Greg Milano
SAI Group, LLC
12 Industrial Way
Salem, NH 03079
860-707-9001
gmilano@saigrp.com

December 2, 2019

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) CT5218
269 Flanders Road, East Lyme, CT 06333 (CL&P pole #6077)
N 42.361892
W -72.209099

Dear Ms. Bachman:

AT&T currently maintains three (3) antennas at the 107-foot level of the existing 98-foot transmission line monopole with extension height at 110-feet at 269 Flanders Road, East Lyme, CT. The tower and property are owned by Eversource. AT&T now intends to remove three (3) antennas and replace them with three (3) ET-X-UW-68-14-65-18-iR-AT-RA KMV antennas. These antennas would be installed at the 107-foot level of the tower. AT&T also intends to remove three (3) TMAs and replace them with three (3) Commscope TMAT192123B68-31. All RRUs will be mounted at ground. AT&T plans to install three (3) Ericsson 4478 B5 RRUS and three (3) 4415 B30 RRUS.

Attached is the Petition No. 530, AT&T Wireless PCS, LLC, East Lyme, Connecticut, Staff Report, November 28, 2001. This petition included no details which could feasibly be violated by this modification, including total facility height or mounting restrictions. This modification complies with the attached petition. Attached is a letter of authorization from Eversource.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Mark C. Nickerson, First Selectman for the Town of East Lyme, East Lyme Planning and Zoning Department as well as the property and tower owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

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

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

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

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

Sincerely,

Greg Milano

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Attachments

cc: Mark C. Nickerson- First Selectman
Gary A. Goeschel II, Director of Planning
Eversource Energy - Property Owner/Tower Owner

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0%
AT&T	2	1294	107	0.0917	880	0.5867	1.56%
AT&T	2	1556	107	0.1103	1900	1.0000	1.10%
AT&T	4	934	107	0.1324	1900	1.0000	1.32%
AT&T	1	647	107	0.0229	880	0.5867	0.39%
AT&T LTE	1	1615	107	0.0572	734	0.4893	1.17%
Site Total							5.55%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							0%
AT&T UMTS	1	256	156	0.0090	850	0.5667	0.16%
AT&T LTE	1	1476	156	0.0520	700	0.4667	1.12%
AT&T LTE	1	1285	156	0.0453	2300	1.0000	0.45%
AT&T LTE	2	3664	156	0.2583	1900	1.0000	2.58%
AT&T LTE	1	381	156	0.0134	850	0.5667	0.24%
AT&T 5G	1	381	156	0.0134	850	0.5667	0.24%
Site Total							4.78%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

PROJECT INFORMATION

SCOPE OF WORK:	ITEMS TO BE MOUNTED ON THE EXISTING TOWER: • NEW AT&T ANTENNA: (ET-X-UW-68-14-65-18-iR-AT-RA) (TYP. OF 1 PER SECTOR, TOTAL OF 3) • NEW AT&T TMA'S (TMAT192123B68-31) (TYP. OF 1 PER SECTOR, TOTAL OF 3) ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION: • NEW AT&T RRUS 4478 B5 (850) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T RRUS 4415 B30 (WCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3). • INSTALL (1) OUTDOOR DC12. • ADD (1) 6630. • INSTALL 850 RXAIT & 850 LLC. • INSTALL LOW BAND COMBINER (QBC0007F2V51-1) (TOTAL OF 6) • INSTALL SURGE ARRESTOR (TSXDC-4310FM) (TYP. OF 8 PER SECTOR, TOTAL OF 24) ITEMS TO REMAIN: • (6) RRU'S, (15) SURGE ARRESTORS, (6) 1-5/8" COAX.
SITE ADDRESS:	269 FLANDERS ROAD EAST LYME, CT 06333
LATITUDE:	41.361892° N, 41° 21' 42.81" N
LONGITUDE:	72.209099° W, 72° 12' 32.76" W
TYPE OF SITE:	TRANSMISSION TOWER / OUTDOOR EQUIPMENT
STRUCTURE HEIGHT:	96'-6"±
RAD CENTER:	107'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

at&t

SITE NUMBER: CT5218

SITE NAME: EAST LYME EAST

FA CODE: 10071017

PACE ID: MRCTB031911, MRCTB031561

PROJECT: LTE 3C/4C 2020 UPGRADE

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLANS	1
A-2	ANTENNA LAYOUTS & ELEVATION	1
A-3	DETAILS	1
G-1	GROUNDING DETAILS	1
RF-1	RF PLUMBING DIAGRAM	1

VICINITY MAP

DIRECTIONS TO SITE:

START OUT GOING NORTHEAST ON ENTERPRISE DRIVE TOWARD CAPITAL BLVD. TURN LEFT ONTO CAPITOL BLVD. TURN LEFT ONTO WEST ST. TAKE RAMP LEFT FOR 1-91 N. AT EXIT 25, TAKE RAMP RIGHT FOR CT-3 NORTH TOWARD GLASTONBURY. TAKE RAMP RIGHT FOR CT-82 EAST TOWARD MONTVILLE /NEW LONDON/ NORWICH/ SALEM. TURN LEFT ONTO CT-82 / E HADDAM RD TOWARD MONTVILLE / NEW LONDON/ NORWICH/SALEM /CT-82 EAST. AT ROUNDABOUT, TAKE 1ST EXIT ONTO CT-85 S/ NEW LONDON RD. TAKE RAMP RIGHT FOR I-395 SOUTH TOWARD NEW HAVEN. TAKE RAMP FOR I-95 S/ GOVERNOR JOHN DAVIS LODGE TPKE. AT EXIT 74, TAKE RAMP RIGHT FOR CT-161 TOWARD NIAANTIC. TURN RIGHT ONTO CT-161/ FLANDERS RD.

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.

72 HOURS

CALL BEFORE YOU DIG

CALL TOLL FREE 1-800-922-4455

OR CALL 811

UNDERGROUND SERVICE ALERT

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

HUDSON Design Group LLC
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553 FAX: (978) 336-5586

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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: DJM

AT&T

TITLE SHEET (LTE 3C/4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5218	T-1	1

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 CONTINUOUS 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 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS
    ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE (NFPA 70–2017)

    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–G, 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		

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5218
SITE NAME: EAST LYME EAST

269 FLANDERS ROAD
EAST LYME, CT 06333
NEW LONDON COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: DJM

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

AT&T

GENERAL NOTES
(LTE 3C/4C)

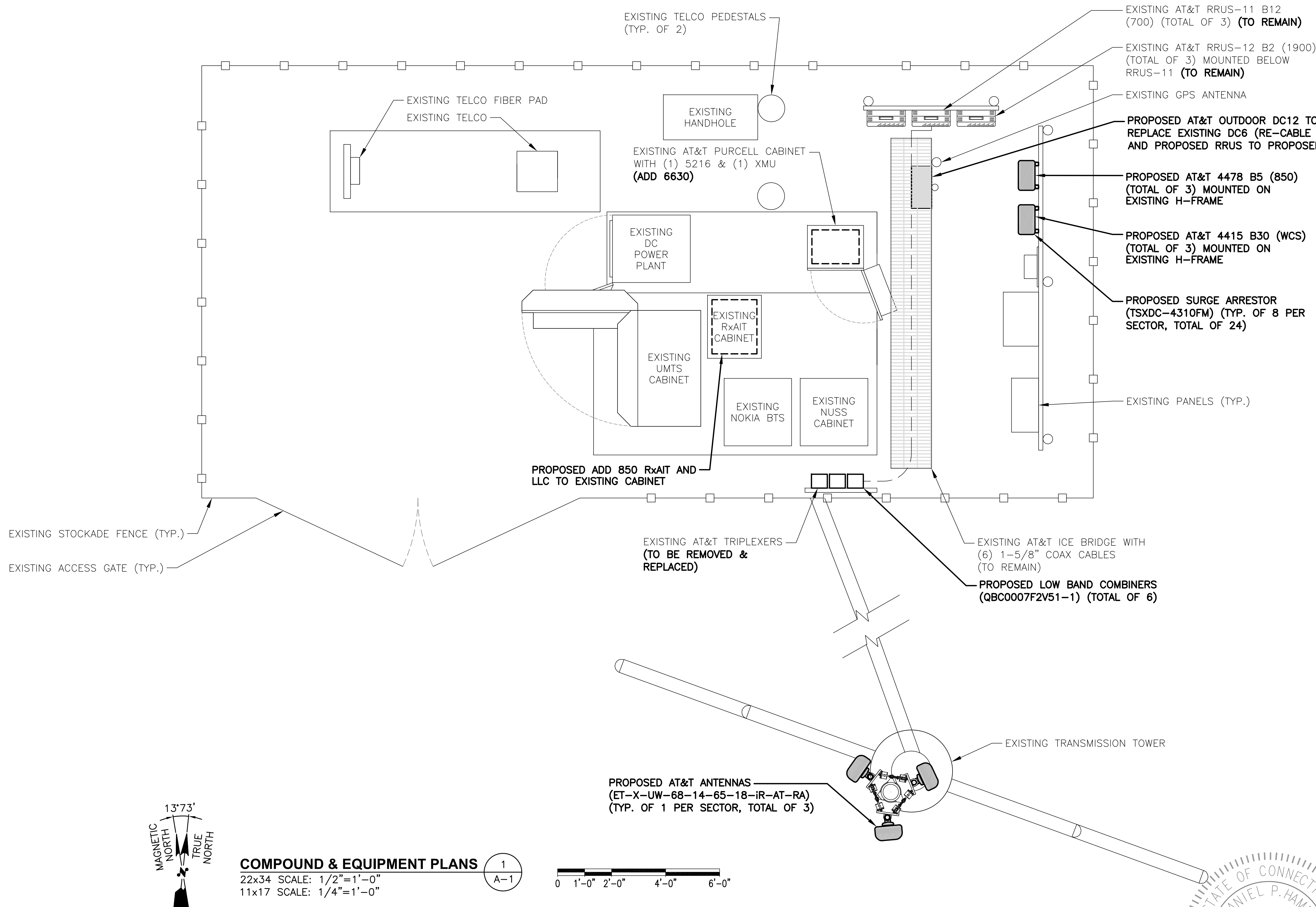
SITE NUMBER	DRAWING NUMBER	REV
CT5218	GN–1	1

NOTE:

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

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: CENTEK Engineering, Inc, DATED: AUGUST 13, 2019 (REV.1) FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



COMPOUND & EQUIPMENT PLANS (1 / A-1)

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

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

AT&T

COMPOUND & EQUIPMENT PLANS (LTE 3C/4C)

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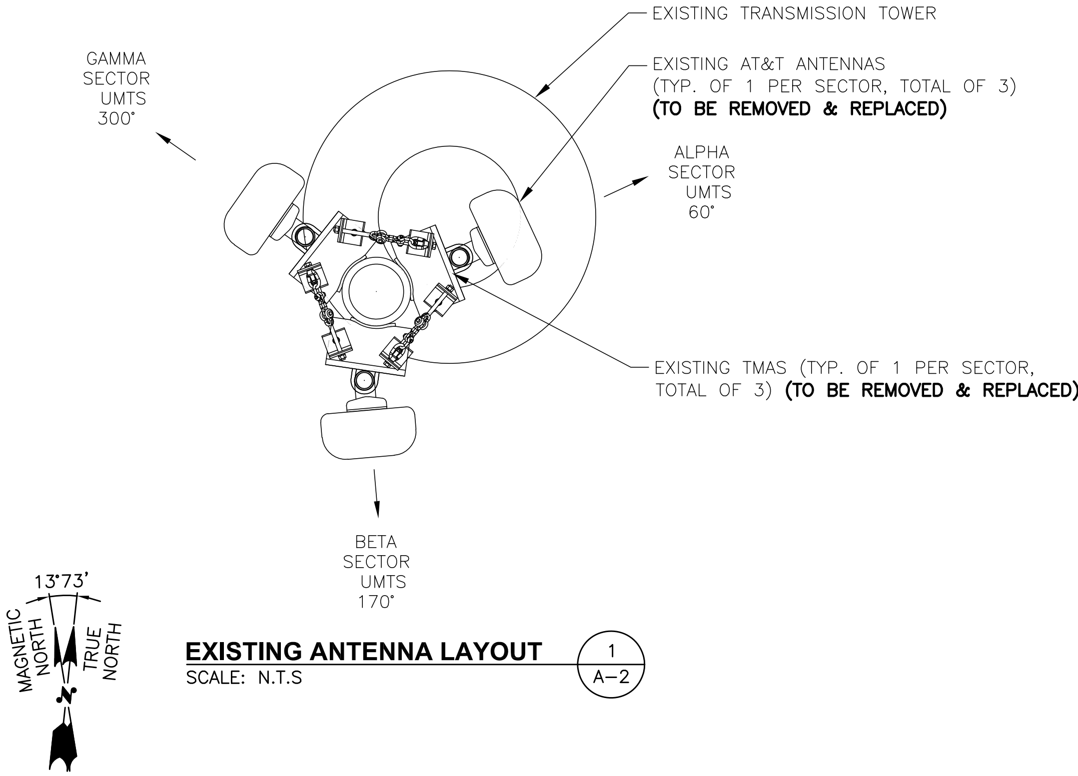
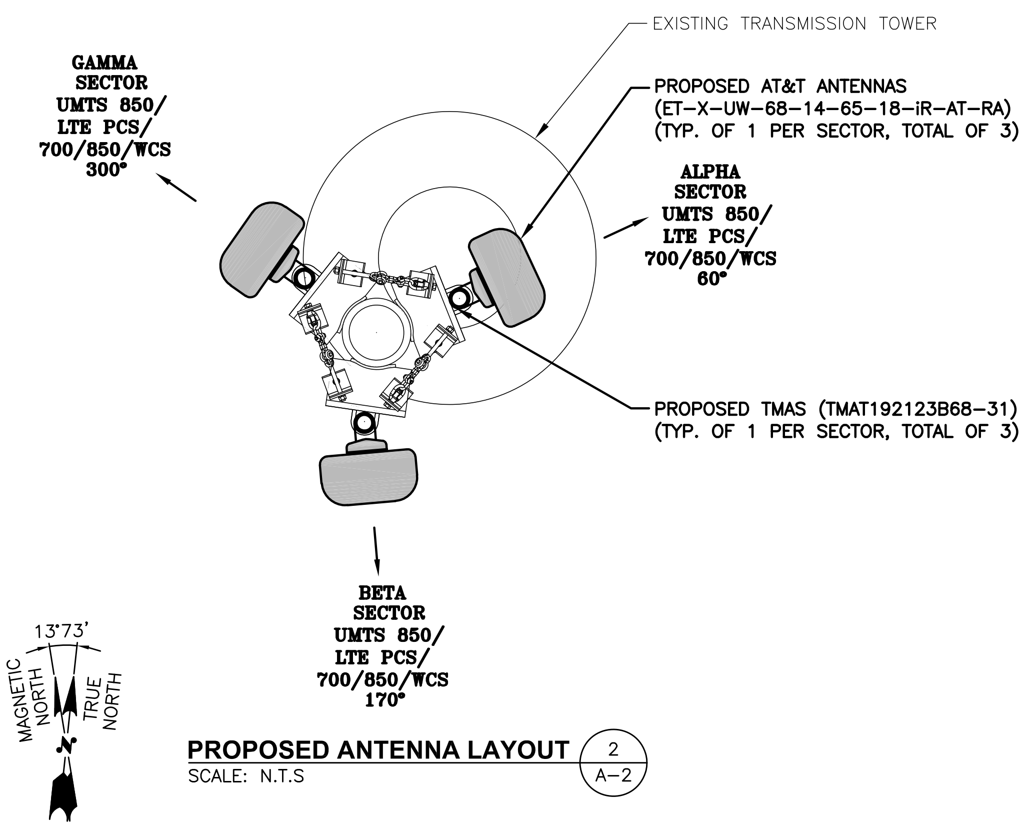
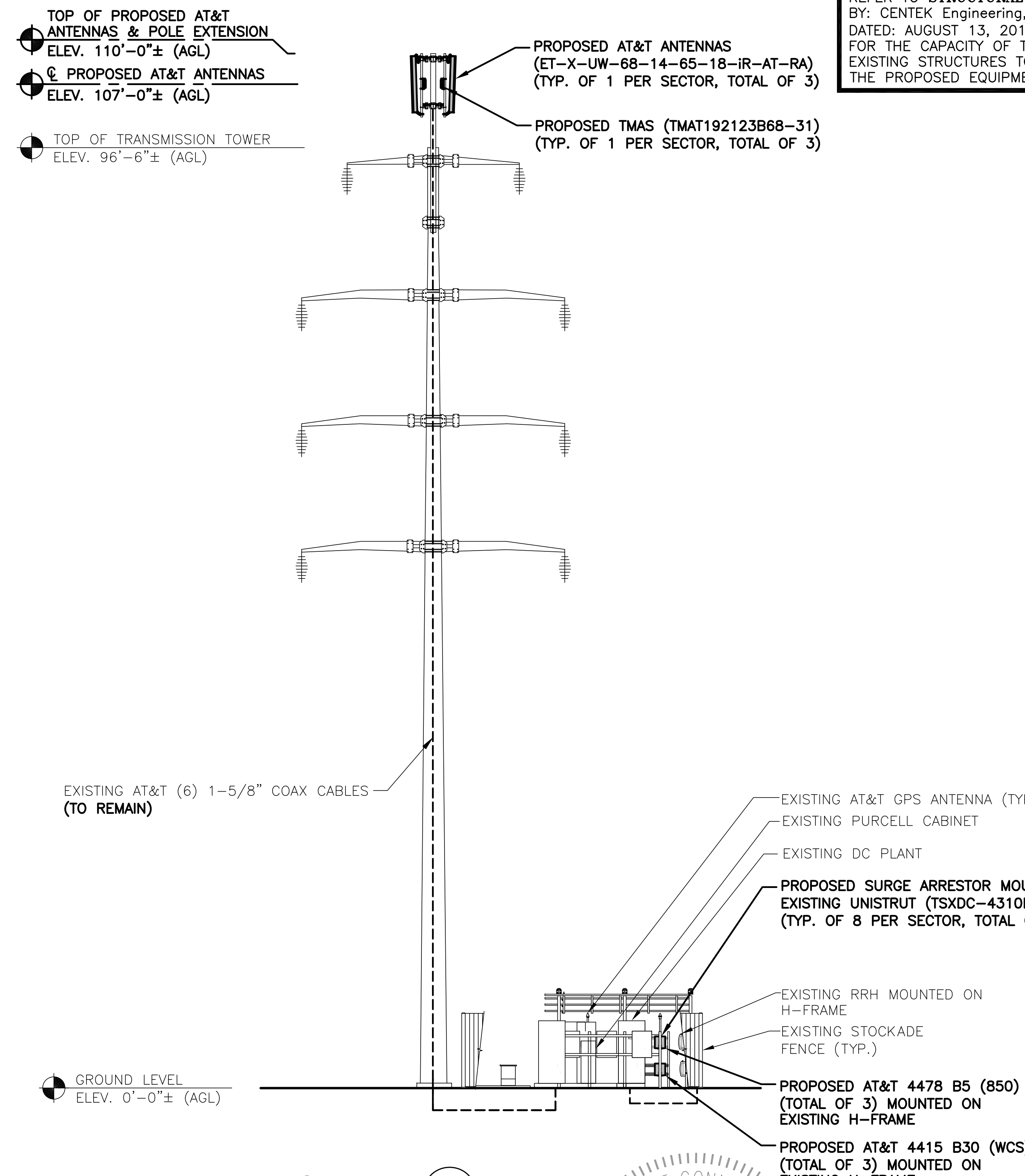


EXISTING ANTENNA LAYOUT (1 / A-2)
SCALE: N.T.S



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



ELEVATION (3 / A-2)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

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AT&T
ANTENNA LAYOUTS & ELEVATION (LTE 3C/4C)

SITE NUMBER	DRAWING NUMBER	REV
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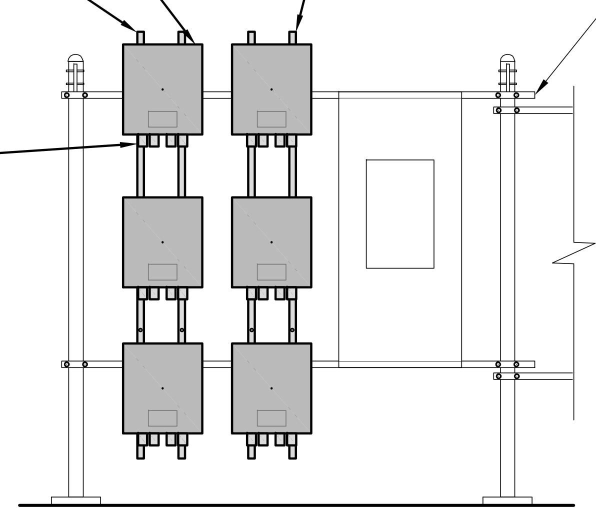
ANTENNA SCHEDULE

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	PROPOSED	UMTS 850/LTE PCS /700/850/WCW	ET-X-UW-68-14-65 -18-iR-AT-RA	72x12x6.3	107'-0"±	60°	(1)(P) TMAT192123B68-31 (2)(P)(G) QBC0007F2V51-1	(E)(G)(1) RRUS-11 B12 (700) (E)(G)(1) RRUS-12 B2 (1900) (P)(G)(1) RRUS 4478 B5 (850) (P)(G)(1) RRUS 4415 B30 (WCS)	19.7x17x7.2 20.4x18.5x7.5 18.1x13.4x8.3 18.1X13.4X8.3	(2) 1-5/8" COAX	--
B1	PROPOSED	UMTS 850/LTE PCS /700/850/WCW	ET-X-UW-68-14-65 -18-iR-AT-RA	72x12x6.3	107'-0"±	170°	(1)(P) TMAT192123B68-31 (2)(P)(G) QBC0007F2V51-1	(E)(G)(1) RRUS-11 B12 (700) (E)(G)(1) RRUS-12 B2 (1900) (P)(G)(1) RRUS 4478 B5 (850) (P)(G)(1) RRUS 4415 B30 (WCS)	19.7x17x7.2 20.4x18.5x7.5 18.1x13.4x8.3 18.1X13.4X8.3	(2) 1-5/8" COAX	--
C1	PROPOSED	UMTS 850/LTE PCS /700/850/WCW	ET-X-UW-68-14-65 -18-iR-AT-RA	72x12x6.3	107'-0"±	300°	(1)(P) TMAT192123B68-31 (2)(P)(G) QBC0007F2V51-1	(E)(G)(1) RRUS-11 B12 (700) (E)(G)(1) RRUS-12 B2 (1900) (P)(G)(1) RRUS 4478 B5 (850) (P)(G)(1) RRUS 4415 B30 (WCS)	19.7x17x7.2 20.4x18.5x7.5 18.1x13.4x8.3 18.1X13.4X8.3	(2) 1-5/8" COAX	--

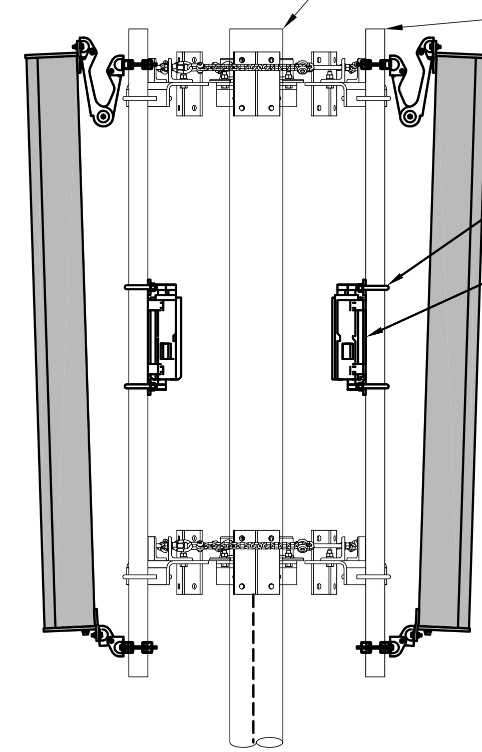
FINAL ANTENNA SCHEDULE (1 / A-3)
SCALE: N.T.S

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

NOTE:
REFER TO **STRUCTURAL ANALYSIS** BY: CENTEK Engineering, Inc, DATED: AUGUST 13, 2019 (REV.1) FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



PROPOSED RRH MOUNTING DETAIL (2 / A-3)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"



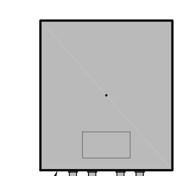
PROPOSED ANTENNA MOUNTING DETAIL (3 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 0'-6" 1'-0" 2'-0" 3'-0"

RRU CHART

QUANTITY	MODEL	L	W	D
3(E)(G)	RRUS-11 B12 (700)	19.7"	17.0"	7.2"
3(E)(G)	RRUS-12 B2 (1900)	20.4"	18.5"	7.5"
3(P)(G)	RRUS 4478 B5 (850)	18.1"	13.4"	8.3"
3(P)(G)	RRUS 4415 B30 (WCS)	18.1"	13.4"	8.3"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL (4 / A-3)
SCALE: N.T.S

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845
TEL: (978) 557-5553 FAX: (978) 336-5586

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5218
SITE NAME: EAST LYME EAST

269 FLANDERS ROAD
EAST LYME, CT 06333
NEW LONDON COUNTY

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

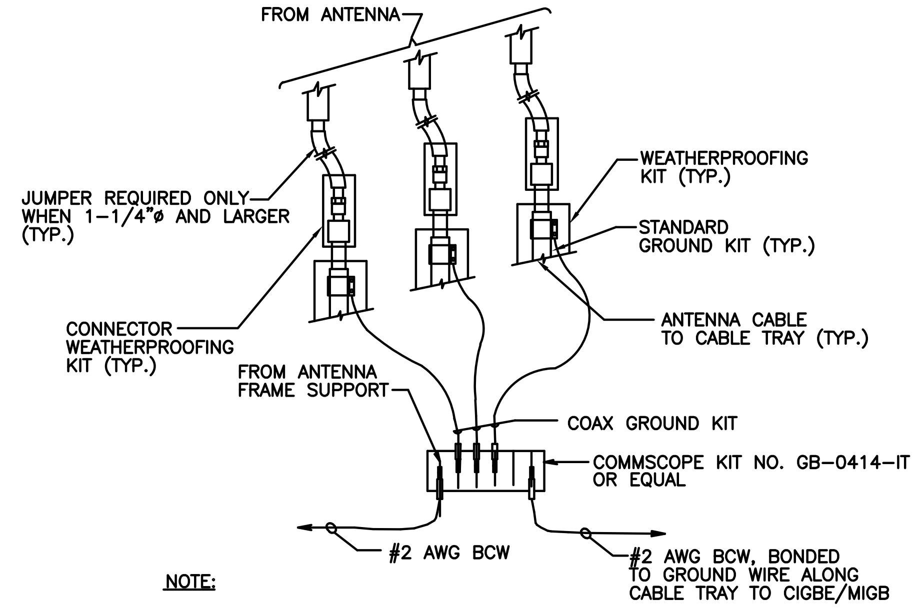
NO.	DATE	REVISIONS	BY	CHK	APP'D
1	09/24/19	ISSUED FOR CONSTRUCTION	JW	AT	DPH
0	08/30/19	ISSUED FOR REVIEW	AM	AT	DPH
A	04/17/19	ISSUED FOR REVIEW	MR	AT	DJC

SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: DJM

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

AT&T
DETAILS (LTE 3C/4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5218	A-3	1

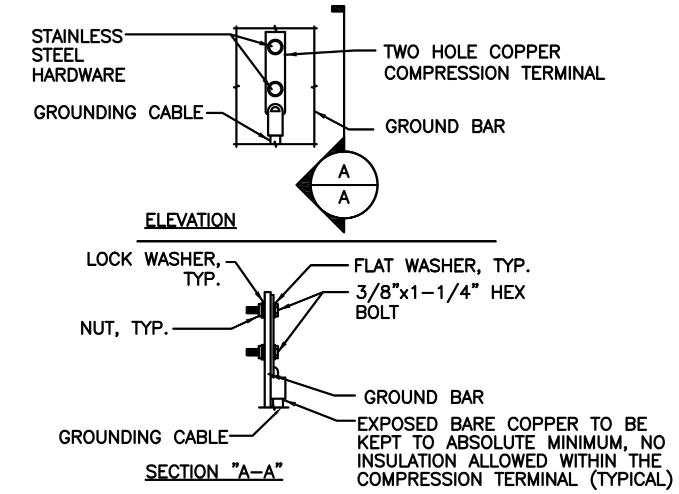


NOTE:

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

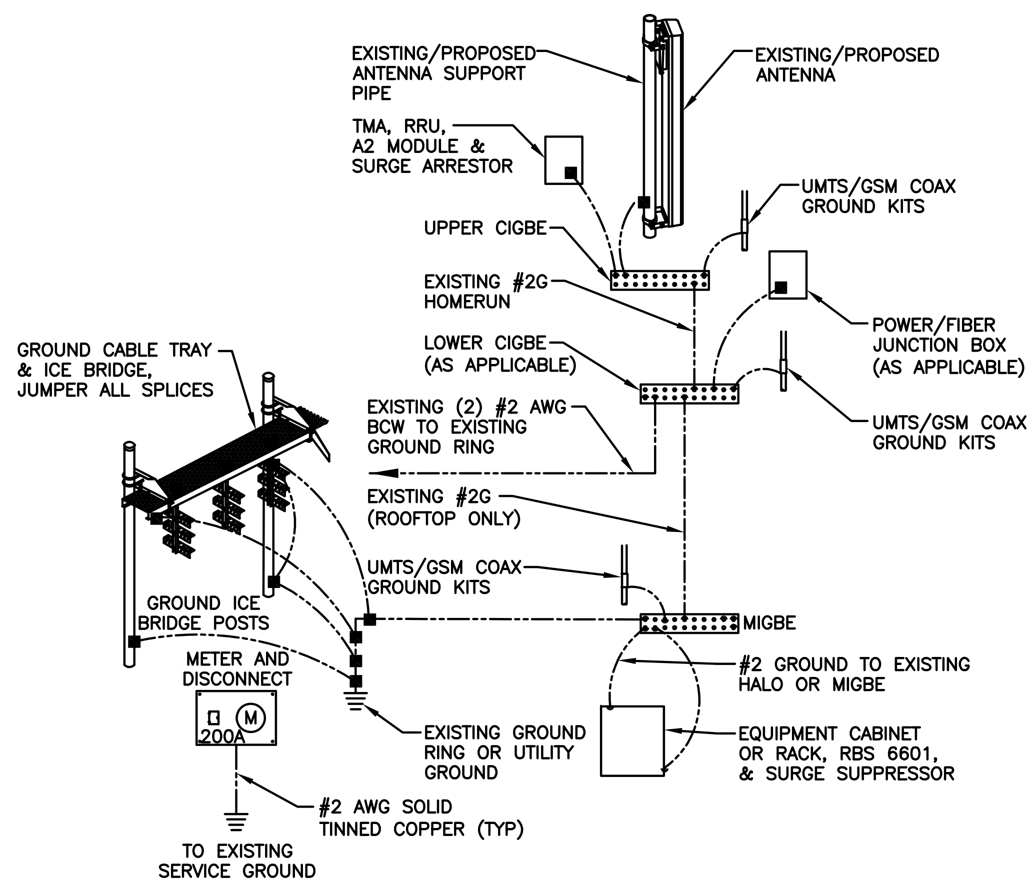


NOTES:

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

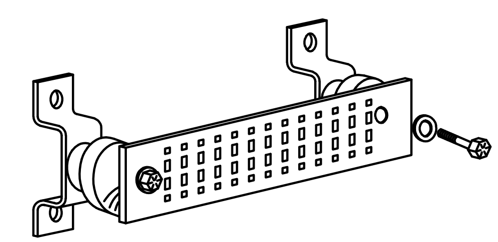
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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 (4 / G-1)

SCALE: N.T.S

HUDSON Design Group LLC
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SITE NUMBER: CT5218
SITE NAME: EAST LYME EAST

269 FLANDERS ROAD
EAST LYME, CT 06333
NEW LONDON COUNTY

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

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0	08/30/19	ISSUED FOR REVIEW	AM	AT	DPH
A	04/17/19	ISSUED FOR REVIEW	MR	AT	DJC

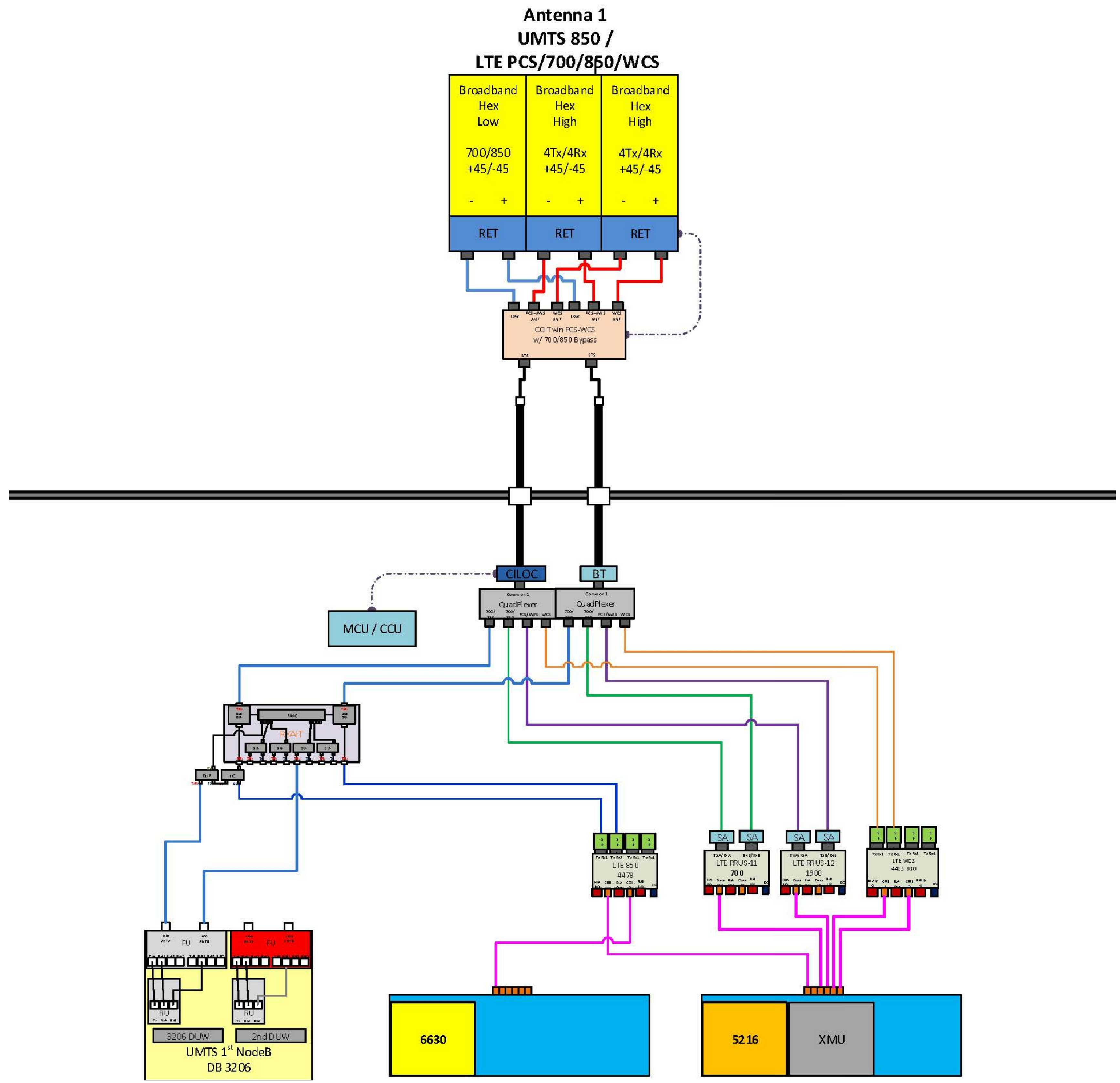
SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: DJM

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

AT&T

GROUNDING DETAILS
(LTE 3C/4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5218	G-1	1



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.

HDG HUDSON Design Group LLC
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SCALE: AS SHOWN | DESIGNED BY: AT | DRAWN BY: DJM

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

AT&T

RF PLUMBING DIAGRAM
(LTE 3C/4C)

SITE NUMBER	DRAWING NUMBER	REV
CT5218	RF-1	1

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Antenna Mast and Utility Pole

AT&T Site Ref: CT5218

Structure No. 6077

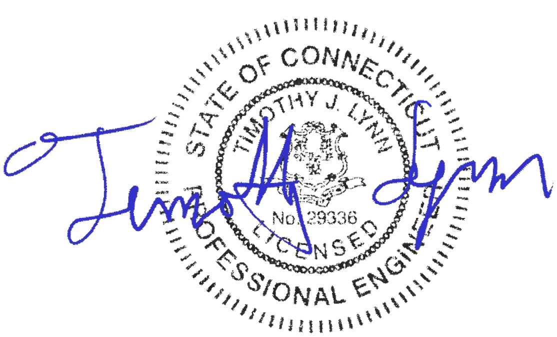
96'-6" AGL Electric Transmission Pole

269 Flanders Road
East Lyme, CT

CENTEK Project No. 19072.00

~~Date: May 24, 2019~~

Rev 1: August 13, 2019



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 analysis the existing mast and 110' (96-ft-6-in AGL) utility pole embedded 13'-6" into the ground located at 269 Flanders Road in East Lyme, CT for the proposed AT&T Mobility antenna upgrade.

The existing/proposed loads consist of the following:

- AT&T MOBILITY (Existing to Remain):
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the exterior of the pole.
  Antenna Mast: HSS 6.625x0.432 x 18-ft long conforming to ASTM A500 Gr. B (Fy = 42 ksi).
- AT&T MOBILITY (Existing to Remove):
  Antennas: One (1) KMW-AM-X-CD-17-65-00T panel antenna, one (1) KMW-AM-X-CD-16-65-00T panel antenna, one (1) Andrew SBNH-1D6565C panel antenna and three (3) CCI DTMABP7819VG12A TMAs flush mounted with a RAD center elevation of 107-ft above grade.
- **AT&T MOBILITY (Proposed):**
  Antennas: Three (3) KMW ET-X-UW-68-14-65-18 panel antennas and three (3) Commscope TMAT192123B68-31TMAs flush mounted with a RAD center elevation of 107-ft above grade.

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. 48-11, "Design of Steel Transmission Pole Structures", defines allowable steel stresses for evaluation of the utility pole.
- All utility pole members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- Pipe mast will be properly installed and maintained.
- No residual stresses exist due to incorrect pole erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Pipe mast and utility pole will be in plumb condition.
- Utility pole was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

Analysis

Structural analysis of the existing antenna mast was independently completed using the current version of RISA-3D computer program licensed to CENTEK Engineering, Inc.

The existing mast consisting of a HSS 6.625x0.432 pipe x 18-ft long conforming to ASTM A500 Gr. B (Fy = 42 ksi) connected at two points to the existing pole was analyzed for its ability to resist loads prescribed by the TIA 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-G, ASCE Manual No. 48-11 – "Design of Steel Transmission Pole Structures", NESC C2-2012 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 C2-2012 ~ Construction Grade B, and ASCE Manual No. 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.................................... 120 mph (1)
  Radial Ice Thickness............................ 0"

  Note 1: NESC C2-2007, 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 the Eversource Design Criteria Table, TIA-222-G and AISC standards.

  Load cases considered:

  Load Case 1:
  Wind Speed………………………………... 105 mph (2016 CSBC Appendix-N)
  Radial Ice Thickness……………………….. 0"

  Load Case 2:
  Wind Pressure.……………………………. 50 mph wind pressure
  Radial Ice Thickness……………………….. 0.75"

Results

- MAST ASSEMBLY

  The existing pipe mast **was found** to be structurally adequate.

Component	Stress Ratio (percentage of capacity)	Result
HSS6.625"x0.432 Pipe	63.4%	**PASS**
Connection	84.8%	**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. 48-11, "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 **84.17%** occurs in the utility pole under the **NESC Extreme** loading condition.

  POLE SECTION:

  The utility pole **was found** to be within allowable limits.

Tower Section	Elevation	Stress Ratio (% of capacity)	Result
Tube Number 3	6.50'-56.50' (AGL)	84.17%	**PASS**

- FOUNDATION AND ANCHORS

  The existing utility pole is directly embedded 13-ft-6-in into the ground. Review of the foundation consisted of a comparison of the base reactions obtained from the proposed tower analysis and the original tower design calculation.

  BASE REACTIONS:

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

Load Case	Shear	Axial	Moment
NESC Heavy Wind	10.63 kips	45.24 kips	880.87 ft-kips
NESC Extreme Wind	17.46 kips	23.91 kips	1239.13 ft-kips

Note 1 – 10% increase applied to tower base reactions per OTRM 051

FOUNDATION:

Foundation	Original Loading	Proposed Loading	Result
Direct Embendment	1408.84 ft-kips	1363.05 ft-kips	**PASS**

Note 1: Taken from NUSCO drawing 09000-50001 sheet 3 of 8.

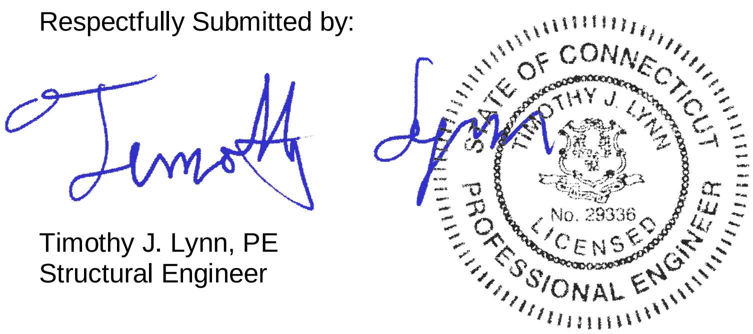
Conclusion

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

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

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.

G E N E R A L D E S C R I P T I O N O F S T R U C T U R A L A N A L Y S I S P R O G R A M ~ R I S A - 3 D

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 drawing/editing environment: draw, generate, modify and load elements as well as snap, move, rotate, copy, mirror, scale, split, merge, mesh, delete, apply, trim, extend, etc.
- Versatile drawing grids (orthogonal, radial, skewed, DXF underlay)
- Universal snaps and object snaps allow drawing without grids
- Powerful graphic select/unselect tools including box, line, polygon, invert, criteria, spreadsheet based, save/recall selections with locking
- True spreadsheet editing with cut, paste, fill, math, sort, find, etc.
- Dynamic synchronization between spreadsheets and graphics
- Open multiple spreadsheets simultaneously
- Constant in-stream error checking and data validation
- Unlimited undo/redo capability, automatic timed backup
- Generation templates for grids, disks, cylinders, cones, arcs, trusses, tanks, hydrostatic loads, geodesic domes, etc.
- Support for all units systems & conversions at any time
- Automatic interaction with RISASection custom shape libraries
- Steel Shapes: AISC, Historic, Australian, British, Canadian, Chilean, Chinese, European, Indian, Mexican
- Light Gage Shapes: AISI, SSMA, Dale/Incor, Dietrich, Marino\WARE
- Import DXF, RISA-2D, STAAD and CIS/2 files
- Export DXF, SDNF and CIS/2 files
- Robust two-way link with Revit Structure 2019
- Link with Tekla Structures 2018

Analysis Features

- Analysis of 1D members (beams, columns, braces, etc.) using Finite Element Method
- Analysis of 2D elements (plates, walls) using Finite Element Method
- Analysis of 3D elements (solids) using Finite Element Method
- Partial fixity member end releases using rotational spring constants
- Time History Analysis
- Accelerated true sparse solver for static analysis
- Flexible modeling of P-Delta effects
- Accelerated Sparse Lanczos dynamics solver, very fast and robust
- Multiple simultaneous dynamic and response spectra analysis using Gupta, CQC or SRSS with automatic calc of scaling factors
- Automatic inclusion of mass offset (5% or user defined) for dynamics when integrated with RISAFloor
- Ritz vector dynamic solver
- True physical member modeling (members are aware of interior joints)
- Plate/shell elements with plane stress only option
- 8 node solid elements
- High end mesh generation — draw a polygon with any number of sides to create a mesh of well formed quadrilateral (NO triangular) elements
- Automatic rigid diaphragm modeling with detachable joints

- Area loads with one-way or two-way distributions with optional "blow through" distribution for loading open structures
- Plate thermal loads
- Simultaneous moving loads, AASHTO/custom for bridges, cranes…
- Torsional warping calculations for stiffness, stress and design of hot rolled steel
- Member end releases, rigid end offsets, analysis offsets
- Enforced joint displacements
- One Way members, for tension only bracing, slipping, etc.
- One Way springs, for modeling soils and other effects
- Euler members: Compression up to buckling load, then disable
- Stress calculations on any arbitrary shape
- Inactivate members, plates, solids and diaphragms without deleting them
- Story drift calculations provide relative drift and ratio to height
- Automatic self-weight calculations for members, plates and solids

<u>Graphics Features</u>

- Unlimited simultaneous model view windows
- "True to scale" rendering with translucency, even when drawing
- High-speed redraw algorithm for instant refreshing
- Dynamically zoom, pan, rotate, scroll, snap views
- Font and color control
- Saved views to quickly restore frequent or desired views
- Rendered or wire-frame animations of deflected model and mode shapes
- Animation of moving loads with speed control
- Distance tool for measuring between points
- Force/moment summation about any arbitrary cut line
- High quality customizable graphics printing

<u>Design Codes</u>

- Steel Design Codes: AISC 360-16/10/05: ASD & LRFD, AISC 2nd & 3rd: LRFD, AISC 9th: ASD, CSA S16-14/09/05/01/CSA-S16.1-94, BS 5950-1: 2000, EN 1993-1-1:2014/2005, ENV 1993-1-1:1992, IS 800: 2007/1998, AS 4100-1998, NZS 3404: 1997
- Seismic design per AISC 341-10/05, including 358 prequalified connections
- Concrete Design Codes: ACI 318-14/11/08/05/02/99, CSA A23.3-14/04/94, NTC-DF 2004, BS 8110-1: 1997, BS EN 1992-1-1: 2004+A1: 2014/2004, EN 1992-1-1:1992, IS 456: 2000, AS 3600-2001, NZS 3101: 1995, SBC 304-2007
- Cold Formed Steel Design Codes: AISI S100-16/12/10/07: ASD & LRFD, AISI NAS-04/01: ASD & LRFD, AISI 1999: ASD & LRFD, CSA S136-16/12/10/07/04/01: LSD, CANACERO 16: ASD, CANACERO 12/10/07/04/01: ASD & LRFD
- Aluminum Design Codes: AA ADM1-15/10: ASD & LRFD, AA ADM1-05: ASD
- Wood Design Codes: AWC NDS-18/15/12: ASD, AF&PA NDS-08/05/01/97/91: ASD, CSA 086-14/09 Ultimate, Structural Composite Lumber, multi-ply, full sawn, Glulam, shear walls
- Masonry Design Codes: TMS 402-16: ASD & Strength, ACI 530-13/11/08/05/02: ASD & Strength, ACI 530-99: ASD, UBC 1997: ASD & Strength
- Stainless Steel Design Code: AISC 360-10: ASD & LRFD
- Wind loads are generated automatically (ASCE 7-16/10/05/02/98/95, NBC 15/10/05, NTC 2004, & IS 875: 1987) for building-type structures, including partial wind cases
- Seismic loads are generated automatically (ASCE 7-16/10/05/02, CBC 2001, IBC 2000, UBC 1997, NBC 15/10/05, NTC 2004, & IS 1893: 2002) for building-type structures, including accidental torsion

<u>Design Features</u>

- Designs/optimizes concrete, hot rolled & cold formed steel, masonry, wood and aluminum

- Program selected or user-defined rebar layouts for flexure and shear
- Concrete beam detailing (Rectangular, T and L).
- Concrete column interaction diagrams
- Concrete wall design including in-plane, out-of-plane & bearing loads
- Automatic spectra generation for ASCE 7, NBC, IS 1893, NTC
- Extensive user controlled generation of load combinations
- Intelligent unbraced length calculations for physical members
- Tapered wide flange design per AISC Design Guide 25
- Masonry wall design for in-plane and out-of-plane
- Wood Shapes: Complete NDS species/grade and Glulam database
- Complete wood wall design for bearing & shear walls: Segmented, Perforated & Force Transfer Around Openings design methods
- Strap and Hold Down design for Wood Shear Walls
- Seismic design of concrete walls using ACI 318-14 Chapter 18
- Concrete seismic coupling beams for multi-story walls with diaphragms

Results Features

- Graphic presentation of color-coded results and plotted designs
- Color contours on plates, solid stresses/forces with smoothing and animation
- Spreadsheet results with sorting and filtering of: deflections, forces, stresses, optimized sizes for strength or deflection, code designs, concrete reinforcing, material takeoffs, etc.
- Standard and user-defined reports
- Graphic member detail reports with force/stress/deflection diagrams and detailed design calculations and expanded diagrams

Integrated Building Design

RISA-3D, RISAFloor, RISAFoundation and RISAConnection are so tightly integrated that they operate as one program on the same building model. Optimize the gravity system in RISAFloor, the lateral system in RISA-3D, the connection design in RISAConnection and the foundation system in RISAFoundation, with a complete flow of information both ways.

General Features

- Compatible with Windows 7/8.1/10 (64-bit Windows)
- Program technical support provided by Professional Engineers

G E N E R A L D E S C R I P T I O N O F S T R U C T U R A L A N A L Y S I S P R O G R A M ~ P L S - P O L E

PLS-POLE is a powerful and easy to use Microsoft Windows program for the analysis and design of structures made up of wood, laminated wood, steel, concrete and Fiber Reinforced Polymer (FRP) poles or modular aluminum masts. The program performs design checks of structures under user specified loads and can also calculate maximum allowable wind and weight spans. Virtually any transmission, substation or communications structure can be modeled, including poles, H-frames, A-Frames, and X-Frames. These models are rapidly built from components such as poles, arms, guys, braces, and insulators

Summary of Features:

- Runs under Microsoft Windows (Vista, 7, 8 and 10 both 32 bit and x64 editions)
- Specialized program for the analysis and design of transmission, distribution and substation structures made up of wood, laminated wood, FRP, steel and concrete poles or modular aluminum masts. (single poles, H-Frames, A-Frames, X-Frames…)
- 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
- Linear and Nonlinear finite element analysis options
- Implements the 2017 edition of ANSI O5.1 including reduction of fiber stress with height
- Wood poles can be selected from ANSI O.5 standard
- 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)
- Base plate analysis and design for steel poles
- Steel and concrete poles can be selected from standard sizes available from manufacturers
- Automatic pole class selection
- Steel pole shaft optimizer that considers stresses and allowable deflections
- 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)
- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Design checks for ASCE, AS/NZS 7000 or other requirements
- Automatic calculation of dead and wind loads
- Automated loading on structure (wind, ice and drag coefficients) according to:
  - ASCE 74-1991, 2009
  - NESC 2002, 2007, 2012, 2017
  - IEC 60826:2003
  - IS 802 : 1995, 2015
  - EN50341-1:2001 and 2012 (CENELEC)
  - EN50341-3-2:2001 (Belgium NNA)
  - EN50341-3-9:2001, EN50341-2-9:2015, 2017 (UK NNA)
  - EN50341-3-17:2001 (Portugal NNA)
  - AS/NZS 7000:2010
  - ESAA C(b)1-2003 (Austalia)
  - TPNZ (New Zealand)
  - REE (Spain)
  - Russian 7th
  - ISEC-NCR-83

- 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
- Detailed user's manual with examples
- On-line/electronic user's manual linked in to provide context sensitive help (also available in French)
- User interface available in English, French and Spanish
- US or SI (metric) units
- 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
- CAD design drawings, title blocks, drawing borders or photos can be tied to structure model
- Can link directly to line design program PLS-CADD
- Automatic generation of structure files for PLS-CADD

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

ANSI Standard C2-2012 (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-G:

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 "NU 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 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

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

Attachment A
Eversource Design Criteria

		Attachment A ES Design Criteria	Basic Wind Speed	Pressure	Height Factor	Gust Factor	Load or Stress Factor	Force Coef. - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (0.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
Ice Condition	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
Ice Condition	NESC Heavy	Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	-----	4	1	1	2.5	1.6 Flat Surfaces 1.3 Round Surfaces
Ice Condition	NESC Heavy	Conductors:	Conductor Loads Provided by ES					
High Wind Condition	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
High Wind Condition	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
High Wind Condition	NESC Extreme Wind	Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
High Wind Condition	NESC Extreme Wind	Conductors:	Conductor Loads Provided by ES					
NESC Extreme Ice with Wind Condition*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load 1.25 x Gust Response Factor Apply a 1.25 x Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
NESC Extreme Ice with Wind Condition*		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
NESC Extreme Ice with Wind Condition*		Conductors:	Conductor Loads Provided by ES					
NESC Extreme Ice with Wind Condition*		*Only for structures installed after 2007						

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

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

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

a) Wireless communication mast for its total height above ground level, including the initial and any planned future equipment (Support Platforms, Antennas, TMA's etc.) above the top of an electric transmission structure.

b) Conductors and related devices and hardware (wire loads will be provided by Eversource).

c) Electric Transmission Structure

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

ii) Shape Factor Multiplier:

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

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

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

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

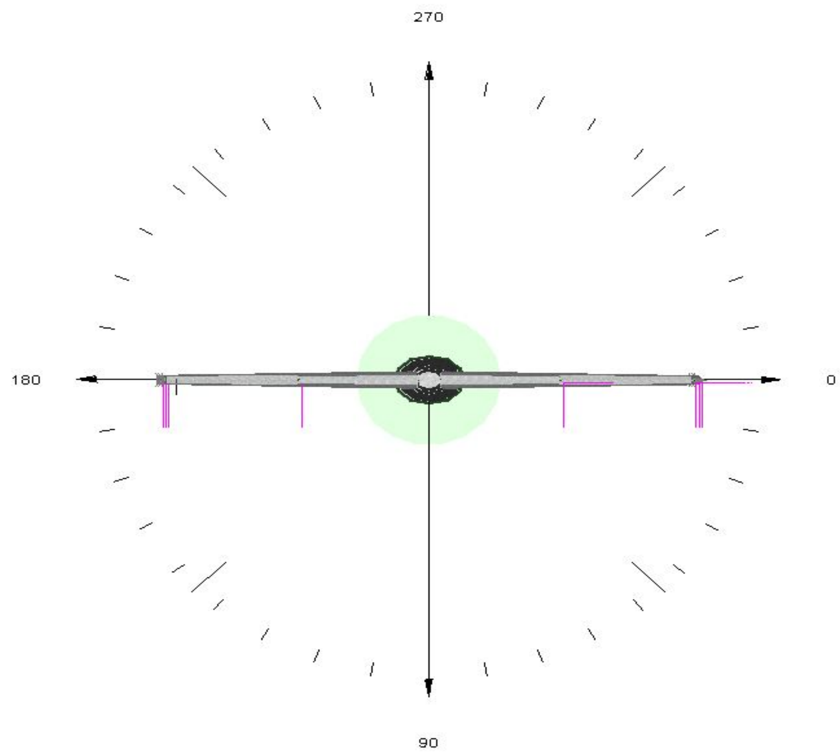
Project: Lines 1500 & 1617, Structure 6077
Date: 11/09/2018
Engineer: JS
Purpose Recalculate wire loads.

Shield Wires: 1500: 7 No. 8 Alumoweld, sagged in PLS-CADD
1617: Taihan 0.457" OPGW, sagged in PLS-CADD

Conductors: 1272 45/7 "Bittern" ACSR, sagged in PLS-CADD

NESC Rule 250B

		1500 Line	1617 Line	
Shield:	**V**	1802	1926	**V**
	T	-570	1680	**T**
	L	-143	-198	**L**
Top Phase:	**V**	4758	4677	**V**
	T	298	456	**T**
	L	-56	-56	**L**
Mid Phase:	**V**	4082	3981	**V**
	T	1300	2518	**T**
	L	-50	-169	**L**
Bot Phase:	**V**	3417	3303	**V**
	T	-755	1444	**T**
	L	-87	-50	**L**



Positive longitudinal loads (90 degree angle) are facing the substation.
Positive transverse loads (0 degree angle) are facing the 1617 line.

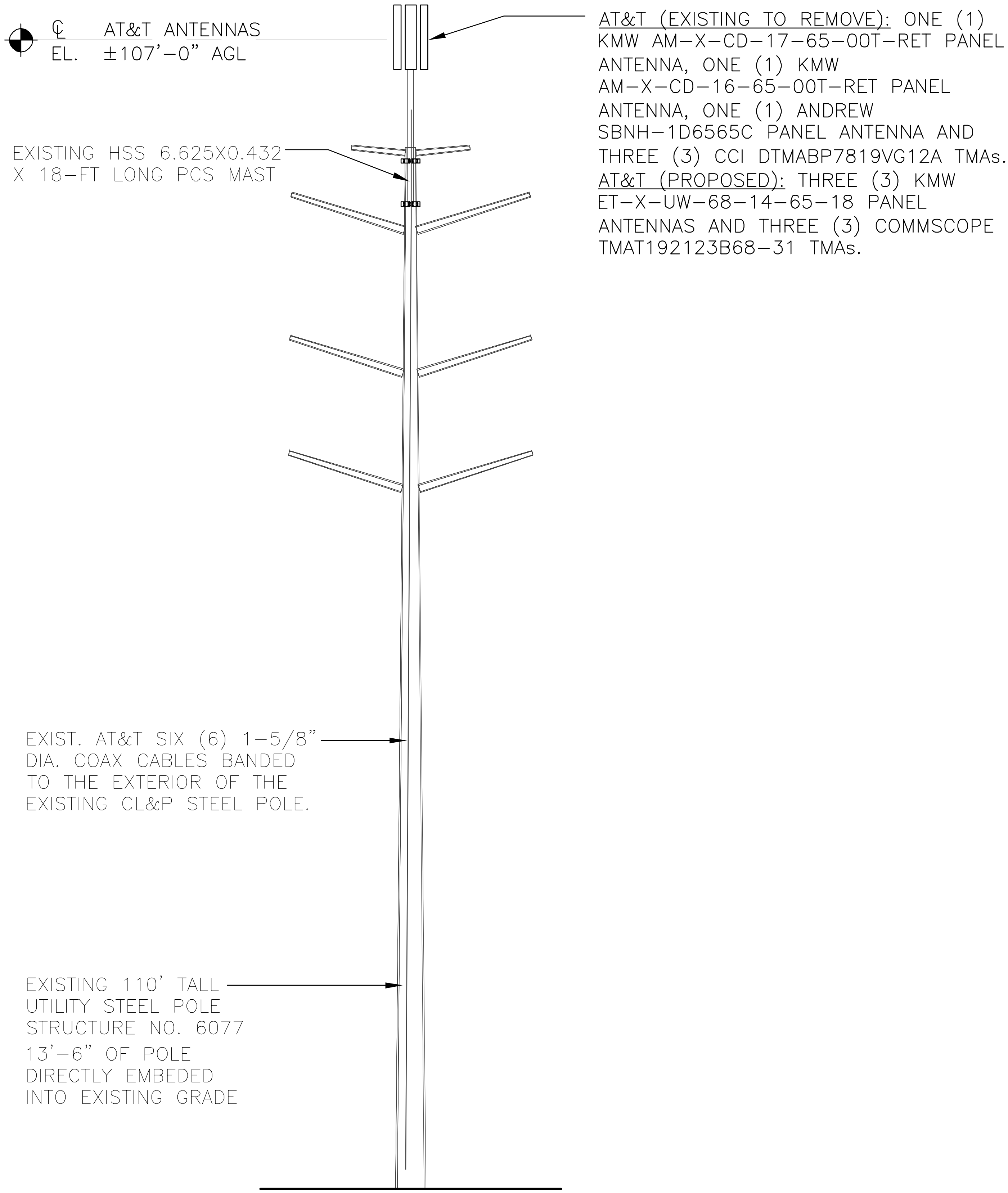
Project: Lines 1500 & 1617, Structure 6077
Date: 11/09/2018
Engineer: JS
Purpose Recalculate wire loads.

Shield Wires: 1500: 7 No. 8 Alumoweld, sagged in PLS-CADD
1617: Taihan 0.457" OPGW, sagged in PLS-CADD

Conductors: 1272 45/7 "Bittern" ACSR, sagged in PLS-CADD

NESC Rule 250C - 23 psf wind

		1500 Line	1617 Line	
Shield:	**V**	840	946	**V**
	T	-137	847	**T**
	L	-139	-194	**L**
Top Phase:	**V**	2300	2264	**V**
	T	728	728	**T**
	L	-201	-197	**L**
Mid Phase:	**V**	1955	1955	**V**
	T	1143	1143	**T**
	L	-149	-209	**L**
Bot Phase:	**V**	1604	1546	**V**
	T	198	1189	**T**
	L	-89	-96	**L**



1 / EL–1 **TOWER ELEVATION**

SCALE: NOT TO SCALE

REVISIONS		
00	5/24/19	ISSUED FOR REVIEW
01	8/13/19	CONSTRUCTION

CENTEK engineering
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CT5218
EVERSOURCE 6077

269 FLANDERS RD
EAST LYME, CT 06357

PROJECT NO:	19072.00
DRAWN BY:	TJL
CHECKED BY:	CAG
SCALE:	AS NOTED
DATE:	5/24/19

TOWER AND MAST ELEVATION

EL-1

DWG. 1 OF 1

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

Wind Speeds

Basic Wind Speed	$V := 105$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)
Basic Wind Speed Service Loads	$V_{Ser} := 60$	mph	(User Input - TIA-222-G 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 =	$h := 110$	ft	(User Input)
Height to Center of Antennas =	$z_{ATT} := 107$	ft	(User Input)
Height to Center of Mast =	$z_{Mast1} := 100$	ft	(User Input)
Radial Ice Thickness =	$t_i := 0.75$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topograpic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H := 1.35$		(User Input)

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-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1.15$$

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

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

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

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

Importance Factor (Service) = $I_{Ser} := 1$ (Per Section 2.8.3 of TIA-222-G)

$K_{iz} := \left(\frac{z_{ATT}}{33}\right)^{0.1} = 1.125$ $t_{izATT} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.109$

Velocity Pressure Coefficient Antennas = $Kz_{ATT} := 2.01\left(\left(\frac{z_{ATT}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.284$

Velocity Pressure w/o Ice Antennas = $qz_{ATT} := 0.00256 \cdot K_d \cdot Kz_{ATT} \cdot V^2 \cdot I_{Wind} = 39.585$

Velocity Pressure with Ice Antennas = $qz_{ice.ATT} := 0.00256 \cdot K_d \cdot Kz_{ATT} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 7.805$

Velocity Pressure Service = $qz_{ATT.Ser} := 0.00256 \cdot K_{dSer} \cdot Kz_{ATT} \cdot V_{Ser}^2 \cdot I_{Ser} = 10.057$

$K_{izMast1} := \left(\frac{z_{Mast1}}{33}\right)^{0.1} = 1.117$ $t_{izMast1} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast1} \cdot K_{zt}^{0.35} = 2.095$

Velocity Pressure Coefficient Mast = $Kz_{Mast1} := 2.01\left(\left(\frac{z_{Mast1}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.266$

Velocity Pressure w/o Ice Mast= $qz_{Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V^2 \cdot I_{Wind} = 39.025$

Velocity Pressure with Ice Mast = $qz_{ice.Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 7.695$

Velocity Pressure Service = $qz_{Mast1.Ser} := 0.00256 \cdot K_{dSer} \cdot Kz_{Mast1} \cdot V_{Ser}^2 \cdot I_{Ser} = 9.914$

Development of Wind & Ice Load on Mast

Mast Data: (HSS6.625x0.432) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 6.625$ in (User Input)

Mast Length = $L_{mast} := 18$ ft (User Input)

Mast Thickness = $t_{mast} := 0.432$ in (User Input)

Velocity Coefficient = $C := \sqrt{I \cdot Kz_{Mast1}} \cdot V \cdot \frac{D_{mast}}{12} = 65$

Mast Force Coefficient = $CF_{mast} = 0.6$

Wind Load (without ice)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.552$ sf/ft

Total Mast Wind Force = $qz_{Mast1} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 17$ plf **BLC 5**

Wind Load (with ice)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2 \cdot t_{izMast1}\right)}{12} = 0.901$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast1} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 6$ plf **BLC 4**

Wind Load (Service)

Total Mast Wind Force Service Loads = $qz_{Mast1.Ser} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 4$ plf **BLC 6**

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 = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast1} \cdot 2\right)^2 - D_{mast}^{\,2}\right] = 57.4$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 22$ plf **BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model = KMW ET-X-UW-68-14-65-18

Antenna Shape = Flat (User Input)

Antenna Height = $L_{ant} := 72$ in (User Input)

Antenna Width = $W_{ant} := 12$ in (User Input)

Antenna Thickness = $T_{ant} := 6.3$ in (User Input)

Antenna Weight = $WT_{ant} := 50$ lbs (User Input)

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

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.0$

Antenna Force Coefficient = $Ca_{ant} = 1.36$

Wind Load (without ice)

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 18$ sf

Total Antenna Wind Force = $F_{ant} := qz_{ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 1304$ lbs **BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izATT}) \cdot (W_{ant} + 2 \cdot t_{izATT})}{144} = 8.6$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 25.8$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qz_{ice.ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 368$ lbs **BLC 4**

Wind Load (Service)

Total Antenna Wind Force Service Loads = $F_{ant.Ser} := qz_{ATT.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 331$ lbs **BLC 6**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5443$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 2 \cdot t_{izATT})(W_{ant} + 2 \cdot t_{izATT}) \cdot (T_{ant} + 2 \cdot t_{izATT}) - V_{ant} = 7558$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 245$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 735$ lbs **BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope TMAT192123B68-31		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 11.1$	in	(User Input)
Antenna Width =	$W_{ant} := 9.4$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.8$	in	(User Input)
Antenna Weight =	$WT_{ant} := 23$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.2$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.7$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 2.2$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{ATT} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 139$	lbs	**BLC 5,7**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izATT}) \cdot (W_{ant} + 2 \cdot t_{izATT})}{144} = 1.4$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 4.3$	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 4,6**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{ATT.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 35$	lbs	**BLC 8**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 69$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 396$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izATT})(W_{ant} + 2 \cdot t_{izATT}) \cdot (T_{ant} + 2 \cdot t_{izATT}) - V_{ant} = 1276$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 41$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 124$	lbs	**BLC 3**

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Pipe Mounts		
Mount Shape =	Round		(User Input)
Pipe Mount Length =	$L_{mnt} := 72$	in	(User Input)
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf	(User Input)
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in	(User Input)
Number of Mounting Pipes =	$N_{mnt} := 3$		(User Input)
Mount Bracket Weight =	$W_{b.mnt} := 101$	lbs	(User Input)
Mount Aspect Ratio =	$Ar_{mnt} := \frac{L_{mnt}}{D_{mnt}} = 30$		
Mount Force Coefficient =	$Ca_{mnt} := 1.2$		

Wind Load (without ice)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area = $A_{mnt} := 0.0$ sf

Total Mount Wind Force = $F_{mnt} := qz_{ATT} \cdot G_H \cdot Ca_{mnt} \cdot A_{mnt} = 0$ lbs **BLC 5**

Wind Load (with ice)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area w/ Ice = $A_{ICEmnt} := 0.0$ sf

Total Mount Wind Force = $Fi_{mnt} := qz_{ice.ATT} \cdot G_H \cdot Ca_{mnt} \cdot A_{ICEmnt} = 0$ lbs **BLC 4**

Gravity Loads (without ice)

Weight Each Pipe Mount = $WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 22$ lbs

Weight of All Mounts = $WT_{mnt} \cdot N_{mnt} + W_{b.mnt} = 167$ lbs **BLC 2**

Gravity Loads (ice only)

Volume of Each Pipe = $V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^2 \cdot L_{mnt} = 319$ cu in

Volume of Ice on Each Pipe = $V_{ice} := \left[\frac{\pi}{4} \cdot \left[\left(D_{mnt} + 2 \cdot t_{izATT}\right)^2\right] \cdot \left(L_{mnt} + 2 \cdot t_{izATT}\right)\right] - V_{mnt} = 2 \times 10^3$ cu in

Weight of Ice each mount (incl, hardware) = $W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 74$ lbs

Weight of Ice on All Mounts = $W_{ICEmnt} \cdot N_{mnt} + 30 = 252$ lbs **BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type = HELIAX 1-5/8"

Shape = Round (User Input)

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

Coax Cable Length = $L_{coax} := 15$ ft (User Input)

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

Total Number of Coax = $N_{coax} := 6$ (User Input)

Total Number of Exterior Coax = $Ne_{coax} := 6$ (User Input)

No. of Coax Projecting Outside Face of Mast = $NP_{coax} := 2$ (User Input)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 90.9$

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

Wind Load (without ice)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.3$ sf/ft

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{Mast1} \cdot G_H \cdot A_{coax} = 21$ plf **BLC 5**

Wind Load (with ice)

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

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast1} \cdot G_H \cdot AICE_{coax} = 8$ plf **BLC 4**

Wind Load (Service)

Total Coax Wind Force Service Loads = $F_{coax} := Ca_{coax} \cdot qz_{Mast1.Ser} \cdot G_H \cdot A_{coax} = 5$ plf **BLC 6**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 6$ plf **BLC 2**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot t_{izMast1})^2 - D_{coax}^{\ 2}\right] = 26.8$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 63$ plf **BLC 3**

(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	Accelerated 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 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	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 (\1...	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 ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	HSS6.625X0.432	Column	Pipe	A500 Gr.42	Typical	7.86	38.2	38.2	76.4

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Mast	18									Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	BOTCO...	TOPMA...			Mast	Column	Pipe	A500 Gr...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	BOTCONNECTION	0	0	0	0	
2	TOPCONNECTION	0	4	0	0	
3	TOPMAST	0	18	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	TOPCONNECTION	Reaction	Reaction	Reaction		Reaction	
2	BOTCONNECTION	Reaction	Reaction	Reaction		Reaction	

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.15	15
2	M1	Y	-.069	15
3	M1	Y	-.167	15

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.735	15
2	M1	Y	-.124	15
3	M1	Y	-.252	15

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.368	15
2	M1	X	.055	15

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	1.304	15
2	M1	X	.139	15

Member Point Loads (BLC 6 : Service)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.331	15
2	M1	X	.035	15

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	M1	Y	-.006	-.006	0	0

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	M1	Y	-.022	-.022	0	0
2	M1	Y	-.063	-.063	0	0

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	M1	X	.006	.006	0	0
2	M1	X	.008	.008	0	0

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	M1	X	.017	.017	0	0
2	M1	X	.021	.021	0	0

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	M1	X	.004	.004	0	0
2	M1	X	.005	.005	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Self Weight (Mast)	None								
2	Weight of Appurtenances	None					3	1		
3	Weight of Ice Only	None					3	2		
4	(x) TIA Wind with Ice	None					2	2		
5	(x) TIA Wind	None					2	2		
6	Service	None					2	2		

Load Combinations

	Description	Solve	PDe...	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-dire...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dire...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0...	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	TOPCONNEC...	max	-1.74	4	3.049	3	0	4	0	4	0	4	0	4
2		min	-11.147	1	.434	2	0	1	0	1	0	1	0	1
3	BOTCONNEC...	max	7.744	1	.184	3	0	4	0	4	0	4	0	4
4		min	1.212	4	.011	2	0	1	0	1	0	1	0	1
5	Totals:	max	-.528	4	3.234	3	0	4						
6		min	-3.403	1	.445	2	0	1						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotatio...	LC	Z Rotatio...	LC
1	BOTCONNE...	max	0	4	0	4	0	4	0	4	0	4	3.214e-03	1
2		min	0	1	0	1	0	1	0	1	0	1	5.03e-04	4
3	TOPCONNE...	max	0	4	0	4	0	4	0	4	0	4	-1.089e-03	4
4		min	0	1	0	1	0	1	0	1	0	1	-6.958e-03	1
5	TOPMAST	max	4.575	1	0	2	0	4	0	4	0	4	-5.371e-03	4
6		min	.716	4	-.002	3	0	1	0	1	0	1	-3.429e-02	1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	...	phi*P...	phi*P...	phi*...	phi*...	...	Eqn
1	M1	HSS6.625X0.432	.634	4.1...	1	.090	3.9...		1	164....	297....	49.14	49.14	...	H1-...

Joint Reactions

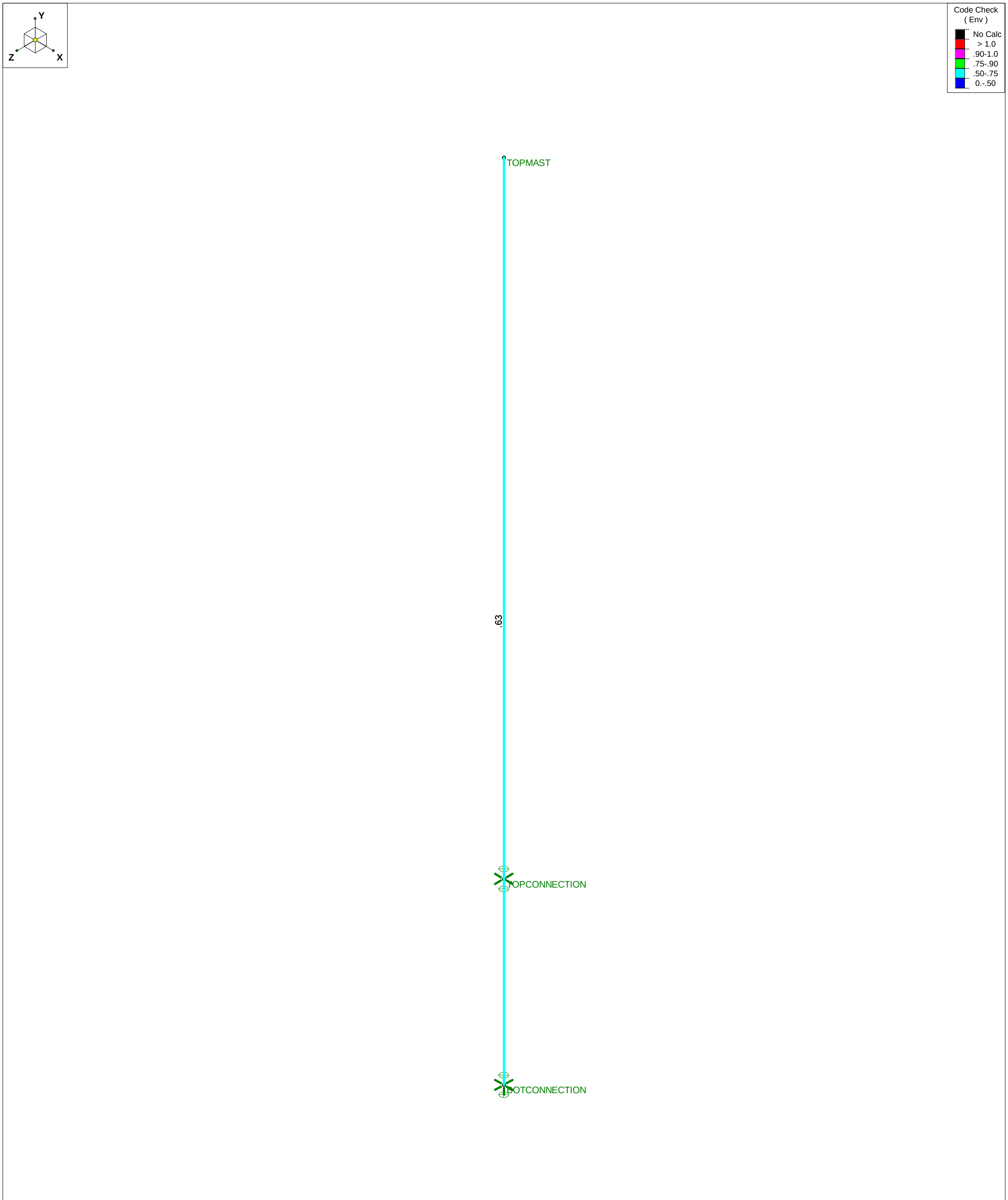
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	TOPCONNECTION	-11.147	.578	0	0	0	0
2	1	BOTCONNECTION	7.744	.014	0	0	0	0
3	1	Totals:	-3.403	.593	0			
4	1	COG (ft):	X: 0	Y: 13.688	Z: 0			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	TOPCONNECTION	-11.14	.434	0	0	0	0
2	2	BOTCONNECTION	7.737	.011	0	0	0	0
3	2	Totals:	-3.403	.445	0			
4	2	COG (ft):	X: 0	Y: 13.688	Z: 0			

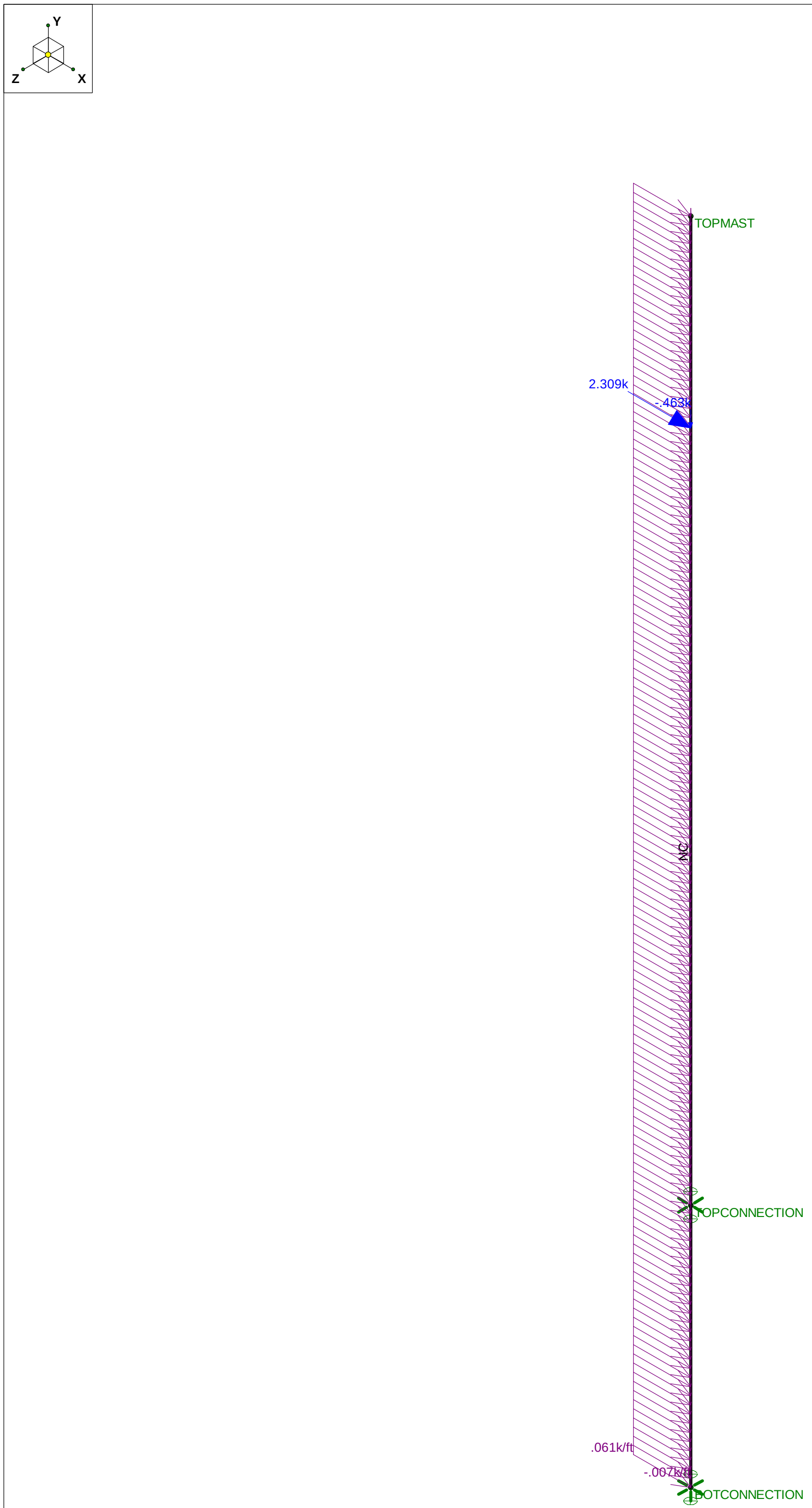
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	TOPCONNECTION	-2.18	3.049	0	0	0	0
2	3	BOTCONNECTION	1.505	.184	0	0	0	0
3	3	Totals:	-.675	3.234	0			
4	3	COG (ft):	X: 0	Y: 11.921	Z: 0			



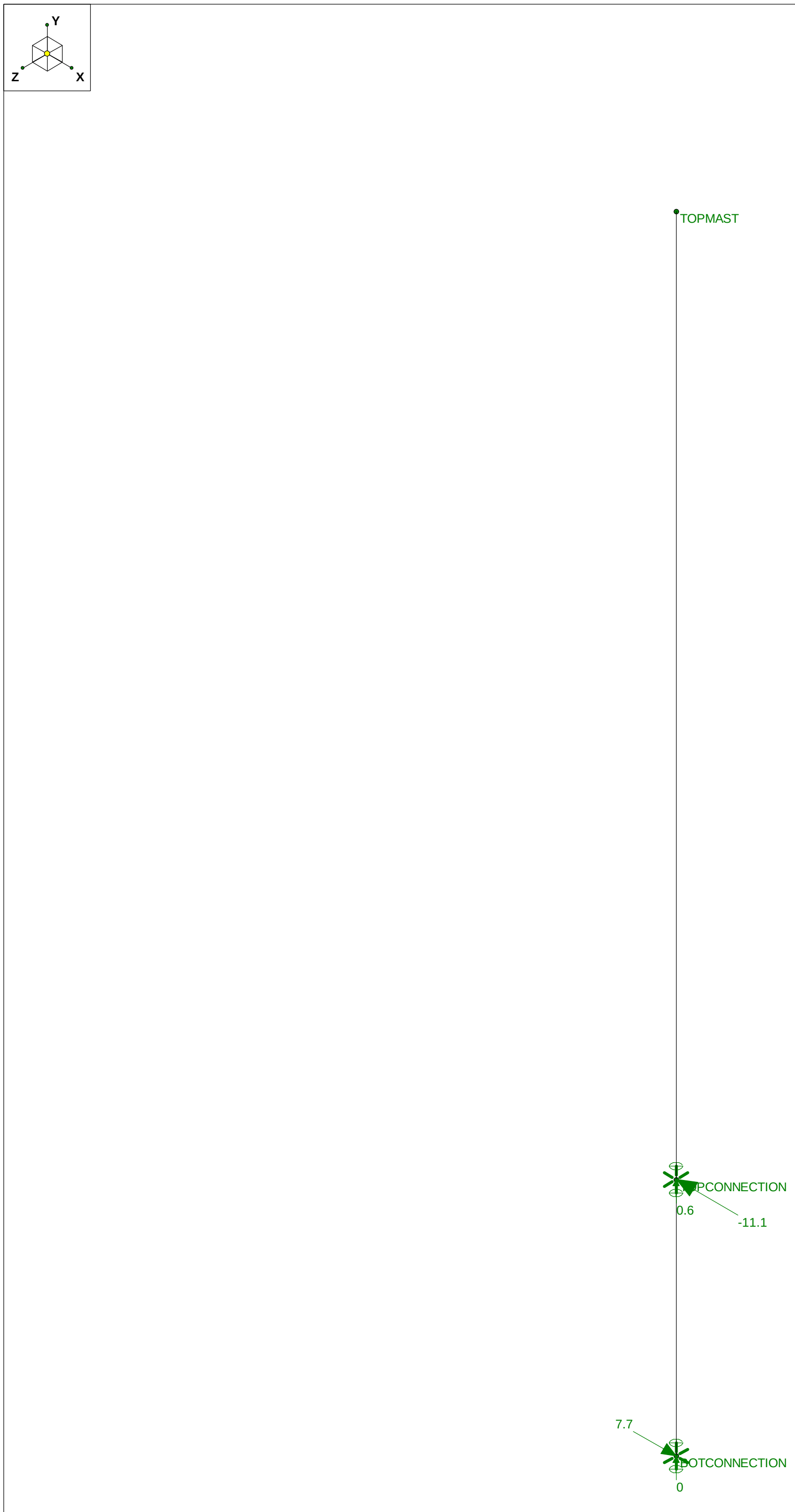
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

CENTEK engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 7:55 AM
19072.00 - CT5218	Unity Check	TIA.r3d



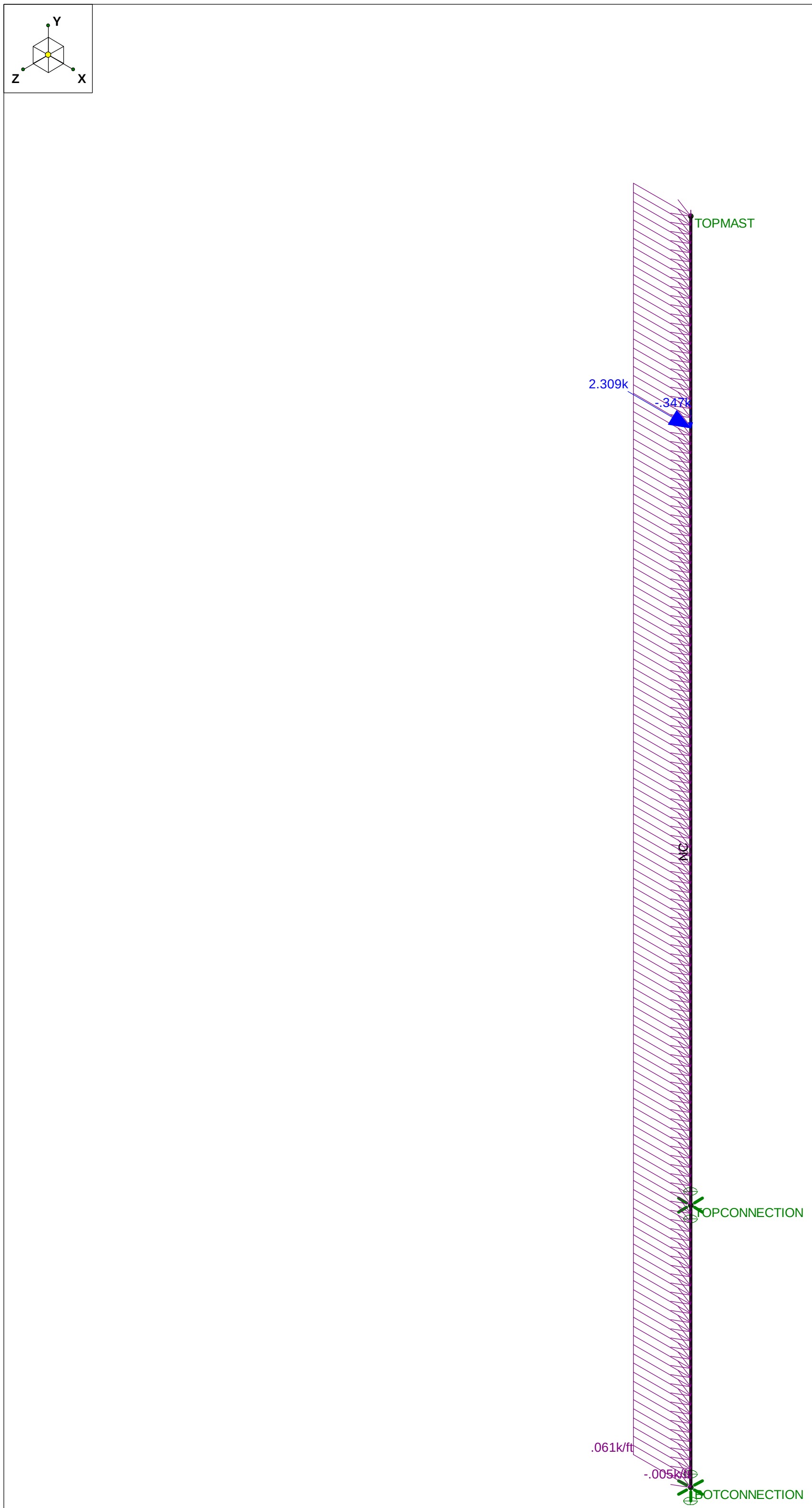
Member Code Checks Displayed
Loads: LC 1, 1.2D + 1.6W (X-direction)

CENTEK engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 7:55 AM
19072.00 - CT5218	LC #1 - Loads	TIA.r3d



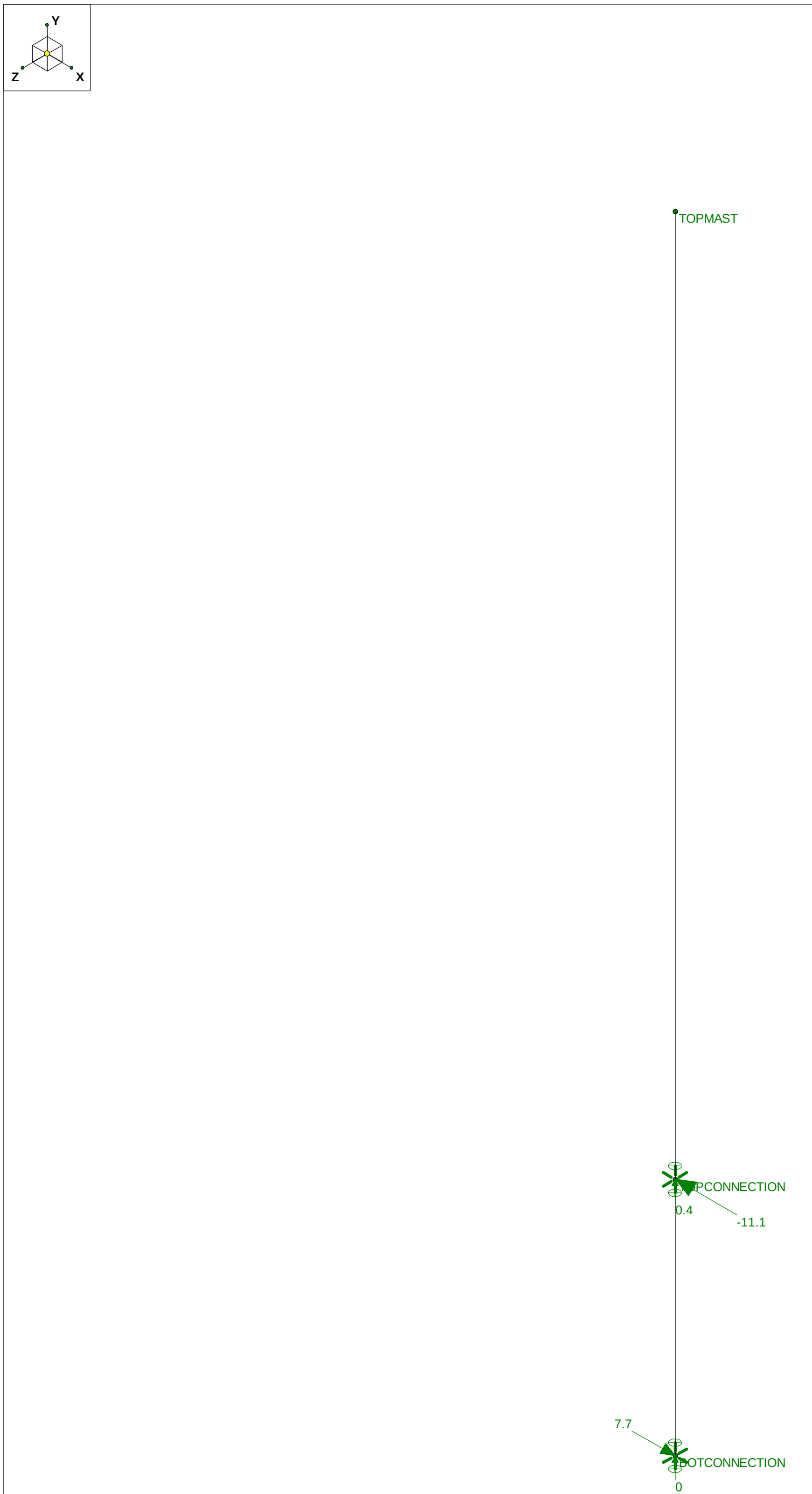
Reaction and Moment Units are k and k-ft

CENTEK engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 7:57 AM
19072.00 - CT5218	LC #1 - Reactions	TIA.r3d



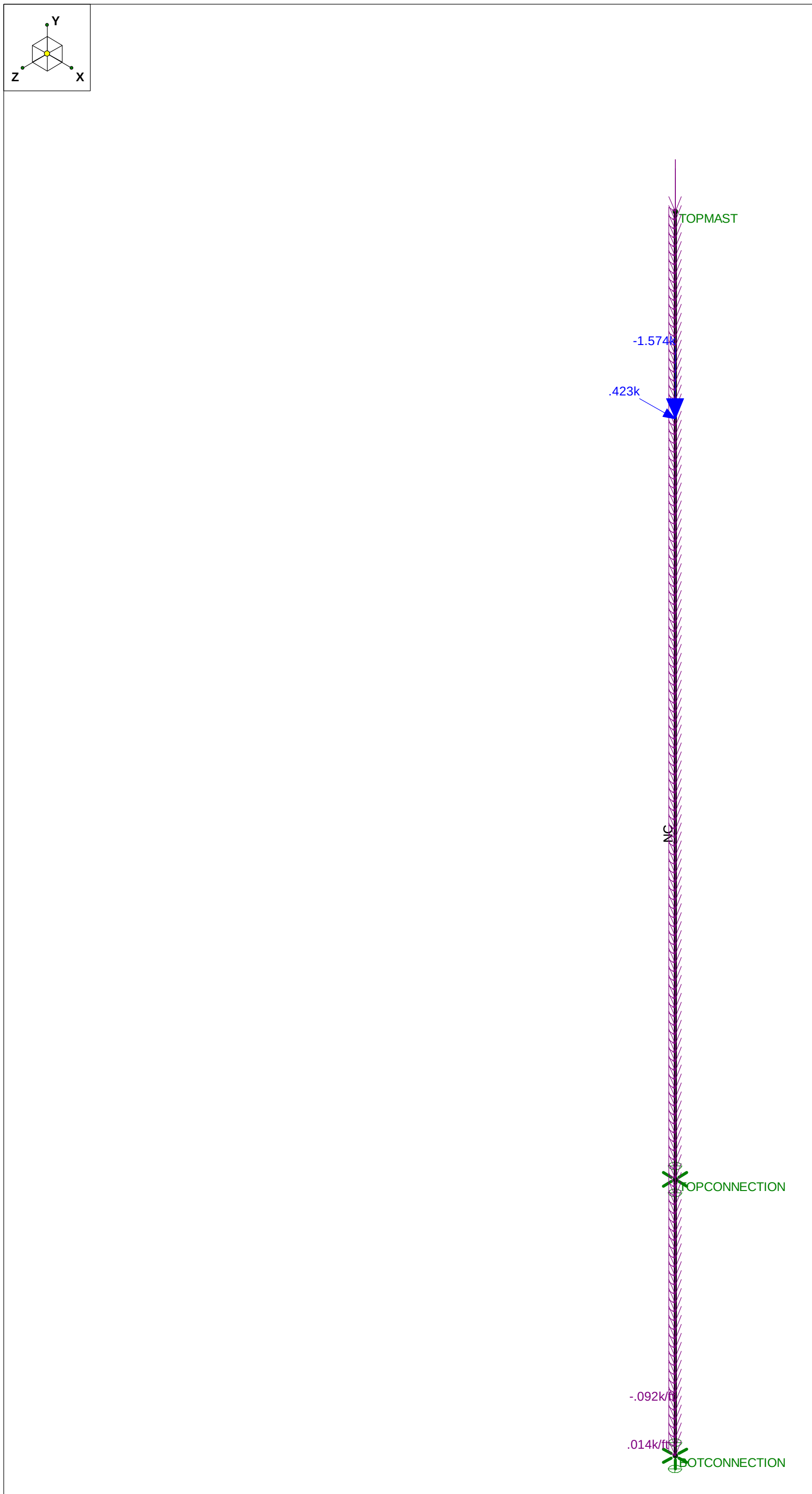
Member Code Checks Displayed
Loads: LC 2, 0.9D + 1.6W (X-direction)

CENTEK engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 7:55 AM
19072.00 - CT5218	LC #2 - Loads	TIA.r3d



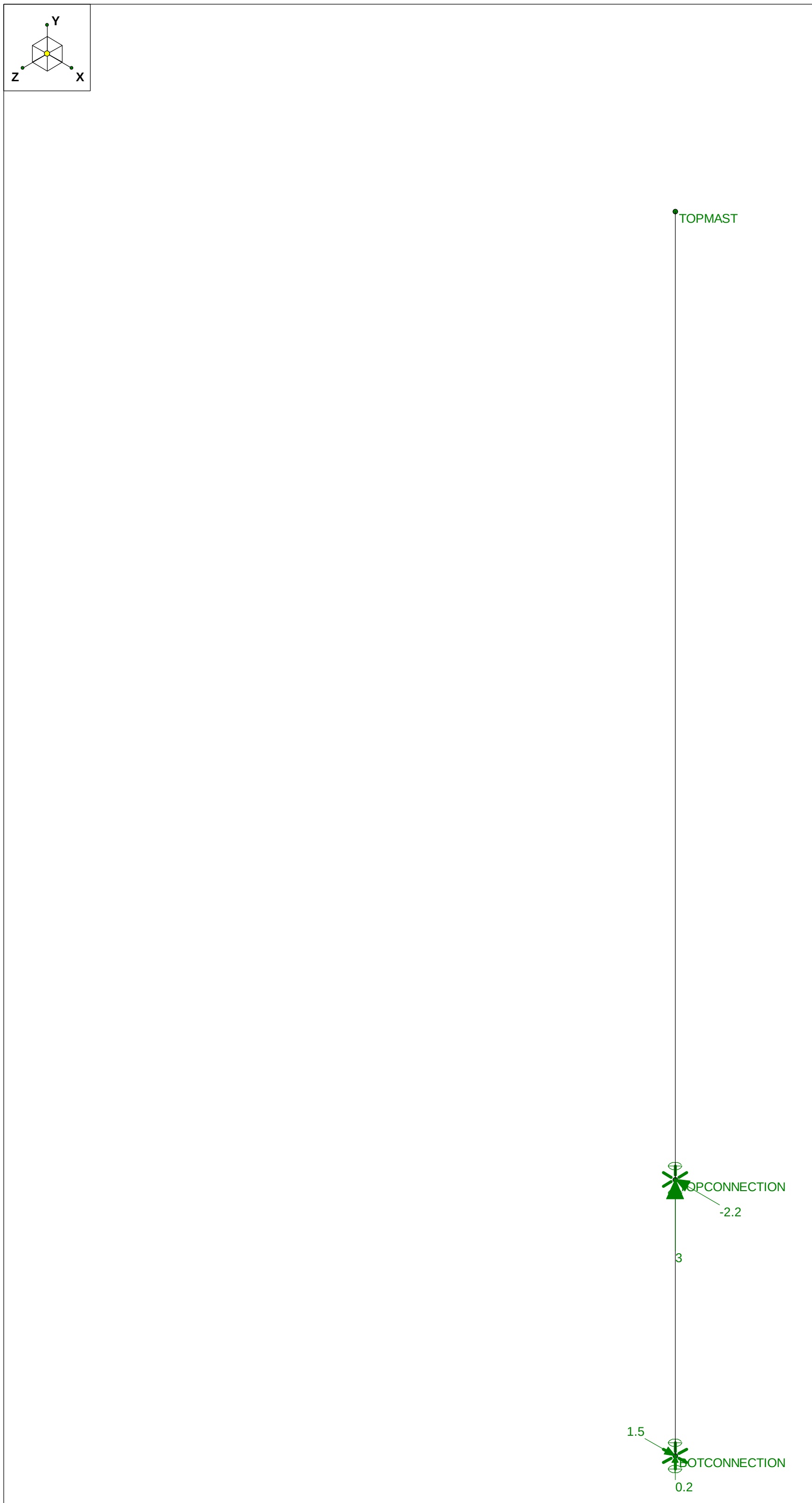
Reaction and Moment Units are k and k-ft

CENTEK engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 7:57 AM
19072.00 - CT5218	LC #2 - Reactions	TIA.r3d



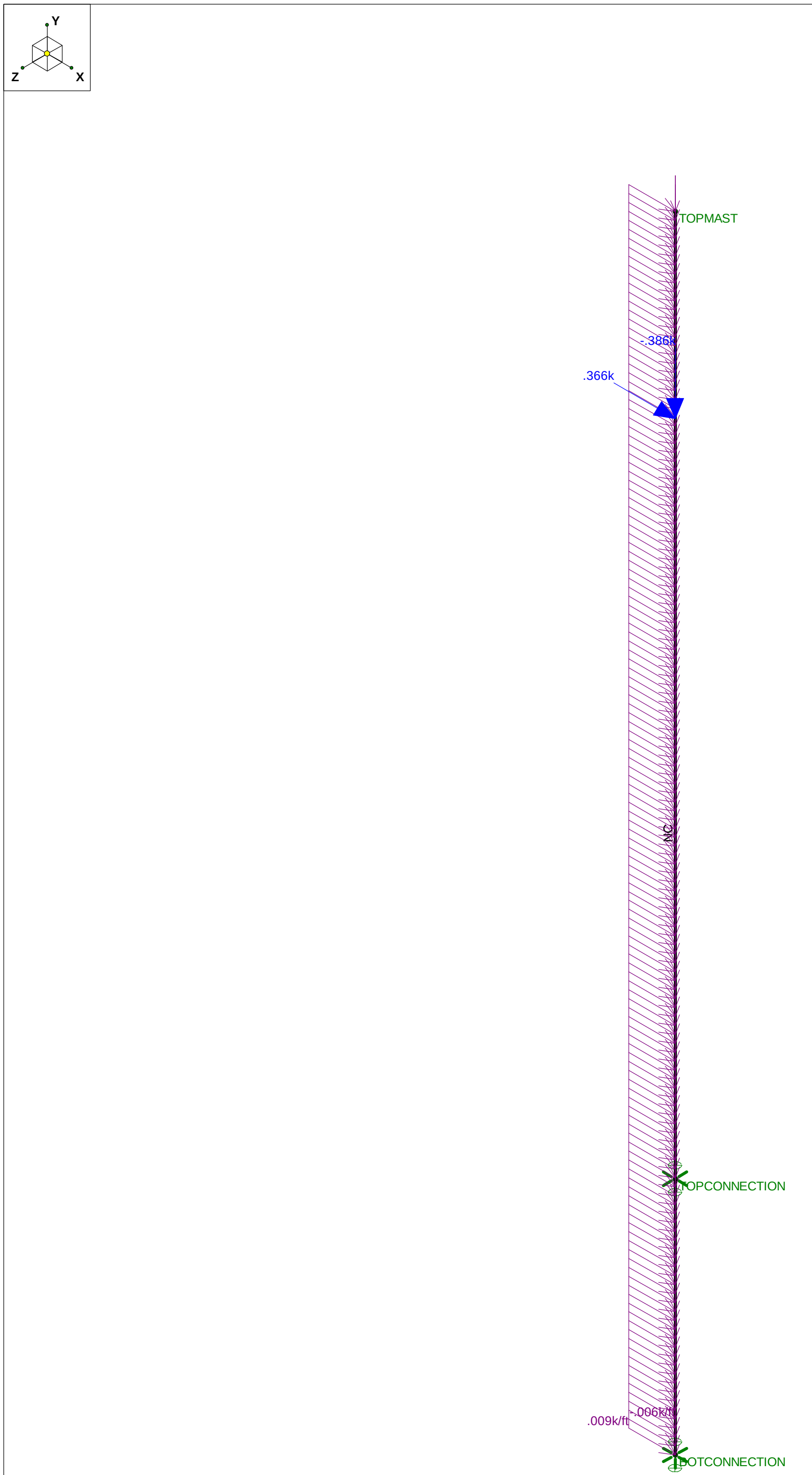
Member Code Checks Displayed
Loads: LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)

CENTEK engineering, INC.	Pole # 6077 - Mast	
TJL		Aug 13, 2019 at 7:55 AM
19072.00 - CT5218	LC #3 - Loads	TIA.r3d



Reaction and Moment Units are k and k-ft

CENTEK engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 7:58 AM
19072.00 - CT5218	LC #3 - Reactions	TIA.r3d

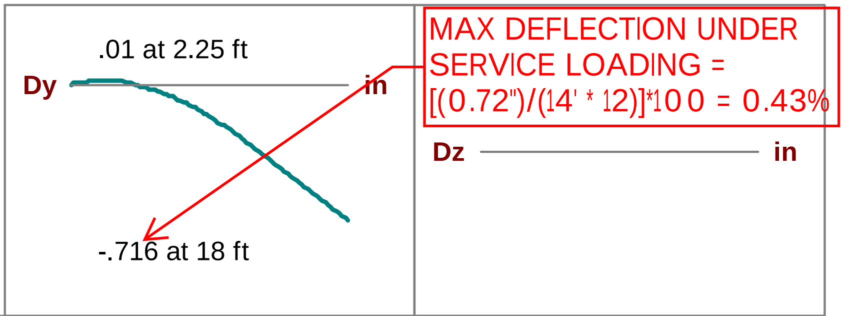


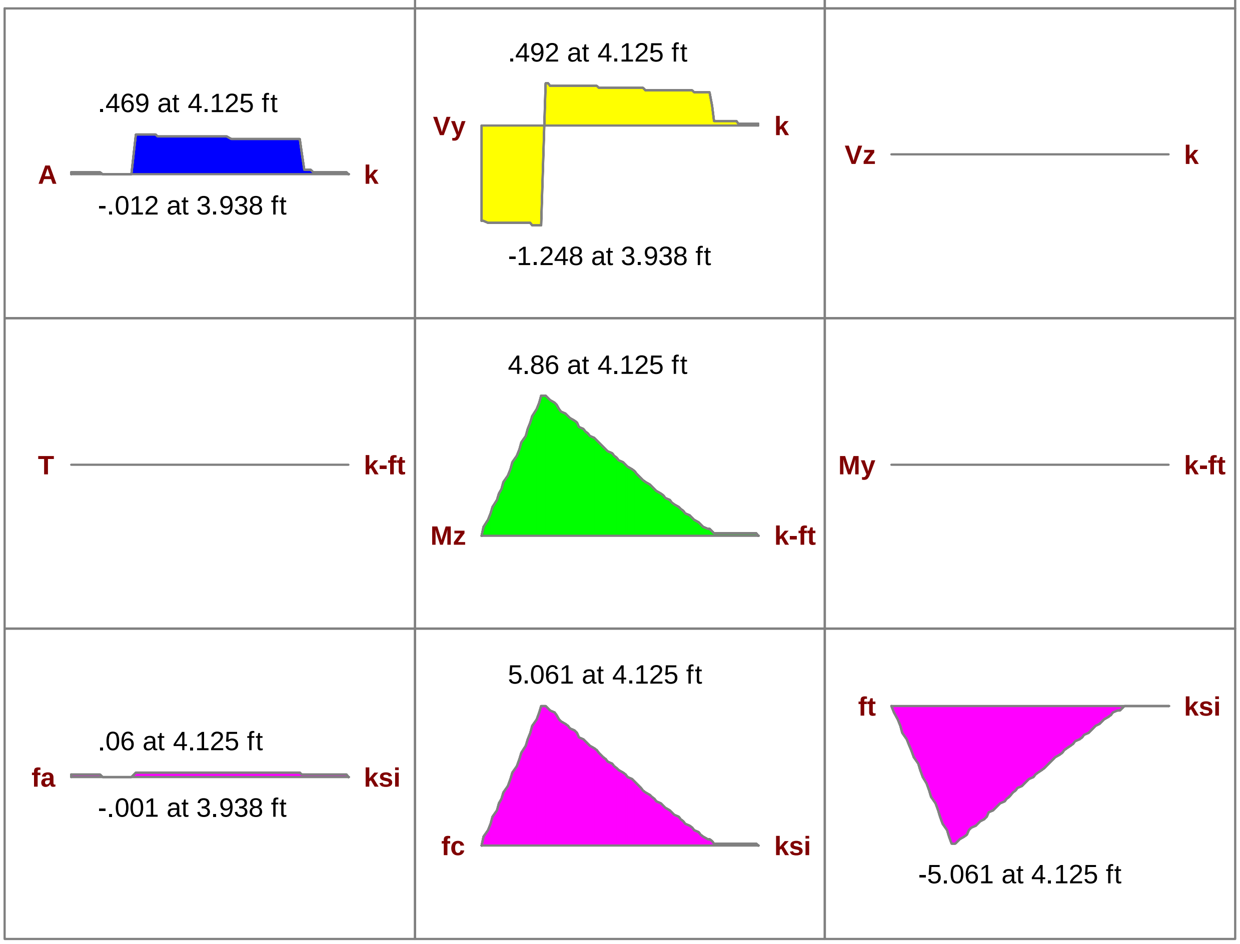
Member Code Checks Displayed
Loads: LC 4, 1.0D + 1.0WService

CENTEK engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 7:56 AM
19072.00 - CT5218	LC #4 - Loads	TIA.r3d

Column: ***M1***

Shape: **HSS6.625X0.432**
Material: **A500 Gr.42**
Length: **18 ft**
I Joint: **BOTCONNECTION**
J Joint: **TOPMAST**
LC 4: 1.0D + 1.0WService
Code Check: **0.100 (bending)**
Report Based On 97 Sections





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

Direct Analysis Method

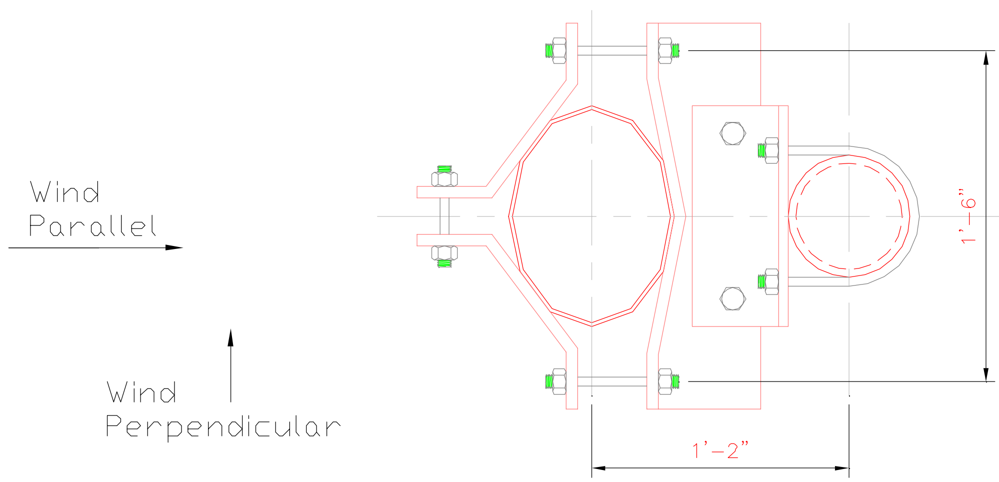
Max Bending Check	**0.100**	Max Shear Check	**0.014 (s)**
Location	**4.125 ft**	Location	**3.938 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/301**
Bending	**Compact**	Compression	**Non-Slender**

			y-y	z-z
Fy	**42 ksi**	Lb	**18 ft**	**18 ft**
phi*Pnc	**164.759 k**	KL/r	**97.979**	**97.979**
phi*Pnt	**297.108 k**			
phi*Mny	**49.14 k-ft**	L Comp Flange	**18 ft**	
phi*Mnz	**49.14 k-ft**	L-torque	**18 ft**	
phi*Vny	**89.132 k**	Tau_b	**1**	
phi*Vnz	**89.132 k**			
phi*Tn	**46.292 k-ft**			
Cb	**1.582**			

Mast Connection to Transmission Pole:

Reactions:

Moment =	$Moment := 0 \cdot kips$	(Input From Risa-3D)
Vertical =	$Vertical := 0.6 \cdot kips$	(Input From Risa-3D)
Horizontal =	$Horizontal := 11.2 \cdot kips$	(Input From Risa-3D)



Check U-Bolts

Bolt Data:

Bolt Type =	ASTMA36	(User Input)
Bolt Diameter =	$d_b := 0.75 \cdot in$	(User Input)
Number of U-Bolts =	$N_{ub} := 2$	(User Input)
Nomianl Tensile Strength =	$F_{nt} := 43.5 \cdot ksi$	(User Input)
Nomianl Shear Strength =	$F_{nv} := 26.1 \cdot ksi$	(User Input)
Resistance Factor =	$\phi := 0.75$	(User Input)
BoltArea =	$a_b := \frac{1}{4} \cdot \pi \cdot d_b^2 = 0.442 \cdot in^2$	

Wind Parallel to Connection:

Shear Force per Bolt = $F_{v.bolt} := \frac{Vertical}{N_{ub} \cdot 2} = 0.15 \cdot kips$

Shear Stress per Bolt = $f_v := \frac{F_{v.bolt}}{a_b} = 0.34 \cdot ksi$

Bolt_Shear := if$\left(f_v < \phi \cdot F_{nv}, \text{"OK"}, \text{"Overstressed"}\right)$

Bolt_Shear = "OK"

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 43.5 \cdot ksi$

Tension Force Each Bolt = $F_{tension.bolt} := \frac{Horizontal}{N_{ub} \cdot 2} = 2.8 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.bolt}}{a_b} = 6.3 \cdot ksi$

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

Bolt_Tension = "OK"

Wind Perpendicular to Connection:

Shear Force per Bolt = $F_{v.bolt} := \frac{\sqrt{Vertical^2 + Horizontal^2}}{N_{ub} \cdot 2} = 2.804 \cdot kips$

Shear Stress per Bolt = $f_v := \frac{F_{v.bolt}}{a_b} = 6.347 \cdot ksi$

Bolt_Shear := if$\left(f_v < \phi \cdot F_{nv}, \text{"OK"}, \text{"Overstressed"}\right)$

Bolt_Shear = "OK"

Check WT Connection Bolts

Bolt Data:

Bolt Type = ASTMA325 (User Input)

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

Number of Bolts in WT to Plate Connection = $N_{WTb} := 2$ (User Input)

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

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

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

Design Shear Slip Critical Bolt = $F_{v.sc} := 6.64 \cdot kips$ (User Input)

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

Wind Parallel or Perpendicular to Connection:

Shear Force per Bolt = $F_{v.bolt} := \frac{Horizontal}{N_{WTb}} = 5.6 \cdot kips$

Bolt_Shear := if($F_{v.bolt} < F_{v.sc}$, "OK" , "Overstressed")

Bolt_Shear = "OK"

Shear Stress per Bolt = $f_v := \frac{F_{v.bolt}}{a_b} = 12.676 \cdot ksi$

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 88.83 \cdot ksi$

Tension Force Each Bolt = $F_{tension.bolt} := \frac{Vertical}{N_{WTb}} = 0.3 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.bolt}}{a_b} = 0.7 \cdot ksi$

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

Bolt_Tension = "OK"

Check Threaded Rods

Bolt Data:

Bolt Type = ASTMA36 (User Input)

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

Number of Bolts = $N_b := 4$ (User Input)

Nomianl Tensile Strength = $F_{nt} := 43.5 \cdot ksi$ (User Input)

Nomianl Shear Strength = $F_{nv} := 26.1 \cdot ksi$ (User Input)

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

Bolt Eccentricity from C.L. Mast = $e := 14 \cdot in$ (User Input)

Vetical Spacing Between Top and Bottom Bolts = $S_{vert} := 2.25 \cdot in$ (User Input) (Assumed based on min spacing requirements)

Horizontal Spacing Between Top and Bottom Bolts = $S_{horz} := 18 \cdot in$ (User Input)

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

Wind Parallel to Connection:

Shear Force per Bolt = $F_{v.bolt} := \frac{Vertical}{N_b} = 0.15 \cdot kips$

Shear Stress per Bolt = $f_v := \frac{F_{v.bolt}}{a_b} = 0.34 \cdot ksi$

$Bolt\_Shear := if\left(f_v < \phi \cdot F_{nv}, \text{"OK"}, \text{"Overstressed"}\right)$

$Bolt\_Shear = \text{"OK"}$

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 43.5 \cdot ksi$

Tension Force Each Bolt = $F_{tension.bolt} := \frac{Horizontal}{N_b} + \frac{Vertical \cdot e}{S_{vert} \cdot 2} = 4.667 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.bolt}}{a_b} = 10.6 \cdot ksi$

$Bolt\_Tension := if\left(f_t < \phi \cdot F'_{nt}, \text{"OK"}, \text{"Overstressed"}\right)$

$Bolt\_Tension = \text{"OK"}$

Wind Perpendicular to Connection:

Shear Force per Bolt = $F_{v.bolt} := \frac{\sqrt{Vertical^2 + Horizontal^2}}{N_b} = 2.804 \cdot kips$

Shear Stress per Bolt = $f_v := \frac{F_{v.bolt}}{a_b} = 6.347 \cdot ksi$

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

Bolt_Shear = "OK"

Tensile Stress Adjusted for Shear = $F'_{nt} := \begin{cases} \left(1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v\right) & \text{if } 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi \cdot F_{nv}} \cdot f_v \le F_{nt} \\ F_{nt} & \text{otherwise} \end{cases} = 42.45 \cdot ksi$

Tension Force Each Bolt = $F_{tension.bolt} := \frac{Horizontal \cdot e}{S_{horz} \cdot 2} + \frac{Vertical \cdot e}{S_{vert} \cdot 2} = 6.222 \cdot kips$

Tension Stress Each Bolt = $f_t := \frac{F_{tension.bolt}}{a_b} = 14.1 \cdot ksi$

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

Bolt_Tension = "OK"

Basic Components

Heavy Wind Pressure = $p := 4.00$ psf (User Input NESC 2012 Figure 250-1 & Table 250-1)

Basic Windspeed = $V := 120$ mph (User Input NESC 2012 Figure 250-2(e))

Radial Ice Thickness = $Ir := 0.50$ in (User Input)

Radial Ice Density = $Id := 56.0$ pcf (User Input)

Factors for Extreme Wind Calculation

Elevation of Top of Mast Above Grade = $TME := 110$ ft (User Input)

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

NESC Factor = $kv := 1.43$ (User Input from NESC 2012 Table 250-3 equation)

Importance Factor = $I := 1.0$ (User Input from NESC 2012 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.291$ (NESC 2012 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.308$ (NESC 2012 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.842$ (NESC 2012 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.863$ (NESC 2012 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 41.1$ psf (NESC 2012 Section 250.C.2)

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 Design Criteria Table

Overload Factors for Wind Loads:

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

Overload Factors for Vertical Loads:

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

Development of Wind & Ice Load on Mast

Mast Data: (HSS 6.625x0.432)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 6.625$	in	(User Input)
Mast Length =	$L_{mast} := 18$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.432$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.552$ sf/ft

Total Mast Wind Force (Above Top of Tower) = $qz \cdot Cd_{coax} \cdot A_{mast} \cdot m = 45$ plf **BLC 5**

Total Mast Wind Force (Below Top of Tower) = $qz \cdot Cd_{coax} \cdot A_{mast} = 36$ plf **BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 0.635$ sf/ft

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

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 = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 11.2$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 4$ plf **BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	KMW ET-X-UW-68-14-65-18		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 12$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 50$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 18$ sf

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1479$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.6$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.8$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 127$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant1} := WT_{ant} \cdot N_{ant} = 150$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5443$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1485$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 48$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 144$ lbs **BLC 3**

Development of Wind & Ice Load on TMAs

TMA Data:

TMA Model =	Commscope TMAT192123B68-31		
TMA Shape =	Flat		(User Input)
TMA Height =	$L_{TMA} := 11.1$	in	(User Input)
TMA Width =	$W_{TMA} := 9.4$	in	(User Input)
TMA Thickness =	$T_{TMA} := 3.8$	in	(User Input)
TMA Weight =	$WT_{TMA} := 23$	lbs	(User Input)
Number of TMAs =	$N_{TMA} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all TMAs Simultaneously

Surface Area for One TMA = $SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.7$ sf

TMA Projected Surface Area = $A_{TMA} := SA_{TMA} \cdot N_{TMA} = 2.2$ sf

Total TMA Wind Force = $F_{TMA1} := qz \cdot Cd_F \cdot A_{TMA} \cdot m = 179$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all TMAs Simultaneously

Surface Area for One TMA w/ Ice = $SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 0.9$ sf

TMA Projected Surface Area w/ Ice = $A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 2.6$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA1} := p \cdot Cd_F \cdot A_{ICETMA} = 17$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All TMAs = $Wt_{TMA1} := WT_{TMA} \cdot N_{TMA} = 69$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each TMA = $V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 396$ cu in

Volume of Ice on Each TMA = $V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1) \cdot (T_{TMA} + 1) - V_{TMA} = 208$ cu in

Weight of Ice on Each TMA = $W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 7$ lbs

Weight of Ice on All TMAs = $Wt_{ice.TMA1} := W_{ICETMA} \cdot N_{TMA} = 20$ lbs **BLC 3**

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Site Pro Tri-Sector Chain Mount w/ 3 Pipes		
Mount Shape =	Round		(User Input)
Pipe Mount Length =	$L_{mnt} := 72$	in	(User Input)
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf	(User Input)
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in	(User Input)
Number of Mounting Pipes =	$N_{mnt} := 3$		(User Input)
Tri Sector Chain Mount Weight =	$W_{tsc.mnt} := 101$	lbs	(User Input)

Wind Load (NESC Extreme)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area = $A_{mnt} := 0.0$ sf

Total Mount Wind Force = $F_{mnt} := qz \cdot Cd_F \cdot A_{mnt} \cdot m = 0$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Mount is Shielded by Antenna

Mount Projected Surface Area w/ Ice = $A_{ICEmnt} := 0.0$ sf

Total Mount Wind Force = $Fi_{mnt} := p \cdot Cd_F \cdot A_{ICEmnt} = 0$ lbs **BLC 4**

Gravity Loads (without ice)

Weight Each Pipe Mount = $WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 22$ lbs

Weight of All Mounts = $WT_{mnt} \cdot N_{mnt} + W_{tsc.mnt} = 167$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Pipe = $V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^{2} \cdot L_{mnt} = 319$ cu in

Volume of Ice on Each Pipe = $V_{ice} := \left[\frac{\pi}{4} \cdot \left[\left(D_{mnt} + 1\right)^2\right] \cdot \left(L_{mnt} + 1\right)\right] - V_{mnt} = 334$ cu in

Weight of Ice each mount (incl, hardware) = $W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 11$ lbs

Weight of Ice on All Mounts = $W_{ICEmnt} \cdot N_{mnt} + 5 = 37$ lbs **BLC 3**

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Subject: Load Analysis of Antenna Mast and AT&T Equipment on Pole #6077

Location: East Lyme, CT

Rev. 1: 8/13/19

Prepared by: T.J.L Checked by: C.A.G.
Job No. 19072.00

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type = HELIAX 1-5/8"

Shape = Round (User Input)

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

Coax Cable Length = $L_{coax} := 15$ ft (User Input)

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

Total Number of Coax = $N_{coax} := 6$ (User Input)

No. of Coax Projecting Outside Face of PCS Mast = $NP_{coax} := 2$ (User Input)

Wind Load (NESC Extreme)

Coax projected surface area = $A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.3$ sf/ft

Total Coax Wind Force (Above NU Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} \cdot m = 27$ plf **BLC 5**

Total Coax Wind Force (Below NU Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} = 22$ plf **BLC 5**

Wind Load (NESC Heavy)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot Ir)}{12} = 0.4$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := p \cdot Cd_{coax} \cdot AICE_{coax} = 3$ plf **BLC 4**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 6$ plf **BLC 2**

Gravity Load (ice only)

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

Ice Weight All Coax per foot = $WTi_{coax} := Id \cdot \left(N_{coax} \cdot \frac{Ai_{coax}}{144}\right) = 9$ plf **BLC 3**

(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	Accelerated 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 (\1...	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 ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	HSS6.625X0.432	Column	Pipe	A500 Gr.42	Typical	7.86	38.2	38.2	76.4

Hot Rolled Steel Design Parameters

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	y sway	z sway	Function
1	M1	Mast	18			Lbyy									Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	BOTCO...	TOPMA...			Mast	Column	Pipe	A500 Gr....	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	BOTCONNECTION	0	0	0	0	
2	TOPCONNECTION	0	4	0	0	
3	TOPMAST	0	18	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	BOTCONNECTION	Reaction	Reaction	Reaction		Reaction	
2	TOPCONNECTION	Reaction	Reaction	Reaction		Reaction	

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.15	15
2	M1	Y	-.069	15
3	M1	Y	-.167	15

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.144	15
2	M1	Y	-.02	15
3	M1	Y	-.037	15

Member Point Loads (BLC 4 : NESC Heavy Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.127	15
2	M1	X	.017	15

Member Point Loads (BLC 5 : NESC Extreme Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	1.479	15
2	M1	X	.179	15

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	M1	Y	-.006	-.006	0	0

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	M1	Y	-.004	-.004	0	0
2	M1	Y	-.009	-.009	0	0

Member Distributed Loads (BLC 4 : NESC Heavy Wind)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.004	.004	0	0
2	M1	X	.003	.003	0	0

Member Distributed Loads (BLC 5 : NESC Extreme Wind)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.036	.036	0	5
2	M1	X	.045	.045	5	0
3	M1	X	.022	.022	0	5
4	M1	X	.027	.027	5	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					3	1		
3	Weight of Ice Only	None					3	2		
4	NESC Heavy Wind	None					2	2		
5	NESC Extreme Wind	None					2	4		

Load Combinations

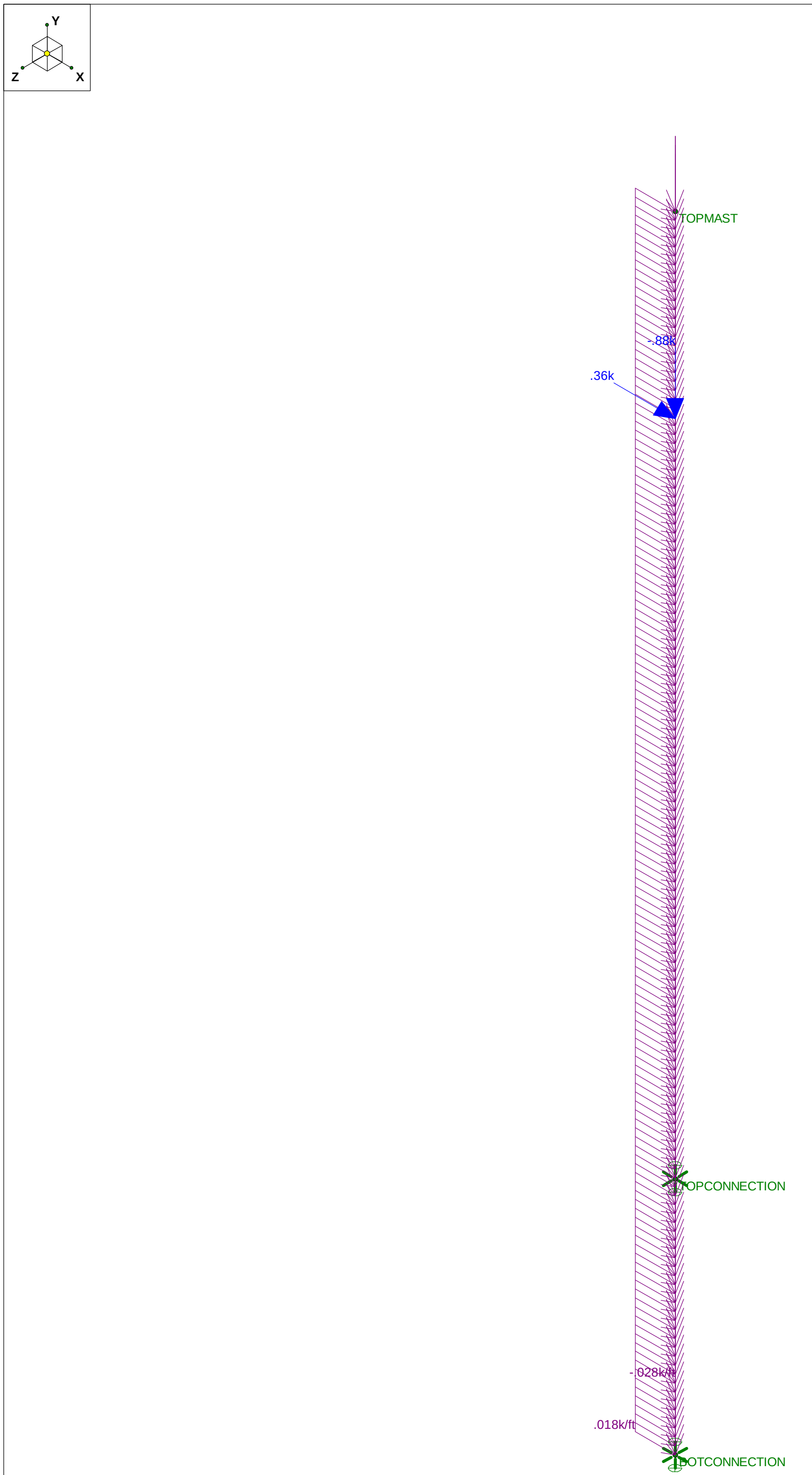
	Description	Solve	PDe...	S...	B...	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	NESC Heavy Wind	Yes			1	1.5	2	1.5	3	1.5	4	2.5												
2	NESC Extreme Wind	Yes			1	1	2	1	5	1														
3	Self Weight				1	1																		

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	BOTCONNECTION	1.384	.137	0	0	0	0
2	1	TOPCONNECTION	-2.059	1.978	0	0	0	0
3	1	Totals:	-.675	2.116	0			
4	1	COG (ft):	X: 0	Y: 11.497	Z: 0			

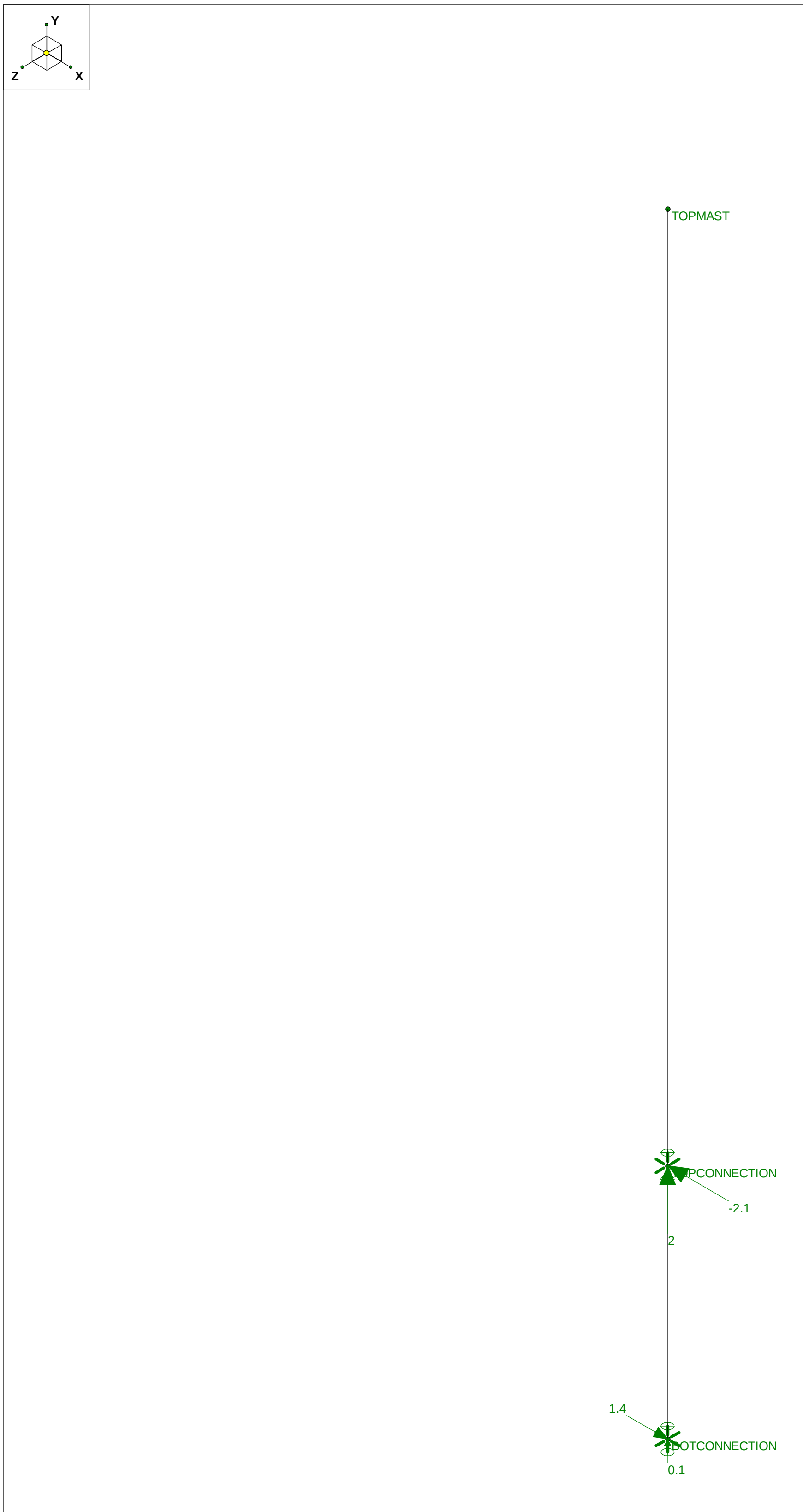
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	BOTCONNECTION	6.206	.065	0	0	0	0
2	2	TOPCONNECTION	-9.09	.91	0	0	0	0
3	2	Totals:	-2.884	.975	0			
4	2	COG (ft):	X: 0	Y: 11.374	Z: 0			



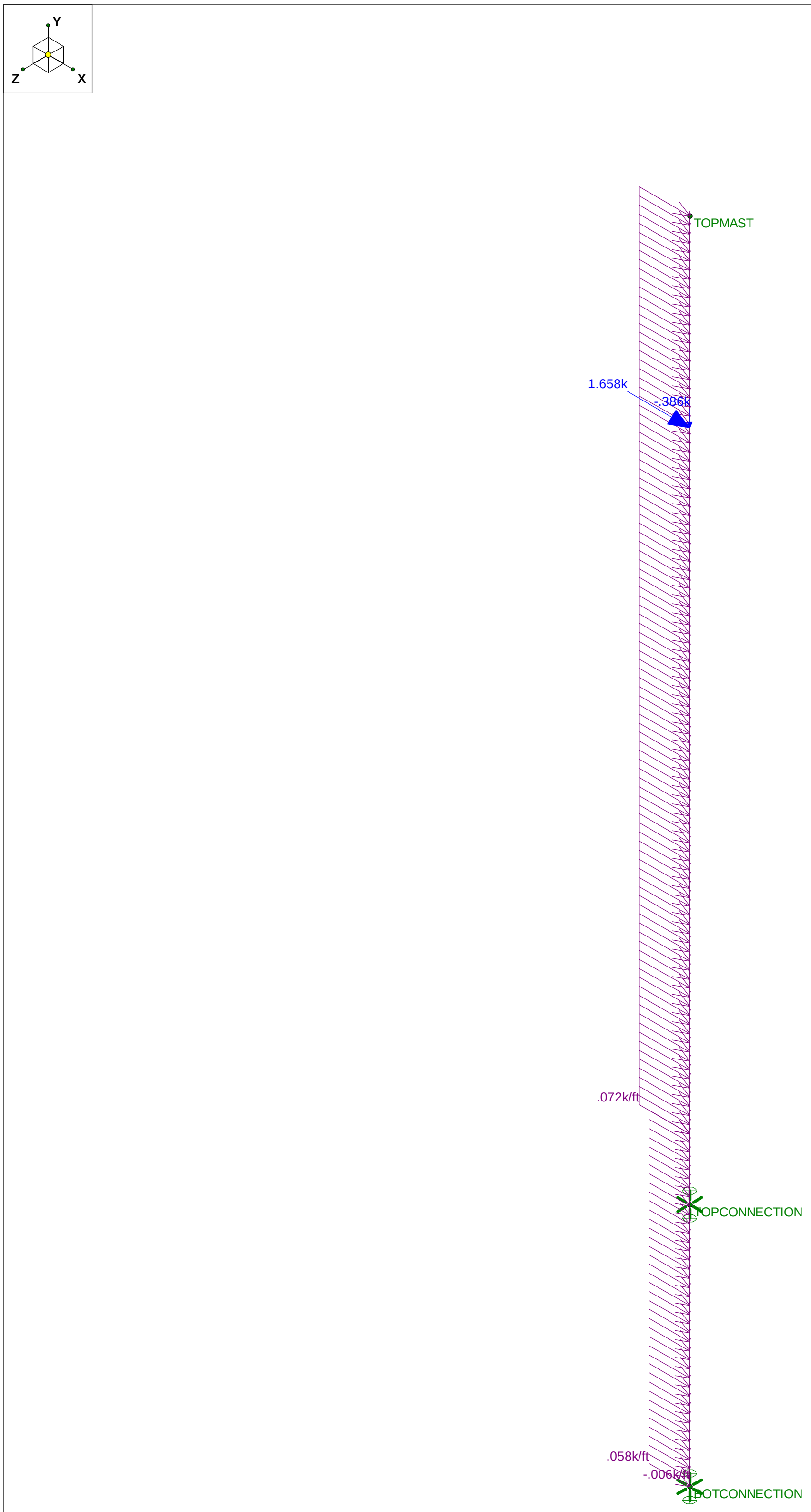
Loads: LC 1, NESC Heavy Wind

CENTEK Engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 8:15 AM
19072.00 / AT&T CT5218	LC #1 - Loads	NESC.r3d



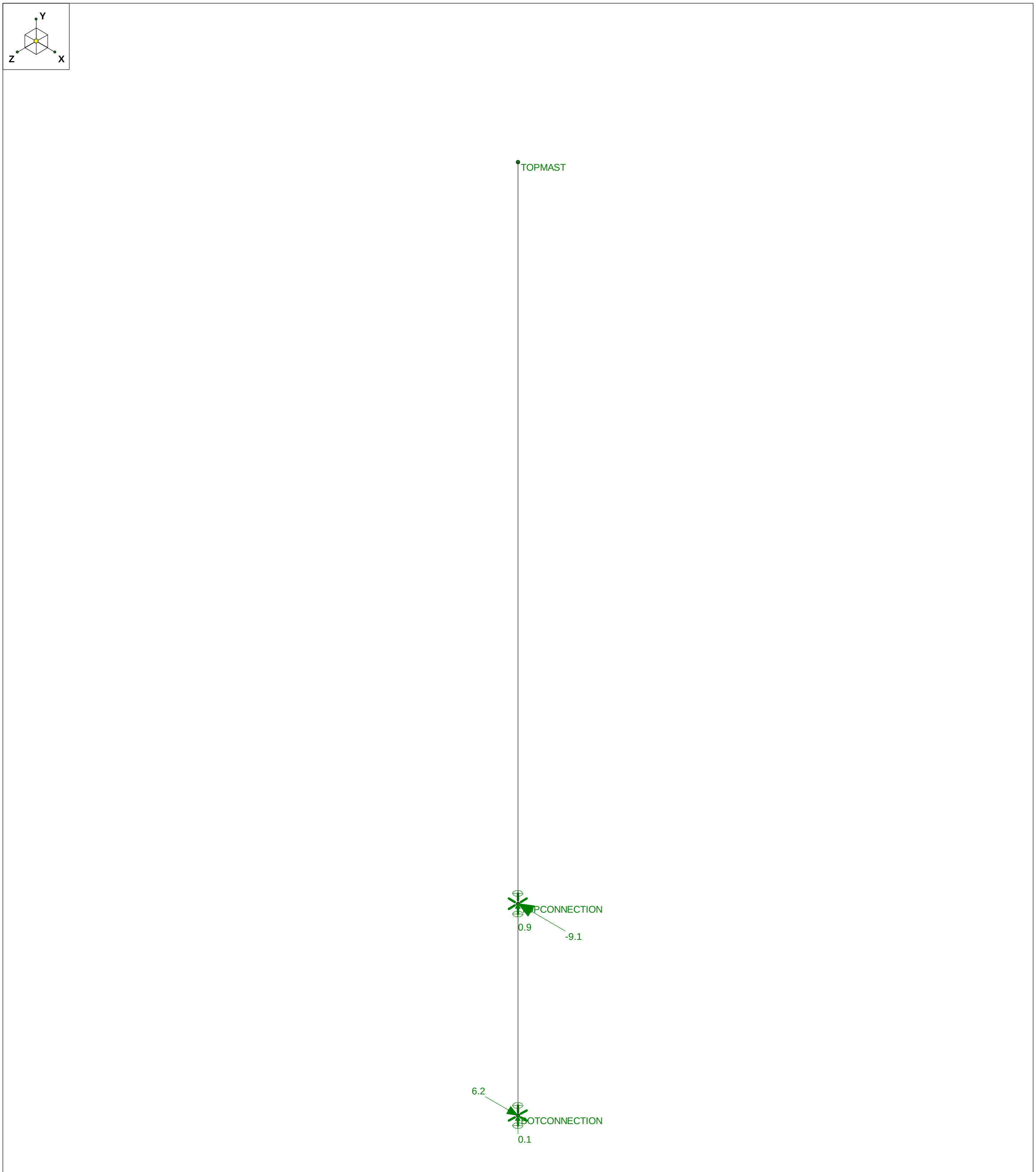
Results for LC 1, NESC Heavy Wind
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 8:16 AM
19072.00 / AT&T CT5218	LC #1 - Reactions	NESC.r3d



Loads: LC 2, NESC Extreme Wind

CENTEK Engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 8:16 AM
19072.00 / AT&T CT5218	LC #1 - Loads	NESC.r3d



Results for LC 2, NESC Extreme Wind
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Pole # 6077 - Mast	Aug 13, 2019 at 8:17 AM
19072.00 / AT&T CT5218	LC #2 - Reactions	NESC.r3d

Coax Cable on CL&P Pole

Coaxial Cable Span $Coax_{Span} := 10 \cdot ft$ *(User Input)*

Heavy Wind Pressure = $p := 4 \cdot psf$ *(User Input)*

Radial Ice Thickness = $Ir := 0.5 \cdot in$ *(User Input)*

Radial Ice Density = $Id := 56 \cdot pcf$ *(User Input)*

Basic Windspeed = $V := 120$ mph (User Input NESC 2012 Figure 250-2(e))

Height to Top of Coax Above Grade = $TC := 107$ ft (User Input)

NESC Factor = $kv := 1.43$ (User Input from NESC 2012 Table 250-3 equation)

Importance Factor = $I := 1.0$ (User Input from NESC 2012 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.18$ (NESC 2012 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TC)}\right]^{\frac{1}{7}} = 0.31$ (NESC 2012 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TC}{220}\right)} = 0.846$ (NESC 2012 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.865$ (NESC 2012 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 37.6$ psf (NESC 2012 Section 250.C.2)

Diameter of Coax Cable = $D_{coax} := 1.98 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax} := 1.04 \cdot plf$ *(User Input)*

Number of Coax Cables = $N_{coax} := 6$ *(User Input)*

Number of Projected Coax Cables = $NP_{coax} := 2$ *(User Input)*

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

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

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

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

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

Wind Area without Ice = $A := \left(NP_{coax} \cdot D_{coax}\right) = 3.96 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 4.96 \cdot in$

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

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 9.09 \cdot plf$

Heavy Wind Vertical Load =

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

Heavy Wind Transverse Load =

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

$Heavy\_WInd_{Vert} = 230 lb$ $Heavy\_Wind_{Trans} = 66 lb$

Extreme Wind Vertical Load =

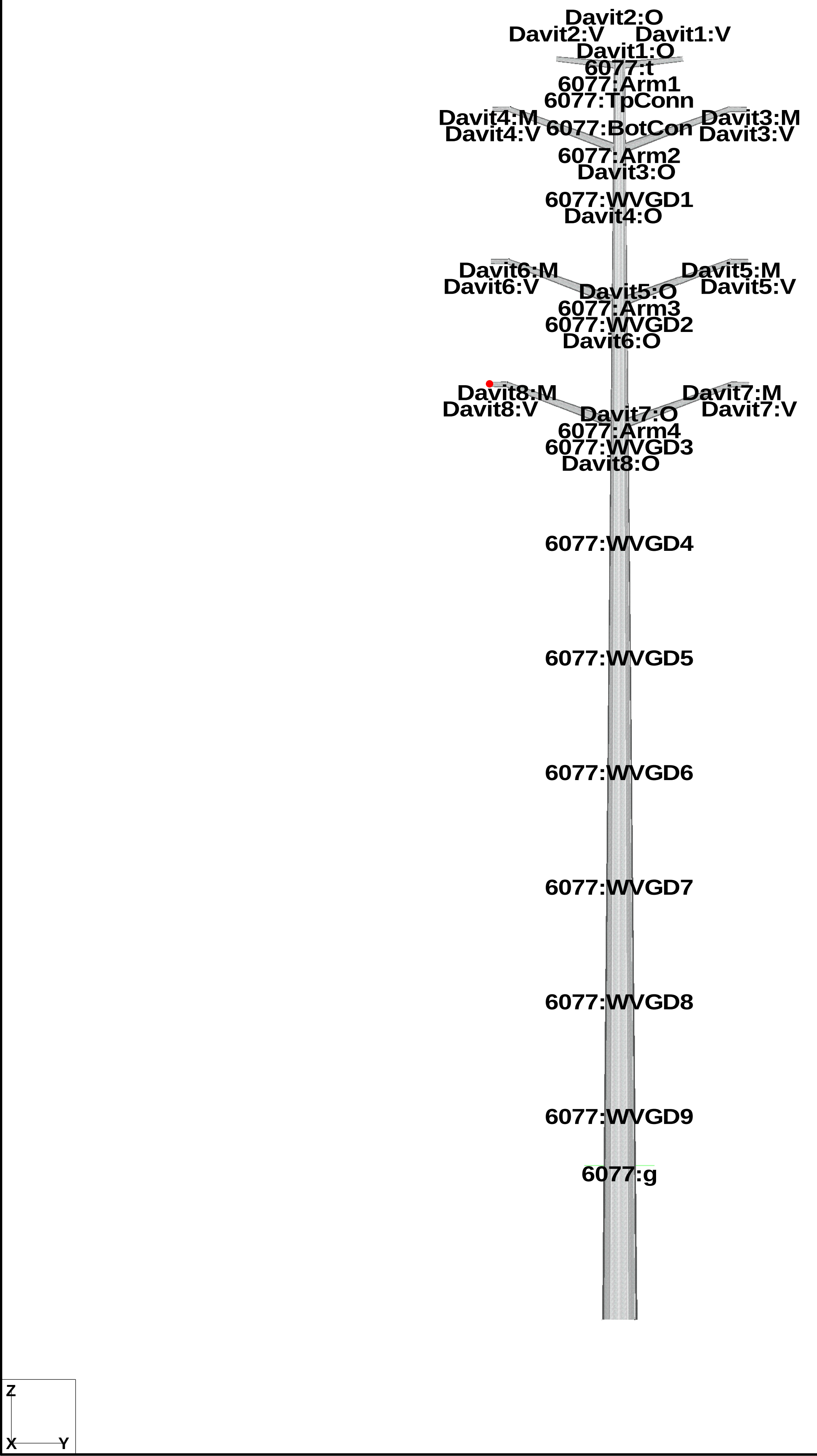
$$Extreme\_Wind_{Vert} := \overrightarrow{\left(N_{coax} \cdot W_{coax} \cdot Coax_{Span} \cdot OF_{EWV}\right)}$$

Extreme Wind Transverse Load =

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

$Extreme\_Wind_{Vert} = 62 lb$ $Extreme\_Wind_{Trans} = 199 lb$

Centek Engineering Inc, Project: "cl&p structure # 6077"
PLS-POLE Version 12.50, 9:54:57 AM Friday, May 24, 2019
Undeformed geometry displayed



Project Name : 19072.00 - East Lyme, CT
Project Notes: Struct # 6077/ AT&T - CT5218
Project File : J:\Jobs\1907200.WI\04_Structural\Tower Analysis\Backup Documentation\Rev (1)\Calcs\PLS-Pole\cl&p structure # 6077.pol
Date run : 8:20:14 AM Tuesday, August 13, 2019
by : PLS-POLE Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: j:\jobs\1907200.wi\04_structural\tower analysis\backup documentation\rev (1)\calcs\pls-pole\cl&p #6077.lca

*** Analysis Results:

Maximum element usage is 84.17% for Steel Pole "6077" in load case "NESC Extreme Wind"
Maximum insulator usage is 11.42% for Clamp "Clamp9" in load case "NESC Extreme Wind"

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 Wind	6077:g	0.81	-10.59	-45.24	10.63	875.58	96.36	880.87	1.54	0.00
NESC Extreme Wind	6077:g	1.27	-17.42	-23.91	17.46	1232.76	125.49	1239.13	3.54	0.00

Summary of Tip Deflections For All Load Cases:

Note: postive 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 Wind	6077:t	-12.29	64.00	-2.62	65.22	-1.30	-6.31	0.04
NESC Extreme Wind	6077:t	-14.96	88.52	-4.95	89.91	-1.53	-9.27	0.00

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
6077	1	506	NESC Extreme Wind	83.73	145.15
6077	2	1115	NESC Extreme Wind	81.81	385.20
6077	3	4749	NESC Extreme Wind	84.17	1127.57
6077	4	2872	NESC Extreme Wind	72.48	1239.14

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
6077	84.17	NESC Extreme Wind	26	9241.8

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	26.87	NESC Heavy Wind	1	61.8
Davit2	26.03	NESC Heavy Wind	1	61.8
Davit3	63.36	NESC Heavy Wind	1	213.0
Davit4	58.21	NESC Heavy Wind	1	213.0
Davit5	59.73	NESC Heavy Wind	1	213.0
Davit6	45.61	NESC Heavy Wind	1	213.0
Davit7	48.27	NESC Heavy Wind	1	213.0
Davit8	47.19	NESC Heavy Wind	1	213.0

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy Wind	63.36	Davit3	Tubular Davit
NESC Extreme Wind	84.17	6077	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy Wind	62.99	6077	15
NESC Extreme Wind	84.17	6077	26

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC Heavy Wind	63.36	Davit3	1
NESC Extreme Wind	31.99	Davit3	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	3.20	NESC Heavy Wind	0.0
Clamp2	Clamp	2.37	NESC Heavy Wind	0.0
Clamp3	Clamp	5.87	NESC Heavy Wind	0.0
Clamp4	Clamp	5.96	NESC Heavy Wind	0.0
Clamp5	Clamp	5.89	NESC Heavy Wind	0.0
Clamp6	Clamp	5.36	NESC Heavy Wind	0.0
Clamp7	Clamp	4.51	NESC Heavy Wind	0.0
Clamp8	Clamp	4.38	NESC Heavy Wind	0.0
Clamp9	Clamp	11.42	NESC Extreme Wind	0.0
Clamp11	Clamp	7.76	NESC Extreme Wind	0.0
Clamp13	Clamp	0.30	NESC Heavy Wind	0.0
Clamp14	Clamp	0.30	NESC Heavy Wind	0.0

Clamp15	Clamp	0.30	NESC Heavy Wind	0.0
Clamp16	Clamp	0.30	NESC Heavy Wind	0.0
Clamp17	Clamp	0.30	NESC Heavy Wind	0.0
Clamp18	Clamp	0.30	NESC Heavy Wind	0.0
Clamp19	Clamp	0.30	NESC Heavy Wind	0.0
Clamp20	Clamp	0.30	NESC Heavy Wind	0.0
Clamp21	Clamp	0.30	NESC Heavy Wind	0.0

*** Weight of structure (lbs):

Weight of Tubular Davit Arms:	1401.4
Weight of Steel Poles:	9241.8
Total:	10643.2

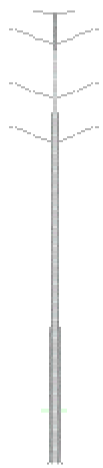
*** End of Report

```
***************************************************************************
*                                                                         *
*                                 PLS-POLE                                *
*                     POLE AND FRAME ANALYSIS AND DESIGN                  *
*                Copyright Power Line Systems, Inc. 1999-2011             *
*                                                                         *
***************************************************************************
```

Project Name : 19072.00 - East Lyme, CT
Project Notes: Struct # 6077/ AT&T - CT5218
Project File : J:\Jobs\1907200.WI\04_Structural\Tower Analysis\Backup Documentation\Rev (1)\Calcs\PLS-Pole\cl&p structure # 6077.pol
Date run : 8:20:14 AM Tuesday, August 13, 2019
by : PLS-POLE Version 12.50
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 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 Property	Stock Number	Length	Default Embedded	Base Plate	Shape	Tip Diameter	Base Diameter	Taper	Default Drag	Tubes	Modulus of Elasticity	Weight Density	Shape At	Strength Check	Distance From	Ultimate	Ultimate

Label		(ft)	Length (ft)			(in)	(in)	(in/ft)	Coef.		Override (ksi)	Override (lbs/ft^3)	Base	Type	Tip (ft)	Trans. Load (kips)	Long. Load (kips)
CL&P6077	6077	110.00	13.5	No	Meyer	12	36.75	0	1.6	4 tubes	0	0		Calculated	0.000	0.0000	0.0000

Steel Tubes Properties:

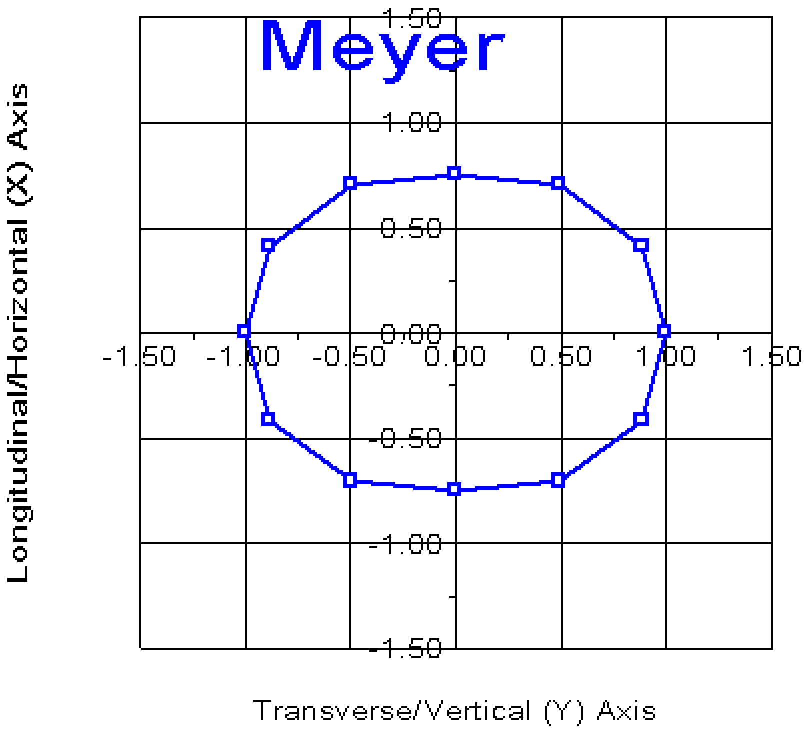
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Gap (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Calculated Taper (in/ft)	Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Diam. Lap Length (ft)	Actual Overlap (ft)
CL&P6077	1	20	0.1875	0.000	0.000	0.000	65.000	0.000	506	10.53	0.22045	12.00	16.41	2.004	0.000
CL&P6077	2	20	0.3125	0.000	0.000	0.000	65.000	0.000	1115	10.40	0.22045	16.66	21.07	2.555	0.000
CL&P6077	3	50	0.375	0.000	0.000	0.000	65.000	0.000	4749	26.75	0.22045	21.19	32.22	3.933	0.000
CL&P6077	4	20	0.4375	0.000	0.000	0.000	65.000	0.000	2872	10.22	0.22045	32.34	36.75	0.000	0.000

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)
6077			0	0	0	0	0	CL&P6077	15 labels		0.00	0

Relative Attachment Labels for Steel Pole "6077":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
6077:Arm1	0.00	96.00
6077:Arm2	0.00	88.81
6077:Arm3	0.00	75.52
6077:Arm4	0.00	64.81
6077:TpConn	0.00	95.25
6077:BotCon	0.00	91.25
6077:WVGD1	0.00	85.00
6077:WVGD2	0.00	75.00
6077:WVGD3	0.00	64.50
6077:WVGD4	0.00	55.00
6077:WVGD5	0.00	45.00
6077:WVGD6	0.00	35.00
6077:WVGD7	0.00	25.00
6077:WVGD8	0.00	15.00
6077:WVGD9	0.00	5.00



Pole Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	T-Moment Inertia (in^4)	L-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	T-Moment Capacity (ft-k)	L-Moment Capacity (ft-k)
6077	6077:t	6077:t Ori	0.00	12.00	6.26	102.22	68.13	0.00	14.0	65.00	65.00	92.28	82.01
6077	6077:Arm1	6077:Arm1 End	0.50	12.11	6.32	105.12	70.06	0.00	14.2	65.00	65.00	94.03	83.57
6077	6077:Arm1	6077:Arm1 Ori	0.50	12.11	6.32	105.12	70.06	0.00	14.2	65.00	65.00	94.03	83.57
6077	6077:TpConn	6077:TpConn End	1.25	12.28	6.41	109.56	73.03	0.00	14.4	65.00	65.00	96.69	85.93
6077	6077:TpConn	6077:TpConn Ori	1.25	12.28	6.41	109.56	73.03	0.00	14.4	65.00	65.00	96.69	85.93
6077	6077:BotCon	6077:BotCon End	5.25	13.16	6.88	135.40	90.27	0.00	15.6	65.00	65.00	111.48	99.10
6077	6077:BotCon	6077:BotCon Ori	5.25	13.16	6.88	135.40	90.27	0.00	15.6	65.00	65.00	111.48	99.10
6077	6077:Arm2	6077:Arm2 End	7.69	13.69	7.16	152.97	102.00	0.00	16.3	65.00	65.00	121.01	107.59
6077	6077:Arm2	6077:Arm2 Ori	7.69	13.69	7.16	152.97	102.00	0.00	16.3	65.00	65.00	121.01	107.59
6077	6077:WVGD1	6077:WVGD1 End	11.50	14.54	7.61	183.41	122.32	0.00	17.4	65.00	65.00	136.70	121.56
6077	6077:WVGD1	6077:WVGD1 Ori	11.50	14.54	7.61	183.41	122.32	0.00	17.4	65.00	65.00	136.70	121.56
6077	#6077:0	Tube 1 End	15.75	15.47	8.10	221.81	147.97	0.00	18.6	65.00	65.00	155.30	138.14
6077	#6077:0	Tube 1 Ori	15.75	15.47	8.10	221.81	147.97	0.00	18.6	65.00	65.00	155.30	138.14
6077	#6077:1	SpliceT End	20.00	16.41	8.60	265.22	176.96	0.00	19.9	65.00	65.00	175.10	155.78
6077	#6077:1	SpliceT Ori	20.00	16.66	14.43	450.70	300.25	0.00	11.4	65.00	65.00	293.09	260.33
6077	6077:Arm3	6077:Arm3 End	20.98	16.88	14.62	468.88	312.36	0.00	11.6	65.00	65.00	301.00	267.37
6077	6077:Arm3	6077:Arm3 Ori	20.98	16.88	14.62	468.88	312.36	0.00	11.6	65.00	65.00	301.00	267.37

6077	6077:WVGD2	6077:WVGD2	End	21.50	16.99	14.72	478.72	318.92	0.00	11.7	65.00	65.00	305.25	271.14
6077	6077:WVGD2	6077:WVGD2	Ori	21.50	16.99	14.72	478.72	318.92	0.00	11.7	65.00	65.00	305.25	271.14
6077	#6077:2	Tube 2	End	26.50	18.09	15.70	580.43	386.74	0.00	12.5	65.00	65.00	347.56	308.77
6077	#6077:2	Tube 2	Ori	26.50	18.09	15.70	580.43	386.74	0.00	12.5	65.00	65.00	347.56	308.77
6077	#6077:3	Tube 2	End	29.09	18.66	16.21	638.44	425.42	0.00	13.0	65.00	65.00	370.58	329.25
6077	#6077:3	Tube 2	Ori	29.09	18.66	16.21	638.44	425.42	0.00	13.0	65.00	65.00	370.58	329.25
6077	6077:Arm4	6077:Arm4	End	31.69	19.24	16.71	700.18	466.61	0.00	13.4	65.00	65.00	394.34	350.38
6077	6077:Arm4	6077:Arm4	Ori	31.69	19.24	16.71	700.18	466.61	0.00	13.4	65.00	65.00	394.34	350.38
6077	6077:WVGD3	6077:WVGD3	End	32.00	19.30	16.77	707.88	471.74	0.00	13.5	65.00	65.00	397.25	352.97
6077	6077:WVGD3	6077:WVGD3	Ori	32.00	19.30	16.77	707.88	471.74	0.00	13.5	65.00	65.00	397.25	352.97
6077	#6077:4	Tube 2	End	36.00	20.19	17.55	811.42	540.82	0.00	14.2	65.00	65.00	435.46	386.99
6077	#6077:4	Tube 2	Ori	36.00	20.19	17.55	811.42	540.82	0.00	14.2	65.00	65.00	435.46	386.99
6077	#6077:5	SpliceT	End	40.00	21.07	18.34	924.59	616.33	0.00	14.9	65.00	65.00	475.43	422.56
6077	#6077:5	SpliceT	Ori	40.00	21.19	22.06	1117.87	744.79	0.00	12.2	65.00	65.00	571.42	507.62
6077	6077:WVGD4	6077:WVGD4	End	41.50	21.52	22.41	1172.18	781.00	0.00	12.4	65.00	65.00	589.98	524.12
6077	6077:WVGD4	6077:WVGD4	Ori	41.50	21.52	22.41	1172.18	781.00	0.00	12.4	65.00	65.00	589.98	524.12
6077	#6077:6	Tube 3	End	46.50	22.63	23.58	1365.82	910.14	0.00	13.1	65.00	65.00	653.95	581.03
6077	#6077:6	Tube 3	Ori	46.50	22.63	23.58	1365.82	910.14	0.00	13.1	65.00	65.00	653.95	581.03
6077	6077:WVGD5	6077:WVGD5	End	51.50	23.73	24.75	1579.66	1052.78	0.00	13.9	65.00	65.00	721.20	640.87
6077	6077:WVGD5	6077:WVGD5	Ori	51.50	23.73	24.75	1579.66	1052.78	0.00	13.9	65.00	65.00	721.20	640.87
6077	#6077:7	Tube 3	End	56.50	24.83	25.92	1814.69	1209.60	0.00	14.6	65.00	65.00	791.73	703.65
6077	#6077:7	Tube 3	Ori	56.50	24.83	25.92	1814.69	1209.60	0.00	14.6	65.00	65.00	791.73	703.65
6077	6077:WVGD6	6077:WVGD6	End	61.50	25.93	27.09	2071.93	1381.27	0.00	15.3	65.00	65.00	865.53	769.36
6077	6077:WVGD6	6077:WVGD6	Ori	61.50	25.93	27.09	2071.93	1381.27	0.00	15.3	65.00	65.00	865.53	769.36
6077	#6077:8	Tube 3	End	66.50	27.04	28.27	2352.36	1568.46	0.00	16.1	65.00	65.00	942.62	838.00
6077	#6077:8	Tube 3	Ori	66.50	27.04	28.27	2352.36	1568.46	0.00	16.1	65.00	65.00	942.62	838.00
6077	6077:WVGD7	6077:WVGD7	End	71.50	28.14	29.44	2657.01	1771.84	0.00	16.8	65.00	65.00	1022.98	909.58
6077	6077:WVGD7	6077:WVGD7	Ori	71.50	28.14	29.44	2657.01	1771.84	0.00	16.8	65.00	65.00	1022.98	909.58
6077	#6077:9	Tube 3	End	76.50	29.24	30.61	2986.85	1992.09	0.00	17.5	65.00	65.00	1106.63	984.09
6077	#6077:9	Tube 3	Ori	76.50	29.24	30.61	2986.85	1992.09	0.00	17.5	65.00	65.00	1106.63	984.09
6077	6077:WVGD8	6077:WVGD8	End	81.50	30.34	31.78	3342.91	2229.87	0.00	18.2	65.00	65.00	1193.55	1061.54
6077	6077:WVGD8	6077:WVGD8	Ori	81.50	30.34	31.78	3342.91	2229.87	0.00	18.2	65.00	65.00	1193.55	1061.54
6077	#6077:10	Tube 3	End	85.75	31.28	32.77	3666.91	2446.27	0.00	18.9	65.00	65.00	1270.01	1129.67
6077	#6077:10	Tube 3	Ori	85.75	31.28	32.77	3666.91	2446.27	0.00	18.9	65.00	65.00	1270.01	1129.67
6077	#6077:11	SpliceT	End	90.00	32.22	33.77	4011.18	2676.25	0.00	19.5	65.00	65.00	1348.85	1199.93
6077	#6077:11	SpliceT	Ori	90.00	32.34	39.46	4703.67	3136.50	0.00	16.5	65.00	65.00	1575.60	1400.86
6077	6077:WVGD9	6077:WVGD9	End	91.50	32.67	39.87	4851.74	3235.36	0.00	16.7	65.00	65.00	1608.75	1430.38
6077	6077:WVGD9	6077:WVGD9	Ori	91.50	32.67	39.87	4851.74	3235.36	0.00	16.7	65.00	65.00	1608.75	1430.38
6077	6077:g	6077:g	End	96.50	33.77	41.24	5367.69	3579.86	0.00	17.3	65.00	65.00	1721.74	1531.04

Tubular Davit Properties:

Davit Property Label	Stock Number	Steel Shape	Thickness (in)	Base Diameter or Depth (in)	Tip Diameter or Depth (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry	Strength Check Type	Vertical Capacity (lbs)	Tension Capacity (lbs)	Compres. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress (ksi)	Weight Density Override (lbs/ft^3)	Steel Shape At End
ARM A	ARM A	8T	0.1875	7	5	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0	
ARM D	ARM D	8T	0.25	9.125	5	0	1.3	29000	2 points	Calculated	0	0	0	0	65	0	

Intermediate Joints for Davit Property "ARM A":

Joint Label	Horz. Offset	Vert. Offset

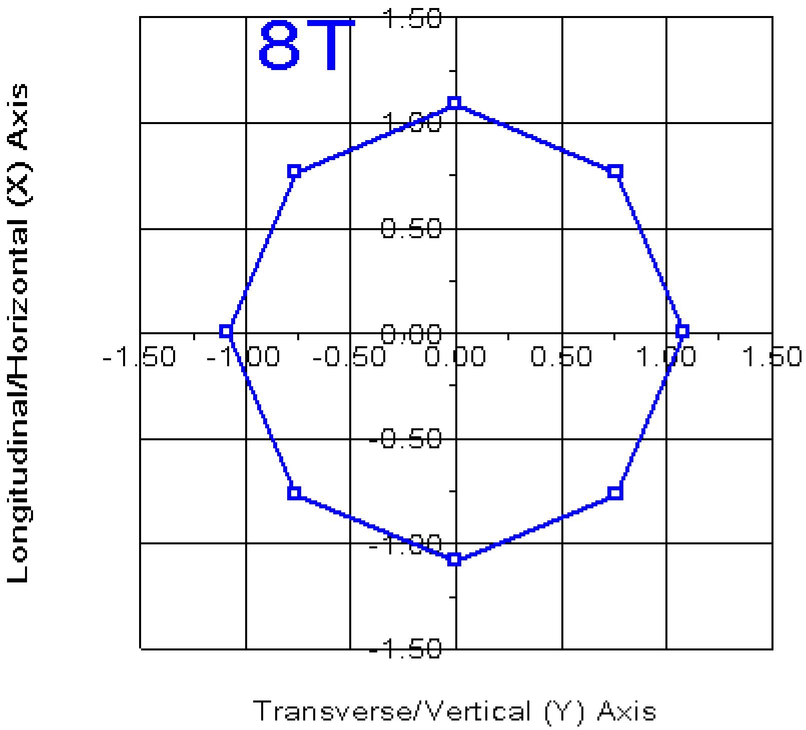
	(ft)	(ft)
V	5	-0.5

Intermediate Joints for Davit Property "ARM D":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
M	9	-3.3125
V	10.5	-3.3125

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
Davit1	6077:Arm1	ARM A	0
Davit2	6077:Arm1	ARM A	-180
Davit3	6077:Arm2	ARM D	0
Davit4	6077:Arm2	ARM D	-180
Davit5	6077:Arm3	ARM D	0
Davit6	6077:Arm3	ARM D	-180
Davit7	6077:Arm4	ARM D	0
Davit8	6077:Arm4	ARM D	-180



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	7.00	4.23	25.98	25.98	0.00	11.3	65.00	65.00	37.15	37.15
Davit1	#Davit1:0	End	2.51	6.00	3.61	16.14	16.14	0.00	9.1	65.00	65.00	26.92	26.92
Davit1	#Davit1:0	Origin	2.51	6.00	3.61	16.14	16.14	0.00	9.1	65.00	65.00	26.92	26.92
Davit1	Davit1:V	End	5.02	5.00	2.99	9.16	9.16	0.00	6.9	65.00	65.00	18.35	18.35
Davit2	Davit2:O	Origin	0.00	7.00	4.23	25.98	25.98	0.00	11.3	65.00	65.00	37.15	37.15
Davit2	#Davit2:0	End	2.51	6.00	3.61	16.14	16.14	0.00	9.1	65.00	65.00	26.92	26.92
Davit2	#Davit2:0	Origin	2.51	6.00	3.61	16.14	16.14	0.00	9.1	65.00	65.00	26.92	26.92
Davit2	Davit2:V	End	5.02	5.00	2.99	9.16	9.16	0.00	6.9	65.00	65.00	18.35	18.35
Davit3	Davit3:O	Origin	0.00	9.13	7.35	76.59	76.59	0.00	11.0	65.00	65.00	84.00	84.00
Davit3	#Davit3:0	End	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit3	#Davit3:0	Origin	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit3	Davit3:M	End	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit3	Davit3:M	Origin	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit3	Davit3:V	End	11.09	5.00	3.94	11.76	11.76	0.00	4.1	65.00	65.00	23.55	23.55

Davit4	Davit4:O	Origin	0.00	9.13	7.35	76.59	76.59	0.00	11.0	65.00	65.00	84.00	84.00
Davit4	#Davit4:0	End	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit4	#Davit4:0	Origin	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit4	Davit4:M	End	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit4	Davit4:M	Origin	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit4	Davit4:V	End	11.09	5.00	3.94	11.76	11.76	0.00	4.1	65.00	65.00	23.55	23.55
Davit5	Davit5:O	Origin	0.00	9.13	7.35	76.59	76.59	0.00	11.0	65.00	65.00	84.00	84.00
Davit5	#Davit5:0	End	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit5	#Davit5:0	Origin	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit5	Davit5:M	End	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit5	Davit5:M	Origin	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit5	Davit5:V	End	11.09	5.00	3.94	11.76	11.76	0.00	4.1	65.00	65.00	23.55	23.55
Davit6	Davit6:O	Origin	0.00	9.13	7.35	76.59	76.59	0.00	11.0	65.00	65.00	84.00	84.00
Davit6	#Davit6:0	End	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit6	#Davit6:0	Origin	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit6	Davit6:M	End	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit6	Davit6:M	Origin	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit6	Davit6:V	End	11.09	5.00	3.94	11.76	11.76	0.00	4.1	65.00	65.00	23.55	23.55
Davit7	Davit7:O	Origin	0.00	9.13	7.35	76.59	76.59	0.00	11.0	65.00	65.00	84.00	84.00
Davit7	#Davit7:0	End	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit7	#Davit7:0	Origin	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit7	Davit7:M	End	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit7	Davit7:M	Origin	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit7	Davit7:V	End	11.09	5.00	3.94	11.76	11.76	0.00	4.1	65.00	65.00	23.55	23.55
Davit8	Davit8:O	Origin	0.00	9.13	7.35	76.59	76.59	0.00	11.0	65.00	65.00	84.00	84.00
Davit8	#Davit8:0	End	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit8	#Davit8:0	Origin	4.80	7.34	5.87	39.09	39.09	0.00	8.0	65.00	65.00	53.29	53.29
Davit8	Davit8:M	End	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit8	Davit8:M	Origin	9.59	5.56	4.40	16.41	16.41	0.00	5.1	65.00	65.00	29.54	29.54
Davit8	Davit8:V	End	11.09	5.00	3.94	11.76	11.76	0.00	4.1	65.00	65.00	23.55	23.55

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)
clamp	clamp1	8e+004

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
Clamp1	Davit1:V	clamp	No Limit
Clamp2	Davit2:V	clamp	No Limit
Clamp3	Davit3:V	clamp	No Limit
Clamp4	Davit4:V	clamp	No Limit
Clamp5	Davit5:V	clamp	No Limit
Clamp6	Davit6:V	clamp	No Limit
Clamp7	Davit7:V	clamp	No Limit

Clamp8	Davit8:V	clamp	No Limit
Clamp9	6077:TpConn	clamp	No Limit
Clamp11	6077:BotCon	clamp	No Limit
Clamp13	6077:WVGD1	clamp	No Limit
Clamp14	6077:WVGD2	clamp	No Limit
Clamp15	6077:WVGD3	clamp	No Limit
Clamp16	6077:WVGD4	clamp	No Limit
Clamp17	6077:WVGD5	clamp	No Limit
Clamp18	6077:WVGD6	clamp	No Limit
Clamp19	6077:WVGD7	clamp	No Limit
Clamp20	6077:WVGD8	clamp	No Limit
Clamp21	6077:WVGD9	clamp	No Limit

*** Loads Data

Loads from file: j:\jobs\1907200.wi\04_structural\tower analysis\backup documentation\rev (1)\calcs\pls-pole\cl&p #6077.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)	96.50 (ft)	
Structure height	96.50 (ft)	
Structure height above ground	96.50 (ft)	

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles Tubular and Towers	SF for Wood Arms Poles	SF for Conc. Pole Ult.	SF for Conc. Pole First Crack	SF for Conc. Zero Tens.	SF for Guys and Cables	SF for Non Tubular Arms	SF for Braces	SF for Insuls.	SF For Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	Pole Deflection Check	Pole Deflection Limit % or (ft)
NESC Heavy Wind	1.5000	2.5000	1.00000	0.6500	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	19 loads	Wind on All	4	0	0.000	0.000	0.0	No Limit	0
NESC Extreme Wind	1.0000	1.0000	1.00000	0.6500	0.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	19 loads	NESC 2012	37	0	0.000	0.000	0.0	No Limit	0

Point Loads for Load Case "NESC Heavy Wind":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:V	1926	1680	-198	Shield Wire
Davit2:V	1802	-570	-143	Shield Wire
Davit3:V	4677	456	-56	Conductor
Davit4:V	4758	298	-56	Conductor
Davit5:V	3981	2518	-169	Conductor
Davit6:V	4082	1300	-50	Conductor
Davit7:V	3303	1444	-50	Conductor
Davit8:V	3417	-755	-87	Conductor
6077:TpConn	1978	2059	0	Top Connection
6077:BotCon	137	-1384	0	Bottom Connection
6077:WVGD1	230	66	0	Coax Cables
6077:WVGD2	230	66	0	Coax Cables
6077:WVGD3	230	66	0	Coax Cables
6077:WVGD4	230	66	0	Coax Cables
6077:WVGD5	230	66	0	Coax Cables
6077:WVGD6	230	66	0	Coax Cables

6077:WVGD7	230	66	0	Coax Cables
6077:WVGD8	230	66	0	Coax Cables
6077:WVGD9	230	66	0	Coax Cables

Point Loads for Load Case "NESC Extreme Wind":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:V	946	847	-194	Shield Wire
Davit2:V	840	-137	-139	Shield Wire
Davit3:V	2264	728	-197	Conductor
Davit4:V	2300	728	-201	Conductor
Davit5:V	1955	1143	-209	Conductor
Davit6:V	1955	1143	-149	Conductor
Davit7:V	1546	1189	-96	Conductor
Davit8:V	1604	198	-89	Conductor
6077:TpConn	910	9090	0	Top Connection
6077:BotCon	65	-6206	0	Bottom Connection
6077:WVGD1	62	199	0	Coax Cables
6077:WVGD2	62	199	0	Coax Cables
6077:WVGD3	62	199	0	Coax Cables
6077:WVGD4	62	199	0	Coax Cables
6077:WVGD5	62	199	0	Coax Cables
6077:WVGD6	62	199	0	Coax Cables
6077:WVGD7	62	199	0	Coax Cables
6077:WVGD8	62	199	0	Coax Cables
6077:WVGD9	62	199	0	Coax Cables

Detailed Pole Loading Data for Load Case "NESC Extreme Wind":

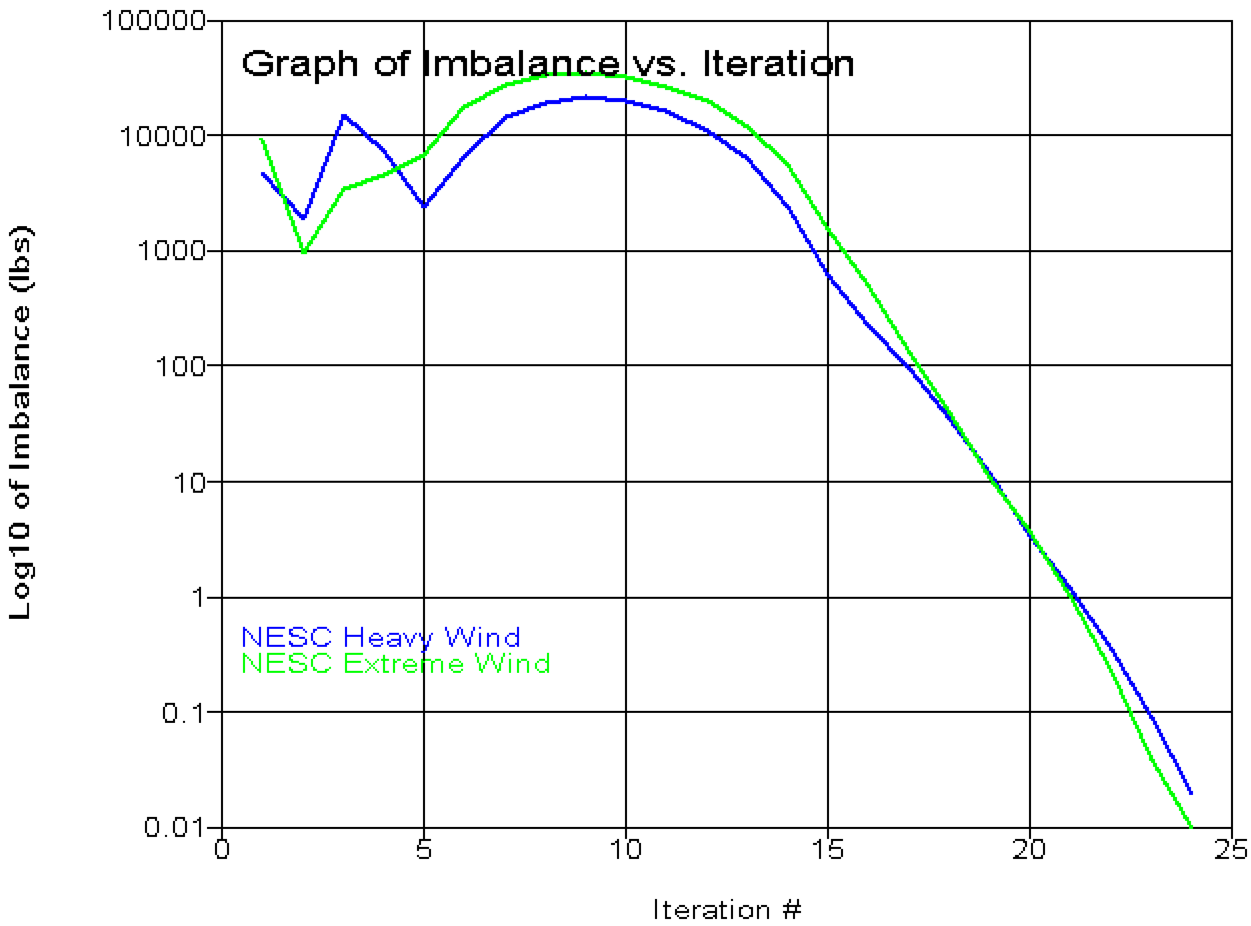
Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

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)
6077	6077:t	6077:Arm1	96.50	96.00	96.25	12.055	1.1e+006	1.000	37.29	0.00	10.70	18.73	0.00	0.00	18.73	0.00
6077	6077:Arm1	6077:TpConn	96.00	95.25	95.63	12.193	1.11e+006	1.000	37.29	0.00	16.24	28.41	0.00	0.00	28.41	0.00
6077	6077:TpConn	6077:BotCon	95.25	91.25	93.25	12.716	1.16e+006	1.000	37.29	0.00	90.39	158.05	0.00	0.00	158.05	0.00
6077	6077:BotCon	6077:Arm2	91.25	88.81	90.03	13.426	1.23e+006	1.000	37.29	0.00	58.21	101.68	0.00	0.00	101.68	0.00
6077	6077:Arm2	6077:WVGD1	88.81	85.00	86.91	14.115	1.29e+006	1.000	37.29	0.00	95.79	167.21	0.00	0.00	167.21	0.00
6077	6077:WVGD1		85.00	80.75	82.88	15.004	1.37e+006	1.000	37.29	0.00	113.61	198.13	0.00	0.00	198.13	0.00
6077			80.75	76.50	78.63	15.941	1.46e+006	1.000	37.29	0.00	120.81	210.50	0.00	0.00	210.50	0.00
6077		6077:Arm3	76.50	75.52	76.01	16.767	1.53e+006	1.000	37.29	0.00	48.42	51.06	0.00	0.00	51.06	0.00
6077	6077:Arm3	6077:WVGD2	75.52	75.00	75.26	16.932	1.55e+006	1.000	37.29	0.00	25.97	27.36	0.00	0.00	27.36	0.00
6077	6077:WVGD2		75.00	70.00	72.50	17.541	1.6e+006	1.000	37.29	0.00	258.83	272.51	0.00	0.00	272.51	0.00
6077			70.00	67.41	68.70	18.378	1.68e+006	1.000	37.29	0.00	140.81	148.11	0.00	0.00	148.11	0.00
6077		6077:Arm4	67.41	64.81	66.11	18.950	1.73e+006	1.000	37.29	0.00	145.28	152.72	0.00	0.00	152.72	0.00
6077	6077:Arm4	6077:WVGD3	64.81	64.50	64.66	19.270	1.76e+006	1.000	37.29	0.00	17.80	18.71	0.00	0.00	18.71	0.00
6077	6077:WVGD3		64.50	60.50	62.50	19.745	1.81e+006	1.000	37.29	0.00	233.63	245.41	0.00	0.00	245.41	0.00
6077			60.50	56.50	58.50	20.627	1.89e+006	1.000	37.29	0.00	244.25	256.37	0.00	0.00	256.37	0.00
6077		6077:WVGD4	56.50	55.00	55.75	21.359	1.95e+006	1.000	37.29	0.00	113.48	99.55	0.00	0.00	99.55	0.00
6077	6077:WVGD4		55.00	50.00	52.50	22.075	2.02e+006	1.000	37.29	0.00	391.26	342.95	0.00	0.00	342.95	0.00
6077		6077:WVGD5	50.00	45.00	47.50	23.177	2.12e+006	1.000	37.29	0.00	411.18	360.07	0.00	0.00	360.07	0.00
6077	6077:WVGD5		45.00	40.00	42.50	24.280	2.22e+006	1.000	37.29	0.00	431.10	377.20	0.00	0.00	377.20	0.00

6077		6077:WVGD6	40.00	35.00	37.50	25.382	2.32e+006	1.000	37.29	0.00	451.03	394.32	0.00	0.00	394.32	0.00
6077	6077:WVGD6		35.00	30.00	32.50	26.484	2.42e+006	1.000	37.29	0.00	470.95	411.45	0.00	0.00	411.45	0.00
6077		6077:WVGD7	30.00	25.00	27.50	27.586	2.52e+006	1.000	37.29	0.00	490.87	428.57	0.00	0.00	428.57	0.00
6077	6077:WVGD7		25.00	20.00	22.50	28.689	2.62e+006	1.000	37.29	0.00	510.80	445.70	0.00	0.00	445.70	0.00
6077		6077:WVGD8	20.00	15.00	17.50	29.791	2.72e+006	1.000	37.29	0.00	530.72	462.82	0.00	0.00	462.82	0.00
6077	6077:WVGD8		15.00	10.75	12.88	30.811	2.82e+006	1.000	37.29	0.00	466.78	406.86	0.00	0.00	406.86	0.00
6077			10.75	6.50	8.63	31.747	2.9e+006	1.000	37.29	0.00	481.19	419.24	0.00	0.00	419.24	0.00
6077		6077:WVGD9	6.50	5.00	5.75	32.506	2.97e+006	1.000	37.29	0.00	202.48	151.50	0.00	0.00	151.50	0.00
6077	6077:WVGD9	6077:g	5.00	0.00	2.50	33.223	3.04e+006	1.000	37.29	0.00	690.03	516.14	0.00	0.00	516.14	0.00

*** Analysis Results:

Maximum element usage is 84.17% for Steel Pole "6077" in load case "NESC Extreme Wind"
Maximum insulator usage is 11.42% for Clamp "Clamp9" in load case "NESC Extreme Wind"



*** Analysis Results for Load Case No. 1 "NESC Heavy Wind" - Number of iterations in SAPS 24

Equilibrium Joint Positions and Rotations for Load Case "NESC Heavy Wind":

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)
6077:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
6077:t	-1.024	5.333	-0.2179	-6.3103	-1.2991	0.0400	-1.024	5.333	96.28
6077:Arm1	-1.013	5.278	-0.2148	-6.3103	-1.2991	0.0400	-1.013	5.278	95.79

6077:TpConn	-0.9957	5.196	-0.21	-6.3091	-1.2980	0.0389	-0.9957	5.196	95.04
6077:BotCon	-0.9049	4.758	-0.1849	-6.2261	-1.2774	0.0341	-0.9049	4.758	91.07
6077:Arm2	-0.8507	4.496	-0.17	-6.1311	-1.2557	0.0316	-0.8507	4.496	88.64
6077:WVGD1	-0.7685	4.095	-0.1478	-5.8995	-1.1961	0.0276	-0.7685	4.095	84.85
6077:Arm3	-0.5855	3.181	-0.101	-5.1625	-1.0045	0.0190	-0.5855	3.181	75.42
6077:WVGD2	-0.5764	3.134	-0.09884	-5.1308	-0.9967	0.0182	-0.5764	3.134	74.9
6077:Arm4	-0.4128	2.285	-0.06143	-4.3880	-0.8306	0.0052	-0.4128	2.285	64.75
6077:WVGD3	-0.4082	2.261	-0.06047	-4.3627	-0.8251	0.0050	-0.4082	2.261	64.44
6077:WVGD4	-0.2852	1.603	-0.03619	-3.5721	-0.6591	-0.0001	-0.2852	1.603	54.96
6077:WVGD5	-0.1828	1.043	-0.01938	-2.8386	-0.5125	-0.0023	-0.1828	1.043	44.98
6077:WVGD6	-0.1053	0.6097	-0.00913	-2.1231	-0.3754	-0.0031	-0.1053	0.6097	34.99
6077:WVGD7	-0.05077	0.2981	-0.003601	-1.4450	-0.2504	-0.0028	-0.05077	0.2981	25
6077:WVGD8	-0.01695	0.101	-0.0011	-0.8117	-0.1379	-0.0019	-0.01695	0.101	15
6077:WVGD9	-0.001739	0.01054	-0.0002014	-0.2364	-0.0394	-0.0006	-0.001739	0.01054	5
Davit1:O	-1.012	5.275	-0.2702	-6.3103	-1.2991	0.0400	-1.012	5.78	95.73
Davit1:V	-1.016	5.299	-0.844	-6.6943	-1.2988	0.0791	-1.016	10.8	95.66
Davit2:O	-1.014	5.281	-0.1593	-6.3103	-1.2991	0.0400	-1.014	4.776	95.84
Davit2:V	-1.035	5.362	0.3663	-5.9304	-1.3065	0.0126	-1.035	-0.1427	96.87
Davit3:O	-0.8496	4.492	-0.2309	-6.1311	-1.2557	0.0316	-0.8496	5.063	88.58
Davit3:M	-0.9052	4.835	-1.38	-8.0064	-1.2636	0.0541	-0.9052	14.41	90.74
Davit3:V	-0.9019	4.82	-1.591	-8.1105	-1.2632	0.0554	-0.9019	15.89	90.53
Davit4:O	-0.8517	4.499	-0.1091	-6.1311	-1.2557	0.0316	-0.8517	3.928	88.7
Davit4:M	-0.9396	4.835	0.6879	-4.3809	-1.2745	0.0099	-0.9396	-4.736	92.81
Davit4:V	-0.9419	4.839	0.8004	-4.2732	-1.2748	0.0086	-0.9419	-6.232	92.93
Davit5:O	-0.5847	3.178	-0.1643	-5.1625	-1.0045	0.0190	-0.5847	3.881	75.36
Davit5:M	-0.6352	3.479	-1.143	-6.8813	-1.0176	0.0828	-0.6352	13.18	77.69
Davit5:V	-0.6342	3.468	-1.325	-6.9646	-1.0170	0.0866	-0.6342	14.67	77.51
Davit6:O	-0.5864	3.183	-0.03779	-5.1625	-1.0045	0.0190	-0.5864	2.48	75.48
Davit6:M	-0.656	3.465	0.644	-3.7800	-1.0186	-0.0026	-0.656	-6.238	79.48
Davit6:V	-0.6578	3.468	0.7412	-3.6890	-1.0188	-0.0037	-0.6578	-7.735	79.57
Davit7:O	-0.412	2.283	-0.1227	-4.3880	-0.8306	0.0052	-0.412	3.084	64.69
Davit7:M	-0.4509	2.544	-0.9471	-5.7912	-0.8363	0.0237	-0.4509	12.35	67.18
Davit7:V	-0.4493	2.536	-1.1	-5.8629	-0.8361	0.0249	-0.4493	13.84	67.03
Davit8:O	-0.4136	2.287	-0.0001177	-4.3880	-0.8306	0.0052	-0.4136	1.486	64.81
Davit8:M	-0.4721	2.514	0.5608	-2.9912	-0.8462	-0.0261	-0.4721	-7.287	68.69
Davit8:V	-0.474	2.516	0.6376	-2.9125	-0.8464	-0.0280	-0.474	-8.785	68.76

Joint Support Reactions for Load Case "NESC Heavy Wind":

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 %
6077:g	0.81	0.0	-10.59	0.0	0.0	-45.24	0.0	0.0	46.47	0.0	875.58	0.0	96.4	0.0	0.0	1.54	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Heavy Wind":

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.
6077	6077:t	Origin	0.00	64.00	-12.29	-2.62	-0.00	0.00	0.0	-0.01	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.0	4
6077	6077:Arm1	End	0.50	63.34	-12.15	-2.58	0.00	0.00	0.0	-0.01	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	0.0	3
6077	6077:Arm1	Origin	0.50	63.34	-12.15	-2.58	0.05	0.21	0.3	-3.79	1.55	0.43	-0.60	0.16	0.46	0.10	1.22	1.9	4
6077	6077:TpConn	End	1.25	62.35	-11.95	-2.52	1.21	0.53	0.3	-3.79	1.55	0.43	-0.59	0.95	0.25	0.12	1.67	2.6	2
6077	6077:TpConn	Origin	1.25	62.35	-11.95	-2.52	1.21	0.53	0.3	-5.61	3.86	0.48	-0.88	0.78	0.97	0.11	2.50	3.8	3
6077	6077:BotCon	End	5.25	57.10	-10.86	-2.22	16.64	2.44	0.3	-5.61	3.86	0.48	-0.82	9.70	0.16	0.11	10.53	16.2	1
6077	6077:BotCon	Origin	5.25	57.10	-10.86	-2.22	16.64	2.43	0.3	-6.01	2.56	0.48	-0.87	9.70	0.16	0.11	10.59	16.3	1

6077	6077:Arm2	End	7.69	53.95	-10.21	-2.04	22.87	3.60	0.3	-6.01	2.56	0.48	-0.84	12.29	0.16	0.10	13.13	20.2	1
6077	6077:Arm2	Origin	7.69	53.95	-10.21	-2.04	27.47	4.65	0.3	-16.06	4.42	0.81	-2.24	14.75	0.26	0.09	17.01	26.2	1
6077	6077:WVGD1	End	11.50	49.14	-9.22	-1.77	44.32	7.72	0.3	-16.06	4.42	0.81	-2.11	21.08	0.25	0.08	23.19	35.7	1
6077	6077:WVGD1	Origin	11.50	49.14	-9.22	-1.77	44.32	7.72	0.3	-16.46	4.53	0.79	-2.16	21.08	0.24	0.07	23.25	35.8	1
6077	Tube 1	End	15.75	44.03	-8.19	-1.50	63.56	11.09	0.3	-16.46	4.53	0.79	-2.03	26.60	0.23	0.06	28.64	44.1	1
6077	Tube 1	Origin	15.75	44.03	-8.19	-1.50	63.56	11.08	0.2	-16.66	4.53	0.77	-2.06	26.60	0.22	0.05	28.66	44.1	1
6077	SpliceT	End	20.00	39.23	-7.23	-1.26	82.81	14.36	0.2	-16.66	4.53	0.77	-1.94	30.74	0.21	0.05	32.68	50.3	1
6077	SpliceT	Origin	20.00	39.23	-7.23	-1.26	82.81	14.35	0.2	-16.80	4.53	0.76	-1.16	18.37	0.12	0.02	19.53	30.0	1
6077	6077:Arm3	End	20.98	38.17	-7.03	-1.21	87.26	15.09	0.2	-16.80	4.53	0.76	-1.15	18.84	0.12	0.02	19.99	30.8	1
6077	6077:Arm3	Origin	20.98	38.17	-7.03	-1.21	99.27	16.28	1.5	-25.17	9.13	1.13	-1.72	21.44	0.18	0.19	23.17	35.6	1
6077	6077:WVGD2	End	21.50	37.61	-6.92	-1.19	104.02	16.86	1.5	-25.17	9.13	1.13	-1.71	22.15	0.18	0.19	23.87	36.7	1
6077	6077:WVGD2	Origin	21.50	37.61	-6.92	-1.19	104.02	16.85	1.5	-25.64	9.22	1.11	-1.74	22.15	0.18	0.19	23.90	36.8	1
6077	Tube 2	End	26.50	32.41	-5.91	-0.95	150.14	22.44	1.5	-25.64	9.22	1.11	-1.63	28.08	0.17	0.16	29.72	45.7	1
6077	Tube 2	Origin	26.50	32.41	-5.91	-0.95	150.14	22.42	1.4	-25.98	9.21	1.09	-1.65	28.08	0.16	0.16	29.74	45.8	1
6077	Tube 2	End	29.09	29.86	-5.42	-0.84	174.04	25.25	1.4	-25.98	9.21	1.09	-1.60	30.53	0.16	0.15	32.13	49.4	1
6077	Tube 2	Origin	29.09	29.86	-5.42	-0.84	174.04	25.24	1.3	-26.23	9.20	1.07	-1.62	30.53	0.15	0.14	32.15	49.5	1
6077	6077:Arm4	End	31.69	27.42	-4.95	-0.74	197.91	28.03	1.3	-26.23	9.20	1.07	-1.57	32.62	0.15	0.13	34.20	52.6	1
6077	6077:Arm4	Origin	31.69	27.42	-4.95	-0.74	198.68	28.80	0.9	-33.65	10.45	1.31	-2.01	32.75	0.18	0.09	34.77	53.5	1
6077	6077:WVGD3	End	32.00	27.13	-4.90	-0.73	201.95	29.21	0.9	-33.65	10.45	1.31	-2.01	33.04	0.18	0.09	35.05	53.9	1
6077	6077:WVGD3	Origin	32.00	27.13	-4.90	-0.73	201.95	29.20	0.8	-34.09	10.50	1.29	-2.03	33.04	0.18	0.08	35.08	54.0	1
6077	Tube 2	End	36.00	23.61	-4.24	-0.59	243.95	34.36	0.8	-34.09	10.50	1.29	-1.94	36.41	0.17	0.07	38.36	59.0	1
6077	Tube 2	Origin	36.00	23.61	-4.24	-0.59	243.95	34.34	0.7	-34.51	10.43	1.25	-1.97	36.41	0.17	0.06	38.38	59.0	1
6077	SpliceT	End	40.00	20.38	-3.63	-0.47	285.67	39.34	0.7	-34.51	10.43	1.25	-1.88	39.06	0.16	0.06	40.94	63.0	1
6077	SpliceT	Origin	40.00	20.38	-3.63	-0.47	285.67	39.33	0.6	-34.82	10.38	1.22	-1.58	32.50	0.13	0.04	34.08	52.4	1
6077	6077:WVGD4	End	41.50	19.24	-3.42	-0.43	301.24	41.16	0.6	-34.82	10.38	1.22	-1.55	33.19	0.13	0.04	34.74	53.5	1
6077	6077:WVGD4	Origin	41.50	19.24	-3.42	-0.43	301.25	41.15	0.6	-35.47	10.44	1.20	-1.58	33.19	0.12	0.04	34.77	53.5	1
6077	Tube 3	End	46.50	15.69	-2.77	-0.32	353.42	47.16	0.6	-35.47	10.44	1.20	-1.50	35.13	0.12	0.03	36.63	56.4	1
6077	Tube 3	Origin	46.50	15.69	-2.77	-0.32	353.43	47.13	0.4	-36.14	10.39	1.16	-1.53	35.13	0.11	0.02	36.66	56.4	1
6077	6077:WVGD5	End	51.50	12.52	-2.19	-0.23	405.38	52.94	0.4	-36.14	10.39	1.16	-1.46	36.54	0.11	0.02	38.00	58.5	1
6077	6077:WVGD5	Origin	51.50	12.52	-2.19	-0.23	405.38	52.91	0.2	-37.06	10.42	1.12	-1.50	36.54	0.11	0.01	38.03	58.5	1
6077	Tube 3	End	56.50	9.73	-1.69	-0.16	457.50	58.52	0.2	-37.06	10.42	1.12	-1.43	37.56	0.10	0.01	38.99	60.0	1
6077	Tube 3	Origin	56.50	9.73	-1.69	-0.16	457.51	58.50	0.0	-37.79	10.38	1.08	-1.46	37.56	0.10	0.00	39.02	60.0	1
6077	6077:WVGD6	End	61.50	7.32	-1.26	-0.11	509.43	63.91	0.0	-37.79	10.38	1.08	-1.39	38.26	0.09	0.00	39.65	61.0	1
6077	6077:WVGD6	Origin	61.50	7.32	-1.26	-0.11	509.43	63.88	-0.2	-38.78	10.42	1.04	-1.43	38.26	0.09	0.01	39.69	61.1	1
6077	Tube 3	End	66.50	5.27	-0.90	-0.07	561.54	69.10	-0.2	-38.78	10.42	1.04	-1.37	38.72	0.09	0.01	40.09	61.7	1
6077	Tube 3	Origin	66.50	5.27	-0.90	-0.07	561.55	69.08	-0.4	-39.56	10.39	1.00	-1.40	38.72	0.08	0.01	40.12	61.7	1
6077	6077:WVGD7	End	71.50	3.58	-0.61	-0.04	613.52	74.10	-0.4	-39.56	10.39	1.00	-1.34	38.98	0.08	0.01	40.33	62.0	1
6077	6077:WVGD7	Origin	71.50	3.58	-0.61	-0.04	613.52	74.09	-0.6	-40.60	10.44	0.97	-1.38	38.98	0.08	0.02	40.36	62.1	1
6077	Tube 3	End	76.50	2.23	-0.38	-0.02	665.73	78.91	-0.6	-40.60	10.44	0.97	-1.33	39.10	0.07	0.02	40.43	62.2	1
6077	Tube 3	Origin	76.50	2.23	-0.38	-0.02	665.73	78.90	-0.8	-41.44	10.43	0.93	-1.35	39.10	0.07	0.03	40.46	62.2	1
6077	6077:WVGD8	End	81.50	1.21	-0.20	-0.01	717.86	83.54	-0.8	-41.44	10.43	0.93	-1.30	39.09	0.07	0.03	40.40	62.2	1
6077	6077:WVGD8	Origin	81.50	1.21	-0.20	-0.01	717.86	83.53	-1.0	-42.47	10.49	0.89	-1.34	39.09	0.07	0.03	40.43	62.2	1
6077	Tube 3	End	85.75	0.60	-0.10	-0.01	762.42	87.33	-1.0	-42.47	10.49	0.89	-1.30	39.02	0.06	0.03	40.32	62.0	1
6077	Tube 3	Origin	85.75	0.60	-0.10	-0.01	762.42	87.33	-1.2	-43.23	10.48	0.86	-1.32	39.02	0.06	0.04	40.34	62.1	1
6077	SpliceT	End	90.00	0.21	-0.04	-0.00	806.97	90.98	-1.2	-43.23	10.48	0.86	-1.28	38.89	0.06	0.03	40.17	61.8	1
6077	SpliceT	Origin	90.00	0.21	-0.04	-0.00	806.97	90.99	-1.3	-43.77	10.48	0.84	-1.11	33.29	0.05	0.03	34.40	52.9	1
6077	6077:WVGD9	End	91.50	0.13	-0.02	-0.00	822.69	92.25	-1.3	-43.77	10.48	0.84	-1.10	33.24	0.05	0.03	34.34	52.8	1
6077	6077:WVGD9	Origin	91.50	0.13	-0.02	-0.00	822.69	92.25	-1.4	-44.70	10.58	0.82	-1.12	33.24	0.05	0.03	34.36	52.9	1
6077	6077:g	End	96.50	0.00	0.00	0.00	875.58	96.36	-1.4	-44.70	10.58	0.82	-1.08	33.06	0.05	0.03	34.14	52.5	1

Detailed Tubular Davit Arm Usages for Load Case "NESC Heavy Wind":

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	63.30	-12.14	-3.24	-9.75	1.21	0.0	1.71	1.97	-0.24	0.40	17.06	0.12	0.00	17.47	26.9	1
Davit1	#Davit1:O	End	2.51	63.45	-12.16	-6.63	-4.81	0.60	0.0	1.71	1.97	-0.24	0.47	11.61	0.14	0.00	12.09	18.6	1

Davit1	#Davit1:0	Origin	2.51	63.45	-12.16	-6.63	-4.81	0.60	-0.0	1.71	1.91	-0.24	0.47	11.61	0.14	0.00	12.09	18.6	1
Davit1	Davit1:V	End	5.02	63.59	-12.19	-10.13	0.00	-0.00	-0.0	1.71	1.91	-0.24	0.57	0.00	1.33	0.00	2.38	3.7	3
Davit2	Davit2:O	Origin	0.00	63.37	-12.16	-1.91	-9.65	-0.92	-0.0	0.17	1.94	0.18	0.04	16.88	0.09	0.00	16.92	26.0	1
Davit2	#Davit2:0	End	2.51	63.87	-12.29	1.29	-4.77	-0.46	-0.0	0.17	1.94	0.18	0.05	11.51	0.11	0.00	11.56	17.8	1
Davit2	#Davit2:0	Origin	2.51	63.87	-12.29	1.29	-4.77	-0.46	-0.0	0.19	1.90	0.18	0.05	11.51	0.11	0.00	11.56	17.8	1
Davit2	Davit2:V	End	5.02	64.34	-12.42	4.40	-0.00	-0.00	-0.0	0.19	1.90	0.18	0.06	0.00	1.32	0.00	2.29	3.5	3
Davit3	Davit3:O	Origin	0.00	53.91	-10.20	-2.77	-53.10	1.78	0.1	-0.71	4.89	-0.16	-0.10	41.09	0.05	0.04	41.18	63.4	1
Davit3	#Davit3:0	End	4.80	55.85	-10.53	-9.18	-29.67	0.99	0.1	-0.71	4.89	-0.16	-0.12	36.19	0.06	0.06	36.31	55.9	1
Davit3	#Davit3:0	Origin	4.80	55.85	-10.53	-9.18	-29.67	1.00	0.1	-0.59	4.76	-0.16	-0.10	36.19	0.06	0.05	36.29	55.8	1
Davit3	Davit3:M	End	9.59	58.02	-10.86	-16.56	-6.87	0.22	0.1	-0.59	4.76	-0.16	-0.13	15.11	0.08	0.09	15.25	23.5	1
Davit3	Davit3:M	Origin	9.59	58.02	-10.86	-16.56	-6.87	0.24	-0.0	1.11	4.58	-0.16	0.25	15.11	0.08	0.00	15.37	23.6	1
Davit3	Davit3:V	End	11.09	57.84	-10.82	-19.09	0.00	-0.00	-0.0	1.11	4.58	-0.16	0.28	0.00	2.43	0.00	4.22	6.5	3
Davit4	Davit4:O	Origin	0.00	53.99	-10.22	-1.31	-48.47	-1.46	-0.1	-2.44	4.36	0.14	-0.33	37.51	0.04	0.04	37.84	58.2	1
Davit4	#Davit4:0	End	4.80	56.20	-10.75	3.89	-27.59	-0.81	-0.1	-2.44	4.36	0.14	-0.42	33.65	0.05	0.06	34.06	52.4	1
Davit4	#Davit4:0	Origin	4.80	56.20	-10.75	3.89	-27.59	-0.82	-0.1	-2.31	4.27	0.13	-0.39	33.65	0.05	0.05	34.04	52.4	1
Davit4	Davit4:M	End	9.59	58.01	-11.28	8.25	-7.10	-0.18	-0.1	-2.31	4.27	0.13	-0.53	15.63	0.06	0.09	16.16	24.9	1
Davit4	Davit4:M	Origin	9.59	58.01	-11.28	8.25	-7.10	-0.24	-0.0	-0.66	4.74	0.16	-0.15	15.63	0.08	0.00	15.78	24.3	1
Davit4	Davit4:V	End	11.09	58.07	-11.30	9.60	-0.00	-0.00	-0.0	-0.66	4.74	0.16	-0.17	0.00	2.51	0.00	4.36	6.7	3
Davit5	Davit5:O	Origin	0.00	38.13	-7.02	-1.97	-49.93	2.63	0.1	1.38	4.72	-0.24	0.19	38.63	0.07	0.05	38.82	59.7	1
Davit5	#Davit5:0	End	4.80	39.83	-7.31	-7.41	-27.32	1.47	0.1	1.38	4.72	-0.24	0.23	33.32	0.09	0.08	33.55	51.6	1
Davit5	#Davit5:0	Origin	4.80	39.83	-7.31	-7.41	-27.32	1.48	0.1	1.49	4.55	-0.24	0.25	33.32	0.08	0.08	33.57	51.7	1
Davit5	Davit5:M	End	9.59	41.75	-7.62	-13.72	-5.49	0.33	0.1	1.49	4.55	-0.24	0.34	12.08	0.11	0.14	12.42	19.1	1
Davit5	Davit5:M	Origin	9.59	41.75	-7.62	-13.72	-5.49	0.35	-0.0	2.98	3.66	-0.24	0.68	12.08	0.11	0.00	12.76	19.6	1
Davit5	Davit5:V	End	11.09	41.62	-7.61	-15.90	0.00	-0.00	-0.0	2.98	3.66	-0.24	0.76	0.00	1.94	0.00	3.45	5.3	3
Davit6	Davit6:O	Origin	0.00	38.20	-7.04	-0.45	-37.78	-1.16	-0.1	-3.00	3.36	0.11	-0.41	29.24	0.03	0.03	29.64	45.6	1
Davit6	#Davit6:0	End	4.80	40.04	-7.45	3.97	-21.69	-0.65	-0.1	-3.00	3.36	0.11	-0.51	26.45	0.04	0.04	26.96	41.5	1
Davit6	#Davit6:0	Origin	4.80	40.04	-7.45	3.97	-21.69	-0.65	-0.1	-2.90	3.27	0.11	-0.49	26.45	0.04	0.04	26.95	41.5	1
Davit6	Davit6:M	End	9.59	41.58	-7.87	7.73	-6.01	-0.14	-0.1	-2.90	3.27	0.11	-0.66	13.21	0.05	0.07	13.88	21.3	1
Davit6	Davit6:M	Origin	9.59	41.58	-7.87	7.73	-6.01	-0.18	-0.0	-1.56	4.00	0.12	-0.36	13.21	0.06	0.00	13.57	20.9	1
Davit6	Davit6:V	End	11.09	41.62	-7.89	8.89	-0.00	-0.00	-0.0	-1.56	4.00	0.12	-0.40	0.00	2.13	0.00	3.70	5.7	3
Davit7	Davit7:O	Origin	0.00	27.39	-4.94	-1.47	-40.47	1.10	0.1	0.45	3.80	-0.10	0.06	31.31	0.03	0.02	31.37	48.3	1
Davit7	#Davit7:0	End	4.80	28.86	-5.18	-6.06	-22.25	0.61	0.1	0.45	3.80	-0.10	0.08	27.13	0.04	0.03	27.21	41.9	1
Davit7	#Davit7:0	Origin	4.80	28.86	-5.18	-6.06	-22.25	0.61	0.1	0.54	3.65	-0.10	0.09	27.13	0.04	0.03	27.23	41.9	1
Davit7	Davit7:M	End	9.59	30.53	-5.41	-11.37	-4.73	0.14	0.1	0.54	3.65	-0.10	0.12	10.41	0.05	0.06	10.53	16.2	1
Davit7	Davit7:M	Origin	9.59	30.53	-5.41	-11.37	-4.73	0.15	-0.0	1.77	3.15	-0.10	0.40	10.41	0.05	0.00	10.81	16.6	1
Davit7	Davit7:V	End	11.09	30.44	-5.39	-13.20	0.00	-0.00	-0.0	1.77	3.15	-0.10	0.45	0.00	1.67	0.00	2.94	4.5	3
Davit8	Davit8:O	Origin	0.00	27.45	-4.96	-0.00	-39.50	-1.35	-0.1	-0.81	3.63	0.12	-0.11	30.56	0.03	0.03	30.67	47.2	1
Davit8	#Davit8:0	End	4.80	28.96	-5.31	3.70	-22.07	-0.75	-0.1	-0.81	3.63	0.12	-0.14	26.92	0.04	0.05	27.06	41.6	1
Davit8	#Davit8:0	Origin	4.80	28.96	-5.31	3.70	-22.07	-0.76	-0.1	-0.70	3.52	0.12	-0.12	26.92	0.04	0.04	27.04	41.6	1
Davit8	Davit8:M	End	9.59	30.17	-5.67	6.73	-5.20	-0.17	-0.1	-0.70	3.52	0.12	-0.16	11.44	0.06	0.08	11.60	17.8	1
Davit8	Davit8:M	Origin	9.59	30.17	-5.67	6.73	-5.20	-0.21	-0.0	0.58	3.47	0.14	0.13	11.44	0.07	0.00	11.57	17.8	1
Davit8	Davit8:V	End	11.09	30.20	-5.69	7.65	-0.00	-0.00	-0.0	0.58	3.47	0.14	0.15	0.00	1.84	0.00	3.19	4.9	3

Summary of Clamp Capacities and Usages for Load Case "NESC Heavy Wind":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
Clamp1	2.563	80.00	80.00	3.20

Clamp2	1.895	80.00	80.00	2.37
Clamp3	4.700	80.00	80.00	5.87
Clamp4	4.768	80.00	80.00	5.96
Clamp5	4.714	80.00	80.00	5.89
Clamp6	4.284	80.00	80.00	5.36
Clamp7	3.605	80.00	80.00	4.51
Clamp8	3.500	80.00	80.00	4.38
Clamp9	2.855	80.00	80.00	3.57
Clamp11	1.391	80.00	80.00	1.74
Clamp13	0.239	80.00	80.00	0.30
Clamp14	0.239	80.00	80.00	0.30
Clamp15	0.239	80.00	80.00	0.30
Clamp16	0.239	80.00	80.00	0.30
Clamp17	0.239	80.00	80.00	0.30
Clamp18	0.239	80.00	80.00	0.30
Clamp19	0.239	80.00	80.00	0.30
Clamp20	0.239	80.00	80.00	0.30
Clamp21	0.239	80.00	80.00	0.30

*** Analysis Results for Load Case No. 2 "NESC Extreme Wind" - Number of iterations in SAPS 24

Equilibrium Joint Positions and Rotations for Load Case "NESC Extreme Wind":

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)
6077:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
6077:t	-1.247	7.377	-0.4126	-9.2666	-1.5321	0.0008	-1.247	7.377	96.09
6077:Arm1	-1.233	7.296	-0.4059	-9.2666	-1.5321	0.0008	-1.233	7.296	95.59
6077:TpConn	-1.213	7.176	-0.3958	-9.2654	-1.5311	-0.0004	-1.213	7.176	94.85
6077:BotCon	-1.106	6.536	-0.3429	-9.0656	-1.5132	-0.0025	-1.106	6.536	90.91
6077:Arm2	-1.042	6.156	-0.3123	-8.8384	-1.4945	-0.0017	-1.042	6.156	88.5
6077:WVGD1	-0.9443	5.585	-0.2678	-8.3738	-1.4310	-0.0015	-0.9443	5.585	84.73
6077:Arm3	-0.7245	4.312	-0.1789	-7.0493	-1.2182	-0.0018	-0.7245	4.312	75.34
6077:WVGD2	-0.7135	4.248	-0.1749	-6.9983	-1.2093	-0.0022	-0.7135	4.248	74.83
6077:Arm4	-0.5147	3.099	-0.1075	-5.9184	-1.0169	-0.0074	-0.5147	3.099	64.71
6077:WVGD3	-0.5092	3.067	-0.1058	-5.8832	-1.0105	-0.0075	-0.5092	3.067	64.39
6077:WVGD4	-0.358	2.182	-0.0628	-4.8114	-0.8149	-0.0102	-0.358	2.182	54.94
6077:WVGD5	-0.2311	1.426	-0.03306	-3.8387	-0.6397	-0.0107	-0.2311	1.426	44.97
6077:WVGD6	-0.134	0.8385	-0.01497	-2.8908	-0.4731	-0.0096	-0.134	0.8385	34.99
6077:WVGD7	-0.06505	0.4126	-0.005331	-1.9844	-0.3186	-0.0075	-0.06505	0.4126	24.99
6077:WVGD8	-0.02187	0.1408	-0.001235	-1.1253	-0.1771	-0.0047	-0.02187	0.1408	15
6077:WVGD9	-0.00226	0.01482	-0.0001224	-0.3312	-0.0510	-0.0015	-0.00226	0.01482	5
Davit1:O	-1.231	7.29	-0.4871	-9.2666	-1.5321	0.0008	-1.231	7.794	95.51
Davit1:V	-1.225	7.304	-1.309	-9.4476	-1.5294	0.0395	-1.225	12.81	95.19
Davit2:O	-1.236	7.303	-0.3247	-9.2666	-1.5321	0.0008	-1.236	6.798	95.68
Davit2:V	-1.272	7.446	0.4638	-9.0947	-1.5404	-0.0258	-1.272	1.941	96.96
Davit3:O	-1.04	6.149	-0.3999	-8.8384	-1.4945	-0.0017	-1.04	6.72	88.41
Davit3:M	-1.095	6.568	-1.908	-9.7717	-1.5021	0.0767	-1.095	16.14	90.22
Davit3:V	-1.09	6.546	-2.164	-9.8198	-1.5012	0.0812	-1.09	17.62	89.96
Davit4:O	-1.044	6.163	-0.2246	-8.8384	-1.4945	-0.0017	-1.044	5.592	88.59
Davit4:M	-1.173	6.746	1.058	-8.1043	-1.5322	-0.0774	-1.173	-2.824	93.18
Davit4:V	-1.181	6.761	1.268	-8.0547	-1.5331	-0.0821	-1.181	-4.309	93.39
Davit5:O	-0.7227	4.307	-0.2652	-7.0493	-1.2182	-0.0018	-0.7227	5.01	75.25
Davit5:M	-0.7756	4.663	-1.472	-7.8886	-1.2287	0.0799	-0.7756	14.37	77.36
Davit5:V	-0.7733	4.648	-1.679	-7.9293	-1.2280	0.0847	-0.7733	15.85	77.15
Davit6:O	-0.7264	4.317	-0.09263	-7.0493	-1.2182	-0.0018	-0.7264	3.614	75.43
Davit6:M	-0.8252	4.768	0.9397	-6.4816	-1.2438	-0.0602	-0.8252	-4.935	79.77
Davit6:V	-0.8305	4.778	1.108	-6.4401	-1.2443	-0.0637	-0.8305	-6.425	79.94
Davit7:O	-0.5132	3.095	-0.1901	-5.9184	-1.0169	-0.0074	-0.5132	3.896	64.62
Davit7:M	-0.5567	3.404	-1.199	-6.6095	-1.0229	0.0294	-0.5567	13.21	66.93
Davit7:V	-0.5544	3.394	-1.372	-6.6416	-1.0226	0.0316	-0.5544	14.7	66.75
Davit8:O	-0.5163	3.104	-0.02485	-5.9184	-1.0169	-0.0074	-0.5163	2.302	64.79
Davit8:M	-0.5951	3.47	0.8367	-5.3379	-1.0319	-0.0408	-0.5951	-6.332	68.96
Davit8:V	-0.5987	3.476	0.9755	-5.3018	-1.0321	-0.0428	-0.5987	-7.825	69.1

Joint Support Reactions for Load Case "NESC Extreme Wind":

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 %
6077:g	1.27	0.0	-17.42	0.0	0.0	-23.91	0.0	0.0	29.60	0.0	1232.76	0.0	125.5	0.0	0.0	3.54	0.0	0.0

Detailed Steel Pole Usages for Load Case "NESC Extreme Wind":

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.
6077	6077:t	Origin	0.00	88.52	-14.96	-4.95	0.00	0.00	0.0	-0.01	0.01	0.00	-0.00	0.00	0.00	0.00	0.01	0.0	4
6077	6077:Arm1	End	0.50	87.56	-14.80	-4.87	0.00	0.00	0.0	-0.01	0.01	0.00	-0.00	0.00	0.00	0.00	0.01	0.0	4
6077	6077:Arm1	Origin	0.50	87.56	-14.80	-4.87	0.21	0.19	0.3	-1.77	1.04	0.39	-0.28	0.21	0.28	0.11	0.83	1.3	3
6077	6077:TpConn	End	1.25	86.11	-14.56	-4.75	0.99	0.48	0.3	-1.77	1.04	0.39	-0.28	0.79	0.19	0.13	1.20	1.8	2
6077	6077:TpConn	Origin	1.25	86.11	-14.56	-4.75	0.99	0.48	0.3	-1.27	10.26	0.41	-0.20	0.36	2.98	0.10	5.36	8.3	4
6077	6077:BotCon	End	5.25	78.43	-13.28	-4.11	42.03	2.13	0.3	-1.27	10.26	0.41	-0.18	24.50	0.14	0.11	24.69	38.0	1
6077	6077:BotCon	Origin	5.25	78.43	-13.28	-4.11	42.03	2.12	0.3	-2.42	4.27	0.41	-0.35	24.50	0.14	0.11	24.86	38.2	1
6077	6077:Arm2	End	7.69	73.87	-12.50	-3.75	52.44	3.13	0.3	-2.42	4.27	0.41	-0.34	28.17	0.13	0.10	28.51	43.9	1
6077	6077:Arm2	Origin	7.69	73.87	-12.50	-3.75	59.42	4.85	0.2	-7.17	6.61	0.94	-1.00	31.92	0.31	0.07	32.93	50.7	1
6077	6077:WVGD1	End	11.50	67.01	-11.33	-3.21	84.63	8.44	0.2	-7.17	6.61	0.94	-0.94	40.24	0.29	0.06	41.19	63.4	1
6077	6077:WVGD1	Origin	11.50	67.01	-11.33	-3.21	84.63	8.42	0.2	-7.37	6.94	0.93	-0.97	40.24	0.29	0.05	41.21	63.4	1
6077	Tube 1	End	15.75	59.83	-10.09	-2.69	114.14	12.39	0.2	-7.37	6.94	0.93	-0.91	47.77	0.27	0.04	48.68	74.9	1
6077	Tube 1	Origin	15.75	59.83	-10.09	-2.69	114.15	12.36	0.1	-7.56	7.08	0.92	-0.93	47.77	0.26	0.03	48.71	74.9	1
6077	SpliceT	End	20.00	53.20	-8.95	-2.24	144.24	16.27	0.1	-7.56	7.08	0.92	-0.88	53.54	0.25	0.02	54.43	83.7	1
6077	SpliceT	Origin	20.00	53.20	-8.95	-2.24	144.24	16.25	0.0	-7.69	7.17	0.91	-0.53	31.99	0.15	0.01	32.52	50.0	1
6077	6077:Arm3	End	20.98	51.74	-8.69	-2.15	151.27	17.15	0.0	-7.69	7.17	0.91	-0.53	32.67	0.15	0.01	33.19	51.1	1
6077	6077:Arm3	Origin	20.98	51.74	-8.69	-2.15	160.61	18.62	0.7	-11.71	10.03	1.36	-0.80	34.68	0.22	0.09	35.49	54.6	1
6077	6077:WVGD2	End	21.50	50.98	-8.56	-2.10	165.82	19.33	0.7	-11.71	10.03	1.36	-0.80	35.31	0.22	0.09	36.11	55.6	1
6077	6077:WVGD2	Origin	21.50	50.98	-8.56	-2.10	165.82	19.31	0.6	-11.94	10.34	1.36	-0.81	35.31	0.21	0.08	36.13	55.6	1
6077	Tube 2	End	26.50	43.92	-7.34	-1.67	217.52	26.10	0.6	-11.94	10.34	1.36	-0.76	40.68	0.20	0.07	41.44	63.8	1
6077	Tube 2	Origin	26.50	43.92	-7.34	-1.67	217.53	26.07	0.5	-12.21	10.48	1.34	-0.78	40.68	0.20	0.06	41.46	63.8	1
6077	Tube 2	End	29.09	40.48	-6.74	-1.47	244.72	29.56	0.5	-12.21	10.48	1.34	-0.75	42.92	0.19	0.06	43.68	67.2	1
6077	Tube 2	Origin	29.09	40.48	-6.74	-1.47	244.72	29.53	0.5	-12.41	10.59	1.33	-0.77	42.92	0.19	0.05	43.69	67.2	1
6077	6077:Arm4	End	31.69	37.19	-6.18	-1.29	272.19	33.00	0.5	-12.41	10.59	1.33	-0.74	44.87	0.19	0.05	45.61	70.2	1
6077	6077:Arm4	Origin	31.69	37.19	-6.18	-1.29	276.34	33.79	0.5	-15.90	12.42	1.58	-0.95	45.55	0.22	0.05	46.50	71.5	1
6077	6077:WVGD3	End	32.00	36.80	-6.11	-1.27	280.22	34.28	0.5	-15.90	12.42	1.58	-0.95	45.85	0.22	0.05	46.80	72.0	1
6077	6077:WVGD3	Origin	32.00	36.80	-6.11	-1.27	280.22	34.26	0.4	-16.12	12.70	1.57	-0.96	45.85	0.22	0.04	46.81	72.0	1
6077	Tube 2	End	36.00	32.07	-5.30	-1.03	331.01	40.54	0.4	-16.12	12.70	1.57	-0.92	49.41	0.21	0.04	50.33	77.4	1
6077	Tube 2	Origin	36.00	32.07	-5.30	-1.03	331.02	40.49	0.2	-16.46	12.84	1.55	-0.94	49.41	0.21	0.02	50.35	77.5	1
6077	SpliceT	End	40.00	27.72	-4.56	-0.82	382.37	46.68	0.2	-16.46	12.84	1.55	-0.90	52.28	0.20	0.02	53.18	81.8	1
6077	SpliceT	Origin	40.00	27.72	-4.56	-0.82	382.37	46.65	0.1	-16.71	12.94	1.53	-0.76	43.49	0.16	0.01	44.25	68.1	1
6077	6077:WVGD4	End	41.50	26.18	-4.30	-0.75	401.78	48.95	0.1	-16.71	12.94	1.53	-0.75	44.27	0.16	0.01	45.01	69.2	1
6077	6077:WVGD4	Origin	41.50	26.18	-4.30	-0.75	401.78	48.92	-0.0	-17.08	13.29	1.52	-0.76	44.27	0.16	0.00	45.03	69.3	1
6077	Tube 3	End	46.50	21.40	-3.49	-0.56	468.24	56.51	-0.0	-17.08	13.29	1.52	-0.72	46.54	0.15	0.00	47.27	72.7	1
6077	Tube 3	Origin	46.50	21.40	-3.49	-0.56	468.25	56.46	-0.3	-17.60	13.52	1.50	-0.75	46.54	0.15	0.02	47.29	72.8	1
6077	6077:WVGD5	End	51.50	17.12	-2.77	-0.40	535.87	63.93	-0.3	-17.60	13.52	1.50	-0.71	48.30	0.14	0.01	49.01	75.4	1
6077	6077:WVGD5	Origin	51.50	17.12	-2.77	-0.40	535.87	63.88	-0.5	-18.18	13.97	1.47	-0.73	48.30	0.14	0.03	49.03	75.4	1
6077	Tube 3	End	56.50	13.34	-2.15	-0.27	605.73	71.23	-0.5	-18.18	13.97	1.47	-0.70	49.73	0.13	0.03	50.43	77.6	1
6077	Tube 3	Origin	56.50	13.34	-2.15	-0.27	605.74	71.19	-0.8	-18.74	14.23	1.45	-0.72	49.73	0.13	0.04	50.45	77.6	1
6077	6077:WVGD6	End	61.50	10.06	-1.61	-0.18	676.89	78.42	-0.8	-18.74	14.23	1.45	-0.69	50.83	0.12	0.04	51.53	79.3	1
6077	6077:WVGD6	Origin	61.50	10.06	-1.61	-0.18	676.89	78.38	-1.1	-19.37	14.70	1.42	-0.72	50.83	0.12	0.05	51.55	79.3	1
6077	Tube 3	End	66.50	7.27	-1.15	-0.11	750.40	85.49	-1.1	-19.37	14.70	1.42	-0.69	51.75	0.12	0.05	52.43	80.7	1
6077	Tube 3	Origin	66.50	7.27	-1.15	-0.11	750.41	85.46	-1.5	-19.97	14.99	1.40	-0.71	51.75	0.12	0.06	52.45	80.7	1
6077	6077:WVGD7	End	71.50	4.95	-0.78	-0.06	825.34	92.45	-1.5	-19.97	14.99	1.40	-0.68	52.44	0.11	0.06	53.12	81.7	1
6077	6077:WVGD7	Origin	71.50	4.95	-0.78	-0.06	825.34	92.42	-1.8	-20.65	15.48	1.38	-0.70	52.44	0.11	0.07	53.14	81.8	1
6077	Tube 3	End	76.50	3.10	-0.48	-0.03	902.77	99.28	-1.8	-20.65	15.48	1.38	-0.67	53.03	0.10	0.06	53.70	82.6	1
6077	Tube 3	Origin	76.50	3.10	-0.48	-0.03	902.77	99.27	-2.2	-21.29	15.80	1.35	-0.70	53.03	0.10	0.08	53.72	82.6	1
6077	6077:WVGD8	End	81.50	1.69	-0.26	-0.01	981.75	106.00	-2.2	-21.29	15.80	1.35	-0.67	53.47	0.10	0.07	54.14	83.3	1
6077	6077:WVGD8	Origin	81.50	1.69	-0.26	-0.01	981.75	106.00	-2.6	-21.95	16.29	1.33	-0.69	53.47	0.10	0.08	54.16	83.3	1
6077	Tube 3	End	85.75	0.84	-0.13	-0.01	1051.00	111.62	-2.6	-21.95	16.29	1.33	-0.67	53.79	0.09	0.08	54.46	83.8	1
6077	Tube 3	Origin	85.75	0.84	-0.13	-0.01	1051.00	111.62	-2.9	-22.53	16.58	1.31	-0.69	53.79	0.09	0.09	54.48	83.8	1
6077	SpliceT	End	90.00	0.30	-0.05	-0.00	1121.46	117.15	-2.9	-22.53	16.58	1.31	-0.67	54.04	0.09	0.08	54.71	84.2	1
6077	SpliceT	Origin	90.00	0.30	-0.05	-0.00	1121.46	117.16	-3.1	-22.94	16.78	1.29	-0.58	46.26	0.08	0.08	46.85	72.1	1
6077	6077:WVGD9	End	91.50	0.18	-0.03	-0.00	1146.63	119.09	-3.1	-22.94	16.78	1.29	-0.58	46.33	0.08	0.08	46.90	72.2	1

6077	6077:WVGD9	Origin	91.50	0.18	-0.03	-0.00	1146.62	119.10	-3.3	-23.51	17.23	1.28	-0.59	46.33	0.07	0.08	46.92	72.2	1
6077	6077:g	End	96.50	0.00	0.00	0.00	1232.76	125.48	-3.3	-23.51	17.23	1.28	-0.57	46.54	0.07	0.08	47.11	72.5	1

Detailed Tubular Davit Arm Usages for Load Case "NESC Extreme Wind":

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	87.48	-14.78	-5.85	-4.59	1.10	0.0	0.91	0.93	-0.22	0.21	8.03	0.11	0.00	8.25	12.7	1
Davit1	#Davit1:0	End	2.51	87.57	-14.73	-10.75	-2.25	0.55	0.0	0.91	0.93	-0.22	0.25	5.44	0.13	0.00	5.70	8.8	1
Davit1	#Davit1:0	Origin	2.51	87.57	-14.73	-10.75	-2.26	0.55	-0.0	0.91	0.90	-0.22	0.25	5.44	0.13	0.00	5.70	8.8	1
Davit1	Davit1:V	End	5.02	87.65	-14.70	-15.70	0.00	-0.00	-0.0	0.91	0.90	-0.22	0.30	0.00	0.62	0.00	1.12	1.7	3
Davit2	Davit2:O	Origin	0.00	87.63	-14.83	-3.90	-4.36	-0.81	-0.0	-0.09	0.88	0.16	-0.02	7.63	0.08	0.00	7.66	11.8	1
Davit2	#Davit2:0	End	2.51	88.50	-15.04	0.86	-2.15	-0.40	-0.0	-0.09	0.88	0.16	-0.03	5.19	0.09	0.00	5.22	8.0	1
Davit2	#Davit2:0	Origin	2.51	88.50	-15.04	0.86	-2.15	-0.40	-0.0	-0.08	0.86	0.16	-0.02	5.19	0.09	0.00	5.21	8.0	1
Davit2	Davit2:V	End	5.02	89.35	-15.26	5.57	-0.00	-0.00	-0.0	-0.08	0.86	0.16	-0.03	0.00	0.60	0.00	1.03	1.6	3
Davit3	Davit3:O	Origin	0.00	73.79	-12.48	-4.80	-26.83	2.84	0.1	0.25	2.52	-0.26	0.03	20.76	0.07	0.05	20.80	32.0	1
Davit3	#Davit3:0	End	4.80	76.26	-12.79	-13.61	-14.76	1.59	0.1	0.25	2.52	-0.26	0.04	18.00	0.09	0.08	18.04	27.8	1
Davit3	#Davit3:0	Origin	4.80	76.26	-12.79	-13.61	-14.76	1.59	0.1	0.29	2.42	-0.26	0.05	18.00	0.09	0.08	18.05	27.8	1
Davit3	Davit3:M	End	9.59	78.82	-13.14	-22.90	-3.17	0.36	0.1	0.29	2.42	-0.26	0.07	6.97	0.12	0.15	7.05	10.8	1
Davit3	Davit3:M	Origin	9.59	78.82	-13.14	-22.90	-3.17	0.38	-0.0	1.10	2.11	-0.26	0.25	6.97	0.12	0.00	7.22	11.1	1
Davit3	Davit3:V	End	11.09	78.56	-13.09	-25.96	0.00	-0.00	-0.0	1.10	2.11	-0.26	0.28	0.00	1.12	0.00	1.96	3.0	3
Davit4	Davit4:O	Origin	0.00	73.96	-12.53	-2.70	-19.89	-2.71	-0.1	-1.82	1.75	0.25	-0.25	15.39	0.07	0.05	15.64	24.1	1
Davit4	#Davit4:0	End	4.80	77.55	-13.29	5.17	-11.49	-1.52	-0.1	-1.82	1.75	0.25	-0.31	14.01	0.09	0.09	14.33	22.0	1
Davit4	#Davit4:0	Origin	4.80	77.55	-13.29	5.17	-11.49	-1.52	-0.1	-1.76	1.71	0.25	-0.30	14.01	0.09	0.08	14.32	22.0	1
Davit4	Davit4:M	End	9.59	80.96	-14.07	12.70	-3.27	-0.34	-0.1	-1.76	1.71	0.25	-0.40	7.20	0.12	0.15	7.61	11.7	1
Davit4	Davit4:M	Origin	9.59	80.96	-14.07	12.70	-3.27	-0.40	-0.0	-1.04	2.18	0.26	-0.24	7.19	0.13	0.00	7.43	11.4	1
Davit4	Davit4:V	End	11.09	81.13	-14.17	15.22	-0.00	-0.00	-0.0	-1.04	2.18	0.26	-0.27	0.00	1.16	0.00	2.02	3.1	3
Davit5	Davit5:O	Origin	0.00	51.68	-8.67	-3.18	-24.42	2.77	0.1	0.64	2.32	-0.25	0.09	18.90	0.07	0.05	18.99	29.2	1
Davit5	#Davit5:0	End	4.80	53.77	-8.97	-10.21	-13.30	1.55	0.1	0.64	2.32	-0.25	0.11	16.22	0.09	0.08	16.33	25.1	1
Davit5	#Davit5:0	Origin	4.80	53.77	-8.97	-10.21	-13.30	1.55	0.1	0.68	2.21	-0.25	0.12	16.22	0.09	0.08	16.34	25.1	1
Davit5	Davit5:M	End	9.59	55.95	-9.31	-17.66	-2.68	0.35	0.1	0.68	2.21	-0.25	0.16	5.89	0.12	0.14	6.06	9.3	1
Davit5	Davit5:M	Origin	9.59	55.95	-9.31	-17.66	-2.68	0.37	-0.0	1.40	1.78	-0.25	0.32	5.89	0.12	0.00	6.21	9.6	1
Davit5	Davit5:V	End	11.09	55.78	-9.28	-20.14	0.00	-0.00	-0.0	1.40	1.78	-0.25	0.36	0.00	0.95	0.00	1.68	2.6	3
Davit6	Davit6:O	Origin	0.00	51.81	-8.72	-1.11	-15.15	-2.02	-0.1	-1.98	1.32	0.18	-0.27	11.72	0.05	0.04	11.99	18.4	1
Davit6	#Davit6:0	End	4.80	54.58	-9.30	5.22	-8.83	-1.13	-0.1	-1.98	1.32	0.18	-0.34	10.77	0.07	0.06	11.11	17.1	1
Davit6	#Davit6:0	Origin	4.80	54.58	-9.30	5.22	-8.83	-1.13	-0.1	-1.93	1.27	0.18	-0.33	10.77	0.06	0.06	11.10	17.1	1
Davit6	Davit6:M	End	9.59	57.22	-9.90	11.28	-2.73	-0.25	-0.1	-1.93	1.27	0.18	-0.44	6.01	0.09	0.11	6.46	9.9	1
Davit6	Davit6:M	Origin	9.59	57.22	-9.90	11.28	-2.73	-0.29	-0.0	-1.36	1.82	0.19	-0.31	6.01	0.09	0.00	6.32	9.7	1
Davit6	Davit6:V	End	11.09	57.34	-9.97	13.30	-0.00	-0.00	-0.0	-1.36	1.82	0.19	-0.34	0.00	0.97	0.00	1.71	2.6	3
Davit7	Davit7:O	Origin	0.00	37.14	-6.16	-2.28	-20.33	1.37	0.1	0.74	1.95	-0.13	0.10	15.73	0.04	0.03	15.83	24.4	1
Davit7	#Davit7:0	End	4.80	38.95	-6.41	-8.16	-10.96	0.77	0.1	0.74	1.95	-0.13	0.13	13.37	0.04	0.04	13.50	20.8	1
Davit7	#Davit7:0	Origin	4.80	38.95	-6.41	-8.16	-10.96	0.77	0.1	0.77	1.85	-0.12	0.13	13.37	0.04	0.04	13.51	20.8	1
Davit7	Davit7:M	End	9.59	40.85	-6.68	-14.39	-2.11	0.17	0.1	0.77	1.85	-0.12	0.18	4.64	0.06	0.07	4.82	7.4	1
Davit7	Davit7:M	Origin	9.59	40.85	-6.68	-14.39	-2.11	0.18	-0.0	1.36	1.41	-0.12	0.31	4.64	0.06	0.00	4.95	7.6	1
Davit7	Davit7:V	End	11.09	40.73	-6.65	-16.47	0.00	-0.00	-0.0	1.36	1.41	-0.12	0.35	0.00	0.75	0.00	1.34	2.1	3
Davit8	Davit8:O	Origin	0.00	37.24	-6.20	-0.30	-16.11	-1.22	-0.1	-0.95	1.46	0.11	-0.13	12.46	0.03	0.02	12.59	19.4	1
Davit8	#Davit8:0	End	4.80	39.51	-6.66	5.01	-9.12	-0.68	-0.1	-0.95	1.46	0.11	-0.16	11.12	0.04	0.04	11.28	17.4	1
Davit8	#Davit8:0	Origin	4.80	39.51	-6.66	5.01	-9.12	-0.68	-0.1	-0.90	1.40	0.11	-0.15	11.12	0.04	0.04	11.27	17.3	1
Davit8	Davit8:M	End	9.59	41.64	-7.14	10.04	-2.38	-0.15	-0.1	-0.90	1.40	0.11	-0.20	5.24	0.05	0.07	5.45	8.4	1

Davit8	Davit8:M	Origin	9.59	41.64	-7.14	10.04	-2.38	-0.18	-0.0	-0.35	1.59	0.12	-0.08	5.24	0.06	0.00	5.32	8.2	1
Davit8	Davit8:V	End	11.09	41.71	-7.18	11.71	-0.00	-0.00	-0.0	-0.35	1.59	0.12	-0.09	0.00	0.84	0.00	1.46	2.3	3

Summary of Clamp Capacities and Usages for Load Case "NESC Extreme Wind":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
Clamp1	1.285	80.00	80.00	1.61
Clamp2	0.862	80.00	80.00	1.08
Clamp3	2.386	80.00	80.00	2.98
Clamp4	2.421	80.00	80.00	3.03
Clamp5	2.274	80.00	80.00	2.84
Clamp6	2.270	80.00	80.00	2.84
Clamp7	1.953	80.00	80.00	2.44
Clamp8	1.619	80.00	80.00	2.02
Clamp9	9.135	80.00	80.00	11.42
Clamp11	6.206	80.00	80.00	7.76
Clamp13	0.208	80.00	80.00	0.26
Clamp14	0.208	80.00	80.00	0.26
Clamp15	0.208	80.00	80.00	0.26
Clamp16	0.208	80.00	80.00	0.26
Clamp17	0.208	80.00	80.00	0.26
Clamp18	0.208	80.00	80.00	0.26
Clamp19	0.208	80.00	80.00	0.26
Clamp20	0.208	80.00	80.00	0.26
Clamp21	0.208	80.00	80.00	0.26

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
6077	84.17	NESC Extreme Wind	26	9241.8

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Segment Number	Weight (lbs)
Davit1	26.87	NESC Heavy Wind	1	61.8
Davit2	26.03	NESC Heavy Wind	1	61.8
Davit3	63.36	NESC Heavy Wind	1	213.0
Davit4	58.21	NESC Heavy Wind	1	213.0
Davit5	59.73	NESC Heavy Wind	1	213.0
Davit6	45.61	NESC Heavy Wind	1	213.0
Davit7	48.27	NESC Heavy Wind	1	213.0
Davit8	47.19	NESC Heavy Wind	1	213.0

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy Wind	63.36	Davit3	Tubular Davit
NESC Extreme Wind	84.17	6077	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Segment Number
NESC Heavy Wind	62.99	6077	15
NESC Extreme Wind	84.17	6077	26

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Usage %	Tubular Davit Label	Segment Number
NESC Heavy Wind	63.36	Davit3	1
NESC Extreme Wind	31.99	Davit3	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)

Clamp1	Clamp	3.20	NESC Heavy Wind	0.0
Clamp2	Clamp	2.37	NESC Heavy Wind	0.0
Clamp3	Clamp	5.87	NESC Heavy Wind	0.0
Clamp4	Clamp	5.96	NESC Heavy Wind	0.0
Clamp5	Clamp	5.89	NESC Heavy Wind	0.0
Clamp6	Clamp	5.36	NESC Heavy Wind	0.0
Clamp7	Clamp	4.51	NESC Heavy Wind	0.0
Clamp8	Clamp	4.38	NESC Heavy Wind	0.0
Clamp9	Clamp	11.42	NESC Extreme Wind	0.0
Clamp11	Clamp	7.76	NESC Extreme Wind	0.0
Clamp13	Clamp	0.30	NESC Heavy Wind	0.0
Clamp14	Clamp	0.30	NESC Heavy Wind	0.0
Clamp15	Clamp	0.30	NESC Heavy Wind	0.0
Clamp16	Clamp	0.30	NESC Heavy Wind	0.0
Clamp17	Clamp	0.30	NESC Heavy Wind	0.0
Clamp18	Clamp	0.30	NESC Heavy Wind	0.0
Clamp19	Clamp	0.30	NESC Heavy Wind	0.0
Clamp20	Clamp	0.30	NESC Heavy Wind	0.0
Clamp21	Clamp	0.30	NESC Heavy Wind	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 Wind	Clamp1	Clamp	Davit1:V	-0.198	1.680	1.926	2.563
NESC Heavy Wind	Clamp2	Clamp	Davit2:V	-0.143	-0.570	1.802	1.895
NESC Heavy Wind	Clamp3	Clamp	Davit3:V	-0.056	0.456	4.677	4.700
NESC Heavy Wind	Clamp4	Clamp	Davit4:V	-0.056	0.298	4.758	4.768
NESC Heavy Wind	Clamp5	Clamp	Davit5:V	-0.169	2.518	3.981	4.714
NESC Heavy Wind	Clamp6	Clamp	Davit6:V	-0.050	1.300	4.082	4.284
NESC Heavy Wind	Clamp7	Clamp	Davit7:V	-0.050	1.444	3.303	3.605
NESC Heavy Wind	Clamp8	Clamp	Davit8:V	-0.087	-0.755	3.417	3.500
NESC Heavy Wind	Clamp9	Clamp	6077:TpConn	0.000	2.059	1.978	2.855
NESC Heavy Wind	Clamp11	Clamp	6077:BotCon	0.000	-1.384	0.137	1.391
NESC Heavy Wind	Clamp13	Clamp	6077:WVGD1	0.000	0.066	0.230	0.239
NESC Heavy Wind	Clamp14	Clamp	6077:WVGD2	0.000	0.066	0.230	0.239
NESC Heavy Wind	Clamp15	Clamp	6077:WVGD3	0.000	0.066	0.230	0.239
NESC Heavy Wind	Clamp16	Clamp	6077:WVGD4	0.000	0.066	0.230	0.239
NESC Heavy Wind	Clamp17	Clamp	6077:WVGD5	0.000	0.066	0.230	0.239
NESC Heavy Wind	Clamp18	Clamp	6077:WVGD6	0.000	0.066	0.230	0.239
NESC Heavy Wind	Clamp19	Clamp	6077:WVGD7	0.000	0.066	0.230	0.239
NESC Heavy Wind	Clamp20	Clamp	6077:WVGD8	0.000	0.066	0.230	0.239
NESC Heavy Wind	Clamp21	Clamp	6077:WVGD9	0.000	0.066	0.230	0.239
NESC Extreme Wind	Clamp1	Clamp	Davit1:V	-0.194	0.847	0.946	1.285
NESC Extreme Wind	Clamp2	Clamp	Davit2:V	-0.139	-0.137	0.840	0.862
NESC Extreme Wind	Clamp3	Clamp	Davit3:V	-0.197	0.728	2.264	2.386
NESC Extreme Wind	Clamp4	Clamp	Davit4:V	-0.201	0.728	2.300	2.421
NESC Extreme Wind	Clamp5	Clamp	Davit5:V	-0.209	1.143	1.955	2.274
NESC Extreme Wind	Clamp6	Clamp	Davit6:V	-0.149	1.143	1.955	2.270
NESC Extreme Wind	Clamp7	Clamp	Davit7:V	-0.096	1.189	1.546	1.953
NESC Extreme Wind	Clamp8	Clamp	Davit8:V	-0.089	0.198	1.604	1.619
NESC Extreme Wind	Clamp9	Clamp	6077:TpConn	0.000	9.090	0.910	9.135
NESC Extreme Wind	Clamp11	Clamp	6077:BotCon	0.000	-6.206	0.065	6.206
NESC Extreme Wind	Clamp13	Clamp	6077:WVGD1	0.000	0.199	0.062	0.208
NESC Extreme Wind	Clamp14	Clamp	6077:WVGD2	0.000	0.199	0.062	0.208
NESC Extreme Wind	Clamp15	Clamp	6077:WVGD3	0.000	0.199	0.062	0.208

NESC Extreme Wind	Clamp16	Clamp	6077:WVGD4	0.000	0.199	0.062	0.208
NESC Extreme Wind	Clamp17	Clamp	6077:WVGD5	0.000	0.199	0.062	0.208
NESC Extreme Wind	Clamp18	Clamp	6077:WVGD6	0.000	0.199	0.062	0.208
NESC Extreme Wind	Clamp19	Clamp	6077:WVGD7	0.000	0.199	0.062	0.208
NESC Extreme Wind	Clamp20	Clamp	6077:WVGD8	0.000	0.199	0.062	0.208
NESC Extreme Wind	Clamp21	Clamp	6077:WVGD9	0.000	0.199	0.062	0.208

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 Wind	7.640	-0.809	32.131	618.391	-69.822	1.218
NESC Extreme Wind	10.514	-1.274	14.943	856.899	-109.625	1.010

*** Weight of structure (lbs):

Weight of Tubular Davit Arms:	1401.4
Weight of Steel Poles:	9241.8
Total:	10643.2

*** End of Report

Property Location: FLANDERS RD **MAP ID:** 31.3/ 21/ / / **Bldg Name:** **State Use:** 4230

Vision ID: 5478 **Account #** 001395 **Bldg #:** 1 of 1 **Sec #:** 1 of 1 **Card** 1 of 1 **Print Date:** 05/08/2018 18:30

CURRENT OWNER	TOPO.	UTILITIES	STRT./ROAD	LOCATION
CONN LIGHT & POWER CO PO BOX 270 HARTFORD, CT 04141 Additional Owners:	1 Level		1 Paved	1 Urban

SUPPLEMENTAL DATA

Other ID:	Block
Sub-Div	Fire 000
Photo	Tot Disabled
Devl Lot #	Heart
Vet Exempt	Freeze
Tract 07162	
GIS ID: 31.3 21	ASSOC PID#

CURRENT ASSESSMENT

Description	Code	Appraised Value	Assessed Value
UTL LAND	4-1	26,800	18,760
UTL OUTBL	4-3	900	630
Total		27,700	19,390

6045
EAST LYME, CT

VISION

RECORD OF OWNERSHIP

RECORD OF OWNERSHIP	BK-VOL/PAGE	SALE DATE	q/u	v/i	SALE PRICE	V.C.
CONN LIGHT & POWER CO	024/ 481	05/17/1924			0	

PREVIOUS ASSESSMENTS (HISTORY)

Yr.	Code	Assessed Value	Yr.	Code	Assessed Value	Yr.	Code	Assessed Value
2017	4-1	18,760	2016	4-1	18,760	2016	4-1	18,760
2017	4-3	630	2016	4-3	630	2016	4-3	630
Total:		19,390	Total:		19,390	Total:		19,390

EXEMPTIONS

Year	Type	Description	Amount
		Total:	

OTHER ASSESSMENTS

Code	Description	Number	Amount	Comm. Int.

This signature acknowledges a visit by a Data Collector or Assessor

APPRAISED VALUE SUMMARY

Appraised Bldg. Value (Card)	0
Appraised XF (B) Value (Bldg)	0
Appraised OB (L) Value (Bldg)	900
Appraised Land Value (Bldg)	26,800
Special Land Value	0
Total Appraised Parcel Value	27,700
Valuation Method:	C
Adjustment:	0
Net Total Appraised Parcel Value	27,700

ASSESSING NEIGHBORHOOD

NBHD/ SUB	NBHD Name	Street Index Name	Tracing	Batch
0030/A				

NOTES

ANTENNAS+PERS. PROP.

10/1/02 FENCING

BUILDING PERMIT RECORD

Permit ID	Issue Date	Type	Description	Amount	Insp. Date	% Comp.	Date Comp.	Comments
B8782	03/26/2002	CM	Commercial	51,895	10/01/2002	100	10/01/2002	POLE & FENCING
2001-104	05/22/2001	CM	Commercial	0	08/31/2001	100		INSTALL ANTENNAS

VISIT/ CHANGE HISTORY

Date	Type	IS	ID	Cd.	Purpose/Result
02/23/2011			AD	00	Measur+Listed
12/08/2006			RT	40	Hearing-No Change
07/20/2006			BD	63	Review
10/01/2002			NW	55	Building Permit Change
08/31/2001			NS	00	Measur+Listed

LAND LINE VALUATION SECTION

B #	Use Code	Use Description	Zone	D	Front	Depth	Units		Unit Price	I. Factor	S.A.	Acre Disc	C. Factor	ST. Idx	Adj.	Notes- Adj	Special Pricing Spec Use	Spec Calc	S Adj Fact	Adj. Unit Price	Land Value
1	4230	ELEC ROW	CA				2,614	SF	27.30	2.5000	H	1.0000	0.20	0030	0.75	UNB			1.00	10.24	26,800

Total Card Land Units: 0.06 AC **Parcel Total Land Area:** 0.06 AC **Total Land Value:** 26,800

CONSTRUCTION DETAIL

Element	Cd.	Ch.	Description
Model	**00**		**Vacant**

CONSTRUCTION DETAIL (CONTINUED)

Element	Cd.	Ch.	Description

MIXED USE

Code	Description	Percentage
4230	**ELEC ROW**	**100**

COST/MARKET VALUATION

Adj. Base Rate:	**0.00**
	0
Net Other Adj:	**0.00**
Replace Cost	**0**
AYB	
EYB	**0**
Dep Code	
Remodel Rating	
Year Remodeled	
Dep %	
Functional Obslnc	
External Obslnc	
Cost Trend Factor	**1**
Condition	
% Complete	
Overall % Cond	
Apprais Val	
Dep % Ovr	**0**
Dep Ovr Comment	
Misc Imp Ovr	**0**
Misc Imp Ovr Comment	
Cost to Cure Ovr	**0**
Cost to Cure Ovr Comment	

OB-OUTBUILDING & YARD ITEMS(L) / XF-BUILDING EXTRA FEATURES(B)

Code	Description	Sub	Sub Descript	L/B	Units	Unit Price	Yr	Gde	Dp Rt	Cnd	%Cnd	Apr Value
SHD3	**METAL**			**L**	**144**	**0.00**	**2001**		**0**		**100**	**0**
FN4	**FENCE-8' CH/**			**L**	**48**	**18.00**	**2002**		**0**		**100**	**900**

BUILDING SUB-AREA SUMMARY SECTION

Code	Description	Living Area	Gross Area	Eff. Area	Unit Cost	Undeprec. Value
	Ttl. Gross Liv/Lease Area:	**0**	**0**	**0**		

FLANDERS RD

11/27/2019

1"=125'

Property Information

Parcel ID	31.3 21
Address	FLANDERS RD
Sale Price	$0.00

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.

EVERSOURCE
ENERGY

56 Prospect Street,
Hartford, CT 06103

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

November 21, 2019

Mr. Tim Burks
SAI
193 Shadow Pond Lane
Suffield, CT 06078

RE: AT&T Antenna Site, CT5218, Flanders Rd, East Lyme, CT, structure 6077

Dear Mr. Burks:

Based on the structural report and construction drawings provided by Centek Engineering, as well as a review of the structural report by Paul J. Ford & Company, Eversource accepts the proposed modification of the subject site.

Please contact Christopher Gelinas of Eversource Real Estate at 860-665-2008 to complete the site lease amendment if needed. Please contact me at 860-728-4503 for other questions regarding this site.

Sincerely,

Joel Szarkowicz
Transmission Line Engineering

REF: 19072.00 - CT5218 Structural Analysis Rev1 19.08.13.pdf
CT5218_LTE_ 3C_4C_CD_REV1_09.24.19.pdf

Petition No. 530
AT&T Wireless PCS, LLC
East Lyme, Connecticut
Staff Report
November 28, 2001

On November 5, 2001, Connecticut Siting Council (Council) member Gerald J. Heffernan and Christina Lepage and Robert Mercier of the Council staff met with AT&T Wireless PCS, Inc. (AT&T) representatives Peter Carbone and Karen Couture on Flanders Road, East Lyme, Connecticut for inspection of an electric transmission structure. The property and structure is owned by Connecticut Light and Power Co. (CL&P). AT&T 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.

AT&T proposes the installation of six panel antennas on a pipe extension. The antennas would extend approximately 10-feet above the existing 98-foot transmission line monopole structure (# 6077). The height at the top of the antennas would be about 109-feet above ground level (AGL), with a centerline of 108-feet AGL.

Equipment cabinets will be located on a 12-foot by 20-foot concrete pad within a 16-foot by 33-foot compound with an 8-foot high stockade fence with 1-foot of barbed wire near to the base of the tower. Placement of the proposed equipment compound would be within a vegetated area adjacent to a cleared area. The proposed compound would require the removal of some vegetation. AT&T investigated the possible use of the cleared area as a location of the equipment compound and have determined that they can not use the cleared area because it is owned by the Department of Transportation (DOT). The DOT has refused AT&T request for a lease or easement over their land in similar proposals. An underground conduit from an existing utility pole will provide power and telephone service to the site. A gravel access drive will be constructed for direct access to the site.

The zoning designation of this site is Commercial (CA). AT&T identified that the surrounding landscape is comprised of transmission towers, high voltage lines, right-of-way, the railroad station, Interstate 95 and commercial uses. The nearest residence is 350 feet to the north.

The worst-case power density for the telecommunications operations at the site has been calculated to be 2.77% of the applicable standard for uncontrolled environments.

AT&T contends that the proposed modification of the structure would not cause a substantial adverse environmental impact and would prevent the construction of a new tower in the area. AT&T also states that the proposed facility would not be out of scale with the existing surrounding landscape.

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