March 11, 2024

Ms. Melanie A. Bachman
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: Notice of Exempt Modification New Cingular Wireless PCS LLC ("AT&T") Site CT1104
45 Maple Ridge Drive, Farmington, CT 06032 (the "Property")
Latitude: 41-43-04.7 N Longitude: -72-46-09.5 W

Dear Ms. Bachman:

AT&T currently maintains (6) antennas at the 92'± level on the existing 95' steel transmission tower pole # 8012 ("Tower") at 45 Maple Ridge Drive, in Farmington, CT. The Tower and property are owned by Connecticut Light & Power ("Eversource"). AT&T intends to modify its facility by adding (3) AIR6449 B77 antennas & (3) AIR6419 B77G antennas at the 92' ± of the tower. The Air6449 B77 and AIR6419 B77G antennas are stacked one on top of the other. The height of AT&T's existing antennas is 92' and proposed antennas is 92' ± on the Tower.

This modification may include B2, B5, B17, B14, B29, B30, B66 & n77 hardware that is 4G(LTE) and/or 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

AT&T's facility received CT Siting Council approval in Petition 644 on October 29, 2003 and relocated its equipment to the new Eversource structure which was approved under Sub Petition 1293-FA-02 on September 20, 2021. These approvals contained no conditions that could feasibly be violated by AT&T proposed modifications, including facility height or mounting restrictions. AT&T's modification complies with the Council's approvals.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies ("R.C.S.A") §16-50j-73 for construction that constitutes an exempt modification pursuant to R.C.S.A §16-50j-72(b)(2). In accordance with to R.C.S.A §16-50j-73, a copy of this letter is being sent to the Hon. Kathleen A. Blonski, Town Manager, Town of Farmington, Ms. Shannon Rutherford, P.E., Town Planner, Town of Farmington, and Eversource as structure and property owner.

The planned modification of the facility falls squarely within those activities explicitly provided for in R.C.S.A §16-50j-72(b)(2). Specifically:

1. The proposed modifications will not result in an increase in the height of the new structure.

2. The proposed modifications will not require an extension of the site boundary.

3. The proposed modification 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 modified facility 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 new structure and foundation can support the proposed loading.

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

Sincerely,

Hollis M. Redding

Hollis M. Redding
SAI Communications, LLC
12 Industrial Way
Salem, NH 03079
Mobile: 860-834-6964
hredding@saigrp.com

Enclosures

Cc:
Hon. Kathleen A. Blonski, Town Manager, Town of Farmington
Ms. Shannon Rutherford, P.E., Town Planner, Town of Farmington
Connecticut Light & Power, ("Eversource"), the structure & property owner

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

CT1104

45 Maple Ridge Drive, Farmington, CT 06032

May 25, 2023

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of AT&T antenna arrays to be mounted at 88' AGL on an existing self-utility pole located at 45 Maple Ridge Drive in Farmington, CT. The coordinates of the tower are 41° 43' 4.692" N, 72° 46' 9.49" W.

AT&T is proposing the following:

1) Install twelve (12) multi-band antennas (four per sector) to support its commercial LTE network and the FirstNet National Public Safety Broadband Network ("NPSBN").

This report considers the planned antenna configuration for AT&T[1] to derive the resulting % MPE of its proposed installation.

In light of the fact that the T-Mobile facility on CL&P Pole #8011 at 40 Maple Ridge Drive is only 330 feet east of the AT&T facility, the two facilities were treated as collocated to represent a "worst-case" condition and the results presented are the sum of the effect of both facilities.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment C of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment C contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

[1] As referenced to AT&T's Radio Frequency Design Sheet updated 09/22/2021.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{EIRP}{\pi \times R^2} \right) \times \text{Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{\left(H^2 + V^2\right)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Off Beam Loss is determined by the selected antenna patterns

Ground reflection factor of 1.6

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Antenna Inventory

Table 1 below outlines AT&T's proposed antenna configuration for the site. The associated data sheets and antenna patterns for these specific antenna models are included in Attachments C.

Operator	Sector / Call Sign	TX Freq (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Tilt	Length (ft)	Antenna Centerline Height (ft)
AT&T	Alpha / 50°	739	160	14.0	4019	DMP65R-BU6D	74	0	6.0	88
		850	160	14.6	4614		63			
		2300	160	18.4	11069		54			
		763	160	14.5	4509	TPA65R-BU6D	73	0	6.0	88
		1900	160	15.1	5177		66			
		2100	240	18.1	15496		66			
		3500	108	23.5	24178	AIR 6419	11	0	2.5	88
		3500	108	23.5	24178	AIR 6449	11	0	2.5	88
	Beta / 160°	739	160	14.0	4019	DMP65R-BU6D	74	0	6.0	88
		850	160	14.6	4614		63			
		2300	160	18.4	11069		54			
		763	160	14.5	4509	TPA65R-BU6D	73	0	6.0	88
		1900	160	15.1	5177		66			
		2100	240	18.1	15496		66			
		3500	108	23.5	24178	AIR 6419	11	0	2.5	88
		3500	108	23.5	24178	AIR 6449	11	0	2.5	88
	Gamma / 280°	739	160	14.0	4019	DMP65R-BU6D	74	0	6.0	88
		850	160	14.6	4614		63			
		2300	160	18.4	11069		54			
		763	160	14.5	4509	TPA65R-BU6D	73	0	6.0	88
		1900	160	15.1	5177		66			
		2100	240	18.1	15496		66			
		3500	108	23.5	24178	AIR 6419	11	0	2.5	88
		3500	108	23.5	24178	AIR 6449	11	0	2.5	88

Table 1: Proposed Antenna Inventory[2] [3]

[2] Antenna heights are in reference to AT&T's Radio Frequency Design Sheet updated 09/22/2021.

[3] Transmit power assumes 0 dB of cable loss.

5. Calculation Results

The calculated power density results are shown in Figure 1 below. For completeness, the calculations for this analysis range from 0 feet horizontal distance (directly below the antennas) to a value of 3,000 feet horizontal distance from the site. In addition to the other worst-case scenario considerations that were previously mentioned, the power density calculations to each horizontal distance point away from the antennas was completed using a local maximum off beam antenna gain (within ± 5 degrees of the true mathematical angle) to incorporate a realistic worst-case scenario.

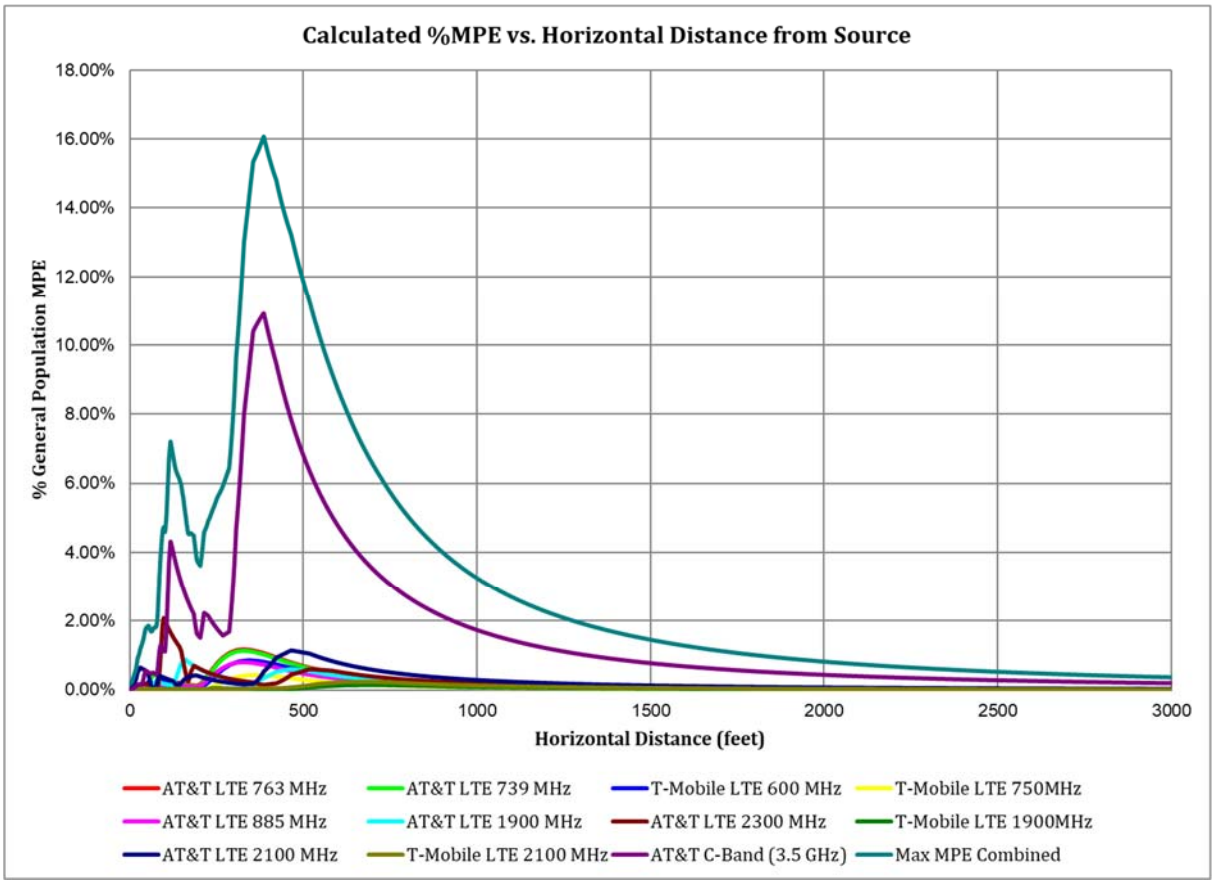


Figure 1: Graph of General Population % MPE vs. Distance

The highest percent of MPE (16.07**%** of the General Population limit) is calculated to occur at a horizontal distance of 386 feet from antennas. Please note that the percent of MPE calculations close to the site take into account off beam loss, which is determined from the vertical pattern of the antennas used. Therefore, RF power density levels may increase as the distance from the site increases. At distances of approximately 1500 feet and beyond, one would now be in the main beam of the antenna pattern and off beam loss is no longer considered. Beyond this point, RF levels become calculated solely on distance from the site and the percent of MPE decreases significantly as distance from the site increases.

Table 2 below lists percent of MPE values as well as the associated parameters that were included in the calculations. The highest percent of MPE value was calculated to occur at a horizontal distance of 386 feet from the site (reference Figure 1).

As stated in Section 3, all calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. In addition, a six-foot height offset was considered in this analysis to account for average human height. As a result, the predicted signal levels are significantly higher than the actual signal levels will be from the final configuration. The results presented in Figure 1 and Table 2 assume level ground elevation from the base of the tower out to the horizontal distances calculated.

Carrier	Number of Transmitters	Power out of Base Station Per Transmitter (Watts)	Antenna Height (Feet)	Distance to the Base of Antennas (Feet)	Power Density (mW/cm^2)	Limit (mW/cm^2)	% MPE
AT&T C-Band (3.5 GHz)	2	108.5	88.0	386	0.109173	1.000	10.92%
AT&T LTE 1900 MHz	1	160.0	88.0	386	0.003503	1.000	0.35%
AT&T LTE 2100 MHz	1	240.0	88.0	386	0.005358	1.000	0.54%
AT&T LTE 2300 MHz	1	160.0	88.0	386	0.001452	1.000	0.15%
AT&T LTE 739 MHz	1	160.0	88.0	386	0.005057	0.493	1.03%
AT&T LTE 763 MHz	1	160.0	88.0	386	0.005419	0.509	1.07%
AT&T LTE 885 MHz	1	160.0	88.0	386	0.004304	0.590	0.73%
T-Mobile LTE 1900MHz	1	80.0	82.0	386	0.000231	1.000	0.02%
T-Mobile LTE 2100 MHz	1	120.0	82.0	386	0.000469	1.000	0.05%
T-Mobile LTE 600 MHz	1	80.0	73.0	386	0.003248	0.400	0.81%
T-Mobile LTE 750MHz	1	40.0	73.0	386	0.002098	0.500	0.42%
						Total	**16.07%**

Table 2: Maximum Percent of General Population Exposure Values[4]

[4] Antenna information for T-Mobile was taken from Connecticut Siting Council Notice of Exempt Modification, 40 Maple Ridge Drive, Farmington CT.

6. Conclusion

The above analysis verifies that RF exposure levels from the site with AT&T's proposed antenna configuration will be well below the maximum permissible levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using the conservative calculation methods and parameters detailed above, the maximum cumulative percent of MPE in consideration of all transmitters is calculated to be **16.07% of the FCC limit (General Population/Uncontrolled)**. This maximum cumulative percent of MPE value is calculated to occur 386 feet away from the site.

7. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Report Prepared By: Ram Acharya
RF Engineer 1
C Squared Systems, LLC

May 24, 2023
Date

Reviewed/Approved By: Martin J. Lavin
Senior RF Engineer
C Squared Systems, LLC

May 25, 2023
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[5]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[6]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 3: FCC Limits for Maximum Permissible Exposure

[5] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[6] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

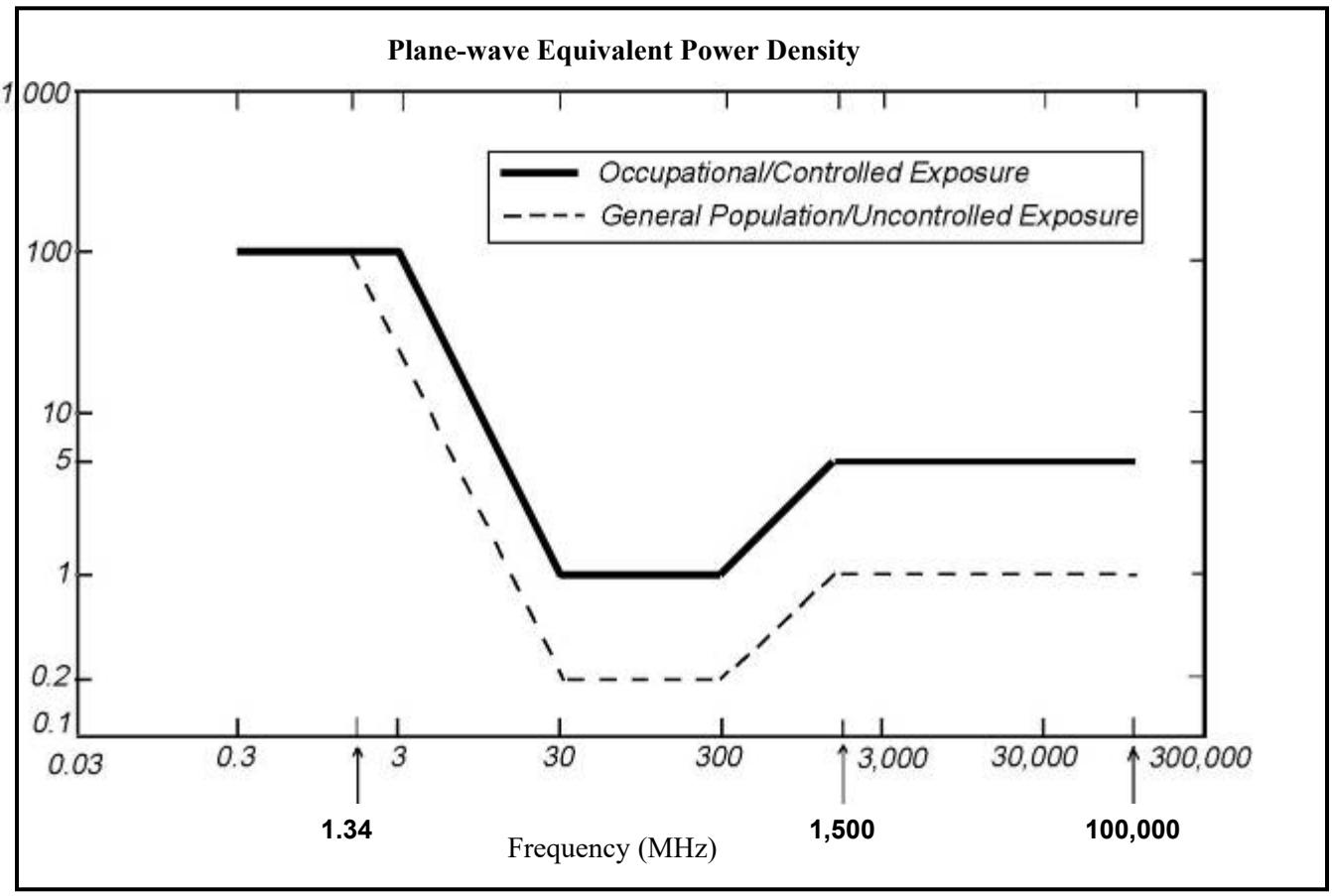
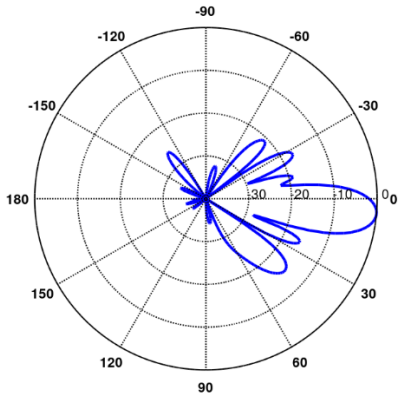
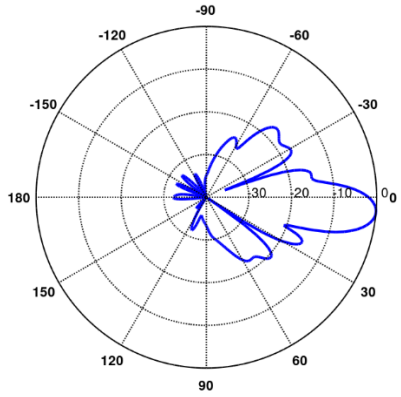
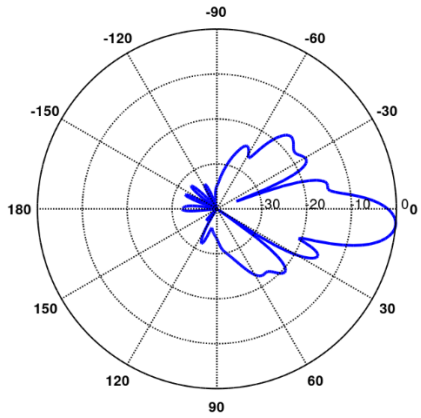
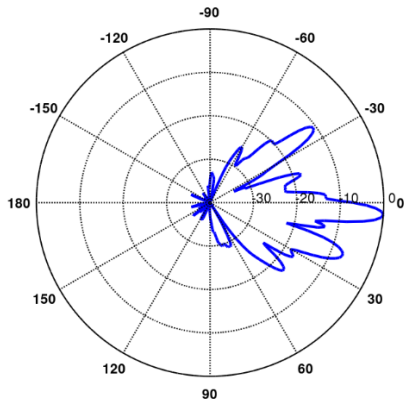
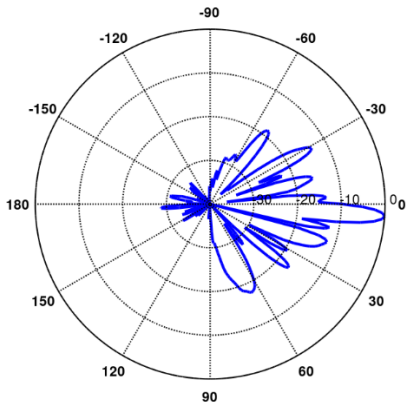
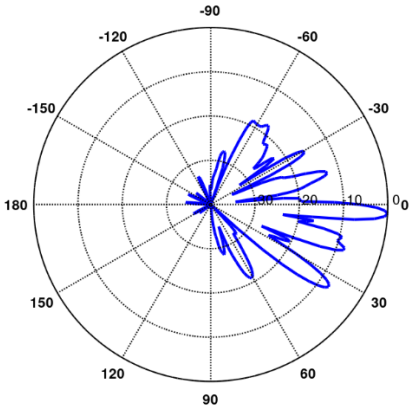


Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: AT&T Mobility Antenna Model Data Sheets and Electrical Patterns

739 MHz Manufacturer: CCI Model #: DMP65R-BU6DA Frequency Band: 698-798 MHz Gain: 14.0 dBi Vertical Beamwidth: 13° Horizontal Beamwidth: 74° Polarization: Dual Linear 45° Dimensions (L x W x D): 71.2” x 20.7” x 7.7”	
763 MHz Manufacturer: CCI Model #: TPA65R-BU6D Frequency Band: 698 – 806 MHz Gain: 14.5 dBi Vertical Beamwidth: 12.8° Horizontal Beamwidth: 73° Polarization: Dual Linear 45° Dimensions (L x W x D): 71.2” x 20.7” x 7.7”	
885 MHz Manufacturer: CCI Model #: DMP65R-BU6DA Frequency Band: 824 - 896 MHz Gain: 13.7 dBi Vertical Beamwidth: 11.1° Horizontal Beamwidth: 63° Polarization: Dual Linear 45° Dimensions (L x W x D): 71.2” x 20.7” x 7.7”	

1900 MHz Manufacturer: CCI Model #: TPA65R-BU6D Frequency Band: 1850 – 1990 MHz Gain: 18.1 dBi Vertical Beamwidth: 5.2° Horizontal Beamwidth: 66° Polarization: Dual Linear 45° Dimensions (L x W x D): 71.2” x 20.7” x 7.7”	
2100 MHz Manufacturer: CCI Model #: TPA65R-BU6D Frequency Band: 1920 – 2180 MHz Gain: 18.4 dBi Vertical Beamwidth: 4.8° Horizontal Beamwidth: 66° Polarization: Dual Linear 45° Dimensions (L x W x D): 71.2” x 20.7” x 7.7”	
2300 MHz Manufacturer: CCI Model #: DMP65R-BU6DA Frequency Band: 2300 - 2400 MHz Gain: 17.3 dBi Vertical Beamwidth: 4.1° Horizontal Beamwidth: 54° Polarization: Dual Linear 45° Dimensions (L x W x D): 71.2” x 20.7” x 7.7”	

SITE ID: CTL01104
EVERSOURCE STRUCT. NO. 8012
FARMINGTON NU MAPLE RIDGE DRIVE
45 MAPLE RIDGE DRIVE
FARMINGTON, CT 06032

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. 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.
3. 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.
4. 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 THE WORK.
5. 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.
6. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
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. 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.
14. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
12. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
13. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
25. 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.

SITE DIRECTIONS

FROM: 500 ENTERPRISE DRIVE, ROCKY HILL, CONNECTICUT **TO:** 45 MAPLE RIDGE DRIVE, FARMINGTON, CT 06032

1.	HEAD EAST.	0.05 MI.
2.	TURN RIGHT TOWARD ENTERPRISE DR.	0.02 MI.
3.	TURN LEFT ONTO ENTERPRISE DR.	0.26 MI.
4.	TURN LEFT ONTO CAPITOL BLVD.	0.27 MI.
5.	TURN LEFT ONTO WEST ST.	0.30 MI.
6.	TURN LEFT AND TAKE RAMP ONTO I-91 S TOWARD NEW HAVEN.	1.66 MI.
7.	TAKE EXIT 22N TOWARD NEW BRITAIN ONTO CT-9 N.	9.92 MI.
8.	TAKE EXIT 30 TOWARD CT-71/CORBINS CORNER.	0.29 MI.
9.	TURN RIGHT ONTO HARTFORD RD (CT-71).	0.15 MI.
10.	CONTINUE ON SOUTHEAST RD (CT-71).	0.19 MI.
11.	CONTINUE ON NEW BRITAIN AVE (CT-71).	0.55 MI.
12.	TURN LEFT ONTO SOUTH RD.	0.58 MI.
13.	TURN LEFT ONTO MAPLE RIDGE DR.	0.35 MI.
14.	45 MAPLE RIDGE DR. FARMINGTON, CT 06032-2603	

SITE COORDINATES: LATITUDE: 41°-43'-04.7" N
LONGITUDE: 72°-46'-09.5" W
GROUND ELEVATION: ±235' AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH

VICINITY MAP

NORTH

PROJECT SUMMARY

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

1. RETAIN (6) EXISTING COMMSCOPE CBC78192123T-DS PENTAPLEXERS
2. RETAIN (6) EXISTING KAELUS DBC2055F1V1-2 DIPLEXERS
3. RETAIN (6) EXISTING KATHREIN E1K3456225 SMART BIAS TEES
4. RETAIN (3) EXISTING ERICSSON 4478 B14 RADIOS
5. RETAIN (3) EXISTING ERICSSON 4449 B5/B12 RADIOS
6. RETAIN (3) EXISTING ERICSSON 4415 B25 RADIOS
7. RETAIN (3) EXISTING RRUs-32 B30 RADIOS
8. RETAIN (3) EXISTING RRUs-32 B66A RADIOS
9. RETAIN (24) EXISTING COMMSCOPE 1-5/8 COAX CABLES
10. RELOCATE POS.3 ANTENNA/APPURTENANCES TO POS.4
11. INSTALL (3) PROPOSED ERICSSON AIR 6419 B77G ANTENNAS
12. INSTALL (3) PROPOSED ERICSSON AIR 6449 B77 ANTENNAS
13. INSTALL (1) PROPOSED RAYCAP DC6-48-60-18-8C-EV DC SURGE PROTECTOR
14. INSTALL (1) PROPOSED FIBER CABLE AND (2) DC CABLES

PROJECT INFORMATION

AT&T SITE NUMBER:	CTL01104
AT&T SITE NAME:	FARMINGTON NU MAPLE RIDGE DR.
SITE ADDRESS:	EVERSOURCE STRUCT. NO. 8012 45 MAPLE RIDGE DRIVE FARMINGTON, CT 06032
AT&T PACE JOB	PACE JOB 1 - MRCTB052362 PACE JOB 2 - MRCTB051442
AT&T PROJECT	5G NR 1 SR C BAND
LESSEE/APPLICANT:	AT&T MOBILITY 84 DEERFIELD LANE, MERIDEN, CT 06450
CONTACT PERSON:	TARAH NOLAN SAI COMMUNICATIONS (603) 401-8990
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT. 06405
PROJECT COORDINATES:	LATITUDE: 41°-43'-04.7"N LONGITUDE: 72°-46'-09.5"W GROUND ELEVATION: ±235' AMSL

SHEET INDEX

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C-3	TYPICAL EQUIPMENT DETAILS	1
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REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	03/01/24	ASC	TJR	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
0	12/01/23	ASC	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
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AT&T MOBILITY

SITE ID: CTL01104
EVERSOURCE STRUCT. NO. 8012
FARMINGTON NU MAPLE RIDGE DRIVE
45 MAPLE RIDGE DRIVE FARMINGTON, CT 06032

DATE: 10/20/22
SCALE: AS NOTED
JOB NO. 22021.05

TITLE SHEET

T-1

Sheet No. 1 of 7

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)
- WIND LOAD: (UTILITY POLE & FOUNDATION)
  BASIC WIND SPEED (V) = 97 MPH (3-SECOND GUST)
  BASED ON NESC C2-2023, SECTION 25 RULE 250C.

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

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.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
17. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE AT&T CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
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.

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY) (GROUND)	(E/P) TMA (QTY)	(E/P) FEEDER (QTY)	(E/P) SQUID (QTY)
A1	EXISTING	(EMPTY)	(EMPTY)	(EMPTY)					(E) (24) 1-5/8"ø COAX (P) FIBER CABLE (1) (P) DC CABLE (2)	(P) DC6-48-60-18-8C-EV (1)
A2	EXISTING	4T4R/4T4R	CCI DMP65R-BU6DA	71.2 x 20.7 x 7.7	92'	50°	(E) RADIO 4449 B5/B12 (1), (E) RRUs 32 B30 (1)	(E) TMABPDB7823VG12A (2)		
A3	PROPOSED	B77+B77G DOD	ERICSSON AIR6449 B77D + AIR6419 B77G (STACKED)	30.6 x 15.9 x 10.6 + 31.1 x 16.1 x 7.3	92'	50°	(P) RRU INTEGRATED WITHIN AIR6449 B77D (1), (P) RRU INTEGRATED WITHIN AIR6419 B77G (1)			
A4	EXISTING	4T4R/DUAL 4T4R	CCI TPA65R-BU6DA-K	71.2 x 20.7 x 7.7	92'	50°	(E) RADIO 4478 B14 (1), (E) RADIO 4415 B25 (1), (E) RRUs 32 B66A (1)	(E) TMA2124F03V5-1D (2)		
B1	EXISTING	(EMPTY)	(EMPTY)	(EMPTY)						
B2	EXISTING	4T4R/4T4R	CCI DMP65R-BU6DA	71.2 x 20.7 x 7.7	92'	160°	(E) RADIO 4449 B5/B12 (1), (E) RRUs 32 B30 (1)	(E) TMABPDB7823VG12A (2)		
B3	PROPOSED	B77+B77G DOD	ERICSSON AIR6449 B77D + AIR6419 B77G (STACKED)	30.6 x 15.9 x 10.6 + 31.1 x 16.1 x 7.3	92'	160°	(P) RRU INTEGRATED WITHIN AIR6449 B77D (1), (P) RRU INTEGRATED WITHIN AIR6419 B77G (1)			
B4	EXISTING	4T4R/DUAL 4T4R	CCI TPA65R-BU6DA-K	71.2 x 20.7 x 7.7	92'	160°	(E) RADIO 4478 B14 (1), (E) RADIO 4415 B25 (1), (E) RRUs 32 B66A (1)	(E) TMA2124F03V5-1D (2)		
C1	EXISTING	(EMPTY)	(EMPTY)	(EMPTY)						
C2	EXISTING	4T4R/4T4R	CCI DMP65R-BU6DA	71.2 x 20.7 x 7.7	92'	280°	(E) RADIO 4449 B5/B12 (1), (E) RRUs 32 B30 (1)	(E) TMABPDB7823VG12A (2)		
C3	PROPOSED	B77+B77G DOD	ERICSSON AIR6449 B77D + AIR6419 B77G (STACKED)	30.6 x 15.9 x 10.6 + 31.1 x 16.1 x 7.3	92'	280°	(P) RRU INTEGRATED WITHIN AIR6449 B77D (1), (P) RRU INTEGRATED WITHIN AIR6419 B77G (1)			
C4	EXISTING	4T4R/DUAL 4T4R	CCI TPA65R-BU6DA-K	71.2 x 20.7 x 7.7	92'	280°	(E) RADIO 4478 B14 (1), (E) RADIO 4415 B25 (1), (E) RRUs 32 B66A (1)	(E) TMA2124F03V5-1D (2)		

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	03/01/24	ASC	TJR	CONSTRUCTION DRAWINGS - REVISED PER CLIENT COMMENTS
0	12/01/23	ASC	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION
A	10/20/22	BSP	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CLIENT REVIEW

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AT&T MOBILITY

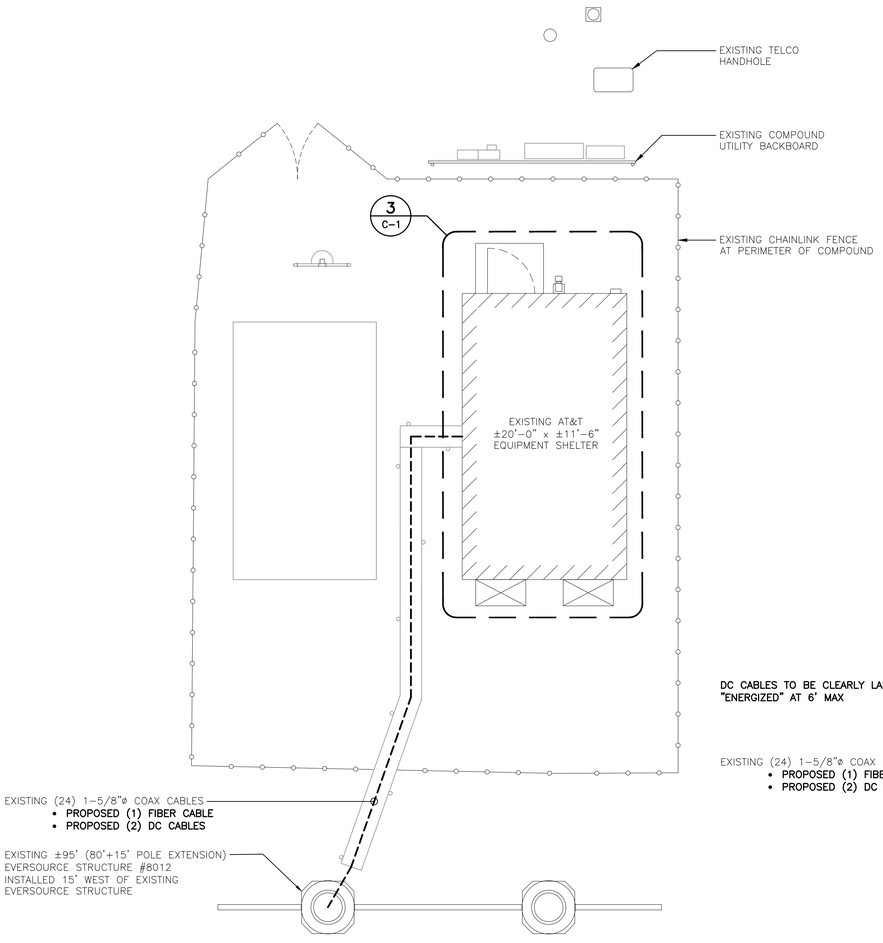
SITE ID: CTL01104
EVERSOURCE STRUCT. NO. 8012
FARMINGTON NU MAPLE RIDGE DRIVE
45 MAPLE RIDGE DRIVE FARMINGTON, CT 06032

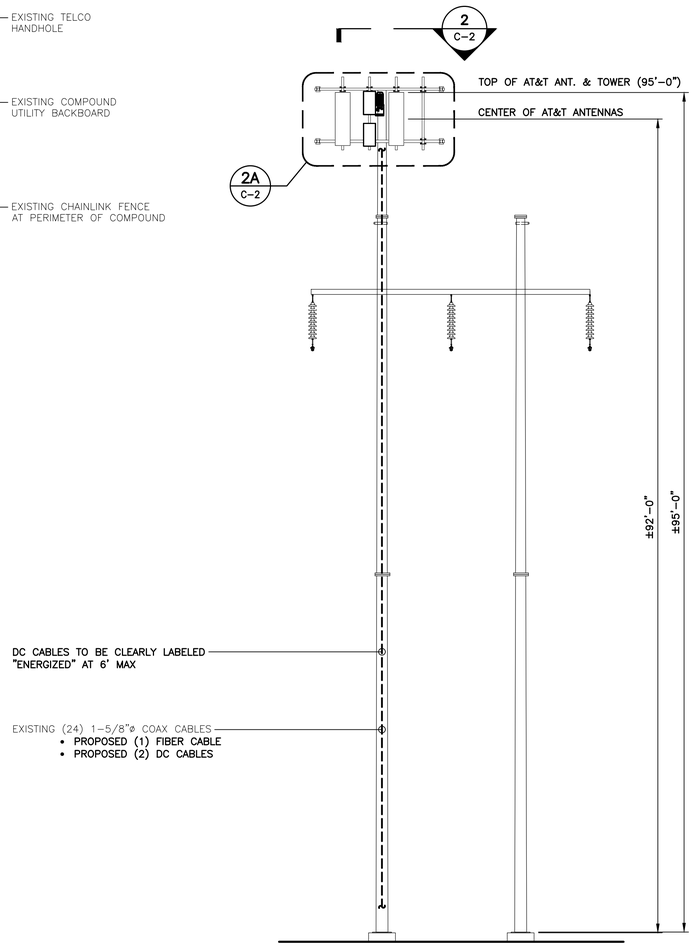
DATE: 10/20/22
SCALE: AS NOTED
JOB NO. 22021.05

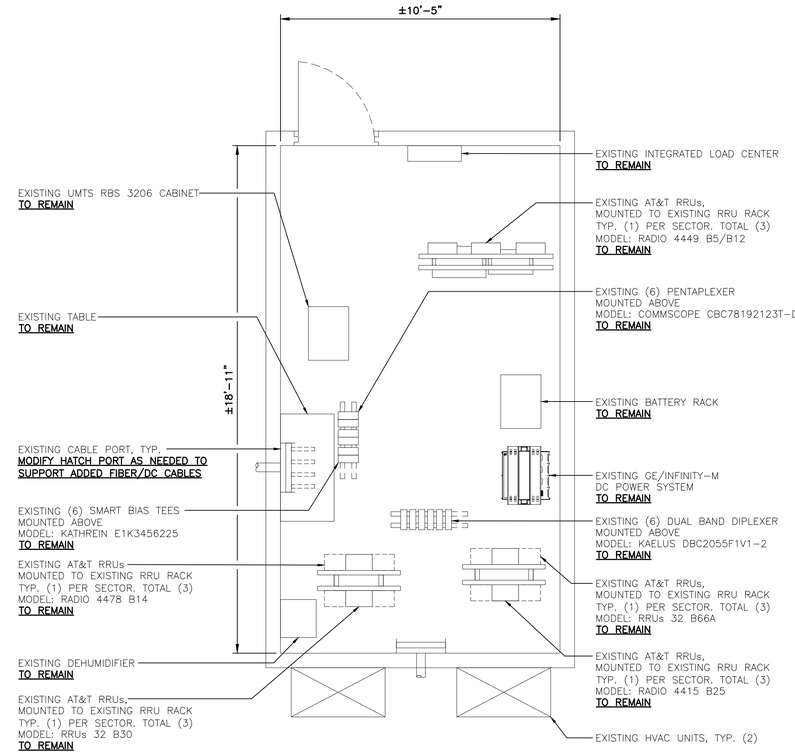
GENERAL NOTES AND ANTENNA SCHEDULE

N-1

STRUCTURAL COMPLIANCE
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 # 22021.05) DATED 01/17/24 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

1 C-1 **PROPOSED COMPOUND PLAN**
SCALE: 1" = 5'-0"

APPROX. NORTH

GRAPHIC SCALE
5 0 2.5 5 10 20
1" = 5'-0"

2 C-1 **PROPOSED SOUTHWEST TOWER ELEVATION**
SCALE: NOT TO SCALE

3 C-1 **PROPOSED EQUIPMENT SHELTER PLAN**
SCALE: 3/8" = 1'-0"

APPROX. NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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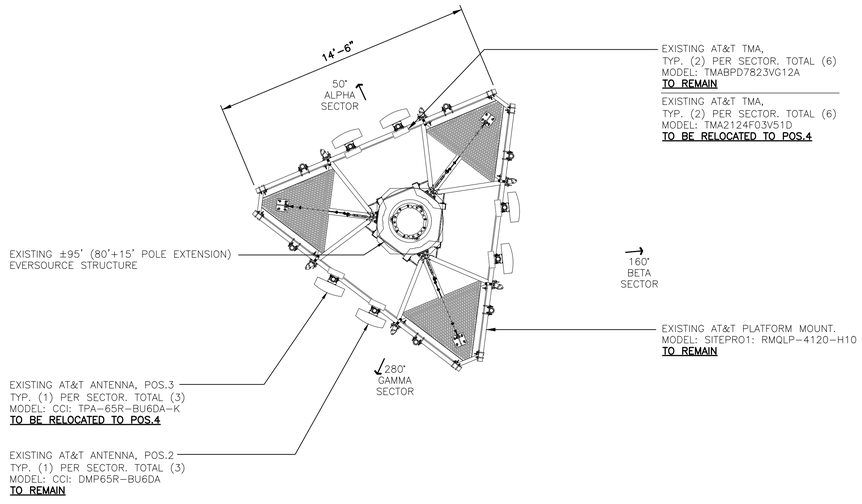
45 MAPLE RIDGE DRIVE FARMINGTON, CT 06032

DATE: 10/20/22
SCALE: AS NOTED
JOB NO. 22021.05

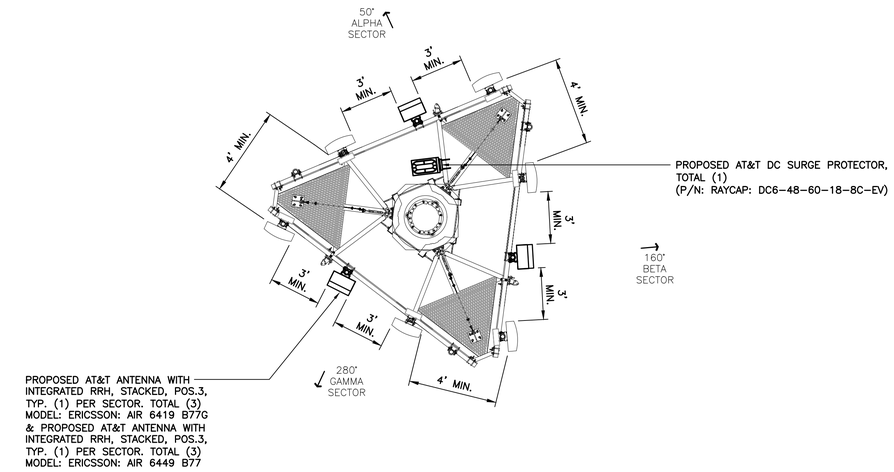
COMPOUND PLAN, ELEVATION PLAN, & EQUIPMENT PLAN

C-1

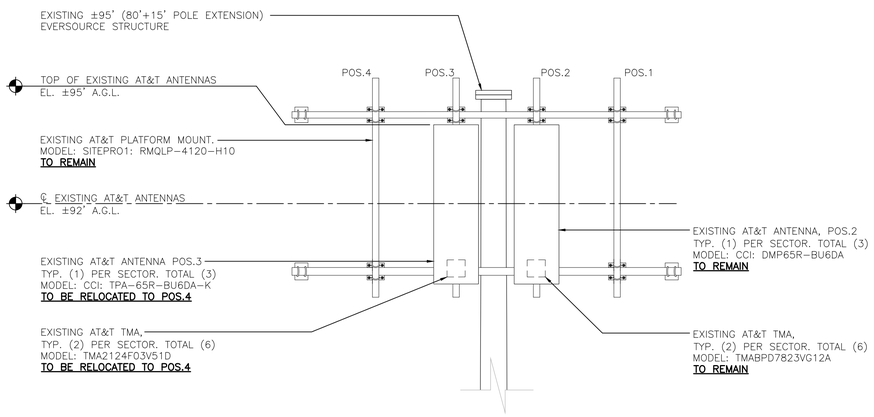
Sheet No. 3 of 7



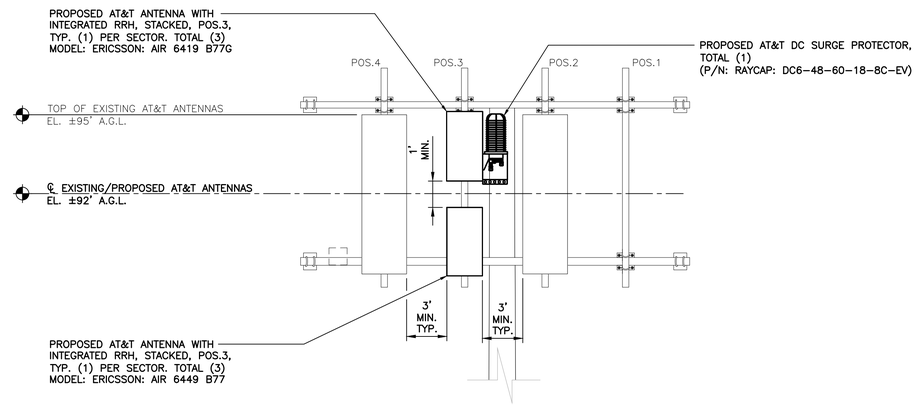
1 / C-2 **EXISTING ANTENNA PLAN**
SCALE: 1/4" = 1'-0"
APPROX. NORTH



2 / C-2 **PROPOSED ANTENNA PLAN**
SCALE: 1/4" = 1'-0"
APPROX. NORTH



1A / C-2 **EXISTING ANTENNA ELEVATION**
SCALE: 3/8" = 1'-0"



2A / C-2 **PROPOSED ANTENNA ELEVATION**
SCALE: 3/8" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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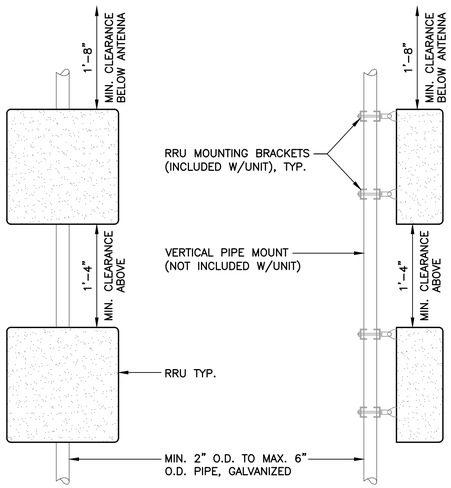
45 MAPLE RIDGE DRIVE FARMINGTON, CT 06032

DATE: 10/20/22
SCALE: AS NOTED
JOB NO. 22021.05

ANTENNA PLANS & ELEVATIONS

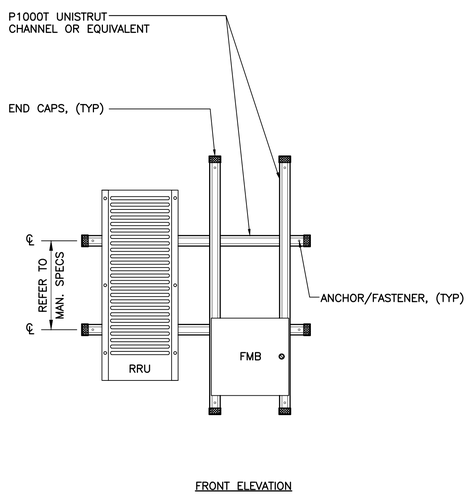
C-2

Sheet No. 4 of 7



NOTES: (PIPE MOUNTING)

1. AT&T 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.

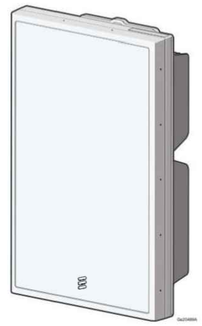


NOTES: (UNISTRUT MOUNTING)

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



ALPHA/BETA/GAMMA ANTENNA WITH BUILT-IN RRH		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6419 B77G	31.1"L x 16.1"W x 7.3"D	44 LBS.
MAKE: ERICSSON MODEL: AIR6449 B77	30.6"L x 15.9"W x 10.6"D	82.5 LBS.

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

2 C-3 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

SURGE PROTECTOR		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RAYCAP MODEL: DC6-48-60-18-8C-EV	31.4"H x 10.2"W x 18.2"D	26.2 LBS

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

3 C-3 PROPOSED DC SURGE PROTECTOR DETAIL

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	10/20/22	BSP	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CLIENT REVIEW
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SITE ID: CTL01104
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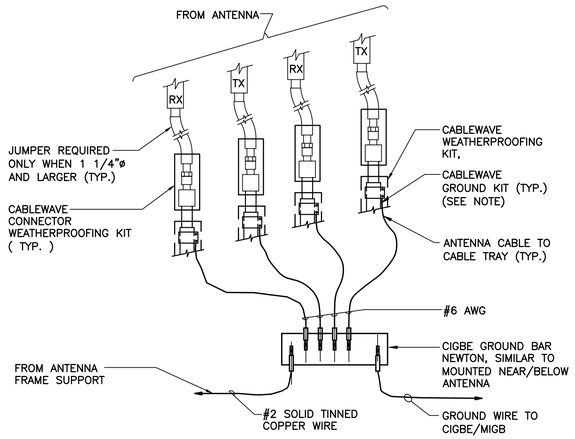
TYPICAL EQUIPMENT DETAILS

C-3

Sheet No. 5 of 7

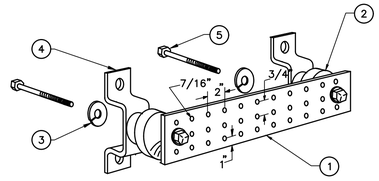


NOTES:

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

1 E-1 CONNECTION OF GROUND WIRES TO GROUND BAR

SCALE: NOT TO SCALE

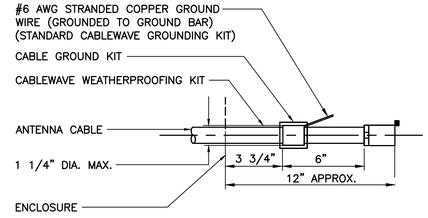


NOTES

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-1 GROUND BAR DETAIL

SCALE: NOT TO SCALE

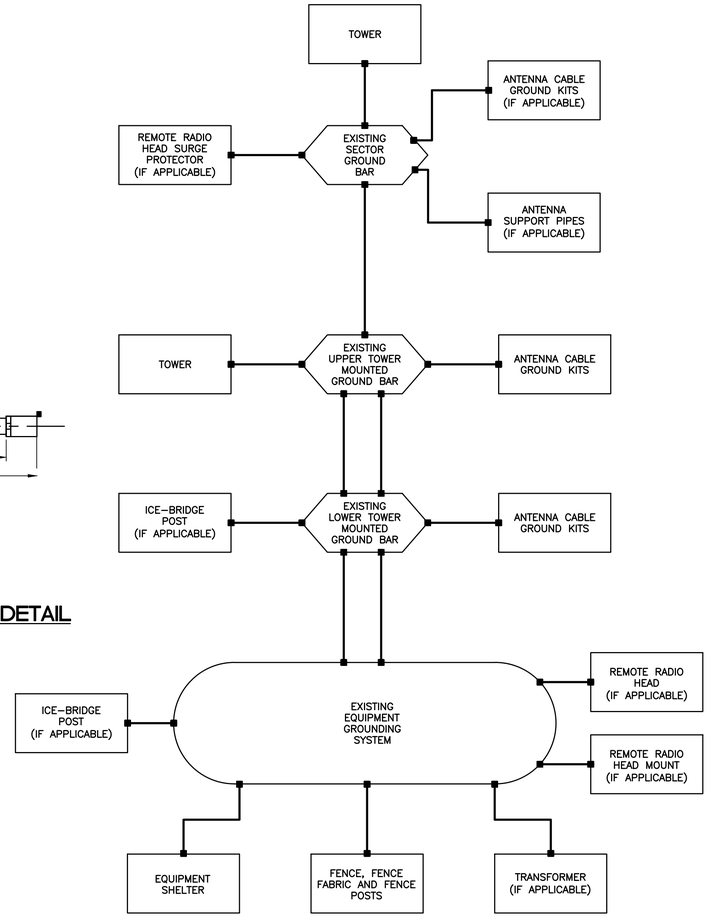


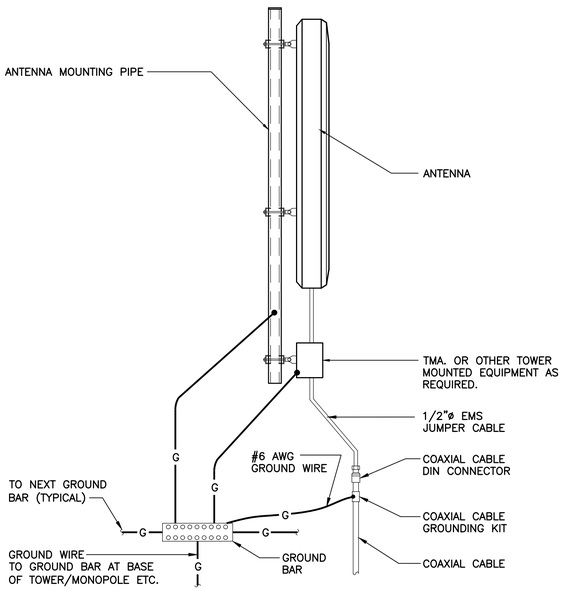
NOTES:

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

3 E-1 ANTENNA CABLE GROUNDING DETAIL

SCALE: NOT TO SCALE

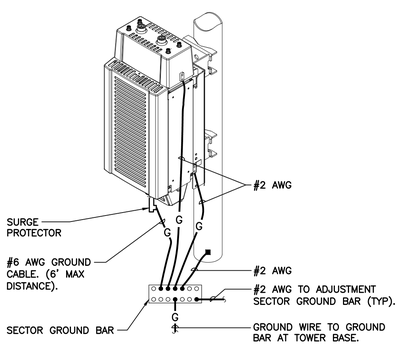




4 E-1 TYPICAL ANTENNA GROUNDING DETAIL

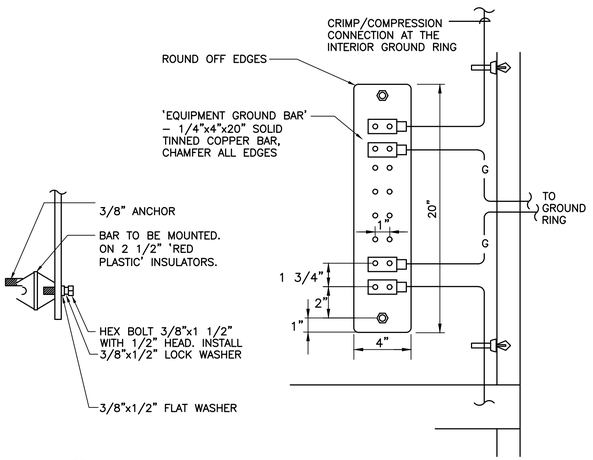
SCALE: NOT TO SCALE

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-1 RRH POLE MOUNT GROUNDING

SCALE: NOT TO SCALE



6 E-1 EQUIPMENT GROUND BAR DETAIL

SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

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 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. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
7. COORDINATE ALL TOWER MOUNTED EQUIPMENT WITH OWNER.
8. ALL TOWER MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
9. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

7 E-1 ELECTRICAL SCHEMATIC DIAGRAM

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	03/01/24	ASC	TJR	CONSTRUCTION DRAWINGS – REVISED PER CLIENT COMMENTS
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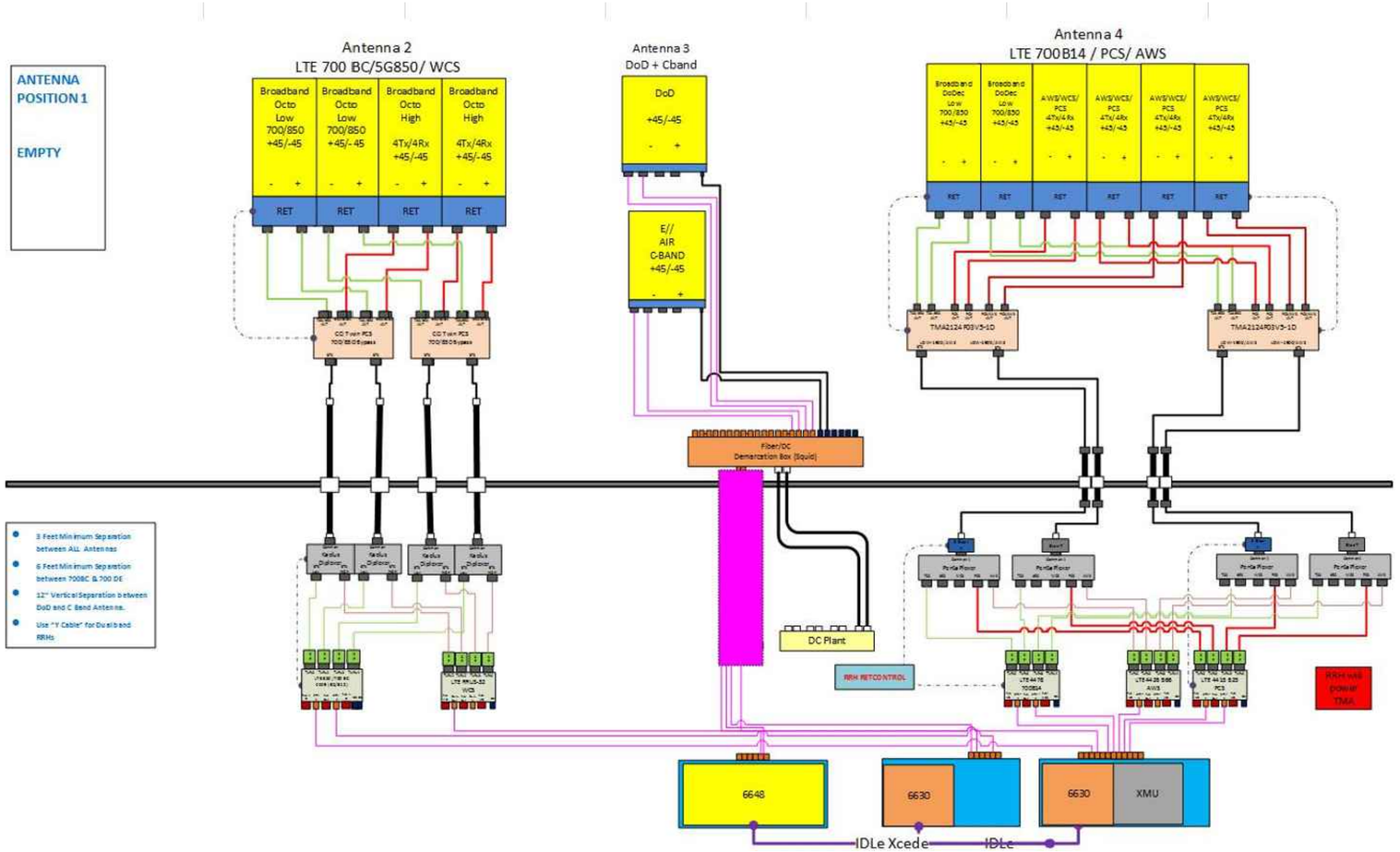
TYPICAL ELECTRICAL DETAILS

E-1

Sheet No. 6 of 7



1 / E-2 **ALPHA/BETA/GAMMA SECTOR CONFIG.**
SCALE: NOT TO SCALE

ELECTRICAL SPECIFICATIONS

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. 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).

D. 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.

E. 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.

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

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.

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ELECTRICAL SPECIFICATIONS & PLUMB. DIAGRAM

E-2

Sheet No. 7 of 7

CENTEK engineering

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Structural Analysis of Utility Pole

AT&T Site Ref: CT1104

Eversource Structure No. 8012

95' Tall with 12' Future Extension
Electric Transmission Pole

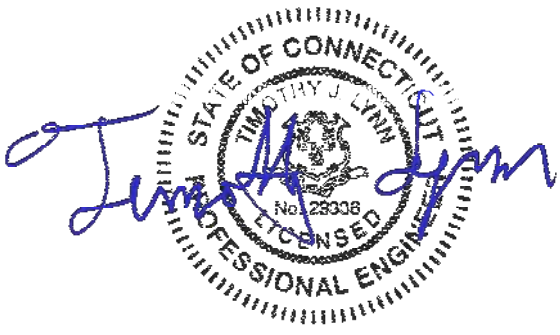
45 Maple Ridge Drive
Farmington, CT

CENTEK Project No. 22021.05

~~Date: May 31, 2022~~

Rev 4: January 17, 2024

Max Stress Ratio = 67%



Prepared for:
AT&T Mobility
500 Enterprise Drive, Suite 3A
Rocky Hill, CT 06067

T a b l e o f C o n t e n t s

Introduction

The purpose of this report is to analyze the 95' w/ 12' future extension utility pole located in Farmington, CT for the proposed antenna and equipment upgrade by AT&T.

The loads consist of the following:

- AT&T (Existing to Remain):
  Antennas: Three (3) CCI DMP65R-BU6DA panel antennas, three (3) CCI TPA65R-BU6DA panel antennas, six (6) CCI TMABPD7823VG12A TMAs and six (6) Kaelus TMA2124F03V5-1D TMAs mounted on platform with handrail kit p/n RMQLP-4120-H10 to the utility pole with a RAD center elevation of 92-ft above grade.
  Coax Cables: Twenty-four (24) 1-5/8" ∅ coax cables mounted to the outside of the pole as indicated in Section 4 of this report.
- **AT&T (Proposed):**
  Antennas: Three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson AIR6419 panel antennas and one (1) DC6 surge arrestor mounted on platform with handrail kit p/n RMQLP-4120-H10 to the utility pole with a RAD center elevation of 92-ft above grade.
  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.

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……..	4.0 psf
Radial Ice Thickness……..	1.0"
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)

R e s u l t s

- 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 **43.27%** occurs in the utility pole 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
LP - Section 2	0.00' -40.00' (AGL)	43.27%	**PASS**
RP - Section 4	0.00' -40.00' (AGL)	40.01%	**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
LP - Base Plate	Bending	66.31%	**PASS**
RP - Base Plate	Bending	66.69%	**PASS**

- FOUNDATION AND ANCHORS

  The base of the tower is connected to the foundation by means of (12) 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
LP -NESC Heavy Wind	13.93 kips	36.66 kips	882.67 ft-kips
LP - NESC Extreme Wind	25.58 kips	20.50 kips	1583.48 ft-kips
LP - NESC Extreme Ice w/ Wind	8.75 kips	33.44 kips	586.42 ft-kips
RP -NESC Heavy Wind	12.68 kips	55.72 kips	833.84 ft-kips
RP - NESC Extreme Wind	22.45 kips	26.89 kips	1454.17 ft-kips
RP - NESC Extreme Ice w/ Wind	7.83 kips	53.24 kips	553.54 ft-kips

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

FLANGE BOLTS AND ANCHOR BOLTS:

The flange bolts, flange plates and anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
LP - Flange Bolts	Tension	39.2%	**PASS**
LP - Flange Plate	Bending	39.7%	**PASS**
LP - Anchor Bolts	Tension	48.9%	**PASS**
RP - Flange Bolts	Tension	40.9%	**PASS**
RP - Flange Plate	Bending	41.9%	**PASS**
RP - Anchor Bolts	Tension	49.3%	**PASS**

FOUNDATION:

Force	Original Design Loading	Proposed Loading	Result
LP - Moment	3293.0 ft-kips	1741.9 ft-kips	**PASS**
LP - Shear	51.9 kips	28.1 kips	**PASS**
RP - Moment	3293.0 ft-kips	1599.6 ft-kips	**PASS**
RP – Shear	51.9 kips	24.7 kips	**PASS**

Note 1: Taken from Eversource drawing 01085-60003p001 dated 10/12/21.

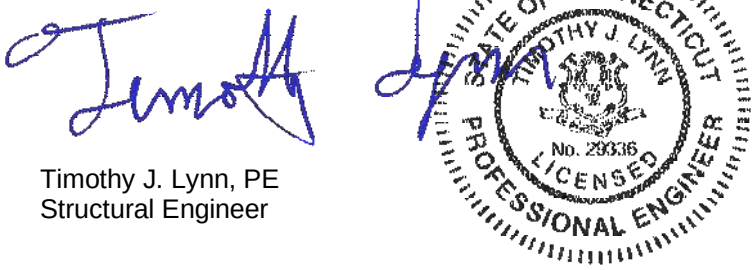
Conclusion

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 AT&T. 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

S T A N D A R D C O N D I T I O N S F O R F U R N I S H I N G O F P R O F E S S I O N A L E N G I N E E R I N G S E R V I C E S O N E X I S T I N G S T R U C T U R E S

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-H covering the design of telecommunications structures specifies LRFD design approach. This approach applies the loads from extreme weather loading conditions, and designs the structure so that it does not exceed code defined percentage of failure 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 Eversource 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 1700-year recurrence for TIA-22-H risk category III and a 100-year recurrence for NESC Grade B. 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) and Combined Ice and Wind (Rule 250B-Heavy) 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
	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by ES					
High Wind Condition	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by ES					
NESC Extreme Ice with Wind Condition*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load 1.25 x Gust Response Factor Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by ES					
		*Only for structures installed after 2007						

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:

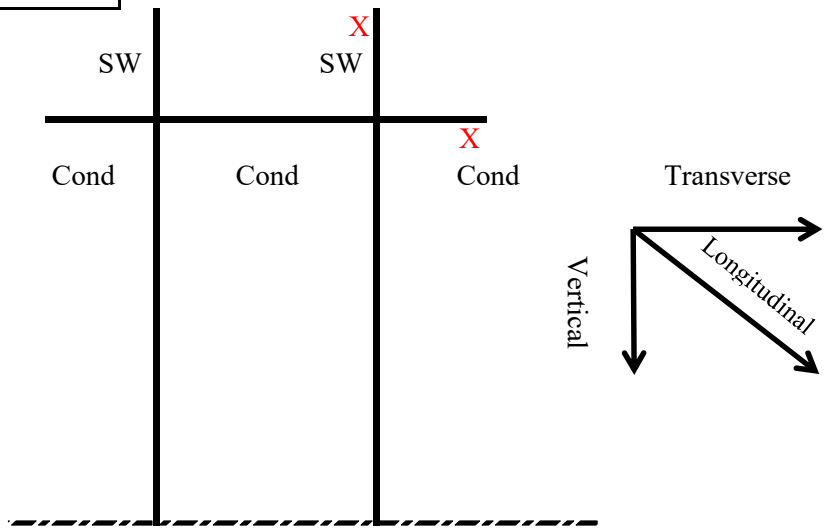
Mount Type	Cable Cd	Pole Cd
Coaxial Cables on outside periphery (One layer)	1.45	1.45
Coaxial Cables mounted on stand offs	1.6	1.6

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.

EVERSOURCE

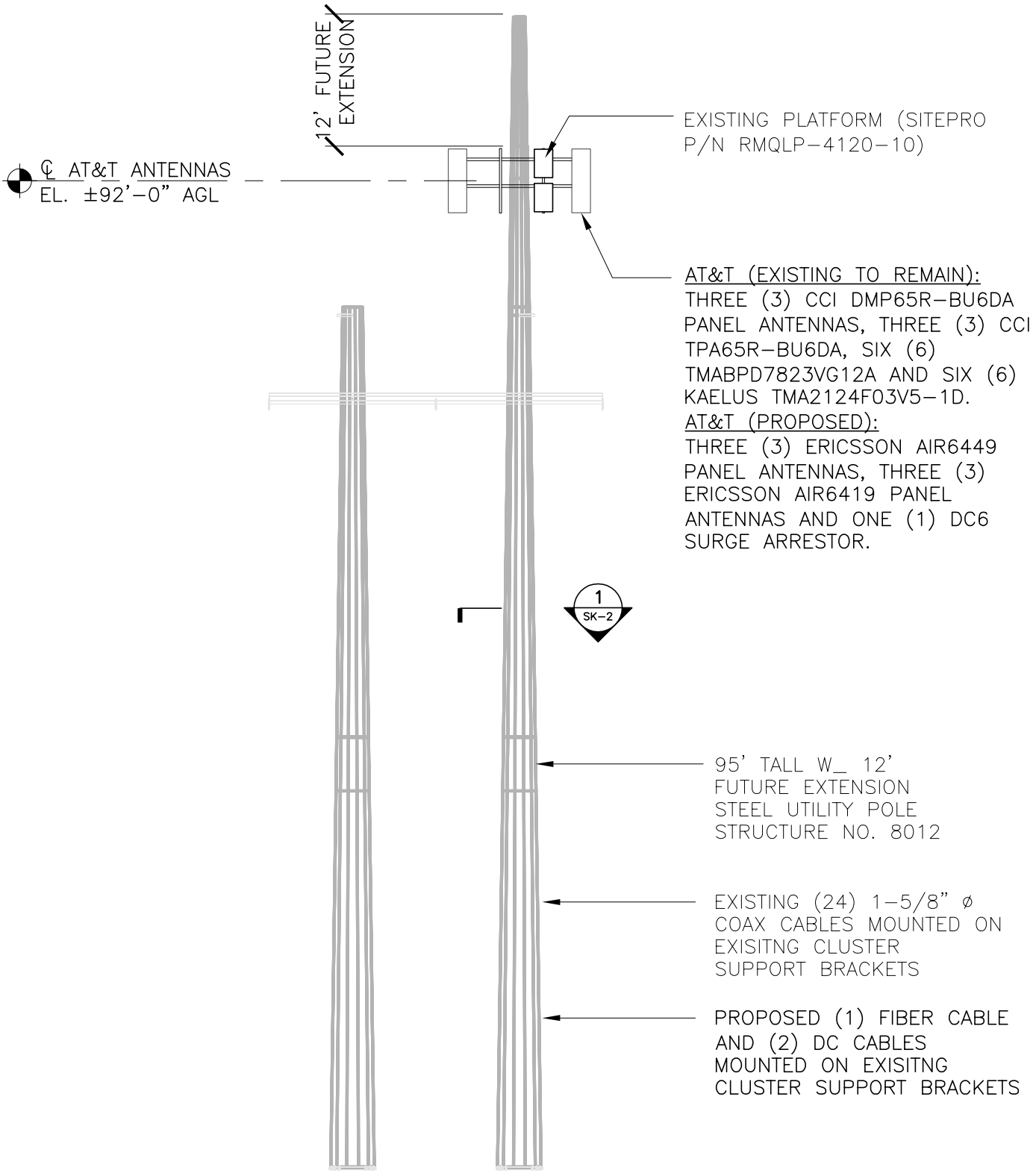
Wire Loads
Load Tree

Project Number
(Newington S/S - Farmir
Structure Number
#8012
Line Number
1783



Single Circuit Steel H-Frame Configuration
X Denotes Broken Wire Location

	Case	Vertical	Transverse	Longitudinal
Conductor	1	8055.1275	3533.4191	0
	2	3462.1	5240.6207	0
	3	3462.1	722.2362	0
	4	8211.07	2666.1391	0
	5	5370.085	2081.5931	0
	6	3462.1	722.2362	0
	7a	5270.085	1766.7096	12540
	7b	5270.085	1766.7096	12540
Shield Wire	Case	Vertical	Transverse	Longitudinal
	1	2422.3455	1890.7651	0
	2	673.5	1712.122	0
	3	673.5	261.67978	0
	4	3489.294	1589.9711	0
	5	1614.897	1078.6955	0
	6	673.5	261.67978	0
	7a	1614.897	945.38254	6050
	7b	1614.897	945.38254	6050



1
SK-1

TOWER + MAST ELEVATION

SCALE: NOT TO SCALE

REVISIONS		
00	5/31/22	ISSUED FOR REVIEW

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CT1104
STRUCTURE 8012

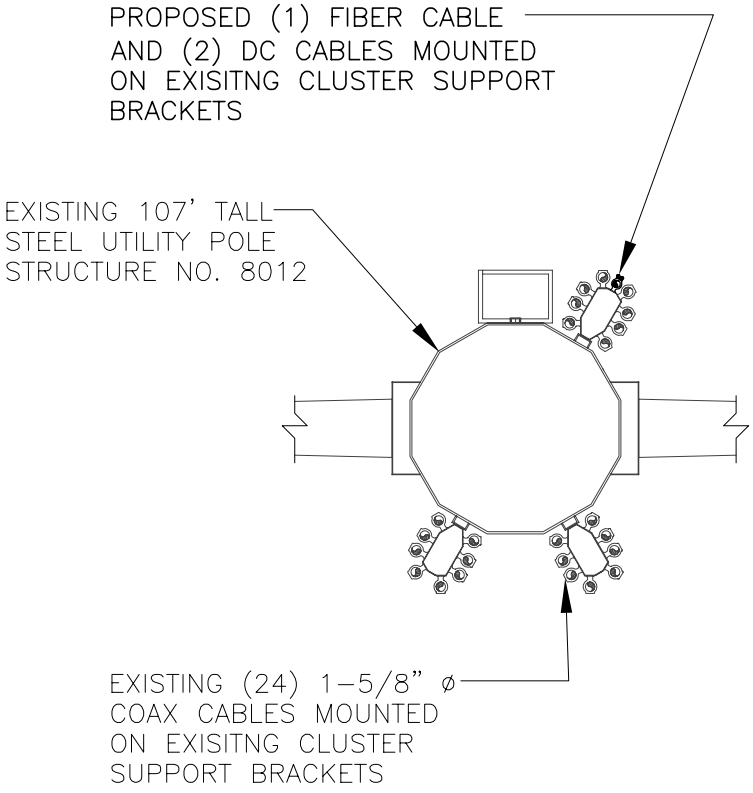
45 MAPLE RIDGE DRIVE
FARMINGTON, CT

PROJECT NO:	22021.05
DRAWN BY:	TJL
CHECKED BY:	CAG
SCALE:	AS NOTED
DATE:	5/31/22

TOWER AND MAST ELEVATION

SK-1

DWG. 1 OF 2



1 / SK-2 COAX CABLE PLAN

SCALE: NOT TO SCALE

REVISIONS		
00	5/31/22	ISSUED FOR REVIEW

CENTEK engineering
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CT1104
STRUCTURE 8012

45 MAPLE RIDGE DRIVE
FARMINGTON, CT

PROJECT NO:	22021.05
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	5/31/22

FEEDLINE PLAN

SK-2

DWG. 2 OF 2

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Subject: Loads - Structure #8012

Location: Farmington, CT

Rev. 4: 1/17/24

Prepared by: T.J.L Checked by: C.F.C.
Job No. 22021.05

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 =	$TME := 107$ ft	(User Input)
Multiplier Gust Response Factor =	$m := 1.25$	(User Input - Only for NESC Extreme wind case)
Velocity Pressure Coefficient =	$Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.284$	(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 =	$z_s := 0.67 \cdot TME = 71.69$	(NESC 2023 Table 250-3)
Turbulence Intensity =	$I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.176$	(NESC 2023 Table 250-3)
Response Term =	$B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.92$	(NESC 2023 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.842$	(NESC 2023 Table 250-3)
Wind Pressure =	$qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot psf = 33.5 \cdot psf$	(NESC 2023 Section 250.C.1)

NESC Extreme Ice w/ Wind Components

Heavy Wind Pressure =	$p_{ex} := 4.0 \cdot psf$	(User Input NESC 2023 Figure 250-3 & Table 250-4)
Radial Ice Thickness =	$Ir_{ex} := 1.0 \cdot in$	(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)

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Subject: Loads - Structure #8012

Location: Farmington, CT

Rev. 4: 1/17/24

Prepared by: T.J.L Checked by: C.F.C.
Job No. 22021.05

Development of Wind & Ice Load on Antennas

Antenna Data:	(AT&T)	
Antenna Model =	CCI DMP65-Bu6D	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 71.2 \cdot in$	(User Input)
Antenna Width =	$W_{ant} := 20.7 \cdot in$	(User Input)
Antenna Thickness =	$T_{ant} := 7.7 \cdot in$	(User Input)
Antenna Weight =	$WT_{ant} := 96 \cdot lb$	(User Input)
Number of Antennas =	$N_{ant} := 3$	(User Input)
Gravity Load (without ice)		
Weight of All Antennas =	$Wt_{ant1} := WT_{ant} \cdot N_{ant} = 288\,lb$	
Gravity Load (ice only)		
Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 11349 \cdot in^3$	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 2282 \cdot in^3$	
Weight of Ice on Each Antenna =	$W_{ICEant} := V_{ice} \cdot Id = 74\,lb$	
Weight of Ice on All Antennas =	$Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 222\,lb$	
Gravity Load (Extreme ice only)		
Volume of Extreme Ice on Each Antenna =	$V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 4769 \cdot in^3$	
Weight of Extreme Ice on Each Antenna =	$W_{ICE.exant} := V_{ice.ex} \cdot Id = 155\,lb$	
Weight of Extreme Ice on All Antennas =	$Wt_{ice.ex.ant1} := W_{ICE.exant} \cdot N_{ant} = 464\,lb$	
Wind Load (NESC Heavy)		
Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 10.9\,ft^2$	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 32.6\,ft^2$	
Total Antenna Wind Force w/ Ice =	$Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 209\,lb$	
Wind Load (NESC Extreme)		
Surface Area for One Antenna =	$SA_{ant} := L_{ant} \cdot W_{ant} = 10.2\,ft^2$	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 30.7\,ft^2$	
Total Antenna Wind Force =	$F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 2057\,lb$	
Wind Load (NESC Extreme Ice w/ Wind)		
Surface Area for One Antenna w/ Extreme Ice =	$SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 11.5\,ft^2$	
Antenna Projected Surface Area w/ Extreme Ice =	$A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 34.6\,ft^2$	
Total Antenna Wind Force w/ Extreme Ice =	$Fi_{ex.ant1} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 277\,lb$	

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	CCI TPA65-BU6D	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 71.2 \cdot in$	(User Input)
Antenna Width =	$W_{ant} := 20.7 \cdot in$	(User Input)
Antenna Thickness =	$T_{ant} := 7.7 \cdot in$	(User Input)
Antenna Weight =	$WT_{ant} := 70 \cdot lb$	(User Input)
Number of Antennas =	$N_{ant} := 3$	(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant2} := WT_{ant} \cdot N_{ant} = 210\,lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 11349 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 2282 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 74\,lb$

Weight of Ice on All Antennas = $Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 222\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 4769 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 155\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant2} := W_{ICE.exant} \cdot N_{ant} = 464\,lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 10.9\,ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 32.6\,ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 209\,lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 10.2\,ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 30.7\,ft^2$

Total Antenna Wind Force = $F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 2057\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 11.5\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 34.6\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant2} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 277\,lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	Ericsson AIR6419	
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 = $Wt_{ant3} := WT_{ant} \cdot N_{ant} = 168\,lb$

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 = $Wt_{ice.ant3} := W_{ICEant} \cdot N_{ant} = 88\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 1917 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 62\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant3} := W_{ICE.exant} \cdot N_{ant} = 186\,lb$

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 = $Fi_{ant3} := p \cdot Cd_F \cdot A_{ICEant} = 73\,lb$

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 = $F_{ant3} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 699\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 4.2\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 12.5\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant3} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 100\,lb$

Development of Wind & Ice Load on Antennas

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 = $Wt_{ant4} := WT_{ant} \cdot N_{ant} = 288\,lb$

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 = $Wt_{ice.ant4} := W_{ICEant} \cdot N_{ant} = 101\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 2195 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 71\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant4} := W_{ICE.exant} \cdot N_{ant} = 213\,lb$

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 = $Fi_{ant4} := p \cdot Cd_F \cdot A_{ICEant} = 71\,lb$

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 = $F_{ant4} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 679\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 4.1\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 12.2\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant4} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 97\,lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	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 =	$WT_{ant} := 25 \cdot lb$	(User Input)
Number of Antennas =	$N_{ant} := 6$	(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant5} := WT_{ant} \cdot N_{ant} = 150\,lb$

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 = $Wt_{ice.ant5} := W_{ICEant} \cdot N_{ant} = 57\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 647 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 21\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant5} := W_{ICE.exant} \cdot N_{ant} = 126\,lb$

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 = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 7.6\,ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant5} := p \cdot Cd_F \cdot A_{ICEant} = 49\,lb$

Wind Load (NESC Extreme)

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

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 6.5\,ft^2$

Total Antenna Wind Force = $F_{ant5} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 438\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 1.5\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 8.8\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant5} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 71\,lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	Kaelus TMA2124F03V5-1D	
Antenna Shape =	Flat	(User Input)
Antenna Height =	$L_{ant} := 9.65 \cdot in$	(User Input)
Antenna Width =	$W_{ant} := 8.27 \cdot in$	(User Input)
Antenna Thickness =	$T_{ant} := 5.04 \cdot in$	(User Input)
Antenna Weight =	$WT_{ant} := 20 \cdot lb$	(User Input)
Number of Antennas =	$N_{ant} := 6$	(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant6} := WT_{ant} \cdot N_{ant} = 120\,lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 402 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 194 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 6\,lb$

Weight of Ice on All Antennas = $Wt_{ice.ant6} := W_{ICEant} \cdot N_{ant} = 38\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := \left(L_{ant} + 2 \cdot Ir_{ex}\right)\left(W_{ant} + 2 \cdot Ir_{ex}\right)\left(T_{ant} + 2 \cdot Ir_{ex}\right) - V_{ant} = 440 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 14\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant6} := W_{ICE.exant} \cdot N_{ant} = 86\,lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right) = 0.7\,ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 4.1\,ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant6} := p \cdot Cd_F \cdot A_{ICEant} = 26\,lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 0.6\,ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 3.3\,ft^2$

Total Antenna Wind Force = $F_{ant6} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 223\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := \left(L_{ant} + 2 \cdot Ir_{ex}\right) \cdot \left(W_{ant} + 2 \cdot Ir_{ex}\right) = 0.8\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 5\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant6} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 40\,lb$

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	Raycap DC6-48-60-18-8C		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 31.4 \cdot in$	in	(User Input)
Antenna Width =	$W_{ant} := 18.28 \cdot in$	in	(User Input)
Antenna Thickness =	$T_{ant} := 10.24 \cdot in$	in	(User Input)
Antenna Weight =	$WT_{ant} := 26 \cdot lb$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant7} := WT_{ant} \cdot N_{ant} = 26\,lb$

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5878 \cdot in^3$

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 1144 \cdot in^3$

Weight of Ice on Each Antenna = $W_{ICEant} := V_{ice} \cdot Id = 37\,lb$

Weight of Ice on All Antennas = $Wt_{ice.ant7} := W_{ICEant} \cdot N_{ant} = 37\,lb$

Gravity Load (Extreme ice only)

Volume of Extreme Ice on Each Antenna = $V_{ice.ex} := (L_{ant} + 2 \cdot Ir_{ex})(W_{ant} + 2 \cdot Ir_{ex})(T_{ant} + 2 \cdot Ir_{ex}) - V_{ant} = 2413 \cdot in^3$

Weight of Extreme Ice on Each Antenna = $W_{ICE.exant} := V_{ice.ex} \cdot Id = 78\,lb$

Weight of Extreme Ice on All Antennas = $Wt_{ice.ex.ant7} := W_{ICE.exant} \cdot N_{ant} = 78\,lb$

Wind Load (NESC Heavy)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := (L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir) = 4.3\,ft^2$

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 4.3\,ft^2$

Total Antenna Wind Force w/ Ice = $Fi_{ant7} := p \cdot Cd_F \cdot A_{ICEant} = 28\,lb$

Wind Load (NESC Extreme)

Surface Area for One Antenna = $SA_{ant} := L_{ant} \cdot W_{ant} = 4ft^2$

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 4ft^2$

Total Antenna Wind Force = $F_{ant7} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 267\,lb$

Wind Load (NESC Extreme Ice w/ Wind)

Surface Area for One Antenna w/ Extreme Ice = $SA_{ICE.exant} := (L_{ant} + 2 \cdot Ir_{ex}) \cdot (W_{ant} + 2 \cdot Ir_{ex}) = 4.7\,ft^2$

Antenna Projected Surface Area w/ Extreme Ice = $A_{ICE.exant} := SA_{ICE.exant} \cdot N_{ant} = 4.7\,ft^2$

Total Antenna Wind Force w/ Extreme Ice = $Fi_{ex.ant7} := p_{ex} \cdot Cd_F \cdot A_{ICE.exant} \cdot m = 38\,lb$

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 (1" ice) =	$EPA_{ice.ex} := 40.1 \cdot ft^2$	(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 (1" ice) =	$W_{ice.ex} := 4180 \cdot lb$	(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 1" ice on Antenna Pipes =	$Wap_{ice.ex} := \left[\left[(4.375)^2 - (2.375)^2\right] \cdot 120 \cdot 12\right] \cdot in^3 \cdot \frac{\pi}{4} \cdot (Id) = 495 \cdot lb$	
Total Pipe Length =	$TPL := 12 \cdot 10 \cdot ft = 120 ft$	
Total Antenna Length =	$TAL := 71.2 \cdot in \cdot 6 + 31.1 \cdot in \cdot 3 + 30.6 \cdot in \cdot 3 = 51.025 ft$	
Exposed Pipe Area =	$ExPA := (TPL - TAL) 2.375 \cdot in = 13.651 ft^2$	
Exposed Pipe Area (0.5" Ice) =	$ExPA_{ice} := (TPL - TAL) 3.375 \cdot in = 19.399 ft^2$	
Exposed Pipe Area (1" Ice) =	$ExPA_{ice.ex} := (TPL - TAL) 4.375 \cdot in = 25.147 ft^2$	
Mount Projected Surface Area =	$CdAa := 1.3 \cdot ExPA + EPA = 45.9 ft^2$	
Mount Projected Surface Area w/ Ice =	$CdAa_{ice} := 1.3 \cdot ExPA_{ice} + EPA_{ice} = 59.3 ft^2$	
Mount Projected Surface Area w/ Extreme Ice =	$CdAa_{ice.ex} := 1.3 \cdot ExPA_{ice.ex} + EPA_{ice.ex} = 72.8 ft^2$	

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 = $Wt_{ice.ex.mnt1} := W_{ice.ex} - W + Wap_{ice.ex} = 1410 lb$

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt1} := p \cdot CdAa_{ice} = 237 lb$

Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt1} := qz \cdot CdAa \cdot m = 1921 lb$

Wind Load (NESC Extreme Ice w/ Wind)

Total Mount Wind Force w/ Extreme Ice = $Fi_{ex.mnt1} := p_{ex} \cdot CdAa_{ice.ex} \cdot m = 364 lb$

Total Equipment Loads:

AT&T Loads:

NESC Heavy Wind Vertical =

$$Wt_{tot} := \left(Wt_{ant1} + Wt_{ant2} + Wt_{ant3} + Wt_{ant4} + Wt_{ant5} + Wt_{ant6} + Wt_{ant7} + Wt_{mnt1}\right) = 4515\,lb$$

$$Wt_{ice.tot} := \left(Wt_{ice.ant1} + Wt_{ice.ant2} + Wt_{ice.ant3} + Wt_{ice.ant4} + Wt_{ice.ant5} + Wt_{ice.ant6} + Wt_{ice.ant7} + Wt_{ice.mnt1}\right) = 1366\,lb$$

$$\left(Wt_{tot} + Wt_{ice.tot}\right)\cdot 1.5 = 8822\,lb$$

NESC Heavy Wind Trasnsverse =

$$\left(Fi_{ant1} + Fi_{ant2} + Fi_{ant3} + Fi_{ant4} + Fi_{ant5} + Fi_{ant6} + Fi_{ant7} + Fi_{mnt1}\right)\cdot 2.5 = 2256\,lb$$

NESC Extreme Wind Vertical =

$$\left(Wt_{ant1} + Wt_{ant2} + Wt_{ant3} + Wt_{ant4} + Wt_{ant5} + Wt_{ant6} + Wt_{ant7} + Wt_{mnt1}\right) = 4515\,lb$$

NESC Extreme Wind Trasnsverse =

$$\left(F_{ant1} + F_{ant2} + F_{ant3} + F_{ant4} + F_{ant5} + F_{ant6} + F_{ant7} + F_{mnt1}\right) = 8341\,lb$$

NESC Extreme Ice w/ Wind Vertical =

$$Wt_{ice.ex.tot} := \left(Wt_{ice.ex.ant1} + Wt_{ice.ex.ant2} + Wt_{ice.ex.ant3} + Wt_{ice.ex.ant4} + Wt_{ice.ex.ant5} + Wt_{ice.ex.ant6} + Wt_{ice.ex.ant7} + Wt_{ice.ex.mnt1}\right) = 3027\,lb$$

$$\left(Wt_{tot} + Wt_{ice.ex.tot}\right) = 7542\,lb$$

NESC Extreme Ice w/ Wind Trasnsverse =

$$\left(Fi_{ex.ant1} + Fi_{ex.ant2} + Fi_{ex.ant3} + Fi_{ex.ant4} + Fi_{ex.ant5} + Fi_{ex.ant6} + Fi_{ex.ant7} + Fi_{ex.mnt1}\right) = 1263\,lb$$

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Subject:	Coax Cable on Pole #8012
Location:	Farmington, CT
Rev. 3: 12/1/23	Prepared by: T.J.L Checked by: C.F.C. Job No. 22021.05

Coax Cable on 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 =	$p_{ex} := 4 \cdot psf$		*(User Input)*
Extreme Radial Ice Thickness =	$Ir_{ex} := 1.0 \cdot in$		*(User Input)*
Basic Windspeed =	$V := 110$	mph	(User Input)
Height to Top of Coax Above Grade =	$TC := 107$	ft	(User Input)
Multiplier Gust Response Factor =	$m := 1.00$		(User Input - Only for NESC Extreme wind case)
Velocity Pressure Coefficient =	$Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.18$		(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 =	$z_s := 0.67 \cdot TC = 71.69$		(NESC 2023 Table 250-3)
Turbulence Intensity =	$I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.176$		(NESC 2023 Table 250-3)
Response Term =	$B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.92$		(NESC 2023 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.842$		(NESC 2023 Table 250-3)
Wind Pressure =	$qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf = 30.8$	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 =	$N_{coax} := 27$	*(User Input)*	(24) AT&T Coax Cables (1) AT&T Fiber Cable (2) AT&T DC 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)*

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

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

Projected width with Extreme Ice = $A_{ice.ex} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir_{ex}\right) = 13.88 \cdot in$

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 = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 40.904 \cdot plf$

Extreme Ice Area per Liner Ft = $Ai_{coax.ex} := \frac{\pi}{4} \cdot \left[\left(D_{coax} + 2 \cdot Ir_{ex}\right)^2 - D_{coax}^2\right] = 0.065\,ft^2$

Weight of Extreme Ice on All Coax Cables = $W_{ice.ex} := Ai_{coax.ex} \cdot Id \cdot N_{coax} = 98.3 \cdot plf$

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 =

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

$Heavy\_WInd_{Vert} = 1035\,lb$ $Heavy\_Wind_{Trans} = 172\,lb$

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 =

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

$Extreme\_Wind_{Vert} = 281\,lb$ $Extreme\_Wind_{Trans} = 488\,lb$

Extreme Ice w/ Wind Vertical Load =

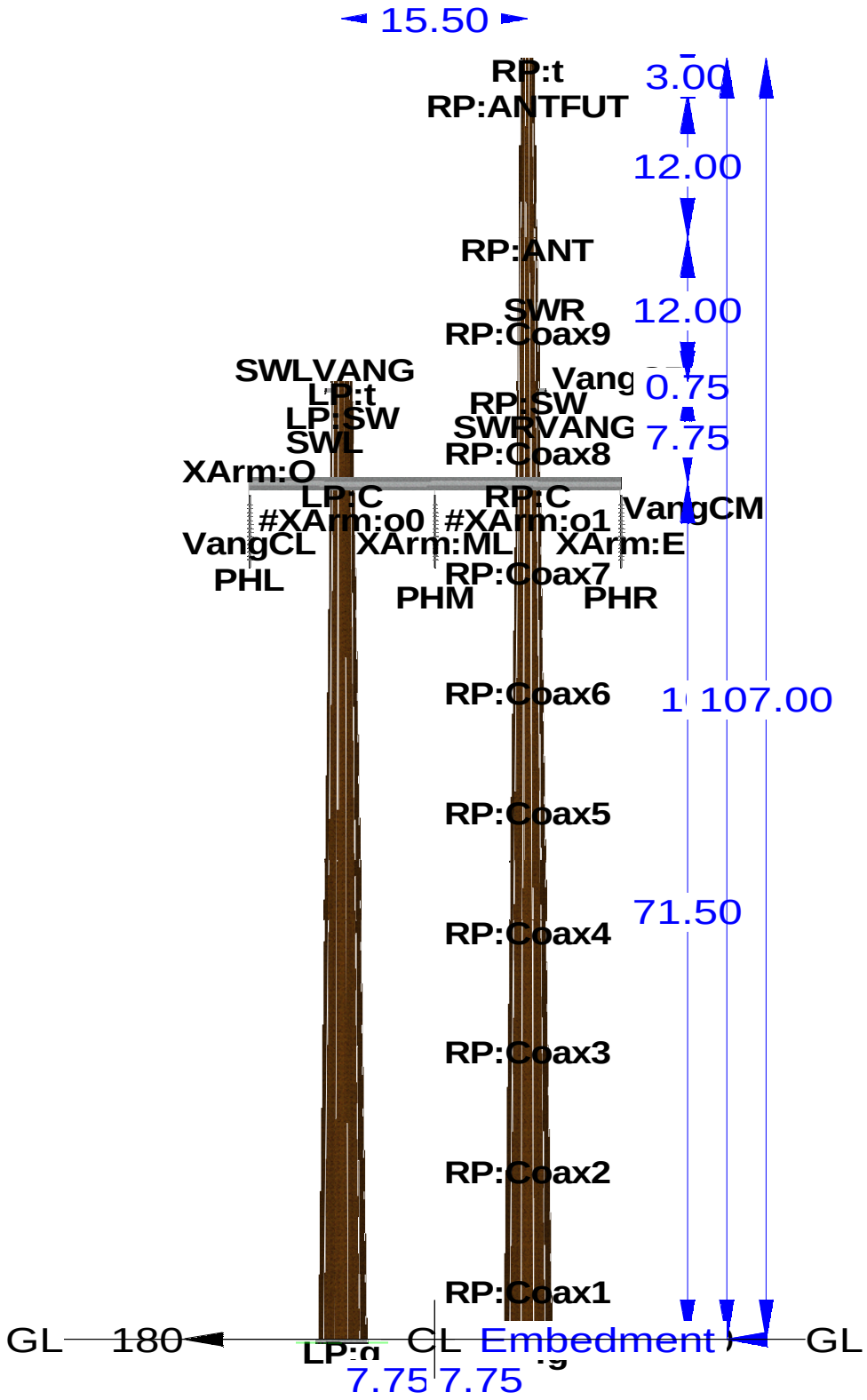
$$Extreme\_Ice_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax} + W_{ice.ex}\right) \cdot Coax_{Span} \cdot OF_{EIV}\right]}$$

Extreme Ice w/ Wind Transverse Load =

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

$Extreme\_Ice_{Vert} = 1264\,lb$ $Extreme\_Ice_{Trans} = 74\,lb$

Centek Engineering Inc, Project: "qt003 & 103_str#8012_80ft(lp)-107ft(rp)_r3"
PLS-POLE Version 18.01, 10:53:45 AM Friday, December 1, 2023
Undeformed geometry displayed



Project Name :
Project Notes:
Project File : J:\Jobs\2202100.WI\05_CT1104\05_Structural\Tower Analysis\Backup Documentation\Rev (4)\Calcs\PLS-Pole\qt003 & 103_str#8012_80ft(lp)-107ft(rp)_r3.pol
Date run : 8:20:57 AM Wednesday, January 17, 2024
by : PLS-POLE Version 18.01
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: J:\Jobs\2202100.WI\05_CT1104\05_Structural\Tower Analysis\Backup Documentation\Rev (4)\Calcs\PLS-Pole\qt003 & 103-str#8012-r3.lca

*** Analysis Results:

Maximum element usage is 66.69% for Base Plate "RP" in load case "NESC Rule 250D"

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 %
NESC Rule 250B	LP:g	-0.19	-13.93	-36.66	13.93	882.09	-31.95	882.67	-10.69	0.00
NESC Rule 250B	RP:g	-0.03	-12.68	-55.72	12.68	833.61	-19.81	833.84	-4.94	0.00
NESC 250C	LP:g	-0.15	-25.58	-20.50	25.58	1583.35	-19.96	1583.48	-19.94	0.00
NESC 250C	RP:g	0.10	-22.45	-26.89	22.45	1453.26	-0.93	1453.26	-2.82	0.00
NESC Rule 250D	LP:g	-0.11	-8.75	-33.44	8.75	585.78	-27.51	586.42	-7.48	0.00
NESC Rule 250D	RP:g	0.02	-7.83	-53.24	7.83	553.23	-18.51	553.54	-4.33	0.00
NESC 250C -	LP:g	0.06	25.57	-18.43	25.57	-1582.56	-3.11	1582.56	20.27	0.00
NESC 250C -	RP:g	-0.12	22.45	-28.96	22.45	-1454.06	-17.88	1454.17	3.24	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)
NESC Rule 250B	LP:t	0.60	9.90	-0.08	9.92	0.08	-0.99	0.05
NESC Rule 250B	RP:t	0.85	17.02	-0.18	17.05	0.07	-1.23	0.02
NESC 250C	LP:t	0.31	17.56	-0.22	17.57	0.04	-1.75	0.09
NESC 250C	RP:t	0.22	31.74	-0.53	31.74	0.02	-2.43	0.01
NESC Rule 250D	LP:t	0.55	6.71	-0.05	6.73	0.08	-0.67	0.03
NESC Rule 250D	RP:t	0.83	11.42	-0.10	11.45	0.07	-0.82	0.02
NESC 250C -	LP:t	0.10	-17.57	-0.21	17.57	0.02	1.75	-0.09
NESC 250C -	RP:t	0.56	-31.71	-0.53	31.72	0.04	2.42	-0.01

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
LP	1	4666	NESC 250C	32.60	648.17
LP	2	6821	NESC 250C	43.27	1583.60
RP	1	364	NESC 250C -	1.26	2.81

RP	2	992	NESC 250C -	18.89	120.71
RP	3	4666	NESC 250C -	34.43	679.99
RP	4	6821	NESC 250C -	40.01	1454.17

*** 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)
LP	43.27	NESC 250C	2.5	18	12719.3
RP	40.01	NESC 250C -	2.5	25	14075.1

Summary of Tubular X-Arm Usages:

Tubular X-Arm Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
XArm	30.28	NESC Rule 250B	71.5	3	1523.8

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Rule 250B	66.39	RP	Base Plate
NESC 250C	64.19	LP	Base Plate
NESC Rule 250D	66.69	RP	Base Plate
NESC 250C -	64.58	RP	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Height AGL (ft)	Segment Number
NESC Rule 250B	24.92	LP	2.5	18
NESC 250C	43.27	LP	2.5	18
NESC Rule 250D	16.83	LP	2.5	18
NESC 250C -	43.07	LP	2.5	18

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 %
NESC Rule 250B	LP	1	12.996	35.429	1856.767	-67.232	33.004	45.049	-1.5	118.509	2.234	66.01
NESC 250C	LP	1	12.996	19.270	1857.837	-23.397	32.095	43.808	-1.5	115.531	2.203	64.19
NESC Rule 250D	LP	1	12.996	32.205	1855.940	-87.135	33.155	45.256	-1.5	118.961	2.239	66.31
NESC 250C -	LP	4	12.996	17.201	-1857.980	-3.623	31.805	43.413	-1.5	114.602	2.193	63.61
NESC Rule 250B	RP	1	12.996	54.486	1857.459	-44.144	33.194	45.309	-1.5	119.246	2.241	66.39
NESC 250C	RP	1	12.996	25.656	1857.983	-1.191	31.980	43.652	-1.5	115.213	2.199	63.96
NESC Rule 250D	RP	1	12.996	52.007	1856.945	-62.135	33.345	45.516	-1.5	119.704	2.246	66.69

NESC 250C -	RP	4	12.996	27.725	-1857.843	-22.842	32.292	44.078	-1.5	116.215	2.210	64.58

Summary of Tubular X-Arm Usages by Load Case:

Load Case	Maximum Tubular X-Arm Usage %	Label	Height AGL (ft)	Segment Number
NESC Rule 250B	30.28	XArm	71.5	3
NESC 250C	16.69	XArm	71.5	3
NESC Rule 250D	29.73	XArm	71.5	3
NESC 250C -	15.82	XArm	71.5	6

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
RAntFUT	Clamp	0.00	NESC Rule 250B	0.0
RAnt	Clamp	0.00	NESC Rule 250B	0.0
Coax1	Clamp	0.00	NESC Rule 250B	0.0
Coax2	Clamp	0.00	NESC Rule 250B	0.0
Coax3	Clamp	0.00	NESC Rule 250B	0.0
Coax4	Clamp	0.00	NESC Rule 250B	0.0
Coax5	Clamp	0.00	NESC Rule 250B	0.0
Coax6	Clamp	0.00	NESC Rule 250B	0.0
Coax7	Clamp	0.00	NESC Rule 250B	0.0
Coax8	Clamp	0.00	NESC Rule 250B	0.0
Coax9	Clamp	0.00	NESC Rule 250B	0.0
SWL	Suspension	0.00	NESC Rule 250B	1.0
SWR	Suspension	0.00	NESC Rule 250B	1.0
PHL	Suspension	0.00	NESC Rule 250B	50.0
PHM	Suspension	0.00	NESC Rule 250B	50.0
PHR	Suspension	0.00	NESC Rule 250B	50.0

*** Weight of structure (lbs):

Weight of Tubular X-Arms:	1523.8
Weight of Steel Poles:	26794.4
Weight of Suspensions:	152.0
Total:	28470.2

*** End of Report

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**************************************************************************
*                                                                        *
*                              PLS-POLE                                  *
*                    POLE AND FRAME ANALYSIS AND DESIGN                  *
*                Copyright Power Line Systems 1999-2023                  *
*                                                                        *
**************************************************************************

Project Name :
Project Notes:
Project File : J:\Jobs\2202100.WI\05_CT1104\05_Structural\Tower Analysis\Backup Documentation\Rev (4)\Calcs\PLS-Pole\qt003 & 103_str#8012_80ft(lp)-
107ft(rp)_r3.pol
Date run     : 8:20:56 AM Wednesday, January 17, 2024
by           : PLS-POLE Version 18.01
Licensed to  : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.
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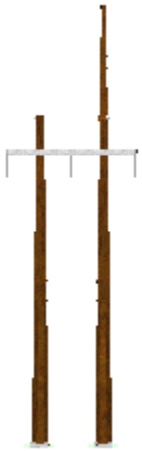


```
Modeling options:
  Offset Arms from Pole/Mast:   Yes
  Offset Braces from Pole/Mast: Yes
  Offset Guys from Pole/Mast:   Yes
  Offset Posts from Pole/Mast:  Yes
  Offset Strains from Pole/Mast:  Yes
  Use Alternate Convergence Process: No
  Steel poles and tubular arms checked with ASCE/SEI 48-19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

Vang Connectivity:

Vang Label	Attach Label	Tip Label	Azimuth (deg)	Length (ft)	Measured Relative To
SWLVang	LP:SW	SWLVANG	180	0.5	Face
SWRVang	RP:SW	SWRVANG	0	0.5	Face

ArmSusL	XArm:O	VangCL	0	0.5	Face
ArmSusM	XArm:ML	VangCM	0	0.5	Face
ArmSusR	XArm:E	VangCR	0	0.5	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 Length (ft)	Default Embedded Length (ft)	Base Plate	Shape Number	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)
QT003_Str#8012_80FT(LP)-R3	80.00	0	Yes	12F	0	48.5	0.3283	1.6	2 tubes	0	0	Calculated	Corten Steel	0.000	0.0000	0.0000
QT103_Str#8012_107FT(RP)-R3	107.00	0	Yes	12F	13	48.5	0	1.6	4 tubes	0	0	Calculated	Corten Steel	0.000	0.0000	0.0000

Steel Tubes Properties:

Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Butt Offset (in)	Gap or Overlap Stress (ksi)	Yield Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. 1.5x Diameter Lap (in)	Actual Lap Length (ft)	Overlap (ft)
QT003_Str#8012_80FT(LP)-R3	1	40	0.375	0.000	0.000	0.000	65.000	0.000	4666	21.54	0.32827	22.24	35.37	4.327	0.000
QT003_Str#8012_80FT(LP)-R3	2	40	0.375	0.000	0.000	0.000	65.000	0.000	6821	21.05	0.32827	35.37	48.50	0.000	0.000

Steel Tubes Properties:

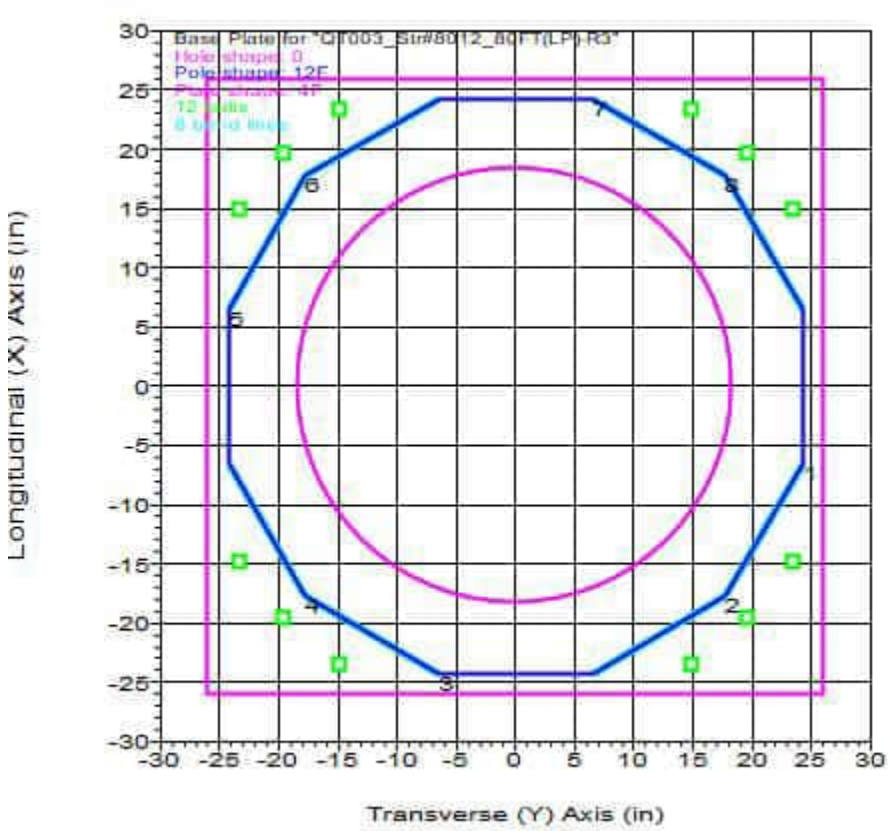
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Butt Offset (in)	Gap or Overlap Stress (ksi)	Yield Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. 1.5x Diameter Lap (in)	Actual Lap Length (ft)	Overlap (ft)
QT103_Str#8012_107FT(RP)-R3	1	12	0.1875	0.000	0.000	0.000	65.000	0.000	364	6.27	0.32827	13.00	16.94	2.071	0.000
QT103_Str#8012_107FT(RP)-R3	2	15	0.3125	0.000	0.000	0.000	65.000	0.000	992	7.82	0.32827	17.19	22.11	2.686	0.000
QT103_Str#8012_107FT(RP)-R3	3	40	0.375	0.000	0.000	0.000	65.000	0.000	4666	21.54	0.32827	22.24	35.37	4.327	0.000
QT103_Str#8012_107FT(RP)-R3	4	40	0.375	0.000	0.000	0.000	65.000	0.000	6821	21.05	0.32827	35.37	48.50	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)
QT003_Str#8012_80FT(LP)-R3	52.000	4F	2.750	1233	0.000	37.000	0	490.00	50.000	2.250	55.750	12	18334.12	18334.12
QT103_Str#8012_107FT(RP)-R3	52.000	4F	2.750	1233	0.000	37.000	0	490.00	50.000	2.250	55.750	12	18334.12	18334.12

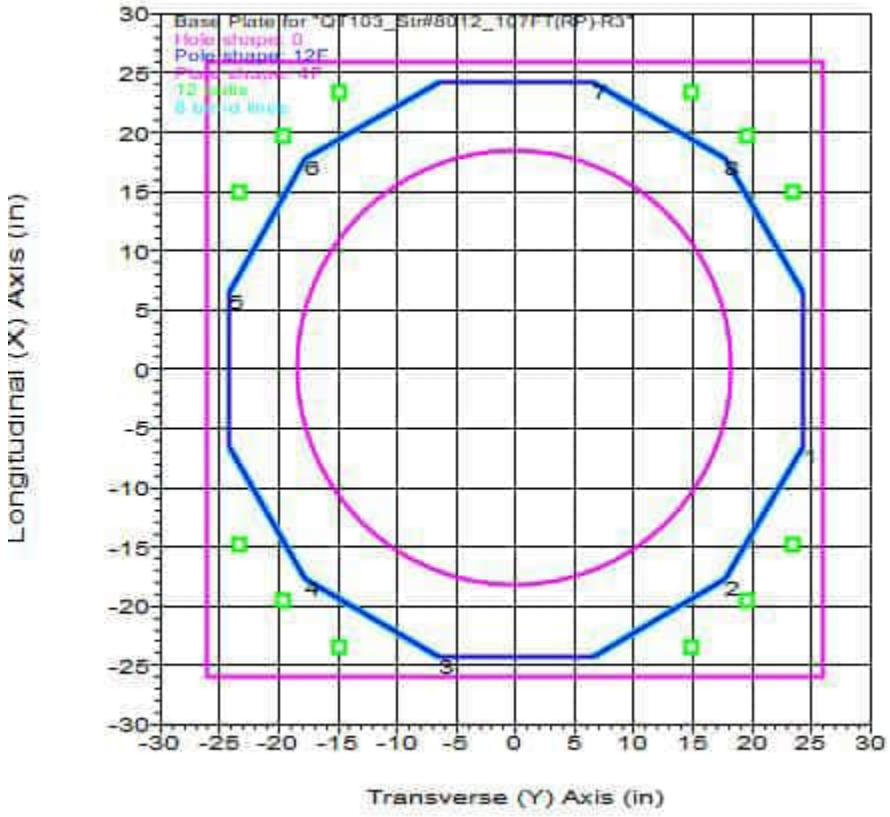
Base Plate Bolt Coordinates for Property "QT003_Str#8012_80FT(LP)-R3":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0.5336	0.8386	0
0.704	0.704	0
0.8386	0.5336	0



Base Plate Bolt Coordinates for Property "QT103_Str#8012_107FT(RP)-R3":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0.5336	0.8386	0
0.704	0.704	0
0.8386	0.5336	0



Steel Pole Connectivity:

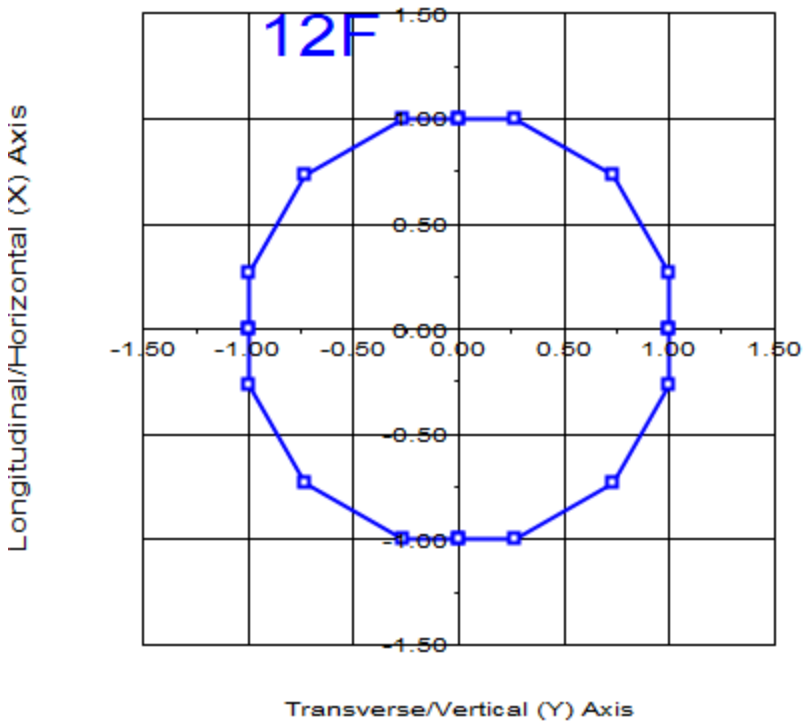
Pole Label	Tip Joint	Base Joint	X of Base (ft)	Y of Base (ft)	Z of Base (ft)	Inclin. About X (deg)	Inclin. About Y (deg)	Property Set	Attach. Labels	Base Connect	Embed % Override	Embed C. Override (ft)
LP			0	-7.75	0	0	0	QT003_Str#8012_80FT(LP)-R3	2 labels		0.00	0
RP			0	7.75	0	0	0	QT103_Str#8012_107FT(RP)-R3	13 labels		0.00	0

Relative Attachment Labels for Steel Pole "LP":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
LP:SW	0.75	0.00
LP:C	8.50	0.00

Relative Attachment Labels for Steel Pole "RP":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
RP:ANTFUT	3.00	0.00
RP:ANT	15.00	0.00
RP:SW	27.75	0.00
RP:C	35.50	0.00
RP:Coax1	0.00	5.00
RP:Coax2	0.00	15.00
RP:Coax3	0.00	25.00
RP:Coax4	0.00	35.00
RP:Coax5	0.00	45.00
RP:Coax6	0.00	55.00
RP:Coax7	0.00	65.00
RP:Coax8	0.00	75.00
RP:Coax9	0.00	85.00



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)
LP	LP:t	LP:t Ori	0.00	22.24	26.36	1613.33	1613.33	0.00	13.2	65.00	65.00	785.93	785.93
LP	LP:SW	LP:SW End	0.75	22.48	26.66	1668.44	1668.44	0.00	13.4	65.00	65.00	803.87	803.87
LP	LP:SW	LP:SW Ori	0.75	22.48	26.66	1668.44	1668.44	0.00	13.4	65.00	65.00	803.87	803.87
LP	#LP:0	Tube 1 End	4.63	23.76	28.19	1973.24	1973.24	0.00	14.3	65.00	65.00	899.82	899.82
LP	#LP:0	Tube 1 Ori	4.63	23.76	28.19	1973.24	1973.24	0.00	14.3	65.00	65.00	899.82	899.82
LP	LP:C	LP:C End	8.50	25.03	29.73	2313.08	2313.08	0.00	15.2	65.00	65.00	1001.18	1001.18
LP	LP:C	LP:C Ori	8.50	25.03	29.73	2313.08	2313.08	0.00	15.2	65.00	65.00	1001.18	1001.18
LP	#LP:1	Tube 1 End	13.50	26.67	31.71	2806.43	2806.43	0.00	16.4	65.00	65.00	1139.97	1139.97
LP	#LP:1	Tube 1 Ori	13.50	26.67	31.71	2806.43	2806.43	0.00	16.4	65.00	65.00	1139.97	1139.97
LP	#LP:2	Tube 1 End	18.50	28.31	33.68	3365.38	3365.38	0.00	17.5	65.00	65.00	1287.76	1287.76
LP	#LP:2	Tube 1 Ori	18.50	28.31	33.68	3365.38	3365.38	0.00	17.5	65.00	65.00	1287.76	1287.76
LP	#LP:3	Tube 1 End	23.50	29.95	35.66	3994.01	3994.01	0.00	18.7	65.00	65.00	1444.56	1444.56
LP	#LP:3	Tube 1 Ori	23.50	29.95	35.66	3994.01	3994.01	0.00	18.7	65.00	65.00	1444.56	1444.56
LP	#LP:4	Tube 1 End	28.50	31.59	37.64	4696.43	4696.43	0.00	19.9	65.00	65.00	1610.36	1610.36
LP	#LP:4	Tube 1 Ori	28.50	31.59	37.64	4696.43	4696.43	0.00	19.9	65.00	65.00	1610.36	1610.36
LP	#LP:5	Tube 1 End	33.50	33.24	39.62	5476.73	5476.73	0.00	21.1	65.00	65.00	1785.18	1785.18
LP	#LP:5	Tube 1 Ori	33.50	33.24	39.62	5476.74	5476.74	0.00	21.1	65.00	65.00	1785.18	1785.18

LP	#LP:6	Tube 1	End	36.75	34.30	40.91	6027.63	6027.63	0.00	21.8	65.00	65.00	1903.64	1903.64
LP	#LP:6	Tube 1	Ori	36.75	34.30	40.91	6027.63	6027.63	0.00	21.8	65.00	65.00	1903.64	1903.64
LP	#LP:7	SpliceT	End	40.00	35.37	42.19	6614.29	6614.29	0.00	22.6	65.00	65.00	2025.91	2025.91
LP	#LP:7	SpliceT	Ori	40.00	35.37	42.19	6614.29	6614.29	0.00	22.6	65.00	65.00	2025.91	2025.91
LP	#LP:8	Tube 2	End	45.00	37.01	44.17	7589.25	7589.25	0.00	23.8	65.00	65.00	2221.44	2221.44
LP	#LP:8	Tube 2	Ori	45.00	37.01	44.17	7589.25	7589.25	0.00	23.8	65.00	65.00	2221.44	2221.44
LP	#LP:9	Tube 2	End	50.00	38.65	46.15	8655.60	8655.60	0.00	24.9	65.00	65.00	2425.98	2425.98
LP	#LP:9	Tube 2	Ori	50.00	38.65	46.15	8655.60	8655.60	0.00	24.9	65.00	65.00	2425.98	2425.98
LP	#LP:10	Tube 2	End	55.00	40.29	48.13	9817.44	9817.44	0.00	26.1	65.00	65.00	2639.53	2639.53
LP	#LP:10	Tube 2	Ori	55.00	40.29	48.13	9817.44	9817.44	0.00	26.1	65.00	65.00	2639.53	2639.53
LP	#LP:11	Tube 2	End	60.00	41.93	50.11	11078.85	11078.85	0.00	27.3	65.00	65.00	2862.09	2862.09
LP	#LP:11	Tube 2	Ori	60.00	41.93	50.11	11078.85	11078.85	0.00	27.3	65.00	65.00	2862.09	2862.09
LP	#LP:12	Tube 2	End	65.00	43.58	52.09	12443.94	12443.94	0.00	28.5	65.00	65.00	3093.66	3093.66
LP	#LP:12	Tube 2	Ori	65.00	43.58	52.09	12443.95	12443.95	0.00	28.5	65.00	65.00	3093.66	3093.66
LP	#LP:13	Tube 2	End	70.00	45.22	54.07	13916.80	13916.80	0.00	29.6	65.00	65.00	3334.24	3334.24
LP	#LP:13	Tube 2	Ori	70.00	45.22	54.07	13916.80	13916.80	0.00	29.6	65.00	65.00	3334.24	3334.24
LP	#LP:14	Tube 2	End	75.00	46.86	56.05	15501.53	15501.53	0.00	30.8	65.00	64.01	3529.36	3529.36
LP	#LP:14	Tube 2	Ori	75.00	46.86	56.05	15501.53	15501.53	0.00	30.8	65.00	64.01	3529.36	3529.36
LP	LP:g	LP:g	End	80.00	48.50	58.03	17202.21	17202.21	0.00	32.0	65.00	62.86	3715.97	3715.97
RP	RP:t	RP:t	Ori	0.00	13.00	7.72	162.33	162.33	0.00	15.9	65.00	65.00	135.28	135.28
RP	RP:ANTFUT	RP:ANTFUT	End	3.00	13.98	8.32	202.71	202.71	0.00	17.3	65.00	65.00	157.03	157.03
RP	RP:ANTFUT	RP:ANTFUT	Ori	3.00	13.98	8.32	202.71	202.71	0.00	17.3	65.00	65.00	157.03	157.03
RP	#RP:15	Tube 1	End	7.50	15.46	9.21	275.03	275.03	0.00	19.4	65.00	65.00	192.70	192.70
RP	#RP:15	Tube 1	Ori	7.50	15.46	9.21	275.03	275.03	0.00	19.4	65.00	65.00	192.70	192.70
RP	#RP:16	SpliceT	End	12.00	16.94	10.10	362.79	362.79	0.00	21.5	65.00	65.00	232.02	232.02
RP	#RP:16	SpliceT	Ori	12.00	17.19	16.96	618.41	618.41	0.00	12.1	65.00	65.00	389.74	389.74
RP	RP:ANT	RP:ANT	End	15.00	18.17	17.95	733.08	733.08	0.00	12.9	65.00	65.00	436.98	436.98
RP	RP:ANT	RP:ANT	Ori	15.00	18.17	17.95	733.08	733.08	0.00	12.9	65.00	65.00	436.98	436.98
RP	#RP:17	Tube 2	End	18.50	19.32	19.10	883.81	883.81	0.00	13.9	65.00	65.00	495.50	495.50
RP	#RP:17	Tube 2	Ori	18.50	19.32	19.10	883.81	883.81	0.00	13.9	65.00	65.00	495.50	495.50
RP	RP:Coax9	RP:Coax9	End	22.00	20.47	20.26	1053.91	1053.91	0.00	14.9	65.00	65.00	557.71	557.71
RP	RP:Coax9	RP:Coax9	Ori	22.00	20.47	20.26	1053.91	1053.91	0.00	14.9	65.00	65.00	557.71	557.71
RP	#RP:18	SpliceT	End	27.00	22.11	21.91	1332.82	1332.82	0.00	16.3	65.00	65.00	652.95	652.95
RP	#RP:18	SpliceT	Ori	27.00	22.24	26.36	1613.31	1613.31	0.00	13.2	65.00	65.00	785.92	785.92
RP	RP:SW	RP:SW	End	27.75	22.48	26.66	1668.42	1668.42	0.00	13.4	65.00	65.00	803.87	803.87
RP	RP:SW	RP:SW	Ori	27.75	22.48	26.66	1668.42	1668.42	0.00	13.4	65.00	65.00	803.87	803.87
RP	RP:Coax8	RP:Coax8	End	32.00	23.88	28.34	2004.55	2004.55	0.00	14.4	65.00	65.00	909.39	909.39
RP	RP:Coax8	RP:Coax8	Ori	32.00	23.88	28.34	2004.55	2004.55	0.00	14.4	65.00	65.00	909.39	909.39
RP	RP:C	RP:C	End	35.50	25.03	29.73	2313.06	2313.06	0.00	15.2	65.00	65.00	1001.18	1001.18
RP	RP:C	RP:C	Ori	35.50	25.03	29.73	2313.06	2313.06	0.00	15.2	65.00	65.00	1001.18	1001.18
RP	#RP:19	Tube 3	End	38.75	26.10	31.01	2626.48	2626.48	0.00	16.0	65.00	65.00	1090.36	1090.36
RP	#RP:19	Tube 3	Ori	38.75	26.10	31.01	2626.48	2626.48	0.00	16.0	65.00	65.00	1090.36	1090.36
RP	RP:Coax7	RP:Coax7	End	42.00	27.16	32.30	2967.02	2967.02	0.00	16.7	65.00	65.00	1183.35	1183.35
RP	RP:Coax7	RP:Coax7	Ori	42.00	27.16	32.30	2967.02	2967.02	0.00	16.7	65.00	65.00	1183.35	1183.35
RP	#RP:20	Tube 3	End	47.00	28.80	34.28	3546.44	3546.44	0.00	17.9	65.00	65.00	1333.84	1333.84
RP	#RP:20	Tube 3	Ori	47.00	28.80	34.28	3546.44	3546.44	0.00	17.9	65.00	65.00	1333.84	1333.84
RP	RP:Coax6	RP:Coax6	End	52.00	30.45	36.26	4196.78	4196.78	0.00	19.1	65.00	65.00	1493.35	1493.35
RP	RP:Coax6	RP:Coax6	Ori	52.00	30.45	36.26	4196.78	4196.78	0.00	19.1	65.00	65.00	1493.35	1493.35
RP	#RP:21	Tube 3	End	57.00	32.09	38.24	4922.14	4922.14	0.00	20.2	65.00	65.00	1661.86	1661.86
RP	#RP:21	Tube 3	Ori	57.00	32.09	38.24	4922.14	4922.14	0.00	20.2	65.00	65.00	1661.86	1661.86
RP	RP:Coax5	RP:Coax5	End	62.00	33.73	40.22	5726.60	5726.60	0.00	21.4	65.00	65.00	1839.37	1839.37
RP	RP:Coax5	RP:Coax5	Ori	62.00	33.73	40.22	5726.60	5726.60	0.00	21.4	65.00	65.00	1839.37	1839.37
RP	#RP:22	SpliceT	End	67.00	35.37	42.19	6614.26	6614.26	0.00	22.6	65.00	65.00	2025.90	2025.90
RP	#RP:22	SpliceT	Ori	67.00	35.37	42.19	6614.27	6614.27	0.00	22.6	65.00	65.00	2025.90	2025.90
RP	RP:Coax4	RP:Coax4	End	72.00	37.01	44.17	7589.23	7589.23	0.00	23.8	65.00	65.00	2221.44	2221.44
RP	RP:Coax4	RP:Coax4	Ori	72.00	37.01	44.17	7589.23	7589.23	0.00	23.8	65.00	65.00	2221.44	2221.44
RP	#RP:23	Tube 4	End	77.00	38.65	46.15	8655.58	8655.58	0.00	24.9	65.00	65.00	2425.98	2425.98
RP	#RP:23	Tube 4	Ori	77.00	38.65	46.15	8655.58	8655.58	0.00	24.9	65.00	65.00	2425.98	2425.98

RP	RP:Coax3	RP:Coax3 End	82.00	40.29	48.13	9817.42	9817.42	0.00	26.1	65.00	65.00	2639.53	2639.53
RP	RP:Coax3	RP:Coax3 Ori	82.00	40.29	48.13	9817.42	9817.42	0.00	26.1	65.00	65.00	2639.53	2639.53
RP	#RP:24	Tube 4 End	87.00	41.93	50.11	11078.84	11078.84	0.00	27.3	65.00	65.00	2862.09	2862.09
RP	#RP:24	Tube 4 Ori	87.00	41.93	50.11	11078.84	11078.84	0.00	27.3	65.00	65.00	2862.09	2862.09
RP	RP:Coax2	RP:Coax2 End	92.00	43.58	52.09	12443.93	12443.93	0.00	28.5	65.00	65.00	3093.66	3093.66
RP	RP:Coax2	RP:Coax2 Ori	92.00	43.58	52.09	12443.93	12443.93	0.00	28.5	65.00	65.00	3093.66	3093.66
RP	#RP:25	Tube 4 End	97.00	45.22	54.07	13916.79	13916.79	0.00	29.6	65.00	65.00	3334.23	3334.23
RP	#RP:25	Tube 4 Ori	97.00	45.22	54.07	13916.80	13916.80	0.00	29.6	65.00	65.00	3334.23	3334.23
RP	RP:Coax1	RP:Coax1 End	102.00	46.86	56.05	15501.52	15501.52	0.00	30.8	65.00	64.01	3529.36	3529.36
RP	RP:Coax1	RP:Coax1 Ori	102.00	46.86	56.05	15501.52	15501.52	0.00	30.8	65.00	64.01	3529.36	3529.36
RP	RP:g	RP:g End	107.00	48.50	58.03	17202.21	17202.21	0.00	32.0	65.00	62.86	3715.97	3715.97

Tubular X-Arm Properties:

Cross Arm Property Label	Stock Number	Steel Shape	Thickness (in)	Diameter or Depth (in)	Length (ft)	Modulus of Elasticity (ksi)	Drag Coef.	Geometry	Strength Check Type	Vertical Capacity (lbs)	Trans. Capacity (lbs)	Long. Capacity (lbs)	Steel Yield Stress (ksi)	Weight Density Override (lbs/ft^3)	Texture
31FT_XArm_QT003&QT103	8F		0.375	12	31	29000	1.3	3 points	Calculated	0	0	0	65	0	

Joints Relative to the Origin for Cross Arm Property "31FT_XArm_QT003&QT103":

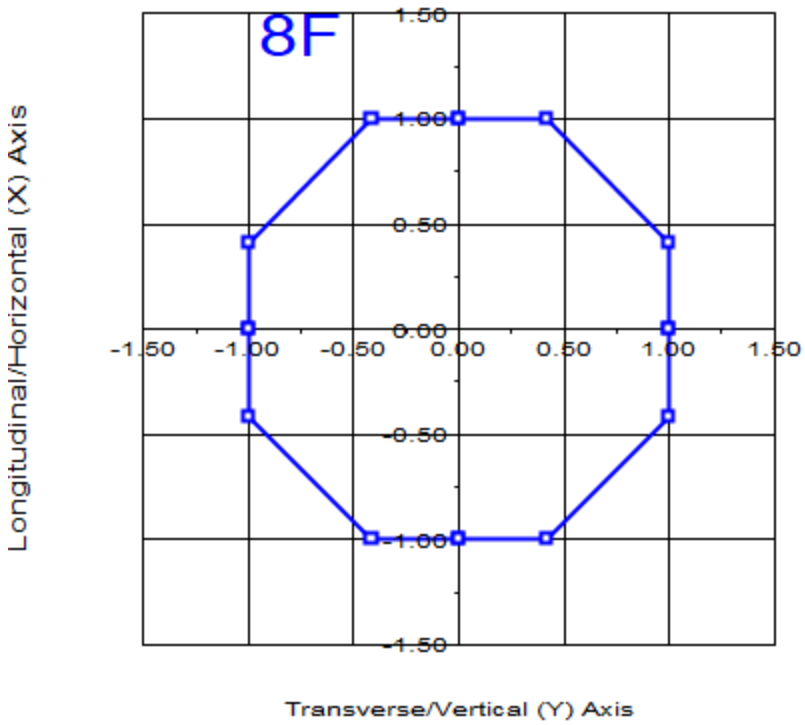
Joint Label	Offset (ft)
LP	7.75
ML	15.5
RP	23.25

Tubular X-Arm Connectivity:

X-Arm Label	X-Arm Property Set	Azimuth (deg)	Slope (deg)	Attach. Labels	Connects
XArm	31FT_XArm_QT003&QT103	0	0		5 connections

X-Arm Connections for "XArm":

Attach Label	Offset (ft)	Connect At	Connection Code Type
XArm:O	0.000		
XArm:LP	7.750	LP:C	Pinned Face
XArm:ML	15.500		
XArm:RP	23.250	RP:C	Pinned Face
XArm:E	31.000		



Tubular X-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)
XArm	XArm:O	Origin	0.00	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	#sXArm:0	End	3.87	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	#sXArm:0	Origin	3.87	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	XArm:LP	End	7.75	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	XArm:LP	Origin	7.75	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	#sXArm:1	End	11.63	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	#sXArm:1	Origin	11.63	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	XArm:ML	End	15.50	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	XArm:ML	Origin	15.50	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	#sXArm:2	End	19.38	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	#sXArm:2	Origin	19.38	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	XArm:RP	End	23.25	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	XArm:RP	Origin	23.25	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	#sXArm:3	End	27.13	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	#sXArm:3	Origin	27.13	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14
XArm	XArm:E	End	31.00	12.00	14.45	258.25	258.25	0.00	9.1	65.00	65.00	233.14	233.14

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)	Hardware Capacity (lbs)	Notes
CLAMP		1e+05	0	

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
RAntFUT	RP:ANTFUT	CLAMP	No Uplift
RAnt	RP:ANT	CLAMP	No Uplift
Coax1	RP:Coax1	CLAMP	No Limit
Coax2	RP:Coax2	CLAMP	No Limit
Coax3	RP:Coax3	CLAMP	No Limit
Coax4	RP:Coax4	CLAMP	No Limit
Coax5	RP:Coax5	CLAMP	No Limit
Coax6	RP:Coax6	CLAMP	No Limit
Coax7	RP:Coax7	CLAMP	No Limit
Coax8	RP:Coax8	CLAMP	No Limit
Coax9	RP:Coax9	CLAMP	No Limit

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
SW SUS		0.25	1	0	2.5e+04	0	0	0	0	0	0	0	Sheds	No
dummy Susp		6	50	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)
SWL	SWLVANG	SWL	SW SUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	No Limit
SWR	SWRVANG	SWR	SW SUS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	No Limit
PHL	VangCL	PHL	dummy Susp	-90.00	77.00	-90.00	48.00	0.00	0.00	0.00	0.00	No Limit
PHM	VangCM	PHM	dummy Susp	-77.00	77.00	-48.00	48.00	0.00	0.00	0.00	0.00	No Limit
PHR	VangCR	PHR	dummy Susp	-77.00	90.00	-48.00	90.00	0.00	0.00	0.00	0.00	No Limit

*** Loads Data

Loads from file: J:\Jobs\2202100.WI\05_CT1104\05_Structural\Tower Analysis\Backup Documentation\Rev (4)\Calcs\PLS-Pole\qt003 & 103-str#8012-r3.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 0.00 (ft)
  Z of ground with shift 0.00 (ft)
  Z of structure top (highest joint) 107.00 (ft)
  Structure height 107.00 (ft)
  Structure height above ground 107.00 (ft)

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles and Tubular Towers	SF for Wood Poles	SF for Conc. Poles	SF for Conc. Poles	SF for Guys	SF for Non Tubular Arms	SF for Braces	SF for Insuls.	SF For Hardware	Point Loads	Wind/Ice Found. Check	Trans. Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	Pole Deflection % or (ft)	Pole Deflection Limit	Model Wind Pressure (psf)
NESC Rule 250B	1.5000	2.5000	1.00000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	15 loads	Wind on All	4	0.500	57.000	0.0	No Limit	0
NESC 250C	1.0000	1.0000	1.00000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	15 loads	NESC 2017	31	0.000	57.000	0.0	No Limit	0
NESC Rule 250D	1.0000	1.0000	1.00000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	15 loads	Wind on All	4	1.000	57.000	15.0	No Limit	0
NESC 250C -	1.0000	1.0000	1.00000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	0.0000	1.0000	0.0000	15 loads	NESC 2017	-31	0.000	57.000	0.0	No Limit	0

Point Loads for Load Case "NESC Rule 250B":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
RP:ANT	8822	2256	0	
SWL	2422.35	1890.8	0	
SWR	2422.35	1890.8	0	
PHL	8055.13	3533.42	0	
PHM	8055.13	3533.42	0	
PHR	8055.13	3533.42	0	
RP:Coax1	1035	172	0	
RP:Coax2	1035	172	0	
RP:Coax3	1035	172	0	
RP:Coax4	1035	172	0	
RP:Coax5	1035	172	0	
RP:Coax6	1035	172	0	

RP:Coax7	1035	172	0
RP:Coax8	1035	172	0
RP:Coax9	1035	172	0

Detailed Pole Loading Data for Load Case "NESC Rule 250B":

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)
LP	LP:t	LP:SW	80.00	79.25	79.63	22.362	1.06e+06	1.600	10.00	0.50	101.49	22.36	10.67	1.00	23.36	0.00
LP	LP:SW		79.25	75.38	77.31	23.121	1.09e+06	1.600	10.00	0.50	542.45	119.46	57.01	5.17	124.63	0.00
LP		LP:C	75.38	71.50	73.44	24.393	1.15e+06	1.600	10.00	0.50	572.79	126.04	60.15	5.17	131.20	0.00
LP	LP:C		71.50	66.50	69.00	25.849	1.22e+06	1.600	10.00	0.50	783.90	172.34	82.25	6.67	179.01	0.00
LP			66.50	61.50	64.00	27.491	1.3e+06	1.600	10.00	0.50	834.41	183.28	87.47	6.67	189.95	0.00
LP			61.50	56.50	59.00	29.132	1.38e+06	1.600	10.00	0.50	884.92	194.22	92.70	6.67	200.89	0.00
LP			56.50	51.50	54.00	30.773	1.46e+06	1.600	10.00	0.50	935.43	205.17	97.92	6.67	211.83	0.00
LP			51.50	46.50	49.00	32.415	1.53e+06	1.600	10.00	0.50	985.94	216.11	103.14	6.67	222.78	0.00
LP			46.50	43.25	44.87	33.769	1.6e+06	1.600	10.00	0.50	667.94	146.34	69.84	4.33	150.67	0.00
LP			43.25	40.00	41.63	34.836	1.65e+06	1.600	10.00	0.50	689.28	150.96	72.05	4.33	155.30	0.00
LP			40.00	35.00	37.50	36.190	1.71e+06	1.600	10.00	0.50	1102.11	241.28	115.15	6.67	247.95	0.00
LP			35.00	30.00	32.50	37.831	1.79e+06	1.600	10.00	0.50	1152.61	252.22	120.38	6.67	258.89	0.00
LP			30.00	25.00	27.50	39.473	1.87e+06	1.600	10.00	0.50	1203.12	263.16	125.60	6.67	269.83	0.00
LP			25.00	20.00	22.50	41.114	1.95e+06	1.600	10.00	0.50	1253.63	274.11	130.82	6.67	280.77	0.00
LP			20.00	15.00	17.50	42.755	2.02e+06	1.600	10.00	0.50	1304.14	285.05	136.04	6.67	291.72	0.00
LP			15.00	10.00	12.50	44.397	2.1e+06	1.600	10.00	0.50	1354.65	295.99	141.27	6.67	302.66	0.00
LP			10.00	5.00	7.50	46.038	2.18e+06	1.600	10.00	0.50	1405.15	306.94	146.49	6.67	313.60	0.00
LP		LP:g	5.00	0.00	2.50	47.679	2.26e+06	1.600	10.00	0.50	1455.66	317.88	151.71	6.67	324.55	0.00
RP	RP:t	RP:ANTFUT	107.00	104.00	105.50	13.492	6.39e+05	1.600	10.00	0.50	122.83	53.97	25.76	4.00	57.97	0.00
RP	RP:ANTFUT		104.00	99.50	101.75	14.723	6.97e+05	1.600	10.00	0.50	201.29	88.35	42.16	6.00	94.35	0.00
RP			99.50	95.00	97.25	16.201	7.67e+05	1.600	10.00	0.50	221.77	97.21	46.39	6.00	103.21	0.00
RP		RP:ANT	95.00	92.00	93.50	17.682	8.37e+05	1.600	10.00	0.50	267.20	70.73	33.76	4.00	74.73	0.00
RP	RP:ANT		92.00	88.50	90.25	18.749	8.88e+05	1.600	10.00	0.50	330.94	87.50	41.76	4.67	92.16	0.00
RP		RP:Coax9	88.50	85.00	86.75	19.897	9.42e+05	1.600	10.00	0.50	351.56	92.86	44.32	4.67	97.53	0.00
RP	RP:Coax9		85.00	80.00	82.50	21.293	1.01e+06	1.600	10.00	0.50	538.03	141.96	67.75	6.67	148.63	0.00
RP		RP:SW	80.00	79.25	79.63	22.361	1.06e+06	1.600	10.00	0.50	101.46	22.36	10.67	1.00	23.36	0.00
RP	RP:SW	RP:Coax8	79.25	75.00	77.13	23.182	1.1e+06	1.600	10.00	0.50	596.55	131.37	62.70	5.67	137.04	0.00
RP	RP:Coax8	RP:C	75.00	71.50	73.25	24.454	1.16e+06	1.600	10.00	0.50	518.68	114.13	54.47	4.67	118.79	0.00
RP	RP:C		71.50	68.25	69.88	25.562	1.21e+06	1.600	10.00	0.50	503.79	110.77	52.87	4.33	115.11	0.00
RP		RP:Coax7	68.25	65.00	66.63	26.629	1.26e+06	1.600	10.00	0.50	525.13	115.40	55.07	4.33	119.73	0.00
RP	RP:Coax7		65.00	60.00	62.50	27.983	1.32e+06	1.600	10.00	0.50	849.56	186.56	89.04	6.67	193.23	0.00
RP		RP:Coax6	60.00	55.00	57.50	29.624	1.4e+06	1.600	10.00	0.50	900.07	197.51	94.26	6.67	204.17	0.00
RP	RP:Coax6		55.00	50.00	52.50	31.266	1.48e+06	1.600	10.00	0.50	950.58	208.45	99.48	6.67	215.12	0.00
RP		RP:Coax5	50.00	45.00	47.50	32.907	1.56e+06	1.600	10.00	0.50	1001.09	219.39	104.71	6.67	226.06	0.00
RP	RP:Coax5		45.00	40.00	42.50	34.548	1.64e+06	1.600	10.00	0.50	1051.60	230.34	109.93	6.67	237.00	0.00
RP		RP:Coax4	40.00	35.00	37.50	36.190	1.71e+06	1.600	10.00	0.50	1102.10	241.28	115.15	6.67	247.95	0.00
RP	RP:Coax4		35.00	30.00	32.50	37.831	1.79e+06	1.600	10.00	0.50	1152.61	252.22	120.37	6.67	258.89	0.00
RP		RP:Coax3	30.00	25.00	27.50	39.473	1.87e+06	1.600	10.00	0.50	1203.12	263.16	125.60	6.67	269.83	0.00
RP	RP:Coax3		25.00	20.00	22.50	41.114	1.95e+06	1.600	10.00	0.50	1253.63	274.11	130.82	6.67	280.77	0.00
RP		RP:Coax2	20.00	15.00	17.50	42.755	2.02e+06	1.600	10.00	0.50	1304.14	285.05	136.04	6.67	291.72	0.00
RP	RP:Coax2		15.00	10.00	12.50	44.397	2.1e+06	1.600	10.00	0.50	1354.65	295.99	141.27	6.67	302.66	0.00
RP		RP:Coax1	10.00	5.00	7.50	46.038	2.18e+06	1.600	10.00	0.50	1405.15	306.94	146.49	6.67	313.60	0.00
RP	RP:Coax1	RP:g	5.00	0.00	2.50	47.679	2.26e+06	1.600	10.00	0.50	1455.66	317.88	151.71	6.67	324.55	0.00

Point Loads for Load Case "NESC 250C":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
RP:ANT	4515	8341	0	
SWL	673.5	1712.12	0	
SWR	673.5	1712.12	0	
PHL	3462.1	5240.62	0	
PHM	3462.1	5240.62	0	
PHR	3462.1	5240.62	0	
RP:Coax1	281	488	0	
RP:Coax2	281	488	0	
RP:Coax3	281	488	0	
RP:Coax4	281	488	0	
RP:Coax5	281	488	0	
RP:Coax6	281	488	0	
RP:Coax7	281	488	0	
RP:Coax8	281	488	0	
RP:Coax9	281	488	0	

Detailed Pole Loading Data for Load Case "NESC 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)
LP	LP:t	LP:SW	80.00	79.25	79.63	22.362	1.88e+06	1.000	31.62	0.00	67.66	44.19	0.00	0.00	44.19	0.00
LP	LP:SW		79.25	75.38	77.31	23.121	1.95e+06	1.000	31.62	0.00	361.63	236.04	0.00	0.00	236.04	0.00
LP		LP:C	75.38	71.50	73.44	24.393	2.05e+06	1.000	31.62	0.00	381.86	249.03	0.00	0.00	249.03	0.00
LP	LP:C		71.50	66.50	69.00	25.849	2.18e+06	1.000	31.62	0.00	522.60	340.51	0.00	0.00	340.51	0.00
LP			66.50	61.50	64.00	27.491	2.31e+06	1.000	31.62	0.00	556.28	362.14	0.00	0.00	362.14	0.00
LP			61.50	56.50	59.00	29.132	2.45e+06	1.000	31.62	0.00	589.95	383.76	0.00	0.00	383.76	0.00
LP			56.50	51.50	54.00	30.773	2.59e+06	1.000	31.62	0.00	623.62	405.38	0.00	0.00	405.38	0.00
LP			51.50	46.50	49.00	32.415	2.73e+06	1.000	31.62	0.00	657.29	427.00	0.00	0.00	427.00	0.00
LP			46.50	43.25	44.87	33.769	2.84e+06	1.000	31.62	0.00	445.30	289.15	0.00	0.00	289.15	0.00
LP			43.25	40.00	41.63	34.836	2.93e+06	1.000	31.62	0.00	459.52	298.28	0.00	0.00	298.28	0.00
LP			40.00	35.00	37.50	36.190	3.05e+06	1.000	31.62	0.00	734.74	476.73	0.00	0.00	476.73	0.00
LP			35.00	30.00	32.50	37.831	3.18e+06	1.000	31.62	0.00	768.41	498.35	0.00	0.00	498.35	0.00
LP			30.00	25.00	27.50	39.473	3.32e+06	1.000	31.62	0.00	802.08	519.97	0.00	0.00	519.97	0.00
LP			25.00	20.00	22.50	41.114	3.46e+06	1.000	31.62	0.00	835.75	541.60	0.00	0.00	541.60	0.00
LP			20.00	15.00	17.50	42.755	3.6e+06	1.000	31.62	0.00	869.43	563.22	0.00	0.00	563.22	0.00
LP			15.00	10.00	12.50	44.397	3.74e+06	1.000	31.62	0.00	903.10	584.84	0.00	0.00	584.84	0.00
LP			10.00	5.00	7.50	46.038	3.88e+06	1.000	31.62	0.00	936.77	606.46	0.00	0.00	606.46	0.00
LP		LP:g	5.00	0.00	2.50	47.679	4.01e+06	1.000	31.62	0.00	970.44	628.08	0.00	0.00	628.08	0.00
RP	RP:t	RP:ANTFUT	107.00	104.00	105.50	13.492	1.14e+06	1.000	31.62	0.00	81.88	106.64	0.00	0.00	106.64	0.00
RP	RP:ANTFUT		104.00	99.50	101.75	14.723	1.24e+06	1.000	31.62	0.00	134.19	174.56	0.00	0.00	174.56	0.00
RP			99.50	95.00	97.25	16.201	1.36e+06	1.000	31.62	0.00	147.85	192.07	0.00	0.00	192.07	0.00
RP		RP:ANT	95.00	92.00	93.50	17.682	1.49e+06	1.000	31.62	0.00	178.14	139.75	0.00	0.00	139.75	0.00
RP	RP:ANT		92.00	88.50	90.25	18.749	1.58e+06	1.000	31.62	0.00	220.62	172.88	0.00	0.00	172.88	0.00
RP		RP:Coax9	88.50	85.00	86.75	19.897	1.67e+06	1.000	31.62	0.00	234.37	183.48	0.00	0.00	183.48	0.00
RP	RP:Coax9		85.00	80.00	82.50	21.293	1.79e+06	1.000	31.62	0.00	358.68	280.49	0.00	0.00	280.49	0.00
RP		RP:SW	80.00	79.25	79.63	22.361	1.88e+06	1.000	31.62	0.00	67.64	44.19	0.00	0.00	44.19	0.00
RP	RP:SW	RP:Coax8	79.25	75.00	77.13	23.182	1.95e+06	1.000	31.62	0.00	397.70	259.57	0.00	0.00	259.57	0.00
RP	RP:Coax8	RP:C	75.00	71.50	73.25	24.454	2.06e+06	1.000	31.62	0.00	345.79	225.49	0.00	0.00	225.49	0.00

RP	RP:C		71.50	68.25	69.88	25.562	2.15e+06	1.000	31.62	0.00	335.86	218.87	0.00	0.00	218.87	0.00
RP		RP:Coax7	68.25	65.00	66.63	26.629	2.24e+06	1.000	31.62	0.00	350.09	228.01	0.00	0.00	228.01	0.00
RP	RP:Coax7		65.00	60.00	62.50	27.983	2.36e+06	1.000	31.62	0.00	566.38	368.62	0.00	0.00	368.62	0.00
RP		RP:Coax6	60.00	55.00	57.50	29.624	2.49e+06	1.000	31.62	0.00	600.05	390.24	0.00	0.00	390.24	0.00
RP	RP:Coax6		55.00	50.00	52.50	31.266	2.63e+06	1.000	31.62	0.00	633.72	411.87	0.00	0.00	411.87	0.00
RP		RP:Coax5	50.00	45.00	47.50	32.907	2.77e+06	1.000	31.62	0.00	667.39	433.49	0.00	0.00	433.49	0.00
RP	RP:Coax5		45.00	40.00	42.50	34.548	2.91e+06	1.000	31.62	0.00	701.06	455.11	0.00	0.00	455.11	0.00
RP		RP:Coax4	40.00	35.00	37.50	36.190	3.05e+06	1.000	31.62	0.00	734.74	476.73	0.00	0.00	476.73	0.00
RP	RP:Coax4		35.00	30.00	32.50	37.831	3.18e+06	1.000	31.62	0.00	768.41	498.35	0.00	0.00	498.35	0.00
RP		RP:Coax3	30.00	25.00	27.50	39.473	3.32e+06	1.000	31.62	0.00	802.08	519.97	0.00	0.00	519.97	0.00
RP	RP:Coax3		25.00	20.00	22.50	41.114	3.46e+06	1.000	31.62	0.00	835.75	541.59	0.00	0.00	541.59	0.00
RP		RP:Coax2	20.00	15.00	17.50	42.755	3.6e+06	1.000	31.62	0.00	869.42	563.22	0.00	0.00	563.22	0.00
RP	RP:Coax2		15.00	10.00	12.50	44.397	3.74e+06	1.000	31.62	0.00	903.10	584.84	0.00	0.00	584.84	0.00
RP		RP:Coax1	10.00	5.00	7.50	46.038	3.88e+06	1.000	31.62	0.00	936.77	606.46	0.00	0.00	606.46	0.00
RP	RP:Coax1	RP:g	5.00	0.00	2.50	47.679	4.01e+06	1.000	31.62	0.00	970.44	628.08	0.00	0.00	628.08	0.00

Point Loads for Load Case "NESC Rule 250D":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
RP:ANT	7542	1263	0	
SWL	3489.29	1589.97	0	
SWR	3489.29	1589.97	0	
PHL	8211.07	2666.14	0	
PHM	8211.07	2666.14	0	
PHR	8211.07	2666.14	0	
RP:Coax1	1264	74	0	
RP:Coax2	1264	74	0	
RP:Coax3	1264	74	0	
RP:Coax4	1264	74	0	
RP:Coax5	1264	74	0	
RP:Coax6	1264	74	0	
RP:Coax7	1264	74	0	
RP:Coax8	1264	74	0	
RP:Coax9	1264	74	0	

Detailed Pole Loading Data for Load Case "NESC Rule 250D":

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)
LP	LP:t	LP:SW	80.00	79.25	79.63	22.362	6.7e+05	1.600	4.00	1.00	67.66	8.95	21.35	0.80	9.75	0.00
LP	LP:SW		79.25	75.38	77.31	23.121	6.92e+05	1.600	4.00	1.00	361.63	47.80	114.03	4.13	51.93	0.00
LP		LP:C	75.38	71.50	73.44	24.393	7.31e+05	1.600	4.00	1.00	381.86	50.43	120.30	4.13	54.56	0.00
LP	LP:C		71.50	66.50	69.00	25.849	7.74e+05	1.600	4.00	1.00	522.60	68.96	164.50	5.34	74.29	0.00
LP			66.50	61.50	64.00	27.491	8.23e+05	1.600	4.00	1.00	556.28	73.33	174.95	5.34	78.67	0.00
LP			61.50	56.50	59.00	29.132	8.72e+05	1.600	4.00	1.00	589.95	77.71	185.39	5.34	83.05	0.00
LP			56.50	51.50	54.00	30.773	9.22e+05	1.600	4.00	1.00	623.62	82.09	195.84	5.34	87.43	0.00
LP			51.50	46.50	49.00	32.415	9.71e+05	1.600	4.00	1.00	657.29	86.47	206.28	5.34	91.80	0.00
LP			46.50	43.25	44.87	33.769	1.01e+06	1.600	4.00	1.00	445.30	58.55	139.68	3.47	62.02	0.00
LP			43.25	40.00	41.63	34.836	1.04e+06	1.600	4.00	1.00	459.52	60.40	144.10	3.47	63.87	0.00
LP			40.00	35.00	37.50	36.190	1.08e+06	1.600	4.00	1.00	734.74	96.54	230.30	5.34	101.87	0.00

LP			35.00	30.00	32.50	37.831	1.13e+06	1.600	4.00	1.00	768.41	100.92	240.75	5.34	106.25	0.00
LP			30.00	25.00	27.50	39.473	1.18e+06	1.600	4.00	1.00	802.08	105.30	251.20	5.34	110.63	0.00
LP			25.00	20.00	22.50	41.114	1.23e+06	1.600	4.00	1.00	835.75	109.67	261.64	5.34	115.01	0.00
LP			20.00	15.00	17.50	42.755	1.28e+06	1.600	4.00	1.00	869.43	114.05	272.09	5.34	119.39	0.00
LP			15.00	10.00	12.50	44.397	1.33e+06	1.600	4.00	1.00	903.10	118.43	282.53	5.34	123.77	0.00
LP			10.00	5.00	7.50	46.038	1.38e+06	1.600	4.00	1.00	936.77	122.81	292.98	5.34	128.14	0.00
LP		LP:g	5.00	0.00	2.50	47.679	1.43e+06	1.600	4.00	1.00	970.44	127.19	303.42	5.34	132.52	0.00
RP	RP:t	RP:ANTFUT	107.00	104.00	105.50	13.492	4.04e+05	1.600	4.00	1.00	81.88	21.60	51.52	3.20	24.80	0.00
RP	RP:ANTFUT		104.00	99.50	101.75	14.723	4.41e+05	1.600	4.00	1.00	134.19	35.35	84.33	4.80	40.15	0.00
RP			99.50	95.00	97.25	16.201	4.85e+05	1.600	4.00	1.00	147.85	38.89	92.79	4.80	43.70	0.00
RP		RP:ANT	95.00	92.00	93.50	17.682	5.3e+05	1.600	4.00	1.00	178.14	28.30	67.51	3.20	31.50	0.00
RP	RP:ANT		92.00	88.50	90.25	18.749	5.61e+05	1.600	4.00	1.00	220.62	35.01	83.52	3.73	38.74	0.00
RP		RP:Coax9	88.50	85.00	86.75	19.897	5.96e+05	1.600	4.00	1.00	234.37	37.15	88.64	3.73	40.89	0.00
RP	RP:Coax9		85.00	80.00	82.50	21.293	6.38e+05	1.600	4.00	1.00	358.68	56.80	135.50	5.34	62.13	0.00
RP		RP:SW	80.00	79.25	79.63	22.361	6.7e+05	1.600	4.00	1.00	67.64	8.95	21.35	0.80	9.75	0.00
RP	RP:SW	RP:Coax8	79.25	75.00	77.13	23.182	6.94e+05	1.600	4.00	1.00	397.70	52.56	125.40	4.53	57.10	0.00
RP	RP:Coax8	RP:C	75.00	71.50	73.25	24.454	7.32e+05	1.600	4.00	1.00	345.79	45.66	108.93	3.73	49.40	0.00
RP	RP:C		71.50	68.25	69.88	25.562	7.66e+05	1.600	4.00	1.00	335.86	44.32	105.74	3.47	47.79	0.00
RP		RP:Coax7	68.25	65.00	66.63	26.629	7.97e+05	1.600	4.00	1.00	350.09	46.17	110.15	3.47	49.64	0.00
RP	RP:Coax7		65.00	60.00	62.50	27.983	8.38e+05	1.600	4.00	1.00	566.38	74.65	178.08	5.34	79.98	0.00
RP		RP:Coax6	60.00	55.00	57.50	29.624	8.87e+05	1.600	4.00	1.00	600.05	79.03	188.52	5.34	84.36	0.00
RP	RP:Coax6		55.00	50.00	52.50	31.266	9.36e+05	1.600	4.00	1.00	633.72	83.40	198.97	5.34	88.74	0.00
RP		RP:Coax5	50.00	45.00	47.50	32.907	9.86e+05	1.600	4.00	1.00	667.39	87.78	209.41	5.34	93.12	0.00
RP	RP:Coax5		45.00	40.00	42.50	34.548	1.03e+06	1.600	4.00	1.00	701.06	92.16	219.86	5.34	97.50	0.00
RP		RP:Coax4	40.00	35.00	37.50	36.190	1.08e+06	1.600	4.00	1.00	734.74	96.54	230.30	5.34	101.87	0.00
RP	RP:Coax4		35.00	30.00	32.50	37.831	1.13e+06	1.600	4.00	1.00	768.41	100.92	240.75	5.34	106.25	0.00
RP		RP:Coax3	30.00	25.00	27.50	39.473	1.18e+06	1.600	4.00	1.00	802.08	105.30	251.20	5.34	110.63	0.00
RP	RP:Coax3		25.00	20.00	22.50	41.114	1.23e+06	1.600	4.00	1.00	835.75	109.67	261.64	5.34	115.01	0.00
RP		RP:Coax2	20.00	15.00	17.50	42.755	1.28e+06	1.600	4.00	1.00	869.42	114.05	272.09	5.34	119.39	0.00
RP	RP:Coax2		15.00	10.00	12.50	44.397	1.33e+06	1.600	4.00	1.00	903.10	118.43	282.53	5.34	123.77	0.00
RP		RP:Coax1	10.00	5.00	7.50	46.038	1.38e+06	1.600	4.00	1.00	936.77	122.81	292.98	5.34	128.14	0.00
RP	RP:Coax1	RP:g	5.00	0.00	2.50	47.679	1.43e+06	1.600	4.00	1.00	970.44	127.19	303.42	5.34	132.52	0.00

Point Loads for Load Case "NESC 250C -":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
RP:ANT	4515	-8341	0	
SWL	673.5	-1712.12	0	
SWR	673.5	-1712.12	0	
PHL	3462.1	-5240.62	0	
PHM	3462.1	-5240.62	0	
PHR	3462.1	-5240.62	0	
RP:Coax1	281	-488	0	
RP:Coax2	281	-488	0	
RP:Coax3	281	-488	0	
RP:Coax4	281	-488	0	
RP:Coax5	281	-488	0	
RP:Coax6	281	-488	0	
RP:Coax7	281	-488	0	
RP:Coax8	281	-488	0	
RP:Coax9	281	-488	0	

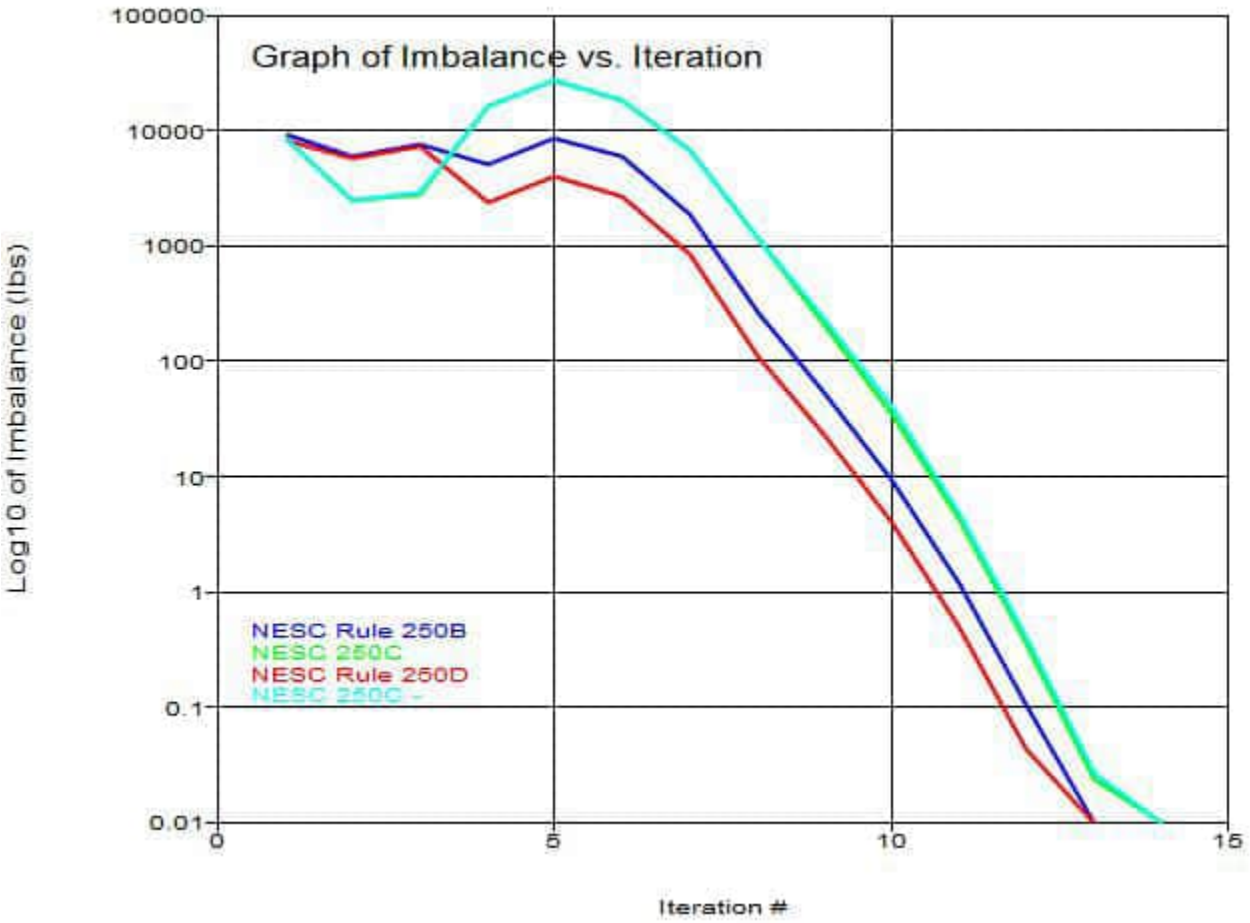
Detailed Pole Loading Data for Load Case "NESC 250C -":

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)
LP	LP:t	LP:SW	80.00	79.25	79.63	22.362	1.88e+06	1.000	31.62	0.00	67.66	44.19	0.00	0.00	-44.19	0.00
LP	LP:SW		79.25	75.38	77.31	23.121	1.95e+06	1.000	31.62	0.00	361.63	236.04	0.00	0.00	-236.04	0.00
LP		LP:C	75.38	71.50	73.44	24.393	2.05e+06	1.000	31.62	0.00	381.86	249.03	0.00	0.00	-249.03	0.00
LP	LP:C		71.50	66.50	69.00	25.849	2.18e+06	1.000	31.62	0.00	522.60	340.51	0.00	0.00	-340.51	0.00
LP			66.50	61.50	64.00	27.491	2.31e+06	1.000	31.62	0.00	556.28	362.14	0.00	0.00	-362.14	0.00
LP			61.50	56.50	59.00	29.132	2.45e+06	1.000	31.62	0.00	589.95	383.76	0.00	0.00	-383.76	0.00
LP			56.50	51.50	54.00	30.773	2.59e+06	1.000	31.62	0.00	623.62	405.38	0.00	0.00	-405.38	0.00
LP			51.50	46.50	49.00	32.415	2.73e+06	1.000	31.62	0.00	657.29	427.00	0.00	0.00	-427.00	0.00
LP			46.50	43.25	44.87	33.769	2.84e+06	1.000	31.62	0.00	445.30	289.15	0.00	0.00	-289.15	0.00
LP			43.25	40.00	41.63	34.836	2.93e+06	1.000	31.62	0.00	459.52	298.28	0.00	0.00	-298.28	0.00
LP			40.00	35.00	37.50	36.190	3.05e+06	1.000	31.62	0.00	734.74	476.73	0.00	0.00	-476.73	0.00
LP			35.00	30.00	32.50	37.831	3.18e+06	1.000	31.62	0.00	768.41	498.35	0.00	0.00	-498.35	0.00
LP			30.00	25.00	27.50	39.473	3.32e+06	1.000	31.62	0.00	802.08	519.97	0.00	0.00	-519.97	0.00
LP			25.00	20.00	22.50	41.114	3.46e+06	1.000	31.62	0.00	835.75	541.60	0.00	0.00	-541.60	0.00
LP			20.00	15.00	17.50	42.755	3.6e+06	1.000	31.62	0.00	869.43	563.22	0.00	0.00	-563.22	0.00
LP			15.00	10.00	12.50	44.397	3.74e+06	1.000	31.62	0.00	903.10	584.84	0.00	0.00	-584.84	0.00
LP			10.00	5.00	7.50	46.038	3.88e+06	1.000	31.62	0.00	936.77	606.46	0.00	0.00	-606.46	0.00
LP		LP:g	5.00	0.00	2.50	47.679	4.01e+06	1.000	31.62	0.00	970.44	628.08	0.00	0.00	-628.08	0.00
RP	RP:t	RP:ANTFUT	107.00	104.00	105.50	13.492	1.14e+06	1.000	31.62	0.00	81.88	106.64	0.00	0.00	-106.64	0.00
RP	RP:ANTFUT		104.00	99.50	101.75	14.723	1.24e+06	1.000	31.62	0.00	134.19	174.56	0.00	0.00	-174.56	0.00
RP			99.50	95.00	97.25	16.201	1.36e+06	1.000	31.62	0.00	147.85	192.07	0.00	0.00	-192.07	0.00
RP		RP:ANT	95.00	92.00	93.50	17.682	1.49e+06	1.000	31.62	0.00	178.14	139.75	0.00	0.00	-139.75	0.00
RP	RP:ANT		92.00	88.50	90.25	18.749	1.58e+06	1.000	31.62	0.00	220.62	172.88	0.00	0.00	-172.88	0.00
RP		RP:Coax9	88.50	85.00	86.75	19.897	1.67e+06	1.000	31.62	0.00	234.37	183.48	0.00	0.00	-183.48	0.00
RP	RP:Coax9		85.00	80.00	82.50	21.293	1.79e+06	1.000	31.62	0.00	358.68	280.49	0.00	0.00	-280.49	0.00
RP		RP:SW	80.00	79.25	79.63	22.361	1.88e+06	1.000	31.62	0.00	67.64	44.19	0.00	0.00	-44.19	0.00
RP	RP:SW	RP:Coax8	79.25	75.00	77.13	23.182	1.95e+06	1.000	31.62	0.00	397.70	259.57	0.00	0.00	-259.57	0.00
RP	RP:Coax8	RP:C	75.00	71.50	73.25	24.454	2.06e+06	1.000	31.62	0.00	345.79	225.49	0.00	0.00	-225.49	0.00
RP	RP:C		71.50	68.25	69.88	25.562	2.15e+06	1.000	31.62	0.00	335.86	218.87	0.00	0.00	-218.87	0.00
RP		RP:Coax7	68.25	65.00	66.63	26.629	2.24e+06	1.000	31.62	0.00	350.09	228.01	0.00	0.00	-228.01	0.00
RP	RP:Coax7		65.00	60.00	62.50	27.983	2.36e+06	1.000	31.62	0.00	566.38	368.62	0.00	0.00	-368.62	0.00
RP		RP:Coax6	60.00	55.00	57.50	29.624	2.49e+06	1.000	31.62	0.00	600.05	390.24	0.00	0.00	-390.24	0.00
RP	RP:Coax6		55.00	50.00	52.50	31.266	2.63e+06	1.000	31.62	0.00	633.72	411.87	0.00	0.00	-411.87	0.00
RP		RP:Coax5	50.00	45.00	47.50	32.907	2.77e+06	1.000	31.62	0.00	667.39	433.49	0.00	0.00	-433.49	0.00
RP	RP:Coax5		45.00	40.00	42.50	34.548	2.91e+06	1.000	31.62	0.00	701.06	455.11	0.00	0.00	-455.11	0.00
RP		RP:Coax4	40.00	35.00	37.50	36.190	3.05e+06	1.000	31.62	0.00	734.74	476.73	0.00	0.00	-476.73	0.00
RP	RP:Coax4		35.00	30.00	32.50	37.831	3.18e+06	1.000	31.62	0.00	768.41	498.35	0.00	0.00	-498.35	0.00
RP		RP:Coax3	30.00	25.00	27.50	39.473	3.32e+06	1.000	31.62	0.00	802.08	519.97	0.00	0.00	-519.97	0.00
RP	RP:Coax3		25.00	20.00	22.50	41.114	3.46e+06	1.000	31.62	0.00	835.75	541.59	0.00	0.00	-541.59	0.00
RP		RP:Coax2	20.00	15.00	17.50	42.755	3.6e+06	1.000	31.62	0.00	869.42	563.22	0.00	0.00	-563.22	0.00
RP	RP:Coax2		15.00	10.00	12.50	44.397	3.74e+06	1.000	31.62	0.00	903.10	584.84	0.00	0.00	-584.84	0.00
RP		RP:Coax1	10.00	5.00	7.50	46.038	3.88e+06	1.000	31.62	0.00	936.77	606.46	0.00	0.00	-606.46	0.00
RP	RP:Coax1	RP:g	5.00	0.00	2.50	47.679	4.01e+06	1.000	31.62	0.00	970.44	628.08	0.00	0.00	-628.08	0.00

*** Analysis Results:

Maximum element usage is 66.69% for Base Plate "RP" in load case "NESC Rule 250D"



*** Analysis Results for Load Case No. 1 "NESC Rule 250B" - Number of iterations in SAPS 13

Equilibrium Joint Positions and Rotations for Load Case "NESC 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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.04965	0.8253	-0.006987	-0.9916	0.0822	0.0467	0.04965	-6.925	79.99
LP:SW	0.04858	0.8123	-0.006874	-0.9916	0.0822	0.0467	0.04858	-6.938	79.24
LP:C	0.03758	0.6782	-0.005677	-0.9870	0.0822	0.0467	0.03758	-7.072	71.49

RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.07061	1.419	-0.01481	-1.2321	0.0695	0.0215	0.07061	9.169	107
RP:ANTFUT	0.067	1.354	-0.01411	-1.2319	0.0695	0.0215	0.067	9.104	104
RP:ANT	0.05257	1.097	-0.01133	-1.2232	0.0692	0.0215	0.05257	8.847	91.99
RP:Coax9	0.04418	0.9487	-0.009623	-1.1959	0.0689	0.0215	0.04418	8.699	84.99
RP:SW	0.03733	0.8306	-0.008297	-1.1539	0.0685	0.0215	0.03733	8.581	79.24
RP:Coax8	0.0323	0.7462	-0.007376	-1.1167	0.0682	0.0214	0.0323	8.496	74.99
RP:C	0.02817	0.679	-0.006659	-1.0807	0.0679	0.0214	0.02817	8.429	71.49
RP:Coax7	0.0214	0.5606	-0.005361	-0.9999	0.0535	0.0170	0.0214	8.311	64.99
RP:Coax6	0.01364	0.3984	-0.003713	-0.8500	0.0372	0.0120	0.01364	8.148	55
RP:Coax5	0.008238	0.2637	-0.002481	-0.6884	0.0257	0.0084	0.008238	8.014	45
RP:Coax4	0.004547	0.1574	-0.001594	-0.5257	0.0172	0.0056	0.004547	7.907	35
RP:Coax3	0.002137	0.07925	-0.0009682	-0.3671	0.0108	0.0035	0.002137	7.829	25
RP:Coax2	0.0007155	0.02823	-0.0005173	-0.2149	0.0057	0.0019	0.0007155	7.778	15
RP:Coax1	7.52e-05	0.003183	-0.0001633	-0.0698	0.0017	0.0006	7.52e-05	7.753	5
SWLVANG	0.04979	0.8125	0.01799	-0.9916	0.0822	0.0467	0.04979	-8.374	79.27
SWRVANG	0.03676	0.8303	-0.03723	-1.1539	0.0685	0.0215	0.03676	10.02	79.21
XArm:O	0.04423	0.6801	-0.09135	0.7180	0.0910	0.0502	1.587	-14.82	71.41
XArm:LP	0.03757	0.6796	-0.008204	0.4129	0.0908	0.0501	1.58	-7.07	71.49
XArm:ML	0.03201	0.6796	0.01558	-0.0023	0.0837	0.0338	1.575	0.6796	71.52
XArm:RP	0.02816	0.6796	-0.008772	-0.4001	0.0766	0.0237	1.571	8.43	71.49
XArm:E	0.02486	0.6793	-0.08586	-0.6423	0.0765	0.0236	1.568	16.18	71.41
VangCL	0.04263	0.6926	-0.09127	0.7180	0.0910	0.0502	1.585	-14.81	70.41
VangCM	0.03055	0.6796	0.01558	-0.0023	0.0837	0.0338	1.573	0.6796	70.52
VangCR	0.02353	0.6681	-0.0858	-0.6423	0.0765	0.0236	1.566	16.17	70.41

Joint Support Reactions for Load Case "NESC Rule 250B":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift 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 %
LP:g	-0.19	0.0	-13.93	0.0	0.0	-36.66	0.0	0.0	0.00	0.0	882.09	0.0	-31.9	0.0	0.0	-10.69	0.0	0.0
RP:g	-0.03	0.0	-12.68	0.0	0.0	-55.72	0.0	0.0	0.00	0.0	833.61	0.0	-19.8	0.0	0.0	-4.94	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC 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.
LP	LP:t	Origin	0.00	9.90	0.60	-0.08	0.00	0.00	-0.0	-0.06	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
LP	LP:SW	End	0.75	9.75	0.58	-0.08	0.01	-0.00	-0.0	-0.06	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	3
LP	LP:SW	Origin	0.75	9.75	0.58	-0.08	-3.47	0.00	0.0	-2.80	2.03	-0.01	-0.11	0.28	0.00	0.00	0.39	0.6	2
LP	Tube 1	End	4.63	8.94	0.52	-0.08	4.38	-0.03	0.0	-2.80	2.03	-0.01	-0.10	0.32	0.00	0.00	0.42	0.6	2
LP	Tube 1	Origin	4.63	8.94	0.52	-0.08	4.38	-0.03	0.0	-3.42	2.16	-0.01	-0.12	0.32	0.00	0.00	0.44	0.7	2
LP	LP:C	End	8.50	8.14	0.45	-0.07	12.76	-0.08	0.0	-3.42	2.16	-0.01	-0.11	0.83	0.00	0.00	0.94	1.5	2
LP	LP:C	Origin	8.50	8.14	0.45	-0.07	12.76	-20.80	10.7	-17.97	10.73	-0.13	-0.60	1.57	0.71	0.36	2.86	4.4	4
LP	Tube 1	End	13.50	7.11	0.37	-0.06	66.40	-21.46	10.7	-17.97	10.73	-0.13	-0.57	4.11	0.01	0.32	4.71	7.3	2
LP	Tube 1	Origin	13.50	7.11	0.37	-0.06	66.39	-21.47	10.7	-18.87	10.92	-0.14	-0.60	4.11	0.01	0.32	4.74	7.3	2
LP	Tube 1	End	18.50	6.12	0.31	-0.05	120.98	-22.13	10.7	-18.87	10.92	-0.14	-0.56	6.41	0.01	0.28	6.98	10.7	2
LP	Tube 1	Origin	18.50	6.12	0.31	-0.05	120.98	-22.14	10.7	-19.83	11.11	-0.14	-0.59	6.41	0.01	0.28	7.01	10.8	2
LP	Tube 1	End	23.50	5.18	0.25	-0.04	176.53	-22.81	10.7	-19.83	11.11	-0.14	-0.56	8.22	0.01	0.25	8.79	13.5	2
LP	Tube 1	Origin	23.50	5.18	0.25	-0.04	176.53	-22.83	10.7	-20.84	11.31	-0.14	-0.58	8.22	0.01	0.25	8.81	13.6	2
LP	Tube 1	End	28.50	4.31	0.20	-0.03	233.07	-23.51	10.7	-20.84	11.31	-0.14	-0.55	9.66	0.01	0.22	10.22	15.7	2
LP	Tube 1	Origin	28.50	4.31	0.20	-0.03	233.07	-23.52	10.7	-21.92	11.52	-0.14	-0.58	9.66	0.01	0.22	10.25	15.8	2
LP	Tube 1	End	33.50	3.51	0.16	-0.03	290.65	-24.22	10.7	-21.92	11.52	-0.14	-0.55	10.82	0.01	0.20	11.38	17.5	2
LP	Tube 1	Origin	33.50	3.51	0.16	-0.03	290.65	-24.23	10.7	-22.84	11.69	-0.15	-0.58	10.82	0.01	0.20	11.40	17.5	2

LP	Tube 1	End	36.75	3.03	0.13	-0.02	328.64	-24.69	10.7	-22.84	11.69	-0.15	-0.56	11.45	0.01	0.19	12.01	18.5	2
LP	Tube 1	Origin	36.75	3.03	0.13	-0.02	328.64	-24.70	10.7	-23.60	11.83	-0.15	-0.58	11.45	0.01	0.19	12.03	18.5	2
LP	SpliceT	End	40.00	2.59	0.11	-0.02	367.08	-25.17	10.7	-23.60	11.83	-0.15	-0.56	11.99	0.01	0.18	12.56	19.3	2
LP	SpliceT	Origin	40.00	2.59	0.11	-0.02	367.08	-25.18	10.7	-24.61	12.02	-0.15	-0.58	11.99	0.01	0.18	12.58	19.4	2
LP	Tube 2	End	45.00	1.98	0.08	-0.01	427.16	-25.92	10.7	-24.61	12.02	-0.15	-0.56	12.70	0.01	0.16	13.26	20.4	2
LP	Tube 2	Origin	45.00	1.98	0.08	-0.01	427.16	-25.94	10.7	-25.87	12.25	-0.16	-0.59	12.70	0.01	0.16	13.29	20.4	2
LP	Tube 2	End	50.00	1.45	0.06	-0.01	488.39	-26.70	10.7	-25.87	12.25	-0.16	-0.56	13.28	0.01	0.15	13.84	21.3	2
LP	Tube 2	Origin	50.00	1.45	0.06	-0.01	488.39	-26.72	10.7	-27.19	12.48	-0.16	-0.59	13.28	0.01	0.15	13.87	21.3	2
LP	Tube 2	End	55.00	1.00	0.04	-0.01	550.80	-27.50	10.7	-27.19	12.48	-0.16	-0.56	13.75	0.01	0.14	14.31	22.0	2
LP	Tube 2	Origin	55.00	1.00	0.04	-0.01	550.80	-27.52	10.7	-28.56	12.73	-0.17	-0.59	13.75	0.01	0.14	14.34	22.1	2
LP	Tube 2	End	60.00	0.64	0.02	-0.01	614.45	-28.33	10.7	-28.56	12.73	-0.17	-0.57	14.13	0.01	0.13	14.70	22.6	2
LP	Tube 2	Origin	60.00	0.64	0.02	-0.01	614.45	-28.35	10.7	-29.99	12.98	-0.17	-0.60	14.13	0.01	0.13	14.73	22.7	2
LP	Tube 2	End	65.00	0.36	0.01	-0.00	679.36	-29.19	10.7	-29.99	12.98	-0.17	-0.58	14.44	0.01	0.12	15.02	23.1	2
LP	Tube 2	Origin	65.00	0.36	0.01	-0.00	679.36	-29.20	10.7	-31.48	13.24	-0.18	-0.60	14.44	0.01	0.12	15.04	23.1	2
LP	Tube 2	End	70.00	0.16	0.01	-0.00	745.57	-30.07	10.7	-31.48	13.24	-0.18	-0.58	14.69	0.01	0.11	15.28	23.5	2
LP	Tube 2	Origin	70.00	0.16	0.01	-0.00	745.57	-30.09	10.7	-33.02	13.51	-0.18	-0.61	14.69	0.01	0.11	15.30	23.5	2
LP	Tube 2	End	75.00	0.04	0.00	-0.00	813.14	-30.99	10.7	-33.02	13.51	-0.18	-0.59	14.90	0.01	0.10	15.49	24.2	2
LP	Tube 2	Origin	75.00	0.04	0.00	-0.00	813.14	-31.00	10.7	-34.62	13.79	-0.19	-0.62	14.90	0.01	0.10	15.52	24.2	2
LP	LP:g	End	80.00	0.00	0.00	0.00	882.09	-31.94	10.7	-34.62	13.79	-0.19	-0.60	15.07	0.01	0.09	15.66	24.9	2
RP	RP:t	Origin	0.00	17.02	0.85	-0.18	-0.00	0.00	0.0	-0.07	0.03	-0.00	-0.01	0.00	0.01	0.00	0.02	0.0	5
RP	RP:ANTFUT	End	3.00	16.25	0.80	-0.17	0.09	-0.00	0.0	-0.07	0.03	-0.00	-0.01	0.04	0.00	0.00	0.05	0.1	2
RP	RP:ANTFUT	Origin	3.00	16.25	0.80	-0.17	0.09	-0.00	-0.0	-0.27	0.11	-0.00	-0.03	0.04	0.00	0.00	0.07	0.1	2
RP	Tube 1	End	7.50	15.09	0.74	-0.16	0.59	-0.02	-0.0	-0.27	0.11	-0.00	-0.03	0.20	0.00	0.00	0.23	0.4	2
RP	Tube 1	Origin	7.50	15.09	0.74	-0.16	0.59	-0.02	-0.0	-0.53	0.22	-0.01	-0.06	0.20	0.00	0.00	0.26	0.4	2
RP	SpliceT	End	12.00	13.93	0.67	-0.14	1.56	-0.04	-0.0	-0.53	0.22	-0.01	-0.05	0.44	0.00	0.00	0.49	0.8	2
RP	SpliceT	Origin	12.00	13.93	0.67	-0.14	1.56	-0.04	-0.0	-0.81	0.31	-0.01	-0.05	0.26	0.00	0.00	0.31	0.5	2
RP	RP:ANT	End	15.00	13.16	0.63	-0.14	2.49	-0.07	-0.0	-0.81	0.31	-0.01	-0.05	0.37	0.00	0.00	0.42	0.6	2
RP	RP:ANT	Origin	15.00	13.16	0.63	-0.14	2.49	-0.07	-0.0	-9.92	2.84	-0.02	-0.55	0.37	0.00	0.00	0.93	1.4	2
RP	Tube 2	End	18.50	12.27	0.58	-0.13	12.44	-0.15	-0.0	-9.92	2.84	-0.02	-0.52	1.64	0.00	0.00	2.16	3.3	2
RP	Tube 2	Origin	18.50	12.27	0.58	-0.13	12.44	-0.15	-0.0	-10.30	2.94	-0.03	-0.54	1.64	0.00	0.00	2.18	3.3	2
RP	RP:Coax9	End	22.00	11.38	0.53	-0.12	22.75	-0.24	-0.0	-10.30	2.94	-0.03	-0.51	2.66	0.00	0.00	3.17	4.9	2
RP	RP:Coax9	Origin	22.00	11.38	0.53	-0.12	22.75	-0.24	-0.0	-11.84	3.27	-0.03	-0.58	2.66	0.00	0.00	3.24	5.0	2
RP	SpliceT	End	27.00	10.15	0.46	-0.10	39.08	-0.39	-0.0	-11.84	3.27	-0.03	-0.54	3.90	0.00	0.00	4.44	6.8	2
RP	SpliceT	Origin	27.00	10.15	0.46	-0.10	39.08	-0.39	-0.0	-12.20	3.35	-0.03	-0.46	3.24	0.00	0.00	3.70	5.7	2
RP	RP:SW	End	27.75	9.97	0.45	-0.10	41.60	-0.42	-0.0	-12.20	3.35	-0.03	-0.46	3.37	0.00	0.00	3.83	5.9	2
RP	RP:SW	Origin	27.75	9.97	0.45	-0.10	45.08	-0.42	-0.0	-14.97	5.38	-0.04	-0.56	3.65	0.00	0.00	4.22	6.5	2
RP	RP:Coax8	End	32.00	8.95	0.39	-0.09	67.93	-0.59	-0.0	-14.97	5.38	-0.04	-0.53	4.87	0.00	0.00	5.39	8.3	2
RP	RP:Coax8	Origin	32.00	8.95	0.39	-0.09	67.93	-0.59	-0.0	-16.62	5.70	-0.05	-0.59	4.87	0.00	0.00	5.45	8.4	2
RP	RP:C	End	35.50	8.15	0.34	-0.08	87.87	-0.75	-0.0	-16.62	5.70	-0.05	-0.56	5.72	0.00	0.00	6.28	9.7	2
RP	RP:C	Origin	35.50	8.15	0.34	-0.08	87.87	-20.58	4.9	-29.65	8.49	0.03	-1.00	6.06	0.00	0.17	7.07	10.9	2
RP	Tube 3	End	38.75	7.42	0.30	-0.07	115.46	-20.48	4.9	-29.65	8.49	0.03	-0.96	7.21	0.00	0.15	8.17	12.6	2
RP	Tube 3	Origin	38.75	7.42	0.30	-0.07	115.46	-20.48	4.9	-30.23	8.59	0.03	-0.97	7.21	0.00	0.15	8.19	12.6	2
RP	RP:Coax7	End	42.00	6.73	0.26	-0.06	143.39	-20.38	4.9	-30.23	8.59	0.03	-0.94	8.18	0.00	0.14	9.12	14.0	2
RP	RP:Coax7	Origin	42.00	6.73	0.26	-0.06	143.39	-20.38	4.9	-32.03	8.92	0.03	-0.99	8.18	0.00	0.14	9.17	14.1	2
RP	Tube 3	End	47.00	5.71	0.21	-0.05	188.01	-20.23	4.9	-32.03	8.92	0.03	-0.93	9.43	0.00	0.12	10.36	15.9	2
RP	Tube 3	Origin	47.00	5.71	0.21	-0.05	188.01	-20.24	4.9	-33.00	9.10	0.03	-0.96	9.43	0.00	0.12	10.39	16.0	2
RP	RP:Coax6	End	52.00	4.78	0.16	-0.04	233.48	-20.09	4.9	-33.00	9.10	0.03	-0.91	10.40	0.00	0.11	11.31	17.4	2
RP	RP:Coax6	Origin	52.00	4.78	0.16	-0.04	233.48	-20.09	4.9	-35.07	9.46	0.03	-0.97	10.40	0.00	0.11	11.37	17.5	2
RP	Tube 3	End	57.00	3.93	0.13	-0.04	280.78	-19.95	4.9	-35.07	9.46	0.03	-0.92	11.19	0.00	0.10	12.11	18.6	2
RP	Tube 3	Origin	57.00	3.93	0.13	-0.04	280.78	-19.96	4.9	-36.16	9.65	0.02	-0.95	11.19	0.00	0.10	12.14	18.7	2
RP	RP:Coax5	End	62.00	3.16	0.10	-0.03	329.01	-19.84	4.9	-36.16	9.65	0.02	-0.90	11.81	0.00	0.09	12.71	19.6	2
RP	RP:Coax5	Origin	62.00	3.16	0.10	-0.03	329.01	-19.84	4.9	-38.34	10.02	0.02	-0.95	11.81	0.00	0.09	12.77	19.6	2
RP	SpliceT	End	67.00	2.48	0.07	-0.02	379.11	-19.74	4.9	-38.34	10.02	0.02	-0.91	12.33	0.00	0.08	13.24	20.4	2
RP	SpliceT	Origin	67.00	2.48	0.07	-0.02	379.11	-19.74	4.9	-39.55	10.22	0.02	-0.94	12.33	0.00	0.08	13.27	20.4	2
RP	RP:Coax4	End	72.00	1.89	0.05	-0.02	430.22	-19.65	4.9	-39.55	10.22	0.02	-0.90	12.74	0.00	0.07	13.64	21.0	2
RP	RP:Coax4	Origin	72.00	1.89	0.05	-0.02	430.22	-19.66	4.9	-41.84	10.61	0.01	-0.95	12.74	0.00	0.07	13.69	21.1	2
RP	Tube 4	End	77.00	1.38	0.04	-0.02	483.27	-19.60	4.9	-41.84	10.61	0.01	-0.91	13.09	0.00	0.07	14.00	21.5	2
RP	Tube 4	Origin	77.00	1.38	0.04	-0.02	483.27	-19.60	4.9	-43.16	10.83	0.01	-0.94	13.09	0.00	0.07	14.02	21.6	2

RP	RP:Coax3	End	82.00	0.95	0.03	-0.01	537.40	-19.56	4.9	-43.16	10.83	0.01	-0.90	13.36	0.00	0.06	14.26	21.9	2
RP	RP:Coax3	Origin	82.00	0.95	0.03	-0.01	537.40	-19.57	4.9	-45.56	11.23	0.00	-0.95	13.36	0.00	0.06	14.31	22.0	2
RP	Tube 4	End	87.00	0.60	0.02	-0.01	593.54	-19.55	4.9	-45.56	11.23	0.00	-0.91	13.60	0.00	0.06	14.51	22.3	2
RP	Tube 4	Origin	87.00	0.60	0.02	-0.01	593.54	-19.56	4.9	-46.99	11.46	-0.00	-0.94	13.60	0.00	0.06	14.54	22.4	2
RP	RP:Coax2	End	92.00	0.34	0.01	-0.01	650.84	-19.57	4.9	-46.99	11.46	-0.00	-0.90	13.78	0.00	0.05	14.69	22.6	2
RP	RP:Coax2	Origin	92.00	0.34	0.01	-0.01	650.84	-19.58	4.9	-49.51	11.88	-0.01	-0.95	13.78	0.00	0.05	14.74	22.7	2
RP	Tube 4	End	97.00	0.15	0.00	-0.00	710.22	-19.62	4.9	-49.51	11.88	-0.01	-0.92	13.95	0.00	0.05	14.86	22.9	2
RP	Tube 4	Origin	97.00	0.15	0.00	-0.00	710.22	-19.62	4.9	-51.04	12.12	-0.02	-0.94	13.95	0.00	0.05	14.89	22.9	2
RP	RP:Coax1	End	102.00	0.04	0.00	-0.00	770.84	-19.70	4.9	-51.04	12.12	-0.02	-0.91	14.08	0.00	0.05	14.99	23.4	2
RP	RP:Coax1	Origin	102.00	0.04	0.00	-0.00	770.84	-19.70	4.9	-53.67	12.55	-0.02	-0.96	14.08	0.00	0.05	15.03	23.5	2
RP	RP:g	End	107.00	0.00	0.00	0.00	833.61	-19.81	4.9	-53.67	12.55	-0.02	-0.92	14.19	0.00	0.04	15.12	24.0	2

Detailed Tubular X-Arm Usages for Load Case "NESC 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.
XArm	XArm:O	Origin	0.00	8.16	0.53	-1.10	-3.53	-0.01	0.0	-3.43	-8.24	-0.02	-0.24	0.00	1.19	0.00	2.07	3.2	4
XArm	#sXArm:0	End	3.87	8.16	0.49	-0.54	-35.46	-0.07	0.0	-3.43	-8.24	-0.02	-0.24	9.90	0.00	0.00	10.13	15.6	2
XArm	#sXArm:0	Origin	3.87	8.16	0.49	-0.54	-35.46	-0.07	0.0	-3.45	-8.52	-0.02	-0.24	9.90	0.00	0.00	10.13	15.6	2
XArm	XArm:LP	End	7.75	8.15	0.45	-0.10	-68.46	-0.13	0.0	-3.45	-8.52	-0.02	-0.24	19.10	0.00	0.00	19.34	29.8	2
XArm	XArm:LP	Origin	7.75	8.15	0.45	-0.10	-68.46	-2.39	-0.6	4.60	5.19	0.10	0.32	19.36	0.01	0.09	19.68	30.3	2
XArm	#sXArm:1	End	11.63	8.15	0.41	0.13	-48.34	-1.98	-0.6	4.60	5.19	0.10	0.32	13.71	0.01	0.09	14.03	21.6	2
XArm	#sXArm:1	Origin	11.63	8.15	0.41	0.13	-48.34	-1.98	-0.6	4.62	4.89	0.10	0.32	13.71	0.01	0.09	14.03	21.6	2
XArm	XArm:ML	End	15.50	8.16	0.38	0.19	-29.38	-1.58	-0.6	4.62	4.89	0.10	0.32	8.38	0.01	0.09	8.70	13.4	2
XArm	XArm:ML	Origin	15.50	8.16	0.38	0.19	-32.92	-1.59	-0.6	1.09	-3.46	0.09	0.08	9.36	0.01	0.09	9.44	14.5	2
XArm	#sXArm:2	End	19.38	8.16	0.36	0.12	-46.31	-1.25	-0.6	1.09	-3.46	0.09	0.08	13.06	0.01	0.09	13.13	20.2	2
XArm	#sXArm:2	Origin	19.38	8.16	0.36	0.12	-46.31	-1.25	-0.6	1.07	-3.75	0.09	0.07	13.06	0.01	0.09	13.13	20.2	2
XArm	XArm:RP	End	23.25	8.16	0.34	-0.11	-60.83	-0.91	-0.6	1.07	-3.75	0.09	0.07	17.06	0.01	0.09	17.14	26.4	2
XArm	XArm:RP	Origin	23.25	8.16	0.34	-0.11	-60.83	-0.09	-0.0	3.61	8.45	0.01	0.25	16.97	0.00	0.00	17.22	26.5	2
XArm	#sXArm:3	End	27.13	8.15	0.32	-0.52	-28.08	-0.04	-0.0	3.61	8.45	0.01	0.25	7.83	0.00	0.00	8.08	12.4	2
XArm	#sXArm:3	Origin	27.13	8.15	0.32	-0.52	-28.08	-0.04	-0.0	3.62	8.16	0.01	0.25	7.83	0.00	0.00	8.09	12.4	2
XArm	XArm:E	End	31.00	8.15	0.30	-1.03	3.53	0.00	-0.0	3.62	8.16	0.01	0.25	0.00	1.18	0.00	2.05	3.2	4

Summary of Clamp Capacities and Usages for Load Case "NESC 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 %
RAntFUT	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00
RAnt	9.106	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax1	1.049	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax2	1.049	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax3	1.049	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax4	1.049	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax5	1.049	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax6	1.049	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax7	1.049	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax8	1.049	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax9	1.049	100.00	0.00	0.00	0.00	0.00	0.00	0.00

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

Suspension	Tension	Input Factored Tension	Input Factored Hardware	Max.

Label		Tension Capacity (kips)	Tension Capacity (kips)	Usage %	Hardware Capacity (kips)	Hardware Capacity (kips)	Usage %	Usage %
SWL	3.073	25.00	0.00	0.00	0.00	0.00	0.00	0.00
SWR	3.073	25.00	0.00	0.00	0.00	0.00	0.00	0.00
PHL	8.796	30.00	0.00	0.00	0.00	0.00	0.00	0.00
PHM	8.796	30.00	0.00	0.00	0.00	0.00	0.00	0.00
PHR	8.796	30.00	0.00	0.00	0.00	0.00	0.00	0.00

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

Equilibrium Joint Positions and Rotations for Load Case "NESC 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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.02574	1.464	-0.018	-1.7468	0.0432	0.0877	0.02574	-6.286	79.98
LP:SW	0.02521	1.441	-0.01765	-1.7468	0.0432	0.0877	0.02521	-6.309	79.23
LP:C	0.01973	1.205	-0.01404	-1.7397	0.0432	0.0877	0.01973	-6.545	71.49
RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.0182	2.645	-0.04433	-2.4254	0.0205	0.0122	0.0182	10.39	107
RP:ANTFUT	0.01715	2.518	-0.04164	-2.4250	0.0205	0.0122	0.01715	10.27	104
RP:ANT	0.01298	2.011	-0.03094	-2.4093	0.0204	0.0122	0.01298	9.761	91.97
RP:Coax9	0.01055	1.72	-0.02483	-2.3290	0.0203	0.0122	0.01055	9.47	84.98
RP:SW	0.008561	1.493	-0.02026	-2.1992	0.0203	0.0122	0.008561	9.243	79.23
RP:Coax8	0.007094	1.333	-0.01722	-2.0969	0.0202	0.0121	0.007094	9.083	74.98
RP:C	0.005889	1.207	-0.01495	-2.0027	0.0201	0.0121	0.005889	8.957	71.49
RP:Coax7	0.004043	0.9905	-0.01123	-1.8147	0.0143	0.0097	0.004043	8.74	64.99
RP:Coax6	0.002188	0.6993	-0.006838	-1.5127	0.0084	0.0068	0.002188	8.449	54.99
RP:Coax5	0.001108	0.461	-0.003849	-1.2114	0.0048	0.0048	0.001108	8.211	45
RP:Coax4	0.0005048	0.2746	-0.001961	-0.9195	0.0026	0.0032	0.0005048	8.025	35
RP:Coax3	0.0001911	0.1381	-0.0008776	-0.6402	0.0013	0.0020	0.0001911	7.888	25
RP:Coax2	4.929e-05	0.04918	-0.0003295	-0.3743	0.0005	0.0011	4.929e-05	7.799	15
RP:Coax1	3.352e-06	0.00555	-7.909e-05	-0.1216	0.0001	0.0003	3.352e-06	7.756	5
SWLVANG	0.02744	1.442	0.02615	-1.7468	0.0432	0.0877	0.02744	-7.745	79.28
SWRVANG	0.008237	1.491	-0.0754	-2.1992	0.0203	0.0122	0.008237	10.68	79.17
XArm:O	0.03239	1.208	-0.05488	0.3525	0.0471	0.0940	1.575	-14.29	71.45
XArm:LP	0.01972	1.207	-0.01542	0.1875	0.0469	0.0937	1.563	-6.543	71.48
XArm:ML	0.01015	1.208	-0.005129	-0.0006	0.0355	0.0497	1.553	1.208	71.49
XArm:RP	0.005888	1.208	-0.01562	-0.1650	0.0242	0.0147	1.549	8.958	71.48
XArm:E	0.003891	1.208	-0.04581	-0.2388	0.0242	0.0147	1.547	16.71	71.45
VangCL	0.03156	1.214	-0.05486	0.3525	0.0471	0.0940	1.574	-14.29	70.45
VangCM	0.009526	1.208	-0.005129	-0.0006	0.0355	0.0497	1.552	1.208	70.49
VangCR	0.00347	1.204	-0.0458	-0.2388	0.0242	0.0147	1.546	16.7	70.45

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

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift 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 %
LP:g	-0.15	0.0	-25.58	0.0	0.0	-20.50	0.0	0.0	0.00	0.0	1583.35	0.0	-20.0	0.0	0.0	-19.94	0.0	0.0
RP:g	0.10	0.0	-22.45	0.0	0.0	-26.89	0.0	0.0	0.00	0.0	1453.26	0.0	-0.9	0.0	0.0	-2.82	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC 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.
LP	LP:t	Origin	0.00	17.56	0.31	-0.22	-0.00	0.00	-0.0	-0.03	0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
LP	LP:SW	End	0.75	17.29	0.30	-0.21	0.02	-0.00	-0.0	-0.03	0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	4
LP	LP:SW	Origin	0.75	17.29	0.30	-0.21	-0.95	0.00	0.0	-0.87	1.90	-0.00	-0.03	0.00	0.15	0.00	0.25	0.4	5
LP	Tube 1	End	4.63	15.87	0.27	-0.19	6.42	-0.01	0.0	-0.87	1.90	-0.00	-0.03	0.46	0.00	0.00	0.49	0.8	2

LP	Tube 1	Origin	4.63	15.87	0.27	-0.19	6.42	-0.01	0.0	-1.24	2.16	-0.01	-0.04	0.46	0.00	0.00	0.51	0.8	2
LP	LP:C	End	8.50	14.46	0.24	-0.17	14.77	-0.04	0.0	-1.24	2.16	-0.01	-0.04	0.96	0.00	0.00	1.00	1.5	2
LP	LP:C	Origin	8.50	14.46	0.24	-0.17	14.76	-9.22	20.0	-8.18	19.08	-0.16	-0.28	0.86	1.27	0.67	3.54	5.4	4
LP	Tube 1	End	13.50	12.65	0.20	-0.14	110.16	-10.01	20.0	-8.18	19.08	-0.16	-0.26	6.43	0.01	0.59	6.77	10.4	2
LP	Tube 1	Origin	13.50	12.65	0.20	-0.14	110.16	-10.03	20.0	-8.74	19.44	-0.16	-0.28	6.43	0.01	0.59	6.79	10.4	2
LP	Tube 1	End	18.50	10.89	0.17	-0.11	207.35	-10.79	20.0	-8.74	19.44	-0.16	-0.26	10.61	0.01	0.52	10.91	16.8	2
LP	Tube 1	Origin	18.50	10.89	0.17	-0.11	207.35	-10.82	20.0	-9.34	19.81	-0.16	-0.28	10.61	0.01	0.52	10.93	16.8	2
LP	Tube 1	End	23.50	9.23	0.14	-0.09	306.41	-11.56	20.0	-9.34	19.81	-0.16	-0.26	13.93	0.01	0.47	14.21	21.9	2
LP	Tube 1	Origin	23.50	9.23	0.14	-0.09	306.41	-11.59	20.0	-9.99	20.21	-0.16	-0.28	13.93	0.01	0.47	14.23	21.9	2
LP	Tube 1	End	28.50	7.68	0.11	-0.07	407.44	-12.31	20.0	-9.99	20.21	-0.16	-0.27	16.58	0.01	0.42	16.86	25.9	2
LP	Tube 1	Origin	28.50	7.68	0.11	-0.07	407.44	-12.35	20.0	-10.67	20.62	-0.15	-0.28	16.58	0.01	0.42	16.88	26.0	2
LP	Tube 1	End	33.50	6.26	0.09	-0.05	510.52	-13.06	20.0	-10.67	20.62	-0.15	-0.27	18.72	0.01	0.38	19.00	29.2	2
LP	Tube 1	Origin	33.50	6.26	0.09	-0.05	510.52	-13.10	20.0	-11.26	20.96	-0.15	-0.28	18.72	0.01	0.38	19.01	29.2	2
LP	Tube 1	End	36.75	5.41	0.08	-0.04	578.65	-13.55	20.0	-11.26	20.96	-0.15	-0.28	19.88	0.01	0.35	20.17	31.0	2
LP	Tube 1	Origin	36.75	5.41	0.08	-0.04	578.65	-13.58	20.0	-11.75	21.25	-0.15	-0.29	19.88	0.01	0.35	20.18	31.0	2
LP	SpliceT	End	40.00	4.62	0.06	-0.03	647.71	-14.03	20.0	-11.75	21.25	-0.15	-0.28	20.90	0.01	0.33	21.19	32.6	2
LP	SpliceT	Origin	40.00	4.62	0.06	-0.03	647.71	-14.07	20.0	-12.39	21.62	-0.15	-0.29	20.90	0.01	0.33	21.20	32.6	2
LP	Tube 2	End	45.00	3.53	0.05	-0.02	755.83	-14.77	20.0	-12.39	21.62	-0.15	-0.28	22.23	0.01	0.30	22.52	34.6	2
LP	Tube 2	Origin	45.00	3.53	0.05	-0.02	755.83	-14.81	20.0	-13.19	22.09	-0.15	-0.30	22.23	0.01	0.30	22.54	34.7	2
LP	Tube 2	End	50.00	2.58	0.03	-0.02	866.30	-15.50	20.0	-13.19	22.09	-0.15	-0.29	23.32	0.01	0.28	23.61	36.3	2
LP	Tube 2	Origin	50.00	2.58	0.03	-0.02	866.30	-15.55	19.9	-14.03	22.58	-0.15	-0.30	23.32	0.01	0.28	23.63	36.4	2
LP	Tube 2	End	55.00	1.79	0.02	-0.01	979.20	-16.24	19.9	-14.03	22.58	-0.15	-0.29	24.22	0.01	0.25	24.52	37.7	2
LP	Tube 2	Origin	55.00	1.79	0.02	-0.01	979.20	-16.29	19.9	-14.91	23.08	-0.15	-0.31	24.22	0.01	0.25	24.53	37.7	2
LP	Tube 2	End	60.00	1.14	0.01	-0.01	1094.62	-16.98	19.9	-14.91	23.08	-0.15	-0.30	24.96	0.01	0.23	25.26	38.9	2
LP	Tube 2	Origin	60.00	1.14	0.01	-0.01	1094.62	-17.02	19.9	-15.82	23.61	-0.15	-0.32	24.96	0.01	0.23	25.28	38.9	2
LP	Tube 2	End	65.00	0.64	0.01	-0.00	1212.66	-17.71	19.9	-15.82	23.61	-0.15	-0.30	25.58	0.01	0.22	25.89	39.8	2
LP	Tube 2	Origin	65.00	0.64	0.01	-0.00	1212.65	-17.76	19.9	-16.76	24.15	-0.15	-0.32	25.58	0.01	0.22	25.90	39.9	2
LP	Tube 2	End	70.00	0.29	0.00	-0.00	1333.40	-18.45	19.9	-16.76	24.15	-0.15	-0.31	26.09	0.01	0.20	26.40	40.6	2
LP	Tube 2	Origin	70.00	0.29	0.00	-0.00	1333.40	-18.50	19.9	-17.74	24.71	-0.15	-0.33	26.09	0.01	0.20	26.42	40.6	2
LP	Tube 2	End	75.00	0.07	0.00	-0.00	1456.93	-19.20	19.9	-17.74	24.71	-0.15	-0.32	26.52	0.01	0.19	26.84	41.9	2
LP	Tube 2	Origin	75.00	0.07	0.00	-0.00	1456.93	-19.24	19.9	-18.75	25.28	-0.15	-0.33	26.52	0.01	0.19	26.85	42.0	2
LP	LP:g	End	80.00	0.00	0.00	0.00	1583.35	-19.94	19.9	-18.75	25.28	-0.15	-0.32	26.88	0.01	0.17	27.20	43.3	2
RP	RP:t	Origin	0.00	31.74	0.22	-0.53	-0.00	0.00	0.0	-0.04	0.05	-0.00	-0.01	0.00	0.01	0.00	0.03	0.0	5
RP	RP:ANTFUT	End	3.00	30.21	0.21	-0.50	0.16	-0.00	0.0	-0.04	0.05	-0.00	-0.00	0.07	0.00	0.00	0.07	0.1	2
RP	RP:ANTFUT	Origin	3.00	30.21	0.21	-0.50	0.16	-0.00	-0.0	-0.15	0.20	-0.00	-0.02	0.05	0.03	0.00	0.09	0.1	3
RP	Tube 1	End	7.50	27.93	0.19	-0.45	1.06	-0.00	-0.0	-0.15	0.20	-0.00	-0.02	0.36	0.00	0.00	0.38	0.6	2
RP	Tube 1	Origin	7.50	27.93	0.19	-0.45	1.06	-0.00	-0.0	-0.29	0.39	-0.00	-0.03	0.36	0.00	0.00	0.39	0.6	2
RP	SpliceT	End	12.00	25.65	0.17	-0.40	2.81	-0.01	-0.0	-0.29	0.39	-0.00	-0.03	0.79	0.00	0.00	0.82	1.3	2
RP	SpliceT	Origin	12.00	25.65	0.17	-0.40	2.81	-0.01	-0.0	-0.45	0.56	-0.00	-0.03	0.47	0.00	0.00	0.50	0.8	2
RP	RP:ANT	End	15.00	24.14	0.16	-0.37	4.50	-0.02	-0.0	-0.45	0.56	-0.00	-0.03	0.67	0.00	0.00	0.69	1.1	2
RP	RP:ANT	Origin	15.00	24.14	0.16	-0.37	4.50	-0.02	-0.0	-4.81	9.25	-0.01	-0.27	0.00	1.05	0.00	1.84	2.8	5
RP	Tube 2	End	18.50	22.37	0.14	-0.33	36.87	-0.04	-0.0	-4.81	9.25	-0.01	-0.25	4.84	0.00	0.00	5.09	7.8	2
RP	Tube 2	Origin	18.50	22.37	0.14	-0.33	36.87	-0.04	-0.0	-5.05	9.43	-0.01	-0.26	4.84	0.00	0.00	5.10	7.8	2
RP	RP:Coax9	End	22.00	20.64	0.13	-0.30	69.88	-0.06	-0.0	-5.05	9.43	-0.01	-0.25	8.15	0.00	0.00	8.40	12.9	2
RP	RP:Coax9	Origin	22.00	20.64	0.13	-0.30	69.88	-0.06	-0.0	-5.62	10.17	-0.01	-0.28	8.15	0.00	0.00	8.42	13.0	2
RP	SpliceT	End	27.00	18.26	0.11	-0.25	120.72	-0.10	-0.0	-5.62	10.17	-0.01	-0.26	12.02	0.00	0.00	12.28	18.9	2
RP	SpliceT	Origin	27.00	18.26	0.11	-0.25	120.72	-0.10	-0.0	-5.84	10.33	-0.01	-0.22	9.99	0.00	0.00	10.21	15.7	2
RP	RP:SW	End	27.75	17.91	0.10	-0.24	128.46	-0.11	-0.0	-5.84	10.33	-0.01	-0.22	10.39	0.00	0.00	10.61	16.3	2
RP	RP:SW	Origin	27.75	17.91	0.10	-0.24	129.43	-0.11	-0.0	-6.70	12.22	-0.01	-0.25	10.47	0.00	0.00	10.72	16.5	2
RP	RP:Coax8	End	32.00	15.99	0.09	-0.21	181.37	-0.15	-0.0	-6.70	12.22	-0.01	-0.24	12.97	0.00	0.00	13.20	20.3	2
RP	RP:Coax8	Origin	32.00	15.99	0.09	-0.21	181.37	-0.15	-0.0	-7.35	12.96	-0.01	-0.26	12.97	0.00	0.00	13.23	20.3	2
RP	RP:C	End	35.50	14.49	0.07	-0.18	226.74	-0.19	-0.0	-7.35	12.96	-0.01	-0.25	14.72	0.00	0.00	14.97	23.0	2
RP	RP:C	Origin	35.50	14.49	0.07	-0.18	226.74	-8.70	2.8	-12.66	12.66	0.11	-0.43	14.87	0.01	0.09	15.30	23.5	2
RP	Tube 3	End	38.75	13.16	0.06	-0.16	267.90	-8.33	2.8	-12.66	12.66	0.11	-0.41	16.10	0.01	0.09	16.51	25.4	2
RP	Tube 3	Origin	38.75	13.16	0.06	-0.16	267.90	-8.33	2.8	-13.02	12.88	0.11	-0.42	16.10	0.01	0.09	16.52	25.4	2
RP	RP:Coax7	End	42.00	11.89	0.05	-0.13	309.74	-7.96	2.8	-13.02	12.88	0.11	-0.40	17.13	0.01	0.08	17.53	27.0	2
RP	RP:Coax7	Origin	42.00	11.89	0.05	-0.13	309.74	-7.96	2.8	-13.77	13.66	0.11	-0.43	17.13	0.01	0.08	17.56	27.0	2
RP	Tube 3	End	47.00	10.06	0.04	-0.11	378.03	-7.38	2.8	-13.77	13.66	0.11	-0.40	18.52	0.01	0.07	18.92	29.1	2

RP	Tube 3	Origin	47.00	10.06	0.04	-0.11	378.03	-7.39	2.8	-14.39	14.02	0.11	-0.42	18.52	0.01	0.07	18.94	29.1	2
RP	RP:Coax6	End	52.00	8.39	0.03	-0.08	448.10	-6.81	2.8	-14.39	14.02	0.11	-0.40	19.58	0.01	0.06	19.98	30.7	2
RP	RP:Coax6	Origin	52.00	8.39	0.03	-0.08	448.10	-6.82	2.8	-15.31	14.89	0.11	-0.42	19.58	0.01	0.06	20.01	30.8	2
RP	Tube 3	End	57.00	6.88	0.02	-0.06	522.54	-6.25	2.8	-15.31	14.89	0.11	-0.40	20.50	0.01	0.06	20.90	32.2	2
RP	Tube 3	Origin	57.00	6.88	0.02	-0.06	522.54	-6.26	2.8	-16.00	15.29	0.11	-0.42	20.50	0.01	0.06	20.92	32.2	2
RP	RP:Coax5	End	62.00	5.53	0.01	-0.05	598.97	-5.69	2.8	-16.00	15.29	0.11	-0.40	21.22	0.01	0.05	21.62	33.3	2
RP	RP:Coax5	Origin	62.00	5.53	0.01	-0.05	598.97	-5.69	2.8	-17.00	16.19	0.11	-0.42	21.22	0.01	0.05	21.64	33.3	2
RP	SpliceT	End	67.00	4.34	0.01	-0.03	679.94	-5.13	2.8	-17.00	16.19	0.11	-0.40	21.86	0.01	0.05	22.26	34.3	2
RP	SpliceT	Origin	67.00	4.34	0.01	-0.03	679.94	-5.14	2.8	-17.76	16.63	0.11	-0.42	21.86	0.01	0.05	22.28	34.3	2
RP	RP:Coax4	End	72.00	3.30	0.01	-0.02	763.09	-4.58	2.8	-17.76	16.63	0.11	-0.40	22.36	0.00	0.04	22.77	35.0	2
RP	RP:Coax4	Origin	72.00	3.30	0.01	-0.02	763.09	-4.59	2.8	-18.83	17.58	0.11	-0.43	22.36	0.00	0.04	22.79	35.1	2
RP	Tube 4	End	77.00	2.40	0.00	-0.02	850.97	-4.03	2.8	-18.83	17.58	0.11	-0.41	22.83	0.00	0.04	23.24	35.7	2
RP	Tube 4	Origin	77.00	2.40	0.00	-0.02	850.97	-4.04	2.8	-19.65	18.05	0.11	-0.43	22.83	0.00	0.04	23.26	35.8	2
RP	RP:Coax3	End	82.00	1.66	0.00	-0.01	941.21	-3.50	2.8	-19.65	18.05	0.11	-0.41	23.20	0.00	0.04	23.61	36.3	2
RP	RP:Coax3	Origin	82.00	1.66	0.00	-0.01	941.21	-3.50	2.8	-20.79	19.03	0.11	-0.43	23.20	0.00	0.04	23.63	36.4	2
RP	Tube 4	End	87.00	1.05	0.00	-0.01	1036.37	-2.97	2.8	-20.79	19.03	0.11	-0.41	23.55	0.00	0.03	23.97	36.9	2
RP	Tube 4	Origin	87.00	1.05	0.00	-0.01	1036.37	-2.97	2.8	-21.69	19.54	0.10	-0.43	23.55	0.00	0.03	23.99	36.9	2
RP	RP:Coax2	End	92.00	0.59	0.00	-0.00	1134.08	-2.44	2.8	-21.69	19.54	0.10	-0.42	23.84	0.00	0.03	24.26	37.3	2
RP	RP:Coax2	Origin	92.00	0.59	0.00	-0.00	1134.08	-2.45	2.8	-22.90	20.56	0.10	-0.44	23.84	0.00	0.03	24.28	37.4	2
RP	Tube 4	End	97.00	0.26	0.00	-0.00	1236.89	-1.93	2.8	-22.90	20.56	0.10	-0.42	24.12	0.00	0.03	24.55	37.8	2
RP	Tube 4	Origin	97.00	0.26	0.00	-0.00	1236.89	-1.94	2.8	-23.87	21.11	0.10	-0.44	24.12	0.00	0.03	24.56	37.8	2
RP	RP:Coax1	End	102.00	0.07	0.00	-0.00	1342.43	-1.43	2.8	-23.87	21.11	0.10	-0.43	24.35	0.00	0.03	24.78	38.7	2
RP	RP:Coax1	Origin	102.00	0.07	0.00	-0.00	1342.43	-1.43	2.8	-25.15	22.16	0.10	-0.45	24.35	0.00	0.03	24.80	38.7	2
RP	RP:g	End	107.00	0.00	0.00	0.00	1453.26	-0.93	2.8	-25.15	22.16	0.10	-0.43	24.59	0.00	0.02	25.02	39.8	2

Detailed Tubular X-Arm Usages for Load Case "NESC 250C":

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.
XArm	XArm:O	Origin	0.00	14.49	0.39	-0.66	-5.24	-0.00	0.0	-5.22	-3.59	-0.01	-0.36	1.46	0.00	0.00	1.82	2.8	2
XArm	#sXArm:0	End	3.87	14.49	0.31	-0.39	-19.14	-0.05	0.0	-5.22	-3.59	-0.01	-0.36	5.34	0.00	0.00	5.70	8.8	2
XArm	#sXArm:0	Origin	3.87	14.49	0.31	-0.39	-19.14	-0.05	0.0	-5.22	-3.77	-0.01	-0.36	5.34	0.00	0.00	5.70	8.8	2
XArm	XArm:LP	End	7.75	14.49	0.24	-0.19	-33.75	-0.09	0.0	-5.22	-3.77	-0.01	-0.36	9.42	0.00	0.00	9.78	15.1	2
XArm	XArm:LP	Origin	7.75	14.49	0.24	-0.19	-33.75	-5.72	-1.0	11.17	3.07	0.15	0.77	10.07	0.02	0.15	10.85	16.7	2
XArm	#sXArm:1	End	11.63	14.49	0.17	-0.09	-21.84	-5.16	-1.0	11.17	3.07	0.15	0.77	6.68	0.02	0.15	7.46	11.5	2
XArm	#sXArm:1	Origin	11.63	14.49	0.17	-0.09	-21.84	-5.16	-1.0	11.17	2.87	0.14	0.77	6.68	0.02	0.15	7.46	11.5	2
XArm	XArm:ML	End	15.50	14.49	0.12	-0.06	-10.73	-4.61	-1.0	11.17	2.87	0.14	0.77	3.52	0.02	0.15	4.31	6.6	2
XArm	XArm:ML	Origin	15.50	14.49	0.12	-0.06	-15.97	-4.62	-1.0	5.93	-0.80	0.13	0.41	4.99	0.02	0.15	5.40	8.3	2
XArm	#sXArm:2	End	19.38	14.49	0.09	-0.09	-19.05	-4.11	-1.0	5.93	-0.80	0.13	0.41	5.79	0.02	0.15	6.20	9.5	2
XArm	#sXArm:2	Origin	19.38	14.49	0.09	-0.09	-19.05	-4.11	-1.0	5.93	-0.99	0.13	0.41	5.79	0.02	0.15	6.20	9.5	2
XArm	XArm:RP	End	23.25	14.49	0.07	-0.19	-22.91	-3.61	-1.0	5.93	-0.99	0.13	0.41	6.80	0.02	0.15	7.22	11.1	2
XArm	XArm:RP	Origin	23.25	14.49	0.07	-0.19	-22.91	-0.02	-0.0	5.25	3.73	0.00	0.36	6.39	0.00	0.00	6.75	10.4	2
XArm	#sXArm:3	End	27.13	14.49	0.06	-0.35	-8.46	-0.01	-0.0	5.25	3.73	0.00	0.36	2.36	0.00	0.00	2.72	4.2	2
XArm	#sXArm:3	Origin	27.13	14.49	0.06	-0.35	-8.46	-0.01	-0.0	5.26	3.54	0.00	0.36	2.36	0.00	0.00	2.72	4.2	2
XArm	XArm:E	End	31.00	14.49	0.05	-0.55	5.24	0.00	-0.0	5.26	3.54	0.00	0.36	1.46	0.00	0.00	1.83	2.8	2

Summary of Clamp Capacities and Usages for Load Case "NESC 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 %
RAntFUT	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00
RAnt	9.485	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Coax1	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax2	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax3	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax4	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax5	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax6	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax7	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax8	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax9	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Summary of Suspension Capacities and Usages for Load Case "NESC 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 %
SWL	1.840	25.00	0.00	0.00	0.00	0.00	0.00	0.00
SWR	1.840	25.00	0.00	0.00	0.00	0.00	0.00	0.00
PHL	6.281	30.00	0.00	0.00	0.00	0.00	0.00	0.00
PHM	6.281	30.00	0.00	0.00	0.00	0.00	0.00	0.00
PHR	6.281	30.00	0.00	0.00	0.00	0.00	0.00	0.00

*** Analysis Results for Load Case No. 3 "NESC Rule 250D" - Number of iterations in SAPS 13

Equilibrium Joint Positions and Rotations for Load Case "NESC 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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.04612	0.5588	-0.003968	-0.6730	0.0775	0.0327	0.04612	-7.191	80
LP:SW	0.04511	0.5499	-0.003915	-0.6730	0.0775	0.0327	0.04511	-7.2	79.25
LP:C	0.03469	0.4588	-0.003334	-0.6715	0.0775	0.0327	0.03469	-7.291	71.5
RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.06905	0.9518	-0.008055	-0.8150	0.0675	0.0189	0.06905	8.702	107
RP:ANTFUT	0.06552	0.9091	-0.007748	-0.8150	0.0675	0.0189	0.06552	8.659	104
RP:ANT	0.05144	0.7387	-0.006514	-0.8112	0.0674	0.0189	0.05144	8.489	91.99
RP:Coax9	0.04325	0.6402	-0.005707	-0.7970	0.0672	0.0189	0.04325	8.39	84.99
RP:SW	0.03654	0.5612	-0.005064	-0.7747	0.0670	0.0188	0.03654	8.311	79.24
RP:Coax8	0.03159	0.5045	-0.004605	-0.7521	0.0668	0.0188	0.03159	8.255	75
RP:C	0.02753	0.4592	-0.004241	-0.7300	0.0666	0.0188	0.02753	8.209	71.5
RP:Coax7	0.02086	0.379	-0.00353	-0.6779	0.0524	0.0150	0.02086	8.129	65
RP:Coax6	0.01323	0.269	-0.002598	-0.5770	0.0364	0.0105	0.01323	8.019	55
RP:Coax5	0.007942	0.1776	-0.001864	-0.4663	0.0250	0.0073	0.007942	7.928	45
RP:Coax4	0.004355	0.1057	-0.001293	-0.3549	0.0166	0.0049	0.004355	7.856	35
RP:Coax3	0.002033	0.05303	-0.0008451	-0.2467	0.0103	0.0031	0.002033	7.803	25
RP:Coax2	0.0006752	0.01882	-0.0004783	-0.1437	0.0054	0.0016	0.0006752	7.769	15
RP:Coax1	7.022e-05	0.002112	-0.0001557	-0.0464	0.0016	0.0005	7.022e-05	7.752	5
SWLVANG	0.04596	0.55	0.01296	-0.6730	0.0775	0.0327	0.04596	-8.637	79.26
SWRVANG	0.03604	0.5611	-0.02449	-0.7747	0.0670	0.0188	0.03604	9.748	79.23
XArm:O	0.03932	0.4603	-0.08901	0.7164	0.0862	0.0352	1.582	-15.04	71.41
XArm:LP	0.03468	0.4598	-0.005716	0.4162	0.0860	0.0352	1.578	-7.29	71.49
XArm:ML	0.03065	0.4598	0.01844	-0.0024	0.0806	0.0257	1.574	0.4598	71.52
XArm:RP	0.02753	0.4597	-0.006315	-0.4078	0.0752	0.0207	1.57	8.21	71.49
XArm:E	0.02463	0.4594	-0.08521	-0.6605	0.0751	0.0206	1.567	15.96	71.41
VangCL	0.03781	0.4728	-0.08893	0.7164	0.0862	0.0352	1.581	-15.03	70.41
VangCM	0.02925	0.4597	0.01844	-0.0024	0.0806	0.0257	1.572	0.4597	70.52
VangCR	0.02333	0.4478	-0.08514	-0.6605	0.0751	0.0206	1.566	15.95	70.41

Joint Support Reactions for Load Case "NESC Rule 250D":

Joint Label	X Force (kips)	X Usage %(kips)	Y Force	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift Usage %	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 %
LP:g	-0.11	0.0	-8.75	0.0	0.0	-33.44	0.0	0.0	0.00	0.0	585.78	0.0	-27.5	0.0	0.0	-7.48	0.0	0.0
RP:g	0.02	0.0	-7.83	0.0	0.0	-53.24	0.0	0.0	0.00	0.0	553.23	0.0	-18.5	0.0	0.0	-4.33	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC 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.
LP	LP:t	Origin	0.00	6.71	0.55	-0.05	0.00	0.00	-0.0	-0.04	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
LP	LP:SW	End	0.75	6.60	0.54	-0.05	0.00	-0.00	-0.0	-0.04	0.01	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	2
LP	LP:SW	Origin	0.75	6.60	0.54	-0.05	-5.01	0.00	0.0	-3.80	1.67	-0.01	-0.14	0.41	0.00	0.00	0.55	0.8	2
LP	Tube 1	End	4.63	6.05	0.48	-0.04	1.46	-0.02	0.0	-3.80	1.67	-0.01	-0.13	0.03	0.12	0.00	0.26	0.4	4

LP	Tube 1	Origin	4.63	6.05	0.48	-0.04	1.46	-0.02	0.0	-4.29	1.73	-0.01	-0.15	0.03	0.12	0.00	0.28	0.4	4
LP	LP:C	End	8.50	5.51	0.42	-0.04	8.16	-0.06	0.0	-4.29	1.73	-0.01	-0.14	0.53	0.00	0.00	0.68	1.0	2
LP	LP:C	Origin	8.50	5.51	0.42	-0.04	8.16	-20.52	7.5	-18.43	7.52	-0.10	-0.62	1.47	0.50	0.25	2.47	3.8	4
LP	Tube 1	End	13.50	4.81	0.34	-0.03	45.78	-21.00	7.5	-18.43	7.52	-0.10	-0.58	2.93	0.01	0.22	3.53	5.4	2
LP	Tube 1	Origin	13.50	4.81	0.34	-0.03	45.78	-21.01	7.5	-19.15	7.60	-0.10	-0.60	2.93	0.01	0.22	3.56	5.5	2
LP	Tube 1	End	18.50	4.13	0.28	-0.03	83.79	-21.48	7.5	-19.15	7.60	-0.10	-0.57	4.52	0.01	0.20	5.10	7.8	2
LP	Tube 1	Origin	18.50	4.13	0.28	-0.03	83.79	-21.48	7.5	-19.90	7.68	-0.09	-0.59	4.52	0.01	0.20	5.12	7.9	2
LP	Tube 1	End	23.50	3.49	0.22	-0.03	122.18	-21.95	7.5	-19.90	7.68	-0.09	-0.56	5.76	0.01	0.17	6.33	9.7	2
LP	Tube 1	Origin	23.50	3.49	0.22	-0.03	122.18	-21.95	7.5	-20.71	7.76	-0.09	-0.58	5.76	0.01	0.17	6.35	9.8	2
LP	Tube 1	End	28.50	2.90	0.18	-0.02	160.96	-22.42	7.5	-20.71	7.76	-0.09	-0.55	6.74	0.00	0.16	7.29	11.2	2
LP	Tube 1	Origin	28.50	2.90	0.18	-0.02	160.96	-22.42	7.5	-21.55	7.84	-0.09	-0.57	6.74	0.00	0.16	7.32	11.3	2
LP	Tube 1	End	33.50	2.36	0.14	-0.02	200.14	-22.89	7.5	-21.55	7.84	-0.09	-0.54	7.51	0.00	0.14	8.06	12.4	2
LP	Tube 1	Origin	33.50	2.36	0.14	-0.02	200.14	-22.89	7.5	-22.28	7.90	-0.09	-0.56	7.51	0.00	0.14	8.08	12.4	2
LP	Tube 1	End	36.75	2.04	0.12	-0.02	225.82	-23.20	7.5	-22.28	7.90	-0.09	-0.54	7.92	0.00	0.13	8.47	13.0	2
LP	Tube 1	Origin	36.75	2.04	0.12	-0.02	225.82	-23.20	7.5	-22.88	7.96	-0.10	-0.56	7.92	0.00	0.13	8.49	13.1	2
LP	SpliceT	End	40.00	1.74	0.10	-0.01	251.68	-23.50	7.5	-22.88	7.96	-0.10	-0.54	8.28	0.00	0.12	8.82	13.6	2
LP	SpliceT	Origin	40.00	1.74	0.10	-0.01	251.68	-23.51	7.5	-23.67	8.03	-0.10	-0.56	8.28	0.00	0.12	8.84	13.6	2
LP	Tube 2	End	45.00	1.32	0.07	-0.01	291.82	-23.98	7.5	-23.67	8.03	-0.10	-0.54	8.73	0.00	0.11	9.26	14.3	2
LP	Tube 2	Origin	45.00	1.32	0.07	-0.01	291.82	-23.98	7.5	-24.67	8.11	-0.10	-0.56	8.73	0.00	0.11	9.29	14.3	2
LP	Tube 2	End	50.00	0.97	0.05	-0.01	332.39	-24.46	7.5	-24.67	8.11	-0.10	-0.53	9.08	0.00	0.10	9.62	14.8	2
LP	Tube 2	Origin	50.00	0.97	0.05	-0.01	332.39	-24.47	7.5	-25.71	8.20	-0.10	-0.56	9.08	0.00	0.10	9.64	14.8	2
LP	Tube 2	End	55.00	0.67	0.03	-0.01	373.41	-24.95	7.5	-25.71	8.20	-0.10	-0.53	9.36	0.00	0.10	9.90	15.2	2
LP	Tube 2	Origin	55.00	0.67	0.03	-0.01	373.41	-24.95	7.5	-26.79	8.30	-0.10	-0.56	9.36	0.00	0.10	9.92	15.3	2
LP	Tube 2	End	60.00	0.43	0.02	-0.01	414.90	-25.44	7.5	-26.79	8.30	-0.10	-0.53	9.58	0.00	0.09	10.11	15.6	2
LP	Tube 2	Origin	60.00	0.43	0.02	-0.01	414.90	-25.45	7.5	-27.92	8.39	-0.10	-0.56	9.58	0.00	0.09	10.14	15.6	2
LP	Tube 2	End	65.00	0.24	0.01	-0.00	456.86	-25.94	7.5	-27.92	8.39	-0.10	-0.54	9.75	0.00	0.08	10.28	15.8	2
LP	Tube 2	Origin	65.00	0.24	0.01	-0.00	456.86	-25.95	7.5	-29.09	8.49	-0.10	-0.56	9.75	0.00	0.08	10.30	15.9	2
LP	Tube 2	End	70.00	0.11	0.01	-0.00	499.32	-26.45	7.5	-29.09	8.49	-0.10	-0.54	9.87	0.00	0.08	10.41	16.0	2
LP	Tube 2	Origin	70.00	0.11	0.01	-0.00	499.32	-26.46	7.5	-30.31	8.59	-0.10	-0.56	9.87	0.00	0.08	10.43	16.1	2
LP	Tube 2	End	75.00	0.03	0.00	-0.00	542.29	-26.97	7.5	-30.31	8.59	-0.10	-0.54	9.97	0.00	0.07	10.51	16.4	2
LP	Tube 2	Origin	75.00	0.03	0.00	-0.00	542.29	-26.98	7.5	-31.56	8.70	-0.11	-0.56	9.97	0.00	0.07	10.53	16.5	2
LP	LP:g	End	80.00	0.00	0.00	0.00	585.78	-27.50	7.5	-31.56	8.70	-0.11	-0.54	10.03	0.00	0.07	10.58	16.8	2
RP	RP:t	Origin	0.00	11.42	0.83	-0.10	0.00	0.00	0.0	-0.07	0.01	-0.00	-0.01	0.00	0.00	0.00	0.01	0.0	5
RP	RP:ANTFUT	End	3.00	10.91	0.79	-0.09	0.04	-0.00	0.0	-0.07	0.01	-0.00	-0.01	0.02	0.00	0.00	0.02	0.0	2
RP	RP:ANTFUT	Origin	3.00	10.91	0.79	-0.09	0.04	-0.00	-0.0	-0.24	0.05	-0.00	-0.03	0.02	0.00	0.00	0.05	0.1	2
RP	Tube 1	End	7.50	10.14	0.72	-0.09	0.26	-0.01	-0.0	-0.24	0.05	-0.00	-0.03	0.09	0.00	0.00	0.11	0.2	2
RP	Tube 1	Origin	7.50	10.14	0.72	-0.09	0.26	-0.01	-0.0	-0.47	0.09	-0.00	-0.05	0.09	0.00	0.00	0.14	0.2	2
RP	SpliceT	End	12.00	9.37	0.66	-0.08	0.68	-0.02	-0.0	-0.47	0.09	-0.00	-0.05	0.19	0.00	0.00	0.24	0.4	2
RP	SpliceT	Origin	12.00	9.37	0.66	-0.08	0.68	-0.02	-0.0	-0.72	0.13	-0.00	-0.04	0.11	0.00	0.00	0.16	0.2	2
RP	RP:ANT	End	15.00	8.86	0.62	-0.08	1.08	-0.03	-0.0	-0.72	0.13	-0.00	-0.04	0.16	0.00	0.00	0.20	0.3	2
RP	RP:ANT	Origin	15.00	8.86	0.62	-0.08	1.08	-0.03	-0.0	-8.51	1.54	-0.01	-0.47	0.16	0.00	0.00	0.64	1.0	2
RP	Tube 2	End	18.50	8.27	0.57	-0.07	6.48	-0.08	-0.0	-8.51	1.54	-0.01	-0.45	0.85	0.00	0.00	1.30	2.0	2
RP	Tube 2	Origin	18.50	8.27	0.57	-0.07	6.48	-0.08	-0.0	-8.83	1.59	-0.02	-0.46	0.85	0.00	0.00	1.32	2.0	2
RP	RP:Coax9	End	22.00	7.68	0.52	-0.07	12.03	-0.14	-0.0	-8.83	1.59	-0.02	-0.44	1.41	0.00	0.00	1.84	2.8	2
RP	RP:Coax9	Origin	22.00	7.68	0.52	-0.07	12.03	-0.14	-0.0	-10.50	1.73	-0.02	-0.52	1.41	0.00	0.00	1.93	3.0	2
RP	SpliceT	End	27.00	6.86	0.45	-0.06	20.69	-0.24	-0.0	-10.50	1.73	-0.02	-0.48	2.07	0.00	0.00	2.55	3.9	2
RP	SpliceT	Origin	27.00	6.86	0.45	-0.06	20.69	-0.24	-0.0	-10.79	1.77	-0.02	-0.41	1.72	0.00	0.00	2.13	3.3	2
RP	RP:SW	End	27.75	6.73	0.44	-0.06	22.02	-0.25	-0.0	-10.79	1.77	-0.02	-0.40	1.79	0.00	0.00	2.19	3.4	2
RP	RP:SW	Origin	27.75	6.73	0.44	-0.06	27.03	-0.25	-0.0	-14.57	3.44	-0.03	-0.55	2.19	0.00	0.00	2.74	4.2	2
RP	RP:Coax8	End	32.00	6.05	0.38	-0.06	41.66	-0.37	-0.0	-14.57	3.44	-0.03	-0.51	2.98	0.00	0.00	3.50	5.4	2
RP	RP:Coax8	Origin	32.00	6.05	0.38	-0.06	41.66	-0.37	-0.0	-16.32	3.59	-0.03	-0.58	2.98	0.00	0.00	3.56	5.5	2
RP	RP:C	End	35.50	5.51	0.33	-0.05	54.21	-0.47	-0.0	-16.32	3.59	-0.03	-0.55	3.53	0.00	0.00	4.08	6.3	2
RP	RP:C	Origin	35.50	5.51	0.33	-0.05	54.21	-20.23	4.3	-29.28	6.22	0.02	-0.98	3.87	0.00	0.15	4.86	7.5	2
RP	Tube 3	End	38.75	5.02	0.29	-0.05	74.44	-20.16	4.3	-29.28	6.22	0.02	-0.94	4.76	0.00	0.13	5.71	8.8	2
RP	Tube 3	Origin	38.75	5.02	0.29	-0.05	74.44	-20.17	4.3	-29.73	6.26	0.02	-0.96	4.76	0.00	0.13	5.72	8.8	2
RP	RP:Coax7	End	42.00	4.55	0.25	-0.04	94.80	-20.09	4.3	-29.73	6.26	0.02	-0.92	5.50	0.00	0.12	6.43	9.9	2
RP	RP:Coax7	Origin	42.00	4.55	0.25	-0.04	94.80	-20.09	4.3	-31.60	6.41	0.02	-0.98	5.50	0.00	0.12	6.48	10.0	2
RP	Tube 3	End	47.00	3.86	0.20	-0.04	126.82	-19.97	4.3	-31.60	6.41	0.02	-0.92	6.44	0.00	0.11	7.37	11.3	2

RP	Tube 3	Origin	47.00	3.86	0.20	-0.04	126.82	-19.97	4.3	-32.37	6.47	0.03	-0.94	6.44	0.00	0.11	7.39	11.4	2
RP	RP:Coax6	End	52.00	3.23	0.16	-0.03	159.16	-19.84	4.3	-32.37	6.47	0.03	-0.89	7.16	0.00	0.10	8.05	12.4	2
RP	RP:Coax6	Origin	52.00	3.23	0.16	-0.03	159.16	-19.84	4.3	-34.45	6.62	0.03	-0.95	7.16	0.00	0.10	8.11	12.5	2
RP	Tube 3	End	57.00	2.65	0.12	-0.03	192.24	-19.71	4.3	-34.45	6.62	0.03	-0.90	7.73	0.00	0.09	8.63	13.3	2
RP	Tube 3	Origin	57.00	2.65	0.12	-0.03	192.24	-19.71	4.3	-35.31	6.68	0.03	-0.92	7.73	0.00	0.09	8.65	13.3	2
RP	RP:Coax5	End	62.00	2.13	0.10	-0.02	225.65	-19.57	4.3	-35.31	6.68	0.03	-0.88	8.16	0.00	0.08	9.04	13.9	2
RP	RP:Coax5	Origin	62.00	2.13	0.10	-0.02	225.65	-19.57	4.3	-37.48	6.83	0.03	-0.93	8.16	0.00	0.08	9.09	14.0	2
RP	SpliceT	End	67.00	1.67	0.07	-0.02	259.82	-19.44	4.3	-37.48	6.83	0.03	-0.89	8.50	0.00	0.07	9.39	14.4	2
RP	SpliceT	Origin	67.00	1.67	0.07	-0.02	259.82	-19.44	4.3	-38.43	6.90	0.03	-0.91	8.50	0.00	0.07	9.41	14.5	2
RP	RP:Coax4	End	72.00	1.27	0.05	-0.02	294.33	-19.30	4.3	-38.43	6.90	0.03	-0.87	8.76	0.00	0.07	9.63	14.8	2
RP	RP:Coax4	Origin	72.00	1.27	0.05	-0.02	294.33	-19.30	4.3	-40.69	7.06	0.03	-0.92	8.76	0.00	0.07	9.69	14.9	2
RP	Tube 4	End	77.00	0.92	0.04	-0.01	329.62	-19.17	4.3	-40.69	7.06	0.03	-0.88	8.97	0.00	0.06	9.85	15.2	2
RP	Tube 4	Origin	77.00	0.92	0.04	-0.01	329.62	-19.17	4.3	-41.73	7.13	0.03	-0.90	8.97	0.00	0.06	9.87	15.2	2
RP	RP:Coax3	End	82.00	0.64	0.02	-0.01	365.28	-19.04	4.3	-41.73	7.13	0.03	-0.87	9.12	0.00	0.06	9.99	15.4	2
RP	RP:Coax3	Origin	82.00	0.64	0.02	-0.01	365.28	-19.05	4.3	-44.07	7.29	0.02	-0.92	9.12	0.00	0.06	10.04	15.4	2
RP	Tube 4	End	87.00	0.40	0.01	-0.01	401.72	-18.92	4.3	-44.07	7.29	0.02	-0.88	9.24	0.00	0.05	10.12	15.6	2
RP	Tube 4	Origin	87.00	0.40	0.01	-0.01	401.72	-18.92	4.3	-45.20	7.37	0.02	-0.90	9.24	0.00	0.05	10.14	15.6	2
RP	RP:Coax2	End	92.00	0.23	0.01	-0.01	438.57	-18.81	4.3	-45.20	7.37	0.02	-0.87	9.32	0.00	0.05	10.19	15.7	2
RP	RP:Coax2	Origin	92.00	0.23	0.01	-0.01	438.57	-18.81	4.3	-47.63	7.53	0.02	-0.91	9.32	0.00	0.05	10.24	15.7	2
RP	Tube 4	End	97.00	0.10	0.00	-0.00	476.22	-18.70	4.3	-47.63	7.53	0.02	-0.88	9.38	0.00	0.04	10.26	15.8	2
RP	Tube 4	Origin	97.00	0.10	0.00	-0.00	476.22	-18.70	4.3	-48.85	7.62	0.02	-0.90	9.38	0.00	0.04	10.29	15.8	2
RP	RP:Coax1	End	102.00	0.03	0.00	-0.00	514.31	-18.60	4.3	-48.85	7.62	0.02	-0.87	9.42	0.00	0.04	10.29	16.1	2
RP	RP:Coax1	Origin	102.00	0.03	0.00	-0.00	514.31	-18.60	4.3	-51.37	7.78	0.02	-0.92	9.42	0.00	0.04	10.34	16.1	2
RP	RP:g	End	107.00	0.00	0.00	0.00	553.23	-18.51	4.3	-51.37	7.78	0.02	-0.89	9.44	0.00	0.04	10.33	16.4	2

Detailed Tubular X-Arm Usages for Load Case "NESC Rule 250D":

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.
XArm	XArm:O	Origin	0.00	5.52	0.47	-1.07	-2.67	-0.00	0.0	-2.57	-8.34	-0.01	-0.18	0.00	1.20	0.00	2.09	3.2	4
XArm	#sXArm:0	End	3.87	5.52	0.44	-0.51	-34.98	-0.06	0.0	-2.57	-8.34	-0.01	-0.18	9.76	0.00	0.00	9.94	15.3	2
XArm	#sXArm:0	Origin	3.87	5.52	0.44	-0.51	-34.98	-0.06	0.0	-2.59	-8.52	-0.01	-0.18	9.76	0.00	0.00	9.94	15.3	2
XArm	XArm:LP	End	7.75	5.52	0.42	-0.07	-68.00	-0.11	0.0	-2.59	-8.52	-0.01	-0.18	18.97	0.00	0.00	19.15	29.5	2
XArm	XArm:LP	Origin	7.75	5.52	0.42	-0.07	-67.99	-1.47	-0.5	2.88	4.95	0.07	0.20	19.13	0.01	0.07	19.33	29.7	2
XArm	#sXArm:1	End	11.63	5.52	0.39	0.16	-48.83	-1.17	-0.5	2.88	4.95	0.07	0.20	13.75	0.01	0.07	13.95	21.5	2
XArm	#sXArm:1	Origin	11.63	5.52	0.39	0.16	-48.83	-1.18	-0.5	2.89	4.74	0.07	0.20	13.75	0.01	0.07	13.95	21.5	2
XArm	XArm:ML	End	15.50	5.52	0.37	0.22	-30.45	-0.89	-0.5	2.89	4.74	0.07	0.20	8.59	0.01	0.07	8.79	13.5	2
XArm	XArm:ML	Origin	15.50	5.52	0.37	0.22	-33.11	-0.89	-0.5	0.23	-3.66	0.06	0.02	9.34	0.01	0.07	9.35	14.4	2
XArm	#sXArm:2	End	19.38	5.52	0.35	0.15	-47.30	-0.66	-0.5	0.23	-3.66	0.06	0.02	13.26	0.01	0.07	13.28	20.4	2
XArm	#sXArm:2	Origin	19.38	5.52	0.35	0.15	-47.30	-0.66	-0.5	0.21	-3.85	0.06	0.01	13.26	0.01	0.07	13.28	20.4	2
XArm	XArm:RP	End	23.25	5.52	0.33	-0.08	-62.23	-0.42	-0.5	0.21	-3.85	0.06	0.01	17.40	0.01	0.07	17.41	26.8	2
XArm	XArm:RP	Origin	23.25	5.52	0.33	-0.08	-62.23	-0.09	-0.0	2.74	8.47	0.01	0.19	17.36	0.00	0.00	17.55	27.0	2
XArm	#sXArm:3	End	27.13	5.51	0.31	-0.50	-29.40	-0.04	-0.0	2.74	8.47	0.01	0.19	8.20	0.00	0.00	8.39	12.9	2
XArm	#sXArm:3	Origin	27.13	5.51	0.31	-0.50	-29.40	-0.04	-0.0	2.76	8.28	0.01	0.19	8.20	0.00	0.00	8.39	12.9	2
XArm	XArm:E	End	31.00	5.51	0.30	-1.02	2.67	0.00	-0.0	2.76	8.28	0.01	0.19	0.00	1.19	0.00	2.08	3.2	4

Summary of Clamp Capacities and Usages for Load Case "NESC 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 %
RAntFUT	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00
RAnt	7.647	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Coax1	1.266	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax2	1.266	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax3	1.266	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax4	1.266	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax5	1.266	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax6	1.266	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax7	1.266	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax8	1.266	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax9	1.266	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Summary of Suspension Capacities and Usages for Load Case "NESC 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 %
SWL	3.834	25.00	0.00	0.00	0.00	0.00	0.00	0.00
SWR	3.834	25.00	0.00	0.00	0.00	0.00	0.00	0.00
PHL	8.633	30.00	0.00	0.00	0.00	0.00	0.00	0.00
PHM	8.633	30.00	0.00	0.00	0.00	0.00	0.00	0.00
PHR	8.633	30.00	0.00	0.00	0.00	0.00	0.00	0.00

*** Analysis Results for Load Case No. 4 "NESC 250C -" - Number of iterations in SAPS 14

Equilibrium Joint Positions and Rotations for Load Case "NESC 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)
LP:g	0	0	0	0.0000	0.0000	0.0000	0	-7.75	0
LP:t	0.008132	-1.464	-0.01789	1.7511	0.0208	-0.0892	0.008132	-9.214	79.98
LP:SW	0.007895	-1.441	-0.01754	1.7511	0.0208	-0.0892	0.007895	-9.191	79.23
LP:C	0.005449	-1.205	-0.01392	1.7419	0.0208	-0.0892	0.005449	-8.955	71.49
RP:g	0	0	0	0.0000	0.0000	0.0000	0	7.75	0
RP:t	0.04639	-2.642	-0.04436	2.4211	0.0430	-0.0143	0.04639	5.108	107
RP:ANTFUT	0.04417	-2.516	-0.04168	2.4207	0.0430	-0.0143	0.04417	5.234	104
RP:ANT	0.03529	-2.01	-0.03101	2.4050	0.0430	-0.0143	0.03529	5.74	91.97
RP:Coax9	0.03011	-1.72	-0.02492	2.3247	0.0429	-0.0143	0.03011	6.03	84.98
RP:SW	0.02587	-1.492	-0.02037	2.1949	0.0428	-0.0142	0.02587	6.258	79.23
RP:Coax8	0.02274	-1.333	-0.01734	2.0939	0.0427	-0.0141	0.02274	6.417	74.98
RP:C	0.02017	-1.207	-0.01507	2.0007	0.0426	-0.0140	0.02017	6.543	71.48
RP:Coax7	0.01586	-0.9907	-0.01134	1.8138	0.0354	-0.0112	0.01586	6.759	64.99
RP:Coax6	0.01058	-0.6996	-0.006929	1.5127	0.0265	-0.0079	0.01058	7.05	54.99
RP:Coax5	0.006639	-0.4612	-0.003918	1.2118	0.0194	-0.0055	0.006639	7.289	45
RP:Coax4	0.003787	-0.2747	-0.002012	0.9199	0.0137	-0.0037	0.003787	7.475	35
RP:Coax3	0.001832	-0.1382	-0.0009119	0.6405	0.0089	-0.0023	0.001832	7.612	25
RP:Coax2	0.0006291	-0.04921	-0.0003491	0.3745	0.0049	-0.0012	0.0006291	7.701	15
RP:Coax1	6.8e-05	-0.005553	-8.535e-05	0.1217	0.0015	-0.0004	6.8e-05	7.744	5
SWLVANG	0.005643	-1.441	-0.06145	1.7511	0.0208	-0.0892	0.005643	-10.63	79.19
SWRVANG	0.02627	-1.493	0.03466	2.1949	0.0428	-0.0142	0.02627	7.694	79.28
XArm:O	-0.007457	-1.208	-0.04406	0.2329	0.0246	-0.0952	1.535	-16.71	71.46
XArm:LP	0.005447	-1.208	-0.01468	0.1590	0.0248	-0.0955	1.548	-8.958	71.49
XArm:ML	0.01547	-1.208	-0.005049	-0.0063	0.0356	-0.0536	1.558	-1.208	71.49
XArm:RP	0.02017	-1.208	-0.01636	-0.1955	0.0464	-0.0170	1.563	6.542	71.48
XArm:E	0.02243	-1.208	-0.05689	-0.3605	0.0464	-0.0170	1.565	14.29	71.44
VangCL	-0.007879	-1.203	-0.04405	0.2329	0.0246	-0.0952	1.535	-16.7	70.46
VangCM	0.01485	-1.208	-0.005049	-0.0063	0.0356	-0.0536	1.558	-1.208	70.49
VangCR	0.02162	-1.214	-0.05687	-0.3605	0.0464	-0.0170	1.564	14.29	70.44

Joint Support Reactions for Load Case "NESC 250C -":

Joint Label	X Force (kips)	X Usage %(kips)	Y Force	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift 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 %
LP:g	0.06	0.0	25.57	0.0	0.0	-18.43	0.0	0.0	0.00	0.0	-1582.56	0.0	-3.1	0.0	0.0	20.27	0.0	0.0
RP:g	-0.12	0.0	22.45	0.0	0.0	-28.96	0.0	0.0	0.00	0.0	-1454.06	0.0	-17.9	0.0	0.0	3.24	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC 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.
LP	LP:t	Origin	0.00	-17.57	0.10	-0.21	0.00	0.00	0.0	-0.03	-0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	5
LP	LP:SW	End	0.75	-17.30	0.09	-0.21	-0.02	-0.00	0.0	-0.03	-0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	4
LP	LP:SW	Origin	0.75	-17.30	0.09	-0.21	-0.99	-0.00	0.0	-0.87	-1.90	-0.00	-0.03	0.00	0.15	0.00	0.25	0.4	5
LP	Tube 1	End	4.63	-15.87	0.08	-0.19	-8.35	-0.02	0.0	-0.87	-1.90	-0.00	-0.03	0.60	0.00	0.00	0.63	1.0	2

LP	Tube 1	Origin	4.63	-15.87	0.08	-0.19	-8.35	-0.02	0.0	-1.24	-2.16	-0.01	-0.04	0.60	0.00	0.00	0.65	1.0	2
LP	LP:C	End	8.50	-14.46	0.07	-0.17	-16.70	-0.04	0.0	-1.24	-2.16	-0.01	-0.04	1.09	0.00	0.00	1.13	1.7	2
LP	LP:C	Origin	8.50	-14.46	0.07	-0.17	-16.70	-7.95	-20.3	-6.12	-19.01	0.06	-0.21	0.81	1.26	0.68	3.52	5.4	4
LP	Tube 1	End	13.50	-12.64	0.05	-0.14	-111.77	-7.64	-20.3	-6.12	-19.01	0.06	-0.19	6.49	0.00	0.60	6.76	10.4	2
LP	Tube 1	Origin	13.50	-12.64	0.05	-0.14	-111.77	-7.66	-20.3	-6.67	-19.37	0.06	-0.21	6.49	0.00	0.60	6.78	10.4	2
LP	Tube 1	End	18.50	-10.89	0.04	-0.11	-208.64	-7.32	-20.3	-6.67	-19.37	0.06	-0.20	10.63	0.00	0.53	10.87	16.7	2
LP	Tube 1	Origin	18.50	-10.89	0.04	-0.11	-208.64	-7.36	-20.3	-7.28	-19.75	0.06	-0.22	10.63	0.00	0.53	10.89	16.7	2
LP	Tube 1	End	23.50	-9.23	0.03	-0.09	-307.40	-7.00	-20.3	-7.28	-19.75	0.06	-0.20	13.92	0.00	0.47	14.14	21.8	2
LP	Tube 1	Origin	23.50	-9.23	0.03	-0.09	-307.40	-7.03	-20.3	-7.92	-20.15	0.06	-0.22	13.92	0.00	0.47	14.16	21.8	2
LP	Tube 1	End	28.50	-7.68	0.02	-0.07	-408.15	-6.66	-20.3	-7.92	-20.15	0.06	-0.21	16.55	0.00	0.42	16.77	25.8	2
LP	Tube 1	Origin	28.50	-7.68	0.02	-0.07	-408.15	-6.70	-20.3	-8.60	-20.56	0.06	-0.23	16.55	0.00	0.42	16.79	25.8	2
LP	Tube 1	End	33.50	-6.26	0.02	-0.05	-510.96	-6.31	-20.3	-8.60	-20.56	0.06	-0.22	18.67	0.00	0.38	18.90	29.1	2
LP	Tube 1	Origin	33.50	-6.26	0.02	-0.05	-510.96	-6.35	-20.3	-9.20	-20.92	0.07	-0.23	18.67	0.00	0.38	18.91	29.1	2
LP	Tube 1	End	36.75	-5.41	0.02	-0.04	-578.94	-6.09	-20.3	-9.20	-20.92	0.07	-0.22	19.82	0.00	0.36	20.06	30.9	2
LP	Tube 1	Origin	36.75	-5.41	0.02	-0.04	-578.94	-6.13	-20.3	-9.68	-21.20	0.07	-0.24	19.82	0.00	0.36	20.07	30.9	2
LP	SpliceT	End	40.00	-4.62	0.01	-0.03	-647.85	-5.87	-20.3	-9.68	-21.20	0.07	-0.23	20.84	0.00	0.34	21.07	32.4	2
LP	SpliceT	Origin	40.00	-4.62	0.01	-0.03	-647.85	-5.91	-20.3	-10.32	-21.58	0.07	-0.24	20.84	0.00	0.34	21.09	32.4	2
LP	Tube 2	End	45.00	-3.53	0.01	-0.02	-755.77	-5.51	-20.3	-10.32	-21.58	0.07	-0.23	22.16	0.00	0.31	22.40	34.5	2
LP	Tube 2	Origin	45.00	-3.53	0.01	-0.02	-755.77	-5.56	-20.3	-11.13	-22.06	0.07	-0.25	22.16	0.00	0.31	22.42	34.5	2
LP	Tube 2	End	50.00	-2.58	0.01	-0.02	-866.05	-5.15	-20.3	-11.13	-22.06	0.07	-0.24	23.24	0.00	0.28	23.49	36.1	2
LP	Tube 2	Origin	50.00	-2.58	0.01	-0.02	-866.05	-5.20	-20.3	-11.97	-22.55	0.07	-0.26	23.24	0.00	0.28	23.51	36.2	2
LP	Tube 2	End	55.00	-1.79	0.00	-0.01	-978.80	-4.80	-20.3	-11.97	-22.55	0.07	-0.25	24.14	0.00	0.26	24.39	37.5	2
LP	Tube 2	Origin	55.00	-1.79	0.00	-0.01	-978.80	-4.85	-20.3	-12.84	-23.06	0.07	-0.27	24.14	0.00	0.26	24.41	37.5	2
LP	Tube 2	End	60.00	-1.14	0.00	-0.01	-1094.09	-4.45	-20.3	-12.84	-23.06	0.07	-0.26	24.87	0.00	0.24	25.13	38.7	2
LP	Tube 2	Origin	60.00	-1.14	0.00	-0.01	-1094.09	-4.50	-20.3	-13.75	-23.59	0.07	-0.27	24.87	0.00	0.24	25.15	38.7	2
LP	Tube 2	End	65.00	-0.64	0.00	-0.00	-1212.02	-4.10	-20.3	-13.75	-23.59	0.07	-0.26	25.49	0.00	0.22	25.76	39.6	2
LP	Tube 2	Origin	65.00	-0.64	0.00	-0.00	-1212.02	-4.15	-20.3	-14.69	-24.13	0.07	-0.28	25.49	0.00	0.22	25.77	39.7	2
LP	Tube 2	End	70.00	-0.29	0.00	-0.00	-1332.69	-3.76	-20.3	-14.69	-24.13	0.07	-0.27	26.00	0.00	0.20	26.27	40.4	2
LP	Tube 2	Origin	70.00	-0.29	0.00	-0.00	-1332.69	-3.81	-20.3	-15.67	-24.70	0.06	-0.29	26.00	0.00	0.20	26.29	40.5	2
LP	Tube 2	End	75.00	-0.07	0.00	-0.00	-1456.17	-3.42	-20.3	-15.67	-24.70	0.06	-0.28	26.43	0.00	0.19	26.71	41.7	2
LP	Tube 2	Origin	75.00	-0.07	0.00	-0.00	-1456.17	-3.47	-20.3	-16.68	-25.28	0.06	-0.30	26.43	0.00	0.19	26.73	41.8	2
LP	LP:g	End	80.00	0.00	0.00	0.00	-1582.56	-3.09	-20.3	-16.68	-25.28	0.06	-0.29	26.79	0.00	0.18	27.07	43.1	2
RP	RP:t	Origin	0.00	-31.71	0.56	-0.53	0.00	0.00	-0.0	-0.04	-0.05	-0.00	-0.01	0.00	0.01	0.00	0.03	0.0	5
RP	RP:ANTFUT	End	3.00	-30.19	0.53	-0.50	-0.16	-0.00	-0.0	-0.04	-0.05	-0.00	-0.00	0.07	0.00	0.00	0.07	0.1	2
RP	RP:ANTFUT	Origin	3.00	-30.19	0.53	-0.50	-0.16	-0.00	0.0	-0.15	-0.20	-0.00	-0.02	0.05	0.03	0.00	0.09	0.1	3
RP	Tube 1	End	7.50	-27.91	0.49	-0.45	-1.06	-0.00	0.0	-0.15	-0.20	-0.00	-0.02	0.36	0.00	0.00	0.38	0.6	2
RP	Tube 1	Origin	7.50	-27.91	0.49	-0.45	-1.06	-0.00	0.0	-0.29	-0.39	-0.00	-0.03	0.36	0.00	0.00	0.39	0.6	2
RP	SpliceT	End	12.00	-25.63	0.45	-0.40	-2.81	-0.01	0.0	-0.29	-0.39	-0.00	-0.03	0.79	0.00	0.00	0.82	1.3	2
RP	SpliceT	Origin	12.00	-25.63	0.45	-0.40	-2.81	-0.01	0.0	-0.45	-0.56	-0.00	-0.03	0.47	0.00	0.00	0.50	0.8	2
RP	RP:ANT	End	15.00	-24.12	0.42	-0.37	-4.50	-0.02	0.0	-0.45	-0.56	-0.00	-0.03	0.67	0.00	0.00	0.69	1.1	2
RP	RP:ANT	Origin	15.00	-24.12	0.42	-0.37	-4.50	-0.02	0.0	-4.81	-9.25	-0.01	-0.27	0.00	1.05	0.00	1.84	2.8	5
RP	Tube 2	End	18.50	-22.36	0.39	-0.33	-36.87	-0.05	0.0	-4.81	-9.25	-0.01	-0.25	4.84	0.00	0.00	5.09	7.8	2
RP	Tube 2	Origin	18.50	-22.36	0.39	-0.33	-36.87	-0.05	0.0	-5.05	-9.43	-0.01	-0.26	4.84	0.00	0.00	5.10	7.8	2
RP	RP:Coax9	End	22.00	-20.63	0.36	-0.30	-69.88	-0.08	0.0	-5.05	-9.43	-0.01	-0.25	8.15	0.00	0.00	8.40	12.9	2
RP	RP:Coax9	Origin	22.00	-20.63	0.36	-0.30	-69.88	-0.08	0.0	-5.62	-10.17	-0.01	-0.28	8.15	0.00	0.00	8.42	13.0	2
RP	SpliceT	End	27.00	-18.25	0.32	-0.25	-120.71	-0.13	0.0	-5.62	-10.17	-0.01	-0.26	12.02	0.00	0.00	12.28	18.9	2
RP	SpliceT	Origin	27.00	-18.25	0.32	-0.25	-120.71	-0.13	0.0	-5.84	-10.33	-0.01	-0.22	9.99	0.00	0.00	10.21	15.7	2
RP	RP:SW	End	27.75	-17.91	0.31	-0.24	-128.46	-0.14	0.0	-5.84	-10.33	-0.01	-0.22	10.39	0.00	0.00	10.61	16.3	2
RP	RP:SW	Origin	27.75	-17.91	0.31	-0.24	-127.49	-0.14	-0.0	-6.70	-12.22	-0.01	-0.25	10.31	0.00	0.00	10.56	16.3	2
RP	RP:Coax8	End	32.00	-15.99	0.27	-0.21	-179.43	-0.20	-0.0	-6.70	-12.22	-0.01	-0.24	12.83	0.00	0.00	13.07	20.1	2
RP	RP:Coax8	Origin	32.00	-15.99	0.27	-0.21	-179.43	-0.20	-0.0	-7.35	-12.96	-0.01	-0.26	12.83	0.00	0.00	13.09	20.1	2
RP	RP:C	End	35.50	-14.49	0.24	-0.18	-224.80	-0.25	-0.0	-7.35	-12.96	-0.01	-0.25	14.60	0.00	0.00	14.85	22.8	2
RP	RP:C	Origin	35.50	-14.49	0.24	-0.18	-224.80	-9.95	-3.3	-14.72	-12.74	-0.11	-0.50	14.77	0.01	0.11	15.26	23.5	2
RP	Tube 3	End	38.75	-13.16	0.21	-0.16	-266.19	-10.30	-3.3	-14.72	-12.74	-0.11	-0.47	16.03	0.01	0.10	16.51	25.4	2
RP	Tube 3	Origin	38.75	-13.16	0.21	-0.16	-266.19	-10.30	-3.3	-15.09	-12.95	-0.11	-0.49	16.03	0.01	0.10	16.52	25.4	2
RP	RP:Coax7	End	42.00	-11.89	0.19	-0.14	-308.27	-10.65	-3.3	-15.09	-12.95	-0.11	-0.47	17.09	0.01	0.09	17.56	27.0	2
RP	RP:Coax7	Origin	42.00	-11.89	0.19	-0.14	-308.27	-10.66	-3.2	-15.84	-13.72	-0.11	-0.49	17.09	0.01	0.09	17.58	27.0	2
RP	Tube 3	End	47.00	-10.06	0.16	-0.11	-376.88	-11.19	-3.2	-15.84	-13.72	-0.11	-0.46	18.51	0.01	0.08	18.97	29.2	2

RP	Tube 3	Origin	47.00	-10.06	0.16	-0.11	-376.88	-11.20	-3.2	-16.46	-14.08	-0.11	-0.48	18.51	0.01	0.08	18.99	29.2	2
RP	RP:Coax6	End	52.00	-8.40	0.13	-0.08	-447.26	-11.73	-3.2	-16.46	-14.08	-0.11	-0.45	19.60	0.01	0.07	20.06	30.9	2
RP	RP:Coax6	Origin	52.00	-8.40	0.13	-0.08	-447.26	-11.73	-3.2	-17.38	-14.94	-0.11	-0.48	19.60	0.01	0.07	20.08	30.9	2
RP	Tube 3	End	57.00	-6.89	0.10	-0.06	-521.98	-12.27	-3.2	-17.38	-14.94	-0.11	-0.45	20.54	0.01	0.07	21.00	32.3	2
RP	Tube 3	Origin	57.00	-6.89	0.10	-0.06	-521.98	-12.28	-3.2	-18.07	-15.34	-0.11	-0.47	20.54	0.01	0.07	21.02	32.3	2
RP	RP:Coax5	End	62.00	-5.53	0.08	-0.05	-598.66	-12.81	-3.2	-18.07	-15.34	-0.11	-0.45	21.28	0.01	0.06	21.73	33.4	2
RP	RP:Coax5	Origin	62.00	-5.53	0.08	-0.05	-598.66	-12.82	-3.2	-19.07	-16.24	-0.11	-0.47	21.28	0.01	0.06	21.75	33.5	2
RP	SpliceT	End	67.00	-4.34	0.06	-0.03	-679.86	-13.36	-3.2	-19.07	-16.24	-0.11	-0.45	21.93	0.01	0.05	22.38	34.4	2
RP	SpliceT	Origin	67.00	-4.34	0.06	-0.03	-679.86	-13.36	-3.2	-19.83	-16.67	-0.11	-0.47	21.93	0.01	0.05	22.40	34.5	2
RP	RP:Coax4	End	72.00	-3.30	0.05	-0.02	-763.20	-13.90	-3.2	-19.83	-16.67	-0.11	-0.45	22.44	0.00	0.05	22.89	35.2	2
RP	RP:Coax4	Origin	72.00	-3.30	0.05	-0.02	-763.20	-13.91	-3.2	-20.89	-17.61	-0.11	-0.47	22.44	0.00	0.05	22.91	35.3	2
RP	Tube 4	End	77.00	-2.40	0.03	-0.02	-851.25	-14.46	-3.2	-20.89	-17.61	-0.11	-0.45	22.91	0.00	0.05	23.36	35.9	2
RP	Tube 4	Origin	77.00	-2.40	0.03	-0.02	-851.25	-14.46	-3.2	-21.72	-18.08	-0.11	-0.47	22.91	0.00	0.05	23.38	36.0	2
RP	RP:Coax3	End	82.00	-1.66	0.02	-0.01	-941.64	-15.01	-3.2	-21.72	-18.08	-0.11	-0.45	23.29	0.00	0.04	23.74	36.5	2
RP	RP:Coax3	Origin	82.00	-1.66	0.02	-0.01	-941.64	-15.02	-3.2	-22.86	-19.06	-0.11	-0.47	23.29	0.00	0.04	23.76	36.6	2
RP	Tube 4	End	87.00	-1.05	0.01	-0.01	-1036.92	-15.58	-3.2	-22.86	-19.06	-0.11	-0.46	23.64	0.00	0.04	24.10	37.1	2
RP	Tube 4	Origin	87.00	-1.05	0.01	-0.01	-1036.92	-15.58	-3.2	-23.76	-19.56	-0.11	-0.47	23.64	0.00	0.04	24.12	37.1	2
RP	RP:Coax2	End	92.00	-0.59	0.01	-0.00	-1134.73	-16.14	-3.2	-23.76	-19.56	-0.11	-0.46	23.93	0.00	0.04	24.39	37.5	2
RP	RP:Coax2	Origin	92.00	-0.59	0.01	-0.00	-1134.73	-16.15	-3.2	-24.97	-20.58	-0.12	-0.48	23.93	0.00	0.04	24.41	37.6	2
RP	Tube 4	End	97.00	-0.26	0.00	-0.00	-1237.61	-16.71	-3.2	-24.97	-20.58	-0.12	-0.46	24.21	0.00	0.03	24.68	38.0	2
RP	Tube 4	Origin	97.00	-0.26	0.00	-0.00	-1237.61	-16.72	-3.2	-25.93	-21.12	-0.12	-0.48	24.21	0.00	0.03	24.69	38.0	2
RP	RP:Coax1	End	102.00	-0.07	0.00	-0.00	-1343.20	-17.29	-3.2	-25.93	-21.12	-0.12	-0.46	24.45	0.00	0.03	24.91	38.9	2
RP	RP:Coax1	Origin	102.00	-0.07	0.00	-0.00	-1343.20	-17.30	-3.2	-27.21	-22.17	-0.12	-0.49	24.45	0.00	0.03	24.93	38.9	2
RP	RP:g	End	107.00	0.00	0.00	0.00	-1454.06	-17.88	-3.2	-27.21	-22.17	-0.12	-0.47	24.68	0.00	0.03	25.15	40.0	2

Detailed Tubular X-Arm Usages for Load Case "NESC 250C -":

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.
XArm	XArm:O	Origin	0.00	-14.49	-0.09	-0.53	5.24	0.00	0.0	5.26	-3.54	-0.01	0.36	1.46	0.00	0.00	1.83	2.8	2
XArm	#sXArm:0	End	3.87	-14.49	-0.01	-0.34	-8.46	-0.04	0.0	5.26	-3.54	-0.01	0.36	2.36	0.00	0.00	2.73	4.2	2
XArm	#sXArm:0	Origin	3.87	-14.49	-0.01	-0.34	-8.46	-0.04	0.0	5.25	-3.73	-0.01	0.36	2.36	0.00	0.00	2.73	4.2	2
XArm	XArm:LP	End	7.75	-14.49	0.07	-0.18	-22.91	-0.08	0.0	5.25	-3.73	-0.01	0.36	6.40	0.00	0.00	6.76	10.4	2
XArm	XArm:LP	Origin	7.75	-14.49	0.07	-0.18	-22.92	5.18	1.0	-11.17	0.96	-0.07	-0.77	6.99	0.01	0.14	7.77	11.9	2
XArm	#sXArm:1	End	11.63	-14.49	0.13	-0.08	-19.20	4.90	1.0	-11.17	0.96	-0.07	-0.77	5.92	0.01	0.14	6.70	10.3	2
XArm	#sXArm:1	Origin	11.63	-14.49	0.13	-0.08	-19.20	4.90	1.0	-11.17	0.79	-0.08	-0.77	5.92	0.01	0.14	6.70	10.3	2
XArm	XArm:ML	End	15.50	-14.49	0.19	-0.06	-16.16	4.61	1.0	-11.17	0.79	-0.08	-0.77	5.04	0.01	0.14	5.82	8.9	2
XArm	XArm:ML	Origin	15.50	-14.49	0.19	-0.06	-10.92	4.61	1.0	-5.93	-2.86	-0.09	-0.41	3.58	0.01	0.14	4.00	6.1	2
XArm	#sXArm:2	End	19.38	-14.49	0.22	-0.09	-21.99	4.28	1.0	-5.93	-2.86	-0.09	-0.41	6.62	0.01	0.14	7.04	10.8	2
XArm	#sXArm:2	Origin	19.38	-14.49	0.22	-0.09	-21.99	4.28	1.0	-5.94	-3.04	-0.09	-0.41	6.62	0.01	0.14	7.04	10.8	2
XArm	XArm:RP	End	23.25	-14.49	0.24	-0.20	-33.76	3.93	1.0	-5.94	-3.04	-0.09	-0.41	9.87	0.01	0.14	10.28	15.8	2
XArm	XArm:RP	Origin	23.25	-14.49	0.24	-0.20	-33.76	-0.04	-0.0	-5.22	3.77	0.00	-0.36	9.42	0.00	0.00	9.78	15.0	2
XArm	#sXArm:3	End	27.13	-14.50	0.26	-0.41	-19.15	-0.02	-0.0	-5.22	3.77	0.00	-0.36	5.34	0.00	0.00	5.70	8.8	2
XArm	#sXArm:3	Origin	27.13	-14.50	0.26	-0.41	-19.15	-0.02	-0.0	-5.22	3.59	0.00	-0.36	5.34	0.00	0.00	5.70	8.8	2
XArm	XArm:E	End	31.00	-14.50	0.27	-0.68	-5.24	-0.00	-0.0	-5.22	3.59	0.00	-0.36	1.46	0.00	0.00	1.82	2.8	2

Summary of Clamp Capacities and Usages for Load Case "NESC 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 %
RAntFUT	0.000	100.00	0.00	0.00	0.00	0.00	0.00	0.00
RAnt	9.485	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Coax1	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax2	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax3	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax4	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax5	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax6	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax7	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax8	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00
Coax9	0.563	100.00	0.00	0.00	0.00	0.00	0.00	0.00

Summary of Suspension Capacities and Usages for Load Case "NESC 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 %
SWL	1.840	25.00	0.00	0.00	0.00	0.00	0.00	0.00
SWR	1.840	25.00	0.00	0.00	0.00	0.00	0.00	0.00
PHL	6.281	30.00	0.00	0.00	0.00	0.00	0.00	0.00
PHM	6.281	30.00	0.00	0.00	0.00	0.00	0.00	0.00
PHR	6.281	30.00	0.00	0.00	0.00	0.00	0.00	0.00

*** 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)
LP	43.27	NESC 250C	2.5	18	12719.3
RP	40.01	NESC 250C -	2.5	25	14075.1

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 %	
LP	NESC Rule 250B	1	-0.541	2.021	-1.479	1.479	12.996	33.004	45.049	-1.5	118.509	2.234	2.750	66.01	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250B	2	-1.479	1.479	-2.021	0.541	12.996	24.710	33.728	-1.5	101.211	1.933	2.750	49.42	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250B	3	-2.021	-0.541	-1.479	-1.479	12.996	20.727	28.292	-1.5	-88.439	1.771	2.750	41.45	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250B	4	-1.479	-1.479	-0.541	-2.021	12.996	29.644	40.464	-1.5	-107.400	2.117	2.750	59.29	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250B	5	0.541	-2.021	1.479	-1.479	12.996	31.290	42.710	-1.5	-112.604	2.175	2.750	62.58	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250B	6	1.479	-1.479	2.021	-0.541	12.996	22.995	31.388	-1.5	-95.306	1.865	2.750	45.99	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250B	7	2.021	0.541	1.479	1.479	12.996	22.441	30.632	-1.5	94.343	1.842	2.750	44.88	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250B	8	1.479	1.479	0.541	2.021	12.996	31.359	42.804	-1.5	113.304	2.178	2.750	62.72	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC 250C	1	-0.541	2.021	-1.479	1.479	12.996	32.095	43.808	-1.5	115.531	2.203	2.750	64.19	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC 250C	2	-1.479	1.479	-2.021	0.541	12.996	23.592	32.203	-1.5	97.680	1.889	2.750	47.18	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC 250C	3	-2.021	-0.541	-1.479	-1.479	12.996	21.870	29.853	-1.5	-92.078	1.819	2.750	43.74	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC 250C	4	-1.479	-1.479	-0.541	-2.021	12.996	30.590	41.754	-1.5	-110.508	2.151	2.750	61.18	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC 250C	5	0.541	-2.021	1.479	-1.479	12.996	31.162	42.536	-1.5	-112.319	2.171	2.750	62.32	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC 250C	6	1.479	-1.479	2.021	-0.541	12.996	22.660	30.930	-1.5	-94.468	1.851	2.750	45.32	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC 250C	7	2.021	0.541	1.479	1.479	12.996	22.803	31.125	-1.5	95.290	1.857	2.750	45.61	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC 250C	8	1.479	1.479	0.541	2.021	12.996	31.522	43.027	-1.5	113.720	2.184	2.750	63.04	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250D	1	-0.541	2.021	-1.479	1.479	12.996	33.155	45.256	-1.5	118.961	2.239	2.750	66.31	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250D	2	-1.479	1.479	-2.021	0.541	12.996	24.957	34.066	-1.5	101.916	1.943	2.750	49.91	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250D	3	-2.021	-0.541	-1.479	-1.479	12.996	20.459	27.926	-1.5	-87.649	1.759	2.750	40.92	Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
LP	NESC Rule 250D	4	-1.479	-1.479	-0.541	-2.021	12.996	29.465	40.219	-1.5	-106.847	2.111	2.750	58.93	Note: actual load

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overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP NESC Rule 250D    5  0.541 -2.021  1.479 -1.479 12.996  31.597   43.129    -1.5 -113.593     2.186     2.750    63.19  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP NESC Rule 250D    6  1.479 -1.479  2.021 -0.541 12.996  23.399   31.939    -1.5  -96.549     1.881     2.750    46.80  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP NESC Rule 250D    7  2.021  0.541  1.479  1.479 12.996  22.017   30.053    -1.5   93.016     1.825     2.750    44.03  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP NESC Rule 250D    8  1.479  1.479  0.541  2.021 12.996  31.023   42.346    -1.5  112.215     2.166     2.750    62.05  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2

    LP    NESC 250C -    1 -0.541  2.021 -1.479  1.479 12.996  30.884   42.156    -1.5 -111.455     2.161     2.750    61.77  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP    NESC 250C -    2 -1.479  1.479 -2.021  0.541 12.996  22.256   30.379    -1.5  -93.268     1.835     2.750    44.51  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP    NESC 250C -    3 -2.021 -0.541 -1.479 -1.479 12.996  23.210   31.682    -1.5   96.505     1.874     2.750    46.42  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP    NESC 250C -    4 -1.479 -1.479 -0.541 -2.021 12.996  31.805   43.413    -1.5  114.602     2.193     2.750    63.61  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP    NESC 250C -    5  0.541 -2.021  1.479 -1.479 12.996  31.716   43.292    -1.5  114.321     2.190     2.750    63.43  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP    NESC 250C -    6  1.479 -1.479  2.021 -0.541 12.996  23.088   31.515    -1.5   96.135     1.869     2.750    46.18  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP    NESC 250C -    7  2.021  0.541  1.479  1.479 12.996  22.378   30.546    -1.5  -93.638     1.840     2.750    44.76  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    LP    NESC 250C -    8  1.479  1.479  0.541  2.021 12.996  30.973   42.277    -1.5 -111.735     2.164     2.750    61.95  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2

    RP NESC Rule 250B    1 -0.541  2.021 -1.479  1.479 12.996  33.194   45.309    -1.5  119.246     2.241     2.750    66.39  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP NESC Rule 250B    2 -1.479  1.479 -2.021  0.541 12.996  24.789   33.837    -1.5  101.655     1.936     2.750    49.58  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP NESC Rule 250B    3 -2.021 -0.541 -1.479 -1.479 12.996  20.664   28.206    -1.5  -88.065     1.768     2.750    41.33  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP NESC Rule 250B    4 -1.479 -1.479 -0.541 -2.021 12.996  29.478   40.236    -1.5 -106.747     2.112     2.750    58.96  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP NESC Rule 250B    5  0.541 -2.021  1.479 -1.479 12.996  30.558   41.711    -1.5 -110.165     2.150     2.750    61.12  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP NESC Rule 250B    6  1.479 -1.479  2.021 -0.541 12.996  22.153   30.239    -1.5  -92.574     1.830     2.750    44.31  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP NESC Rule 250B    7  2.021  0.541  1.479  1.479 12.996  23.300   31.804    -1.5   97.146     1.877     2.750    46.60  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP NESC Rule 250B    8  1.479  1.479  0.541  2.021 12.996  32.114   43.834    -1.5  115.828     2.204     2.750    64.23  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2

    RP      NESC 250C    1 -0.541  2.021 -1.479  1.479 12.996  31.980   43.652    -1.5  115.213     2.199     2.750    63.96  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP      NESC 250C    2 -1.479  1.479 -2.021  0.541 12.996  23.374   31.905    -1.5   97.086     1.880     2.750    46.75  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP      NESC 250C    3 -2.021 -0.541 -1.479 -1.479 12.996  22.092   30.156    -1.5  -92.688     1.828     2.750    44.18  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP      NESC 250C    4 -1.479 -1.479 -0.541 -2.021 12.996  30.709   41.918    -1.5 -110.844     2.155     2.750    61.42  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP      NESC 250C    5  0.541 -2.021  1.479 -1.479 12.996  30.739   41.957    -1.5 -110.937     2.156     2.750    61.48  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP      NESC 250C    6  1.479 -1.479  2.021 -0.541 12.996  22.133   30.211    -1.5  -92.810     1.830     2.750    44.27  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP      NESC 250C    7  2.021  0.541  1.479  1.479 12.996  23.334   31.850    -1.5   96.964     1.879     2.750    46.67  Note: actual load
overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
    RP      NESC 250C    8  1.479  1.479  0.541  2.021 12.996  31.951   43.612    -1.5  115.120     2.198     2.750    63.90  Note: actual load
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overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2

RP NESC Rule 250D 1 -0.541 2.021 -1.479 1.479 12.996 33.345 45.516 -1.5 119.704 2.246 2.750 66.69 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC Rule 250D 2 -1.479 1.479 -2.021 0.541 12.996 25.027 34.161 -1.5 102.341 1.946 2.750 50.05 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC Rule 250D 3 -2.021 -0.541 -1.479 -1.479 12.996 20.414 27.865 -1.5 -87.327 1.757 2.750 40.83 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC Rule 250D 4 -1.479 -1.479 -0.541 -2.021 12.996 29.309 40.006 -1.5 -106.226 2.105 2.750 58.62 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC Rule 250D 5 0.541 -2.021 1.479 -1.479 12.996 30.829 42.081 -1.5 -111.036 2.159 2.750 61.66 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC Rule 250D 6 1.479 -1.479 2.021 -0.541 12.996 22.511 30.726 -1.5 -93.673 1.845 2.750 45.02 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC Rule 250D 7 2.021 0.541 1.479 1.479 12.996 22.930 31.299 -1.5 95.994 1.862 2.750 45.86 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC Rule 250D 8 1.479 1.479 0.541 2.021 12.996 31.825 43.440 -1.5 114.894 2.194 2.750 63.65 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2

RP NESC 250C - 1 -0.541 2.021 -1.479 1.479 12.996 30.392 41.485 -1.5 -109.825 2.144 2.750 60.78 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC 250C - 2 -1.479 1.479 -2.021 0.541 12.996 21.675 29.586 -1.5 -91.403 1.811 2.750 43.35 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC 250C - 3 -2.021 -0.541 -1.479 -1.479 12.996 23.787 32.469 -1.5 98.357 1.897 2.750 47.57 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC 250C - 4 -1.479 -1.479 -0.541 -2.021 12.996 32.292 44.078 -1.5 116.215 2.210 2.750 64.58 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC 250C - 5 0.541 -2.021 1.479 -1.479 12.996 31.733 43.315 -1.5 114.446 2.191 2.750 63.47 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC 250C - 6 1.479 -1.479 2.021 -0.541 12.996 23.017 31.417 -1.5 96.023 1.866 2.750 46.03 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC 250C - 7 2.021 0.541 1.479 1.479 12.996 22.446 30.638 -1.5 -93.736 1.843 2.750 44.89 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2
RP NESC 250C - 8 1.479 1.479 0.541 2.021 12.996 30.951 42.247 -1.5 -111.594 2.164 2.750 61.90 Note: actual load overridden by one half of pole moment capacity at the base as per ASCE/SEI 48-19 6.4.2

Summary of Tubular X-Arm Usages:

Tubular X-Arm Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
XArm	30.28	NESC Rule 250B	71.5	3	1523.8

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Rule 250B	66.39	RP	Base Plate
NESC 250C	64.19	LP	Base Plate
NESC Rule 250D	66.69	RP	Base Plate
NESC 250C -	64.58	RP	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Steel Pole Usage %	Label	Height AGL (ft)	Segment Number
NESC Rule 250B	24.92	LP	2.5	18
NESC 250C	43.27	LP	2.5	18
NESC Rule 250D	16.83	LP	2.5	18
NESC 250C -	43.07	LP	2.5	18

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 %
NESC Rule 250B	LP	1	12.996	35.429	1856.767	-67.232	33.004	45.049	-1.5	118.509	2.234	66.01
NESC 250C	LP	1	12.996	19.270	1857.837	-23.397	32.095	43.808	-1.5	115.531	2.203	64.19
NESC Rule 250D	LP	1	12.996	32.205	1855.940	-87.135	33.155	45.256	-1.5	118.961	2.239	66.31
NESC 250C -	LP	4	12.996	17.201	-1857.980	-3.623	31.805	43.413	-1.5	114.602	2.193	63.61
NESC Rule 250B	RP	1	12.996	54.486	1857.459	-44.144	33.194	45.309	-1.5	119.246	2.241	66.39
NESC 250C	RP	1	12.996	25.656	1857.983	-1.191	31.980	43.652	-1.5	115.213	2.199	63.96
NESC Rule 250D	RP	1	12.996	52.007	1856.945	-62.135	33.345	45.516	-1.5	119.704	2.246	66.69
NESC 250C -	RP	4	12.996	27.725	-1857.843	-22.842	32.292	44.078	-1.5	116.215	2.210	64.58

Summary of Tubular X-Arm Usages by Load Case:

Load Case	Maximum Tubular X-Arm Usage %	Label	Height AGL (ft)	Segment Number
NESC Rule 250B	30.28	XArm	71.5	3
NESC 250C	16.69	XArm	71.5	3
NESC Rule 250D	29.73	XArm	71.5	3
NESC 250C -	15.82	XArm	71.5	6

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
RAntFUT	Clamp	0.00	NESC Rule 250B	0.0
RAnt	Clamp	0.00	NESC Rule 250B	0.0
Coax1	Clamp	0.00	NESC Rule 250B	0.0
Coax2	Clamp	0.00	NESC Rule 250B	0.0
Coax3	Clamp	0.00	NESC Rule 250B	0.0
Coax4	Clamp	0.00	NESC Rule 250B	0.0
Coax5	Clamp	0.00	NESC Rule 250B	0.0
Coax6	Clamp	0.00	NESC Rule 250B	0.0
Coax7	Clamp	0.00	NESC Rule 250B	0.0
Coax8	Clamp	0.00	NESC Rule 250B	0.0
Coax9	Clamp	0.00	NESC Rule 250B	0.0
SWL	Suspension	0.00	NESC Rule 250B	1.0
SWR	Suspension	0.00	NESC Rule 250B	1.0
PHL	Suspension	0.00	NESC Rule 250B	50.0
PHM	Suspension	0.00	NESC Rule 250B	50.0
PHR	Suspension	0.00	NESC Rule 250B	50.0

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)
NESC Rule 250B	RAntFUT	Clamp	RP:ANTFUT	0.000	0.000	-0.000	0.000
NESC Rule 250B	RAnt	Clamp	RP:ANT	0.000	2.256	8.822	9.106
NESC Rule 250B	Coax1	Clamp	RP:Coax1	0.000	0.172	1.035	1.049
NESC Rule 250B	Coax2	Clamp	RP:Coax2	0.000	0.172	1.035	1.049
NESC Rule 250B	Coax3	Clamp	RP:Coax3	0.000	0.172	1.035	1.049
NESC Rule 250B	Coax4	Clamp	RP:Coax4	0.000	0.172	1.035	1.049
NESC Rule 250B	Coax5	Clamp	RP:Coax5	0.000	0.172	1.035	1.049
NESC Rule 250B	Coax6	Clamp	RP:Coax6	0.000	0.172	1.035	1.049
NESC Rule 250B	Coax7	Clamp	RP:Coax7	0.000	0.172	1.035	1.049
NESC Rule 250B	Coax8	Clamp	RP:Coax8	0.000	0.172	1.035	1.049
NESC Rule 250B	Coax9	Clamp	RP:Coax9	0.000	0.172	1.035	1.049
NESC Rule 250B	SWL	Suspension	SWLVANG	0.000	1.891	2.422	3.073
NESC Rule 250B	SWR	Suspension	SWRVANG	0.000	1.891	2.422	3.073
NESC Rule 250B	PHL	Suspension	VangCL	0.000	3.533	8.055	8.796
NESC Rule 250B	PHM	Suspension	VangCM	0.000	3.533	8.055	8.796
NESC Rule 250B	PHR	Suspension	VangCR	0.000	3.533	8.055	8.796
NESC 250C	RAntFUT	Clamp	RP:ANTFUT	0.000	0.000	-0.000	0.000
NESC 250C	RAnt	Clamp	RP:ANT	0.000	8.341	4.515	9.485
NESC 250C	Coax1	Clamp	RP:Coax1	0.000	0.488	0.281	0.563
NESC 250C	Coax2	Clamp	RP:Coax2	0.000	0.488	0.281	0.563
NESC 250C	Coax3	Clamp	RP:Coax3	0.000	0.488	0.281	0.563
NESC 250C	Coax4	Clamp	RP:Coax4	0.000	0.488	0.281	0.563
NESC 250C	Coax5	Clamp	RP:Coax5	0.000	0.488	0.281	0.563
NESC 250C	Coax6	Clamp	RP:Coax6	0.000	0.488	0.281	0.563
NESC 250C	Coax7	Clamp	RP:Coax7	0.000	0.488	0.281	0.563
NESC 250C	Coax8	Clamp	RP:Coax8	0.000	0.488	0.281	0.563
NESC 250C	Coax9	Clamp	RP:Coax9	0.000	0.488	0.281	0.563
NESC 250C	SWL	Suspension	SWLVANG	0.000	1.712	0.673	1.840
NESC 250C	SWR	Suspension	SWRVANG	0.000	1.712	0.673	1.840
NESC 250C	PHL	Suspension	VangCL	0.000	5.241	3.462	6.281
NESC 250C	PHM	Suspension	VangCM	0.000	5.241	3.462	6.281
NESC 250C	PHR	Suspension	VangCR	0.000	5.241	3.462	6.281
NESC Rule 250D	RAntFUT	Clamp	RP:ANTFUT	0.000	0.000	-0.000	0.000
NESC Rule 250D	RAnt	Clamp	RP:ANT	0.000	1.263	7.542	7.647
NESC Rule 250D	Coax1	Clamp	RP:Coax1	0.000	0.074	1.264	1.266
NESC Rule 250D	Coax2	Clamp	RP:Coax2	0.000	0.074	1.264	1.266
NESC Rule 250D	Coax3	Clamp	RP:Coax3	0.000	0.074	1.264	1.266
NESC Rule 250D	Coax4	Clamp	RP:Coax4	0.000	0.074	1.264	1.266
NESC Rule 250D	Coax5	Clamp	RP:Coax5	0.000	0.074	1.264	1.266
NESC Rule 250D	Coax6	Clamp	RP:Coax6	0.000	0.074	1.264	1.266
NESC Rule 250D	Coax7	Clamp	RP:Coax7	0.000	0.074	1.264	1.266
NESC Rule 250D	Coax8	Clamp	RP:Coax8	0.000	0.074	1.264	1.266
NESC Rule 250D	Coax9	Clamp	RP:Coax9	0.000	0.074	1.264	1.266
NESC Rule 250D	SWL	Suspension	SWLVANG	0.000	1.590	3.489	3.834
NESC Rule 250D	SWR	Suspension	SWRVANG	0.000	1.590	3.489	3.834
NESC Rule 250D	PHL	Suspension	VangCL	0.000	2.666	8.211	8.633
NESC Rule 250D	PHM	Suspension	VangCM	0.000	2.666	8.211	8.633
NESC Rule 250D	PHR	Suspension	VangCR	0.000	2.666	8.211	8.633
NESC 250C -	RAntFUT	Clamp	RP:ANTFUT	0.000	0.000	-0.000	0.000
NESC 250C -	RAnt	Clamp	RP:ANT	0.000	-8.341	4.515	9.485
NESC 250C -	Coax1	Clamp	RP:Coax1	0.000	-0.488	0.281	0.563
NESC 250C -	Coax2	Clamp	RP:Coax2	0.000	-0.488	0.281	0.563
NESC 250C -	Coax3	Clamp	RP:Coax3	0.000	-0.488	0.281	0.563
NESC 250C -	Coax4	Clamp	RP:Coax4	0.000	-0.488	0.281	0.563

NESC 250C -	Coax5	Clamp	RP:Coax5	0.000	-0.488	0.281	0.563
NESC 250C -	Coax6	Clamp	RP:Coax6	0.000	-0.488	0.281	0.563
NESC 250C -	Coax7	Clamp	RP:Coax7	0.000	-0.488	0.281	0.563
NESC 250C -	Coax8	Clamp	RP:Coax8	0.000	-0.488	0.281	0.563
NESC 250C -	Coax9	Clamp	RP:Coax9	0.000	-0.488	0.281	0.563
NESC 250C -	SWL	Suspension	SWLVANG	0.000	-1.712	0.673	1.840
NESC 250C -	SWR	Suspension	SWRVANG	0.000	-1.712	0.673	1.840
NESC 250C -	PHL	Suspension	VangCL	0.000	-5.241	3.462	6.281
NESC 250C -	PHM	Suspension	VangCM	0.000	-5.241	3.462	6.281
NESC 250C -	PHR	Suspension	VangCR	0.000	-5.241	3.462	6.281

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)
NESC Rule 250B	18.186	0.000	47.147	1464.784	-37.284	-16.355
NESC 250C	31.879	0.000	18.777	2399.365	-16.025	-24.257
NESC Rule 250D	13.107	0.000	50.530	1108.679	-38.006	-12.340
NESC 250C -	-31.879	0.000	18.777	-2290.183	-16.025	24.257

*** Weight of structure (lbs):

Weight of Tubular X-Arms:	1523.8
Weight of Steel Poles:	26794.4
Weight of Suspensions:	152.0
Total:	28470.2

*** End of Report

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Subject: Anchor Bolt Analysis CL&P Pole #8012

Location: Farmington, CT

Rev. 3: 12/1/23

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 22021.05

Anchor Bolt Analysis: (Left Pole)

Input Data:

Bolt Force:

Maximum Tensile Force = $T_{Max} := 119 \cdot kips$ (User Input from PLS-Pole)

Maximum Shear Force at Base = $V_{base} := 26 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use AST MA615 Grade 75

Number of Anchor Bolts = $N := 12$ (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 = $V_{Max} := \frac{V_{base}}{N} = 2.2 \times 10^3 lbf$

Shear Stress per Bolt = $f_v := \frac{V_{Max}}{A_s} = 667.1 psi$

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 = $F_{tv} := F_t \cdot \sqrt{1 - \left(\frac{f_v}{F_v}\right)^2} = 74.99 \cdot ksi$

Bolt Tension % of Capacity = $\frac{T_{Max}}{F_{tv} \cdot A_s} = 48.86 \cdot \%$

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

Condition1 = "OK"

Anchor Bolt Analysis: (Right Pole)

Input Data:

Bolt Force:

Maximum Tensile Force = $T_{Max} := 120 \cdot kips$ (User Input from PLS-Pole)

Maximum Shear Force at Base = $V_{base} := 23 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use AST MA615 Grade 75

Number of Anchor Bolts = $N := 12$ (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 = $V_{Max} := \frac{V_{base}}{N} = 1.9 \times 10^3 \, lbf$

Shear Stress per Bolt = $f_v := \frac{V_{Max}}{A_s} = 590.2 \, psi$

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 = $F_{tv} := F_t \cdot \sqrt{1 - \left(\frac{f_v}{F_v} \right)^2} = 74.99 \cdot ksi$

Bolt Tension % of Capacity = $\frac{T_{Max}}{F_{tv} \cdot A_s} = 49.27 \cdot \%$

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

Condition1 = "OK"

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Subject:	Flange Bolts and Flangeplate Analysis
Location:	Structure 8012 Farmington, CT
Rev. 3: 12/1/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22021.05

Flange Bolt and Flange Plate Analysis:

Input Data:

Right Pole - Flange @ 95-ft

Tower Reactions:

Overturning Moment =	OM := 3·ft·kips	(User Input)
Shear Force =	Shear := 1·kips	(User Input)
Axial Force =	Axial := 1·kips	(User Input)

Flange Bolt Data:

Use AST MA325

Number of Flange Bolts =	N := 8	(User Input)
Diameter of Bolt Circle =	D_{bc} := 20.75·in	(User Input)
Bolt Minimum Tensile Strength =	F_{ub} := 120·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Flange Bolts =	D := 1.00·in	(User Input)
Threads per Inch =	n := 8	(User Input)

Flange Plate Data:

Use AST MA871 Grade 65

Plate Yield Strength =	Fy_{bp} := 65·ksi	(User Input)
Flange Plate Thickness =	t_{bp} := 1.00·in	(User Input)
Flange Plate Diameter =	D_{bp} := 23.5·in	(User Input)
Outer Pole Diameter =	D_{pole} := 16.94·in	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 10.375 \cdot in$

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

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

$d_1 = 7.34 \cdot in$ $d_7 = -7.34 \cdot in$

$d_2 = 10.38 \cdot in$ $d_8 = -0.00 \cdot in$

$d_3 = 7.34 \cdot in$ $d_9 = \blacksquare \cdot in$

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

$d_5 = -7.34 \cdot in$ $d_{11} = \blacksquare \cdot in$

$d_6 = -10.38 \cdot in$ $d_{12} = \blacksquare \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 8.47 \cdot in$

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

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

$MA_2 = 1.91 \cdot in$ $MA_8 = 0.00 \cdot in$

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

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

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

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

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 13 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 430.563 \cdot in^2$

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 = $V_{Max} := \frac{Shear}{N \cdot A_g} = 0.2 \cdot ksi$

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

Condition1 = $Condition1 := if\left(V_{Max} \le F_v, "OK", "Overstressed"\right)$ $\frac{V_{Max}}{F_v} = 0.38 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 1.2 \cdot ksi$

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

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 1.36 \cdot \%$

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 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 1.36 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts =

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

$C_1 = 0.7 \cdot kips$

$C_2 = 1.0 \cdot kips$

$C_3 = 0.7 \cdot kips$

$C_4 = 0.1 \cdot kips$

$C_5 = -0.5 \cdot kips$

$C_6 = -0.7 \cdot kips$

$C_7 = -0.5 \cdot kips$

$C_8 = 0.1 \cdot kips$

$C_9 = \blacksquare \cdot kips$

$C_{10} = \blacksquare \cdot kips$

$C_{11} = \blacksquare \cdot kips$

$C_{12} = \blacksquare \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \, t_{bp}^{\,2}\right)} = 0.9 \cdot ksi$$

Allowable Bending Stress in Plate =

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

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 1.5 \cdot \%$$

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:

Right Pole - Flange @ 80-ft

Tower Reactions:

Overturning Moment =	OM := 121·ft·kips	(User Input)
Shear Force =	Shear := 10·kips	(User Input)
Axial Force =	Axial := 6.0·kips	(User Input)

Flange Bolt Data:

Use AST MA325

Number of Flange Bolts =	N := 24	(User Input)
Diameter of Bolt Circle =	D_{bc} := 26.25·in	(User Input)
Bolt Minimum Tensile Strength =	F_{ub} := 120·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Flange Bolts =	D := 1.00·in	(User Input)
Threads per Inch =	n := 8	(User Input)

Flange Plate Data:

Use AST MA588 Grade 50

Plate Yield Strength =	Fy_{bp} := 50·ksi	(User Input)
Flange Plate Thickness =	t_{bp} := 1.75·in	(User Input)
Flange Plate Diameter =	D_{bp} := 29·in	(User Input)
Outer Pole Diameter =	D_{pole} := 22.11·in	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 13.125 \cdot in$

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

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

$d_1 = 3.40 \cdot in$ $d_7 = 12.68 \cdot in$

$d_2 = 6.56 \cdot in$ $d_8 = 11.37 \cdot in$

$d_3 = 9.28 \cdot in$ $d_9 = 9.28 \cdot in$

$d_4 = 11.37 \cdot in$ $d_{10} = 6.56 \cdot in$

$d_5 = 12.68 \cdot in$ $d_{11} = 3.40 \cdot in$

$d_6 = 13.13 \cdot in$ $d_{12} = 0.00 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 11.055 \cdot in$

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

$MA_1 = 0.00 \cdot in$ $MA_7 = 1.62 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = 0.31 \cdot in$

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

$MA_4 = 0.31 \cdot in$ $MA_{10} = 0.00 \cdot in$

$MA_5 = 1.62 \cdot in$ $MA_{11} = 0.00 \cdot in$

$MA_6 = 2.07 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 15 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 2.067 \times 10^3 \cdot in^2$

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 = $V_{Max} := \frac{Shear}{N \cdot A_g} = 0.5 \cdot ksi$

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

Condition1 = $Condition1 := if\left(V_{Max} \le F_v, "OK", "Overstressed"\right)$ $\frac{V_{Max}}{F_v} = 1.26 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 14.8 \cdot ksi$

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

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 16.45 \cdot \%$

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 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 16.45 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts =

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

$C_1 = 2.6 \cdot kips$ $C_7 = 9.2 \cdot kips$

$C_2 = 4.9 \cdot kips$ $C_8 = 8.2 \cdot kips$

$C_3 = 6.8 \cdot kips$ $C_9 = 6.8 \cdot kips$

$C_4 = 8.2 \cdot kips$ $C_{10} = 4.9 \cdot kips$

$C_5 = 9.2 \cdot kips$ $C_{11} = 2.6 \cdot kips$

$C_6 = 9.5 \cdot kips$ $C_{12} = 0.3 \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^2\right)} = 7.1 \cdot ksi$$

Allowable Bending Stress in Plate =

$$F_{bp} := 0.9 \cdot Fy_{bp} = 45 \cdot ksi$$

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 15.8 \cdot \%$$

Condition1 =

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

Condition1 = "Ok"

Flange Bolt and Flange Plate Analysis:

Input Data: Right Pole - Flange @ 40-ft

Tower Reactions:

Overturning Moment =	OM := 680·ft·kips	(User Input)
Shear Force =	Shear := 17·kips	(User Input)
Axial Force =	Axial := 18·kips	(User Input)

Flange Bolt Data:

Use AST MA325

Number of Flange Bolts =	N := 36	(User Input)
Diameter of Bolt Circle =	D_{bc} := 39.75·in	(User Input)
Bolt Minimum Tensile Strength =	F_{ub} := 120·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Flange Bolts =	D := 1.00·in	(User Input)
Threads per Inch =	n := 8	(User Input)

Flange Plate Data:

Use AST MA588 Grade 50

Plate Yield Strength =	Fy_{bp} := 50·ksi	(User Input)
Flange Plate Thickness =	t_{bp} := 1.75·in	(User Input)
Flange Plate Diameter =	D_{bp} := 42.5·in	(User Input)
Outer Pole Diameter =	D_{pole} := 35.37·in	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 19.875 \cdot in$

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

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

$d_1 = 3.45 \cdot in$ $d_7 = 18.68 \cdot in$

$d_2 = 6.80 \cdot in$ $d_8 = 19.57 \cdot in$

$d_3 = 9.94 \cdot in$ $d_9 = 19.88 \cdot in$

$d_4 = 12.78 \cdot in$ $d_{10} = 19.57 \cdot in$

$d_5 = 15.23 \cdot in$ $d_{11} = 18.68 \cdot in$

$d_6 = 17.21 \cdot in$ $d_{12} = 17.21 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 17.685 \cdot in$

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

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.99 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_8 = 1.89 \cdot in$

$MA_3 = 0.00 \cdot in$ $MA_9 = 2.19 \cdot in$

$MA_4 = 0.00 \cdot in$ $MA_{10} = 1.89 \cdot in$

$MA_5 = 0.00 \cdot in$ $MA_{11} = 0.99 \cdot in$

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

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 18.9 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 7.11 \times 10^3 \cdot in^2$

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 = $V_{Max} := \frac{Shear}{N \cdot A_g} = 0.6 \cdot ksi$

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

Condition1 = $Condition1 := if\left(V_{Max} \le F_v, "OK", "Overstressed"\right)$ $\frac{V_{Max}}{F_v} = 1.43 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 36.8 \cdot ksi$

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

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 40.92 \cdot \%$

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 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 40.93 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

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

$C_1 = 4.5 \cdot kips$ $C_7 = 21.9 \cdot kips$

$C_2 = 8.3 \cdot kips$ $C_8 = 23.0 \cdot kips$

$C_3 = 11.9 \cdot kips$ $C_9 = 23.3 \cdot kips$

$C_4 = 15.2 \cdot kips$ $C_{10} = 23.0 \cdot kips$

$C_5 = 18.0 \cdot kips$ $C_{11} = 21.9 \cdot kips$

$C_6 = 20.3 \cdot kips$ $C_{12} = 20.3 \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \, t_{bp}^{\,2}\right)} = 18.8 \cdot ksi$$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 45 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 41.9 \cdot \%$

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

Condition1 = "Ok"

Flange Bolt and Flange Plate Analysis:

Input Data:

Left Pole - Flange @ 40-ft

Tower Reactions:

Overturning Moment =	OM := 648·ft·kips	(User Input)
Shear Force =	Shear := 22·kips	(User Input)
Axial Force =	Axial := 13·kips	(User Input)

Flange Bolt Data:

Use AST MA325

Number of Flange Bolts =	N := 36	(User Input)
Diameter of Bolt Circle =	D_{bc} := 39.75·in	(User Input)
Bolt Minimum Tensile Strength =	F_{ub} := 120·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Flange Bolts =	D := 1.00·in	(User Input)
Threads per Inch =	n := 8	(User Input)

Flange Plate Data:

Use AST MA588 Grade 50

Plate Yield Strength =	Fy_{bp} := 50·ksi	(User Input)
Flange Plate Thickness =	t_{bp} := 1.75·in	(User Input)
Flange Plate Diameter =	D_{bp} := 42.5·in	(User Input)
Outer Pole Diameter =	D_{pole} := 35.37·in	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 19.875 \cdot in$

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

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

$d_1 = 3.45 \cdot in$ $d_7 = 18.68 \cdot in$
$d_2 = 6.80 \cdot in$ $d_8 = 19.57 \cdot in$
$d_3 = 9.94 \cdot in$ $d_9 = 19.88 \cdot in$
$d_4 = 12.78 \cdot in$ $d_{10} = 19.57 \cdot in$
$d_5 = 15.23 \cdot in$ $d_{11} = 18.68 \cdot in$
$d_6 = 17.21 \cdot in$ $d_{12} = 17.21 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 17.685 \cdot in$

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

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.99 \cdot in$
$MA_2 = 0.00 \cdot in$ $MA_8 = 1.89 \cdot in$
$MA_3 = 0.00 \cdot in$ $MA_9 = 2.19 \cdot in$
$MA_4 = 0.00 \cdot in$ $MA_{10} = 1.89 \cdot in$
$MA_5 = 0.00 \cdot in$ $MA_{11} = 0.99 \cdot in$
$MA_6 = 0.00 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 18.9 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 7.11 \times 10^3 \cdot in^2$

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 = $V_{Max} := \frac{Shear}{N \cdot A_g} = 0.8 \cdot ksi$

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

Condition1 = $Condition1 := if\left(V_{Max} \le F_v, "OK", "Overstressed"\right)$ $\frac{V_{Max}}{F_v} = 1.85 \cdot \%$

Condition1 = "OK"

Maximum Tensile Stress = $T_{Max} := \frac{\left(OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N}\right)}{A_n} = 35.3 \cdot ksi$

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

Condition2 = $Condition2 := if\left(\frac{T_{Max}}{F_t} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_t} = 39.21 \cdot \%$

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 = $Condition3 := if\left(\frac{T_{Max}}{F_{t.v}} \le 1.00, "OK", "Overstressed"\right)$ $\frac{T_{Max}}{F_{t.v}} = 39.21 \cdot \%$

Condition3 = "OK"

Flange Plate Analysis:

Force from Bolts =

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

$C_1 = 4.1 \cdot kips$ $C_7 = 20.8 \cdot kips$

$C_2 = 7.8 \cdot kips$ $C_8 = 21.8 \cdot kips$

$C_3 = 11.2 \cdot kips$ $C_9 = 22.1 \cdot kips$

$C_4 = 14.3 \cdot kips$ $C_{10} = 21.8 \cdot kips$

$C_5 = 17.0 \cdot kips$ $C_{11} = 20.8 \cdot kips$

$C_6 = 19.2 \cdot kips$ $C_{12} = 19.2 \cdot kips$

Maximum Bending Stress in Plate =

$$f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^2\right)} = 17.9 \cdot ksi$$

Allowable Bending Stress in Plate =

$$F_{bp} := 0.9 \cdot Fy_{bp} = 45 \cdot ksi$$

Plate Bending Stress % of Capacity =

$$\frac{f_{bp}}{F_{bp}} = 39.7 \cdot \%$$

Condition1 =

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

Condition1 = "Ok"

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTL01104	DATE:	3/10/2020	RF DESIGN ENG:	Mateen Mohammed	RF PERF ENG:	Folarin Ayo
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	5107767382	RF PERF PHONE:	
REVISION:	Preliminary	RF MANAGER:	John Benedetto	RF DESIGN EMAIL:	mm093q@att.com	RF PERF EMAIL:	

RFDS PROGRAM TYPE:	2021 5G NR Radio		
RFDS TECHNOLOGY:	5G NR 1SR CBAND		
STATE/ISTATUS:	Preliminary/Approved		
RFDS ID:	4541348		
Created By:	mm093q	Updated By:	mm093q
Created:	5/17/2021	Updated:	12/17/2021
Estimated SQIN:	13.688	Expiration:	
RER Initiative:		Calculation ID:	20211214134006215 6
PRD || SUB GRP #1	5G NR Radio || 5G NR 1SR CBand		
PRD || SUB GRP #2	5G NR Radio || 5G NR 1SR CBand		
PRD || SUB GRP #3			
PRD || SUB GRP #4			
PRD || SUB GRP #5			
PRD || SUB GRP #6			
PRD || SUB GRP #7			
PRD || SUB GRP #8			

ADDITIONAL WORKFLOW NOTIFICATIONS:	
RFDS VERSION:	3.00
UMTS FREQUENCY:	
LTE FREQUENCY:	700,1900,AWS,WCS
5G FREQUENCY:	CBAND,DoD,850,1900,AWS
IPLAN JOB # 1:	ER_-RCTB-21-01922
IPLAN JOB # 2:	ER_-RCTB-21-00876
IPLAN JOB # 3:	
IPLAN JOB # 4:	
IPLAN JOB # 5:	
IPLAN JOB # 6:	
IPLAN JOB # 7:	
IPLAN JOB # 8:	

CBand+DoD.
Self support Tower on the Top to Utility pole.

Removed Iplan - ER_-RCTB-21-06480 , LTE Multi Carrier || BWE Tower Top RRH Swap

Section 2 - LOCATION INFORMATION

USID:	59423	FA LOCATION CODE:	10035295	LOCATION NAME:	FARMINGTON NU MAPLE RIDGE DR	ORACLE PRJT # 1:	2051A1027B
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT	ORACLE PRJT # 2:	2051A0Z7DJ
ADDRESS:	45 MAPLE RIDGE DRIVE	CITY:	FARMINGTON	STATE:	CT	ORACLE PRJT # 3:	
ZIP CODE:	06032	COUNTY:	HARTFORD	LONG (DEC. DEG.):	-72.7693019	ORACLE PRJT # 4:	
LATITUDE (D-M-S):	41d 43m4.692s	LONGITUDE (D-M-S):	-72d -46m-9.48684s	LAT (DEC. DEG.):	41.7179700	ORACLE PRJT # 5:	

ORACLE PRJT # 6:		PACE JOB #6:	
ORACLE PRJT # 7:		PACE JOB #7:	
ORACLE PRJT # 8:		PACE JOB #8:	
BORDER CELL WITH CONTOUR COORD:		SEARCH RING NAME:	
AM STUDY REQ'D (Y/N):	No	SEARCH RING ID:	
FREQ COORD:		BTA:	MSA / RSA:
		LAC(UMTS):	05986
RF DISTRICT:	TBD		
RF ZONE:	TBD	RNC(UMTS):	MIDDLETOWN RNC06
		MME POOL ID(LTE):	FF01
PARENT NAME(UMTS):	MDTWCTNICRBR06		

DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:

UPDATED 8/19/2021 (CISCO 901 SIAD) (5G BBU 6630)(GROUND LEVEL SHELTER WITH CIPHER LOCK ON DOOR 4252) (NOTECLOSE DOOR GENTLY DO NOT PUSH HARD OR DOOR WILL GET STRUCK IN DOOR FRAME)(THIS IS A POWER POLE SITE ALL UMTS AND LTE RADIO HEADS ARE LOCATED IN SHELTER) CT1104TAKE I91 SOUTH TOWARD NEW HAVEN MERGE ONTO CT 9N VIA EXIT 22N TOWARD NEW BRITIAN TAKE THE CT 71 EXIT NUMBER 30 TOWARD CORBINS CORNER TURN RIGHT ONTO CT 71 TURN LEFT ONTO SOUTH RD TURN LEFT ONTO MAPLE RIDGE DR SITE IS ON THE RIGHT DOWN THE ROAD EVERSOURCE POWER MOUNT 1ST GATE COMBO IS 5509 OR 4252 CODE 2ND GATE COMBO IS 4252 CIPHER LOCK ON DOOR 4252 METER # 89 094 946 POWER COMPANY IS EVERSOURCE TEL # 8609472000

Section 3 - LICENSE COVERAGE/FILING INFORMATION

CGSA - NO FILING TRIGGERED (Yes/No):	Yes	CGSA LOSS:		PCS REDUCED - UPS ZIP:	
CGSA - MINOR FILING NEEDED (Yes/No):	No	CGSA EXT AGMT NEEDED:		PCS POPS REDUCED:	
CGSA - MAJOR FILING NEEDED (Yes/No):	No	CGSA SCORECARD UPDATED:		CGSA CALL SIGNS:	

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	No	GROUND ELEVATION (ft):	0	STRUCTURE TYPE:	UTILITY
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	0.00	FCC ASR NUMBER:	
SUB-LEASE RIGHTS?:	No	STRUCTURE HEIGHT (ft):	101.00		
LIGHTING TYPE:	NOT REQUIRED				

MARKET LOCATION 700 MHz Band:	
MARKET LOCATION 850 MHz Band:	On-Air
MARKET LOCATION 1900 MHz Band:	On-Air
MARKET LOCATION AWS Band:	
MARKET LOCATION WCS Band:	
MARKET LOCATION Future Band:	

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911				INTRADO		0		
SECTOR B				INTRADO		0		
SECTOR C				INTRADO		0		
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911				INTRADO		0		
SECTOR B				INTRADO		0		
SECTOR C				INTRADO		0		
SECTOR D								
SECTOR E								
SECTOR F								
OMNI								

Section 6/7 - BBU INFORMATION - existing

	BBU 1	BBU 2	BBU 3	BBU 4
BBU ID:	172525	229472	366891	551242
TECHNOLOGY:	UMTS	UMTS	LTE	LTE,5G
BBU NAME:	CTU1104	CTV1104	CTL01104	CTL00104R,CTCN001104
BBU USID:	59423	59423	59423	59423
CELL ID / BCF:	CTU1104	CTU1104	CTL01104	CTL00104R
BTA/TID:	184V	184U	184L	184L
4-9 DIGIT SITE ID:	1104	1104	1104	0104
COW OR TOY?:	No	No	No	No
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL
BTS LOCATION ID:	INTERNAL	INTERNAL	INTERNAL	
BASE STATION TYPE:	BASE	OVERLAY	BASE	OVERLAY
EQUIPMENT NAME:	FARMINGTON NU MAPLE RIDGE DR	FARMINGTON NU MAPLE RIDGE DR	FARMINGTON NU MAPLE RIDGE DR	FARMINGTON NU MAPLE RIDGE DR
DISASTER PRIORITY:	1	1	3	3
EQUIPMENT VENDOR:	ERICSSON	ERICSSON	ERICSSON	ERICSSON
EQUIPMENT TYPE (Model):			6601 INDOOR MU	6601 INDOOR MU
BASEBAND CONFIGURATION :				
MARKET STATE CODE:			CT	CT,CTC
NODE B NUMBER:	0	0	1104	104,1104
SIDEHAUL SWITCH VENDOR:				
SIDEHAUL SWITCH MODEL:				
SIDEHAUL SWITCH NAME:				
CSS - CTS COMMON ID:	CTU1104	CTV1104	CTL01104	CTL00104R
CSS - SECONDARY FUNCTION ID:				CTCN001104

Section 6/7 - BBU INFORMATION - final

	BBU 1	BBU 2	BBU 3
BBU ID:	366891	0	551242
TECHNOLOGY:	LTE	5G	LTE,5G
BBU NAME:	CTL01104	CTCN011104	CTL00104R,CTCN001104
BBU USID:	59423	59423	59423
CELL ID / BCF:	CTL01104	CTCN011104	CTL00104R
BTA/TID:	184L		184L
4-9 DIGIT SITE ID:	1104	14011104	0104
COW OR TOY?:	No	No	No
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL
BTS LOCATION ID:	INTERNAL	INTERNAL	
BASE STATION TYPE:	BASE	OVERLAY	OVERLAY
EQUIPMENT NAME:	FARMINGTON NU MAPLE RIDGE DR	CTCN011104	FARMINGTON NU MAPLE RIDGE DR
DISASTER PRIORITY:	3	0	3
EQUIPMENT VENDOR:	ERICSSON	ERICSSON	ERICSSON
EQUIPMENT TYPE (Model):	BASEBAND 6630	BASEBAND 6648	BASEBAND 6630
BASEBAND CONFIGURATION :	1x6601 / 1x6630 / 1xXMU03	xxxxx / 1x6648 / xxxxx + IDLe	xxxxx / 1x6630 Mixed-Mode / xxxxx + I
MARKET STATE CODE:	CT	CTC	CT,CTC
NODE B NUMBER:	1104	11104	104,1104
SIDEHAUL SWITCH VENDOR:			
SIDEHAUL SWITCH MODEL:			
SIDEHAUL SWITCH NAME:			
CSS - CTS COMMON ID:	CTL01104		CTL00104R
CSS - SECONDARY FUNCTION ID:			CTCN001104

Section 7b - Radio INFORMATION - existing

Section 7b - Radio INFORMATION - final

Section 8 - RBS/SECTOR ASSOCIATION - existing

	BBU 1	BBU 2	BBU 3	BBU 4
CTS Common ID	CTU1104	CTV1104	CTL01104	CTL00104R,CTCN001104
Soft Sector IDs	CTU11044	CTV11041	CTL01104_2A_2	CTCN001104_N005A_1
	CTU11045	CTV11042	CTL01104_2B_2	CTCN001104_N005B_1
	CTU11046	CTV11043	CTL01104_2C_2	CTCN001104_N005C_1
	CTU11047	CTV1104A	CTL01104_3A_1	CTL00104_2A_2
	CTU11048	CTV1104B	CTL01104_3B_1	CTL00104_2B_2
	CTU11049	CTV1104C	CTL01104_3C_1	CTL00104_2C_2
			CTL01104_7A_1	CTL00104_3A_1
			CTL01104_7A_2_E	CTL00104_7A_1
			CTL01104_7A_3_F	CTL00104_9A_1
			CTL01104_7B_1	CTL00104_9A_2
			CTL01104_7B_2_E	CTL00104_9A_3
			CTL01104_7B_3_F	CTL00104_9B_1
			CTL01104_7C_1	CTL00104_9B_2
			CTL01104_7C_2_E	CTL00104_9B_3
			CTL01104_7C_3_F	CTL00104_9C_1
			CTL01104_8A_1	CTL00104_9C_2
			CTL01104_8B_1	CTL00104_9C_3
			CTL01104_8C_1	
			CTL01104_9A_1	
			CTL01104_9A_2	
			CTL01104_9B_1	
			CTL01104_9B_2	
			CTL01104_9C_1	
			CTL01104_9C_2	

Section 8 - RBS/SECTOR ASSOCIATION - final

	BBU 1	BBU 2	BBU 3
CTS Common ID	CTL01104	CTCN011104	CTL00104R,CTCN001104
Soft Sector IDs	CTL01104_3A_1	CTCN011104_N077A_1	CTCN001104_N002A_1
	CTL01104_3B_1	CTCN011104_N077A_2	CTCN001104_N002B_1
	CTL01104_3C_1	CTCN011104_N077B_1	CTCN001104_N002C_1
	CTL01104_7A_1	CTCN011104_N077B_2	CTCN001104_N005A_1
	CTL01104_7A_3_F	CTCN011104_N077C_1	CTCN001104_N005B_1
	CTL01104_7B_1	CTCN011104_N077C_2	CTCN001104_N005C_1
	CTL01104_7B_3_F		CTCN001104_N066A_1
	CTL01104_7C_1		CTCN001104_N066B_1
	CTL01104_7C_3_F		CTCN001104_N066C_1
			CTL00104_2A_2
			CTL00104_2B_2
			CTL00104_2C_2
			CTL00104_9A_1
			CTL00104_9A_2
			CTL00104_9A_3
			CTL00104_9B_1
			CTL00104_9B_2
			CTL00104_9B_3
			CTL00104_9C_1
			CTL00104_9C_2
			CTL00104_9C_3

Section 9 - SOFT SECTOR ID - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 3RD 700	LTE 3RD 1900	LTE 4TH 700	LTE 4TH 1900	LTE 5TH 1900	5G 1ST 850	5G 1ST 1900	5G 1ST AWS	5G 1ST CBAND	5G 2ND CBAND
USEID (excluding Hard Sector)	59423.850.3G.1	59423.1900.3G.1	59423.850.3G.2	59423.1900.3G.2																			
SECTOR A SOFT SECTOR ID	CTV11041	CTU11047	CTV1104A	CTU11044	CTL01104_7A_1	CTL01104_8A_1	CTL00104_9A_1	CTL00104_2A_2	CTL01104_3A_1	CTL01104_7A_2_E	CTL01104_9A_2	CTL01104_2A_2	CTL00104_3A_1	CTL01104_7A_3_F	CTL00104_9A_3	CTL00104_7A_1	CTL00104_9A_2	CTL01104_9A_1	CTCN001104_N005A_1				
SECTOR B	CTV11042	CTU11048	CTV1104B	CTU11045	CTL01104_7B_1	CTL01104_8B_1	CTL00104_9B_1	CTL00104_2B_2	CTL01104_3B_1	CTL01104_7B_2_E	CTL01104_9B_2	CTL01104_2B_2		CTL01104_7B_3_F	CTL00104_9B_3		CTL00104_9B_2	CTL01104_9B_1	CTCN001104_N005B_1				
SECTOR C	CTV11043	CTU11049	CTV1104C	CTU11046	CTL01104_7C_1	CTL01104_8C_1	CTL00104_9C_1	CTL00104_2C_2	CTL01104_3C_1	CTL01104_7C_2_E	CTL01104_9C_2	CTL01104_2C_2		CTL01104_7C_3_F	CTL00104_9C_3		CTL00104_9C_2	CTL01104_9C_1	CTCN001104_N005C_1				
SECTOR D																							
SECTOR E																							
SECTOR F																							
OMNI																							

Section 9 - SOFT SECTOR ID - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 3RD 700	LTE 3RD 1900	LTE 4TH 700	LTE 4TH 1900	LTE 5TH 1900	5G 1ST 850	5G 1ST 1900	5G 1ST AWS	5G 1ST CBAND	5G 2ND CBAND
USEID (excluding Hard Sector)																							
SECTOR A SOFT SECTOR ID					CTL01104_7A_1		CTL00104_9A_1	CTL00104_2A_2	CTL01104_3A_1					CTL01104_7A_3_F	CTL00104_9A_3		CTL00104_9A_2		CTCN001104_N005	CTCN001104_N002	CTCN001104_N066	CTCN011104_N077	CTCN011104_N077A_2
SECTOR B					CTL01104_7B_1		CTL00104_9B_1	CTL00104_2B_2	CTL01104_3B_1					CTL01104_7B_3_F	CTL00104_9B_3		CTL00104_9B_2		CTCN001104_N005	CTCN001104_N002	CTCN001104_N066	CTCN011104_N077	CTCN011104_N077B_2
SECTOR C					CTL01104_7C_1		CTL00104_9C_1	CTL00104_2C_2	CTL01104_3C_1					CTL01104_7C_3_F	CTL00104_9C_3		CTL00104_9C_2		CTCN001104_N005	CTCN001104_N002	CTCN001104_N066	CTCN011104_N077	CTCN011104_N077C_2
SECTOR D																							
SECTOR E																							
SECTOR F																							
OMNI																							

Section 9 - Cell Number - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 3RD 700	LTE 3RD 1900	LTE 4TH 700	LTE 4TH 1900	LTE 5TH 1900	5G 1ST 850	5G 1ST 1900	5G 1ST AWS	5G 1ST CBAND	5G 2ND CBAND
USEID (excluding Hard Sector)	59423.850.3G.1	59423.1900.3G.1	59423.850.3G.2	59423.1900.3G.2																			
SECTOR A CELL NUMBER					15	1	8	192	149	185	178	192	149	171	203	15	178	8	25				
SECTOR B					16	2	9	193	150	186	179	193		172	204		179	9	49				
SECTOR C					17	3	10	194	151	187	180	194		173	205		180	10	73				
SECTOR D																							
SECTOR E																							
SECTOR F																							
OMNI																							

Section 9 - Cell Number - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 3RD 700	LTE 3RD 1900	LTE 4TH 700	LTE 4TH 1900	LTE 5TH 1900	5G 1ST 850	5G 1ST 1900	5G 1ST AWS	5G 1ST CBAND	5G 2ND CBAND
USEID (excluding Hard Sector)																							
SECTOR A CELL NUMBER					15		8	192	149					171	203		178		25	26	27	28	29
SECTOR B					16		9	193	150					172	204		179		49	50	51	52	53
SECTOR C					17		10	194	151					173	205		180		73	74	75	76	77
SECTOR D																							
SECTOR E																							
SECTOR F																							
OMNI																							

Section 10 - CID/SAC - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 3RD 700	LTE 3RD 1900	LTE 4TH 700	LTE 4TH 1900	LTE 5TH 1900	5G 1ST 850	5G 1ST 1900	5G 1ST AWS	5G 1ST CBAND	5G 2ND CBAND
SECTOR A CID/SAC	11041	11047	01041	11044																			
SECTOR B	11042	11048	01042	11045																			
SECTOR C	11043	11049	01043	11046																			
SECTOR D																							
SECTOR E																							
SECTOR F																							
OMNI																							

Section 10 - CID/SAC - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	UMTS 2ND 1900	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST AWS	LTE 1ST WCS	LTE 2ND 700	LTE 2ND 1900	LTE 2ND AWS	LTE 2ND WCS	LTE 3RD 700	LTE 3RD 1900	LTE 4TH 700	LTE 4TH 1900	LTE 5TH 1900	5G 1ST 850	5G 1ST 1900	5G 1ST AWS	5G 1ST CBAND	5G 2ND CBAND
SECTOR A CID/SAC																							
SECTOR B																							
SECTOR C																							
SECTOR D																							
SECTOR E																							
SECTOR F																							
OMNI																							

Section 11 - CURRENT RADIO COUNTS existing

Section 12 - CURRENT T1 COUNTS existing

Section 13 - NEW/PROPOSED RADIO COUNTS

Section 14 - NEW/PROPOSED T1 COUNTS

Section 15A - CURRENT TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL		DMP65R-BU6DA	TPA-65R-BU6DA-K				
ANTENNA VENDOR		CCI	CCI				
ANTENNA SIZE (H x W x D)		71.2X20.7X7.7	71.2X20.7X7.7				
ANTENNA WEIGHT		79.4	69				
AZIMUTH		50	50				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		92	92				
ANTENNA TIP HEIGHT		95	95				
MECHANICAL DOWNTILT		0	0				
FEEDER AMOUNT		4	4				
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)		Internal	Internal				
SURGE ARRESTOR (QTY/MODEL)		8 TSXDC-4310FM	4 TSXDC-4310FM				
DIPLEXER (QTY/MODEL)		2 DBC2055F1V1-2					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			RRH CONTROLLED				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)		2 TMABPD7823VG12A	2 TMA2124F03V5-1D				
CURRENT INJECTORS FOR TMA (QTY/MODEL)			1 1000860				
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 4449 B5/B12	1 4478 B14				
RRH - 850 band (QTY/MODEL)		with another band					
RRH - 1900 band (QTY/MODEL)			1 4415 B25				
RRH - AWS band (QTY/MODEL)			1 4426 B66				
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
RRH_7B_1 (QTY/MODEL)							
RRH_7B_2 (QTY/MODEL)							
RRH_7B_3 (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)			4 Pentaplexer 5PX-0726-O				
Additional Component 2 (QTY/MODEL)			2 K SBT 782-11055				
Additional Component 3 (QTY/MODEL)			10 Andrew APTDC-BDFDM-DB				
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RX/AIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 1		59423.A.700.4G.1	CTL01104_7A_1	CTL01104_7A_1		LTE 700	BU6D_725MHz_10DT	12.7	160	10	BOTTOM	1-5/8 Coax	130									
	PORT 2		59423.A.850.4G.1	CTL01104_8A_1	CTL01104_8A_1		LTE 850	BU6D_850MHz_10DT	13.3	160	10	BOTTOM	1-5/8 Coax	130									
	PORT 3		59423.A.WCS.4G.1	CTL01104_3A_1	CTL01104_3A_1		LTE WCS	BU6D_2355MHz_04DT	17.7	160	4	Bottom	1-5/8 Coax	130									
	PORT 5		59423.A.850.5G.1	CTCN001104_N005A_1	CTCN001104_N005A_1		5G 850	BU6D_850MHz_10DT	13.3	160	10	BOTTOM	1-5/8 Coax	130									
ANTENNA POSITION 3	PORT 1		59423.A.700.4G.5	CTL01104_7A_3_F	CTL01104_7A_3_F		LTE 700	TPA65R-BU6DA-K	13.1	50	10	Bottom	1-5/8 Coax	130									
	PORT 2		59423.A.850.3G.1	CTV11041	CTV11041		UMTS 850	TPA65R-BU6DA-K	13.5	50	10	None	1-5/8 Coax	130									
	PORT 3		59423.A.AWS.4G.4	CTL00104_2A_2	CTL00104_2A_2		LTE AWS	TPA65R-BU6DA-K	17	50	6	Bottom	1-5/8 Coax	130									
	PORT 4		59423.A.1900.4G.1	CTL00104_9A_1	CTL00104_9A_1		LTE 1900	TPA65R-BU6DA-K	15.6	50	4	Bottom	1-5/8 Coax	130									
	PORT 7		59423.A.1900.4G.4	CTL00104_9A_2	CTL00104_9A_2		LTE 1900	TPA65R-BU6DA-K	15.6	50	4	Bottom	1-5/8 Coax	130									
	PORT 8		59423.A.1900.4G.4	CTL00104_9A_3	CTL00104_9A_3		LTE 1900	TPA65R-BU6DA-K	15.6	50	4	Bottom	1-5/8 Coax	130									

Section 15B - CURRENT TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL		DMP65R-BU6DA	TPA-65R-BU6DA-K				
ANTENNA VENDOR		CCI	CCI				
ANTENNA SIZE (H x W x D)		71.2X20.7X7.7	71.2X20.7X7.7				
ANTENNA WEIGHT		79.4	69				
AZIMUTH		160	160				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		92	92				
ANTENNA TIP HEIGHT		95	95				
MECHANICAL DOWNTILT		0	0				
FEEDER AMOUNT		4	4				
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)		Internal	Internal				
SURGE ARRESTOR (QTY/MODEL)		8 TSXDC-4310FM	4 TSXDC-4310FM				
DIPLEXER (QTY/MODEL)		2 DBC2055F1V1-2					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			RRH CONTROLLED				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)		2 TMABPD7823VG12A	2 TMA2124F03V5-1D				
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 4449 B5/B12	1 4478 B14				
RRH - 850 band (QTY/MODEL)		with another band					
RRH - 1900 band (QTY/MODEL)			1 4415 B25				
RRH - AWS band (QTY/MODEL)			1 4426 B66				
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
RRH_7B_1 (QTY/MODEL)							
RRH_7B_2 (QTY/MODEL)							
RRH_7B_3 (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)			4 Pentaplexer 5PX-0726-O				
Additional Component 2 (QTY/MODEL)			2 K SBT 782-11055				
Additional Component 3 (QTY/MODEL)			10 Andrew APTDC-BDFDM-DB				
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RX/AIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 1		59423.B.700.4G.1	CTL01104_7B_1	CTL01104_7B_1		LTE 700	BU6D_725MHz_02DT	13.2	160	2	BOTTOM	1-5/8 Coax	130									
	PORT 2		59423.B.850.4G.1	CTL01104_8B_1	CTL01104_8B_1		LTE 850	BU6D_850MHz_02DT	13.1	160	2	BOTTOM	1-5/8 Coax	130									
	PORT 3		59423.B.WCS.4G.1	CTL01104_3B_1	CTL01104_3B_1		LTE WCS	BU6D_2355MHz_02DT	18.5	160	2	Bottom	1-5/8 Coax	130									
	PORT 5		59423.B.850.5G.1	CTCN001104_N005B_1	CTCN001104_N005B_1		5G 850	BU6D_850MHz_02DT	13.1	160	2	BOTTOM	1-5/8 Coax	130									
ANTENNA POSITION 3	PORT 1		59423.B.700.4G.5	CTL01104_7B_3_F	CTL01104_7B_3_F		LTE 700	TPA65R-BU6DA-K	13.7	160	2	Bottom	1-5/8 Coax	130									
	PORT 2		59423.B.850.3G.1	CTV11042	CTV11042		UMTS 850	TPA65R-BU6DA-K	13.2	160	2	None	1-5/8 Coax	130									
	PORT 3		59423.B.AWS.4G.tmp4	CTL00104_2B_2	CTL00104_2B_2		LTE AWS	TPA65R-BU6DA-K	16.7	160	3	Bottom	1-5/8 Coax	130									
	PORT 4		59423.B.1900.4G.1	CTL00104_9B_1	CTL00104_9B_1		LTE 1900	TPA65R-BU6DA-K	16	160	2	Bottom	1-5/8 Coax	130									
	PORT 7		59423.B.1900.4G.4	CTL00104_9B_2	CTL00104_9B_2		LTE 1900	TPA65R-BU6DA-K	16	160	2	Bottom	1-5/8 Coax	130									
	PORT 8		59423.B.1900.4G.4	CTL00104_9B_3	CTL00104_9B_3		LTE 1900	TPA65R-BU6DA-K	16	160	2	Bottom	1-5/8 Coax	130									

Section 15C - CURRENT TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL		DMP65R-BU6DA	TPA-65R-BU6DA-K				
ANTENNA VENDOR		CCI	CCI				
ANTENNA SIZE (H x W x D)		71.2X20.7X7.7	71.2X20.7X7.7				
ANTENNA WEIGHT		79.4	69				
AZIMUTH		280	280				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		92	92				
ANTENNA TIP HEIGHT		95	95				
MECHANICAL DOWNTILT		0	0				
FEEDER AMOUNT		4	4				
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)		Internal	Internal				
SURGE ARRESTOR (QTY/MODEL)		8 TSXDC-4310FM					
DIPLEXER (QTY/MODEL)		2 DBC2055F1V1-2					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)			RRH CONTROLLED				
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)		2 TMABPD7823VG12A	2 TMA2124F03V5-1D				
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 4449 B5/B12	1 4478 B14				
RRH - 850 band (QTY/MODEL)		with another band					
RRH - 1900 band (QTY/MODEL)			1 4415 B25				
RRH - AWS band (QTY/MODEL)			1 4426 B66				
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
RRH_7B_1 (QTY/MODEL)							
RRH_7B_2 (QTY/MODEL)							
RRH_7B_3 (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)			4 Pentaplexer 5PX-0726-O				
Additional Component 2 (QTY/MODEL)			2 K SBT 782-11055				
Additional Component 3 (QTY/MODEL)			10 Andrew APTDC-BDFDM-DB				
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 1		59423.C.700.4G.1	CTL01104_7C_1	CTL01104_7C_1		LTE 700	BU6D_725MHz_06DT	12.8	280	6	BOTTOM	1-5/8 Coax	130									
	PORT 2		59423.C.850.4G.1	CTL01104_8C_1	CTL01104_8C_1		LTE 850	BU6D_850MHz_06DT	13.2	280	6	BOTTOM	1-5/8 Coax	130									
	PORT 3		59423.C.WCS.4G.1	CTL01104_3C_1	CTL01104_3C_1		LTE WCS	BU6D_2355MHz_07DT	17.2	280	7	Bottom	1-5/8 Coax	130									
	PORT 5		59423.C.850.5G.1	CTCN001104_N005C_1	CTCN001104_N005C_1		5G 850	BU6D_850MHz_06DT	13.2	280	6	BOTTOM	1-5/8 Coax	130									
ANTENNA POSITION 3	PORT 1		59423.C.700.4G.5	CTL01104_7C_3_F	CTL01104_7C_3_F		LTE 700	TPA65R-BU6DA-K	13.5	280	6	Bottom	1-5/8 Coax	130									
	PORT 2		59423.C.850.3G.1	CTV11043	CTV11043		UMTS 850	TPA65R-BU6DA-K	13.4	280	6	None	1-5/8 Coax	130									
	PORT 3		59423.C.AWS.4G.tmp4	CTL00104_2C_2	CTL00104_2C_2		LTE AWS	TPA65R-BU6DA-K	16.7	280	3	Bottom	1-5/8 Coax	130									
	PORT 4		59423.C.1900.4G.1	CTL00104_9C_1	CTL00104_9C_1		LTE 1900	TPA65R-BU6DA-K	15.9	280	7	Bottom	1-5/8 Coax	130									
	PORT 7		59423.C.1900.4G.4	CTL00104_9C_2	CTL00104_9C_2		LTE 1900	TPA65R-BU6DA-K	15.9	280	7	Bottom	1-5/8 Coax	130									
	PORT 8		59423.C.1900.4G.4	CTL00104_9C_3	CTL00104_9C_3		LTE 1900	TPA65R-BU6DA-K	15.9	280	7	Bottom	1-5/8 Coax	130									

Section 16A - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?				Yes			
ANTENNA MAKE - MODEL			AIR6449 B77D+AIR6419 B77G STACKED				
ANTENNA VENDOR			Ericsson				
ANTENNA SIZE (H x W x D)			30.4X15.9X8.1				
ANTENNA WEIGHT			81.6				
AZIMUTH			50				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)			88				
ANTENNA TIP HEIGHT			91				
MECHANICAL DOWNTILT							
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)			Built-in				
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)			1 DC6-48-60-18-8F				
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS_band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)			1 integrated within: AIR6449 B77D				
Additional RRH #2 - any band (QTY/MODEL)			1 integrated within: AIR6419 B77G				
RRH_7B_1 (QTY/MODEL)							
RRH_7B_2 (QTY/MODEL)							
RRH_7B_3 (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)			1 gateway (FHG) 6673				
Local Market Note 1	-Keep Pos-1 Empty for future SOW. -Replace antennas.						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x6630 / 1xXMU03 / 1x6630 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 3	PORT 1			CTCN011104_N077A_1	CTCN011104_N077A_1		5G CBAND	B77D+AIR6419 B77G STACKED		50	0	Integrated	FIBER	0									
	PORT 3			CTCN011104_N077A_2	CTCN011104_N077A_2		5G DoD	B77D+AIR6419 B77G STACKED		50	0	Integrated	FIBER	0									
ANTENNA POSITION 4	PORT 11			CTCN001104_N002A_1	CTCN001104_N002A_1		5G 1900	TPA65R-BU6DA-K	17.15	50	4	BOTTOM	Commscope 1-5/8	130									
	PORT 12			CTCN001104_N066A_1	CTCN001104_N066A_1		5G AWS	TPA65R-BU6DA-K	17.15	50	4	BOTTOM	Commscope 1-5/8	130									

Section 16B - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?				Yes			
ANTENNA MAKE - MODEL			AIR6449 B77D+AIR6419 B77G STACKED				
ANTENNA VENDOR			Ericsson				
ANTENNA SIZE (H x W x D)			30.4X15.9X8.1				
ANTENNA WEIGHT			81.6				
AZIMUTH			160				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)			88				
ANTENNA TIP HEIGHT			91				
MECHANICAL DOWNTILT							
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)			Built-in				
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)			1 integrated within: AIR6449 B77D				
Additional RRH #2 - any band (QTY/MODEL)			1 integrated within: AIR6419 B77G				
RRH_7B_1 (QTY/MODEL)							
RRH_7B_2 (QTY/MODEL)							
RRH_7B_3 (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	-Keep Pos-1 Empty for future SOW. -Replace antennas.						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x6630 / 1xXMU03 / 1x6630 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 3	PORT 1			CTCN011104_N077B_1	CTCN011104_N077B_1		5G CBAND	B77D+AIR6419 B77G STACKED		160	0	Integrated	FIBER	0									
	PORT 3			CTCN011104_N077B_2	CTCN011104_N077B_2		5G DoD	B77D+AIR6419 B77G STACKED		160	0	Integrated	FIBER	0									
ANTENNA POSITION 4	PORT 11			CTCN001104_N002B_1	CTCN001104_N002B_1		5G 1900	TPA65R-BU6DA-K	16.85	160	2	BOTTOM	Commscope 1-5/8	130									
	PORT 12			CTCN001104_N066B_1	CTCN001104_N066B_1		5G AWS	TPA65R-BU6DA-K	16.85	160	2	BOTTOM	Commscope 1-5/8	130									

Section 16C - PLANNED/PROPOSED TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?				Yes			
ANTENNA MAKE - MODEL			AIR6449 B77D+AIR6419 B77G STACKED				
ANTENNA VENDOR			Ericsson				
ANTENNA SIZE (H x W x D)			30.4X15.9X8.1				
ANTENNA WEIGHT			81.6				
AZIMUTH			280				
MAGNETIC DECLINATION							
RADIATION CENTER (feet)			88				
ANTENNA TIP HEIGHT			91				
MECHANICAL DOWNTILT							
FEEDER AMOUNT							
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)			Built-in				
SURGE ARRESTOR (QTY/MODEL)							
DIPLEXER (QTY/MODEL)							
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)							
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)							
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)							
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)			1 integrated within: AIR6449 B77D				
Additional RRH #2 - any band (QTY/MODEL)			1 integrated within: AIR6419 B77G				
RRH_7B_1 (QTY/MODEL)							
RRH_7B_2 (QTY/MODEL)							
RRH_7B_3 (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	-Keep Pos-1 Empty for future SOW. -Replace antennas.						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x6630 / 1xXMU03 / 1x6630 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 3	PORT 1			CTCN011104_N077C_1	CTCN011104_N077C_1		5G CBAND	B77D+AIR6419 B77G STACKED		280	0	Integrated	FIBER	0									
	PORT 3			CTCN011104_N077C_2	CTCN011104_N077C_2		5G DoD	B77D+AIR6419 B77G STACKED		280	0	Integrated	FIBER	0									
ANTENNA POSITION 4	PORT 11			CTCN001104_N002C_1	CTCN001104_N002C_1		5G 1900	TPA65R-BU6DA-K	17	280	3	BOTTOM	Commscope 1-5/8	130									
	PORT 12			CTCN001104_N066C_1	CTCN001104_N066C_1		5G AWS	TPA65R-BU6DA-K	17	280	3	BOTTOM	Commscope 1-5/8	130									

Section 16.5A - SCOPING TOWER CONFIGURATION - SECTOR A (OR OMNI)

Section 17A - FINAL TOWER CONFIGURATION - SECTOR A (OR OMNI)

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL		DMP65R-BU6DA	AIR6449 B77D+AIR6419 B77G STACKED	TPA65R-BU6DA-K			
ANTENNA VENDOR		CCI	Ericsson	CCI			
ANTENNA SIZE (H x W x D)		71.2X20.7X7.7	30.4X15.9X8.1	71.2X20.7X7.7			
ANTENNA WEIGHT		79.4	81.6	69			
AZIMUTH		50	50	50			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		88	88	88			
ANTENNA TIP HEIGHT		91	91	91			
MECHANICAL DOWNTILT		0		0			
FEEDER AMOUNT		4		4			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)		Built-in	Built-in	Built-in			
SURGE ARRESTOR (QTY/MODEL)		8 TSXDC-4310FM		12 TSXDC-4310FM			
DIPLEXER (QTY/MODEL)		2 DBC2055F1V1-2					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		RRH CONTROLLED		RRH CONTROLLED			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)		2 TMABPD7823VG12A		2 TMA2124F03V5-1D			
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)			1 DC6-48-60-18-8F				
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 4449 B5/B12		1 4478 B14			
RRH - 850 band (QTY/MODEL)		with another band					
RRH - 1900 band (QTY/MODEL)				1 4415 B25			
RRH - AWS band (QTY/MODEL)				1 4426 B66			
RRH - WCS_band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)			1 integrated within: AIR6449 B77D				
Additional RRH #2 - any band (QTY/MODEL)			1 integrated within: AIR6419 B77G				
RRH_7B_1 (QTY/MODEL)							
RRH_7B_2 (QTY/MODEL)							
RRH_7B_3 (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)				4 Pentaplexer 5PX-0726-O			
Additional Component 2 (QTY/MODEL)				2 K SBT 782-11055			
Additional Component 3 (QTY/MODEL)			1 gateway (FHG) 6673	2 Polyphaser 1000860			
Local Market Note 1	-Keep Pos-1 Empty for future SOW. -Replace antennas.						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x6630 / 1xXMU03 / 1x6630 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 1	59423.A.700.4G.1		CTL01104_7A_1	CTL01104_7A_1		LTE 700	DMP65R-BU6DA	14.7	50	5	BOTTOM	Commscope 1-5/8	130									
	PORT 3	59423.A.WCS.4G.1		CTL01104_3A_1	CTL01104_3A_1		LTE WCS	DMP65R-BU6DA	18.1	50	3	BOTTOM	Commscope 1-5/8	130									
	PORT 5	59423.A.850.5G.1		CTCN001104_N005A_1	CTCN001104_N005A_1		5G 850	DMP65R-BU6DA	14.7	50	5	BOTTOM	Commscope 1-5/8	130									
ANTENNA POSITION 3	PORT 1	59423.A.CBAND.5G.tmp1		CTCN011104_N077A_1	CTCN011104_N077A_1		5G CBAND	B77D+AIR6419 B77G STACKED		50	0	Integrated	FIBER	0									
	PORT 3	59423.A.CBAND.5G.tmp2		CTCN011104_N077A_2	CTCN011104_N077A_2		5G DoD	B77D+AIR6419 B77G STACKED		50	0	Integrated	FIBER	0									
ANTENNA POSITION 4	PORT 1	59423.A.700.4G.6		CTL01104_7A_3_F	CTL01104_7A_3_F		LTE 700	TPA65R-BU6DA-K	14.7	50	5	BOTTOM	Commscope 1-5/8	130									
	PORT 3	59423.A.1900.4G.2		CTL00104_9A_1	CTL00104_9A_1		LTE 1900	TPA65R-BU6DA-K	17.15	50	4	BOTTOM	Commscope 1-5/8	130									
	PORT 4	59423.A.1900.4G.5		CTL00104_9A_2	CTL00104_9A_2		LTE 1900	TPA65R-BU6DA-K	17.15	50	4	BOTTOM	Commscope 1-5/8	130									
	PORT 7	59423.A.AWS.4G.5		CTL00104_2A_2	CTL00104_2A_2		LTE AWS	TPA65R-BU6DA-K	17.15	50	4	BOTTOM	Commscope 1-5/8	130									
	PORT 8	59423.A.1900.4G.6		CTL00104_9A_3	CTL00104_9A_3		LTE 1900	TPA65R-BU6DA-K	17.15	50	4	BOTTOM	Commscope 1-5/8	130									
	PORT 11	59423.A.1900.5G.tmp1		CTCN001104_N002A_1	CTCN001104_N002A_1		5G 1900	TPA65R-BU6DA-K	17.15	50	4	BOTTOM	Commscope 1-5/8	130									
	PORT 12	59423.A.AWS.5G.tmp1		CTCN001104_N066A_1	CTCN001104_N066A_1		5G AWS	TPA65R-BU6DA-K	17.15	50	4	BOTTOM	Commscope 1-5/8	130									

Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL		DMP65R-BU6DA	AIR6449 B77D+AIR6419 B77G STACKED	TPA65R-BU6DA-K			
ANTENNA VENDOR		CCI	Ericsson	CCI			
ANTENNA SIZE (H x W x D)		71.2X20.7X7.7	30.4X15.9X8.1	71.2X20.7X7.7			
ANTENNA WEIGHT		79.4	81.6	69			
AZIMUTH		160	160	160			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		88	88	88			
ANTENNA TIP HEIGHT		91	91	91			
MECHANICAL DOWNTILT				2			
FEEDER AMOUNT		4		4			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)		Built-in	Built-in	Built-in			
SURGE ARRESTOR (QTY/MODEL)		8 TSXDC-4310FM		12 TSXDC-4310FM			
DIPLEXER (QTY/MODEL)		2 DBC2055F1V1-2					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		RRH CONTROLLED		RRH CONTROLLED			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)		2 TMABPD7823VG12A		2 TMA2124F03V5-1D			
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 4449 B5/B12		1 4478 B14			
RRH - 850 band (QTY/MODEL)		with another band					
RRH - 1900 band (QTY/MODEL)				1 4415 B25			
RRH - AWS band (QTY/MODEL)				1 4426 B66			
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)			1 integrated within: AIR6449 B77D				
Additional RRH #2 - any band (QTY/MODEL)			1 integrated within: AIR6419 B77G				
RRH_7B_1 (QTY/MODEL)							
RRH_7B_2 (QTY/MODEL)							
RRH_7B_3 (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)				4 Pentaplexer 5PX-0726-O			
Additional Component 2 (QTY/MODEL)				2 K SBT 782-11055			
Additional Component 3 (QTY/MODEL)				2 Polyphaser 1000860			
Local Market Note 1	-Keep Pos -1 Empty for future SOW. -Replace antennas.						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x6630 / 1x6MJ03 / 1x6630 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 1	59423.B.700.4G.1		CTL01104_7B_1	CTL01104_7B_1		LTE 700	DMP65R-BU6DA	14.9	160	2	BOTTOM	Commscope 1-5/8	130									
	PORT 2	59423.B.850.5G.1		CTCN001104_N005B_1	CTCN001104_N005B_1		5G 850	DMP65R-BU6DA	14.9	160	2	BOTTOM	Commscope 1-5/8	130									
	PORT 3	59423.B.WCS.4G.1		CTL01104_3B_1	CTL01104_3B_1		LTE WCS	DMP65R-BU6DA	18.1	160	3	BOTTOM	Commscope 1-5/8	130									
	PORT 5	59423.B.1900.4G.5		CTL00104_9B_1	CTL00104_9B_1		LTE 1900	DMP65R-BU6DA	14.9	160	2	BOTTOM	Commscope 1-5/8	130									
ANTENNA POSITION 3	PORT 1	59423.B.CBAND.5G.tmp1		CTCN011104_N077B_1	CTCN011104_N077B_1		5G CBAND	B77D+AIR6419 B77G STACKED		160	0	Integrated	FIBER	0									
	PORT 3	59423.B.CBAND.5G.tmp2		CTCN011104_N077B_2	CTCN011104_N077B_2		5G DoD	B77D+AIR6419 B77G STACKED		160	0	Integrated	FIBER	0									
ANTENNA POSITION 4	PORT 3	59423.B.1900.4G.5		CTL00104_9B_1	CTL00104_9B_1		LTE 1900	TPA65R-BU6DA-K	16.85	160	2	BOTTOM	Commscope 1-5/8	130									
	PORT 4	59423.B.1900.4G.6		CTL00104_9B_2	CTL00104_9B_2		LTE 1900	TPA65R-BU6DA-K	16.85	160	2	BOTTOM	Commscope 1-5/8	130									
	PORT 5	59423.B.700.4G.6		CTL01104_7B_3_F	CTL01104_7B_3_F		LTE 700	TPA65R-BU6DA-K	14.9	160	2	BOTTOM	Commscope 1-5/8	130									
	PORT 7	59423.B.AWS.4G.5		CTL00104_2B_2	CTL00104_2B_2		LTE AWS	TPA65R-BU6DA-K	16.85	160	2	BOTTOM	Commscope 1-5/8	130									
	PORT 8	59423.B.1900.4G.7		CTL00104_9B_3	CTL00104_9B_3		LTE 1900	TPA65R-BU6DA-K	16.85	160	2	BOTTOM	Commscope 1-5/8	130									
	PORT 11	59423.B.1900.5G.tmp1		CTCN001104_N002B_1	CTCN001104_N002B_1		5G 1900	TPA65R-BU6DA-K	16.85	160	2	BOTTOM	Commscope 1-5/8	130									
	PORT 12	59423.B.AWS.5G.tmp1		CTCN001104_N066B_1	CTCN001104_N066B_1		5G AWS	TPA65R-BU6DA-K	16.85	160	2	BOTTOM	Commscope 1-5/8	130									

Section 17C - FINAL TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL		DMP65R-BU6DA	AIR6449 B77D+AIR6419 B77G STACKED	TPA65R-BU6DA-K			
ANTENNA VENDOR		CCI	Ericsson	CCI			
ANTENNA SIZE (H x W x D)		71.2X20.7X7.7	30.4X15.9X8.1	71.2X20.7X7.7			
ANTENNA WEIGHT		79.4	81.6	69			
AZIMUTH		280	280	280			
MAGNETIC DECLINATION							
RADIATION CENTER (feet)		88	88	88			
ANTENNA TIP HEIGHT		91	91	91			
MECHANICAL DOWNTILT		0		0			
FEEDER AMOUNT		4		4			
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)		Built-in	Built-in	Built-in			
SURGE ARRESTOR (QTY/MODEL)		8 TSXDC-4310FM		12 TSXDC-4310FM			
DIPLEXER (QTY/MODEL)		2 DBC2055F1V1-2					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		RRH CONTROLLED		RRH CONTROLLED			
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)		2 TMABPD7823VG12A		2 TMA2124F03V5-1D			
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 4449 B5/B12		1 4478 B14			
RRH - 850 band (QTY/MODEL)		with another band					
RRH - 1900 band (QTY/MODEL)				1 4415 B25			
RRH - AWS band (QTY/MODEL)				1 4426 B66			
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)			1 integrated within: AIR6449 B77D				
Additional RRH #2 - any band (QTY/MODEL)			1 integrated within: AIR6419 B77G				
RRH_7B_1 (QTY/MODEL)							
RRH_7B_2 (QTY/MODEL)							
RRH_7B_3 (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)				4 Pentaplexer 5PX-0726-O			
Additional Component 2 (QTY/MODEL)				2 K SBT 782-11055			
Additional Component 3 (QTY/MODEL)				2 Polyphaser 1000860			
Local Market Note 1	-Keep Pos-1 Empty for future SOW. -Replace antennas.						
Local Market Note 2							
Local Market Note 3	1x6601 / 1x6630 / 1x6MJ03 / 1x6630 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 2	PORT 1	59423.C.700.4G.1		CTL01104_7C_1	CTL01104_7C_1		LTE 700	DMP65R-BU6DA	14.9	280	2	BOTTOM	Commscope 1-5/8	130									
	PORT 3	59423.C.WCS.4G.1		CTL01104_3C_1	CTL01104_3C_1		LTE WCS	DMP65R-BU6DA	18.1	280	3	BOTTOM	Commscope 1-5/8	130									
	PORT 5	59423.C.850.5G.1		CTCN001104_N005C_1	CTCN001104_N005C_1		5G 850	DMP65R-BU6DA	14.9	280	2	BOTTOM	Commscope 1-5/8	130									
ANTENNA POSITION 3	PORT 1	59423.C.CBAND.5G.tmp1		CTCN011104_N077C_1	CTCN011104_N077C_1		5G CBAND	B77D+AIR6419 B77G STACKED		280	0	Integrated	FIBER	0									
	PORT 3	59423.C.CBAND.5G.tmp2		CTCN011104_N077C_2	CTCN011104_N077C_2		5G DoD	B77D+AIR6419 B77G STACKED		280	0	Integrated	FIBER	0									
ANTENNA POSITION 4	PORT 3	59423.C.1900.4G.5		CTL00104_9C_1	CTL00104_9C_1		LTE 1900	TPA65R-BU6DA-K	17	280	3	BOTTOM	Commscope 1-5/8	130									
	PORT 4	59423.C.1900.4G.6		CTL00104_9C_2	CTL00104_9C_2		LTE 1900	TPA65R-BU6DA-K	17	280	3	BOTTOM	Commscope 1-5/8	130									
	PORT 5	59423.C.700.4G.3_F		CTL01104_7C_3_F	CTL01104_7C_3_F		LTE 700	TPA65R-BU6DA-K	15.4	280	2	BOTTOM	Commscope 1-5/8	130									
	PORT 7	59423.C.AWS.4G.5		CTL00104_2C_2	CTL00104_2C_2		LTE AWS	TPA65R-BU6DA-K	17	280	3	BOTTOM	Commscope 1-5/8	130									
	PORT 8	59423.C.1900.4G.7		CTL00104_9C_3	CTL00104_9C_3		LTE 1900	TPA65R-BU6DA-K	17	280	3	BOTTOM	Commscope 1-5/8	130									
	PORT 11	59423.C.1900.5G.tmp1		CTCN001104_N002C_1	CTCN001104_N002C_1		5G 1900	TPA65R-BU6DA-K	17	280	3	BOTTOM	Commscope 1-5/8	130									
	PORT 12	59423.C.AWS.5G.tmp1		CTCN001104_N066C_1	CTCN001104_N066C_1		5G AWS	TPA65R-BU6DA-K	17	280	3	BOTTOM	Commscope 1-5/8	130									

Antennas

MultiPort Series

DATA SHEET

Diplexed Multi-Band Antenna

DMP65R-BU6D

- Six foot (1.8 m) internally multiplexed MultiBand antenna, including eight external RF ports (12 RF ports internal), with a 65° azimuth beamwidth covering 698-896 MHz and 1695-2400 MHz frequencies
- Four wide high band ports covering 1695-2400 MHz and four wide low band ports covering 698-896 MHz in a single antenna enclosure
- Innovative Multiplexed/RET Control configuration, supporting Dual Band Radio Configurations (B12/B5 and B29/B5). The antenna provides Dual 4T4R (4x4 MIMO) capability, while providing independent RET control, an Industry First
- Innovative Low and High Band Array configuration allows for 4T4R (4x4 MIMO) on Low Band and 4T4R (4x4 MIMO) High Band Arrays, using full length arrays (non stacked), all in a 20.7" (525 mm) width enclosure, an Industry First
- Industry leading antenna topology and RET shielding techniques drastically mitigate PIM propagation from B12/B14/B29 operations, allowing for superior Network performance
- Full Spectrum Compliance for PCS, AWS-3 and WCS frequencies and 700/850 MHz Dual Band Radio Configurations
- LTE Optimized FBR and SPR performance, providing for an efficient use of valuable radio capacity
- LTE Optimized Boresight and Sector XPD and USL performance, essential for LTE Performance
- Exceeds minimum PIM performance requirements
- Equipped with new 4.3-10 connector, which is 40% smaller than traditional 7/16 DIN connector
- Ordering options for External RET Controllers (Type 1) or Internally Integrated RET Controllers (Type 17)

Overview

The CCI internally multiplexed MultiBand array is an eight port (12 RF ports internal) antenna, with four wide band ports covering 1695-2400 MHz and four low band ports covering 698-896 MHz. The antenna provides the capability to deploy 4T4R (4x4 MIMO) in the high band, with separate RET control. The antenna also provides the capability to provide independent RET control for 700/850 MHz Dual Band Radio Configurations, while maintaining 4T4R (4x4 MIMO) across the low band ports.

CCI antennas are designed and produced to ISO 9001 certification standards for reliability and quality in our state-of-the-art manufacturing facilities.

Applications

- 4x4 MIMO for the High Band and 4X4 MIMO Low Band ports
- Ready for Network Standardization on 4.3-10 DIN connectors
- With CCI's multiband antennas, wireless providers can connect multiple platforms to a single antenna, reducing tower load, lease expense, deployment time and installation costs

SPECIFICATIONS

Diplexed Multi-Band Antenna

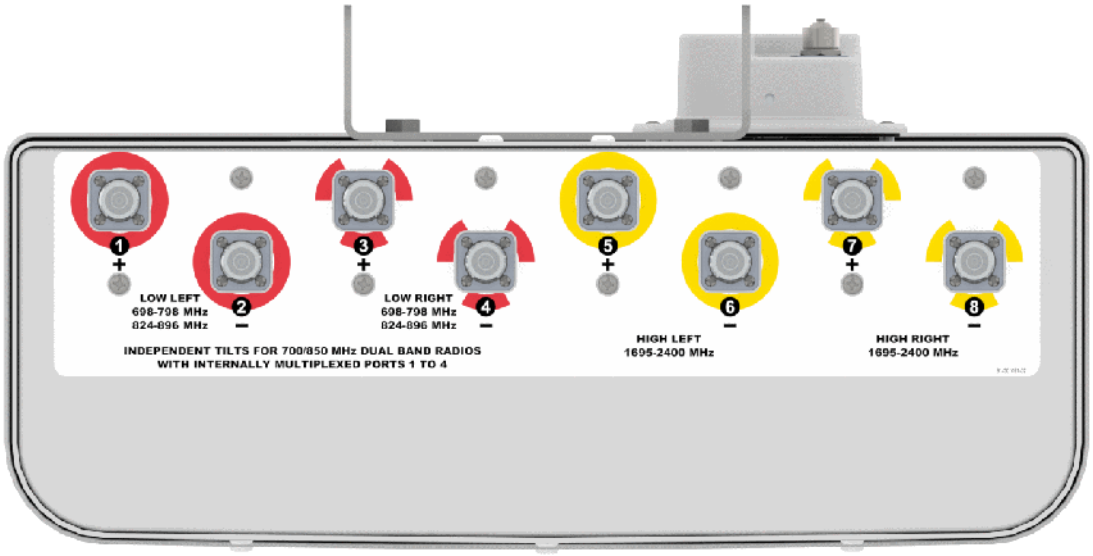
DMP65R-BU6D

Mechanical

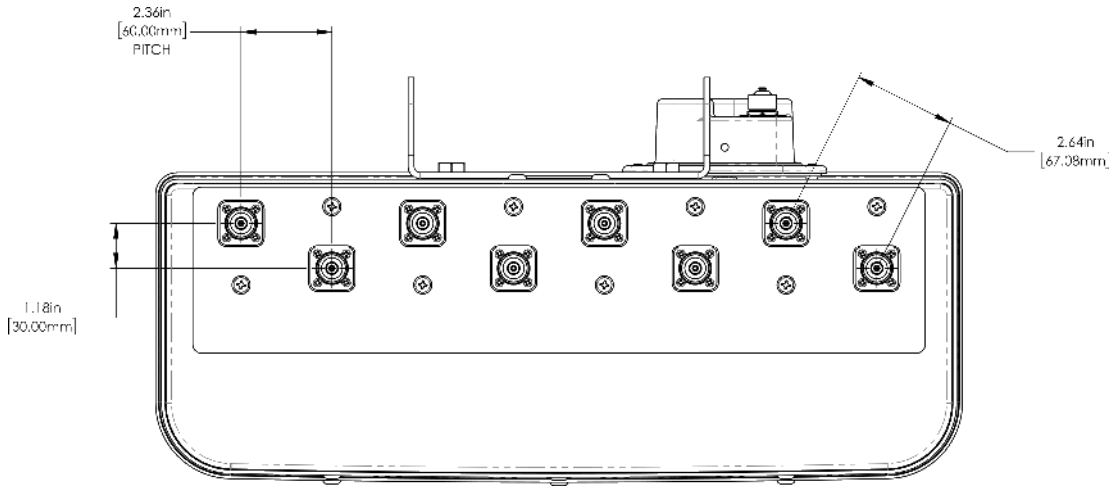
Dimensions (LxWxD)	71.2x20.7x7.7 in (1808x525x197 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	325 lbs (1446 N) @ 100 mph (161 kph)
Side Wind Load	144 lbs (642 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	12.7 ft^2 (1.2 m^2)
Weight *	96.0 lbs (43.6 kg)
Connector	8 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

** Weight excludes mounting*

Bottom View



Connector Spacing



Antennas

MultiPort Series

DATA SHEET

Multi-Band Twelve-Port Antenna

TPA65R-BU6D

- Six foot (1.8 m) multiband, twelve port antenna with a 65° azimuth beamwidth covering 698-896 MHz and 1695-2400 MHz frequencies
- Eight high band ports covering 1695-2400 MHz and four low band ports covering 698-896 MHz in a single antenna enclosure
- Innovative Low and High Band Array configuration allows for 4T4R (4x4 MIMO) on Low Band and Dual 4T4R (4x4 MIMO) High Band Arrays, using full length arrays (non stacked), all in a 20.7" (525 mm) width enclosure, an Industry First
- Full Spectrum Compliance for WCS and AWS-3 frequencies and Band 14 Operations
- Array configuration allows for 4T4R (4X4 MIMO) on Low Band, essential for Band 14 Operations
- LTE Optimized FBR and SPR performance, providing for an efficient use of valuable radio capacity
- LTE Optimized Boresight and Sector XPD and USL performance, essential for LTE Performance
- Exceeds minimum PIM performance requirements
- Equipped with new 4.3-10 connector, which is 40% smaller than traditional 7/16 DIN connector
- Ordering options for External RET Controllers (Type 1) or Internally Integrated RET Controllers (Type 17)

Overview

The CCI 12-Port multiband array is a twelve port antenna, with eight wide band ports covering 1695-2400 MHz and four low band ports covering 698-896 MHz. The antenna provides the capability to deploy Dual 4×4 Multiple-input Multiple-output (MIMO) in the high band and 4X4 Multiple-input Multiple-output (MIMO) across low band ports. The CCI 12-Port allows independent tilt control between the low band ports and high band ports and independent tilt control between left and right antenna arrays.

In this three RET configuration, the 1st RET is dedicated for the four Low Band ports. The 2nd RET is dedicated for the four Left High Band ports and the 3th RET is dedicated for the four Right High Band ports. This RET arrangement allows for complete flexibility in coverage control between left and right antenna arrays.

CCI antennas are designed and produced to ISO 9001 certification standards for reliability and quality in our state-of-the-art manufacturing facilities.

Applications

- Dual 4×4 MIMO for the High Band and 4X4 MIMO Low Band ports
- Ready for Network Standardization on 4.3-10 DIN connectors
- With CCI's multiband antennas, wireless providers can connect multiple platforms to a single antenna, reducing tower load, lease expense, deployment time and installation costs

SPECIFICATIONS

Multi-Band Twelve-Port Antenna

TPA65R-BU6D

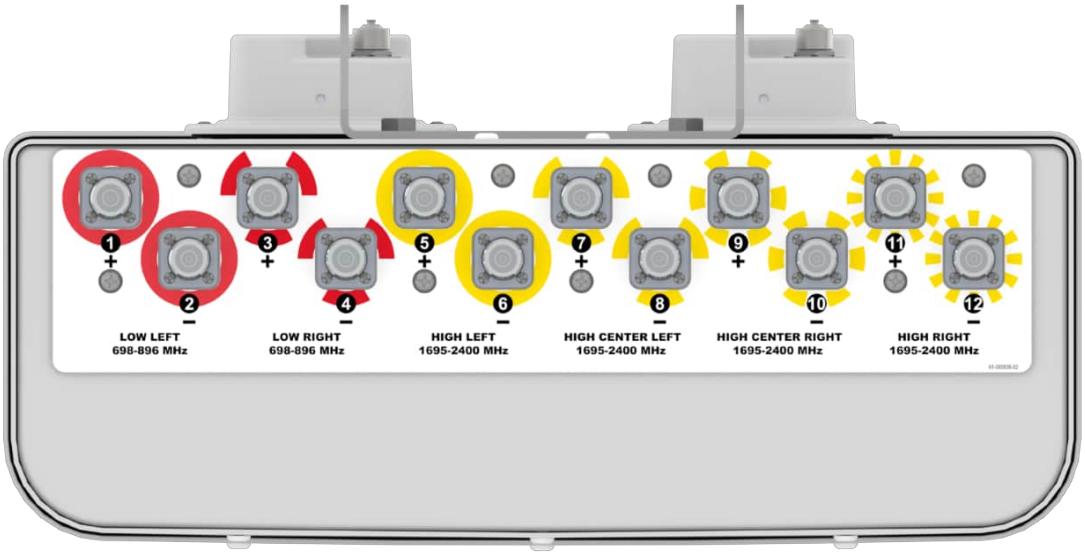
Mechanical

Dimensions (LxWxD)	71.2x20.7x7.7 in (1808x525x197 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	325 lbs (1446 N) @ 100 mph (161 kph)
Side Wind Load	144 lbs (642 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	12.7 ft^2 (1.2 m^2)
Weight *	68.3 lbs (31.0 kg)
Packaging Dimensions (LxWxD)	81.4x25.2x13.9 in (2067x641x354 mm)
Packaged Weight ~	116.8 lbs (53.0 kg)
Connector	12 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

** Weight excludes mounting*

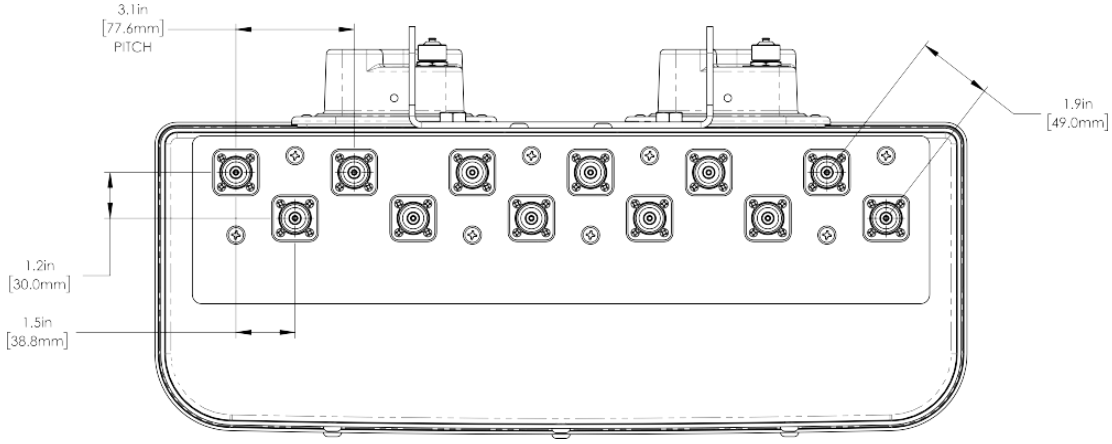
Bottom View

TPA65R-BU6DA



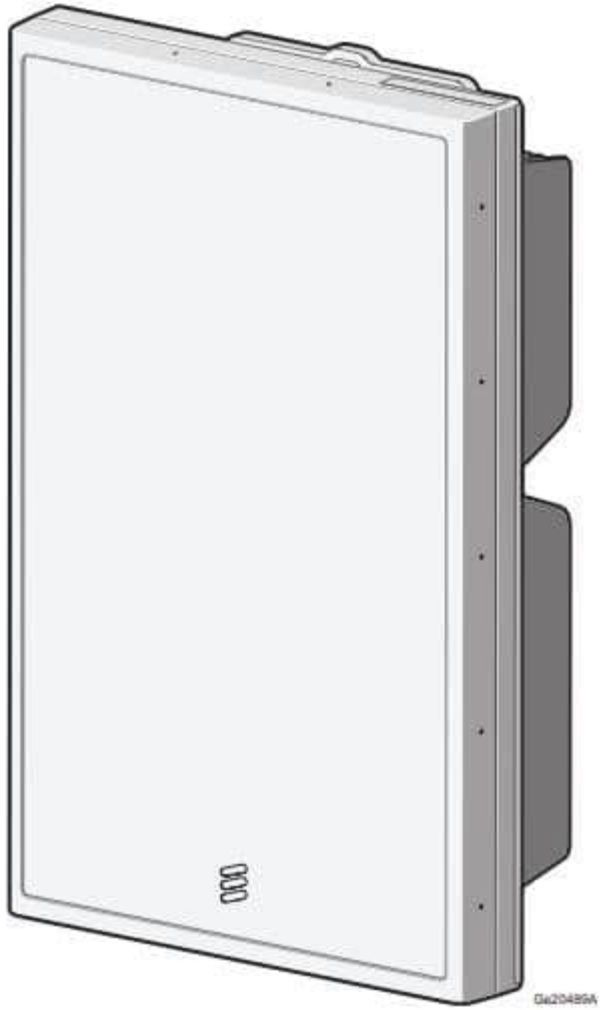
Connector Spacing

TPA65R-BU6DA



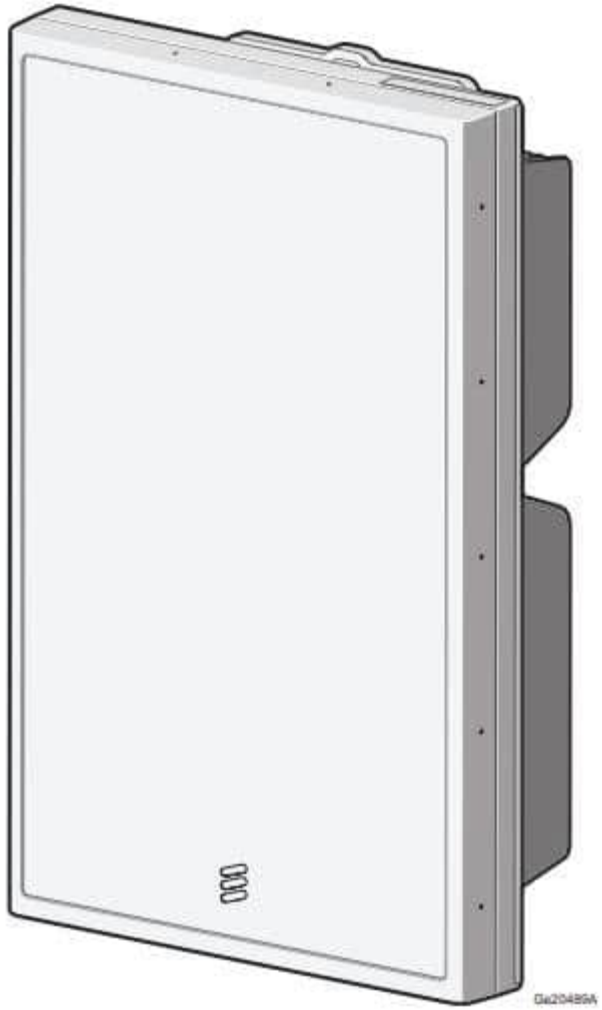
ERICSSON AIR 6419 B77G

- ERICSSON AIR 6419 has a total of 2 ECPRI connections @ 25.8 Gbps, 1 DC Power cable connection
- Operates over B77G DOD band (3.4-3.6 GHz)
- Breaker size = 45A DC, DC Power Consumption = 1280W (for dimensioning)
- Dimensions
  - Height: 31.1” (790 mm)
  - Width: 16.1” (408 mm)
  - Depth: 7.3” (186 mm)
- Weight, excl. mounting hardware = 44 lbs (20 kg)
- Weight with Mounting Hardware = 55.4 lbs (25.2 kg)
- Max Frontal Wind Load @ 42m/s = 454 N
- Horizontal Separation Required between AIR 6419 = 100mm
- Minimum Vertical Space Required below/above AIR 6419 = 300mm
- Minimum Height Above Users = 5m
- Outdoor Installation locations to avoid:
  - Hot microclimates caused by, for example, heat radiated or reflected from dark or metallic walls or floors
  - Chimney mouths or ventilation system outlets
  - In front of Large glass surfaces or concrete surfaces
- Avoid radio interference by keeping the area directly in front of the antenna clear of metal surfaces such as railing, ladders or chains or equipment generating electromagnetic fields, for example, electric motors in air conditioners or diesel generators in front of antenna
- Do not use metallic paint to cover the AIR 6419 If painting is required. Do not paint underside of AIR 6419.



ERICSSON AIR 6449 B77

- ERICSSON AIR 6449 has a total of 4 ECPRI connections @ 25 Gbps
- Operates over B77 band (3.3-4.2 GHz)
- Breaker size = 50A DC, DC Power Consumption = 1280W (for dimensioning)
- Dimensions
  - Height: 30.6” (778 mm)
  - Width: 15.9” (403 mm)
  - Depth: 10.6” (268 mm)
- Weight, excl. mounting hardware = 82.5 lbs (37.5 kg)
- Weight with Mounting Hardware = 95.5 lbs (43.4 kg)
- Max Frontal Wind Load @ 42m/s = 478 N
- Horizontal Separation Required between AIR 6449 = 100mm
- Minimum Vertical Space Required below AIR 6449 = 300mm
- Minimum Height Above Users = 5m
- Outdoor Installation locations to avoid:
  - Hot microclimates caused by, for example, heat radiated or reflected from dark or metallic walls or floors
  - Chimney mouths or ventilation system outlets
  - In front of Large glass surfaces or concrete surfaces
- Avoid radio interference by keeping the area directly in front of the antenna clear of metal surfaces such as railing, ladders or chains or equipment generating electromagnetic fields, for example, electric motors in air conditioners or diesel generators in front of antenna
- Do not use metallic paint to cover the AIR 6449 If painting is required. Do not paint underside of AIR 6449.



Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass

Tel: 201-342-3338 Fax: 201-342-3339 www.cciproducts.com

General Information

CCI's Triple Band TMA with 700/850 bypass contains two triple band TMA's in a single housing. The TMA's are fully duplexed and share a single LNA for all three bands. The bypass path provides excellent isolation to the TMA path. Separate antenna ports for the bypass path and TMA path are combined onto a single BTS port. Low noise high linearity amplifiers improve the uplink sensitivity and the receive performance of base stations. The TMA is fully compliant with the latest AISG 2.0 specification. The TMA supports CDMA, EDGE/GSM, UMTS and LTE BTS equipment. The TMA is ideally suited for sites upgraded to quad-band using the existing infrastructure. The TMA allows the sharing of feeder lines for both AWS and PCS bands thus reducing tower loading, leasing, and installation costs. The input and output connectors are located inline for ease of installation in space constrained areas such as uni-pole structures and stealth antennas.

Model TMABPDB7823VG12A

Contents:

Features:

- Small lightweight unit
- Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass
- Independent Gain Control
- High linearity
- Lightning protected
- Fail-safe bypass mode
- High reliability

Technical Description

The TMA system is an outdoor quad band tower mount unit which provides low noise amplification of PCS, AWS, and WCS uplink signals combined with 700/850 bypassed signals from separate antenna ports to a common BTS port. The tower mount unit consists of 14 band-pass filters, two redundant low noise amplifiers (LNA) with bypass failure circuitry, two bias tees, AISG control circuitry, and lightning protection circuitry all housed in an IP68 enclosure suited to long life masthead mounting. The AWS, PCS and WCS paths are dual duplexed to separate the low power uplink signals from the high power down link signals at the BTS and antenna ports. The AWS, PCS, and WCS uplink signals are amplified with a dedicated ultra-low noise PHEMT LNA with adjustable gain control. The unit provides protection against lightning strikes via a multistage surge protection circuit. DC power and AISG 2.0 control is provided via the BTS feeder cable. The unit operates in current window alarm (CWA) mode until a valid AISG message is detected, at which point it automatically switches to AISG mode. Once in AISG mode, the unit can only switch back to CWA mode with the receipt of an AISG CCI vendor defined command. In CWA mode, the unit requires 12VDC at each BTS port and follows typical current window convention. In AISG mode, the unit will accept 10-30 VDC from either BTS port. In AISG mode, the unit does not require an AISG 2.0 compatible site control unit (SCU) and may also be powered by a standard power distribution unit (PDU).

An optional Site Control Unit (SCU) is available to power up to 32 AISG modules per sector and to provide the monitoring and alarm functions for the system. The SCU is housed in a single (1U) 1.75" x 19" rack and contains dual redundant power supplies capable of being "hot swapped" that provide a regulated DC supply voltage on the RF coax for the tower mount amplifiers.

CCI Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass Typical Specifications

Description	Typical Specifications			
Electrical Specifications	**700/850**	**PCS**	**AWS**	**WCS**
Receive Frequency Range	-	1850 – 1910 MHz	1710 – 1755 MHz	2305 – 2320 MHz
Transmit Frequency Range	-	1930 – 1990 MHz	2110 – 2155 MHz	2345 – 2360 MHz
Bypass Frequency Range	698 - 894 MHz	-	-	-
Amplifier Gain	-	6 to 12 dB Adjustable in 0.25 dB steps via AISG	6 to 12 dB Adjustable in 0.25 dB steps via AISG	6 to 12 dB Adjustable in 0.25 dB steps via AISG
Gain Variation	-	±1.0 dB	±1.0 dB	±1.0 dB
System Noise Figure	-	1.4 dB Typ.	1.3 dB Typ.	1.3 dB Typ.
Input Third Order Intercept Point	-	+12 dBm Min at Max. Gain		
Input / Output Return Loss	18 dB Min all ports, 12 dB Min. Bypass Mode			
Insertion Loss	0.25 dB Typ.			
Transmit Passband	-	0.5 dB Typical	0.4 dB Typical	0.4 dB Typical
Bypass Mode, (PCS/AWS/WCS) Rx Passband	-	2.5 dB Typ.	2.5 dB Typ.	2.5 dB Typ.
Filter Characteristics				
Continuous Average Power	200 Watts max			
Peak Envelope Power	2 KW max			
Intermodulation Performance				
IMD at ANT port in Rx Band	< -112 dBm (-155 dBc) [2 tones at +43 dBm]			
Operating Voltage	+10V to +30V DC provided via coax or AISG			
Power Consumption	<2.0 Watts			
Mechanical Specifications				
Connectors	DIN 7-16 female x 2; AISG x 1			
Dimensions (Body Only)	10.63” (H) x 11.024” (W) x 3.72” (D); (290.60 (H) x 280.00 (W) x 95.0 (D) mm)			
Dimensions (with Conn. & Bracket)	14.25” (H) x 11.024” (W) x 4.11” (D); (362.00 (H) x 280.00 (W) x 104.40 (D) mm)			
Weight	23.1 Lbs. (10.5 Kg) - with Brackets; 22 Lbs. (10 Kg) - without brackets			
Mounting	Pole/Wall Mounting Bracket			
Environmental Specifications				
Operating Temperature	-40˚ C to +65˚C			
Lightning Protection	8/20us, ±2KA max, 10 strikes each, IEC61000-4-5			
Enclosure	IP68			
MTBF	>500,000 hours			

All specifications are subject to change. The latest specifications are available at www.cciproducts.com

TMA2124F03V5-1D

TWIN TMA 1900/AWS/LOWPASS 555-960MHZ 6 ANT

NON-DIPLEXED 1900/AWS ANTENNA PORTS

Designed to be deployed in co-located AWS & 1900 networks, the Kaelus TMA2124 provides gain in 1900 and AWS uplink, using independent LNAs per band and per channel. Low loss bypass 555-960MHz signal to low band antennas is also provided.

FEATURES

- Improved base station sensitivity through excellent noise figure performance and linearity
- AISG 2.0 compatible, full software upgradable using AISG "personality" upload
- DC/AISG passthrough to AWS antenna (port 5)
- AISG OUT connector disabled when AISG device (SBT equipped antenna) present on Port 3 +R1/+R1
- One AISG subunit per LNA, 4 in total. All fixed gain
- 555-960 bypass to low band antenna

TECHNICAL SPECIFICATIONS

BAND NAME	1900	AWS
DOWNLINK		
Passband	1930 - 1990MHz	2110 - 2200MHz
Insertion loss	0.4dB typical	0.3dB typical
Return loss	22dB typical	
Maximum input power	160W (average) / 2kW (PEP)	160W (average) / 2kW (PEP)
Intermodulation products	-155dBc maximum, at antenna port in RX band with 2 x 20W carriers	-163dBc maximum, at antenna port in RX band with 2 x 20W carriers
UPLINK		
Passband	1850 - 1910MHz	1695 - 1780MHz
Gain	13dB	
Gain variation	±1dB maximum	
Return loss	22dB typical	
Bypass return loss	14dB typical	
Bypass loss	3dB typical	
Noise figure	1.2dB typical @ 13dB gain	1.0dB typical @ 13dB gain
Output IP3	+28dBm typical	
Maximum input power with no damage	+12dBm	
555-960 LOWPASS FILTER		
Passband	555 - 960MHz	
Insertion loss	0.2dB typical	
Return loss	21dB typical	
Maximum input power	250W (average) / 2.5kW (PEP)	
Intermodulation products	-155dBc maximum, at antenna port with 2 x 20W carriers	
ELECTRICAL		
Impedance	50Ohms	

Contact Us: +1 303 768 8080 | +61 (0) 7 3907 1200 | www.kaelus.com

POWER SUPPLY AND ALARM (CURRENT WINDOW ALARM MODE, DEFAULT)	
Current window alarm mode (CWA) is the default operating mode and can be configured to specific customer requirements. The TMA2124F03V4 is configured so that both channels are independently powered and monitored via their respective BTS port, 7 or 8. The BTS port sinks additional current to indicate an alarm state in its uplink path. Normal operating and alarm current values are configured independently via a field-loadable personality file. Please contact Kaelus for more information.	
DC supply voltage	+8.5 to +18V DC, case is DC ground
DC supply	Each BTS port powered individually
DC supply current, normal mode	200mA per port typical (both ports are powered)
DC supply current, alarm mode	300mA per port typical (both ports are powered)

AISG MODE OF OPERATION (AUTO SELECTED ON VALID AISG 2.0 FRAMES)	
AISG signals can be applied to port 7 or port 8. The TMA unit switches to AISG mode when valid frames are detected on either port 7 or 8. All LNAs take DC power from the port with the AISG frames or, if DC is present on both ports, power will be supplied equally between the ports. Each LNA is controlled uniquely by its sub-unit number.	
DC supply voltage	+7.5V to +30V DC
AISG version	2.0 (1.1 optional)
Supply current, AISG mode	500mA @ 7.5V, 135mA @ 30V typical
AISG connector, current rating	IEC60130-9, 8-pin female, < 4A peak, 2A continuous, pin 6
Field firmware upgradable	Yes (R951022ATA2.0 Rev 2.9.12)
AISG pass through to antenna port	Yes

ANTENNA AISG OOK + DC

When DC is applied it is quickly switched through to port 5. If an over-current condition is detected, DC & AISG are disconnected from port 5. If DC remains connected to the load at port 5, DC and AISG are disconnected from the AISG OUT 8 pin connector. If DC is disconnected from port 5, DC and AISG are enabled at the AISG OUT 8 pin connector. If a short circuit is detected at the AISG OUT 8 pin connector, DC and AISG are disabled.

Mode of Operation	Voltage at Port 5	Assumption	"Autosense + Protection" Switch Status	Comment
AISG or CWA	High	Device present or open circuit	Close	DC & AISG OOK will be supplied to port 5. DC & AISG is removed from the AISG OUT 8 pin port
AISG or CWA	Low	DC short circuit or low DC resistance	Open	DC & AISG OOK will not be supplied to port 5. DC & AISG are supplied to the AISG OUT 8 pin port

ENVIRONMENTAL	
For further details of environmental compliance, please contact Kaelus.	
Temperature range	-40ºC to +65ºC | -40°F to +149°F
Ingress protection	IP67
Altitude	3,000m | 10,000ft
Lightning protection	IEC61312-1, RF: ±5kA maximum (8/20us), AISG: ±2kA maximum (8/20us)
MTBF	>1,000,000 hours
Compliance	FCC Part 15 subpart B

MECHANICAL	
Dimensions H x D x W	245 x 128 x 210mm | 9.65 x 5.04 x 8.27in Excluding connectors
Weight	8.1kg | 17.86lbs
Finish	Painted, light grey (RAL 7035)
Connectors	4.3-10 (F) x 8 long neck, AISG (F) x 1
Wind Load	Front 390N, Side 147N (Single) Front 251N, Side 409N (Twin) At 74m/s (AS/NZS 1170-2-2011 Structural design - Wind actions - Cyclone areas)
Mounting	Pole/wall bracket supplied with two metal clamps 45-178mm diameter poles

ORDERING INFORMATION

PART NUMBER	CONFIGURATION	OPTIONAL FEATURES	CONNECTORS
TMA2124F03V5-1D	TWIN 2 in / 6 out	STANDARD	4.3-10 (F)
TMA2124F03V5-2D	QUAD 4 in / 12 out	STANDARD	4.3-10 (F)

Contact Us: +1 303 768 8080 | +61 (0) 7 3907 1200 | www.kaelus.com

DATA SHEET

DC Surge Protection Solutions

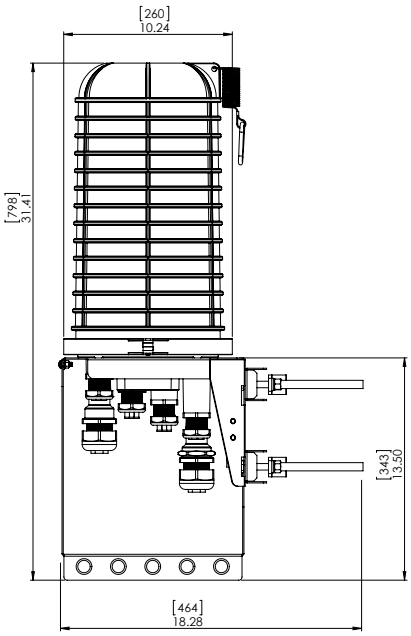
DC6-48-60-18-8C-EV

Overvoltage Protection and Fiber Distribution/Cable Management Solution

Rooftop / Towertop

The DC6-48-60-18-8C-EV is designed to provide the ultimate coordination between the SPD and the RRH/RRU by offering industry-leading low-clamping voltage of 160V and extremely robust protection for use in a high DC voltage environment. Capable of providing 12.5kA (10/350 µs) max per circuit surge capacity for up to 6 -48V DC circuits.

powered by **Strikesorb®**



Features

- Provides discrete protection for six individual -48V DC circuits
- Surge protection of 90kA 8/20 µs
- Maximum impulse current 12.5kA 10/350 µs
- Fiber connections for up to 18 fiber pair
- Simplifies inter-connectivity and cable management for DC conductors
- UL 1449 4th Edition Type 2 protective device
- IEC 61643-11 Class I protection for DC applications
- Form C relay contacts included, allowing remote monitoring of suppressor status
- Copper-coated lid to reduce power line interference
- Patented design
- Patented Strikesorb technology ensures lowest let-through voltage available in the industry, providing enhanced coordination with the RRH/RRU
- Raycap recommends that DC protection system be installed within 5 meters of the radio

Benefits

- Strikesorb modules are fully recognized to UL 1449 4th Edition, and IEC 61643-11 Safety Standards, meeting all intermediate and high current fault requirements to facilitate use in original equipment manufacturers (OEM) applications
- Strikesorb offers unique maintenance-free protection against direct lightning currents
- Design provides maximum flexibility for installation
- NEMA 4X enclosure allows for indoor or outdoor installation

G02-01-203 180122

Raycap

www.raycap.com

SPECIFICATIONS

DC Surge Protection Solutions

DC6-48-60-18-8C-EV

Overvoltage Protection and Fiber Distribution/Cable Management Solution

powered by **Strikesorb®**

Electrical

Model Number		DC6-48-60-18-8C-EV
CEQ / ANT Number		CEQ.18537
Number of Circuits Protected		6
Surge Protective Device (SPD) Type per UL 1449 4th Edition		Type 2
Surge Protection Class as per IEC 61643-11		Class I
Nominal Operating DC Voltage [U_n]		48 V
Nominal Discharge Current [I_n] per UL 1449 4th Edition		20 kA 8/20 µs
Maximum Surge Current [I_{max}] per IEC 61643-11		90 kA 8/20 µs
Maximum Impulse (Lightning) Current [I_{imp}] per IEC 61643-11		12.5 kA 10/350 µs
Maximum Continuous Operating DC Voltage [U_c] (MCOV)		60 VDC
Voltage Protection Level [U_p] per IEC 61643-11		160 V
Voltage Protection Rating (VPR) per UL 1449 4th Edition		330 V
Suppression Technology		MOV
Strikesorb Module Type 2CA (UL 1449 4th edition)		30-V1-EV
Protection Modes:	Normal Mode	-48V to Return
	Common Mode	Return to Ground

Mechanical

Connection Terminal (Alarm) Method		Form C Hardwired, #22 to #12 AWG [0.34 to 4 mm²]
Connection Terminal (Suppression) Method (for all power cables)		Compression lug 2 hole, #10, 5/8 pitch, #12 – #4 AWG [3.3 – 21.15 mm²]
Connection Terminal (Terminal Block) Method	Copper	#12 to #4 AWG [3.3 – 21.15 mm²]
Fiber Connection Method		LC-LC Single Mode
Environmental Ingress Protection (IP) Rating		IP 68
Operating Temperature (°C)		-40° C to +100° C
Storage Temperature (°C)		-70° C to +80° C
Cold Temperature Cycling IEC 61300-2-22		-30° C to +60° C 200 hrs @5 PSI
Resistance to Aggressive Materials CEI IEC 61073-2		Including Acids and Bases
UV Protection ISO 4892-2 Method A		Xenon-Arc 2160 hrs
Enclosure Type		Outdoor NEMA 4X
Enclosure Dimensions (L x W x H)		18.28" x 10.24" x 31.4" [464 x 260 x 797 mm]
Weight*		System: 16.0 lbs [7.25 kg] Mount: 10.2 lbs [4.62 kg] Total: 26.2 lbs [11.87 kg]
Combined Wind Loading	Sustained	150 mph Sustained: 105.7 lbs [470 N]
	Gust	195 mph Gust: 213.6 lbs [950 N]

Standards Compliance & Certifications

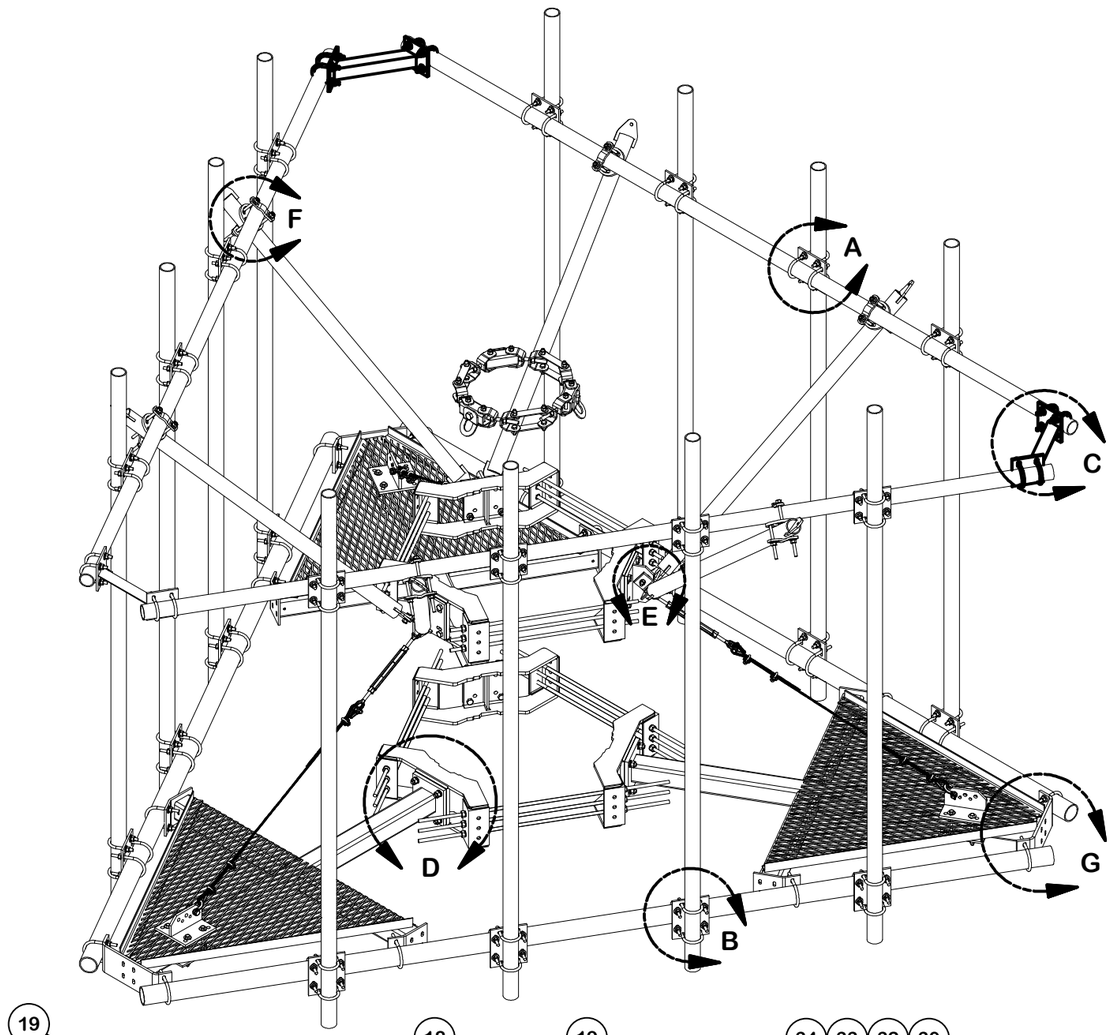
NEBS certified to: GR-63-CORE Issue 4, GR-1089-CORE Issue 6, GR-3108-CORE Issue 3, GR-487-CORE Issue 4, ATT-TP-76200 Issue 18

Strikesorb modules are compliant to the following Surge Protection Device Standards:

Standards: UL 1449 4th Edition: 2011, IEC 61643-11: 2011, EN 61643-11: 2012, IEEE C62.11: 2005, IEEE C62.41: 2002, IEEE C62.45: 2002, NEMA-LS-1

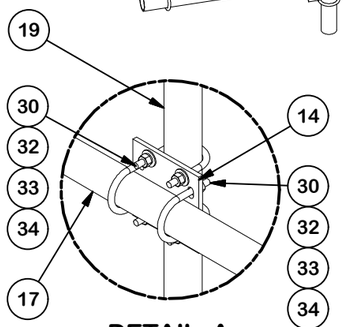
Certifications: UL, VDE, CE

AWG=American Wire Gauge

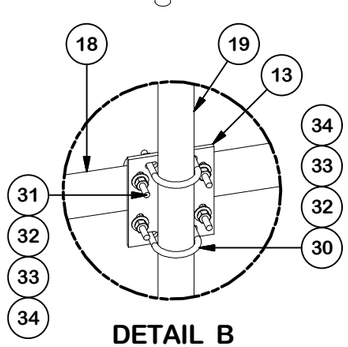


PARTS LIST

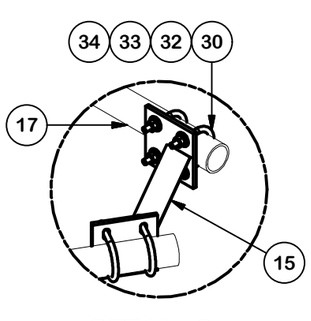
ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	6	X-LWRM	RING MOUNT WELDMENT		68.81	412.85
2	3	X-SV196L	LONG PLATFORM WELDMENT		230.94	692.81
3	6	X-TBW	T-BRACKET WELDMENT		13.60	81.60
4	6	SHCM-T	CHAIN MOUNT TIGHTENER BRACKET	3 in	1.86	11.15
5	6	X-VSKL	LONG SUPPORT WELDMENT FOR VSK REINFORCEMENTS		37.05	222.33
6	6	X-127594	FLAT DISK CLAMP PLATE 4" CENTERS (GALV.)		2.51	15.04
7	12	X-100064	CLAMP (4" V-CLAMP) GALVANIZED		0.92	11.06
8	3	320751-I	1/2" CHAIN SHACKLE		0.76	2.29
9	3	320601-I	5/8" TURNBUCKLE		2.63	7.89
10	6	320777-I	5/16" THIMBLE		0.06	0.36
11	12	320152-I	5/16" WIRE ROPE CLIP		1.32	15.78
12	3	AC516-10	5/16" AIRECRAFT CABLE		1.25	3.76
13	15	SCX4	CROSSOVER PLATE	8 1/2 in	6.02	90.32
14	12	SCX2	CROSSOVER PLATE	7 in	4.80	57.56
15	3	X-AHCP	ANGLE HANDRAIL CORNER PLATE		12.92	38.76
17	3	P30174	2-7/8" O.D. x 174" SCH. 40 PIPE	174 in	84.20	252.59
18	3	P3174	3-1/2" X 174" SCH 40 GALVANIZED PIPE	174 in	109.97	329.90
19	12	P30120	2-7/8" x 120" (2-1/2" SCH. 40) GALVANIZED PIPE	120 in	58.07	696.79
20	18	G58R-48	5/8" x 48" THREADED ROD (HDG.)		4.18	75.27
20	18	G58R-24	5/8" x 24" THREADED ROD (HDG.)		2.09	37.63
21	12	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	3.75
22	12	A58234	5/8" x 2-3/4" HDG A325 HEX BOLT	2 3/4 in	0.36	4.27
23	12	A58FW	5/8" HDG A325 FLATWASHER		0.03	0.41
24	60	G58LW	5/8" HDG LOCKWASHER		0.03	1.57
25	60	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	7.79
26	6	G12112	1/2" x 1-1/2" HDG HEX BOLT GR5	1/2 in	0.15	0.89
27	3	G12212	1/2" x 2-1/2" HDG HEX BOLT GR5	2 1/2 in	0.20	0.61
28	12	G1204	1/2" x 4" HDG HEX BOLT GR5 FULL THREAD	4 in	0.27	3.24
29	24	G12065	1/2" x 6-1/2" HDG HEX BOLT GR5 FULL THREAD	5 1/2 in	0.41	9.83
30	84	X-UB1300	1/2" X 3" X 5" X 2" U-BOLT (HDG.)		0.67	56.19
31	36	X-UB1306	1/2" X 3-5/8" X 6" X 3" U-BOLT (HDG.)		0.83	29.82
32	288	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	9.82
33	285	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	3.96
34	285	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	20.41
35	1	HALO40	5,000 LB. MAINTENANCE TIE-OFF POINT		41.12	41.12
					TOTAL WT. #	3249.41



DETAIL A



DETAIL B



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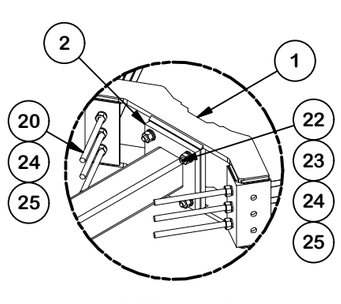

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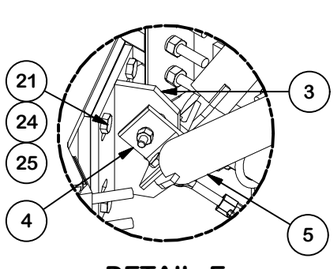
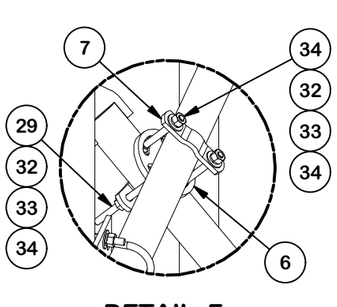
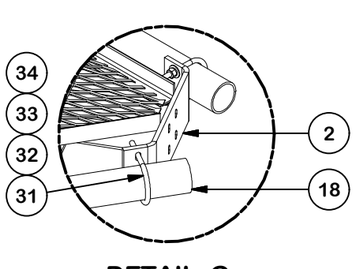


DETAIL E



DETAIL F



DETAIL G

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES (± 0.030")
DRILLED AND GAS CUT HOLES (± 0.030") - NO CONING OF HOLES
LASER CUT EDGES AND HOLES (± 0.010") - NO CONING OF HOLES
BENDS AND ANGLES ARE ± 1/2 DEGREE
ALL OTHER MACHINING (± 0.030")
ALL OTHER ASSEMBLY (± 0.060")

DESCRIPTION
14' 6" LOW PROFILE PLATFORM
WITH TWELVE 2-7/8" ANTENNA MOUTING
PIPES, REINFORCED HANDRAIL, AND CABLE

SITE PRO 1
A valmont COMPANY
Engineering Support Team: 1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX
Tampa, FL

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CSL 10/17/2019	10/18/2019	RMQLP-4120-H10

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
87	02	CUSTOMER	BMC 10/18/2019	RMQLP-4120-H10

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 5, 2020

Site Pro 1 / Valmont Mounting System:

Part Number = RMQLP-4120-H10
Part Description = 14' Low Pro-Platform with Handrail System

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

EPA_N	= 42.20(28.15) sq-Ft	$EPA_{N\ (0.5"\ Ice)}$	= 51.14(34.10) sq-Ft	$EPA_{N\ (1"\ Ice)}$	= 60.14(40.10) sq-Ft
EPA_T	= 39.62(26.41) sq-Ft	$EPA_{T\ (0.5"\ Ice)}$	= 48.52(32.35) sq-Ft	$EPA_{T(1"\ Ice)}$	= 57.81(38.54) sq-Ft
Weight	= 3265 lb	$Weight_{(0.5"\ Ice)}$	=3657 lb	$Weight_{(1"\ Ice)}$	= 4180 lb

Classification Rating:

Heavy 10

Design Standards

ANSI/TIA-222-G-2012
ANSI/TIA-222-H-2018
ASCE 7-16
ATT-002-291-373
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 twelve (12) mounting locations (antenna, mount pipe, radio, dish, and any other appurtenance) evenly spaced across the face of the mount, with a zero inch (0) vertical eccentricity on the mast pipe. 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

March 28, 2022
December 1, 2023 (Rev. 1)

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:	AT&T Site Number:	CT1104 (C-Band)
	FA Number:	10035295
	PACE Number:	MRCTB052362
	PT Number:	2051A1027B
	TEP Project Number:	317712.901435
	AT&T Site Name:	FARMINGTON NU MAPLE RIDGE DR
	Site Address:	45 Maple Ridge Drive Farmington, CT 06032

To Whom It May Concern:

TEP Northeast (TEP NE) has been authorized by SAI Communications to perform a mount analysis on the existing AT&T antenna/RRH mount to determine their capability of supporting the following additional loading:

- (3) DMP65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 96 lbs. /each)
- (3) TPA65R-BU6DA-K Antennas (71.2"x20.7"x7.7" – Wt. = 69 lbs. /each)
- (6) TMABPD7823VG12A TMA's (10.7"x11.1"x3.8" – Wt. = 25 lbs. /each)
- (6) TMA2124F03V5-1D TMA's (9.7"x8.3"x5.1" – Wt. = 18 lbs. /each)
- **(3) AIR6419 Antennas (31.2"x16.1"x9.1" – Wt. = 66 lbs. /each)**
- **(3) AIR6449 Antennas (30.6"x15.9"x10.6" – Wt. 84 lbs. /each)**
- **(1) Squid Surge Arrestor (31.4"x10.2"Ø – Wt. = 29 lbs. /each)**

**Proposed equipment shown in bold*

Mount fabrication drawings prepared by SitePro1 P/N RMQLP-4120-H10, dated October 18, 2019 were used to perform this analysis. TEP NE conducted a ground audit of the existing antennas mount on February 17, 2022.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2021 with 2022 Connecticut State Building Code, and AT&T Mount Technical Directive – R22.
- TEP NE considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix P of the Connecticut State Building Code, the max basic wind speed for this site is equal to 130 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.99 in was used for this analysis.
- TEP NE considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.
- TEP NE considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- TEP NE considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.188 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.055.
- The mount has been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 4.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mount is secured to the existing monopole with ring mounts and threaded rods. TEP NE considers the threaded rods to be the governing connection member.

Based on our evaluation, we have determined that the existing mount **IS CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing (C-Band) Mount Rating	42	LC2	89%	**PASS**

Reference Documents:

- Mount Fabrication Drawings prepared by SitePro1 P/N RMQLP-4120-H10, dated October 18, 2019.

This determination was based on the following limitations and assumptions:

1. TEP NE is not responsible for any modifications completed prior to and hereafter which TEP NE was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mount must be tightened and re-plumbed prior to the installation of new appurtenances.
6. TEP NE performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
TEP Northeast

Michael Cabral
Director

Daniel P. Hamm, PE
Vice President

FIELD PHOTOS:


02/17/2022 12:22


02/17/2022 12:23


02/17/2022 12:23


02/17/2022 12:24


02/17/2022 12:24


02/17/2022 12:25

Wind & Ice
Calculations

Date: 12/1/2023
Project Name: FARMINGTON NU MAPLE RIDGE DR
Project No.: CT1104
Designed By: LBW **Checked By:** MSC

TEP NORTHEAST

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\ (z/z_g)^{2/\alpha}$

z=	135	(ft)
z_g=	900	(ft)
α=	9.5	

K_z= 1.348

Kzmin ≤ Kz ≤ 2.01

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c\ K_t/K_h)]^2$

$K_h = e^{(f*z/H)}$

K_{zt}= 1

(If Category 1 then K_{zt} =1.0)

Category= 1

K_h=	1	
K_c=	1.0	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	135	
z_s=	238	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	0.99	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness =	t_i = 1.50	in
Importance Factor =	I= 1.15	(from Table 2-3)
	K_{iz} = 1.15	(from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$

t_{iz} = 1.99 in

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2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	95.5	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h=	1.35	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

$F = q_z * G_h * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$

		K_z=	1.348	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**54.94**	K_e=	0.99	(from 2.6.8)
$q_{z\ (ice)}$=	**8.13**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.93**	V_{max}=	130	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

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Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = 1.99 in | **Angle =** 0 (deg) | **Equivalent Angle =** 180 (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	698	130	37
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.94	1.20	230	48	12
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	223	47	12
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.44	1.24	698	130	37
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	2.82	1.21	19	8	1
TMABPD7823VG12A TMA (Shielded)	10.7	0.0	11.1	0.00	0.00	1.20	0	4	0
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	1.90	1.20	23	8	1
TMA2124F03V5-1D TMA (Shielded)	9.7	0.0	8.3	0.00	0.00	1.20	0	4	0
Surge Arrestor	31.4	10.2	10.2	2.22	3.08	0.70	86	20	5
2-1/2" Pipe	2.9	12.0		0.24	0.24	1.20	16		
3" Pipe	3.5	12.0		0.29	0.29	1.20	19		
2x2 Angle	2.0	12.0		0.17	0.17	2.00	18		
2-1/2x2-1/2 Angle	2.5	12.0		0.21	0.21	2.00	23		
HSS 4x4	4.0	12.0		0.33	0.33	1.25	23		
6x3/8 PL	6.0	12.0		0.50	0.50	2.00	55		

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TEP NORTHEAST

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.99	in.	Equivalent Angle =	210	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	601
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	230	134	206
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	223	151	205
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	601
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	19	54	28
TMABPD7823VG12A TMA (Shielded	10.7	1.9	11.1	0.14	0.82	5.63	0.96	1.34	1.20	10	54	21
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	23	37	26
TMA2124F03V5-1D TMA (Shielded)	9.7	2.6	8.3	0.17	0.56	3.80	1.17	1.26	1.20	12	37	18

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	113
AIR6419 Antenna	35.2	20.1	13.1	4.90	3.19	1.75	2.69	1.20	1.21	48	31	44
AIR6449 Antenna	34.6	19.9	14.6	4.77	3.50	1.74	2.37	1.20	1.20	47	34	43
TPA65R-BU6DA-K Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	113
TMABPD7823VG12A TMA	14.7	7.8	15.1	0.79	1.54	1.89	0.97	1.20	1.20	8	15	10
TMABPD7823VG12A TMA (Shielded	14.7	3.9	15.1	0.40	1.54	3.78	0.97	1.26	1.20	4	15	7
TMA2124F03V5-1D TMA	13.7	9.1	12.3	0.86	1.17	1.51	1.11	1.20	1.20	8	11	9
TMA2124F03V5-1D TMA (Shielded)	13.7	4.5	12.3	0.43	1.17	3.01	1.11	1.22	1.20	4	11	6

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	32
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	12	7	11
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	11
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	32
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	1
TMABPD7823VG12A TMA (Shielded	10.7	1.9	11.1	0.14	0.82	5.63	0.96	1.34	1.20	1	3	1
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	1	2	1
TMA2124F03V5-1D TMA (Shielded)	9.7	2.6	8.3	0.17	0.56	3.80	1.17	1.26	1.20	1	2	1

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WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.99	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	406
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	230	134	158
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	223	151	169
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	406
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	19	54	45
TMABPD7823VG12A TMA (Shielded	10.7	2.9	11.1	0.21	0.82	3.75	0.96	1.26	1.20	15	54	44
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	23	37	33
TMA2124F03V5-1D TMA (Shielded)	9.7	3.8	8.3	0.26	0.56	2.54	1.17	1.20	1.20	17	37	32

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	83
AIR6419 Antenna	35.2	20.1	13.1	4.90	3.19	1.75	2.69	1.20	1.21	48	31	35
AIR6449 Antenna	34.6	19.9	14.6	4.77	3.50	1.74	2.37	1.20	1.20	47	34	37
TPA65R-BU6DA-K Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	83
TMABPD7823VG12A TMA	14.7	7.8	15.1	0.79	1.54	1.89	0.97	1.20	1.20	8	15	13
TMABPD7823VG12A TMA (Shielded	14.7	5.8	15.1	0.59	1.54	2.52	0.97	1.20	1.20	6	15	13
TMA2124F03V5-1D TMA	13.7	9.1	12.3	0.86	1.17	1.51	1.11	1.20	1.20	8	11	11
TMA2124F03V5-1D TMA (Shielded)	13.7	6.8	12.3	0.65	1.17	2.01	1.11	1.20	1.20	6	11	10

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	22
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	12	7	8
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	9
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	22
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	2
TMABPD7823VG12A TMA (Shielded	10.7	2.9	11.1	0.21	0.82	3.75	0.96	1.26	1.20	1	3	2
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	1	2	2
TMA2124F03V5-1D TMA (Shielded)	9.7	3.8	8.3	0.26	0.56	2.54	1.17	1.20	1.20	1	2	2

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WIND LOADS

Angle = 90 (deg) | Ice Thickness = 1.99 in. | Equivalent Angle = 270 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	308
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	230	134	134
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	223	151	151
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	308
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	19	54	54
TMABPD7823VG12A TMA (Shielded	10.7	0.0	11.1	0.00	0.82	0.00	0.96	1.20	1.20	0	54	54
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	23	37	37
TMA2124F03V5-1D TMA (Shielded)	9.7	0.0	8.3	0.00	0.56	0.00	1.17	1.20	1.20	0	37	37

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	68
AIR6419 Antenna	35.2	20.1	13.1	4.90	3.19	1.75	2.69	1.20	1.21	48	31	31
AIR6449 Antenna	34.6	19.9	14.6	4.77	3.50	1.74	2.37	1.20	1.20	47	34	34
TPA65R-BU6DA-K Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	68
TMABPD7823VG12A TMA	14.7	7.8	15.1	0.79	1.54	1.89	0.97	1.20	1.20	8	15	15
TMABPD7823VG12A TMA (Shielded	14.7	4.0	15.1	0.40	1.54	3.69	0.97	1.25	1.20	4	15	15
TMA2124F03V5-1D TMA	13.7	9.1	12.3	0.86	1.17	1.51	1.11	1.20	1.20	8	11	11
TMA2124F03V5-1D TMA (Shielded)	13.7	4.0	12.3	0.38	1.17	3.44	1.11	1.24	1.20	4	11	11

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	16
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	12	7	7
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	8
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	16
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	3
TMABPD7823VG12A TMA (Shielded	10.7	0.0	11.1	0.00	0.82	0.00	0.96	1.20	1.20	0	3	3
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	1	2	2
TMA2124F03V5-1D TMA (Shielded)	9.7	0.0	8.3	0.00	0.56	0.00	1.17	1.20	1.20	0	2	2

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WIND LOADS

Angle = 120 (deg) | Ice Thickness = 1.99 in. | Equivalent Angle = 300 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	406
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	230	134	158
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	223	151	169
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	406
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	19	54	45
TMABPD7823VG12A TMA (Shielded)	10.7	2.9	11.1	0.21	0.82	3.75	0.96	1.26	1.20	15	54	44
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	23	37	33
TMA2124F03V5-1D TMA (Shielded)	9.7	3.8	8.3	0.26	0.56	2.54	1.17	1.20	1.20	17	37	32

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	83
AIR6419 Antenna	35.2	20.1	13.1	4.90	3.19	1.75	2.69	1.20	1.21	48	31	35
AIR6449 Antenna	34.6	19.9	14.6	4.77	3.50	1.74	2.37	1.20	1.20	47	34	37
TPA65R-BU6DA-K Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	83
TMABPD7823VG12A TMA	14.7	7.8	15.1	0.79	1.54	1.89	0.97	1.20	1.20	8	15	13
TMABPD7823VG12A TMA (Shielded)	14.7	5.8	15.1	0.59	1.54	2.52	0.97	1.20	1.20	6	15	13
TMA2124F03V5-1D TMA	13.7	9.1	12.3	0.86	1.17	1.51	1.11	1.20	1.20	8	11	11
TMA2124F03V5-1D TMA (Shielded)	13.7	6.8	12.3	0.65	1.17	2.01	1.11	1.20	1.20	6	11	10

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	22
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	12	7	8
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	9
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	22
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	2
TMABPD7823VG12A TMA (Shielded)	10.7	2.9	11.1	0.21	0.82	3.75	0.96	1.26	1.20	1	3	2
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	1	2	2
TMA2124F03V5-1D TMA (Shielded)	9.7	3.8	8.3	0.26	0.56	2.54	1.17	1.20	1.20	1	2	2

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WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.99	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	601
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	230	134	206
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	223	151	205
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	698	308	601
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	19	54	28
TMABPD7823VG12A TMA (Shielded)	10.7	1.9	11.1	0.14	0.82	5.63	0.96	1.34	1.20	10	54	21
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	23	37	26
TMA2124F03V5-1D TMA (Shielded)	9.7	2.6	8.3	0.17	0.56	3.80	1.17	1.26	1.20	12	37	18

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	113
AIR6419 Antenna	35.2	20.1	13.1	4.90	3.19	1.75	2.69	1.20	1.21	48	31	44
AIR6449 Antenna	34.6	19.9	14.6	4.77	3.50	1.74	2.37	1.20	1.20	47	34	43
TPA65R-BU6DA-K Antenna	75.2	24.7	11.7	12.88	6.09	3.05	6.44	1.22	1.38	128	68	113
TMABPD7823VG12A TMA	14.7	7.8	15.1	0.79	1.54	1.89	0.97	1.20	1.20	8	15	10
TMABPD7823VG12A TMA (Shielded)	14.7	3.9	15.1	0.40	1.54	3.78	0.97	1.26	1.20	4	15	7
TMA2124F03V5-1D TMA	13.7	9.1	12.3	0.86	1.17	1.51	1.11	1.20	1.20	8	11	9
TMA2124F03V5-1D TMA (Shielded)	13.7	4.5	12.3	0.43	1.17	3.01	1.11	1.22	1.20	4	11	6

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	32
AIR6419 Antenna	31.2	16.1	9.1	3.49	1.97	1.94	3.43	1.20	1.24	12	7	11
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	12	8	11
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	37	16	32
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	1
TMABPD7823VG12A TMA (Shielded)	10.7	1.9	11.1	0.14	0.82	5.63	0.96	1.34	1.20	1	3	1
TMA2124F03V5-1D TMA	9.7	5.1	8.3	0.34	0.56	1.90	1.17	1.20	1.20	1	2	1
TMA2124F03V5-1D TMA (Shielded)	9.7	2.6	8.3	0.17	0.56	3.80	1.17	1.26	1.20	1	2	1

Date: 12/1/2023
Project Name: FARMINGTON NU MAPLE RIDGE DR
Project No.: CT1104
Designed By: LBW **Checked By:** MSC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.99 in.
Density of ice: 56 pcf

DMP65R-BU6DA Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		347 lbs
Weight of object:	96.0 lbs	
Combined weight of ice and object:		443 lbs

AIR6419 Antenna

Weight of ice based on total radial SF area:

Height (in):	31.2	
Width (in):	16.1	
Depth (in):	9.1	
Total weight of ice on object:		129 lbs
Weight of object:	66.0 lbs	
Combined weight of ice and object:		195 lbs

AIR6449 Antenna

Weight of ice based on total radial SF area:

Height (in):	30.6	
Width (in):	15.9	
Depth (in):	10.6	
Total weight of ice on object:		131 lbs
Weight of object:	84.0 lbs	
Combined weight of ice and object:		215 lbs

TPA65R-BU6DA-K Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		347 lbs
Weight of object:	69.0 lbs	
Combined weight of ice and object:		416 lbs

TMABPD7823VG12A TMA

Weight of ice based on total radial SF area:

Height (in):	10.7	
Width (in):	3.8	
Depth (in):	11.1	
Total weight of ice on object:		30 lbs
Weight of object:	25.0 lbs	
Combined weight of ice and object:		55 lbs

TMA2124F03V5-1D TMA

Weight of ice based on total radial SF area:

Height (in):	9.7	
Width (in):	5.1	
Depth (in):	8.3	
Total weight of ice on object:		23 lbs
Weight of object:	18.0 lbs	
Combined weight of ice and object:		41 lbs

Squid Surge Arrestor

Weight of ice based on total radial SF area:

Depth (in):	31.4	
Diameter(in):	10.2	
Total weight of ice on object:		78 lbs
Weight of object:	29 lbs	
Combined weight of ice and object:		107 lbs

2-1/2" pipe

Per foot weight of ice:

diameter (in):	2.88	
Per foot weight of ice on object:		12 plf

3" Pipe

Per foot weight of ice:

diameter (in):	3.5	
Per foot weight of ice on object:		13 plf

L 2x2 Angles

Weight of ice based on total radial SF area:

Height (in):	2	
Width (in):	2	
Per foot weight of ice on object:		12 plf

HSS 4x4

Weight of ice based on total radial SF area:

Height (in):	4	
Width (in):	4	
Per foot weight of ice on object:		19 plf

L 2-1/2x2-1/2 Angles

Weight of ice based on total radial SF area:

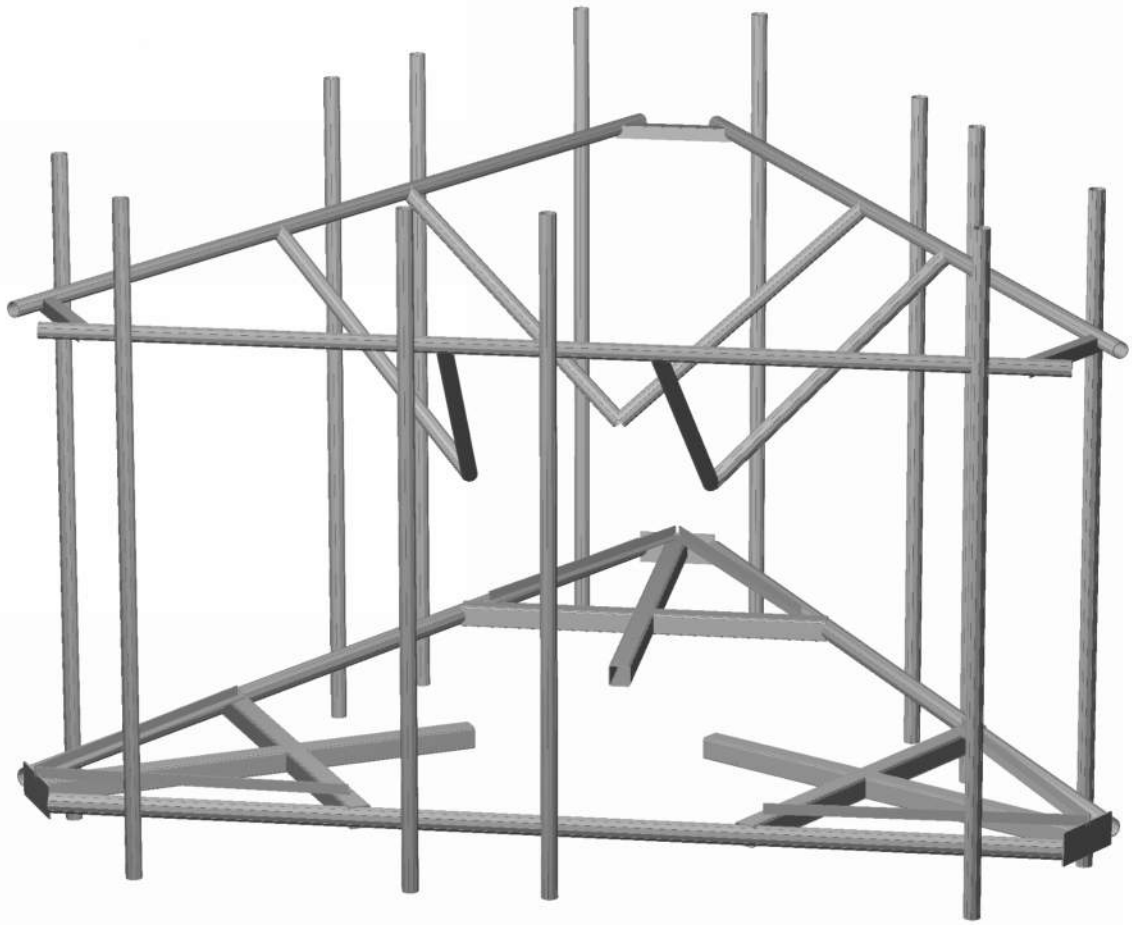
Height (in):	2.5	
Width (in):	2.5	
Per foot weight of ice on object:		13 plf

PL 6x3/8

Weight of ice based on total radial SF area:

Height (in):	6	
Width (in):	0.375	
Per foot weight of ice on object:		19 plf

Mount Calculations
(Existing Conditions)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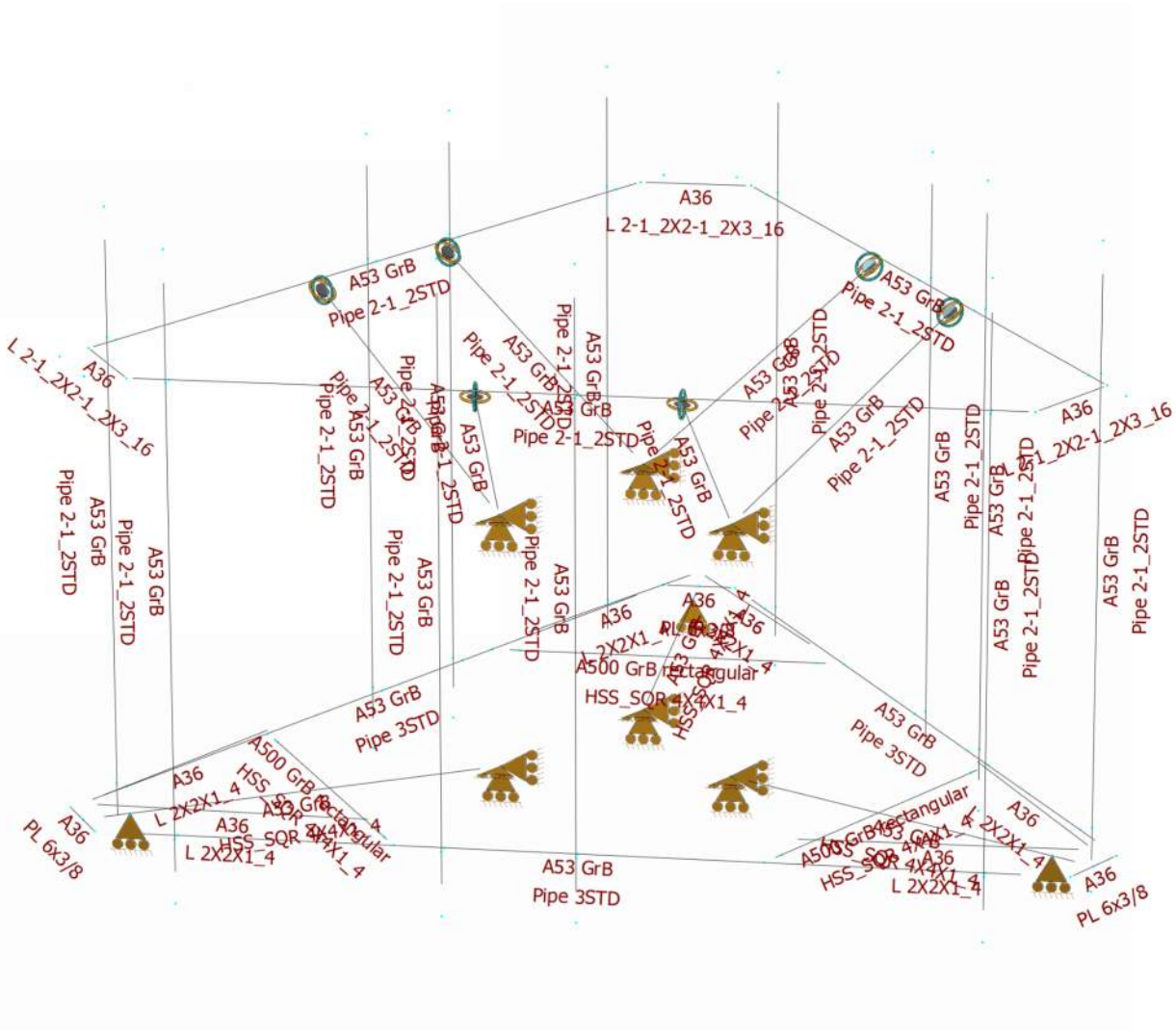
X
Z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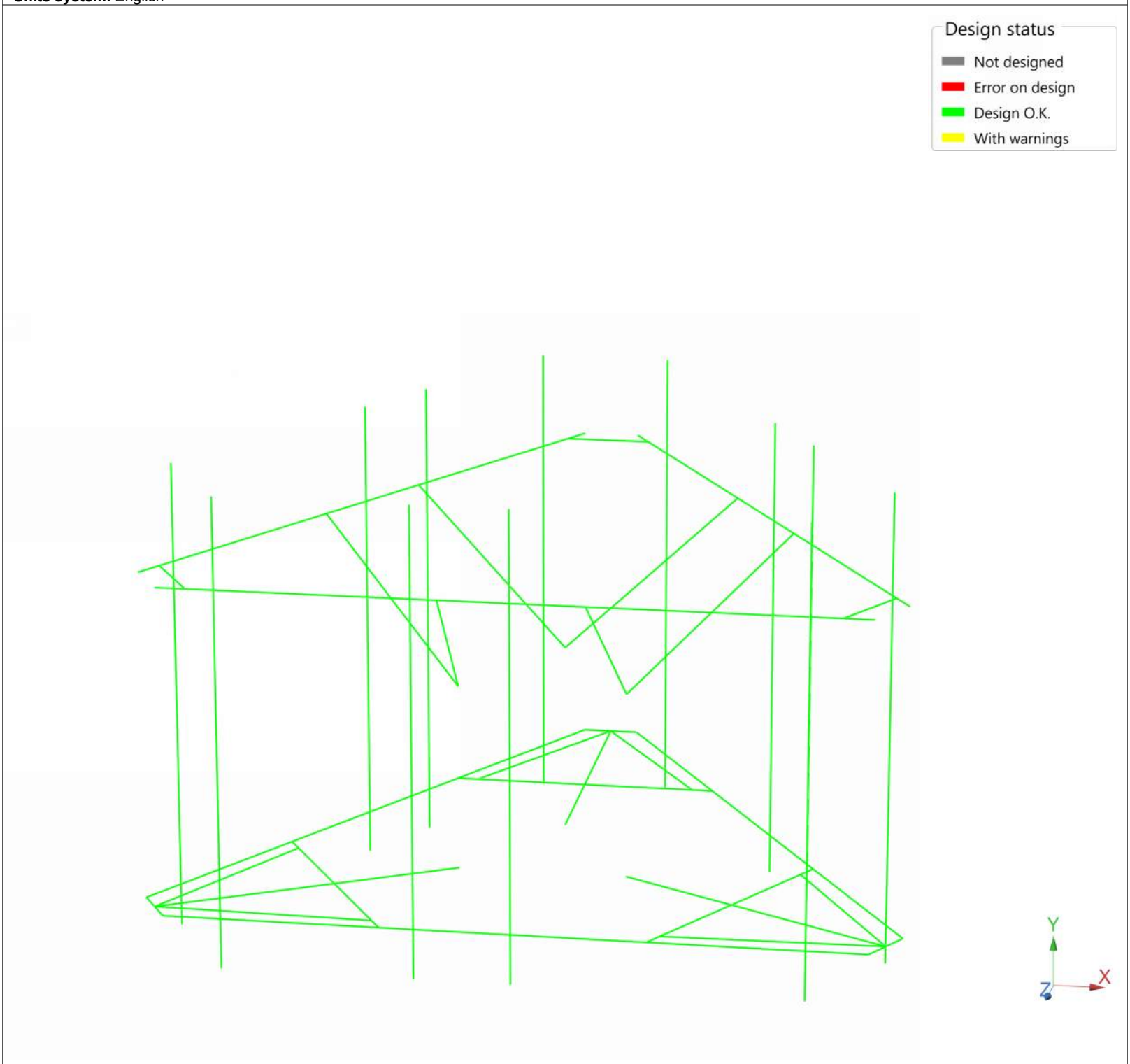
L 2-1_2X2-1_2X3_16
A53 GrB
Pipe 2-1_2STD
A53 GrB
Pipe 3STD
A500 GrB Rectangular
HSS_SQR 4X4X1_4
A36
L 2X2X1_4
A36
PL 6x3/8
Y
X
Z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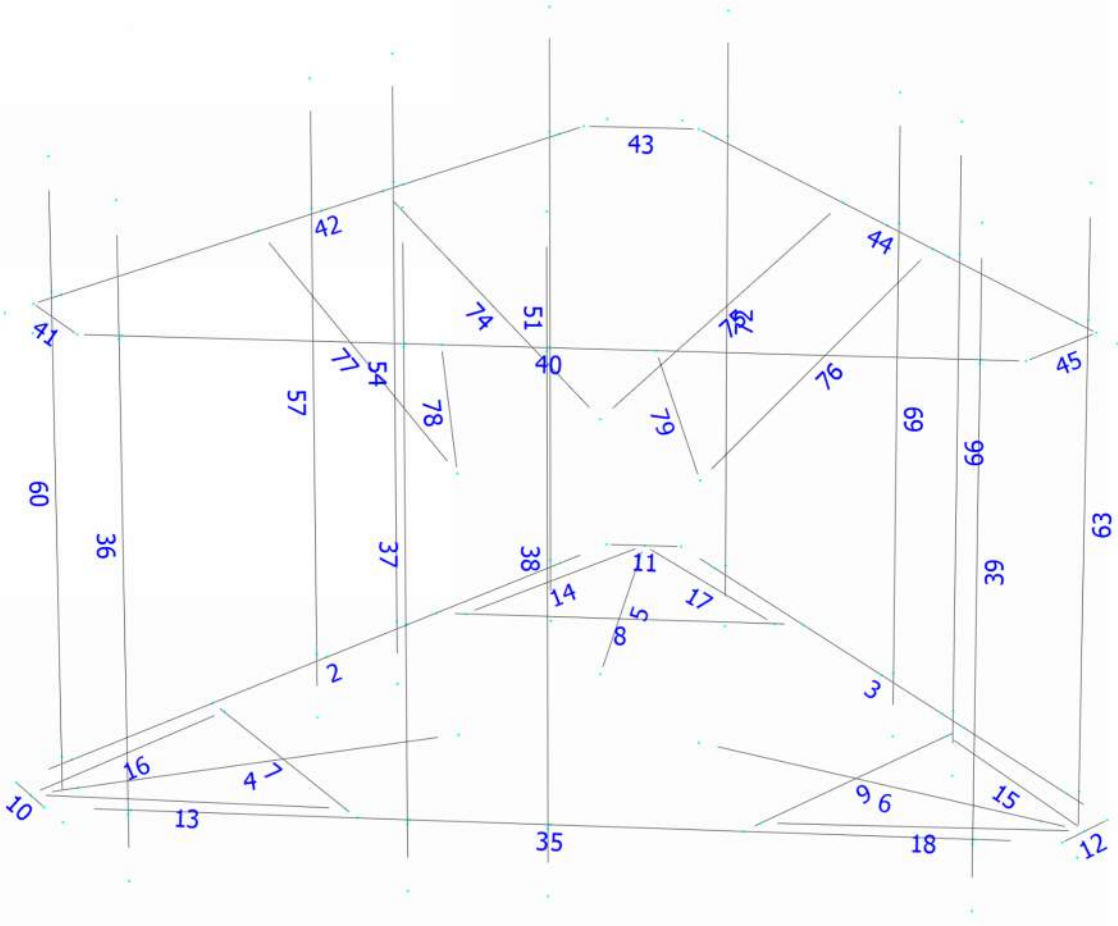
Error on design
Design O.K.
With warnings
Y
X
Z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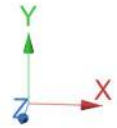

Y
X
Z

Current Date: 12/1/2023 2:08 PM
Units system: English

Load data

Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	500 lb Live Load on Antenna 1	No	LL
LLa2	500 lb Live Load on Antenna 2	No	LL
LLa3	500 lb Live Load on Antenna 3	No	LL
LLa4	500 lb Live Load on Antenna 4	No	LL

Distributed force on members

Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	13	y	-0.01	0.00	0.00	No	0.00	No
	14	y	-0.01	0.00	0.00	No	0.00	No
	15	y	-0.01	0.00	0.00	No	0.00	No
	16	y	-0.01	0.00	0.00	No	0.00	No
	17	y	-0.01	0.00	0.00	No	0.00	No
	18	y	-0.01	0.00	0.00	No	0.00	No
W0	2	z	-0.019	0.00	0.00	No	0.00	No
	3	z	-0.019	0.00	0.00	No	0.00	No
	4	z	-0.023	0.00	0.00	No	0.00	No
	6	z	-0.023	0.00	0.00	No	0.00	No
	7	z	-0.023	0.00	0.00	No	0.00	No
	8	z	-0.023	0.00	0.00	No	0.00	No
	9	z	-0.023	0.00	0.00	No	0.00	No
	10	z	-0.055	0.00	0.00	No	0.00	No
	11	z	-0.055	0.00	0.00	No	0.00	No
	12	z	-0.055	0.00	0.00	No	0.00	No
	13	z	-0.018	0.00	0.00	No	0.00	No
	14	z	-0.018	0.00	0.00	No	0.00	No
	15	z	-0.018	0.00	0.00	No	0.00	No
	16	z	-0.018	0.00	0.00	No	0.00	No
	17	z	-0.018	0.00	0.00	No	0.00	No
	18	z	-0.018	0.00	0.00	No	0.00	No
	35	z	-0.019	0.00	0.00	No	0.00	No
	36	z	-0.016	-0.016	6.00	No	10.00	No
	37	z	-0.016	0.00	0.00	No	0.00	No
	38	z	-0.016	-0.016	7.00	No	10.00	No
	39	z	-0.016	-0.016	6.00	No	10.00	No
	40	z	-0.016	0.00	0.00	No	0.00	No

	41	z	-0.023	0.00	0.00	No	0.00	No
	42	z	-0.016	0.00	0.00	No	0.00	No
	43	z	-0.023	0.00	0.00	No	0.00	No
	44	z	-0.016	0.00	0.00	No	0.00	No
	45	z	-0.023	0.00	0.00	No	0.00	No
	51	z	-0.016	0.00	0.00	No	0.00	No
	54	z	-0.016	0.00	0.00	No	0.00	No
	57	z	-0.016	0.00	0.00	No	0.00	No
	60	z	-0.016	0.00	0.00	No	0.00	No
	63	z	-0.016	0.00	0.00	No	0.00	No
	66	z	-0.016	0.00	0.00	No	0.00	No
	69	z	-0.016	0.00	0.00	No	0.00	No
	72	z	-0.016	0.00	0.00	No	0.00	No
	74	z	-0.016	0.00	0.00	No	0.00	No
	75	z	-0.016	0.00	0.00	No	0.00	No
	76	z	-0.016	0.00	0.00	No	0.00	No
	77	z	-0.016	0.00	0.00	No	0.00	No
	78	z	-0.016	0.00	0.00	No	0.00	No
	79	z	-0.016	0.00	0.00	No	0.00	No
W30	2	x	-0.019	0.00	0.00	No	0.00	No
	3	x	-0.019	0.00	0.00	No	0.00	No
	4	x	-0.023	0.00	0.00	No	0.00	No
	5	x	-0.023	0.00	0.00	No	0.00	No
	6	x	-0.023	0.00	0.00	No	0.00	No
	7	x	-0.023	0.00	0.00	No	0.00	No
	9	x	-0.023	0.00	0.00	No	0.00	No
	10	x	-0.055	0.00	0.00	No	0.00	No
	11	x	-0.055	0.00	0.00	No	0.00	No
	12	x	-0.055	0.00	0.00	No	0.00	No
	13	x	-0.018	0.00	0.00	No	0.00	No
	14	x	-0.018	0.00	0.00	No	0.00	No
	15	x	-0.018	0.00	0.00	No	0.00	No
	16	x	-0.018	0.00	0.00	No	0.00	No
	17	x	-0.018	0.00	0.00	No	0.00	No
	18	x	-0.018	0.00	0.00	No	0.00	No
	36	x	-0.016	0.00	0.00	No	0.00	No
	37	x	-0.016	0.00	0.00	No	0.00	No
	38	x	-0.016	0.00	0.00	No	0.00	No
	39	x	-0.016	0.00	0.00	No	0.00	No
	41	x	-0.023	0.00	0.00	No	0.00	No
	42	x	-0.016	0.00	0.00	No	0.00	No
	43	x	-0.023	0.00	0.00	No	0.00	No
	44	x	-0.016	0.00	0.00	No	0.00	No
	45	x	-0.023	0.00	0.00	No	0.00	No
	51	x	-0.016	0.00	0.00	No	0.00	No
	54	x	-0.016	0.00	0.00	No	0.00	No
	57	x	-0.016	0.00	0.00	No	0.00	No
	60	x	-0.016	0.00	0.00	No	0.00	No
	63	x	-0.016	0.00	0.00	No	0.00	No
	66	x	-0.016	0.00	0.00	No	0.00	No
	69	x	-0.016	0.00	0.00	No	0.00	No
	72	x	-0.016	0.00	0.00	No	0.00	No
	74	x	-0.016	0.00	0.00	No	0.00	No
	75	x	-0.016	0.00	0.00	No	0.00	No
	76	x	-0.016	0.00	0.00	No	0.00	No
	77	x	-0.016	0.00	0.00	No	0.00	No
	78	x	-0.016	0.00	0.00	No	0.00	No
	79	x	-0.016	0.00	0.00	No	0.00	No
Di	2	y	-0.013	0.00	0.00	No	0.00	No
	3	y	-0.013	0.00	0.00	No	0.00	No
	4	y	-0.019	0.00	0.00	No	0.00	No
	5	y	-0.019	0.00	0.00	No	0.00	No

6	y	-0.019	0.00	0.00	No	0.00	No
7	y	-0.019	0.00	0.00	No	0.00	No
8	y	-0.019	0.00	0.00	No	0.00	No
9	y	-0.019	0.00	0.00	No	0.00	No
10	y	-0.019	0.00	0.00	No	0.00	No
11	y	-0.019	0.00	0.00	No	0.00	No
12	y	-0.019	0.00	0.00	No	0.00	No
13	y	-0.012	0.00	0.00	No	0.00	No
14	y	-0.012	0.00	0.00	No	0.00	No
15	y	-0.012	0.00	0.00	No	0.00	No
16	y	-0.012	0.00	0.00	No	0.00	No
17	y	-0.012	0.00	0.00	No	0.00	No
18	y	-0.012	0.00	0.00	No	0.00	No
35	y	-0.013	0.00	0.00	No	0.00	No
36	y	-0.012	0.00	0.00	No	0.00	No
37	y	-0.012	0.00	0.00	No	0.00	No
38	y	-0.012	0.00	0.00	No	0.00	No
39	y	-0.012	0.00	0.00	No	0.00	No
40	y	-0.012	0.00	0.00	No	0.00	No
41	y	-0.013	0.00	0.00	No	0.00	No
42	y	-0.012	0.00	0.00	No	0.00	No
43	y	-0.013	0.00	0.00	No	0.00	No
44	y	-0.012	0.00	0.00	No	0.00	No
45	y	-0.013	0.00	0.00	No	0.00	No
51	y	-0.012	0.00	0.00	No	0.00	No
54	y	-0.012	0.00	0.00	No	0.00	No
57	y	-0.012	0.00	0.00	No	0.00	No
60	y	-0.012	0.00	0.00	No	0.00	No
63	y	-0.012	0.00	0.00	No	0.00	No
66	y	-0.012	0.00	0.00	No	0.00	No
69	y	-0.012	0.00	0.00	No	0.00	No
72	y	-0.012	0.00	0.00	No	0.00	No
74	y	-0.012	0.00	0.00	No	0.00	No
75	y	-0.012	0.00	0.00	No	0.00	No
76	y	-0.012	0.00	0.00	No	0.00	No
77	y	-0.012	0.00	0.00	No	0.00	No
78	y	-0.012	0.00	0.00	No	0.00	No
79	y	-0.012	0.00	0.00	No	0.00	No

Concentrated forces on members

Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	36	y	-0.035	0.50	No
		y	-0.035	5.50	No
		y	-0.036	7.00	No
	38	y	-0.033	0.50	No
		y	-0.033	2.50	No
		y	-0.042	4.50	No
		y	-0.042	6.50	No
	39	y	-0.048	0.50	No
		y	-0.048	5.50	No
		y	-0.05	7.00	No
	51	y	-0.035	0.50	No
		y	-0.035	5.50	No
		y	-0.036	7.00	No
	57	y	-0.033	0.50	No
		y	-0.033	2.50	No

		y	-0.042	4.50	No
		y	-0.042	6.50	No
	60	y	-0.048	0.50	No
		y	-0.048	5.50	No
		y	-0.05	7.00	No
	63	y	-0.035	0.50	No
		y	-0.035	5.50	No
		y	-0.036	7.00	No
	69	y	-0.033	0.50	No
		y	-0.033	2.50	No
		y	-0.042	4.50	No
		y	-0.042	6.50	No
	72	y	-0.048	0.50	No
		y	-0.048	5.50	No
		y	-0.05	7.00	No
W0	36	z	-0.35	0.50	No
		z	-0.35	5.50	No
	38	z	-0.115	0.50	No
		z	-0.115	2.50	No
		z	-0.112	4.50	No
		z	-0.112	6.50	No
	39	z	-0.35	0.50	No
		z	-0.35	5.50	No
	51	z	-0.203	0.50	No
		z	-0.203	5.50	No
		z	-0.032	7.00	No
	57	z	-0.08	0.50	No
		z	-0.08	2.50	No
		z	-0.085	4.50	No
		z	-0.085	6.50	No
	60	z	-0.203	0.50	No
		z	-0.203	5.50	No
		z	-0.044	7.00	No
	63	z	-0.203	0.50	No
		z	-0.203	5.50	No
		z	-0.032	7.00	No
	69	z	-0.08	0.50	No
		z	-0.08	2.50	No
		z	-0.085	4.50	No
		z	-0.085	6.50	No
	72	z	-0.203	0.50	No
		z	-0.203	5.50	No
		z	-0.044	7.00	No
W30	36	x	-0.155	0.50	No
		x	-0.155	5.50	No
		x	-0.037	7.00	No
	38	x	-0.068	0.50	No
		x	-0.068	2.50	No
		x	-0.076	4.50	No
		x	-0.076	6.50	No
	39	x	-0.155	0.50	No
		x	-0.155	5.50	No
		x	-0.054	7.00	No
	51	x	-0.301	0.50	No
		x	-0.301	5.50	No
		x	-0.018	7.00	No
	57	x	-0.104	0.50	No
		x	-0.104	2.50	No
		x	-0.103	4.50	No
		x	-0.103	6.50	No
	60	x	-0.301	0.50	No
		x	-0.301	5.50	No

		x	-0.021	7.00	No
	63	x	-0.301	0.50	No
		x	-0.301	5.50	No
		x	-0.018	7.00	No
	69	x	-0.104	0.50	No
		x	-0.104	2.50	No
		x	-0.103	4.50	No
		x	-0.103	6.50	No
	72	x	-0.301	0.50	No
		x	-0.301	5.50	No
		x	-0.021	7.00	No
Di	36	y	-0.174	0.50	No
		y	-0.174	5.50	No
		y	-0.046	7.00	No
	38	y	-0.065	0.50	No
		y	-0.065	2.50	No
		y	-0.065	4.50	No
		y	-0.065	6.50	No
	39	y	-0.174	0.50	No
		y	-0.174	5.50	No
		y	-0.059	7.00	No
	51	y	-0.174	0.50	No
		y	-0.174	5.50	No
		y	-0.046	7.00	No
	57	y	-0.065	0.50	No
		y	-0.065	2.50	No
		y	-0.065	4.50	No
		y	-0.065	6.50	No
	60	y	-0.174	0.50	No
		y	-0.174	5.50	No
		y	-0.059	7.00	No
	63	y	-0.174	0.50	No
		y	-0.174	5.50	No
		y	-0.046	7.00	No
	69	y	-0.065	0.50	No
		y	-0.065	2.50	No
		y	-0.065	4.50	No
		y	-0.065	6.50	No
	72	y	-0.174	0.50	No
		y	-0.174	5.50	No
		y	-0.059	7.00	No
Wi0	36	z	-0.065	0.50	No
		z	-0.065	5.50	No
		z	-0.007	7.00	No
	38	z	-0.024	0.50	No
		z	-0.024	2.50	No
		z	-0.024	4.50	No
		z	-0.024	6.50	No
	39	z	-0.065	0.50	No
		z	-0.065	5.50	No
		z	-0.008	7.00	No
	51	z	-0.042	0.50	No
		z	-0.042	5.50	No
		z	-0.01	7.00	No
	57	z	-0.018	0.50	No
		z	-0.018	2.50	No
		z	-0.019	4.50	No
		z	-0.019	6.50	No
	60	z	-0.042	0.50	No
		z	-0.042	5.50	No
		z	-0.013	7.00	No
	63	z	-0.042	0.50	No

		z	-0.042	5.50	No
		z	-0.01	7.00	No
	69	z	-0.018	0.50	No
		z	-0.018	2.50	No
		z	-0.019	4.50	No
		z	-0.019	6.50	No
	72	z	-0.042	0.50	No
		z	-0.042	5.50	No
		z	-0.013	7.00	No
Wi30	36	x	-0.035	0.50	No
		x	-0.035	5.50	No
		x	-0.011	7.00	No
	38	x	-0.016	0.50	No
		x	-0.016	2.50	No
		x	-0.018	4.50	No
		x	-0.018	6.50	No
	39	x	-0.035	0.50	No
		x	-0.035	5.50	No
		x	-0.015	7.00	No
	51	x	-0.057	0.50	No
		x	-0.057	5.50	No
		x	-0.006	7.00	No
	57	x	-0.022	0.50	No
		x	-0.022	2.50	No
		x	-0.022	4.50	No
		x	-0.022	6.50	No
	60	x	-0.057	0.50	No
		x	-0.057	5.50	No
		x	-0.007	7.00	No
	63	x	-0.057	0.50	No
		x	-0.057	5.50	No
		x	-0.006	7.00	No
	69	x	-0.022	0.50	No
		x	-0.022	2.50	No
		x	-0.022	4.50	No
		x	-0.022	6.50	No
	72	x	-0.057	0.50	No
		x	-0.057	5.50	No
		x	-0.007	7.00	No
WL0	36	z	-0.019	0.50	No
		z	-0.019	5.50	No
	38	z	-0.007	0.50	No
		z	-0.007	2.50	No
		z	-0.006	4.50	No
		z	-0.006	6.50	No
	39	z	-0.019	0.50	No
		z	-0.019	5.50	No
	51	z	-0.011	0.50	No
		z	-0.011	5.50	No
		z	-0.002	7.00	No
	57	z	-0.005	0.50	No
		z	-0.005	2.50	No
		z	-0.005	4.50	No
		z	-0.005	6.50	No
	60	z	-0.011	0.50	No
		z	-0.011	5.50	No
		z	-0.002	7.00	No
	63	z	-0.011	0.50	No
		z	-0.011	5.50	No
		z	-0.002	7.00	No
	69	z	-0.005	0.50	No
		z	-0.005	2.50	No

		z	-0.005	4.50	No
		z	-0.005	6.50	No
	72	z	-0.011	0.50	No
		z	-0.011	5.50	No
		z	-0.002	7.00	No
WL30	36	x	-0.009	0.50	No
		x	-0.009	5.50	No
		x	-0.003	7.00	No
	38	x	-0.004	0.50	No
		x	-0.004	2.50	No
		x	-0.005	4.50	No
		x	-0.005	6.50	No
	39	x	-0.009	0.50	No
		x	-0.009	5.50	No
		x	-0.002	7.00	No
	51	x	-0.016	0.50	No
		x	-0.016	5.50	No
		x	-0.001	7.00	No
	57	x	-0.006	0.50	No
		x	-0.006	2.50	No
		x	-0.006	4.50	No
		x	-0.006	6.50	No
	60	x	-0.016	0.50	No
		x	-0.016	5.50	No
		x	-0.001	7.00	No
	63	x	-0.016	0.50	No
		x	-0.016	5.50	No
		x	-0.001	7.00	No
	69	x	-0.006	0.50	No
		x	-0.006	2.50	No
		x	-0.006	4.50	No
		x	-0.006	6.50	No
	72	x	-0.016	0.50	No
		x	-0.016	5.50	No
		x	-0.001	7.00	No
LL1	35	y	-0.50	50.00	Yes
LL2	35	y	-0.50	0.00	Yes
LLa1	39	y	-0.50	50.00	Yes
LLa2	38	y	-0.50	50.00	Yes
LLa3	37	y	-0.50	50.00	Yes
LLa4	36	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	**MultX**	**MultY**	**MultZ**
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	500 lb Live Load on Antenna 1	No	0.00	0.00	0.00

LLa2	500 lb Live Load on Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load on Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load on Antenna 4	No	0.00	0.00	0.00

Glossary

Comb : Indicates if load condition is a load combination

Current Date: 12/1/2023 2:01 PM
Units system: English

Steel Code Check
Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+1.6W0
LC2=1.2DL+1.6W30
LC3=1.2DL-1.6W0
LC4=1.2DL-1.6W30
LC5=0.9DL+1.6W0
LC6=0.9DL+1.6W30
LC7=0.9DL-1.6W0
LC8=0.9DL-1.6W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.2DL
LC14=0.9DL
LC15=1.2DL+1.6LL1
LC16=1.2DL+1.6LL2
LC17=1.2DL+WL0+LLa1
LC18=1.2DL+WL30+LLa1
LC19=1.2DL-WL0+LLa1
LC20=1.2DL-WL30+LLa1
LC21=1.2DL+WL0+LLa2
LC22=1.2DL+WL30+LLa2
LC23=1.2DL-WL0+LLa2
LC24=1.2DL-WL30+LLa2
LC25=1.2DL+WL0+LLa3
LC26=1.2DL+WL30+LLa3
LC27=1.2DL-WL0+LLa3
LC28=1.2DL-WL30+LLa3
LC29=1.2DL+WL0+LLa4
LC30=1.2DL+WL30+LLa4
LC31=1.2DL-WL0+LLa4
LC32=1.2DL-WL30+LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 4X4X1_4	**4**	LC3 at 58.43%	0.28	OK	
		5	LC1 at 58.43%	0.29	OK	
		6	LC4 at 58.43%	**0.35**	**OK**	
		7	LC2 at 50.00%	0.29	OK	
		8	LC1 at 50.00%	0.33	OK	
		9	LC4 at 50.00%	0.32	OK	
	L 2-1_2X2-1_2X3_16	**41**	LC4 at 0.00%	**0.88**	**OK**	
		43	LC3 at 100.00%	0.78	OK	
		45	LC2 at 0.00%	0.81	OK	
	L 2X2X1_4	**13**	LC2 at 100.00%	**0.17**	**OK**	
		14	LC1 at 100.00%	0.17	OK	
		15	LC4 at 100.00%	0.17	OK	
		16	LC2 at 0.00%	0.13	OK	
		17	LC9 at 0.00%	0.13	OK	

	18	LC4 at 0.00%	0.13	OK
Pipe 2-1_2STD	**36**	LC2 at 90.00%	0.69	OK
	37	LC2 at 90.00%	0.61	OK
	38	LC4 at 90.00%	0.64	OK
	39	LC4 at 90.00%	0.72	OK
	40	LC7 at 37.93%	0.86	OK
	42	LC2 at 60.34%	**0.89**	**OK**
	44	LC8 at 39.66%	0.83	OK
	51	LC1 at 90.00%	0.69	OK
	54	LC1 at 90.00%	0.76	OK
	57	LC3 at 90.00%	0.79	OK
	60	LC2 at 90.00%	0.75	OK
	63	LC4 at 90.00%	0.72	OK
	66	LC3 at 90.00%	0.64	OK
	69	LC1 at 90.00%	0.80	OK
	72	LC1 at 90.00%	0.72	OK
	74	LC3 at 0.00%	0.86	OK
	75	LC3 at 0.00%	0.86	OK
	76	LC2 at 0.00%	0.77	OK
	77	LC4 at 0.00%	0.78	OK
	78	LC4 at 0.00%	0.77	OK
	79	LC2 at 0.00%	0.75	OK
Pipe 3STD	**2**	LC2 at 50.00%	**0.51**	**OK**
	3	LC1 at 50.00%	0.49	OK
	35	LC4 at 50.00%	0.44	OK
PL 6x3/8	**10**	LC2 at 50.00%	0.38	OK
	11	LC1 at 50.00%	**0.44**	**OK**
	12	LC4 at 50.00%	0.43	OK

Current Date: 12/1/2023 1:29 PM
Units system: English

Geometry data

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
3	0.596	-4.00	-8.7157	0
4	7.846	-4.00	3.8417	0
9	-7.846	-4.00	3.8417	0
10	-0.596	-4.00	-8.7157	0
12	7.25	-4.00	4.874	0
13	-7.25	-4.00	4.874	0
14	7.548	-4.00	4.3578	0
15	1.7716	-4.00	1.0228	0
18	-7.548	-4.00	4.3578	0
19	-1.7716	-4.00	1.0228	0
20	0.00	-4.00	-8.7157	0
21	0.00	-4.00	-2.0457	0
22	2.846	-4.00	-4.8186	0
23	5.596	-4.00	-0.0554	0
26	-2.846	-4.00	-4.8186	0
27	-5.596	-4.00	-0.0554	0
28	-2.75	-4.00	4.874	0
29	2.75	-4.00	4.874	0
30	5.3725	-4.00	0.3317	0
31	2.9735	-4.00	4.4869	0
34	-2.9735	-4.00	4.4869	0
35	-5.3725	-4.00	0.3317	0
36	-2.399	-4.00	-4.8186	0
37	2.399	-4.00	-4.8186	0
86	6.00	-4.00	4.874	0
87	6.00	-4.00	5.074	0
90	0.00	-4.00	4.874	0
91	0.00	-4.00	5.074	0
94	-2.00	-4.00	4.874	0
95	-2.00	-4.00	5.074	0
98	-6.00	-4.00	4.874	0
99	-6.00	-4.00	5.074	0
100	6.00	5.00	5.074	0
101	0.00	5.00	5.074	0
102	-2.00	5.00	5.074	0
103	-6.00	5.00	5.074	0
104	6.00	-5.00	5.074	0
105	0.00	-5.00	5.074	0
106	-2.00	-5.00	5.074	0
107	-6.00	-5.00	5.074	0
108	-7.25	3.00	4.874	0
109	-7.846	3.00	3.8417	0
110	-0.596	3.00	-8.7157	0
111	0.596	3.00	-8.7157	0
112	7.25	3.00	4.874	0
113	7.846	3.00	3.8417	0
114	-1.7716	0.00	1.0228	0
115	0.00	0.00	-2.0457	0
116	1.7716	0.00	1.0228	0
117	-6.00	3.00	4.874	0

118	-6.00	3.00	5.074	0
119	-2.00	3.00	4.874	0
120	-2.00	3.00	5.074	0
121	0.00	3.00	4.874	0
122	0.00	3.00	5.074	0
123	6.00	3.00	4.874	0
124	6.00	3.00	5.074	0
125	-1.221	-4.00	-7.6332	0
126	-1.3942	-4.00	-7.7332	0
127	-1.3942	5.00	-7.7332	0
128	-1.3942	-5.00	-7.7332	0
129	-1.221	3.00	-7.6332	0
130	-1.3942	3.00	-7.7332	0
131	-3.221	-4.00	-4.1691	0
132	-3.3942	-4.00	-4.2691	0
133	-3.3942	5.00	-4.2691	0
134	-3.3942	-5.00	-4.2691	0
135	-3.221	3.00	-4.1691	0
136	-3.3942	3.00	-4.2691	0
137	-4.221	-4.00	-2.437	0
138	-4.3942	-4.00	-2.537	0
139	-4.3942	5.00	-2.537	0
140	-4.3942	-5.00	-2.537	0
141	-4.221	3.00	-2.437	0
142	-4.3942	3.00	-2.537	0
143	-7.221	-4.00	2.7592	0
144	-7.3942	-4.00	2.6592	0
145	-7.3942	5.00	2.6592	0
146	-7.3942	-5.00	2.6592	0
147	-7.221	3.00	2.7592	0
148	-7.3942	3.00	2.6592	0
149	7.221	-4.00	2.7592	0
150	7.3942	-4.00	2.6592	0
151	7.3942	5.00	2.6592	0
152	7.3942	-5.00	2.6592	0
153	7.221	3.00	2.7592	0
154	7.3942	3.00	2.6592	0
155	5.221	-4.00	-0.7049	0
156	5.3942	-4.00	-0.8049	0
157	5.3942	5.00	-0.8049	0
158	5.3942	-5.00	-0.8049	0
159	5.221	3.00	-0.7049	0
160	5.3942	3.00	-0.8049	0
161	4.221	-4.00	-2.437	0
162	4.3942	-4.00	-2.537	0
163	4.3942	5.00	-2.537	0
164	4.3942	-5.00	-2.537	0
165	4.221	3.00	-2.437	0
166	4.3942	3.00	-2.537	0
167	1.221	-4.00	-7.6332	0
168	1.3942	-4.00	-7.7332	0
169	1.3942	5.00	-7.7332	0
170	1.3942	-5.00	-7.7332	0
171	1.221	3.00	-7.6332	0
172	1.3942	3.00	-7.7332	0
173	4.971	3.00	-1.138	0
174	-1.50	3.00	4.874	0
175	-3.471	3.00	-3.736	0
176	1.50	3.00	4.874	0
177	-4.971	3.00	-1.138	0
178	3.471	3.00	-3.736	0
179	0.00	-4.00	-7.9746	0

180	6.9062	-4.00	3.9873	0
181	-6.9062	-4.00	3.9873	0
182	-6.625	3.00	4.874	0
183	-7.5335	3.00	3.3004	0
184	6.625	3.00	4.874	0
185	7.5335	3.00	3.3004	0
186	0.9085	3.00	-8.1744	0
187	-0.9085	3.00	-8.1744	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
15	1	1	1	0	0	0
19	1	1	1	0	0	0
21	1	1	1	0	0	0
114	1	1	1	0	0	0
115	1	1	1	0	0	0
116	1	1	1	0	0	0
179	0	1	0	0	0	0
180	0	1	0	0	0	0
181	0	1	0	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
2	9	10		Pipe 3STD	A53 GrB	0.00	0.00	0.00
3	3	4		Pipe 3STD	A53 GrB	0.00	0.00	0.00
4	18	19		HSS_SQR 4X4X1_4	A53 GrB	0.00	0.00	0.00
5	20	21		HSS_SQR 4X4X1_4	A53 GrB	0.00	0.00	0.00
6	14	15		HSS_SQR 4X4X1_4	A53 GrB	0.00	0.00	0.00
7	28	27		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
8	26	22		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
9	23	29		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
10	13	9		PL 6x3/8	A36	0.00	0.00	0.00
11	10	3		PL 6x3/8	A36	0.00	0.00	0.00
12	12	4		PL 6x3/8	A36	0.00	0.00	0.00
13	34	18		L 2X2X1_4	A36	0.00	0.00	0.00
14	36	20		L 2X2X1_4	A36	0.00	0.00	0.00
15	30	14		L 2X2X1_4	A36	0.00	0.00	0.00
16	18	35		L 2X2X1_4	A36	0.00	0.00	0.00
17	20	37		L 2X2X1_4	A36	0.00	0.00	0.00
18	14	31		L 2X2X1_4	A36	0.00	0.00	0.00
35	12	13		Pipe 3STD	A53 GrB	0.00	0.00	0.00
36	103	107		Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
37	102	106		Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
38	101	105		Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
39	100	104		Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
40	112	108		Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
41	183	182		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
42	109	110		Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
43	187	186		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
44	111	113		Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
45	185	184		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00

51	127	128	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
54	133	134	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
57	139	140	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
60	145	146	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
63	151	152	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
66	157	158	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
69	163	164	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
72	169	170	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
74	115	175	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
75	115	178	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
76	116	173	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
77	114	177	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
78	114	174	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00
79	116	176	Pipe 2-1_2STD	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
36	0.00	2	1.00	0.00	0.00
37	0.00	2	1.00	0.00	0.00
38	0.00	2	1.00	0.00	0.00
39	0.00	2	1.00	0.00	0.00
41	180.00	0	0.00	0.00	0.00
43	180.00	0	0.00	0.00	0.00
45	90.00	0	0.00	0.00	0.00
51	0.00	2	1.00	0.00	0.00
54	0.00	2	1.00	0.00	0.00
57	0.00	2	1.00	0.00	0.00
60	0.00	2	1.00	0.00	0.00
63	0.00	2	1.00	0.00	0.00
66	0.00	2	1.00	0.00	0.00
69	0.00	2	1.00	0.00	0.00
72	0.00	2	1.00	0.00	0.00

Rigid end offsets

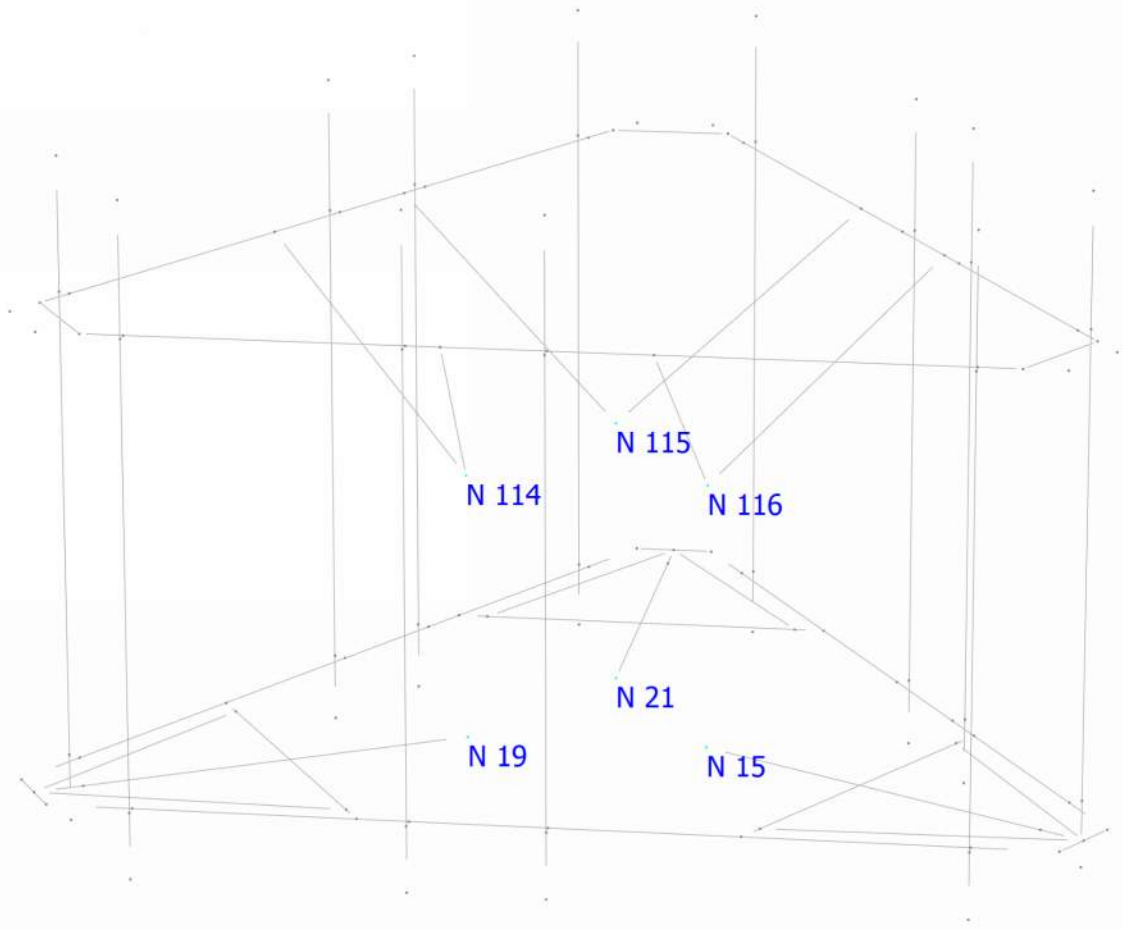
Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
13	0.00	3.00	0.00	0.00	3.00	0.00
14	0.00	3.00	0.00	0.00	3.00	0.00
15	0.00	3.00	0.00	0.00	3.00	0.00
16	0.00	3.00	0.00	0.00	3.00	0.00
17	0.00	3.00	0.00	0.00	3.00	0.00
18	0.00	3.00	0.00	0.00	3.00	0.00

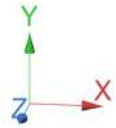
Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
74	0	0	0	0	1	1	0	0	0	0	Full
75	0	0	0	0	1	1	0	0	0	0	Full
76	0	0	0	0	1	1	0	0	0	0	Full
77	0	0	0	0	1	1	0	0	0	0	Full
78	0	0	0	0	1	1	0	0	0	0	Full
79	0	0	0	0	1	1	0	0	0	0	Full

Glossary

Cb22, Cb33 : Moment gradient coefficients
Cm22, Cm33 : Coefficients applied to bending term in interaction formula
d0 : Tapered member section depth at J end of member
DJX : Rigid end offset distance measured from J node in axis X
DJY : Rigid end offset distance measured from J node in axis Y
DJZ : Rigid end offset distance measured from J node in axis Z
DKX : Rigid end offset distance measured from K node in axis X
DKY : Rigid end offset distance measured from K node in axis Y
DKZ : Rigid end offset distance measured from K node in axis Z
dL : Tapered member section depth at K end of member
Ig factor : Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22 : Effective length factor about axis 2
K33 : Effective length factor about axis 3
L22 : Member length for calculation of axial capacity
L33 : Member length for calculation of axial capacity
LB pos : Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg : Lateral unbraced length of the compression flange in the negative side of local axis 2
RX : Rotation about X
RY : Rotation about Y
RZ : Rotation about Z
TO : 1 = Tension only member 0 = Normal member
TX : Translation in X
TY : Translation in Y
TZ : Translation in Z


N 115
N 114
N 116
N 21
N 19
N 15


Y
X
Z

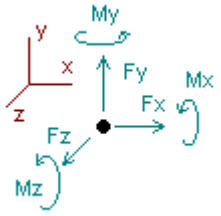
Current Date: 12/1/2023 2:02 PM
Units system: English

Analysis result

Nodes

Envelope for nodal reactions

Note.- **Ic** is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

LC1=1.2DL+1.6W0
LC2=1.2DL+1.6W30
LC3=1.2DL-1.6W0
LC4=1.2DL-1.6W30
LC5=0.9DL+1.6W0
LC6=0.9DL+1.6W30
LC7=0.9DL-1.6W0
LC8=0.9DL-1.6W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.2DL
LC14=0.9DL
LC15=1.2DL+1.6LL1
LC16=1.2DL+1.6LL2
LC17=1.2DL+WL0+LLa1
LC18=1.2DL+WL30+LLa1
LC19=1.2DL-WL0+LLa1
LC20=1.2DL-WL30+LLa1
LC21=1.2DL+WL0+LLa2
LC22=1.2DL+WL30+LLa2
LC23=1.2DL-WL0+LLa2
LC24=1.2DL-WL30+LLa2
LC25=1.2DL+WL0+LLa3
LC26=1.2DL+WL30+LLa3
LC27=1.2DL-WL0+LLa3
LC28=1.2DL-WL30+LLa3
LC29=1.2DL+WL0+LLa4
LC30=1.2DL+WL30+LLa4
LC31=1.2DL-WL0+LLa4
LC32=1.2DL-WL30+LLa4

Node		Forces						Moments					
		Fx [Kip]	**lc**	**Fy** [Kip]	**lc**	**Fz** [Kip]	**lc**	**Mx** [Kip*ft]	**lc**	**My** [Kip*ft]	**lc**	**Mz** [Kip*ft]	**lc**
21	Max	0.243	LC6	1.239	LC1	0.591	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.244	LC8	-0.712	LC7	-0.573	LC7	0.00000	LC1	0.00000	LC1	0.00000	LC1
15	Max	0.602	LC6	1.368	LC4	0.301	LC5	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.618	LC4	-0.848	LC6	-0.313	LC3	0.00000	LC1	0.00000	LC1	0.00000	LC1
19	Max	0.516	LC2	1.071	LC2	0.410	LC5	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.501	LC8	-0.564	LC8	-0.420	LC3	0.00000	LC1	0.00000	LC1	0.00000	LC1
115	Max	2.640	LC2	1.200	LC3	1.025	LC5	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-2.612	LC8	-0.981	LC5	-1.038	LC3	0.00000	LC1	0.00000	LC1	0.00000	LC1
116	Max	1.429	LC2	1.510	LC2	1.874	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-1.426	LC8	-1.268	LC8	-1.804	LC7	0.00000	LC1	0.00000	LC1	0.00000	LC1
114	Max	1.093	LC6	1.229	LC4	2.055	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-1.122	LC4	-0.984	LC6	-2.019	LC7	0.00000	LC1	0.00000	LC1	0.00000	LC1

Date: 12/1/2023
Project Name: FARMINGTON NU MAPLE RIDGE DR
Project No.: CT1104
Designed By: LBW **Checked By:** MSC

CHECK CONNECTION CAPACITY (Worst Case)

Reference: AISC Steel Construction Manual 14th Edition (ASD)

Bolt Type = A325 5/8" Threaded Rod

Allowable Tensile Load =

F_{Tall} = 13806 lbs.

Allowable Shear Load =

F_{Vall}= 8283 lbs.

TENSILE FORCES

Reaction **F =** 591 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 243 lbs. (See Bentley Output)
Reactions in Y direction: 1239 lbs. (See Bentley Output)

Resultant: 1263 lbs.

No. of Supports = 1
No. of Bolts / Support = 4

Tension Design Load /Bolts =

f_t= 147.75 lbs. < 13806 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v= 315.65 lbs. < 8283 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.011	+	0.038	=	0.049	<	1.0	**Therefore, OK !**

Town of Farmington, CT

Property Listing Report

Map Block Lot	109 37A	Building #		Unique Identifier	11950045

Property Information

Property Location	45 MAPLE RIDGE DR
Mailing Address	POST OFFICE BOX 270 HARTFORD CT 06141
Land Use	Commercial Vacant Land
Zoning Code	R20
Neighborhood	97

Owner	CONN LIGHT & POWER CO
Co-Owner	
Book / Page	0288/0347
Land Class	Public Utility
Census Tract	4601
Acreage	2

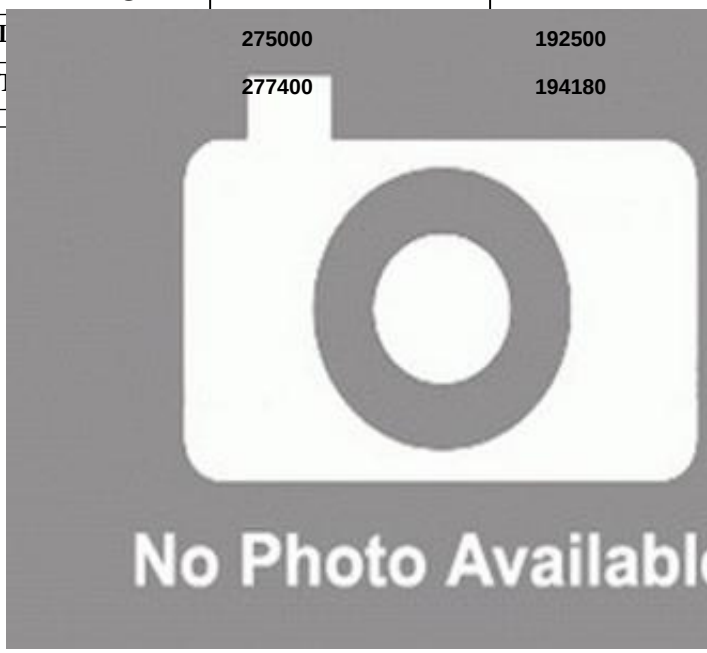
Valuation Summary

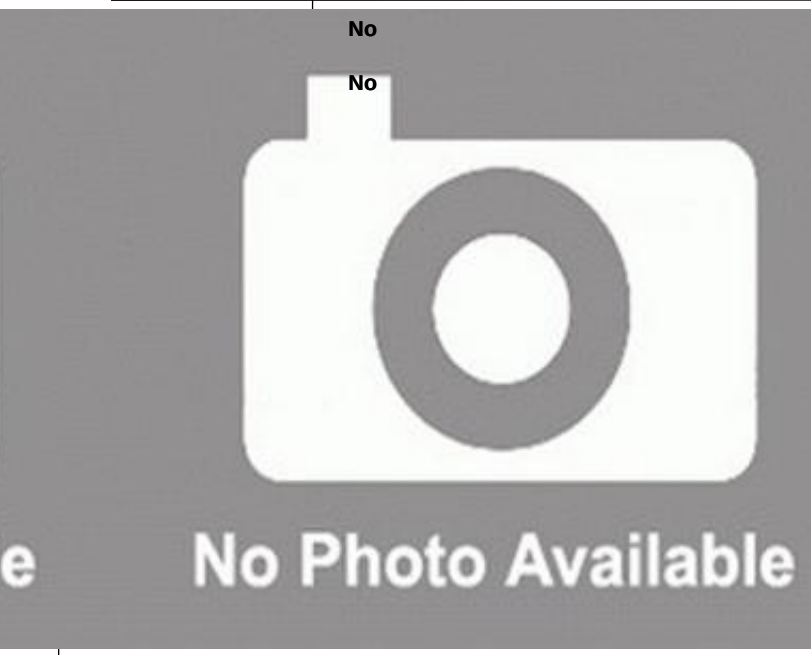
(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Outbuildings	2400	1680
I	275000	192500
T	277400	194180

Utility Information

Electric	No
Gas	No
Sewer	No
	No
	No





Primary Construction Details

Year Built		Heating Fuel		Building Use	
Building Desc.		Heating Type		Building Condition	
Building Style		AC Type		Frame Type	
Stories		Bedrooms		Fireplaces	
Exterior Walls		Full Bathrooms		Bsmt Gar	
Exterior Walls 2		Half Bathrooms		Fin Bsmt Area	
Interior Walls		Extra Fixtures		Fin Bsmt Quality	
Interior Walls 2		Total Rooms		Building Grade	
Interior Floors 1		Bath Style		Roof Style	
Interior Floors 2		Kitchen Style		Roof Cover	
		Occupancy			

Report Created On 8/15/2022

Town of Farmington, CT

Property Listing Report | Map Block Lot **109 37A** | Building # | Unique Identifier **11950045**

Detached Outbuildings

Type	Description	Area (sq ft)	Condition	Year Built
Utility	Pump House	240	Average	1960

Attached Extra Features

Type	Description	Area (sq ft)	Condition	Year Built

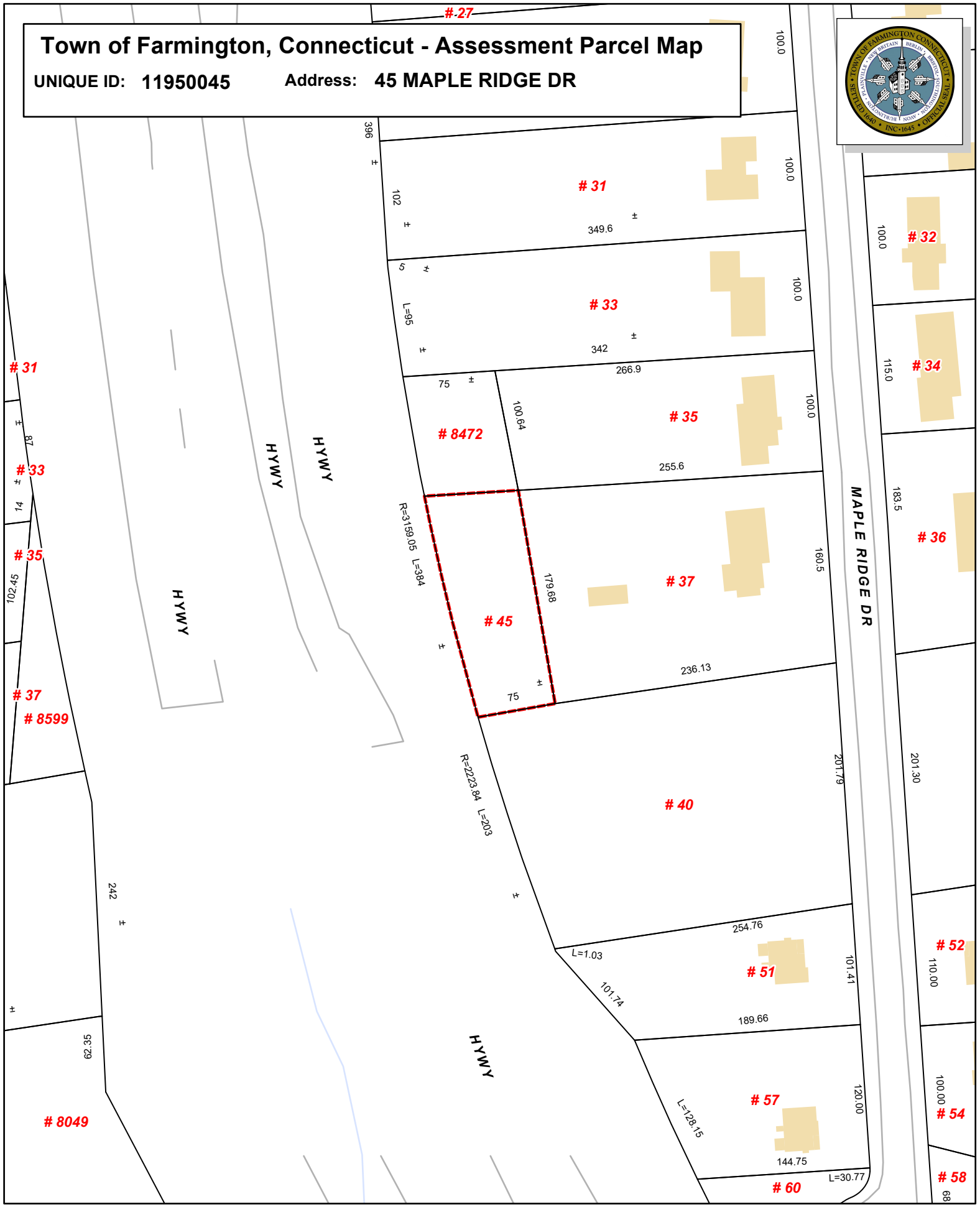
Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CONN LIGHT & POWER CO	0288_0347	1/1/1900	0

Report Created On **8/15/2022**

Town of Farmington, Connecticut - Assessment Parcel Map

UNIQUE ID: 11950045 **Address:** 45 MAPLE RIDGE DR



Map Produced August 2022

Approximate Scale: 1:1,200

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

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

November 6, 2003

Thomas J. Regan, Esq.
Brown Rudnick Berlack Israels LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402

RE: **PETITION NO. 644** - Sprint Spectrum, L.P., d/b/a Sprint PCS and Southwestern Bell Mobile Systems, LLC, d/b/a Cingular Wireless petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the addition of Sprint PCS and Cingular Wireless Antennas to an existing Connecticut Light & Power Company electrical transmission structure at 45 Maple Ridge Drive, Farmington, Connecticut.

Dear Attorney Regan:

At a public meeting held on October 29, 2003, the Connecticut Siting Council (Council) considered and ruled that this proposal would not have a substantial adverse environmental effect, and pursuant to General Statutes § 16-50k would not require a Certificate of Environmental Compatibility and Public Need.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the supplemental filing dated September 22, 2003 and with the condition that the color of the equipment building, equipment cabinets, and bollards conform with the surrounding landscape.

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

Very truly yours,

Pamela B. Katz, P.E.
Chairman

PBK/laf

Enclosure: Staff Report dated October 29, 2003

c: Honorable Arline B. Whitaker, Chairman Town Council, Town of Farmington
Jeffrey Ollendorf, Planning and Zoning Official, Town of Farmington

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

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Petition No. 644
Sprint Spectrum, L.P. and Southwestern Bell Mobile System, LLC
Maple Ridge Drive, Farmington

Staff Report
October 29, 2003

On August 27, 2003, Connecticut Siting Council (Council) member Edward Wilinsky and Robert Mercier of Council staff met with Sprint Spectrum, L.P d/b/a Sprint PCS (Sprint) representative Thomas Regan at a Connecticut Light & Power Company (CL&P) right-of-way on Maple Ridge Drive in Farmington for the inspection of an electric transmission structure owned by CL&P. Sprint and Southwestern Bell Mobile System, LLC d/b/a Cingular Wireless (Cingular), with the agreement of CL&P, propose to redesign and replace CL&P transmission tower #8012 to allow for the installation of telecommunication equipment at this location. Sprint and Cingular (Applicant) are petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the redesign and replacement of the transmission structure.

The Applicant proposes to replace an existing 61-foot H-frame transmission line structure with a new laminated wood structure. The new H-frame structure would consist of two poles, an 86-foot pole and a 100-foot pole connected by diagonal and horizontal cross beams. The 100-foot pole would accommodate 3 panel antennas owned by Sprint at a centerline height of 100 feet and 3 panel antennas owned by Cingular at a centerline height of 88 feet. The total height of the structure with antennas would be approximately 102 feet. The antennas of both carriers would be flush mounted to the pole.

A 42-foot by 33-foot equipment compound enclosed with six-foot high chain link fence would be constructed at the base of the transmission tower. Sprint would place four cabinets, no taller than six feet, on a concrete pad within the compound. Cingular would place a 20-foot by 12-foot by 11.75-foot equipment building within the compound.

Access to the site would be via a 12-foot wide, 125-foot long gravel driveway that would extend from Maple Ridge Drive within the existing CL&P right-of-way. No wetlands or watercourses are within or adjacent to the proposed construction area. Soil and erosion controls would be installed prior to construction.

Land use in the immediate area is residential. The two nearest residences are 37 Maple Ridge Drive, approximately 186 feet north of the site, and 51 Maple Ridge Drive, approximately 153 feet south of the site. Visual simulations indicate the residence at 37 Maple Ridge Drive would have year round views of most of the structure. The residence at 51 Maple Ridge Drive would have mostly winter views of the structure. The structure and compound would be visible from Maple Ridge Drive where the transmission line crosses the road. No landscaping is planned; existing shrubby vegetation in the right-of-way would provide limited screening. A 65-foot CL&P structure east of site and adjacent to Maple Ridge Drive was replaced with an 80-foot structure in 1999 to accommodate three flush mounted antennas owned by Omnipoint Communications Inc. (Petition 423).

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CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
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E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

September 20, 2021

Kathleen M. Shanley
Manager – Transmission Siting
Eversource Energy
P.O. Box 270
Hartford, CT 06141

RE: **SUB-PETITION NO. 1293- FA-02 (Farmington) –** Eversource Energy declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for all transmission facility asset condition maintenance improvements statewide to comply with the updated National Electrical Safety Code clearance requirements.

Dear Ms. Shanley:

The Connecticut Siting Council (Council) hereby acknowledges your notice to replace 2 transmission structures at various locations along Eversource transmission line right-of-way in the Town of Farmington pursuant to National Electrical Safety Code standards, with the following conditions:

1. Any deviation from the proposed transmission line maintenance activity as specified in this notice and supporting materials filed with the Council shall render this acknowledgement invalid;
2. Any material changes to this transmission line maintenance activity as proposed shall require the filing of a new notice with the Council;
3. Not less than 45 days after completion of the transmission line maintenance activity, the Council shall be notified in writing that construction has been completed;
4. The validity of this action shall expire one year from the date of this letter; and
5. The petitioner may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed transmission line maintenance activities are to be implemented as specified here and in your notice dated August 9, 2021. This decision is under the exclusive jurisdiction of the Council.

Thank you for your attention and cooperation.

Sincerely,

Melanie Bachman
Executive Director

c: Honorable C.J. Thomas, Town Council Chairman, Town of Farmington (towncouncil@farmington-ct.org)

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E-Mail: siting.council@ct.gov
Web Site: portal.ct.gov/csc

VIA ELECTRONIC MAIL

November 26, 2021

Hollis M. Redding
SAI Communications, LLC
12 Industrial Way
Salem, NH 03079
hredding@saigrp.com

RE: **EM-CING-052-211116** - New Cingular Wireless PCS, LLC (AT&T) notice of intent to modify an existing telecommunications facility located at 40 (a/k/a 45) Maple Ridge Drive, Farmington, Connecticut.

Dear Ms. Redding:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

1. Any deviation from the proposed modification as specified in this notice and supporting materials submitted to the Council shall render this acknowledgement invalid;

2. Any material changes to this modification as proposed shall require the filing of a new notice with the Council;

3. The Council shall be notified in writing at least two weeks prior to the commencement of site construction activities;

4. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;

5. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by AT&T shall be removed within 60 days of the date the antenna ceased to function;

6. The validity of this action shall expire one year from the date of this letter; and

7. The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated November 12, 2021. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site by any dimension, increase noise levels at the tower site boundary by six decibels or more, and increase the total radio frequencies electromagnetic radiation

power density measured at the tower site boundary to or above the standards adopted by the Federal Communications Commission pursuant to Section 704 of the Telecommunications Act of 1996 and by the state Department of Energy and Environmental Protection pursuant to Connecticut General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below state and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/CMW/laf

c: The Honorable C. J. Thomas, Chairman, Town of Farmington (towncouncil@farmington-ct.org)
Kathleen Blonski, Town Manager, Town of Farmington (blonskik@farmington-ct.org)

EVERSOURCE ENERGY

56 Prospect Street,
Hartford, CT 06103

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

March 07, 2024

Tarah Nolan
SAI
12 Industrial Way
Salem, NH 03079

RE: AT&T Antenna Site CT1104, Maple Ridge Drive, Farmington CT, Eversource Structure 8012

Dear Ms. Nolan:

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 & 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 (860) 728-4862.

Sincerely,

Masie Hartt

Masie Hartt
Transmission Line Engineering

Ref: 2024-0117 - CT1104 Structural Analysis Rev4 (22021.05)
CT1104 (C-Band) Mount Structural Analysis Rev.1 12012023
2024-0301_22021.05 CT1104 - Rev1 CDs (S&S)

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R001

KATHLEEN BLONSKI, TOWN MANAGER
TOWN OF FARMINGTON
1 MONTIETH DR
FARMINGTON CT 06032-1082

USPS TRACKING

9405 5036 9930 0668 2632 04

Electronic Rate Approved #038555749

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usps.com
$9.85
US POSTAGE
Flat Rate Env

9405 5036 9930 0668 2632 11 0098 5000 0020 6037

U.S. POSTAGE PAID
Click-N-Ship®

03/11/2024 Mailed from 03079 986738813783291

PRIORITY MAIL®

HOLLIS M REDDING
SAI GROUP
12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 03/13/24
Ref#: CT1104
0003

C015

CHRIS GELINAS
EVERSOURCE
107 SELDEN ST
BERLIN CT 06037-1616

USPS TRACKING

9405 5036 9930 0668 2632 11

Electronic Rate Approved #038555749

UNITED STATES POSTAL SERVICE®

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P

usps.com
$10.15
US POSTAGE
Legal Flat Rt Env

9405 5036 9930 0668 2632 28 0101 5000 0020 6051

U.S. POSTAGE PAID
Click-N-Ship®

03/11/2024 Mailed from 03079 986738813782625

PRIORITY MAIL®

HOLLIS M REDDING
SAI GROUP
12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 03/13/24
Ref#: CT1104
0003

C006

MELANIE BACHMAN EXECUTIVE DIRECTOR
CT SITING COUNCIL
10 FRANKLIN SQ
NEW BRITAIN CT 06051-2655

USPS TRACKING #

9405 5036 9930 0668 2632 28

Electronic Rate Approved #038555749

Cut on dotted line.

From: auto-reply@usps.com
Sent: Monday, March 11, 2024 1:36 PM
To: Hollis Redding
Subject: USPS® Expected Delivery by Wednesday, March 13, 2024 arriving by 9:00pm 940550369930066826320 4

Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 1:18 pm on March 11, 2024 in MERIDEN, CT 06450.

Tracking Number: **9405503699300668263204**

Expected Delivery By

Wed
13
Mar

By 9:00pm

From: auto-reply@usps.com
Sent: Monday, March 11, 2024 1:36 PM
To: Hollis Redding
Subject: USPS® Expected Delivery by Wednesday, March 13, 2024 arriving by 9:00pm 940550369930066826321 1

Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 1:18 pm on March 11, 2024 in MERIDEN, CT 06450.

Tracking Number: **9405503699300668263211**

Expected Delivery By

Wed
13
Mar

By 9:00pm