0.06822	-0.0004326	-0.5138	0.0018	-0.0003	0.0002432	0.06822	15
P:AL1	2.749e-05	0.00782	-8.563e-05	-0.1685	0.0006	-0.0001	2.749e-05	0.00782	5
S1:O	0.0163	3.906	0.003618	-4.0675	0.0176	-0.0091	0.0163	2.478	108.4
S1:b	0.01619	3.908	0.05804	-4.0712	0.0176	-0.0091	0.01619	1.713	108.5
S1:T	0.01487	4.014	0.9007	-4.0061	0.0176	-0.0093	0.01487	-10.08	110.4
S2:O	0.01669	3.899	-0.199	-4.0675	0.0176	-0.0091	0.01669	5.327	108.2
S2:B	0.01687	3.897	-0.2535	-4.0767	0.0174	-0.0202	0.01687	6.092	108.2
S2:T	0.03328	3.936	-0.963	-4.0385	0.0009	-0.1415	0.03328	16.03	108.4
A1:O	0.01415	3.449	0.02293	-3.9313	0.0172	-0.0075	0.01415	1.924	101.9
A1:B	0.01407	3.451	0.07546	-3.9255	0.0172	-0.0075	0.01407	1.159	102
A1:T	0.01354	3.507	0.5162	-3.8407	0.0172	-0.0075	0.01354	-5.305	103
A2:O	0.009973	2.528	0.0542	-3.4917	0.0149	-0.0048	0.009973	0.7941	87.82
A2:B	0.009921	2.529	0.1009	-3.4851	0.0149	-0.0048	0.009921	0.02852	87.87
A2:T	0.009563	2.588	0.5803	-3.3761	0.0149	-0.0048	0.009563	-7.933	89.08
A3:O	0.006659	1.75	0.06802	-2.8788	0.0116	-0.0030	0.006659	-0.1886	73.96
A3:B	0.006627	1.751	0.1065	-2.8718	0.0116	-0.0030	0.006627	-0.9546	74
A3:T	0.006478	1.79	0.4277	-2.7802	0.0116	-0.0030	0.006478	-7.436	74.93
A4:O	0.01449	3.442	-0.1862	-3.9313	0.0172	-0.0075	0.01449	4.967	101.7
A4:B	0.01457	3.44	-0.2389	-3.9256	0.0172	-0.0075	0.01457	5.735	101.7
A4:1	0.01579	3.473	-0.8199	-3.6953	0.0172	-0.0078	0.01579	14.41	101.9
A4:T	0.01598	3.478	-0.9082	-3.6758	0.0171	-0.0078	0.01598	15.79	101.9
A5:O	0.01021	2.521	-0.157	-3.4917	0.0149	-0.0048	0.01021	4.255	87.61
A5:B	0.01026	2.52	-0.2039	-3.4900	0.0149	-0.0048	0.01026	5.024	87.57
A5:1	0.01125	2.558	-0.8408	-3.2690	0.0148	-0.0050	0.01125	15.71	87.88
A5:T	0.01138	2.562	-0.9189	-3.2514	0.0148	-0.0050	0.01138	17.09	87.92
A6:O	0.006821	1.745	-0.1267	-2.8788	0.0116	-0.0030	0.006821	3.684	73.77
A6:B	0.006854	1.744	-0.1654	-2.8744	0.0116	-0.0030	0.006854	4.453	73.73
A6:1	0.007384	1.773	-0.5883	-2.6566	0.0116	-0.0031	0.007384	13.13	74.09

A6:T	0.007469	1.776	-0.6515	-2.6377	0.0116	-0.0031	0.007469	14.51	74.14
1	0.01471	3.979	0.9051	-4.0061	0.0176	-0.0093	0.01471	-10.16	109.9
2	0.0333	3.901	-0.9649	-4.0385	0.0009	-0.1415	0.0333	16.04	107.9
3	0.01333	3.463	0.5218	-3.8407	0.0172	-0.0075	0.01333	-5.411	102.4
4	0.009384	2.549	0.585	-3.3761	0.0149	-0.0048	0.009384	-8.032	88.42
5	0.006339	1.757	0.4315	-2.7802	0.0116	-0.0030	0.006339	-7.53	74.27
6	0.01575	3.426	-0.9108	-3.6758	0.0171	-0.0078	0.01575	15.81	101.1
7	0.01118	2.517	-0.9214	-3.2514	0.0148	-0.0050	0.01118	17.11	87.11
8	0.007307	1.739	-0.6537	-2.6377	0.0116	-0.0031	0.007307	14.53	73.33
A	0.01558	3.429	-0.8225	-3.6953	0.0172	-0.0078	0.01558	14.43	101.2
B	0.01108	2.519	-0.8432	-3.2690	0.0148	-0.0050	0.01108	15.73	87.19
C	0.007246	1.741	-0.5904	-2.6566	0.0116	-0.0031	0.007246	13.16	73.4

Joint Support Reactions for Load Case "RULE 250C":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
P:g	-0.37	0.0	-128.51	0.0	0.0	-72.97	0.0	0.0	147.79	0.0	11573.49	0.0	-40.9	0.0	0.0	4.46	0.0	0.0

Detailed Steel Pole Usages for Load Case "RULE 250C":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
P	P:t	Origin	0.00	71.43	0.30	-2.09	-0.00	-0.00	-0.0	-0.13	0.14	-0.00	-0.01	0.00	0.02	0.00	0.03	0.0	5
P	P:AT&T	End	4.00	67.79	0.29	-1.95	0.57	-0.00	-0.0	-0.13	0.14	-0.00	-0.01	0.05	0.00	0.00	0.06	0.1	2
P	P:AT&T	Origin	4.00	67.79	0.29	-1.95	0.57	-0.00	-0.0	-4.23	11.39	0.00	-0.21	0.00	1.13	0.00	1.97	3.0	5
P	Tube 1	End	7.00	65.05	0.28	-1.85	34.76	0.00	-0.0	-4.23	11.39	0.00	-0.20	2.92	0.28	0.00	3.15	4.9	2
P	Tube 1	Origin	7.00	65.05	0.28	-1.85	34.76	0.00	0.0	-4.45	11.62	0.00	-0.21	2.92	0.29	0.00	3.17	4.9	2
P	SpliceT	End	10.00	62.33	0.27	-1.75	69.63	0.00	0.0	-4.45	11.62	0.00	-0.20	5.40	0.28	0.00	5.62	8.6	2
P	SpliceT	Origin	10.00	62.33	0.27	-1.75	69.63	0.00	0.0	-4.61	11.78	0.00	-0.17	4.31	0.22	0.00	4.49	6.9	2
P	P:AL13	End	11.00	61.43	0.26	-1.71	81.41	0.00	0.0	-4.61	11.78	0.00	-0.16	4.91	0.22	0.00	5.09	7.8	2
P	P:AL13	Origin	11.00	61.43	0.26	-1.71	81.41	0.00	0.0	-5.53	12.59	-0.00	-0.20	4.91	0.24	0.00	5.12	7.9	2
P	P:T-Mo	End	16.00	56.93	0.24	-1.54	144.35	0.00	0.0	-5.53	12.59	-0.00	-0.18	7.69	0.22	0.00	7.89	12.1	2
P	P:T-Mo	Origin	16.00	56.93	0.24	-1.54	144.35	0.00	0.0	-8.32	19.50	0.00	-0.28	7.69	0.35	0.00	7.99	12.3	2
P	P:AL12	End	21.00	52.50	0.22	-1.38	241.83	0.00	0.0	-8.32	19.50	0.00	-0.26	11.47	0.33	0.00	11.75	18.1	2
P	P:AL12	Origin	21.00	52.50	0.22	-1.38	241.83	0.00	0.0	-9.50	20.50	-0.00	-0.30	11.47	0.34	0.00	11.79	18.1	2
P	SpliceT	End	26.00	48.16	0.20	-1.22	344.33	-0.00	0.0	-9.50	20.50	-0.00	-0.28	14.63	0.32	0.00	14.93	23.0	2
P	SpliceT	Origin	26.00	48.16	0.20	-1.22	344.33	-0.00	0.0	-9.91	20.81	-0.00	-0.25	12.17	0.27	0.00	12.43	19.1	2
P	P:SW	End	27.56	46.83	0.20	-1.17	376.78	-0.00	0.0	-9.91	20.81	-0.00	-0.24	12.88	0.27	0.00	13.13	20.2	2
P	P:SW	Origin	27.56	46.83	0.20	-1.17	381.43	-0.14	-4.5	-10.74	32.56	-0.37	-0.26	13.04	0.42	0.08	13.34	20.5	2
P	P:AL11	End	31.00	43.92	0.18	-1.07	493.43	-1.44	-4.5	-10.74	32.56	-0.37	-0.25	15.73	0.41	0.07	16.00	24.6	2
P	P:AL11	Origin	31.00	43.92	0.18	-1.07	493.43	-1.43	-4.5	-11.86	33.44	-0.37	-0.28	15.73	0.42	0.07	16.03	24.7	2
P	P:A1	End	34.11	41.34	0.17	-0.98	597.28	-2.60	-4.5	-11.86	33.44	-0.37	-0.27	17.90	0.41	0.07	18.19	28.0	2
P	P:A1	Origin	34.11	41.34	0.17	-0.98	577.89	-2.59	-4.5	-15.23	59.28	-0.37	-0.35	17.32	0.72	0.07	17.72	27.3	2
P	Tube 3	End	37.55	38.53	0.16	-0.88	782.23	-3.89	-4.5	-15.23	59.28	-0.37	-0.34	21.93	0.69	0.07	22.31	34.3	2
P	Tube 3	Origin	37.55	38.53	0.16	-0.88	782.23	-3.88	-4.5	-15.86	59.64	-0.37	-0.35	21.93	0.70	0.07	22.32	34.3	2
P	P:AL10	End	41.00	35.79	0.15	-0.79	987.81	-5.18	-4.5	-15.86	59.64	-0.37	-0.34	25.96	0.68	0.06	26.33	40.5	2
P	P:AL10	Origin	41.00	35.79	0.15	-0.79	987.81	-5.17	-4.5	-17.16	60.56	-0.37	-0.37	25.96	0.69	0.06	26.36	40.6	2
P	Tube 3	End	44.62	32.99	0.13	-0.70	1206.74	-6.53	-4.5	-17.16	60.56	-0.37	-0.36	29.71	0.66	0.06	30.09	46.3	2
P	Tube 3	Origin	44.62	32.99	0.13	-0.70	1206.74	-6.52	-4.5	-17.88	60.95	-0.37	-0.37	29.71	0.67	0.06	30.10	46.3	2
P	P:A2	End	48.23	30.30	0.12	-0.62	1427.08	-7.89	-4.5	-17.88	60.95	-0.37	-0.36	32.97	0.65	0.05	33.35	51.3	2
P	P:A2	Origin	48.23	30.30	0.12	-0.62	1413.80	-7.88	-4.5	-21.83	86.79	-0.37	-0.44	32.66	0.92	0.05	33.15	51.0	2
P	P:AL9	End	51.00	28.30	0.11	-0.56	1654.15	-8.92	-4.5	-21.83	86.79	-0.37	-0.43	36.45	0.90	0.05	36.92	56.8	2
P	P:AL9	Origin	51.00	28.30	0.11	-0.56	1654.15	-8.91	-4.5	-23.37	87.76	-0.37	-0.46	36.45	0.91	0.05	36.95	56.8	2

P	Tube 3	End	56.00	24.85	0.10	-0.46	2092.92	-10.81	-4.5	-23.37	87.76	-0.37	-0.44	42.46	0.87	0.05	42.93	66.0	2
P	Tube 3	Origin	56.00	24.85	0.10	-0.46	2092.92	-10.79	-4.5	-24.62	88.31	-0.37	-0.46	42.46	0.88	0.05	42.95	66.1	2
P	P:AL8	End	61.00	21.65	0.08	-0.37	2534.44	-12.69	-4.5	-24.62	88.31	-0.37	-0.45	47.49	0.84	0.04	47.96	74.3	2
P	P:AL8	Origin	61.00	21.65	0.08	-0.37	2534.44	-12.67	-4.5	-26.04	89.18	-0.38	-0.47	47.49	0.85	0.04	47.99	74.4	2
P	P:A3	End	62.11	20.97	0.08	-0.35	2633.03	-13.09	-4.5	-26.04	89.18	-0.38	-0.47	48.50	0.85	0.04	48.99	76.3	2
P	P:A3	Origin	62.11	20.97	0.08	-0.35	2614.58	-13.08	-4.5	-30.19	114.96	-0.37	-0.54	48.16	1.09	0.04	48.74	75.9	2
P	SpliceT	End	67.00	18.14	0.07	-0.28	3177.22	-14.95	-4.5	-30.19	114.96	-0.37	-0.52	54.33	1.05	0.04	54.89	87.1	2
P	SpliceT	Origin	67.00	18.14	0.07	-0.28	3177.22	-14.93	-4.5	-31.62	115.47	-0.38	-0.41	40.64	0.79	0.03	41.08	63.2	2
P	P:AL7	End	71.00	16.00	0.06	-0.23	3639.08	-16.45	-4.5	-31.62	115.47	-0.38	-0.40	43.90	0.77	0.03	44.32	68.2	2
P	P:AL7	Origin	71.00	16.00	0.06	-0.23	3639.08	-16.43	-4.5	-33.85	116.55	-0.38	-0.43	43.90	0.78	0.03	44.35	68.2	2
P	Tube 4	End	76.00	13.52	0.05	-0.18	4221.82	-18.33	-4.5	-33.85	116.55	-0.38	-0.41	47.44	0.75	0.03	47.87	73.7	2
P	Tube 4	Origin	76.00	13.52	0.05	-0.18	4221.82	-18.31	-4.5	-35.69	117.17	-0.38	-0.43	47.44	0.75	0.03	47.90	73.7	2
P	P:AL6	End	81.00	11.27	0.04	-0.14	4807.65	-20.22	-4.5	-35.69	117.17	-0.38	-0.42	50.45	0.73	0.02	50.89	78.3	2
P	P:AL6	Origin	81.00	11.27	0.04	-0.14	4807.65	-20.20	-4.5	-38.04	118.26	-0.38	-0.45	50.45	0.73	0.02	50.92	78.3	2
P	Tube 4	End	85.00	9.63	0.04	-0.11	5280.68	-21.72	-4.5	-38.04	118.26	-0.38	-0.43	52.55	0.71	0.02	53.00	81.5	2
P	Tube 4	Origin	85.00	9.63	0.04	-0.11	5280.68	-21.70	-4.5	-39.61	118.76	-0.38	-0.45	52.55	0.72	0.02	53.02	81.6	2
P	SpliceT	End	89.00	8.15	0.03	-0.09	5755.72	-23.23	-4.5	-39.61	118.76	-0.38	-0.44	54.39	0.70	0.02	54.84	84.4	2
P	SpliceT	Origin	89.00	8.15	0.03	-0.09	5755.72	-23.22	-4.5	-40.87	119.15	-0.38	-0.36	43.41	0.56	0.02	43.79	67.4	2
P	P:AL5	End	91.00	7.46	0.03	-0.08	5994.03	-23.98	-4.5	-40.87	119.15	-0.38	-0.36	44.08	0.55	0.02	44.45	68.4	2
P	P:AL5	Origin	91.00	7.46	0.03	-0.08	5994.03	-23.97	-4.5	-43.14	120.17	-0.38	-0.38	44.08	0.56	0.02	44.47	68.4	2
P	Tube 5	End	96.00	5.88	0.02	-0.06	6594.85	-25.87	-4.5	-43.14	120.17	-0.38	-0.37	45.58	0.54	0.02	45.96	70.7	2
P	Tube 5	Origin	96.00	5.88	0.02	-0.06	6594.85	-25.85	-4.5	-45.52	120.87	-0.38	-0.39	45.58	0.54	0.02	45.98	70.7	2
P	P:AL4	End	101.00	4.49	0.02	-0.04	7199.18	-27.75	-4.5	-45.52	120.87	-0.38	-0.38	46.85	0.53	0.02	47.24	72.7	2
P	P:AL4	Origin	101.00	4.49	0.02	-0.04	7199.18	-27.73	-4.5	-48.61	122.10	-0.38	-0.40	46.85	0.53	0.02	47.26	72.7	2
P	Tube 5	End	106.00	3.29	0.01	-0.03	7809.68	-29.63	-4.5	-48.61	122.10	-0.38	-0.39	47.94	0.52	0.01	48.34	74.4	2
P	Tube 5	Origin	106.00	3.29	0.01	-0.03	7809.68	-29.62	-4.5	-51.12	122.82	-0.38	-0.41	47.94	0.52	0.01	48.36	74.4	2
P	P:AL3	End	111.00	2.28	0.01	-0.02	8423.78	-31.51	-4.5	-51.12	122.82	-0.38	-0.40	48.86	0.51	0.01	49.27	75.8	2
P	P:AL3	Origin	111.00	2.28	0.01	-0.02	8423.78	-31.50	-4.5	-54.33	124.07	-0.38	-0.42	48.86	0.51	0.01	49.29	75.8	2
P	Tube 5	End	116.00	1.46	0.01	-0.01	9044.13	-33.39	-4.5	-54.33	124.07	-0.38	-0.41	49.64	0.50	0.01	50.06	77.0	2
P	Tube 5	Origin	116.00	1.46	0.01	-0.01	9044.13	-33.38	-4.5	-56.96	124.82	-0.38	-0.43	49.64	0.50	0.01	50.08	77.1	2
P	P:AL2	End	121.00	0.82	0.00	-0.01	9668.21	-35.27	-4.5	-56.96	124.82	-0.38	-0.42	50.30	0.49	0.01	50.72	78.0	2
P	P:AL2	Origin	121.00	0.82	0.00	-0.01	9668.21	-35.26	-4.5	-60.29	126.08	-0.37	-0.45	50.30	0.49	0.01	50.75	78.1	2
P	Tube 5	End	126.00	0.37	0.00	-0.00	10298.61	-37.15	-4.5	-60.29	126.08	-0.37	-0.43	50.85	0.48	0.01	51.29	78.9	2
P	Tube 5	Origin	126.00	0.37	0.00	-0.00	10298.61	-37.14	-4.5	-63.04	126.85	-0.37	-0.45	50.85	0.48	0.01	51.31	78.9	2
P	P:AL1	End	131.00	0.09	0.00	-0.00	10932.84	-39.03	-4.5	-63.04	126.85	-0.37	-0.44	51.30	0.47	0.01	51.75	79.6	2
P	P:AL1	Origin	131.00	0.09	0.00	-0.00	10932.84	-39.01	-4.5	-66.49	128.13	-0.37	-0.47	51.30	0.48	0.01	51.77	79.6	2
P	P:g	End	136.00	0.00	0.00	0.00	11573.49	-40.90	-4.5	-66.49	128.13	-0.37	-0.46	51.67	0.46	0.01	52.13	80.2	2

Summary of Brace Forces and Usages for Load Case "RULE 250C":

Brace Label	Forces (kips)	Allowable Compression (kips)	Allowable Tension (kips)	Usage %
B1	22.08	36.72	146.25	20.13
B2	9.10	97.57	146.25	8.30
B3	-17.42	52.09	146.25	44.58
B4	22.13	36.34	146.25	20.18
B5	8.43	97.41	146.25	7.68
B6	-17.29	52.10	146.25	44.25
B7	22.18	36.20	146.25	20.22
B8	8.80	97.57	146.25	8.02
B9	-17.13	52.14	146.25	43.80

Detailed Tubular Davit Arm Usages for Load Case "RULE 250C":

Element Label	Joint Label	Joint Position	Rel. Dist.	Trans. Defl.	Long. Defl.	Vert. Defl.	Vert. Mom.	Horz. Mom.	Tors. Mom.	Axial Force	Vert. Shear	Horz. Shear	P/A	M/S	V/Q	T/R	Res.	Max. Usage	At Pt.

			(ft)	(in)	(in)	(in)	(ft-k)	(ft-k)	(ft-k)	(kips)	(kips)	(kips)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	%	
S1	S1:O	Origin	0.00	46.87	0.20	0.04	1.57	-0.01	0.0	-5.76	0.27	0.00	-0.71	0.93	0.03	0.00	1.64	2.5	2
S1	S1:b	End	0.77	46.90	0.19	0.70	1.78	-0.01	0.0	-5.76	0.27	0.00	-0.73	1.11	0.03	0.00	1.84	2.8	2
S1	S1:b	Origin	0.77	46.90	0.19	0.70	1.78	-0.01	-0.0	-5.74	-0.32	0.00	-0.73	1.11	0.03	0.00	1.84	2.8	2
S1	#S1:0	End	5.77	47.43	0.19	4.94	0.19	-0.00	-0.0	-5.74	-0.32	0.00	-0.87	0.17	0.04	0.00	1.05	1.6	2
S1	#S1:0	Origin	5.77	47.43	0.19	4.94	0.19	-0.00	-0.0	-5.73	-0.41	0.00	-0.87	0.17	0.05	0.00	1.05	1.6	2
S1	#S1:1	End	9.24	47.80	0.18	7.89	-1.23	-0.00	-0.0	-5.73	-0.41	0.00	-1.01	1.50	0.06	0.00	2.51	3.9	2
S1	#S1:1	Origin	9.24	47.80	0.18	7.89	-1.23	-0.00	-0.0	-5.72	-0.47	0.00	-1.01	1.50	0.07	0.00	2.51	3.9	2
S1	S1:T	End	12.71	48.17	0.18	10.81	-2.87	0.00	-0.0	-5.72	-0.47	0.00	-1.20	4.95	0.08	0.00	6.15	9.5	2
S2	S2:O	Origin	0.00	46.79	0.20	-2.39	-3.20	-3.93	0.1	5.75	0.18	0.37	0.94	4.06	0.07	0.06	5.01	7.7	3
S2	S2:B	End	0.77	46.76	0.20	-3.04	-3.07	-3.64	0.1	5.75	0.18	0.37	0.97	4.03	0.08	0.07	5.01	7.7	3
S2	S2:B	Origin	0.77	46.76	0.20	-3.04	-3.07	-3.64	-0.2	5.71	0.63	0.37	0.96	4.03	0.21	0.08	5.02	7.7	3
S2	#S2:0	End	5.74	47.00	0.27	-7.31	0.08	-1.81	-0.2	5.71	0.63	0.37	1.20	2.34	0.26	0.12	3.60	5.5	3
S2	#S2:0	Origin	5.74	47.00	0.27	-7.31	0.08	-1.81	-0.2	5.71	0.55	0.36	1.20	2.34	0.23	0.12	3.59	5.5	3
S2	S2:T	End	10.71	47.23	0.40	-11.56	2.83	-0.01	-0.2	5.71	0.55	0.36	1.58	6.33	0.23	0.22	7.95	12.2	2
A1	A1:O	Origin	0.00	41.38	0.17	0.28	-9.42	-0.00	-0.0	-12.73	1.29	0.00	-1.04	2.41	0.08	0.00	3.46	5.3	2
A1	A1:B	End	0.77	41.41	0.17	0.91	-8.43	-0.00	-0.0	-12.73	1.29	0.00	-1.08	2.32	0.09	0.00	3.41	5.2	2
A1	A1:B	Origin	0.77	41.41	0.17	0.91	-8.43	-0.00	-0.0	-12.78	0.04	0.00	-1.08	2.32	0.00	0.00	3.41	5.2	2
A1	#A1:0	End	4.04	41.75	0.17	3.56	-8.30	-0.00	-0.0	-12.78	0.04	0.00	-1.29	3.23	0.00	0.00	4.52	7.0	2
A1	#A1:0	Origin	4.04	41.75	0.17	3.56	-8.30	-0.00	-0.0	-12.76	-0.06	0.00	-1.29	3.23	0.00	0.00	4.52	6.9	2
A1	A1:T	End	7.32	42.08	0.16	6.19	-8.49	0.00	-0.0	-12.76	-0.06	0.00	-1.58	5.02	0.01	0.00	6.60	10.2	2
A2	A2:O	Origin	0.00	30.33	0.12	0.65	-10.71	-0.00	-0.0	-12.72	1.44	0.00	-1.04	2.74	0.09	0.00	3.79	5.8	2
A2	A2:B	End	0.77	30.35	0.12	1.21	-9.60	-0.00	-0.0	-12.72	1.44	0.00	-1.07	2.61	0.10	0.00	3.69	5.7	2
A2	A2:B	Origin	0.77	30.35	0.12	1.21	-9.60	-0.00	-0.0	-12.79	0.20	0.00	-1.08	2.61	0.01	0.00	3.69	5.7	2
A2	#A2:0	End	4.79	30.71	0.12	4.11	-8.81	0.00	-0.0	-12.79	0.20	0.00	-1.28	3.40	0.02	0.00	4.68	7.2	2
A2	#A2:0	Origin	4.79	30.71	0.12	4.11	-8.81	0.00	-0.0	-12.77	0.08	0.00	-1.28	3.40	0.01	0.00	4.68	7.2	2
A2	A2:T	End	8.82	31.06	0.11	6.96	-8.49	0.00	-0.0	-12.77	0.08	0.00	-1.58	5.02	0.01	0.00	6.60	10.1	2
A3	A3:O	Origin	0.00	21.00	0.08	0.82	-11.15	-0.00	-0.0	-12.70	1.53	0.00	-1.04	2.86	0.10	0.00	3.90	6.0	2
A3	A3:B	End	0.77	21.02	0.08	1.28	-9.98	0.00	-0.0	-12.70	1.53	0.00	-1.08	2.75	0.10	0.00	3.83	5.9	2
A3	A3:B	Origin	0.77	21.02	0.08	1.28	-9.98	0.00	-0.0	-12.78	0.28	0.00	-1.08	2.75	0.02	0.00	3.83	5.9	2
A3	#A3:0	End	4.04	21.25	0.08	3.22	-9.08	0.00	-0.0	-12.78	0.28	0.00	-1.29	3.53	0.02	0.00	4.82	7.4	2
A3	#A3:0	Origin	4.04	21.25	0.08	3.22	-9.08	0.00	-0.0	-12.76	0.18	0.00	-1.29	3.53	0.01	0.00	4.82	7.4	2
A3	A3:T	End	7.32	21.47	0.08	5.13	-8.49	0.00	-0.0	-12.76	0.18	0.00	-1.58	5.02	0.02	0.00	6.60	10.1	2
A4	A4:O	Origin	0.00	41.30	0.17	-2.23	10.28	-0.02	-0.0	12.77	1.50	-0.00	0.84	2.13	0.08	0.00	2.98	4.6	2
A4	A4:B	End	0.77	41.28	0.17	-2.87	11.43	-0.02	-0.0	12.77	1.50	-0.00	0.86	2.49	0.08	0.00	3.36	5.2	2
A4	A4:B	Origin	0.77	41.28	0.17	-2.87	11.43	-0.02	-0.0	12.58	2.53	-0.00	0.85	2.49	0.14	0.00	3.35	5.2	2
A4	#A4:0	End	5.11	41.48	0.18	-6.40	22.41	-0.02	-0.0	12.58	2.53	-0.00	0.99	6.63	0.16	0.00	7.62	11.7	2
A4	#A4:0	Origin	5.11	41.48	0.18	-6.40	22.41	-0.02	-0.0	12.58	2.37	-0.00	0.99	6.63	0.15	0.00	7.62	11.7	2
A4	A4:1	End	9.45	41.68	0.19	-9.84	32.68	-0.03	-0.0	12.58	2.37	-0.00	1.18	13.84	0.18	0.00	15.02	23.1	2
A4	A4:1	Origin	9.45	41.68	0.19	-9.84	19.24	-0.03	-0.0	-6.95	-18.01	0.02	-0.65	8.15	1.36	0.00	9.11	14.0	2
A4	A4:T	End	10.83	41.73	0.19	-10.90	-5.61	0.00	-0.0	-6.95	-18.01	0.02	-0.69	0.00	3.74	0.00	6.52	10.0	4
A5	A5:O	Origin	0.00	30.26	0.12	-1.88	3.18	-0.01	-0.0	12.77	1.78	-0.00	0.70	0.56	0.08	0.00	1.27	1.9	2
A5	A5:B	End	0.77	30.24	0.12	-2.45	4.55	-0.01	-0.0	12.77	1.78	-0.00	0.72	0.83	0.08	0.00	1.56	2.4	2
A5	A5:B	Origin	0.77	30.24	0.12	-2.45	4.55	-0.01	-0.0	12.56	2.75	-0.00	0.71	0.83	0.12	0.00	1.55	2.4	2
A5	#A5:0	End	5.77	30.46	0.13	-6.08	18.31	-0.01	-0.0	12.56	2.75	-0.00	0.82	4.50	0.14	0.00	5.32	8.2	2
A5	#A5:0	Origin	5.77	30.46	0.13	-6.08	18.31	-0.01	-0.0	12.57	2.55	-0.00	0.82	4.50	0.13	0.00	5.32	8.2	2
A5	#A5:1	End	8.61	30.58	0.13	-8.11	25.56	-0.01	-0.0	12.57	2.55	-0.00	0.90	7.59	0.15	0.00	8.49	13.1	2
A5	#A5:1	Origin	8.61	30.58	0.13	-8.11	25.56	-0.01	-0.0	12.57	2.43	-0.00	0.90	7.59	0.14	0.00	8.49	13.1	2
A5	A5:1	End	11.46	30.70	0.14	-10.09	32.49	-0.01	-0.0	12.57	2.43	-0.00	1.00	11.90	0.16	0.00	12.90	19.8	2
A5	A5:1	Origin	11.46	30.70	0.14	-10.09	19.48	-0.01	-0.0	-6.41	-17.87	0.01	-0.51	7.14	1.15	0.00	7.90	12.2	2
A5	A5:T	End	12.84	30.75	0.14	-11.03	-5.17	0.00	-0.0	-6.41	-17.87	0.01	-0.54	0.00	3.12	0.00	5.43	8.4	4

A6	A6:O	Origin	0.00	20.94	0.08	-1.52	7.70	-0.00	-0.0	12.74	1.73	-0.00	0.84	1.60	0.09	0.00	2.44	3.8	2
A6	A6:B	End	0.77	20.93	0.08	-1.98	9.03	-0.00	-0.0	12.74	1.73	-0.00	0.86	1.97	0.09	0.00	2.83	4.4	2
A6	A6:B	Origin	0.77	20.93	0.08	-1.98	9.03	-0.00	-0.0	12.53	2.76	-0.00	0.84	1.97	0.15	0.00	2.83	4.3	2
A6	#A6:0	End	5.11	21.11	0.09	-4.57	21.01	-0.00	-0.0	12.53	2.76	-0.00	0.98	6.21	0.17	0.00	7.20	11.1	2
A6	#A6:0	Origin	5.11	21.11	0.09	-4.57	21.01	-0.00	-0.0	12.54	2.59	-0.00	0.98	6.21	0.16	0.00	7.20	11.1	2
A6	A6:1	End	9.45	21.27	0.09	-7.06	32.26	-0.01	-0.0	12.54	2.59	-0.00	1.17	13.66	0.20	0.00	14.84	22.8	2
A6	A6:1	Origin	9.45	21.27	0.09	-7.06	18.86	-0.01	-0.0	-6.94	-17.73	0.00	-0.65	7.99	1.34	0.00	8.94	13.8	2
A6	A6:T	End	10.83	21.32	0.09	-7.82	-5.60	0.00	-0.0	-6.94	-17.73	0.00	-0.69	0.00	3.68	0.00	6.41	9.9	4

Summary of Clamp Capacities and Usages for Load Case "RULE 250C":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
1	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
2	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
3	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
4	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
5	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
6	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
7	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
8	0.000	50.00	0.00	0.00	50.00	0.00	0.00	0.00
9	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
10	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
11	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
12	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
13	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
14	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
15	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
16	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
17	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
18	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
19	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
20	11.650	50.00	0.00	0.00	50.00	0.00	0.00	0.00
21	6.860	50.00	0.00	0.00	50.00	0.00	0.00	0.00
24	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
25	0.828	50.00	0.00	0.00	50.00	0.00	0.00	0.00
SW1	5.736	50.00	0.00	0.00	50.00	0.00	0.00	0.00
SW2	5.748	50.00	0.00	0.00	50.00	0.00	0.00	0.00

Summary of Suspension Capacities and Usages for Load Case "RULE 250C":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
C1	12.756	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C2	12.756	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C3	12.756	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C4	12.756	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C5	12.756	30.00	0.00	0.00	0.00	0.00	0.00	0.00
C6	12.756	30.00	0.00	0.00	0.00	0.00	0.00	0.00

*** Analysis Results for Load Case No. 3 "RULE 250D" - Number of iterations in SAPS 14

Equilibrium Joint Positions and Rotations for Load Case "RULE 250D":

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1P	0.02039	2.498	-0.6419	0.0000	0.0000	0.0000	0.02039	14.8	99.35
2P	0.01466	1.845	-0.6875	0.0000	0.0000	0.0000	0.01466	16.37	85.34
3P	0.009689	1.276	-0.5018	0.0000	0.0000	0.0000	0.009689	14.02	71.49
P:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
P:t	0.03435	4.3	-0.09054	-2.8898	0.0243	-0.0114	0.03435	4.3	135.9
P:AT&T	0.03262	4.098	-0.08545	-2.8897	0.0243	-0.0114	0.03262	4.098	131.9
P:AL13	0.02958	3.745	-0.07648	-2.8818	0.0243	-0.0114	0.02958	3.745	124.9
P:T-Mo	0.02741	3.494	-0.07011	-2.8708	0.0242	-0.0114	0.02741	3.494	119.9
P:AL12	0.02525	3.245	-0.06378	-2.8549	0.0242	-0.0114	0.02525	3.245	114.9
P:SW	0.02242	2.919	-0.05559	-2.8283	0.0241	-0.0114	0.02242	2.919	108.4
P:AL11	0.02089	2.75	-0.05135	-2.8109	0.0239	-0.0103	0.02089	2.75	104.9
P:A1	0.01953	2.598	-0.04757	-2.7895	0.0235	-0.0094	0.01953	2.598	101.8
P:AL10	0.01664	2.266	-0.03939	-2.7088	0.0222	-0.0076	0.01664	2.266	94.96
P:A2	0.01385	1.932	-0.03146	-2.5740	0.0204	-0.0060	0.01385	1.932	87.74
P:AL9	0.01285	1.809	-0.02863	-2.5106	0.0196	-0.0055	0.01285	1.809	84.97
P:AL8	0.00962	1.393	-0.01966	-2.2195	0.0164	-0.0039	0.00962	1.393	74.98
P:A3	0.0093	1.351	-0.0188	-2.1828	0.0160	-0.0037	0.0093	1.351	73.88
P:AL7	0.006991	1.034	-0.01285	-1.8914	0.0133	-0.0027	0.006991	1.034	64.99
P:AL6	0.004859	0.7302	-0.007926	-1.5706	0.0107	-0.0020	0.004859	0.7302	54.99
P:AL5	0.003187	0.4846	-0.004613	-1.2402	0.0083	-0.0014	0.003187	0.4846	45
P:AL4	0.001901	0.2917	-0.002504	-0.9590	0.0063	-0.0010	0.001901	0.2917	35
P:AL3	0.000957	0.1481	-0.001218	-0.6777	0.0044	-0.0006	0.000957	0.1481	25
P:AL2	0.0003415	0.05322	-0.0005091	-0.4009	0.0026	-0.0004	0.0003415	0.05322	15
P:AL1	3.877e-05	0.006097	-0.0001346	-0.1314	0.0008	-0.0001	3.877e-05	0.006097	5
S1:O	0.02217	2.921	0.01489	-2.8283	0.0241	-0.0114	0.02217	1.493	108.5
S1:b	0.02203	2.922	0.05239	-2.7809	0.0241	-0.0114	0.02203	0.7267	108.5
S1:T	0.02028	2.977	0.547	-2.0359	0.0240	-0.0118	0.02028	-11.12	110
S2:O	0.02268	2.917	-0.1261	-2.8283	0.0241	-0.0114	0.02268	4.346	108.3
S2:B	0.02291	2.917	-0.1644	-2.8925	0.0241	-0.0253	0.02291	5.112	108.3
S2:T	0.04345	2.952	-0.7299	-3.4393	0.0068	-0.1773	0.04345	15.05	108.6
A1:O	0.01931	2.6	0.02665	-2.7895	0.0235	-0.0094	0.01931	1.075	101.9
A1:B	0.0192	2.601	0.06382	-2.7710	0.0235	-0.0094	0.0192	0.3087	102
A1:T	0.01851	2.637	0.3683	-2.6043	0.0235	-0.0094	0.01851	-6.175	102.9
A2:O	0.01369	1.934	0.0464	-2.5740	0.0204	-0.0060	0.01369	0.1998	87.82
A2:B	0.01362	1.934	0.08068	-2.5524	0.0204	-0.0060	0.01362	-0.5664	87.85
A2:T	0.01316	1.973	0.42	-2.3237	0.0204	-0.0061	0.01316	-8.548	88.92
A3:O	0.009194	1.352	0.05505	-2.1828	0.0160	-0.0037	0.009194	-0.5868	73.95
A3:B	0.009153	1.353	0.08411	-2.1636	0.0160	-0.0037	0.009153	-1.353	73.98
A3:T	0.008965	1.379	0.3195	-1.9929	0.0160	-0.0037	0.008965	-7.847	74.82
A4:O	0.01975	2.596	-0.1218	-2.7895	0.0235	-0.0094	0.01975	4.121	101.8
A4:B	0.01986	2.595	-0.1593	-2.7986	0.0235	-0.0094	0.01986	4.89	101.7
A4:1	0.02143	2.624	-0.5816	-2.7014	0.0235	-0.0094	0.02143	13.56	102.1
A4:T	0.02168	2.627	-0.646	-2.6844	0.0235	-0.0094	0.02168	14.94	102.1
A5:O	0.014	1.93	-0.1093	-2.5740	0.0204	-0.0060	0.014	3.664	87.66
A5:B	0.01407	1.929	-0.144	-2.5868	0.0204	-0.0060	0.01407	4.433	87.63
A5:1	0.01536	1.962	-0.6301	-2.5262	0.0204	-0.0060	0.01536	15.11	88.09
A5:T	0.01552	1.966	-0.6904	-2.5108	0.0204	-0.0060	0.01552	16.49	88.14
A6:O	0.009405	1.349	-0.09265	-2.1828	0.0160	-0.0037	0.009405	3.288	73.8
A6:B	0.009447	1.349	-0.1221	-2.1927	0.0160	-0.0037	0.009447	4.058	73.77
A6:1	0.01014	1.373	-0.4533	-2.1045	0.0160	-0.0037	0.01014	12.73	74.23

A6:T	0.01025	1.376	-0.5034	-2.0880	0.0160	-0.0037	0.01025	14.1	74.29
1	0.02006	2.959	0.5489	-2.0359	0.0240	-0.0118	0.02006	-11.18	109.6
2	0.04344	2.922	-0.7317	-3.4393	0.0068	-0.1773	0.04344	15.06	108.1
3	0.01823	2.607	0.3718	-2.6043	0.0235	-0.0094	0.01823	-6.267	102.2
4	0.01292	1.946	0.423	-2.3237	0.0204	-0.0061	0.01292	-8.635	88.26
5	0.008775	1.356	0.3221	-1.9929	0.0160	-0.0037	0.008775	-7.932	74.16
6	0.02135	2.59	-0.6482	-2.6844	0.0235	-0.0094	0.02135	14.97	101.3
7	0.01524	1.93	-0.6926	-2.5108	0.0204	-0.0060	0.01524	16.52	87.34
8	0.01002	1.347	-0.5053	-2.0880	0.0160	-0.0037	0.01002	14.14	73.48
A	0.02115	2.591	-0.5838	-2.7014	0.0235	-0.0094	0.02115	13.59	101.4
B	0.01512	1.932	-0.6322	-2.5262	0.0204	-0.0060	0.01512	15.14	87.4
C	0.009947	1.347	-0.4552	-2.1045	0.0160	-0.0037	0.009947	12.76	73.53

Joint Support Reactions for Load Case "RULE 250D":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
P:g	-0.56	0.0	-99.14	0.0	0.0	-115.87	0.0	0.0	152.49	0.0	9026.01	0.0	-57.6	0.0	0.0	5.57	0.0	0.0

Detailed Steel Pole Usages for Load Case "RULE 250D":

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. (ksi)	Max. Usage %	At Pt.
P	P:t	Origin	0.00	51.60	0.41	-1.09	-0.00	-0.00	-0.0	-0.14	0.05	-0.00	-0.01	0.00	0.01	0.00	0.01	0.0	5
P	P:AT&T	End	4.00	49.18	0.39	-1.03	0.20	-0.00	-0.0	-0.14	0.05	-0.00	-0.01	0.02	0.00	0.00	0.02	0.0	2
P	P:AT&T	Origin	4.00	49.18	0.39	-1.03	0.20	-0.00	0.0	-7.45	2.33	-0.00	-0.36	0.00	0.23	0.00	0.54	0.8	5
P	Tube 1	End	7.00	47.36	0.38	-0.98	7.19	-0.02	0.0	-7.45	2.33	-0.00	-0.35	0.60	0.06	0.00	0.96	1.5	2
P	Tube 1	Origin	7.00	47.36	0.38	-0.98	7.19	-0.02	0.0	-7.66	2.41	-0.01	-0.36	0.60	0.06	0.00	0.97	1.5	2
P	SpliceT	End	10.00	45.55	0.36	-0.93	14.43	-0.04	0.0	-7.66	2.41	-0.01	-0.35	1.12	0.06	0.00	1.47	2.3	2
P	SpliceT	Origin	10.00	45.55	0.36	-0.93	14.43	-0.04	0.0	-7.82	2.47	-0.01	-0.28	0.89	0.05	0.00	1.18	1.8	2
P	P:AL13	End	11.00	44.94	0.35	-0.92	16.89	-0.04	0.0	-7.82	2.47	-0.01	-0.28	1.02	0.05	0.00	1.30	2.0	2
P	P:AL13	Origin	11.00	44.94	0.35	-0.92	16.89	-0.04	0.0	-10.34	2.78	-0.01	-0.37	1.02	0.05	0.00	1.39	2.1	2
P	P:T-Mo	End	16.00	41.93	0.33	-0.84	30.79	-0.09	0.0	-10.34	2.78	-0.01	-0.35	1.64	0.05	0.00	1.99	3.1	2
P	P:T-Mo	Origin	16.00	41.93	0.33	-0.84	30.79	-0.09	0.0	-15.23	4.26	-0.01	-0.51	1.64	0.08	0.00	2.16	3.3	2
P	P:AL12	End	21.00	38.93	0.30	-0.77	52.07	-0.15	0.0	-15.23	4.26	-0.01	-0.48	2.47	0.07	0.00	2.96	4.5	2
P	P:AL12	Origin	21.00	38.93	0.30	-0.77	52.07	-0.15	0.0	-17.99	4.64	-0.02	-0.57	2.47	0.08	0.00	3.04	4.7	2
P	SpliceT	End	26.00	35.96	0.28	-0.69	75.25	-0.23	0.0	-17.99	4.64	-0.02	-0.54	3.20	0.07	0.00	3.74	5.8	2
P	SpliceT	Origin	26.00	35.96	0.28	-0.69	75.25	-0.23	0.0	-18.38	4.74	-0.02	-0.46	2.66	0.06	0.00	3.12	4.8	2
P	P:SW	End	27.56	35.03	0.27	-0.67	82.65	-0.26	0.0	-18.38	4.74	-0.02	-0.45	2.83	0.06	0.00	3.28	5.0	2
P	P:SW	Origin	27.56	35.03	0.27	-0.67	83.06	-0.45	-5.6	-22.86	17.24	-0.49	-0.56	2.84	0.22	0.10	3.45	5.3	2
P	P:AL11	End	31.00	33.00	0.25	-0.62	142.37	-2.13	-5.6	-22.86	17.24	-0.49	-0.54	4.55	0.22	0.09	5.12	7.9	2
P	P:AL11	Origin	31.00	33.00	0.25	-0.62	142.37	-2.13	-5.6	-25.56	17.58	-0.49	-0.60	4.55	0.22	0.09	5.18	8.0	2
P	P:A1	End	34.11	31.18	0.23	-0.57	196.96	-3.66	-5.6	-25.56	17.58	-0.49	-0.59	5.92	0.21	0.09	6.53	10.0	2
P	P:A1	Origin	34.11	31.18	0.23	-0.57	186.35	-3.66	-5.6	-34.45	43.75	-0.49	-0.79	5.61	0.53	0.09	6.48	10.0	2
P	Tube 3	End	37.55	29.17	0.22	-0.52	337.18	-5.37	-5.6	-34.45	43.75	-0.49	-0.76	9.48	0.51	0.08	10.30	15.8	2
P	Tube 3	Origin	37.55	29.17	0.22	-0.52	337.18	-5.37	-5.6	-35.01	43.87	-0.50	-0.78	9.48	0.51	0.08	10.31	15.9	2
P	P:AL10	End	41.00	27.19	0.20	-0.47	488.39	-7.08	-5.6	-35.01	43.87	-0.50	-0.75	12.87	0.50	0.08	13.66	21.0	2
P	P:AL10	Origin	41.00	27.19	0.20	-0.47	488.39	-7.08	-5.6	-37.84	44.19	-0.50	-0.81	12.87	0.50	0.08	13.72	21.1	2
P	Tube 3	End	44.62	25.16	0.18	-0.42	648.16	-8.89	-5.6	-37.84	44.19	-0.50	-0.79	15.99	0.49	0.07	16.80	25.9	2
P	Tube 3	Origin	44.62	25.16	0.18	-0.42	648.16	-8.89	-5.6	-38.48	44.30	-0.50	-0.80	15.99	0.49	0.07	16.82	25.9	2
P	P:A2	End	48.23	23.18	0.17	-0.38	808.32	-10.71	-5.6	-38.48	44.30	-0.50	-0.77	18.71	0.47	0.07	19.51	30.0	2
P	P:A2	Origin	48.23	23.18	0.17	-0.38	804.99	-10.70	-5.6	-47.81	70.43	-0.50	-0.96	18.64	0.75	0.07	19.65	30.2	2
P	P:AL9	End	51.00	21.70	0.15	-0.34	1000.04	-12.11	-5.6	-47.81	70.43	-0.50	-0.94	22.08	0.73	0.06	23.06	35.5	2
P	P:AL9	Origin	51.00	21.70	0.15	-0.34	1000.04	-12.10	-5.6	-50.83	70.73	-0.51	-1.00	22.08	0.73	0.06	23.12	35.6	2

P	Tube 3	End	56.00	19.13	0.13	-0.29	1353.68	-14.66	-5.6	-50.83	70.73	-0.51	-0.96	27.50	0.70	0.06	28.49	43.8	2
P	Tube 3	Origin	56.00	19.13	0.13	-0.29	1353.68	-14.64	-5.6	-51.91	70.83	-0.51	-0.98	27.50	0.70	0.06	28.51	43.9	2
P	P:AL8	End	61.00	16.72	0.12	-0.24	1707.80	-17.21	-5.6	-51.91	70.83	-0.51	-0.94	32.04	0.68	0.05	33.01	51.2	2
P	P:AL8	Origin	61.00	16.72	0.12	-0.24	1707.80	-17.20	-5.6	-54.83	71.08	-0.51	-0.99	32.04	0.68	0.05	33.06	51.2	2
P	P:A3	End	62.11	16.21	0.11	-0.23	1786.38	-17.78	-5.6	-54.83	71.08	-0.51	-0.99	32.95	0.67	0.05	33.96	52.9	2
P	P:A3	Origin	62.11	16.21	0.11	-0.23	1776.50	-17.77	-5.6	-64.22	97.08	-0.52	-1.15	32.76	0.92	0.05	33.96	52.9	2
P	SpliceT	End	67.00	14.05	0.10	-0.18	2251.64	-20.31	-5.6	-64.22	97.08	-0.52	-1.11	38.55	0.89	0.05	39.70	63.0	2
P	SpliceT	Origin	67.00	14.05	0.10	-0.18	2251.64	-20.30	-5.6	-65.48	97.13	-0.52	-0.85	28.83	0.67	0.04	29.71	45.7	2
P	P:AL7	End	71.00	12.41	0.08	-0.15	2640.16	-22.39	-5.6	-65.48	97.13	-0.52	-0.82	31.88	0.65	0.03	32.73	50.4	2
P	P:AL7	Origin	71.00	12.41	0.08	-0.15	2640.16	-22.37	-5.6	-69.16	97.39	-0.52	-0.87	31.88	0.65	0.03	32.77	50.4	2
P	Tube 4	End	76.00	10.50	0.07	-0.12	3127.10	-25.00	-5.6	-69.16	97.39	-0.52	-0.84	35.18	0.63	0.03	36.03	55.4	2
P	Tube 4	Origin	76.00	10.50	0.07	-0.12	3127.10	-24.98	-5.6	-70.83	97.46	-0.52	-0.86	35.18	0.63	0.03	36.05	55.5	2
P	P:AL6	End	81.00	8.76	0.06	-0.10	3614.38	-27.62	-5.6	-70.83	97.46	-0.52	-0.83	37.97	0.60	0.03	38.81	59.7	2
P	P:AL6	Origin	81.00	8.76	0.06	-0.10	3614.38	-27.61	-5.6	-74.62	97.68	-0.53	-0.88	37.97	0.61	0.03	38.86	59.8	2
P	Tube 4	End	85.00	7.50	0.05	-0.08	4005.10	-29.73	-5.6	-74.62	97.68	-0.53	-0.85	39.89	0.59	0.03	40.76	62.7	2
P	Tube 4	Origin	85.00	7.50	0.05	-0.08	4005.10	-29.72	-5.6	-76.04	97.72	-0.53	-0.87	39.89	0.59	0.03	40.78	62.7	2
P	SpliceT	End	89.00	6.35	0.04	-0.06	4395.96	-31.85	-5.6	-76.04	97.72	-0.53	-0.85	41.58	0.58	0.03	42.44	65.3	2
P	SpliceT	Origin	89.00	6.35	0.04	-0.06	4395.96	-31.84	-5.6	-77.20	97.75	-0.53	-0.69	33.18	0.46	0.02	33.88	52.1	2
P	P:AL5	End	91.00	5.82	0.04	-0.06	4591.46	-32.91	-5.6	-77.20	97.75	-0.53	-0.68	33.79	0.45	0.02	34.48	53.0	2
P	P:AL5	Origin	91.00	5.82	0.04	-0.06	4591.46	-32.90	-5.6	-80.96	97.98	-0.53	-0.71	33.79	0.46	0.02	34.51	53.1	2
P	Tube 5	End	96.00	4.58	0.03	-0.04	5081.35	-35.59	-5.6	-80.96	97.98	-0.53	-0.69	35.15	0.44	0.02	35.85	55.1	2
P	Tube 5	Origin	96.00	4.58	0.03	-0.04	5081.35	-35.57	-5.6	-83.20	98.07	-0.54	-0.71	35.15	0.44	0.02	35.86	55.2	2
P	P:AL4	End	101.00	3.50	0.02	-0.03	5571.69	-38.27	-5.6	-83.20	98.07	-0.54	-0.69	36.29	0.43	0.02	36.99	56.9	2
P	P:AL4	Origin	101.00	3.50	0.02	-0.03	5571.69	-38.26	-5.6	-87.73	98.31	-0.54	-0.73	36.29	0.43	0.02	37.02	57.0	2
P	Tube 5	End	106.00	2.57	0.02	-0.02	6063.21	-40.98	-5.6	-87.73	98.31	-0.54	-0.70	37.25	0.42	0.02	37.96	58.4	2
P	Tube 5	Origin	106.00	2.57	0.02	-0.02	6063.21	-40.97	-5.6	-90.09	98.38	-0.54	-0.72	37.25	0.42	0.02	37.98	58.4	2
P	P:AL3	End	111.00	1.78	0.01	-0.01	6555.12	-43.70	-5.6	-90.09	98.38	-0.54	-0.70	38.05	0.41	0.02	38.76	59.6	2
P	P:AL3	Origin	111.00	1.78	0.01	-0.01	6555.12	-43.69	-5.6	-94.74	98.60	-0.55	-0.74	38.05	0.41	0.02	38.80	59.7	2
P	Tube 5	End	116.00	1.14	0.01	-0.01	7048.10	-46.44	-5.6	-94.74	98.60	-0.55	-0.72	38.72	0.40	0.02	39.44	60.7	2
P	Tube 5	Origin	116.00	1.14	0.01	-0.01	7048.10	-46.43	-5.6	-97.22	98.67	-0.55	-0.74	38.72	0.40	0.02	39.46	60.7	2
P	P:AL2	End	121.00	0.64	0.00	-0.01	7541.45	-49.20	-5.6	-97.22	98.67	-0.55	-0.72	39.26	0.39	0.01	39.99	61.5	2
P	P:AL2	Origin	121.00	0.64	0.00	-0.01	7541.45	-49.19	-5.6	-101.99	98.87	-0.55	-0.75	39.26	0.39	0.01	40.02	61.6	2
P	Tube 5	End	126.00	0.29	0.00	-0.00	8035.78	-51.98	-5.6	-101.99	98.87	-0.55	-0.73	39.70	0.38	0.01	40.45	62.2	2
P	Tube 5	Origin	126.00	0.29	0.00	-0.00	8035.78	-51.96	-5.6	-104.58	98.93	-0.56	-0.75	39.70	0.38	0.01	40.46	62.3	2
P	P:AL1	End	131.00	0.07	0.00	-0.00	8530.44	-54.77	-5.6	-104.58	98.93	-0.56	-0.73	40.06	0.37	0.01	40.80	62.8	2
P	P:AL1	Origin	131.00	0.07	0.00	-0.00	8530.44	-54.76	-5.6	-109.46	99.12	-0.56	-0.77	40.06	0.37	0.01	40.83	62.8	2
P	P:g	End	136.00	0.00	0.00	0.00	9026.01	-57.58	-5.6	-109.46	99.12	-0.56	-0.75	40.33	0.36	0.01	41.08	63.2	2

Summary of Brace Forces and Usages for Load Case "RULE 250D":

Brace Label	Forces (kips)	Allowable Compression (kips)	Allowable Tension (kips)	Usage %
B1	22.77	36.72	146.25	15.57
B2	7.97	97.57	146.25	5.45
B3	-15.25	52.09	146.25	29.27
B4	22.77	36.34	146.25	15.57
B5	7.38	97.41	146.25	5.04
B6	-15.14	52.10	146.25	29.05
B7	22.76	36.20	146.25	15.56
B8	7.68	97.57	146.25	5.25
B9	-14.96	52.14	146.25	28.69

Detailed Tubular Davit Arm Usages for Load Case "RULE 250D":

Element Label	Joint Label	Joint Position	Rel. Dist.	Trans. Defl.	Long. Defl.	Vert. Defl.	Vert. Mom.	Horz. Mom.	Tors. Mom.	Axial Force	Vert. Shear	Horz. Shear	P/A	M/S.	V/Q.	T/R.	Res.	Max. Usage	At Pt.

			(ft)	(in)	(in)	(in)	(ft-k)	(ft-k)	(ft-k)	(kips)	(kips)	(kips)	(ksi)	(ksi)	(ksi)	(ksi)	(ksi)	%	
S1	S1:O	Origin	0.00	35.05	0.27	0.18	-22.07	-0.00	-0.0	-6.21	2.11	0.00	-0.77	13.04	0.21	0.00	13.82	21.3	2
S1	S1:b	End	0.77	35.06	0.26	0.63	-20.46	-0.00	-0.0	-6.21	2.11	0.00	-0.79	12.72	0.22	0.00	13.51	20.8	2
S1	S1:b	Origin	0.77	35.06	0.26	0.63	-20.46	-0.00	-0.0	-6.35	1.50	0.00	-0.81	12.72	0.15	0.00	13.53	20.8	2
S1	#S1:0	End	5.77	35.37	0.26	3.34	-12.95	-0.00	-0.0	-6.35	1.50	0.00	-0.97	11.62	0.18	0.00	12.59	19.4	2
S1	#S1:0	Origin	5.77	35.37	0.26	3.34	-12.95	-0.00	-0.0	-6.33	1.43	0.00	-0.96	11.62	0.18	0.00	12.58	19.4	2
S1	#S1:1	End	9.24	35.56	0.25	5.03	-7.97	0.00	-0.0	-6.33	1.43	0.00	-1.12	9.65	0.21	0.00	10.78	16.6	2
S1	#S1:1	Origin	9.24	35.56	0.25	5.03	-7.97	0.00	-0.0	-6.32	1.39	0.00	-1.11	9.65	0.20	0.00	10.78	16.6	2
S1	S1:T	End	12.71	35.72	0.24	6.56	-3.13	0.00	-0.0	-6.32	1.39	0.00	-1.33	5.41	0.24	0.00	6.75	10.4	2
S2	S2:O	Origin	0.00	35.01	0.27	-1.51	-22.63	-4.93	0.2	6.20	2.01	0.47	1.02	19.07	0.30	0.08	20.10	30.9	2
S2	S2:B	End	0.77	35.00	0.27	-1.97	-21.09	-4.57	0.2	6.20	2.01	0.47	1.05	18.86	0.31	0.08	19.92	30.7	2
S2	S2:B	Origin	0.77	35.00	0.27	-1.97	-21.09	-4.56	-0.2	6.01	2.47	0.46	1.02	18.86	0.37	0.10	19.90	30.6	2
S2	#S2:0	End	5.74	35.20	0.36	-5.21	-8.80	-2.27	-0.2	6.01	2.47	0.46	1.26	12.38	0.46	0.16	13.69	21.1	2
S2	#S2:0	Origin	5.74	35.20	0.36	-5.21	-8.80	-2.26	-0.2	6.03	2.36	0.45	1.27	12.38	0.44	0.16	13.69	21.1	2
S2	S2:T	End	10.71	35.42	0.52	-8.76	2.94	-0.02	-0.2	6.03	2.36	0.45	1.67	6.57	0.58	0.27	8.37	12.9	2
A1	A1:O	Origin	0.00	31.20	0.23	0.32	-29.86	0.00	-0.0	-13.02	4.08	0.00	-1.07	7.65	0.27	0.00	8.73	13.4	2
A1	A1:B	End	0.77	31.21	0.23	0.77	-26.74	0.00	-0.0	-13.02	4.08	0.00	-1.10	7.37	0.28	0.00	8.49	13.1	2
A1	A1:B	Origin	0.77	31.21	0.23	0.77	-26.74	0.00	-0.0	-13.33	2.79	0.00	-1.13	7.37	0.19	0.00	8.50	13.1	2
A1	#A1:0	End	4.04	31.43	0.23	2.62	-17.61	0.00	-0.0	-13.33	2.79	0.00	-1.34	6.85	0.22	0.00	8.21	12.6	2
A1	#A1:0	Origin	4.04	31.43	0.23	2.62	-17.61	0.00	-0.0	-13.31	2.70	0.00	-1.34	6.85	0.22	0.00	8.20	12.6	2
A1	A1:T	End	7.32	31.64	0.22	4.42	-8.78	0.00	-0.0	-13.31	2.70	0.00	-1.65	5.19	0.27	0.00	6.85	10.5	2
A2	A2:O	Origin	0.00	23.20	0.16	0.56	-34.93	0.01	-0.0	-13.01	4.18	-0.00	-1.06	8.95	0.27	0.00	10.02	15.4	2
A2	A2:B	End	0.77	23.21	0.16	0.97	-31.73	0.01	-0.0	-13.01	4.18	-0.00	-1.10	8.63	0.28	0.00	9.74	15.0	2
A2	A2:B	Origin	0.77	23.21	0.16	0.97	-31.73	0.01	-0.0	-13.32	2.90	-0.00	-1.12	8.63	0.20	0.00	9.76	15.0	2
A2	#A2:0	End	4.79	23.45	0.16	3.05	-20.03	0.00	-0.0	-13.32	2.90	-0.00	-1.34	7.74	0.23	0.00	9.08	14.0	2
A2	#A2:0	Origin	4.79	23.45	0.16	3.05	-20.03	0.00	-0.0	-13.29	2.80	-0.00	-1.33	7.74	0.22	0.00	9.08	14.0	2
A2	A2:T	End	8.82	23.68	0.16	5.04	-8.77	0.00	-0.0	-13.29	2.80	-0.00	-1.65	5.19	0.28	0.00	6.85	10.5	2
A3	A3:O	Origin	0.00	16.23	0.11	0.66	-30.90	0.01	-0.0	-12.98	4.21	-0.00	-1.06	7.91	0.27	0.00	8.99	13.8	2
A3	A3:B	End	0.77	16.23	0.11	1.01	-27.67	0.01	-0.0	-12.98	4.21	-0.00	-1.10	7.62	0.28	0.00	8.74	13.4	2
A3	A3:B	Origin	0.77	16.23	0.11	1.01	-27.67	0.01	-0.0	-13.30	2.93	-0.00	-1.13	7.62	0.20	0.00	8.76	13.5	2
A3	#A3:0	End	4.04	16.39	0.11	2.45	-18.08	0.00	-0.0	-13.30	2.93	-0.00	-1.34	7.04	0.24	0.00	8.38	12.9	2
A3	#A3:0	Origin	4.04	16.39	0.11	2.45	-18.08	0.00	-0.0	-13.28	2.84	-0.00	-1.34	7.04	0.23	0.00	8.38	12.9	2
A3	A3:T	End	7.32	16.55	0.11	3.83	-8.78	0.00	-0.0	-13.28	2.84	-0.00	-1.64	5.19	0.28	0.00	6.85	10.5	2
A4	A4:O	Origin	0.00	31.15	0.24	-1.46	-18.94	-0.00	0.0	13.04	4.28	0.00	0.86	3.93	0.23	0.00	4.80	7.4	2
A4	A4:B	End	0.77	31.14	0.24	-1.91	-15.64	-0.00	0.0	13.04	4.28	0.00	0.88	3.41	0.23	0.00	4.31	6.6	2
A4	A4:B	Origin	0.77	31.14	0.24	-1.91	-15.64	-0.00	-0.0	12.61	5.31	-0.00	0.85	3.41	0.29	0.00	4.29	6.6	2
A4	#A4:0	End	5.11	31.31	0.25	-4.47	7.42	-0.00	-0.0	12.61	5.31	-0.00	0.99	2.19	0.33	0.00	3.23	5.0	2
A4	#A4:0	Origin	5.11	31.31	0.25	-4.47	7.42	-0.00	-0.0	12.61	5.13	-0.00	0.99	2.19	0.32	0.00	3.23	5.0	2
A4	A4:1	End	9.45	31.48	0.26	-6.98	29.71	-0.00	-0.0	12.61	5.13	-0.00	1.18	12.58	0.39	0.00	13.77	21.2	2
A4	A4:1	Origin	9.45	31.48	0.26	-6.98	16.84	-0.00	-0.0	-6.08	-15.77	0.00	-0.57	7.13	1.19	0.00	7.97	12.3	2
A4	A4:T	End	10.83	31.53	0.26	-7.75	-4.91	0.00	-0.0	-6.08	-15.77	0.00	-0.61	0.00	3.27	0.00	5.70	8.8	4
A5	A5:O	Origin	0.00	23.16	0.17	-1.31	-30.99	-0.00	0.0	13.03	4.52	0.00	0.72	5.43	0.20	0.00	6.15	9.5	2
A5	A5:B	End	0.77	23.15	0.17	-1.73	-27.52	-0.00	0.0	13.03	4.52	0.00	0.73	5.02	0.20	0.00	5.77	8.9	2
A5	A5:B	Origin	0.77	23.15	0.17	-1.73	-27.52	-0.00	-0.0	12.59	5.48	0.00	0.71	5.02	0.25	0.00	5.75	8.8	2
A5	#A5:0	End	5.77	23.33	0.18	-4.47	-0.09	-0.00	-0.0	12.59	5.48	0.00	0.82	0.00	0.74	0.00	1.52	2.3	4
A5	#A5:0	Origin	5.77	23.33	0.18	-4.47	-0.09	-0.00	-0.0	12.60	5.27	0.00	0.82	0.00	0.71	0.00	1.48	2.3	4
A5	#A5:1	End	8.61	23.44	0.18	-6.03	14.90	0.00	-0.0	12.60	5.27	0.00	0.90	4.42	0.30	0.00	5.35	8.2	2
A5	#A5:1	Origin	8.61	23.44	0.18	-6.03	14.90	0.00	-0.0	12.60	5.15	0.00	0.90	4.42	0.30	0.00	5.35	8.2	2
A5	A5:1	End	11.46	23.54	0.18	-7.56	29.53	0.00	-0.0	12.60	5.15	0.00	1.00	10.82	0.33	0.00	11.83	18.2	2
A5	A5:1	Origin	11.46	23.54	0.18	-7.56	17.05	0.00	0.0	-5.61	-15.64	-0.00	-0.44	6.25	1.00	0.00	6.91	10.6	2
A5	A5:T	End	12.84	23.59	0.19	-8.28	-4.53	0.00	0.0	-5.61	-15.64	-0.00	-0.47	0.00	2.73	0.00	4.75	7.3	4

A6	A6:O	Origin	0.00	16.19	0.11	-1.11	-20.61	-0.00	0.0	12.99	4.42	0.00	0.85	4.28	0.23	0.00	5.15	7.9	2
A6	A6:B	End	0.77	16.18	0.11	-1.46	-17.21	-0.00	0.0	12.99	4.42	0.00	0.88	3.75	0.24	0.00	4.64	7.1	2
A6	A6:B	Origin	0.77	16.18	0.11	-1.46	-17.21	-0.00	-0.0	12.55	5.45	0.00	0.85	3.75	0.29	0.00	4.62	7.1	2
A6	#A6:0	End	5.11	16.33	0.12	-3.47	6.43	-0.00	-0.0	12.55	5.45	0.00	0.98	1.90	0.34	0.00	2.94	4.5	2
A6	#A6:0	Origin	5.11	16.33	0.12	-3.47	6.43	-0.00	-0.0	12.55	5.27	0.00	0.98	1.90	0.33	0.00	2.94	4.5	2
A6	A6:1	End	9.45	16.47	0.12	-5.44	29.29	0.00	-0.0	12.55	5.27	0.00	1.17	12.40	0.40	0.00	13.59	20.9	2
A6	A6:1	Origin	9.45	16.47	0.12	-5.44	16.47	0.00	0.0	-6.07	-15.49	-0.00	-0.57	6.97	1.17	0.00	7.81	12.0	2
A6	A6:T	End	10.83	16.51	0.12	-6.04	-4.89	0.00	0.0	-6.07	-15.49	-0.00	-0.60	0.00	3.21	0.00	5.60	8.6	4

Summary of Clamp Capacities and Usages for Load Case "RULE 250D":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
1	0.000	50.00	50.00	0.00	50.00	0.00	0.00	0.00
2	0.000	50.00	50.00	0.00	50.00	0.00	0.00	0.00
3	0.000	50.00	50.00	0.00	50.00	0.00	0.00	0.00
4	0.000	50.00	50.00	0.00	50.00	0.00	0.00	0.00
5	0.000	50.00	50.00	0.00	50.00	0.00	0.00	0.00
6	0.000	50.00	50.00	0.00	50.00	0.00	0.00	0.00
7	0.000	50.00	50.00	0.00	50.00	0.00	0.00	0.00
8	0.000	50.00	50.00	0.00	50.00	0.00	0.00	0.00
9	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
10	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
11	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
12	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
13	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
14	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
15	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
16	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
17	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
18	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
19	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
20	7.402	50.00	50.00	14.80	50.00	0.00	0.00	14.80
21	4.579	50.00	50.00	9.16	50.00	0.00	0.00	9.16
24	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
25	2.234	50.00	50.00	4.47	50.00	0.00	0.00	4.47
SW1	6.461	50.00	50.00	12.92	50.00	0.00	0.00	12.92
SW2	6.478	50.00	50.00	12.96	50.00	0.00	0.00	12.96

Summary of Suspension Capacities and Usages for Load Case "RULE 250D":

Suspension Label	Tension (kips)	Input Tension Capacity (kips)	Factored Tension Capacity (kips)	Tension Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
C1	13.565	30.00	30.00	45.22	0.00	0.00	0.00	45.22
C2	13.565	30.00	30.00	45.22	0.00	0.00	0.00	45.22
C3	13.565	30.00	30.00	45.22	0.00	0.00	0.00	45.22
C4	13.565	30.00	30.00	45.22	0.00	0.00	0.00	45.22
C5	13.565	30.00	30.00	45.22	0.00	0.00	0.00	45.22
C6	13.565	30.00	30.00	45.22	0.00	0.00	0.00	45.22

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
P	87.10	RULE 250C	70.1	19	41171.8

Base Plate Results by Bend Line:

Pole Label	Load Case	Bend Line #	Start X (ft)	Start Y (ft)	End X (ft)	End Y (ft)	Length (in)	Bending Stress (ksi)	Bolt Mom. Sum (ft-k)	# Bolts Acting	Bolt Max Load (kips)	Min Plate Thickness (in)	Actual Thickness (in)	Usage %
P	RULE 250B	1	0.818	3.052	-0.818	3.052	19.627	20.369	88.843	2	147.246	2.553	4.000	40.74
P	RULE 250B	2	-0.818	3.052	-2.234	2.234	19.627	33.893	147.830	3.5	141.594	3.293	4.000	67.79
P	RULE 250B	3	-2.234	2.234	-3.052	0.818	19.627	20.355	88.781	3.5	107.657	2.552	4.000	40.71
P	RULE 250B	4	-3.052	0.818	-3.052	-0.818	19.627	4.008	17.480	2	33.588	1.132	4.000	8.02
P	RULE 250B	5	-3.052	-0.818	-2.234	-2.234	19.627	17.972	78.385	3.5	-98.860	2.398	4.000	35.94
P	RULE 250B	6	-2.234	-2.234	-0.818	-3.052	19.627	31.683	138.187	3.5	-133.480	3.184	4.000	63.37
P	RULE 250B	7	-0.818	-3.052	0.818	-3.052	19.627	19.332	84.319	2	-139.757	2.487	4.000	38.66
P	RULE 250B	8	0.818	-3.052	2.234	-2.234	19.627	31.926	139.247	3.5	-134.106	3.196	4.000	63.85
P	RULE 250B	9	2.234	-2.234	3.052	-0.818	19.627	18.387	80.198	3.5	-100.169	2.426	4.000	36.77
P	RULE 250B	10	3.052	-0.818	3.052	0.818	19.627	4.008	17.480	2	31.771	1.132	4.000	8.02
P	RULE 250B	11	3.052	0.818	2.234	2.234	19.627	19.940	86.968	3.5	106.348	2.526	4.000	39.88
P	RULE 250B	12	2.234	2.234	0.818	3.052	19.627	33.651	146.770	3.5	140.968	3.281	4.000	67.30
P	RULE 250C	1	0.818	3.052	-0.818	3.052	19.627	25.821	112.621	2	186.554	2.874	4.000	51.64
P	RULE 250C	2	-0.818	3.052	-2.234	2.234	19.627	42.801	186.680	3.5	179.203	3.701	4.000	85.60
P	RULE 250C	3	-2.234	2.234	-3.052	0.818	19.627	25.320	110.435	3.5	135.312	2.846	4.000	50.64
P	RULE 250C	4	-3.052	0.818	-3.052	-0.818	19.627	5.160	22.507	2	39.796	1.285	4.000	10.32
P	RULE 250C	5	-3.052	-0.818	-2.234	-2.234	19.627	24.030	104.808	3.5	-130.599	2.773	4.000	48.06
P	RULE 250C	6	-2.234	-2.234	-0.818	-3.052	19.627	41.635	181.594	3.5	-174.981	3.650	4.000	83.27
P	RULE 250C	7	-0.818	-3.052	0.818	-3.052	19.627	25.298	110.341	2	-182.781	2.845	4.000	50.60
P	RULE 250C	8	0.818	-3.052	2.234	-2.234	19.627	41.809	182.355	3.5	-175.430	3.658	4.000	83.62
P	RULE 250C	9	2.234	-2.234	3.052	-0.818	19.627	24.328	106.110	3.5	-131.539	2.790	4.000	48.66
P	RULE 250C	10	3.052	-0.818	3.052	0.818	19.627	5.160	22.507	2	38.491	1.285	4.000	10.32
P	RULE 250C	11	3.052	0.818	2.234	2.234	19.627	25.021	109.133	3.5	134.372	2.830	4.000	50.04
P	RULE 250C	12	2.234	2.234	0.818	3.052	19.627	42.626	185.919	3.5	178.754	3.693	4.000	85.25
P	RULE 250D	1	0.818	3.052	-0.818	3.052	19.627	20.360	88.802	2	147.180	2.552	4.000	40.72
P	RULE 250D	2	-0.818	3.052	-2.234	2.234	19.627	33.857	147.670	3.5	141.506	3.292	4.000	67.71
P	RULE 250D	3	-2.234	2.234	-3.052	0.818	19.627	20.262	88.377	3.5	107.430	2.546	4.000	40.52
P	RULE 250D	4	-3.052	0.818	-3.052	-0.818	19.627	4.024	17.553	2	33.052	1.135	4.000	8.05
P	RULE 250D	5	-3.052	-0.818	-2.234	-2.234	19.627	18.225	79.488	3.5	-99.950	2.415	4.000	36.45
P	RULE 250D	6	-2.234	-2.234	-0.818	-3.052	19.627	31.993	139.542	3.5	-134.717	3.200	4.000	63.99
P	RULE 250D	7	-0.818	-3.052	0.818	-3.052	19.627	19.507	85.083	2	-141.024	2.498	4.000	39.01
P	RULE 250D	8	0.818	-3.052	2.234	-2.234	19.627	32.239	140.613	3.5	-135.350	3.212	4.000	64.48
P	RULE 250D	9	2.234	-2.234	3.052	-0.818	19.627	18.645	81.320	3.5	-101.273	2.443	4.000	37.29
P	RULE 250D	10	3.052	-0.818	3.052	0.818	19.627	4.024	17.553	2	31.216	1.135	4.000	8.05
P	RULE 250D	11	3.052	0.818	2.234	2.234	19.627	19.842	86.544	3.5	106.107	2.520	4.000	39.68
P	RULE 250D	12	2.234	2.234	0.818	3.052	19.627	33.611	146.599	3.5	140.873	3.280	4.000	67.22

Summary of Tubular Davit Usages:

Tubular Davit	Maximum	Load Case	Height	Segment	Weight

Label	Usage %		AGL (ft)	Number	(lbs)
S1	21.26	RULE 250D	107.1	1	277.8
S2	30.93	RULE 250D	107.1	1	176.8
A1	13.45	RULE 250B	100.5	1	252.6
A2	15.55	RULE 250B	86.4	1	304.6
A3	13.85	RULE 250B	72.5	1	252.6
A4	23.11	RULE 250C	101.1	3	465.1
A5	19.85	RULE 250C	87.2	4	658.2
A6	22.83	RULE 250C	73.1	3	465.1

Summary of Brace Usages:

Brace Label	Maximum Usage %	Load Case	Weight (lbs)
B1	22.70	RULE 250B	0.0
B2	8.30	RULE 250C	0.0
B3	44.58	RULE 250C	0.0
B4	22.70	RULE 250B	0.0
B5	7.68	RULE 250C	0.0
B6	44.25	RULE 250C	0.0
B7	22.68	RULE 250B	0.0
B8	8.02	RULE 250C	0.0
B9	43.80	RULE 250C	0.0

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
RULE 250B	67.79	P	Base Plate
RULE 250C	87.10	P	Steel Pole
RULE 250D	67.71	P	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Height AGL (ft)	Segment Number
RULE 250B	65.38	P	47.6	24
RULE 250C	87.10	P	70.1	19
RULE 250D	65.29	P	47.6	24

Summary of Base Plate Usages by Load Case:

Load Case	Pole Label	Bend Line #	Length (in)	Vertical Load (kips)	X Moment (ft-k)	Y Moment (ft-k)	Bending Stress (ksi)	Bolt Moment Sum (ft-k)	# Bolts Acting On Bend Line	Max Bolt Load For Bend Line (kips)	Minimum Plate Thickness (in)	Usage %
RULE 250B	P	2	19.627	134.786	8988.453	-56.971	33.893	147.830	3.5	141.594	3.293	67.79
RULE 250C	P	2	19.627	67.917	11573.494	-40.902	42.801	186.680	3.5	179.203	3.701	85.60
RULE 250D	P	2	19.627	110.812	9026.010	-57.582	33.857	147.670	3.5	141.506	3.292	67.71

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Height AGL (ft)	Segment Number
RULE 250B	23.47	S2	107.1	1
RULE 250C	23.11	A4	101.1	3
RULE 250D	30.93	S2	107.1	1

Summary of Brace Usages by Load Case:

Load Case	Maximum Usage %	Brace Label
RULE 250B	42.15	B3
RULE 250C	44.58	B3
RULE 250D	29.27	B3

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	0.00	RULE 250B	0.0
2	Clamp	0.00	RULE 250B	0.0
3	Clamp	0.00	RULE 250B	0.0
4	Clamp	0.00	RULE 250B	0.0
5	Clamp	0.00	RULE 250B	0.0
6	Clamp	0.00	RULE 250B	0.0
7	Clamp	0.00	RULE 250B	0.0
8	Clamp	0.00	RULE 250B	0.0
9	Clamp	4.47	RULE 250D	0.0
10	Clamp	4.47	RULE 250D	0.0
11	Clamp	4.47	RULE 250D	0.0
12	Clamp	4.47	RULE 250D	0.0
13	Clamp	4.47	RULE 250D	0.0
14	Clamp	4.47	RULE 250D	0.0
15	Clamp	4.47	RULE 250D	0.0
16	Clamp	4.47	RULE 250D	0.0
17	Clamp	4.47	RULE 250D	0.0
18	Clamp	4.47	RULE 250D	0.0
19	Clamp	4.47	RULE 250D	0.0
20	Clamp	14.80	RULE 250D	0.0
21	Clamp	9.16	RULE 250D	0.0
24	Clamp	4.47	RULE 250D	0.0
25	Clamp	4.47	RULE 250D	0.0
SW1	Clamp	12.92	RULE 250D	0.0
SW2	Clamp	12.96	RULE 250D	0.0
C1	Suspension	45.22	RULE 250D	150.0
C2	Suspension	45.22	RULE 250D	150.0
C3	Suspension	45.22	RULE 250D	150.0
C4	Suspension	45.22	RULE 250D	150.0
C5	Suspension	45.22	RULE 250D	150.0
C6	Suspension	45.22	RULE 250D	150.0

Loads At Insulator Attachments For All Load Cases:

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
RULE 250B	1	Clamp	A1:T	0.000	0.000	-0.000	0.000
RULE 250B	2	Clamp	A2:T	0.000	0.000	-0.000	0.000
RULE 250B	3	Clamp	A3:T	0.000	0.000	-0.000	0.000
RULE 250B	4	Clamp	A4:T	0.000	0.000	-0.000	0.000
RULE 250B	5	Clamp	A5:T	0.000	0.000	-0.000	0.000
RULE 250B	6	Clamp	A6:T	0.000	0.000	-0.000	0.000
RULE 250B	7	Clamp	S1:T	0.000	0.000	-0.000	0.000
RULE 250B	8	Clamp	S2:T	0.000	0.000	-0.000	0.000
RULE 250B	9	Clamp	P:AL1	0.000	0.172	2.414	2.420
RULE 250B	10	Clamp	P:AL2	0.000	0.172	2.414	2.420
RULE 250B	11	Clamp	P:AL3	0.000	0.172	2.414	2.420
RULE 250B	12	Clamp	P:AL4	0.000	0.172	2.414	2.420
RULE 250B	13	Clamp	P:AL5	0.000	0.172	2.414	2.420
RULE 250B	14	Clamp	P:AL6	0.000	0.172	2.414	2.420
RULE 250B	15	Clamp	P:AL7	0.000	0.172	2.414	2.420
RULE 250B	16	Clamp	P:AL8	0.000	0.172	2.414	2.420
RULE 250B	17	Clamp	P:AL9	0.000	0.172	2.414	2.420
RULE 250B	18	Clamp	P:AL10	0.000	0.172	2.414	2.420
RULE 250B	19	Clamp	P:AL11	0.000	0.172	2.414	2.420
RULE 250B	20	Clamp	P:AT&T	0.000	2.722	9.375	9.762
RULE 250B	21	Clamp	P:T-Mo	0.000	1.629	5.706	5.934
RULE 250B	24	Clamp	P:AL12	0.000	0.172	2.414	2.420
RULE 250B	25	Clamp	P:AL13	0.000	0.172	2.414	2.420
RULE 250B	SW1	Clamp	1	0.000	5.529	1.546	5.741
RULE 250B	SW2	Clamp	2	0.389	5.529	1.546	5.754
RULE 250B	C1	Suspension	3	0.000	12.119	4.426	12.902
RULE 250B	C2	Suspension	4	0.000	12.119	4.426	12.902
RULE 250B	C3	Suspension	5	0.000	12.119	4.426	12.902
RULE 250B	C4	Suspension	1P	0.000	12.119	4.426	12.902
RULE 250B	C5	Suspension	2P	0.000	12.119	4.426	12.902
RULE 250B	C6	Suspension	3P	0.000	12.119	4.426	12.902
RULE 250C	1	Clamp	A1:T	0.000	0.000	-0.000	0.000
RULE 250C	2	Clamp	A2:T	0.000	0.000	-0.000	0.000
RULE 250C	3	Clamp	A3:T	0.000	0.000	-0.000	0.000
RULE 250C	4	Clamp	A4:T	0.000	0.000	-0.000	0.000
RULE 250C	5	Clamp	A5:T	0.000	0.000	-0.000	0.000
RULE 250C	6	Clamp	A6:T	0.000	0.000	-0.000	0.000
RULE 250C	7	Clamp	S1:T	0.000	0.000	-0.000	0.000
RULE 250C	8	Clamp	S2:T	0.000	0.000	-0.000	0.000
RULE 250C	9	Clamp	P:AL1	0.000	0.506	0.655	0.828
RULE 250C	10	Clamp	P:AL2	0.000	0.506	0.655	0.828
RULE 250C	11	Clamp	P:AL3	0.000	0.506	0.655	0.828
RULE 250C	12	Clamp	P:AL4	0.000	0.506	0.655	0.828
RULE 250C	13	Clamp	P:AL5	0.000	0.506	0.655	0.828
RULE 250C	14	Clamp	P:AL6	0.000	0.506	0.655	0.828
RULE 250C	15	Clamp	P:AL7	0.000	0.506	0.655	0.828
RULE 250C	16	Clamp	P:AL8	0.000	0.506	0.655	0.828
RULE 250C	17	Clamp	P:AL9	0.000	0.506	0.655	0.828
RULE 250C	18	Clamp	P:AL10	0.000	0.506	0.655	0.828
RULE 250C	19	Clamp	P:AL11	0.000	0.506	0.655	0.828
RULE 250C	20	Clamp	P:AT&T	0.000	10.669	4.680	11.650
RULE 250C	21	Clamp	P:T-Mo	0.000	6.290	2.739	6.860
RULE 250C	24	Clamp	P:AL12	0.000	0.506	0.655	0.828
RULE 250C	25	Clamp	P:AL13	0.000	0.506	0.655	0.828

RULE 250C	SW1	Clamp	1	0.000	5.721	0.414	5.736
RULE 250C	SW2	Clamp	2	0.374	5.721	0.414	5.748
RULE 250C	C1	Suspension	3	0.000	12.609	1.933	12.756
RULE 250C	C2	Suspension	4	0.000	12.609	1.933	12.756
RULE 250C	C3	Suspension	5	0.000	12.609	1.933	12.756
RULE 250C	C4	Suspension	1P	0.000	12.609	1.933	12.756
RULE 250C	C5	Suspension	2P	0.000	12.609	1.933	12.756
RULE 250C	C6	Suspension	3P	0.000	12.609	1.933	12.756
RULE 250D	1	Clamp	A1:T	0.000	0.000	-0.000	0.000
RULE 250D	2	Clamp	A2:T	0.000	0.000	-0.000	0.000
RULE 250D	3	Clamp	A3:T	0.000	0.000	-0.000	0.000
RULE 250D	4	Clamp	A4:T	0.000	0.000	-0.000	0.000
RULE 250D	5	Clamp	A5:T	0.000	0.000	-0.000	0.000
RULE 250D	6	Clamp	A6:T	0.000	0.000	-0.000	0.000
RULE 250D	7	Clamp	S1:T	0.000	0.000	-0.000	0.000
RULE 250D	8	Clamp	S2:T	0.000	0.000	-0.000	0.000
RULE 250D	9	Clamp	P:AL1	0.000	0.114	2.231	2.234
RULE 250D	10	Clamp	P:AL2	0.000	0.114	2.231	2.234
RULE 250D	11	Clamp	P:AL3	0.000	0.114	2.231	2.234
RULE 250D	12	Clamp	P:AL4	0.000	0.114	2.231	2.234
RULE 250D	13	Clamp	P:AL5	0.000	0.114	2.231	2.234
RULE 250D	14	Clamp	P:AL6	0.000	0.114	2.231	2.234
RULE 250D	15	Clamp	P:AL7	0.000	0.114	2.231	2.234
RULE 250D	16	Clamp	P:AL8	0.000	0.114	2.231	2.234
RULE 250D	17	Clamp	P:AL9	0.000	0.114	2.231	2.234
RULE 250D	18	Clamp	P:AL10	0.000	0.114	2.231	2.234
RULE 250D	19	Clamp	P:AL11	0.000	0.114	2.231	2.234
RULE 250D	20	Clamp	P:AT&T	0.000	1.836	7.171	7.402
RULE 250D	21	Clamp	P:T-Mo	0.000	1.104	4.444	4.579
RULE 250D	24	Clamp	P:AL12	0.000	0.114	2.231	2.234
RULE 250D	25	Clamp	P:AL13	0.000	0.114	2.231	2.234
RULE 250D	SW1	Clamp	1	0.000	6.095	2.144	6.461
RULE 250D	SW2	Clamp	2	0.470	6.095	2.144	6.478
RULE 250D	C1	Suspension	3	0.000	12.809	4.466	13.565
RULE 250D	C2	Suspension	4	0.000	12.809	4.466	13.565
RULE 250D	C3	Suspension	5	0.000	12.809	4.466	13.565
RULE 250D	C4	Suspension	1P	0.000	12.809	4.466	13.565
RULE 250D	C5	Suspension	2P	0.000	12.809	4.466	13.565
RULE 250D	C6	Suspension	3P	0.000	12.809	4.466	13.565

Overturning Moments For User Input Concentrated Loads:

Moments are static equivalents based on central axis of 0,0 (i.e. a single pole).

Load Case	Total Tran. Load (kips)	Total Long. Load (kips)	Total Vert. Load (kips)	Transverse Overturning Moment (ft-k)	Longitudinal Overturning Moment (ft-k)	Torsional Moment (ft-k)
RULE 250B	90.359	0.389	76.111	8269.655	-42.336	4.722
RULE 250C	110.633	0.374	28.360	10432.855	-40.703	4.540
RULE 250D	93.466	0.470	71.702	8523.074	-51.151	5.706

```
*** Weight of structure (lbs):
    Weight of Tubular Davit Arms:      2852.8
    Weight of Steel Poles:            41171.8
    Weight of Suspensions:              900.0
    Total:                            44924.6
```

*** End of Report

Anchor Bolt Analysis:

Input Data:

Bolt Force:

Maximum Tensile Force = $T_{Max} := 179 \cdot kips$ (User Input from PLS-Pole)

Maximum Shear Force at Base = $V_{base} := 129 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use ASTM A615 Grade 75

Number of Anchor Bolts = $N := 36$ (User Input)

Bolt "Column" Distance = $l := 3.0 \cdot in$ (User Input)

Bolt Ultimate Strength = $F_u := 100 \cdot ksi$ (User Input)

Bolt Yeild Strength= $F_y := 75 \cdot ksi$ (User Input)

Bolt Modulus = $E := 29000 \cdot ksi$ (User Input)

Diameter of Anchor Bolts = $D := 2.25 \cdot in$ (User Input)

Threads per Inch = $n := 4.5$ (User Input)

Anchor Bolt Analysis:

Stress Area of Bolt = $A_s := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 3.248 \cdot in^2$

Maximum Shear Force per Bolt = $V_{Max} := \frac{V_{base}}{N} = 3.6 \times 10^3 \, lbf$

Shear Stress per Bolt = $f_v := \frac{V_{Max}}{A_s} = 1.1 \times 10^3 \, psi$

Tensile Stress Permitted = $F_t := 0.75 \cdot F_u = 75 \cdot ksi$

Shear Stress Permitted = $F_v := 0.35 F_u = 35 \cdot ksi$

Permitted Axial Tensile Stress in Conjuction with Shear = $F_{tv} := F_t \cdot \sqrt{1 - \left(\frac{f_v}{F_v}\right)^2} = 74.96 \cdot ksi$

Bolt Tension % of Capacity = $\frac{T_{Max}}{F_{tv} \cdot A_s} = 73.52 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{F_{tv} \cdot A_s} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

$Condition1 = \text{"OK"}$

Flange Bolt and Flange Plate Analysis:

Input Data: Flange @ 126-ft

Tower Reactions:

Overturning Moment =	$OM := 70 \cdot ft \cdot kips$	(User Input)
Shear Force =	$Shear := 12 \cdot kips$	(User Input)
Axial Force =	$Axial := 5 \cdot kips$	(User Input)

Flange Bolt Data:

Use ASTM A325

Number of Flange Bolts =	$N := 12$	(User Input)
Diameter of Bolt Circle =	$D_{bc} := 32 \cdot in$	(User Input)
Bolt Minimum Tensile Strength =	$F_{ub} := 120 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Flange Bolts =	$D := 1.00 \cdot in$	(User Input)
Threads per Inch =	$n := 8$	(User Input)

Flange Plate Data:

Use ASTM A871 Grade 65

Plate Yield Strength =	$Fy_{bp} := 65 \cdot ksi$	(User Input)
Flange Plate Thickness =	$t_{bp} := 1 \cdot in$	(User Input)
Flange Plate Diameter =	$D_{bp} := 34.75 \cdot in$	(User Input)
Outer Pole Diameter =	$D_{pole} := 27.8 \cdot in$	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 16 \cdot in$

Distance to Bolts = $i := 1..N$

$$d_i := \left\| \begin{array}{l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array} \right.$$

$d_1 = 8.00 \cdot in$ $d_7 = -8.00 \cdot in$

$d_2 = 13.86 \cdot in$ $d_8 = -13.86 \cdot in$

$d_3 = 16.00 \cdot in$ $d_9 = -16.00 \cdot in$

$d_4 = 13.86 \cdot in$ $d_{10} = -13.86 \cdot in$

$d_5 = 8.00 \cdot in$ $d_{11} = -8.00 \cdot in$

$d_6 = 0.00 \cdot in$ $d_{12} = -0.00 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 13.9 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := \text{if}\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.00 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = 0.00 \cdot in$

$MA_3 = 2.10 \cdot in$ $MA_9 = 0.00 \cdot in$

$MA_4 = 0.00 \cdot in$ $MA_{10} = 0.00 \cdot in$

$MA_5 = 0.00 \cdot in$ $MA_{11} = 0.00 \cdot in$

$MA_6 = 0.00 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 16.7 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i (d_i)^2 = 1.536 \times 10^3 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$

Check Flange Bolts:

Maximum Shear Stress = $V_{Max} := \frac{Shear}{N \cdot A_g} = 1.3 \cdot ksi$

Permitted Shear Stress = $F_v := (0.35 \cdot F_{ub}) = 42 \cdot ksi$

Condition1 = Condition1 := if$(V_{Max} \le F_v,$ "OK" , "Overstressed"$)$ $\quad \frac{V_{Max}}{F_v} = 3.03 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 13.8 \cdot ksi$

Permitted Tensile Stress = $F_t := (0.75 \cdot F_{ub}) = 90 \cdot ksi$

Condition2 = Condition2 := if$\left(\frac{T_{Max}}{F_t} \le 1.00,\right.$ "OK" , "Overstressed"$\left.\right)$ $\quad \frac{T_{Max}}{F_t} = 15.29 \cdot \%$

Condition2 = "OK"

Permitted Tensile Stress with Shear = $F_{t.v} := F_t \cdot \sqrt{1 - \left(\frac{V_{Max}}{F_v}\right)^2} = 90 \cdot ksi$

Condition3 = Condition3 := if$\left(\frac{T_{Max}}{F_{t.v}} \le 1.00,\right.$ "OK" , "Overstressed"$\left.\right)$ $\quad \frac{T_{Max}}{F_{t.v}} = 15.29 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts =

$$C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$$

$C_1 = 4.8 \cdot kips$ $\quad C_7 = -4.0 \cdot kips$

$C_2 = 8.0 \cdot kips$ $\quad C_8 = -7.2 \cdot kips$

$C_3 = 9.2 \cdot kips$ $\quad C_9 = -8.3 \cdot kips$

$C_4 = 8.0 \cdot kips$ $\quad C_{10} = -7.2 \cdot kips$

$C_5 = 4.8 \cdot kips$ $\quad C_{11} = -4.0 \cdot kips$

$C_6 = 0.4 \cdot kips$ $\quad C_{12} = 0.4 \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^{\,2}\right)} = 6.9 \cdot ksi$$

Allowable Bending Stress in Plate =

$$F_{bp} := 0.9 \cdot Fy_{bp} = 58.5 \cdot ksi$$

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 11.8 \cdot \%$$

Condition1 =

$$Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, \text{"Ok"}, \text{"Overstressed"}\right)$$

Condition1 = "Ok"

Flange Bolt and Flange Plate Analysis:

Input Data: Flange @ 110-ft

Tower Reactions:

Overturning Moment =	$OM := 345 \cdot ft \cdot kips$	(User Input)
Shear Force =	$Shear := 21 \cdot kips$	(User Input)
Axial Force =	$Axial := 10 \cdot kips$	(User Input)

Flange Bolt Data:

Use ASTM A325

Number of Flange Bolts =	$N := 20$	(User Input)
Diameter of Bolt Circle =	$D_{bc} := 38.25 \cdot in$	(User Input)
Bolt Minimum Tensile Strength =	$F_{ub} := 120 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Flange Bolts =	$D := 1.00 \cdot in$	(User Input)
Threads per Inch =	$n := 8$	(User Input)

Flange Plate Data:

Use ASTM A871 Grade 65

Plate Yield Strength =	$Fy_{bp} := 65 \cdot ksi$	(User Input)
Flange Plate Thickness =	$t_{bp} := 1.25 \cdot in$	(User Input)
Flange Plate Diameter =	$D_{bp} := 41 \cdot in$	(User Input)
Outer Pole Diameter =	$D_{pole} := 33.6 \cdot in$	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 19.125 \cdot in$

Distance to Bolts = $i := 1..N$

$$d_i := \begin{array}{|l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array}$$

$d_1 = 5.91 \cdot in$ $d_7 = 15.47 \cdot in$

$d_2 = 11.24 \cdot in$ $d_8 = 11.24 \cdot in$

$d_3 = 15.47 \cdot in$ $d_9 = 5.91 \cdot in$

$d_4 = 18.19 \cdot in$ $d_{10} = 0.00 \cdot in$

$d_5 = 19.13 \cdot in$ $d_{11} = -5.91 \cdot in$

$d_6 = 18.19 \cdot in$ $d_{12} = -11.24 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 16.8 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := \mathrm{if}\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.00 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = 0.00 \cdot in$

$MA_3 = 0.00 \cdot in$ $MA_9 = 0.00 \cdot in$

$MA_4 = 1.39 \cdot in$ $MA_{10} = 0.00 \cdot in$

$MA_5 = 2.32 \cdot in$ $MA_{11} = 0.00 \cdot in$

$MA_6 = 1.39 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 18.8 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i (d_i)^2 = 3.658 \times 10^3 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$

Check Flange Bolts:

Maximum Shear Stress = $V_{Max} := \frac{Shear}{N \cdot A_g} = 1.3 \cdot ksi$

Permitted Shear Stress = $F_v := (0.35 \cdot F_{ub}) = 42 \cdot ksi$

Condition1 = $Condition1 := if(V_{Max} \le F_v, "OK", "Overstressed")$ $\frac{V_{Max}}{F_v} = 3.18 \cdot \%$

$Condition1 = "OK"$

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 34.9 \cdot ksi$

Permitted Tensile Stress = $F_t := (0.75 \cdot F_{ub}) = 90 \cdot ksi$

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 38.79 \cdot \%$

$Condition2 = "OK"$

Permitted Tensile Stress with Shear = $F_{t.v} := F_t \cdot \sqrt{1 - \left(\frac{V_{Max}}{F_v}\right)^2} = 90 \cdot ksi$

Condition3 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 38.81 \cdot \%$

$Condition3 = "OK"$

Flange Plate Analysis:

Force from Bolts = $C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$

$C_1 = 7.2 \cdot kips$	$C_7 = 18.0 \cdot kips$
$C_2 = 13.2 \cdot kips$	$C_8 = 13.2 \cdot kips$
$C_3 = 18.0 \cdot kips$	$C_9 = 7.2 \cdot kips$
$C_4 = 21.1 \cdot kips$	$C_{10} = 0.5 \cdot kips$
$C_5 = 22.1 \cdot kips$	$C_{11} = -6.2 \cdot kips$
$C_6 = 21.1 \cdot kips$	$C_{12} = -12.2 \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^{\,2}\right)} = 22.5 \cdot ksi$$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 58.5 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 38.4 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, \text{"Ok"}, \text{"Overstressed"}\right)$

Condition1 = "Ok"

Flange Bolt and Flange Plate Analysis:

Input Data:

Flange @ 69-ft

Tower Reactions:

Overturning Moment =	$OM := 3178 \cdot ft \cdot kips$	(User Input)
Shear Force =	$Shear := 116 \cdot kips$	(User Input)
Axial Force =	$Axial := 32 \cdot kips$	(User Input)

Flange Bolt Data:

Use ASTM A325

Number of Flange Bolts =	$N := 60$	(User Input)
Diameter of Bolt Circle =	$D_{bc} := 53.75 \cdot in$	(User Input)
Bolt Minimum Tensile Strength =	$F_{ub} := 120 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Flange Bolts =	$D := 1.00 \cdot in$	(User Input)
Threads per Inch =	$n := 8$	(User Input)

Flange Plate Data:

Use ASTM A588 Grade 50

Plate Yield Strength =	$Fy_{bp} := 50 \cdot ksi$	(User Input)
Flange Plate Thickness =	$t_{bp} := 2.5 \cdot in$	(User Input)
Flange Plate Diameter =	$D_{bp} := 56.5 \cdot in$	(User Input)
Outer Pole Diameter =	$D_{pole} := 48.27 \cdot in$	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 26.875 \cdot in$

Distance to Bolts = $i := 1..N$

$$d_i := \begin{array}{|l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array}$$

$d_1 = 2.81 \cdot in$	$d_7 = 17.98 \cdot in$	$d_{13} = 26.29 \cdot in$	$d_{19} = 24.55 \cdot in$	$d_{25} = 13.44 \cdot in$
$d_2 = 5.59 \cdot in$	$d_8 = 19.97 \cdot in$	$d_{14} = 26.73 \cdot in$	$d_{20} = 23.27 \cdot in$	$d_{26} = 10.93 \cdot in$
$d_3 = 8.30 \cdot in$	$d_9 = 21.74 \cdot in$	$d_{15} = 26.87 \cdot in$	$d_{21} = 21.74 \cdot in$	$d_{27} = 8.30 \cdot in$
$d_4 = 10.93 \cdot in$	$d_{10} = 23.27 \cdot in$	$d_{16} = 26.73 \cdot in$	$d_{22} = 19.97 \cdot in$	$d_{28} = 5.59 \cdot in$
$d_5 = 13.44 \cdot in$	$d_{11} = 24.55 \cdot in$	$d_{17} = 26.29 \cdot in$	$d_{23} = 17.98 \cdot in$	$d_{29} = 2.81 \cdot in$
$d_6 = 15.80 \cdot in$	$d_{12} = 25.56 \cdot in$	$d_{18} = 25.56 \cdot in$	$d_{24} = 15.80 \cdot in$	$d_{30} = 0.00 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 24.135 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := \text{if}\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$	$MA_7 = 0.00 \cdot in$	$MA_{13} = 2.15 \cdot in$	$MA_{19} = 0.42 \cdot in$	$MA_{25} = 0.00 \cdot in$
$MA_2 = 0.00 \cdot in$	$MA_8 = 0.00 \cdot in$	$MA_{14} = 2.59 \cdot in$	$MA_{20} = 0.00 \cdot in$	$MA_{26} = 0.00 \cdot in$
$MA_3 = 0.00 \cdot in$	$MA_9 = 0.00 \cdot in$	$MA_{15} = 2.74 \cdot in$	$MA_{21} = 0.00 \cdot in$	$MA_{27} = 0.00 \cdot in$
$MA_4 = 0.00 \cdot in$	$MA_{10} = 0.00 \cdot in$	$MA_{16} = 2.59 \cdot in$	$MA_{22} = 0.00 \cdot in$	$MA_{28} = 0.00 \cdot in$
$MA_5 = 0.00 \cdot in$	$MA_{11} = 0.42 \cdot in$	$MA_{17} = 2.15 \cdot in$	$MA_{23} = 0.00 \cdot in$	$MA_{29} = 0.00 \cdot in$
$MA_6 = 0.00 \cdot in$	$MA_{12} = 1.42 \cdot in$	$MA_{18} = 1.42 \cdot in$	$MA_{24} = 0.00 \cdot in$	$MA_{30} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 23.5 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i (d_i)^2 = 2.167 \times 10^4 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$

Check Flange Bolts:

Maximum Shear Stress = $V_{Max} := \frac{Shear}{N \cdot A_g} = 2.5 \cdot ksi$

Permitted Shear Stress = $F_v := (0.35 \cdot F_{ub}) = 42 \cdot ksi$

Condition1 = Condition1 := if$(V_{Max} \le F_v$, "OK" , "Overstressed"$)$ $\frac{V_{Max}}{F_v} = 5.86 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 77.2 \cdot ksi$

Permitted Tensile Stress = $F_t := (0.75 \cdot F_{ub}) = 90 \cdot ksi$

Condition2 = Condition2 := if$\left(\frac{T_{Max}}{F_t} \le 1.00\right.$, "OK" , "Overstressed"$\left.\right)$ $\frac{T_{Max}}{F_t} = 85.78 \cdot \%$

Condition2 = "OK"

Permitted Tensile Stress with Shear = $F_{t.v} := F_t \cdot \sqrt{1 - \left(\frac{V_{Max}}{F_v}\right)^2} = 89.8 \cdot ksi$

Condition3 = Condition3 := if$\left(\frac{T_{Max}}{F_{t.v}} \le 1.00\right.$, "OK" , "Overstressed"$\left.\right)$ $\frac{T_{Max}}{F_{t.v}} = 85.93 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts = $C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$

$C_1 = 5.5 \cdot kips$	$C_7 = 32.2 \cdot kips$	$C_{13} = 46.8 \cdot kips$	$C_{19} = 43.7 \cdot kips$	$C_{25} = 24.2 \cdot kips$
$C_2 = 10.4 \cdot kips$	$C_8 = 35.7 \cdot kips$	$C_{14} = 47.6 \cdot kips$	$C_{20} = 41.5 \cdot kips$	$C_{26} = 19.8 \cdot kips$
$C_3 = 15.1 \cdot kips$	$C_9 = 38.8 \cdot kips$	$C_{15} = 47.8 \cdot kips$	$C_{21} = 38.8 \cdot kips$	$C_{27} = 15.1 \cdot kips$
$C_4 = 19.8 \cdot kips$	$C_{10} = 41.5 \cdot kips$	$C_{16} = 47.6 \cdot kips$	$C_{22} = 35.7 \cdot kips$	$C_{28} = 10.4 \cdot kips$
$C_5 = 24.2 \cdot kips$	$C_{11} = 43.7 \cdot kips$	$C_{17} = 46.8 \cdot kips$	$C_{23} = 32.2 \cdot kips$	$C_{29} = 5.5 \cdot kips$
$C_6 = 28.3 \cdot kips$	$C_{12} = 45.5 \cdot kips$	$C_{18} = 45.5 \cdot kips$	$C_{24} = 28.3 \cdot kips$	$C_{30} = 0.5 \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \, t_{bp}^{\;2}\right)} = 30.5 \cdot ksi$$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 45 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 67.7 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, \text{"Ok"}, \text{"Overstressed"}\right)$

Condition1 = "Ok"

Flange Bolt and Flange Plate Analysis:

Input Data: Flange @ 47-ft

Tower Reactions:

Overturning Moment = $OM := 5756 \cdot ft \cdot kips$ (User Input)

Shear Force = $Shear := 120 \cdot kips$ (User Input)

Axial Force = $Axial := 41 \cdot kips$ (User Input)

Flange Bolt Data:

Use ASTM A325

Number of Flange Bolts = $N := 48$ (User Input)

Diameter of Bolt Circle = $D_{bc} := 63.25 \cdot in$ (User Input)

Bolt Minimum Tensile Strength = $F_{ub} := 120 \cdot ksi$ (User Input)

Bolt Modulus = $E := 29000 \cdot ksi$ (User Input)

Diameter of Flange Bolts = $D := 1.5 \cdot in$ (User Input)

Threads per Inch = $n := 6$ (User Input)

Flange Plate Data:

Use ASTM A588 Grade 50

Plate Yield Strength = $Fy_{bp} := 50 \cdot ksi$ (User Input)

Flange Plate Thickness = $t_{bp} := 3 \cdot in$ (User Input)

Flange Plate Diameter = $D_{bp} := 67.25 \cdot in$ (User Input)

Outer Pole Diameter = $D_{pole} := 56.33 \cdot in$ (User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 31.625 \cdot in$

Distance to Bolts = $i := 1..N$

$$d_i := \left| \begin{array}{l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N}\right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array} \right.$$

$d_1 = 4.13 \cdot in$	$d_7 = 25.09 \cdot in$	$d_{13} = 31.35 \cdot in$	$d_{19} = 19.25 \cdot in$
$d_2 = 8.19 \cdot in$	$d_8 = 27.39 \cdot in$	$d_{14} = 30.55 \cdot in$	$d_{20} = 15.81 \cdot in$
$d_3 = 12.10 \cdot in$	$d_9 = 29.22 \cdot in$	$d_{15} = 29.22 \cdot in$	$d_{21} = 12.10 \cdot in$
$d_4 = 15.81 \cdot in$	$d_{10} = 30.55 \cdot in$	$d_{16} = 27.39 \cdot in$	$d_{22} = 8.19 \cdot in$
$d_5 = 19.25 \cdot in$	$d_{11} = 31.35 \cdot in$	$d_{17} = 25.09 \cdot in$	$d_{23} = 4.13 \cdot in$
$d_6 = 22.36 \cdot in$	$d_{12} = 31.63 \cdot in$	$d_{18} = 22.36 \cdot in$	$d_{24} = 0.00 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 28.165 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$	$MA_7 = 0.00 \cdot in$	$MA_{13} = 3.19 \cdot in$	$MA_{19} = 0.00 \cdot in$
$MA_2 = 0.00 \cdot in$	$MA_8 = 0.00 \cdot in$	$MA_{14} = 2.38 \cdot in$	$MA_{20} = 0.00 \cdot in$
$MA_3 = 0.00 \cdot in$	$MA_9 = 1.05 \cdot in$	$MA_{15} = 1.05 \cdot in$	$MA_{21} = 0.00 \cdot in$
$MA_4 = 0.00 \cdot in$	$MA_{10} = 2.38 \cdot in$	$MA_{16} = 0.00 \cdot in$	$MA_{22} = 0.00 \cdot in$
$MA_5 = 0.00 \cdot in$	$MA_{11} = 3.19 \cdot in$	$MA_{17} = 0.00 \cdot in$	$MA_{23} = 0.00 \cdot in$
$MA_6 = 0.00 \cdot in$	$MA_{12} = 3.46 \cdot in$	$MA_{18} = 0.00 \cdot in$	$MA_{24} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 29.4 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 2.4 \times 10^4 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 1.767 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 1.405 \cdot in^2$

Check Flange Bolts:

Maximum Shear Stress = $V_{Max} := \frac{Shear}{N \cdot A_g} = 1.4 \cdot ksi$

Permitted Shear Stress = $F_v := \left(0.35 \cdot F_{ub}\right) = 42 \cdot ksi$

Condition1 = Condition1 := if$\left(V_{Max} \le F_v, \text{"OK"}, \text{"Overstressed"}\right)$ $\frac{V_{Max}}{F_v} = 3.37 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 64.2 \cdot ksi$

Permitted Tensile Stress = $F_t := \left(0.75 \cdot F_{ub}\right) = 90 \cdot ksi$

Condition2 = Condition2 := if$\left(\frac{T_{Max}}{F_t} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$ $\frac{T_{Max}}{F_t} = 71.28 \cdot \%$

Condition2 = "OK"

Permitted Tensile Stress with Shear = $F_{t.v} := F_t \cdot \sqrt{1 - \left(\frac{V_{Max}}{F_v}\right)^2} = 89.9 \cdot ksi$

Condition3 = Condition3 := if$\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$ $\frac{T_{Max}}{F_{t.v}} = 71.32 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts = $C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$

$C_1 = 12.7 \cdot kips$	$C_7 = 73.1 \cdot kips$	$C_{13} = 91.1 \cdot kips$	$C_{19} = 56.3 \cdot kips$
$C_2 = 24.4 \cdot kips$	$C_8 = 79.7 \cdot kips$	$C_{14} = 88.8 \cdot kips$	$C_{20} = 46.4 \cdot kips$
$C_3 = 35.7 \cdot kips$	$C_9 = 84.9 \cdot kips$	$C_{15} = 84.9 \cdot kips$	$C_{21} = 35.7 \cdot kips$
$C_4 = 46.4 \cdot kips$	$C_{10} = 88.8 \cdot kips$	$C_{16} = 79.7 \cdot kips$	$C_{22} = 24.4 \cdot kips$
$C_5 = 56.3 \cdot kips$	$C_{11} = 91.1 \cdot kips$	$C_{17} = 73.1 \cdot kips$	$C_{23} = 12.7 \cdot kips$
$C_6 = 65.2 \cdot kips$	$C_{12} = 91.9 \cdot kips$	$C_{18} = 65.2 \cdot kips$	$C_{24} = 0.9 \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^{\ 2}\right)} = 34 \cdot ksi$$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 45 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 75.6 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, \text{"Ok"}, \text{"Overstressed"}\right)$

Condition1 = "Ok"

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Section 1 - Site Information

Site ID: CT11296A
Status: Final
Version: 4
Project Type: L600
Approved: 03/13/2023 6:24:55 PM
Approved By: Farhan.Badar@T-Mobile.com
Last Modified: 03/13/2023 6:24:55 PM
Last Modified By: Farhan.Badar@T-Mobile.com

Site Name: Wilton/Rt 33
Site Class: Utility Lattice Tower
Site Type: Structure Non Building
Plan Year:
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Northeast Utilities

Latitude: 41.18118739
Longitude: -73.3932395
Address: 144 Chestnut Hill Road (Rte-53)
City, State: Wilton, CT
Region: NORTHEAST

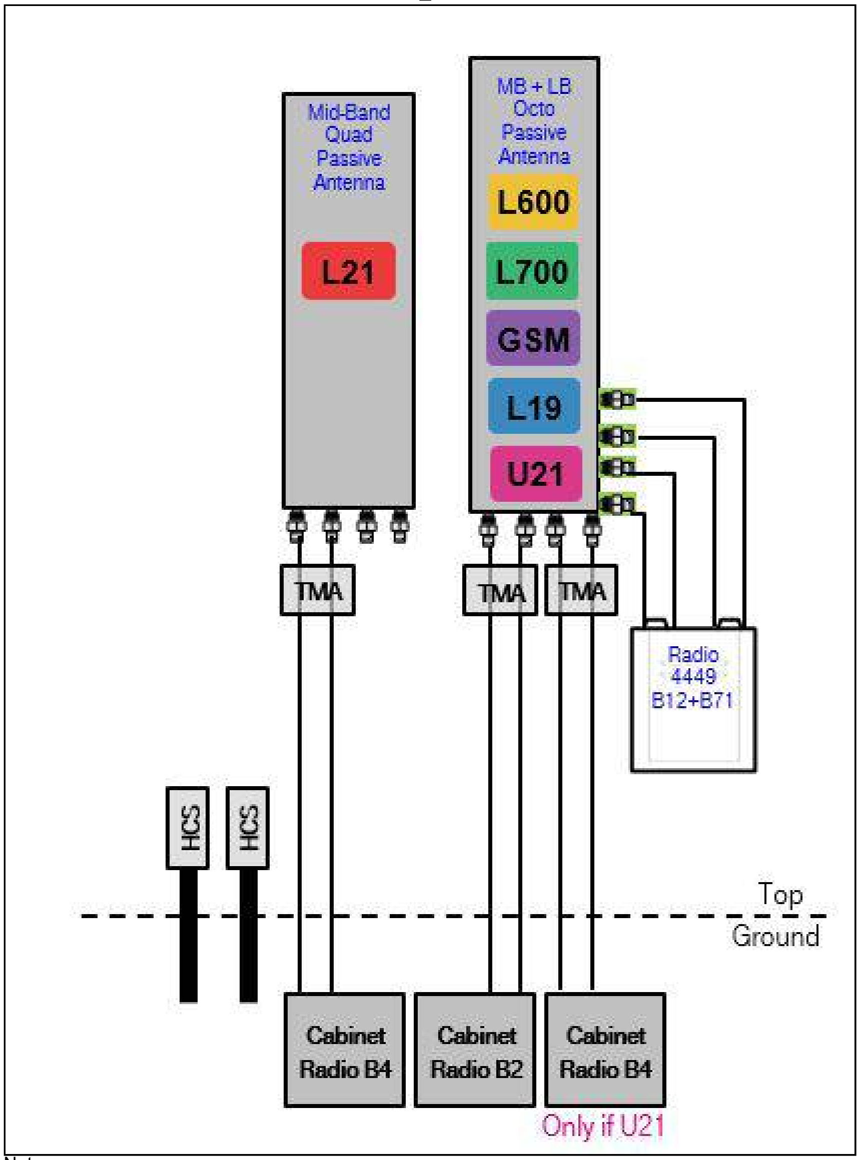
RAN Template: 67D94B Outdoor			**AL Template:** 67D94B_1DP+1QP+1OP	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 24	**TMA Count:** 0	**RRU Count:** 3

Section 2 - Existing Template Images

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

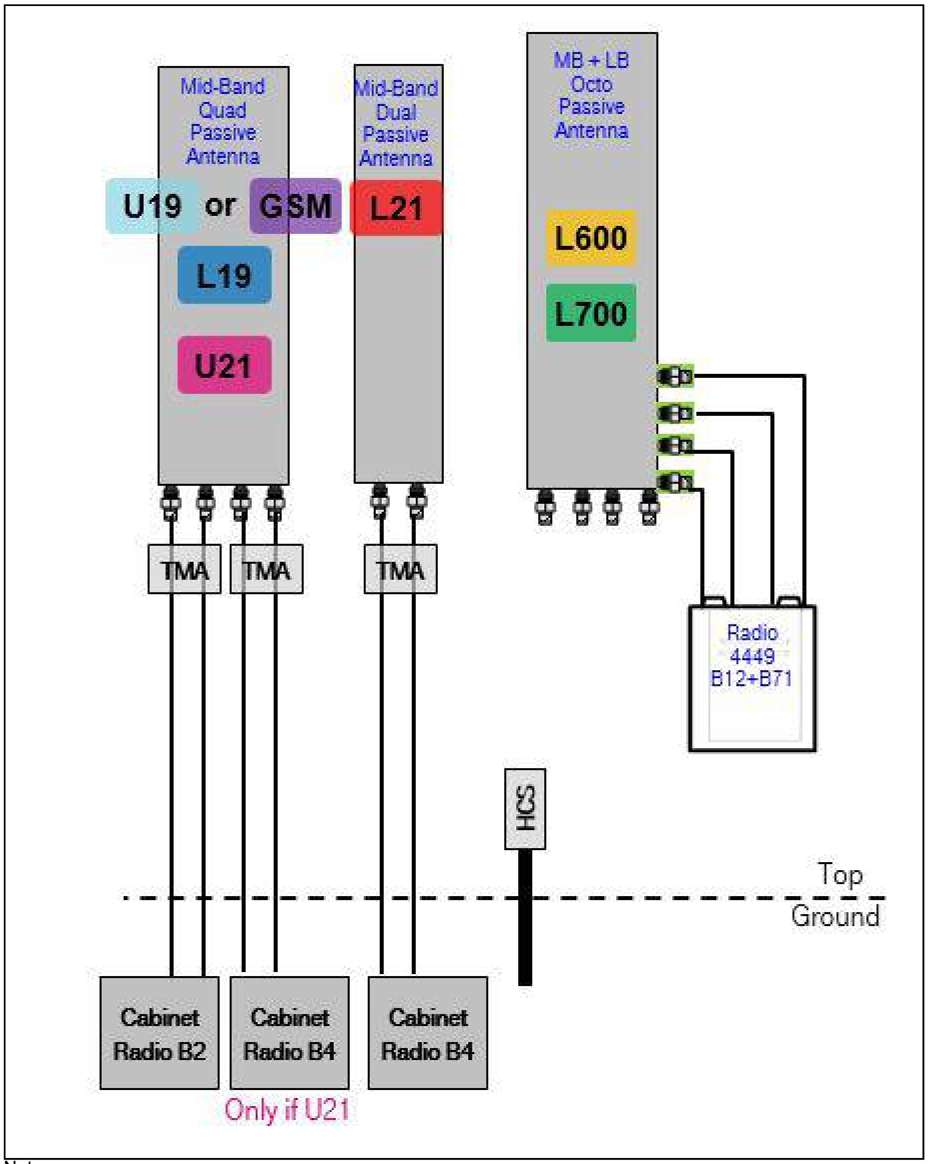
Section 3 - Proposed Template Images

4Sec-67D94A_1QP+1OP.JPG



Notes:

67D94B_1DP+1QP+1OP.JPG


Mid-Band Quad Passive Antenna
U19
or
GSM
L19
U21
Mid-Band Dual Passive Antenna
L21
MB + LB Octo Passive Antenna
L600
L700
TMA
TMA
TMA
Radio 4449 B12+B71
HCS
Top
Ground
Cabinet Radio B2
Cabinet Radio B4
Cabinet Radio B4
Only if U21

Notes:

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 94DB Outdoor (evolved from 4B)

Enclosure	1
Enclosure Type	RBS 6102
Radio	RUS01 B2 **(x3)**: L1900, G1900; RUS01 B2 **(x3)**: L1900; RUS01 B4 **(x3)**: U2100 (DECOMMISSIONED); RUS01 B4 **(x3)**: L2100
Baseband	BB 6630: L1900, L2100; DUG20; DUW30: U2100 (DECOMMISSIONED)

Proposed RAN Equipment

Template: 67D94B Outdoor

Enclosure	1	2
Enclosure Type	RBS 6102	Ancillary Equipment (Ericsson)
Radio	RUS01 B2 **(x3)**: L1900, G1900; RUS01 B4 **(x6)**: L2100; RUS01 B4 **(x3)**: U2100 (DECOMMISSIONED)	
Baseband	BB 6630: L1900, L2100; BB 6648: N600, L600, L700; DUG20: G1900; DUW30: U2100 (DECOMMISSIONED)	

RAN Scope of Work:

3 4449 radios - L6/L7 radios on ground
3 RUS01B2 radios for GSM/L19 Mixedmode
3 RUS01B4 radios for U21
3 diplexers for U21/L19 to be diplexed together on 2 coax for each sector
3 dual-band twin TMA

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Section 6 - A&L Equipment

Existing Template:
Proposed Template: 67D94B_1DP+1QP+1OP

Sector 1 (Existing) view from behind	
Coverage Type	A - Outdoor Macro
Antenna	1
Antenna Model	EMS - RR90-17-02DP (Dual)
Azimuth	30
M. Tilt	0
Height (ft)	97
Ports	P1
Active Tech	L1900 G1900 L2100
Dark Tech	
Restricted Tech	
Decomm. Tech	U2100
E. Tilt	2
Cables	7/8" Coax - 99 ft. ; Generic Feeder Coax - 99 ft.
TMAs	Generic Style 4 - PCS+AWS (At Antenna) **(x2)**
Diplexer / Combiners	Generic AWS/PCS Diplexer (At Antenna) **(x2)**
Radio	
Sector Equipment	

Unconnected Equipment:

Cable: Generic Feeder Coax - 99 ft. **(x2)**

TMA: Generic Twin Style 1B - AWS

Scope of Work:

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 1 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	30		30			
M. Tilt	0		0			
Height (ft)	119		119			
Ports	P1	P2	P3	P4	P5	P6
Active Tech	G1900 N1900 L1900	L2100	N600 L700 L600	N600 L700 L600		
Dark Tech						
Restricted Tech						
Decomm. Tech						
E. Tilt						
Cables	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**		
TMAs	RFS Twin Style 3CX - ATMA4P4DBP-1A20 (At Cabinet)	Ericsson Twin Style 1B - KRY 112 144/1 (At Cabinet)				
Diplexer / Combiners	RFS AWS/PCS - FDAP5002/1A20 (At Cabinet)					
Radio			Radio 4449 B71+B85 (At Cabinet)	Radio 4449 B71+B85 (At Cabinet)		
Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)				Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

Add (1) LB/MB Octo to Position 2.
Add (1) Radio 4449 B71+B12 for L600 and L700 at Ground Level.
Add Smart Bias-T.
Daisy Chain RETs.

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

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 2 (Existing) view from behind	
Coverage Type	A - Outdoor Macro
Antenna	1
Antenna Model	EMS - RR90-17-02DP (Dual)
Azimuth	
M. Tilt	0
Height (ft)	150
Ports	P1
Active Tech	L1900 G1900 L2100
Dark Tech	
Restricted Tech	
Decomm. Tech	U2100
E. Tilt	2
Cables	7/8" Coax - 99 ft. Generic Feeder Coax - 99 ft.
TMAs	Generic Style 4 - PCS+AWS (At Antenna) **(x2)**
Diplexer / Combiners	Generic AWS/PCS Diplexer (At Antenna) **(x2)**
Radio	
Sector Equipment	

Unconnected Equipment:

Cable: Generic Feeder Coax - 99 ft. **(x2)** TMA: Generic Twin Style 1B - AWS

Scope of Work:

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	150		150			
M. Tilt	0		0			
Height (ft)	119		119			
Ports	P1	P2	P3	P4	P5	P6
Active Tech	L1900 G1900 N1900	L2100	N600 L700 L600	N600 L700 L600		
Dark Tech						
Restricted Tech						
Decomm. Tech						
E. Tilt						
Cables	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**		
TMAs	RFS Twin Style 3CX - ATMA4P4DBP-1A20 (At Cabinet)	Ericsson Twin Style 1B - KRY 112 144/1 (At Cabinet)				
Diplexer / Combiners	RFS AWS/PCS - FDAP5002/1A20 (At Cabinet)					
Radio			Radio 4449 B71+B85 (At Cabinet)	Radio 4449 B71+B85 (At Cabinet)		
Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)				Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

Add (1) LB/MB Octo to Position 2.
Add (1) Radio 4449 B71+B12 for L600 and L700 at Ground Level.
Add Smart Bias-T.
Daisy Chain RETs.

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

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 3 (Existing) view from behind	
Coverage Type	A - Outdoor Macro
Antenna	1
Antenna Model	EMS - RR90-17-02DP (Dual)
Azimuth	
M. Tilt	0
Height (ft)	270
Ports	P1
Active Tech	L1900 G1900 L2100
Dark Tech	
Restricted Tech	
Decomm. Tech	U2100
E. Tilt	2
Cables	7/8" Coax - 99 ft. Generic Feeder Coax - 99 ft.
TMAs	Generic Style 4 - PCS+AWS (At Antenna) **(x2)**
Diplexer / Combiners	Generic AWS/PCS Diplexer (At Antenna) **(x2)**
Radio	
Sector Equipment	

Unconnected Equipment:

Cable: Generic Feeder Coax - 99 ft. **(x2)** TMA: Generic Twin Style 1B - AWS

Scope of Work:

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	270		270			
M. Tilt	0		0			
Height (ft)	119		119			
Ports	P1	P2	P3	P4	P5	P6
Active Tech	G1900 L1900 N1900	L2100	N600 L700 L600	N600 L700 L600		
Dark Tech						
Restricted Tech						
Decomm. Tech						
E. Tilt						
Cables	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**		
TMAs	RFS Twin Style 3CX - ATMA4P4DBP-1A20 (At Cabinet)	Ericsson Twin Style 1B - KRY 112 144/1 (At Cabinet)				
Diplexer / Combiners	RFS AWS/PCS - FDAP5002/1A20 (At Cabinet)					
Radio			Radio 4449 B71+B85 (At Cabinet)	Radio 4449 B71+B85 (At Cabinet)		
Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)				Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

Add (1) LB/MB Octo to Position 2.
Add (1) Radio 4449 B71+B12 for L600 and L700 at Ground Level.
Add Smart Bias-T.
Daisy Chain 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, 617-746/617-746/1695-2200/1695-2200MHz, 65deg, 15/15/18/18dBi, 2.4m (8ft), VET, RET, 0-12°/0-12°/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 600MHz, 700MHz, AWS & PCS 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 diasy 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 (617-746 MHZ) [R1]

Frequency Band	MHz	617-698	698-746
Gain	dBi	15.1	15.5
Horizontal Beamwidth @3dB	Deg	65	62
Vertical Beamwidth @3dB	Deg	11.4	10.4
Electrical Downtilt Range	Deg	0-12	0-12
Upper Side Lobe Suppression 0 to +20	dB	19	20
Front-to-Back, at +/-30°, Copolar	dB	25	24
Cross Polar Discrimination (XPD) @ Boresight	dB	19	19
Cross Polar Discrimination (XPD) @ +/-60	dB	5	3
3rd Order PIM 2 x 43dBm	dBc		-153
VSWR	-	1.5:1	1.5:1
Cross Polar Isolation	dB	25	25
Maximum Effective Power per Port	Watt	250	250

LOW BAND RIGHT ARRAY (617-746 MHZ) [R2]

Frequency Band	MHz	617-698	698-746
Gain	dBi	14.8	15.1
Horizontal Beamwidth @3dB	Deg	65	62
Vertical Beamwidth @3dB	Deg	11.4	10.3
Electrical Downtilt Range	Deg	0-12	0-12
Upper Side Lobe Suppression 0 to +20	dB	19	20
Front-to-Back, at +/-30°, Copolar	dB	25	23
Cross Polar Discrimination (XPD) @ Boresight	dB	19	19
Cross Polar Discrimination (XPD) @ +/-60	dB	5	3
3rd Order PIM 2 x 43dBm	dBc		-153
VSWR	-	1.5:1	1.5:1
Cross Polar Isolation	dB	25	25
Maximum Effective Power per Port	Watt	250	250

RADIO FREQUENCY SYSTEMS
The Clear Choice®

Dual Slant Polarized Quad Band (8 Port) Antenna, 617-746/617-746/1695-2200/1695-2200MHz, 65deg, 15/15/18/18dBi, 2.4m (8ft), VET, RET, 0-12°/0-12°/2-12°/2-12°

ELECTRICAL SPECIFICATIONS

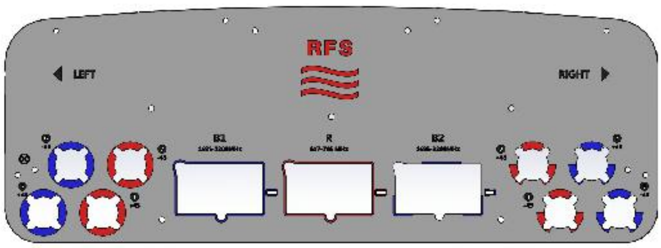
Impedance	Ohm	50.0
Polarization	Deg	±45°

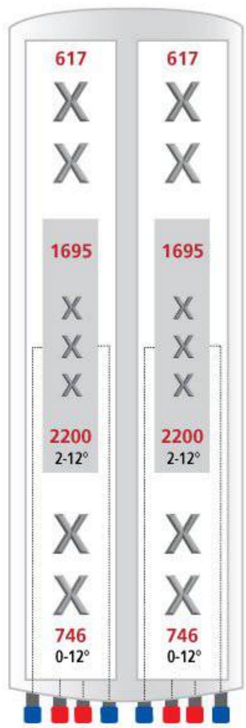
MECHANICAL SPECIFICATIONS

Dimensions - H x W x D	mm (in)	2436 x 609 x 222 (95.9 x 24 x 8.7)
Weight (Antenna Only)	kg (lb)	58 (128)
Weight (Mounting Hardware only)	kg (lb)	11.5 (25.3)
Shipping Weight	kg (lb)	80 (176)
Connector type		8 x 4.3-10 female at bottom + 6 AISG connectors (3 male, 3 female)
Adjustment mechanism		Integrated RET solution AISG compliant (Field Replaceable) + Manual Override + External Tilt Indicator
Mounting Hardware Material		Galvanized steel
Radome Material / Color		Fiber Glass / Light Grey RAL7035

TESTING AND ENVIRONMENTAL

Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Lightning protection		IEC 61000-4-5
Survival/Rated Wind Velocity	km/h	241 (150)
Environmental		ETSI 300-019-2-4 Class 4.1E





ORDERING INFORMATION

Order No.	Configuration	Mounting Hardware	Mounting pipe Diameter	Shipping Weight
APXVAARR24_43-U-NA20	Field Replace RET included (3)	APM40-5E Beam tilt kit (included)	60-120mm	80 Kg

Product Data Sheet	APX16DWV-16DWVS-E-A20

Optimizer® Side-by-Side Dual Polarized Antenna, 1710-2200, 65deg, 18.4dBi, 1.4m, VET, 0-10deg RET

Product Description

A combination of two X-Polarized antennas in a single radome, this pair of variable tilt antennas provides exceptional suppression of all upper sidelobes at all downtilt angles. It also features a wide downtilt range. This antenna is optimized for performance across the entire frequency band (1710-2200 MHz). The antenna comes pre-connected with two antenna control units (ACU).

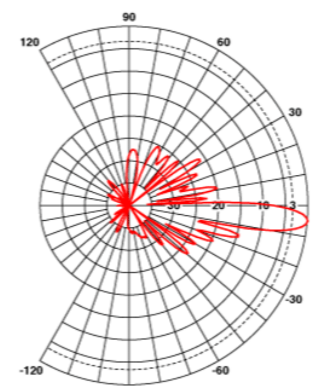
Features/Benefits

- **Variable electrical downtilt - provides enhanced precision in controlling intercell interference. The tilt is infield adjustable 0-10 deg.**
- **High Suppression of all Upper Sidelobes (Typically <-20dB).**
- **Gain tracking – difference between AWS UL (1710-1755 MHz) and DL (2110-2155 MHz) <1dB.**
- **Two X-Polarised panels in a single radome.**
- **Azimuth horizontal beamwidth difference <4deg between AWS UL (1710-1755 MHz) and DL (2110-2155 MHz).**
- **Low profile for low visual impact.**
- **Dual polarization; Broadband design.**
- **Includes (2) AISG 2.0 Compatible ACU-A20-N antenna control units.**

Technical Specifications

Electrical Specifications

Frequency Range, MHz	1710-2200
Horizontal Beamwidth, deg	65
Vertical Beamwidth, deg	5.9 to 7.7
Electrical Downtilt, deg	0-10
Gain, dBi (dBd)	18.4 (16.3)
1st Upper Sidelobe Suppression, dB	> 18 (typically > 20)
Upper Sidelobe Suppression, dB	> 18 all (typically > 20)
Front-To-Back Ratio, dB	>26 (typically 28)
Polarization	Dual pol +/-45°
VSWR	< 1.5:1
Isolation between Ports, dB	> 30
3rd Order IMP @ 2 x 43 dBm, dBc	> 150 (155 Typical)
Impedance, Ohms	50
Maximum Power Input, W	300
Lightning Protection	Direct Ground
Connector Type	(4) 7-16 Long Neck Female



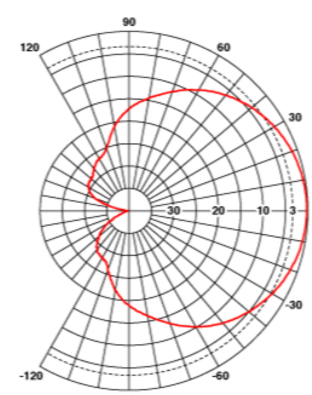
Vertical Pattern

Mechanical Specifications

Dimensions - HxWxD, mm (in)	1420 x 331 x 80 (55.9 x 13 x 3.15)
Weight w/o Mtg Hardware, kg (lb)	18.5 (40.7)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	160 (100)
Max Wind Loading Area, m² (ft²)	0.47 (5.03)
Front Thrust @ Rated Wind, N (lbf)	756 (170)
Maximum Thrust @ Rated Wind, N (lbf)	756 (170)
Wind Load - Side @ Rated Wind, N (lbf)	231 (52)
Wind Load - Rear @ Rated Wind, N (lbf)	408 (92)
Radome Material	Fiberglass
Radome Color	Light Grey RAL7035
Mounting Hardware Material	Diecasted Aluminum
Shipping Weight, kg (lb)	24.5 (53.9)
Packing Dimensions, HxWxD, mm (in)	1520 x 408 x 198 (59.8 x 16 x 7.8)

Ordering Information

Mounting Hardware	APM40-2 + APM40-E2



Horizontal Pattern

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

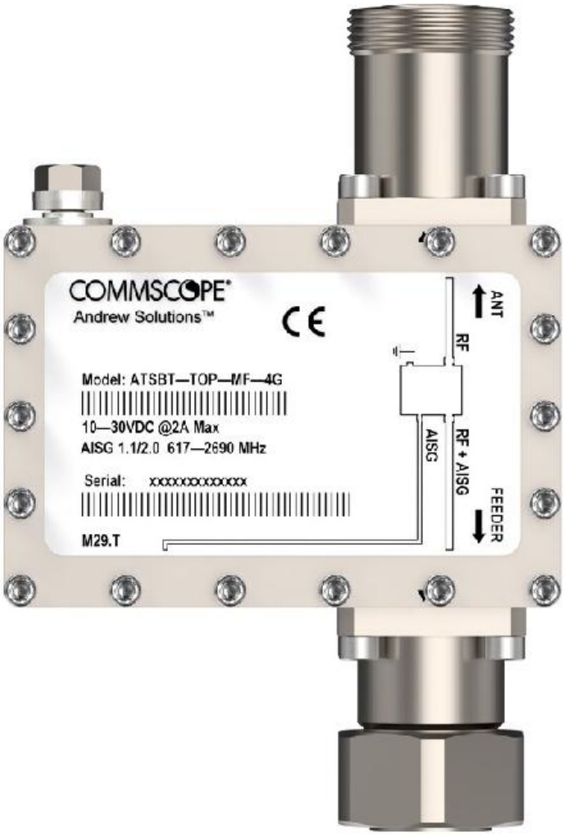
Height	143 mm | 5.63 in
Width	94 mm | 3.701 in
Depth	50 mm | 1.969 in

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

COMMSCOPE®

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**

SITE PRO 1
A valmont COMPANY
1545 Pidco Drive
Plymouth, IN 46563
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

CENTEK engineering

Centered on Solutions℠

Antenna Mount Analysis Report

Site Ref: CT11296A

144 Chestnut Hill Road
Wilton, CT

Centek Project No. 22073.01

Date: May 18, 2023

Max Stress Ratio = 40%

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

Table of Contents

CENTEK engineering

Centered on Solutions℠

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: CT11296A
144 Chestnut Hill Road
Wilton, CT

Centek Project No. 22073.01

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 APXVAARR24_43 panel antennas, three (3) RFS APX16DWV-16DWVS panel antennas and six (6) Commscope ATSBT-TOP-MF-4G Bias Tees mounted on one (1) Platform to the utility pole with a RAD center elevation of 120-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 120 mph for Wilton 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

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED
PROFESSIONAL ENGINEER

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Section 2 - Calculations

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-H

Wind Speeds

Basic Wind Speed	$V := 120$	mph	(User Input - CSBC 2022 Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input - TIA-222-H Annex B)
Basic Wind Speed (Mount)	$V_m := 30$	mph	(User Input - TIA-222-H Section 16.3)

Input

Structure Type =	Structure_Type := Flexible		(User Input)
Structure Category =	SC := III		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 136$	ft	(User Input)
Height to Center of Antennas =	$z_{ant} := 120$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.0$	in	(User Input per Annex B of TIA-222-H)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1$		(User Input)
Shielding Factor for Appurtenances =	$K_a := 1.0$		(User Input)
Rooftop Wind Speed-up Factor =	$K_s := 1.0$		(User Input)
Ground Elevation Factor =	$K_e = 0.996$		(User Input)
Gust Response Factor =	$G_H = 1.35$		(User Input)

Output

Wind Direction Probability Factor = $K_d := 0.95$ (Per Table 2-2 of TIA-222-H)

Importance Factors = (Per Table 2-3 of TIA-222-H)

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \\ 1.25 & \text{if } SC = 4 \end{cases} = 1.15$$

$$I_{Seismic} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \\ 1.50 & \text{if } SC = 4 \end{cases} = 1.25$$

$$K_{iz} := \left(\frac{z_{ant}}{33}\right)^{0.1} = 1.138 \qquad t_{iz} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.308$$

Velocity Pressure Coefficient Antennas = $Kz_{ant} := 2.01\left(\left(\frac{z_{ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.315$

Velocity Pressure w/o Ice Antennas = $qz_{ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V^2 = 45.854$

Velocity Pressure with Ice Antennas = $qz_{ice.ant} := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_i^2 = 7.961$

Velocity Pressure with Ice Antennas = $qz_m := 0.00256 \cdot K_{zt} \cdot K_s \cdot K_e \cdot K_d \cdot Kz_{ant} \cdot V_m^2 = 2.866$

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	RFSAPXVAARR24_43		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height=	$L_{app} := 95.9$	in	(User Input)
Appurtenance Width =	$W_{app} := 24$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 8.7$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 154$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 4.0$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.27$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 16$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 1253$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 5.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 454$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 18.2$	sf
Total Appurtenance Wind Force w/ Ice=	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} \cdot N_{app} = 248$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 7.7$	sf
Total Appurtenance Wind Force w/ Ice=	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 105$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 16$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} \cdot N_{app} = 78$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 5.8$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 28$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2 \times 10^4$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 9652$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 313$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 313$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	RFS APX16DWV-16DWVS		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 55.9$	in	(User Input)
Appurtenance Width =	$W_{app} := 13$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 3.15$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 45$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 4.3$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.28$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 5$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 400$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.2$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 97$	lbs

Wind Load (with ice)

Surface Area for One Appurtenance w/ Ice (Front) =	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 6.3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 87$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 2.3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 32$	lbs

Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 5$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 25$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 1.2$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 6$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 2289$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 2981$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 97$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 97$	lbs

Development of Wind & Ice Load on Appurtenances

Appurtenance Data:

Appurtenance Model =	Commscope ATSBT-TOP-MF-4G		
Appurtenance Shape =	Flat		(User Input)
Appurtenance Height =	$L_{app} := 5.63$	in	(User Input)
Appurtenance Width =	$W_{app} := 3.701$	in	(User Input)
Appurtenance Thickness =	$T_{app} := 1.969$	in	(User Input)
Appurtenance Weight =	$WT_{app} := 2$	lbs	(User Input)
Number of Appurtenances =	$N_{app} := 1$		(User Input)
Appurtenance Aspect Ratio =	$Ar_{app} := \frac{L_{app}}{W_{app}} = 1.5$		
Appurtenance Force Coefficient =	$Ca_{app} = 1.2$		

Wind Load (without ice)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 11$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_{ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 6$	lbs

Wind Load (with ice)

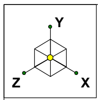
Surface Area for One Appurtenance w/ Ice (Front)=	$SA_{ICEappF} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (W_{app} + 2 \cdot t_{iz})}{144} = 0.4$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappF} = 5$	lbs
Surface Area for One Appurtenance w/ Ice (Side) =	$SA_{ICEappS} := \frac{(L_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz})}{144} = 0.3$	sf
Total Appurtenance Wind Force w/ Ice =	$Fi_{app} := qz_{ice.ant} \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{ICEappS} = 3$	lbs

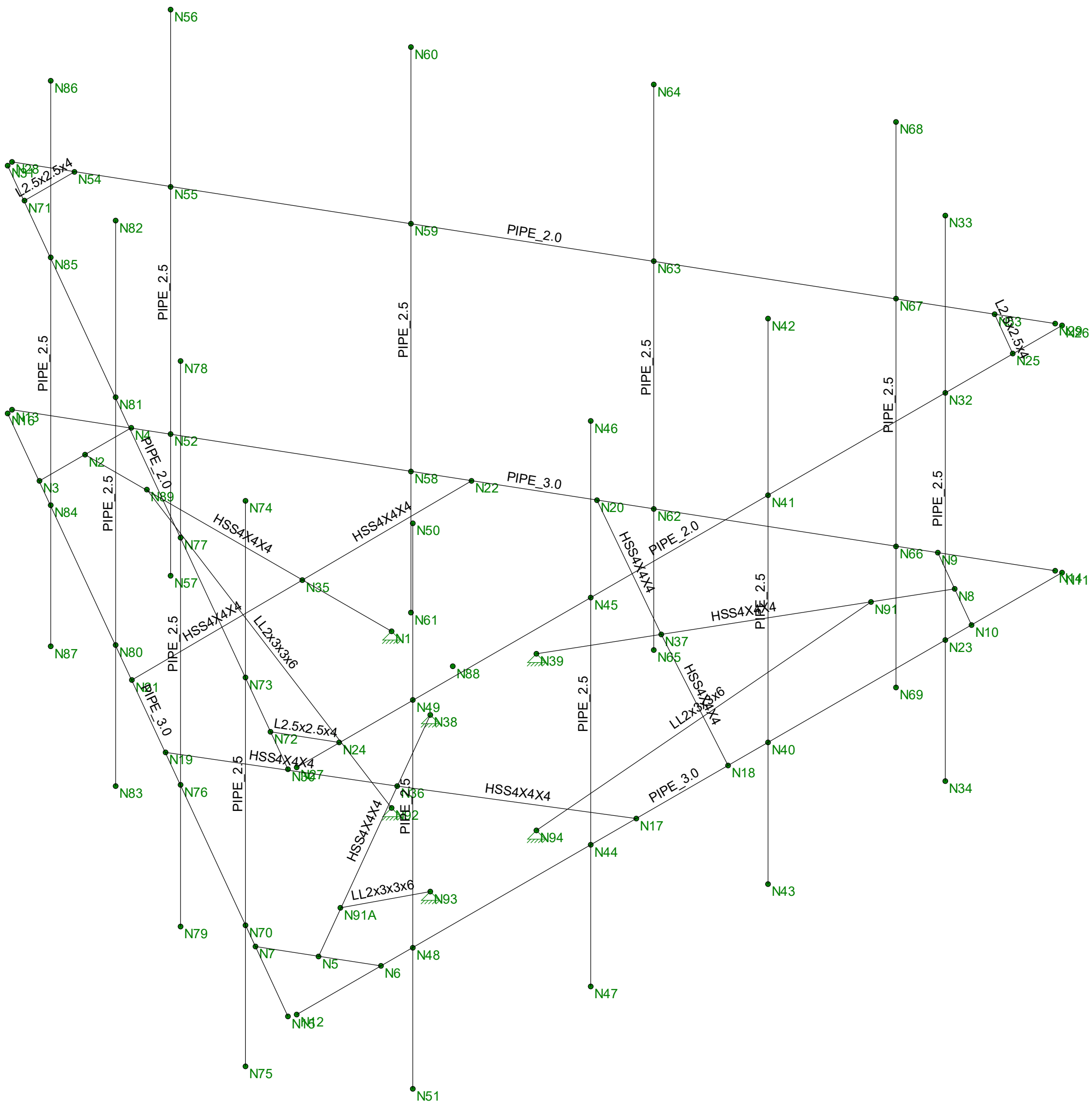
Wind Load (Mount)

Surface Area for One Appurtenance (Front) =	$SA_{appF} := \frac{L_{app} \cdot W_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appF} = 1$	lbs
Surface Area for One Appurtenance (Side) =	$SA_{appS} := \frac{L_{app} \cdot T_{app}}{144} = 0.1$	sf
Total Appurtenance Wind Force =	$F_{app} := qz_m \cdot G_H \cdot Ca_{app} \cdot K_a \cdot SA_{appS} = 0$	lbs

Gravity Loads (ice only)

Volume of Each Appurtenance =	$V_{app} := L_{app} \cdot W_{app} \cdot T_{app} = 41$	cu in
Volume of Ice on Each Appurtenance =	$V_{ice} := (L_{app} + 2 \cdot t_{iz})(W_{app} + 2 \cdot t_{iz}) \cdot (T_{app} + 2 \cdot t_{iz}) - V_{app} = 198$	cu in
Weight of Ice on Each Appurtenance =	$W_{ICEapp} := \frac{V_{ice}}{1728} \cdot Id = 6$	lbs
Weight of Ice on All Appurtenances =	$W_{ICEapp} \cdot N_{app} = 6$	lbs





Envelope Only Solution

Centek Engineering		
TJL	CT11296A	May 18, 2023 at 11:36 AM
22073.01	Member Framing	Mount.R3D

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Outrigger	HSS4X4X4	Beam	HSS Pipe	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
2	Horz Pipe	PIPE_3.0	Beam	Pipe	A53 Grade B	Typical	2.07	2.85	2.85	5.69
3	Antenna Pipe	PIPE_2.5	Column	Pipe	A53 Grade B	Typical	1.61	1.45	1.45	2.89
4	Handrail	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	Support	HSS4X4X4	Beam	HSS Pipe	A500 Gr.46	Typical	3.37	7.8	7.8	12.8
6	Handrail Corner	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026
7	Double Angle Supp...	LL2x3x3x6	Beam	Double Angle (No Gap)	A36 Gr.36	Typical	1.83	4.92	.61	.024

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Outrigger	5			Lbyy						Lateral
2	M2	Outrigger	5			Lbyy						Lateral
3	M3	Outrigger	5			Lbyy						Lateral
4	M4	Horz Pipe	12.5			Lbyy						Lateral
5	M5	Horz Pipe	12.475			Lbyy						Lateral
6	M6	Horz Pipe	12.5			Lbyy						Lateral
7	M10	Support	2.786			Lbyy						Lateral
8	M11	Support	2.837			Lbyy						Lateral
9	M12	Support	2.786			Lbyy						Lateral
10	M13	Handrail	12.5			Lbyy						Lateral
11	M14	Handrail	12.475			Lbyy						Lateral
12	M15	Handrail	12.5			Lbyy						Lateral
13	M16	Antenna Pipe	8			Lbyy						Lateral
14	M17	Support	2.811			Lbyy						Lateral
15	M18	Support	2.761			Lbyy						Lateral
16	M19	Support	2.736			Lbyy						Lateral
17	M20	Antenna Pipe	8			Lbyy						Lateral
18	M21	Antenna Pipe	8			Lbyy						Lateral
19	M22	Antenna Pipe	8			Lbyy						Lateral
20	M23	Antenna Pipe	8			Lbyy						Lateral
21	M24	Antenna Pipe	8			Lbyy						Lateral
22	M25	Antenna Pipe	8			Lbyy						Lateral
23	M26	Antenna Pipe	8			Lbyy						Lateral
24	M27	Antenna Pipe	8			Lbyy						Lateral
25	M28	Antenna Pipe	8			Lbyy						Lateral
26	M29	Antenna Pipe	8			Lbyy						Lateral
27	M30	Antenna Pipe	8			Lbyy						Lateral
28	M31	Handrail Corner	.821			Lbyy						Lateral
29	M32	Handrail Corner	.821			Lbyy						Lateral
30	M33	Handrail Corner	.821			Lbyy						Lateral
31	M34	Double Angle Supp...	4.717			Lbyy						Lateral
32	M35	Double Angle Supp...	4.717			Lbyy						Lateral
33	M36	Double Angle Supp...	4.717			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M1	N1	N2			Outrigger	Beam	HSS Pipe	A500 Gr.46	Typical
2	M2	N38	N5			Outrigger	Beam	HSS Pipe	A500 Gr.46	Typical
3	M3	N39	N8			Outrigger	Beam	HSS Pipe	A500 Gr.46	Typical
4	M4	N16	N15			Horz Pipe	Beam	Pipe	A53 Grade B	Typical
5	M5	N13	N14			Horz Pipe	Beam	Pipe	A53 Grade B	Typical
6	M6	N12	N11			Horz Pipe	Beam	Pipe	A53 Grade B	Typical
7	M7	N9	N10			RIGID	None	None	RIGID	Typical
8	M8	N7	N6			RIGID	None	None	RIGID	Typical
9	M9	N3	N4			RIGID	None	None	RIGID	Typical
10	M10	N22	N35			Support	Beam	HSS Pipe	A500 Gr.46	Typical
11	M11	N36	N17			Support	Beam	HSS Pipe	A500 Gr.46	Typical
12	M12	N37	N20			Support	Beam	HSS Pipe	A500 Gr.46	Typical
13	M13	N31	N30			Handrail	Beam	Pipe	A53 Grade B	Typical
14	M14	N28	N29			Handrail	Beam	Pipe	A53 Grade B	Typical
15	M15	N27	N26			Handrail	Beam	Pipe	A53 Grade B	Typical
16	M16	N34	N33			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
17	M17	N35	N21			Support	Beam	HSS Pipe	A500 Gr.46	Typical
18	M18	N36	N19			Support	Beam	HSS Pipe	A500 Gr.46	Typical
19	M19	N18	N37			Support	Beam	HSS Pipe	A500 Gr.46	Typical
20	M20	N43	N42			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
21	M21	N47	N46			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
22	M22	N51	N50			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
23	M23	N57	N56			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
24	M24	N61	N60			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
25	M25	N65	N64			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
26	M26	N69	N68			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
27	M27	N75	N74			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
28	M28	N79	N78			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
29	M29	N83	N82			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
30	M30	N87	N86			Antenna Pipe	Column	Pipe	A53 Grade B	Typical
31	M31	N53	N25			Handrail Corner	Beam	Single An...	A36 Gr.36	Typical
32	M32	N72	N24			Handrail Corner	Beam	Single An...	A36 Gr.36	Typical
33	M33	N54	N71			Handrail Corner	Beam	Single An...	A36 Gr.36	Typical
34	M34	N91	N94			Double Angle Supports	Beam	Double An...	A36 Gr.36	Typical
35	M35	N89	N92			Double Angle Supports	Beam	Double An...	A36 Gr.36	Typical
36	M36	N91A	N93			Double Angle Supports	Beam	Double An...	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	-1	0	0	0	
2	N2	-6	0	0	0	
3	N3	-6	0	0.75	0	
4	N4	-6	0	-0.75	0	
5	N5	3	0	5.196152	0	
6	N6	3.649519	0	4.821152	0	
7	N7	2.350481	0	5.571152	0	
8	N8	3	0	-5.196152	0	
9	N9	2.350481	0	-5.571152	0	
10	N10	3.649519	0	-4.821152	0	
11	N11	3.649519	0	-6.3	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
12	N12	3.649519	0	6.2	0	
13	N13	-7.237418	0	-0.035576	0	
14	N14	3.566249	0	-6.273076	0	
15	N15	3.60955	0	6.298076	0	
16	N16	-7.215768	0	0.048076	0	
17	N17	3.649519	0	.65	0	
18	N18	3.649519	0	-.85	0	
19	N19	-1.131939	0	3.560576	0	
20	N20	-1.17524	0	-3.535576	0	
21	N21	-2.430977	0	2.810576	0	
22	N22	-2.474279	0	-2.785576	0	
23	N23	3.649519	0	-4.4	0	
24	N24	3.649519	3.5	5.5	0	
25	N25	3.649519	3.5	-5.5	0	
26	N26	3.649519	3.5	-6.3	0	
27	N27	3.649519	3.5	6.2	0	
28	N28	-7.237418	3.5	-0.035576	0	
29	N29	3.566249	3.5	-6.273076	0	
30	N30	3.60955	3.5	6.298076	0	
31	N31	-7.215768	3.5	0.048076	0	
32	N32	3.649519	3.5	-4.4	0	
33	N33	3.649519	6	-4.4	0	
34	N34	3.649519	-2	-4.4	0	
35	N35	-2.452725	0	0	0	
36	N36	1.237334	0	2.143125	0	
37	N37	1.248014	0	-2.161623	0	
38	N38	.5	0	0.866025	0	
39	N39	.5	0	-0.866025	0	
40	N40	3.649519	0	-1.5	0	
41	N41	3.649519	3.5	-1.5	0	
42	N42	3.649519	6	-1.5	0	
43	N43	3.649519	-2	-1.5	0	
44	N44	3.649519	0	1.4	0	
45	N45	3.649519	3.5	1.4	0	
46	N46	3.649519	6	1.4	0	
47	N47	3.649519	-2	1.4	0	
48	N48	3.649519	0	4.3	0	
49	N49	3.649519	3.5	4.3	0	
50	N50	3.649519	6	4.3	0	
51	N51	3.649519	-2	4.3	0	
52	N52	-5.59197	0	-0.985576	0	
53	N53	2.93838	3.5	-5.910576	0	
54	N54	-6.587899	3.5	-0.410576	0	
55	N55	-5.59197	3.5	-0.985576	0	
56	N56	-5.59197	6	-0.985576	0	
57	N57	-5.59197	-2	-0.985576	0	
58	N58	-3.102147	0	-2.423076	0	
59	N59	-3.102147	3.5	-2.423076	0	
60	N60	-3.102147	6	-2.423076	0	
61	N61	-3.102147	-2	-2.423076	0	
62	N62	-0.590673	0	-3.873076	0	
63	N63	-0.590673	3.5	-3.873076	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
64	N64	-0.590673	6	-3.873076	0	
65	N65	-0.590673	-2	-3.873076	0	
66	N66	1.9208	0	-5.323076	0	
67	N67	1.9208	3.5	-5.323076	0	
68	N68	1.9208	6	-5.323076	0	
69	N69	1.9208	-2	-5.323076	0	
70	N70	1.964102	0	5.348076	0	
71	N71	-6.587899	3.5	0.410576	0	
72	N72	2.93838	3.5	5.910576	0	
73	N73	1.964102	3.5	5.348076	0	
74	N74	1.964102	6	5.348076	0	
75	N75	1.964102	-2	5.348076	0	
76	N76	-0.547372	0	3.898076	0	
77	N77	-0.547372	3.5	3.898076	0	
78	N78	-0.547372	6	3.898076	0	
79	N79	-0.547372	-2	3.898076	0	
80	N80	-3.058846	0	2.448076	0	
81	N81	-3.058846	3.5	2.448076	0	
82	N82	-3.058846	6	2.448076	0	
83	N83	-3.058846	-2	2.448076	0	
84	N84	-5.570319	0	0.998076	0	
85	N85	-5.570319	3.5	0.998076	0	
86	N86	-5.570319	6	0.998076	0	
87	N87	-5.570319	-2	0.998076	0	
88	N88	0	0	0	0	
89	N89	-5	0	0	0	
90	N91	2.5	0	-4.330127	0	
91	N91A	2.5	0	4.330127	0	
92	N92	-1	-2.5	0	0	
93	N93	.5	-2.5	0.866025	0	
94	N94	.5	-2.5	-0.866025	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction			
2	N38	Reaction	Reaction	Reaction			
3	N39	Reaction	Reaction	Reaction			
4	N92	Reaction	Reaction	Reaction			
5	N93	Reaction	Reaction	Reaction			
6	N94	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Dead Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M21	Y	-.077	1
2	M25	Y	-.077	1
3	M29	Y	-.077	1
4	M21	Y	-.077	7
5	M25	Y	-.077	7
6	M29	Y	-.077	7

Member Point Loads (BLC 2 : Dead Load) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
7	M16	Y	-.023	7
8	M23	Y	-.023	7
9	M27	Y	-.023	7
10	M16	Y	-.023	4
11	M23	Y	-.023	4
12	M27	Y	-.023	4
13	M16	Y	-.002	3
14	M21	Y	-.002	3
15	M23	Y	-.002	3
16	M25	Y	-.002	3
17	M27	Y	-.002	3
18	M29	Y	-.002	3

Member Point Loads (BLC 3 : Ice Load)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M21	Y	-.157	1
2	M25	Y	-.157	1
3	M29	Y	-.157	1
4	M21	Y	-.157	7
5	M25	Y	-.157	7
6	M29	Y	-.157	7
7	M16	Y	-.049	7
8	M23	Y	-.049	7
9	M27	Y	-.049	7
10	M16	Y	-.049	4
11	M23	Y	-.049	4
12	M27	Y	-.049	4
13	M16	Y	-.006	3
14	M21	Y	-.006	3
15	M23	Y	-.006	3
16	M25	Y	-.006	3
17	M27	Y	-.006	3
18	M29	Y	-.006	3

Member Point Loads (BLC 4 : Lm Maintenance Load (500lb))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M16	Y	-.5	%50
2	M23	Y	-.5	%50
3	M27	Y	-.5	%50

Member Point Loads (BLC 5 : Lv Maintenance Load (250lb))

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M13	Y	-.25	%50
2	M14	Y	-.25	%50
3	M15	Y	-.25	%50

Member Point Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	X	.053	1
2	M29	X	.053	1

Member Point Loads (BLC 6 : Wind with Ice X) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
3	M25	X	.053	7
4	M29	X	.053	7
5	M21	X	.124	1
6	M21	X	.124	7
7	M23	X	.016	7
8	M27	X	.016	7
9	M23	X	.016	4
10	M27	X	.016	4
11	M16	X	.044	7
12	M16	X	.044	4
13	M16	X	.005	3
14	M21	X	.005	3
15	M23	X	.005	3
16	M25	X	.005	3
17	M27	X	.005	3
18	M29	X	.005	3

Member Point Loads (BLC 7 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	X	.227	1
2	M29	X	.227	1
3	M25	X	.227	7
4	M29	X	.227	7
5	M21	X	.627	1
6	M21	X	.627	7
7	M23	X	.049	7
8	M27	X	.049	7
9	M23	X	.049	4
10	M27	X	.049	4
11	M16	X	.2	7
12	M16	X	.2	4
13	M16	X	.011	3
14	M21	X	.011	3
15	M23	X	.011	3
16	M25	X	.011	3
17	M27	X	.011	3
18	M29	X	.011	3

Member Point Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	X	.014	1
2	M29	X	.014	1
3	M25	X	.014	7
4	M29	X	.014	7
5	M21	X	.039	1
6	M21	X	.039	7
7	M23	X	.003	7
8	M27	X	.003	7
9	M23	X	.003	4
10	M27	X	.003	4
11	M16	X	.013	7

Member Point Loads (BLC 8 : Wm Wind X) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
12	M16	X	.013	4
13	M16	X	.001	3
14	M21	X	.001	3
15	M23	X	.001	3
16	M25	X	.001	3
17	M27	X	.001	3
18	M29	X	.001	3

Member Point Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	Z	.124	1
2	M29	Z	.124	1
3	M25	Z	.124	7
4	M29	Z	.124	7
5	M21	Z	.053	1
6	M21	Z	.053	7
7	M23	Z	.044	7
8	M27	Z	.044	7
9	M23	Z	.044	4
10	M27	Z	.044	4
11	M16	Z	.016	7
12	M16	Z	.016	4
13	M16	Z	.005	3
14	M21	Z	.005	3
15	M23	Z	.005	3
16	M25	Z	.005	3
17	M27	Z	.005	3
18	M29	Z	.005	3

Member Point Loads (BLC 10 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	Z	.627	1
2	M29	Z	.627	1
3	M25	Z	.627	7
4	M29	Z	.627	7
5	M21	Z	.227	1
6	M21	Z	.227	7
7	M23	Z	.2	7
8	M27	Z	.2	7
9	M23	Z	.2	4
10	M27	Z	.2	4
11	M16	Z	.049	7
12	M16	Z	.049	4
13	M16	Z	.011	3
14	M21	Z	.011	3
15	M23	Z	.011	3
16	M25	Z	.011	3
17	M27	Z	.011	3
18	M29	Z	.011	3

Member Point Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M25	Z	.039	1
2	M29	Z	.039	1
3	M25	Z	.039	7
4	M29	Z	.039	7
5	M21	Z	.014	1
6	M21	Z	.014	7
7	M23	Z	.013	7
8	M27	Z	.013	7
9	M23	Z	.013	4
10	M27	Z	.013	4
11	M16	Z	.003	7
12	M16	Z	.003	4
13	M16	Z	.001	3
14	M21	Z	.001	3
15	M23	Z	.001	3
16	M25	Z	.001	3
17	M27	Z	.001	3
18	M29	Z	.001	3

Member Distributed Loads (BLC 6 : Wind with Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	.004	.004	0	0
2	M2	PX	.004	.004	0	0
3	M3	PX	.004	.004	0	0
4	M4	PX	.004	.004	0	0
5	M5	PX	.004	.004	0	0
6	M6	PX	.004	.004	0	0
7	M7	PX	.004	.004	0	0
8	M8	PX	.004	.004	0	0
9	M9	PX	.004	.004	0	0
10	M10	PX	.004	.004	0	0
11	M11	PX	.004	.004	0	0
12	M12	PX	.004	.004	0	0
13	M13	PX	.004	.004	0	0
14	M14	PX	.004	.004	0	0
15	M15	PX	.004	.004	0	0
16	M16	PX	.004	.004	0	0
17	M17	PX	.004	.004	0	0
18	M18	PX	.004	.004	0	0
19	M19	PX	.004	.004	0	0
20	M20	PX	.004	.004	0	0
21	M21	PX	.004	.004	0	0
22	M22	PX	.004	.004	0	0
23	M23	PX	.004	.004	0	0
24	M24	PX	.004	.004	0	0
25	M25	PX	.004	.004	0	0
26	M26	PX	.004	.004	0	0
27	M27	PX	.004	.004	0	0
28	M28	PX	.004	.004	0	0
29	M29	PX	.004	.004	0	0

Member Distributed Loads (BLC 6 : Wind with Ice X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
30	M30	PX	.004	.004	0	0
31	M31	PX	.004	.004	0	0
32	M32	PX	.004	.004	0	0
33	M33	PX	.004	.004	0	0
34	M34	PX	.004	.004	0	0
35	M35	PX	.004	.004	0	0
36	M36	PX	.004	.004	0	0

Member Distributed Loads (BLC 7 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	.016	.016	0	0
2	M2	PX	.016	.016	0	0
3	M3	PX	.016	.016	0	0
4	M4	PX	.016	.016	0	0
5	M5	PX	.016	.016	0	0
6	M6	PX	.016	.016	0	0
7	M7	PX	.016	.016	0	0
8	M8	PX	.016	.016	0	0
9	M9	PX	.016	.016	0	0
10	M10	PX	.016	.016	0	0
11	M11	PX	.016	.016	0	0
12	M12	PX	.016	.016	0	0
13	M13	PX	.016	.016	0	0
14	M14	PX	.016	.016	0	0
15	M15	PX	.016	.016	0	0
16	M16	PX	.016	.016	0	0
17	M17	PX	.016	.016	0	0
18	M18	PX	.016	.016	0	0
19	M19	PX	.016	.016	0	0
20	M20	PX	.016	.016	0	0
21	M21	PX	.016	.016	0	0
22	M22	PX	.016	.016	0	0
23	M23	PX	.016	.016	0	0
24	M24	PX	.016	.016	0	0
25	M25	PX	.016	.016	0	0
26	M26	PX	.016	.016	0	0
27	M27	PX	.016	.016	0	0
28	M28	PX	.016	.016	0	0
29	M29	PX	.016	.016	0	0
30	M30	PX	.016	.016	0	0
31	M31	PX	.016	.016	0	0
32	M32	PX	.016	.016	0	0
33	M33	PX	.016	.016	0	0
34	M34	PX	.016	.016	0	0
35	M35	PX	.016	.016	0	0
36	M36	PX	.016	.016	0	0

Member Distributed Loads (BLC 8 : Wm Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PX	.003	.003	0	0
2	M2	PX	.003	.003	0	0

Member Distributed Loads (BLC 8 : Wm Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
3	M3	PX	.003	.003	0	0
4	M4	PX	.003	.003	0	0
5	M5	PX	.003	.003	0	0
6	M6	PX	.003	.003	0	0
7	M7	PX	.003	.003	0	0
8	M8	PX	.003	.003	0	0
9	M9	PX	.003	.003	0	0
10	M10	PX	.003	.003	0	0
11	M11	PX	.003	.003	0	0
12	M12	PX	.003	.003	0	0
13	M13	PX	.003	.003	0	0
14	M14	PX	.003	.003	0	0
15	M15	PX	.003	.003	0	0
16	M16	PX	.003	.003	0	0
17	M17	PX	.003	.003	0	0
18	M18	PX	.003	.003	0	0
19	M19	PX	.003	.003	0	0
20	M20	PX	.003	.003	0	0
21	M21	PX	.003	.003	0	0
22	M22	PX	.003	.003	0	0
23	M23	PX	.003	.003	0	0
24	M24	PX	.003	.003	0	0
25	M25	PX	.003	.003	0	0
26	M26	PX	.003	.003	0	0
27	M27	PX	.003	.003	0	0
28	M28	PX	.003	.003	0	0
29	M29	PX	.003	.003	0	0
30	M30	PX	.003	.003	0	0
31	M31	PX	.003	.003	0	0
32	M32	PX	.003	.003	0	0
33	M33	PX	.003	.003	0	0
34	M34	PX	.003	.003	0	0
35	M35	PX	.003	.003	0	0
36	M36	PX	.003	.003	0	0

Member Distributed Loads (BLC 9 : Wind with Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	.004	.004	0	0
2	M2	PZ	.004	.004	0	0
3	M3	PZ	.004	.004	0	0
4	M4	PZ	.004	.004	0	0
5	M5	PZ	.004	.004	0	0
6	M6	PZ	.004	.004	0	0
7	M7	PZ	.004	.004	0	0
8	M8	PZ	.004	.004	0	0
9	M9	PZ	.004	.004	0	0
10	M10	PZ	.004	.004	0	0
11	M11	PZ	.004	.004	0	0
12	M12	PZ	.004	.004	0	0
13	M13	PZ	.004	.004	0	0
14	M14	PZ	.004	.004	0	0

Member Distributed Loads (BLC 9 : Wind with Ice Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
15	M15	PZ	.004	.004	0	0
16	M16	PZ	.004	.004	0	0
17	M17	PZ	.004	.004	0	0
18	M18	PZ	.004	.004	0	0
19	M19	PZ	.004	.004	0	0
20	M20	PZ	.004	.004	0	0
21	M21	PZ	.004	.004	0	0
22	M22	PZ	.004	.004	0	0
23	M23	PZ	.004	.004	0	0
24	M24	PZ	.004	.004	0	0
25	M25	PZ	.004	.004	0	0
26	M26	PZ	.004	.004	0	0
27	M27	PZ	.004	.004	0	0
28	M28	PZ	.004	.004	0	0
29	M29	PZ	.004	.004	0	0
30	M30	PZ	.004	.004	0	0
31	M31	PZ	.004	.004	0	0
32	M32	PZ	.004	.004	0	0
33	M33	PZ	.004	.004	0	0
34	M34	PZ	.004	.004	0	0
35	M35	PZ	.004	.004	0	0
36	M36	PZ	.004	.004	0	0

Member Distributed Loads (BLC 10 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	.016	.016	0	0
2	M2	PZ	.016	.016	0	0
3	M3	PZ	.016	.016	0	0
4	M4	PZ	.016	.016	0	0
5	M5	PZ	.016	.016	0	0
6	M6	PZ	.016	.016	0	0
7	M7	PZ	.016	.016	0	0
8	M8	PZ	.016	.016	0	0
9	M9	PZ	.016	.016	0	0
10	M10	PZ	.016	.016	0	0
11	M11	PZ	.016	.016	0	0
12	M12	PZ	.016	.016	0	0
13	M13	PZ	.016	.016	0	0
14	M14	PZ	.016	.016	0	0
15	M15	PZ	.016	.016	0	0
16	M16	PZ	.016	.016	0	0
17	M17	PZ	.016	.016	0	0
18	M18	PZ	.016	.016	0	0
19	M19	PZ	.016	.016	0	0
20	M20	PZ	.016	.016	0	0
21	M21	PZ	.016	.016	0	0
22	M22	PZ	.016	.016	0	0
23	M23	PZ	.016	.016	0	0
24	M24	PZ	.016	.016	0	0
25	M25	PZ	.016	.016	0	0
26	M26	PZ	.016	.016	0	0

Member Distributed Loads (BLC 10 : Wind Z) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
27	M27	PZ	.016	.016	0	0
28	M28	PZ	.016	.016	0	0
29	M29	PZ	.016	.016	0	0
30	M30	PZ	.016	.016	0	0
31	M31	PZ	.016	.016	0	0
32	M32	PZ	.016	.016	0	0
33	M33	PZ	.016	.016	0	0
34	M34	PZ	.016	.016	0	0
35	M35	PZ	.016	.016	0	0
36	M36	PZ	.016	.016	0	0

Member Distributed Loads (BLC 11 : Wm Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	PZ	.003	.003	0	0
2	M2	PZ	.003	.003	0	0
3	M3	PZ	.003	.003	0	0
4	M4	PZ	.003	.003	0	0
5	M5	PZ	.003	.003	0	0
6	M6	PZ	.003	.003	0	0
7	M7	PZ	.003	.003	0	0
8	M8	PZ	.003	.003	0	0
9	M9	PZ	.003	.003	0	0
10	M10	PZ	.003	.003	0	0
11	M11	PZ	.003	.003	0	0
12	M12	PZ	.003	.003	0	0
13	M13	PZ	.003	.003	0	0
14	M14	PZ	.003	.003	0	0
15	M15	PZ	.003	.003	0	0
16	M16	PZ	.003	.003	0	0
17	M17	PZ	.003	.003	0	0
18	M18	PZ	.003	.003	0	0
19	M19	PZ	.003	.003	0	0
20	M20	PZ	.003	.003	0	0
21	M21	PZ	.003	.003	0	0
22	M22	PZ	.003	.003	0	0
23	M23	PZ	.003	.003	0	0
24	M24	PZ	.003	.003	0	0
25	M25	PZ	.003	.003	0	0
26	M26	PZ	.003	.003	0	0
27	M27	PZ	.003	.003	0	0
28	M28	PZ	.003	.003	0	0
29	M29	PZ	.003	.003	0	0
30	M30	PZ	.003	.003	0	0
31	M31	PZ	.003	.003	0	0
32	M32	PZ	.003	.003	0	0
33	M33	PZ	.003	.003	0	0
34	M34	PZ	.003	.003	0	0
35	M35	PZ	.003	.003	0	0
36	M36	PZ	.003	.003	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Dead Load	None					18			
3	Ice Load	None					18			
4	Lm Maintenance Load (500lb)	None					3			
5	Lv Maintenance Load (250lb)	None					3			
6	Wind with Ice X	None					18	36		
7	Wind X	None					18	36		
8	Wm Wind X	None					18	36		
9	Wind with Ice Z	None					18	36		
10	Wind Z	None					18	36		
11	Wm Wind Z	None					18	36		

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.4D	Yes	Y		1	1.4	2	1.4																
2	1.2D +1.5Lv	Yes	Y		1	1.2	2	1.2	5	1.5														
3	1.2D + 1.0W (X-directi...	Yes	Y		1	1.2	2	1.2	7	1														
4	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	6	1												
5	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	8	1												
6	1.2D + 1.0W (Z-directi...	Yes	Y		1	1.2	2	1.2	10	1														
7	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	9	1												
8	1.2D +1.5Lm+ 1.0Wm ...	Yes	Y		1	1.2	2	1.2	4	1.5	11	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	1.343	8	.301	2	.196	3	0	8	0	8	0	8
2		min	-4.657	3	.131	3	-2.624	6	0	1	0	1	0	1
3	N38	max	-.352	1	.299	2	-.607	1	0	8	0	8	0	8
4		min	-4.113	6	.132	5	-4.509	6	0	1	0	1	0	1
5	N39	max	3.37	6	.295	2	2.466	3	0	8	0	8	0	8
6		min	-2.25	3	.121	3	-3.852	6	0	1	0	1	0	1
7	N92	max	1.224	3	1.408	8	.03	6	0	8	0	8	0	8
8		min	-2.239	8	-.752	3	-.018	5	0	1	0	1	0	1
9	N93	max	1.614	6	2.13	6	2.98	6	0	8	0	8	0	8
10		min	.572	1	.729	1	.988	1	0	1	0	1	0	1
11	N94	max	1.214	5	1.504	5	1.263	6	0	8	0	8	0	8
12		min	-.607	6	-.861	6	-2.059	5	0	1	0	1	0	1
13	Totals:	max	0	6	4.643	8	0	2						
14		min	-5.728	3	2.393	6	-6.711	6						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	0	8	0	8	0	8	2.114e-03	6	6.537e-03	6	4.411e-04	2
2		min	0	1	0	1	0	1	-8.481e-05	5	-4.584e-04	3	8.808e-05	3
3	N2	max	.003	3	.02	3	.251	6	3.951e-03	6	2.814e-03	6	3.442e-04	8
4		min	0	8	-.014	8	-.017	3	-5.625e-04	5	-1.963e-04	3	-9.739e-04	3

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
5	N3	max	.025	6	.02	3	.251	6	3.951e-03	6	2.814e-03	6	3.442e-04	8
6		min	0	5	-.04	6	-.017	3	-5.625e-04	5	-1.963e-04	3	-9.739e-04	3
7	N4	max	.005	3	.032	6	.251	6	3.951e-03	6	2.814e-03	6	3.442e-04	8
8		min	-.026	6	-.016	5	-.017	3	-5.625e-04	5	-1.963e-04	3	-9.739e-04	3
9	N5	max	.201	6	-.005	2	.004	3	1.819e-03	6	3.516e-03	6	8.653e-04	6
10		min	-.003	3	-.031	6	-.111	6	-8.447e-04	3	-6.533e-04	3	-2.577e-03	3
11	N6	max	.185	6	-.005	2	.009	3	1.819e-03	6	3.516e-03	6	8.653e-04	6
12		min	-.001	5	-.041	3	-.139	6	-8.447e-04	3	-6.533e-04	3	-2.577e-03	3
13	N7	max	.217	6	.007	3	.001	5	1.819e-03	6	3.516e-03	6	8.653e-04	6
14		min	-.006	3	-.045	6	-.084	6	-8.447e-04	3	-6.533e-04	3	-2.577e-03	3
15	N8	max	.024	3	.022	6	.012	3	1.778e-03	6	3.615e-03	6	5.254e-05	2
16		min	-.199	6	-.018	3	-.111	6	-3.268e-05	1	-2.266e-05	5	-2.658e-03	3
17	N9	max	.024	3	.037	6	.012	3	1.778e-03	6	3.615e-03	6	5.254e-05	2
18		min	-.215	6	-.008	5	-.083	6	-3.268e-05	1	-2.266e-05	5	-2.658e-03	3
19	N10	max	.025	3	.007	6	.011	3	1.778e-03	6	3.615e-03	6	5.254e-05	2
20		min	-.183	6	-.042	3	-.139	6	-3.268e-05	1	-2.266e-05	5	-2.658e-03	3
21	N11	max	.023	3	.038	6	.011	3	1.768e-03	6	3.615e-03	6	5.254e-05	2
22		min	-.247	6	-.028	3	-.139	6	-4.426e-05	1	-2.618e-05	5	-2.658e-03	3
23	N12	max	.243	6	-.004	2	.009	3	1.827e-03	6	3.516e-03	6	8.653e-04	6
24		min	-.011	3	-.046	6	-.139	6	-8.367e-04	3	-6.381e-04	3	-2.577e-03	3
25	N13	max	.003	3	.034	3	.293	6	3.955e-03	6	2.826e-03	6	3.52e-04	8
26		min	-.001	6	-.019	8	-.02	3	-5.58e-04	5	-1.92e-04	3	-9.661e-04	3
27	N14	max	.023	3	.038	6	.011	3	1.774e-03	6	3.603e-03	6	4.519e-05	2
28		min	-.246	6	-.025	3	-.135	6	-3.764e-05	1	-2.341e-05	5	-2.665e-03	3
29	N15	max	.247	6	-.004	2	.009	3	1.824e-03	6	3.502e-03	6	8.571e-04	6
30		min	-.012	3	-.048	6	-.137	6	-8.4e-04	3	-6.488e-04	3	-2.585e-03	3
31	N16	max	.003	3	.034	3	.292	6	3.947e-03	6	2.826e-03	6	3.516e-04	8
32		min	0	8	-.019	8	-.02	3	-5.667e-04	5	-2.003e-04	3	-9.665e-04	3
33	N17	max	.015	6	-.008	6	.01	3	6.217e-05	4	2.583e-03	6	-2.345e-04	6
34		min	0	1	-.077	3	-.137	6	-4.433e-04	6	-1.394e-04	3	-3.062e-03	3
35	N18	max	.013	3	-.011	1	.01	3	2.84e-04	3	2.648e-03	6	-2.964e-04	1
36		min	-.02	6	-.076	3	-.137	6	-1.868e-04	6	-5.486e-05	3	-3.226e-03	3
37	N19	max	.135	6	.027	3	.06	6	2.363e-03	6	3.106e-03	6	1.928e-03	6
38		min	-.001	5	-.071	6	-.01	3	-1.081e-03	3	-8.545e-05	3	-3.895e-04	3
39	N20	max	.018	3	.054	6	.065	6	1.731e-03	6	2.987e-03	6	2.743e-04	2
40		min	-.132	6	-.02	2	0	5	-4.857e-04	2	-3.685e-04	3	-1.738e-03	6
41	N21	max	.11	6	.017	3	.104	6	2.624e-03	6	3.015e-03	6	1.725e-03	6
42		min	-.002	3	-.08	6	-.008	3	-9.734e-04	3	-2.158e-05	5	2.545e-05	3
43	N22	max	.013	3	.064	6	.105	6	2.41e-03	6	2.84e-03	6	2.907e-04	5
44		min	-.109	6	-.019	2	-.007	3	-4.925e-04	2	-4.347e-04	3	-1.48e-03	6
45	N23	max	.026	3	-.002	6	.011	3	1.523e-03	6	3.712e-03	6	-3.548e-06	2
46		min	-.164	6	-.047	3	-.139	6	6.515e-05	1	-1.463e-05	5	-3.348e-03	3
47	N24	max	.19	6	-.006	1	.013	3	2.885e-03	6	7.74e-03	6	2.925e-03	6
48		min	0	2	-.064	3	-.018	6	1.912e-05	1	-8.144e-03	3	-7.473e-03	3
49	N25	max	.204	3	.029	6	.014	3	2.347e-03	6	7.479e-03	3	-2.58e-05	1
50		min	-.19	6	-.057	3	-.018	6	-1.123e-03	3	3.752e-05	1	-8.22e-03	3
51	N26	max	.133	3	.051	6	.014	3	2.343e-03	6	7.465e-03	3	-2.58e-05	1
52		min	-.26	6	-.068	3	-.018	6	-1.126e-03	3	3.752e-05	1	-8.22e-03	3
53	N27	max	.255	6	-.006	1	.013	3	2.888e-03	6	7.74e-03	6	2.925e-03	6
54		min	0	2	-.079	3	-.018	6	2.187e-05	1	-8.135e-03	3	-7.473e-03	3
55	N28	max	.114	3	.067	3	.475	6	8.436e-03	6	1.867e-04	5	4.821e-05	2
56		min	0	1	-.01	8	-.028	3	-4.345e-04	5	-5.016e-03	6	-4.355e-03	6

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
57	N29	max	.149	3	.087	6	.032	3	7.301e-03	6	1.024e-02	6	3.371e-05	2
58		min	-.279	6	-.016	5	-.019	6	-5.858e-05	2	-8.184e-05	2	-3.403e-03	3
59	N30	max	.278	6	-.006	1	.004	8	6.705e-03	6	9.488e-03	6	5.171e-04	6
60		min	0	2	-.107	6	-.018	6	-4.058e-03	3	-6.063e-03	3	-4.591e-03	3
61	N31	max	.114	3	.067	3	.474	6	8.247e-03	6	2.472e-04	3	5.036e-03	6
62		min	-.005	6	-.051	6	-.021	3	-5.383e-04	5	-5.381e-03	6	-2.846e-03	3
63	N32	max	.296	3	-.002	6	.014	3	2.409e-03	6	5.549e-03	3	-1.785e-05	1
64		min	-.114	6	-.047	3	-.018	6	-2.068e-04	3	1.003e-04	1	-9.11e-03	3
65	N33	max	.597	3	-.002	6	.064	6	2.824e-03	6	5.549e-03	3	-1.786e-05	1
66		min	-.073	6	-.047	3	0	1	-2.069e-04	3	1.003e-04	1	-1.025e-02	3
67	N34	max	0	2	-.002	6	0	5	1.431e-03	6	3.712e-03	6	-3.548e-06	2
68		min	-.186	6	-.047	3	-.174	6	6.515e-05	1	-1.463e-05	5	-3.256e-03	3
69	N35	max	.001	3	-.001	3	.104	6	2.114e-03	6	4.344e-03	6	1.946e-04	2
70		min	0	8	-.007	2	-.007	3	-8.481e-05	5	-2.919e-04	3	-1.65e-05	3
71	N36	max	.074	6	-.004	5	0	5	6.522e-04	6	3.977e-03	6	6.38e-04	6
72		min	0	5	-.007	2	-.041	6	-5.909e-04	3	-1.106e-04	3	-1.399e-03	3
73	N37	max	.015	3	-.001	6	.008	3	5.581e-04	3	3.958e-03	6	-3.007e-05	1
74		min	-.072	6	-.007	2	-.04	6	-1.79e-04	2	-4.541e-04	3	-1.33e-03	3
75	N38	max	0	8	0	8	0	8	7.654e-04	6	5.085e-03	6	5.727e-04	6
76		min	0	1	0	1	0	1	-4.811e-04	3	-8.241e-06	5	-1.463e-03	3
77	N39	max	0	8	0	8	0	8	4.704e-04	3	4.864e-03	6	-1.139e-04	1
78		min	0	1	0	1	0	1	-4.006e-04	2	-1.084e-03	3	-1.38e-03	3
79	N40	max	.015	3	-.011	1	.01	3	4.226e-04	3	2.968e-03	6	-2.235e-04	1
80		min	-.042	6	-.073	3	-.138	6	-1.037e-04	8	-2.464e-04	3	-4.599e-03	3
81	N41	max	.453	3	-.011	1	.014	3	1.498e-03	6	3.274e-03	3	-7.022e-05	1
82		min	-.021	6	-.073	3	-.019	6	-2.184e-06	5	9.929e-06	8	-1.347e-02	3
83	N42	max	.861	3	-.011	1	.03	6	1.677e-03	6	3.274e-03	3	-7.023e-05	1
84		min	-.007	6	-.073	3	.002	1	-2.184e-06	5	9.929e-06	8	-1.365e-02	3
85	N43	max	-.005	1	-.011	1	.005	5	4.226e-04	3	2.968e-03	6	-2.234e-04	1
86		min	-.093	3	-.073	3	-.146	6	-1.208e-04	8	-2.464e-04	3	-4.508e-03	3
87	N44	max	.04	6	-.005	6	.01	3	-3.075e-05	7	2.958e-03	6	7.727e-05	6
88		min	0	2	-.075	3	-.137	6	-3.506e-04	3	-2.482e-05	5	-4.108e-03	3
89	N45	max	.529	3	-.005	6	.013	3	2.186e-03	6	1.563e-03	6	6.212e-04	6
90		min	.004	8	-.075	3	-.019	6	-4.154e-04	2	-1.952e-03	3	-1.819e-02	3
91	N46	max	1.152	3	-.005	6	.078	6	3.46e-03	6	1.563e-03	6	6.217e-04	6
92		min	.003	8	-.075	3	-.013	2	-4.157e-04	2	-1.952e-03	3	-2.14e-02	3
93	N47	max	.042	6	-.005	6	.018	3	-3.523e-05	1	2.958e-03	6	7.723e-05	6
94		min	-.055	3	-.075	3	-.125	6	-6.175e-04	6	-2.482e-05	5	-2.674e-03	3
95	N48	max	.162	6	-.006	1	.009	3	1.293e-03	6	3.664e-03	6	8.269e-04	6
96		min	0	5	-.047	3	-.138	6	-8.544e-04	3	-9.102e-04	3	-3.368e-03	3
97	N49	max	.288	3	-.006	1	.013	3	2.229e-03	6	4.266e-03	6	1.813e-03	6
98		min	0	8	-.047	3	-.018	6	-5.245e-05	1	-7.737e-03	3	-9.157e-03	3
99	N50	max	.567	3	-.006	1	.053	6	2.408e-03	6	4.266e-03	6	1.813e-03	6
100		min	-.009	8	-.047	3	-.002	1	-5.246e-05	1	-7.737e-03	3	-9.336e-03	3
101	N51	max	.182	6	-.006	1	.03	3	1.202e-03	6	3.664e-03	6	8.269e-04	6
102		min	-.074	3	-.047	3	-.168	6	-8.544e-04	3	-9.102e-04	3	-3.277e-03	3
103	N52	max	.006	3	.041	6	.237	6	4.38e-03	6	2.955e-03	6	1.602e-04	8
104		min	-.034	6	-.017	5	-.016	3	-4.834e-04	5	-2.313e-04	3	-1.01e-03	3
105	N53	max	.172	3	.066	6	.07	3	7.302e-03	6	1.025e-02	6	3.598e-05	2
106		min	-.234	6	-.011	5	0	1	-5.728e-05	2	-8.184e-05	2	-3.401e-03	3
107	N54	max	.116	3	.045	3	.514	6	8.435e-03	6	1.862e-04	5	4.57e-05	2
108		min	0	1	-.013	8	-.023	3	-4.36e-04	5	-5.024e-03	6	-4.357e-03	6

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
109	N55	max	.124	3	.041	6	.556	6	9.576e-03	6	1.502e-04	2	-5.315e-06	2
110		min	0	2	-.018	5	-.013	5	-6.225e-05	5	-1.395e-03	6	-3.829e-03	6
111	N56	max	.219	3	.041	6	.871	6	1.072e-02	6	1.502e-04	2	-5.316e-06	2
112		min	0	2	-.018	5	-.015	5	-6.227e-05	5	-1.395e-03	6	-3.83e-03	6
113	N57	max	.004	5	.041	6	.133	6	4.288e-03	6	2.955e-03	6	1.602e-04	8
114		min	-.052	6	-.017	5	-.021	3	-4.833e-04	5	-2.313e-04	3	-9.188e-04	3
115	N58	max	.011	3	.062	6	.13	6	4.167e-03	6	3.435e-03	6	2.571e-04	5
116		min	-.095	6	-.018	2	-.01	3	-3.84e-04	2	-3.661e-04	3	-1.873e-03	6
117	N59	max	.156	3	.062	6	.544	6	1.19e-02	6	1.459e-03	6	-2.652e-05	1
118		min	-.004	2	-.018	2	-.007	2	-3.083e-04	2	-2.03e-03	3	-5.647e-03	6
119	N60	max	.247	3	.062	6	.905	6	1.208e-02	6	1.459e-03	6	-2.653e-05	1
120		min	-.002	1	-.018	2	-.016	2	-3.083e-04	2	-2.03e-03	3	-5.648e-03	6
121	N61	max	.009	5	.062	6	.031	6	4.075e-03	6	3.435e-03	6	2.742e-04	5
122		min	-.14	6	-.018	2	-.033	3	-3.84e-04	2	-3.661e-04	3	-1.872e-03	6
123	N62	max	.02	3	.049	6	.044	6	2.592e-03	6	3.054e-03	6	2.769e-04	2
124		min	-.144	6	-.02	2	0	2	-3.159e-04	2	-5.218e-04	3	-2.053e-03	6
125	N63	max	.195	3	.048	6	.475	6	1.488e-02	6	5.46e-03	6	4.157e-04	2
126		min	-.005	2	-.021	2	-.008	2	-4.013e-05	1	-1.362e-03	3	-6.419e-03	6
127	N64	max	.365	3	.048	6	1	6	1.809e-02	6	5.46e-03	6	4.16e-04	2
128		min	-.017	2	-.021	2	-.006	1	-4.017e-05	1	-1.362e-03	3	-6.424e-03	6
129	N65	max	.01	3	.049	6	.011	6	1.428e-03	3	3.054e-03	6	2.768e-04	2
130		min	-.193	6	-.02	2	-.029	3	-3.157e-04	2	-5.218e-04	3	-2.053e-03	6
131	N66	max	.024	3	.036	6	.013	3	2.394e-03	6	3.967e-03	6	2.461e-04	2
132		min	-.204	6	-.006	2	-.063	6	1.117e-05	1	-2.501e-05	5	-2.363e-03	3
133	N67	max	.195	3	.036	6	.186	6	7.783e-03	6	1.005e-02	6	7.336e-05	2
134		min	-.16	6	-.006	2	-.002	2	-2.597e-05	2	-1.62e-04	2	-3.818e-03	3
135	N68	max	.314	3	.036	6	.424	6	7.962e-03	6	1.005e-02	6	7.337e-05	2
136		min	-.085	6	-.006	2	-.003	2	-2.598e-05	2	-1.62e-04	2	-3.997e-03	3
137	N69	max	.006	2	.036	6	0	1	2.303e-03	6	3.967e-03	6	2.461e-04	2
138		min	-.231	6	-.006	2	-.119	6	1.117e-05	1	-2.501e-05	5	-2.271e-03	3
139	N70	max	.207	6	.015	3	0	5	2.338e-03	6	3.736e-03	6	1.334e-03	6
140		min	-.004	3	-.046	6	-.067	6	-1.259e-03	3	-6.129e-04	3	-2.318e-03	3
141	N71	max	.115	3	.046	3	.514	6	8.248e-03	6	2.497e-04	3	5.033e-03	6
142		min	-.028	6	-.048	6	-.023	3	-5.37e-04	5	-5.388e-03	6	-2.848e-03	3
143	N72	max	.234	6	-.006	1	.058	6	6.704e-03	6	9.497e-03	6	5.199e-04	6
144		min	0	2	-.08	6	-.05	3	-4.059e-03	3	-6.067e-03	3	-4.588e-03	3
145	N73	max	.17	6	.015	3	.168	6	7.482e-03	6	8.493e-03	6	1.912e-03	6
146		min	0	2	-.046	6	-.099	3	-3.518e-03	3	-2.325e-03	3	-4.137e-03	3
147	N74	max	.293	3	.015	3	.42	6	8.626e-03	6	8.493e-03	6	1.913e-03	6
148		min	-.004	8	-.046	6	-.205	3	-3.519e-03	3	-2.325e-03	3	-4.553e-03	3
149	N75	max	.239	6	.015	3	.026	3	2.246e-03	6	3.736e-03	6	1.334e-03	6
150		min	-.058	3	-.046	6	-.121	6	-1.259e-03	3	-6.129e-04	3	-2.227e-03	3
151	N76	max	.147	6	.027	3	.038	6	3.479e-03	6	3.3e-03	6	2.228e-03	6
152		min	-.001	5	-.068	6	-.01	3	-1.473e-03	3	-3.648e-05	5	-1.183e-03	3
153	N77	max	.166	3	.027	3	.412	6	1.055e-02	6	7.155e-03	6	5.374e-03	6
154		min	-.007	8	-.068	6	-.111	3	-3.894e-03	3	-7.819e-05	5	-3.56e-03	3
155	N78	max	.277	3	.027	3	.733	6	1.073e-02	6	7.155e-03	6	5.375e-03	6
156		min	-.132	6	-.068	6	-.228	3	-3.895e-03	3	-7.819e-05	5	-3.739e-03	3
157	N79	max	.201	6	.027	3	.025	3	3.387e-03	6	3.3e-03	6	2.228e-03	6
158		min	-.027	3	-.068	6	-.044	6	-1.473e-03	3	-3.648e-05	5	-1.092e-03	3
159	N80	max	.094	6	.013	3	.13	6	3.827e-03	6	3.703e-03	6	2.036e-03	6
160		min	-.002	3	-.081	6	-.008	3	-1.091e-03	3	-1.232e-04	3	-4.662e-04	3

Envelope Joint Displacements (Continued)

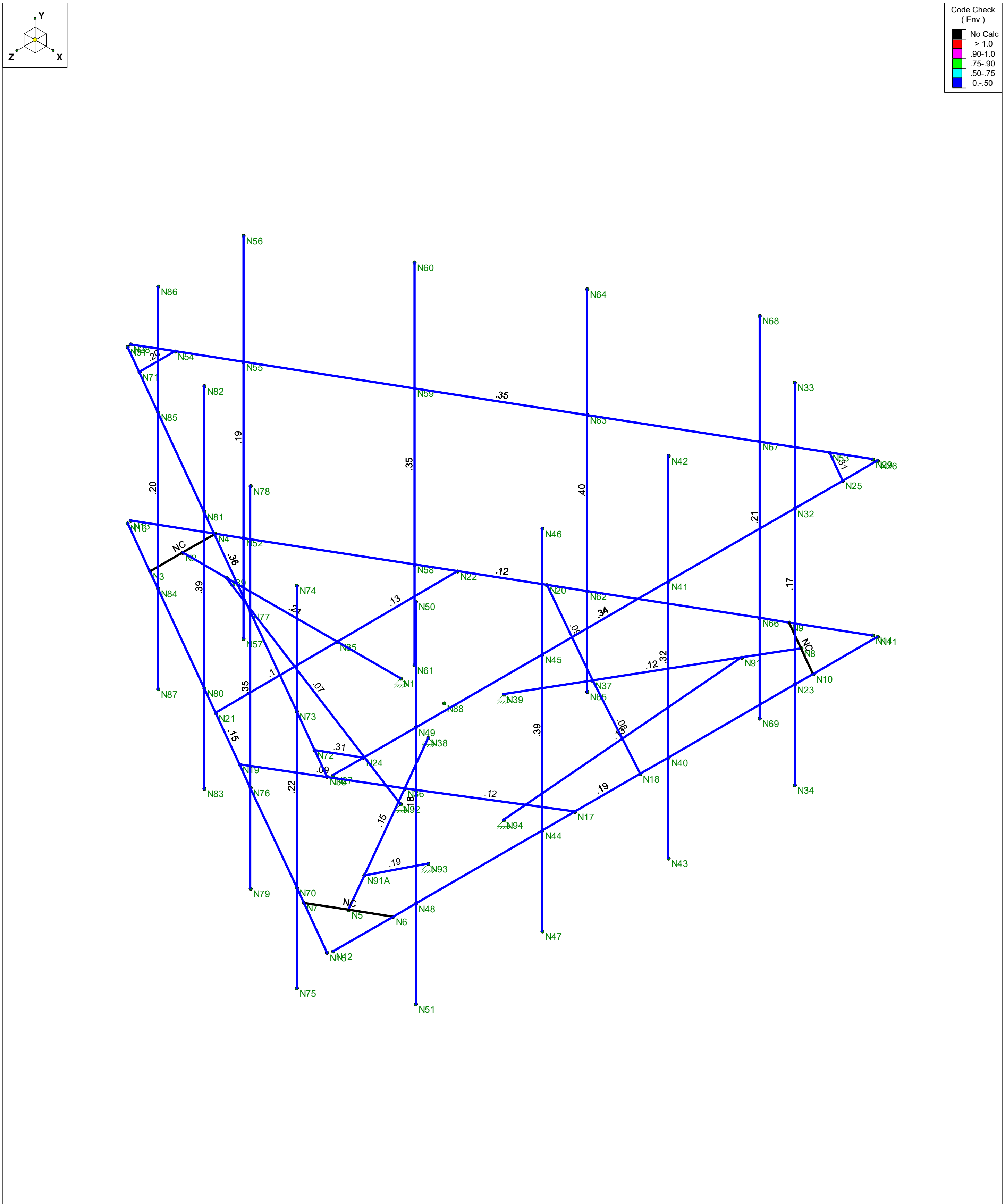
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
161	N81	max	.151	3	.013	3	.608	6	1.619e-02	6	2.974e-03	6	6.654e-03	6
162		min	-.083	6	-.081	6	-.086	3	-3.389e-03	3	-1.645e-04	5	-3.982e-03	3
163	N82	max	.301	3	.013	3	1.172	6	1.94e-02	6	2.974e-03	6	6.659e-03	6
164		min	-.282	6	-.081	6	-.187	3	-3.391e-03	3	-1.645e-04	5	-5.257e-03	3
165	N83	max	.143	6	.013	3	.068	6	2.392e-03	6	3.703e-03	6	2.035e-03	6
166		min	-.002	5	-.081	6	-.009	2	-1.09e-03	3	-1.232e-04	3	-2.142e-05	5
167	N84	max	.033	6	.015	3	.236	6	4.509e-03	6	2.807e-03	6	5.061e-04	6
168		min	0	5	-.051	6	-.016	3	-3.372e-04	5	-1.689e-04	3	-1.067e-03	3
169	N85	max	.12	3	.015	3	.568	6	9.594e-03	6	1.161e-03	3	4.378e-03	6
170		min	-.059	6	-.051	6	-.033	3	-1.111e-03	3	-2.963e-03	6	-2.832e-03	3
171	N86	max	.209	3	.015	3	.86	6	9.774e-03	6	1.161e-03	3	4.378e-03	6
172		min	-.19	6	-.051	6	-.066	3	-1.111e-03	3	-2.963e-03	6	-3.011e-03	3
173	N87	max	.045	6	.015	3	.13	6	4.417e-03	6	2.807e-03	6	5.061e-04	6
174		min	-.023	3	-.051	6	-.009	3	-3.372e-04	5	-1.689e-04	3	-9.756e-04	3
175	N88	max	0	8	0	8	0	8	0	8	0	8	0	8
176		min	0	1	0	1	0	1	0	1	0	1	0	1
177	N89	max	.003	3	.008	3	.216	6	3.318e-03	6	3.031e-03	6	3.746e-04	8
178		min	0	8	-.008	8	-.015	3	-3.946e-04	5	-2.113e-04	3	-7.518e-04	3
179	N91	max	.025	3	.009	6	.012	3	1.354e-03	6	3.45e-03	6	4.015e-05	2
180		min	-.163	6	-.01	3	-.091	6	-7.561e-05	5	-4.844e-05	3	-2.145e-03	3
181	N91A	max	.165	6	-.004	1	.002	5	1.399e-03	6	3.402e-03	6	6.042e-04	6
182		min	-.001	5	-.016	6	-.091	6	-6.945e-04	3	-4.37e-04	3	-2.107e-03	3
183	N92	max	0	8	0	8	0	8	2.94e-03	6	2.425e-03	6	2.827e-04	2
184		min	0	1	0	1	0	1	-2.582e-04	5	-2.848e-04	3	1.363e-04	5
185	N93	max	0	8	0	8	0	8	3.702e-04	6	4.766e-03	6	2.142e-04	6
186		min	0	1	0	1	0	1	-5.813e-04	3	-1.354e-03	3	-1.51e-03	3
187	N94	max	0	8	0	8	0	8	6.21e-04	3	4.745e-03	6	-1.103e-04	1
188		min	0	1	0	1	0	1	-2.531e-04	2	-1.205e-05	1	-1.54e-03	3

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Mem...	Shape	Code Check	L...	LC	Sh...	Loc[ft]	Dir	...	phi*P...	phi*P...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
1	M25	PIPE_2.5	.402	2	6	.092	5.5		6	30.038	50.715	3.596	3.5...	2....	H1...
2	M29	PIPE_2.5	.392	2	6	.059	5.5		6	30.038	50.715	3.596	3.5...	1....	H1...
3	M21	PIPE_2.5	.389	2	3	.086	5.5		3	30.038	50.715	3.596	3.5...	1....	H1...
4	M13	PIPE_2.0	.360	4....	6	.162	1.953		6	6.295	32.13	1.872	1.8...	3....	H1...
5	M24	PIPE_2.5	.352	2	6	.069	2		6	30.038	50.715	3.596	3.5...	2....	H1...
6	M14	PIPE_2.0	.347	7....	6	.205	10.526		6	6.321	32.13	1.872	1.8...	3....	H1...
7	M28	PIPE_2.5	.346	2	6	.111	2		6	30.038	50.715	3.596	3.5...	2....	H1...
8	M15	PIPE_2.0	.337	4....	3	.217	1.953		3	6.295	32.13	1.872	1.8...	2....	H1...
9	M20	PIPE_2.5	.323	2	3	.094	2		3	30.038	50.715	3.596	3.5...	1....	H1...
10	M32	L2.5x2.5x4	.307	0	3	.101	0	z	3	37.717	38.556	1.114	2.5...	1....	H2...
11	M31	L2.5x2.5x4	.306	0	3	.110	0	z	3	37.717	38.556	1.114	2.5...	1....	H2...
12	M1	HSS4X4X4	.244	1....	6	.069	0	z	6	125.6...	139.5...	16.181	16....	1....	H1...
13	M27	PIPE_2.5	.216	2	6	.117	2		6	30.038	50.715	3.596	3.5...	2....	H1...
14	M26	PIPE_2.5	.208	2	6	.141	2		6	30.038	50.715	3.596	3.5...	2....	H1...
15	M33	L2.5x2.5x4	.200	0	6	.146	0	z	6	37.717	38.556	1.114	2.5...	2....	H2...
16	M30	PIPE_2.5	.196	2	6	.131	2		6	30.038	50.715	3.596	3.5...	1....	H1...
17	M23	PIPE_2.5	.194	2	6	.105	2		6	30.038	50.715	3.596	3.5...	1....	H1...
18	M6	PIPE_3.0	.190	7....	6	.211	7.161		3	28.251	65.205	5.749	5.7...	2....	H1...
19	M36	LL2x3x3x6	.189	0	6	.006	0	z	6	35.747	59.292	6.298	1.6...	1....	H1...

Envelope AISC 15th(360-16): LRFD Steel Code Checks (Continued)

	Mem...	Shape	Code Check	L...	LC	Sh...	Loc[ft]	Dir	...	phi*P...	phi*P...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
20	M22	PIPE_2.5	.178	2	3	.148	2		3	30.038	50.715	3.596	3.5...	1....	H1...
21	M16	PIPE_2.5	.168	2	3	.124	5.5		3	30.038	50.715	3.596	3.5...	1....	H1...
22	M2	HSS4X4X4	.150	1....	6	.072	4.01	y	6	125.6...	139.5...	16.181	16....	1....	H1...
23	M4	PIPE_3.0	.147	5....	6	.197	5.469		6	28.251	65.205	5.749	5.7...	2....	H1...
24	M34	LL2x3x3x6	.129	0	3	.006	0	z	6	35.747	59.292	6.298	1.6...	1....	H1...
25	M10	HSS4X4X4	.125	2....	6	.057	0	z	6	135.06	139.5...	16.181	16....	2....	H1...
26	M3	HSS4X4X4	.125	1....	6	.063	4.01	y	3	125.6...	139.5...	16.181	16....	1....	H1...
27	M5	PIPE_3.0	.124	5....	6	.236	5.458		6	28.345	65.205	5.749	5.7...	2....	H1...
28	M11	HSS4X4X4	.117	0	6	.044	0	z	3	134.8...	139.5...	16.181	16....	1....	H1...
29	M17	HSS4X4X4	.105	0	6	.060	0	z	6	134.9...	139.5...	16.181	16....	1....	H1...
30	M12	HSS4X4X4	.092	0	3	.035	0	y	3	135.06	139.5...	16.181	16....	2....	H1...
31	M18	HSS4X4X4	.091	0	6	.036	0	y	3	135.1...	139.5...	16.181	16....	1....	H1...
32	M19	HSS4X4X4	.080	2....	3	.039	2.736	z	3	135.2...	139.5...	16.181	16....	1....	H1...
33	M35	LL2x3x3x6	.074	4....	8	.005	0	z	6	35.747	59.292	6.298	1.6...	1....	H1...



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek Engineering		
TJL	CT11296A	May 18, 2023 at 11:36 AM
22073.01	Unity Check	Mount.R3D

Antenna Mount Connection:

Anchor Data:

A307 Threaded Rod =

Number of Anchor Bolts = $N := 4$ (User Input)

Diameter of Bolts = $D := 0.625\text{in}$ (User Input)

Design Tension = $T_{design} := 10.4 \cdot \text{kips}$ (User Input)

Design Shear = $V_{design} := 6.23 \cdot \text{kips}$ (User Input)

Design Reactions:

Fx = $F_x := 4.7 \cdot \text{kips}$ (User Input)

Fy = $F_y := 1.5 \cdot \text{kips}$ (User Input)

Fz = $F_z := 4.6 \cdot \text{kips}$ (User Input)

Anchor Check:

Max Tension Force = $T_{Max} := \frac{F_z}{N} = 1150\,\text{lb}$

Max Shear Force = $V_{Max} := \frac{F_y}{N} + \frac{F_x}{N} = 1550\,\text{lb}$

Condition 1 = $\text{Condition1} := \text{if}\left(\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}} \le 1.0, \text{"OK"}, \text{"NG"}\right) = \text{"OK"}$

% of Capacity = $\max\left[\frac{T_{Max}}{T_{design}}, \frac{V_{Max}}{V_{design}}, \left(\frac{\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}}}{1.0}\right)\right] = 35.9 \cdot \%$

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Section 1 - Site Information

Site ID: CT11296A
Status: Final
Version: 4
Project Type: L600
Approved: 03/13/2023 6:24:55 PM
Approved By: Farhan.Badar@T-Mobile.com
Last Modified: 03/13/2023 6:24:55 PM
Last Modified By: Farhan.Badar@T-Mobile.com

Site Name: Wilton/Rt 33
Site Class: Utility Lattice Tower
Site Type: Structure Non Building
Plan Year:
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Northeast Utilities

Latitude: 41.18118739
Longitude: -73.3932395
Address: 144 Chestnut Hill Road (Rte-53)
City, State: Wilton, CT
Region: NORTHEAST

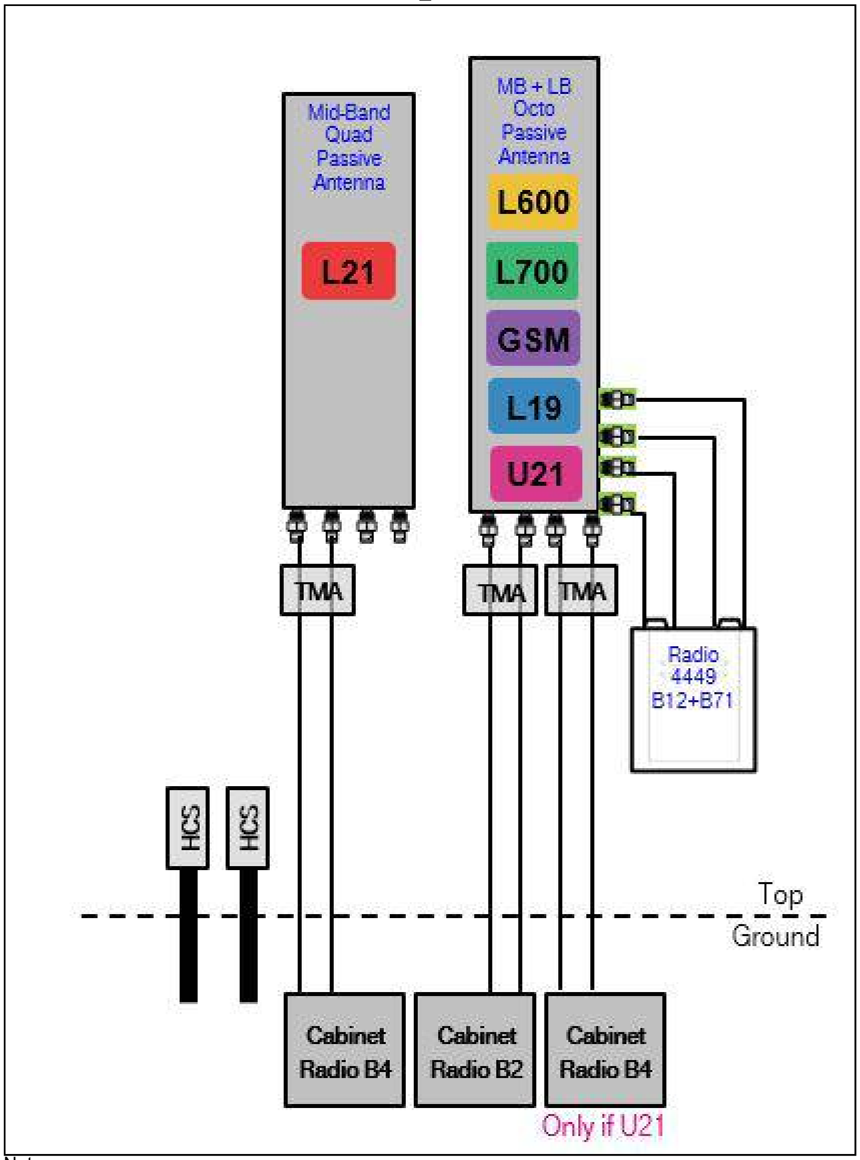
RAN Template: 67D94B Outdoor			**AL Template:** 67D94B_1DP+1QP+1OP	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 24	**TMA Count:** 0	**RRU Count:** 3

Section 2 - Existing Template Images

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

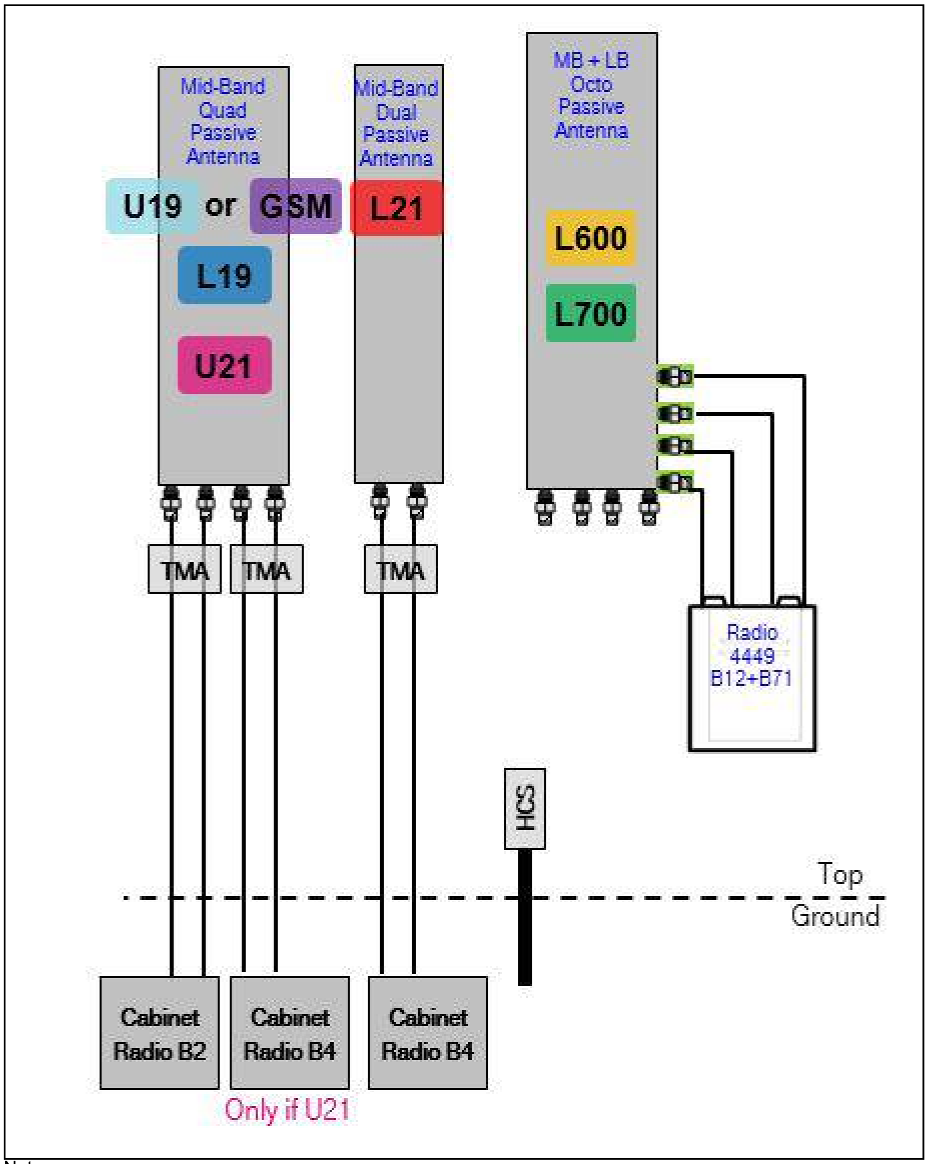
Section 3 - Proposed Template Images

4Sec-67D94A_1QP+1OP.JPG



Notes:

67D94B_1DP+1QP+1OP.JPG


Mid-Band
Quad
Passive
Antenna
U19
or
GSM
L19
U21
Mid-Band
Dual
Passive
Antenna
L21
MB + LB
Octo
Passive
Antenna
L600
L700
TMA
TMA
TMA
Radio
4449
B12+B71
HCS
Top
Ground
Cabinet
Radio B2
Cabinet
Radio B4
Cabinet
Radio B4
Only if U21

Notes:

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 94DB Outdoor (evolved from 4B)

Enclosure	1
Enclosure Type	RBS 6102
Radio	RUS01 B2 **(x 3)**: L1900, G1900; RUS01 B2 **(x 3)**: L1900; RUS01 B4 **(x 3)**: U2100 (DECOMMISSIONED); RUS01 B4 **(x 3)**: L2100
Baseband	BB 6630: L1900, L2100; DUG20; DUW30: U2100 (DECOMMISSIONED)

Proposed RAN Equipment

Template: 67D94B Outdoor

Enclosure	1	2
Enclosure Type	RBS 6102	Ancillary Equipment (Ericsson)
Radio	RUS01 B2 **(x 3)**: L1900, G1900; RUS01 B4 **(x 6)**: L2100; RUS01 B4 **(x 3)**: U2100 (DECOMMISSIONED)	
Baseband	BB 6630: L1900, L2100; BB 6648: N600, L600, L700; DUG20: G1900; DUW30: U2100 (DECOMMISSIONED)	

RAN Scope of Work:

3 4449 radios - L6/L7 radios on ground
3 RUS01B2 radios for GSM/L19 Mixedmode
3 RUS01B4 radios for U21
3 diplexers for U21/L19 to be diplexed together on 2 coax for each sector
3 dual-band twin TMA

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Section 6 - A&L Equipment

Existing Template:
Proposed Template: 67D94B_1DP+1QP+1OP

Sector 1 (Existing) view from behind	
Coverage Type	A - Outdoor Macro
Antenna	**1**
Antenna Model	EMS - RR90-17-02DP (Dual)
Azimuth	30
M. Tilt	0
Height (ft)	97
Ports	**P1**
Active Tech	L1900 G1900 L2100
Dark Tech	
Restricted Tech	
Decomm. Tech	U2100
E. Tilt	2
Cables	7/8" Coax - 99 ft. Generic Feeder Coax - 99 ft.
TMAs	Generic Style 4 - PCS+AWS (At Antenna) **(x2)**
Diplexer / Combiners	Generic AWS/PCS Diplexer (At Antenna) **(x2)**
Radio	
Sector Equipment	

Unconnected Equipment:

Cable: Generic Feeder Coax - 99 ft. **(x2)** TMA: Generic Twin Style 1B - AWS

Scope of Work:

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	30		30			
M. Tilt	0		0			
Height (ft)	119		119			
Ports	P1	P2	P3	P4	P5	P6
Active Tech	G1900 N1900 L1900	L2100	N600 L700 L600	N600 L700 L600		
Dark Tech						
Restricted Tech						
Decomm. Tech						
E. Tilt						
Cables	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**		
TMAs	RFS Twin Style 3CX - ATMA4P4DBP-1A20 (At Cabinet)	Ericsson Twin Style 1B - KRY 112 144/1 (At Cabinet)				
Diplexer / Combiners	RFS AWS/PCS - FDAP5002/1A20 (At Cabinet)					
Radio			Radio 4449 B71+B85 (At Cabinet)	Radio 4449 B71+B85 (At Cabinet)		
Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)				Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

Add (1) LB/MB Octo to Position 2.
Add (1) Radio 4449 B71+B12 for L600 and L700 at Ground Level.
Add Smart Bias-T.
Daisy Chain RETs.

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

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 2 (Existing) view from behind	
Coverage Type	A - Outdoor Macro
Antenna	1
Antenna Model	EMS - RR90-17-02DP (Dual)
Azimuth	
M. Tilt	0
Height (ft)	150
Ports	P1
Active Tech	L1900 G1900 L2100
Dark Tech	
Restricted Tech	
Decomm. Tech	U2100
E. Tilt	2
Cables	7/8" Coax - 99 ft. Generic Feeder Coax - 99 ft.
TMAs	Generic Style 4 - PCS+AWS (At Antenna) **(x2)**
Diplexer / Combiners	Generic AWS/PCS Diplexer (At Antenna) **(x2)**
Radio	
Sector Equipment	

Unconnected Equipment:

Cable: Generic Feeder Coax - 99 ft. **(x2)** TMA: Generic Twin Style 1B - AWS

Scope of Work:

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 2 (Proposed) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	150		150			
M. Tilt	0		0			
Height (ft)	119		119			
Ports	P1	P2	P3	P4	P5	P6
Active Tech	L1900 G1900 N1900	L2100	N600 L700 L600	N600 L700 L600		
Dark Tech						
Restricted Tech						
Decomm. Tech						
E. Tilt						
Cables	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**		
TMAs	RFS Twin Style 3CX - ATMA4P4DBP-1A20 (At Cabinet)	Ericsson Twin Style 1B - KRY 112 144/1 (At Cabinet)				
Diplexer / Combiners	RFS AWS/PCS - FDAP5002/1A20 (At Cabinet)					
Radio			Radio 4449 B71+B85 (At Cabinet)	SHARED Radio 4449 B71+B85 (At Cabinet)		
Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)				Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

Add (1) LB/MB Octo to Position 2.
Add (1) Radio 4449 B71+B12 for L600 and L700 at Ground Level.
Add Smart Bias-T.
Daisy Chain RETs.

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

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 3 (Existing) view from behind	
Coverage Type	A - Outdoor Macro
Antenna	1
Antenna Model	EMS - RR90-17-02DP (Dual)
Azimuth	
M. Tilt	0
Height (ft)	270
Ports	P1
Active Tech	L1900 G1900 L2100
Dark Tech	
Restricted Tech	
Decomm. Tech	U2100
E. Tilt	2
Cables	7/8" Coax - 99 ft. Generic Feeder Coax - 99 ft.
TMAs	Generic Style 4 - PCS+AWS (At Antenna) **(x2)**
Diplexer / Combiners	Generic AWS/PCS Diplexer (At Antenna) **(x2)**
Radio	
Sector Equipment	

Unconnected Equipment:

Cable: Generic Feeder Coax - 99 ft. **(x2)** TMA: Generic Twin Style 1B - AWS

Scope of Work:

RAN Template:	A&L Template:
67D94B Outdoor	67D94B_1DP+1QP+1OP

CT11296A_L600_4

Print Name: Standard (2)
PORs: L600_5G POPs

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1		2			
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAARR24_43-U-NA20 (Octo)			
Azimuth	270		270			
M. Tilt	0		0			
Height (ft)	119		119			
Ports	P1	P2	P3	P4	P5	P6
Active Tech	G1900 L1900 N1900	L2100	N600 L700 L600	N600 L700 L600		
Dark Tech						
Restricted Tech						
Decomm. Tech						
E. Tilt						
Cables	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**	7/8In STANDARD COAX CABLE - 99 ft. **(x2)**		
TMAs	RFS Twin Style 3CX - ATMA4P4DBP-1A20 (At Cabinet)	Ericsson Twin Style 1B - KRY 112 144/1 (At Cabinet)				
Diplexer / Combiners	RFS AWS/PCS - FDAP5002/1A20 (At Cabinet)					
Radio			Radio 4449 B71+B85 (At Cabinet)	Radio 4449 B71+B85 (At Cabinet)		
Sector Equipment		Andrew Smart Bias T (Ericsson) (At Antenna)				Andrew Smart Bias T (Ericsson) (At Antenna)

Unconnected Equipment:

Scope of Work:

Add (1) LB/MB Octo to Position 2.
Add (1) Radio 4449 B71+B12 for L600 and L700 at Ground Level.
Add Smart Bias-T.
Daisy Chain RETs.

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

Exhibit F

Power Density/RF Emissions Report

FOX HILL TELECOM

Radio Frequency Emissions Analysis Report

T Mobile

Site ID: CT11296A

Wilton/Rt 33
144 Chestnut Hill Road (Rte-53)
Wilton, CT 06897

May 15, 2023

Fox Hill Telecom Project Number: 230530

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	1.71 %

May 15, 2023

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

Emissions Analysis for Site: **CT11296A – Wilton/Rt 33**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **144 Chestnut Hill Road (Rte-53), Wilton, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ 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 ($\mu W/cm^2$). The general population exposure limits for the 600 MHz & 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency bands is 1000 $\mu W/cm^2$. 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.

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 **144 Chestnut Hill Road (Rte-53), Wilton, 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

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

S = Power Density (in μw/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.

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)
GSM	1900 MHz (PCS)	1	15
LTE / 5G NR	1900 MHz (PCS)	4	40
LTE	2100 MHz (AWS)	4	40
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20

Table 1: Channel Data Table

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 APX16DWV-16DWV-S-E-A20	120
A	2	RFS APXVAARR24_43-U-NA20	120
B	1	RFS APX16DWV-16DWV-S-E-A20	120
B	2	RFS APXVAARR24_43-U-NA20	120
C	1	RFS APX16DWV-16DWV-S-E-A20	120
C	2	RFS APXVAARR24_43-U-NA20	120

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 APX16DWV-16DWV-S-E-A20	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	9	335	13,033.01	0.92
Antenna A2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	0.79
						Sector A Composite MPE%	**1.71**
Antenna B1	RFS APX16DWV-16DWV-S-E-A20	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	9	335	13,033.01	0.92
Antenna B2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	0.79
						Sector B Composite MPE%	**1.71**
Antenna C1	RFS APX16DWV-16DWV-S-E-A20	1900 MHz (PCS) / 2100 MHz (AWS)	15.9	9	335	13,033.01	0.92
Antenna C2	RFS APXVAARR24_43-U-NA20	600 MHz / 700 MHz	12.95 / 13.35	4	120	2,443.03	0.79
						Sector C Composite MPE%	**1.71**

Table 3: T-MOBILE Emissions Levels

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	**1.71 %**
No Additional Carriers	NA
Site Total MPE %:	**1.71 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	1.71 %
T-MOBILE Sector B Total:	1.71 %
T-MOBILE Sector C Total:	1.71 %
Site Total:	1.71 %

Table 5: Site MPE Summary

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 ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 1900 MHz (PCS) GSM	1	583.57	120	0.40	1900 MHz (PCS)	1000	0.04%
T-Mobile 1900 MHz (PCS) LTE / 5G NR	4	1,556.18	120	4.40	1900 MHz (PCS)	1000	0.44%
T-Mobile 2100 MHz (AWS) LTE	4	1,556.18	120	4.40	2100 MHz (AWS)	1000	0.44%
T-Mobile 600 MHz LTE / 5G NR	2	788.97	120	2.20	600 MHz	400	0.55%
T-Mobile 700 MHz LTE	2	432.54	120	1.12	700 MHz	467	0.24%
						Total:	**1.71 %**

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:	1.71 %
Sector B:	1.71 %
Sector C:	1.71 %
T-MOBILE Maximum Total (per sector):	1.71 %
Site Total:	1.71 %
Site Compliance Status:	**COMPLIANT**

The estimated composite MPE value for this site assuming all carriers present is **1.71 %** 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

July 7, 2023

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

RE: T-Mobile Antenna Site CT11296A, Chestnut Hill Rd, Wilton CT, Eversource Structure 19800

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 Gelinas 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: 2023-0602 - CT11296A - Structural Analysis Rev2 (22073.01)
2023-0518 - CT11296A - Mount Analysis Rev0 (22073.01) (1)
2023-0705_22073.01 CT11296A - Rev1 CDs (S&S)

Exhibit H

Recipient Mailings

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Flat Rate Env

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PRIORITY MAIL®

Expected Delivery Date: 09/08/23
Ref#: CT11296A
0001

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

C019

LYNNE VANDERSLICE
FIRST SELCTWOMAN
238 DANBURY RD
WILTON CT 06897-4008

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Electronic Rate Approved #038555749

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Trans. #:	594522468	Priority Mail® Postage:	$9.65
Print Date:	09/06/2023	Total:	$9.65
Ship Date:	09/06/2023		
Expected Delivery Date:	09/08/2023		

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

Ref#: CT11296A

To: LYNNE VANDERSLICE
FIRST SELCTWOMAN
238 DANBURY RD
WILTON CT 06897-4008

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$9.65
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09/06/2023 Mailed from 01566 986748213381945

PRIORITY MAIL®

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

Expected Delivery Date: 09/08/23
Ref#: CT11296A

0001

C019

MICHAEL WRINN
DIRECTOR OF PLANNING & LAND USE
238 DANBURY RD
WILTON CT 06897-4008

USPS TRACKING #

9405 5036 9930 0599 2417 53

Electronic Rate Approved #038555749

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9405 5036 9930 0599 2417 53

Trans. #:	594522468	Priority Mail® Postage:	**$9.65**
Print Date:	09/06/2023	Total:	**$9.65**
Ship Date:	09/06/2023		
Expected Delivery Date:	09/08/2023		

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

Ref#: CT11296A

To: MICHAEL WRINN
DIRECTOR OF PLANNING & LAND USE
238 DANBURY RD
WILTON CT 06897-4008

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PRIORITY MAIL®

Expected Delivery Date: 09/08/23
Ref#: CT11296A

0001

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

B060

CONNECTICUT LIGHT & POWER-EVERSOURCE
PO BOX 270
HARTFORD CT 06141-0270

USPS TRACKING #

9405 5036 9930 0599 2417 60

Electronic Rate Approved #038555749

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USPS TRACKING # :

9405 5036 9930 0599 2417 60

Trans. #:	594522468	Priority Mail® Postage:	**$9.65**
Print Date:	09/06/2023	Total:	**$9.65**
Ship Date:	09/06/2023		
Expected Delivery Date:	09/08/2023		

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

Ref#: CT11296A

To: CONNECTICUT LIGHT & POWER-EVERSOURCE
ENERGY
PO BOX 270
HARTFORD CT 06141-0270

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

09/14/2023 04:10 PM

Product	Qty	Unit Price	Price
Prepaid Mail Wilton, CT 06897 Weight: 0 lb 15.20 oz Acceptance Date: Thu 09/14/2023 Tracking #: 9405 5036 9930 0599 2417 46	1		$0.00
Prepaid Mail Hartford, CT 06141 Weight: 1 lb 2.50 oz Acceptance Date: Thu 09/14/2023 Tracking #: 9405 5036 9930 0599 2417 60	1		$0.00
Prepaid Mail Wilton, CT 06897 Weight: 1 lb 2.70 oz Acceptance Date: Thu 09/14/2023 Tracking #: 9405 5036 9930 0599 2417 53	1		$0.00

Grand Total: $0.00

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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Receipt #: 840-50180227-2-3282480-1
Clerk: 5