March 12, 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 CT2185
761 Federal Road, Brookfield, CT 06804 (the "Property")
Latitude: 41-28-43.57 N Longitude: 73-24-29.89 W

Dear Ms. Bachman:

AT&T currently maintains (6) antennas at the 100'+ level on the existing 90' electric transmission structure #2683 ("Structure") located at 761 Federal Road, Brookfield, CT. The property & Structure are owned by Connecticut Light & Power ("Eversource"). AT&T intends to modify its facility by removing the (6) antennas and adding (3) OPA65R-BU6DA & (3) TPA65R-BU6DA antennas at the 100' level of the existing Structure. AT&T also indents on replacing (12) Tower Mounted Amplifiers ("TMAs") with (6) TMABPD7823VG12A and (6) TMA2124F03V5-1D TMAs at the 100'+ of the Structure. The height of AT&Ts existing and proposed antennas & TMAs is 100'+ on the Structure.

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.

The AT&T facility received CT Siting Council ("Council") approval in Petition 494 on November 30, 2000. AT&Ts modification complies with the above-mentioned approval.

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. Stephen C. Dunn, First Selectman, Town of Brookfield, as elected official, Ms. Laura Barkowski, Land Use Director, Town of Brookfield, and Eversource, the Structure & 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 existing 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 existing 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. Stephen C. Dunn, First Selectman, Town of Brookfield
Ms. Laura Barkowski, Land Use Director, Town of Brookfield
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

CT2185

761 Federal Road, Brookfield, CT

March 11, 2024

Table of Contents

List of Figures

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of AT&T's antenna arrays to be mounted at 100' on an existing utility tower located at 761 Federal Road in Brookfield, CT. The coordinates of the tower are 41° 28' 43.57" N, 73° 24' 29.89" W.

Verizon is proposing the following:

1) Install six (6) multi-band antennas, two (2) per sector to support its commercial LTE and 5G network.

This report considers the planned antenna configuration for AT&T[1] as well as existing antenna configuration for T-Mobile[2] to derive the resulting % MPE of its proposed modification.

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 (RFDS) dated 03/24/2023 and TEP Northeast's Constructions Drawings, rev 3, dated 06/14/2023.

[2] As referenced to T-Mobile's Connecticut Siting Council Notice of Exempt Modification – 761-763 Federal Road, Brookfield, Connecticut, dated 1/17/23

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:

$$\text{Power Density} = \left(\frac{\text{GRF}^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

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 (GRF) 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 / Azimuth	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 / 30°	700	160	14.5	4509	TPA65R-BU6D	73	0	6	100
		850	160	15.1	5177		63			
		1900	160	18.1	10330		66			
		2100	240	18.4	16604		66			
		700	160	14.3	4306	OPA65R-BU6D	73	0	6	100
	Beta / 150°	700	160	14.5	4509	TPA65R-BU8D	73	0	6	100
		850	160	15.1	5177		63			
		1900	160	18.1	10330		66			
		2100	240	18.4	16604		66			
		700	160	14.3	4306	OPA65R-BU6D	73	0	6	100
	Gamma / 270°	700	160	14.5	4509	TPA65R-BU8D	73	0	6	100
		850	160	15.1	5177		63			
		1900	160	18.1	10330		66			
		2100	240	18.4	16604		66			
		700	160	14.3	4306	OPA65R-BU6D	73	0	6	100

Table 1: Proposed Antenna Inventory[3,4]

[3] Antenna heights are in reference to TEP Northeast's Constructions Drawings, rev 3, dated 6/14/2023.

[4] 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.

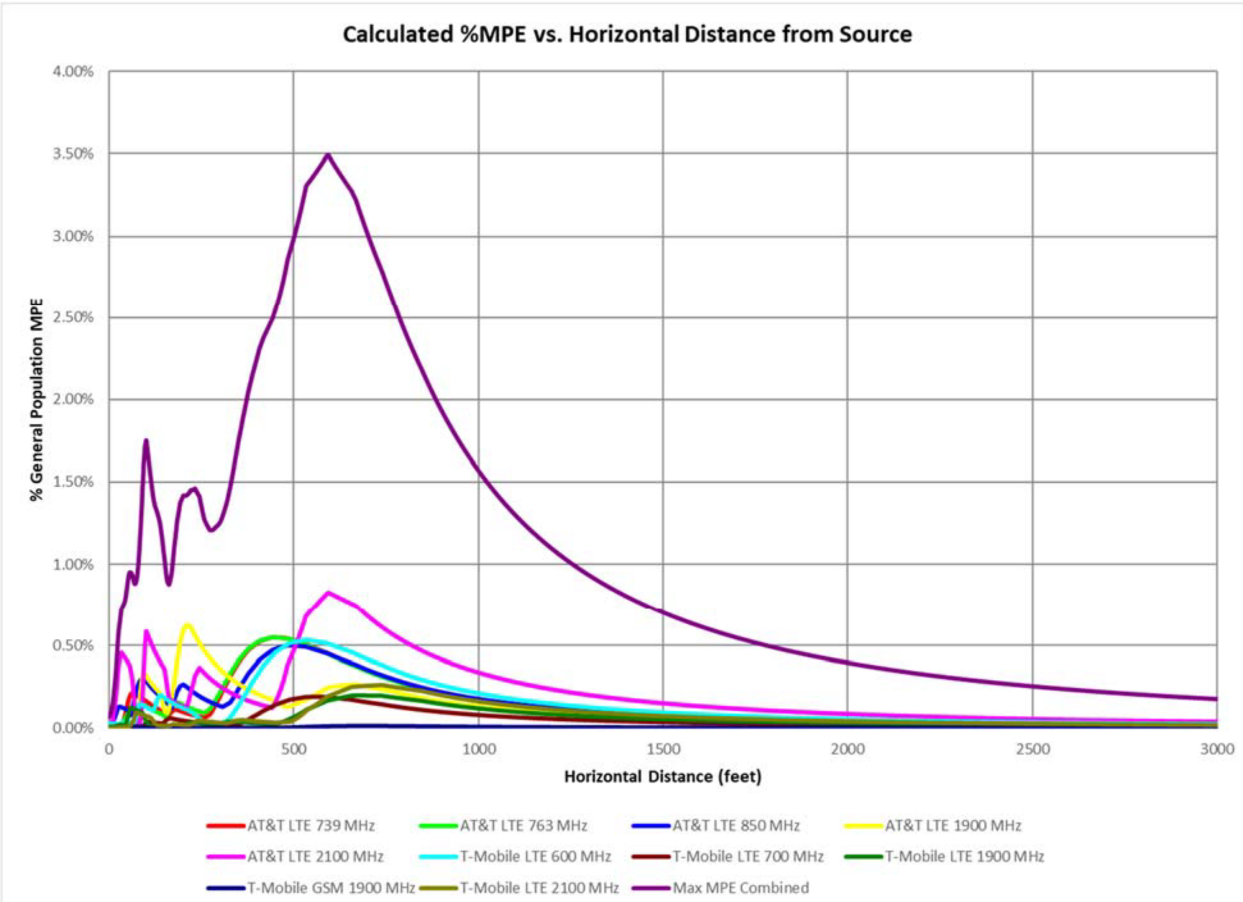


Figure 1: Graph of General Population % MPE vs. Distance

The highest percent of MPE (3.49% of the General Population limit) is calculated to occur at a horizontal distance of 593 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 593 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 LTE 1900 MHz	1	160.0	100.0	593	0.002457	1.000	0.25%
AT&T LTE 2100 MHz	1	240.0	100.0	593	0.008261	1.000	0.83%
AT&T LTE 739 MHz	1	160.0	100.0	593	0.002228	0.493	0.45%
AT&T LTE 763 MHz	1	160.0	100.0	593	0.002280	0.509	0.45%
AT&T LTE 850 MHz	1	160.0	100.0	593	0.002552	0.567	0.45%
T-Mobile GSM 1900 MHz	1	10.0	110.0	593	0.000105	1.000	0.01%
T-Mobile LTE 1900 MHz	1	160.0	110.0	593	0.001673	1.000	0.17%
T-Mobile LTE 2100 MHz	1	160.0	110.0	593	0.001931	1.000	0.19%
T-Mobile LTE 600 MHz	1	120.0	110.0	593	0.002043	0.400	0.51%
T-Mobile LTE 700 MHz	1	40.0	110.0	593	0.000878	0.467	0.19%
						Total	3.49%

Table 2: Maximum Percent of General Population Exposure Values[5,6,7]

[5] Frequencies listed are representative of the operating band and are not the specific operating frequency.

[6] The total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[7] In the case where antenna pattern data was unavailable from the manufacturer, typical antenna pattern was used based on the frequency, bandwidth and gain of the antenna.

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 **3.49 %** of the FCC limit (General Population/Uncontrolled). This maximum cumulative percent of MPE value is calculated to occur 593 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 C Squared Systems, LLC	March 8, 2024 Date
Reviewed/Approved By:	Martin Lavin Senior RF Engineer C Squared Systems, LLC	March 11, 2024 Date

Attachment A: References

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

IEEE C95.1-2019, IEEE Standard Safety Levels With Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2021, IEEE Recommended Practice for Measurements and Computations of Electric, Magnetic, and Electromagnetic Fields with Respect to Human Exposure to Such Fields, 0 Hz-300 GHz IEEE-SA Standards Board

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

(A) Limits for Occupational/Controlled Exposure[8]

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[9]

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

[8] 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.

[9] 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.

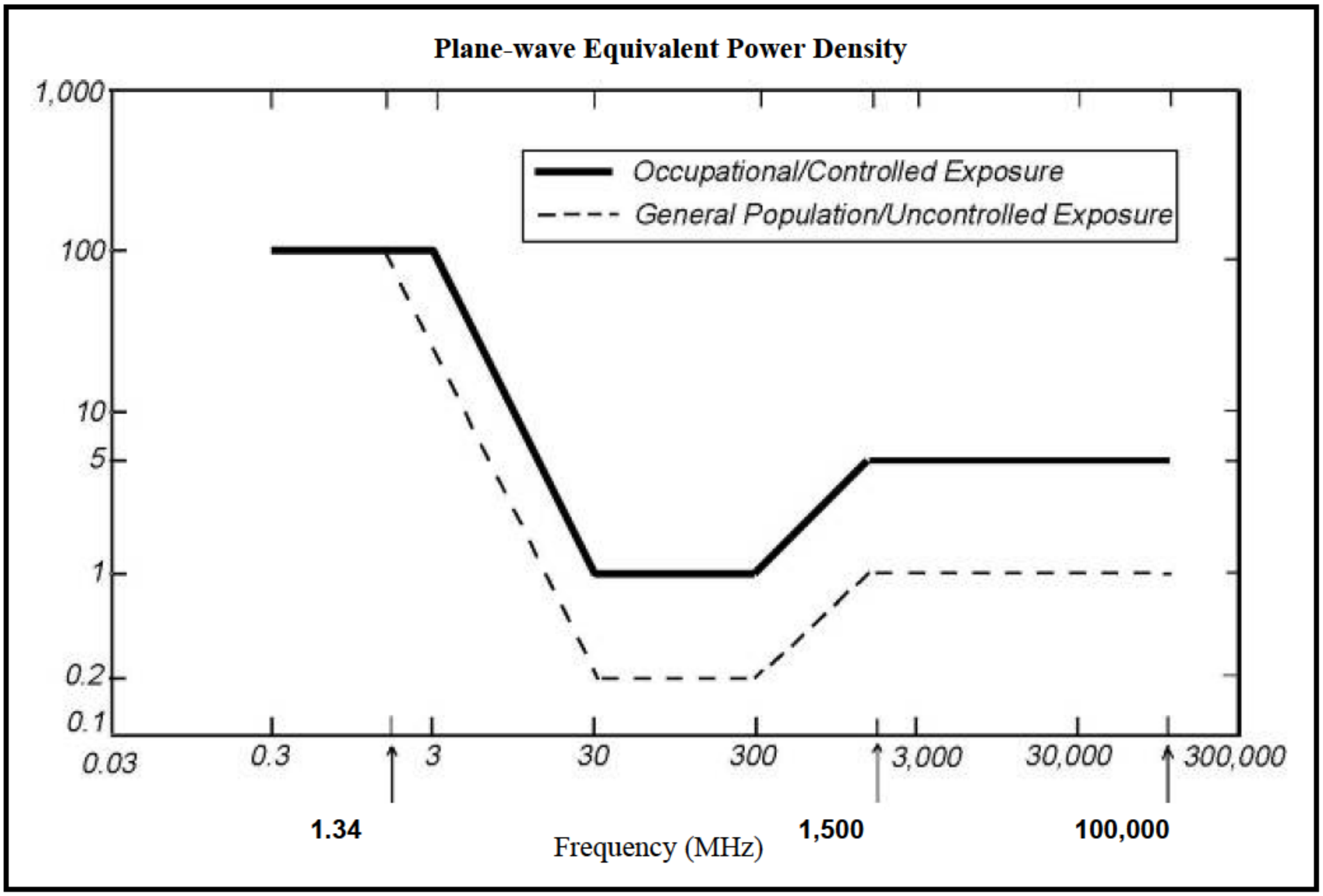
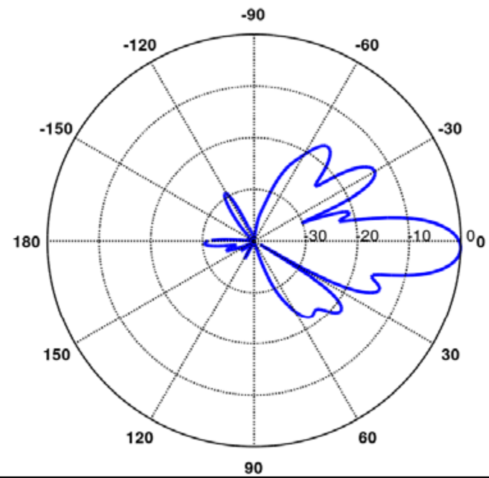
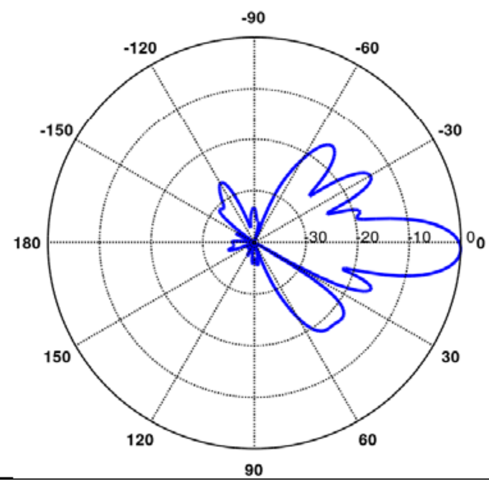
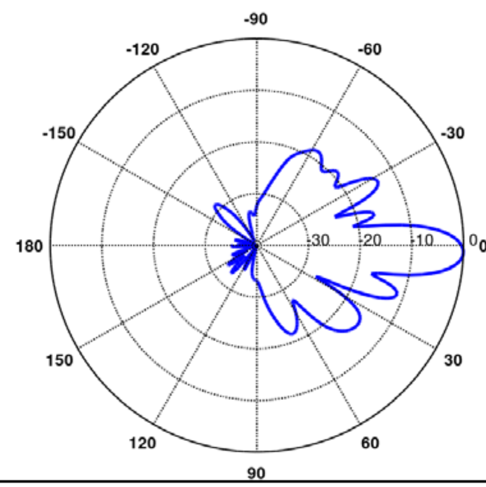


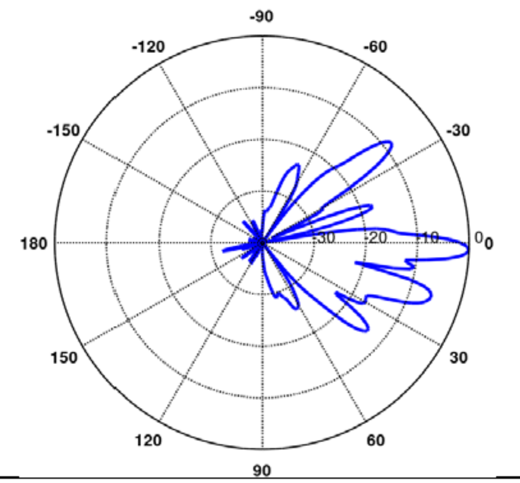
Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

700 MHz Manufacturer: CCI Model #: OPA65R-BU6D Frequency Band: 698-806 MHz Gain: 14.3 dBi Vertical Beamwidth: 12.9° Horizontal Beamwidth: 73° Polarization: Dual Linear 45° Dimensions (L x W x D): 71.2" x 20.7" x 7.7"	
700 MHz Manufacturer: CCI Model #: TPA65R-BU8D 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"	
850 MHz Manufacturer: CCI Model #: DMP65R-BU8D Frequency Band: 824-896 MHz Gain: 15.1 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"	

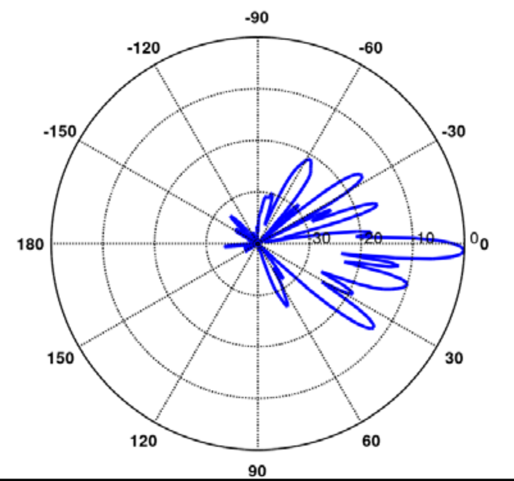
1900 MHz

Manufacturer:	CCI
Model #:	TPA65R-BU8D
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-BU8D
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“



PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING TRANSMISSION STRUCTURE:
- NEW AT&T ANTENNAS: OPA65R–BU6DA (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: TPA65R–BU6DA–K (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T TMA's: TMABPD7823VG12A (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- NEW AT&T TMA'S: TMA2124F03V5–1D (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- PROPOSED (6) NEW 1–1/4" COAX CABLES.
- PROPOSED T–ARM MOUNT: SITE PRO1 P/N ULP12–4120 (12'–6"WIDE) (TOTAL OF 2).

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- ADD 6651 WITH XCEDE+IDLE.
- NEW AT&T RRUS: 4478 B14 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: B5/B12 4449 (850/700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 8843 B2/B66A (PCS/AWS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T SURGE ARRESTOR: TSXDC–4310FM (TYP. OF 16 PER SECTOR, TOTAL OF 48).
- NEW AT&T TRIPLEXERS: CBC61923T–DS (TYP. OF 2 PER SECTOR, TOTAL OF 6)
- INSTALL (1) OUTDOOR DC–12.

ITEMS TO BE REMOVED:
- EXISTING AT&T ANTENNAS: 7770 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNAS: OPA–65R–LCUU–H6 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: RRUS–11 B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: RRUS–11 B5 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: RRUS–12 B2 (PCS) (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T TMA's: LGP 21401 (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T TMA's: DTMABP7819VG12A (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T DIPLEXER: LGP 21901 (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T SURGE ARRESTOR: APTDC–BDFDM–DBW (TYP. OF 6 PER SECTOR, TOTAL OF 18).
- DECOMM UMTS/GSM ANTENNAS & LINE COMPONENTS.

ITEMS TO REMAIN:
- (18) COAX CABLES.

SITE ADDRESS:	761 FEDERAL ROAD BROOKFIELD, CT 06804
LATITUDE:	41.478770' N, 41° 28' 43.57" N
LONGITUDE:	73.408305' W, 73° 24' 29.89" W
TYPE OF SITE:	TRANSMISSION STRUCTURE / INDOOR
STRUCTURE HEIGHT:	90'–0"±
RAD CENTER:	100'–0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

at&t

SITE NUMBER: CTL02185

SITE NAME: BROOKFIELD STATION RD

FA CODE: 10035273
EVERSOURCE STR: 2683

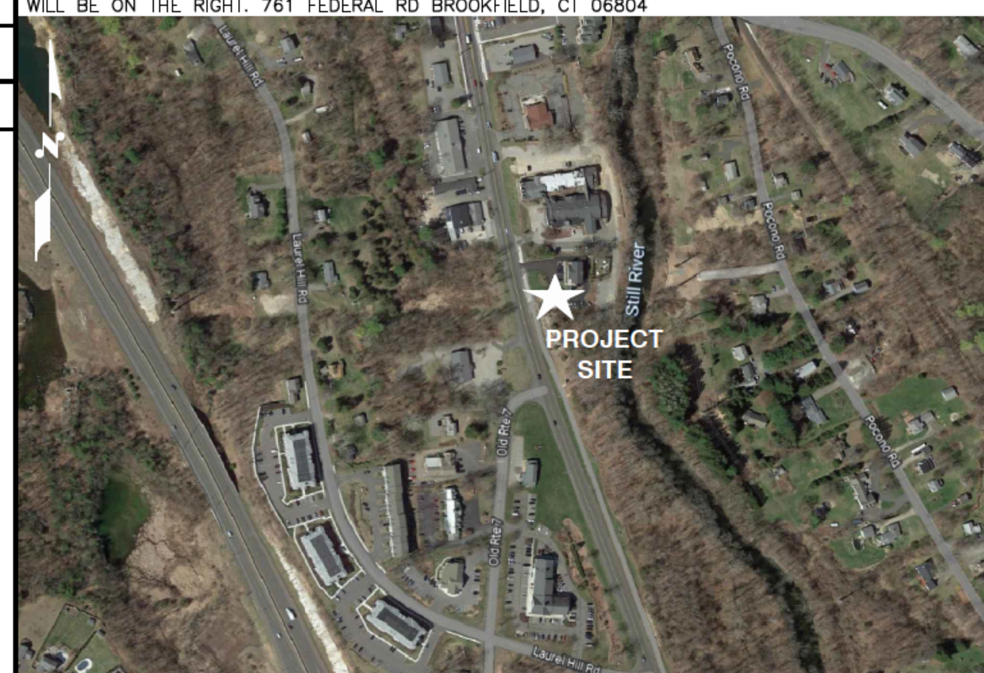
PACE ID: MRCTB062167, MRCTB062202, MRCTB062344,MRCTB062352,MRCTB062386

PROJECT: LTE 3C-4C_5G NR 1 DR-1_5G NR SOFTWARE UPGRADE_4TX4RX SOFTWARE RETROFIT 2023 UPGRADE UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

GET ON I–91 S FROM ENTERPRISE DR, CAPITAL BLVD AND STATE HWY 411. HEAD SOUTH TOWARD ENTERPRISE DR. TURN LEFT ONTO ENTERPRISE DR. TURN LEFT ONTO CAPITAL BLVD. USE THE LEFT 2 LANES TO TURN LEFT ONTO STATE HWY 411. TURN LEFT TO MERGE ONTO I–91 S. FOLLOW I–91 S, I–691 W AND I–84 TO US–202 E/US–7 N IN DANBURY. TAKE EXIT 7 FROM I–84. MERGE ONTO I–91 S. KEEP RIGHT TO STAY ON I–91 S. TAKE EXIT 18 FOR I–691 W TOWARD MERIDEN/WATERBURY. CONTINUE ONTO I–691 W. USE THE LEFT 2 LANES TO TAKE EXIT 1 FOR I–84 W TOWARD WATERBURY/DANBURY. MERGE ONTO I–84. TAKE EXIT 7 FOR US–7 N/US–202 E TOWARD NEW MILFORD/BROOKFIELD. CONTINUE ON US–7 N TO YOUR DESTINATION IN BROOKFIELD. CONTINUE ONTO US–202 E/US–7 N. CONTINUE TO FOLLOW US–7 N. USE THE RIGHT LANE TO TAKE THE US–202 RAMP TO BROOKFIELD. TURN RIGHT ONTO US–202 E. TURN RIGHT. TURN RIGHT. DESTINATION WILL BE ON THE RIGHT. 761 FEDERAL RD BROOKFIELD, CT 06804



GENERAL NOTES

1. THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
2. THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.
5. NOTE TO GENERAL CONTRACTOR: (PRIOR TO CONSTRUCTION COMPLETION)

   TEP NORTHEAST (TEP OPCO, LLC.) TO PERFORM POST/CLIMB AND INSPECTION TO CONFIRM PROPOSED INSTALLATION COMPLIES WITH THE RECORD STAMPED DRAWINGS AND STRUCTURAL REPORTS PRIOR TO SUBMITTING FCCA (FINAL CONSTRUCTION CONTROL AFFIDAVIT). GC IS RESPONSIBLE FOR COORDINATING INSPECTIONS WITH TEP NORTHEAST (TEP OPCO, LLC.) PRIOR TO CONSTRUCTION BEING COMPLETED.

72 HOURS

CALL BEFORE YOU DIG

CALL TOLL FREE 1–800–922–4455

OR CALL 811

UNDERGROUND SERVICE ALERT

TEP NORTHEAST
TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL02185
SITE NAME: BROOKFIELD STATION RD

761 FEDERAL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/14/23	ISSUED FOR CONSTRUCTION	MR	HC	DPH
2	05/16/23	ISSUED FOR CONSTRUCTION	MR	HC	DPH
1	03/30/23	ISSUED FOR CONSTRUCTION	AH	HC	DPH
A	10/17/22	ISSUED FOR REVIEW	GA/TF	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: GA

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET
LTE 3C–4C_5G NR 1 DR–1_5G NR SOFTWARE UPGRADE_4TX4RX SOFTWARE RETROFIT 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL02185	T–1	3

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE–SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81 STANDARDS) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS AND #2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON–ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONDUCTIVE WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL 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 CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR–ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. **APPLICABLE BUILDING CODES:**
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

    BUILDING CODE: IBC 2021 WITH 2022 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2020 NATIONAL ELECTRICAL CODE (NFPA 70–2020)

    SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

    AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;

    AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;

    TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222–H, STRUCTURAL STANDARDS FOR STEEL

    FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBRR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

TEP NORTHEAST
TEP OPCO, LLC
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SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL02185
SITE NAME: BROOKFIELD STATION RD

761 FEDERAL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	06/14/23	ISSUED FOR CONSTRUCTION	MR	HC	DPH
2	05/16/23	ISSUED FOR CONSTRUCTION	MR	HC	DPH
1	03/30/23	ISSUED FOR CONSTRUCTION	[illegible]	HC	DPH
A	10/17/22	ISSUED FOR REVIEW	[illegible]	HC	DPH

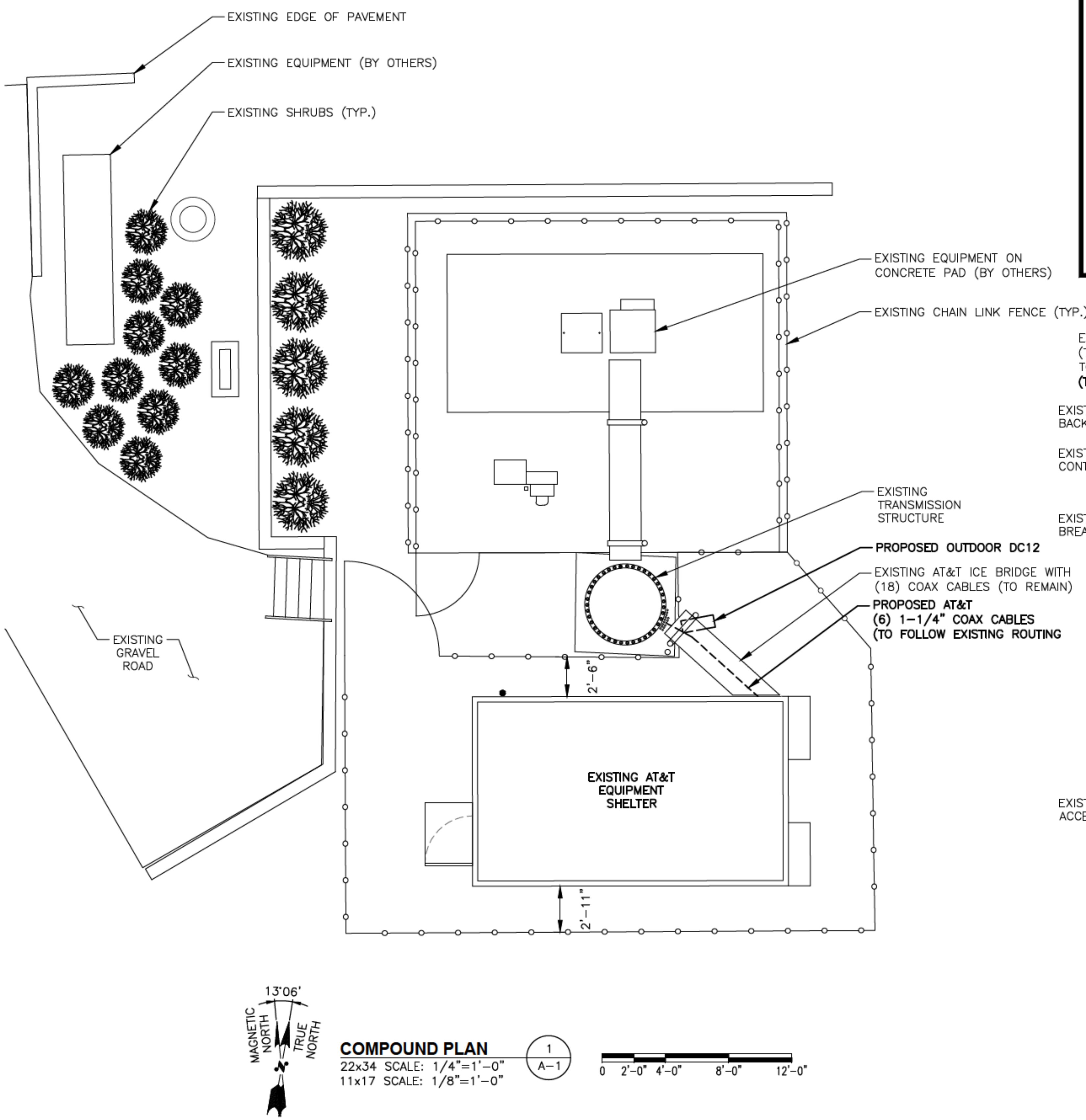
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: GA

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED
PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES
LTE 3C–4C_5G NR 1 DR–1_5G NR SOFTWARE UPGRADE_4TX4RX SOFTWARE RETROFIT 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL02185	GN–1	3



COMPOUND PLAN (1 / A-1)

22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

0 2'-0" 4'-0" 8'-0" 12'-0"

NOTE TO GENERAL CONTRACTOR:
(PRIOR TO CONSTRUCTION COMPLETION)

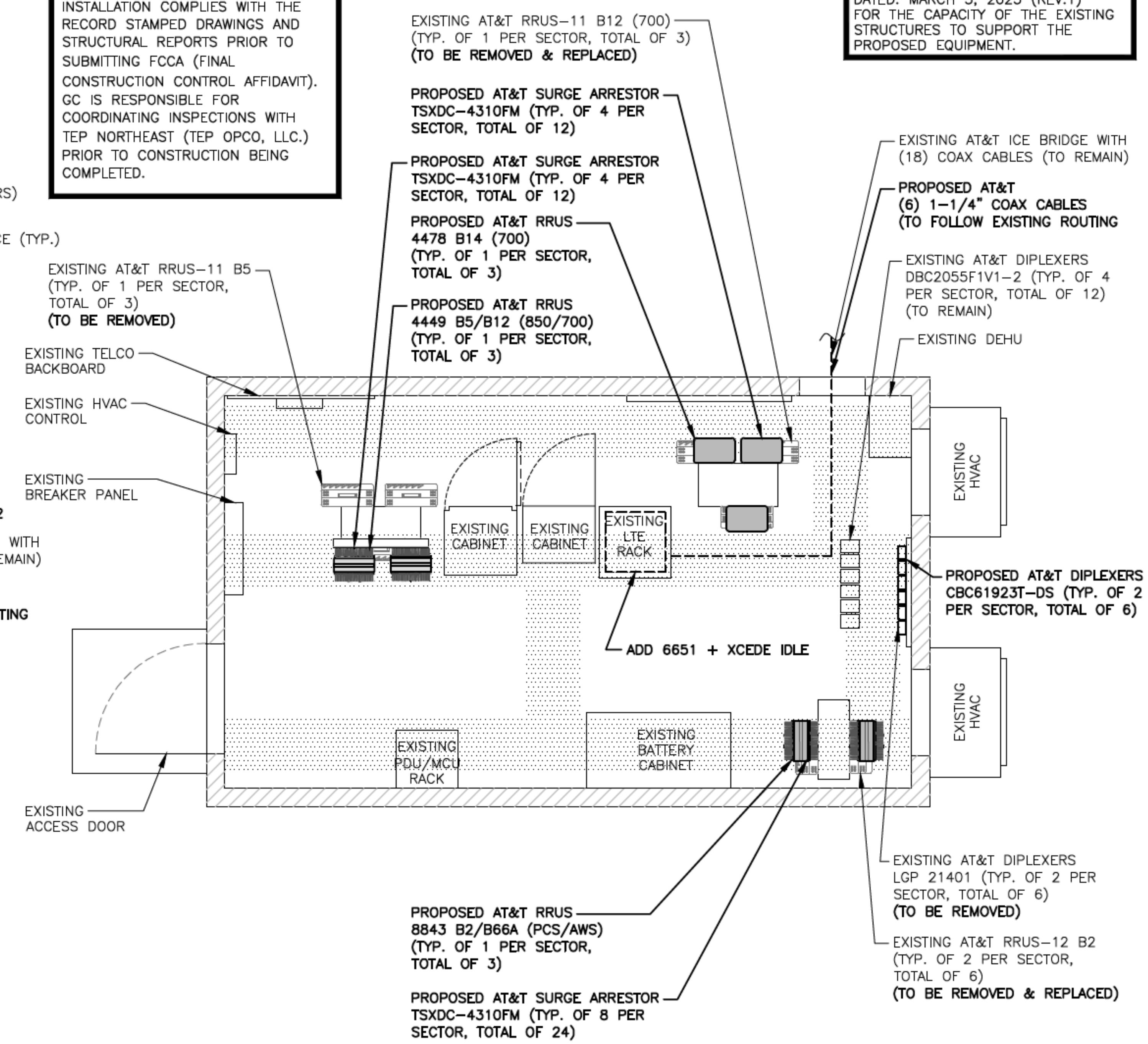
TEP NORTHEAST (TEP OPCO, LLC.) TO PERFORM POST/CLIMB AND INSPECTION TO CONFIRM PROPOSED INSTALLATION COMPLIES WITH THE RECORD STAMPED DRAWINGS AND STRUCTURAL REPORTS PRIOR TO SUBMITTING FCCA (FINAL CONSTRUCTION CONTROL AFFIDAVIT). GC IS RESPONSIBLE FOR COORDINATING INSPECTIONS WITH TEP NORTHEAST (TEP OPCO, LLC.) PRIOR TO CONSTRUCTION BEING COMPLETED.

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

REFER TO **STRUCTURAL ANALYSIS**
BY: CENTEK ENGINEERING.
DATED: MARCH 3, 2023 (REV.1)
FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



EQUIPMENT PLAN (2 / A-1)

22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

0 1'-0" 2'-0" 4'-0" 6'-0"

TEP NORTHEAST
TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

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SITE NUMBER: CTL02185
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NO.	DATE	REVISIONS	BY	CHK	APP'D
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1	03/30/23	ISSUED FOR CONSTRUCTION	[illegible]	HC	DPH
A	10/17/22	ISSUED FOR REVIEW	[illegible]	HC	[illegible]

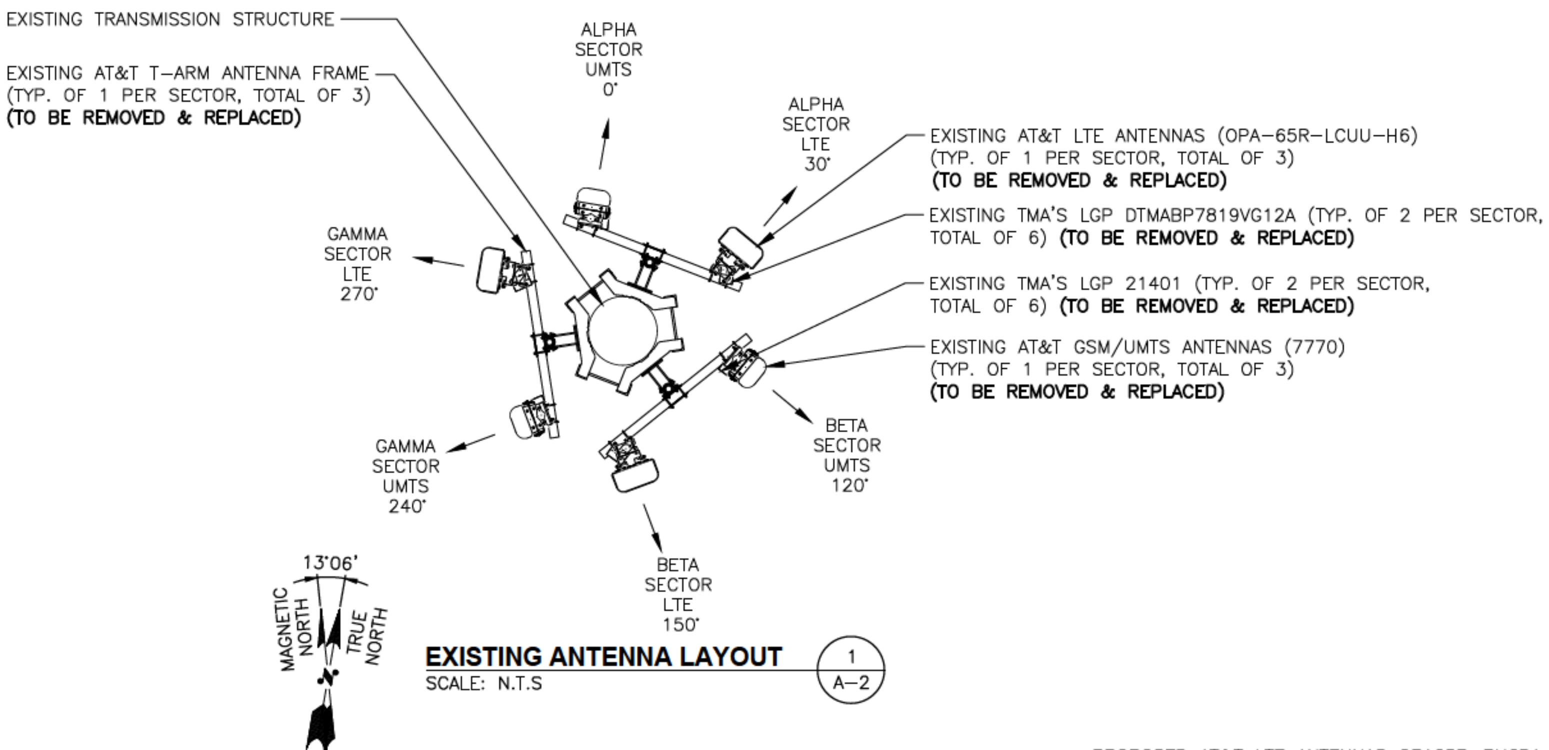
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: GA

STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

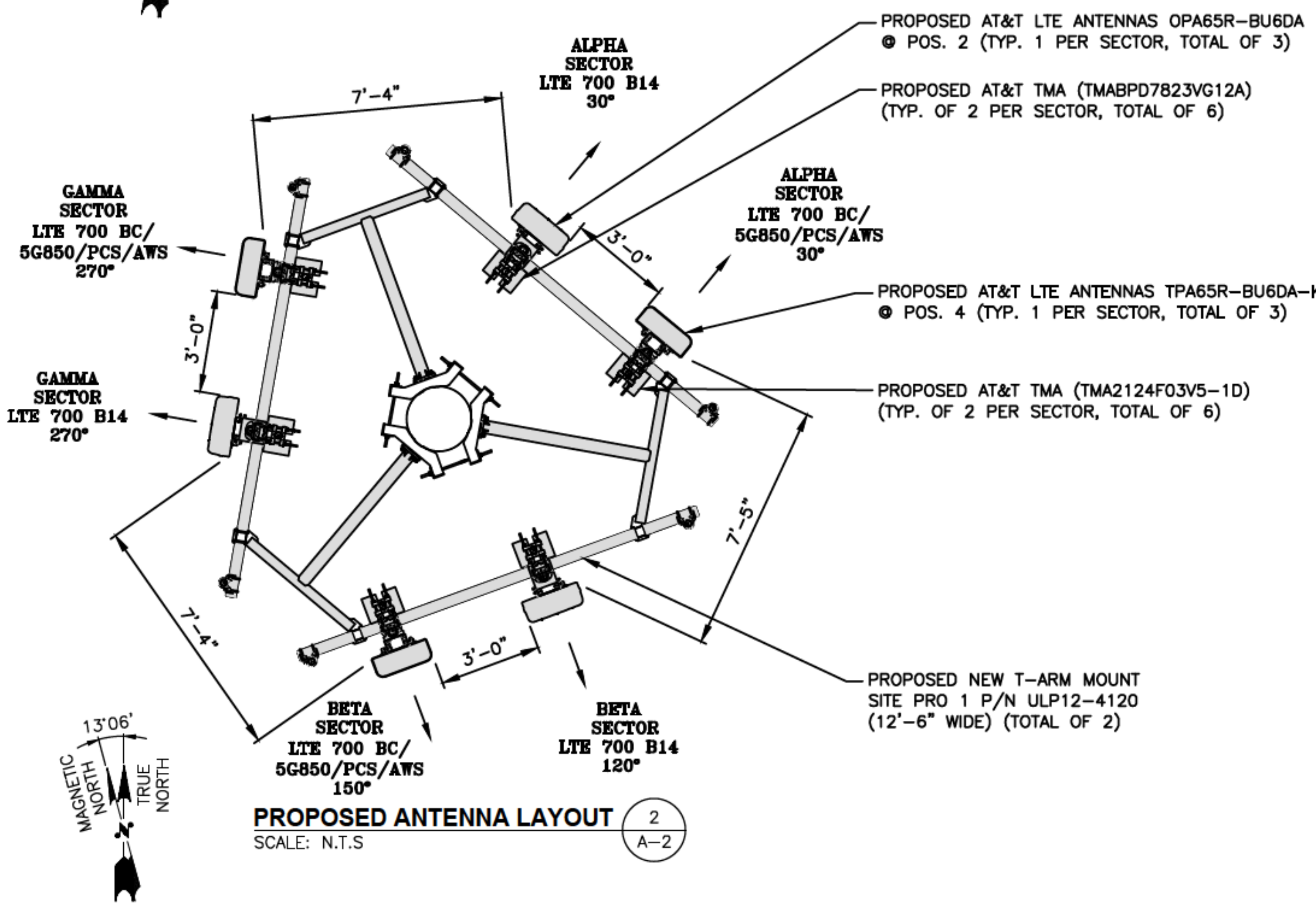
AT&T

COMPOUND & EQUIPMENT PLANS
LTE 3C-4C_5G NR 1 DR-1_5G NR SOFTWARE UPGRADE_4TX4RX SOFTWARE RETROFIT 2023 UPGRADE

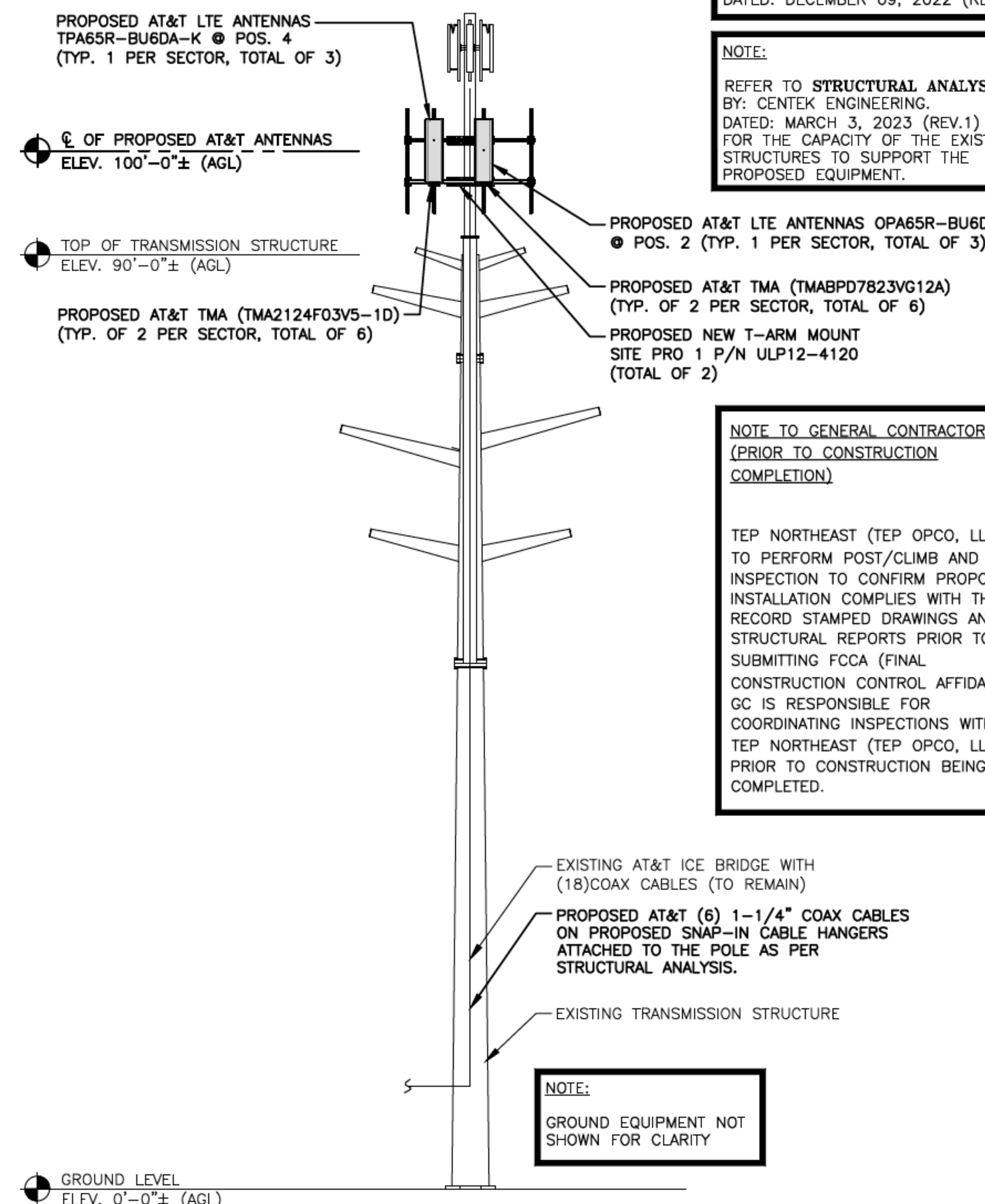
SITE NUMBER	DRAWING NUMBER	REV
CTL02185	A-1	3



EXISTING ANTENNA LAYOUT (1 / A-2)
SCALE: N.T.S



PROPOSED ANTENNA LAYOUT (2 / A-2)
SCALE: N.T.S



ELEVATION
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"
0' 10'-8" 21'-4" 32'-0"

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: TEP NORTHEAST (TEP OPCO, LLC.) DATED: DECEMBER 09, 2022 (REV. 1)

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: CENTEK ENGINEERING. DATED: MARCH 3, 2023 (REV.1) FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

NOTE TO GENERAL CONTRACTOR: (PRIOR TO CONSTRUCTION COMPLETION)

TEP NORTHEAST (TEP OPCO, LLC.) TO PERFORM POST/CLIMB AND INSPECTION TO CONFIRM PROPOSED INSTALLATION COMPLIES WITH THE RECORD STAMPED DRAWINGS AND STRUCTURAL REPORTS PRIOR TO SUBMITTING FCCA (FINAL CONSTRUCTION CONTROL AFFIDAVIT). GC IS RESPONSIBLE FOR COORDINATING INSPECTIONS WITH TEP NORTHEAST (TEP OPCO, LLC.) PRIOR TO CONSTRUCTION BEING COMPLETED.

NOTE:

GROUND EQUIPMENT NOT SHOWN FOR CLARITY

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TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: GA

STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

AT&T

ANTENNA LAYOUTS & ELEVATION
LTE 3C-4C_5G NR 1 DR-1_5G NR SOFTWARE UPGRADE_4TX4RX SOFTWARE RETROFIT 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL02185	A-2	3

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	–	–	–	–	–	–	–	–	–	–	
A2	PROPOSED	LTE 700 B14	OPA65R-BU6DA	71.2X21X7.8	100'-0"±	30°	(2)(P) TMABPD7823VG12A (2)(E)(G) DBC2055F1V1-2	(1)(P)(G) 4478 B14 (700)	18.1X13.4X8.3	(2)(E)1-1/4" COAX (2)(P)1-1/4" COAX	
A3	–	–	–	–	–	–	–	–	–	–	
A4	PROPOSED	LTE 700 BC/ 5G850/PCS/AWS	TPA65R-BU6DA-K	71.2X20.7X7.7	100'-0"±	30°	(2)(P) TMA2124F03V5-1D (2)(P)(G) CBC61923T-DS	(1)(P)(G) 4449 B5/B12 (850/700) (1)(P)(G) 8843 B2/B66A (PCS/AWS)	17.9X13.2X10.4 14.9X13.2X10.9	(4)(E)1-1/4" COAX	
B1	–	–	–	–	–	–	–	–	–	–	
B2	PROPOSED	LTE 700 B14	OPA65R-BU6DA	71.2X21X7.8	100'-0"±	150°	(2)(P) TMABPD7823VG12A (2)(E)(G) DBC2055F1V1-2	(1)(P)(G) 4478 B14 (700)	18.1X13.4X8.3	(2)(E)1-1/4" COAX (2)(P)1-1/4" COAX	
B3	–	–	–	–	–	–	–	–	–	–	
B4	PROPOSED	LTE 700 BC/ 5G850/PCS/AWS	TPA65R-BU6DA-K	71.2X20.7X7.7	100'-0"±	150°	(2)(P) TMA2124F03V5-1D (2)(P)(G) CBC61923T-DS	(1)(P)(G) 4449 B5/B12 (850/700) (1)(P)(G) 8843 B2/B66A (PCS/AWS)	17.9X13.2X10.4 14.9X13.2X10.9	(4)(E)1-1/4" COAX	
C1	–	–	–	–	–	–	–	–	–	–	
C2	PROPOSED	LTE 700 B14	OPA65R-BU6DA	71.2X21X7.8	100'-0"±	270°	(2)(P) TMABPD7823VG12A (2)(E)(G) DBC2055F1V1-2	(1)(P)(G) 4478 B14 (700)	18.1X13.4X8.3	(2)(E)1-1/4" COAX (2)(P)1-1/4" COAX	
C3	–	–	–	–	–	–	–	–	–	–	
C4	PROPOSED	LTE 700 BC/ 5G850/PCS/AWS	TPA65R-BU6DA-K	71.2X20.7X7.7	100'-0"±	270°	(2)(P) TMA2124F03V5-1D (2)(P)(G) CBC61923T-DS	(1)(P)(G) 4449 B5/B12 (850/700) (1)(P)(G) 8843 B2/B66A (PCS/AWS)	17.9X13.2X10.4 14.9X13.2X10.9	(4)(E)1-1/4" COAX	

FINAL ANTENNA SCHEDULE (1 / A-3)
SCALE: N.T.S

NOTE:
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
TEP NORTHEAST (TEP OPCO, LLC.)
DATED: DECEMBER 09, 2022 (REV. 1)

NOTE:
REFER TO **STRUCTURAL ANALYSIS** BY: CENTEK ENGINEERING.
DATED: MARCH 3, 2023 (REV.1)
FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

NOTE TO GENERAL CONTRACTOR:
(PRIOR TO CONSTRUCTION COMPLETION)

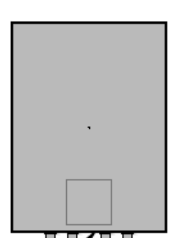
TEP NORTHEAST (TEP OPCO, LLC.) TO PERFORM POST/CLIMB AND INSPECTION TO CONFIRM PROPOSED INSTALLATION COMPLIES WITH THE RECORD STAMPED DRAWINGS AND STRUCTURAL REPORTS PRIOR TO SUBMITTING FCCA (FINAL CONSTRUCTION CONTROL AFFIDAVIT). GC IS RESPONSIBLE FOR COORDINATING INSPECTIONS WITH TEP NORTHEAST (TEP OPCO, LLC.) PRIOR TO CONSTRUCTION BEING COMPLETED.

RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
3(P)	4449 (850/700)	17.9"x13.2"x10.4"
3(P)	8843 (PCS/AWS)	14.9"x13.2"x10.9"
3(P)	4478 B14 (700)	18.1"x13.4"x8.3"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

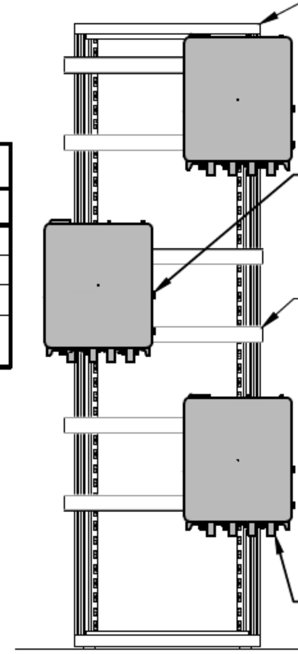
NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



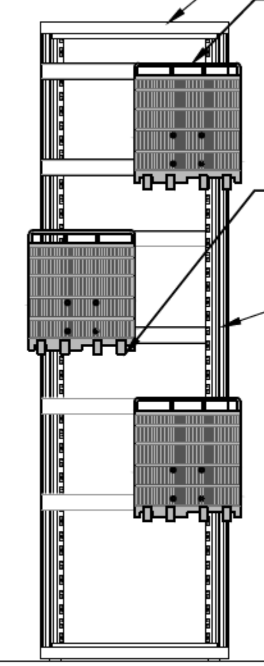
PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

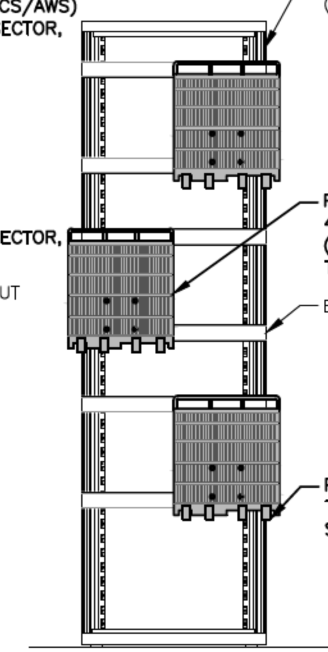
PROPOSED RRUS DETAIL (2 / A-3)
SCALE: N.T.S



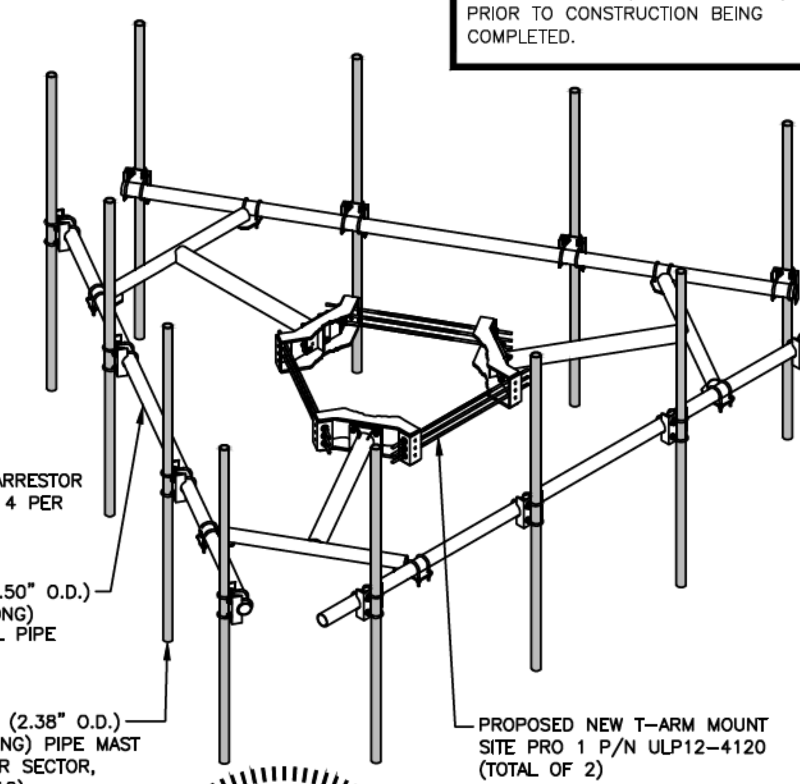
PROPOSED RRU MOUNTING DETAIL (3 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 5'-4" 10'-8" 21'-4" 32'-0"



PROPOSED RRUS MOUNTING DETAIL (4 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 5'-4" 10'-8" 21'-4" 32'-0"



PROPOSED RRUS MOUNTING DETAIL (5 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 5'-4" 10'-8" 21'-4" 32'-0"



PROPOSED T-ARM MOUNT DETAIL (6 / A-3)
SCALE: N.T.S

TEP NORTHEAST
TEP OPCO, LLC.
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SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CTL02185
SITE NAME: BROOKFIELD STATION RD

761 FEDERAL ROAD
BROOKFIELD, CT 06804
FAIRFIELD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP'D
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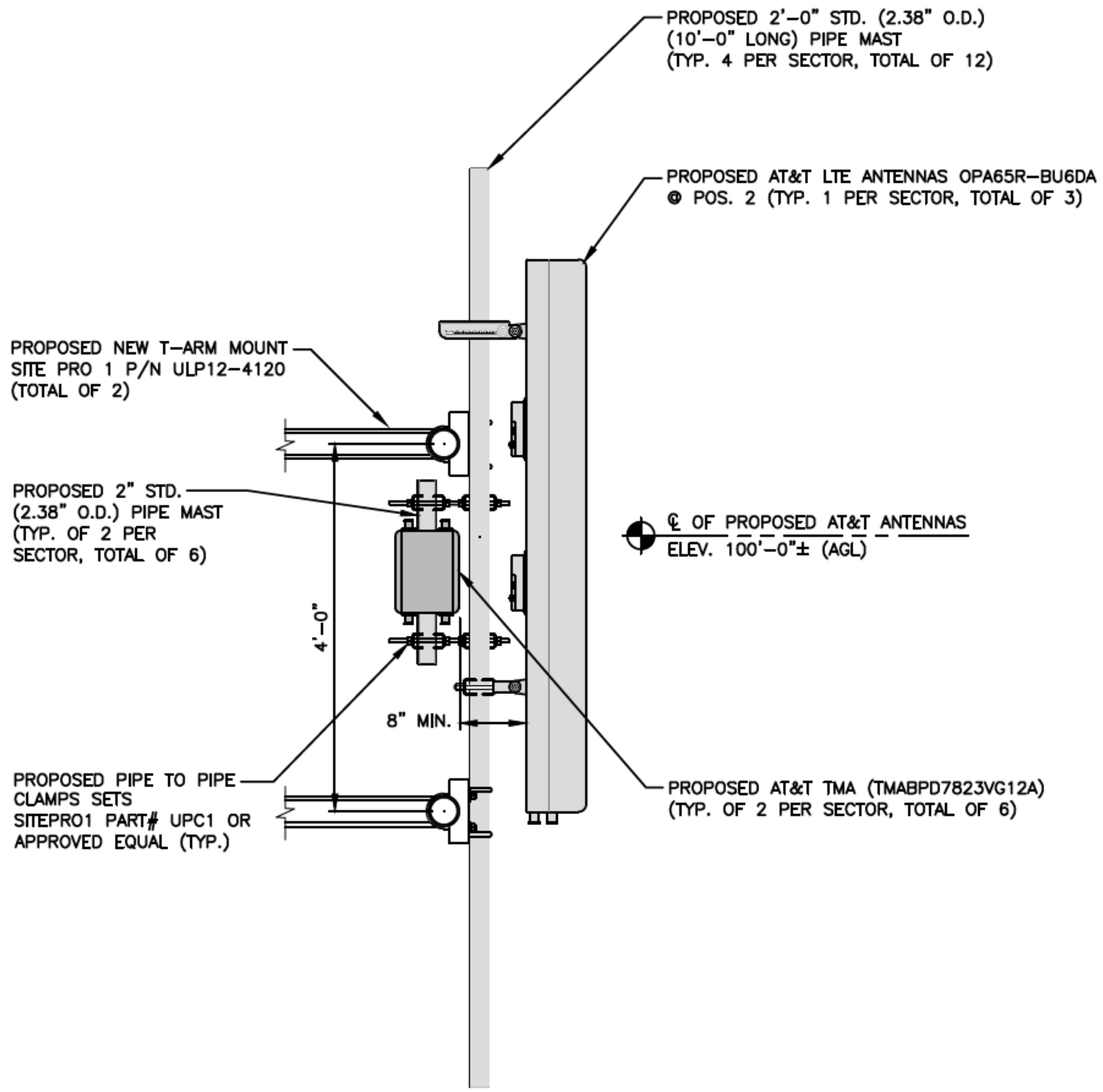
2	05/16/23	ISSUED FOR CONSTRUCTION	MR	HC	DPH
1	03/30/23	ISSUED FOR CONSTRUCTION	AH	HC	DPH
A	10/17/22	ISSUED FOR REVIEW	GA/TH	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: GA

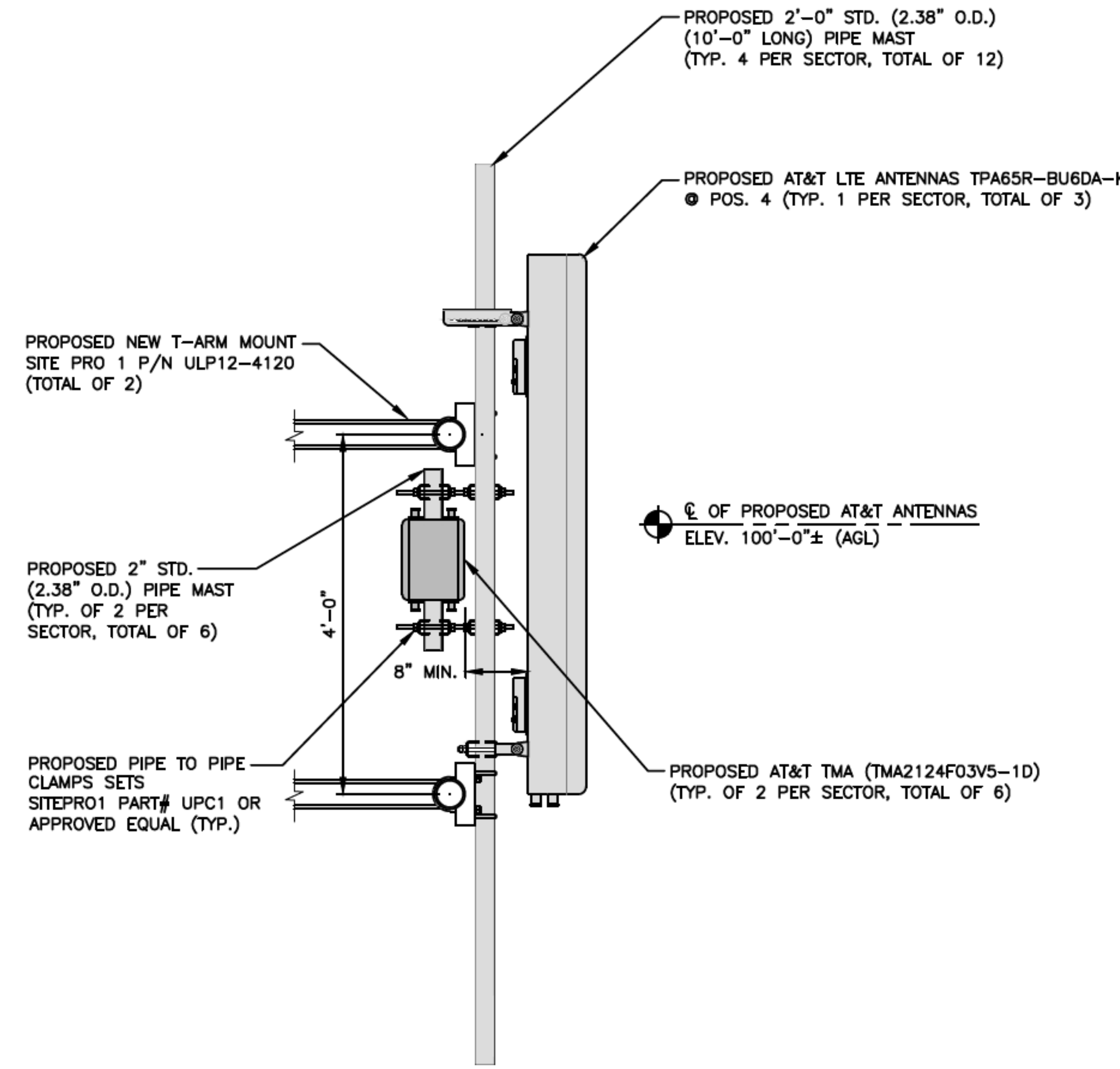
STATE OF CONNECTICUT DANIEL P. HAMM No. 24178 LICENSED PROFESSIONAL ENGINEER

AT&T
DETAILS
LTE 3C-4C_5G NR 1 DR-1_5G NR SOFTWARE UPGRADE_4TX4RX SOFTWARE RETROFIT 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL02185	A-3	3



PROPOSED LTE ANTENNA MOUNTING DETAIL (1 / A-4)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 0'-6" 1'-0" 2'-0" 3'-0"



PROPOSED LTE ANTENNA MOUNTING DETAIL (2 / A-4)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 0'-6" 1'-0" 2'-0" 3'-0"

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
TEP NORTHEAST (TEP OPCO, LLC.)
DATED: DECEMBER 09, 2022 (REV. 1)

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: CENTEK ENGINEERING.
DATED: MARCH 3, 2023 (REV.1)
FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

NOTE TO GENERAL CONTRACTOR: (PRIOR TO CONSTRUCTION COMPLETION)

TEP NORTHEAST (TEP OPCO, LLC.) TO PERFORM POST/CLIMB AND INSPECTION TO CONFIRM PROPOSED INSTALLATION COMPLIES WITH THE RECORD STAMPED DRAWINGS AND STRUCTURAL REPORTS PRIOR TO SUBMITTING FCCA (FINAL CONSTRUCTION CONTROL AFFIDAVIT). GC IS RESPONSIBLE FOR COORDINATING INSPECTIONS WITH TEP NORTHEAST (TEP OPCO, LLC.) PRIOR TO CONSTRUCTION BEING COMPLETED.

TEP NORTHEAST
TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

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SITE NUMBER	DRAWING NUMBER	REV
CTL02185	A-4	3

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND DI.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS. AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST

BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
REQUIRED	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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TEP OPCO, LLC.
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
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STATE OF CONNECTICUT
DANIEL P. HAMM
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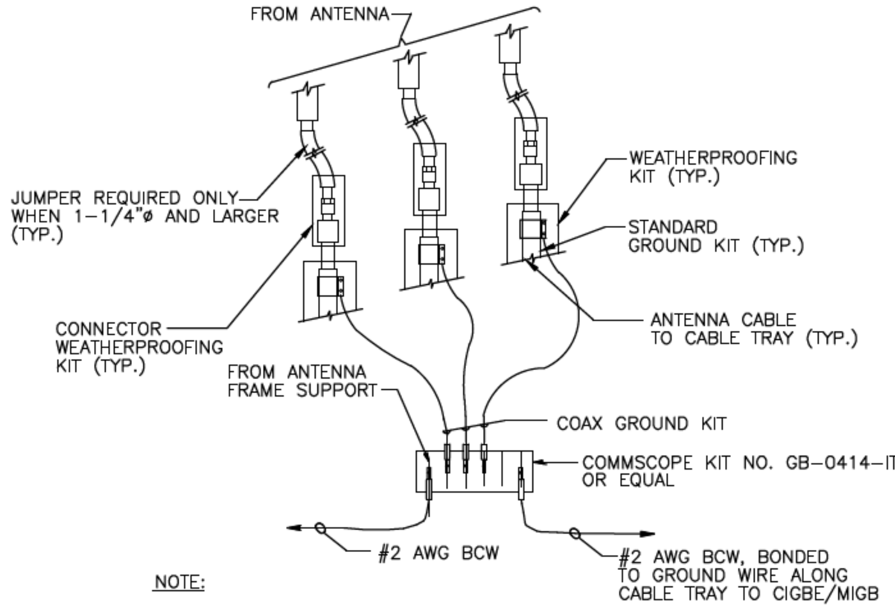
AT&T

STRUCTURAL NOTES
LTE 3C-4C_5G NR 1 DR-1_5G NR SOFTWARE UPGRADE_4TX4RX SOFTWARE RETROFIT 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL02185	SN-1	3

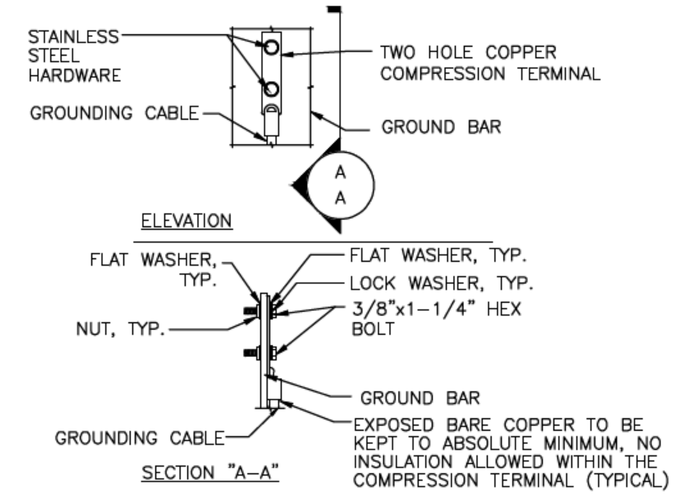


NOTE:

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

GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1 / G-1)

SCALE: N.T.S

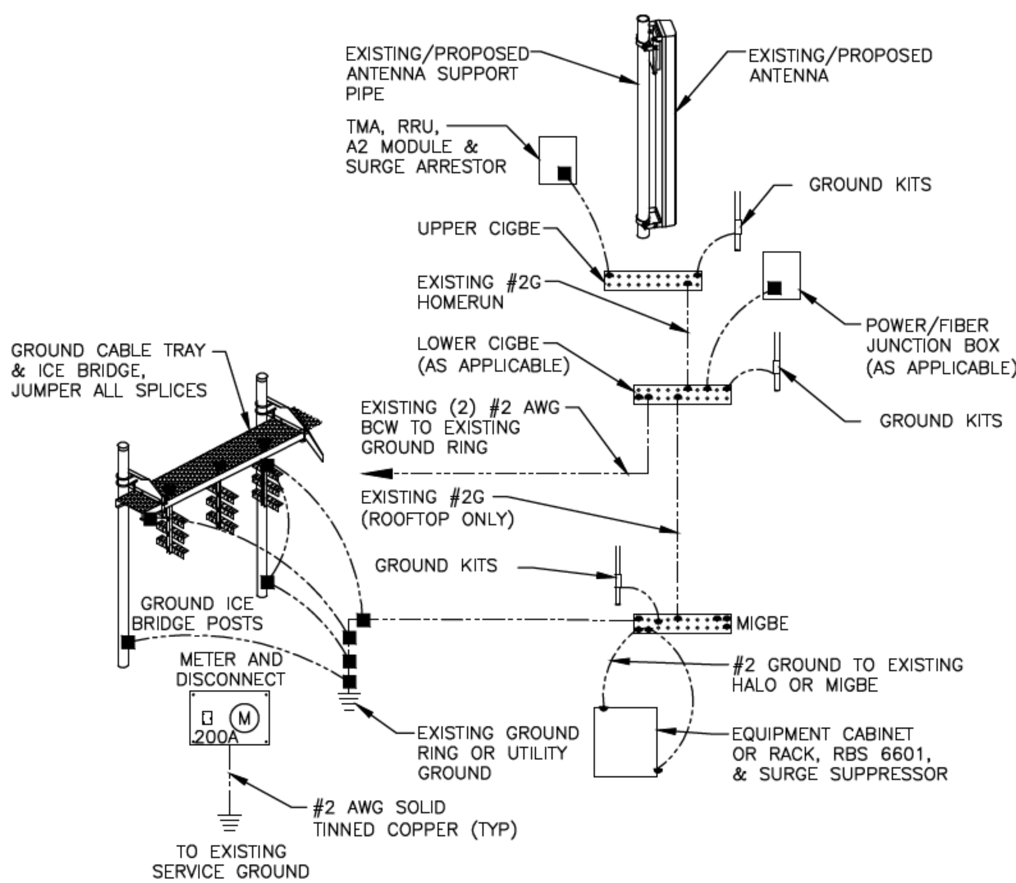


NOTES:

1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATION.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB

TYPICAL GROUND BAR CONNECTION DETAIL (3 / G-1)

SCALE: N.T.S



GROUNDING RISER DIAGRAM (2 / G-1)

SCALE: N.T.S

AT&T GROUNDING STANDARDS TO BE FOLLOWED:

ATT-TP-76416
ATT-TP-76300
ATT-CEM-18002
ATT-002-290-531
ATT-002-290-701
ATT-CEM-23001

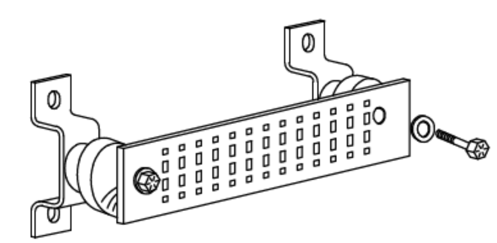
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

CABLE ENTRY PORTS (HATCH PLATES) (#2 AWG)
GENERATOR FRAMEWORK (IF AVAILABLE) (#2 AWG)
TELCO GROUND BAR
COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2 AWG)
+24V POWER SUPPLY RETURN BAR (#2 AWG)
-48V POWER SUPPLY RETURN BAR (#2 AWG)
RECTIFIER FRAMES.

SECTION "A" – SURGE ABSORBERS

INTERIOR GROUND RING (#2 AWG)
EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2 AWG)
METALLIC COLD WATER PIPE (IF AVAILABLE) (#2 AWG)
BUILDING STEEL (IF AVAILABLE) (#2 AWG)



GROUND BAR - DETAIL (AS REQUIRED)

SCALE: N.T.S

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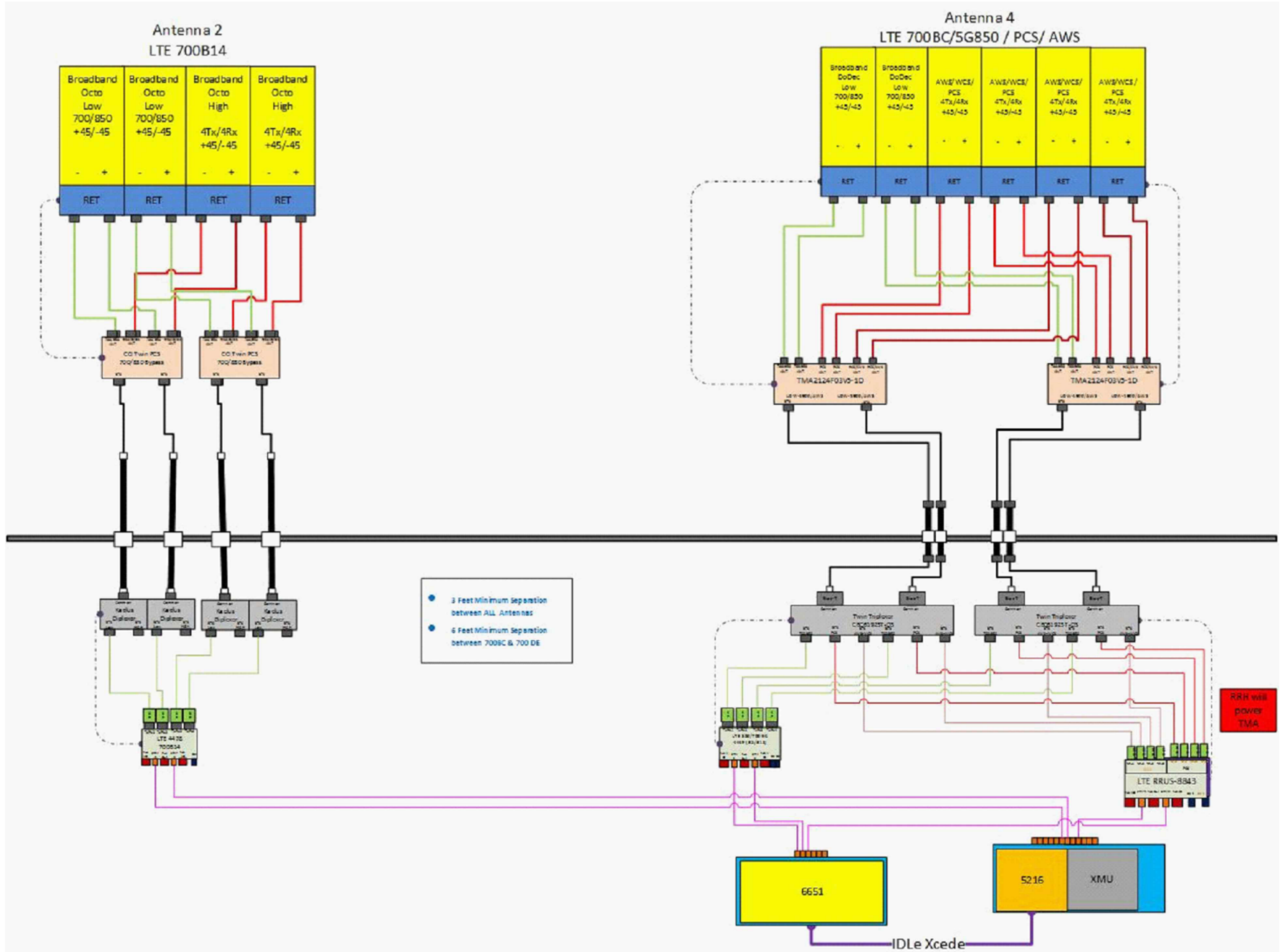
AT&T

GROUNDING DETAILS
LTE 3C-4C_5G NR 1 DR-1_5G NR SOFTWARE UPGRADE_4TX4RX SOFTWARE RETROFIT 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL02185	G-1	3

NOTE:

REV: 3
DATED: 03/23/2023
RFDS ID: 5109874



RF PLUMBING DIAGRAM (1 / RF-1)
SCALE: N.T.S

NOTE:
1. CONTRACTOR TO CONFIRM ALL PARTS.
2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

NOTE:

REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

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RF PLUMBING DIAGRAM
LTE 3C-4C_5G NR 1 DR-1_5G NR SOFTWARE UPGRADE_4TX4RX SOFTWARE RETROFIT 2023 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CTL02185	RF-1	3

Structural Analysis of Antenna Mast and Tower

AT&T Site Ref: CT2185

Eversource Structure No. 2683
90’ Electric Transmission Pole

761 Federal Road
Brookfield, CT

CENTEK Project No. 22021.10

~~Date: January 20, 2023~~
Rev 1: March 3, 2023

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

Table of Contents

Introduction

The purpose of this report is to analyze the antenna mast and 90' utility pole located at 761 Federal Road in Brookfield, CT for the proposed antenna and equipment upgrade by AT&T.

The existing/proposed loads consist of the following:

- T-MOBILE (Existing/Reserved):
  Antennas: Three (3) RFS APXVAALL24_43 panel antennas, three (3) Commscope VV-65A-R1 panel antennas and six (6) ATSBT-FM-4G Bias Tees mounted on monopole double support arm (SitePro p/n RDS-296) to the proposed pipe mast with RAD center elevation of 110-ft above grade.
  Coax Cables: Twenty-four (24) 1-5/8" ∅ coax cables running on the exterior of the pole and antenna mast.
- AT&T (Existing to Remain):
  Coax Cables: Eighteen (18) 1-1/4" ∅ coax cables running on the exterior of the pole.
- **AT&T (Existing to Remove):**
  Antennas: Three (3) Powerwave 7770 panel antennas, three (3) CCI OPA-65R-LCUU-H6 panel antennas, six (6) CCI DTMABP7819VG12A TMAs and six (6) Powerwave LGP-21401 TMAs mounted on dual standoff mounts to the existing mast with a RAD center elevation of 100-ft above grade level.
- **AT&T (Proposed):**
  Antennas: Three (3) CCI TPA65R-BU6D panel antennas, three (3) CCI OPA65R-BU6D panel antennas, six (6) CCI TMABPD7823VG12A TMAs and six (6) Kaelus TMA2124F03V5-1D TMAs mounted on two (2) Site Pro ultra low profile platforms (ULP12-4120) with a RAD center elevation of 100-ft above grade level.
  Coax Cables: Six (6) 1-1/4" ∅ coax cables running on the exterior of the pole.

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.
- For TIA analysis, shielding of antennas was accounted for using Ka factor per TIA, Section 2.6.9.2.2.
- For NESC analysis, total wind area of each antenna grouping was calculated per TIA-H, Section 2.6.9.2.
- Mast replacement per structural analysis report prepared by Centek (for T-Mobile) dated December 7, 2022 must be completed prior to (or concurrent with) this upgrade.

Analysis

The mast consisting of a Pipe 16 x 37-ft long X-strong pipe (O.D. =16") connected at two points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA-222-H standard. Section 5 of this report details these gravity and lateral wind loads. NESC prescribed loads were also applied to the mast in order to obtain reactions needed for analyzing the utility pole structure. These loads are developed in Section 7 of this report. Load cases and combinations used in RISA-3D for TIA/EIA loading and for NESC/NU loading are listed in report Sections 6 and 8, respectively.

An envelope solution was first made to determine maximum and minimum forces, stresses, and deflections to confirm the selected section as adequate. Additional analyses were then made to determine the NESC forces to be applied to the pole structure.

The RISA-3D program contains a library of all AISC shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized. The forces calculated in RISA-3D using NESC guidelines were then applied to the pole using PLS-Pole. Maximum usage for the pole was calculated considering the additional forces from the mast and associated appurtenances.

Design Basis

Our analysis was performed in accordance with TIA-222-H, 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 48-11.

  Load cases considered:

  Load Case 1: NESC Heavy
  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 Speed....................................... 100 mph (1)
  Radial Ice Thickness............................ 0"

  Note 1: NESC C2-2023, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

- MAST ASSEMBLY ANALYSIS

  Mast, appurtenances and connections to the utility tower were analyzed and designed in accordance with TIA-222-H and AISC standards.

  Load cases considered:

  Load Case 1:
  Wind Speed……………………………….. 125 mph (2022 CSBC Appendix-P)
  Radial Ice Thickness……………………….. 0"

  Load Case 2:
  Wind Pressure……………………………… 50 mph wind pressure
  Radial Ice Thickness……………………….. 1.0"

Results

- MAST ASSEMBLY

  The antenna mast was determined to be structurally **adequate**.

Member	Stress Ratio (% of capacity)	Result
Pipe 16 X-strong x 37-ft long	93.2%	**PASS**
Connection	99.3%	**PASS**

- 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 **91.46%** occurs in the utility pole base plate under the **NESC Extreme Longitudinal** loading condition.

  POLE SECTION:

  The utility pole was found to be within allowable limits.

Tower Section	Elevation	Stress Ratio (% of capacity)	Result
Tube Number 3	0'-20.67' (AGL)	90.63%	**PASS**

  BASE PLATE:

  The base plate was found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Base Plate	Bending	91.46%	**PASS**

- FOUNDATION AND ANCHORS

The existing foundation consists of a 10-ft square x 9-ft long reinforced concrete pier with (16) rock anchors. The base of the tower is connected to the foundation by means of (12) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 8-ft into the concrete foundation structure. Foundation information was obtained from NUSCO drawing # 01039-60001.

BASE REACTIONS:

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

Load Case	Shear	Axial	Moment
NESC Heavy Wind	24.98 kips	68.31 kips	2024.13 ft-kips
NESC Extreme Wind	30.70 kips	33.73 kips	2450.59 ft-kips
NESC Extreme Long	22.49 kips	33.76 kips	1786.14 ft-kips

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

ANCHOR BOLTS:

The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
Anchor Bolts	Tension	92.8%	**PASS**

FOUNDATION:

The foundation was found to be within allowable limits.

Foundation	Design Limit	Design Load (1)	Proposed Loading (2)	Result
Reinf. Conc. Pier w/ Rock Anchors	OTM(3)	2973.5 ft-kips	2695.6 ft-kips	**PASS**

Note 1: Design Load taken from NUSCO drawing no. 01039-50002.
Note 2: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.
Note 3: OTM denotes Overturning Moment

Conclusion

This analysis shows that the subject antenna mast and utility pole **are 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

STATE OF CONNECTICUT TIMOTHY J. LYNN No. 29336 LICENSED PROFESSIONAL ENGINEER

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES

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

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.

- Information from the field and/or drawings in the possession of CENTEK engineering, Inc. or generated by field inspections or measurements of the structure.

- It is the responsibility of the client to ensure that the information provided to CENTEK engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the "as new" condition.

- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222.

- All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. CENTEK engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA-3D

RISA-3D Structural Analysis Program is an integrated structural analysis and design software package for buildings, bridges, tower structures, etc.

Modeling Features:

- Comprehensive CAD-like graphic drawing/editing capabilities that let you draw, modify and load elements as well as snap, move, rotate, copy, mirror, scale, split, merge, mesh, delete, apply, etc.
- Versatile drawing grids (orthogonal, radial, skewed)
- Universal snaps and object snaps allow drawing without grids
- Versatile general truss generator
- Powerful graphic select/unselect tools including box, line, polygon, invert, criteria, spreadsheet selection, with locking
- Saved selections to quickly recall desired selections
- Modification tools that modify single items or entire selections
- Real spreadsheets with cut, paste, fill, math, sort, find, etc.
- Dynamic synchronization between spreadsheets and views so you can edit or view any data in the plotted views or in the spreadsheets
- Simultaneous view of multiple spreadsheets
- Constant in-stream error checking and data validation
- Unlimited undo/redo capability
- Generation templates for grids, disks, cylinders, cones, arcs, trusses, tanks, hydrostatic loads, etc.
- Support for all units systems & conversions at any time
- Automatic interaction with RISASection libraries
- Import DXF, RISA-2D, STAAD and ProSteel 3D files
- Export DXF, SDNF and ProSteel 3D files

Analysis Features:

- Static analysis and P-Delta effects
- Multiple simultaneous dynamic and response spectra analysis using Gupta, CQC or SRSS mode combinations
- Automatic inclusion of mass offset (5% or user defined) for dynamic analysis
- Physical member modeling that does not require members to be broken up at intermediate joints
- State of the art 3 or 4 node plate/shell elements
- High-end automatic mesh generation — draw a polygon with any number of sides to create a mesh of well-formed quadrilateral (NOT triangular) elements.
- Accurate analysis of tapered wide flanges - web, top and bottom flanges may all taper independently
- Automatic rigid diaphragm modeling
- Area loads with one-way or two-way distributions
- Multiple simultaneous moving loads with standard AASHTO loads and custom moving loads for bridges, cranes, etc.
- Torsional warping calculations for stiffness, stress and design
- Automatic Top of Member offset modeling
- Member end releases & rigid end offsets
- Joint master-slave assignments
- Joints detachable from diaphragms
- Enforced joint displacements
- 1-Way members, for tension only bracing, slipping, etc.

- 1-Way springs, for modeling soils and other effects
- Euler members that take compression up to their buckling load, then turn off.
- Stress calculations on any arbitrary shape
- Inactive members, plates, and diaphragms allows you to quickly remove parts of structures from consideration
- Story drift calculations provide relative drift and ratio to height
- Automatic self-weight calculations for members and plates
- Automatic subgrade soil spring generator

Graphics Features:

- Unlimited simultaneous model view windows
- Extraordinary "true to scale" rendering, even when drawing
- High-speed redraw algorithm for instant refreshing
- Dynamic scrolling stops right where you want
- Plot & print virtually everything with color coding & labeling
- Rotate, zoom, pan, scroll and snap views
- Saved views to quickly restore frequent or desired views
- Full render or wire-frame animations of deflected model and dynamic mode shapes with frame and speed control
- Animation of moving loads with speed control
- High quality customizable graphics printing

Design Features:

- Designs concrete, hot rolled steel, cold formed steel and wood
- ACI 1999/2002, BS 8110-97, CSA A23.3-94, IS456:2000,EC 2-1992 with consistent bar sizes through adjacent spans
- Exact integration of concrete stress distributions using parabolic or rectangular stress blocks
- Concrete beam detailing (Rectangular, T and L)
- Concrete column interaction diagrams
- Steel Design Codes: AISC ASD 9th, LRFD 2nd & 3rd, HSS Specification, CAN/CSA-S16.1-1994 & 2004, BS 5950-1-2000, IS 800-1984, Euro 3-1993 including local shape databases
- AISI 1999 cold formed steel design
- NDS 1991/1997/2001 wood design, including Structural Composite Lumber, multi-ply, full sawn
- Automatic spectra generation for UBC 1997, IBC 2000/2003
- Generation of load combinations: ASCE, UBC, IBC, BOCA, SBC, ACI
- Unbraced lengths for physical members that recognize connecting elements and full lengths of members
- Automatic approximation of K factors
- Tapered wide flange design with either ASD or LRFD codes
- Optimization of member sizes for all materials and all design codes, controlled by standard or user-defined lists of available sizes and criteria such as maximum depths
- Automatic calculation of custom shape properties
- Steel Shapes: AISC, HSS, CAN, ARBED, British, Euro, Indian, Chilean
- Light Gage Shapes: AISI, SSMA, Dale / Incor, Dietrich, Marino\WARE
- Wood Shapes: Complete NDS species/grade database
- Full seamless integration with RISAFoot (Ver 2 or better) for advanced footing design and detailing
- Plate force summation tool

Results Features:

- Graphic presentation of color-coded results and plotted designs
- Color contours of plate stresses and forces with quadratic smoothing, the contours may also be animated
- Spreadsheet results with sorting and filtering of: reactions, member & joint deflections, beam & plate forces/stresses, optimized sizes, code designs, concrete reinforcing, material takeoffs, frequencies and mode shapes
- Standard and user-defined reports
- Graphic member detail reports with force/stress/deflection diagrams and detailed design calculations and expanded diagrams that display magnitudes at any dialed location
- Saved solutions quickly restore analysis and design results.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-POLE

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

Modeling Features:

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

Analysis Features:

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

Results Features:

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

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

Introduction

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

ANSI Standard TIA-222 covering the design of telecommunications structures specifies 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 NU effort in “unifying” both codes was to establish what level of strength each approach would provide, and then increasing the appropriate elements of each to achieve a similar level of security under extreme weather loadings.

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

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

Note 1: Prepared from documentation provide from Northeast Utilities.

P C S   M a s t

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

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

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

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

The uniform loadings and factors specified for the above components in the table are based upon the National Electrical Safety Code 2017 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

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

Project: 1618/1887 Line, Structure 2683
Date: 3/1/2019
Engineer: TG
Purpose: Recalculate wire loads for AT&T/ Sprint site.

Shield Wires:

1618: 0.457" 24F OPGW, tensioned to 4200# @ NESC 250B final
1887: 0.646" 48 OPGW, tensioned to 5500# @ NESC 250B final

Conductors:

1618: 336 ACSR tensioned to 4000# @ NESC 250B final
1887: 556 ACSS tensioned to 4000# @ NESC 250B final

NESC 250B

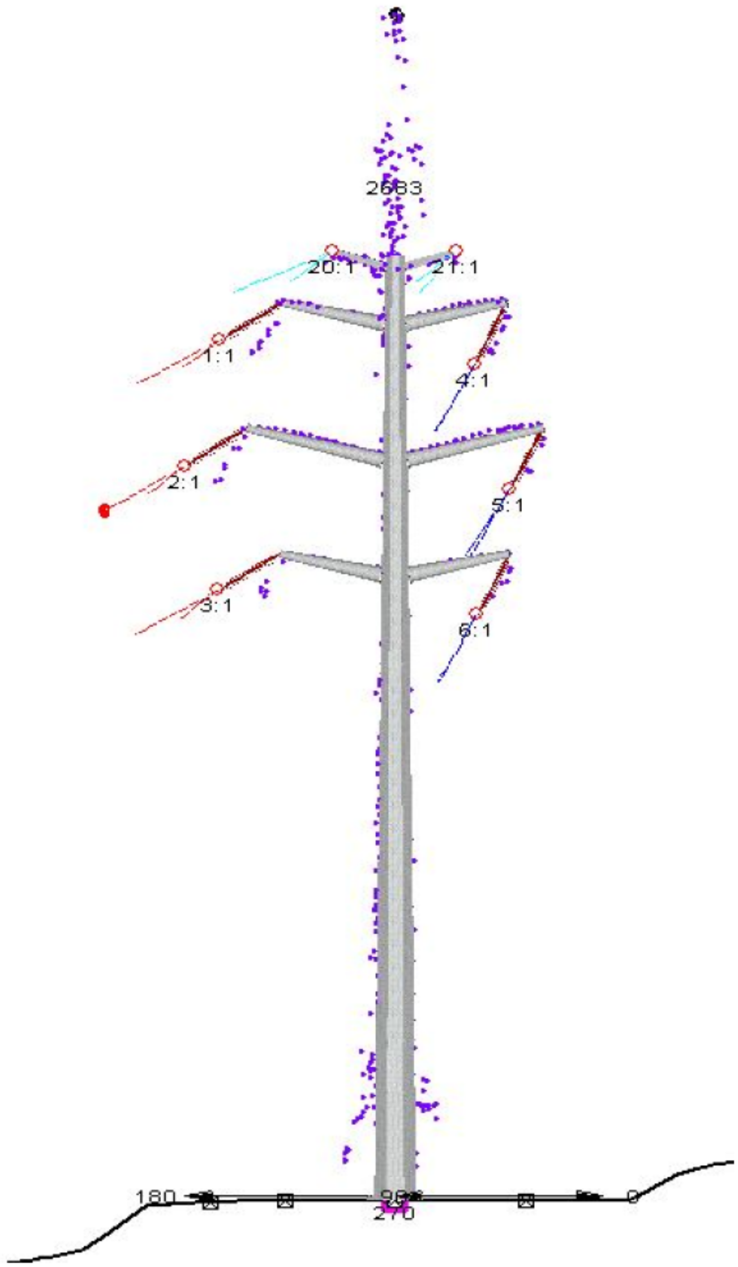
	Vert.	*Trans.*	*Long.*
1618 OPGW	871	-1715	105
1887 OPGW	1449	-2103	21
1618 Conductor	1581	-2183	124
1887 Conductor	2028	-2006	33

NESC 250C

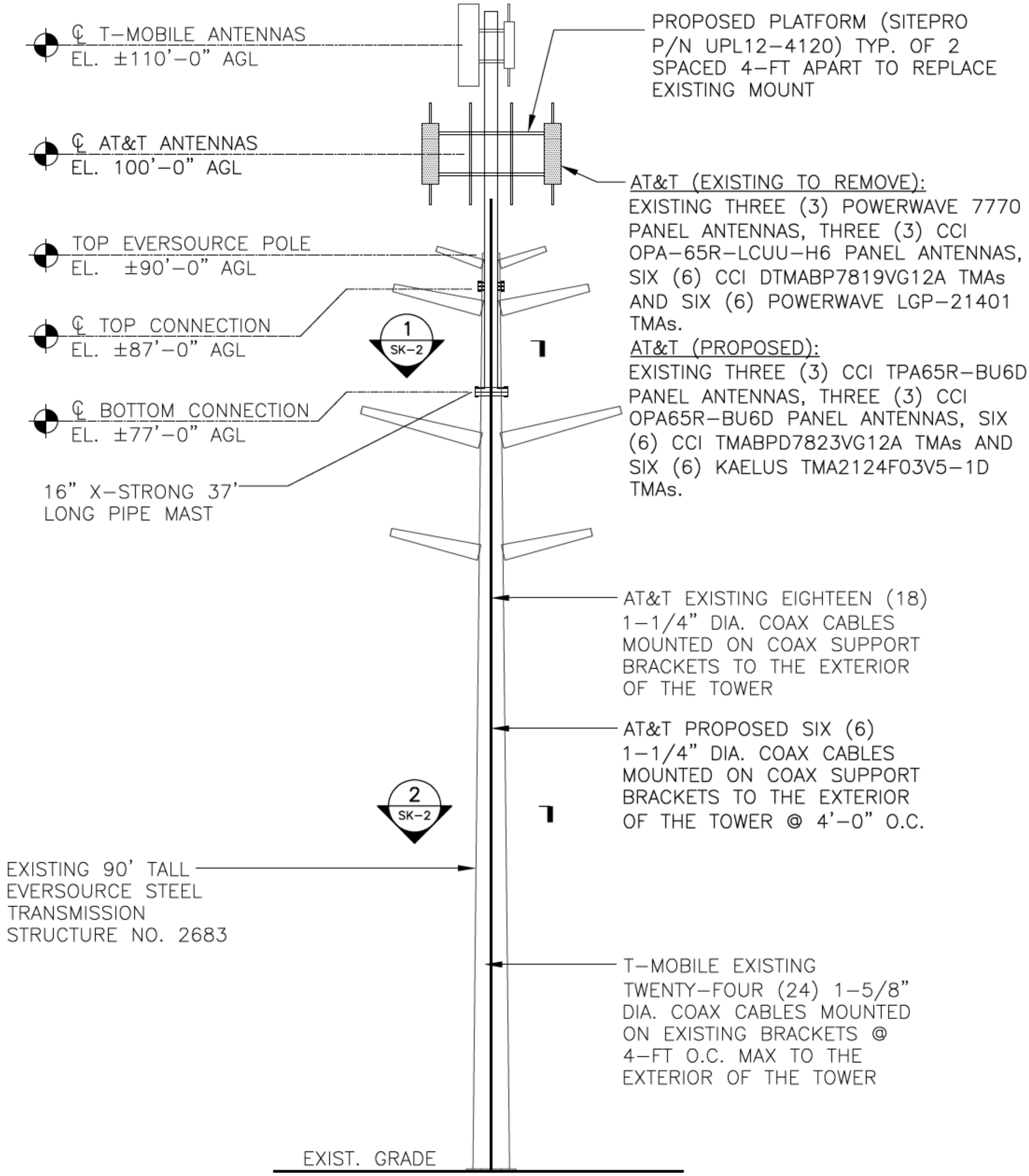
	Vert.	*Trans.*	*Long.*
1618 OPGW	249	-930	57
1887 OPGW	558	-1299	15
1618 Conductor	634	-1392	78
1887 Conductor	878	-1548	27

Historical NESC 250C

	Vert.	*Trans.*	*Long.*
1618 OPGW	240	-843	51
1887 OPGW	541	-1193	14
1618 Conductor	617	-1265	71
1887 Conductor	856	-1408	25



Positive transverse loads are in the 0 degree direction.
Looking east. 1618 Line is on attachment sets 1, 2, 3. 1887 Line is on attachment sets 4, 5, 6.
Positive longitudinal loads are toward the west.



1
SK-1

TOWER ELEVATION

SCALE: NOT TO SCALE

REVISIONS		
00	1/20/23	ISSUED FOR REVIEW
01	3/3/23	ISSUED FOR REVIEW

CENTEK engineering
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CT2185
STRUCTURE 2683

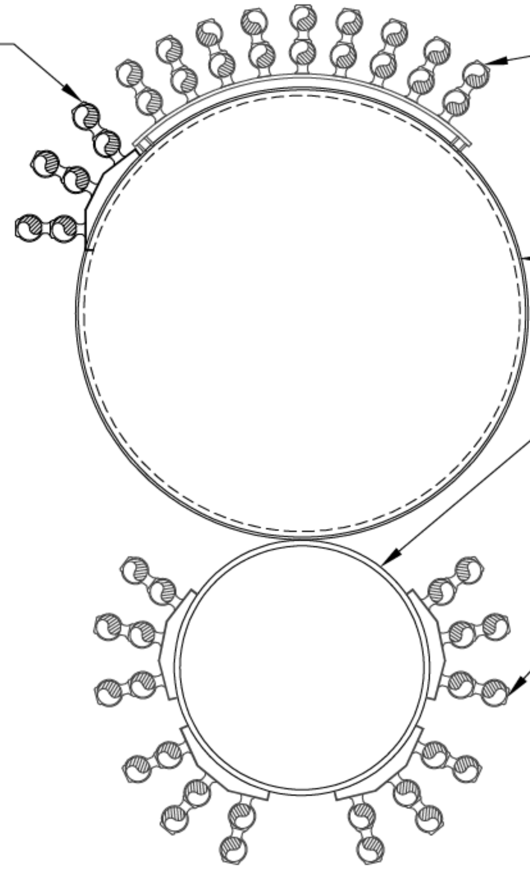
761 FEDERAL ROAD
BROOKFIELD, CT

PROJECT NO:	22021.10
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	1/20/23

TOWER ELEVATION

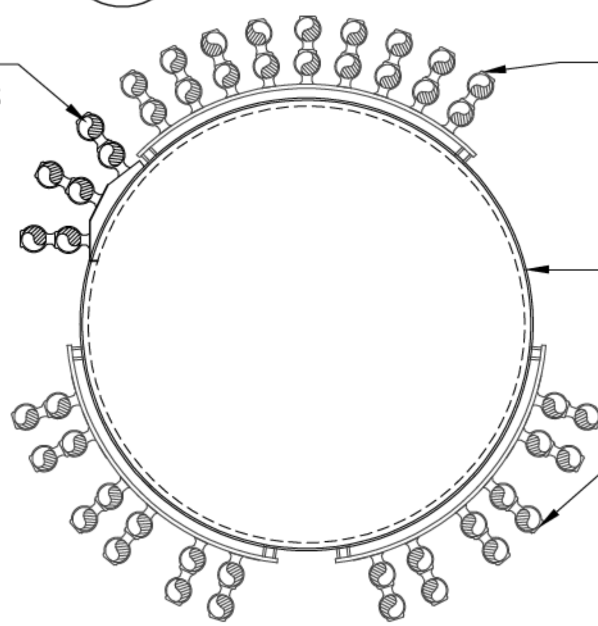
SK-1

DWG. 1 OF 2



1 / SK–2 COAX CABLE PLAN

SCALE: 1" = 1'–0"



2 / SK–2 COAX CABLE PLAN

SCALE: 1" = 1'–0"

REVISIONS

00	1/20/23	ISSUED FOR REVIEW
01	3/3/23	ISSUED FOR REVIEW

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CT2185
STRUCTURE 2683

761 FEDERAL ROAD
BROOKFIELD, CT

PROJECT NO:	22021.10
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	1/20/23

FEELINE PLAN

SK-2

DWG. 2 OF 2

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Centered on Solutions™ www.centekeng.com
63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	Loads on AT&T Mast - Structure 24063
Location:	Orange, CT
Rev. 1: 3/2/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22021.10

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-H

Wind Speeds

Basic Wind Speed	$V := 125$	mph	(User Input - 2022 CSBC Appendix P)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-H)
Basic Wind Speed Service Loads	$V_{Ser} := 60$	mph	(User Input - TIA-222-H Section 2.8.3)

Input

Structure Type =	Structure_Type := Pole		(User Input)
Structure Category =	SC := III		(User Input)
Exposure Category =	Exp := C		(User Input)
Structure Height =	$h := 90$	ft	(User Input)
Height to Center of Antennas=	$z_{T\_Mo} := 110$	ft	(User Input)
Height to Center of Antennas=	$z_{ATT} := 100$	ft	(User Input)
Height to Center of Mast =	$z_{Mast1} := 105.5$	ft	(User Input)
Height to Center of Mast =	$z_{Mast2} := 87$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.0$	in	(User Input per Annex B of TIA-222-H)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1.0$		(User Input)
Shielding Factor for Appurtenances =	$K_a := 0.8$		(User Input)
Shielding Factor for Mount =	$K_{a.mnt} := 0.75$		(User Input)
Ground Elevation Factor =	$K_e = 0.996$		(User Input)
Gust Response Factor =	$G_H := 1.35$		(User Input - Section 2.6.9.4 of TIA-222-H)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if Structure\_Type = Pole} \\ 0.85 & \text{if Structure\_Type = Lattice} \end{cases} = 0.95$$

(Per Table 2-2 of TIA-222-H)

Importance Factors =

$$I_{ice} := \begin{cases} 0 & \text{if SC = 1} \\ 1.00 & \text{if SC = 2} \\ 1.15 & \text{if SC = 3} \\ 1.25 & \text{if SC = 4} \end{cases} = 1.15$$

(Per Table 2-3 of TIA-222-H)

Wind Direction Probability Factor (Service) = $K_{dSer} := 0.85$ (Per Section 2.8.3 of TIA-222-H)

$K_{iz} := \left(\frac{z_{T\_Mo}}{33}\right)^{0.1} = 1.128$ $t_{izT\_Mo} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.297$

Velocity Pressure Coefficient Antennas = $Kz_{T\_Mo} := 2.01\left(\left(\frac{z_{T\_Mo}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.291$

Velocity Pressure w/o Ice Antennas = $qz_{T\_Mo} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{T\_Mo} \cdot V^2 = 48.852$

Velocity Pressure with Ice Antennas = $qz_{ice.T\_Mo} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{T\_Mo} \cdot V_i^2 = 7.816$

Velocity Pressure Service = $qz_{T\_Mo.Ser} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_{dSer} \cdot Kz_{T\_Mo} \cdot V_{Ser}^2 = 10.071$

$K_{iz} := \left(\frac{z_{ATT}}{33}\right)^{0.1} = 1.117$ $t_{izATT} := t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.285$

Velocity Pressure Coefficient Antennas = $Kz_{ATT} := 2.01\left(\left(\frac{z_{ATT}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.266$

Velocity Pressure w/o Ice Antennas = $qz_{ATT} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{ATT} \cdot V^2 = 47.882$

Velocity Pressure with Ice Antennas = $qz_{ice.ATT} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{ATT} \cdot V_i^2 = 7.661$

Velocity Pressure Service = $qz_{ATT.Ser} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_{dSer} \cdot Kz_{ATT} \cdot V_{Ser}^2 = 9.871$

$K_{izMast1} := \left(\frac{z_{Mast1}}{33}\right)^{0.1} = 1.123$ $t_{izMast1} := t_i \cdot I_{ice} \cdot K_{izMast1} \cdot K_{zt}^{0.35} = 1.292$

Velocity Pressure Coefficient Mast = $Kz_{Mast1} := 2.01\left(\left(\frac{z_{Mast1}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.28$

Velocity Pressure w/o Ice Mast= $qz_{Mast1} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{Mast1} \cdot V^2 = 48.424$

Velocity Pressure with Ice Mast = $qz_{ice.Mast1} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{Mast1} \cdot V_i^2 = 7.748$

Velocity Pressure Service = $qz_{Mast1.Ser} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_{dSer} \cdot Kz_{Mast1} \cdot V_{Ser}^2 = 9.983$

$K_{izMast2} := \left(\frac{z_{Mast2}}{33}\right)^{0.1} = 1.102$ $t_{izMast2} := t_i \cdot I_{ice} \cdot K_{izMast2} \cdot K_{zt}^{0.35} = 1.267$

Velocity Pressure Coefficient Mast = $Kz_{Mast2} := 2.01\left(\left(\frac{z_{Mast2}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.229$

Velocity Pressure w/o Ice Mast= $qz_{Mast2} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{Mast2} \cdot V^2 = 46.498$

Velocity Pressure with Ice Mast = $qz_{ice.Mast2} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_d \cdot Kz_{Mast2} \cdot V_i^2 = 7.44$

Velocity Pressure Service = $qz_{Mast2.Ser} := 0.00256 \cdot K_{zt} \cdot K_e \cdot K_{dSer} \cdot Kz_{Mast2} \cdot V_{Ser}^2 = 9.585$

Development of Wind & Ice Load on Mast

Mast Data: (16 Sch. 80 (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 16$ in (User Input)

Mast Length = $L_{mast} := 37$ ft (User Input)

Mast Thickness = $t_{mast} := 0.5$ in (User Input)

Mast Aspect Ratio = $Ar_{mast} := \frac{12L_{mast}}{D_{mast}} = 27.8$

Mast Force Coefficient = $Ca_{mast} = 1.2$

Gravity Loads (without ice)

Weight of the mast = Self Weight (Computed internally by Risa-3D) plf **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast1} \cdot 2\right)^2 - D_{mast}^2\right] = 70.2$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 27$ plf **BLC 3**

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast2} \cdot 2\right)^2 - D_{mast}^2\right] = 68.7$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 27$ plf **BLC 3**

Wind Load (with ice)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2 \cdot t_{izMast1}\right)}{12} = 1.549$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast1} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 19$ plf **BLC 4**

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2 \cdot t_{izMast2}\right)}{12} = 1.545$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast2} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 19$ plf **BLC 4**

Wind Load (without ice)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.333$ sf/ft

Total Mast Wind Force = $qz_{Mast1} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 105$ plf **BLC 5**

Total Mast Wind Force = $qz_{Mast2} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 100$ plf **BLC 5**

Wind Load (Service)

Total Mast Wind Force Service Loads = $qz_{Mast1.Ser} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 22$ plf **BLC 6**

Total Mast Wind Force Service Loads = $qz_{Mast2.Ser} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 21$ plf **BLC 6**

Development of Wind & Ice Load on Antennas

Antenna Data: (T-Mobile)

Antenna Model = RFSAPXVAALL24_43

Antenna Shape = Flat (User Input)

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

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

Antenna Thickness = $T_{ant} := 8.5$ in (User Input)

Antenna Weight = $WT_{ant} := 150$ lbs (User Input)

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

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$

Antenna Force Coefficient = $Ca_{ant} = 1.27$

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 450$ lbs **BLC 2**

Gravity Loads (ice only) cu in

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot t_{izT\_Mo})(W_{ant} + 2 \cdot t_{izT\_Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\_Mo}) - V_{ant} = 9497$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 308$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 923$ lbs **BLC 3**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\_Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\_Mo})}{144} = 18.2$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 54.6$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qz_{ice.T\_Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 583$ lbs **BLC 4**

Wind Load (without ice)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 48$ sf

Total Antenna Wind Force = $F_{ant} := qz_{T\_Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 3204$ lbs **BLC 5**

Wind Load (Service)

Total Antenna Wind Force Service Loads = $F_{ant.Ser} := qz_{T\_Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 660$ lbs **BLC 6**

Development of Wind & Ice Load on Antennas

Antenna Data: (T-Mobile)

Antenna Model = Commscope VV-65A-R1

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 54.724$ in (User Input)

Antenna Width = $W_{ant} := 12.087$ in (User Input)

Antenna Thickness = $T_{ant} := 4.646$ in (User Input)

Antenna Weight = $WT_{ant} := 30$ lbs (User Input)

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

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.5$

Antenna Force Coefficient = $Ca_{ant} = 1.29$

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 90$ lbs BLC 2

Gravity Loads (ice only)

cu in

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3073$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot t_{izT\_Mo}\right)\left(W_{ant} + 2 \cdot t_{izT\_Mo}\right) \cdot \left(T_{ant} + 2 \cdot t_{izT\_Mo}\right) - V_{ant} = 3020$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 98$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 294$ lbs BLC 3

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot t_{izT\_Mo}\right) \cdot \left(W_{ant} + 2 \cdot t_{izT\_Mo}\right)}{144} = 5.8$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 17.5$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qz_{ice.T\_Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 191$ lbs BLC 4

Wind Load (without ice)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.6$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 13.8$ sf

Total Antenna Wind Force = $F_{ant} := qz_{T\_Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 938$ lbs BLC 5

Wind Load (Service)

Total Antenna Wind Force Service Loads = $F_{ant.Ser} := qz_{T\_Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 193$ lbs BLC 6

Development of Wind & Ice Load on Antennas

Antenna Data: (T-Mobile)

Antenna Model =	ATSBT-TOP-FM4G Bias Tee		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 5.63$	in	(User Input)
Antenna Width =	$W_{ant} := 3.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 2$	in	(User Input)
Antenna Weight =	$WT_{ant} := 2$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 6$		(User Input)

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.5$

Antenna Force Coefficient = $Ca_{ant} = 1.2$

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 12$ lbs **BLC 2**

Gravity Loads (ice only)

cu in

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 42$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot t_{izT\_Mo})(W_{ant} + 2 \cdot t_{izT\_Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\_Mo}) - V_{ant} = 196$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 6$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 38$ lbs **BLC 3**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\_Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\_Mo})}{144} = 0.4$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.2$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qz_{ice.T\_Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 22$ lbs **BLC 4**

Wind Load (without ice)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 0.9$ sf

Total Antenna Wind Force = $F_{ant} := qz_{T\_Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 55$ lbs **BLC 5**

Wind Load (Service)

Total Antenna Wind Force Service Loads = $F_{ant.Ser} := qz_{T\_Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 11$ lbs **BLC 6**

Development of Wind & Ice Load on Antennas

Mount Data: (T-Mobile)

Mount Type:	SitePro RDS-296 - Double Support Arm x2		
Mount Shape =	Flat		(User Input)
Mount Projected Surface Area =	$CaAa := 13.5$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CaAa_{ice} := 17.6$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 1100$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 2000$	lbs	

Gravity Loads (without ice)

Weight of All Mounts =	$WT_{mnt} = 1100$	lbs	**BLC 2**

Gravity Loads (ice only)

Weight of Ice on All Mounts =	$WT_{mnt.ice} - WT_{mnt} = 900$	lbs	**BLC 3**

Wind Load (with ice)

Total Mount Wind Force =	$Fi_{mnt} := qz_{ice.T\_Mo} \cdot G_H \cdot CaAa_{ice} = 186$	lbs	**BLC 4**

Wind Load (without ice)

Total Mount Wind Force =	$F_{mnt} := qz_{T\_Mo} \cdot G_H \cdot CaAa = 890$	lbs	**BLC 5**

Wind Load (Service)

Total Mount Wind Force =	$Fi_{mnt} := qz_{T\_Mo.Ser} \cdot G_H \cdot CaAa = 184$	lbs	**BLC 6**

Total Pipe Length = $TPL := 8 \cdot ft \cdot 6 = 48 ft$

Total Antenna Length = $TAL := 96 \cdot in \cdot 3 + 54.7 \cdot in \cdot 3 = 37.675 ft$

Exposed Pipe Area = $ExPA := (TPL - TAL) 2.375 \cdot in = 2.043 ft^2$

CaAa = $1.2 \cdot ExPA + (3.5 \cdot in) \cdot 48 \cdot in \cdot 6 \cdot 1.2 + 4 \cdot in \cdot 8 \cdot in \cdot 6 \cdot 2.0 = 13.519 ft^2$

Exposed Pipe Area (with Ice) = $ExPA := (TPL - TAL) 3.375 \cdot in = 2.904 ft^2$

CaAa (with ice) = $1.2 \cdot ExPA + (4.5 \cdot in) \cdot 48 \cdot in \cdot 6 \cdot 1.2 + 5 \cdot in \cdot 8 \cdot in \cdot 6 \cdot 2.0 = 17.6 ft^2$

$463 \cdot lb \cdot 2 + 175 \cdot lb = 1101 lb$

$$\frac{\pi}{4}\left[\left(2.375 \cdot in + 2 \cdot t_{izT\_Mo} \cdot in\right)^2 - (2.375 \cdot in)^2\right] \cdot 96 \cdot in \cdot 6 \cdot (Id \cdot pcf) + \frac{\pi}{4}\left[\left(3.5 \cdot in + 2 \cdot t_{izT\_Mo} \cdot in\right)^2 - (3.5 \cdot in)^2\right] \cdot 48 \cdot in \cdot 6 \cdot (Id \cdot pcf) = 462 lb$$

Development of Wind & Ice Load on Antennas

Antenna Data:	(AT&T)		
Antenna Model =	CCI OPA65R-BU6D		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 71.2$	in	(User Input)
Antenna Width =	$W_{ant} := 21$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.8$	in	(User Input)
Antenna Weight =	$WT_{ant} := 70$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 3.4$		
Antenna Force Coefficient =	$Ca_{ant} = 1.24$		

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 210$ lbs **BLC 2**

Gravity Loads (ice only)

cu in

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1 \times 10^4$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot t_{izATT})(W_{ant} + 2 \cdot t_{izATT}) \cdot (T_{ant} + 2 \cdot t_{izATT}) - V_{ant} = 6367$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 206$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 619$ lbs **BLC 3**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izATT}) \cdot (W_{ant} + 2 \cdot t_{izATT})}{144} = 12.1$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 36.2$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qz_{ice.ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 372$ lbs **BLC 4**

Wind Load (without ice)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 10.4$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 31.1$ sf

Total Antenna Wind Force = $F_{ant} := qz_{ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 1997$ lbs **BLC 5**

Wind Load (Service)

Total Antenna Wind Force Service Loads = $F_{ant.Ser} := qz_{ATT.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 412$ lbs **BLC 6**

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	CCI TPA65R-BU6D		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 71.2$	in	(User Input)
Antenna Width =	$W_{ant} := 20.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 75$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 3.4$		
Antenna Force Coefficient =	$Ca_{ant} = 1.24$		

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 225$	lbs	BLC 2

Gravity Loads (ice only)

cu in

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1 \times 10^{4}$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izATT})(W_{ant} + 2 \cdot t_{izATT}) \cdot (T_{ant} + 2 \cdot t_{izATT}) - V_{ant} = 6280$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 204$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 611$	lbs	BLC 3

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izATT}) \cdot (W_{ant} + 2 \cdot t_{izATT})}{144} = 11.9$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 35.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 367$	lbs	BLC 4

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 10.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 30.7$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 1972$	lbs	BLC 5

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{ATT.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 406$	lbs	BLC 6

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model = Kaelus TMA2124F03V5-1D

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 9.65$ in (User Input)

Antenna Width = $W_{ant} := 8.27$ in (User Input)

Antenna Thickness = $T_{ant} := 5.04$ in (User Input)

Antenna Weight = $WT_{ant} := 20$ lbs (User Input)

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

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.2$

Antenna Force Coefficient = $Ca_{ant} = 1.2$

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 120$ lbs **BLC 2**

Gravity Loads (ice only)

cu in

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

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot t_{izATT})(W_{ant} + 2 \cdot t_{izATT}) \cdot (T_{ant} + 2 \cdot t_{izATT}) - V_{ant} = 606$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 20$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 118$ lbs **BLC 3**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izATT}) \cdot (W_{ant} + 2 \cdot t_{izATT})}{144} = 0.9$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 5.5$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qz_{ice.ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 55$ lbs **BLC 4**

Wind Load (without ice)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.6$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 3.3$ sf

Total Antenna Wind Force = $F_{ant} := qz_{ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 206$ lbs **BLC 5**

Wind Load (Service)

Total Antenna Wind Force Service Loads = $F_{ant.Ser} := qz_{ATT.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 43$ lbs **BLC 6**

Development of Wind & Ice Load on Antennas

Antenna Data: (AT&T)

Antenna Model =	CCI TMABPD7823VG12A		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 14.25$	in	(User Input)
Antenna Width =	$W_{ant} := 11.024$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.11$	in	(User Input)
Antenna Weight =	$WT_{ant} := 25$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 6$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.3$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 150$	lbs	BLC 2

Gravity Loads (ice only)

cu in

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 646$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izATT})(W_{ant} + 2 \cdot t_{izATT}) \cdot (T_{ant} + 2 \cdot t_{izATT}) - V_{ant} = 882$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 29$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 171$	lbs	BLC 3

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izATT}) \cdot (W_{ant} + 2 \cdot t_{izATT})}{144} = 1.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 9.5$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 95$	lbs	BLC 4

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 6.5$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 406$	lbs	BLC 5

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{ATT.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 84$	lbs	BLC 6

Development of Wind & Ice Load on Antennas

Mount Data: (AT&T)

Mount Type:	SitePro ULP12-4120 x2	
Mount EPA (no ice) =	$EPA := 12.77 \cdot ft^2$	(User Input from SitePro Document)
Mount EPA (1" ice) =	$EPA_{ice} := 19.12 \cdot ft^2$	(User Input from SitePro Document)
Weight (no ice) =	$W := 882 \cdot lb$	(User Input from SitePro Document)
Weight (1" ice) =	$W_{ice} := 1250 \cdot lb$	(User Input from SitePro Document)
Total Pipe Length =	$TPL := 12 \cdot 10 \cdot ft = 120 ft$	
Total Antenna Length =	$TAL := 71.2 \cdot in \cdot 3 + 71.2 \cdot in \cdot 3 = 35.6 ft$	
Exposed Pipe Area =	$ExPA := (TPL - TAL) 2.375 \cdot in = 16.704 ft^2$	
Exposed Pipe Area (with Ice) =	$ExPA_{ice} := (TPL - TAL) 4.375 \cdot in = 30.771 ft^2$	
Weight Antenna Pipes (no ice) =	$W_{pipes} := 3.66 plf \cdot 10 \cdot ft \cdot 12 = 439.2 lb$	
Weight Antenna Pipes (1" ice) =	$W_{pipes.ice} := 3.66 plf \cdot 10 \cdot ft \cdot 12 + \frac{\pi}{4}\left[(4.375 \cdot in)^2 - (2.375 \cdot in)^2\right] \cdot 10 \cdot ft \cdot 12 \cdot (Id \cdot pcf) = 934 lb$	
Mount Projected Surface Area =	$CaAa := 1.2 \cdot ExPA + EPA \cdot 2 = 45.6 ft^2$	
Mount Projected Surface Area w/ Ice =	$CaAa_{ice} := 1.2 \cdot ExPA_{ice} + EPA_{ice} \cdot 2 = 75.2 ft^2$	
Mount Weight =	$WT_{mnt} := W \cdot 2 + W_{pipes} = 2203 lb$	
Mount Weight w/ Ice =	$WT_{mnt.ice} := W_{ice} \cdot 2 + W_{pipes.ice} = 3434 lb$	

Gravity Loads (without ice)			
Weight of All Mounts =	$WT_{mnt} = 2203 lb$	lbs	**BLC 2**
Gravity Loads (ice only)			
Weight of Ice on All Mounts =	$WT_{mnt.ice} - WT_{mnt} = 1231 lb$	lbs	**BLC 3**
Wind Load (with ice)			
Total Mount Wind Force =	$Fi_{mnt} := qz_{ice.ATT} \cdot psf \cdot G_H \cdot CaAa_{ice} \cdot K_{a.mnt} = 583 lb$	lbs	**BLC 4**
Wind Load (without ice)			
Total Mount Wind Force =	$F_{mnt} := qz_{ATT} \cdot psf \cdot G_H \cdot CaAa \cdot K_{a.mnt} = 2210 lb$	lbs	**BLC 5**
Wind Load (Service)			
Total Mount Wind Force =	$Fi_{mnt} := qz_{ATT.Ser} \cdot psf \cdot G_H \cdot CaAa \cdot K_{a.mnt} = 456 lb$	lbs	**BLC 6**

Development of Wind & Ice Load on Coax Cables

Cable Data: T-Mobile Cables

Type = 1-5/8"

Shape = Round (User Input)

Coax Outside Diameter = $D_{coax} := 1.98$ in (User Input)

Coax Cable Length = $L_{coax} := 34$ ft (User Input)

Weight of Coax per foot = $Wt_{coax} := 1.04$ plf (User Input)

Total Number of Coax = $N_{coax} := 24$ (User Input

No. of Coax Projecting Outside Face of PCS Mast = $NP_{coax} := 4$ (User Input)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 206.1$

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 25$ plf **BLC 2**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot t_{izMast1}\right)^2 - D_{coax}{}^2\right] = 13.3$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 124$ plf **BLC 3**

Wind Load (with ice)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{\left(NP_{coax} \cdot D_{coax} + 2 \cdot t_{izMast1}\right)}{12} = 0.9$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast1} \cdot G_H \cdot AICE_{coax} = 11$ plf **BLC 4**

Wind Load (without ice)

Coax projected surface area = $A_{coax} := \frac{\left(NP_{coax} D_{coax}\right)}{12} = 0.7$ sf/ft

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{Mast1} \cdot G_H \cdot A_{coax} = 52$ plf **BLC 5**

Wind Load (Service)

Total Coax Wind Force Service Loads = $F_{coax} := Ca_{coax} \cdot qz_{Mast1.Ser} \cdot G_H \cdot A_{coax} = 11$ plf **BLC 6**

Development of Wind & Ice Load on Coax Cables

Cable Data:	AT&T Cables		
Type =	1-1/4"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.55$	in	(User Input)
Coax Cable Length =	$L_{coax} := 10$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 0.66$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 24$		(User Input
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 4$		(User Input)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 77.4$

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$

Gravity Loads (without ice)

Weight of all cables w/o ice: $WT_{coax} := Wt_{coax} \cdot N_{coax} = 16$ plf **BLC 2**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot t_{izMast1}\right)^2 - D_{coax}^2\right] = 11.5$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 108$ plf **BLC 3**

Wind Load (with ice)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{\left(NP_{coax} \cdot D_{coax} + 2 \cdot t_{izMast1}\right)}{12} = 0.7$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast1} \cdot G_H \cdot AICE_{coax} = 9$ plf **BLC 4**

Wind Load (without ice)

Coax projected surface area = $A_{coax} := \frac{\left(NP_{coax} \cdot D_{coax}\right)}{12} = 0.5$ sf/ft

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{Mast1} \cdot G_H \cdot A_{coax} = 41$ plf **BLC 5**

Wind Load (Service)

Total Coax Wind Force Service Loads = $F_{coax} := Ca_{coax} \cdot qz_{Mast1.Ser} \cdot G_H \cdot A_{coax} = 8$ plf **BLC 6**

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Standard Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Om Z	1
Om X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1.5
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	PIPE_16.0X	Column	Pipe	A53 Gr. B	Typical	22	665	665	1330

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M2	Mast	37									Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M2	BOT_C...	TOP_...			Mast	Column	Pipe	A53 Gr. B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	BOT_CONN	0	0	0	0	
2	TOP_CONN	0	10	0	0	
3	TOP_MAST	0	37	0	0	
4	CL_TMO	0	33	0	0	
5	CL_ATT	0	23	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	BOT_CONN	Reaction	Reaction	Reaction		Reaction	
2	TOP_CONN	Reaction		Reaction			

Member Point Loads

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
No Data to Print ...			

Joint Loads and Enforced Displacements (BLC 2 : Weight of Appurtenances)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CL_TMO	L	Y	-.45
2	CL_TMO	L	Y	-.09
3	CL_TMO	L	Y	-.012
4	CL_TMO	L	Y	-1.1
5	CL_ATT	L	Y	-.21
6	CL_ATT	L	Y	-.225
7	CL_ATT	L	Y	-.12
8	CL_ATT	L	Y	-.15
9	CL_ATT	L	Y	-2.203

Joint Loads and Enforced Displacements (BLC 3 : Weight of Ice Only)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CL_TMO	L	Y	-.923

Joint Loads and Enforced Displacements (BLC 3 : Weight of Ice Only) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
2	CL_TMO	L	Y	-.294
3	CL_TMO	L	Y	-.038
4	CL_TMO	L	Y	-.9
5	CL_ATT	L	Y	-.619
6	CL_ATT	L	Y	-.611
7	CL_ATT	L	Y	-.118
8	CL_ATT	L	Y	-.171
9	CL_ATT	L	Y	-1.231

Joint Loads and Enforced Displacements (BLC 4 : (x) TIA Wind with Ice)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CL_TMO	L	X	.583
2	CL_TMO	L	X	.191
3	CL_TMO	L	X	.022
4	CL_TMO	L	X	.186
5	CL_ATT	L	X	.372
6	CL_ATT	L	X	.367
7	CL_ATT	L	X	.055
8	CL_ATT	L	X	.095
9	CL_ATT	L	X	.583

Joint Loads and Enforced Displacements (BLC 5 : (x) TIA Wind)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CL_TMO	L	X	3.204
2	CL_TMO	L	X	.938
3	CL_TMO	L	X	.055
4	CL_TMO	L	X	.89
5	CL_ATT	L	X	1.997
6	CL_ATT	L	X	1.972
7	CL_ATT	L	X	.206
8	CL_ATT	L	X	.406
9	CL_ATT	L	X	2.21

Joint Loads and Enforced Displacements (BLC 6 : Service)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CL_TMO	L	X	.66
2	CL_TMO	L	X	.193
3	CL_TMO	L	X	.011
4	CL_TMO	L	X	.184
5	CL_ATT	L	X	.412
6	CL_ATT	L	X	.406
7	CL_ATT	L	X	.043
8	CL_ATT	L	X	.084
9	CL_ATT	L	X	.456

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	Y	-.025	-.025	0	34
2	M2	Y	-.016	-.016	13	23

Member Distributed Loads (BLC 3 : Weight of Ice Only)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	Y	-.027	-.027	20	0
2	M2	Y	-.027	-.027	0	20
3	M2	Y	-.124	-.124	0	34
4	M2	Y	-.108	-.108	13	23

Member Distributed Loads (BLC 4 : (x) TIA Wind with Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.019	.019	20	0
2	M2	X	.019	.019	0	20
3	M2	X	.011	.011	0	34
4	M2	X	.009	.009	13	23

Member Distributed Loads (BLC 5 : (x) TIA Wind)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.105	.105	20	0
2	M2	X	.1	.1	0	20
3	M2	X	.052	.052	0	34
4	M2	X	.041	.041	13	23

Member Distributed Loads (BLC 6 : Service)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.022	.022	20	0
2	M2	X	.021	.021	0	20
3	M2	X	.011	.011	0	34
4	M2	X	.008	.008	13	23

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight (Mast)	None		-1						
2	Weight of Appurtenances	None				9		2		
3	Weight of Ice Only	None				9		4		
4	(x) TIA Wind with Ice	None				9		4		
5	(x) TIA Wind	None				9		4		
6	Service	None				9		4		

Load Combinations

	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.2D + 1.0W	Yes	Y		1	1.2	2	1.2	5	1														
2	0.9D + 1.0W	Yes	Y		1	.9	2	.9	5	1														
3	1.2D +1.0Di + 1.0Wi	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.0D + 1.0W Service	Yes	Y		1	1	2	1	6	1														

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	BOT_CONN	max	25.698	1	21.208	3	0	4	0	4	0	4	0	4
2		min	5.228	3	7.506	2	0	1	0	1	0	1	0	1
3	TOP_CONN	max	-8.849	3	0	4	0	4	0	4	0	4	0	4
4		min	-43.539	1	0	1	0	1	0	1	0	1	0	1
5	Totals:	max	-3.621	3	21.208	3	0	4						
6		min	-17.841	1	7.506	2	0	1						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	BOT_CONN	max	0	4	0	4	0	4	0	4	0	4	3.854e-03	1
2		min	0	1	0	1	0	1	0	1	0	1	7.837e-04	3
3	TOP_CONN	max	0	4	-.002	2	0	4	0	4	0	4	-1.703e-03	3
4		min	0	1	-.005	3	0	1	0	1	0	1	-8.375e-03	1
5	TOP_MAST	max	8.276	1	-.004	2	0	4	0	4	0	4	-6.253e-03	3
6		min	1.672	3	-.011	3	0	1	0	1	0	1	-3.104e-02	1
7	CL_TMO	max	6.787	1	-.004	2	0	4	0	4	0	4	-6.251e-03	3
8		min	1.372	3	-.011	3	0	1	0	1	0	1	-3.103e-02	1
9	CL_ATT	max	3.175	1	-.003	2	0	4	0	4	0	4	-5.673e-03	3
10		min	.644	3	-.01	3	0	1	0	1	0	1	-2.806e-02	1

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Memb...	Shape	Code Check	L...	LC	Sh...	L...	Dir	...phi*P...	phi*Pn...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
1	M2	PIPE_16.0X	.932	1...	1	.131	9...		1	496.3... 693	286.125	286...	1....	H1..

Joint Reactions (By Combination)

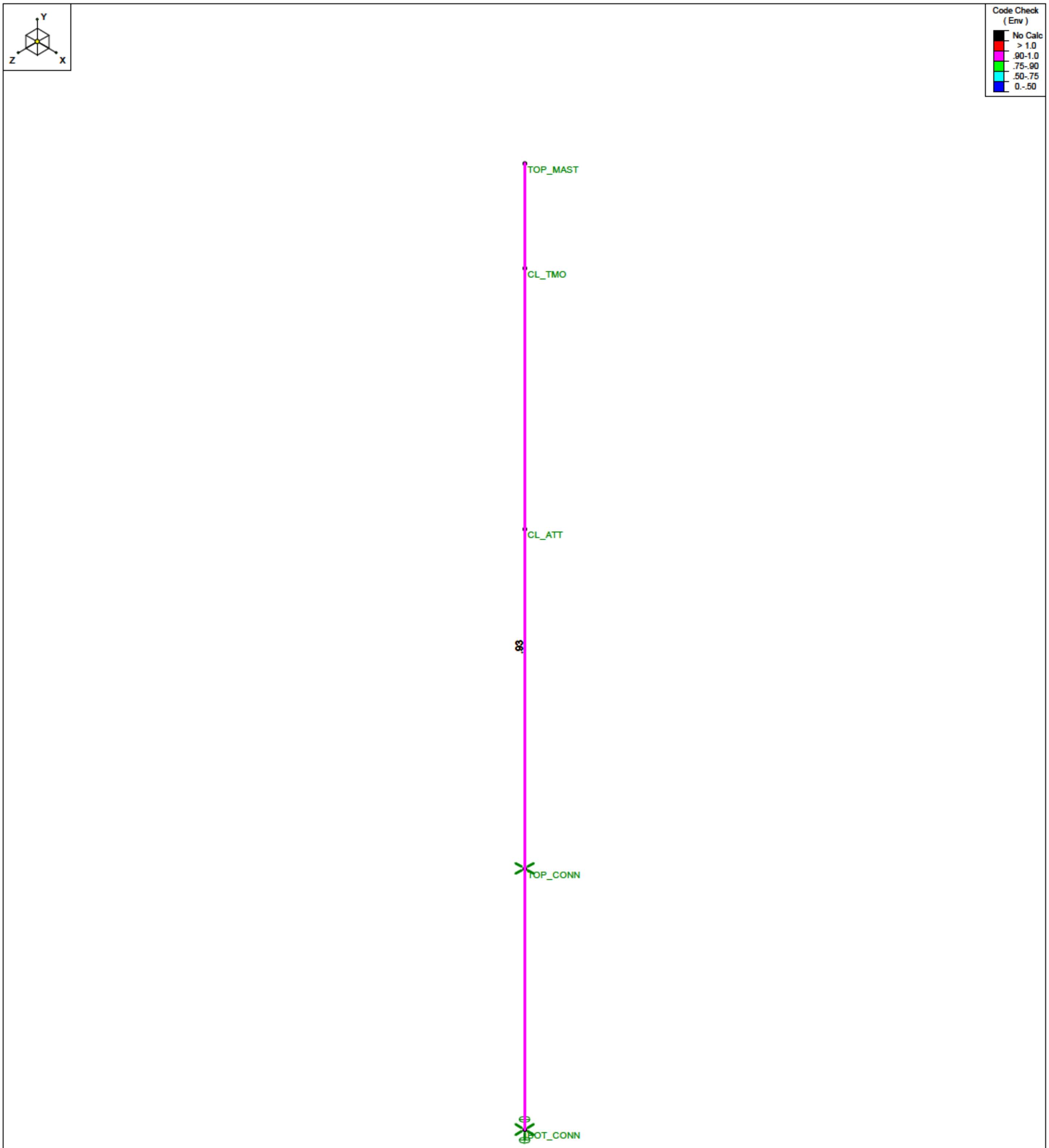
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	BOT_CONN	25.698	10.008	0	0	0	0
2	1	TOP_CONN	-43.539	0	0	0	0	0
3	1	Totals:	-17.841	10.008	0			
4	1	COG (ft):	X: 0	Y: 22.779	Z: 0			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	BOT_CONN	25.622	7.506	0	0	0	0
2	2	TOP_CONN	-43.463	0	0	0	0	0
3	2	Totals:	-17.841	7.506	0			
4	2	COG (ft):	X: 0	Y: 22.779	Z: 0			

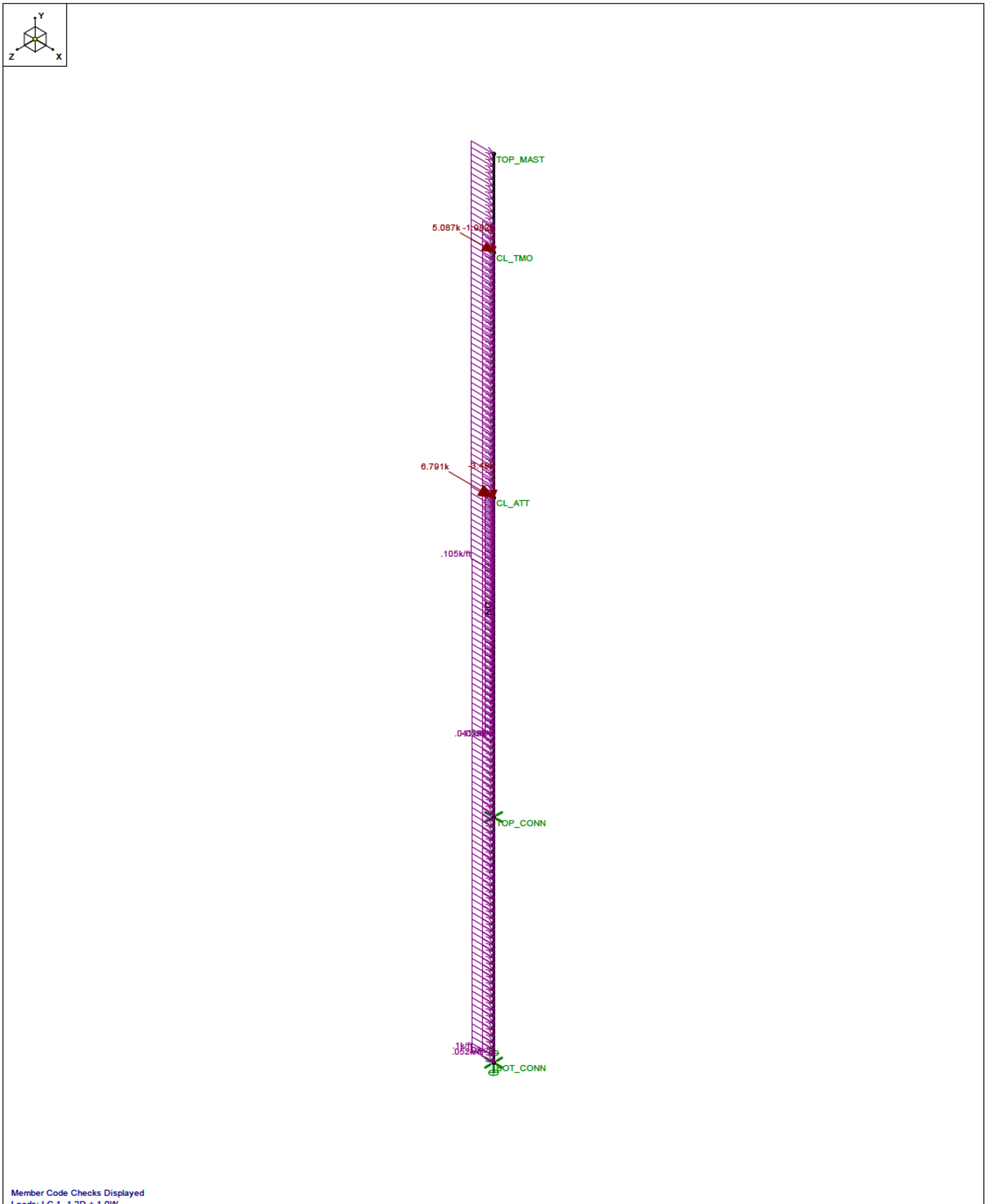
Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	BOT_CONN	5.228	21.208	0	0	0	0
2	3	TOP_CONN	-8.849	0	0	0	0	0
3	3	Totals:	-3.621	21.208	0			
4	3	COG (ft):	X: 0	Y: 22.252	Z: 0			

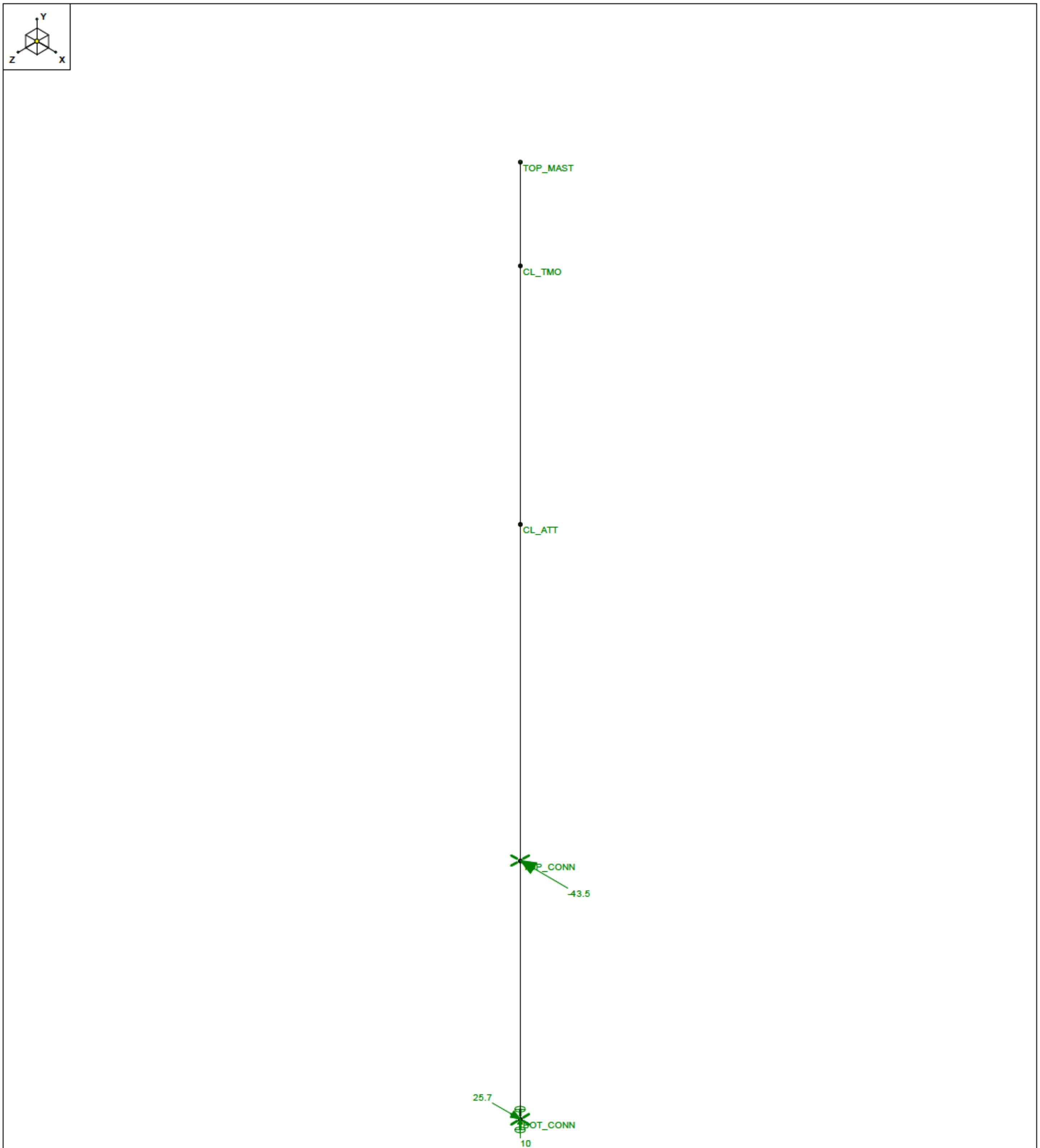


Member Code Checks Displayed (Enveloped)
Envelope Only Solution

CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 11:06 AM
22021.10 /AT&T CT2185	Unity Check	TIA Loads.r3d

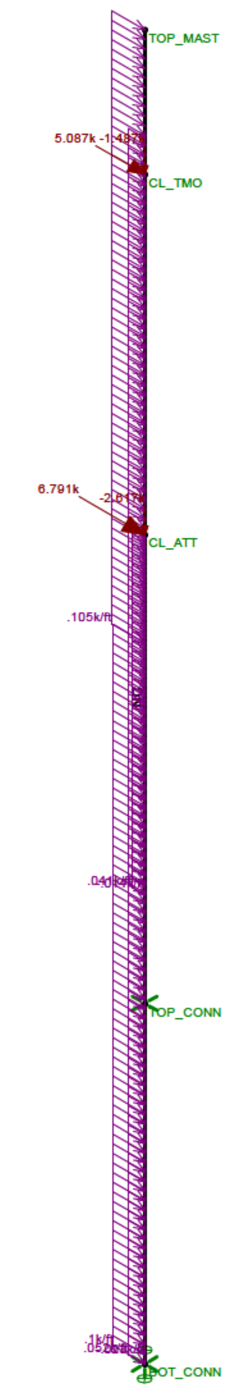


CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 11:07 AM
22021.10 /AT&T CT2185	LC #1 Loads	TIA Loads.r3d



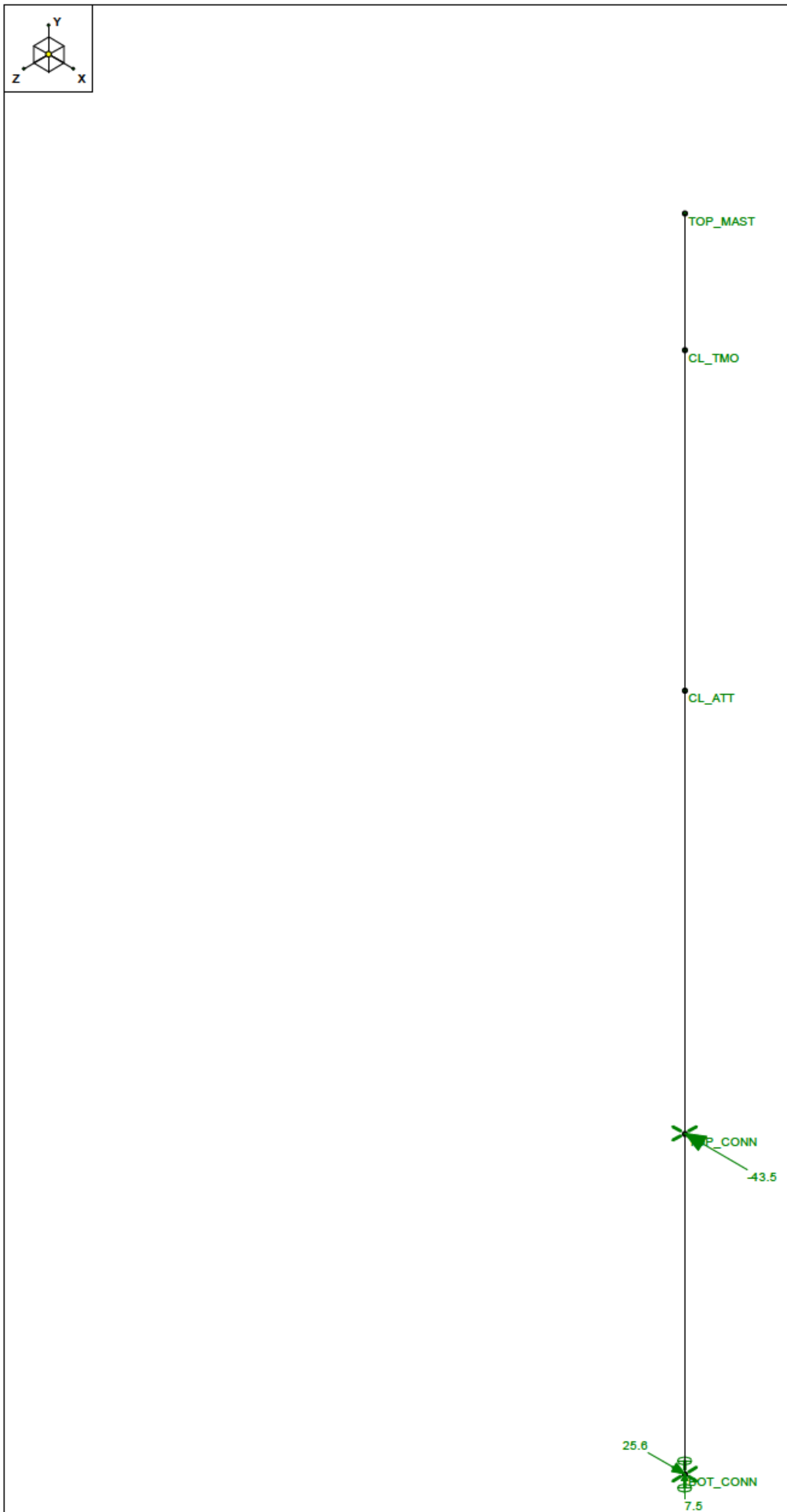
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 11:08 AM
22021.10 /AT&T CT2185	LC #1 Reactions	TIA Loads.r3d



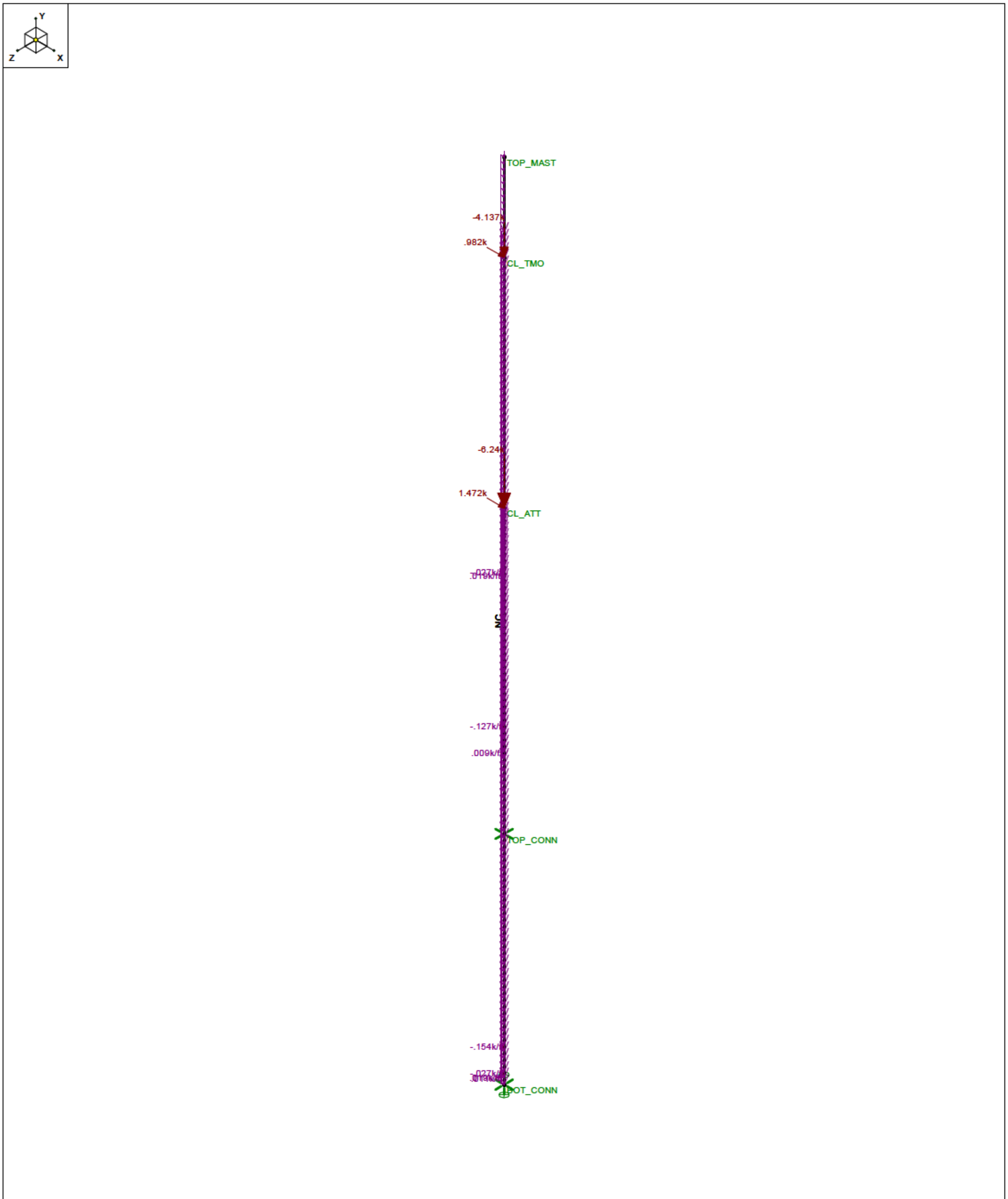
Member Code Checks Displayed
Loads: LC 2, 0.9D + 1.0W

CENTEK Engineering, INC.	Struct # 2683 - Mast	
tjl, cfc		Mar 3, 2023 at 11:07 AM
22021.10 /AT&T CT2185	LC #2 Loads	TIA Loads.r3d



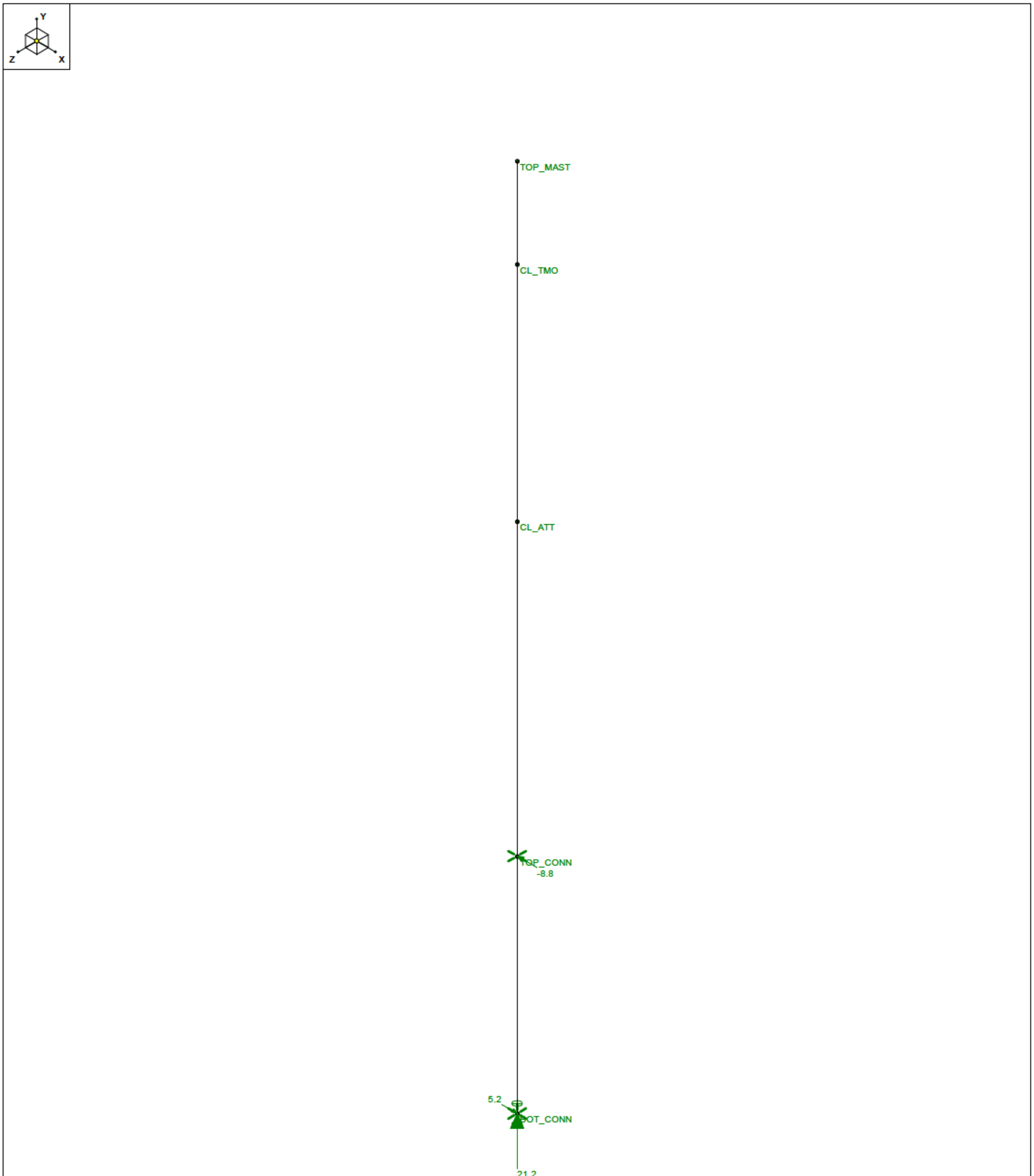
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 11:08 AM
22021.10 /AT&T CT2185	LC #2 Reactions	TIA Loads.r3d



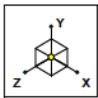
Member Code Checks Displayed
Loads: LC 3, 1.2D +1.0Di + 1.0Wi

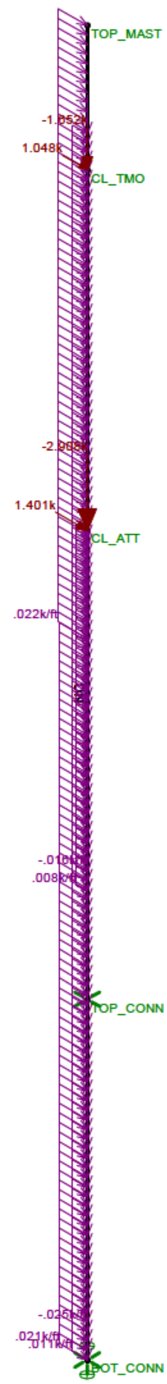
CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 11:07 AM
22021.10 /AT&T CT2185	LC #3 Loads	TIA Loads.r3d



Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 11:09 AM
22021.10 /AT&T CT2185	LC #3 Reactions	TIA Loads.r3d





Member Code Checks Displayed
Loads: LC 4, 1.0D + 1.0WService

CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 11:07 AM
22021.10 /AT&T CT2185	LC #4 Loads	TIA Loads.r3d

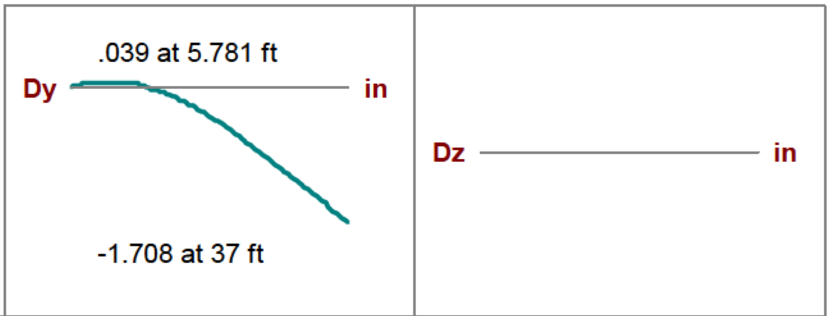
Column: ***M2***

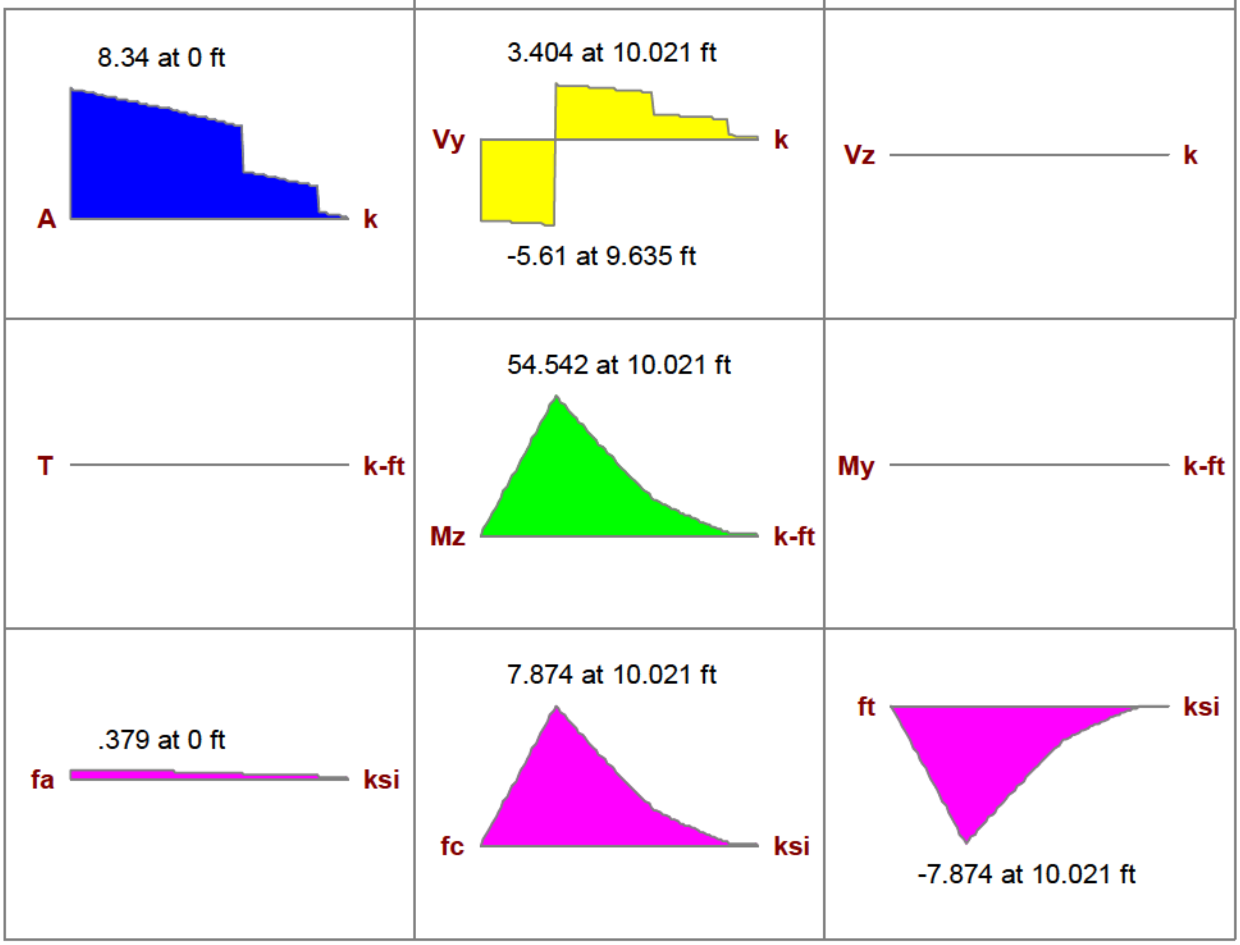
Shape:	**PIPE_16.0X**
Material:	**A53 Gr. B**
Length:	**37 ft**
I Joint:	**BOT_CONN**
J Joint:	**TOP_MAST**

LC 4: 1.0D + 1.0WService

Code Check: **0.198 (bending)**

Report Based On 97 Sections





AISC 14th(360-10): LRFD Code Check

Direct Analysis Method

Max Bending Check	**0.198**	Max Shear Check	**0.027 (s)**
Location	**10.021 ft**	Location	**9.635 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/260**
Bending	**Compact**	Compression	**Non-Slender**

			y-y	z-z
Fy	**35 ksi**	Lb	**37 ft**	**37 ft**
phi*Pnc	**496.325 k**	KL/r	**80.758**	**80.758**
phi*Pnt	**693 k**			
phi*Mny	**286.125 k-ft**	L Comp Flange	**37 ft**	
phi*Mnz	**286.125 k-ft**	L-torque	**37 ft**	
phi*Vny	**207.9 k**	Tau_b	**1**	
phi*Vnz	**207.9 k**			
phi*Tn	**277.636 k-ft**			
Cb	**1.64**			

Mast Top Connection:

Maximum Design Reactions at Brace:

Vertical = $Vert := 0 \cdot kips$ (User Input)

Horizontal = $Horz := 43.6 \cdot kips$ (User Input)

Moment = $Moment := 0$ (User Input)

Bolt Data:

Bolt Grade = A325 (User Input)

Number of Bolts = $n_b := 6$ (User Input)

Bolt Diameter = $d_b := 0.75in$ (User Input)

Nominal Tensile Strength = $F_{nt} := 90 \cdot ksi$ (User Input)

Nominal Shear Strength = $F_{nv} := 54 \cdot ksi$ (User Input)

Resistance Factor = $\phi := 0.75$ (User Input)

Bolt Eccentricity from C.L. Mast = $e := 22.5 \cdot in$ (User Input)

Vetical Spacing Between Top and Bottom Bolts = $S_{vert} := 9 \cdot in$ (User Input)

Horizontal Spacing Between Bolts = $S_{horz} := 24.375 \cdot in$ (User Input)

Bolt Area = $a_b := \frac{1}{4} \cdot \pi \cdot d_b^2 = 0.442 \cdot in^2$

Check Bolt Stresses:

Wind Acting Parallel to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \frac{Vert}{n_b \cdot a_b} = 0 \cdot ksi$

Condition1 := if$(f_v < \phi \cdot F_{nv}$, "OK" , "Overstressed")

Condition1 = "OK"

$\frac{f_v}{(\phi \cdot F_{nv})} = 0 \cdot \%$

Tensile Stress Adjusted for Shear = $F'_{nt} := \left| \begin{array}{l} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) \text{ if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} \text{ otherwise} \end{array} \right. = 90 \cdot ksi$

Tension Force Each Bolt = $F_{tension.bolt} := \frac{Horz}{n_b} + \frac{Vert \cdot e}{S_{vert} \cdot 2} = 7.267 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.bolt}}{a_b} = 16.4 \cdot ksi$

Condition2 := if$(f_t < \phi \cdot F'_{nt}$, "OK" , "Overstressed")

Condition2 = "OK"

$\frac{f_t}{(\phi \cdot F'_{nt})} = 24.4 \cdot \%$

Wind Acting Perpendicular to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \frac{\sqrt{Vert^2 + Horz^2}}{n_b \cdot a_b} = 16.448 \cdot ksi$

Condition3 := if$(f_v < \phi \cdot F_{nv}$, "OK" , "Overstressed")

Condition3 = "OK"

$\frac{f_v}{(\phi \cdot F_{nv})} = 40.6 \cdot \%$

Tensile Stress Adjusted for Shear = $F'_{nt} := \left| \begin{array}{l} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) \text{ if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} \text{ otherwise} \end{array} \right. = 80.45 \cdot ksi$

Tension Force per Bolt = $F_{tension.conn} := \frac{\frac{Horz \cdot e}{n_b}}{S_{horz} \cdot \frac{n_b}{2}} + \frac{Vert \cdot e}{S_{vert} \cdot 2} = 13.415 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.conn}}{a_b} = 30.366 \cdot ksi$

Condition4 := if$(f_t < \phi \cdot F'_{nt}$, "OK" , "Overstressed")

Condition4 = "OK"

$\frac{f_t}{(\phi \cdot F'_{nt})} = 50.3 \cdot \%$

Mast Connection to Bottom Bracket:

Design Reactions at Brace:

Axial (Max) =	$Axial_{max} := 21.2 \cdot kips$	(User Input)
Axial (Min) =	$Axial_{min} := 10.1 \cdot kips$	(User Input - LC # 1)
Horz =	$Horz := 25.7 \cdot kips$	(User Input)
Moment =	$Moment := 0 \cdot kips \cdot ft$	(User Input)

Resistance Factors:

Yielding Factor =	$\phi_t := 0.9$	(User Input)
Rupture Factor =	$\phi_r := 0.75$	(User Input)
Shear Factor =	$\phi_v := 0.9$	(User Input)

Bolt Data:

Bolt Type =	ASTM F1554-105 Rod	(User Input)
Bolt Diameter =	$D := 0.625 \cdot in$	(User Input)
Number of Bolts =	$N_b := 1$	(User Input)
Tensile Stress =	$F_u := 125 \cdot ksi$	(User Input)
Nominal Shear Strength =	$F_{nv} := 0.45 \cdot F_u = 56.25 \cdot ksi$	(User Input)
Bolt Area =	$a_b := \frac{1}{4} \cdot \pi \cdot D^2 = 0.307 \cdot in^2$	
Design Shear Strength =	$F_v := 2 \cdot 0.75 \cdot F_{nv} \cdot a_b = 25.89 \cdot kips$	(User Input - Double Shear)
Distance from Seat Plate to Threaded Rod =	$dist := 3 \cdot in$	(User Input)

Check Bolt:

Shear Force = $f_v := \frac{Horz}{N_b} = 25.7 \cdot kips$

Check Bolt Shear = $Condition1 := if\left(\frac{f_v}{F_v} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

Condition1 = "OK"

$\frac{f_v}{F_v} = 99.28 \cdot \%$

Check Bracket

Yield Strength = $F_y := 36 \cdot ksi$ (User Input)

Plate Height = $Pl_h := 6 \cdot in$ (User Input)

Plate Thickness = $Pl_t := 0.5 \cdot in$ (User Input)

Inside Box Plate Length = $Pl_l := 16.25 \cdot in$ (User Input)

Number of Plates = $n_{plt} := 4$ (User Input)

Plate Gross Area = $A_g := Pl_l \cdot Pl_t = 8.125 \cdot in^2$

Inside of Bracket Box Dimension = $d_1 := 16.25 \cdot in$ (User Input)

Outside of Bracket Box Dimension = $d_2 := d_1 + 2 \cdot Pl_t = 17.25 \cdot in$

Section Modulus Bracket Assembly = $S_x := \frac{(d_2)^4 - (d_1)^4}{6 (d_2)} = 181.8 \cdot in^3$ (User Input)

Design Bending Stress = $F_b := 0.9 \cdot F_y = 32.4 \cdot ksi$

Design Shear = $V_n := \phi_v \cdot 0.6 \cdot F_y \cdot A_g = 157.95 \cdot kips$

Local Moment = $M_{minor} := Horz \cdot dist = 6.4 \cdot ft \cdot kips$

Bending Stress = $f_b := \frac{M_{minor}}{S_x} = 0.42 \cdot ksi$

Max Shear = $V_{max} := \frac{Horz}{n_{plt} \cdot 0.5} = 12.85 \cdot kips$

$Condition2 := if\left(\frac{f_b}{F_b} + \frac{V_{max}}{V_n} < 1, \text{"OK"}, \text{"Overstressed"}\right)$

Condition2 = "OK"

$\frac{f_b}{F_b} + \frac{V_{max}}{V_n} = 9.4 \cdot \%$

Weld Yield Stress = $F_{yw} := 70 \cdot ksi$ (User Input)

Design Weld Stress = $F_w := 0.45 \cdot F_{yw} = 31.5 \cdot ksi$

Weld Size = $sw := 0.25 \cdot in$ (User Input)

Weld Area = $A_w := (d_2 + 2 \cdot 0.707 \cdot sw)^2 - d_2^{\,2} = 12.321 \cdot in^2$ (User Input)

Section Modulus of Weld = $S_x := \frac{(d_2 + 2 \cdot 0.707 \cdot sw)^4 - (d_2)^4}{6 (d_2 + 2 \cdot 0.707 \cdot sw)} = 70.859 \cdot in^3$ (User Input)

Weld Stress = $f_w := \frac{M_{minor}}{S_x} + \frac{Horz}{A_w \cdot 0.5} = 5.26 \cdot ksi$

$Condition3 := if(f_w < F_w, \text{"OK"}, \text{"Overstressed"})$

$\frac{f_w}{F_w} = 16.7 \cdot \%$

Condition3 = "OK"

Gusset Plate Data:

Yield Strength =	$F_y := 36 \cdot ksi$	(User Input)
Tensile Strength =	$F_u := 58 \cdot ksi$	(User Input)
Plate Height =	$Pl_h := 7.5 \cdot in$	(User Input)
Plate Thickness =	$Pl_t := 0.5 \cdot in$	(User Input)
Number of Plates =	$n_{plt} := 3$	(User Input)
Distance from CL Pole to Face of Collar =	$d := 10.5 \cdot in$	(User Input)
Section Modulus Gusset Assembly =	$S_x := \frac{167.3}{6.25} \cdot in^3 = 26.768 \cdot in^3$	(User Input)
Dist Between Outter 2 Gusset Plates =	$d_{plt} := 20 \cdot in$	(User Input)
Vertical Distance from Bot of Mast to Center of Bracket =	$S_{vert} := 7.25 \cdot in$	(User Input)

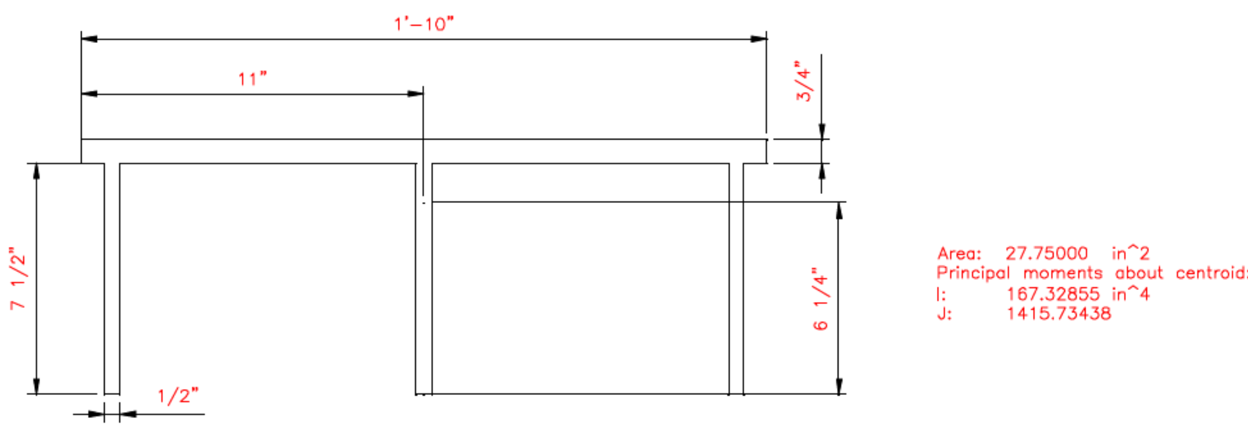


Plate Gross Area =	$A_g := Pl_h \cdot Pl_t = 3.75 \cdot in^2$
Effective Net Area =	$A_{en} := A_g = 3.75 \cdot in^2$
Tensile Yielding =	$P_{at} := \phi_t \cdot F_y \cdot A_g = 121.5 \cdot kips$
Tensile Rupture =	$P_{ar} := \phi_r \cdot F_u \cdot A_{en} = 163.125 \cdot kips$
Design Tension =	$Pa := \min(P_{at}, P_{ar}) = 121.5 \cdot kips$
Design Shear =	$V_n := \phi_v \cdot 0.6 \cdot F_y \cdot A_g = 72.9 \cdot kips$
Design Bending Stress =	$F_b := 0.9 \cdot F_y = 32.4 \cdot ksi$

Wind Acting Parallel to Stiffiner Plates:

Moment Parallel = $M_{par} := Moment + Axial_{max} \cdot d + M_{minor} + Horz \cdot S_{vert} = 486 \cdot in \cdot kips$

Bending Stress = $f_b := \dfrac{M_{par}}{S_x} = 18.16 \cdot ksi$

Max Tension = $T_{max} := \dfrac{Horz}{n_{plt}} = 8.567 \cdot kips$

Max Shear = $V_{max} := \dfrac{Axial_{max}}{n_{plt}} = 7.067 \cdot kips$

$\dfrac{f_b}{F_b} + \dfrac{T_{max}}{Pa} + \dfrac{V_{max}}{V_n} = 72.8 \cdot \%$

$Condition4 := if\left(\dfrac{f_b}{F_b} + \dfrac{T_{max}}{Pa} + \dfrac{V_{max}}{V_n} < 1, \text{"OK"}, \text{"Overstressed"}\right)$

Condition4 = "OK"

Wind Acting Perpendicular to Stiffiner Plates:

Moment Parallel = $M_{par} := Axial_{max} \cdot d = 222.6 \cdot in \cdot kips$

Moment **Perpendicular** = $M_{perp} := Horz \cdot d = 269.85 \cdot in \cdot kips$

Bending Stress = $f_b := \dfrac{M_{par}}{S_x} = 8.32 \cdot ksi$

Max Tension = $T_{max} := \dfrac{M_{perp}}{d_{plt}} = 13.492 \cdot kips$

Max Shear = $V_{max} := \dfrac{Axial_{max} + Horz}{n_{plt}} + \dfrac{Moment + M_{minor} + Horz \cdot S_{vert}}{d_{plt}} = 28.805 \cdot kips$

$Condition5 := if\left(\dfrac{f_b}{F_b} + \dfrac{T_{max}}{Pa} + \dfrac{V_{max}}{V_n} < 1, \text{"OK"}, \text{"Overstressed"}\right)$

Condition5 = "OK"

$\dfrac{f_b}{F_b} + \dfrac{T_{max}}{Pa} + \dfrac{V_{max}}{V_n} = 76.3 \cdot \%$

Weld Data:

Weld Yield Stress = $F_{yw} := 70 \cdot ksi$ (User Input)

Design Weld Stress = $F_w := 0.45 \cdot F_{yw} = 31.5 \cdot ksi$

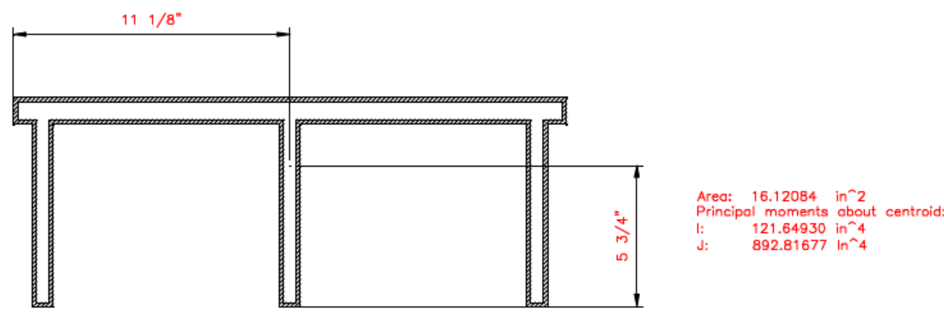
Weld Size = $sw := 0.25 \cdot in$ (User Input)

Weld Area = $A_w := 16.12 \cdot in^2$ (User Input)

Section Modulus of Weld = $S_x := \frac{121.8}{5.75} \cdot in^3 = 21.2 \cdot in^3$ (User Input)

Section Modulus of Weld = $S_z := \frac{892.8}{11.125} \cdot in^3 = 80.3 \cdot in^3$ (User Input)

Weld Area of 1 Gusset = $A_{w1} := 2.8 \cdot in^2$ (User Input)



Wind Acting Parallel to Stiffiner Plates:

Moment Parallel = $M_{par} := Moment + Axial_{max} \cdot d + M_{minor} + Horz \cdot S_{vert} = 486 \cdot in \cdot kips$

Weld Stress = $f_w := \frac{M_{par}}{S_x} + \frac{Axial_{max} + Horz}{A_w} = 25.85 \cdot ksi$

Condition6 := if($f_w < F_w$, "OK", "Overstressed")

Condition6 = "OK"

$\frac{f_w}{F_w} = 82.1 \cdot \%$

Wind Acting Perpendicular to Stiffiner Plates:

Moment Parallel = $M_{par} := Axial_{max} \cdot d = 222.6 \cdot in \cdot kips$

Moment Perpendicular = $M_{perp} := Horz \cdot d = 269.85 \cdot in \cdot kips$

Weld Stress = $f_w := \frac{M_{par}}{S_x} + \frac{M_{perp}}{S_z} + \frac{Axial_{max} + Horz}{A_w} + \frac{Moment + M_{minor} + Horz \cdot S_{vert}}{(d_{plt} \cdot A_{w1})} = 21.48 \cdot ksi$

Condition7 := if($f_w < F_w$, "OK", "Overstressed")

Condition7 = "OK"

$\frac{f_w}{F_w} = 68.2 \cdot \%$

Mast Bottom Connection:

Maximum Design Reactions at Brace:

Vertical =	$Vert := 21.2 \cdot kips$	(User Input)
Horizontal =	$Horz := 25.7 \cdot kips$	(User Input)
Moment =	$Moment := 0 \cdot ft \cdot kips$	(User Input)

Bolt Data:

Bolt Grade =	A325	(User Input)
Number of Bolts =	$n_b := 8$	(User Input)
Bolt Diameter =	$d_b := 0.75 in$	(User Input)
Nominal Tensile Strength =	$F_{nt} := 90 \cdot ksi$	(User Input)
Nominal Shear Strength =	$F_{nv} := 54 \cdot ksi$	(User Input)
Resistance Factor =	$\phi := 0.75$	(User Input)
Bolt Eccentricity from C.L. Mast =	$e := 22.5 \cdot in$	(User Input)
Horizontal Spacing Between Bolts =	$S_{horz} := 27 \cdot in$	(User Input)
Vertical Distance from Rod to Center of Bracket =	$S_{vert} := 7.25 \cdot in$	(User Input)
Vetical Spacing From Plate CL to Bolt 1 =	$d_1 := 2 \cdot in$	(User Input)
Vetical Spacing From Plate CL to Bolt 2 =	$d_2 := 6 \cdot in$	(User Input)

Bolt Polar Moment of Inertia = $I_p := 4 \cdot (d_1)^2 + 4 \cdot (d_2)^2 = 160 \cdot in^2$

Bolt Area = $a_b := \frac{1}{4} \cdot \pi \cdot d_b^2 = 0.442 \cdot in^2$

Check Bolt Stresses:

Wind Acting Parallel to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \dfrac{Vert}{n_b \cdot a_b} = 5.998 \cdot ksi$

Condition1 := if($f_v < \phi \cdot F_{nv}$, "OK", "Overstressed")

Condition1 = "OK"

$\dfrac{f_v}{(\phi \cdot F_{nv})} = 14.8 \cdot \%$

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \dfrac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \dfrac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 90 \cdot ksi$

Tension Force Each Bolt = $F_{tension.bolt} := \dfrac{Horz}{n_b} + \dfrac{(Vert \cdot e + Moment + Horz \cdot S_{vert}) \cdot d_2}{I_p} = 28.1 \cdot kips$

Tension Stress Each Bolt = $f_t := \dfrac{F_{tension.bolt}}{a_b} = 63.6 \cdot ksi$

Condition2 := if($f_t < \phi \cdot F'_{nt}$, "OK", "Overstressed")

Condition2 = "OK"

$\dfrac{f_t}{(\phi \cdot F'_{nt})} = 94.2 \cdot \%$

Wind Acting Perpendicular to Stiffiner Plate:

Shear Stress per Bolt = $f_v := \sqrt{\left[\dfrac{Vert}{n_b \cdot a_b} + \dfrac{(Moment + Horz \cdot S_{vert}) \cdot 2}{S_{horz} \cdot n_b \cdot a_b}\right]^2 + \left(\dfrac{Horz}{n_b \cdot a_b}\right)^2} = 12.286 \cdot ksi$

Condition3 := if($f_v < \phi \cdot F_{nv}$, "OK", "Overstressed")

Condition3 = "OK"

$\dfrac{f_v}{(\phi \cdot F_{nv})} = 30.3 \cdot \%$

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \dfrac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \dfrac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 89.7 \cdot ksi$

Tension Force per Bolt = $F_{tension.conn} := \dfrac{Horz \cdot e}{S_{horz} \cdot \dfrac{n_b}{2}} + \dfrac{Vert \cdot e \cdot d_2}{I_p} = 23.242 \cdot kips$

Tension Stress Each Bolt = $f_t := \dfrac{F_{tension.conn}}{a_b} = 52.608 \cdot ksi$

Condition4 := if($f_t < \phi \cdot F'_{nt}$, "OK", "Overstressed")

Condition4 = "OK"

$\dfrac{f_t}{(\phi \cdot F'_{nt})} = 78.2 \cdot \%$

Basic Components

Heavy Wind Pressure =	$p := 4.00$	psf	(User Input NESC 2023 Figure 250-1 & Table 250-1)
Basic Windspeed =	$V := 100$	mph	(User Input)
Radial Ice Thickness =	$Ir := 0.50$	in	(User Input NESC 2023 Figure 250-1 & Table 250-1)
Radial Ice Density =	$Id := 56.0$	pcf	(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of Mast Above Grade = $TME := 114$ ft (User Input)

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

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.301$ (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 = $z_s := 0.67 \cdot TME = 76.38$ (NESC 2023 Table 250-3)

Turbulence Intensity = $I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.174$ (NESC 2023 Table 250-3)

Response Term = $B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.915$ (NESC 2023 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.841$ (NESC 2023 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf = 28$ (NESC 2023 Section 250.C.1)

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

Eversource Design Criteria Table

Overload Factors for Wind Loads:

NESC Heavy Loading =	**2.5**	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in Risa-3D Analysis

Overload Factors for Vertical Loads:

NESC Heavy Loading =	**1.5**	(User Input)	Apply in Risa-3D Analysis
NESC Extreme Loading =	**1.0**	(User Input)	Apply in Risa-3D Analysis

Development of Wind & Ice Load on PCS Mast

Existing Upper PCS Mast Data: (Pipe 16 Sch. 80)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 16$	in	(User Input)
Mast Length =	$L_{mast} := 37$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.5$	in	(User Input)

Gravity Loads (without ice)

Weight of the mast =	Self Weight	(Computed internally by Risa-3D)	plf	BLC 1

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + Ir \cdot 2\right)^2 - D_{mast}^{\ 2}\right] = 25.9$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 10$ plf **BLC 3**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2 \cdot Ir\right)}{12} = 1.417$ sf/ft

Total Mast Wind Force w/ Ice = $p \cdot Cd_{coax} \cdot AICE_{mast} = 9$ plf **BLC 4**

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.333$ sf/ft

Total Mast Wind Force (Above Structure) = $qz \cdot Cd_{coax} \cdot A_{mast} \cdot m = 75$ plf **BLC 5**

Total Mast Wind Force (Below Structure) = $qz \cdot Cd_{coax} \cdot A_{mast} = 60$ plf **BLC 5**

Development of Wind & Ice Load on Antennas

Antenna Data: (T-Mobile)

Antenna Model = RFSAPXVAALL24_43

Antenna Shape = Flat (User Input)

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

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

Antenna Thickness = $T_{ant} := 8.5$ in (User Input)

Antenna Weight = $WT_{ant} := 150$ lbs (User Input)

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

Gravity Load (without ice)

Weight of All Antennas = $Wt_{a1} := WT_{ant} \cdot N_{ant} = 450$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 3450$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 112$ lbs

Weight of Ice on All Antennas = $Wt_{i.a1} := W_{ICEant} \cdot N_{ant} = 335$ lbs

Wind Load (NESC Heavy)

Effective Projected Area for One Antenna = $EPA_N := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 16.82$ $EPA_T := \frac{(L_{ant} + 2 \cdot Ir) \cdot (T_{ant} + 2 \cdot Ir)}{144} = 6.$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 16.82$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 9$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 9$

$EPA_{tot} := EPA_{A1} + EPA_{A2} + EPA_{A3} = 34.823$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot EPA_{tot} = 223$ lbs

Wind Load (NESC Extreme)

Effective Projected Area for One Antenna = $EPA_N := \frac{L_{ant} \cdot W_{ant}}{144} = 15.98$ $EPA_T := \frac{L_{ant} \cdot T_{ant}}{144} = 5.66$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 15.98$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 8.24$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 8.24$

$EPA_{tot} := EPA_{A1} + EPA_{A2} + EPA_{A3} = 32.466$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot EPA_{tot} \cdot m = 1819$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data: (T-Mobile)

Antenna Model = Commscope VV-65A-R1

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 54.724$ in (User Input)

Antenna Width = $W_{ant} := 12.087$ in (User Input)

Antenna Thickness = $T_{ant} := 4.646$ in (User Input)

Antenna Weight = $WT_{ant} := 30$ lbs (User Input)

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

Gravity Load (without ice)

Weight of All Antennas = $Wt_{a1} := WT_{ant} \cdot N_{ant} = 90$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3073$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 1044$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 34$ lbs

Weight of Ice on All Antennas = $Wt_{i.a1} := W_{ICEant} \cdot N_{ant} = 102$ lbs

Wind Load (NESC Heavy)

Effective Projected Area for One Antenna = $EPA_N := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 5.06$ $EPA_T := \frac{(L_{ant} + 2 \cdot Ir) \cdot (T_{ant} + 2 \cdot Ir)}{144} = 2.$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 5.06$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 2.9$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 2.9$

$EPA_{tot} := EPA_{A1} + EPA_{A2} + EPA_{A3} = 10.874$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot EPA_{tot} = 70$ lbs

Wind Load (NESC Extreme)

Effective Projected Area for One Antenna = $EPA_N := \frac{L_{ant} \cdot W_{ant}}{144} = 4.59$ $EPA_T := \frac{L_{ant} \cdot T_{ant}}{144} = 1.77$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 4.59$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 2.47$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 2.47$

$EPA_{tot} := EPA_{A1} + EPA_{A2} + EPA_{A3} = 9.539$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot EPA_{tot} \cdot m = 534$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data: (T-Mobile)

Antenna Model = ATSBT-TOP-FM4G Bias Tee

Antenna Shape = Flat (User Input)

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

Antenna Width = $W_{ant} := 3.7$ in (User Input)

Antenna Thickness = $T_{ant} := 2.0$ in (User Input)

Antenna Weight = $WT_{ant} := 2$ lbs (User Input)

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

Gravity Load (without ice)

Weight of All Antennas = $Wt_{a1} := WT_{ant} \cdot N_{ant} = 12$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 42$ cu in

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

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 2$ lbs

Weight of Ice on All Antennas = $Wt_{i.a1} := W_{ICEant} \cdot N_{ant} = 10$ lbs

Wind Load (NESC Heavy)

Effective Projected Area for One Antenna = $EPA_N := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 0.22$ $EPA_T := \frac{(L_{ant} + 2 \cdot Ir) \cdot (T_{ant} + 2 \cdot Ir)}{144} = 0.$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 0.22$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 0.16$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 0.16$

$EPA_{tot} := 2EPA_{A1} + 2EPA_{A2} + 2EPA_{A3} = 1.064$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot EPA_{tot} = 7$ lbs

Wind Load (NESC Extreme)

Effective Projected Area for One Antenna = $EPA_N := \frac{L_{ant} \cdot W_{ant}}{144} = 0.14$ $EPA_T := \frac{L_{ant} \cdot T_{ant}}{144} = 0.08$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 0.14$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 0.09$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 0.09$

$EPA_{tot} := 2EPA_{A1} + 2EPA_{A2} + 2EPA_{A3} = 0.669$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot EPA_{tot} \cdot m = 37$ lbs

Development of Wind & Ice Load on Mounts

Mount Data: (T-Mobile)

Mount Type = SitePro RDS-296 - Double SupportArm x2

Mount Shape = Flat (User Input)

Mount Area = $CdA_{mnt} := 13.9$ sq ft (User Input)

Mount Area w/ Ice = $CdA_{ICEmnt} := 18.1$ sq ft (User Input)

Mount Weight = $WT_{mnt} := 1100$ lbs (User Input)

Mount Weight w/ Ice = $WT_{ICEmnt} := 1250$ lbs (User Input)

Gravity Load (without ice)

Weight of Mount = $WT_{mnt} = 1100$ lbs **BLC 2**

Gravity Load (ice only)

Weight of Ice on Mount = $WT_{ICEmnt} - WT_{mnt} = 150$ lbs **BLC 3**

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt} := p \cdot Cd_F \cdot CdA_{ICEmnt} = 116$ lbs **BLC 4**

Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt} := qz \cdot Cd_F \cdot CdA_{mnt} \cdot m = 779$ lbs **BLC 5**

Total Pipe Length = $TPL := 8 \cdot ft \cdot 6 = 48 ft$

Total Antenna Length = $TAL := 96 \cdot in \cdot 3 + 54.7 \cdot in \cdot 3 = 37.675 ft$

Exposed Pipe Area = $ExPA := (TPL - TAL) 2.375 \cdot in = 2.043 ft^2$

CaAa = $1.3 \cdot ExPA + (3.5 \cdot in) \cdot 48 \cdot in \cdot 6 \cdot 1.3 + 4 \cdot in \cdot 8 \cdot in \cdot 6 \cdot 1.6 = 13.89 ft^2$

Exposed Pipe Area (with Ice) = $ExPA := (TPL - TAL) 3.375 \cdot in = 2.904 ft^2$

CaAa (with ice) = $1.3 \cdot ExPA + (4.5 \cdot in) \cdot 48 \cdot in \cdot 6 \cdot 1.3 + 5 \cdot in \cdot 8 \cdot in \cdot 6 \cdot 1.6 = 18.1 ft^2$

$463 \cdot lb \cdot 2 + 175 \cdot lb = 1101 lb$

$$\frac{\pi}{4}\left[(3.375 \cdot in)^2 - (2.375 \cdot in)^2\right] \cdot 96 \cdot in \cdot 6 \cdot (Id \cdot pcf) + \frac{\pi}{4}\left[(4.5 \cdot in)^2 - (3.5 \cdot in)^2\right] \cdot 48 \cdot in \cdot 6 \cdot (Id \cdot pcf) = 142.942 lb$$

Development of Wind & Ice Load on Antennas

Existing Antenna Data: (AT&T)

Antenna Model = CCI OPA65R-BU6D

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 71.2$ in (User Input)

Antenna Width = $W_{ant} := 21.0$ in (User Input)

Antenna Thickness = $T_{ant} := 7.8$ in (User Input)

Antenna Weight = $WT_{ant} := 70$ lbs (User Input)

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

Gravity Load (without ice)

Weight of All Antennas = $Wt_{a1} := WT_{ant} \cdot N_{ant} = 210$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1 \times 10^4$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot Ir)(W_{ant} + 2 \cdot Ir)(T_{ant} + 2 \cdot Ir) - V_{ant} = 2315$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 75$ lbs

Weight of Ice on All Antennas = $Wt_{i.a1} := W_{ICEant} \cdot N_{ant} = 225$ lbs

Wind Load (NESC Heavy)

Effective Projected Area for One Antenna = $EPA_N := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 11.03$ $EPA_T := \frac{(L_{ant} + 2 \cdot Ir) \cdot (T_{ant} + 2 \cdot Ir)}{144} = 4.$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 11.03$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 6.07$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 6.07$

$EPA_{tot} := EPA_{A1} + EPA_{A2} + EPA_{A3} = 23.164$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot EPA_{tot} = 148$ lbs

Wind Load (NESC Extreme)

Effective Projected Area for One Antenna = $EPA_N := \frac{L_{ant} \cdot W_{ant}}{144} = 10.38$ $EPA_T := \frac{L_{ant} \cdot T_{ant}}{144} = 3.86$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 10.38$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 5.49$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 5.49$

$EPA_{tot} := EPA_{A1} + EPA_{A2} + EPA_{A3} = 21.36$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot EPA_{tot} \cdot m = 1197$ lbs

Development of Wind & Ice Load on Antennas

Proposed Antenna Data: (AT&T)

Antenna Model =	CCI TPA65R-BU6D		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 71.2$	in	(User Input)
Antenna Width =	$W_{ant} := 20.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 75$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{a1} := WT_{ant} \cdot N_{ant} = 225$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1 \times 10^{4}$ cu in

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

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 74$ lbs

Weight of Ice on All Antennas = $Wt_{i.a1} := W_{ICEant} \cdot N_{ant} = 222$ lbs

Wind Load (NESC Heavy)

Effective Projected Area for One Antenna = $EPA_N := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 10.88$ $EPA_T := \frac{(L_{ant} + 2 \cdot Ir) \cdot (T_{ant} + 2 \cdot Ir)}{144} = 4.:$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 10.88$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 5.99$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 5.99$

$EPA_{tot} := EPA_{A1} + EPA_{A2} + EPA_{A3} = 22.863$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot EPA_{tot} = 146$ lbs

Wind Load (NESC Extreme)

Effective Projected Area for One Antenna = $EPA_N := \frac{L_{ant} \cdot W_{ant}}{144} = 10.23$ $EPA_T := \frac{L_{ant} \cdot T_{ant}}{144} = 3.81$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 10.23$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 5.41$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 5.41$

$EPA_{tot} := EPA_{A1} + EPA_{A2} + EPA_{A3} = 21.063$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot EPA_{tot} \cdot m = 1180$ lbs

Development of Wind & Ice Load on TMA's

Existing TMA Data: (AT&T)

TMA Model = Kaelus TMA2124F03V5-1D

TMA Shape = Flat (User Input)

TMA Height = $L_{ant} := 9.65$ in (User Input)

TMA Width = $W_{ant} := 8.27$ in (User Input)

TMA Thickness = $T_{ant} := 5.04$ in (User Input)

TMA Weight = $WT_{ant} := 20$ lbs (User Input)

Number of TMA's = $N_{ant} := 6$ (User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{a1} := WT_{ant} \cdot N_{ant} = 120$ lbs

Gravity Load (ice only)

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

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

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 6$ lbs

Weight of Ice on All Antennas = $Wt_{i.a1} := W_{ICEant} \cdot N_{ant} = 38$ lbs

Wind Load (NESC Heavy)

Effective Projected Area for One Antenna = $EPA_N := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 0.69$ $EPA_T := \frac{(L_{ant} + 2 \cdot Ir) \cdot (T_{ant} + 2 \cdot Ir)}{144} = 0.$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 0.69$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 0.51$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 0.51$

$EPA_{tot} := 2EPA_{A1} + 2EPA_{A2} + 2EPA_{A3} = 3.397$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot EPA_{tot} = 22$ lbs

Wind Load (NESC Extreme)

Effective Projected Area for One Antenna = $EPA_N := \frac{L_{ant} \cdot W_{ant}}{144} = 0.55$ $EPA_T := \frac{L_{ant} \cdot T_{ant}}{144} = 0.34$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 0.55$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 0.39$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 0.39$

$EPA_{tot} := 2EPA_{A1} + 2EPA_{A2} + 2EPA_{A3} = 2.676$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot EPA_{tot} \cdot m = 150$ lbs

Development of Wind & Ice Load on TMA's

Proposed TMA Data: (AT&T)

TMA Model = CCI TMABPD7823VG12A

TMA Shape = Flat (User Input)

TMA Height = $L_{ant} := 14.25$ in (User Input)

TMA Width = $W_{ant} := 11.024$ in (User Input)

TMA Thickness = $T_{ant} := 4.11$ in (User Input)

TMA Weight = $WT_{ant} := 25$ lbs (User Input)

Number of TMA's = $N_{ant} := 6$ (User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{a1} := WT_{ant} \cdot N_{ant} = 150$ lbs

Gravity Load (ice only)

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

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

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 9$ lbs

Weight of Ice on All Antennas = $Wt_{i.a1} := W_{ICEant} \cdot N_{ant} = 57$ lbs

Wind Load (NESC Heavy)

Effective Projected Area for One Antenna = $EPA_N := \frac{(L_{ant} + 2 \cdot Ir) \cdot (W_{ant} + 2 \cdot Ir)}{144} = 1.27$ $EPA_T := \frac{(L_{ant} + 2 \cdot Ir) \cdot (T_{ant} + 2 \cdot Ir)}{144} = 0.$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 1.27$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 0.72$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 0.72$

$EPA_{tot} := 2EPA_{A1} + 2EPA_{A2} + 2EPA_{A3} = 5.444$

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot EPA_{tot} = 35$ lbs

Wind Load (NESC Extreme)

Effective Projected Area for One Antenna = $EPA_N := \frac{L_{ant} \cdot W_{ant}}{144} = 1.09$ $EPA_T := \frac{L_{ant} \cdot T_{ant}}{144} = 0.41$

Antenna Projected Surface Area =

$EPA_{A1} := EPA_N \cdot \cos(\phi)^2 + EPA_T \cdot \sin(\phi)^2 = 1.09$

$EPA_{A2} := EPA_N \cdot \cos(120 \cdot deg - \phi)^2 + EPA_T \cdot \sin(120 \cdot deg - \phi)^2 = 0.58$

$EPA_{A3} := EPA_N \cdot \cos(240 \cdot deg - \phi)^2 + EPA_T \cdot \sin(240 \cdot deg - \phi)^2 = 0.58$

$EPA_{tot} := 2EPA_{A1} + 2EPA_{A2} + 2EPA_{A3} = 4.493$

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot EPA_{tot} \cdot m = 252$ lbs

Development of Wind & Ice Load on Mounts

Mount Data: (AT&T)

Mount Type:	SitePro ULP12-4120 x2	
Mount EPA (no ice) =	$EPA := 12.77 \cdot ft^2$	(User Input from SitePro Document)
Mount EPA (0.5" ice) =	$EPA_{ice} := 15.90 \cdot ft^2$	(User Input from SitePro Document)
Weight (no ice) =	$W := 882 \cdot lb$	(User Input from SitePro Document)
Weight (0.5" ice) =	$W_{ice} := 1030 \cdot lb$	(User Input from SitePro Document)
Total Pipe Length =	$TPL := 12 \cdot 10 \cdot ft = 120 ft$	
Total Antenna Length =	$TAL := 71.2 \cdot in \cdot 3 + 71.2 \cdot in \cdot 3 = 35.6 ft$	
Exposed Pipe Area =	$ExPA := (TPL - TAL) 2.375 \cdot in = 16.704 ft^2$	
Exposed Pipe Area (0.5" Ice) =	$ExPA_{ice} := (TPL - TAL) 3.375 \cdot in = 23.737 ft^2$	
Weight Antenna Pipes (no ice) =	$W_{pipes} := 3.66 plf \cdot 10 \cdot ft \cdot 12 = 439.2 lb$	
Weight Antenna Pipes (0.5" ice) =	$W_{pipes.ice} := 3.66 plf \cdot 10 \cdot ft \cdot 12 + \frac{\pi}{4}\left[(3.375 \cdot in)^2 - (2.375 \cdot in)^2\right] \cdot 10 \cdot ft \cdot 12 \cdot (Id \cdot pcf) = 650 lb$	
Mount Projected Surface Area =	$CdAa := 1.3 \cdot ExPA + EPA \cdot 2 = 47.3 ft^2$	
Mount Projected Surface Area w/ Ice =	$CdAa_{ice} := 1.3 \cdot ExPA_{ice} + EPA_{ice} \cdot 2 = 62.7 ft^2$	
Mount Weight =	$WT_{mnt} := W \cdot 2 + W_{pipes} = 2203 lb$	
Mount Weight w/ Ice =	$WT_{mnt.ice} := W_{ice} \cdot 2 + W_{pipes.ice} = 2710 lb$	

Gravity Load (without ice)		
Weight of Mount =	$WT_{mnt} = 2203 lb$	**BLC 2**
Gravity Load (ice only)		
Weight of Ice on Mount =	$WT_{mnt.ice} - WT_{mnt} = 507 lb$	**BLC 3**
Wind Load (NESC Heavy)		
Total Mount Wind Force w/ Ice =	$Fi_{mnt} := p \cdot psf \cdot CdAa_{ice} = 251 lb$	**BLC 4**
Wind Load (NESC Extreme)		
Total Mount Wind Force =	$F_{mnt} := qz \cdot psf \cdot CdAa \cdot m = 1655 lb$	**BLC 5**

Development of Wind & Ice Load on Coax Cables

Existing Coax Cable Data: (T-Mobile)

Coax Type =	HELIAX 1-5/8"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)
Coax Cable Length =	$L_{coax} := 34$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 24$		(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 4$		(User Input)

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 25$ plf **BLC 2**

Gravity Load (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot Ir\right)^2 - D_{coax}^2\right] = 3.9$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 36$ plf **BLC 3**

Wind Load (NESC Heavy)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{\left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right)}{12} = 0.7$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := p \cdot Cd_{coax} \cdot AICE_{coax} = 5$ plf **BLC 4**

Wind Load (NESC Extreme)

Coax projected surface area = $A_{coax} := \frac{\left(NP_{coax} D_{coax}\right)}{12} = 0.7$ sf/ft

Total Coax Wind Force (Above Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} \cdot m = 37$ plf **BLC 5**

Total Coax Wind Force (Below Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} = 30$ plf **BLC 5**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data: (AT&T)

Coax Type = HELIAX 1-1/4"

Shape = Round (User Input)

Coax Outside Diameter = $D_{coax} := 1.55$ in (User Input)

Coax Cable Length = $L_{coax} := 10$ ft (User Input)

Weight of Coax per foot = $Wt_{coax} := 0.66$ plf (User Input)

Total Number of Coax = $N_{coax} := 24$ (User Input)

No. of Coax Projecting Outside Face of PCS Mast = $NP_{coax} := 4$ (User Input)

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 16$ plf **BLC 2**

Gravity Load (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot Ir\right)^2 - D_{coax}^{\ 2}\right] = 3.2$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 30$ plf **BLC 3**

Wind Load (NESC Heavy)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{\left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right)}{12} = 0.6$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := p \cdot Cd_{coax} \cdot AICE_{coax} = 4$ plf **BLC 4**

Wind Load (NESC Extreme)

Coax projected surface area = $A_{coax} := \frac{\left(NP_{coax} D_{coax}\right)}{12} = 0.5$ sf/ft

Total Coax Wind Force (Above Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} \cdot m = 29$ plf **BLC 5**

Total Coax Wind Force (Below Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} = 23$ plf **BLC 5**

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Standard Solver

Hot Rolled Steel Code	AISC 9th: ASD
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI 1999: ASD
Wood Code	AF&PA NDS-91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Om Z	1
Om X	1
Rho Z	1
Rho X	1
Footing Overturning Safety Factor	1.5
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Gr. B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	PIPE_16.0X	Column	Pipe	A53 Gr. B	Typical	22	665	665	1330

Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp b...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	y sway	z sway	Function
1	M2	Mast	37												Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M2	BOT_C...	TOP_...			Mast	Column	Pipe	A53 Gr. B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	BOT_CONN	0	0	0	0	
2	TOP_CONN	0	10	0	0	
3	TOP_MAST	0	37	0	0	
4	CL_TMO	0	33	0	0	
5	CL_ATT	0	23	0	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	BOT_CONN	Reaction	Reaction	Reaction		Reaction	
2	TOP_CONN	Reaction		Reaction			

Member Point Loads

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
No Data to Print ...			

Joint Loads and Enforced Displacements (BLC 2 : Weight of Appurtenances)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CL_TMO	L	Y	-.45
2	CL_TMO	L	Y	-.09
3	CL_TMO	L	Y	-.012
4	CL_TMO	L	Y	-1.1
5	CL_ATT	L	Y	-.21
6	CL_ATT	L	Y	-.225
7	CL_ATT	L	Y	-.12
8	CL_ATT	L	Y	-.15
9	CL_ATT	L	Y	-2.203

Joint Loads and Enforced Displacements (BLC 3 : Weight of Ice Only on PCS Struct)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CL_TMO	L	Y	-.335

Joint Loads and Enforced Displacements (BLC 3 : Weight of Ice Only on PCS Struct) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
2	CL_TMO	L	Y	-.102
3	CL_TMO	L	Y	-.01
4	CL_TMO	L	Y	-.15
5	CL_ATT	L	Y	-.225
6	CL_ATT	L	Y	-.222
7	CL_ATT	L	Y	-.038
8	CL_ATT	L	Y	-.057
9	CL_ATT	L	Y	-.507

Joint Loads and Enforced Displacements (BLC 4 : NESC Heavy Wind on PCS Structure)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CL_TMO	L	X	.223
2	CL_TMO	L	X	.07
3	CL_TMO	L	X	.007
4	CL_TMO	L	X	.116
5	CL_ATT	L	X	.148
6	CL_ATT	L	X	.146
7	CL_ATT	L	X	.022
8	CL_ATT	L	X	.035
9	CL_ATT	L	X	.251

Joint Loads and Enforced Displacements (BLC 5 : NESC Extreme Wind on PCS Structu)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CL_TMO	L	X	1.819
2	CL_TMO	L	X	.534
3	CL_TMO	L	X	.037
4	CL_TMO	L	X	.779
5	CL_ATT	L	X	1.197
6	CL_ATT	L	X	1.18
7	CL_ATT	L	X	.15
8	CL_ATT	L	X	.252
9	CL_ATT	L	X	1.655

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	Y	-.025	-.025	0	34
2	M2	Y	-.016	-.016	13	23

Member Distributed Loads (BLC 3 : Weight of Ice Only on PCS Struct)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	Y	-.01	-.01	0	0
2	M2	Y	-.036	-.036	0	34
3	M2	Y	-.03	-.03	13	23

Member Distributed Loads (BLC 4 : NESC Heavy Wind on PCS Structure)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.009	.009	0	0
2	M2	X	.005	.005	0	34

Member Distributed Loads (BLC 4 : NESC Heavy Wind on PCS Structure) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
3	M2	X	.004	.004	13	23

Member Distributed Loads (BLC 5 : NESC Extreme Wind on PCS Structu)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M2	X	.06	.06	0	13
2	M2	X	.075	.075	13	0
3	M2	X	.03	.03	0	13
4	M2	X	.037	.037	13	34
5	M2	X	.029	.029	13	23

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight (Mast)	None		-1						
2	Weight of Appurtenances	None				9		2		
3	Weight of Ice Only on PCS Struct	None				9		3		
4	NESC Heavy Wind on PCS Structure	None				9		3		
5	NESC Extreme Wind on PCS Structu	None				9		5		

Load Combinations

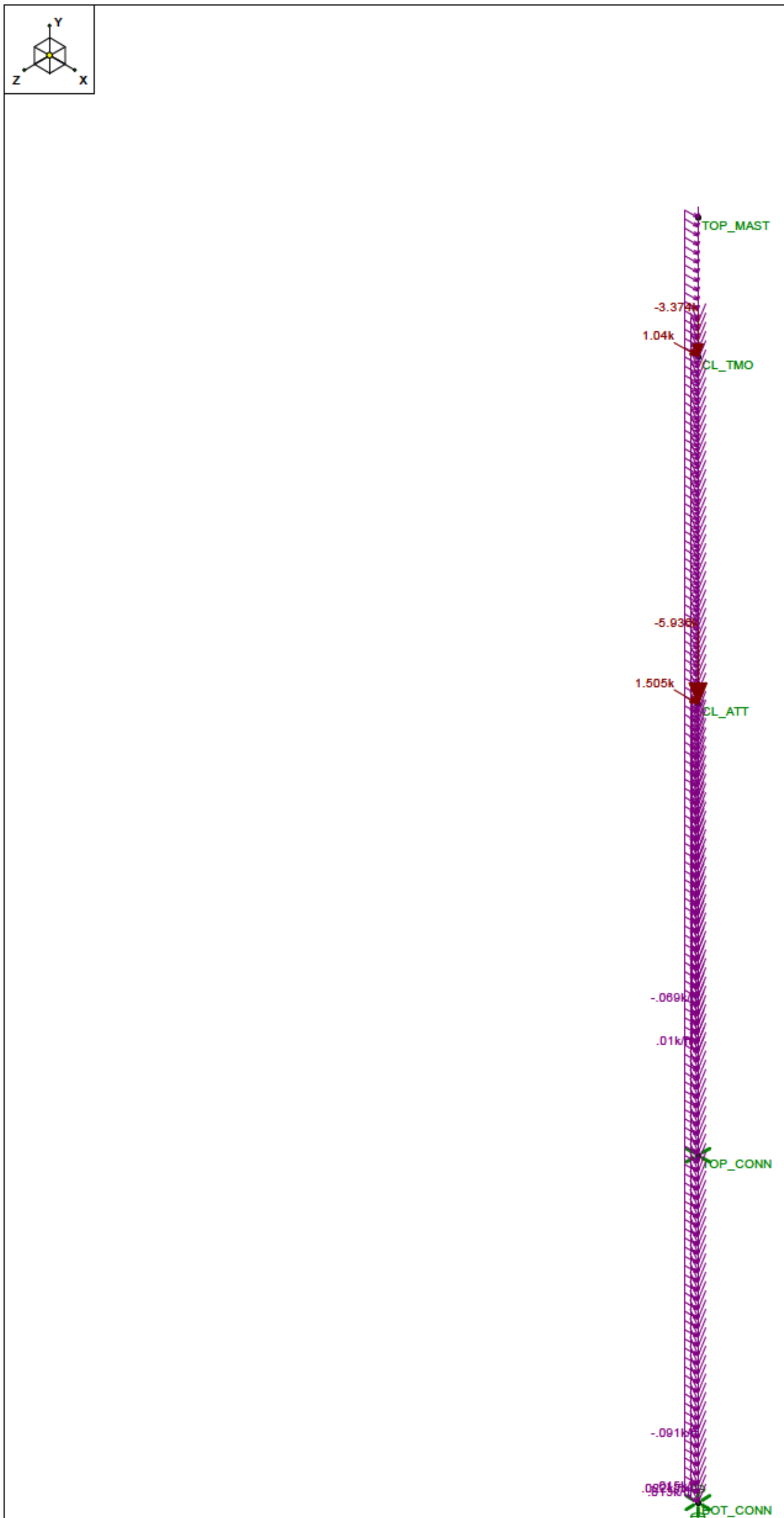
	Description	So..	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	NESC Heavy Wind on ...	Yes			1	1.5	2	1.5	3	1.5	4	2.5												
2	NESC Extreme Wind o...	Yes			1	1	2	1	5	1														
3	Self Weight				1	1																		

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	BOT_CONN	5.434	17.82	0	0	0	0
2	1	TOP_CONN	-9.336	0	0	0	0	0
3	1	Totals:	-3.903	17.82	0			
4	1	COG (ft):	X: 0	Y: 22.463	Z: 0			

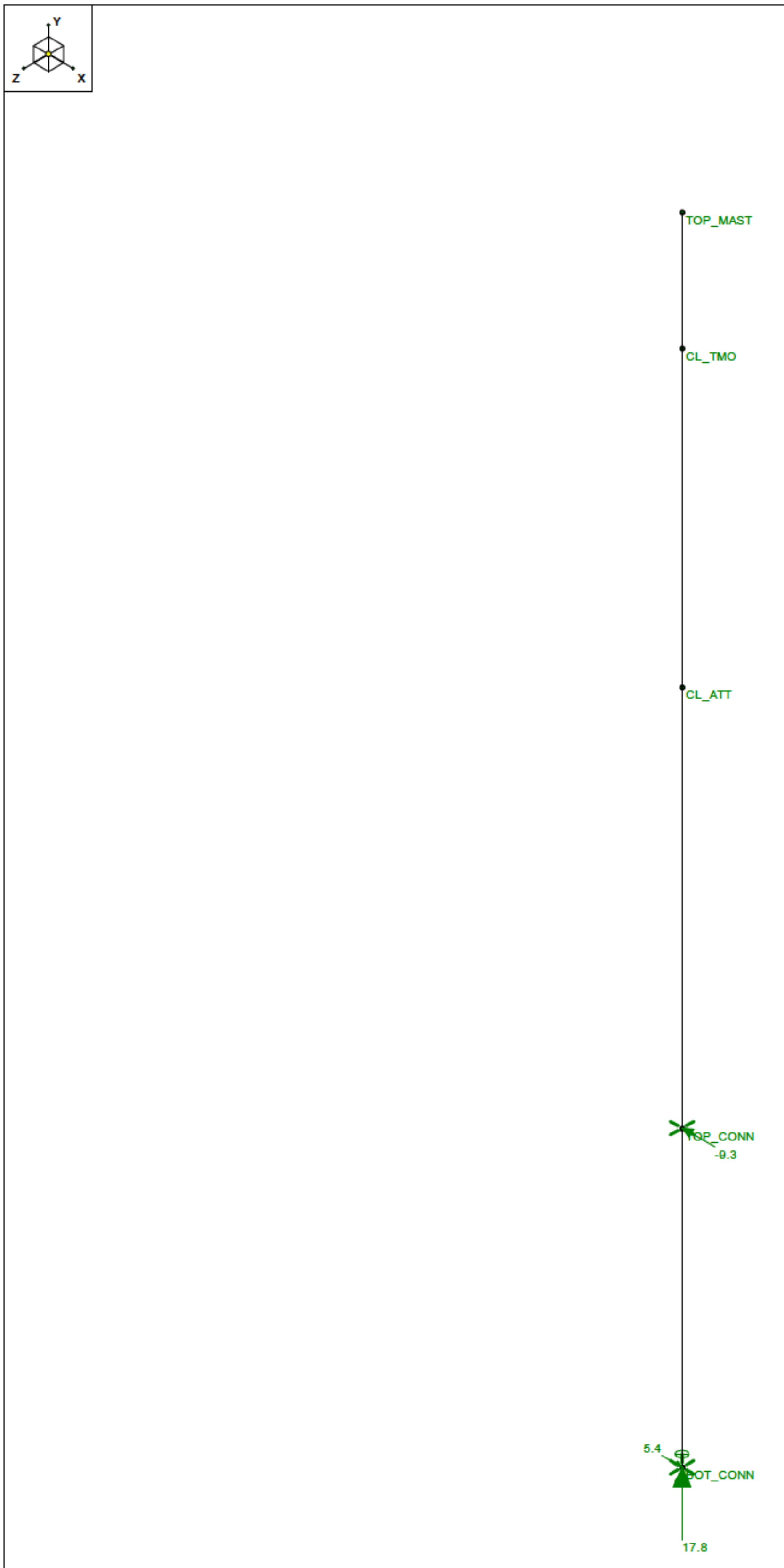
Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	BOT_CONN	16.624	8.34	0	0	0	0
2	2	TOP_CONN	-28.264	0	0	0	0	0
3	2	Totals:	-11.64	8.34	0			
4	2	COG (ft):	X: 0	Y: 22.779	Z: 0			



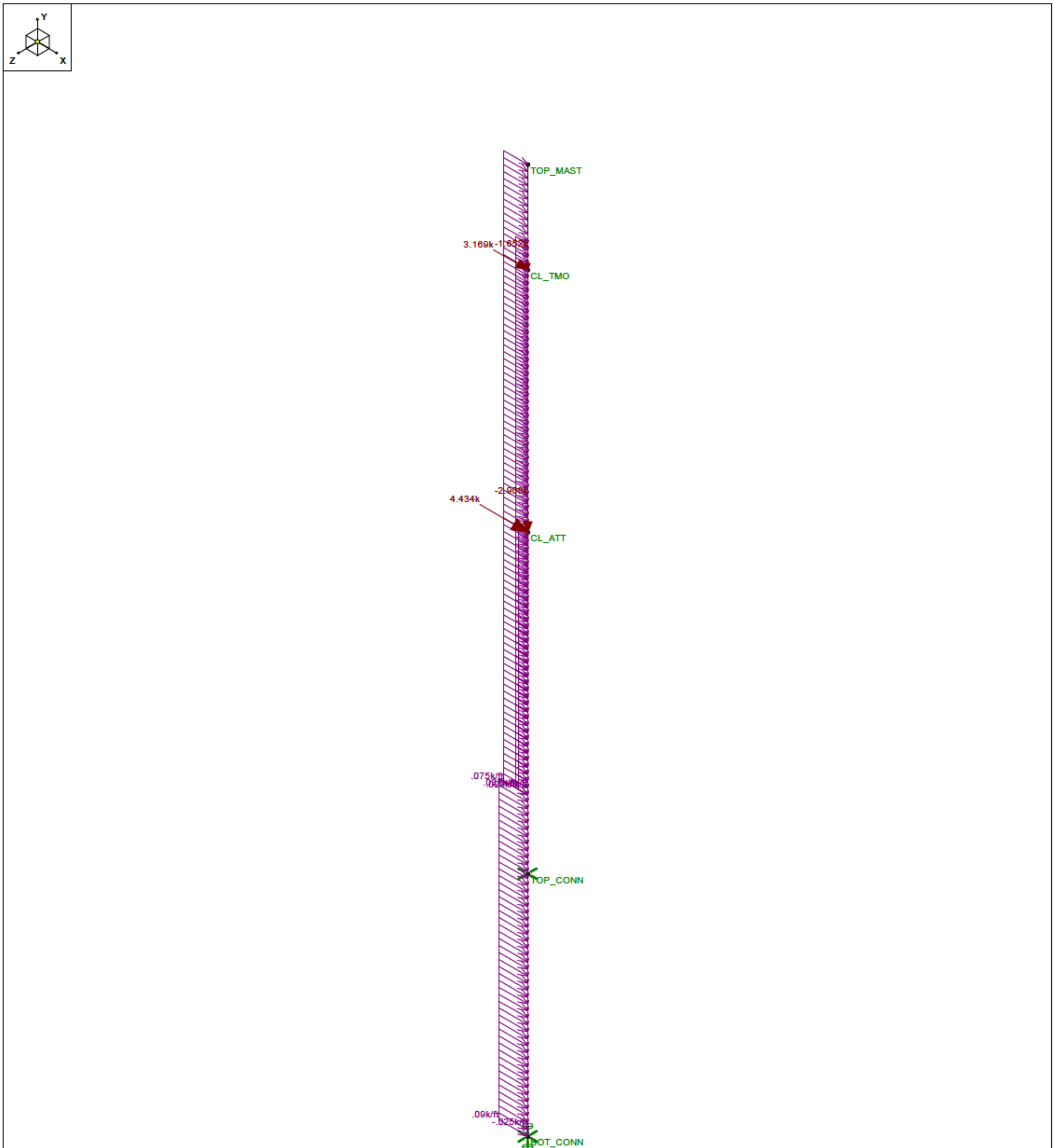
Loads: LC 1, NESC Heavy Wind on PCS Structure

CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 10:45 AM
22021.10 /AT&T CT2185	LC #1 Loads	NESC Loads.r3d



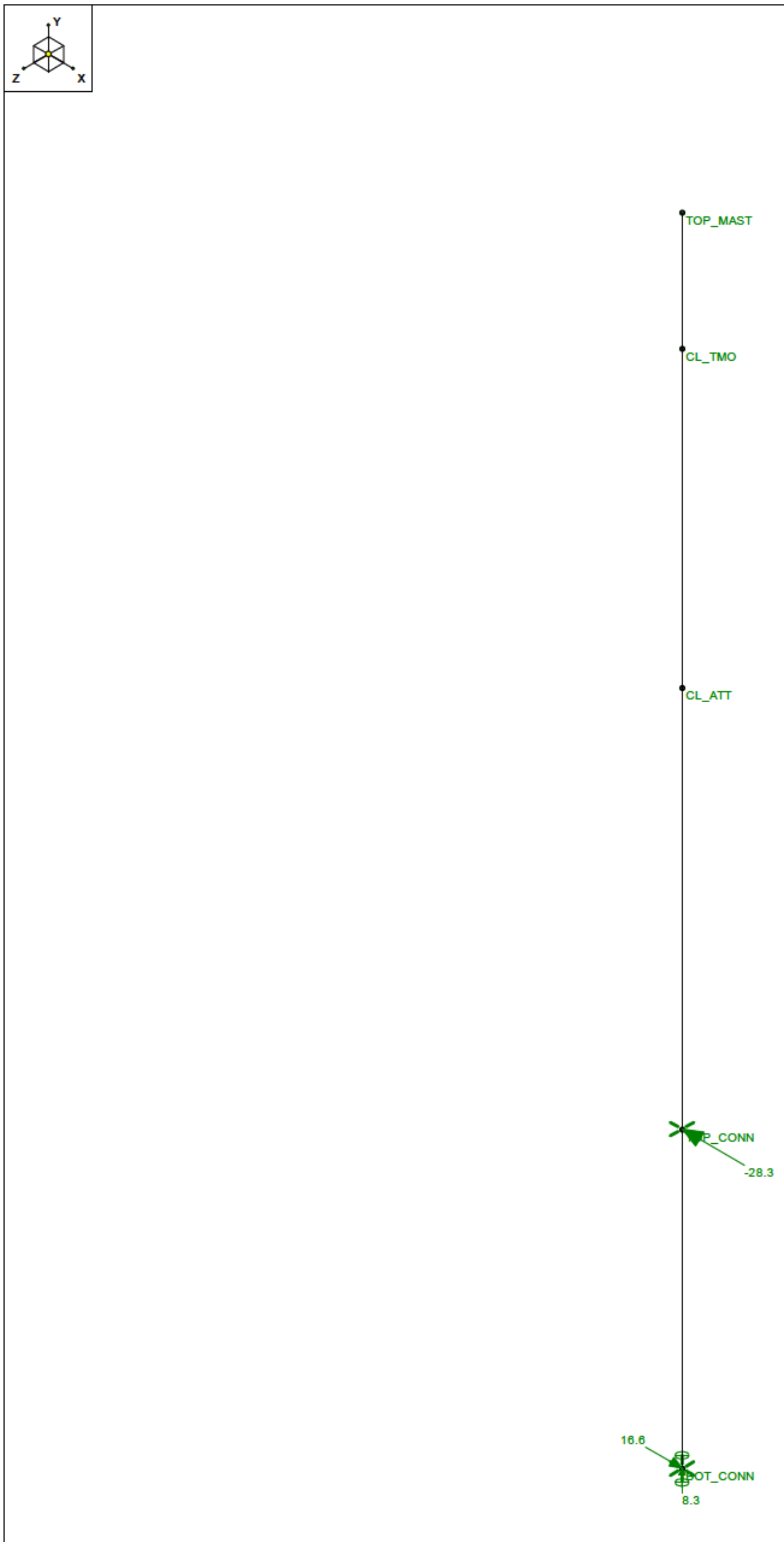
Results for LC 1, NESC Heavy Wind on PCS Structure
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.	Struct # 2683 - Mast	
tjl, cfc		Mar 3, 2023 at 10:47 AM
22021.10 /AT&T CT2185	LC #1 Reactions	NESC Loads.r3d



Loads: LC 2, NESC Extreme Wind on PCS Structure

CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 10:46 AM
22021.10 /AT&T CT2185	LC #2 Loads	NESC Loads.r3d



Results for LC 2, NESC Extreme Wind on PCS Structure
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Struct # 2683 - Mast	Mar 3, 2023 at 10:47 AM
22021.10 /AT&T CT2185	LC #2 Reactions	NESC Loads.r3d

Coax Cable on CL&P Pole (Below 75-ft AGL)

Coaxial Cable Span $Coax_{Span} := 10ft$ *(User Input)*

Heavy Wind Pressure = $p := 4 \cdot psf$ (User Input NESC 2023 Figure 250-1 & Table 250-1)

Radial Ice Thickness = $Ir := 0.5 \cdot in$ (User Input NESC 2023 Figure 250-1 & Table 250-1)

Radial Ice Density = $Id := 56 \cdot pcf$ (User Input)

Basic Windspeed = $V := 100$ mph (User Input)

Height to Top of Coax Above Grade = $TC := 90$ ft (User Input)

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

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.138$ (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 = $z_s := 0.67 \cdot TC = 60.3$ (NESC 2023 Table 250-3)

Turbulence Intensity = $I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.181$ (NESC 2023 Table 250-3)

Response Term = $B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.931$ (NESC 2023 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.845$ (NESC 2023 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf = 24.6$ psf (NESC 2023 Section 250.C.1)

Diameter of Coax Cable = $D_{coax1} := 1.98 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax1} := 1.04 \cdot plf$ *(User Input)*

Number of Coax Cables = $N_{coax1} := 48$ *(User Input)* 24 AT&T Cables and 24 T-Mobile Cables

Number of Projected Coax Cables = $NP_{coax1} := 4$ *(User Input)*

Shape Factor =	$Cd_{coax} := 1.6$	*(User Input)*
Overload Factor for NESC Heavy Wind Load =	$OF_{HW} := 2.5$	*(User Input)*
Overload Factor for NESC Extreme Wind Load =	$OF_{EW} := 1.0$	*(User Input)*
Overload Factor for NESC Heavy Vertical Load =	$OF_{HV} := 1.5$	*(User Input)*
Overload Factor for NESC Extreme Vertical Load =	$OF_{EV} := 1.0$	*(User Input)*

Projected Width with Ice = $A_{ice} := \left(NP_{coax1} \cdot D_{coax1} + 2 \cdot Ir\right) = 8.92 \cdot in$

Projected Width without Ice = $A := \left(NP_{coax1} \cdot D_{coax1}\right) = 7.92 \cdot in$

Ice Area per Liner Ft = $Ai_{coax1} := \frac{\pi}{4} \cdot \left[\left(D_{coax1} + 2 \cdot Ir\right)^2 - D_{coax1}{}^2\right] = 0.027 ft^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax1} \cdot Id \cdot N_{coax1} = 73 \cdot plf$

Heavy Vertical Load =

$$Heavy_{Vert} := \overrightarrow{\left[\left(N_{coax1} \cdot W_{coax1} + W_{ice}\right) \cdot Coax_{Span} \cdot OF_{HV}\right]}$$

Heavy Transverse Load =

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

$Heavy_{Vert} = 1840 lb$ $Heavy_{Trans} = 119 lb$

Extreme Vertical Load =

$$Extreme_{Vert} := \overrightarrow{\left[\left(N_{coax1} \cdot W_{coax1}\right) \cdot Coax_{Span} \cdot OF_{EV}\right]}$$

Extreme Transverse Load =

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

$Extreme_{Vert} = 499 lb$ $Extreme_{Trans} = 260 lb$

Coax Cable on CL&P Pole (Above 75-ft AGL)

Coaxial Cable Span	$Coax_{Span} := 10ft$	(User Input)	
Heavy Wind Pressure =	$p := 4 \cdot psf$	(User Input NESC 2023 Figure 250-1 & Table 250-1)	
Radial Ice Thickness =	$Ir := 0.5 \cdot in$	(User Input NESC 2023 Figure 250-1 & Table 250-1)	
Radial Ice Density =	$Id := 56 \cdot pcf$	(User Input)	
Basic Windspeed =	$V := 100$ mph	(User Input)	
Height to Top of Coax Above Grade =	$TC := 90$ ft	(User Input)	
Multiplier Gust Response Factor =	$m := 1.25$	(User Input - Only for NESC Extreme wind case)	
Velocity Pressure Coefficient =	$Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.138$		(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 =	$z_s := 0.67 \cdot TC = 60.3$		(NESC 2023 Table 250-3)
Turbulence Intensity =	$I_z := C_{exp} \cdot \left(\frac{33}{z_s}\right)^{\frac{1}{6}} = 0.181$		(NESC 2023 Table 250-3)
Response Term =	$B_t := \left[\frac{1}{\left[1 + \left(0.56 \cdot \frac{z_s}{L_s}\right)\right]}\right]^{0.5} = 0.931$		(NESC 2023 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(4.61 \cdot I_z \cdot B_t\right)\right]}{\left(1 + 6.1 \cdot I_z\right)} = 0.845$		(NESC 2023 Table 250-3)
Wind Pressure =	$qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf = 24.6$ psf		(NESC 2023 Section 250.C.1)

Diameter of Coax Cable =	$D_{coax1} := 1.55 \cdot in$	(User Input)	
Weight of Coax Cable =	$W_{coax1} := 0.66 \cdot plf$	(User Input)	
Number of Coax Cables =	$N_{coax1} := 24$	(User Input)	24 AT&T Cables
Number of Projected Coax Cables =	$NP_{coax1} := 2$	(User Input)	T-Mobile Cables on Mast

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

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

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

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

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

Projected Width with Ice = $A_{ice} := \left(NP_{coax1} \cdot D_{coax1} + 2 \cdot Ir\right) = 4.1 \cdot in$

Projected Width without Ice = $A := \left(NP_{coax1} \cdot D_{coax1}\right) = 3.1 \cdot in$

Ice Area per Liner Ft = $Ai_{coax1} := \frac{\pi}{4} \cdot \left[\left(D_{coax1} + 2 \cdot Ir\right)^2 - D_{coax1}{}^2\right] = 0.022 ft^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax1} \cdot Id \cdot N_{coax1} = 30 \cdot plf$

Heavy Vertical Load =

$$Heavy_{Vert} := \overrightarrow{\left[\left(N_{coax1} \cdot W_{coax1} + W_{ice}\right) \cdot Coax_{Span} \cdot OF_{HV}\right]}$$

Heavy Transverse Load =

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

$Heavy_{Vert} = 688 lb$ $Heavy_{Trans} = 55 lb$

Extreme Vertical Load =

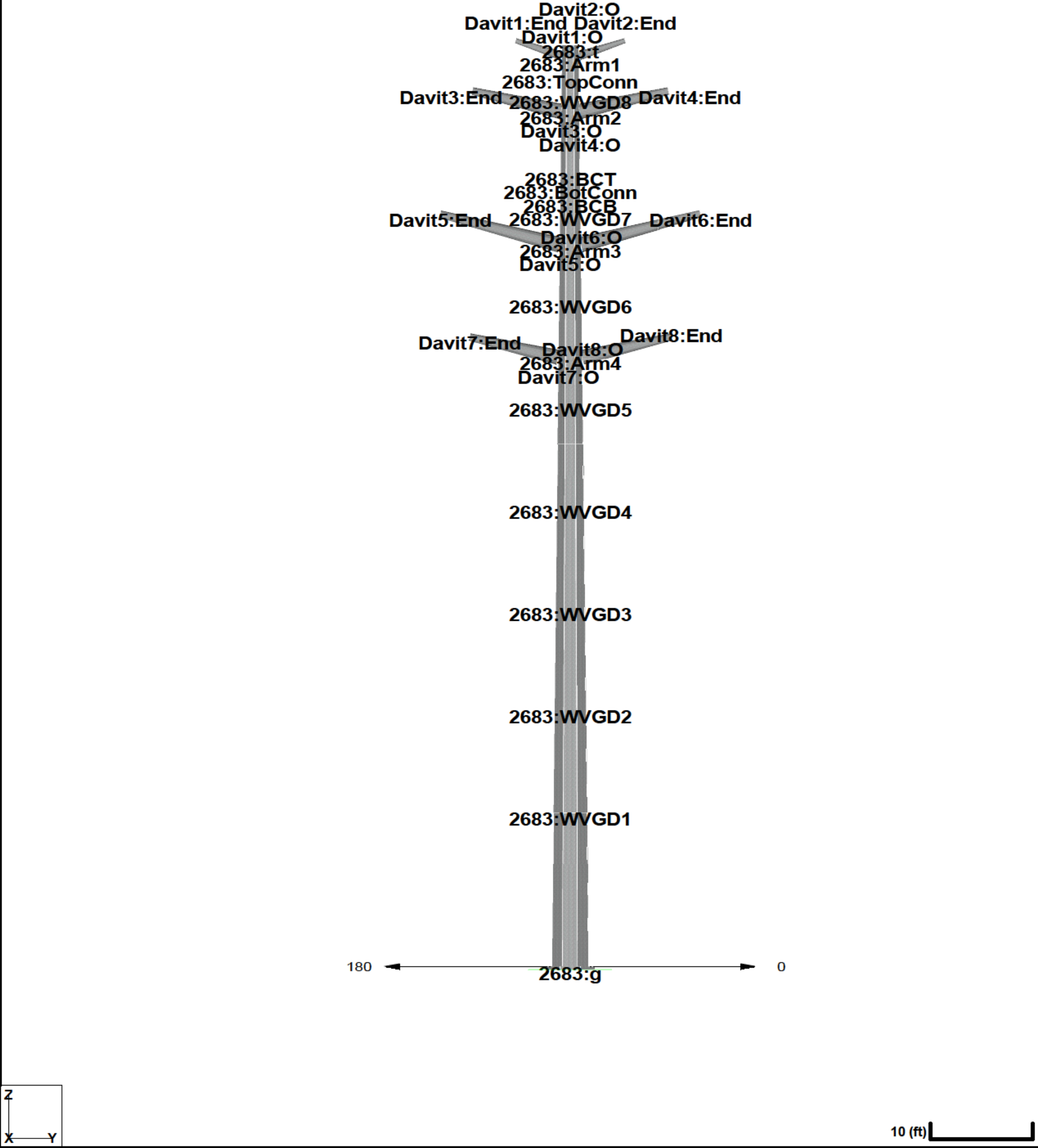
$$Extreme_{Vert} := \overrightarrow{\left[\left(N_{coax1} \cdot W_{coax1}\right) \cdot Coax_{Span} \cdot OF_{EV}\right]}$$

Extreme Transverse Load =

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

$Extreme_{Vert} = 158 lb$ $Extreme_{Trans} = 102 lb$

Centek Engineering Inc, Project: "cl&p structure # 2683"
PLS-POLE Version 16.81, 4:34:25 PM Thursday, January 19, 2023
Undeformed geometry displayed



Project Name : 17159.18 - Brookfield, CT
Project Notes: Struct # 2683/ Sprint - CT54XC713
Project File : J:\Jobs\2202100.WI\10_CT2185\05_Structural\Tower Analysis\Backup Documentation\Rev (1)\Calcs\PLS Pole\cl&p structure # 2683.pol
Date run : 10:41:54 AM Friday, March 03, 2023
by : PLS-POLE Version 17.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: J:\Jobs\2202100.WI\10_CT2185\05_Structural\Tower Analysis\Backup Documentation\Rev (1)\Calcs\PLS Pole\cl&p #2683.lca

*** Analysis Results:

Maximum element usage is 91.46% for Base Plate "2683" in load case "NESC Extreme Long"
Maximum insulator usage is 41.77% for Clamp "Clamp20" in load case "NESC Heavy"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Resultant Force (kips)	Bending Moment (ft-k)	Foundation Usage %
NESC Heavy	2683:g	68.31	24.98	72.73	2024.13	0.00
NESC Extreme	2683:g	33.73	30.70	45.61	2450.59	0.00
NESC Extreme Long	2683:g	33.76	22.49	40.57	1786.14	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
NESC Heavy	2683:g	-0.60	-24.97	-68.31	24.98	2023.54	-48.93	2024.13	-3.33	0.00
NESC Extreme	2683:g	-0.39	-30.70	-33.73	30.70	2450.40	-30.56	2450.59	-1.83	0.00
NESC Extreme Long	2683:g	-22.49	-0.03	-33.76	22.49	11.00	-1786.11	1786.14	-1.27	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 Heavy	2683:t	0.94	41.62	-1.11	41.64	0.09	-4.04	0.02
NESC Extreme	2683:t	0.58	52.09	-1.72	52.13	0.05	-5.26	0.01
NESC Extreme Long	2683:t	38.94	0.39	-0.98	38.96	4.03	-0.05	0.01

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
2683	1	3397	NESC Extreme	74.39	870.38

2683	2	5750	NESC Extreme	80.13	1842.40
2683	3	3427	NESC Extreme	90.63	2450.60

*** 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)
2683	90.63	NESC Extreme	2.5	29	13920.9

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
Davit1	1.72	NESC Heavy	89.7	1	77.9
Davit2	11.27	NESC Heavy	89.7	1	77.9
Davit3	3.08	NESC Heavy	84.0	1	321.0
Davit4	6.70	NESC Heavy	84.0	1	321.0
Davit5	4.15	NESC Heavy	71.1	1	434.7
Davit6	9.38	NESC Heavy	71.1	1	434.7
Davit7	3.20	NESC Heavy	60.0	1	321.0
Davit8	6.76	NESC Heavy	60.0	1	321.0

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	82.11	2683	Steel Pole
NESC Extreme	90.63	2683	Steel Pole
NESC Extreme Long	91.46	2683	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Height AGL (ft)	Segment Number
NESC Heavy	82.11	2683	2.5	29
NESC Extreme	90.63	2683	2.5	29
NESC Extreme Long	66.19	2683	2.5	29

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 Heavy	2683	10	19.000	66.961	2023.539	-48.925	29.668	70.462	3	96.923	2.203	53.94
NESC Extreme	2683	10	19.000	32.385	2450.404	-30.559	33.839	80.369	3	110.732	2.353	61.53
NESC Extreme Long	2683	10	19.000	32.416	11.006	-1786.108	50.301	119.466	3	225.660	2.869	91.46

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Height AGL (ft)	Segment Number
NESC Heavy	11.27	Davit2	89.7	1
NESC Extreme	5.10	Davit2	89.7	1
NESC Extreme Long	3.74	Davit6	71.1	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	2.41	NESC Heavy	0.0
Clamp2	Clamp	3.19	NESC Heavy	0.0
Clamp3	Clamp	3.37	NESC Heavy	0.0
Clamp4	Clamp	3.57	NESC Heavy	0.0
Clamp5	Clamp	3.37	NESC Heavy	0.0
Clamp6	Clamp	3.57	NESC Heavy	0.0
Clamp7	Clamp	3.37	NESC Heavy	0.0
Clamp8	Clamp	3.57	NESC Heavy	0.0
Clamp9	Clamp	2.30	NESC Heavy	0.0
Clamp10	Clamp	2.30	NESC Heavy	0.0
Clamp11	Clamp	2.30	NESC Heavy	0.0
Clamp12	Clamp	2.30	NESC Heavy	0.0
Clamp13	Clamp	2.30	NESC Heavy	0.0
Clamp14	Clamp	2.30	NESC Heavy	0.0
Clamp15	Clamp	2.30	NESC Heavy	0.0
Clamp17	Clamp	35.33	NESC Extreme	0.0
Clamp18	Clamp	23.29	NESC Heavy	0.0
Clamp19	Clamp	0.86	NESC Heavy	0.0
Clamp20	Clamp	41.77	NESC Heavy	0.0
Clamp21	Clamp	41.77	NESC Heavy	0.0

*** Weight of structure (lbs):

Weight of Tubular Davit Arms:	2309.3
Weight of Steel Poles:	13920.9
Total:	16230.2

*** End of Report

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*****************************************************************************
*                                                                           *
*                                 PLS-POLE                                  *
*                     POLE AND FRAME ANALYSIS AND DESIGN                    *
*                Copyright Power Line Systems 1999-2022                     *
*                                                                           *
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Project Name : 17159.18 - Brookfield, CT
Project Notes: Struct # 2683/ Sprint - CT54XC713
Project File : J:\Jobs\2202100.WI\10_CT2185\05_Structural\Tower Analysis\Backup Documentation\Rev (1)\Calcs\PLS Pole\cl&p structure # 2683.pol
Date run : 10:41:53 AM Friday, March 03, 2023
by : PLS-POLE Version 17.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

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 48-05

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

Steel Pole Properties:

Steel Pole Stock Length Default Base Shape Tip Base Taper Default Tubes Modulus of Weight Shape Strength Distance Ultimate
Ultimate Texture
Property Number Embedded Plate Diameter Diameter Drag Elasticity Density At Check From Trans.

Label		(ft)	Length (ft)			(in)	(in)	(in/ft)	Coef.		Override (ksi)	Override (lbs/ft^3)	Base	Type	Tip (ft)	Load (kips)	Long. Load (kips)	
CL&P2683	2683	90.00	0	Yes	8F	19.63	43.21	0	1.6	3 tubes	0	0		Calculated	0.000	0.0000	0.0000	Galvanized Steel

Steel Tubes Properties:

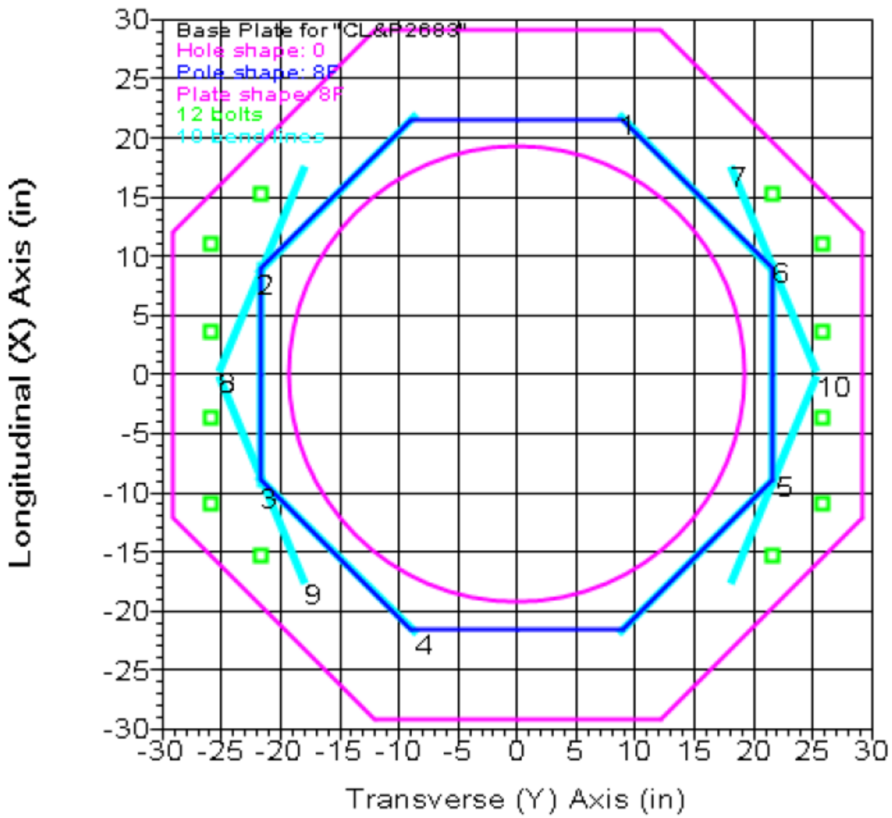
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Gap or Butt Offset (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Diam. Lap Length (ft)	Actual Overlap (ft)
CL&P2683	1	39	0.3125	4.167	0.000	0.000	65.000	0.000	3397	20.92	0.27728	19.63	30.44	3.727	4.167
CL&P2683	2	40.1667	0.375	5.250	0.000	0.000	65.000	0.000	5750	21.18	0.27728	28.66	39.80	4.881	5.250
CL&P2683	3	20.25	0.375	0.000	0.000	0.000	65.000	0.000	3427	10.36	0.27728	37.59	43.20	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)
CL&P2683	58.250	8F	3.000	1347	19.000	38.750	0	490.00	55.000	2.250	51.750	12	28733.01	5839.56

Base Plate Bolt Coordinates for Property "CL&P2683":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0.5894	0.8357	0
0.4251	1	0
0.1425	1	0



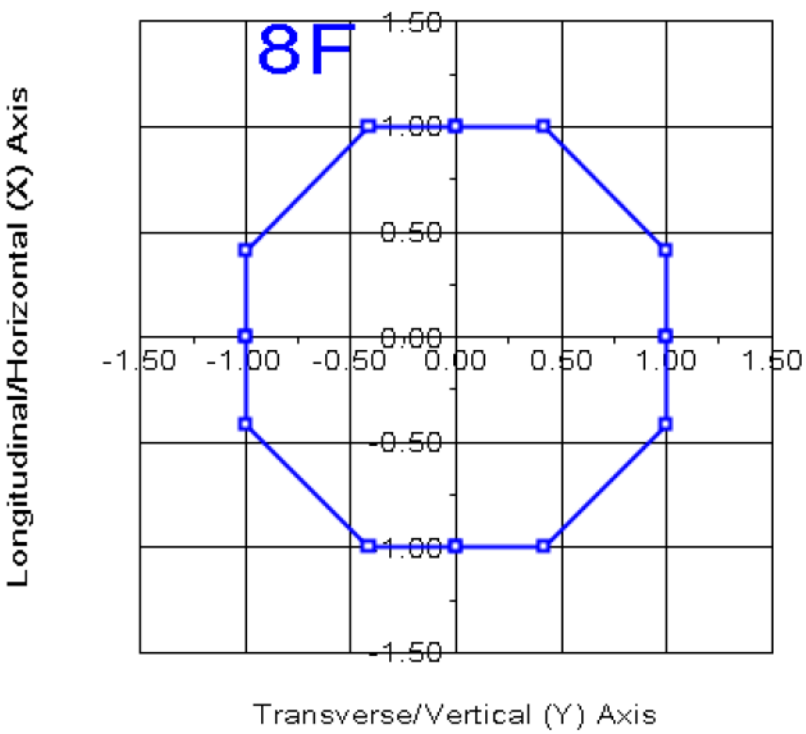
Steel Pole Connectivity:

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)
2683			0	0	0	0	0	CL&P2683	16 labels	Fixed	0.00	0

Relative Attachment Labels for Steel Pole "2683":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
2683:WVGD1	0.00	15.00
2683:WVGD2	0.00	25.00
2683:WVGD3	0.00	35.00
2683:WVGD4	0.00	45.00
2683:WVGD5	0.00	55.00

2683:WVGD6	0.00	65.00
2683:WVGD7	0.00	75.00
2683:TopConn	0.00	87.00
2683:BotConn	0.00	77.00
2683:WVGD8	0.00	85.00
2683:Arm1	0.00	88.92
2683:Arm2	0.00	83.50
2683:Arm3	0.00	70.50
2683:Arm4	0.00	59.50
2683:BCT	0.00	77.50
2683:BCB	0.00	76.50



Pole Steel Properties:

Warning: Capacities and usages printed in splices are listed for the inner tube except at the splice top which uses the outer tube. ??

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)
2683	2683:t	2683:t Ori	0.00	19.63	20.00	985.95	985.95	0.00	21.9	65.00	65.00	544.26	544.26
2683	2683:Arm1	2683:Arm1 End	1.08	19.92	20.31	1032.52	1032.52	0.00	22.3	65.00	65.00	561.40	561.40
2683	2683:Arm1	2683:Arm1 Ori	1.08	19.92	20.31	1032.52	1032.52	0.00	22.3	65.00	65.00	561.40	561.40
2683	2683:TopConn	2683:TopConn End	3.00	20.46	20.86	1118.89	1118.89	0.00	23.0	65.00	65.00	592.53	592.53

2683	2683:TopConn	2683:TopConn	Ori	3.00	20.46	20.86	1118.89	1118.89	0.00	23.0	65.00	65.00	592.53	592.53
2683	2683:WVGD8	2683:WVGD8	End	5.00	21.01	21.43	1213.85	1213.85	0.00	23.7	65.00	65.00	625.85	625.85
2683	2683:WVGD8	2683:WVGD8	Ori	5.00	21.01	21.43	1213.85	1213.85	0.00	23.7	65.00	65.00	625.85	625.85
2683	2683:Arm2	2683:Arm2	End	6.50	21.43	21.87	1288.49	1288.49	0.00	24.3	65.00	65.00	651.44	651.44
2683	2683:Arm2	2683:Arm2	Ori	6.50	21.43	21.87	1288.49	1288.49	0.00	24.3	65.00	65.00	651.44	651.44
2683	#2683:0	Tube 1	End	9.50	22.26	22.73	1446.83	1446.83	0.00	25.4	65.00	65.00	704.16	704.16
2683	#2683:0	Tube 1	Ori	9.50	22.26	22.73	1446.83	1446.83	0.00	25.4	65.00	65.00	704.16	704.16
2683	2683:BCT	2683:BCT	End	12.50	23.09	23.59	1617.64	1617.64	0.00	26.5	65.00	65.00	758.93	758.93
2683	2683:BCT	2683:BCT	Ori	12.50	23.09	23.59	1617.64	1617.64	0.00	26.5	65.00	65.00	758.93	758.93
2683	2683:BotConn	2683:BotConn	End	13.00	23.23	23.73	1647.35	1647.35	0.00	26.6	65.00	65.00	768.26	768.26
2683	2683:BotConn	2683:BotConn	Ori	13.00	23.23	23.73	1647.35	1647.35	0.00	26.6	65.00	65.00	768.26	768.26
2683	2683:BCB	2683:BCB	End	13.50	23.37	23.87	1677.43	1677.43	0.00	26.8	65.00	65.00	777.64	777.64
2683	2683:BCB	2683:BCB	Ori	13.50	23.37	23.87	1677.43	1677.43	0.00	26.8	65.00	65.00	777.64	777.64
2683	2683:WVGD7	2683:WVGD7	End	15.00	23.78	24.31	1769.84	1769.84	0.00	27.4	65.00	65.00	806.14	806.14
2683	2683:WVGD7	2683:WVGD7	Ori	15.00	23.78	24.31	1769.84	1769.84	0.00	27.4	65.00	65.00	806.14	806.14
2683	2683:Arm3	2683:Arm3	End	19.50	25.03	25.60	2067.33	2067.33	0.00	29.0	65.00	65.00	894.70	894.70
2683	2683:Arm3	2683:Arm3	Ori	19.50	25.03	25.60	2067.33	2067.33	0.00	29.0	65.00	65.00	894.70	894.70
2683	#2683:1	Tube 1	End	22.25	25.79	26.39	2264.58	2264.58	0.00	30.0	65.00	65.00	951.09	951.09
2683	#2683:1	Tube 1	Ori	22.25	25.79	26.39	2264.58	2264.58	0.00	30.0	65.00	65.00	951.09	951.09
2683	2683:WVGD6	2683:WVGD6	End	25.00	26.56	27.18	2474.00	2474.00	0.00	31.1	65.00	65.00	1009.21	1009.21
2683	2683:WVGD6	2683:WVGD6	Ori	25.00	26.56	27.18	2474.00	2474.00	0.00	31.1	65.00	65.00	1009.21	1009.21
2683	#2683:2	Tube 1	End	27.75	27.32	27.97	2695.95	2695.95	0.00	32.1	65.00	65.00	1069.06	1069.06
2683	#2683:2	Tube 1	Ori	27.75	27.32	27.97	2695.95	2695.95	0.00	32.1	65.00	65.00	1069.06	1069.06
2683	2683:Arm4	2683:Arm4	End	30.50	28.08	28.76	2930.78	2930.78	0.00	33.1	65.00	64.24	1117.35	1117.35
2683	2683:Arm4	2683:Arm4	Ori	30.50	28.08	28.76	2930.78	2930.78	0.00	33.1	65.00	64.24	1117.35	1117.35
2683	#2683:3	SpliceT	End	34.83	29.28	30.00	3327.87	3327.87	0.00	34.7	65.00	62.89	1191.09	1191.09
2683	#2683:3	SpliceT	Ori	34.83	29.28	30.00	3327.87	3327.87	0.00	34.7	65.00	62.89	1191.10	1191.10
2683	2683:WVGD5	2683:WVGD5	End	35.00	28.70	35.20	3734.31	3734.31	0.00	27.6	65.00	65.00	1409.35	1409.35
2683	2683:WVGD5	2683:WVGD5	Ori	35.00	28.70	35.20	3734.31	3734.31	0.00	27.6	65.00	65.00	1409.35	1409.35
2683	#2683:4	SpliceB	End	39.00	29.81	36.58	4190.24	4190.24	0.00	28.8	65.00	65.00	1522.59	1522.59
2683	#2683:4	SpliceB	Ori	39.00	29.81	36.58	4190.24	4190.24	0.00	28.8	65.00	65.00	1522.59	1522.59
2683	#2683:5	Tube 2	End	42.00	30.65	37.62	4555.54	4555.54	0.00	29.7	65.00	65.00	1610.39	1610.39
2683	#2683:5	Tube 2	Ori	42.00	30.65	37.62	4555.54	4555.54	0.00	29.7	65.00	65.00	1610.39	1610.39
2683	2683:WVGD4	2683:WVGD4	End	45.00	31.48	38.65	4941.47	4941.47	0.00	30.6	65.00	65.00	1700.66	1700.66
2683	2683:WVGD4	2683:WVGD4	Ori	45.00	31.48	38.65	4941.47	4941.47	0.00	30.6	65.00	65.00	1700.66	1700.66
2683	#2683:6	Tube 2	End	50.00	32.86	40.37	5632.09	5632.09	0.00	32.2	65.00	65.00	1856.57	1856.57
2683	#2683:6	Tube 2	Ori	50.00	32.86	40.37	5632.09	5632.09	0.00	32.2	65.00	65.00	1856.57	1856.57
2683	2683:WVGD3	2683:WVGD3	End	55.00	34.25	42.09	6384.24	6384.24	0.00	33.7	65.00	63.72	1979.56	1979.56
2683	2683:WVGD3	2683:WVGD3	Ori	55.00	34.25	42.09	6384.24	6384.24	0.00	33.7	65.00	63.72	1979.56	1979.56
2683	#2683:7	Tube 2	End	60.00	35.64	43.82	7200.54	7200.54	0.00	35.2	65.00	62.42	2102.06	2102.06
2683	#2683:7	Tube 2	Ori	60.00	35.64	43.82	7200.54	7200.54	0.00	35.2	65.00	62.42	2102.06	2102.06
2683	2683:WVGD2	2683:WVGD2	End	65.00	37.02	45.54	8083.61	8083.61	0.00	36.8	65.00	61.12	2224.22	2224.22
2683	2683:WVGD2	2683:WVGD2	Ori	65.00	37.02	45.54	8083.61	8083.61	0.00	36.8	65.00	61.12	2224.22	2224.22
2683	#2683:8	SpliceT	End	69.75	38.34	47.18	8986.78	8986.78	0.00	38.2	65.00	59.89	2339.57	2339.57
2683	#2683:8	SpliceT	Ori	69.75	38.34	47.18	8986.78	8986.78	0.00	38.2	65.00	59.89	2339.57	2339.57
2683	#2683:9	Splice	End	72.38	38.32	47.15	8971.06	8971.06	0.00	38.2	65.00	59.91	2337.64	2337.64
2683	#2683:9	Splice	Ori	72.38	38.32	47.15	8971.06	8971.06	0.00	38.2	65.00	59.91	2337.64	2337.64
2683	2683:WVGD1	2683:WVGD1	End	75.00	39.05	48.05	9497.27	9497.27	0.00	39.0	65.00	59.23	2400.97	2400.97
2683	2683:WVGD1	2683:WVGD1	Ori	75.00	39.05	48.05	9497.27	9497.27	0.00	39.0	65.00	59.23	2400.97	2400.97
2683	#2683:10	Tube 3	End	80.00	40.43	49.78	10555.72	10555.72	0.00	40.5	65.00	57.93	2520.52	2520.52
2683	#2683:10	Tube 3	Ori	80.00	40.43	49.78	10555.72	10555.72	0.00	40.5	65.00	57.93	2520.52	2520.52
2683	#2683:11	Tube 3	End	85.00	41.82	51.50	11690.03	11690.03	0.00	42.0	65.00	56.63	2638.31	2638.31
2683	#2683:11	Tube 3	Ori	85.00	41.82	51.50	11690.03	11690.03	0.00	42.0	65.00	56.63	2638.31	2638.31
2683	2683:g	2683:g	End	90.00	43.20	53.22	12902.82	12902.82	0.00	43.6	65.00	55.27	2751.00	2751.00

Tubular Davit Properties:

Davit	Stock	Steel	Thickness	Base	Tip	Taper	Drag	Modulus	Geometry	Strength	Vertical	Tension	Compres.	Long.	Yield	Weight

Steel Texture
Property Number Shape Diameter Diameter Coef. of Check Capacity Capacity Capacity Capacity Stress Density
Shape
Label or Depth or Depth Elasticity Type Override
At End

Label	Shape	(in)	Diameter or Depth (in)	Diameter or Depth (in)	(in/ft)	Coef.	of Elasticity (ksi)		Check Type	Capacity (lbs)	Capacity (lbs)	Capacity (lbs)	Capacity (lbs)	Stress Override (ksi)	Density (lbs/ft^3)
ARM A	0	0.1875	10.76	6	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0
ARM B	0	0.25	18.5	9	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0
ARM C	0	0.25	18.5	9	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0

Intermediate Joints for Davit Property "ARM A":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	4.5	-1.5

Intermediate Joints for Davit Property "ARM B":

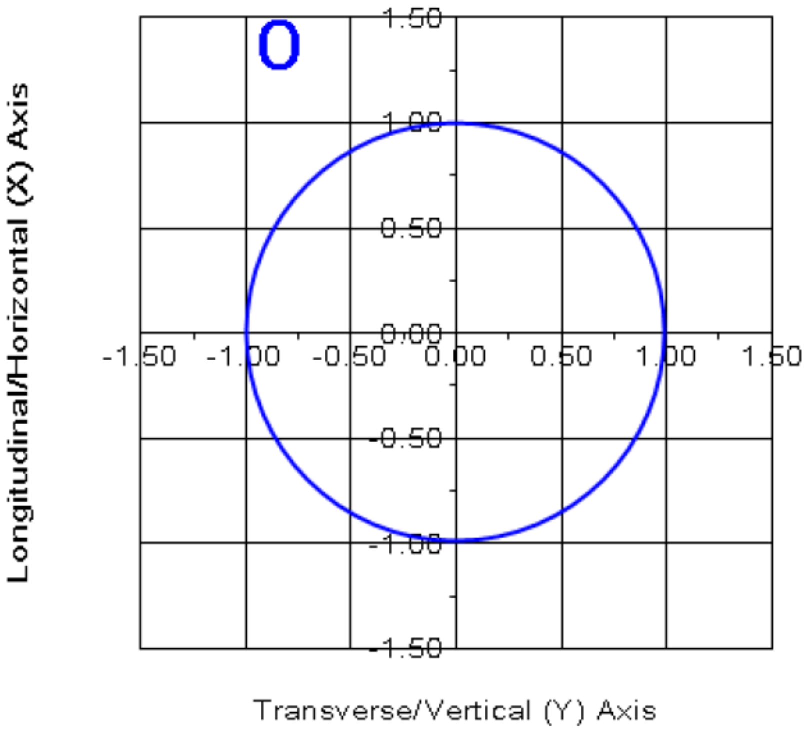
Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	8.67	-2

Intermediate Joints for Davit Property "ARM C":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	11.67	-3

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
Davit1	2683:Arm1	ARM A	180
Davit2	2683:Arm1	ARM A	0
Davit3	2683:Arm2	ARM B	180
Davit4	2683:Arm2	ARM B	0
Davit5	2683:Arm3	ARM C	180
Davit6	2683:Arm3	ARM C	0
Davit7	2683:Arm4	ARM B	180
Davit8	2683:Arm4	ARM B	0



Tubular Davit Arm Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	V-Moment Inertia (in^4)	H-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	V-Moment Capacity (ft-k)	H-Moment Capacity (ft-k)
Davit1	Davit1:O	Origin	0.00	10.76	6.23	87.04	87.04	57.39	0.0	65.00	65.00	87.64	87.64
Davit1	Davit1:End	End	4.74	6.00	3.42	14.47	14.47	32.00	0.0	65.00	65.00	26.13	26.13
Davit2	Davit2:O	Origin	0.00	10.76	6.23	87.04	87.04	57.39	0.0	65.00	65.00	87.64	87.64
Davit2	Davit2:End	End	4.74	6.00	3.42	14.47	14.47	32.00	0.0	65.00	65.00	26.13	26.13
Davit3	Davit3:O	Origin	0.00	18.50	14.33	596.86	596.86	74.00	0.0	65.00	65.00	349.51	349.51
Davit3	#Davit3:0	End	4.45	13.75	10.60	241.63	241.63	55.00	0.0	65.00	65.00	190.37	190.37
Davit3	#Davit3:0	Origin	4.45	13.75	10.60	241.63	241.63	55.00	0.0	65.00	65.00	190.37	190.37
Davit3	Davit3:End	End	8.90	9.00	6.87	65.82	65.82	36.00	0.0	65.00	65.00	79.23	79.23
Davit4	Davit4:O	Origin	0.00	18.50	14.33	596.86	596.86	74.00	0.0	65.00	65.00	349.51	349.51
Davit4	#Davit4:0	End	4.45	13.75	10.60	241.63	241.63	55.00	0.0	65.00	65.00	190.37	190.37
Davit4	#Davit4:0	Origin	4.45	13.75	10.60	241.63	241.63	55.00	0.0	65.00	65.00	190.37	190.37
Davit4	Davit4:End	End	8.90	9.00	6.87	65.82	65.82	36.00	0.0	65.00	65.00	79.23	79.23
Davit5	Davit5:O	Origin	0.00	18.50	14.33	596.86	596.86	74.00	0.0	65.00	65.00	349.51	349.51

Davit5	#Davit5:0	End	5.00	14.56	11.24	287.65	287.65	58.23	0.0	65.00	65.00	214.05	214.05
Davit5	#Davit5:0	Origin	5.00	14.56	11.24	287.65	287.65	58.23	0.0	65.00	65.00	214.05	214.05
Davit5	#Davit5:1	End	8.52	11.78	9.05	150.51	150.51	47.12	0.0	65.00	65.00	138.43	138.43
Davit5	#Davit5:1	Origin	8.52	11.78	9.05	150.51	150.51	47.12	0.0	65.00	65.00	138.43	138.43
Davit5	Davit5:End	End	12.05	9.00	6.87	65.82	65.82	36.00	0.0	65.00	65.00	79.23	79.23
Davit6	Davit6:O	Origin	0.00	18.50	14.33	596.86	596.86	74.00	0.0	65.00	65.00	349.51	349.51
Davit6	#Davit6:0	End	5.00	14.56	11.24	287.65	287.65	58.23	0.0	65.00	65.00	214.05	214.05
Davit6	#Davit6:0	Origin	5.00	14.56	11.24	287.65	287.65	58.23	0.0	65.00	65.00	214.05	214.05
Davit6	#Davit6:1	End	8.52	11.78	9.05	150.51	150.51	47.12	0.0	65.00	65.00	138.43	138.43
Davit6	#Davit6:1	Origin	8.52	11.78	9.05	150.51	150.51	47.12	0.0	65.00	65.00	138.43	138.43
Davit6	Davit6:End	End	12.05	9.00	6.87	65.82	65.82	36.00	0.0	65.00	65.00	79.23	79.23
Davit7	Davit7:O	Origin	0.00	18.50	14.33	596.86	596.86	74.00	0.0	65.00	65.00	349.51	349.51
Davit7	#Davit7:0	End	4.45	13.75	10.60	241.63	241.63	55.00	0.0	65.00	65.00	190.37	190.37
Davit7	#Davit7:0	Origin	4.45	13.75	10.60	241.63	241.63	55.00	0.0	65.00	65.00	190.37	190.37
Davit7	Davit7:End	End	8.90	9.00	6.87	65.82	65.82	36.00	0.0	65.00	65.00	79.23	79.23
Davit8	Davit8:O	Origin	0.00	18.50	14.33	596.86	596.86	74.00	0.0	65.00	65.00	349.51	349.51
Davit8	#Davit8:0	End	4.45	13.75	10.60	241.63	241.63	55.00	0.0	65.00	65.00	190.37	190.37
Davit8	#Davit8:0	Origin	4.45	13.75	10.60	241.63	241.63	55.00	0.0	65.00	65.00	190.37	190.37
Davit8	Davit8:End	End	8.90	9.00	6.87	65.82	65.82	36.00	0.0	65.00	65.00	79.23	79.23

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)	Hardware Capacity (lbs)	Notes
clamp	clamp1	8e+04	0	

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
Clamp1	Davit1:End	clamp	No Limit
Clamp2	Davit2:End	clamp	No Limit
Clamp3	Davit3:End	clamp	No Limit
Clamp4	Davit4:End	clamp	No Limit
Clamp5	Davit5:End	clamp	No Limit
Clamp6	Davit6:End	clamp	No Limit
Clamp7	Davit7:End	clamp	No Limit
Clamp8	Davit8:End	clamp	No Limit
Clamp9	2683:WVGD1	clamp	No Limit
Clamp10	2683:WVGD2	clamp	No Limit
Clamp11	2683:WVGD3	clamp	No Limit
Clamp12	2683:WVGD4	clamp	No Limit
Clamp13	2683:WVGD5	clamp	No Limit
Clamp14	2683:WVGD6	clamp	No Limit
Clamp15	2683:WVGD7	clamp	No Limit
Clamp17	2683:TopConn	clamp	No Limit
Clamp18	2683:BotConn	clamp	No Limit
Clamp19	2683:WVGD8	clamp	No Limit
Clamp20	2683:BCT	clamp	No Limit

Clamp21	2683:BCB	clamp	No Limit

PLS-CADD Link Cable Sets:

Insulator Label	Conductor Attach Label	Insulator Type	Set Number	Phase Number	Set Description	Dead End	Framing Source
Clamp1	Davit1:End	Clamp	20	1		No	
Clamp2	Davit2:End	Clamp	21	1		No	
Clamp3	Davit3:End	Clamp	1	1		No	
Clamp4	Davit4:End	Clamp	4	1		No	
Clamp5	Davit5:End	Clamp	2	1		No	
Clamp6	Davit6:End	Clamp	5	1		No	
Clamp7	Davit7:End	Clamp	3	1		No	
Clamp8	Davit8:End	Clamp	6	1		No	
Clamp9	2683:WVGD1	Clamp	0	0		No	
Clamp10	2683:WVGD2	Clamp	0	0		No	
Clamp11	2683:WVGD3	Clamp	0	0		No	
Clamp12	2683:WVGD4	Clamp	0	0		No	
Clamp13	2683:WVGD5	Clamp	0	0		No	
Clamp14	2683:WVGD6	Clamp	0	0		No	
Clamp15	2683:WVGD7	Clamp	0	0		No	
Clamp17	2683:TopConn	Clamp	0	0		No	
Clamp18	2683:BotConn	Clamp	0	0		No	
Clamp19	2683:WVGD8	Clamp	0	0		No	
Clamp20	2683:BCT	Clamp	0	0		No	
Clamp21	2683:BCB	Clamp	0	0		No	

Material List Options:
- Show Parts: YES
- Decompose Assemblies: NO
- Show Assemblies: YES

Material List

Stock Number	Item Description	Quantity	Unit of Measure
clamp1	Clamp property: clamp	20.00	Each
2683	Steel Pole property: CL&P2683	1.00	Each

*** Loads Data

Loads from file: J:\Jobs\2202100.WI\10_CT2185\05_Structural\Tower Analysis\Backup Documentation\Rev (1)\Calcs\PLS Pole\cl&p #2683.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)   90.42 (ft)
  Structure height   90.42 (ft)
  Structure height above ground   90.42 (ft)

Vector Load Cases:

```
         Load Case   Dead   Wind       SF for SF for SF for SF for SF for SF for  SF for SF for  SF for   SF for SF For    Point      Wind/Ice
Trans.  Longit.    Ice      Ice Temperature       Pole        Pole
       Description   Load   Area  Steel Poles   Wood  Conc.  Conc.  Conc.    Guys     Non Braces Insuls. Hardware Found.    Loads        Model
Wind     Wind Thick.   Density                Deflection Deflection
                   Factor Factor Tubular Arms  Poles   Ult.  First   Zero    and Tubular
Pressure Pressure                                   Check      Limit
                                 and Towers                 Crack  Tens. Cables    Arms
(psf)    (psf)   (in)(lbs/ft^3)     (deg F)              % or (ft)
-----------------------------------------------------------------------------------------------------------------------------------------------
-------------------------------------------------------------
        NESC Heavy 1.5000 2.5000      1.00000 0.6500 0.0000 1.0000 0.0000 1.0000  1.0000 1.0000  1.0000   0.0000 1.0000 20 loads   Wind on All
4        0  0.000     0.000         0.0   No Limit          0
      NESC Extreme 1.0000 1.0000      1.00000 0.6500 0.0000 1.0000 0.0000 1.0000  1.0000 1.0000  1.0000   0.0000 1.0000 20 loads     NESC 2017
25.6        0  0.000     0.000         0.0   No Limit          0
 NESC Extreme Long 1.0000 1.0000      1.00000 0.6500 0.0000 1.0000 0.0000 1.0000  1.0000 1.0000  1.0000   0.0000 1.0000 20 loads     NESC 2017
0     25.6  0.000     0.000         0.0   No Limit          0
```

Point Loads for Load Case "NESC Heavy":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	871	1715	105	
Davit2:End	1449	2103	21	
Davit3:End	1581	2183	124	
Davit4:End	2028	2006	33	
Davit5:End	1581	2183	124	
Davit6:End	2028	2006	33	
Davit7:End	1581	2183	124	
Davit8:End	2028	2006	33	
2683:TopConn	0	9336	0	
2683:BotConn	17820	-5434	0	
2683:BCT	0	33413	0	
2683:BCB	0	-33413	0	
2683:WVGD1	1840	119	0	
2683:WVGD2	1840	119	0	

2683:WVGD3	1840	119	0	
2683:WVGD4	1840	119	0	
2683:WVGD5	1840	119	0	
2683:WVGD6	1840	119	0	
2683:WVGD7	1840	119	0	
2683:WVGD8	688	55	0	

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	249	930	57	
Davit2:End	558	1299	15	
Davit3:End	634	1392	78	
Davit4:End	878	1548	27	
Davit5:End	634	1392	78	
Davit6:End	878	1548	27	
Davit7:End	634	1392	78	
Davit8:End	878	1548	27	
2683:TopConn	0	28264	0	
2683:BotConn	8340	-16624	0	
2683:BCT	0	15638	0	
2683:BCB	0	-15638	0	
2683:WVGD1	499	260	0	
2683:WVGD2	499	260	0	
2683:WVGD3	499	260	0	
2683:WVGD4	499	260	0	
2683:WVGD5	499	260	0	
2683:WVGD6	499	260	0	
2683:WVGD7	499	260	0	
2683:WVGD8	158	102	0	

Detailed Pole Loading Data for Load Case "NESC Extreme":

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)
2683	2683:t	2683:Arm1	90.00	88.92	89.46	19.775	1.5e+06	1.000	25.60	0.00	74.07	45.56	0.00	0.00	45.56	0.00
2683	2683:Arm1	2683:TopConn	88.92	87.00	87.96	20.191	1.53e+06	1.000	25.60	0.00	134.49	82.71	0.00	0.00	82.71	0.00
2683	2683:TopConn	2683:WVGD8	87.00	85.00	86.00	20.734	1.57e+06	1.000	25.60	0.00	143.92	88.47	0.00	0.00	88.47	0.00
2683	2683:WVGD8	2683:Arm2	85.00	83.50	84.25	21.219	1.61e+06	1.000	25.60	0.00	110.50	67.91	0.00	0.00	67.91	0.00
2683	2683:Arm2		83.50	80.50	82.00	21.843	1.65e+06	1.000	25.60	0.00	227.60	139.81	0.00	0.00	139.81	0.00
2683		2683:BCT	80.50	77.50	79.00	22.675	1.72e+06	1.000	25.60	0.00	236.40	145.13	0.00	0.00	145.13	0.00
2683	2683:BCT	2683:BotConn	77.50	77.00	77.25	23.160	1.75e+06	1.000	25.60	0.00	40.25	24.71	0.00	0.00	24.71	0.00
2683	2683:BotConn	2683:BCB	77.00	76.50	76.75	23.299	1.76e+06	1.000	25.60	0.00	40.50	24.85	0.00	0.00	24.85	0.00
2683	2683:BCB	2683:WVGD7	76.50	75.00	75.75	23.576	1.79e+06	1.000	25.60	0.00	122.96	75.45	0.00	0.00	75.45	0.00
2683	2683:WVGD7	2683:Arm3	75.00	70.50	72.75	24.408	1.85e+06	1.000	25.60	0.00	382.07	234.33	0.00	0.00	234.33	0.00
2683	2683:Arm3		70.50	67.75	69.13	25.413	1.93e+06	1.000	25.60	0.00	243.23	149.10	0.00	0.00	149.10	0.00
2683		2683:WVGD6	67.75	65.00	66.38	26.176	1.98e+06	1.000	25.60	0.00	250.62	153.58	0.00	0.00	153.58	0.00
2683	2683:WVGD6		65.00	62.25	63.63	26.938	2.04e+06	1.000	25.60	0.00	258.01	158.05	0.00	0.00	158.05	0.00
2683		2683:Arm4	62.25	59.50	60.88	27.701	2.1e+06	1.000	25.60	0.00	265.40	162.52	0.00	0.00	162.52	0.00
2683	2683:Arm4		59.50	55.17	57.33	28.683	2.17e+06	1.000	25.60	0.00	433.19	265.17	0.00	0.00	265.17	0.00

2683		2683:WVGD5	55.17	55.00	55.08	28.994	2.2e+06	1.000	25.60	0.00	36.98	10.31	0.00	0.00	10.31	0.00
2683	2683:WVGD5		55.00	51.00	53.00	29.259	2.22e+06	1.000	25.60	0.00	905.35	249.70	0.00	0.00	249.70	0.00
2683			51.00	48.00	49.50	30.230	2.29e+06	1.000	25.60	0.00	378.80	193.48	0.00	0.00	193.48	0.00
2683		2683:WVGD4	48.00	45.00	46.50	31.062	2.35e+06	1.000	25.60	0.00	389.27	198.81	0.00	0.00	198.81	0.00
2683	2683:WVGD4		45.00	40.00	42.50	32.171	2.44e+06	1.000	25.60	0.00	672.23	343.18	0.00	0.00	343.18	0.00
2683		2683:WVGD3	40.00	35.00	37.50	33.557	2.54e+06	1.000	25.60	0.00	701.54	357.97	0.00	0.00	357.97	0.00
2683	2683:WVGD3		35.00	30.00	32.50	34.943	2.65e+06	1.000	25.60	0.00	730.85	372.76	0.00	0.00	372.76	0.00
2683		2683:WVGD2	30.00	25.00	27.50	36.330	2.75e+06	1.000	25.60	0.00	760.16	387.55	0.00	0.00	387.55	0.00
2683	2683:WVGD2		25.00	20.25	22.63	37.682	2.85e+06	1.000	25.60	0.00	749.30	381.87	0.00	0.00	381.87	0.00
2683			20.25	17.63	18.94	38.329	2.9e+06	1.000	25.60	0.00	842.55	214.66	0.00	0.00	214.66	0.00
2683		2683:WVGD1	17.63	15.00	16.31	38.682	2.93e+06	1.000	25.60	0.00	858.71	216.63	0.00	0.00	216.63	0.00
2683	2683:WVGD1		15.00	10.00	12.50	39.739	3.01e+06	1.000	25.60	0.00	832.34	423.91	0.00	0.00	423.91	0.00
2683			10.00	5.00	7.50	41.125	3.12e+06	1.000	25.60	0.00	861.55	438.70	0.00	0.00	438.70	0.00
2683		2683:g	5.00	0.00	2.50	42.512	3.22e+06	1.000	25.60	0.00	890.86	453.49	0.00	0.00	453.49	0.00

Point Loads for Load Case "NESC Extreme Long":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	249	0	57	
Davit2:End	558	0	15	
Davit3:End	634	0	78	
Davit4:End	878	0	27	
Davit5:End	634	0	78	
Davit6:End	878	0	27	
Davit7:End	634	0	78	
Davit8:End	878	0	27	
2683:TopConn	0	0	28264	
2683:BotConn	8340	0	-16624	
2683:BCT	0	0	15638	
2683:BCB	0	0	-15638	
2683:WVGD1	499	0	260	
2683:WVGD2	499	0	260	
2683:WVGD3	499	0	260	
2683:WVGD4	499	0	260	
2683:WVGD5	499	0	260	
2683:WVGD6	499	0	260	
2683:WVGD7	499	0	260	
2683:WVGD8	158	0	102	

Detailed Pole Loading Data for Load Case "NESC Extreme Long":

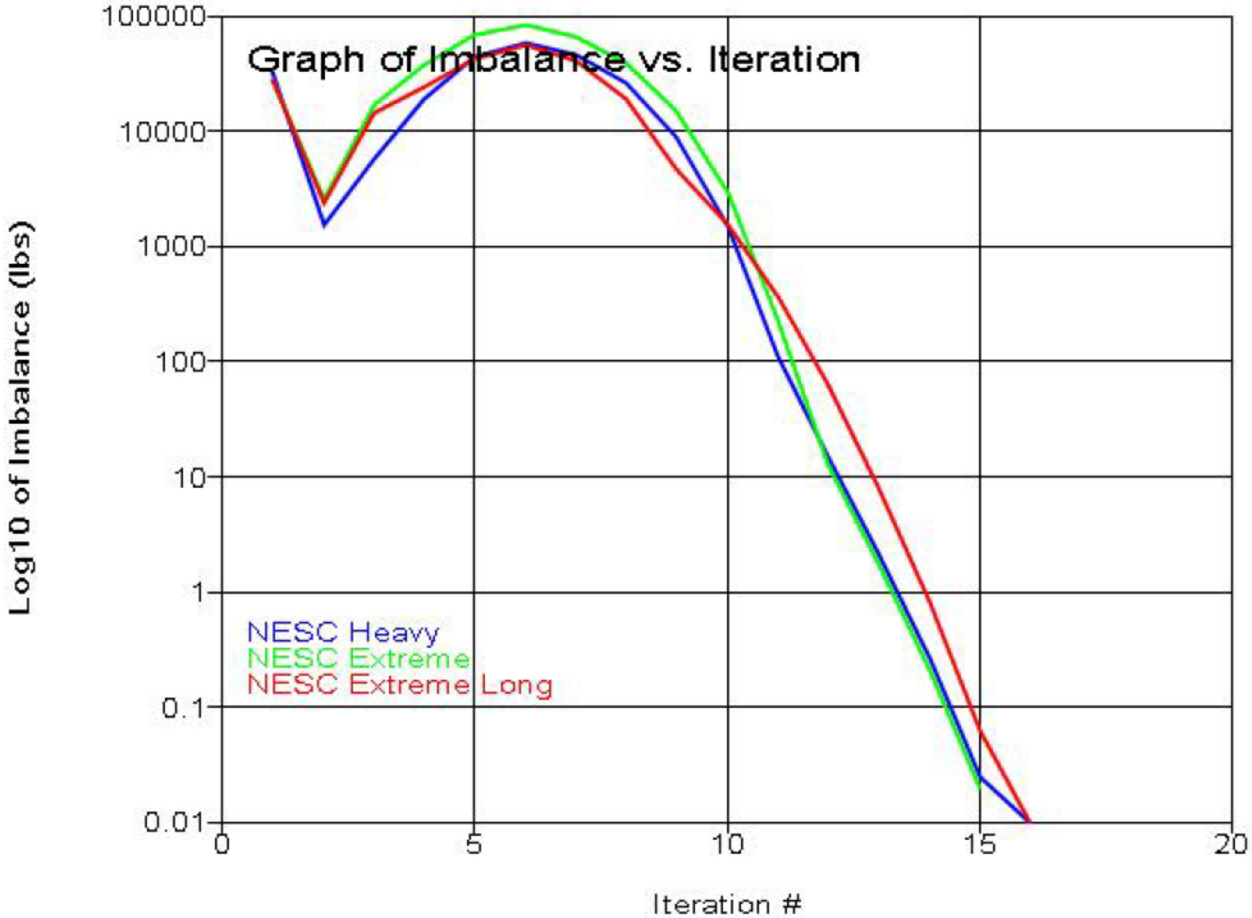
Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

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)
2683	2683:t	2683:Arm1	90.00	88.92	89.46	19.775	1.5e+06	1.000	25.60	0.00	74.07	45.56	0.00	0.00	0.00	45.56
2683	2683:Arm1	2683:TopConn	88.92	87.00	87.96	20.191	1.53e+06	1.000	25.60	0.00	134.49	82.71	0.00	0.00	0.00	82.71
2683	2683:TopConn	2683:WVGD8	87.00	85.00	86.00	20.734	1.57e+06	1.000	25.60	0.00	143.92	88.47	0.00	0.00	0.00	88.47
2683	2683:WVGD8	2683:Arm2	85.00	83.50	84.25	21.219	1.61e+06	1.000	25.60	0.00	110.50	67.91	0.00	0.00	0.00	67.91
2683	2683:Arm2		83.50	80.50	82.00	21.843	1.65e+06	1.000	25.60	0.00	227.60	139.81	0.00	0.00	0.00	139.81
2683		2683:BCT	80.50	77.50	79.00	22.675	1.72e+06	1.000	25.60	0.00	236.40	145.13	0.00	0.00	0.00	145.13
2683	2683:BCT	2683:BotConn	77.50	77.00	77.25	23.160	1.75e+06	1.000	25.60	0.00	40.25	24.71	0.00	0.00	0.00	24.71

2683	2683:BotConn	2683:BCB	77.00	76.50	76.75	23.299	1.76e+06	1.000	25.60	0.00	40.50	24.85	0.00	0.00	0.00	24.85
2683	2683:BCB	2683:WVGD7	76.50	75.00	75.75	23.576	1.79e+06	1.000	25.60	0.00	122.96	75.45	0.00	0.00	0.00	75.45
2683	2683:WVGD7	2683:Arm3	75.00	70.50	72.75	24.408	1.85e+06	1.000	25.60	0.00	382.07	234.34	0.00	0.00	0.00	234.34
2683	2683:Arm3		70.50	67.75	69.13	25.413	1.93e+06	1.000	25.60	0.00	243.23	149.10	0.00	0.00	0.00	149.10
2683		2683:WVGD6	67.75	65.00	66.38	26.176	1.98e+06	1.000	25.60	0.00	250.62	153.58	0.00	0.00	0.00	153.58
2683	2683:WVGD6		65.00	62.25	63.63	26.938	2.04e+06	1.000	25.60	0.00	258.01	158.05	0.00	0.00	0.00	158.05
2683		2683:Arm4	62.25	59.50	60.88	27.701	2.1e+06	1.000	25.60	0.00	265.40	162.52	0.00	0.00	0.00	162.52
2683	2683:Arm4		59.50	55.17	57.33	28.683	2.17e+06	1.000	25.60	0.00	433.19	265.18	0.00	0.00	0.00	265.18
2683		2683:WVGD5	55.17	55.00	55.08	28.994	2.2e+06	1.000	25.60	0.00	36.98	10.31	0.00	0.00	0.00	10.31
2683	2683:WVGD5		55.00	51.00	53.00	29.259	2.22e+06	1.000	25.60	0.00	905.35	249.70	0.00	0.00	0.00	249.70
2683			51.00	48.00	49.50	30.230	2.29e+06	1.000	25.60	0.00	378.80	193.49	0.00	0.00	0.00	193.49
2683		2683:WVGD4	48.00	45.00	46.50	31.062	2.35e+06	1.000	25.60	0.00	389.27	198.81	0.00	0.00	0.00	198.81
2683	2683:WVGD4		45.00	40.00	42.50	32.171	2.44e+06	1.000	25.60	0.00	672.23	343.18	0.00	0.00	0.00	343.18
2683		2683:WVGD3	40.00	35.00	37.50	33.557	2.54e+06	1.000	25.60	0.00	701.54	357.97	0.00	0.00	0.00	357.97
2683	2683:WVGD3		35.00	30.00	32.50	34.943	2.65e+06	1.000	25.60	0.00	730.85	372.76	0.00	0.00	0.00	372.76
2683		2683:WVGD2	30.00	25.00	27.50	36.330	2.75e+06	1.000	25.60	0.00	760.16	387.55	0.00	0.00	0.00	387.55
2683	2683:WVGD2		25.00	20.25	22.63	37.682	2.85e+06	1.000	25.60	0.00	749.30	381.87	0.00	0.00	0.00	381.87
2683			20.25	17.63	18.94	38.329	2.9e+06	1.000	25.60	0.00	842.55	214.66	0.00	0.00	0.00	214.66
2683		2683:WVGD1	17.63	15.00	16.31	38.682	2.93e+06	1.000	25.60	0.00	858.71	216.64	0.00	0.00	0.00	216.64
2683	2683:WVGD1		15.00	10.00	12.50	39.739	3.01e+06	1.000	25.60	0.00	832.34	423.92	0.00	0.00	0.00	423.92
2683			10.00	5.00	7.50	41.125	3.12e+06	1.000	25.60	0.00	861.55	438.71	0.00	0.00	0.00	438.71
2683		2683:g	5.00	0.00	2.50	42.512	3.22e+06	1.000	25.60	0.00	890.86	453.50	0.00	0.00	0.00	453.50

*** Analysis Results:

Maximum element usage is 91.46% for Base Plate "2683" in load case "NESC Extreme Long"
Maximum insulator usage is 41.77% for Clamp "Clamp20" in load case "NESC Heavy"



*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 16

Equilibrium Joint Positions and Rotations for Load Case "NESC Heavy":

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)
2683:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
2683:t	0.07843	3.468	-0.09263	-4.0421	0.0879	0.0207	0.07843	3.468	89.91
2683:Arm1	0.0768	3.392	-0.08995	-4.0421	0.0879	0.0207	0.0768	3.392	88.83

2683:TopConn	0.07392	3.257	-0.08516	-4.0356	0.0877	0.0204	0.07392	3.257	86.91
2683:WVGD8	0.07092	3.116	-0.0802	-4.0209	0.0875	0.0202	0.07092	3.116	84.92
2683:Arm2	0.06868	3.011	-0.07651	-4.0025	0.0872	0.0199	0.06868	3.011	83.42
2683:BCT	0.0599	2.599	-0.06227	-3.8485	0.0847	0.0179	0.0599	2.599	77.44
2683:BotConn	0.05918	2.565	-0.06113	-3.8311	0.0845	0.0177	0.05918	2.565	76.94
2683:BCB	0.05846	2.532	-0.06	-3.8119	0.0842	0.0176	0.05846	2.532	76.44
2683:WVGD7	0.05631	2.433	-0.05667	-3.7507	0.0833	0.0171	0.05631	2.433	74.94
2683:Arm3	0.05	2.146	-0.04731	-3.5571	0.0803	0.0159	0.05	2.146	70.45
2683:WVGD6	0.04267	1.817	-0.03721	-3.2854	0.0754	0.0136	0.04267	1.817	64.96
2683:Arm4	0.03581	1.515	-0.02866	-2.9960	0.0697	0.0117	0.03581	1.515	59.47
2683:WVGD5	0.03061	1.289	-0.02277	-2.7437	0.0645	0.0099	0.03061	1.289	54.98
2683:WVGD4	0.02045	0.8549	-0.01288	-2.2218	0.0529	0.0070	0.02045	0.8549	44.99
2683:WVGD3	0.0123	0.5118	-0.006535	-1.7002	0.0408	0.0048	0.0123	0.5118	34.99
2683:WVGD2	0.006231	0.2585	-0.002876	-1.1957	0.0288	0.0031	0.006231	0.2585	25
2683:WVGD1	0.002218	0.09184	-0.001028	-0.7046	0.0170	0.0017	0.002218	0.09184	15
Davit1:O	0.07719	3.394	-0.03143	-4.0421	0.0879	0.0207	0.07719	2.564	88.89
Davit1:End	0.08195	3.511	0.2814	-4.0295	0.0905	0.0270	0.08195	-1.819	90.7
Davit2:O	0.07641	3.39	-0.1485	-4.0421	0.0879	0.0207	0.07641	4.22	88.77
Davit2:End	0.07662	3.486	-0.4762	-4.1671	0.0882	0.0194	0.07662	8.816	89.94
Davit3:O	0.06909	3.013	-0.01419	-4.0025	0.0872	0.0199	0.06909	2.12	83.49
Davit3:End	0.07646	3.173	0.5827	-3.9638	0.0886	0.0246	0.07646	-6.39	86.08
Davit4:O	0.06828	3.009	-0.1388	-4.0025	0.0872	0.0199	0.06828	3.902	83.36
Davit4:End	0.06744	3.129	-0.7573	-4.0970	0.0874	0.0187	0.06744	12.69	84.74
Davit5:O	0.05038	2.148	0.01741	-3.5571	0.0803	0.0159	0.05038	1.105	70.52
Davit5:End	0.05983	2.354	0.7276	-3.4870	0.0831	0.0244	0.05983	-10.36	74.23
Davit6:O	0.04962	2.144	-0.112	-3.5571	0.0803	0.0159	0.04962	3.187	70.39
Davit6:End	0.04977	2.311	-0.8628	-3.7372	0.0807	0.0136	0.04977	15.02	72.64
Davit7:O	0.03613	1.517	0.03249	-2.9960	0.0697	0.0117	0.03613	0.3464	59.53
Davit7:End	0.04129	1.632	0.4793	-2.9555	0.0711	0.0163	0.04129	-8.208	61.98
Davit8:O	0.0355	1.513	-0.08982	-2.9960	0.0697	0.0117	0.0355	2.683	59.41
Davit8:End	0.03569	1.608	-0.5542	-3.0915	0.0700	0.0105	0.03569	11.45	60.95

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
2683:g	-0.60	0.0	-24.97	0.0	0.0	-68.31	0.0	0.0	72.73	0.0	2023.54	0.0	-48.9	0.0	0.0	-3.33	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Heavy":

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.
2683	2683:t	Origin	0.00	41.62	0.94	-1.11	0.00	0.00	0.0	-0.06	0.02	-0.00	-0.00	0.00	0.00	0.00	0.00	0.0	4
2683	2683:Arm1	End	1.08	40.70	0.92	-1.08	0.02	-0.00	0.0	-0.06	0.02	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	2
2683	2683:Arm1	Origin	1.08	40.70	0.92	-1.08	8.93	-0.20	0.4	-2.49	4.06	-0.13	-0.12	1.04	0.16	0.03	1.21	1.9	2
2683	2683:TopConn	End	3.00	39.08	0.89	-1.02	16.73	-0.45	0.4	-2.49	4.06	-0.13	-0.12	1.86	0.16	0.03	2.00	3.1	2
2683	2683:TopConn	Origin	3.00	39.08	0.89	-1.02	16.73	-0.45	0.4	-2.04	13.44	-0.14	-0.10	0.81	1.23	0.03	2.36	3.6	3
2683	2683:WVGD8	End	5.00	37.39	0.85	-0.96	43.61	-0.72	0.4	-2.04	13.44	-0.14	-0.10	4.56	0.50	0.02	4.74	7.3	2
2683	2683:WVGD8	Origin	5.00	37.39	0.85	-0.96	43.61	-0.72	0.4	-2.92	13.61	-0.14	-0.14	4.56	0.50	0.02	4.79	7.4	2
2683	2683:Arm2	End	6.50	36.13	0.82	-0.92	64.02	-0.92	0.4	-2.92	13.61	-0.14	-0.13	6.43	0.49	0.02	6.62	10.2	2
2683	2683:Arm2	Origin	6.50	36.13	0.82	-0.92	77.37	-1.25	1.3	-7.44	18.18	-0.30	-0.34	7.77	0.66	0.07	8.21	12.6	2
2683	Tube 1	End	9.50	33.64	0.77	-0.83	131.92	-2.16	1.3	-7.44	18.18	-0.30	-0.33	12.26	0.64	0.07	12.65	19.5	2
2683	Tube 1	Origin	9.50	33.64	0.77	-0.83	131.92	-2.16	1.3	-7.81	18.29	-0.30	-0.34	12.26	0.64	0.07	12.66	19.5	2
2683	2683:BCT	End	12.50	31.19	0.72	-0.75	186.78	-3.06	1.3	-7.81	18.29	-0.30	-0.33	16.11	0.62	0.06	16.48	25.4	2

2683	2683:BCT	Origin	12.50	31.19	0.72	-0.75	186.78	-3.07	1.3	-5.79	51.68	-0.31	-0.25	16.11	1.74	0.06	16.65	25.6	2
2683	2683:BotConn	End	13.00	30.78	0.71	-0.73	212.63	-3.22	1.3	-5.79	51.68	-0.31	-0.24	18.10	1.73	0.06	18.61	28.6	2
2683	2683:BotConn	Origin	13.00	30.78	0.71	-0.73	212.63	-3.22	1.3	-24.01	47.47	-0.34	-1.01	18.10	1.59	0.06	19.33	29.7	2
2683	2683:BCB	End	13.50	30.38	0.70	-0.72	236.36	-3.39	1.3	-24.01	47.47	-0.34	-1.01	19.87	1.58	0.06	21.07	32.4	2
2683	2683:BCB	Origin	13.50	30.38	0.70	-0.72	236.36	-3.39	1.3	-26.38	14.15	-0.33	-1.10	19.87	0.47	0.06	21.00	32.3	2
2683	2683:WVGD7	End	15.00	29.19	0.68	-0.68	257.59	-3.88	1.3	-26.38	14.15	-0.33	-1.09	20.90	0.46	0.06	22.00	33.9	2
2683	2683:WVGD7	Origin	15.00	29.19	0.68	-0.68	257.59	-3.88	1.3	-28.62	14.45	-0.33	-1.18	20.90	0.47	0.06	22.10	34.0	2
2683	2683:Arm3	End	19.50	25.75	0.60	-0.57	322.61	-5.35	1.3	-28.62	14.45	-0.33	-1.12	23.60	0.45	0.05	24.73	38.0	2
2683	2683:Arm3	Origin	19.50	25.75	0.60	-0.57	341.84	-5.85	2.5	-33.76	19.00	-0.49	-1.32	25.01	0.59	0.10	26.36	40.5	2
2683	Tube 1	End	22.25	23.74	0.56	-0.50	394.09	-7.20	2.5	-33.76	19.00	-0.49	-1.28	27.14	0.57	0.09	28.44	43.9	2
2683	Tube 1	Origin	22.25	23.74	0.56	-0.50	394.09	-7.20	2.5	-34.18	19.04	-0.49	-1.30	27.14	0.57	0.09	28.46	43.9	2
2683	2683:WVGD6	End	25.00	21.80	0.51	-0.45	446.44	-8.54	2.5	-34.18	19.04	-0.49	-1.26	28.98	0.56	0.09	30.26	47.4	2
2683	2683:WVGD6	Origin	25.00	21.80	0.51	-0.45	446.44	-8.55	2.5	-36.44	19.29	-0.49	-1.34	28.98	0.56	0.09	30.34	47.6	2
2683	Tube 1	End	27.75	19.95	0.47	-0.39	499.50	-9.89	2.5	-36.44	19.29	-0.49	-1.30	30.62	0.55	0.08	31.94	50.8	2
2683	Tube 1	Origin	27.75	19.95	0.47	-0.39	499.50	-9.90	2.5	-36.88	19.32	-0.49	-1.32	30.62	0.55	0.08	31.96	50.9	2
2683	2683:Arm4	End	30.50	18.18	0.43	-0.34	552.64	-11.24	2.5	-36.88	19.32	-0.49	-1.28	32.04	0.53	0.08	33.34	53.9	2
2683	2683:Arm4	Origin	30.50	18.18	0.43	-0.34	565.96	-11.57	3.3	-41.81	23.78	-0.65	-1.45	32.81	0.66	0.10	34.29	55.5	2
2683	SpliceT	End	34.83	15.56	0.37	-0.28	668.98	-14.37	3.3	-41.81	23.78	-0.65	-1.39	35.63	0.63	0.10	37.05	61.5	2
2683	SpliceT	Origin	34.83	15.56	0.37	-0.28	668.98	-14.38	3.3	-42.22	23.78	-0.65	-1.41	35.63	0.63	0.10	37.06	61.5	2
2683	2683:WVGD5	End	35.00	15.47	0.37	-0.27	672.95	-14.49	3.3	-42.22	23.78	-0.65	-1.20	31.31	0.54	0.08	32.53	50.0	2
2683	2683:WVGD5	Origin	35.00	15.47	0.37	-0.27	672.95	-14.49	3.3	-44.80	24.02	-0.65	-1.27	31.31	0.54	0.08	32.60	50.2	2
2683	SpliceB	End	39.00	13.25	0.32	-0.22	769.04	-17.08	3.3	-44.80	24.02	-0.65	-1.22	33.13	0.52	0.08	34.37	52.9	2
2683	SpliceB	Origin	39.00	13.25	0.32	-0.22	769.03	-17.09	3.3	-45.84	24.06	-0.65	-1.25	33.13	0.52	0.08	34.40	52.9	2
2683	Tube 2	End	42.00	11.71	0.28	-0.19	841.21	-19.02	3.3	-45.84	24.06	-0.65	-1.22	34.27	0.51	0.07	35.50	54.6	2
2683	Tube 2	Origin	42.00	11.71	0.28	-0.19	841.21	-19.02	3.3	-46.48	24.08	-0.65	-1.24	34.27	0.51	0.07	35.52	54.6	2
2683	2683:WVGD4	End	45.00	10.26	0.25	-0.15	913.44	-20.95	3.3	-46.48	24.08	-0.65	-1.20	35.24	0.50	0.07	36.46	56.8	2
2683	2683:WVGD4	Origin	45.00	10.26	0.25	-0.15	913.44	-20.96	3.3	-49.20	24.29	-0.64	-1.27	35.24	0.50	0.07	36.53	56.9	2
2683	Tube 2	End	50.00	8.06	0.19	-0.11	1034.90	-24.15	3.3	-49.20	24.29	-0.64	-1.22	36.58	0.48	0.06	37.81	60.3	2
2683	Tube 2	Origin	50.00	8.06	0.19	-0.11	1034.90	-24.16	3.3	-50.34	24.32	-0.64	-1.25	36.58	0.48	0.06	37.84	60.3	2
2683	2683:WVGD3	End	55.00	6.14	0.15	-0.08	1156.50	-27.34	3.3	-50.34	24.32	-0.64	-1.20	37.59	0.46	0.06	38.80	63.4	2
2683	2683:WVGD3	Origin	55.00	6.14	0.15	-0.08	1156.50	-27.35	3.3	-53.36	24.52	-0.63	-1.27	37.59	0.46	0.06	38.87	63.5	2
2683	Tube 2	End	60.00	4.49	0.11	-0.05	1279.11	-30.50	3.3	-53.36	24.52	-0.63	-1.22	38.36	0.44	0.05	39.59	66.3	2
2683	Tube 2	Origin	60.00	4.49	0.11	-0.05	1279.11	-30.51	3.3	-54.59	24.55	-0.63	-1.25	38.36	0.44	0.05	39.61	66.3	2
2683	2683:WVGD2	End	65.00	3.10	0.07	-0.03	1401.85	-33.64	3.3	-54.59	24.55	-0.63	-1.20	38.91	0.43	0.05	40.11	68.9	2
2683	2683:WVGD2	Origin	65.00	3.10	0.07	-0.03	1401.85	-33.65	3.3	-57.66	24.74	-0.62	-1.27	38.91	0.43	0.05	40.18	69.0	2
2683	SpliceT	End	69.75	2.02	0.05	-0.02	1519.34	-36.60	3.3	-57.66	24.74	-0.62	-1.22	39.28	0.42	0.05	40.51	71.3	2
2683	SpliceT	Origin	69.75	2.02	0.05	-0.02	1519.34	-36.61	3.3	-58.93	24.76	-0.62	-1.25	39.28	0.42	0.05	40.54	71.4	2
2683	Splice	End	72.38	1.53	0.04	-0.02	1584.33	-38.22	3.3	-58.93	24.76	-0.62	-1.25	41.01	0.42	0.05	42.27	74.4	2
2683	Splice	Origin	72.38	1.53	0.04	-0.02	1584.33	-38.23	3.3	-60.26	24.78	-0.62	-1.28	41.01	0.42	0.05	42.29	74.4	2
2683	2683:WVGD1	End	75.00	1.10	0.03	-0.01	1649.36	-39.84	3.3	-60.26	24.78	-0.62	-1.25	41.09	0.41	0.04	42.35	75.6	2
2683	2683:WVGD1	Origin	75.00	1.10	0.03	-0.01	1649.36	-39.85	3.3	-63.45	24.93	-0.61	-1.32	41.09	0.41	0.04	42.42	75.7	2
2683	Tube 3	End	80.00	0.49	0.01	-0.01	1774.01	-42.90	3.3	-63.45	24.93	-0.61	-1.27	41.18	0.40	0.04	42.46	77.9	2
2683	Tube 3	Origin	80.00	0.49	0.01	-0.01	1774.01	-42.91	3.3	-64.83	24.94	-0.61	-1.30	41.18	0.40	0.04	42.49	77.9	2
2683	Tube 3	End	85.00	0.12	0.00	-0.00	1898.73	-45.93	3.3	-64.83	24.94	-0.61	-1.26	41.16	0.38	0.04	42.43	80.0	2
2683	Tube 3	Origin	85.00	0.12	0.00	-0.00	1898.73	-45.94	3.3	-66.24	24.96	-0.60	-1.29	41.16	0.38	0.04	42.45	80.1	2
2683	2683:g	End	90.00	0.00	0.00	0.00	2023.54	-48.93	3.3	-66.24	24.96	-0.60	-1.24	41.06	0.37	0.04	42.31	82.1	2

Detailed Tubular Davit Arm Usages for Load Case "NESC Heavy":

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.
Davit1	Davit1:O	Origin	0.00	40.73	0.93	-0.38	-0.95	0.51	0.0	-1.94	0.20	-0.11	-0.31	0.80	0.07	0.00	1.12	1.7	1
Davit1	Davit1:End	End	4.74	42.13	0.98	3.38	-0.00	0.00	0.0	-1.94	0.20	-0.11	-0.57	0.00	0.13	0.00	0.61	0.9	1
Davit2	Davit2:O	Origin	0.00	40.68	0.92	-1.78	-9.40	-0.11	0.0	1.67	1.98	0.02	0.27	6.97	0.64	0.00	7.32	11.3	1
Davit2	Davit2:End	End	4.74	41.84	0.92	-5.71	0.00	0.00	0.0	1.67	1.98	0.02	0.49	0.00	1.16	0.00	2.06	3.2	1

Davit3	Davit3:O	Origin	0.00	36.16	0.83	-0.17	-9.61	1.13	0.0	-2.65	1.19	-0.13	-0.18	1.80	0.17	0.00	2.00	3.1	1
Davit3	#Davit3:0	End	4.45	37.12	0.87	3.42	-4.31	0.57	0.0	-2.65	1.19	-0.13	-0.25	1.48	0.23	0.00	1.78	2.7	1
Davit3	#Davit3:0	Origin	4.45	37.12	0.87	3.42	-4.31	0.57	0.0	-2.58	0.97	-0.13	-0.24	1.48	0.18	0.00	1.76	2.7	1
Davit3	Davit3:End	End	8.90	38.08	0.92	6.99	-0.00	0.00	0.0	-2.58	0.97	-0.13	-0.38	0.00	0.28	0.00	0.62	1.0	1
Davit4	Davit4:O	Origin	0.00	36.11	0.82	-1.67	-22.54	-0.33	-0.0	1.61	2.65	0.04	0.11	4.19	0.37	0.00	4.35	6.7	1
Davit4	#Davit4:0	End	4.45	36.82	0.81	-5.35	-10.73	-0.16	-0.0	1.61	2.65	0.04	0.15	3.67	0.50	0.00	3.91	6.0	1
Davit4	#Davit4:0	Origin	4.45	36.82	0.81	-5.35	-10.73	-0.16	0.0	1.65	2.41	0.04	0.16	3.67	0.46	0.00	3.90	6.0	1
Davit4	Davit4:End	End	8.90	37.54	0.81	-9.09	0.00	0.00	0.0	1.65	2.41	0.04	0.24	0.00	0.70	0.00	1.24	1.9	1
Davit5	Davit5:O	Origin	0.00	25.77	0.60	0.21	-13.28	1.53	0.0	-2.71	1.28	-0.13	-0.19	2.49	0.18	0.00	2.69	4.1	1
Davit5	#Davit5:0	End	5.00	26.80	0.65	3.77	-6.87	0.90	0.0	-2.71	1.28	-0.13	-0.24	2.10	0.23	0.00	2.38	3.7	1
Davit5	#Davit5:0	Origin	5.00	26.80	0.65	3.77	-6.87	0.89	0.0	-2.64	1.05	-0.13	-0.23	2.10	0.19	0.00	2.36	3.6	1
Davit5	#Davit5:1	End	8.52	27.53	0.68	6.26	-3.17	0.45	0.0	-2.64	1.05	-0.13	-0.29	1.50	0.23	0.00	1.84	2.8	1
Davit5	#Davit5:1	Origin	8.52	27.53	0.68	6.26	-3.17	0.45	0.0	-2.59	0.90	-0.13	-0.29	1.50	0.20	0.00	1.82	2.8	1
Davit5	Davit5:End	End	12.05	28.24	0.72	8.73	-0.00	0.00	0.0	-2.59	0.90	-0.13	-0.38	0.00	0.26	0.00	0.59	0.9	1
Davit6	Davit6:O	Origin	0.00	25.72	0.60	-1.34	-32.01	-0.44	-0.0	1.50	2.85	0.04	0.10	5.95	0.40	0.00	6.10	9.4	1
Davit6	#Davit6:0	End	5.00	26.55	0.60	-5.02	-17.75	-0.26	-0.0	1.50	2.85	0.04	0.13	5.39	0.51	0.00	5.59	8.6	1
Davit6	#Davit6:0	Origin	5.00	26.55	0.60	-5.02	-17.75	-0.26	-0.0	1.55	2.60	0.04	0.14	5.39	0.46	0.00	5.59	8.6	1
Davit6	#Davit6:1	End	8.52	27.14	0.60	-7.67	-8.59	-0.13	-0.0	1.55	2.60	0.04	0.17	4.03	0.57	0.00	4.32	6.6	1
Davit6	#Davit6:1	Origin	8.52	27.14	0.60	-7.67	-8.59	-0.13	0.0	1.58	2.44	0.04	0.17	4.03	0.54	0.00	4.31	6.6	1
Davit6	Davit6:End	End	12.05	27.74	0.60	-10.35	0.00	0.00	0.0	1.58	2.44	0.04	0.23	0.00	0.71	0.00	1.25	1.9	1
Davit7	Davit7:O	Origin	0.00	18.20	0.43	0.39	-10.02	1.13	0.0	-2.63	1.24	-0.13	-0.18	1.88	0.17	0.00	2.08	3.2	1
Davit7	#Davit7:0	End	4.45	18.89	0.46	3.08	-4.51	0.56	0.0	-2.63	1.24	-0.13	-0.25	1.55	0.23	0.00	1.84	2.8	1
Davit7	#Davit7:0	Origin	4.45	18.89	0.46	3.08	-4.51	0.56	0.0	-2.56	1.01	-0.13	-0.24	1.55	0.19	0.00	1.82	2.8	1
Davit7	Davit7:End	End	8.90	19.58	0.50	5.75	-0.00	0.00	0.0	-2.56	1.01	-0.13	-0.37	0.00	0.30	0.00	0.64	1.0	1
Davit8	Davit8:O	Origin	0.00	18.16	0.43	-1.08	-22.79	-0.32	-0.0	1.57	2.68	0.04	0.11	4.24	0.37	0.00	4.40	6.8	1
Davit8	#Davit8:0	End	4.45	18.72	0.43	-3.84	-10.86	-0.16	-0.0	1.57	2.68	0.04	0.15	3.71	0.51	0.00	3.96	6.1	1
Davit8	#Davit8:0	Origin	4.45	18.72	0.43	-3.84	-10.86	-0.16	0.0	1.61	2.44	0.04	0.15	3.71	0.46	0.00	3.94	6.1	1
Davit8	Davit8:End	End	8.90	19.29	0.43	-6.65	0.00	0.00	0.0	1.61	2.44	0.04	0.23	0.00	0.71	0.00	1.25	1.9	1

Summary of Clamp Capacities and Usages for Load Case "NESC Heavy":

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 %
Clamp1	1.926	80.00	80.00	2.41	0.00	0.00	0.00	2.41
Clamp2	2.554	80.00	80.00	3.19	0.00	0.00	0.00	3.19
Clamp3	2.698	80.00	80.00	3.37	0.00	0.00	0.00	3.37
Clamp4	2.853	80.00	80.00	3.57	0.00	0.00	0.00	3.57
Clamp5	2.698	80.00	80.00	3.37	0.00	0.00	0.00	3.37
Clamp6	2.853	80.00	80.00	3.57	0.00	0.00	0.00	3.57
Clamp7	2.698	80.00	80.00	3.37	0.00	0.00	0.00	3.37
Clamp8	2.853	80.00	80.00	3.57	0.00	0.00	0.00	3.57
Clamp9	1.844	80.00	80.00	2.30	0.00	0.00	0.00	2.30
Clamp10	1.844	80.00	80.00	2.30	0.00	0.00	0.00	2.30
Clamp11	1.844	80.00	80.00	2.30	0.00	0.00	0.00	2.30
Clamp12	1.844	80.00	80.00	2.30	0.00	0.00	0.00	2.30
Clamp13	1.844	80.00	80.00	2.30	0.00	0.00	0.00	2.30
Clamp14	1.844	80.00	80.00	2.30	0.00	0.00	0.00	2.30
Clamp15	1.844	80.00	80.00	2.30	0.00	0.00	0.00	2.30
Clamp17	9.336	80.00	80.00	11.67	0.00	0.00	0.00	11.67

Clamp18	18.630	80.00	80.00	23.29	0.00	0.00	0.00	23.29
Clamp19	0.690	80.00	80.00	0.86	0.00	0.00	0.00	0.86
Clamp20	33.413	80.00	80.00	41.77	0.00	0.00	0.00	41.77
Clamp21	33.413	80.00	80.00	41.77	0.00	0.00	0.00	41.77

*** Analysis Results for Load Case No. 2 "NESC Extreme" - Number of iterations in SAPS 15

Equilibrium Joint Positions and Rotations for Load Case "NESC Extreme":

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)
2683:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
2683:t	0.04821	4.341	-0.1437	-5.2649	0.0538	0.0117	0.04821	4.341	89.86
2683:Arm1	0.04722	4.242	-0.1392	-5.2649	0.0538	0.0117	0.04722	4.242	88.78
2683:TopConn	0.04546	4.066	-0.1311	-5.2612	0.0537	0.0116	0.04546	4.066	86.87
2683:WVGD8	0.04363	3.882	-0.1226	-5.2415	0.0536	0.0114	0.04363	3.882	84.88
2683:Arm2	0.04227	3.746	-0.1164	-5.2094	0.0534	0.0113	0.04227	3.746	83.38
2683:BCT	0.03691	3.212	-0.09261	-4.9432	0.0519	0.0101	0.03691	3.212	77.41
2683:BotConn	0.03647	3.169	-0.09075	-4.9133	0.0518	0.0100	0.03647	3.169	76.91
2683:BCB	0.03603	3.126	-0.08891	-4.8821	0.0516	0.0099	0.03603	3.126	76.41
2683:WVGD7	0.03471	3	-0.08354	-4.7863	0.0511	0.0097	0.03471	3	74.92
2683:Arm3	0.03086	2.635	-0.06868	-4.4902	0.0493	0.0089	0.03086	2.635	70.43
2683:WVGD6	0.02636	2.223	-0.05305	-4.1036	0.0464	0.0076	0.02636	2.223	64.95
2683:Arm4	0.02215	1.847	-0.04012	-3.7065	0.0430	0.0065	0.02215	1.847	59.46
2683:WVGD5	0.01895	1.569	-0.0314	-3.3743	0.0398	0.0055	0.01895	1.569	54.97
2683:WVGD4	0.01268	1.037	-0.01702	-2.7101	0.0327	0.0039	0.01268	1.037	44.98
2683:WVGD3	0.007641	0.62	-0.008074	-2.0643	0.0253	0.0026	0.007641	0.62	34.99
2683:WVGD2	0.003877	0.3129	-0.003126	-1.4482	0.0179	0.0017	0.003877	0.3129	25
2683:WVGD1	0.001382	0.1112	-0.0008504	-0.8527	0.0106	0.0009	0.001382	0.1112	15
Davit1:O	0.04746	4.246	-0.06298	-5.2649	0.0538	0.0117	0.04746	3.415	88.86
Davit1:End	0.05035	4.402	0.344	-5.2724	0.0553	0.0150	0.05035	-0.9278	90.76
Davit2:O	0.04698	4.239	-0.2153	-5.2649	0.0538	0.0117	0.04698	5.069	88.7
Davit2:End	0.0471	4.358	-0.6376	-5.3203	0.0540	0.0108	0.0471	9.688	89.78
Davit3:O	0.04252	3.749	-0.03532	-5.2094	0.0534	0.0113	0.04252	2.857	83.46
Davit3:End	0.04707	3.967	0.7428	-5.1999	0.0544	0.0142	0.04707	-5.596	86.24
Davit4:O	0.04202	3.742	-0.1974	-5.2094	0.0534	0.0113	0.04202	4.635	83.3
Davit4:End	0.04149	3.888	-0.997	-5.2546	0.0535	0.0103	0.04149	13.45	84.5
Davit5:O	0.03109	2.639	0.01298	-4.4902	0.0493	0.0089	0.03109	1.596	70.51
Davit5:End	0.0369	2.909	0.9153	-4.4731	0.0511	0.0142	0.0369	-9.804	74.42
Davit6:O	0.03062	2.632	-0.1503	-4.4902	0.0493	0.0089	0.03062	3.675	70.35
Davit6:End	0.03078	2.833	-1.084	-4.5786	0.0496	0.0070	0.03078	15.55	72.42
Davit7:O	0.02234	1.85	0.03552	-3.7065	0.0430	0.0065	0.02234	0.6798	59.54
Davit7:End	0.0255	1.997	0.5908	-3.6954	0.0438	0.0094	0.0255	-7.843	62.09
Davit8:O	0.02196	1.845	-0.1158	-3.7065	0.0430	0.0065	0.02196	3.015	59.38
Davit8:End	0.02213	1.957	-0.6846	-3.7531	0.0431	0.0055	0.02213	11.8	60.82

Joint Support Reactions for Load Case "NESC Extreme":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
2683:g	-0.39	0.0	-30.70	0.0	0.0	-33.73	0.0	0.0	45.61	0.0	2450.40	0.0	-30.6	0.0	0.0	-1.83	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Extreme":

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.

2683	2683:t	Origin	0.00	52.09	0.58	-1.72	-0.00	0.00	0.0	-0.04	0.03	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	4
2683	2683:Arm1	End	1.08	50.90	0.57	-1.67	0.03	-0.00	0.0	-0.04	0.03	-0.00	-0.00	0.00	0.00	0.00	0.01	0.0	2
2683	2683:Arm1	Origin	1.08	50.90	0.57	-1.67	5.01	-0.11	0.2	-0.88	2.41	-0.07	-0.04	0.59	0.09	0.01	0.66	1.0	2
2683	2683:TopConn	End	3.00	48.79	0.55	-1.57	9.65	-0.25	0.2	-0.88	2.41	-0.07	-0.04	1.07	0.09	0.01	1.13	1.7	2
2683	2683:TopConn	Origin	3.00	48.79	0.55	-1.57	9.65	-0.25	0.2	1.57	30.66	-0.08	0.08	0.03	3.04	0.01	5.29	8.1	4
2683	2683:WVGD8	End	5.00	46.59	0.52	-1.47	70.96	-0.41	0.2	1.57	30.66	-0.08	0.07	7.39	1.14	0.01	7.72	11.9	2
2683	2683:WVGD8	Origin	5.00	46.59	0.52	-1.47	70.96	-0.41	0.2	1.28	30.86	-0.08	0.06	7.39	1.15	0.01	7.71	11.9	2
2683	2683:Arm2	End	6.50	44.95	0.51	-1.40	117.25	-0.53	0.2	1.28	30.86	-0.08	0.06	11.72	1.12	0.01	11.94	18.4	2
2683	2683:Arm2	Origin	6.50	44.95	0.51	-1.40	125.81	-0.74	0.7	-0.78	34.11	-0.19	-0.04	12.58	1.24	0.04	12.81	19.7	2
2683	Tube 1	End	9.50	41.71	0.47	-1.25	228.15	-1.30	0.7	-0.78	34.11	-0.19	-0.03	21.11	1.19	0.04	21.25	32.7	2
2683	Tube 1	Origin	9.50	41.71	0.47	-1.25	228.15	-1.30	0.7	-1.09	34.27	-0.19	-0.05	21.11	1.20	0.04	21.27	32.7	2
2683	2683:BCT	End	12.50	38.55	0.44	-1.11	330.97	-1.86	0.7	-1.09	34.27	-0.19	-0.05	28.41	1.15	0.03	28.53	43.9	2
2683	2683:BCT	Origin	12.50	38.55	0.44	-1.11	330.97	-1.86	0.7	0.06	49.95	-0.19	0.00	28.41	1.68	0.03	28.57	44.0	2
2683	2683:BotConn	End	13.00	38.03	0.44	-1.09	355.95	-1.96	0.7	0.06	49.95	-0.19	0.00	30.18	1.67	0.03	30.33	46.7	2
2683	2683:BotConn	Origin	13.00	38.03	0.44	-1.09	355.95	-1.96	0.7	-9.74	34.13	-0.19	-0.41	30.18	1.14	0.03	30.66	47.2	2
2683	2683:BCB	End	13.50	37.52	0.43	-1.07	373.01	-2.06	0.7	-9.74	34.13	-0.19	-0.41	31.25	1.14	0.03	31.72	48.8	2
2683	2683:BCB	Origin	13.50	37.52	0.43	-1.07	373.01	-2.06	0.7	-11.18	18.59	-0.19	-0.47	31.25	0.62	0.03	31.74	48.8	2
2683	2683:WVGD7	End	15.00	36.00	0.42	-1.00	400.89	-2.34	0.7	-11.18	18.59	-0.19	-0.46	32.40	0.61	0.03	32.88	50.6	2
2683	2683:WVGD7	Origin	15.00	36.00	0.42	-1.00	400.89	-2.34	0.7	-11.97	19.03	-0.19	-0.49	32.40	0.62	0.03	32.91	50.6	2
2683	2683:Arm3	End	19.50	31.62	0.37	-0.82	486.50	-3.20	0.7	-11.97	19.03	-0.19	-0.47	35.44	0.59	0.03	35.92	55.3	2
2683	2683:Arm3	Origin	19.50	31.62	0.37	-0.82	499.06	-3.52	1.4	-14.48	22.32	-0.30	-0.57	36.36	0.69	0.05	36.95	56.8	2
2683	Tube 1	End	22.25	29.09	0.34	-0.73	560.43	-4.34	1.4	-14.48	22.32	-0.30	-0.55	38.42	0.67	0.05	38.99	60.0	2
2683	Tube 1	Origin	22.25	29.09	0.34	-0.73	560.43	-4.34	1.4	-14.80	22.44	-0.30	-0.56	38.42	0.67	0.05	39.01	60.0	2
2683	2683:WVGD6	End	25.00	26.67	0.32	-0.64	622.13	-5.16	1.4	-14.80	22.44	-0.30	-0.54	40.21	0.65	0.05	40.77	62.7	2
2683	2683:WVGD6	Origin	25.00	26.67	0.32	-0.64	622.13	-5.16	1.4	-15.61	22.85	-0.30	-0.57	40.21	0.67	0.05	40.80	62.8	2
2683	Tube 1	End	27.75	24.36	0.29	-0.56	684.98	-5.98	1.4	-15.61	22.85	-0.30	-0.56	41.80	0.65	0.04	42.37	65.2	2
2683	Tube 1	Origin	27.75	24.36	0.29	-0.56	684.98	-5.98	1.3	-15.95	22.98	-0.30	-0.57	41.80	0.65	0.04	42.39	65.2	2
2683	2683:Arm4	End	30.50	22.17	0.27	-0.48	748.16	-6.79	1.3	-15.95	22.98	-0.30	-0.55	43.17	0.63	0.04	43.74	68.1	2
2683	2683:Arm4	Origin	30.50	22.17	0.27	-0.48	756.74	-7.01	1.8	-18.35	26.21	-0.40	-0.64	43.67	0.72	0.06	44.33	69.0	2
2683	SpliceT	End	34.83	18.95	0.23	-0.38	870.33	-8.75	1.8	-18.35	26.21	-0.40	-0.61	46.14	0.69	0.05	46.77	74.4	2
2683	SpliceT	Origin	34.83	18.95	0.23	-0.38	870.33	-8.75	1.8	-18.66	26.31	-0.40	-0.62	46.14	0.70	0.05	46.78	74.4	2
2683	2683:WVGD5	End	35.00	18.83	0.23	-0.38	874.72	-8.82	1.8	-18.66	26.31	-0.40	-0.53	40.51	0.59	0.05	41.06	63.2	2
2683	2683:WVGD5	Origin	35.00	18.83	0.23	-0.38	874.72	-8.82	1.8	-19.68	26.71	-0.40	-0.56	40.51	0.60	0.05	41.09	63.2	2
2683	SpliceB	End	39.00	16.11	0.20	-0.30	981.56	-10.42	1.8	-19.68	26.71	-0.40	-0.54	42.09	0.58	0.04	42.64	65.6	2
2683	SpliceB	Origin	39.00	16.11	0.20	-0.30	981.56	-10.43	1.8	-20.43	26.88	-0.40	-0.56	42.09	0.58	0.04	42.66	65.6	2
2683	Tube 2	End	42.00	14.22	0.17	-0.25	1062.21	-11.63	1.8	-20.43	26.88	-0.40	-0.54	43.07	0.57	0.04	43.62	67.1	2
2683	Tube 2	Origin	42.00	14.22	0.17	-0.25	1062.21	-11.63	1.8	-20.91	27.03	-0.40	-0.56	43.07	0.57	0.04	43.64	67.1	2
2683	2683:WVGD4	End	45.00	12.45	0.15	-0.20	1143.30	-12.83	1.8	-20.91	27.03	-0.40	-0.54	43.90	0.55	0.04	44.45	68.4	2
2683	2683:WVGD4	Origin	45.00	12.45	0.15	-0.20	1143.30	-12.84	1.8	-22.05	27.51	-0.40	-0.57	43.90	0.56	0.04	44.48	68.4	2
2683	Tube 2	End	50.00	9.78	0.12	-0.14	1280.84	-14.83	1.8	-22.05	27.51	-0.40	-0.55	45.06	0.54	0.03	45.62	70.2	2
2683	Tube 2	Origin	50.00	9.78	0.12	-0.14	1280.84	-14.83	1.8	-22.89	27.76	-0.40	-0.57	45.06	0.55	0.03	45.64	70.2	2
2683	2683:WVGD3	End	55.00	7.44	0.09	-0.10	1419.64	-16.82	1.8	-22.89	27.76	-0.40	-0.54	45.92	0.52	0.03	46.47	72.9	2
2683	2683:WVGD3	Origin	55.00	7.44	0.09	-0.10	1419.64	-16.83	1.8	-24.25	28.30	-0.40	-0.58	45.92	0.53	0.03	46.51	73.0	2
2683	Tube 2	End	60.00	5.44	0.07	-0.06	1561.13	-18.81	1.8	-24.25	28.30	-0.40	-0.55	46.59	0.51	0.03	47.15	75.5	2
2683	Tube 2	Origin	60.00	5.44	0.07	-0.06	1561.13	-18.81	1.8	-25.15	28.57	-0.40	-0.57	46.59	0.52	0.03	47.17	75.6	2
2683	2683:WVGD2	End	65.00	3.76	0.05	-0.04	1703.97	-20.78	1.8	-25.15	28.57	-0.40	-0.55	47.06	0.50	0.03	47.62	77.9	2
2683	2683:WVGD2	Origin	65.00	3.76	0.05	-0.04	1703.97	-20.79	1.8	-26.54	29.11	-0.40	-0.58	47.06	0.51	0.03	47.65	78.0	2
2683	SpliceT	End	69.75	2.45	0.03	-0.02	1842.26	-22.66	1.8	-26.54	29.11	-0.40	-0.56	47.40	0.49	0.03	47.97	80.1	2
2683	SpliceT	Origin	69.75	2.45	0.03	-0.02	1842.26	-22.66	1.8	-27.45	29.32	-0.39	-0.58	47.40	0.49	0.03	47.99	80.1	2
2683	Splice	End	72.38	1.85	0.02	-0.02	1919.23	-23.69	1.8	-27.45	29.32	-0.39	-0.58	49.44	0.49	0.03	50.03	83.5	2
2683	Splice	Origin	72.38	1.85	0.02	-0.02	1919.23	-23.70	1.8	-28.38	29.48	-0.39	-0.60	49.44	0.49	0.03	50.05	83.5	2
2683	2683:WVGD1	End	75.00	1.33	0.02	-0.01	1996.61	-24.72	1.8	-28.38	29.48	-0.39	-0.59	49.50	0.49	0.02	50.10	84.6	2
2683	2683:WVGD1	Origin	75.00	1.33	0.02	-0.01	1996.61	-24.73	1.8	-29.84	29.96	-0.39	-0.62	49.50	0.49	0.02	50.13	84.6	2
2683	Tube 3	End	80.00	0.59	0.01	-0.00	2146.42	-26.68	1.8	-29.84	29.96	-0.39	-0.60	49.58	0.48	0.02	50.19	86.6	2
2683	Tube 3	Origin	80.00	0.59	0.01	-0.00	2146.42	-26.68	1.8	-30.84	30.25	-0.39	-0.62	49.58	0.48	0.02	50.21	86.7	2
2683	Tube 3	End	85.00	0.15	0.00	-0.00	2297.67	-28.62	1.8	-30.84	30.25	-0.39	-0.60	49.57	0.46	0.02	50.18	88.6	2
2683	Tube 3	Origin	85.00	0.15	0.00	-0.00	2297.67	-28.63	1.8	-31.86	30.55	-0.39	-0.62	49.57	0.47	0.02	50.20	88.6	2
2683	2683:g	End	90.00	0.00	0.00	0.00	2450.40	-30.56	1.8	-31.86	30.55	-0.39	-0.60	49.49	0.45	0.02	50.09	90.6	2

Detailed Tubular Davit Arm Usages for Load Case "NESC Extreme":

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.
Davit1	Davit1:O	Origin	0.00	50.95	0.57	-0.76	0.57	0.27	0.0	-0.97	-0.12	-0.06	-0.16	0.47	0.04	0.00	0.63	1.0	1
Davit1	Davit1:End	End	4.74	52.83	0.60	4.13	-0.00	0.00	0.0	-0.97	-0.12	-0.06	-0.28	0.00	0.08	0.00	0.31	0.5	1
Davit2	Davit2:O	Origin	0.00	50.86	0.56	-2.58	-4.17	-0.07	0.0	1.13	0.88	0.02	0.18	3.09	0.28	0.00	3.31	5.1	1
Davit2	Davit2:End	End	4.74	52.30	0.57	-7.65	0.00	0.00	0.0	1.13	0.88	0.02	0.33	0.00	0.51	0.00	0.95	1.5	1
Davit3	Davit3:O	Origin	0.00	44.99	0.51	-0.42	-2.59	0.70	0.0	-1.59	0.36	-0.08	-0.11	0.50	0.05	0.00	0.62	0.9	1
Davit3	#Davit3:0	End	4.45	46.30	0.54	4.25	-1.00	0.35	0.0	-1.59	0.36	-0.08	-0.15	0.36	0.07	0.00	0.52	0.8	1
Davit3	#Davit3:0	Origin	4.45	46.30	0.54	4.25	-1.00	0.35	0.0	-1.54	0.22	-0.08	-0.15	0.36	0.04	0.00	0.51	0.8	1
Davit3	Davit3:End	End	8.90	47.60	0.56	8.91	-0.00	0.00	0.0	-1.54	0.22	-0.08	-0.22	0.00	0.07	0.00	0.25	0.4	1
Davit4	Davit4:O	Origin	0.00	44.90	0.50	-2.37	-10.91	-0.25	-0.0	1.38	1.31	0.03	0.10	2.03	0.18	0.00	2.15	3.3	1
Davit4	#Davit4:0	End	4.45	45.78	0.50	-7.16	-5.10	-0.13	-0.0	1.38	1.31	0.03	0.13	1.74	0.25	0.00	1.92	3.0	1
Davit4	#Davit4:0	Origin	4.45	45.78	0.50	-7.16	-5.10	-0.13	0.0	1.41	1.15	0.03	0.13	1.74	0.22	0.00	1.91	2.9	1
Davit4	Davit4:End	End	8.90	46.66	0.50	-11.96	0.00	0.00	0.0	1.41	1.15	0.03	0.20	0.00	0.33	0.00	0.61	0.9	1
Davit5	Davit5:O	Origin	0.00	31.66	0.37	0.16	-3.76	0.95	0.0	-1.63	0.42	-0.08	-0.11	0.72	0.06	0.00	0.84	1.3	1
Davit5	#Davit5:0	End	5.00	33.01	0.40	4.65	-1.65	0.56	0.0	-1.63	0.42	-0.08	-0.14	0.53	0.08	0.00	0.69	1.1	1
Davit5	#Davit5:0	Origin	5.00	33.01	0.40	4.65	-1.65	0.56	0.0	-1.57	0.28	-0.08	-0.14	0.53	0.05	0.00	0.68	1.0	1
Davit5	#Davit5:1	End	8.52	33.96	0.42	7.82	-0.67	0.28	0.0	-1.57	0.28	-0.08	-0.17	0.34	0.06	0.00	0.52	0.8	1
Davit5	#Davit5:1	Origin	8.52	33.96	0.42	7.82	-0.67	0.28	0.0	-1.54	0.19	-0.08	-0.17	0.34	0.05	0.00	0.51	0.8	1
Davit5	Davit5:End	End	12.05	34.90	0.44	10.98	-0.00	0.00	0.0	-1.54	0.19	-0.08	-0.22	0.00	0.06	0.00	0.25	0.4	1
Davit6	Davit6:O	Origin	0.00	31.59	0.37	-1.80	-16.01	-0.34	-0.0	1.32	1.46	0.03	0.09	2.98	0.20	0.00	3.09	4.8	1
Davit6	#Davit6:0	End	5.00	32.58	0.37	-6.42	-8.70	-0.20	-0.0	1.32	1.46	0.03	0.12	2.64	0.26	0.00	2.80	4.3	1
Davit6	#Davit6:0	Origin	5.00	32.58	0.37	-6.42	-8.70	-0.20	-0.0	1.35	1.29	0.03	0.12	2.64	0.23	0.00	2.79	4.3	1
Davit6	#Davit6:1	End	8.52	33.29	0.37	-9.70	-4.15	-0.10	-0.0	1.35	1.29	0.03	0.15	1.95	0.28	0.00	2.16	3.3	1
Davit6	#Davit6:1	Origin	8.52	33.29	0.37	-9.70	-4.15	-0.10	0.0	1.37	1.18	0.03	0.15	1.95	0.26	0.00	2.15	3.3	1
Davit6	Davit6:End	End	12.05	34.00	0.37	-13.00	0.00	0.00	0.0	1.37	1.18	0.03	0.20	0.00	0.34	0.00	0.63	1.0	1
Davit7	Davit7:O	Origin	0.00	22.20	0.27	0.43	-2.98	0.70	0.0	-1.58	0.40	-0.08	-0.11	0.57	0.06	0.00	0.69	1.1	1
Davit7	#Davit7:0	End	4.45	23.08	0.29	3.76	-1.18	0.35	0.0	-1.58	0.40	-0.08	-0.15	0.42	0.08	0.00	0.58	0.9	1
Davit7	#Davit7:0	Origin	4.45	23.08	0.29	3.76	-1.18	0.35	0.0	-1.53	0.27	-0.08	-0.14	0.42	0.05	0.00	0.57	0.9	1
Davit7	Davit7:End	End	8.90	23.96	0.31	7.09	-0.00	0.00	0.0	-1.53	0.27	-0.08	-0.22	0.00	0.08	0.00	0.26	0.4	1
Davit8	Davit8:O	Origin	0.00	22.14	0.26	-1.39	-11.25	-0.25	-0.0	1.35	1.35	0.03	0.09	2.09	0.19	0.00	2.21	3.4	1
Davit8	#Davit8:0	End	4.45	22.81	0.26	-4.79	-5.26	-0.12	-0.0	1.35	1.35	0.03	0.13	1.80	0.25	0.00	1.97	3.0	1
Davit8	#Davit8:0	Origin	4.45	22.81	0.26	-4.79	-5.26	-0.12	0.0	1.38	1.18	0.03	0.13	1.80	0.22	0.00	1.96	3.0	1
Davit8	Davit8:End	End	8.90	23.48	0.27	-8.22	0.00	0.00	0.0	1.38	1.18	0.03	0.20	0.00	0.34	0.00	0.63	1.0	1

Summary of Clamp Capacities and Usages for Load Case "NESC Extreme":

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 %
Clamp1	0.964	80.00	80.00	1.21	0.00	0.00	0.00	1.21
Clamp2	1.414	80.00	80.00	1.77	0.00	0.00	0.00	1.77
Clamp3	1.532	80.00	80.00	1.91	0.00	0.00	0.00	1.91
Clamp4	1.780	80.00	80.00	2.22	0.00	0.00	0.00	2.22

Clamp5	1.532	80.00	80.00	1.91	0.00	0.00	0.00	1.91
Clamp6	1.780	80.00	80.00	2.22	0.00	0.00	0.00	2.22
Clamp7	1.532	80.00	80.00	1.91	0.00	0.00	0.00	1.91
Clamp8	1.780	80.00	80.00	2.22	0.00	0.00	0.00	2.22
Clamp9	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp10	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp11	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp12	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp13	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp14	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp15	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp17	28.264	80.00	80.00	35.33	0.00	0.00	0.00	35.33
Clamp18	18.599	80.00	80.00	23.25	0.00	0.00	0.00	23.25
Clamp19	0.188	80.00	80.00	0.24	0.00	0.00	0.00	0.24
Clamp20	15.638	80.00	80.00	19.55	0.00	0.00	0.00	19.55
Clamp21	15.638	80.00	80.00	19.55	0.00	0.00	0.00	19.55

*** Analysis Results for Load Case No. 3 "NESC Extreme Long" - Number of iterations in SAPS 16

Equilibrium Joint Positions and Rotations for Load Case "NESC Extreme Long":

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)
2683:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
2683:t	3.245	0.03244	-0.08199	-0.0483	4.0312	0.0080	3.245	0.03244	89.92
2683:Arm1	3.169	0.03152	-0.07932	-0.0483	4.0312	0.0080	3.169	0.03152	88.84
2683:TopConn	3.034	0.0299	-0.07457	-0.0474	4.0308	0.0079	3.034	0.0299	86.93
2683:WVGD8	2.894	0.02823	-0.06962	-0.0466	4.0162	0.0078	2.894	0.02823	84.93
2683:Arm2	2.789	0.027	-0.06594	-0.0461	3.9887	0.0077	2.789	0.027	83.43
2683:BCT	2.381	0.02235	-0.05205	-0.0413	3.7634	0.0069	2.381	0.02235	77.45
2683:BotConn	2.348	0.02199	-0.05097	-0.0409	3.7377	0.0069	2.348	0.02199	76.95
2683:BCB	2.316	0.02163	-0.0499	-0.0406	3.7108	0.0068	2.316	0.02163	76.45
2683:WVGD7	2.219	0.02056	-0.04679	-0.0396	3.6286	0.0067	2.219	0.02056	74.95
2683:Arm3	1.944	0.01751	-0.03827	-0.0368	3.3777	0.0063	1.944	0.01751	70.46
2683:WVGD6	1.635	0.01417	-0.02944	-0.0318	3.0639	0.0054	1.635	0.01417	64.97
2683:Arm4	1.355	0.01129	-0.02223	-0.0275	2.7480	0.0047	1.355	0.01129	59.48
2683:WVGD5	1.149	0.009257	-0.01741	-0.0234	2.4909	0.0039	1.149	0.009257	54.98
2683:WVGD4	0.7581	0.005724	-0.009531	-0.0168	1.9883	0.0027	0.7581	0.005724	44.99
2683:WVGD3	0.4524	0.00323	-0.00464	-0.0117	1.5090	0.0019	0.4524	0.00323	35
2683:WVGD2	0.2282	0.00155	-0.001907	-0.0076	1.0566	0.0012	0.2282	0.00155	25
2683:WVGD1	0.08102	0.0005256	-0.0006008	-0.0042	0.6216	0.0006	0.08102	0.0005256	15
Davit1:O	3.169	0.03152	-0.07862	-0.0483	4.0312	0.0080	3.169	-0.7987	88.84
Davit1:End	3.276	0.03137	-0.08286	-0.0311	4.0339	0.0147	3.276	-5.299	90.34
Davit2:O	3.169	0.03152	-0.08002	-0.0483	4.0312	0.0080	3.169	0.8617	88.84
Davit2:End	3.273	0.03452	-0.09271	-0.0840	4.0335	0.0038	3.273	5.365	90.33
Davit3:O	2.789	0.027	-0.06523	-0.0461	3.9887	0.0077	2.789	-0.8658	83.43
Davit3:End	2.93	0.02699	-0.07025	-0.0188	3.9907	0.0144	2.93	-9.536	85.43
Davit4:O	2.789	0.027	-0.06666	-0.0461	3.9887	0.0077	2.789	0.9198	83.43
Davit4:End	2.926	0.03039	-0.08619	-0.0825	3.9904	0.0030	2.926	9.593	85.41
Davit5:O	1.944	0.01751	-0.0376	-0.0368	3.3777	0.0063	1.944	-1.025	70.46
Davit5:End	2.124	0.01666	-0.04636	0.0144	3.3819	0.0196	2.124	-12.7	73.45
Davit6:O	1.944	0.01751	-0.03894	-0.0368	3.3777	0.0063	1.944	1.061	70.46
Davit6:End	2.119	0.0227	-0.06439	-0.1050	3.3813	-0.0035	2.119	12.74	73.44
Davit7:O	1.355	0.01129	-0.02167	-0.0275	2.7480	0.0047	1.355	-1.159	59.48
Davit7:End	1.453	0.01119	-0.0245	-0.0002	2.7499	0.0113	1.453	-9.829	61.48
Davit8:O	1.355	0.01129	-0.02279	-0.0275	2.7480	0.0047	1.355	1.181	59.48
Davit8:End	1.45	0.01348	-0.03464	-0.0639	2.7495	-0.0001	1.45	9.854	61.47

Joint Support Reactions for Load Case "NESC Extreme Long":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
2683:g	-22.49	0.0	-0.03	0.0	0.0	-33.76	0.0	0.0	40.57	0.0	11.00	0.0	-1786.1	0.0	0.0	-1.27	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Extreme Long":

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.

2683	2683:t	Origin	0.00	0.39	38.94	-0.98	0.00	0.00	0.0	-0.04	0.00	-0.03	-0.00	0.00	0.00	0.00	0.00	0.0	1
2683	2683:Arm1	End	1.08	0.38	38.03	-0.95	0.00	-0.03	0.0	-0.04	0.00	-0.03	-0.00	0.00	0.00	0.00	0.01	0.0	3
2683	2683:Arm1	Origin	1.08	0.38	38.03	-0.95	1.66	-0.39	0.1	-1.08	0.00	-0.46	-0.05	0.21	0.04	0.01	0.28	0.4	2
2683	2683:TopConn	End	3.00	0.36	36.41	-0.89	1.66	-1.27	0.1	-1.08	0.00	-0.46	-0.05	0.24	0.04	0.01	0.30	0.5	2
2683	2683:TopConn	Origin	3.00	0.36	36.41	-0.89	1.66	-1.27	0.1	0.77	-0.00	-28.74	0.04	0.18	2.85	0.01	4.95	7.6	1
2683	2683:WVGD8	End	5.00	0.34	34.72	-0.84	1.66	-58.76	0.1	0.77	-0.00	-28.74	0.04	6.17	1.07	0.01	6.48	10.0	3
2683	2683:WVGD8	Origin	5.00	0.34	34.72	-0.84	1.66	-58.76	0.1	0.48	-0.00	-28.94	0.02	6.17	1.07	0.01	6.47	10.0	3
2683	2683:Arm2	End	6.50	0.32	33.46	-0.79	1.65	-102.17	0.1	0.48	-0.00	-28.94	0.02	10.26	1.05	0.01	10.45	16.1	3
2683	2683:Arm2	Origin	6.50	0.32	33.46	-0.79	4.02	-103.25	0.4	-1.82	-0.00	-29.99	-0.08	10.47	1.09	0.02	10.73	16.5	3
2683	Tube 1	End	9.50	0.30	30.98	-0.71	4.02	-193.22	0.4	-1.82	-0.00	-29.99	-0.08	17.99	1.05	0.02	18.16	27.9	3
2683	Tube 1	Origin	9.50	0.30	30.98	-0.71	4.02	-193.22	0.4	-2.11	0.00	-30.14	-0.09	17.99	1.05	0.02	18.18	28.0	3
2683	2683:BCT	End	12.50	0.27	28.57	-0.62	4.02	-283.65	0.4	-2.11	0.00	-30.14	-0.09	24.44	1.01	0.02	24.59	37.8	3
2683	2683:BCT	Origin	12.50	0.27	28.57	-0.62	4.02	-283.65	0.4	-1.26	-0.00	-45.84	-0.05	24.44	1.54	0.02	24.64	37.9	3
2683	2683:BotConn	End	13.00	0.26	28.18	-0.61	4.02	-306.57	0.4	-1.26	-0.00	-45.84	-0.05	26.08	1.53	0.02	26.27	40.4	3
2683	2683:BotConn	Origin	13.00	0.26	28.18	-0.61	4.02	-306.57	0.4	-10.73	0.01	-29.82	-0.45	26.08	1.00	0.02	26.59	40.9	3
2683	2683:BCB	End	13.50	0.26	27.79	-0.60	4.02	-321.48	0.4	-10.73	0.01	-29.82	-0.45	27.01	0.99	0.02	27.52	42.3	3
2683	2683:BCB	Origin	13.50	0.26	27.79	-0.60	4.02	-321.48	0.4	-11.84	0.01	-14.26	-0.50	27.01	0.47	0.02	27.52	42.3	3
2683	2683:WVGD7	End	15.00	0.25	26.63	-0.56	4.04	-342.87	0.4	-11.84	0.01	-14.26	-0.49	27.78	0.47	0.02	28.28	43.5	3
2683	2683:WVGD7	Origin	15.00	0.25	26.63	-0.56	4.04	-342.87	0.4	-12.62	0.01	-14.68	-0.52	27.78	0.48	0.02	28.31	43.6	3
2683	2683:Arm3	End	19.50	0.21	23.33	-0.46	4.09	-408.95	0.4	-12.62	0.01	-14.68	-0.49	29.83	0.46	0.02	30.34	46.7	3
2683	2683:Arm3	Origin	19.50	0.21	23.33	-0.46	7.23	-410.83	0.9	-15.31	0.01	-16.01	-0.60	30.06	0.50	0.04	30.68	47.2	3
2683	Tube 1	End	22.25	0.19	21.43	-0.40	7.27	-454.85	0.9	-15.31	0.01	-16.01	-0.58	31.29	0.48	0.03	31.88	49.1	3
2683	Tube 1	Origin	22.25	0.19	21.43	-0.40	7.27	-454.85	0.9	-15.60	0.01	-16.13	-0.59	31.29	0.48	0.03	31.89	49.1	3
2683	2683:WVGD6	End	25.00	0.17	19.61	-0.35	7.31	-499.20	0.9	-15.60	0.01	-16.13	-0.57	32.35	0.47	0.03	32.93	50.7	3
2683	2683:WVGD6	Origin	25.00	0.17	19.61	-0.35	7.31	-499.20	0.9	-16.38	0.01	-16.54	-0.60	32.35	0.48	0.03	32.96	50.7	3
2683	Tube 1	End	27.75	0.15	17.89	-0.31	7.35	-544.69	0.9	-16.38	0.01	-16.54	-0.59	33.30	0.47	0.03	33.90	52.2	3
2683	Tube 1	Origin	27.75	0.15	17.89	-0.31	7.35	-544.69	0.9	-16.69	0.01	-16.67	-0.60	33.30	0.47	0.03	33.91	52.2	3
2683	2683:Arm4	End	30.50	0.14	16.26	-0.27	7.39	-590.53	0.9	-16.69	0.01	-16.67	-0.58	34.13	0.46	0.03	34.72	54.0	3
2683	2683:Arm4	Origin	30.50	0.14	16.26	-0.27	9.81	-591.53	1.3	-19.21	0.02	-17.72	-0.67	34.24	0.49	0.04	34.92	54.4	3
2683	SpliceT	End	34.83	0.11	13.88	-0.21	9.88	-668.31	1.3	-19.21	0.02	-17.72	-0.64	35.50	0.47	0.04	36.15	57.5	3
2683	SpliceT	Origin	34.83	0.11	13.88	-0.21	9.88	-668.31	1.3	-19.49	0.02	-17.82	-0.65	35.50	0.47	0.04	36.16	57.5	3
2683	2683:WVGD5	End	35.00	0.11	13.79	-0.21	9.88	-671.28	1.3	-19.49	0.02	-17.82	-0.55	31.15	0.40	0.03	31.71	48.8	3
2683	2683:WVGD5	Origin	35.00	0.11	13.79	-0.21	9.88	-671.28	1.3	-20.48	0.02	-18.22	-0.58	31.15	0.41	0.03	31.74	48.8	3
2683	SpliceB	End	39.00	0.09	11.79	-0.17	9.95	-744.16	1.3	-20.48	0.02	-18.22	-0.56	31.94	0.40	0.03	32.51	50.0	3
2683	SpliceB	Origin	39.00	0.09	11.79	-0.17	9.95	-744.16	1.3	-21.18	0.02	-18.40	-0.58	31.94	0.40	0.03	32.53	50.0	3
2683	Tube 2	End	42.00	0.08	10.39	-0.14	10.00	-799.36	1.3	-21.18	0.02	-18.40	-0.56	32.43	0.39	0.03	33.00	50.8	3
2683	Tube 2	Origin	42.00	0.08	10.39	-0.14	10.00	-799.36	1.3	-21.61	0.02	-18.56	-0.57	32.43	0.39	0.03	33.01	50.8	3
2683	2683:WVGD4	End	45.00	0.07	9.10	-0.11	10.05	-855.02	1.3	-21.61	0.02	-18.56	-0.56	32.84	0.38	0.03	33.41	51.4	3
2683	2683:WVGD4	Origin	45.00	0.07	9.10	-0.11	10.05	-855.02	1.3	-22.69	0.02	-19.05	-0.59	32.84	0.39	0.03	33.43	51.4	3
2683	Tube 2	End	50.00	0.05	7.14	-0.08	10.14	-950.25	1.3	-22.69	0.02	-19.05	-0.56	33.42	0.37	0.02	33.99	52.3	3
2683	Tube 2	Origin	50.00	0.05	7.14	-0.08	10.14	-950.25	1.3	-23.46	0.02	-19.32	-0.58	33.42	0.38	0.02	34.00	52.3	3
2683	2683:WVGD3	End	55.00	0.04	5.43	-0.06	10.23	-1046.85	1.3	-23.46	0.02	-19.32	-0.56	33.83	0.36	0.02	34.40	54.0	3
2683	2683:WVGD3	Origin	55.00	0.04	5.43	-0.06	10.23	-1046.85	1.3	-24.75	0.02	-19.88	-0.59	33.83	0.37	0.02	34.43	54.0	3
2683	Tube 2	End	60.00	0.03	3.96	-0.04	10.33	-1146.25	1.3	-24.75	0.02	-19.88	-0.56	34.16	0.36	0.02	34.74	55.6	3
2683	Tube 2	Origin	60.00	0.03	3.96	-0.04	10.32	-1146.25	1.3	-25.57	0.02	-20.18	-0.58	34.16	0.36	0.02	34.75	55.7	3
2683	2683:WVGD2	End	65.00	0.02	2.74	-0.02	10.43	-1247.13	1.3	-25.57	0.02	-20.18	-0.56	34.39	0.35	0.02	34.96	57.2	3
2683	2683:WVGD2	Origin	65.00	0.02	2.74	-0.02	10.42	-1247.13	1.3	-26.90	0.02	-20.75	-0.59	34.39	0.36	0.02	34.99	57.2	3
2683	SpliceT	End	69.75	0.01	1.79	-0.01	10.53	-1345.68	1.3	-26.90	0.02	-20.75	-0.57	34.56	0.35	0.02	35.13	58.7	3
2683	SpliceT	Origin	69.75	0.01	1.79	-0.01	10.52	-1345.68	1.3	-27.75	0.02	-20.98	-0.59	34.56	0.35	0.02	35.15	58.7	3
2683	Splice	End	72.38	0.01	1.35	-0.01	10.58	-1400.75	1.3	-27.75	0.02	-20.98	-0.59	36.01	0.35	0.02	36.60	61.1	3
2683	Splice	Origin	72.38	0.01	1.35	-0.01	10.58	-1400.75	1.3	-28.64	0.02	-21.15	-0.61	36.01	0.35	0.02	36.62	61.1	3
2683	2683:WVGD1	End	75.00	0.01	0.97	-0.01	10.64	-1456.27	1.3	-28.64	0.02	-21.15	-0.60	36.03	0.35	0.02	36.63	61.9	3
2683	2683:WVGD1	Origin	75.00	0.01	0.97	-0.01	10.64	-1456.27	1.3	-30.05	0.02	-21.66	-0.63	36.03	0.36	0.02	36.66	61.9	3
2683	Tube 3	End	80.00	0.00	0.43	-0.00	10.76	-1564.57	1.3	-30.05	0.02	-21.66	-0.60	36.06	0.34	0.02	36.67	63.3	3
2683	Tube 3	Origin	80.00	0.00	0.43	-0.00	10.75	-1564.57	1.3	-30.97	0.02	-21.99	-0.62	36.06	0.35	0.02	36.69	63.3	3
2683	Tube 3	End	85.00	0.00	0.11	-0.00	10.88	-1674.49	1.3	-30.97	0.02	-21.99	-0.60	36.04	0.34	0.01	36.64	64.7	3
2683	Tube 3	Origin	85.00	0.00	0.11	-0.00	10.87	-1674.49	1.3	-31.93	0.02	-22.32	-0.62	36.04	0.34	0.01	36.66	64.7	3
2683	2683:g	End	90.00	0.00	0.00	0.00	11.01	-1786.11	1.3	-31.93	0.02	-22.32	-0.60	35.98	0.33	0.01	36.58	66.2	3

Detailed Tubular Davit Arm Usages for Load Case "NESC Extreme Long":

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.
Davit1	Davit1:O	Origin	0.00	0.38	38.03	-0.94	-1.27	0.61	0.0	-0.09	0.27	-0.13	-0.01	1.04	0.10	0.00	1.07	1.6	1
Davit1	Davit1:End	End	4.74	0.38	39.31	-0.99	-0.00	-0.00	0.0	-0.09	0.27	-0.13	-0.03	0.00	0.17	0.00	0.30	0.5	1
Davit2	Davit2:O	Origin	0.00	0.38	38.03	-0.96	-2.67	-0.49	-0.0	-0.19	0.56	0.10	-0.03	2.01	0.18	0.00	2.07	3.2	1
Davit2	Davit2:End	End	4.74	0.41	39.28	-1.11	-0.00	0.00	-0.0	-0.19	0.56	0.10	-0.05	0.00	0.33	0.00	0.58	0.9	1
Davit3	Davit3:O	Origin	0.00	0.32	33.47	-0.78	-6.63	2.50	0.0	-0.19	0.82	-0.37	-0.01	1.32	0.13	0.00	1.35	2.1	1
Davit3	#Davit3:0	End	4.45	0.33	34.31	-0.81	-2.99	0.85	0.0	-0.19	0.82	-0.37	-0.02	1.06	0.17	0.00	1.12	1.7	1
Davit3	#Davit3:0	Origin	4.45	0.33	34.31	-0.81	-2.99	0.85	0.0	-0.16	0.67	-0.19	-0.01	1.06	0.13	0.00	1.10	1.7	1
Davit3	Davit3:End	End	8.90	0.32	35.16	-0.84	-0.00	-0.00	0.0	-0.16	0.67	-0.19	-0.02	0.00	0.20	0.00	0.35	0.5	1
Davit4	Davit4:O	Origin	0.00	0.32	33.46	-0.80	-8.77	-2.19	-0.0	-0.25	1.06	0.34	-0.02	1.68	0.15	0.00	1.72	2.6	1
Davit4	#Davit4:0	End	4.45	0.34	34.29	-0.91	-4.06	-0.69	-0.0	-0.25	1.06	0.34	-0.02	1.41	0.21	0.00	1.48	2.3	1
Davit4	#Davit4:0	Origin	4.45	0.34	34.29	-0.91	-4.06	-0.69	-0.0	-0.21	0.91	0.16	-0.02	1.41	0.17	0.00	1.46	2.2	1
Davit4	Davit4:End	End	8.90	0.36	35.11	-1.03	-0.00	0.00	-0.0	-0.21	0.91	0.16	-0.03	0.00	0.27	0.00	0.47	0.7	1
Davit5	Davit5:O	Origin	0.00	0.21	23.33	-0.45	-9.49	3.94	0.0	-0.24	0.91	-0.47	-0.02	1.91	0.14	0.00	1.94	3.0	1
Davit5	#Davit5:0	End	5.00	0.21	24.22	-0.48	-4.95	1.58	0.0	-0.24	0.91	-0.47	-0.02	1.58	0.18	0.00	1.63	2.5	1
Davit5	#Davit5:0	Origin	5.00	0.21	24.22	-0.48	-4.95	1.58	0.0	-0.19	0.75	-0.28	-0.02	1.58	0.14	0.00	1.62	2.5	1
Davit5	#Davit5:1	End	8.52	0.21	24.85	-0.51	-2.30	0.58	0.0	-0.19	0.75	-0.28	-0.02	1.11	0.18	0.00	1.18	1.8	1
Davit5	#Davit5:1	Origin	8.52	0.21	24.85	-0.51	-2.30	0.58	0.0	-0.17	0.65	-0.16	-0.02	1.11	0.15	0.00	1.16	1.8	1
Davit5	Davit5:End	End	12.05	0.20	25.48	-0.56	-0.00	-0.00	0.0	-0.17	0.65	-0.16	-0.02	0.00	0.20	0.00	0.34	0.5	1
Davit6	Davit6:O	Origin	0.00	0.21	23.33	-0.47	-12.37	-3.48	-0.0	-0.30	1.15	0.43	-0.02	2.39	0.17	0.00	2.43	3.7	1
Davit6	#Davit6:0	End	5.00	0.23	24.20	-0.57	-6.64	-1.31	-0.0	-0.30	1.15	0.43	-0.03	2.05	0.22	0.00	2.12	3.3	1
Davit6	#Davit6:0	Origin	5.00	0.23	24.20	-0.57	-6.64	-1.31	-0.0	-0.25	0.99	0.25	-0.02	2.05	0.18	0.00	2.10	3.2	1
Davit6	#Davit6:1	End	8.52	0.25	24.81	-0.67	-3.14	-0.44	-0.0	-0.25	0.99	0.25	-0.03	1.49	0.23	0.00	1.57	2.4	1
Davit6	#Davit6:1	Origin	8.52	0.25	24.81	-0.67	-3.14	-0.44	-0.0	-0.23	0.89	0.13	-0.03	1.49	0.20	0.00	1.55	2.4	1
Davit6	Davit6:End	End	12.05	0.27	25.43	-0.77	-0.00	0.00	-0.0	-0.23	0.89	0.13	-0.03	0.00	0.26	0.00	0.46	0.7	1
Davit7	Davit7:O	Origin	0.00	0.14	16.27	-0.26	-6.67	2.37	0.0	-0.19	0.82	-0.35	-0.01	1.32	0.13	0.00	1.35	2.1	1
Davit7	#Davit7:0	End	4.45	0.14	16.85	-0.27	-3.00	0.79	0.0	-0.19	0.82	-0.35	-0.02	1.06	0.17	0.00	1.12	1.7	1
Davit7	#Davit7:0	Origin	4.45	0.14	16.85	-0.27	-3.00	0.79	0.0	-0.16	0.68	-0.18	-0.01	1.06	0.13	0.00	1.10	1.7	1
Davit7	Davit7:End	End	8.90	0.13	17.43	-0.29	-0.00	-0.00	0.0	-0.16	0.68	-0.18	-0.02	0.00	0.20	0.00	0.35	0.5	1
Davit8	Davit8:O	Origin	0.00	0.14	16.26	-0.27	-8.81	-2.01	-0.0	-0.25	1.06	0.31	-0.02	1.68	0.15	0.00	1.72	2.6	1
Davit8	#Davit8:0	End	4.45	0.15	16.83	-0.34	-4.07	-0.61	-0.0	-0.25	1.06	0.31	-0.02	1.41	0.21	0.00	1.47	2.3	1
Davit8	#Davit8:0	Origin	4.45	0.15	16.83	-0.34	-4.07	-0.61	-0.0	-0.21	0.92	0.14	-0.02	1.41	0.17	0.00	1.46	2.2	1
Davit8	Davit8:End	End	8.90	0.16	17.40	-0.42	-0.00	0.00	-0.0	-0.21	0.92	0.14	-0.03	0.00	0.27	0.00	0.47	0.7	1

Summary of Clamp Capacities and Usages for Load Case "NESC Extreme Long":

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 %
Clamp1	0.255	80.00	80.00	0.32	0.00	0.00	0.00	0.32
Clamp2	0.558	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp3	0.639	80.00	80.00	0.80	0.00	0.00	0.00	0.80
Clamp4	0.878	80.00	80.00	1.10	0.00	0.00	0.00	1.10

Clamp5	0.639	80.00	80.00	0.80	0.00	0.00	0.00	0.80
Clamp6	0.878	80.00	80.00	1.10	0.00	0.00	0.00	1.10
Clamp7	0.639	80.00	80.00	0.80	0.00	0.00	0.00	0.80
Clamp8	0.878	80.00	80.00	1.10	0.00	0.00	0.00	1.10
Clamp9	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp10	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp11	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp12	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp13	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp14	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp15	0.563	80.00	80.00	0.70	0.00	0.00	0.00	0.70
Clamp17	28.264	80.00	80.00	35.33	0.00	0.00	0.00	35.33
Clamp18	18.599	80.00	80.00	23.25	0.00	0.00	0.00	23.25
Clamp19	0.188	80.00	80.00	0.24	0.00	0.00	0.00	0.24
Clamp20	15.638	80.00	80.00	19.55	0.00	0.00	0.00	19.55
Clamp21	15.638	80.00	80.00	19.55	0.00	0.00	0.00	19.55

*** 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)
2683	90.63	NESC Extreme	2.5	29	13920.9

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 %
2683	NESC Heavy	1	1.833	0.713	0.713	1.833	19.000	11.320	26.884	1	72.144	1.361	3.000	20.58
2683	NESC Heavy	2	0.713	-1.833	1.833	-0.713	19.000	11.482	27.269	1	-73.177	1.371	3.000	20.88
2683	NESC Heavy	3	-0.792	-1.800	0.792	-1.800	19.000	24.395	57.939	2	-82.839	1.998	3.000	44.36
2683	NESC Heavy	4	-1.833	-0.713	-0.713	-1.833	19.000	9.569	22.725	1	-60.984	1.251	3.000	17.40
2683	NESC Heavy	5	-0.713	1.833	-1.833	0.713	19.000	13.233	31.428	1	84.337	1.472	3.000	24.06
2683	NESC Heavy	6	0.792	1.800	-0.792	1.800	19.000	27.741	65.886	2	94.000	2.131	3.000	50.44
2683	NESC Heavy	7	1.477	1.497	0.014	2.103	19.000	26.968	64.048	3	91.052	2.101	3.000	49.03
2683	NESC Heavy	8	0.014	-2.103	1.477	-1.497	19.000	26.106	62.001	3	-85.762	2.067	3.000	47.46
2683	NESC Heavy	9	-1.477	-1.497	-0.014	-2.103	19.000	23.405	55.587	3	-79.891	1.957	3.000	42.55
2683	NESC Heavy	10	-0.014	2.103	-1.477	1.497	19.000	29.668	70.462	3	96.923	2.203	3.000	53.94
2683	NESC Extreme	1	1.833	0.713	0.713	1.833	19.000	13.632	32.375	1	86.879	1.494	3.000	24.78
2683	NESC Extreme	2	0.713	-1.833	1.833	-0.713	19.000	13.980	33.202	1	-89.097	1.512	3.000	25.42
2683	NESC Extreme	3	-0.792	-1.800	0.792	-1.800	19.000	30.758	73.051	2	-103.509	2.243	3.000	55.92
2683	NESC Extreme	4	-1.833	-0.713	-0.713	-1.833	19.000	12.785	30.364	1	-81.481	1.446	3.000	23.24
2683	NESC Extreme	5	-0.713	1.833	-1.833	0.713	19.000	14.827	35.213	1	94.495	1.558	3.000	26.96
2683	NESC Extreme	6	0.792	1.800	-0.792	1.800	19.000	32.377	76.895	2	108.906	2.302	3.000	58.87
2683	NESC Extreme	7	1.477	1.497	0.014	2.103	19.000	32.153	76.362	3	107.065	2.294	3.000	58.46
2683	NESC Extreme	8	0.014	-2.103	1.477	-1.497	19.000	32.116	76.276	3	-105.334	2.292	3.000	58.39
2683	NESC Extreme	9	-1.477	-1.497	-0.014	-2.103	19.000	30.430	72.270	3	-101.667	2.231	3.000	55.33
2683	NESC Extreme	10	-0.014	2.103	-1.477	1.497	19.000	33.839	80.369	3	110.732	2.353	3.000	61.53
2683	NESC Extreme Long	1	1.833	0.713	0.713	1.833	19.000	34.435	81.783	1	-219.467	2.374	3.000	62.61
2683	NESC Extreme Long	2	0.713	-1.833	1.833	-0.713	19.000	34.559	82.078	1	-220.258	2.378	3.000	62.83
2683	NESC Extreme Long	3	-0.792	-1.800	0.792	-1.800	19.000	16.133	38.317	2	56.038	1.625	3.000	29.33
2683	NESC Extreme Long	4	-1.833	-0.713	-0.713	-1.833	19.000	35.283	83.797	1	224.870	2.403	3.000	64.15
2683	NESC Extreme Long	5	-0.713	1.833	-1.833	0.713	19.000	35.407	84.091	1	225.660	2.407	3.000	64.38
2683	NESC Extreme Long	6	0.792	1.800	-0.792	1.800	19.000	16.133	38.317	2	56.984	1.625	3.000	29.33
2683	NESC Extreme Long	7	1.477	1.497	0.014	2.103	19.000	48.288	114.684	3	-219.467	2.811	3.000	87.80
2683	NESC Extreme Long	8	0.014	-2.103	1.477	-1.497	19.000	48.577	115.370	3	-220.258	2.819	3.000	88.32
2683	NESC Extreme Long	9	-1.477	-1.497	-0.014	-2.103	19.000	50.013	118.780	3	224.870	2.861	3.000	90.93
2683	NESC Extreme Long	10	-0.014	2.103	-1.477	1.497	19.000	50.301	119.466	3	225.660	2.869	3.000	91.46

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
Davit1	1.72	NESC Heavy	89.7	1	77.9
Davit2	11.27	NESC Heavy	89.7	1	77.9
Davit3	3.08	NESC Heavy	84.0	1	321.0
Davit4	6.70	NESC Heavy	84.0	1	321.0

Davit5	4.15	NESC Heavy	71.1	1	434.7
Davit6	9.38	NESC Heavy	71.1	1	434.7
Davit7	3.20	NESC Heavy	60.0	1	321.0
Davit8	6.76	NESC Heavy	60.0	1	321.0

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	82.11	2683	Steel Pole
NESC Extreme	90.63	2683	Steel Pole
NESC Extreme Long	91.46	2683	Base Plate

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Height AGL (ft)	Segment Number
NESC Heavy	82.11	2683	2.5	29
NESC Extreme	90.63	2683	2.5	29
NESC Extreme Long	66.19	2683	2.5	29

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 Heavy	2683	10	19.000	66.961	2023.539	-48.925	29.668	70.462	3	96.923	2.203	53.94
NESC Extreme	2683	10	19.000	32.385	2450.404	-30.559	33.839	80.369	3	110.732	2.353	61.53
NESC Extreme Long	2683	10	19.000	32.416	11.006	-1786.108	50.301	119.466	3	225.660	2.869	91.46

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Height AGL (ft)	Segment Number
NESC Heavy	11.27	Davit2	89.7	1
NESC Extreme	5.10	Davit2	89.7	1
NESC Extreme Long	3.74	Davit6	71.1	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	2.41	NESC Heavy	0.0
Clamp2	Clamp	3.19	NESC Heavy	0.0
Clamp3	Clamp	3.37	NESC Heavy	0.0
Clamp4	Clamp	3.57	NESC Heavy	0.0
Clamp5	Clamp	3.37	NESC Heavy	0.0
Clamp6	Clamp	3.57	NESC Heavy	0.0

Clamp7	Clamp	3.37	NESC Heavy	0.0
Clamp8	Clamp	3.57	NESC Heavy	0.0
Clamp9	Clamp	2.30	NESC Heavy	0.0
Clamp10	Clamp	2.30	NESC Heavy	0.0
Clamp11	Clamp	2.30	NESC Heavy	0.0
Clamp12	Clamp	2.30	NESC Heavy	0.0
Clamp13	Clamp	2.30	NESC Heavy	0.0
Clamp14	Clamp	2.30	NESC Heavy	0.0
Clamp15	Clamp	2.30	NESC Heavy	0.0
Clamp17	Clamp	35.33	NESC Extreme	0.0
Clamp18	Clamp	23.29	NESC Heavy	0.0
Clamp19	Clamp	0.86	NESC Heavy	0.0
Clamp20	Clamp	41.77	NESC Heavy	0.0
Clamp21	Clamp	41.77	NESC Heavy	0.0

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 Heavy	Clamp1	Clamp	Davit1:End	0.105	1.715	0.871	1.926
NESC Heavy	Clamp2	Clamp	Davit2:End	0.021	2.103	1.449	2.554
NESC Heavy	Clamp3	Clamp	Davit3:End	0.124	2.183	1.581	2.698
NESC Heavy	Clamp4	Clamp	Davit4:End	0.033	2.006	2.028	2.853
NESC Heavy	Clamp5	Clamp	Davit5:End	0.124	2.183	1.581	2.698
NESC Heavy	Clamp6	Clamp	Davit6:End	0.033	2.006	2.028	2.853
NESC Heavy	Clamp7	Clamp	Davit7:End	0.124	2.183	1.581	2.698
NESC Heavy	Clamp8	Clamp	Davit8:End	0.033	2.006	2.028	2.853
NESC Heavy	Clamp9	Clamp	2683:WVGD1	0.000	0.119	1.840	1.844
NESC Heavy	Clamp10	Clamp	2683:WVGD2	0.000	0.119	1.840	1.844
NESC Heavy	Clamp11	Clamp	2683:WVGD3	0.000	0.119	1.840	1.844
NESC Heavy	Clamp12	Clamp	2683:WVGD4	0.000	0.119	1.840	1.844
NESC Heavy	Clamp13	Clamp	2683:WVGD5	0.000	0.119	1.840	1.844
NESC Heavy	Clamp14	Clamp	2683:WVGD6	0.000	0.119	1.840	1.844
NESC Heavy	Clamp15	Clamp	2683:WVGD7	0.000	0.119	1.840	1.844
NESC Heavy	Clamp17	Clamp	2683:TopConn	0.000	9.336	0.000	9.336
NESC Heavy	Clamp18	Clamp	2683:BotConn	0.000	-5.434	17.820	18.630
NESC Heavy	Clamp19	Clamp	2683:WVGD8	0.000	0.055	0.688	0.690
NESC Heavy	Clamp20	Clamp	2683:BCT	0.000	33.413	0.000	33.413
NESC Heavy	Clamp21	Clamp	2683:BCB	0.000	-33.413	0.000	33.413
NESC Extreme	Clamp1	Clamp	Davit1:End	0.057	0.930	0.249	0.964
NESC Extreme	Clamp2	Clamp	Davit2:End	0.015	1.299	0.558	1.414
NESC Extreme	Clamp3	Clamp	Davit3:End	0.078	1.392	0.634	1.532
NESC Extreme	Clamp4	Clamp	Davit4:End	0.027	1.548	0.878	1.780
NESC Extreme	Clamp5	Clamp	Davit5:End	0.078	1.392	0.634	1.532
NESC Extreme	Clamp6	Clamp	Davit6:End	0.027	1.548	0.878	1.780
NESC Extreme	Clamp7	Clamp	Davit7:End	0.078	1.392	0.634	1.532
NESC Extreme	Clamp8	Clamp	Davit8:End	0.027	1.548	0.878	1.780
NESC Extreme	Clamp9	Clamp	2683:WVGD1	0.000	0.260	0.499	0.563
NESC Extreme	Clamp10	Clamp	2683:WVGD2	0.000	0.260	0.499	0.563
NESC Extreme	Clamp11	Clamp	2683:WVGD3	0.000	0.260	0.499	0.563
NESC Extreme	Clamp12	Clamp	2683:WVGD4	0.000	0.260	0.499	0.563
NESC Extreme	Clamp13	Clamp	2683:WVGD5	0.000	0.260	0.499	0.563
NESC Extreme	Clamp14	Clamp	2683:WVGD6	0.000	0.260	0.499	0.563
NESC Extreme	Clamp15	Clamp	2683:WVGD7	0.000	0.260	0.499	0.563
NESC Extreme	Clamp17	Clamp	2683:TopConn	0.000	28.264	0.000	28.264
NESC Extreme	Clamp18	Clamp	2683:BotConn	0.000	-16.624	8.340	18.599

NESC Extreme	Clamp19	Clamp	2683:WVGD8	0.000	0.102	0.158	0.188
NESC Extreme	Clamp20	Clamp	2683:BCT	0.000	15.638	0.000	15.638
NESC Extreme	Clamp21	Clamp	2683:BCB	0.000	-15.638	0.000	15.638
NESC Extreme Long	Clamp1	Clamp	Davit1:End	0.057	0.000	0.249	0.255
NESC Extreme Long	Clamp2	Clamp	Davit2:End	0.015	0.000	0.558	0.558
NESC Extreme Long	Clamp3	Clamp	Davit3:End	0.078	0.000	0.634	0.639
NESC Extreme Long	Clamp4	Clamp	Davit4:End	0.027	0.000	0.878	0.878
NESC Extreme Long	Clamp5	Clamp	Davit5:End	0.078	0.000	0.634	0.639
NESC Extreme Long	Clamp6	Clamp	Davit6:End	0.027	0.000	0.878	0.878
NESC Extreme Long	Clamp7	Clamp	Davit7:End	0.078	0.000	0.634	0.639
NESC Extreme Long	Clamp8	Clamp	Davit8:End	0.027	0.000	0.878	0.878
NESC Extreme Long	Clamp9	Clamp	2683:WVGD1	0.260	0.000	0.499	0.563
NESC Extreme Long	Clamp10	Clamp	2683:WVGD2	0.260	0.000	0.499	0.563
NESC Extreme Long	Clamp11	Clamp	2683:WVGD3	0.260	0.000	0.499	0.563
NESC Extreme Long	Clamp12	Clamp	2683:WVGD4	0.260	0.000	0.499	0.563
NESC Extreme Long	Clamp13	Clamp	2683:WVGD5	0.260	0.000	0.499	0.563
NESC Extreme Long	Clamp14	Clamp	2683:WVGD6	0.260	0.000	0.499	0.563
NESC Extreme Long	Clamp15	Clamp	2683:WVGD7	0.260	0.000	0.499	0.563
NESC Extreme Long	Clamp17	Clamp	2683:TopConn	28.264	0.000	0.000	28.264
NESC Extreme Long	Clamp18	Clamp	2683:BotConn	-16.624	0.000	8.340	18.599
NESC Extreme Long	Clamp19	Clamp	2683:WVGD8	0.102	0.000	0.158	0.188
NESC Extreme Long	Clamp20	Clamp	2683:BCT	15.638	0.000	0.000	15.638
NESC Extreme Long	Clamp21	Clamp	2683:BCB	-15.638	0.000	0.000	15.638

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 Heavy	21.175	0.597	44.535	1755.722	-46.011	-3.370
NESC Extreme	24.611	0.387	17.334	2144.427	-29.663	-1.862
NESC Extreme Long	0.000	13.949	17.334	9.483	-1314.791	-1.862

*** Weight of structure (lbs):
Weight of Tubular Davit Arms: 2309.3
Weight of Steel Poles: 13920.9
Total: 16230.2

*** End of Report

Anchor Bolt Analysis:

Input Data:

Bolt Force:

Maximum Tensile Force = $T_{Max} := 226 \cdot kips$ (User Input from PLS-Pole)

Maximum Shear Force at Base = $V_{base} := 31 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use ASTM A615 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 Yield 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 = $V_{Max} := \frac{V_{base}}{N} = 2.6 \cdot kips$

Shear Stress per Bolt = $f_v := \frac{V_{Max}}{A_s} = 795.4\, psi$

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 = $F_{tv} := F_t \cdot \sqrt{1 - \left(\frac{f_v}{F_v}\right)^2} = 74.98 \cdot ksi$

Bolt Tension % of Capacity = $\frac{T_{Max}}{F_{tv} \cdot A_s} = 92.81 \cdot \%$

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

Condition1 = "OK"

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CTL02185	DATE:	4/4/2022	RF DESIGN ENG:	Mateen Mohammed
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	5107767382
REVISION:	Preliminary	RF MANAGER:	John Benedetto	RF DESIGN EMAIL:	mm093q@att.com

INITIATIVE PROJECT:
AWS3 J (10 MHz) Band 66
PCS MHz A3+A4 (10Mhz) E-UTRA Band 2
700 MHz UPPER D (10 MHz) Band 14
700 MHz LOWER_B+C (10 MHz) E-UTRA Band 17
850 MHz BL+BH (10MHz) E-UTRA Band 5

RF PERF ENG:		RFDS PROGRAM TYPE:	2023 LTE Next Carrier		
RF PERF PHONE:		RFDS TECHNOLOGY:	LTE		
RF PERF EMAIL:		STATE/STATUS:	Final/Approved		
ADDITIONAL WORKFLOW NOTIFICATIONS:		RFDS ID:	5109874		
RFDS VERSION:	2.00	Created By:	mm093q	Updated By:	mm093q
UMTS FREQUENCY:		Created:	4/4/2022	Updated:	10/7/2022
LTE FREQUENCY:	700,1900,AWS,WCS	Estimated SQIN:	10,344	Expiration:	
5G FREQUENCY:	850,1900,AWS	RER Initiative:		Calculation ID:	20220928180519249З
IPLAN JOB # 1:	ER_-RCTB-22-00219	PRD || SUB GRP #1:	LTE Next Carrier || LTE 3C		
IPLAN JOB # 2:	ER_-RCTB-22-00434	PRD || SUB GRP #2:	Cell Site RF Modifications || 5G NR Software Upgrade		
IPLAN JOB # 3:	ER_-RCTB-22-00244	PRD || SUB GRP #3:	LTE Next Carrier || LTE 4C		
IPLAN JOB # 4:	ER_-RCTB-22-00330	PRD || SUB GRP #4:	5G NR Radio || 5G NR 1DR-1		
IPLAN JOB # 5:	ER_-RCTB-22-00387	PRD || SUB GRP #5:	Antenna Modifications || 4TX4RX Software Retrofit		
IPLAN JOB # 6:		PRD || SUB GRP #6:			
IPLAN JOB # 7:		PRD || SUB GRP #7:			
IPLAN JOB # 8:		PRD || SUB GRP #8:			
IPLAN JOB # 9:		PRD || SUB GRP #9:			
IPLAN JOB #10:		PRD || SUB GRP #10:			
IPLAN JOB # 11:		PRD || SUB GRP #11:			
IPLAN JOB # 12:		PRD || SUB GRP #12:			
IPLAN JOB # 13:		PRD || SUB GRP #13:			
IPLAN JOB # 14:		PRD || SUB GRP #14:			
IPLAN JOB # 15:		PRD || SUB GRP #15:			
IPLAN JOB # 16:		PRD || SUB GRP #16:			

Section 2 - LOCATION INFORMATION

USID:	60437	FA LOCATION CODE:	10035273	LOCATION NAME:	BROOKFIELD STATION RD
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT
ADDRESS:	761 FEDERAL ROAD	CITY:	BROOKFIELD	STATE:	CT
ZIP CODE:	06804	COUNTY:	FAIRFIELD	LONG (DEC. DEG.):	-73.4083050
LATITUDE (D-M-S):	41d 28m 43.572s	LONGITUDE (D-M-S):	-73d -24m -29.898s	LAT (DEC. DEG.):	41.4787700

DIRECTIONS, ACCESS AND EQUIPMENT LOCATION: 2185 BROOKFIELD TAKE ROUTE 84 WEST TO EXIT 9 ROUTE 25 RIGHT ON RT 25, FOLLOW ROUTE 25 TO ROUTE 7, LEFT ON ROUTE 7 CELL SITE UNDER POWER LINES ON THE LEFT.

ORACLE PRJT # 1:	2051A1478M	PACE JOB #1:	MRCTB062167		
ORACLE PRJT # 2:	2051A148FF	PACE JOB #2:	MRCTB062352		
ORACLE PRJT # 3:	2051A148JV	PACE JOB #3:	MRCTB062202		
ORACLE PRJT # 4:	2051A14710	PACE JOB #4:	MRCTB062344		
ORACLE PRJT # 5:	2051A147JR	PACE JOB #5:	MRCTB062386		
ORACLE PRJT # 6:		PACE JOB #6:			
ORACLE PRJT # 7:		PACE JOB #7:			
ORACLE PRJT # 8:		PACE JOB #8:			
ORACLE PRJT # 9:		PACE JOB #9:			
ORACLE PRJT # 10:		PACE JOB #10:			
ORACLE PRJT # 11:		PACE JOB #11:			
ORACLE PRJT # 12:		PACE JOB #12:			
ORACLE PRJT # 13:		PACE JOB #13:			
ORACLE PRJT # 14:		PACE JOB #14:			
ORACLE PRJT # 15:		PACE JOB #15:			
ORACLE PRJT # 16:		PACE JOB #16:			
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):	05995		
RF DISTRICT:	TBD				
RF ZONE:	TBD	RNC(UMTS):	BRIDGEPORT RNC03		
		MME POOL ID(LTE):	FF01		
PARENT NAME(UMTS):	BRPTCT04CR0R03				

Section 3 - LICENSE COVERAGE/FILING INFORMATION

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

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	No	GROUND ELEVATION (ft):		STRUCTURE TYPE:	UTILITY	MARKET LOCATION 700 MHz Band:	
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):	0.00	FCC ASR NUMBER:		MARKET LOCATION 850 MHz Band:	On-Air
SUB-LEASE RIGHTS?:	No	STRUCTURE HEIGHT (ft):	85.00			MARKET LOCATION 1900 MHz Band:	On-Air
LIGHTING TYPE:	NOT REQUIRED					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:	290905	218836	401293	363954
TECHNOLOGY:	UMTS	UMTS	UMTS	LTE
BBU NAME:	CTU2185	CTV2185	CTV6185	CTL02185
BBU USID:	60437	60437	60437	60437
CELL ID / BCF:	CTV2185	CTV2185	CTV6185	CTL02185
BTA/TID:	321W	321U	321W	321L
4-9 DIGIT SITE ID:	2185	2185	6185	02185
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	INTERNAL
BASE STATION TYPE:	OVERLAY	BASE	OVERLAY	BASE
EQUIPMENT NAME:	BROOKFIELD STATION RD	BROOKFIELD STATION RD	BROOKFIELD - STATION ROAD	BROOKFIELD STATION RD
DISASTER PRIORITY:	0	0	0	3
EQUIPMENT VENDOR:	ERICSSON	ERICSSON	ERICSSON	ERICSSON
EQUIPMENT TYPE (Model):				6601 INDOOR MU
BASEBAND CONFIGURATION :				
MARKET STATE CODE:				CT
NODE B NUMBER:	0	0	0	2185
SIDEHAUL SWITCH VENDOR:				
SIDEHAUL SWITCH MODEL:				
SIDEHAUL SWITCH NAME:				
SIDEHAUL SWITCH ADDITIONAL CARDS:				
UL-CoMP:				
CSS - CTS COMMON ID:	CTU2185	CTV2185	CTV6185	CTL02185
CSS - SECONDARY FUNCTION ID:				

Section 6/7 - BBU INFORMATION - final

	BBU 1	BBU 2
BBU ID:	363954	0
TECHNOLOGY:	LTE	LTE,5G
BBU NAME:	CTL02185	CTL06185R,CTCN002185
BBU USID:	60437	60437
CELL ID / BCF:	CTL02185	CTCN002185
BTA/TID:	321L	
4-9 DIGIT SITE ID:	02185	14002185
COW OR TOY?:	No	No
CELL SITE TYPE:	SECTORIZED	SECTORIZED
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL
BTS LOCATION ID:	INTERNAL	INTERNAL
BASE STATION TYPE:	BASE	OVERLAY
EQUIPMENT NAME:	BROOKFIELD STATION RD	CTCN002185
DISASTER PRIORITY:	3	0
EQUIPMENT VENDOR:	ERICSSON	ERICSSON
EQUIPMENT TYPE (Model):	6601 RADIONODE 5216	BASEBAND 6630
BASEBAND CONFIGURATION :	1x6601 / 1x5216 / 1x0MU + IDLe	xxxxx / 1x6630 / xxxxx
MARKET STATE CODE:	CT	CT,CTC
NODE B NUMBER:	2185	6185,2185
SIDEHAUL SWITCH VENDOR:		
SIDEHAUL SWITCH MODEL:		
SIDEHAUL SWITCH NAME:		
SIDEHAUL SWITCH ADDITIONAL CARDS:		
UL-CoMP:		
CSS - CTS COMMON ID:	CTL02185	
CSS - SECONDARY FUNCTION ID:		

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	CTU2185	CTV2185	CTV6185	CTL02185
Soft Sector IDs	CTU21857	CTV21851	CTV6185A	CTL02185_7A_1
	CTU21858	CTV21852	CTV6185B	CTL02185_7B_1
	CTU21859	CTV21853	CTV6185C	CTL02185_7C_1
				CTL02185_9A_1
				CTL02185_9A_2
				CTL02185_9B_1
				CTL02185_9B_2
				CTL02185_9C_1
				CTL02185_9C_2

Section 8 - RBS/SECTOR ASSOCIATION - final

	BBU 1	BBU 2
CTS Common ID	CTL02185	CTL06185R,CTCN002185
Soft Sector IDs	CTL02185_7A_1	CTCN002185_N002A_1
	CTL02185_7A_3_F	CTCN002185_N002B_1
	CTL02185_7B_1	CTCN002185_N002C_1
	CTL02185_7B_3_F	CTCN002185_N005A_1
	CTL02185_7C_1	CTCN002185_N005B_1
	CTL02185_7C_3_F	CTCN002185_N005C_1
		CTCN002185_N066A_1
		CTCN002185_N066B_1
		CTCN002185_N066C_1
		CTL06185_2A_2
		CTL06185_2B_2
		CTL06185_2C_2
		CTL06185_9A_1
		CTL06185_9A_2
		CTL06185_9B_1
		CTL06185_9B_2
		CTL06185_9C_1
		CTL06185_9C_2

Section 9 - SOFT SECTOR ID - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900	LTE 4TH 1900	LTE 4TH AWS	LTE 5TH 700	5G 1ST 850	5G 1ST 1900	5G 1ST AWS
USEID (excluding Hard Sector)	60437.850.3G.1	60437.1900.3G.2	60437.850.3G.2									
SECTOR A SOFT SECTOR ID	CTV21851	CTU21857	CTV6185A	CTL02185_7A_1	CTL02185_9A_1	CTL02185_9A_2						
SECTOR B	CTV21852	CTU21858	CTV6185B	CTL02185_7B_1	CTL02185_9B_1	CTL02185_9B_2						
SECTOR C	CTV21853	CTU21859	CTV6185C	CTL02185_7C_1	CTL02185_9C_1	CTL02185_9C_2						
SECTOR D												
SECTOR E												
SECTOR F												
OMNI												

Section 9 - SOFT SECTOR ID - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900	LTE 4TH 1900	LTE 4TH AWS	LTE 5TH 700	5G 1ST 850	5G 1ST 1900	5G 1ST AWS
USEID (excluding Hard Sector)												
SECTOR A SOFT SECTOR ID				CTL02185_7A_1	CTL06185_9A_1		CTL06185_9A_2	CTL06185_2A_2	CTL02185_7A_3_F	CTCN002185_N005	CTCN002185_N002	CTCN002185_N066A_1
SECTOR B				CTL02185_7B_1	CTL06185_9B_1		CTL06185_9B_2	CTL06185_2B_2	CTL02185_7B_3_F	CTCN002185_N005	CTCN002185_N002	CTCN002185_N066B_1
SECTOR C				CTL02185_7C_1	CTL06185_9C_1		CTL06185_9C_2	CTL06185_2C_2	CTL02185_7C_3_F	CTCN002185_N005	CTCN002185_N002	CTCN002185_N066C_1
SECTOR D												
SECTOR E												
SECTOR F												
OMNI												

Section 9 - Cell Number - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900	LTE 4TH 1900	LTE 4TH AWS	LTE 5TH 700	5G 1ST 850	5G 1ST 1900	5G 1ST AWS
USEID (excluding Hard Sector)	60437.850.3G.1	60437.1900.3G.2	60437.850.3G.2									
SECTOR A CELL NUMBER				15	8	178						
SECTOR B				16	9	179						
SECTOR C				17	10	180						
SECTOR D												
SECTOR E												
SECTOR F												
OMNI												

Section 9 - Cell Number - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900	LTE 4TH 1900	LTE 4TH AWS	LTE 5TH 700	5G 1ST 850	5G 1ST 1900	5G 1ST AWS
USEID (excluding Hard Sector)												
SECTOR A CELL NUMBER				15	8		178	192	171	25	26	27
SECTOR B				16	9		179	193	172	49	50	51
SECTOR C				17	10		180	194	173	73	74	75
SECTOR D												
SECTOR E												
SECTOR F												
OMNI												

Section 10 - CID/SAC - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900	LTE 4TH 1900	LTE 4TH AWS	LTE 5TH 700	5G 1ST 850	5G 1ST 1900	5G 1ST AWS
SECTOR A CID/SAC	21851	21857	61851									
SECTOR B	21852	21858	61852									
SECTOR C	21853	21859	61853									
SECTOR D												
SECTOR E												
SECTOR F												
OMNI												

Section 10 - CID/SAC - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 1900	LTE 2ND 1900	LTE 4TH 1900	LTE 4TH AWS	LTE 5TH 700	5G 1ST 850	5G 1ST 1900	5G 1ST AWS
SECTOR A CID/SAC												
SECTOR B												
SECTOR C												
SECTOR D												
SECTOR E												

SECTOR F												
OMNI												

Section 11 - CURRENT RADIO COUNTS existing

	UMTS 1ST 850	UMTS 2ND 1900	UMTS 3RD 850																					
SECTOR A RADIO COUNTS	1	1	1																					
SECTOR B	1	1	1																					
SECTOR C	1	1	1																					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

Section 12 - CURRENT T1 COUNTS existing

Section 13 - NEW/PROPOSED RADIO COUNTS

	UMTS 1ST 850	UMTS 2ND 1900	UMTS 3RD 850																					
SECTOR A RADIO COUNTS	1	1	1																					
SECTOR B	1	1	1																					
SECTOR C	1	1	1																					
SECTOR D																								
SECTOR E																								
SECTOR F																								
OMNI																								

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	7770		OPA-65R-LCUU-H6						
ANTENNA VENDOR	Powerwave		CCI Antennas						
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X9						
ANTENNA WEIGHT	35		57						
AZIMUTH	120		30						
MAGNETIC DECLINATION									
RADIATION CENTER (feet)	97		97						
ANTENNA TIP HEIGHT									
MECHANICAL DOWNTILT	0		0						
FEEDER AMOUNT	2		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)	2	POWERWAVE DB							
SURGE ARRESTOR (QTY/MODEL)			6	APTDC-BDFDM-DBW					
DIPLEXER (QTY/MODEL)	2	LGP 21901	4	Kaelus DBC2055F1V1-2					
DUPLEXER (QTY/MODEL)									
Antenna RET CONTROL UNIT (QTY/MODEL)	1	POWERWAVE 7070		LTE RRH					
DC BLOCK (QTY/MODEL)									
TMA/LNA (QTY/MODEL)	2	LGP 21401	2	DTMABP7819VG12A					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	POLYPHASER 1000860		BUILT-IN					
PDU FOR TMAS (QTY/MODEL)	1	LGP 12104							
FILTER (QTY/MODEL)									
SQUID (QTY/MODEL)									
FIBER TRUNK (QTY/MODEL)									
DC TRUNK (QTY/MODEL)									
REPEATER (QTY/MODEL)									
RRH - 700 band (QTY/MODEL)			1	RRUS-11 B12					
RRH - 850 band (QTY/MODEL)									
RRH - 1900 band (QTY/MODEL)			2	RRUS-12 B2					
RRH - AWS band (QTY/MODEL)									
RRH - WCS band (QTY/MODEL)									
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)									
Additional Component 2 (QTY/MODEL)									
Additional Component 3 (QTY/MODEL)									
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 1	PORT 1			CTV21851	CTV21851		UMTS 850	7770.00.850.04	13		4	None	RFS 1-1/4"	120	RxAit 850	1	850 LLC	No		262.42		1	
	PORT 2			CTV6185A	CTV6185A		UMTS 850	7770.00.850.04	13		4	BOTTOM	RFS 1-1/4"	120	RxAit 850	1	850 LLC	No		262.42		2	
	PORT 3			CTU21857	CTU21857		UMTS 1900	7770.00.1900.00	15		0	None	RFS 1-1/4"	120		0		No		395.37		1	
	PORT 5			321G21851	321G21851		GSM 850	7770.00.850.04	13		4	None	RFS 1-1/4"	120	RxAit 850	1	850 LLC	No		262.42		1	
ANTENNA POSITION 2	PORT 1		60437.A700.4G.1	CTL02185_7A_1	CTL02185_7A_1		LTE 700	H6_716MHz_08DT	13	30	8	BOTTOM	RFS 1-1/4"	120				No		756.83		3	
	PORT 3		60437.A1900.4G.111	CTL02185_9A_1	CTL02185_9A_1		LTE 1900	H6_1930MHz_02DT	16.85	30	2	BOTTOM	RFS 1-1/4"	120				No		2152.78		3	
	PORT 4			CTL02185_9A_2	CTL02185_9A_2		LTE 1900	H6_1930MHz_02DT	16.85	30	2	BOTTOM	RFS 1-1/4"	120				No		2152.78		3	

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	7770		OPA-65R-LCUU-H6											
ANTENNA VENDOR	Powerwave		CCI Antennas											
ANTENNA SIZE (H x W x D)	55X11X5		72X14.8X9											
ANTENNA WEIGHT	35		57											
AZIMUTH	240		150											
MAGNETIC DECLINATION														
RADIATION CENTER (feet)	97		97											
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT	0		0											
FEEDER AMOUNT	2		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)	2	POWERWAVE DB												
SURGE ARRESTOR (QTY/MODEL)			6	APTDC-BDFDM-DBW										
DIPLEXER (QTY/MODEL)	2	LGP 21901	4	Kaelus DBC2055F1V1-2										
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				LTE RRH										
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)	2	LGP 21401	2	DTMABP7819VG12A										
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2	POLYPHASER 1000860		BUILT-IN										
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	RRUS-11 B12										
RRH - 850 band (QTY/MODEL)														
RRH - 1900 band (QTY/MODEL)			2	RRUS-12 B2										
RRH - AWS band (QTY/MODEL)														
RRH - WCS band (QTY/MODEL)														
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)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
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 1	PORT 1			CTV21852	CTV21852		UMTS 850	7770.00.850.03	13		3	None	RFS 1-1/4"	120	RxAit 850	1	850 LLC	No		262.42		9	
	PORT 2			CTV21852	CTV2185B		UMTS 850	7770.00.850.03	13		3	BOTTOM	RFS 1-1/4"	120	RxAit 850	1	850 LLC	No		262.42		10	
	PORT 3			CTU21858	CTU21858		UMTS 1900	7770.00.1900.00	15		0	None	RFS 1-1/4"	120		0		No		395.37		9	
	PORT 5			321G21852	321G21852		GSM 850	7770.00.850.03	13		3	None	RFS 1-1/4"	120	RxAit 850	1	850 LLC	No		262.42		9	
ANTENNA POSITION 2	PORT 1		60437.B.700.4G.1	CTL02185_7B_1	CTL02185_7B_1		LTE 700	H6_700MHz_02DT	13	150	2	BOTTOM	RFS 1-1/4"	120				No		756.83		11	
	PORT 3		60437.B.1900.4G.111	CTL02185_9B_1	CTL02185_9B_1		LTE 1900	H6_1930MHz_02DT	16.85	150	2	BOTTOM	RFS 1-1/4"	120				No		2233.57		11	
	PORT 4			CTL02185_9B_2	CTL02185_9B_2		LTE 1900	H6_1930MHz_02DT	16.85	150	2	BOTTOM	RFS 1-1/4"	120				No		2233.57		11	

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	7770		OPA-65R-LCUU-H6						
ANTENNA VENDOR	Powerwave		CCI Antennas						
ANTENNA SIZE (H x W x D	55X11X5		72X14.8X9						
ANTENNA WEIGHT	35		57						
AZIMUTH	0		270						
MAGNETIC DECLINATION									
RADIATION CENTER (feet)	97		97						
ANTENNA TIP HEIGHT									
MECHANICAL DOWNTILT	0		0						
FEEDER AMOUNT	2		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	2	POWERWAVE DB							
SURGE ARRESTOR (QTY/MODEL			6	APTDC-BDFDM-DBW					
DIPLEXER (QTY/MODEL	2	LGP 21901	4	Kaelus DBC2055F1V1-2					
DUPLEXER (QTY/MODEL									
Antenna RET CONTROL UNIT (QTY/MODEL				LTE RRH					
DC BLOCK (QTY/MODEL									
TMA/LNA (QTY/MODEL	2	LGP 21401	2	DTMABP7819VG12A					
CURRENT INJECTORS FOR TMA (QTY/MODEL	2	POLYPHASER 1000860		BUILT-IN					
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	RRUS-11 B12					
RRH - 850 band (QTY/MODEL									
RRH - 1900 band (QTY/MODEL			2	RRUS-12 B2					
RRH - AWS band (QTY/MODEL									
RRH - WCS band (QTY/MODEL									
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									
Additional Component 2 (QTY/MODEL									
Additional Component 3 (QTY/MODEL									
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 1	PORT 1			CTU21853	CTU21853		UMTS 850	7770.00.850.03	13		3	None	RFS 1-1/4"	120	RxAit 850	1	850 LLC	No		262.42		17	
	PORT 2			CTU6185C	CTU6185C		UMTS 850	7770.00.850.03	13		3	BOTTOM	RFS 1-1/4"	120	RxAit 850	1	850 LLC	No		262.42		18	
	PORT 3			CTU21859	CTU21859		UMTS 1900	7770.00.1900.00	15		0	None	RFS 1-1/4"	120		0		No		395.37		17	
	PORT 5			321G21853	321G21853		GSM 850	7770.00.850.03	13		3	None	RFS 1-1/4"	120	RxAit 850	1	850 LLC	No		262.42		17	
ANTENNA POSITION 2	PORT 1		60437.C.700.4G.1	CTL02185_7C_1	CTL02185_7C_1		LTE 700	H6_700MHz_02DT	13	270	2	BOTTOM	RFS 1-1/4"	120				No		756.83		19	
	PORT 3		60437.C.1900.4G.111	CTL02185_9C_1	CTL02185_9C_1		LTE 1900	H6_1930MHz_02DT	16.85	270	2	BOTTOM	RFS 1-1/4"	120				No		2233.57		19	
	PORT 4			CTL02185_9C_2	CTL02185_9C_2		LTE 1900	H6_1930MHz_02DT	16.85	270	2	BOTTOM	RFS 1-1/4"	120				No		2233.57		19	

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?														
ANTENNA MAKE - MODEL			OPA65R-BU6DA				TPA65R-BU6DA-K							
ANTENNA VENDOR			CCI				CCI							
ANTENNA SIZE (H x W x D)			71.2X21X7.8				71.2X20.7X7.7							
ANTENNA WEIGHT			60.2				69							
AZIMUTH			30				30							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)			97				97							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT			0				0							
FEEDER AMOUNT			2											
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)														
SURGE ARRESTOR (QTY/MODEL)			4	TSXDC-4310FM			12	TSXDC-4310FM						
DIPLEXER (QTY/MODEL)							2	CBC61923T-DS						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				RRH CONTROLLED				RRH CONTROLLED						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)			2	TMABPD7823VG 12A			2	TMA2124F03V5-1D						
CURRENT INJECTORS FOR TMA (QTY/MODEL)				AISG Equipment			2	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	4478 B14			1	4449 B5/B12						
RRH - 850 band (QTY/MODEL)								with another band						
RRH - 1900 band (QTY/MODEL)							1	8843 B2/B66A						
RRH - AWS band (QTY/MODEL)								with another band						
RRH - WCS band (QTY/MODEL)														
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)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	// Add/Swap RRH at bottom with SA, Add BT. // Add 2 Coax,													
Local Market Note 2														
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 || xxxx / 1x6630 Mixed-Mode / xxxx + IDLe													

PORT SPECIFIC FIELDS	PORT NUMBER	USID (CSSng)	USID (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			CTL02185_7A_3_F	CTL02185_7A_3_F		LTE 700	BU6DA_716MHz_08DT	13	30	8	BOTTOM	RFS 1-1/4"	120				No					
ANTENNA POSITION 4	PORT 1			CTL02185_7A_1	CTL02185_7A_1		LTE 700	K_716MHz_08DT	13	30	8	BOTTOM	RFS 1-1/4"	120				No					
	PORT 3			CTL06185_9A_1	CTL06185_9A_1		LTE 1900	K_1930MHz_02DT	16.85	30	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 4			CTL06185_9A_2	CTL06185_9A_2		LTE 1900	K_1930MHz_02DT	16.85	30	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 5			CTCN002185_N005A_1	CTCN002185_N005A_1		5G 850	K_716MHz_08DT	13	30	8	BOTTOM	RFS 1-1/4"	120				No					
	PORT 7			CTL06185_2A_2	CTL06185_2A_2		LTE AWS	K_2170MHz_03DT	13	30	3	BOTTOM	RFS 1-1/4"	120				No					
	PORT 11			CTCN002185_N066A_1	CTCN002185_N066A_1		5G AWS	K_2170MHz_03DT	13	30	3	BOTTOM	RFS 1-1/4"	120				No					
	PORT 12			CTCN002185_N002A_1	CTCN002185_N002A_1		5G 1900	K_2170MHz_03DT	13	30	3	BOTTOM	RFS 1-1/4"	120				No					

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?														
ANTENNA MAKE - MODEL			OPA65R-BU6DA				TPA65R-BU6DA-K							
ANTENNA VENDOR			CCI				CCI							
ANTENNA SIZE (H x W x D)			71.2X21X7.8				71.2X20.7X7.7							
ANTENNA WEIGHT			60.2				69							
AZIMUTH			150				150							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)			97				97							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT			0				0							
FEEDER AMOUNT			2											
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)														
SURGE ARRESTOR (QTY/MODEL)			4	TSXDC-4310FM			12	TSXDC-4310FM						
DIPLEXER (QTY/MODEL)							2	CBC61923T-DS						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				RRH CONTROLLED				RRH CONTROLLED						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)			2	TMABPD7823VG 12A			2	TMA2124F03V5-1D						
CURRENT INJECTORS FOR TMA (QTY/MODEL)				AISG Equipment			4	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	4478 B14			1	4449 B5/B12						
RRH - 850 band (QTY/MODEL)								with another band						
RRH - 1900 band (QTY/MODEL)							1	8843 B2/B66A						
RRH - AWS band (QTY/MODEL)								with another band						
RRH - WCS band (QTY/MODEL)														
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)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	// Add/Swap RRH at bottom with SA, Add BT. // Add 2 Coax,													
Local Market Note 2														
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 || xxxxx / 1x6630 Mixed-Mode / xxxxx + 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			CTL02185_7B_3_F	CTL02185_7B_3_F		LTE 700	BU6DA_700MHz_02DT	13	150	2	BOTTOM	RFS 1-1/4"	120				No					

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 4	PORT 1			CTL02185_7B_1	CTL02185_7B_1		LTE 700	K_700MHz_02DT	13	150	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 3			CTL06185_9B_1	CTL06185_9B_1		LTE 1900	K_1930MHz_02DT	16.85	150	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 4			CTL06185_9B_2	CTL06185_9B_2		LTE 1900	K_1930MHz_02DT	16.85	150	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 5			CTCN002185_N005B_1	CTCN002185_N005B_1		5G 850	K_700MHz_02DT	13	150	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 7			CTL06185_2B_2	CTL06185_2B_2		LTE AWS	K_2170MHz_03DT	13	150	3	BOTTOM	RFS 1-1/4"	120				No					
	PORT 11			CTCN002185_N066B_1	CTCN002185_N066B_1		5G AWS	K_2170MHz_03DT	13	150	3	BOTTOM	RFS 1-1/4"	120				No					
	PORT 12			CTCN002185_N002B_1	CTCN002185_N002B_1		5G 1900	K_2170MHz_03DT	13	150	3	BOTTOM	RFS 1-1/4"	120				No					

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?														
ANTENNA MAKE - MODEL			OPA65R-BU6DA				TPA65R-BU6DA-K							
ANTENNA VENDOR			CCI				CCI							
ANTENNA SIZE (H x W x D)			71.2X21X7.8				71.2X20.7X7.7							
ANTENNA WEIGHT			60.2				69							
AZIMUTH			270				270							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)			97				97							
ANTENNA TIP HEIGHT														
MECHANICAL DOWNTILT			0				0							
FEEDER AMOUNT			2											
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)														
SURGE ARRESTOR (QTY/MODEL)			4	TSXDC-4310FM			12	TSXDC-4310FM						
DIPLEXER (QTY/MODEL)							2	CBC61923T-DS						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				RRH CONTROLLED				RRH CONTROLLED						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)			2	TMABPD7823VG 12A			2	TMA2124F03V5-1D						
CURRENT INJECTORS FOR TMA (QTY/MODEL)				AISG Equipment			4	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	4478 B14			1	4449 B5/B12						
RRH - 850 band (QTY/MODEL)								with another band						
RRH - 1900 band (QTY/MODEL)							1	8843 B2/B66A						
RRH - AWS band (QTY/MODEL)								with another band						
RRH - WCS band (QTY/MODEL)														
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)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	Antenna. // Add/Swap RRH													
Local Market Note 2														
Local Market Note 3	/ 1xXMU03 || xxxx / 1x6630 Mixed-													

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			CTL02185_7C_3_F	CTL02185_7C_3_F		LTE 700	BU6DA_700MHz_02DT	13	270	2	BOTTOM	RFS 1-1/4"	120				No					
ANTENNA POSITION 4	PORT 1			CTL02185_7C_1	CTL02185_7C_1		LTE 700	K_700MHz_02DT	13	270	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 3			CTL06185_9C_1	CTL06185_9C_1		LTE 1900	K_1930MHz_02DT	16.85	270	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 4			CTL06185_9C_2	CTL06185_9C_2		LTE 1900	K_1930MHz_02DT	16.85	270	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 5			CTCN002185_N005C_1	CTCN002185_N005C_1		5G 850	K_700MHz_02DT	13	270	2	BOTTOM	RFS 1-1/4"	120				No					
	PORT 7			CTL06185_2C_2	CTL06185_2C_2		LTE AWS	K_2170MHz_03DT	13	270	3	BOTTOM	RFS 1-1/4"	120				No					
	PORT 11			CTCN002185_N066C_1	CTCN002185_N066C_1		5G AWS	K_2170MHz_03DT	13	270	3	BOTTOM	RFS 1-1/4"	120				No					
	PORT 12			CTCN002185_N002C_1	CTCN002185_N002C_1		5G 1900	K_2170MHz_03DT	13	270	3	BOTTOM	RFS 1-1/4"	120				No					

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			OPA65R-BU6DA				TPA65R-BU6DA-K							
ANTENNA VENDOR			CCI				CCI							
ANTENNA SIZE (H x W x D)			71.2X21X7.8				71.2X20.7X7.7							
ANTENNA WEIGHT			60.2				69							
AZIMUTH			30				30							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)			97				97							
ANTENNA TIP HEIGHT														
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)														
SURGE ARRESTOR (QTY/MODEL)			4	TSXDC-4310FM			12	TSXDC-4310FM						
DIPLEXER (QTY/MODEL)			4	DBC2055F1V1-2			2	CBC61923T-DS						
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)				AISG Equipment			4	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	4478 B14			1	4449 B5/B12						
RRH - 850 band (QTY/MODEL)								with another band						
RRH - 1900 band (QTY/MODEL)							1	8843 B2/B66A						
RRH - AWS band (QTY/MODEL)								with another band						
RRH - WCS band (QTY/MODEL)														
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)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	// Add/Swap RRH at bottom with SA, Add BT. // Add 2 Coax,													
Local Market Note 2														
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 || xxxx / 1x6630 Mixed-Mode / xxxx + 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	60437.A700.4G.tmp5		CTL02185_7A_3_F	CTL02185_7A_3_F		LTE 700	BU6DA_716MHz_08DT	13	30	8	BOTTOM	RFS 1-1/4"	120				No		756.83		3	
ANTENNA POSITION 4	PORT 1	60437.A700.4G.1		CTL02185_7A_1	CTL02185_7A_1		LTE 700	K_716MHz_08DT	13	30	8	BOTTOM	RFS 1-1/4"	120				No		756.83		3	
	PORT 3	60437.A1900.4G.tmp1		CTL06185_9A_1	CTL06185_9A_1		LTE 1900	K_1930MHz_02DT	16.85	30	2	BOTTOM	RFS 1-1/4"	120				No		2152.78		3	
	PORT 4	60437.A1900.4G.tmp4		CTL06185_9A_2	CTL06185_9A_2		LTE 1900	K_1930MHz_02DT	16.85	30	2	BOTTOM	RFS 1-1/4"	120				No		2152.78		3	
	PORT 5	60437.A850.5G.tmp1		CTCN002185_N005A_1	CTCN002185_N005A_1		5G 850	K_716MHz_08DT	13	30	8	BOTTOM	RFS 1-1/4"	120				No		756.83		3	
	PORT 7	60437.AAWS.4G.tmp4		CTL06185_2A_2	CTL06185_2A_2		LTE AWS	K_2170MHz_03DT	13	30	3	BOTTOM	RFS 1-1/4"	120				No		756.83		3	
	PORT 11	60437.AAWS.5G.tmp1		CTCN002185_N066A_1	CTCN002185_N066A_1		5G AWS	K_2170MHz_03DT	13	30	3	BOTTOM	RFS 1-1/4"	120				No		756.83		3	
	PORT 12	60437.A1900.5G.tmp1		CTCN002185_N002A_1	CTCN002185_N002A_1		5G 1900	K_2170MHz_03DT	13	30	3	BOTTOM	RFS 1-1/4"	120				No		756.83		3	

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			OPA65R-BU6DA				TPA65R-BU6DA-K							
ANTENNA VENDOR			CCI				CCI							
ANTENNA SIZE (H x W x D)			71.2X21X7.8				71.2X20.7X7.7							
ANTENNA WEIGHT			60.2				69							
AZIMUTH			150				150							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)			97				97							
ANTENNA TIP HEIGHT														
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)														
SURGE ARRESTOR (QTY/MODEL)			4	TSXDC-4310FM			12	TSXDC-4310FM						
DIPLEXER (QTY/MODEL)			4	DBC2055F1V1-2			2	CBC61923T-DS						
DUPLEXER (QTY/MODEL)														
Antenna RET CONTROL UNIT (QTY/MODEL)				RRH CONTROLLED				RRH CONTROLLED						
DC BLOCK (QTY/MODEL)														
TMA/LNA (QTY/MODEL)			2	TMABPD7823VG 12A			2	TMA2124F03V5-1D						
CURRENT INJECTORS FOR TMA (QTY/MODEL)				AISG Equipment			4	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	4478 B14			1	4449 B5/B12						
RRH - 850 band (QTY/MODEL)								with another band						
RRH - 1900 band (QTY/MODEL)							1	8843 B2/B66A						
RRH - AWS band (QTY/MODEL)								with another band						
RRH - WCS band (QTY/MODEL)														
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)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	// Add/Swap RRH at bottom with SA, Add BT. // Add 2 Coax,													
Local Market Note 2														
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 || xxxxx / 1x6630 Mixed-Mode / xxxxx + 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	60437.B.700.4G.tmp5		CTL02185_7B_3_F	CTL02185_7B_3_F		LTE 700	BU6DA_700MHz_02DT	13	150	2	BOTTOM	RFS 1-1/4"	120				No		756.83		11	
ANTENNA POSITION 4	PORT 1	60437.B.700.4G.1		CTL02185_7B_1	CTL02185_7B_1		LTE 700	K_700MHz_02DT	13	150	2	BOTTOM	RFS 1-1/4"	120				No		756.83		11	
	PORT 3	60437.B.1900.4G.tmp1		CTL06185_9B_1	CTL06185_9B_1		LTE 1900	K_1930MHz_02DT	16.85	150	2	BOTTOM	RFS 1-1/4"	120				No		2233.57		11	
	PORT 4	60437.B.1900.4G.tmp4		CTL06185_9B_2	CTL06185_9B_2		LTE 1900	K_1930MHz_02DT	16.85	150	2	BOTTOM	RFS 1-1/4"	120				No		2233.57		11	
	PORT 5	60437.B.850.5G.tmp1		CTCN002185_N005B_1	CTCN002185_N005B_1		5G 850	K_700MHz_02DT	13	150	2	BOTTOM	RFS 1-1/4"	120				No		756.83		11	
	PORT 7	60437.B.AWS.4G.tmp4		CTL06185_2B_2	CTL06185_2B_2		LTE AWS	K_2170MHz_03DT	13	150	3	BOTTOM	RFS 1-1/4"	120				No		756.83		11	
	PORT 11	60437.B.AWS.5G.tmp1		CTCN002185_N066B_1	CTCN002185_N066B_1		5G AWS	K_2170MHz_03DT	13	150	3	BOTTOM	RFS 1-1/4"	120				No		756.83		11	
	PORT 12	60437.B.1900.5G.tmp1		CTCN002185_N002B_1	CTCN002185_N002B_1		5G 1900	K_2170MHz_03DT	13	150	3	BOTTOM	RFS 1-1/4"	120				No		756.83		11	

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			OPA65R-BU6DA				TPA65R-BU6DA-K							
ANTENNA VENDOR			CCI				CCI							
ANTENNA SIZE (H x W x D)			71.2X21X7.8				71.2X20.7X7.7							
ANTENNA WEIGHT			60.2				69							
AZIMUTH			270				270							
MAGNETIC DECLINATION														
RADIATION CENTER (feet)			97				97							
ANTENNA TIP HEIGHT														
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)														
SURGE ARRESTOR (QTY/MODEL)			4	TSXDC-4310FM			12	TSXDC-4310FM						
DIPLEXER (QTY/MODEL)			4	DBC2055F1V1-2			2	CBC61923T-DS						
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)				AISG Equipment			4	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	4478 B14			1	4449 B5/B12						
RRH - 850 band (QTY/MODEL)								with another band						
RRH - 1900 band (QTY/MODEL)							1	8843 B2/B66A						
RRH - AWS band (QTY/MODEL)								with another band						
RRH - WCS band (QTY/MODEL)														
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)														
Additional Component 2 (QTY/MODEL)														
Additional Component 3 (QTY/MODEL)														
Local Market Note 1	// Add/Swap RRH at bottom with SA, Add BT. // Add 2 Coax,													
Local Market Note 2														
Local Market Note 3	1x6601 / 1x5216 / 1xXMU03 || xxxxx / 1x6630 Mixed-Mode / xxxxx + 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	60437.C.700.4G.tmp5		CTL02185_7C_3_F	CTL02185_7C_3_F		LTE 700	BU6DA_700MHz_02DT	13	270	2	BOTTOM	RFS 1-1/4"	120				No		756.83		19	
ANTENNA POSITION 4	PORT 1	60437.C.700.4G.1		CTL02185_7C_1	CTL02185_7C_1		LTE 700	K_700MHz_02DT	13	270	2	BOTTOM	RFS 1-1/4"	120				No		756.83		19	
	PORT 3	60437.C.1900.4G.tmp1		CTL06185_9C_1	CTL06185_9C_1		LTE 1900	K_1930MHz_02DT	16.85	270	2	BOTTOM	RFS 1-1/4"	120				No		2233.57		19	
	PORT 4	60437.C.1900.4G.tmp4		CTL06185_9C_2	CTL06185_9C_2		LTE 1900	K_1930MHz_02DT	16.85	270	2	BOTTOM	RFS 1-1/4"	120				No		2233.57		19	
	PORT 5	60437.C.850.5G.tmp1		CTCN002185_N005C_1	CTCN002185_N005C_1		5G 850	K_700MHz_02DT	13	270	2	BOTTOM	RFS 1-1/4"	120				No		756.83		19	
	PORT 7	60437.C.AWS.4G.tmp4		CTL06185_2C_2	CTL06185_2C_2		LTE AWS	K_2170MHz_03DT	13	270	3	BOTTOM	RFS 1-1/4"	120				No		756.83		19	
	PORT 11	60437.C.AWS.5G.tmp1		CTCN002185_N066C_1	CTCN002185_N066C_1		5G AWS	K_2170MHz_03DT	13	270	3	BOTTOM	RFS 1-1/4"	120				No		756.83		19	
	PORT 12	60437.C.1900.5G.tmp1		CTCN002185_N002C_1	CTCN002185_N002C_1		5G 1900	K_2170MHz_03DT	13	270	3	BOTTOM	RFS 1-1/4"	120				No		756.83		19	

CCI

Antennas

MultiPort Series

DATA SHEET

Multi-Band Eight-Port Antenna

OPA65R-BU6D

- Six foot (1.8 m) multiband, eigth port antenna with a 65° azimuth beamwidth covering 698-896 MHz and 1695-2400 MHz frequencies
- Four 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 High Band Arrays, using full length arrays (non stacked), all in a 21.0" (534 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 Multi-Port multiband array is a eight port 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 4x4 Multiple-input Multiple-output (MIMO) in the high band and 4X4 Multiple-input Multiple-output (MIMO) across low band ports. The CCI 8-Port allows independent tilt control between the low band ports and high band ports and independent tilt 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

- 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

Multi-Band Eight-Port Antenna

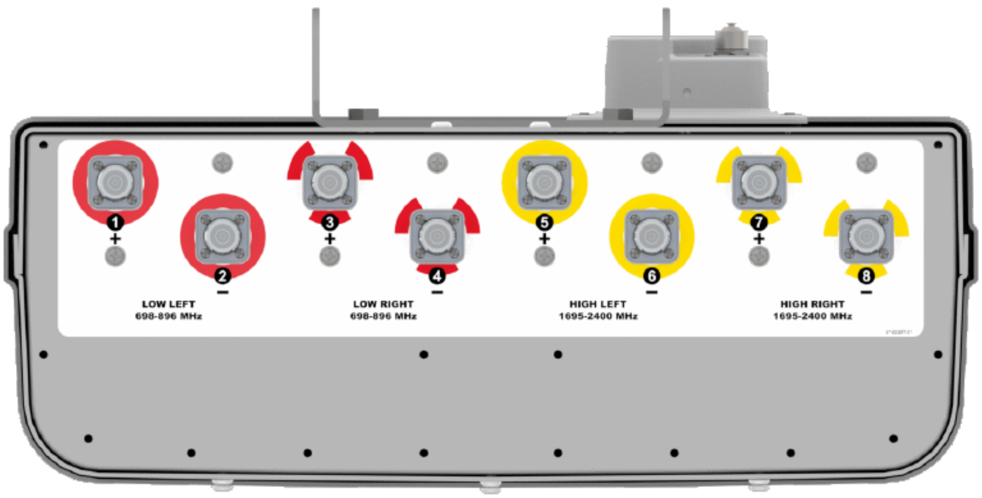
OPA65R-BU6D

Mechanical

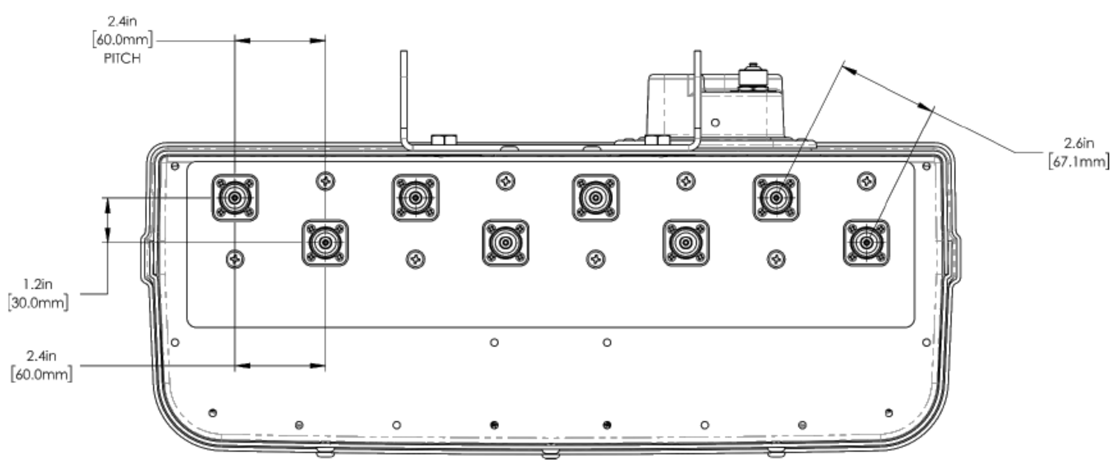
Dimensions (LxWxD)	71.2x21.0x7.8 in (1808x534x198 mm)
Survival Wind Speed	> 150 mph (> 241 kph)
Front Wind Load	330 lbs (1467 N) @ 100 mph (161 kph)
Side Wind Load	145 lbs (646 N) @ 100 mph (161 kph)
Equivalent Flat Plate Area	12.9 ft^2 (1.2 m^2)
Weight *	63.2 lbs (28.7 kg)
Connector	8 x 4.3-10 female
Mounting Pole	2 to 5 in (5 to 12 cm)

** Weight excludes mounting*

Bottom View



Connector Spacing



Antennas MultiPort Series

CCI

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 4x4 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 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

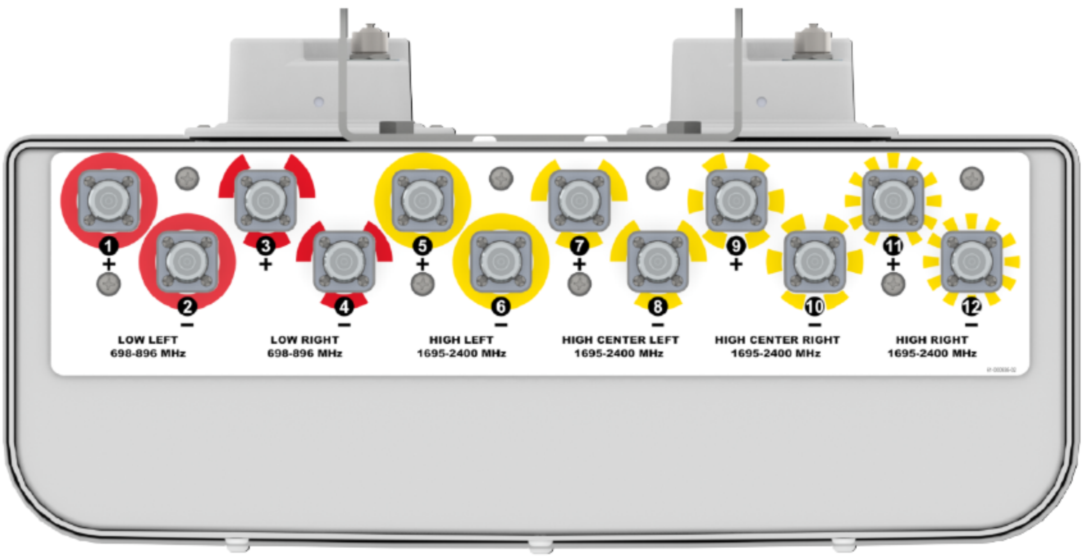
Mechanical

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*

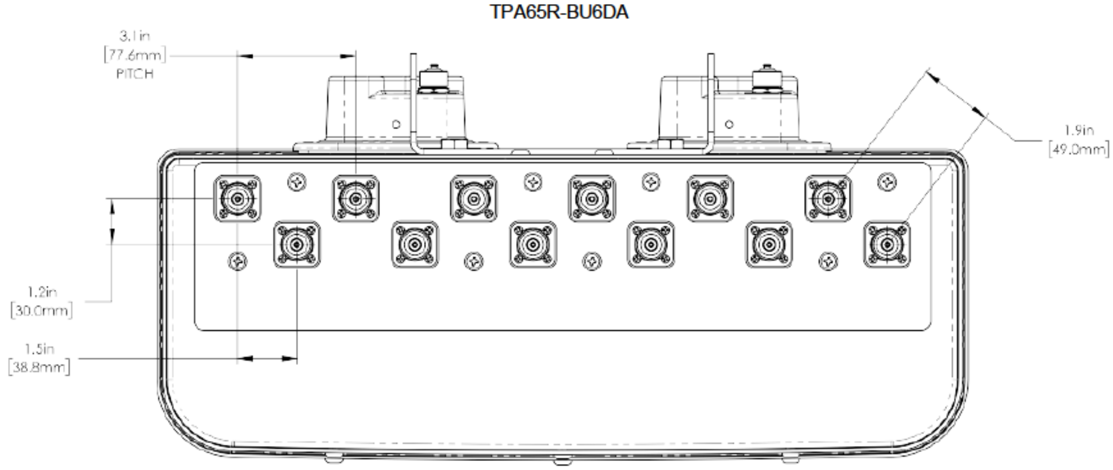
Bottom View

TPA65R-BU6DA



Connector Spacing

TPA65R-BU6DA

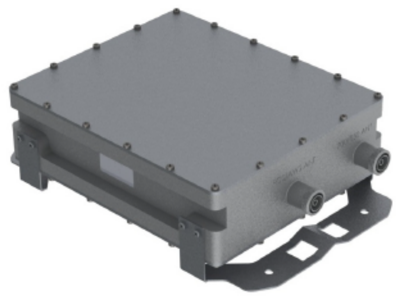


Triple Band (AWS/PCS/WCS) Twin TMA with 700/850 Bypass

CCI
EXTENDING WIRELESS PERFORMANCE

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

General Information



CCI's Triple Band TMA with 700/850 by-pass contains two triple band TMA's in a single housing. The TMA's are fully du-plexed 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.

ModelTMABPDB7823VG12A

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 amplifi-ers (LNA) with bypass failure circuitry, two bias tees, AISG control circuitry, and lightning protection cir-cuitry 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			

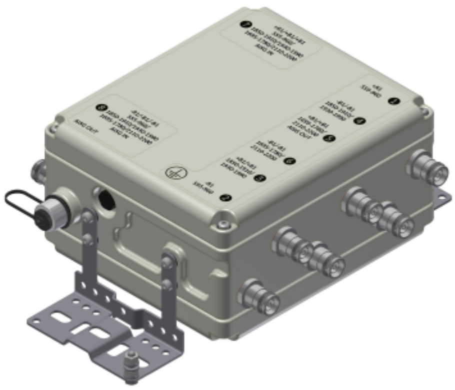
All specifications are subject to change. The latest specifications are available at www.cciproducts.com

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

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 16, 2020

Site Pro 1 / Valmont Mounting System:

Part Number = ULP12-xx
Part Description = 12' 6" Low- Profile T-Arm kit

Mount EPA & Weight (No antenna pipes, (0.67*EPA)):

EPA_N	= 12.77 (8.52) Sq-Ft	$EPA_{N\ (0.5''\ Ice)}$	= 15.90 (10.61) Sq-Ft	$EPA_{N\ (1''\ Ice)}$	= 19.12 (12.75) Sq-Ft
EPA_T	= 11.94 (7.96) Sq-Ft	$EPA_{T\ (0.5''\ Ice)}$	= 15.30 (10.21) Sq-Ft	$EPA_{T\ (1''\ Ice)}$	= 18.48 (12.33) Sq-Ft
Weight	= 882 lb	$Weight_{(0.5''\ Ice)}$	= 1030 lb	$Weight_{(1''\ Ice)}$	= 1250 lb

Classification Rating:

M750R(600)-4[6]

Design Standards

ANSI/TIA-222-G-2012
ANSI/TIA-222-H-2018
ASCE 7-16
International Building Code 2018
TIA-5053

Analysis and Modeling Technique

An elastic three-dimensional frame truss model was created to analyze the mount. The mount was modeled with four (4) mounting locations (antenna, mount pipe, radio, dish, and any other appurtenance) evenly spaced across the face of the mount, with a 6" vertical eccentricity. Wind directions considered were perpendicular (normal) to the face of the frame and at 30 degree increments up to 90 degrees (tangential) to the face of the frame. Wind, dead weight and ice weight on the mount was also included in the model.

Modeling Software

Autodesk Inventor
RISA-3D

December 9, 2022 (Rev. 1)
November 7, 2022

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:	Site Number:	CT2185
	FA Number:	10035273
	PACE Number:	MRCTB062167
	PT Number:	2051A1476M
	TEP Project Number:	350589
	Site Name:	BROOKFIELD STATION RD
	Site Address:	761 Federal Road Brookfield, CT 06804

To Whom It May Concern:

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

- **(3) OPA65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 64 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) (Pos. 2)**
- **(6) TMA2124F03V5-1D TMA's (9.7"x5.0"x8.3" – Wt. = 18 lbs. /each) (Pos. 4)**

**Proposed equipment shown in bold.*

Mount fabrication drawings prepared by SitePro1, P/N ULP12-4120, dated May 24, 2018, were used to perform this analysis.

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 120 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.11 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 0.210 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.055.
- The mounts have 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 3.
- The mounts have been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The proposed mounts will be secured to the existing transmission tower 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 (2) Proposed SitePro1 P/N ULP12-4120 mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Proposed Mount Rating	25	LC4	54%	**PASS**

Reference Documents:

- Fabrication drawings prepared by SitePro1, P/N ULP12-4120, dated May 24, 2018.

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 proposed mount will be adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mounts 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.

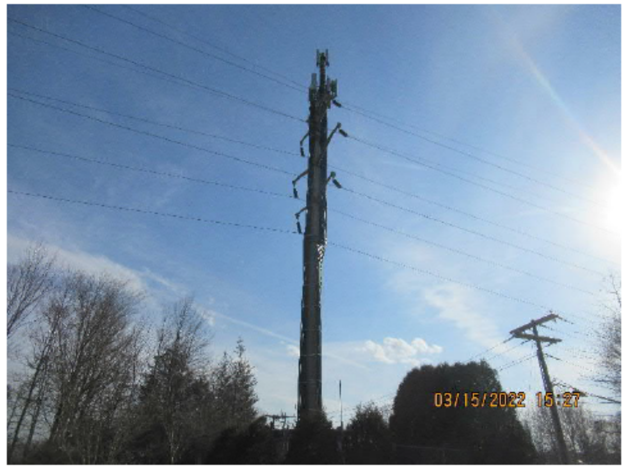
Please feel free to contact our office should you have any questions.

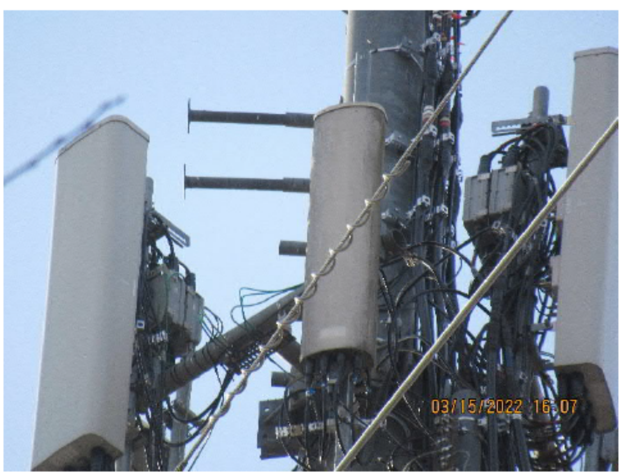
Respectfully Submitted,
TEP Northeast

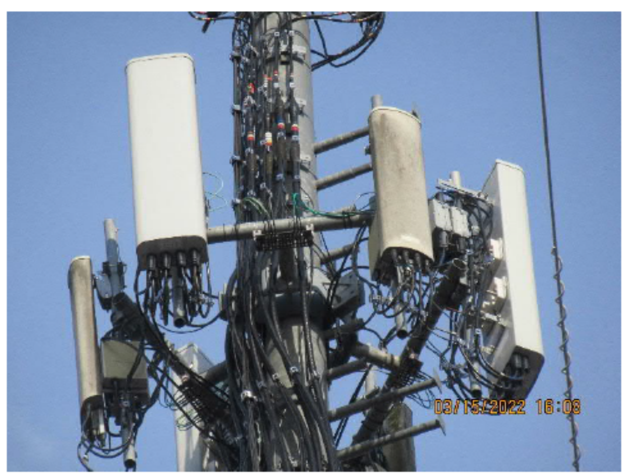
Michael Cabral
Director

Daniel P. Hamm, PE
Vice President

FIELD PHOTOS:
**Existing mounts to be removed & replaced.*







Wind & Ice
Calculations

Date: 12/5/2022
Project Name: BROOKFIELD STATION RD
Project No.: CT2185
Designed By: RL Checked By: MSC

TEP NORTHEAST

2.6.5.2 Velocity Pressure Coeff:

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

z=	97	(ft)
z_g=	900	(ft)
α=	9.5	

K_z= 1.258

$K_{zmin} \le K_z \le 2.01$

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=	97	
z_s=	290	(Mean elevation of base of structure above se
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 =	1.00	in
Importance Factor =	I=	1.00	(from Table 2-3)
	K_{iz} =	1.11	(from Sec. 2.6.10)

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

t_{iz} = 1.11 in

Date: 12/5/2022
Project Name: BROOKFIELD STATION RD
Project No.: CT2185
Designed By: RL Checked By: MSC

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= 90 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

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

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

q_z=	**43.58**
$q_{z\,(ice)}$=	**7.57**
$q_{z\,(30)}$=	**2.72**

K_z=	1.3	(from 2.6.5.2)
K_{zt}=	1.0	(from 2.6.6.2.1)
K_s=	1.0	(from 2.6.7)
K_e=	0.99	(from 2.6.8)
K_d=	0.95	(from Table 2-2)
V_{max}=	120	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

Date: 12/5/2022
Project Name: BROOKFIELD STATION RD
Project No.: CT2185
Designed By: RL Checked By: MSC

TEP NORTHEAST

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		$1.2 - 2.8(r_s) \geq 0.85$	$1.4 - 4.0(r_s) \geq 0.90$	$2.0 - 6.0(r_s) \geq 1.25$
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 = 1.11 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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	554	110	35
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.44	1.24	554	110	35
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	2.82	1.21	15	5	1
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	1.91	1.20	18	5	1
2" Pipe	2.4	12.0	-	0.20	0.20	1.20	10		
3" Pipe	3.5	12.0	-	0.29	0.29	1.20	15		

Date: 12/5/2022
Project Name: BROOKFIELD STATION RD
Project No.: CT2185
Designed By: RL Checked By: MSC

TEP NORTHEAST

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.11	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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	477
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	477
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	43	22
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	18	29	20

WIND LOADS WITH 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)
OPA65R-BU6DA Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	95
TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	95
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	6
TMA2124F03V5-1D TMA	11.9	7.3	10.5	0.60	0.87	1.63	1.13	1.20	1.20	5	8	6

WIND LOADS AT 30 MPH:

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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	30
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	30
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	1
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	1	2	1

Date: 12/5/2022
Project Name: BROOKFIELD STATION RD
Project No.: CT2185
Designed By: RL Checked By: MSC

TEP NORTHEAST

WIND LOADS

Angle = 60 (deg) | Ice Thickness = 1.11 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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	322
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	322
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	43	36
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	18	29	26

WIND LOADS WITH 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)
OPA65R-BU6DA Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	68
TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	68
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	9
TMA2124F03V5-1D TMA	11.9	7.3	10.5	0.60	0.87	1.63	1.13	1.20	1.20	5	8	7

WIND LOADS AT 30 MPH:

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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	20
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	20
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	2
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	1	2	2

Date: 12/5/2022
Project Name: BROOKFIELD STATION RD
Project No.: CT2185
Designed By: RL Checked By: MSC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.11	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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	245
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	245
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	43	43
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	18	29	29

WIND LOADS WITH 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)
OPA65R-BU6DA Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	54
TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	54
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	11
TMA2124F03V5-1D TMA	11.9	7.3	10.5	0.60	0.87	1.63	1.13	1.20	1.20	5	8	8

WIND LOADS AT 30 MPH:

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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	15
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	15
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	3
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	1	2	2

Date: 12/5/2022
Project Name: BROOKFIELD STATION RD
Project No.: CT2185
Designed By: RL Checked By: MSC

TEP NORTHEAST

WIND LOADS

Angle = 120 (deg) | Ice Thickness = 1.11 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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	322
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	322
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	43	36
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	18	29	26

WIND LOADS WITH 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)
OPA65R-BU6DA Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	68
TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	68
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	9
TMA2124F03V5-1D TMA	11.9	7.3	10.5	0.60	0.87	1.63	1.13	1.20	1.20	5	8	7

WIND LOADS AT 30 MPH:

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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	20
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	20
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	2
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	1	2	2

Date: 12/5/2022
Project Name: BROOKFIELD STATION RD
Project No.: CT2185
Designed By: RL Checked By: MSC

WIND LOADS

Angle = 150 (deg) | Ice Thickness = 1.11 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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	477
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	554	245	477
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	43	22
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	18	29	20

WIND LOADS WITH 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)
OPA65R-BU6DA Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	95
TPA65R-BU6DA-K Antenna	73.4	22.9	9.9	11.69	5.06	3.20	7.40	1.23	1.41	109	54	95
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	6
TMA2124F03V5-1D TMA	11.9	7.3	10.5	0.60	0.87	1.63	1.13	1.20	1.20	5	8	6

WIND LOADS AT 30 MPH:

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)
OPA65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	30
TPA65R-BU6DA-K Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	35	15	30
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	1
TMA2124F03V5-1D TMA	9.7	5.0	8.3	0.34	0.55	1.91	1.17	1.20	1.20	1	2	1

Date: 12/5/2022
Project Name: BROOKFIELD STATION RD
Project No.: CT2185
Designed By: RL **Checked By:** MSC

TEP NORTHEAST

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.11 in.
Density of ice: 56 pcf

OPA65R-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:		187 lbs
Weight of object:	64.0 lbs	
Combined weight of ice and object:		251 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:		187 lbs
Weight of object:	69.0 lbs	
Combined weight of ice and object:		256 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:		16 lbs
Weight of object:	25.0 lbs	
Combined weight of ice and object:		41 lbs

TMA2124F03V5-1D TMA

Weight of ice based on total radial SF area:		
Height (in):	9.7	
Width (in):	5.0	
Depth (in):	8.3	
Total weight of ice on object:		12 lbs
Weight of object:	18.0 lbs	
Combined weight of ice and object:		30 lbs

2" pipe

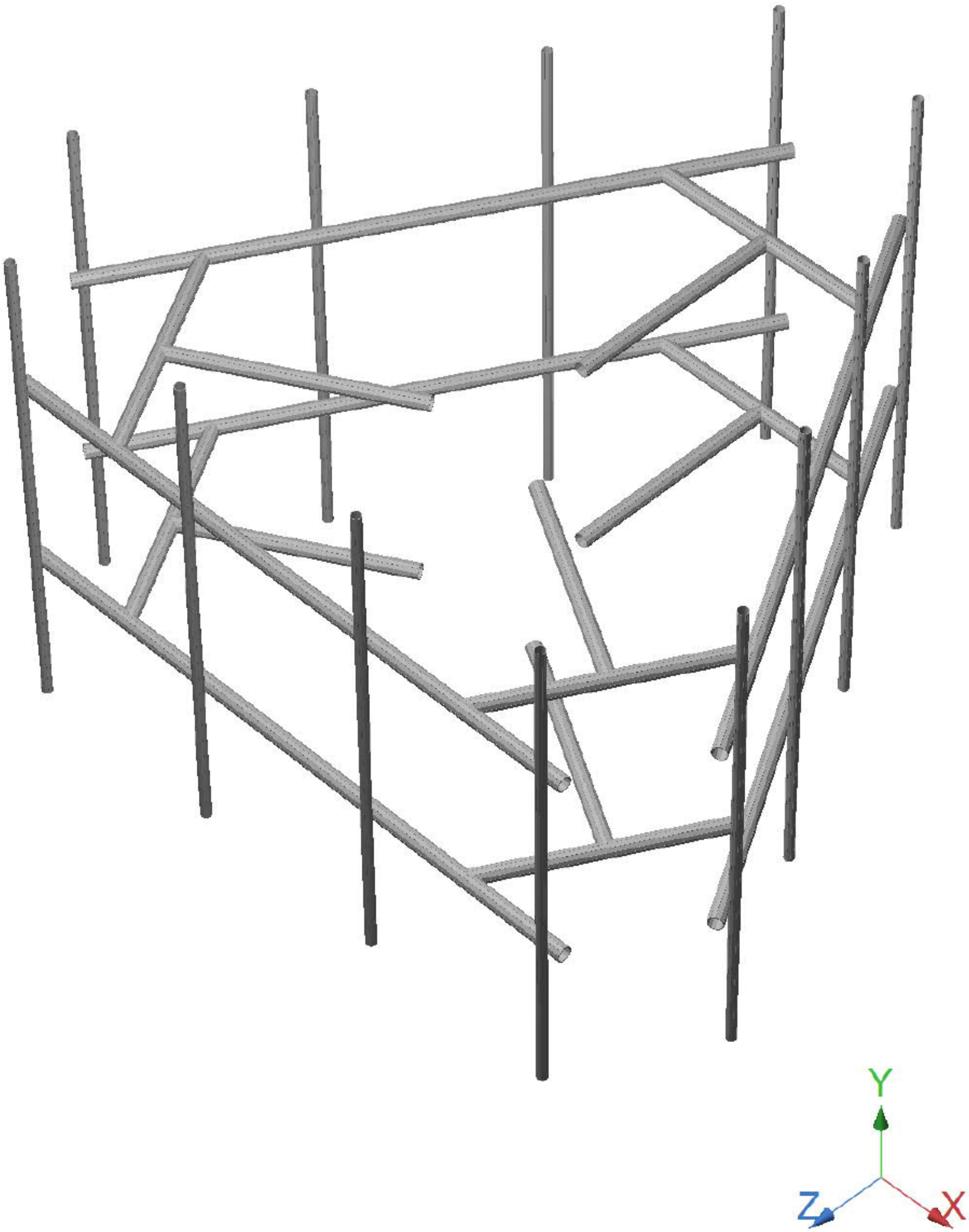
Per foot weight of ice:		
diameter (in):	2.38	
Per foot weight of ice on object:		5 plf

3" Pipe

Per foot weight of ice:		
diameter (in):	3.5	
Per foot weight of ice on object:		6 plf

Mount Calculations
(Proposed Conditions)

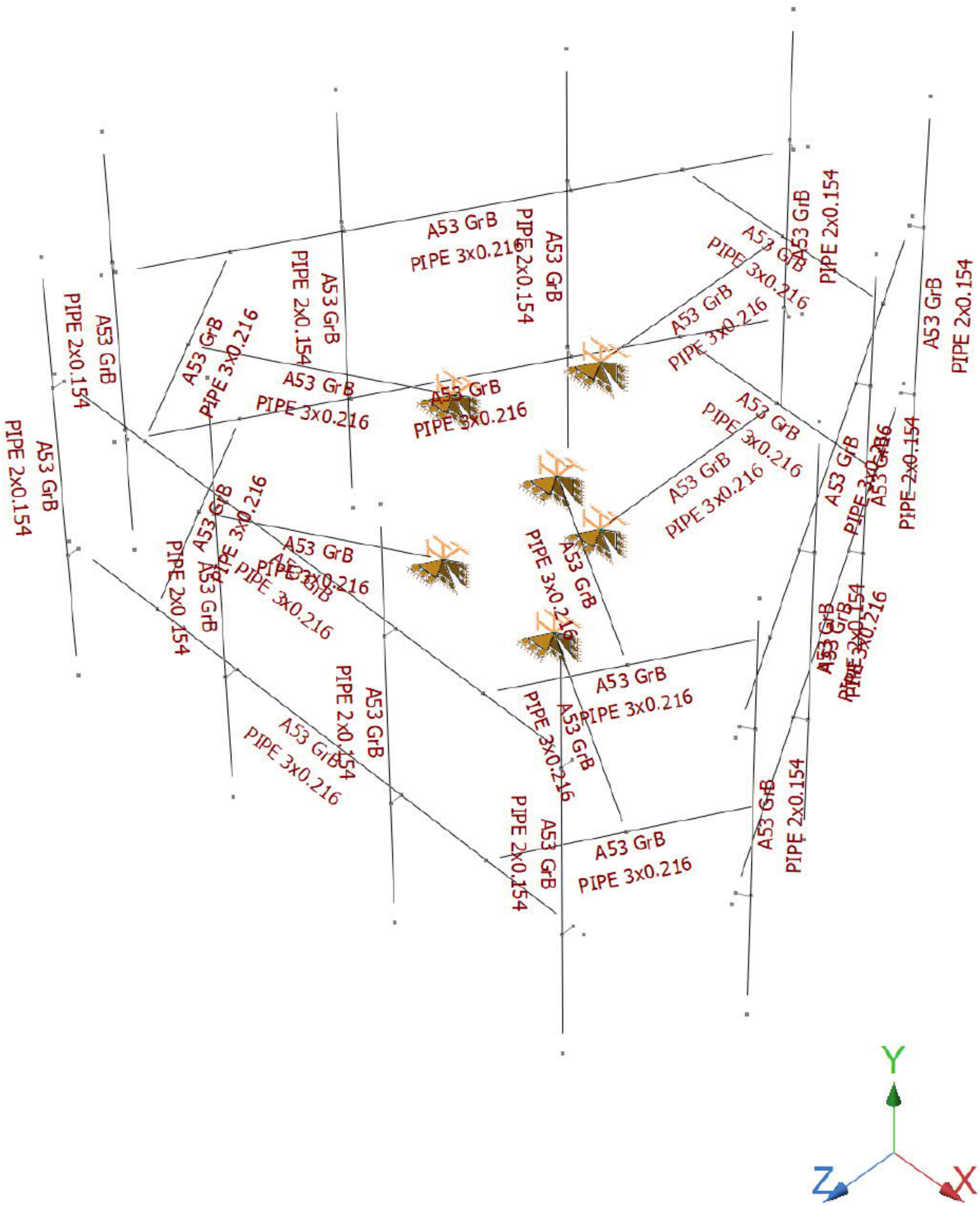
TEP Northeast



RAM® Elements
CONNECT Edition

TEP Northeast

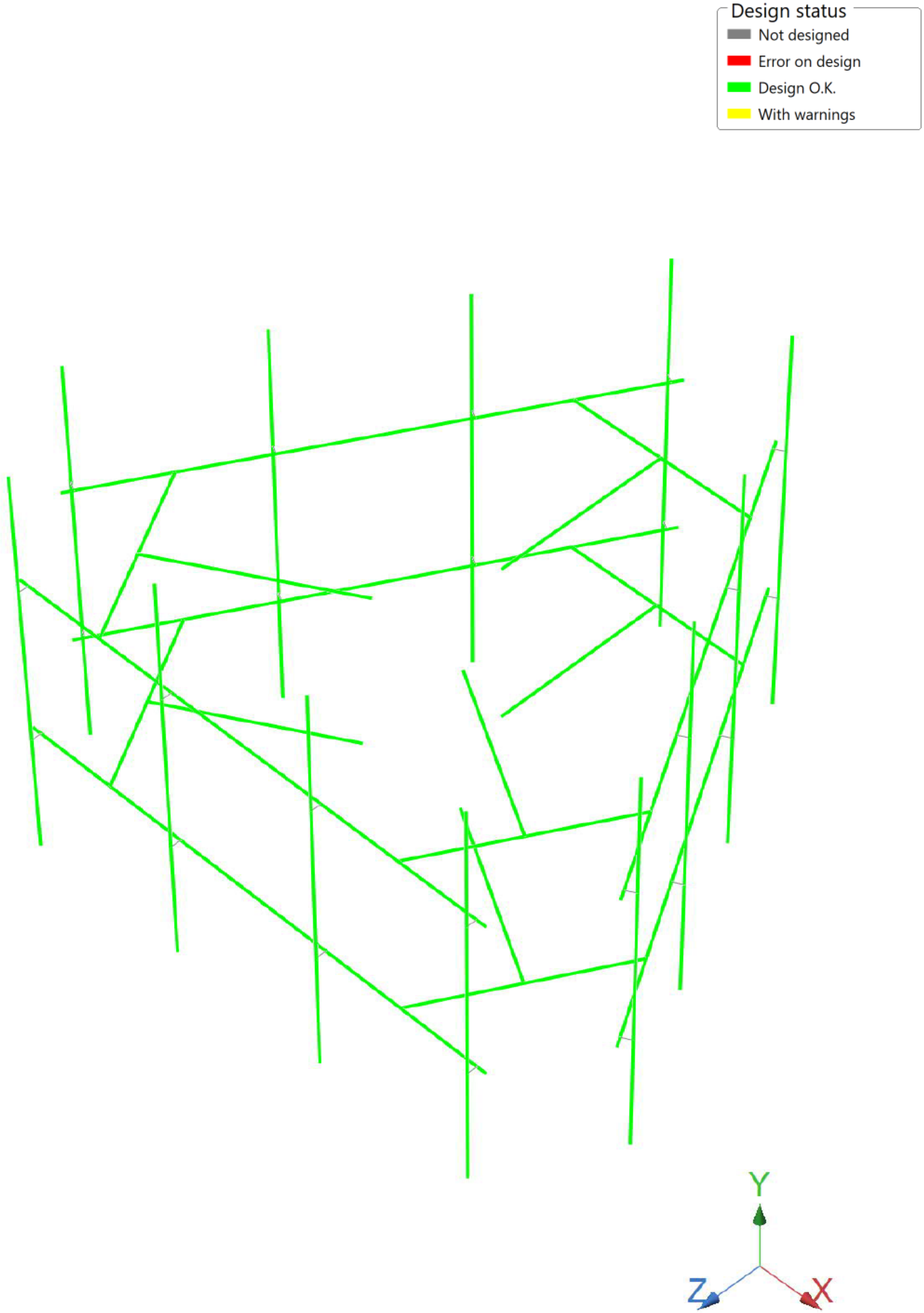
Current Date: 12/5/2022 12:05 PM
Units system: English



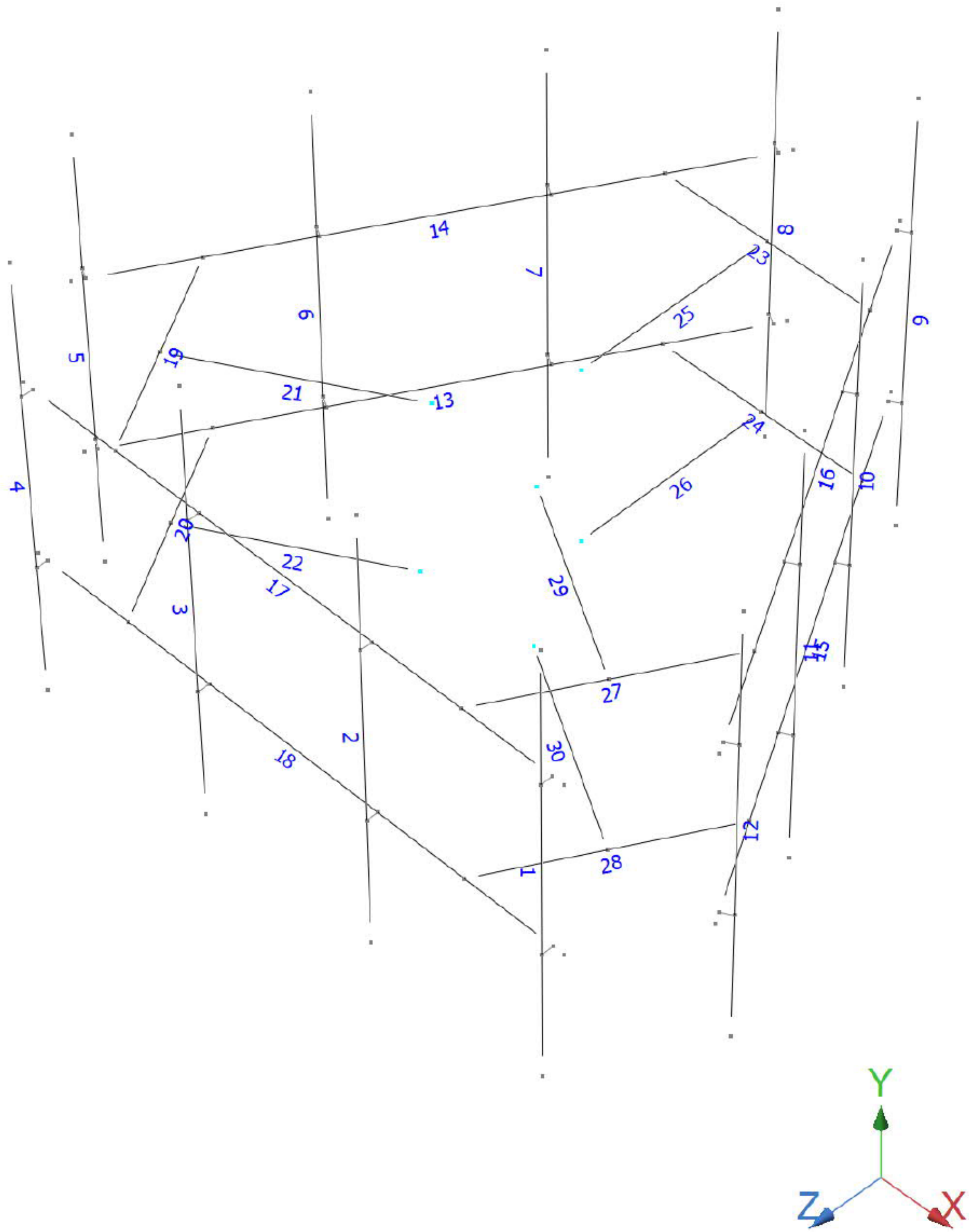
RAM® Elements CONNECT Edition

Current Date: 12/5/2022 12:05 PM
Units system: English

TEP Northeast



TEP Northeast



RAM Elements CONNECT Edition

TEP Northeast

Current Date: 12/5/2022 12:06 PM
Units system: English

Load data

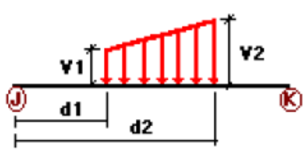
GLOSSARY

Comb : Indicates if load condition is a load combination

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 Antenna 1	No	LL
LLa2	500 lb Live Load Antenna 2	No	LL
LLa3	500 lb Live Load Antenna 3	No	LL
LLa4	500 lb Live Load Antenna 4	No	LL

Distributed force on members

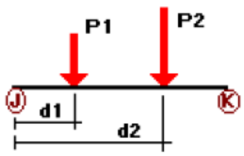


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
W0	1	z	-0.01	-0.01	0.00	No	100.00	Yes
	4	z	-0.01	-0.01	0.00	No	100.00	Yes
	5	z	-0.01	-0.01	0.00	No	100.00	Yes
	6	z	-0.01	-0.01	0.00	No	100.00	Yes
	7	z	-0.01	-0.01	0.00	No	100.00	Yes
	8	z	-0.01	-0.01	0.00	No	100.00	Yes
	9	z	-0.01	-0.01	0.00	No	100.00	Yes
	10	z	-0.01	-0.01	0.00	No	100.00	Yes
	11	z	-0.01	-0.01	0.00	No	100.00	Yes
	12	z	-0.01	-0.01	0.00	No	100.00	Yes
	17	z	-0.015	-0.015	0.00	No	100.00	Yes
	23	z	-0.015	-0.015	0.00	No	100.00	Yes
	29	z	-0.015	-0.015	0.00	No	100.00	Yes
	27	z	-0.015	-0.015	0.00	No	100.00	Yes
	21	z	-0.015	-0.015	0.00	No	100.00	Yes
	19	z	-0.015	-0.015	0.00	No	100.00	Yes

	20	z	-0.015	-0.015	0.00	No	100.00	Yes
	18	z	-0.015	-0.015	0.00	No	100.00	Yes
	28	z	-0.015	-0.015	0.00	No	100.00	Yes
	22	z	-0.015	-0.015	0.00	No	100.00	Yes
	24	z	-0.015	-0.015	0.00	No	100.00	Yes
	30	z	-0.015	-0.015	0.00	No	100.00	Yes
	13	z	-0.015	-0.015	0.00	No	100.00	Yes
	14	z	-0.015	-0.015	0.00	No	100.00	Yes
	15	z	-0.015	-0.015	0.00	No	100.00	Yes
	16	z	-0.015	-0.015	0.00	No	100.00	Yes
W30	1	x	-0.01	-0.01	0.00	No	100.00	Yes
	2	x	-0.01	-0.01	0.00	No	100.00	Yes
	3	x	-0.01	-0.01	0.00	No	100.00	Yes
	4	x	-0.01	-0.01	0.00	No	100.00	Yes
	5	x	-0.01	-0.01	0.00	No	100.00	Yes
	6	x	-0.01	-0.01	0.00	No	100.00	Yes
	7	x	-0.01	-0.01	0.00	No	100.00	Yes
	8	x	-0.01	-0.01	0.00	No	100.00	Yes
	9	x	-0.01	-0.01	0.00	No	100.00	Yes
	12	x	-0.01	-0.01	0.00	No	100.00	Yes
	25	x	-0.015	-0.015	0.00	No	100.00	Yes
	29	x	-0.015	-0.015	0.00	No	100.00	Yes
	27	x	-0.015	-0.015	0.00	No	100.00	Yes
	21	x	-0.015	-0.015	0.00	No	100.00	Yes
	19	x	-0.015	-0.015	0.00	No	100.00	Yes
	20	x	-0.015	-0.015	0.00	No	100.00	Yes
	28	x	-0.015	-0.015	0.00	No	100.00	Yes
	22	x	-0.015	-0.015	0.00	No	100.00	Yes
	26	x	-0.015	-0.015	0.00	No	100.00	Yes
	30	x	-0.015	-0.015	0.00	No	100.00	Yes
	13	x	-0.015	-0.015	0.00	No	100.00	Yes
	14	x	-0.015	-0.015	0.00	No	100.00	Yes
	15	x	-0.015	-0.015	0.00	No	100.00	Yes
	16	x	-0.015	-0.015	0.00	No	100.00	Yes
Di	1	y	-0.005	-0.005	0.00	No	100.00	Yes
	2	y	-0.005	-0.005	0.00	No	100.00	Yes
	3	y	-0.005	-0.005	0.00	No	100.00	Yes
	4	y	-0.005	-0.005	0.00	No	100.00	Yes
	5	y	-0.005	-0.005	0.00	No	100.00	Yes
	6	y	-0.005	-0.005	0.00	No	100.00	Yes
	7	y	-0.005	-0.005	0.00	No	100.00	Yes
	8	y	-0.005	-0.005	0.00	No	100.00	Yes
	9	y	-0.005	-0.005	0.00	No	100.00	Yes
	10	y	-0.005	-0.005	0.00	No	100.00	Yes
	11	y	-0.005	-0.005	0.00	No	100.00	Yes
	12	y	-0.005	-0.005	0.00	No	100.00	Yes
	17	y	-0.006	-0.006	0.00	No	100.00	Yes
	25	y	-0.006	-0.006	0.00	No	100.00	Yes
	23	y	-0.006	-0.006	0.00	No	100.00	Yes
	29	y	-0.006	-0.006	0.00	No	100.00	Yes
	27	y	-0.006	-0.006	0.00	No	100.00	Yes
	21	y	-0.006	-0.006	0.00	No	100.00	Yes
	19	y	-0.006	-0.006	0.00	No	100.00	Yes
	20	y	-0.006	-0.006	0.00	No	100.00	Yes
	18	y	-0.006	-0.006	0.00	No	100.00	Yes
	28	y	-0.006	-0.006	0.00	No	100.00	Yes
	22	y	-0.006	-0.006	0.00	No	100.00	Yes
	26	y	-0.006	-0.006	0.00	No	100.00	Yes
	24	y	-0.006	-0.006	0.00	No	100.00	Yes
	30	y	-0.006	-0.006	0.00	No	100.00	Yes

13	y	-0.006	-0.006	0.00	No	100.00	Yes
14	y	-0.006	-0.006	0.00	No	100.00	Yes
15	y	-0.006	-0.006	0.00	No	100.00	Yes
16	y	-0.006	-0.006	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	2	y	-0.032	1.50	No
		y	-0.032	6.50	No
		y	-0.025	4.50	No
		y	-0.025	4.50	No
	3	y	-0.035	1.50	No
		y	-0.035	6.50	No
		y	-0.018	4.50	No
		y	-0.018	4.50	No
	6	y	-0.032	1.50	No
		y	-0.032	6.50	No
		y	-0.025	4.50	No
		y	-0.025	4.50	No
	7	y	-0.035	1.50	No
		y	-0.035	6.50	No
		y	-0.018	4.50	No
		y	-0.018	4.50	No
	10	y	-0.032	1.50	No
		y	-0.032	6.50	No
		y	-0.025	4.50	No
		y	-0.025	4.50	No
	11	y	-0.035	1.50	No
		y	-0.035	6.50	No
		y	-0.018	4.50	No
		y	-0.018	4.50	No
W0	2	z	-0.277	1.50	No
		z	-0.277	6.50	No
		z	-0.015	4.50	No
		z	-0.015	4.50	No
	3	z	-0.277	1.50	No
		z	-0.277	6.50	No
		z	-0.018	4.50	No
		z	-0.018	4.50	No
	6	z	-0.162	1.50	No
		z	-0.162	6.50	No
		z	-0.036	4.50	No
	7	z	-0.162	1.50	No
		z	-0.162	6.50	No
		z	-0.026	4.50	No
	10	z	-0.162	1.50	No
		z	-0.162	6.50	No
		z	-0.036	4.50	No

	11	z	-0.162	1.50	No
		z	-0.162	6.50	No
		z	-0.026	4.50	No
W30	2	x	-0.123	1.50	No
		x	-0.123	6.50	No
		x	-0.043	4.50	No
	3	x	-0.123	1.50	No
		x	-0.123	6.50	No
		x	-0.029	4.50	No
	6	x	-0.239	1.50	No
		x	-0.239	6.50	No
		x	-0.022	4.50	No
	7	x	-0.239	1.50	No
		x	-0.239	6.50	No
		x	-0.02	4.50	No
	10	x	-0.239	1.50	No
		x	-0.239	6.50	No
		x	-0.022	4.50	No
	11	x	-0.239	1.50	No
		x	-0.239	6.50	No
		x	-0.02	4.50	No
Di	2	y	-0.094	1.50	No
		y	-0.094	6.50	No
		y	-0.016	4.50	No
		y	-0.016	4.50	No
	3	y	-0.094	1.50	No
		y	-0.094	6.50	No
		y	-0.012	4.50	No
		y	-0.012	4.50	No
	6	y	-0.094	1.50	No
		y	-0.094	6.50	No
		y	-0.016	4.50	No
		y	-0.016	4.50	No
	7	y	-0.094	1.50	No
		y	-0.094	6.50	No
		y	-0.012	4.50	No
		y	-0.012	4.50	No
	10	y	-0.094	1.50	No
		y	-0.094	6.50	No
		y	-0.016	4.50	No
		y	-0.016	4.50	No
	11	y	-0.094	1.50	No
		y	-0.094	6.50	No
		y	-0.012	4.50	No
		y	-0.012	4.50	No
Wi0	2	z	-0.055	1.50	No
		z	-0.055	6.50	No
		z	-0.005	4.50	No
		z	-0.005	4.50	No
	3	z	-0.055	1.50	No
		z	-0.055	6.50	No
		z	-0.005	4.50	No
		z	-0.005	4.50	No
	6	z	-0.034	1.50	No
		z	-0.034	6.50	No
		z	-0.009	4.50	No
	7	z	-0.034	1.50	No
		z	-0.034	6.50	No
		z	-0.007	4.50	No
	10	z	-0.034	1.50	No

		z	-0.034	6.50	No
		z	-0.009	4.50	No
	11	z	-0.034	1.50	No
		z	-0.034	6.50	No
		z	-0.007	4.50	No
Wi30	2	x	-0.028	1.50	No
		x	-0.028	6.50	No
		x	-0.011	4.50	No
	3	x	-0.028	1.50	No
		x	-0.028	6.50	No
		x	-0.008	4.50	No
	6	x	-0.048	1.50	No
		x	-0.048	6.50	No
		x	-0.006	4.50	No
	7	x	-0.048	1.50	No
		x	-0.048	6.50	No
		x	-0.006	4.50	No
	10	x	-0.048	1.50	No
		x	-0.048	6.50	No
		x	-0.006	4.50	No
	11	x	-0.048	1.50	No
		x	-0.048	6.50	No
		x	-0.006	4.50	No
WL0	2	z	-0.018	1.50	No
		z	-0.018	6.50	No
		z	-0.001	4.50	No
		z	-0.001	4.50	No
	3	z	-0.018	1.50	No
		z	-0.018	6.50	No
		z	-0.001	4.50	No
		z	-0.001	4.50	No
	6	z	-0.011	1.50	No
		z	-0.011	6.50	No
		z	-0.002	4.50	No
	7	z	-0.011	1.50	No
		z	-0.011	6.50	No
		z	-0.002	4.50	No
	10	z	-0.011	1.50	No
		z	-0.011	6.50	No
		z	-0.002	4.50	No
	11	z	-0.011	1.50	No
		z	-0.011	6.50	No
		z	-0.002	4.50	No
WL30	2	x	-0.008	1.50	No
		x	-0.008	6.50	No
		x	-0.003	4.50	No
	3	x	-0.008	1.50	No
		x	-0.008	6.50	No
		x	-0.002	4.50	No
	6	x	-0.015	1.50	No
		x	-0.015	6.50	No
		x	-0.001	4.50	No
	7	x	-0.015	1.50	No
		x	-0.015	6.50	No
		x	-0.001	4.50	No
	10	x	-0.015	1.50	No
		x	-0.015	6.50	No
		x	-0.001	4.50	No
	11	x	-0.015	1.50	No
		x	-0.015	6.50	No

		x	-0.001	4.50	No
LL1	17	y	-0.25	50.00	Yes
LL2	17	y	-0.25	100.00	Yes
LLa1	1	y	-0.50	50.00	Yes
LLa2	2	y	-0.50	50.00	Yes
LLa3	3	y	-0.50	50.00	Yes
LLa4	4	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 Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

RAM® Elements CONNECT Edition

TEP Northeast

Current Date: 12/5/2022 12:06 PM
Units system: English

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.4DL
LC14=1.2DL+1.6LL1
LC15=1.2DL+1.6LL2
LC16=1.2DL+WL0+1.6LLa1
LC17=1.2DL+WL30+1.6LLa1
LC18=1.2DL-WL0+1.6LLa1
LC19=1.2DL-WL30+1.6LLa1
LC20=1.2DL+WL0+1.6LLa2
LC21=1.2DL+WL30+1.6LLa2
LC22=1.2DL-WL0+1.6LLa2
LC23=1.2DL-WL30+1.6LLa2
LC24=1.2DL+WL0+1.6LLa3
LC25=1.2DL+WL30+1.6LLa3
LC26=1.2DL-WL0+1.6LLa3
LC27=1.2DL-WL30+1.6LLa3
LC28=1.2DL+WL0+1.6LLa4
LC29=1.2DL+WL30+1.6LLa4
LC30=1.2DL-WL0+1.6LLa4
LC31=1.2DL-WL30+1.6LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	PIPE 2x0.154	**1**	LC18 at 68.75%	0.35	OK	
		2	LC18 at 31.25%	0.22	OK	
		3	LC28 at 68.75%	0.21	OK	
		4	LC30 at 68.75%	**0.36**	**OK**	
		5	LC29 at 68.75%	0.16	OK	
		6	LC2 at 29.17%	0.28	OK	
		7	LC2 at 29.17%	0.28	OK	
		8	LC9 at 68.75%	0.10	OK	
		9	LC9 at 31.25%	0.10	OK	
		10	LC4 at 29.17%	0.25	OK	
		11	LC4 at 29.17%	0.25	OK	
		12	LC19 at 31.25%	0.16	OK	
	PIPE 3x0.216	**17**	LC18 at 82.14%	0.15	OK	
		25	LC4 at 0.00%	**0.54**	**OK**	
		23	LC1 at 50.00%	0.30	OK	
		29	LC18 at 0.00%	0.51	OK	
		27	LC3 at 50.00%	0.32	OK	
		21	LC30 at 0.00%	0.47	OK	

19	LC3 at 50.00%	0.30	OK
20	LC3 at 50.00%	0.24	OK
18	LC30 at 17.86%	0.15	OK
28	LC3 at 50.00%	0.23	OK
22	LC28 at 0.00%	0.50	OK
26	LC2 at 0.00%	0.45	OK
24	LC1 at 50.00%	0.23	OK
30	LC16 at 0.00%	0.46	OK
13	LC12 at 18.75%	0.11	OK
14	LC2 at 65.18%	0.13	OK
15	LC10 at 81.25%	0.11	OK
16	LC4 at 34.82%	0.12	OK

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Geometry data

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	2.00	-1.6034	0
5	1.3885	2.00	0.8017	0
3	-1.1691	2.00	0.675	0
6	1.1691	-2.00	0.675	0
2	0.00	-2.00	-1.6034	0
4	-1.3885	-2.00	0.8017	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
1	1	1	1	1	1	1
5	1	1	1	1	1	1
3	1	1	1	1	1	1
6	1	1	1	1	1	1
2	1	1	1	1	1	1
4	1	1	1	1	1	1

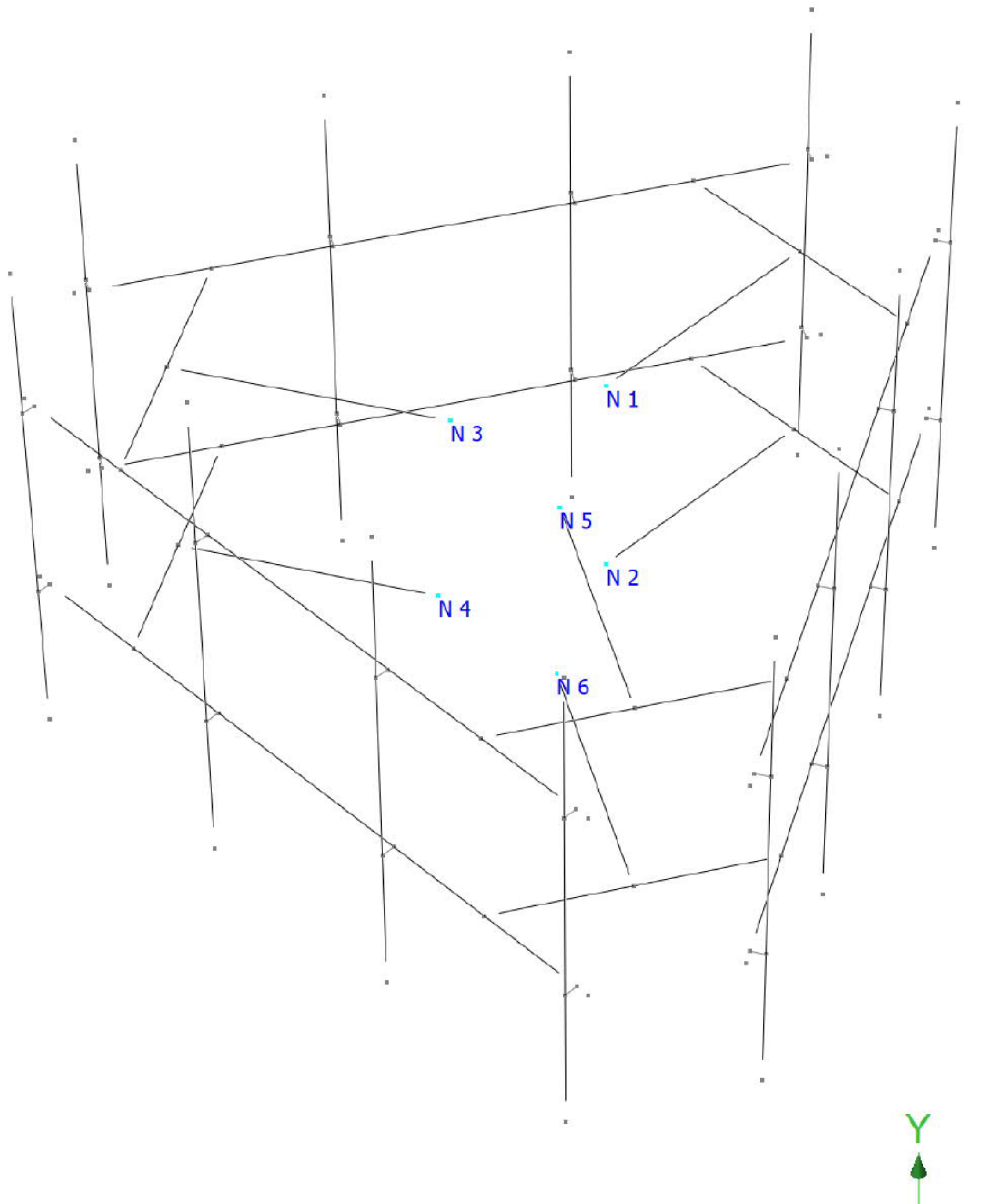
Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	29	33		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
2	28	32		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
3	27	31		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
4	26	30		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
5	42	46		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	43	47		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	44	48		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
8	45	49		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
9	37	41		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
10	36	40		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
11	35	39		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
12	34	38		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
17	16	17		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
25	1	7		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
23	9	8		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
29	5	10		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
27	12	11		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
21	3	13		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
19	15	14		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
20	59	58		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
18	60	61		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
28	62	63		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
22	4	65		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
26	2	66		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
24	68	67		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
30	6	64		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
13	85	87		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
14	89	91		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
15	86	88		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
16	90	92		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
1	0.00	2	1.00	0.00	0.00
2	0.00	2	1.00	0.00	0.00
3	0.00	2	1.00	0.00	0.00
4	0.00	2	1.00	0.00	0.00
5	0.00	2	-0.50	0.00	0.866
6	0.00	2	-0.50	0.00	0.866
7	0.00	2	-0.50	0.00	0.866
8	0.00	2	-0.50	0.00	0.866
9	0.00	2	-0.50	0.00	-0.866
10	0.00	2	-0.50	0.00	-0.866
11	0.00	2	-0.50	0.00	-0.866
12	0.00	2	-0.50	0.00	-0.866

TEP Northeast



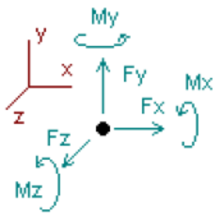
RAM Elements CONNECT Edition

TEP Northeast

Current Date: 12/5/2022 12:07 PM
Units system: English

Analysis result

Reactions



Direction of positive forces and moments

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **LC1=1.2DL+W0**						
1	-0.00001	0.44183	1.19638	1.30548	0.00842	-0.00230
5	0.12859	0.40731	0.83331	-0.55360	-1.38799	1.02402
3	-0.13597	0.36589	0.79602	-0.51223	1.38473	-0.96095
6	0.13624	0.35038	0.58098	-0.48817	-0.95181	0.92886
2	-0.00581	0.45911	0.83700	1.34563	0.01371	-0.00197
4	-0.12303	0.39629	0.61816	-0.52858	0.99843	-1.01457
SUM	0.00000	2.42081	4.86184	0.56851	0.06550	-0.02691
Condition **LC2=1.2DL+W30**						
1	0.84270	0.40553	-0.03729	1.17445	-1.91749	-0.04015
5	0.96540	0.39434	0.25016	-0.58425	0.43587	0.95394
3	0.96751	0.40080	-0.23570	-0.60198	0.49666	-1.08885
6	0.67865	0.33570	0.21755	-0.52734	0.21958	0.84815
2	0.61448	0.41055	-0.03775	1.18534	-1.40857	-0.05390
4	0.65306	0.47389	-0.15697	-0.67189	0.28173	-1.22536
SUM	4.72179	2.42081	0.00000	-0.02566	-1.89223	-0.60617
Condition **LC3=1.2DL-W0**						
1	-0.00044	0.37346	-1.20274	1.04851	-0.00774	0.00376
5	-0.14823	0.44273	-0.84988	-0.69235	1.39418	1.11566
3	0.15605	0.39006	-0.81189	-0.63727	-1.38950	-1.02019
6	-0.11447	0.40523	-0.56400	-0.66400	0.94059	1.04997
2	0.00631	0.35590	-0.83154	1.00791	-0.01495	0.00409
4	0.10078	0.45342	-0.60179	-0.71402	-0.98943	-1.12663
SUM	0.00000	2.42081	-4.86184	-0.65123	-0.06686	0.02666
Condition **LC4=1.2DL-W30**						
1	-0.84325	0.40935	0.03087	1.18030	1.91796	0.04167
5	-0.98530	0.45593	-0.26638	-0.66166	-0.42550	1.18547
3	-0.94708	0.35534	0.22022	-0.54747	-0.50653	-0.89190
6	-0.65717	0.42011	-0.20053	-0.62484	-0.22890	1.13049
2	-0.61401	0.40412	0.04271	1.16890	1.40702	0.05609
4	-0.67498	0.37595	0.17310	-0.57066	-0.27548	-0.91540
SUM	-4.72179	2.42081	0.00000	-0.05543	1.88857	0.60643

Condition **LC5=0.9DL+W0**

1	0.00004	0.33977	1.19750	1.01261	0.00836	-0.00249
5	0.13132	0.30111	0.83560	-0.39727	-1.38937	0.75588
3	-0.13875	0.27148	0.79820	-0.36802	1.38596	-0.71272
6	0.13350	0.25593	0.57871	-0.34361	-0.95036	0.68089
2	-0.00588	0.35726	0.83586	1.05284	0.01388	-0.00224
4	-0.12023	0.29006	0.61598	-0.37266	0.99733	-0.74624
SUM	0.00000	1.81560	4.86184	0.58391	0.06579	-0.02692

Condition **LC6=0.9DL+W30**

1	0.84288	0.30365	-0.03659	0.88000	-1.91786	-0.04052
5	0.96833	0.28821	0.25238	-0.42784	0.43484	0.68517
3	0.96517	0.30610	-0.23383	-0.45872	0.49776	-0.84216
6	0.67572	0.24127	0.21533	-0.38271	0.22068	0.59960
2	0.61431	0.30870	-0.03846	0.89094	-1.40816	-0.05435
4	0.65539	0.36768	-0.15884	-0.51706	0.28072	-0.95879
SUM	4.72179	1.81560	0.00000	-0.01540	-1.89203	-0.61105

Condition **LC7=0.9DL-W0**

1	-0.00039	0.27177	-1.20243	0.75256	-0.00784	0.00357
5	-0.14575	0.33638	-0.84797	-0.53706	1.39326	0.84868
3	0.15352	0.29546	-0.81007	-0.49399	-1.38877	-0.77297
6	-0.11692	0.31075	-0.56591	-0.52038	0.94159	0.80305
2	0.00624	0.25404	-0.83184	0.71200	-0.01481	0.00382
4	0.10330	0.34721	-0.60362	-0.55915	-0.99015	-0.85949
SUM	0.00000	1.81560	-4.86184	-0.64601	-0.06671	0.02666

Condition **LC8=0.9DL-W30**

1	-0.84332	0.30747	0.03159	0.88595	1.91817	0.04168
5	-0.98302	0.34952	-0.26440	-0.50643	-0.42676	0.91912
3	-0.95006	0.26102	0.22234	-0.40322	-0.50567	-0.64315
6	-0.65943	0.32562	-0.20248	-0.48128	-0.22757	0.88413
2	-0.61397	0.30226	0.04199	0.87461	1.40693	0.05601
4	-0.67198	0.26971	0.17096	-0.41468	-0.27628	-0.64648
SUM	-4.72179	1.81560	0.00000	-0.04505	1.88881	0.61131

Condition **LC9=1.2DL+Di+Wi0**

1	-0.00052	0.76532	0.14244	2.20075	0.00233	0.00094
5	-0.01478	0.78591	0.09264	-1.13478	-0.19001	1.96429
3	0.01437	0.69982	0.08773	-1.04780	0.19096	-1.82171
6	0.01438	0.69672	0.06722	-1.04597	-0.11711	1.81431
2	-0.00048	0.76659	0.08227	2.20375	0.00139	0.00156
4	-0.01296	0.78338	0.07170	-1.12764	0.12274	-1.96303
SUM	0.00000	4.49773	0.54400	0.04830	0.01030	-0.00363

Condition **LC10=1.2DL+Di+Wi30**

1	0.11477	0.75727	-0.00727	2.17203	-0.26864	-0.00732
5	0.10450	0.78270	0.01117	-1.14076	0.07593	1.94857
3	0.13714	0.70828	-0.03985	-1.06809	0.06121	-1.85101
6	0.07349	0.69392	0.02799	-1.05382	0.01433	1.79831
2	0.06906	0.75707	0.00784	2.17147	-0.16691	-0.00890
4	0.04003	0.79849	0.00013	-1.15638	0.02937	-2.00515
SUM	0.53900	4.49773	0.00000	-0.07556	-0.25472	-0.12551

Condition **LC11=1.2DL+Di-Wi0**

1	-0.00020	0.74902	-0.15831	2.14261	-0.00118	0.00174
5	-0.01903	0.79335	-0.12097	-1.16406	0.20685	1.98312
3	0.02019	0.70523	-0.11448	-1.07429	-0.20536	-1.83519
6	0.01929	0.70758	-0.03909	-1.08111	0.09911	1.83852
2	0.00145	0.74743	-0.06632	2.13863	-0.00370	0.00236
4	-0.02171	0.79512	-0.04482	-1.16495	-0.10926	-1.98693
SUM	0.00000	4.49773	-0.54400	-0.20317	-0.01354	0.00363

Condition **LC12=1.2DL+Di-Wi30**

1	-0.11549	0.75706	-0.00859	2.17134	0.26979	0.01001
5	-0.13830	0.79656	-0.03949	-1.15808	-0.05898	1.99884
3	-0.10260	0.69677	0.01310	-1.05401	-0.07572	-1.80588
6	-0.03982	0.71038	0.00013	-1.07327	-0.03230	1.85452
2	-0.06809	0.75694	0.00811	2.17092	0.16459	0.01282
4	-0.07471	0.78001	0.02674	-1.13622	-0.01593	-1.94479
SUM	-0.53900	4.49773	0.00000	-0.07930	0.25146	0.12551

Condition **LC13=1.4DL**

1	-0.00023	0.47541	-0.00332	1.37382	0.00037	0.00086
5	-0.01216	0.49592	-0.00981	-0.72712	0.00535	1.24856
3	0.01239	0.44102	-0.00930	-0.67080	-0.00457	-1.15597
6	0.01212	0.44085	0.00974	-0.67244	-0.00568	1.15476
2	0.00031	0.47533	0.00334	1.37360	-0.00073	0.00124
4	-0.01244	0.49575	0.00934	-0.72518	0.00425	-1.24945
SUM	0.00000	2.82427	0.00000	-0.04813	-0.00103	0.00000

Condition **LC14=1.2DL+1.6LL1**

1	0.00040	0.39417	-0.06413	1.12786	-0.00243	0.00068
5	-0.02365	0.53915	-0.05605	-0.86446	0.07619	1.30782
3	0.02330	0.47914	-0.05488	-0.80021	-0.08111	-1.21000
6	0.02303	0.47704	0.05525	-0.80216	-0.08211	1.20577
2	0.00085	0.39428	0.06413	1.12755	-0.00335	0.00110
4	-0.02392	0.53703	0.05569	-0.86359	0.07529	-1.30566
SUM	0.00000	2.82081	0.00000	-1.07501	-0.01753	-0.00029

Condition **LC15=1.2DL+1.6LL2**

1	-0.01130	0.40404	-0.08422	1.15056	0.02238	0.01858
5	-0.13975	0.63069	-0.11835	-1.06641	0.05956	1.66121
3	-0.07728	0.39284	0.00546	-0.62152	-0.08638	-0.99585
6	0.13882	0.54765	0.11766	-0.97635	-0.06599	1.51498
2	0.01247	0.40449	0.08408	1.15082	-0.02778	0.01897
4	0.07704	0.44108	-0.00462	-0.67008	0.08209	-1.07518
SUM	0.00000	2.82081	0.00000	-1.03299	-0.01613	1.14271

Condition **LC16=1.2DL+WL0+1.6LLa1**

1	-0.02018	0.39965	-0.12284	1.12299	0.04253	0.03271
5	-0.26702	0.82446	-0.21080	-1.49911	0.08490	2.21368
3	-0.15051	0.41380	0.04027	-0.68032	-0.10610	-1.01497
6	0.26516	0.71713	0.25972	-1.37843	-0.19594	2.02542
2	0.02253	0.40151	0.19395	1.12564	-0.05332	0.03325
4	0.15002	0.46426	0.01169	-0.73140	0.19526	-1.09514
SUM	0.00000	3.22081	0.17200	-2.04063	-0.03266	2.19496

Condition **LC17=1.2DL+WL30+1.6LLa1**

1	0.01521	0.39712	-0.17033	1.11358	-0.04133	0.03019
5	-0.23178	0.82354	-0.23696	-1.50127	0.16644	2.20906
3	-0.11413	0.41629	0.00020	-0.68669	-0.14984	-1.02402
6	0.28248	0.71639	0.24738	-1.38127	-0.15645	2.02078
2	0.04396	0.39841	0.17057	1.11501	-0.10571	0.03000
4	0.16525	0.46905	-0.01085	-0.74064	0.16378	-1.10849
SUM	0.16100	3.22081	0.00000	-2.08127	-0.12311	2.15751

Condition **LC18=1.2DL-WL0+1.6LLa1**

1	-0.02023	0.39451	-0.21819	1.10393	0.04180	0.03296
5	-0.26821	0.82679	-0.27857	-1.50844	0.21089	2.21955
3	-0.14861	0.41542	-0.02376	-0.68879	-0.23150	-1.01926
6	0.26684	0.72070	0.22625	-1.38990	-0.12757	2.03334
2	0.02302	0.39527	0.14721	1.10418	-0.05463	0.03350
4	0.14719	0.46812	-0.02495	-0.74362	0.12230	-1.10305
SUM	0.00000	3.22081	-0.17200	-2.12264	-0.03872	2.19704

Condition **LC19=1.2DL-WL30+1.6LLa1**

1	-0.05563	0.39704	-0.17069	1.11335	0.12566	0.03549
5	-0.30345	0.82770	-0.25240	-1.50628	0.12936	2.22417
3	-0.18500	0.41293	0.01631	-0.68243	-0.18777	-1.01021
6	0.24952	0.72144	0.23859	-1.38707	-0.16706	2.03798
2	0.00159	0.39836	0.17060	1.11482	-0.00224	0.03675
4	0.13197	0.46333	-0.00240	-0.73438	0.15377	-1.08969
SUM	-0.16100	3.22081	0.00000	-2.08200	0.05173	2.23448

Condition **LC20=1.2DL+WL0+1.6LLa2**

1	-0.00285	0.38255	-0.09543	1.08288	0.00636	0.00614
5	-0.08799	0.72593	-0.11968	-1.27034	0.11898	1.75843
3	-0.02414	0.51271	-0.03830	-0.88704	-0.10373	-1.25417
6	0.08655	0.64045	0.16833	-1.17627	-0.22975	1.61925
2	0.00542	0.38382	0.16683	1.08453	-0.01824	0.00664
4	0.02300	0.57534	0.09025	-0.95332	0.19027	-1.35446
SUM	0.00000	3.22081	0.17200	-2.11955	-0.03611	0.78183

Condition **LC21=1.2DL+WL30+1.6LLa2**

1	0.03254	0.38000	-0.14293	1.07344	-0.07749	0.00361
5	-0.05274	0.72503	-0.14583	-1.27247	0.20054	1.75380
3	0.01222	0.51522	-0.07836	-0.89337	-0.14746	-1.26318
6	0.10387	0.63971	0.15598	-1.17908	-0.19027	1.61459
2	0.02685	0.38072	0.14344	1.07387	-0.07062	0.00339
4	0.03825	0.58012	0.06769	-0.96252	0.15879	-1.36775
SUM	0.16100	3.22081	0.00000	-2.16013	-0.12652	0.74447

Condition **LC22=1.2DL-WL0+1.6LLa2**

1	-0.00291	0.37740	-0.19080	1.06379	0.00564	0.00639
5	-0.08918	0.72824	-0.18743	-1.27968	0.24500	1.76438
3	-0.02228	0.51435	-0.10233	-0.89550	-0.22913	-1.25846
6	0.08824	0.64404	0.13484	-1.18777	-0.16139	1.62723
2	0.00592	0.37758	0.12010	1.06305	-0.01955	0.00690
4	0.02020	0.57920	0.05361	-0.96552	0.11732	-1.36235
SUM	0.00000	3.22081	-0.17200	-2.20163	-0.04211	0.78410

Condition **LC23=1.2DL-WL30+1.6LLa2**

1	-0.03830	0.37994	-0.14330	1.07324	0.08950	0.00892
5	-0.12443	0.72914	-0.16128	-1.27755	0.16345	1.76900
3	-0.05864	0.51185	-0.06227	-0.88917	-0.18541	-1.24945
6	0.07092	0.64478	0.14720	-1.18495	-0.20088	1.63190
2	-0.01551	0.38068	0.14348	1.07371	0.03283	0.01015
4	0.00496	0.57442	0.07616	-0.95632	0.14879	-1.34906
SUM	-0.16100	3.22081	0.00000	-2.16104	0.04829	0.82146

Condition **LC24=1.2DL+WL0+1.6LLa3**

1	0.00522	0.38282	-0.09582	1.08347	-0.01753	-0.00510
5	0.02245	0.57638	-0.03840	-0.95645	0.09164	1.35482
3	0.08673	0.64279	-0.11921	-1.17663	-0.13173	-1.62263
6	-0.02431	0.51150	0.08745	-0.88685	-0.20160	1.25109
2	-0.00268	0.38355	0.16645	1.08394	0.00577	-0.00460
4	-0.08741	0.72376	0.17153	-1.26711	0.21781	-1.75790
SUM	0.00000	3.22081	0.17200	-2.11962	-0.03563	-0.78432

Condition **LC25=1.2DL+WL30+1.6LLa3**

1	0.04061	0.38027	-0.14332	1.07401	-0.10138	-0.00762
5	0.05770	0.57548	-0.06454	-0.95856	0.17322	1.35015
3	0.12308	0.64533	-0.15927	-1.18292	-0.17545	-1.63158
6	-0.00699	0.51076	0.07508	-0.88963	-0.16211	1.24639
2	0.01875	0.38044	0.14306	1.07326	-0.04661	-0.00785
4	-0.07215	0.72853	0.14898	-1.27627	0.18633	-1.77111
SUM	0.16100	3.22081	0.00000	-2.16011	-0.12600	-0.82163

Condition **LC26=1.2DL-WL0+1.6LLa3**

1	0.00515	0.37767	-0.19119	1.06439	-0.01824	-0.00484
5	0.02125	0.57865	-0.10615	-0.96581	0.21770	1.36079
3	0.08858	0.64447	-0.18325	-1.18509	-0.25710	-1.62689
6	-0.02260	0.51509	0.05395	-0.89836	-0.13324	1.25910
2	-0.00219	0.37731	0.11973	1.06246	0.00446	-0.00434
4	-0.09019	0.72762	0.13490	-1.27930	0.14486	-1.76575
SUM	0.00000	3.22081	-0.17200	-2.20171	-0.04155	-0.78193

Condition **LC27=1.2DL-WL30+1.6LLa3**

1	-0.03024	0.38022	-0.14369	1.07385	0.06561	-0.00231
5	-0.01400	0.57956	-0.08001	-0.96371	0.13613	1.36546
3	0.05223	0.64193	-0.14319	-1.17879	-0.21339	-1.61794
6	-0.03992	0.51583	0.06632	-0.89558	-0.17272	1.26381
2	-0.02362	0.38042	0.14312	1.07314	0.05685	-0.00109
4	-0.10546	0.72285	0.15745	-1.27015	0.17634	-1.75254
SUM	-0.16100	3.22081	0.00000	-2.16123	0.04881	-0.74462

Condition **LC28=1.2DL+WL0+1.6LLa4**

1	0.02231	0.40039	-0.12297	1.12458	-0.05260	-0.03170
5	0.14948	0.46458	0.04017	-0.73452	0.09673	1.09541
3	0.26537	0.72197	-0.21063	-1.37924	-0.09781	-2.02949
6	-0.15070	0.41331	0.00892	-0.68021	-0.20390	1.01204
2	-0.02003	0.40078	0.19387	1.12406	0.04197	-0.03118
4	-0.26643	0.81978	0.26264	-1.49560	0.18383	-2.21275
SUM	0.00000	3.22081	0.17200	-2.04093	-0.03180	-2.19766

Condition **LC29=1.2DL+WL30+1.6LLa4**

1	0.05770	0.39783	-0.17045	1.11512	-0.13644	-0.03422
5	0.18471	0.46367	0.01404	-0.73659	0.17830	1.09070
3	0.30171	0.72455	-0.25069	-1.38550	-0.14152	-2.03837
6	-0.13337	0.41256	-0.00345	-0.68297	-0.16441	1.00730
2	0.00140	0.39766	0.17046	1.11337	-0.01042	-0.03443
4	-0.25116	0.82453	0.24009	-1.50471	0.15235	-2.22587
SUM	0.16100	3.22081	0.00000	-2.08128	-0.12214	-2.23487

Condition **LC30=1.2DL-WL0+1.6LLa4**

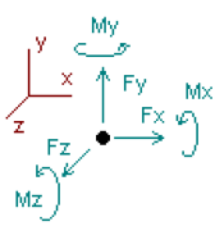
1	0.02224	0.39524	-0.21832	1.10552	-0.05329	-0.03144
5	0.14824	0.46683	-0.02757	-0.74388	0.22280	1.10140
3	0.26722	0.72367	-0.27469	-1.38768	-0.22315	-2.03369
6	-0.14897	0.41690	-0.02458	-0.69174	-0.13554	1.02008
2	-0.01953	0.39454	0.14713	1.10260	0.04066	-0.03092
4	-0.26920	0.82363	0.22602	-1.50777	0.11088	-2.22052
SUM	0.00000	3.22081	-0.17200	-2.12294	-0.03764	-2.19509

Condition **LC31=1.2DL-WL30+1.6LLa4**

1	-0.01314	0.39780	-0.17083	1.11499	0.03055	-0.02892
5	0.11300	0.46774	-0.00144	-0.74181	0.14123	1.10611
3	0.23088	0.72109	-0.23462	-1.38142	-0.17945	-2.02481
6	-0.16630	0.41765	-0.01221	-0.68898	-0.17503	1.02481
2	-0.04097	0.39765	0.17053	1.11329	0.09304	-0.02768
4	-0.28448	0.81887	0.24858	-1.49866	0.14236	-2.20740
SUM	-0.16100	3.22081	0.00000	-2.08259	0.05270	-2.15788

Envelope for nodal reactions

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



Direction of positive forces and moments

Envelope of nodal reactions for :

LC1=1.2DL+W0
LC2=1.2DL+W30
LC3=1.2DL-W0
LC4=1.2DL-W30
LC5=0.9DL+W0
LC6=0.9DL+W30
LC7=0.9DL-W0
LC8=0.9DL-W30
LC9=1.2DL+Di+Wi0
LC10=1.2DL+Di+Wi30
LC11=1.2DL+Di-Wi0
LC12=1.2DL+Di-Wi30
LC13=1.4DL

LC14=1.2DL+1.6LL1
LC15=1.2DL+1.6LL2
LC16=1.2DL+WL0+1.6LLa1
LC17=1.2DL+WL30+1.6LLa1
LC18=1.2DL-WL0+1.6LLa1
LC19=1.2DL-WL30+1.6LLa1
LC20=1.2DL+WL0+1.6LLa2
LC21=1.2DL+WL30+1.6LLa2
LC22=1.2DL-WL0+1.6LLa2
LC23=1.2DL-WL30+1.6LLa2
LC24=1.2DL+WL0+1.6LLa3
LC25=1.2DL+WL30+1.6LLa3
LC26=1.2DL-WL0+1.6LLa3
LC27=1.2DL-WL30+1.6LLa3
LC28=1.2DL+WL0+1.6LLa4
LC29=1.2DL+WL30+1.6LLa4
LC30=1.2DL-WL0+1.6LLa4
LC31=1.2DL-WL30+1.6LLa4

		Forces						Moments					
Node		**Fx** [Kip]	**lc**	**Fy** [Kip]	**lc**	**Fz** [Kip]	**lc**	**Mx** [Kip*ft]	**lc**	**My** [Kip*ft]	**lc**	**Mz** [Kip*ft]	**lc**
1	Max	0.843	LC6	0.765	LC9	1.197	LC5	2.20075	LC9	1.91817	LC8	0.04168	LC8
	Min	-0.843	LC8	0.272	LC7	-1.203	LC3	0.75256	LC7	-1.91786	LC6	-0.04052	LC6
5	Max	0.968	LC6	0.828	LC19	0.836	LC5	-0.39727	LC5	1.39418	LC3	2.22417	LC19
	Min	-0.985	LC4	0.288	LC6	-0.850	LC3	-1.50844	LC18	-1.38937	LC5	0.68517	LC6
3	Max	0.968	LC2	0.725	LC29	0.798	LC5	-0.36802	LC5	1.38596	LC5	-0.64315	LC8
	Min	-0.950	LC8	0.261	LC8	-0.812	LC3	-1.38768	LC30	-1.38950	LC3	-2.03837	LC29
6	Max	0.679	LC2	0.721	LC19	0.581	LC1	-0.34361	LC5	0.94159	LC7	2.03798	LC19
	Min	-0.659	LC8	0.241	LC6	-0.566	LC7	-1.38990	LC18	-0.95181	LC1	0.59960	LC6
2	Max	0.614	LC2	0.767	LC9	0.837	LC1	2.20375	LC9	1.40702	LC4	0.05609	LC4
	Min	-0.614	LC4	0.254	LC7	-0.832	LC7	0.71200	LC7	-1.40857	LC2	-0.05435	LC6
4	Max	0.655	LC6	0.825	LC29	0.618	LC1	-0.37266	LC5	0.99843	LC1	-0.64648	LC8
	Min	-0.675	LC4	0.270	LC8	-0.604	LC7	-1.50777	LC30	-0.99015	LC7	-2.22587	LC29

NORTHEAST

Connection Check

Date:	12/9/2022
Project Name:	BROOKFILED STATION RD
Project No.:	CT2185
Designed By:	RL **Checked By:** MSC

TEP NORTHEAST

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.

CONNECTION PLATE CONFIGURATION (4-BOLTS)

$N_{BOLT\ ROWS}$	=	2	rows	S_Y	=	6	in	(Min.)
N_{BOLTS}	=	2	bolts/row	S_X	=	6	in	(Min.)

TENSILE FORCES

Moment in X axis:	2201	lb-ft.	(See Bentley Output)
Couple Reaction from M_X:	8804	lbs.	
Moment in Y axis:	1918	lb-ft.	(See Bentley Output)
Couple Reaction from M_Y:	7672	lbs.	
Reaction in Z direction:	1203	lbs.	(See Bentley Output)
Resultant:	4420	lbs.	

SHEAR FORCES

Moment in Z axis:	42	lb-ft.	(See Bentley Output)
Couple Reaction from M_Z:	168	lbs.	
Reaction in X direction:	843	lbs.	(See Bentley Output)
Reaction in Y direction:	765	lbs.	(See Bentley Output)
Resultant:	314	lbs.	

(CONT.)

Tension Design Load /Bolts =

f_t=	4420 lbs.	**<**	13806 lbs.	**Therefore, OK !**

Shear Design Load / Bolts=

f_v=	314 lbs.	**<**	8283 lbs.	**Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	$\leq$	1.0			
0.320	+	0.038	=	0.358	**<**	1.0	**Therefore, OK !**

Date: 12/9/2022
Project Name: BROOKFILED STATION RD
Project No.: CT2185
Designed By: RL **Checked By:** MSC

CHECK CONNECTION CAPACITY (Worst Case)

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

Bolt Type = A36 5/8" Threaded Rod

Allowable Tensile Load =

F_{Tall} = 6673 lbs.

Allowable Shear Load =

F_{Vall}= 4004 lbs.

TENSILE FORCES

Reaction F = 1203 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 843 lbs. (See Bentley Output)
Reactions in Y direction: 765 lbs. (See Bentley Output)

Resultant: 1138 lbs.

No. of Supports = 1
No. of Bolts / Support = 3

Tension Design Load /Bolts =

f_t= 401.00 lbs. < 6673 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v= 379.45 lbs. < 4004 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.060	+	0.095	=	0.155	<	1.0	**Therefore, OK !**

Town of Brookfield, CT

Property Listing Report

Map Block Lot	D08060	Building #	1	Section #	1	Account	01179000

Property Information

Property Location	761 FEDERAL RD
Owner	CONNECTICUT LIGHT & POWER COMPANY
Co-Owner	na
Mailing Address	PO BOX 270 HARTFORD CT 06141
Land Use	435 Cell Site Vac Lnd
Land Class	I
Zoning Code	TCD
Census Tract	205100020100

Ph

Street Index	
Acreage	0.1
Utilities	UNKNOWN
Lot Setting/Desc	UNKNOWN Level
Additional Info	

Sketch

Primary Construction Details

Year Built	0	Bedrooms	0	Exterior Walls	
Stories		Full Bathrooms	0	Exterior Walls 2	NA
Building Style	UNKNOWN	Half Bathrooms	0	Interior Walls	
Building Use	Vacant	Extra Fixtures	0	Interior Walls 2	NA
Building Condition		Bath Style	NA	Heating Type	
Interior Floors 1		Kitchen Style	NA	Heating Fuel	
Interior Floors 2	NA	Roof Style		Sq. Ft. Basement	
Total Rooms	0	Roof Cover		Fin BSMT Quality	
Basement Garages	0	AC Type		Extra Kitchens	
Occupancy		Fireplaces	0		
Building Grade					

Report Created On 4/4/2023

Town of Brookfield, CT

Property Listing Report | Map Block Lot: D08060 | Building #: 1 | Section #: 1 | Account: 01179000

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Improvements		
Outbuildings	33170	23230
Land	225730	158010
Total	258900	181240

Sub Areas

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

Outbuilding and Extra Features

Type	Description
Comm Shed	200 S.F.
Fence 6'	110 L.F.
PreCastConc Shed	80 S.F
Cell Tower	1 Units

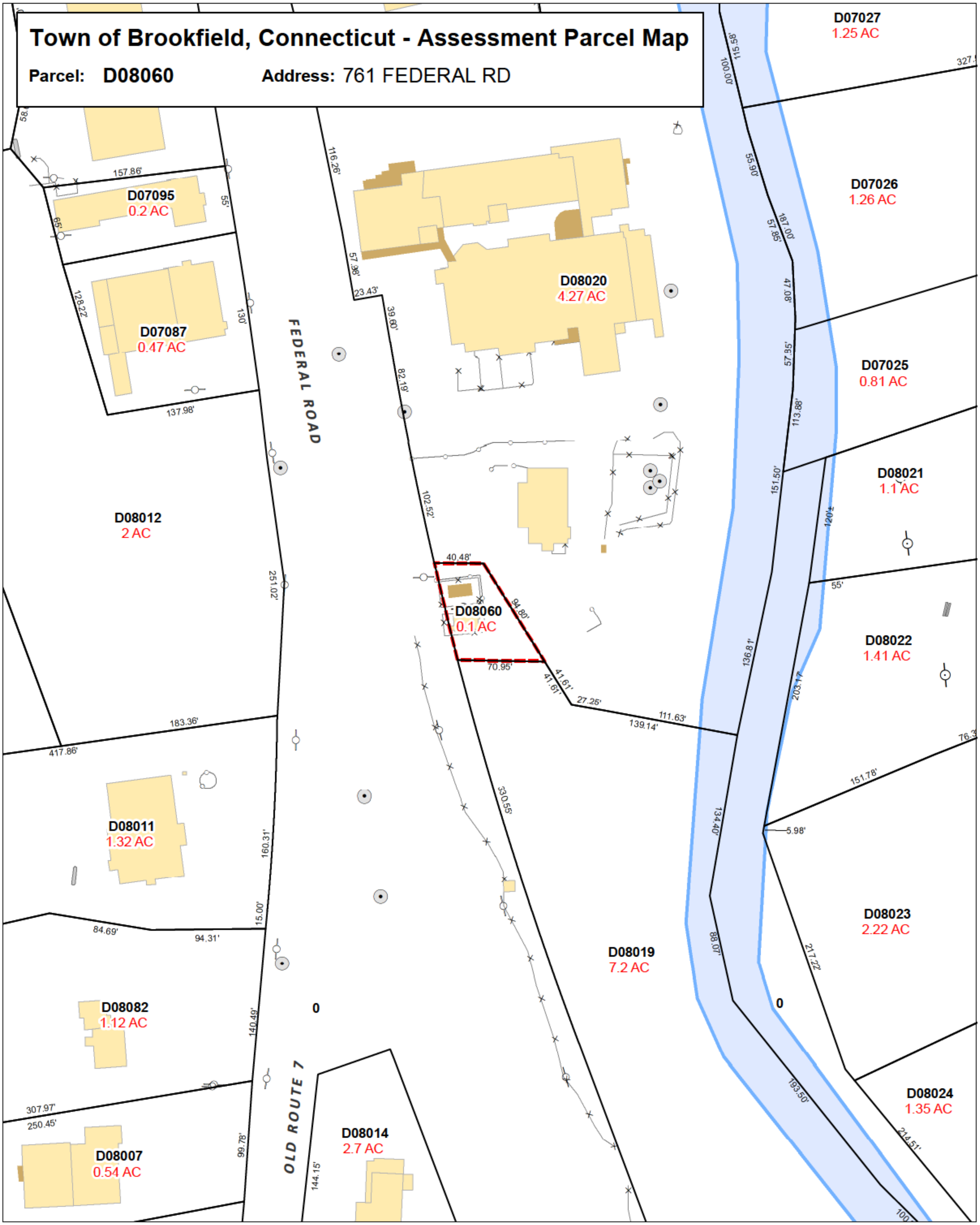
Sales History

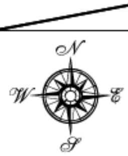
Owner of Record	Book/ Page	Sale Date	Sale Price
CONNECTICUT LIGHT & POWER COMPANY	103/ 160	1973-09-19	0
CONNECTICUT LIGHT & POWER COMPANY	046/ 331	1956-12-13	0

Report Created On 4/4/2023

Town of Brookfield, Connecticut - Assessment Parcel Map

Parcel: **D08060** **Address:** 761 FEDERAL RD





Approximate Scale:
1 inch = 100 feet

Map Produced January 2023

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

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

December 1, 2000

Peter W. van Wilgen
Springwich Cellular Limited Partnership
c/o Southern New England Telecommunications Corp.
500 Enterprise Drive, 3F
Rocky Hill, CT 06067-3900

Re: PETITION NO. 494 - Springwich Cellular Limited Partnership (SCLP) petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for modifications to an existing Connecticut Light and Power Company electric transmission facility located on Route 7, South of Station Road, Brookfield, Connecticut.

Dear Mr. van Wilgen:

At a public meeting held on November 30, 2000, 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. The Council approved this proposal conditioned upon the requirements that a chain-link fence with no barbed wire is used to enclose the site and that landscaping is installed.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the petition, dated November 14, 2000.

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

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/CML

Enclosure: Staff Report dated November 30, 2000

c: Honorable Martin J. Foncello, Jr., First Selectman, Town of Brookfield

Petition No. 494
Springwich Cellular Limited Partnership
North Branford, Connecticut
Staff Report
November 30, 2000

On November 20, 2000, Connecticut Siting Council (Council) member Edward Wilensky and Christina Lepage of the Council staff met with Springwich Cellular Limited Partnership (SCLP) representative Theresa Ranciato-Viele at 763 Federal Road, Brookfield, Connecticut for inspection of an electric transmission structure. The property and structure is owned by Connecticut Light and Power Co. (CL&P). SCLP, with the agreement of CL&P, proposes to modify the structure by installing antennas and associated equipment for telecommunications use and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification.

SCLP proposes the installation of three 8-foot panel antennas on top of a mounting pole. The antennas will extend approximately 10-feet above the existing 90.8-foot transmission line monopole structure (#2683). The centerline of the antennas will be at about 96.8 feet above ground level (AGL) with the top of the antennas at 100.8-feet AGL.

Access to the site will be from Federal Road through an existing CL&P right-of-way. SCLP is proposing to install a 67-foot long driveway with a turn-around to access the structure during construction activity and all regular maintenance. A 2-foot retaining wall will be installed to separate the access road and the telecommunications equipment compound, which is at a higher level. Concrete stairs will be built to separate the two levels.

An 11'x20' equipment building will be placed on a 12'3"x21' concrete pad at the base of the tower. The equipment shelter will contain 12 batteries, which would provide power in the case of a commercial power failure. An 8-foot high chain-link fence will be installed around the entire facility for security of the site. Landscaping will consist of several 6 to 8-foot arborvitae trees to camouflage the fence. Electrical and telephone services will be provided to the property via an existing utility pole #2378, which is located on Federal Road. The power and telephone lines will be installed in underground conduits beneath SCLP's access driveway.

The proposed site is located east of Route 7 (Federal Road) in Brookfield. The site is bordered by commercial buildings and parking lots to the north and by undeveloped land to the south and east. The zoning designation of this site is "Central Business District". The nearest residence is approximately 500 feet to the east of the site.

SCLP states that the equipment will not be seen since it will be enclosed in the equipment building at the base of the structure. SCLP also contends that all erosion and sediment control measures shall be installed as necessary.

The worst-case power density for the telecommunications operations at the site has been calculated to be 14.30% of the applicable standard for uncontrolled environments.

SCLP submits that the proposed modification of the structure would not require a Certificate because it will reduce the need for a new telecommunications tower by utilizing an existing structure and contends that the proposed installation will not cause a substantial adverse environmental effect.

EVERSOURCE ENERGY

56 Prospect Street,
Hartford, CT 06103

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

June 21, 2023

Tarah Nolan
SAI Communications
12 Industrial Way
Salem, NH 03079

RE: AT&T Antenna Site CT2185, Federal Rd, Brookfield CT, Eversource Structure 2683

Dear Ms. Nolan:

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

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

Sincerely,

Richard Badon

Richard Badon
Transmission Line Engineering

Ref: 2023-0303 - CT2185 - Structural Analysis Rev1 (22021.10)
CT2185_LTE 5G NR_CD_Rev3_06.14.23
CT2185 Mount Structural Analysis Rev1 120922

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TOWN OF BROOKFIELD
100 POCONO RD
BROOKFIELD CT 06804-3322

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12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 03/14/24
Ref#: CT2185
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C015

CHRIS GELINAS
EVERSOURCE
107 SELDEN ST
BERLIN CT 06037-1616

USPS TRACKING #

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PRIORITY MAIL®

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

Expected Delivery Date: 03/14/24
Ref#: CT2185
0003

C006

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

USPS TRACKING #

9405 5036 9930 0668 8094 57

Electronic Rate Approved #038555749

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From: auto-reply@usps.com
Sent: Tuesday, March 12, 2024 4:23 PM
To: Hollis Redding
Subject: USPS® Expected Delivery by Thursday, March 14, 2024 arriving by 9:00pm 9405503699300668809433

Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 12:57 pm on March 12, 2024 in MERIDEN, CT 06450.

Tracking Number: 9405503699300668809433

Expected Delivery By

Thur
14
Mar

By 9:00pm

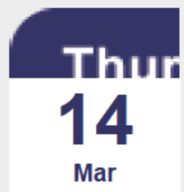
From: auto-reply@usps.com
Sent: Tuesday, March 12, 2024 4:14 PM
To: Hollis Redding
Subject: USPS® Expected Delivery by Thursday, March 14, 2024 arriving by 9:00pm 9405503699300668809440

Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 12:57 pm on March 12, 2024 in MERIDEN, CT 06450.

Tracking Number: [9405503699300668809440]

Expected Delivery By



By 9:00pm