QC Development
PO Box 916
Storrs, CT 06268
860-670-9068
QCDevelopment9068@gmail.com

November 5, 2020

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)
Sound Beach Avenue, Greenwich, CT 06870 (AT&T # CT5150)
N 41.0334916
W 73.5655361

Dear Ms. Bachman:

AT&T currently maintains six (6) antennas at the 103-foot level of the existing 95-foot Utility Structure at Sound Beach Avenue (Old Greenwich Railroad Station), Greenwich, CT. The tower is owned by Eversource and the property is owned by the State of Connecticut Department of Transportation. AT&T now intends to replace the six (6) existing antennas with (3) Andrew SBNHH-1D65A antennas and three (3) Andrew NNH4-65A-R6 antennas. AT&T will also replace six (6) existing TMAs with three (3) CCI TMABPD7823VG12A TMAs. The new antennas and TMAs would be installed at the 103-foot level of the structure. This modification/proposal includes B2, B5, and B12 hardware that is both 4G (LTE) and 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

This facility was approved by the Connecticut Siting Council, Petition No. 467 on June 20, 2000. This approval included no condition(s) that could feasibly be violated by this modification. This modification therefore complies with the aforementioned approval.

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 Fred Camillo, First Selectman for the Town of Greenwich and the Greenwich Planning and Zoning Department, as well as the property and structure owners.

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).

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,

Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Fred Camillo - Elected Official
Katie DeLuca – Director of Planning & Zoning
Eversource - Structure Owner
CT DOT – Property 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*							0.00%
AT&T GSM	1	313	105	0.0115	880	0.5867	0.20%
AT&T UMTS	2	313	105	0.0230	880	0.5867	0.39%
AT&T UMTS	1	628	105	0.0230	1900	1.0000	0.23%
AT&T LTE	1	1476	105	0.0542	740	0.4933	1.10%
AT&T LTE	1	3664	105	0.1344	1900	1.0000	1.34%
AT&T LTE	1	1285	105	0.0471	2300	1.0000	0.47%
Site Total							3.73%

*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*							0.00%
AT&T UMTS	1	313	103	0.0115	850	0.5667	0.20%
AT&T LTE	1	1476	103	0.0542	700	0.4667	1.16%
AT&T LTE	1	1000	103	0.0367	850	0.5667	0.65%
AT&T 5G	1	1000	103	0.0367	850	0.5667	0.65%
AT&T LTE	1	3664	103	0.1344	1900	1.0000	1.34%
AT&T LTE	1	3837	103	0.1408	2100	1.0000	1.41%
AT&T LTE	1	1285	103	0.0471	2300	1.0000	0.47%
Site Total							5.88%

*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 UTILITY TRANSMISSION POLE:
- NEW AT&T ANTENNAS: SBNHH-1D65A @ POS. 1
(TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: NNH4-65A-R6 @ POS. 2
(TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T TMA'S TMABPD7823VG12A @ POS. 1
(TYP. 1 PER SECTOR, TOTAL OF 3).
- INSTALL NEW MOUNT SITE PRO 1 PART# RMV5-272
(3.5"X 3.5" X 1/4" X 6' LONG HSS TO BE USED IN LIEU OF
HORIZONTAL PIPE INCLUDED WITH MOUNT KIT)
(TO REPLACE EXISTING MOUNT).

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- EXISTING 6630 (TO REMAIN).
- ADD RBS 6630.
- ADD IDLe.
- ADD (18) NEW TRIPLEXERS.
- ADD (3) 4449 B5/B12 (850/700).
- ADD (3) 8843 B2/B66A (PCS/AWS).
- ADD TSXDC-4310FM SURGE ARRESTORS (TOTAL OF 36).
- NETSURE 7100 WITH BATTERIES.

ITEMS TO BE REMOVED:
- EXISTING AT&T ANTENNAS: 7770 @ POS. 1
(TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNAS: QS66512-2 @ POS. 2
(TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING LGP17201 TMA'S (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING PENTAPLEXERS IN SHELTER (TOTAL OF 12).

ITEMS TO BE REMAIN (UP TOP):
- EXISTING KAELUS TMA'S (TMA2117F00V1-1)
(TYP. OF 2 PER SECTOR, TOTAL OF 6)
(TO BE RELOCATED ON NEW MOUNT).

SITE ADDRESS:	OLD GREENWICH STATION OLD GREENWICH , CT 06870
LATITUDE:	41.033891° N, 41° 02' 02.01" N
LONGITUDE:	73.563298° W, 73° 33' 47.87" W
TYPE OF SITE:	UTILITY TRANSMISSION POLE / INDOOR
STRUCTURE HEIGHT:	95'-0"± (TOP OF POLE EXTENSION = 105'-0"±)
RAD CENTER:	103'-6"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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SITE NUMBER: CT5150

SITE NAME: OLD GREENWICH RAILROAD STATION

FA CODE: 10071192

PACE ID: MRCTB040537, MRCTB040703, MRCTB040768

PROJECT: LTE 4C_5C_4TX4RX 2020 UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

I-95 NORTH TO EXIT 5 RIVERSIDE, OLD GREENWICH. AT THE END OF THE RAMP TURN RIGHT ONTO ROUTE 1. GO 3/10 OF A MILE AND TURN RIGHT ONTO SOUND BEACH AVE. FOLLOW DOWN TO FORK IN RD AND STAY TO THE RIGHT; GO UNDER TRAIN TRACKS AND TAKE YOUR FIST LEFT INTO OLD GREENWICH RAIL ROAD STATION. STAY IN THE LOWER PARKING LOT AND GO TO THE REAR OF THE LOT AND YOU WILL SEE OUR SHELTER.

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

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

12 INDUSTRIAL WAY
SALEM, NH 03079

500 ENTERPRISE DRIVE, SUITE 3A
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SITE NUMBER: CT5150
SITE NAME: OLD GREENWICH RAILROAD STATION

OLD GREENWICH STATION
OLD GREENWICH , CT 06870
FAIRFIELD COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
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A	09/23/19	ISSUED FOR REVIEW	ET	AT	DPH

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

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

AT&T

TITLE SHEET
LTE 4C_5C_4TX4RX 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5150	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-H, STRUCTURAL STANDARDS FOR STEEL

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

ABBREVIATIONS

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

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5150
SITE NAME: OLD GREENWICH RAILROAD STATION

OLD GREENWICH STATION
OLD GREENWICH , CT 06870
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at&t
500 ENTERPRISE DRIVE, SUITE 3A
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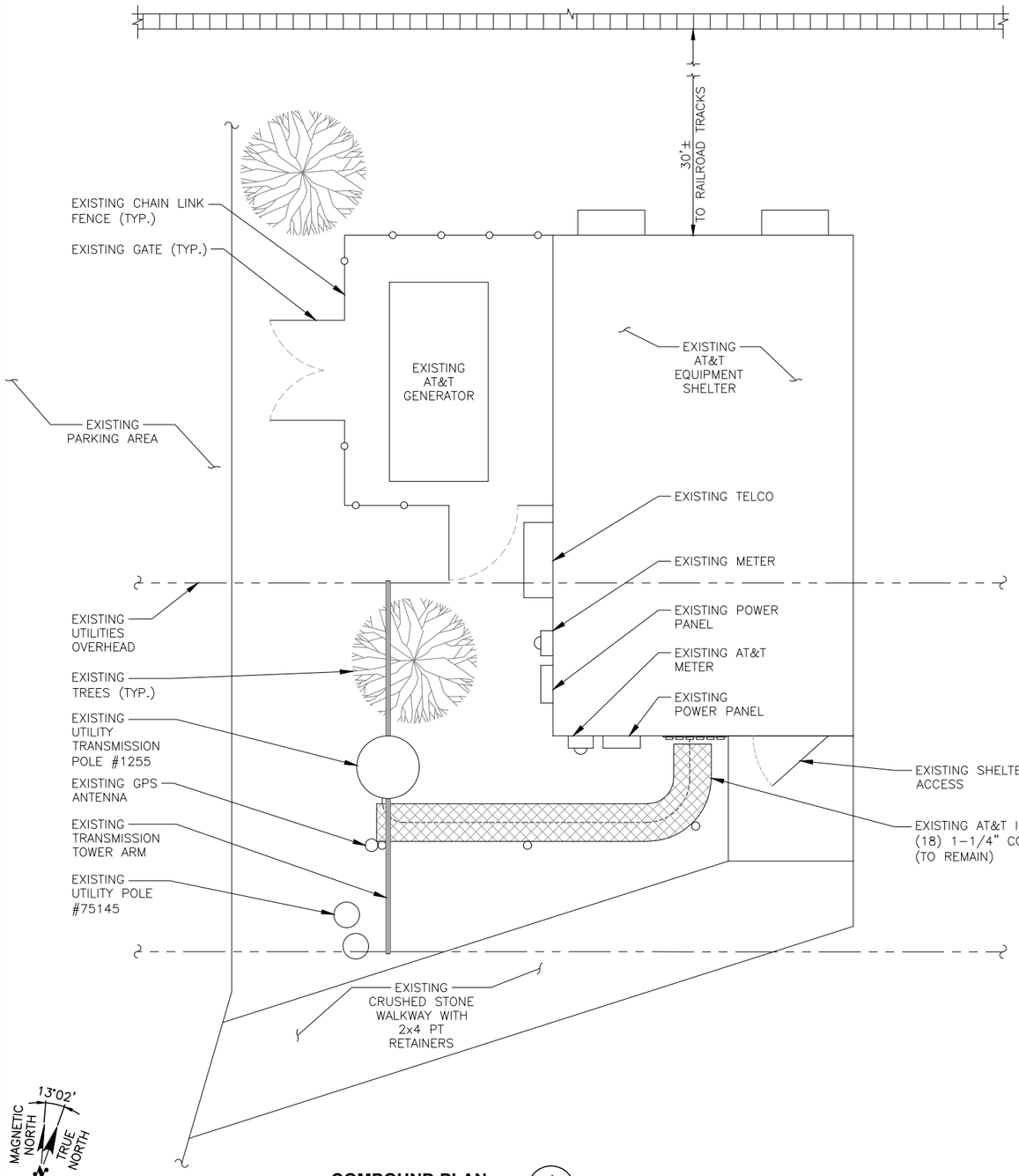
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: ET

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

AT&T

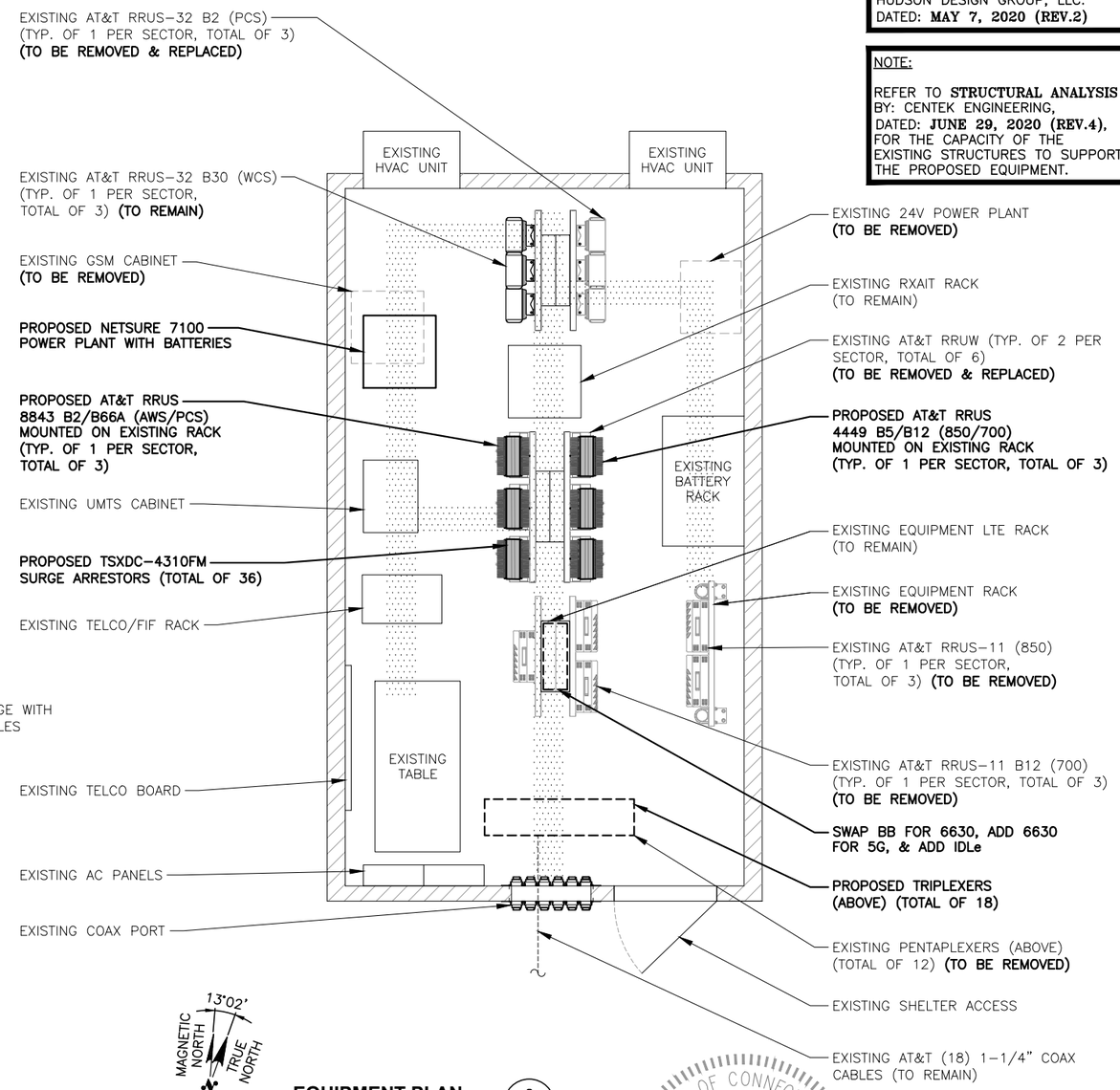
GENERAL NOTES
LTE 4C_5C_4TX4RX 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5150	GN-1	1



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

0 1'-4" 2'-8" 5'-4" 8'-0"



EQUIPMENT PLAN (2 / A-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

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

NOTE:

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

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: **MAY 7, 2020 (REV.2)**

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: CENTEK ENGINEERING, DATED: **JUNE 29, 2020 (REV.4),** FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

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

SAI
12 INDUSTRIAL WAY
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STATE OF CONNECTICUT
DANIEL P. HAMM
No.24178
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AT&T

COMPOUND & EQUIPMENT PLANS
LTE 4C_5C_4TX4RX 2020 UPGRADE

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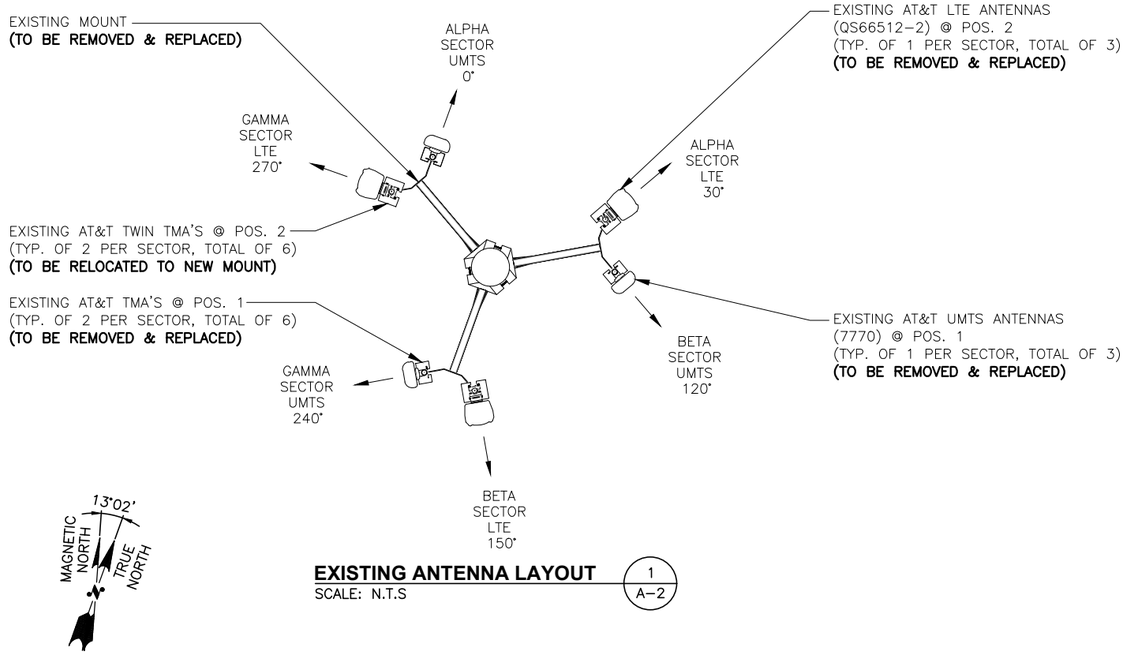
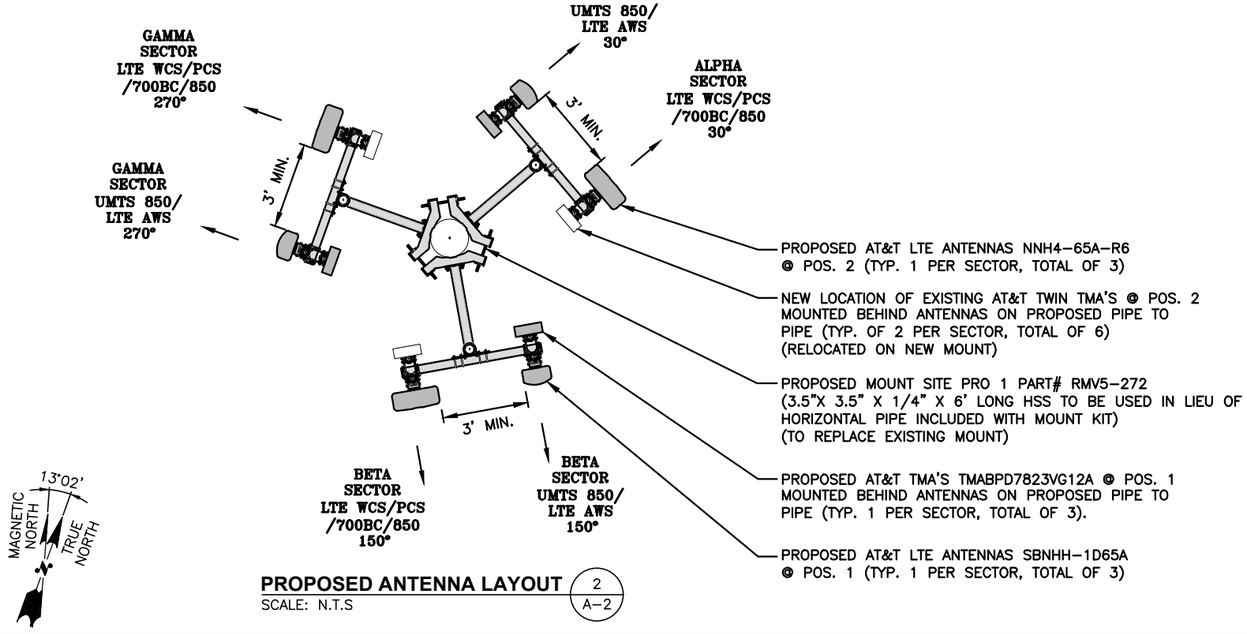
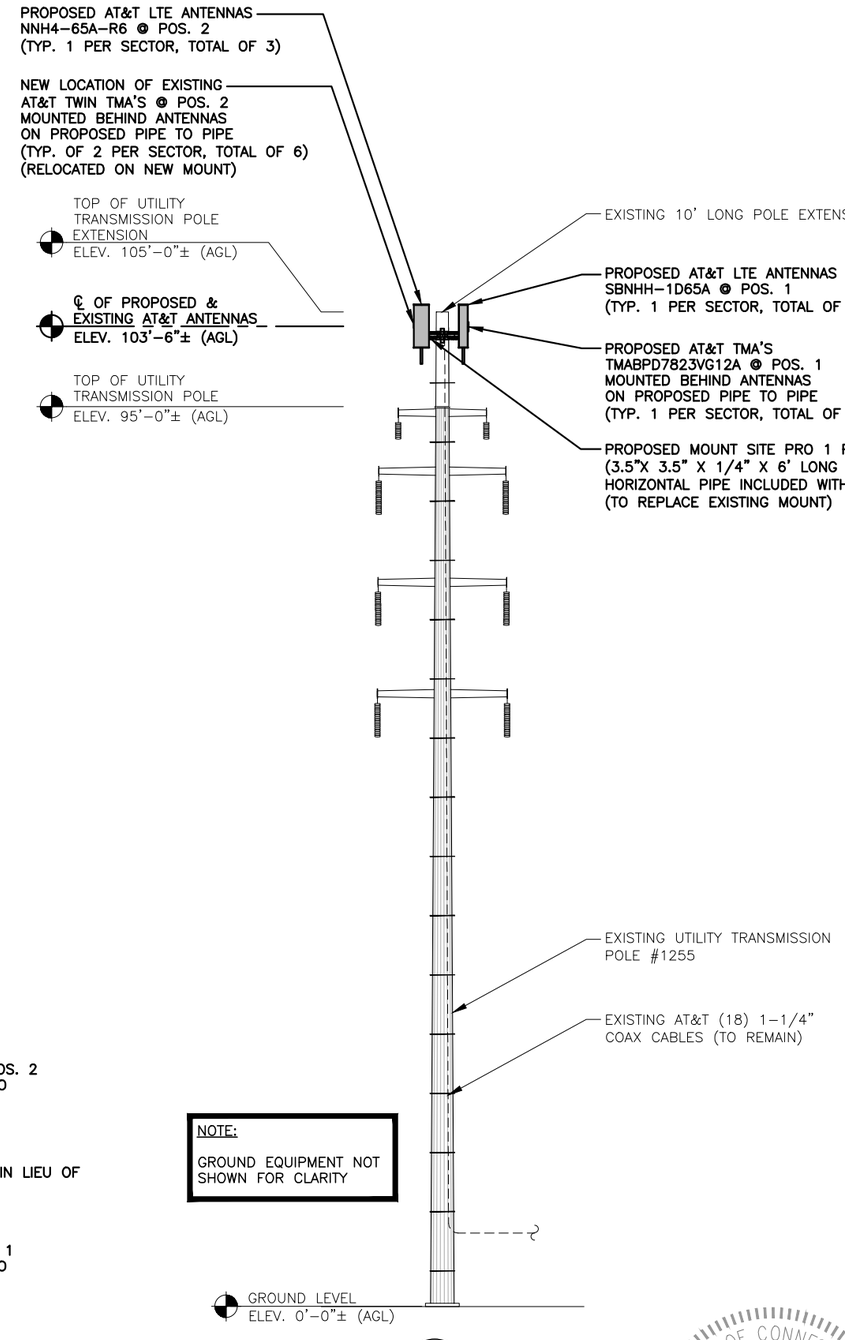


EXISTING ANTENNA LAYOUT (1 / A-2)
SCALE: N.T.S



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



NOTE:
GROUND EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION (3 / A-2)
22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"
0 4'-0" 8'-0" 16'-0" 24'-0"

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

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: **MAY 7, 2020 (REV.2)**

NOTE:
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DATED: **JUNE 29, 2020 (REV.4),** FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

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SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5150
SITE NAME: OLD GREENWICH RAILROAD STATION

OLD GREENWICH STATION
OLD GREENWICH , CT 06870
FAIRFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
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0	08/26/20	ISSUED FOR REVIEW	ET	HC	DPH
A	09/23/19	ISSUED FOR REVIEW	ET	AT	DPH

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

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

AT&T

ANTENNA LAYOUTS & ELEVATION
LTE 4C_5C_4TX4RX 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5150	A-2	1

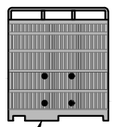
ANTENNA SCHEDULE

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	SURGE ARRESTORS
A1	PROPOSED	UMTS 850/ LTE AWS	SBNHH-1D65A	55x11.9x7.1	103'-6"±	30°	(1)(P) TMABPD7823VG12A (2)(P)(G) TBC0038F1V94-1	–	–	(2)1-1/4 COAX	(4)(P) TSXDC-4310FM
A2	PROPOSED	LTE WCS/PCS /700BC/850	NNH4-65A-R6	55.1X19.6X7.8	103'-6"±	30°	(2)(E) TMA2117F00V1-1 (4)(P)(G) TBC0038F1V94-1	(1)(E)(G) RRUS-32 B30 (WCS) (1)(P)(G) 4449 B5/B12 (850/700) (1)(P)(G) 8843 B2/B66A (PCS/AWS)	– 17.9"x13.2"x10.4"1 4.9"x13.2"x10.9"	(4)1-1/4 COAX	(8)(P) TSXDC-4310FM
A3	–	–	–	–	–	–	–	–	–	–	–
A4	–	–	–	–	–	–	–	–	–	–	–
B1	PROPOSED	UMTS 850/ LTE AWS	SBNHH-1D65A	55x11.9x7.1	103'-6"±	150°	(1)(P) TMABPD7823VG12A (2)(P)(G) TBC0038F1V94-1	–	–	(2)1-1/4 COAX	(4)(P) TSXDC-4310FM
B2	PROPOSED	LTE WCS/PCS /700BC/850	NNH4-65A-R6	55.1X19.6X7.8	103'-6"±	150°	(2)(E) TMA2117F00V1-1 (4)(P)(G) TBC0038F1V94-1	(1)(E)(G) RRUS-32 B30 (WCS) (1)(P)(G) 4449 B5/B12 (850/700) (1)(P)(G) 8843 B2/B66A (PCS/AWS)	– 17.9"x13.2"x10.4"1 4.9"x13.2"x10.9"	(4)1-1/4 COAX	(8)(P) TSXDC-4310FM
B3	–	–	–	–	–	–	–	–	–	–	–
B4	–	–	–	–	–	–	–	–	–	–	–
C1	PROPOSED	UMTS 850/ LTE AWS	SBNHH-1D65A	55x11.9x7.1	103'-6"±	270°	(1)(P) TMABPD7823VG12A (2)(P)(G) TBC0038F1V94-1	–	–	(2)1-1/4 COAX	(4)(P) TSXDC-4310FM
C2	PROPOSED	LTE WCS/PCS /700BC/850	NNH4-65A-R6	55.1X19.6X7.8	103'-6"±	270°	(2)(E) TMA2117F00V1-1 (4)(P)(G) TBC0038F1V94-1	(1)(E)(G) RRUS-32 B30 (WCS) (1)(P)(G) 4449 B5/B12 (850/700) (1)(P)(G) 8843 B2/B66A (PCS/AWS)	– 17.9"x13.2"x10.4"1 4.9"x13.2"x10.9"	(4)1-1/4 COAX	(8)(P) TSXDC-4310FM
C3	–	–	–	–	–	–	–	–	–	–	–
C4	–	–	–	–	–	–	–	–	–	–	–

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

RRU CHART		
QUANTITY	MODEL	SIZE (L x W x D)
P(3)(G)	4449 (850/700)	17.9"x13.2"x10.4"
P(3)(G)	8843 (PCS/AWS)	14.9"x13.2"x10.9"
E(3)(G)	RRUS-32 (WCS)	27.2"x12.1"x7.0"
NOTE: MOUNT PER MANUFACTURER'S SPECIFICATIONS		

NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



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

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

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

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

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PROPOSED NETSURE 7100 POWER PLANT WITH BATTERIES

PROPOSED NETSURE 7100 PHOTO DETAIL (3 / A-3)
SCALE: N.T.S

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

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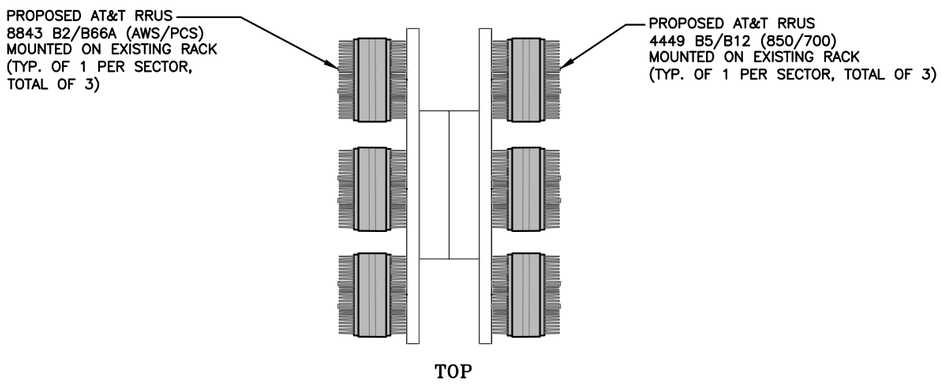
DETAILS
LTE 4C_5C_4TX4RX 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5150	A-3	1



TOP

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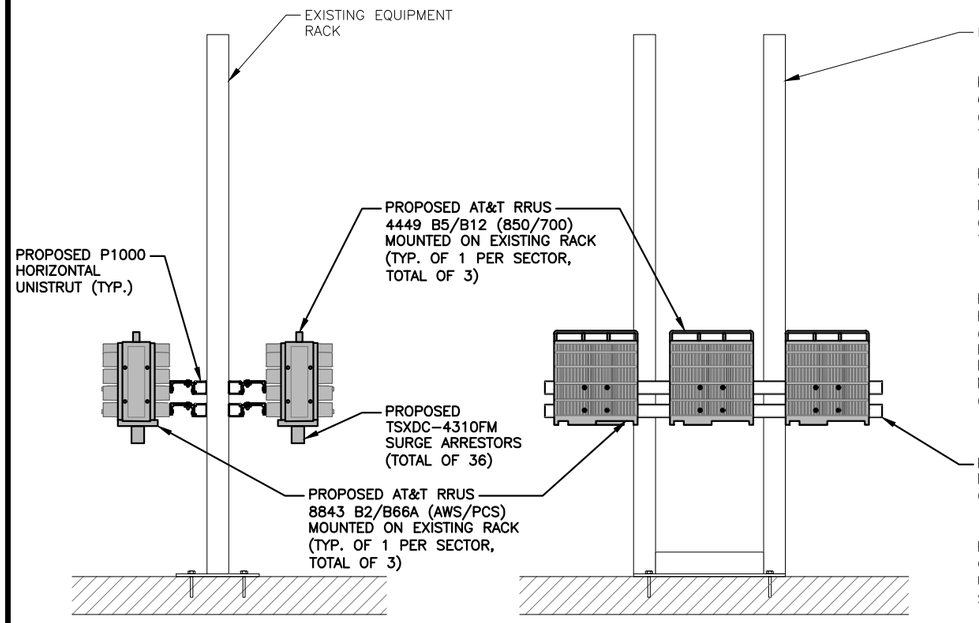
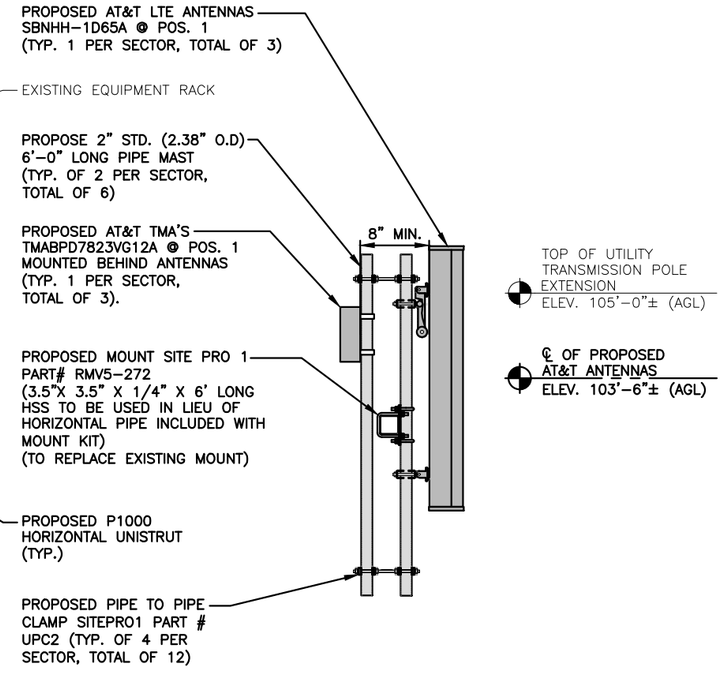
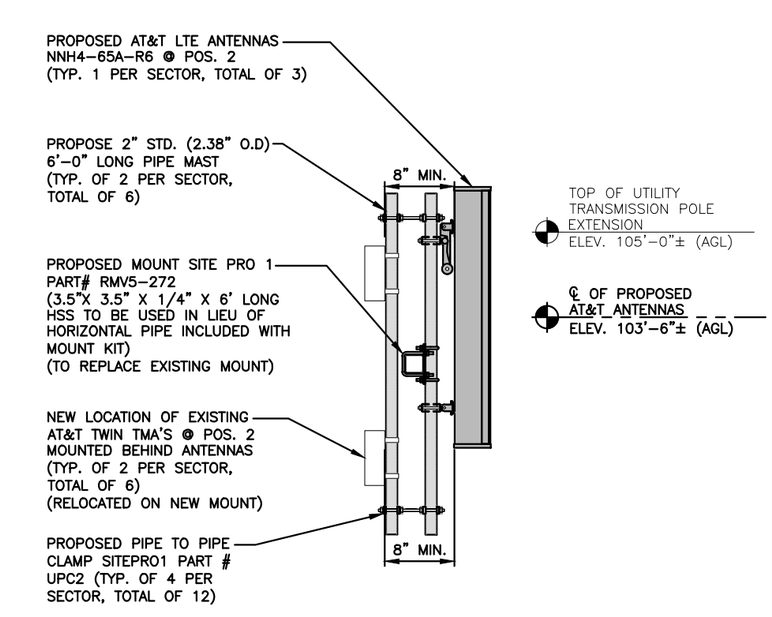


SIDE

FRONT





PROPOSED RRUS DETAILS (1 / A-4)
SCALE: N.T.S

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

0 8" 1'-4" 2'-8" 4'-0"

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

0 8" 1'-4" 2'-8" 4'-0"

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STATE OF CONNECTICUT
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DETAILS
LTE 4C_5C_4TX4RX 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5150	A-4	1

STRUCTURAL NOTES:

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

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

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

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

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

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

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

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STRUCTURAL NOTES
LTE 4C_5C_4TX4RX 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
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NOTE:

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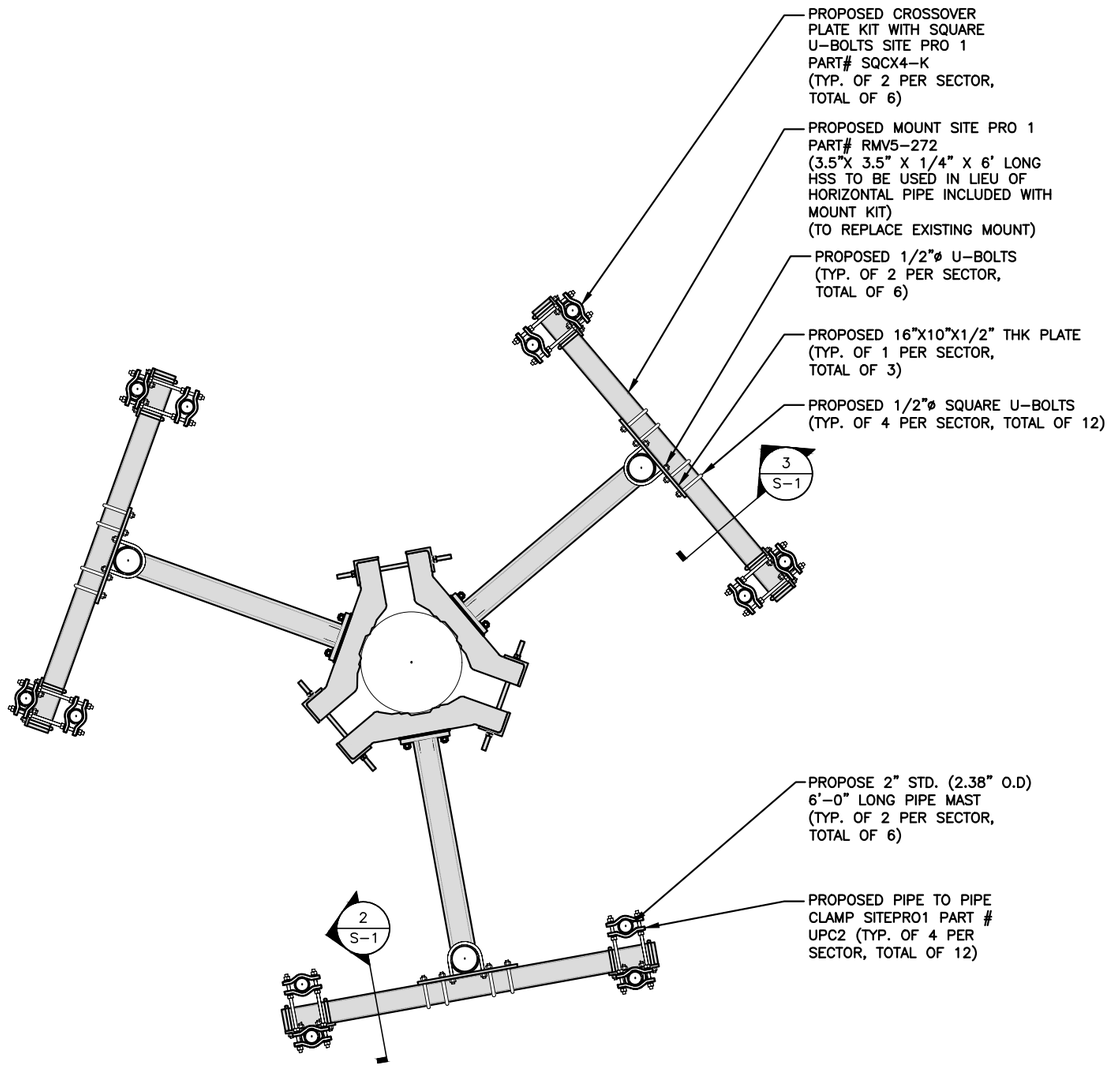

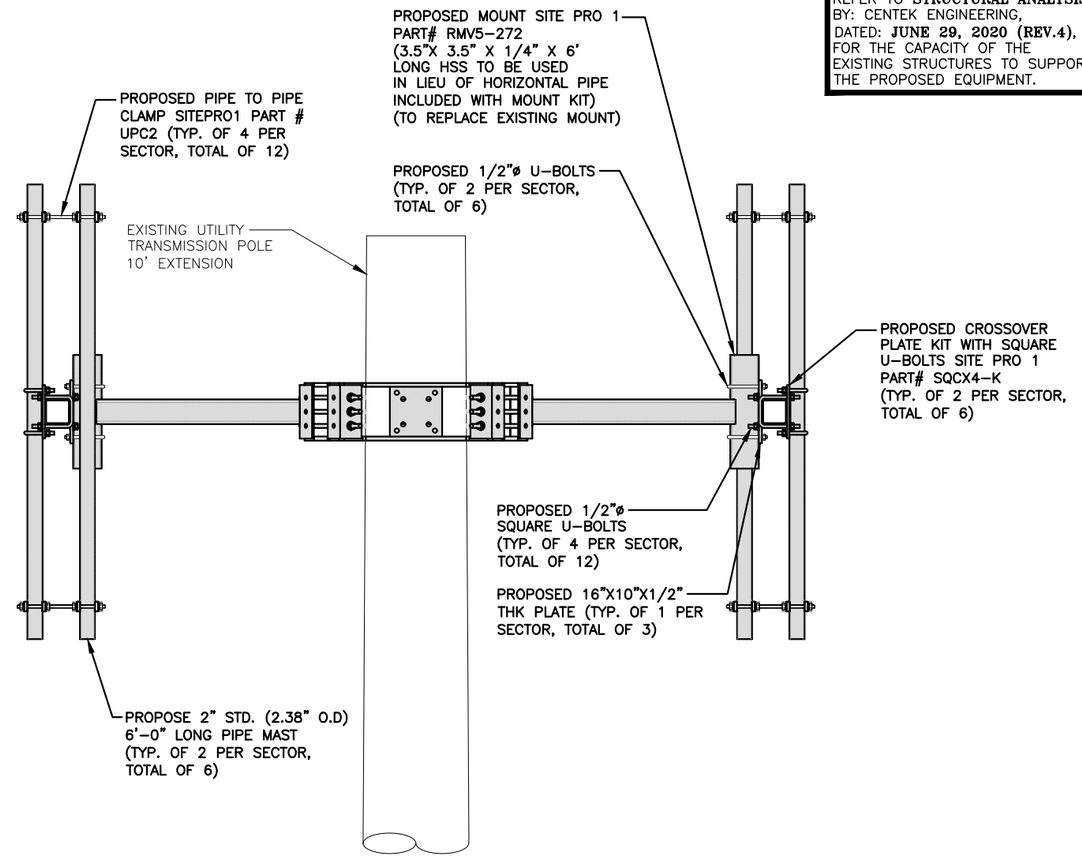

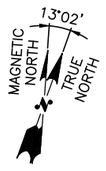

PROPOSED MOUNT PLAN 1 / S-1
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

PROPOSED MOUNT ELEVATION SIDE DETAIL 2 / S-1
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

PROPOSED MOUNT ELEVATION SIDE DETAIL 3 / S-1
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

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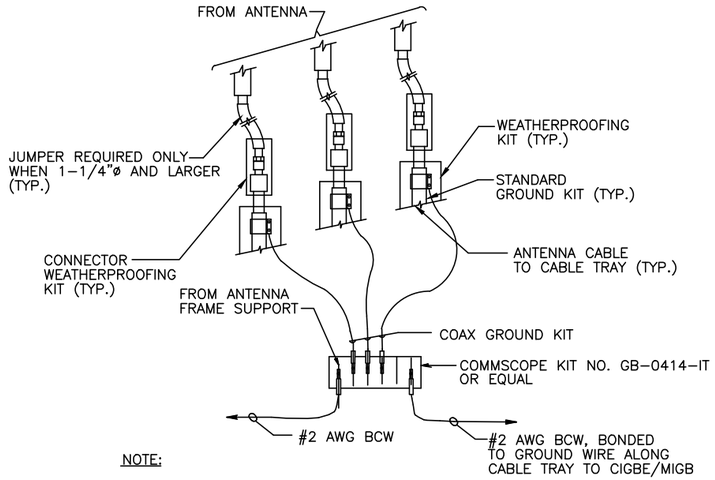
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

MOUNT MODIFICATION DESIGN
LTE 4C_5C_4TX4RX 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5150	S-1	1

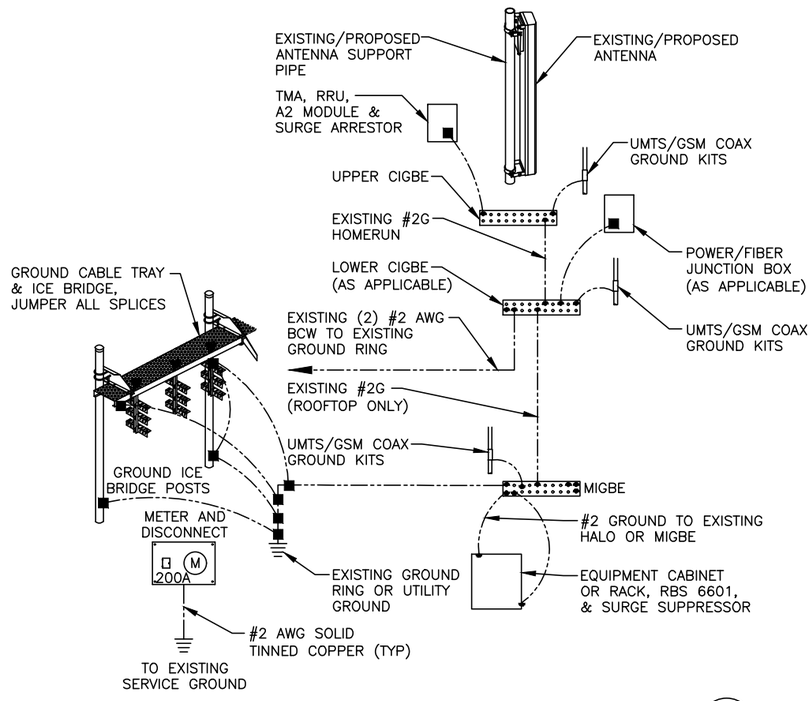


NOTE:

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

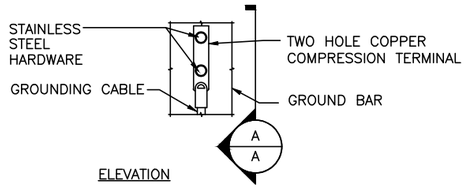
GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1 / G-1)

SCALE: N.T.S



GROUNDING RISER DIAGRAM (2 / 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

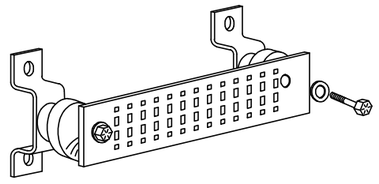
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

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

SECTION "A" – SURGE ABSORBERS

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



GROUND BAR - DETAIL (AS REQUIRED) (4 / G-1)

SCALE: N.T.S

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: CT5150
SITE NAME: OLD GREENWICH RAILROAD STATION

OLD GREENWICH STATION
OLD GREENWICH , CT 06870
FAIRFIELD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	10/19/20	ISSUED FOR CONSTRUCTION	AM	HC	DPH
0	08/26/20	ISSUED FOR REVIEW	ET	HC	DPH
A	09/23/19	ISSUED FOR REVIEW	ET	AT	DPH

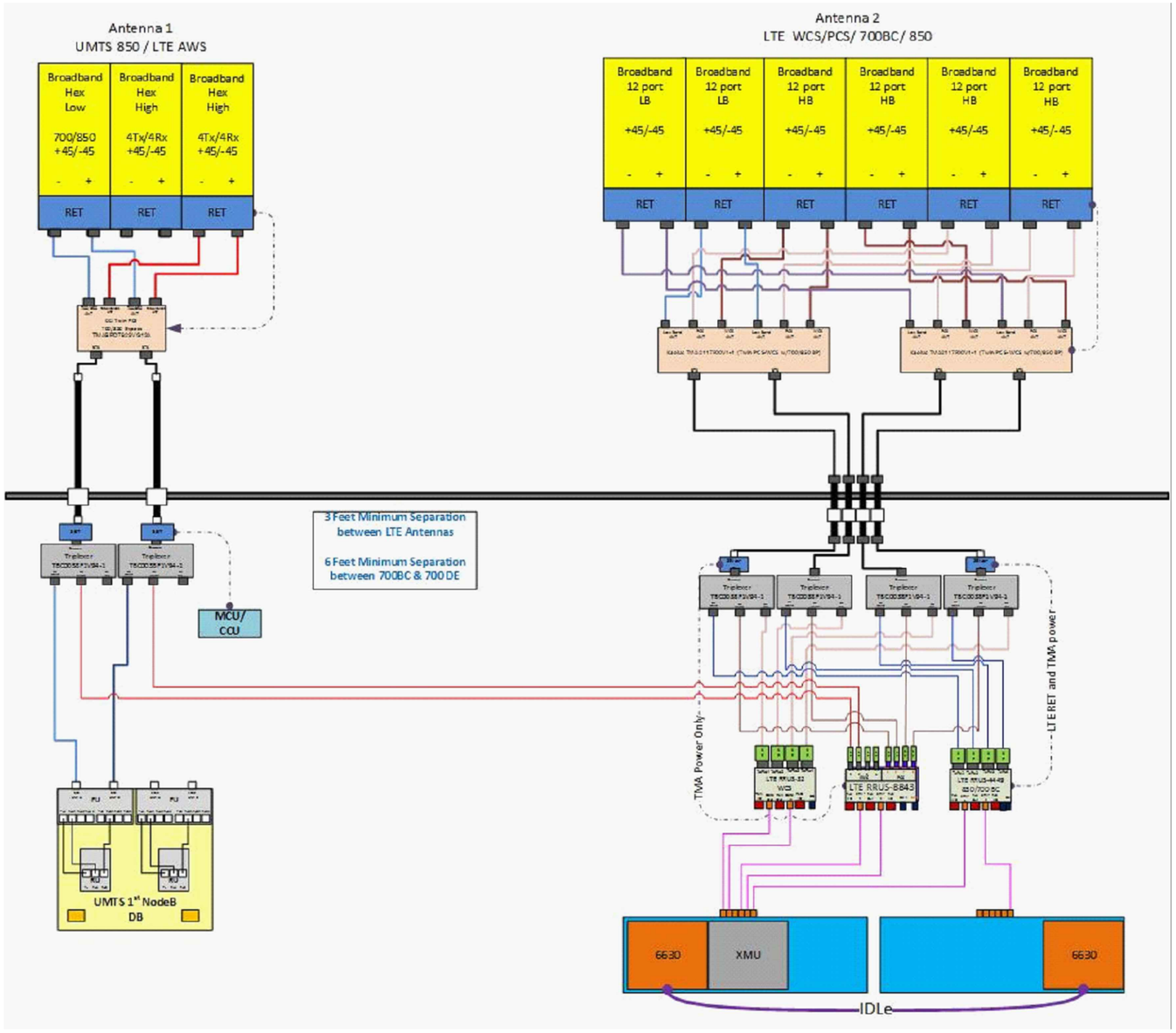
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: ET

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

AT&T

GROUNDING DETAILS
LTE 4C_5C_4TX4RX 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5150	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.

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5150
SITE NAME: OLD GREENWICH RAILROAD STATION

OLD GREENWICH STATION
OLD GREENWICH , CT 06870
FAIRFIELD COUNTY

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

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A	09/23/19	ISSUED FOR REVIEW	ET	AT	DPH

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

AT&T

RF PLUMBING DIAGRAM
LTE 4C_5C_4TX4RX 2020 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5150	RF–1	1

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Antenna Mast and Tower

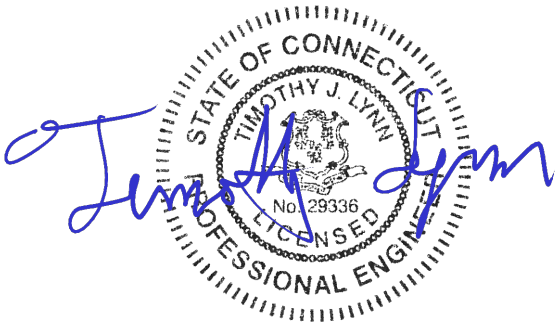
Eversource Structure No. 1255
95' Electric Transmission Pole

AT&T Site #: CT5150
AT&T Site Name: Old Greenwich Railroad Station
Project: LTE 4C / 5C
PACE #: MRCTB040768/ MRCTB040537/ MRCTB040703
PT #: 2051A0PQS5/ 2051A0PQJ1/ 2051A0PQDR
FA #: 10071192

Old Greenwich Station
Greenwich, CT

CENTEK Project No. 19158.00

~~Date: November 11, 2019~~
Rev 4: June 29, 2020



Max Stress Ratio = 99.9%

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

Table of Contents

Introduction

The purpose of this report is to analyze the existing mast and 95' utility pole located at Old Greenwich Station in Greenwich, CT for the proposed antenna and equipment upgrade by AT&T.

The existing/proposed loads consist of the following:

- AT&T (Existing to Remain/Relocate):

  Antennas: Six (6) Kaelus TMA2117f00v1-1 TMAs relocated to three (3) proposed T-Arms with handrails with a RAD center elevation of 103.5-ft above grade level.
  Coax Cables: Eighteen (18) 1-1/4" ∅ coax cables running on the exterior of the pole.

- **AT&T (Proposed):**

  Antennas: Three (3) Commscope SBNHH-1D65A panel antennas, three (3) Commscope NNH4-65A-R6 panel antennas and three (3) CCI TMABPD7823VG12A TMAs mounted to three (3) proposed T-Arms with handrails with a RAD center elevation of 103.5-ft above grade level.

Primary assumptions used in the analysis

- ASCE Manual No. 48-05, "Design of Steel Transmission Pole Structures", defines steel stresses for evaluation of the utility pole.
- All utility tower members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- All coaxial cable will be installed within the antenna mast unless specified otherwise.
- Antenna 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.
- Antenna 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 14"x0.375" x 10' long pipe conforming to ASTM A500 Grade B (Fy = 42ksi) connected at one point to the existing pole was analyzed for its ability to resist loads prescribed by the TIA/EIA 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 48-05, "Design of Steel Transmission Pole Structures", NESC C2-2017 and Eversource Design Criteria.

- UTILITY POLE ANALYSIS

  The purpose of this analysis is to determine the adequacy of the existing utility structure to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the Eversource Design Criteria Table, NESC C2-2017 ~ Construction Grade B, and ASCE Manual No. 48-05, "Design Of Steel Transmission Pole Structures".

  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……	110 mph [(1)]
Radial Ice Thickness……	0"

  Note 1: NESC C2-2017, 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 Design Criteria Table, TIA/EIA-222-G and AISC standards.

  Load cases considered:

  Load Case 1:
  Wind Speed…….... 93 mph (2018 CSBC Appendix -N)
  Radial Ice Thickness……. 0”

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

R e s u l t s

- MAST ASSEMBLY

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

Member	Stress Ratio (% of capacity)	Result
HSS 14”x0.375”	17.6%	**PASS**
Connection	67.4%	**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 48-05, “Design of Steel Transmission Pole Structures” for the applied NESC Heavy and Extreme load cases. The detailed analysis results are provided in Section 9 of this report. The analysis results are summarized as follows:

  A maximum usage of **99.96%** 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	00.00-15.00’ (AGL)	99.96%	**PASS**

  BASE PLATE:

  The base plate was found to be within allowable limits from the PLS output based on 16 bend lines.

Tower Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Base Plate	Bending	98.67%	**PASS**

- FOUNDATION AND ANCHORS

The existing foundation consists of a 10-ft ∅ x 15.5-ft long reinforced concrete caisson. The base of the tower is connected to the foundation by means of (12) 2.25"∅, ASTM A615-75 anchor bolts embedded approximately 6-ft into the concrete foundation structure. Foundation information was obtained from NUSCO drawing # 01037-60005.

BASE REACTIONS:

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

Load Case	Shear	Axial	Moment
NESC Heavy Wind	13.30 kips	41.85 kips	1069.23 ft-kips
NESC Extreme Wind	22.32 kips	20.42 kips	1665.17 ft-kips

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

ANCHOR BOLTS:

The anchor bolts were found to be within allowable limits.

Tower Component	Design Limit	Stress Ratio (% of capacity)	Result
Anchor Bolts	Tension	65.17 %	**PASS**

FOUNDATION:

The foundation was found to be within allowable limits.

Foundation	Design Limit	Proposed Loading	Result
Reinforced Concrete Caisson	Moment Capacity	20.0%	**PASS**
	Lateral Deflection	4.69 in	**PASS**

Note 2: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.

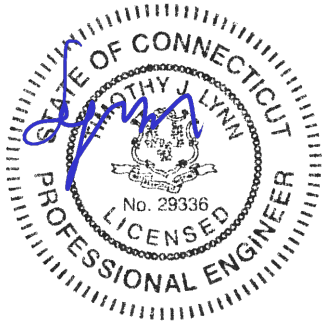
Conclusion

This analysis shows that the subject utility pole **is adequate** to support the proposed AT&T 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.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA-3D

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

Modeling Features

- Comprehensive CAD-like 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

Graphics Features

- 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

Design Codes

- 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

Design Features

- 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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-POLE

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

Modeling Features:

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

Analysis Features:

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

Results Features:

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

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

Introduction

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

ANSI Standard TIA-222-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 C2-2017 (National Electrical Safety Code) covering the design of electric transmission metal structures is based upon an ultimate strength/yield stress design approach. This approach applies a multiplier (overload capacity factor) to the loads possible from extreme weather loading conditions, and designs the structure so that it does not exceed its ultimate strength (yield stress).

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

Two extreme weather conditions are considered. The first is an extreme wind condition (hurricane) based upon a 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 “Eversource Design Criteria”. This specifies uniform loadings (different from the TIA loadings) on the each of the following components of the installed facility:

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

The uniform loadings and factors specified for the above components in the table are based upon the National Electrical Safety Code 2017 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

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

Attachment A
Eversource Design Criteria

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

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

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

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

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

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

c) Electric Transmission Structure

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

ii) Shape Factor Multiplier:

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

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

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

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

Project: 1740/1750 Lines, Structure 1255
Date: 9/25/19
Engineer: JS
Purpose: Recalculate wire loads for AT&T site.

Shield Wires:
1740: 336 "Linnet" ACSR, sagged in PLS-CADD
1750: AFL DNO-8363 OPGW, sagged in PLS-CADD

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

NESC 250B

1740 Line				**1750 Line**	
Linnet	**V**	785		802	**V OPGW**
	T	791		752	**T**
	L	0		0	**L**
Top Phase:	**V**	2020		2007	**V**
	T	1107		1124	**T**
	L	0		0	**L**
Mid Phase:	**V**	2004		2013	**V**
	T	1119		1119	**T**
	L	0		0	**L**
Bot Phase:	**V**	2019		1988	**V**
	T	1121		1142	**T**
	L	0		0	**L**

Project: 1740/1750 Lines, Structure 1255
Date: 9/25/19
Engineer: JS
Purpose: Recalculate wire loads for AT&T site.

Shield Wires:
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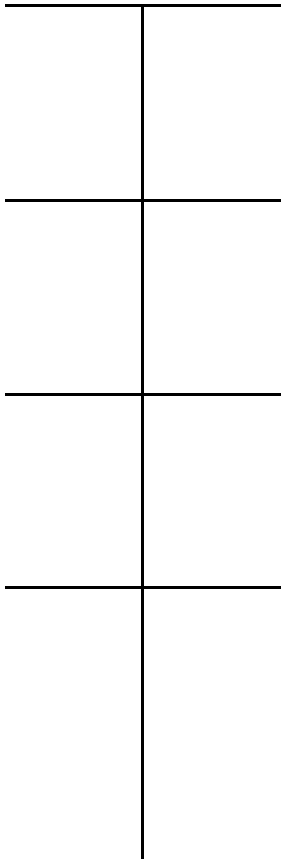
1750: AFL DNO-8363 OPGW, sagged in PLS-CADD

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

NESC 250C

1740 Line			**1750 Line**	
Linnet	**V**	103	131	**V OPGW**
	T	1018	947	**T**
	L	0	0	**L**
Top Phase:	**V**	777	767	**V**
	T	1926	1936	**T**
	L	0	0	**L**
Mid Phase:	**V**	771	776	**V**
	T	1884	1883	**T**
	L	0	0	**L**
Bot Phase:	**V**	785	763	**V**
	T	1828	1841	**T**
	L	0	0	**L**



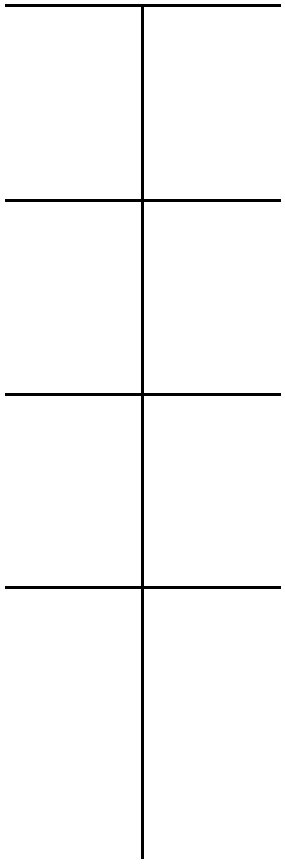
Project: 1740/1750 Lines, Structure 1255
Date: 9/25/19
Engineer: JS
Purpose: Recalculate wire loads for AT&T site.

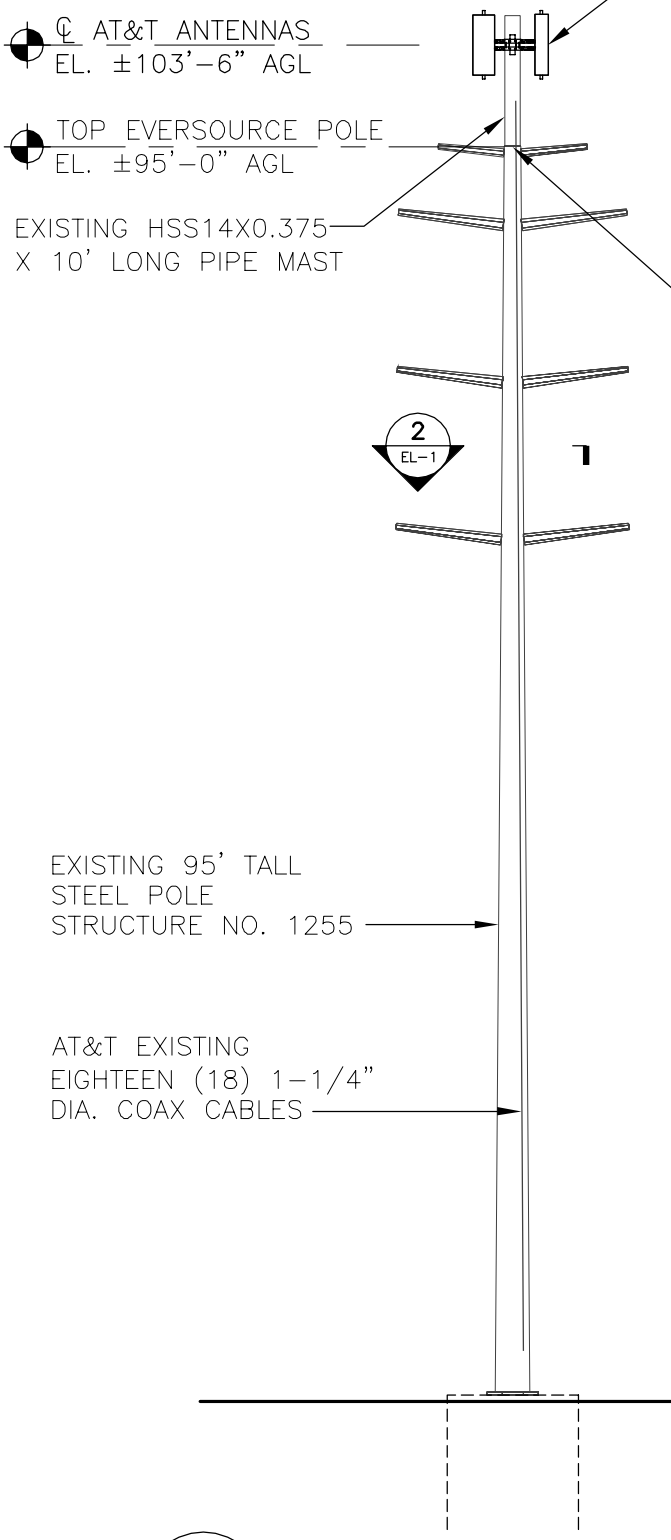
Shield Wires:
1740: 336 "Linnet" ACSR, sagged in PLS-CADD
1750: AFL DNO-8363 OPGW, sagged in PLS-CADD

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

NESC 250C - 23 PSF

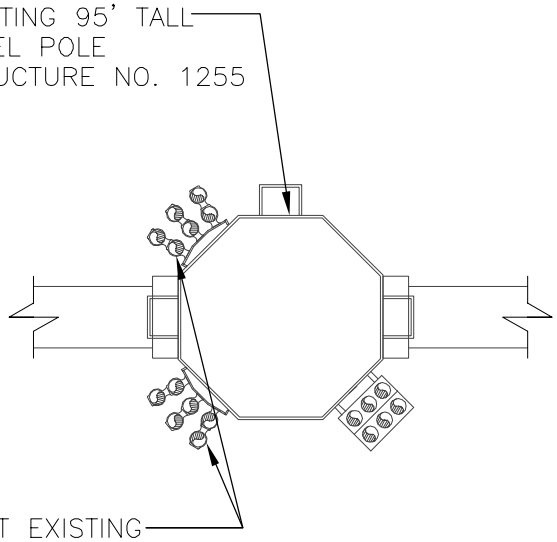
1740 Line				**1750 Line**	
Linnet	**V**	116		139	**V OPGW**
	T	761		708	**T**
	L	0		0	**L**
Top Phase:	**V**	752		743	**V**
	T	1448		1456	**T**
	L	0		0	**L**
Mid Phase:	**V**	743		749	**V**
	T	1453		1454	**T**
	L	0		0	**L**
Bot Phase:	**V**	752		734	**V**
	T	1455		1466	**T**
	L	0		0	**L**





AT&T (EXISTING TO REMAIN): SIX (6) KAELUS TMA2117F00V1-1 TMAs.
AT&T (PROPOSED): THREE (3) COMMSCOPE NNH4-65A-R6 PANEL ANTENNAS, THREE (3) COMMSCOPE SBNHH-1D65A PANEL ANTENNAS AND THREE (3) CCI TMABPD7823VG12A TMAs MOUNTED ON PROPOSED SITEPRO TRIPLE T-ARM (P/N: RMV5-272). **REPLACE EXISTING PIPE HORIZONTALS WITH HSS3.5"X3.5"X1/4" X 6'-0" LONG.**

MAST TO TOWER CONNECTION BOLTS ASSUMED TO BE 5/8" ø. CONTRACTOR TO V.I.F. AND NOTIFY EOR OF ANY DISCREPANCY.



2 / EL-1 **COAX PLAN**
SCALE: NOT TO SCALE

1 / EL-1 **TOWER & MAST ELEVATION**
SCALE: NOT TO SCALE

REVISIONS		
00	11/11/19	ISSUED FOR REVIEW
01	01/29/20	ISSUED FOR REVIEW
02	04/28/20	ISSUED FOR REVIEW
04	06/29/20	CONSTRUCTION

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CT5150
STRUCTURE 1255

OLD GREENWICH STATION
GREENWICH, CT 06870

PROJECT NO:	19158.00
DRAWN BY:	FJP
CHECKED BY:	TJL
SCALE:	AS NOTED
DATE:	11/11/19

TOWER AND MAST ELEVATION

EL-1

DWG. 1 OF 1

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Branford, CT 06405 F: (203) 488-8587

Subject:	Loads on T-Mobile Mast - Structure 1255
Location:	Greenwich, CT
Rev. 4: 6/29/20	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19158.00

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

Wind Speeds

Basic Wind Speed	$V := 93$	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 =	$h := 95$	ft	(User Input)
Height to Center of Antennas =	$z_{T\text{-}Mo} := 103.5$	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)

$$K_{iz} := \left(\frac{z_{T\text{-}Mo}}{33}\right)^{0.1} = 1.121 \qquad t_{izT\text{-}Mo} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.102$$

Velocity Pressure Coefficient Antennas =

$$Kz_{T\text{-}Mo} := 2.01\left(\left(\frac{z_{T\text{-}Mo}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.275$$

Velocity Pressure w/o Ice Antennas =

$$qz_{T\text{-}Mo} := 0.00256 \cdot K_d \cdot Kz_{T\text{-}Mo} \cdot V^2 \cdot I_{Wind} = 30.837$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.T\text{-}Mo} := 0.00256 \cdot K_d \cdot Kz_{T\text{-}Mo} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 7.751$$

Velocity Pressure Service =

$$qz_{T\text{-}Mo.Ser} := 0.00256 \cdot K_{dSer} \cdot Kz_{T\text{-}Mo} \cdot V_{Ser}^2 \cdot I_{Ser} = 9.986$$

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

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=

$$qz_{Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V^2 \cdot I_{Wind} = 30.615$$

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 =

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

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Subject:	Loads on T-Mobile Mast - Structure 1255
Location:	Greenwich, CT
Rev. 4: 6/29/20	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19158.00

Development of Wind & Ice Load on Mast

Mast Data: (HSS14"x0.375") (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 14$ in (User Input)

Mast Length = $L_{mast} := 10$ ft (User Input)

Mast Thickness = $t_{mast} := 0.375$ in (User Input)

Mast Aspect Ratio = $Ar_{mast} := \frac{12 L_{mast}}{D_{mast}} = 8.6$

Mast Force Coefficient = $Ca_{mast} = 0.83$

Wind Load (without ice)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.167$ sf/ft

Total Mast Wind Force = $qz_{Mast1} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 40$ plf **BLC 5**

Wind Load (with ice)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2 \cdot t_{izMast1}\right)}{12} = 1.516$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast1} \cdot G_H \cdot Ca_{mast} \cdot AICE_{mast} = 13$ plf **BLC 4**

Wind Load (Service)

Total Mast Wind Force Service Loads = $qz_{Mast1.Ser} \cdot G_H \cdot Ca_{mast} \cdot A_{mast} = 13$ 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 = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast1} \cdot 2\right)^2 - D_{mast}^2\right] = 105.9$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 41$ plf **BLC 3**

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Subject: Loads on T-Mobile Mast - Structure 1255

Location: Greenwich, CT

Rev. 4: 6/29/20

Prepared by: T.J.L. Checked by: C.A.G.
Job No. 19158.00

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope SBNHH-1D65A			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 55.6$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 33.5$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.7$			
Antenna Force Coefficient =	$Ca_{ant} = 1.3$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 13.8$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 744$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\text{-}Mo})}{144} = 6.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 20.1$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 272$	lbs	**BLC 4**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 241$	lbs	**BLC 6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 101$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 4698$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izT\text{-}Mo})(W_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\text{-}Mo}) - V_{ant} = 6189$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 201$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 602$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope NNH4-65A-R6			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 55.1$	in	(User Input)	
Antenna Width =	$W_{ant} := 19.6$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 7.8$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 103$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 2.8$			
Antenna Force Coefficient =	$Ca_{ant} = 1.21$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 7.5$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 22.5$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 1137$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\text{-}Mo})}{144} = 9.8$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 29.4$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 374$	lbs	**BLC 4**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 368$	lbs	**BLC 6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 309$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 8424$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izT\text{-}Mo})(W_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\text{-}Mo}) - V_{ant} = 8522$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 276$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 829$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Kaelus TMA2117F00V1-1			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 8.46$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.81$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 4.21$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 18$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 6$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 0.7$			
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 =	$A_{ant} := SA_{ant} \cdot N_{ant} = 4.2$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 208$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\text{-}Mo})}{144} = 1.4$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 8.5$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 106$	lbs	**BLC 4**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 67$	lbs	**BLC 6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 108$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 421$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izT\text{-}Mo})(W_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\text{-}Mo}) - V_{ant} = 1286$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 42$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 250$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CCI TMABPD7823VG12A			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 10.7$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.1$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 3.8$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 25$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.0$			
Antenna Force Coefficient =	$Ca_{ant} = 1.2$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.8$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 2.5$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 124$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (W_{ant} + 2 \cdot t_{izT\text{-}Mo})}{144} = 1.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 4.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 60$	lbs	**BLC 4**

Wind Load (Service)

Total Antenna Wind Force Service Loads =	$F_{ant.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 40$	lbs	**BLC 6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 75$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 451$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izT\text{-}Mo})(W_{ant} + 2 \cdot t_{izT\text{-}Mo}) \cdot (T_{ant} + 2 \cdot t_{izT\text{-}Mo}) - V_{ant} = 1374$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 45$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 134$	lbs	**BLC 3**

CENTEK engineering
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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Subject:	Loads on T-Mobile Mast - Structure 1255
Location:	Greenwich, CT
Rev. 4: 6/29/20	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19158.00

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type: SitePro Triple T-Arm p/n RMV5-272 (w/ HSS Horz)

Mount Shape =	Flat		(User Input)
Mount Projected Surface Area =	$CaAa := 6.5$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CaAa_{ice} := 9.5$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 950$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 1100$	lbs	

Wind Load (without ice)

Total Mount Wind Force = $F_{mnt} := qz_{T\text{-}Mo} \cdot G_H \cdot CaAa = 271$ lbs **BLC 5**

Wind Load (with ice)

Total Mount Wind Force = $Fi_{mnt} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot CaAa_{ice} = 99$ lbs **BLC 4**

Wind Load (Service)

Total Mount Wind Force = $F_{mnt.Ser} := qz_{T\text{-}Mo.Ser} \cdot G_H \cdot CaAa = 88$ lbs **BLC 6**

Gravity Loads (without ice)

Weight of All Mounts = $WT_{mnt} = 950$ lbs **BLC 2**

Gravity Loads (ice only)

Weight of Ice on All Mounts = $WT_{mnt.ice} - WT_{mnt} = 150$ lbs **BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 1-1/4"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.55$	in	(User Input)
Coax Cable Length =	$L_{coax} := 10$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 0.66$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 18$		(User Input)
No. of Coax Projecting Outside Face of Memeber =	$NP_{coax} := 4$		(User Input)

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

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

Wind Load (without ice)

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

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{Mast1} \cdot G_H \cdot A_{coax} = 26$ plf **BLC 5**

Wind Load (with ice)

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

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

Wind Load (Service)

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

Gravity Loads (without ice)

Weight of all cables w/o ice = $WT_{coax} := Wt_{coax} \cdot N_{coax} = 12$ plf **BLC 2**

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot t_{izMast1})^2 - D_{coax}^2\right] = 24$ sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 168$ 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 530-05: 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 Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Existing Mast	HSS14x0.375	Column	Pipe	A500 Gr.42	Typical	15	349	349	698

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Existing Mast	10			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N4			Existing Mast	Column	Pipe	A500 Gr...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N4	0	10	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	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.101	8.5
2	M1	Y	-.309	8.5
3	M1	Y	-.108	8.5
4	M1	Y	-.075	8.5
5	M1	Y	-.95	8.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.602	8.5
2	M1	Y	-.829	8.5
3	M1	Y	-.25	8.5
4	M1	Y	-.134	8.5
5	M1	Y	-.15	8.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.272	8.5
2	M1	X	.374	8.5
3	M1	X	.106	8.5
4	M1	X	.06	8.5
5	M1	X	.099	8.5

Member Point Loads (BLC 5 : TIA Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.744	8.5
2	M1	X	1.137	8.5
3	M1	X	.208	8.5
4	M1	X	.124	8.5
5	M1	X	.271	8.5

Member Point Loads (BLC 6 : Service Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.241	8.5
2	M1	X	.368	8.5
3	M1	X	.067	8.5
4	M1	X	.04	8.5
5	M1	X	.088	8.5

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	-.012	-.012	0	6

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	-.168	-.168	0	6
2	M1	Y	-.041	-.041	0	0

Member Distributed Loads (BLC 4 : 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	.011	.011	0	6
2	M1	X	.013	.013	0	6

Member Distributed Loads (BLC 5 : TIA Wind)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.026	.026	0	6
2	M1	X	.04	.04	0	6

Member Distributed Loads (BLC 6 : Service Wind)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.008	.008	0	6
2	M1	X	.013	.013	0	6

Basic Load Cases

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

Load Combinations

	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	1.2D + 1.6W	Yes	Y		1	1.2	2	1.2	5	1.6																
2	0.9D + 1.6W	Yes	Y		1	.9	2	.9	5	1.6																
3	1.2D + 1.0Di + 1.0Wi	Yes	Y		1	1.2	2	1.2	3	1	4	1														
4	1.0D + 1.0 W(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	N1	max	-.93	4	5.933	3	0	4	0	4	0	4	35.708	1
2		min	-4.608	1	1.913	2	0	1	0	1	0	1	7.216	4
3	Totals:	max	-.93	4	5.933	3	0	4						
4		min	-4.608	1	1.913	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	N1	max	0	4	0	4	0	4	0	4	0	4	0	4
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N4	max	.232	1	0	2	0	4	0	4	0	4	-5.304e-04	4
4		min	.047	4	-.001	3	0	1	0	1	0	1	-2.623e-03	1

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

	Member	Shape	Code Check	Lo...	LC	She...	Lo...	...	phi*P...	phi*P...	phi*...	phi*...	Cb	Eqn
1	M1	HSS14x0.375	.176	0	1	.027	0	1	545....	567	205....	205....	1.9..	H1-...

Joint Reactions

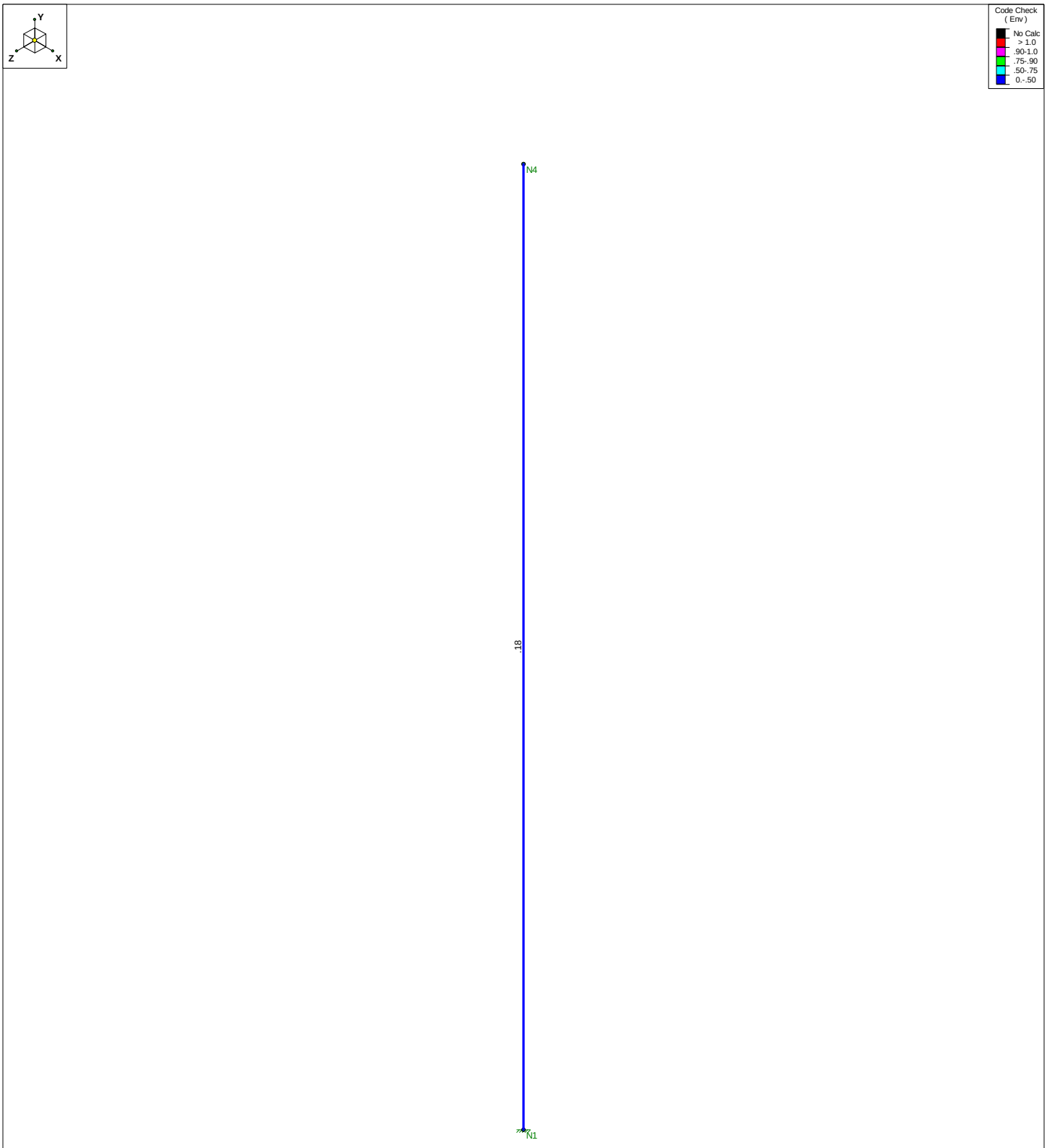
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	-4.608	2.55	0	0	0	35.708
2	1	Totals:	-4.608	2.55	0			
3	1	COG (ft):	X: 0	Y: 7.473	Z: 0			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N1	-4.608	1.913	0	0	0	35.702
2	2	Totals:	-4.608	1.913	0			
3	2	COG (ft):	X: 0	Y: 7.473	Z: 0			

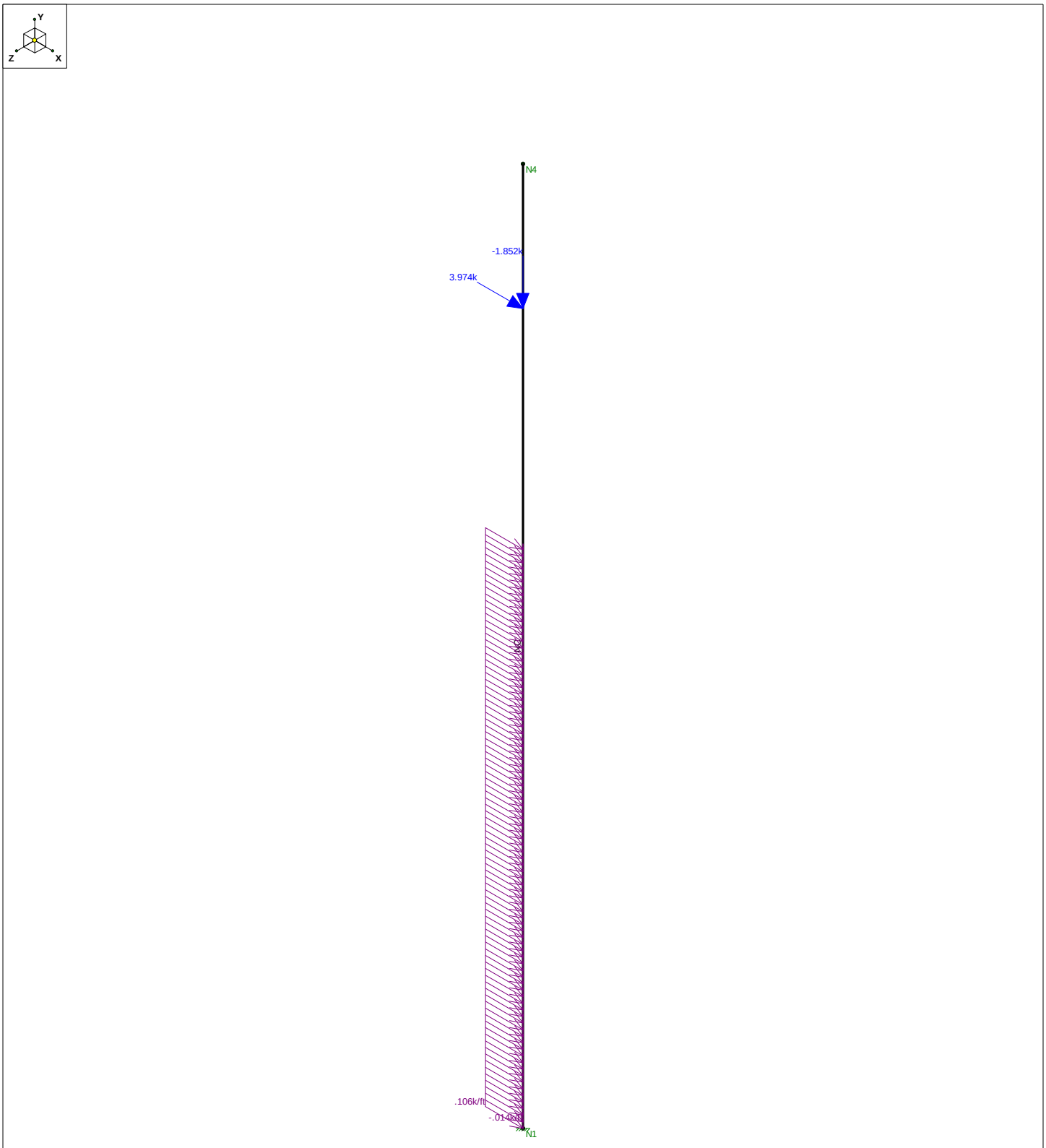
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N1	-1.055	5.933	0	0	0	8.189
2	3	Totals:	-1.055	5.933	0			
3	3	COG (ft):	X: 0	Y: 6.882	Z: 0			



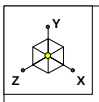
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:11 PM
19158.00 / CT5150	Unity Check	TIA Loading.r3d



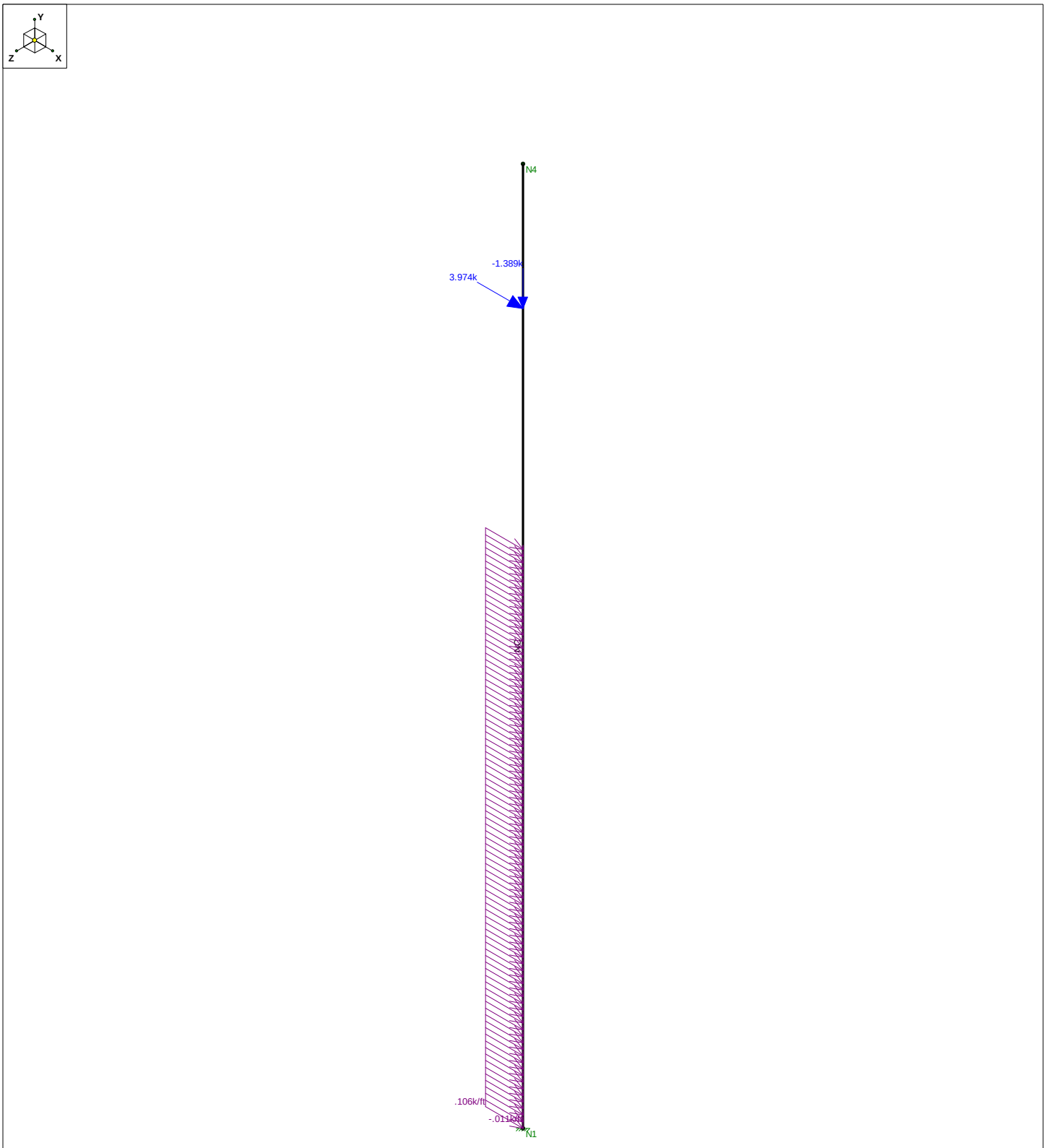
Member Code Checks Displayed
Loads: LC 1, 1.2D + 1.6W

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:11 PM
19158.00 / CT5150	LC #1 Loads	TIA Loading.r3d



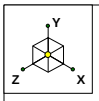
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:13 PM
19158.00 / CT5150	LC #1 Reactions	TIA Loading.r3d



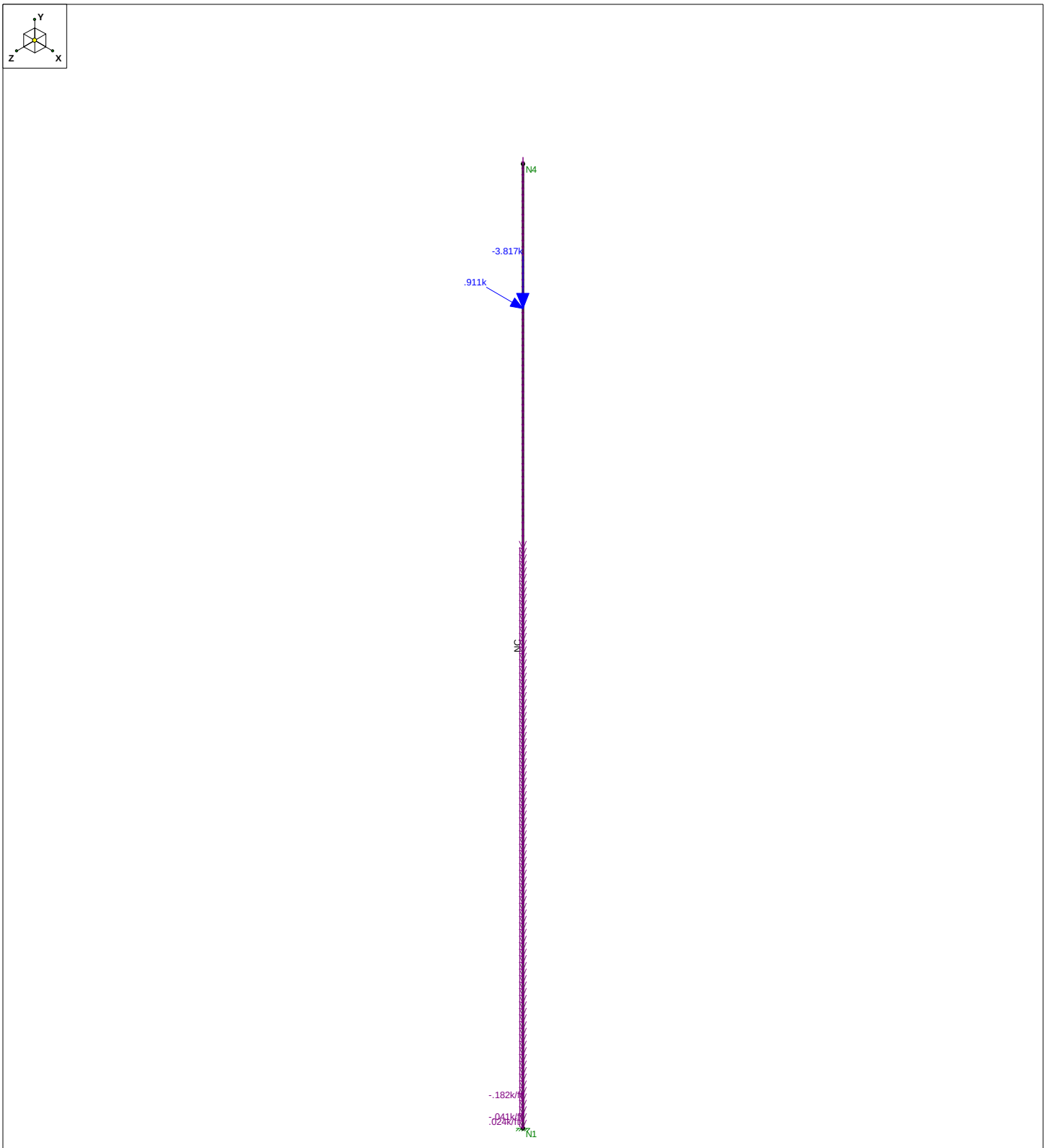
Member Code Checks Displayed
Loads: LC 2, 0.9D + 1.6W

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:12 PM
19158.00 / CT5150	LC #2 Loads	TIA Loading.r3d



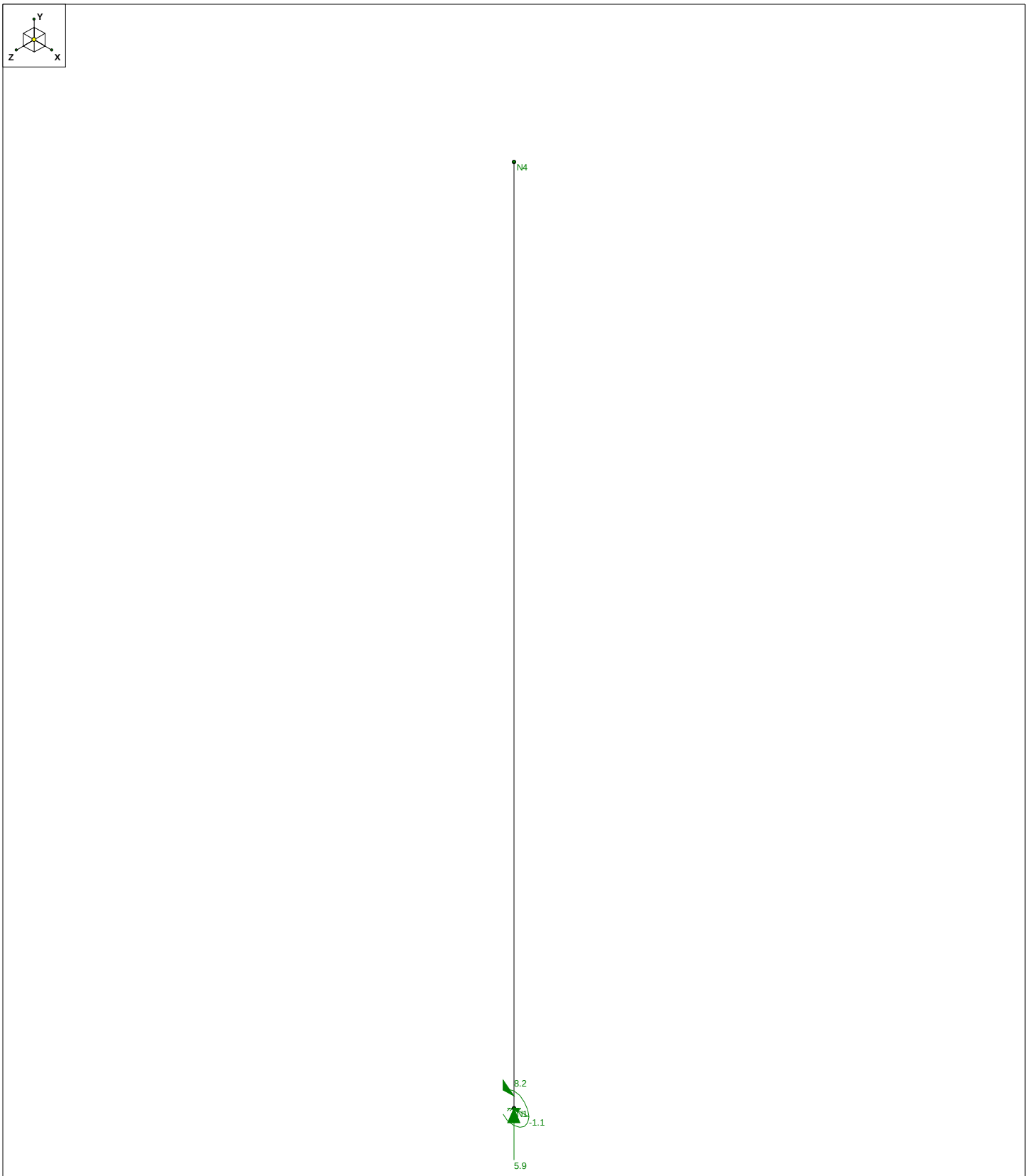
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:14 PM
19158.00 / CT5150	LC #2 Reactions	TIA Loading.r3d



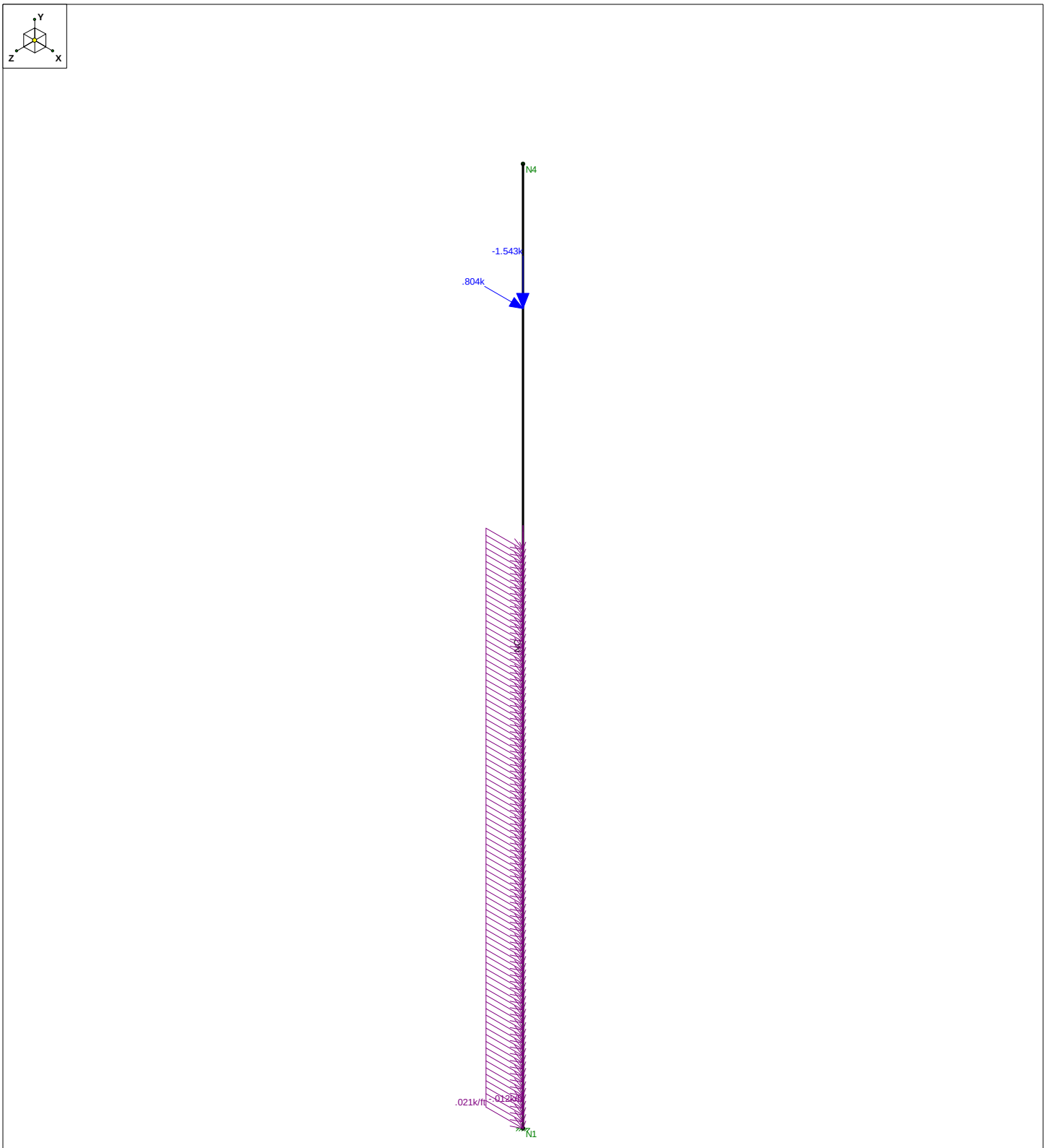
Member Code Checks Displayed
Loads: LC 3, 1.2D + 1.0Di + 1.0Wi

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:12 PM
19158.00 / CT5150	LC #3 Loads	TIA Loading.r3d



Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:15 PM
19158.00 / CT5150	LC #3 Reactions	TIA Loading.r3d



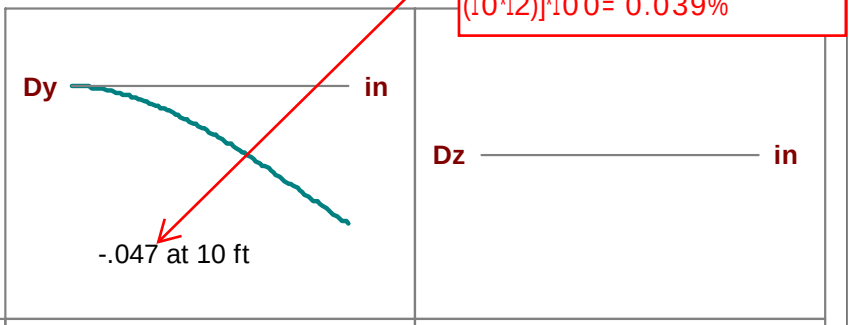
Member Code Checks Displayed
Loads: LC 4, 1.0D + 1.0 W(Service)

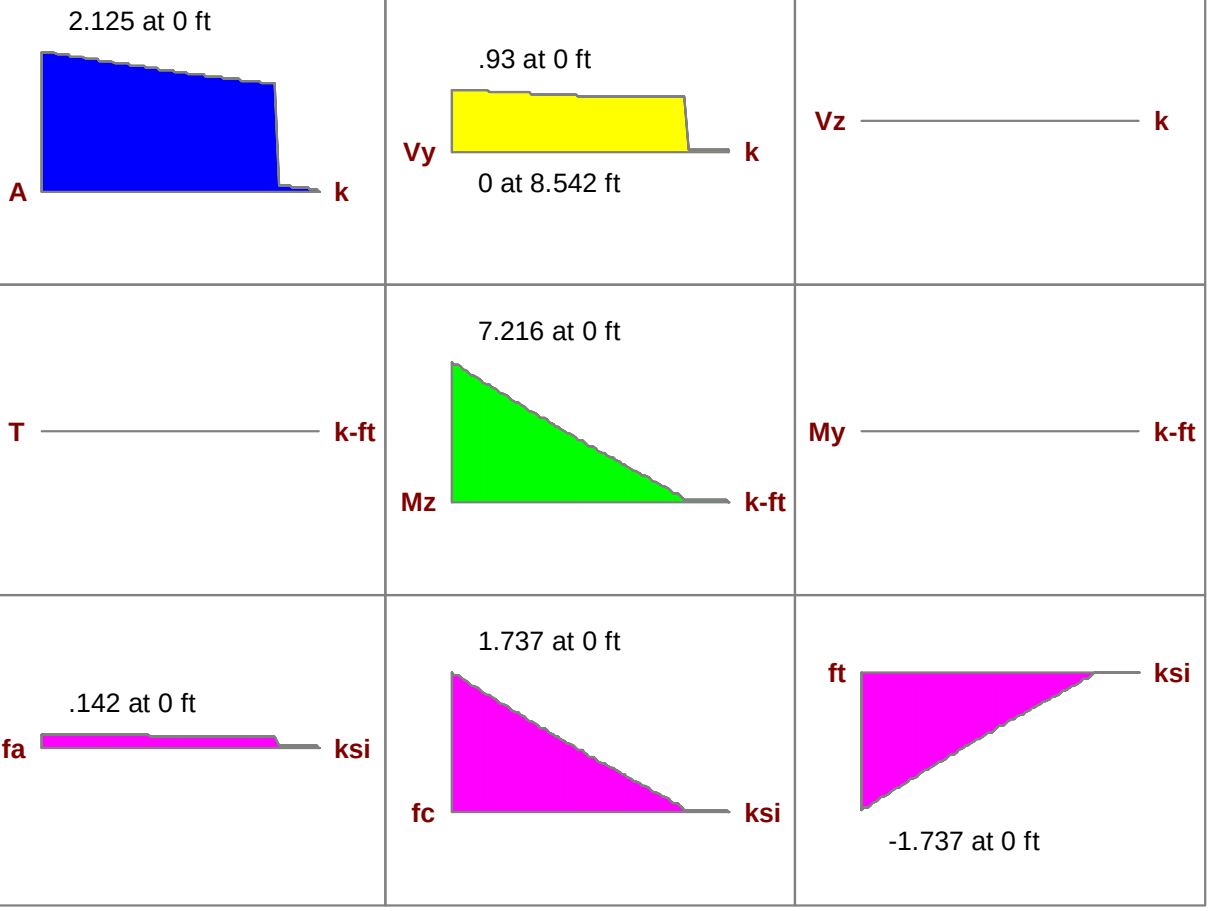
CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:12 PM
19158.00 / CT5150	LC #4 Loads	TIA Loading.r3d

Column: ***M1***

Shape: **HSS14x0.375**
Material: **A500 Gr.42**
Length: **10 ft**
I Joint: **N1**
J Joint: **N4**
LC 4: 1.0D + 1.0 W(Service)
Code Check: **0.037 (bending)**
Report Based On 97 Sections

MAX DEFLECTION UNDER SERVICE LOADING =[(.047")/(10*12)]*100= 0.039%





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

Direct Analysis Method

Max Bending Check	**0.037**	Max Shear Check	**0.005 (s)**
Location	**0 ft**	Location	**0 ft**
Equation	**H1-1b**	Max Defl Ratio	**L/2559**

Bending	**Compact**	Compression	**Non-Slender**

			y-y	z-z
Fy	**42 ksi**	Lb	**10 ft**	**10 ft**
phi*Pnc	**545.851 k**	KL/r	**24.878**	**24.878**
phi*Pnt	**567 k**			
phi*Mny	**205.065 k-ft**	L Comp Flange	**10 ft**	
phi*Mnz	**205.065 k-ft**	L-torque	**10 ft**	
phi*Vny	**170.1 k**	Tau_b	**1**	
phi*Vnz	**170.1 k**			
phi*Tn	**193.079 k-ft**			
Cb	**1.934**			

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Subject:	Mast Connection Tower
Location:	Greenwich, CT
Rev. 0: 4/28/20	Prepared by: T.J.L. Checked by: C.A.G. Job No. 19158.00

Mast Connection to Tower:

Design Reactions:

Axial =	Axial := 2.5·kips	(User Input)
Shear =	Shear := 4.6·kips	(User Input)
Moment =	Moment := 35.7·kips·ft	(User Input)

Anchor Bolt Data:

Bolt Grade =	A325	(User Input)
Design Shear Stress =	$F_v := 40.5 \cdot ksi$	(User Input)
Design Tension Stress =	$F_T := 67.5 \cdot ksi$	(User Input)
Total Number of Bolts =	$n_b := 16$	(User Input)
Number of Bolts per Angle =	$n_{b.per} := 4$	(User Input)
Bolt Diameter =	$d_b := 0.625in$	(User Input - Assumed)
Pole Diameter =	$Pole_d := 15.68 \cdot in$	(User Input)
Mast Diameter =	$Mast_d := 14 \cdot in$	(User Input)
Vert Dist Between Connection to Mast and to Tower =	dist := 18·in	(User Input)
Bolt Area =	$a_b := \frac{1}{4} \cdot \pi \cdot d_b^2 = 0.307 \cdot in^2$	

Weld Data:

Weld Grade	E70XX	(User Input)
Weld Yield Stress =	$F_{yw} := 70 \cdot ksi$	(User Input)
Weld Size =	sw := 0.25·in	(User Input - Assumed)
Weld Length (per angle) =	lw := 18·in	(User Input - Assumed 9" per side of tab plate)

Shear Plate to Mast Weld Check:

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

Weld Area (per plate) = $A_w := lw \cdot (sw \cdot 0.707) = 3.18 \cdot in^2$

Weld Stress = $f_w := \frac{Moment}{Mast_d \cdot A_w} + \frac{Axial}{A_w \cdot 4} + \frac{Shear}{A_w \cdot 2} = 10.54 \cdot ksi$

$Condition1 := if(f_w < F_w, "OK", "Overstressed")$

Condition1 = "OK"

Plate to Angle Bolt Check:

Shear per bolt = $V_{bolt} := \frac{Moment}{Mast_d \cdot n_{b.per}} + \frac{Axial}{n_b} + \frac{Shear}{\frac{n_b}{2}} = 8.38 \cdot kips$

Actual Shear Stress = $f_v := \frac{V_{bolt}}{a_b} = 27.32 \cdot ksi$

$Condition2 := if(f_v < F_v, "OK", "Overstressed")$

Condition2 = "OK"

Angle to Tower Bolt Check:

Shear per bolt = $V_{bolt} := \frac{Moment}{Pole_d \cdot n_{b.per}} + \frac{Axial}{n_b} + \frac{Shear \cdot dist}{Pole_d \cdot n_{b.per}} = 8.31 \cdot kips$

Actual Shear Stress = $f_v := \frac{V_{bolt}}{a_b} = 27.08 \cdot ksi$

$Condition3 := if(f_v < F_v, "OK", "Overstressed")$

Condition3 = "OK"

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Subject: Load Analysis of AT&T Equipment on Structure #1255

Location: Greenwich, CT

Rev. 4: 6/29/20

Prepared by: T.J.L Checked by: C.A.G.
Job No. 19158.00

Basic Components

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2017 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 110	mph	(User Input NESC 2017 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 := 105	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 2017 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2017 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.279$ (NESC 2017 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.311$ (NESC 2017 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.848$ (NESC 2017 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.867$ (NESC 2017 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 34.3$ psf (NESC 2017 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

Overload Factors for Wind Loads:

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

Overload Factors for Vertical Loads:

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

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Subject:	Load Analysis of AT&T Equipment on Structure #1255
Location:	Greenwich, CT
Rev. 4: 6/29/20	Prepared by: T.J.L Checked by: C.A.G. Job No. 19158.00

Development of Wind & Ice Load on Mast

Mast Data: (HSS14"x0.375")

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 14$	in	(User Input)
Mast Length =	$L_{mast} := 10$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.375$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.167$

Total Mast Wind Force (Above Utility Structure) w/ Coax = $qz \cdot Cd_{coax} \cdot A_{mast} \cdot m = 80$ plf **BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 1.25$

Total Mast Wind Force w/ Ice = $p \cdot Cd_{coax} \cdot AICE_{mast} = 8$ 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 = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 22.8$ sq in

Weight of Ice on Mast = $W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 9$ plf **BLC 3**

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Subject: Load Analysis of AT&T Equipment on Structure #1255

Location: Greenwich, CT

Rev. 4: 6/29/20

Prepared by: T.J.L Checked by: C.A.G.
Job No. 19158.00

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope SBNHH-1D65A		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.6$	in	(User Input)
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)
Antenna Weight =	$WT_{ant} := 33.5$	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 =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 13.8$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 946$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 5.1$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 15.2$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 97$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 101$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 4698$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1216$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 39$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 118$	lbs	**BLC 3**

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Location: Greenwich, CT

Rev. 4: 6/29/20

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Job No. 19158.00

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope NNH4-65A-R6		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.1$	in	(User Input)
Antenna Width =	$W_{ant} := 19.6$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.8$	in	(User Input)
Antenna Weight =	$WT_{ant} := 103$	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 =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 7.5$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 22.5$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1545$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 8$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 24.1$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 154$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 309$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 8424$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1746$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 57$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 170$	lbs	**BLC 3**

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Subject: Load Analysis of AT&T Equipment on Structure #1255

Location: Greenwich, CT

Rev. 4: 6/29/20

Prepared by: T.J.L Checked by: C.A.G.
Job No. 19158.00

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Kaelus TMA2117F00V1-1		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 8.46$	in	(User Input)
Antenna Width =	$W_{ant} := 11.81$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.21$	in	(User Input)
Antenna Weight =	$WT_{ant} := 18$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 6$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.7$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 4.2$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 286$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 0.8$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 5$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 32$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 108$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 421$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 211$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 7$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 41$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CCI TMABPD7823VG12A		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 10.7$	in	(User Input)
Antenna Width =	$W_{ant} := 11.1$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.8$	in	(User Input)
Antenna Weight =	$WT_{ant} := 25$	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 =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.8$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 2.5$	sf	
Total Antenna Wind Force =	$F_{ant} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 170$	lbs	**BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 1$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.9$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := p \cdot Cd_F \cdot A_{ICEant} = 19$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 75$	lbs	**BLC 2**

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 451$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 228$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 7$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 22$	lbs	**BLC 3**

Development of Wind & Ice Load on Platform

Platform Data:

Platform Model =	SitePro Triple T-Arm RMV5-272 (w/ HSS Horz)			
Mount Shape =	Flat			
Mount Projected Surface Area =	$CdAa := 6.5$	sf	(User Input)	
Mount Projected Surface Area w/ Ice =	$CdAa_{ice} := 9.5$	sf	(User Input)	
Mount Weight =	$WT_{mnt} := 950$	lbs	(User Input)	
Mount Weight w/ Ice =	$WT_{mnt.ice} := 1100$	lbs	(User Input)	

Gravity Loads (without ice)

Weight of All Mounts =	$Wt_{mnt1} := WT_{mnt} = 950$	lbs	**BLC 2**

Gravity Load (ice only)

Weight of Ice on All Mounts =	$Wt_{ice.mnt1} := \left(WT_{mnt.ice} - WT_{mnt}\right) = 150$	lbs	**BLC 3**

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice =	$Fi_{mnt1} := p \cdot CdAa_{ice} = 38$	lbs	**BLC 4**

Wind Load (NESC Extreme)

Total Mount Wind Force =	$F_{mnt1} := qz \cdot CdAa \cdot m = 279$	lbs	**BLC 5**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 1-1/4"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.55$	in	(User Input)
Coax Cable Length =	$L_{coax} := 10$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 0.66$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 18$		(User Input)
No. of Coax Projecting Outside Face of Mast =	$NP_{coax} := 4$		(User Input)

Wind Load (NESC Extreme)

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

Total Coax Wind Force (Above NU Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} \cdot m = 35$ plf **BLC 5**

Wind Load (NESC Heavy)

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

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

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 12$ plf **BLC 2**

Gravity Load (ice only)

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

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 23$ 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 S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-08
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 Rul...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Existing Mast	HSS14x0.375	Column	Wide Flange	A500 Gr.42	Typical	15	349	349	698

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	Existing Mast	10			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N4			Existing Mast	Column	Wide Flange	A500 Gr...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N4	0	10	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	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.101	8.5
2	M1	Y	-.309	8.5
3	M1	Y	-.108	8.5
4	M1	Y	-.075	8.5
5	M1	Y	-.95	8.5

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.118	8.5
2	M1	Y	-.17	8.5
3	M1	Y	-.041	8.5
4	M1	Y	-.022	8.5
5	M1	Y	-.15	8.5

Member Point Loads (BLC 4 : NESC Heavy Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.097	8.5
2	M1	X	.154	8.5
3	M1	X	.032	8.5
4	M1	X	.019	8.5
5	M1	X	.038	8.5

Member Point Loads (BLC 5 : NESC Extreme Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.946	8.5
2	M1	X	1.545	8.5
3	M1	X	.286	8.5
4	M1	X	.17	8.5
5	M1	X	.279	8.5

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	-.012	-.012	0	6

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	-.023	-.023	0	6
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	6
2	M1	X	.008	.008	0	6

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	.035	.035	0	6
2	M1	X	.08	.08	0	6

Basic Load Cases

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

Load Combinations

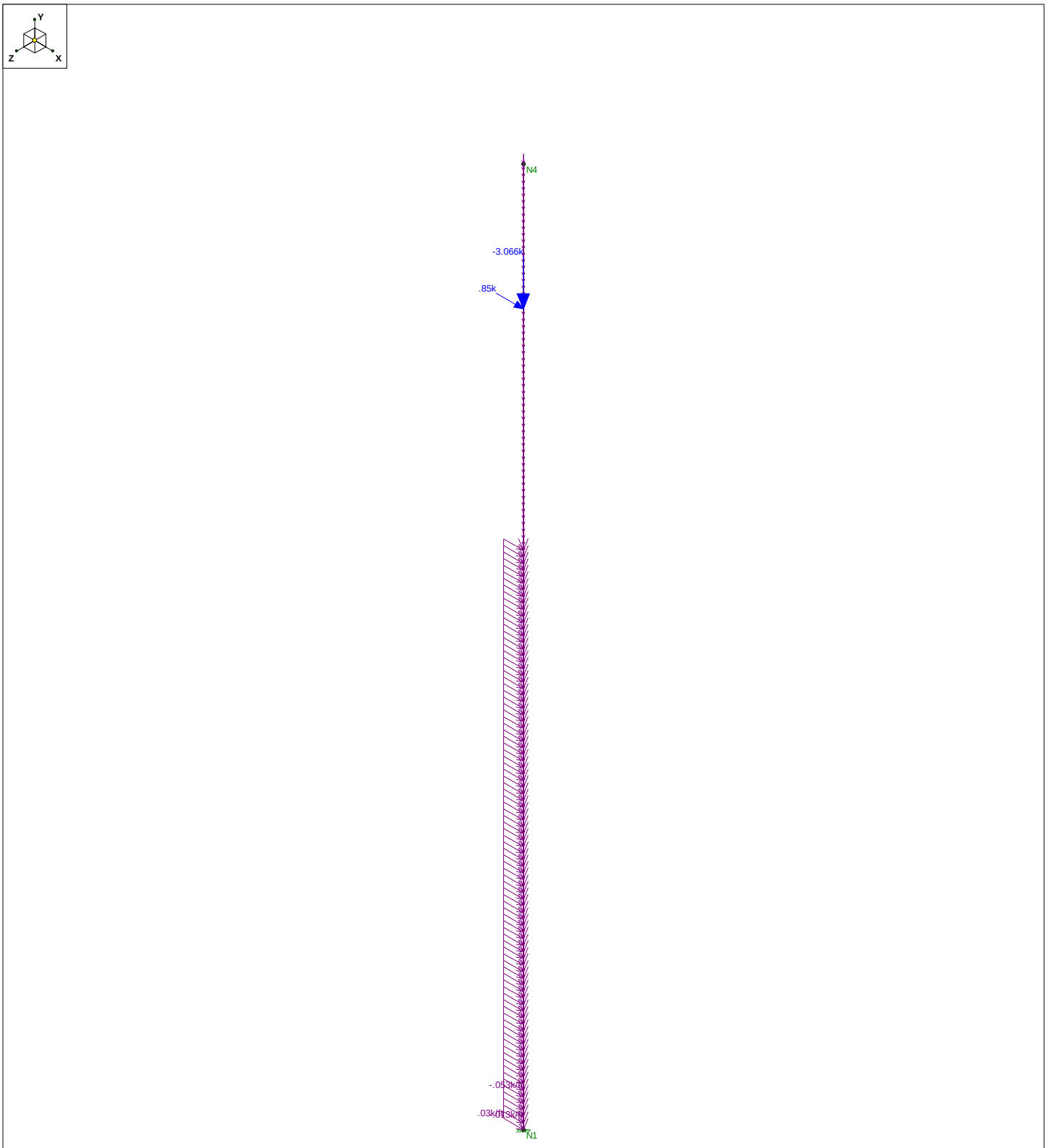
	Description	Solve	P...	S...	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac..	BLC	Fac...
1	NESC Heavy Wind	Yes	Y		1	1.5	2	1.5	3	1.5	4	2.5														
2	NESC Extreme Wind	Yes	Y		1	1	2	1	5	1																

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	-1.03	4.282	0	0	0	7.774
2	1	Totals:	-1.03	4.282	0			
3	1	COG (ft):	X: 0	Y: 7.359	Z: 0			

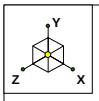
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N1	-3.916	2.125	0	0	0	29.508
2	2	Totals:	-3.916	2.125	0			
3	2	COG (ft):	X: 0	Y: 7.473	Z: 0			



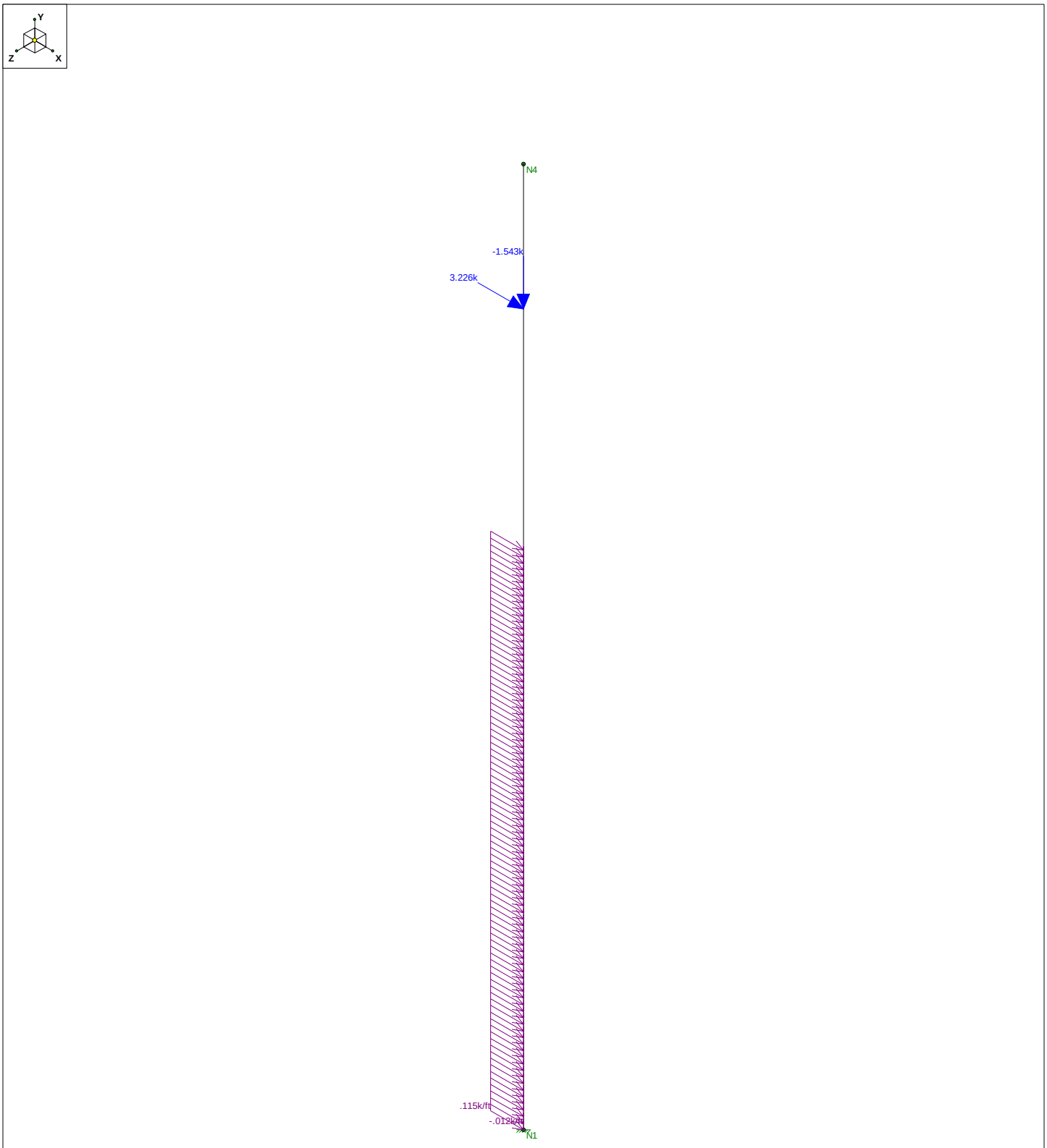
Loads: LC 1, NESC Heavy Wind

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:05 PM
19158.00 /AT&T CT5150	LC #1 Loads	NESC Loading.r3d



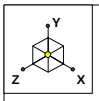
Results for LC 1, NESC Heavy Wind
Reaction and Moment Units are k and k-ft

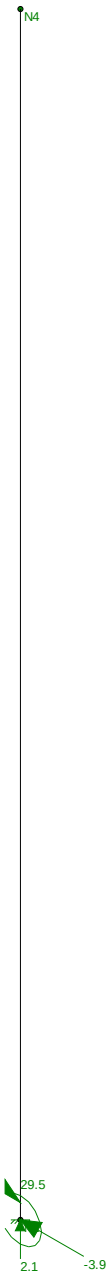
CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:05 PM
19158.00 /AT&T CT5150	LC #1 Reactions	NESC Loading.r3d



Loads: LC 2, NESC Extreme Wind

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:05 PM
19158.00 /AT&T CT5150	LC #2 Loads	NESC Loading.r3d





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

CENTEK Engineering, INC.		
FJP	Structure # 1255 - Mast	June 29, 2020 at 1:06 PM
19158.00 /AT&T CT5150	LC #2 Reactions	NESC Loading.r3d

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

Subject:	Coax Cable on Pole #1255
Location:	Greenwich, CT
Rev. 2: 4/13/20	Prepared by: T.J.L Checked by: C.A.G. Job No. 19158.00

Coax Cable on CL&P Pole

Coaxial Cable Span $Coax_{Span} := \begin{pmatrix} 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \end{pmatrix} ft$ *(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 = $V := 110$ mph (User Input NESC 2017 Figure 250-2(e))

Height to Top of Coax Above Grade = $TC := 105$ ft (User Input)

NESC Factor = $kv := 1.43$ (User Input from NESC 2017 Table 250-3 equation)

Importance Factor = $I := 1.0$ (User Input from NESC 2017 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.175$ (NESC 2017 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TC)}\right]^{\frac{1}{7}} = 0.311$ (NESC 2017 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TC}{220}\right)} = 0.848$ (NESC 2017 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.867$ (NESC 2017 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 31.6$ psf (NESC 2017 Section 250.C.2)

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

Subject: Coax Cable on Pole #1255

Location: Greenwich, CT

Rev. 2: 4/13/20

Prepared by: T.J.L Checked by: C.A.G.
Job No. 19158.00

Diameter of Coax Cable = $D_{coax} := 1.55 \cdot in$ *(User Input)*

Weight of Coax Cable = $W_{coax} := 0.66 \cdot plf$ *(User Input)*

Number of Coax Cables = $N_{coax} := 18$ *(User Input)*

Number of Projected Coax Cables = $NP_{coax} := 4$ *(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 = $A := \left(NP_{coax} \cdot D_{coax}\right) = 6.2 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 7.2 \cdot in$

Ice Area per Liner Ft = $Ai_{coax} := \frac{\pi}{4} \cdot \left[\left(D_{coax} + 2 \cdot Ir\right)^2 - D_{coax}^2\right] = 3.22 \cdot in^2$

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 22.541 \cdot plf$

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 =

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

$$Heavy\_WInd_{Vert} = \begin{pmatrix} 516 \\ 516 \\ 516 \\ 516 \\ 516 \\ 516 \\ 516 \\ 516 \\ 516 \end{pmatrix} lb \qquad Heavy\_Wind_{Trans} = \begin{pmatrix} 96 \\ 96 \\ 96 \\ 96 \\ 96 \\ 96 \\ 96 \\ 96 \\ 96 \end{pmatrix} lb$$

Extreme Wind Vertical Load =

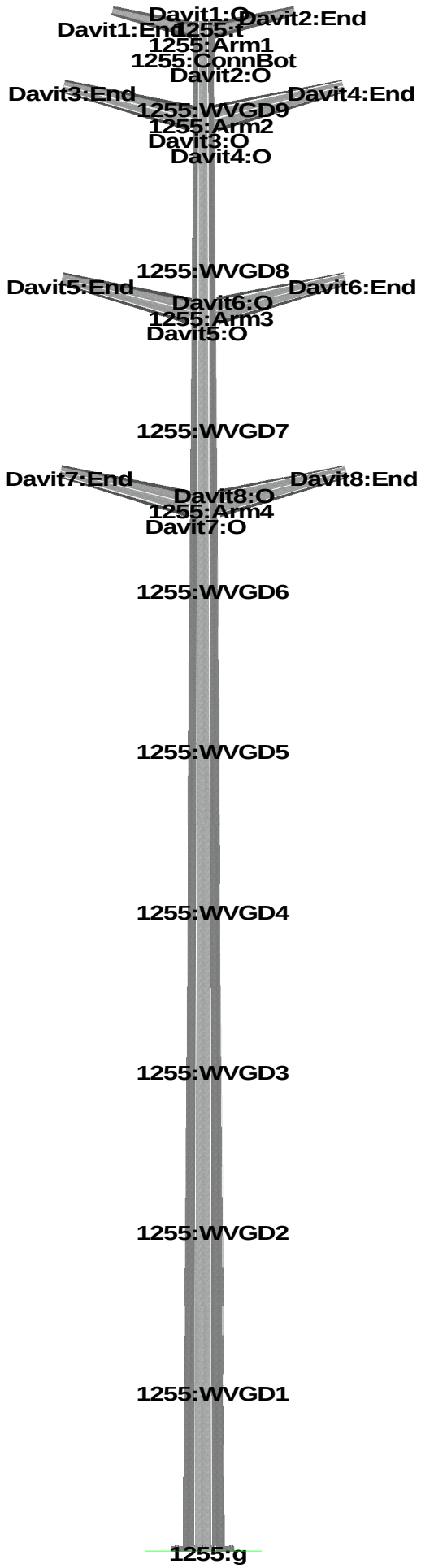
$$Extreme\_Wind_{Vert} := \overrightarrow{\left(N_{coax} \cdot W_{coax} \cdot Coax_{Span} \cdot OF_{EWV}\right)}$$

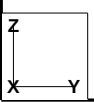
Extreme Wind Transverse Load =

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

$$Extreme\_Wind_{Vert} = \begin{pmatrix} 119 \\ 119 \\ 119 \\ 119 \\ 119 \\ 119 \\ 119 \\ 119 \\ 119 \end{pmatrix} lb \qquad Extreme\_Wind_{Trans} = \begin{pmatrix} 261 \\ 261 \\ 261 \\ 261 \\ 261 \\ 261 \\ 261 \\ 261 \\ 261 \end{pmatrix} lb$$

Centek Engineering Inc, Project: "cl&p structure #1255"
PLS-POLE Version 16.01, 7:26:12 AM Tuesday, April 28, 2020
Undeformed geometry displayed





Project Name : 19158.00 - Greenwich, CT
Project Notes: Structure # 1255 / AT&T CT5150
Project File : J:\Jobs\1915800.WI\04_Structural\Backup Documentation\Rev(4)\PLS-Pole\cl&p structure #1255.pol
Date run : 4:01:03 PM Monday, June 29, 2020
by : PLS-POLE Version 16.01
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.

Loads from file: J:\Jobs\1915800.WI\04_Structural\Backup Documentation\Rev(4)\PLS-Pole\cl&p #1255.lca

*** Analysis Results:

Maximum element usage is 99.96% for Steel Pole "1255" in load case "NESC Extreme"
Maximum insulator usage is 36.88% for Clamp "Clamp18" in load case "NESC Extreme"

Foundation Design Forces For All Load Cases:

Note: loads are factored.

Load Case	Foundation Description	Axial Force (kips)	Shear Force (kips)	Bending Moment (ft-k)	Foundation Usage %
NESC Heavy	1255:g	41.85	13.30	1069.23	0.00
NESC Extreme	1255:g	20.42	22.32	1665.17	0.00

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
NESC Heavy	1255:g	-0.09	-13.30	-41.85	13.30	1069.22	-4.22	1069.23	-0.01	0.00
NESC Extreme	1255:g	-0.02	-22.32	-20.42	22.32	1665.17	-1.03	1665.17	-0.00	0.00

Summary of Tip Deflections For All Load Cases:

Note: positive tip load results in positive deflection

Load Case	Joint Label	Long. Defl. (in)	Tran. Defl. (in)	Vert. Defl. (in)	Resultant Defl. (in)	Long. Rot. (deg)	Tran. Rot. (deg)	Twist (deg)
NESC Heavy	1255:t	0.18	60.43	-2.16	60.47	0.01	-5.47	0.00
NESC Extreme	1255:t	0.04	93.25	-5.08	93.38	0.00	-8.64	0.00

Tubes Summary:

Pole Label	Tube Num.	Weight (lbs)	Load Case	Maximum Usage %	Resultant Moment (ft-k)
1255	1	2464	NESC Extreme	98.35	582.88
1255	2	4117	NESC Extreme	89.89	1253.83
1255	3	2338	NESC Extreme	99.96	1665.17

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
1255	99.96	NESC Extreme	2.5	25	10156.2

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
Davit1	3.25	NESC Heavy	94.8	1	93.0
Davit2	5.48	NESC Heavy	94.8	1	93.0
Davit3	4.17	NESC Heavy	89.5	1	313.4
Davit4	5.52	NESC Heavy	89.5	1	313.4
Davit5	4.16	NESC Heavy	77.5	1	313.4
Davit6	5.54	NESC Heavy	77.5	1	313.4
Davit7	4.24	NESC Heavy	65.5	1	313.4
Davit8	5.51	NESC Heavy	65.5	1	313.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type

NESC Heavy	68.83	1255	Steel Pole
NESC Extreme	99.96	1255	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Steel Pole Usage %	Steel Pole Label	Height AGL (ft)	Segment Number
NESC Heavy	68.83	1255	51.5	14
NESC Extreme	99.96	1255	2.5	25

Summary of Base Plate Usages by Load Case:

Load Case	Pole Label	Bend Line #	Length (in)	Vertical Load (kips)	X Moment (ft-k)	Y Moment (ft-k)	Bending Stress (ksi)	Bolt Moment Sum (ft-k)	# Bolts Acting On Bend Line	Max Bolt Load For Bend Line (kips)	Minimum Plate Thickness (in)	Usage %
NESC Heavy	1255	8	25.500	40.610	1069.223	-4.224	35.651	113.637	3	104.374	2.415	64.82
NESC Extreme	1255	8	25.500	19.183	1665.168	-1.031	54.266	172.972	3	158.719	2.980	98.67

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Tubular Davit Usage %	Davit Label	Height AGL (ft)	Segment Number
NESC Heavy	5.54	Davit6	77.5	1
NESC Extreme	2.58	Davit8	65.5	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	1.39	NESC Heavy	0.0
Clamp2	Clamp	1.37	NESC Heavy	0.0
Clamp3	Clamp	2.88	NESC Heavy	0.0
Clamp4	Clamp	2.88	NESC Heavy	0.0
Clamp5	Clamp	2.87	NESC Heavy	0.0
Clamp6	Clamp	2.88	NESC Heavy	0.0
Clamp7	Clamp	2.89	NESC Heavy	0.0
Clamp8	Clamp	2.87	NESC Heavy	0.0
Clamp9	Clamp	0.66	NESC Heavy	0.0
Clamp10	Clamp	0.66	NESC Heavy	0.0
Clamp11	Clamp	0.66	NESC Heavy	0.0
Clamp12	Clamp	0.66	NESC Heavy	0.0
Clamp13	Clamp	0.66	NESC Heavy	0.0
Clamp14	Clamp	0.66	NESC Heavy	0.0
Clamp15	Clamp	0.66	NESC Heavy	0.0
Clamp16	Clamp	0.66	NESC Heavy	0.0
Clamp17	Clamp	0.66	NESC Heavy	0.0
Clamp18	Clamp	36.88	NESC Extreme	0.0
Clamp19	Clamp	5.57	NESC Extreme	0.0
Clamp20	Clamp	36.88	NESC Extreme	0.0

*** Weight of structure (lbs):
    Weight of Tubular Davit Arms: 2066.2
    Weight of Steel Poles: 10156.2
    Total: 12222.5

*** End of Report

```
**************************************************************************
*                                                                        *
*                              PLS-POLE                                  *
*                   POLE AND FRAME ANALYSIS AND DESIGN                   *
*               Copyright Power Line Systems 1999-2019                   *
*                                                                        *
**************************************************************************

Project Name : 19158.00 - Greenwich, CT
Project Notes: Structure # 1255 / AT&T CT5150
Project File : J:\Jobs\1915800.WI\04_Structural\Backup Documentation\Rev(4)\PLS-Pole\cl&p structure #1255.pol
Date run     : 4:01:01 PM Monday, June 29, 2020
by           : PLS-POLE Version 16.01
Licensed to  : Centek Engineering Inc

Successfully performed nonlinear analysis

The model has 0 warnings.
```

```
Modeling options:
  Offset Arms from Pole/Mast:   Yes
  Offset Braces from Pole/Mast: Yes
  Offset Guys from Pole/Mast:   Yes
  Offset Posts from Pole/Mast:  Yes
  Offset Strains from Pole/Mast:  Yes
  Use Alternate Convergence Process: No
  Steel poles and tubular arms checked with ASCE/SEI 48-05


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

Steel Pole Properties:

Steel Pole Property	Stock Number	Length (ft)	Default Embedded Length (ft)	Base Plate	Shape	Tip Diameter (in)	Base Diameter (in)	Taper (in/ft)	Default Drag Coef.	Tubes	Modulus of Elasticity Override (ksi)	Weight Density Override (lbs/ft^3)	Shape At Base	Strength Check Type	Distance From Tip (ft)	Ultimate Trans. Load (kips)	Ultimate Long. Load (kips)
CL&P1255	1255	95.00	0	Yes	8F	15.68	31.28	0	1.6	3 tubes	0	0	Calculated	0.000 Galvanized Steel	0.0000	0.0000	

Steel Tubes Properties:

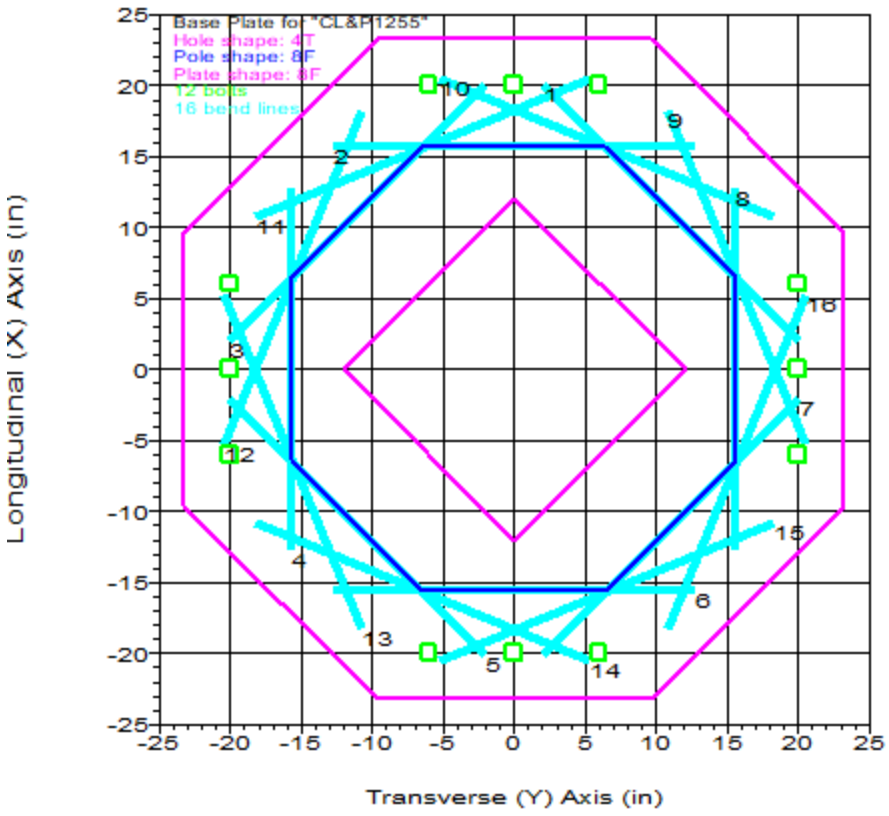
Pole Property	Tube No.	Length (ft)	Thickness (in)	Lap Length (ft)	Lap Factor	Lap Butt (in)	Gap or Offset (in)	Yield Stress (ksi)	Moment Cap. Override (ft-k)	Tube Weight (lbs)	Center of Gravity (ft)	Taper (in/ft)	Calculated Tube Top Diameter (in)	Tube Bot. Diameter (in)	1.5x Lap Length (ft)	Actual Overlap (ft)
CL&P1255	1	45	0.25	3.000	0.000	0.000	0.000	65.000	0.000	2464	24.04	0.17737	15.68	23.66	2.895	3.000
CL&P1255	2	38	0.375	3.917	0.000	0.000	0.000	65.000	0.000	4117	19.83	0.17737	22.63	29.37	3.577	3.917
CL&P1255	3	18.917	0.375	0.000	0.000	0.000	0.000	65.000	0.000	2338	9.64	0.17737	27.92	31.28	0.000	0.000

Base Plate Properties:

Pole Property	Plate Diam. (in)	Plate Shape	Plate Thick. (in)	Plate Weight (lbs)	Bend Line Length Override (in)	Hole Diam. (in)	Hole Shape	Steel Density (lbs/ft^3)	Steel Yield Stress (ksi)	Bolt Diam. (in)	Bolt Pattern Diam. (in)	Num. Of Bolts	Bolt Cage X Inertia (in^4)	Bolt Cage Y Inertia (in^4)
CL&P1255	46.500	8F	3.000	1237	25.500	17.000	4T	490.00	55.000	2.250	40.000	12	10115.14	10115.14

Base Plate Bolt Coordinates for Property "CL&P1255":

Bolt X Coord.	Bolt Y Coord.	Bolt Angle (deg)
0	1	0
0.3	1	0
1	0.3	0
1	0	0



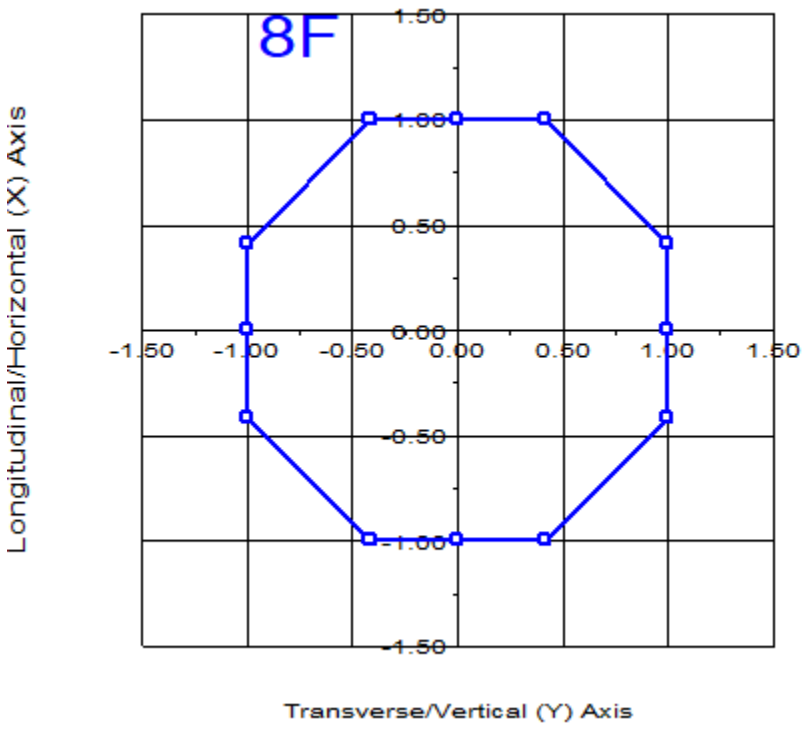
Steel Pole Connectivity:

Pole Label	Tip Joint	Base Joint	X of Base (ft)	Y of Base (ft)	Z of Base (ft)	Inclin. About X (deg)	Inclin. About Y (deg)	Property Set	Attach. Labels	Base Connect	Embed % Override	Embed C. Override (ft)
1255		0	0	0	0	0	0	CL&P1255	14 labels		0.00	0

Relative Attachment Labels for Steel Pole "1255":

Joint Label	Distance From Origin/Top Joint (ft)	Global Z of Attach (ft)
1255:Arm1	0.00	94.50
1255:Arm2	0.00	89.00
1255:Arm3	0.00	77.00
1255:Arm4	0.00	65.00
1255:WVGD1	0.00	10.00
1255:WVGD2	0.00	20.00
1255:WVGD3	0.00	30.00
1255:WVGD4	0.00	40.00
1255:WVGD5	0.00	50.00
1255:WVGD6	0.00	60.00
1255:WVGD7	0.00	70.00

1255:WVGD8	0.00	80.00
1255:WVGD9	0.00	90.00
1255:ConnBot	0.00	94.00



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)
1255	1255:t	1255:t Ori	0.00	15.68	12.78	402.28	402.28	0.00	21.8	65.00	65.00	277.93	277.93
1255	1255:Arm1	1255:Arm1 End	0.50	15.77	12.86	409.25	409.25	0.00	22.0	65.00	65.00	281.16	281.16
1255	1255:Arm1	1255:Arm1 Ori	0.50	15.77	12.86	409.25	409.25	0.00	22.0	65.00	65.00	281.16	281.16
1255	1255:ConnBot	1255:ConnBot End	1.00	15.86	12.93	416.31	416.31	0.00	22.1	65.00	65.00	284.41	284.41
1255	1255:ConnBot	1255:ConnBot Ori	1.00	15.86	12.93	416.31	416.31	0.00	22.1	65.00	65.00	284.41	284.41
1255	1255:WVGD9	1255:WVGD9 End	5.00	16.57	13.52	475.69	475.69	0.00	23.3	65.00	65.00	311.06	311.06
1255	1255:WVGD9	1255:WVGD9 Ori	5.00	16.57	13.52	475.69	475.69	0.00	23.3	65.00	65.00	311.06	311.06
1255	1255:Arm2	1255:Arm2 End	6.00	16.74	13.66	491.37	491.37	0.00	23.6	65.00	65.00	317.91	317.91
1255	1255:Arm2	1255:Arm2 Ori	6.00	16.74	13.66	491.37	491.37	0.00	23.6	65.00	65.00	317.91	317.91
1255	#1255:0	Tube 1 End	10.50	17.54	14.33	566.20	566.20	0.00	24.9	65.00	65.00	349.66	349.66
1255	#1255:0	Tube 1 Ori	10.50	17.54	14.33	566.20	566.20	0.00	24.9	65.00	65.00	349.66	349.66
1255	1255:WVGD8	1255:WVGD8 End	15.00	18.34	14.99	648.26	648.26	0.00	26.2	65.00	65.00	382.91	382.91
1255	1255:WVGD8	1255:WVGD8 Ori	15.00	18.34	14.99	648.26	648.26	0.00	26.2	65.00	65.00	382.91	382.91
1255	1255:Arm3	1255:Arm3 End	18.00	18.87	15.43	707.16	707.16	0.00	27.1	65.00	65.00	405.93	405.93
1255	1255:Arm3	1255:Arm3 Ori	18.00	18.87	15.43	707.16	707.16	0.00	27.1	65.00	65.00	405.93	405.93
1255	#1255:1	Tube 1 End	21.50	19.49	15.94	780.25	780.25	0.00	28.2	65.00	65.00	433.62	433.62
1255	#1255:1	Tube 1 Ori	21.50	19.49	15.94	780.25	780.25	0.00	28.2	65.00	65.00	433.62	433.62
1255	1255:WVGD7	1255:WVGD7 End	25.00	20.11	16.46	858.22	858.22	0.00	29.2	65.00	65.00	462.23	462.23
1255	1255:WVGD7	1255:WVGD7 Ori	25.00	20.11	16.46	858.22	858.22	0.00	29.2	65.00	65.00	462.23	462.23
1255	1255:Arm4	1255:Arm4 End	30.00	21.00	17.19	978.36	978.36	0.00	30.7	65.00	65.00	504.68	504.68
1255	1255:Arm4	1255:Arm4 Ori	30.00	21.00	17.19	978.36	978.36	0.00	30.7	65.00	65.00	504.68	504.68
1255	1255:WVGD6	1255:WVGD6 End	35.00	21.89	17.93	1109.22	1109.22	0.00	32.1	65.00	65.00	549.01	549.01
1255	1255:WVGD6	1255:WVGD6 Ori	35.00	21.89	17.93	1109.22	1109.22	0.00	32.1	65.00	65.00	549.01	549.01
1255	#1255:2	Tube 1 End	38.50	22.51	18.44	1207.45	1207.45	0.00	33.2	65.00	64.18	573.78	573.78
1255	#1255:2	Tube 1 Ori	38.50	22.51	18.44	1207.45	1207.45	0.00	33.2	65.00	64.18	573.78	573.78
1255	#1255:3	SpliceT End	42.00	23.13	18.95	1311.31	1311.31	0.00	34.2	65.00	63.30	598.16	598.16
1255	#1255:3	SpliceT Ori	42.00	23.13	18.95	1311.31	1311.31	0.00	34.2	65.00	63.30	598.16	598.16
1255	1255:WVGD5	1255:WVGD5 End	45.00	23.16	28.32	1943.40	1943.40	0.00	21.4	65.00	65.00	908.98	908.98
1255	1255:WVGD5	1255:WVGD5 Ori	45.00	23.16	28.32	1943.40	1943.40	0.00	21.4	65.00	65.00	908.98	908.98
1255	#1255:4	Tube 2 End	50.00	24.05	29.42	2179.21	2179.21	0.00	22.4	65.00	65.00	981.69	981.69
1255	#1255:4	Tube 2 Ori	50.00	24.05	29.42	2179.21	2179.21	0.00	22.4	65.00	65.00	981.69	981.69
1255	1255:WVGD4	1255:WVGD4 End	55.00	24.94	30.52	2433.36	2433.36	0.00	23.4	65.00	65.00	1057.19	1057.19
1255	1255:WVGD4	1255:WVGD4 Ori	55.00	24.94	30.52	2433.37	2433.37	0.00	23.4	65.00	65.00	1057.19	1057.19
1255	#1255:5	Tube 2 End	60.00	25.82	31.62	2706.55	2706.55	0.00	24.4	65.00	65.00	1135.50	1135.50
1255	#1255:5	Tube 2 Ori	60.00	25.82	31.62	2706.55	2706.55	0.00	24.4	65.00	65.00	1135.50	1135.50
1255	1255:WVGD3	1255:WVGD3 End	65.00	26.71	32.72	2999.46	2999.46	0.00	25.4	65.00	65.00	1216.60	1216.60
1255	1255:WVGD3	1255:WVGD3 Ori	65.00	26.71	32.72	2999.46	2999.46	0.00	25.4	65.00	65.00	1216.60	1216.60
1255	#1255:6	Tube 2 End	70.00	27.60	33.83	3312.77	3312.77	0.00	26.3	65.00	65.00	1300.50	1300.50
1255	#1255:6	Tube 2 Ori	70.00	27.60	33.83	3312.77	3312.77	0.00	26.3	65.00	65.00	1300.50	1300.50
1255	1255:WVGD2	1255:WVGD2 End	75.00	28.48	34.93	3647.18	3647.18	0.00	27.3	65.00	65.00	1387.20	1387.20
1255	1255:WVGD2	1255:WVGD2 Ori	75.00	28.48	34.93	3647.18	3647.18	0.00	27.3	65.00	65.00	1387.20	1387.20

1255	#1255:7	SpliceT	End	76.08	28.67	35.17	3722.46	3722.46	0.00	27.5	65.00	65.00	1406.35	1406.35
1255	#1255:7	SpliceT	Ori	76.08	28.67	35.17	3722.46	3722.46	0.00	27.5	65.00	65.00	1406.35	1406.35
1255	#1255:8	SpliceB	End	80.00	28.62	35.10	3700.70	3700.70	0.00	27.5	65.00	65.00	1400.82	1400.82
1255	#1255:8	SpliceB	Ori	80.00	28.62	35.10	3700.70	3700.70	0.00	27.5	65.00	65.00	1400.83	1400.83
1255	1255:WVGD1	1255:WVGD1	End	85.00	29.51	36.20	4060.31	4060.31	0.00	28.4	65.00	65.00	1490.75	1490.75
1255	1255:WVGD1	1255:WVGD1	Ori	85.00	29.51	36.20	4060.31	4060.31	0.00	28.4	65.00	65.00	1490.75	1490.75
1255	#1255:9	Tube 3	End	90.00	30.39	37.30	4442.50	4442.50	0.00	29.4	65.00	65.00	1583.48	1583.48
1255	#1255:9	Tube 3	Ori	90.00	30.39	37.30	4442.50	4442.50	0.00	29.4	65.00	65.00	1583.48	1583.48
1255	1255:g	1255:g	End	95.00	31.28	38.40	4847.94	4847.94	0.00	30.4	65.00	65.00	1679.01	1679.01

Tubular Davit Properties:

Davit Property Label	Stock Number	Steel Shape	Thickness or Depth (in)	Base Diameter or Depth (in)	Tip Diameter or Depth (in)	Taper (in/ft)	Drag Coef.	Modulus of Elasticity (ksi)	Geometry Type	Strength Check	Vertical Capacity (lbs)	Tension Capacity (lbs)	Compres. Capacity (lbs)	Long. Capacity (lbs)	Yield Stress (ksi)	Weight Density (lbs/ft^3)	Steel Texture Shape	Override At End
ARM1	601420	6T	0.1875	10.75	6	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0		
ARM2	601515	8T	0.25	18.46	9	0	1.3	29000	1 point	Calculated	0	0	0	0	65	0		

Intermediate Joints for Davit Property "ARM1":

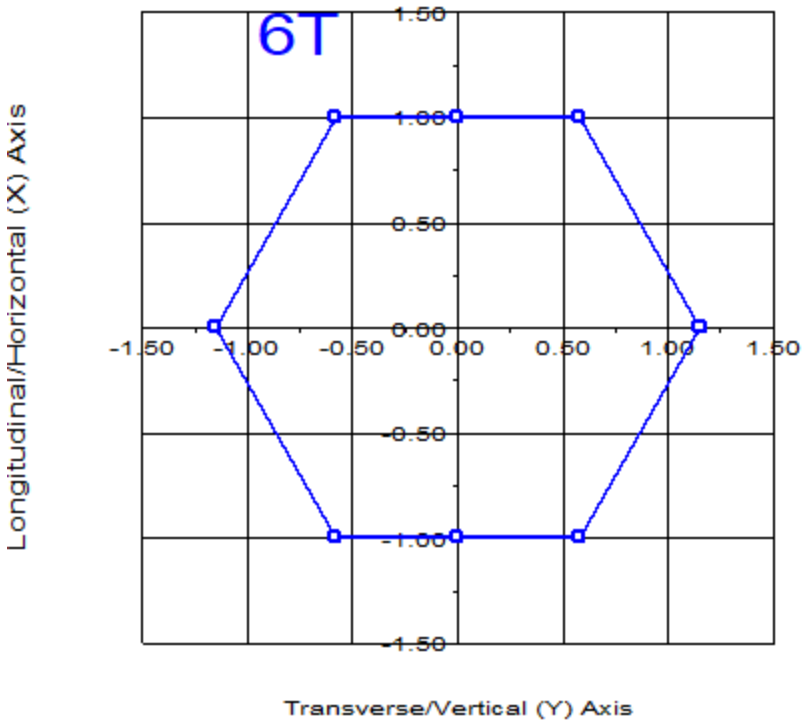
Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	5	-1.2

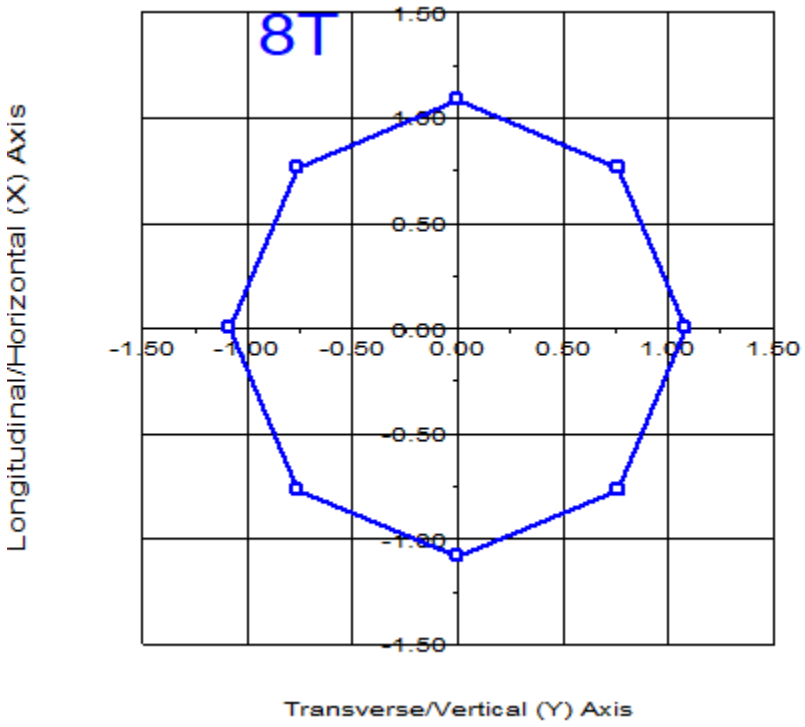
Intermediate Joints for Davit Property "ARM2":

Joint Label	Horz. Offset (ft)	Vert. Offset (ft)
End	8	-2

Tubular Davit Arm Connectivity:

Davit Label	Attach Label	Davit Property Set	Azimuth (deg)
Davit1	1255:Arm1	ARM1	180
Davit2	1255:Arm1	ARM1	0
Davit3	1255:Arm2	ARM2	180
Davit4	1255:Arm2	ARM2	0
Davit5	1255:Arm3	ARM2	180
Davit6	1255:Arm3	ARM2	0
Davit7	1255:Arm4	ARM2	180
Davit8	1255:Arm4	ARM2	0





Tubular Davit Arm Steel Properties:

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Outer Diam. (in)	Area (in^2)	V-Moment Inertia (in^4)	H-Moment Inertia (in^4)	D/t	W/t Max.	Fy (ksi)	Fa Min. (ksi)	V-Moment Capacity (ft-k)	H-Moment Capacity (ft-k)
Davit1	Davit1:O	Origin	0.00	10.75	6.86	106.34	106.34	0.00	27.3	65.00	65.00	92.80	107.16
Davit1	#Davit1:0	End	2.57	8.38	5.32	49.54	49.54	0.00	20.0	65.00	65.00	55.49	64.08
Davit1	#Davit1:0	Origin	2.57	8.38	5.32	49.54	49.54	0.00	20.0	65.00	65.00	55.49	64.08
Davit1	Davit1:End	End	5.14	6.00	3.78	17.73	17.73	0.00	12.7	65.00	65.00	27.73	32.02

Davit2	Davit2:O	Origin	0.00	10.75	6.86	106.34	106.34	0.00	27.3	65.00	65.00	92.80	107.16
Davit2	#Davit2:0	End	2.57	8.38	5.32	49.54	49.54	0.00	20.0	65.00	65.00	55.49	64.08
Davit2	#Davit2:0	Origin	2.57	8.38	5.32	49.54	49.54	0.00	20.0	65.00	65.00	55.49	64.08
Davit2	Davit2:End	End	5.14	6.00	3.78	17.73	17.73	0.00	12.7	65.00	65.00	27.73	32.02
Davit3	Davit3:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit3	#Davit3:0	End	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit3	#Davit3:0	Origin	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit3	Davit3:End	End	8.25	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit4	Davit4:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit4	#Davit4:0	End	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit4	#Davit4:0	Origin	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit4	Davit4:End	End	8.25	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit5	Davit5:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit5	#Davit5:0	End	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit5	#Davit5:0	Origin	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit5	Davit5:End	End	8.25	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit6	Davit6:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit6	#Davit6:0	End	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit6	#Davit6:0	Origin	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit6	Davit6:End	End	8.25	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit7	Davit7:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit7	#Davit7:0	End	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit7	#Davit7:0	Origin	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit7	Davit7:End	End	8.25	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63
Davit8	Davit8:O	Origin	0.00	18.46	15.09	661.20	661.20	0.00	26.4	65.00	65.00	358.49	358.49
Davit8	#Davit8:0	End	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit8	#Davit8:0	Origin	4.12	13.73	11.17	268.25	268.25	0.00	18.6	65.00	65.00	195.54	195.54
Davit8	Davit8:End	End	8.25	9.00	7.25	73.40	73.40	0.00	10.8	65.00	65.00	81.63	81.63

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)	Hardware Capacity (lbs)	Notes
clamp	clamp1	8e+04	0	

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
Clamp1	Davit1:End	clamp	No Limit
Clamp2	Davit2:End	clamp	No Limit
Clamp3	Davit3:End	clamp	No Limit
Clamp4	Davit4:End	clamp	No Limit
Clamp5	Davit5:End	clamp	No Limit
Clamp6	Davit6:End	clamp	No Limit
Clamp7	Davit7:End	clamp	No Limit
Clamp8	Davit8:End	clamp	No Limit
Clamp9	1255:WVGD1	clamp	No Limit
Clamp10	1255:WVGD2	clamp	No Limit
Clamp11	1255:WVGD3	clamp	No Limit
Clamp12	1255:WVGD4	clamp	No Limit
Clamp13	1255:WVGD5	clamp	No Limit
Clamp14	1255:WVGD6	clamp	No Limit
Clamp15	1255:WVGD7	clamp	No Limit
Clamp16	1255:WVGD8	clamp	No Limit
Clamp17	1255:WVGD9	clamp	No Limit
Clamp18	1255:t	clamp	No Limit
Clamp19	1255:Arm1	clamp	No Limit
Clamp20	1255:ConnBot	clamp	No Limit

Material List Options:
Show Parts: YES
Decompose Assemblies: NO
Show Assemblies: YES

Material List

Stock Number	Item Description	Quantity	Unit of Measure
601420	Tubular Davit property: ARM1	2.00	Each
601515	Tubular Davit property: ARM2	6.00	Each
clamp1	Clamp property: clamp	20.00	Each

1255 Steel Pole property: CL&P1255 1.00 Each

*** Loads Data

Loads from file: J:\Jobs\1915800.WI\04_Structural\Backup Documentation\Rev(4)\PLS-Pole\cl&p #1255.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) 95.70 (ft)
  Structure height 95.70 (ft)
  Structure height above ground 95.70 (ft)

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Load Factor	Wind Area Factor	SF for Steel Tubular Arms and Towers	SF for Poles	SF for Ice Thick. (in)	SF for Ice Density (lbs/ft^3)	SF for Temperature (deg F)	SF for Pole Ult. Check	SF for Pole First Crack %	SF for Guys Zero Tens.	SF For Non Braces and Cables	Point Loads Insuls. and Arms	Hardware and Tubular	Found. Deflection	Wind Deflection Limit (ft)	Loads Model Pressure (psf)	Wind Pressure (psf)
NESC Heavy	1.5000	2.5000	1.00000	0.6500	0.0000	0.500	56.000	0.0	No Limit	0	1.0000	1.0000	1.0000	0.0000	1.0000	20 loads	Wind on All	4
NESC Extreme Wind	1.0000	1.0000	1.00000	0.6500	0.0000	0.000	0.000	0.0	No Limit	0	1.0000	1.0000	1.0000	0.0000	1.0000	20 loads	NESC 2017	31

Point Loads for Load Case "NESC Heavy":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
Davit1:End	785	791	0	
Davit2:End	802	752	0	
Davit3:End	2020	1107	0	
Davit4:End	2007	1124	0	
Davit5:End	2004	1119	0	
Davit6:End	2013	1119	0	
Davit7:End	2019	1121	0	
Davit8:End	1988	1142	0	
1255:WVGD1	516	96	0	
1255:WVGD2	516	96	0	
1255:WVGD3	516	96	0	
1255:WVGD4	516	96	0	
1255:WVGD5	516	96	0	
1255:WVGD6	516	96	0	
1255:WVGD7	516	96	0	
1255:WVGD8	516	96	0	
1255:WVGD9	516	96	0	
1255:t	0	7774	0	
1255:Arm1	4282	1030	0	
1255:ConnBot	0	-7774	0	

Detailed Pole Loading Data for Load Case "NESC Heavy":

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 Tran. Load (lbs)	Pole Long. Load (lbs)	Ice Wind Load (lbs)	Pole Wind Load (lbs)	Ice Vertical Load (lbs)
1255	1255:t	1255:Arm1	95.00	94.50	94.75	15.724	7.44e+05	1.600	10.00	0.50	32.72	10.48	5.07	0.67	11.15	0.00
1255	1255:Arm1	1255:ConnBot	94.50	94.00	94.25	15.813	7.49e+05	1.600	10.00	0.50	32.90	10.54	5.09	0.67	11.21	0.00
1255	1255:ConnBot	1255:WVGD9	94.00	90.00	92.00	16.212	7.68e+05	1.600	10.00	0.50	269.98	86.47	41.78	5.33	91.80	0.00
1255	1255:WVGD9	1255:Arm2	90.00	89.00	89.50	16.656	7.89e+05	1.600	10.00	0.50	69.37	22.21	10.73	1.33	23.54	0.00
1255	1255:Arm2		89.00	84.50	86.75	17.143	8.12e+05	1.600	10.00	0.50	321.44	102.87	49.71			

6.00 108.87 0.00														
1255		1255:WVGD8	84.50	80.00	82.25	17.941	8.49e+05	1.600	10.00	0.50	336.63	107.65	52.02	
6.00 113.65 0.00														
1255	1255:WVGD8	1255:Arm3	80.00	77.00	78.50	18.607	8.81e+05	1.600	10.00	0.50	232.86	74.43	35.97	
4.00 78.43 0.00														
1255	1255:Arm3		77.00	73.50	75.25	19.183	9.08e+05	1.600	10.00	0.50	280.20	89.53	43.26	
4.67 94.19 0.00														
1255		1255:WVGD7	73.50	70.00	71.75	19.804	9.38e+05	1.600	10.00	0.50	289.39	92.42	44.66	
4.67 97.09 0.00														
1255	1255:WVGD7	1255:Arm4	70.00	65.00	67.50	20.558	9.73e+05	1.600	10.00	0.50	429.35	137.06	66.23	
6.67 143.73 0.00														
1255	1255:Arm4	1255:WVGD6	65.00	60.00	62.50	21.444	1.02e+06	1.600	10.00	0.50	448.10	142.97	69.09	
6.67 149.64 0.00														
1255	1255:WVGD6		60.00	56.50	58.25	22.198	1.05e+06	1.600	10.00	0.50	324.82	103.60	50.06	
4.67 108.26 0.00														
1255			56.50	53.00	54.75	22.819	1.08e+06	1.600	10.00	0.50	334.01	106.49	51.46	
4.67 111.16 0.00														
1255		1255:WVGD5	53.00	50.00	51.50	23.146	1.1e+06	1.600	10.00	0.50	722.13	92.59	44.74	
4.00 96.59 0.00														
1255	1255:WVGD5		50.00	45.00	47.50	23.605	1.12e+06	1.600	10.00	0.50	736.80	157.38	76.05	
6.67 164.04 0.00														
1255		1255:WVGD4	45.00	40.00	42.50	24.492	1.16e+06	1.600	10.00	0.50	764.82	163.29	78.90	
6.67 169.95 0.00														
1255	1255:WVGD4		40.00	35.00	37.50	25.379	1.2e+06	1.600	10.00	0.50	792.95	169.20	81.76	
6.67 175.87 0.00														
1255		1255:WVGD3	35.00	30.00	32.50	26.266	1.24e+06	1.600	10.00	0.50	821.07	175.11	84.62	
6.67 181.78 0.00														
1255	1255:WVGD3		30.00	25.00	27.50	27.152	1.29e+06	1.600	10.00	0.50	849.20	181.03	87.48	
6.67 187.69 0.00														
1255		1255:WVGD2	25.00	20.00	22.50	28.039	1.33e+06	1.600	10.00	0.50	877.32	186.94	90.33	
6.67 193.60 0.00														
1255	1255:WVGD2		20.00	18.92	19.46	28.579	1.35e+06	1.600	10.00	0.50	193.73	41.27	19.94	
1.44 42.71 0.00														
1255			18.92	15.00	16.96	28.647	1.36e+06	1.600	10.00	0.50	1404.79	149.62	72.30	
5.22 154.85 0.00														
1255		1255:WVGD1	15.00	10.00	12.50	29.063	1.38e+06	1.600	10.00	0.50	909.94	193.76	93.63	
6.67 200.43 0.00														
1255	1255:WVGD1		10.00	5.00	7.50	29.950	1.42e+06	1.600	10.00	0.50	937.91	199.68	96.49	
6.67 206.34 0.00														
1255		1255:g	5.00	0.00	2.50	30.837	1.46e+06	1.600	10.00	0.50	966.03	205.59	99.34	
6.67 212.26 0.00														

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Comment
Davit1:End	116	761	0	
Davit2:End	139	708	0	
Davit3:End	752	1448	0	
Davit4:End	743	1456	0	
Davit5:End	743	1453	0	
Davit6:End	749	1454	0	
Davit7:End	752	1455	0	
Davit8:End	734	1466	0	
1255:WVGD1	119	261	0	
1255:WVGD2	119	261	0	
1255:WVGD3	119	261	0	
1255:WVGD4	119	261	0	
1255:WVGD5	119	261	0	
1255:WVGD6	119	261	0	
1255:WVGD7	119	261	0	
1255:WVGD8	119	261	0	
1255:WVGD9	119	261	0	
1255:t	0	29508	0	
1255:Arm1	2125	3916	0	
1255:ConnBot	0	-29508	0	

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

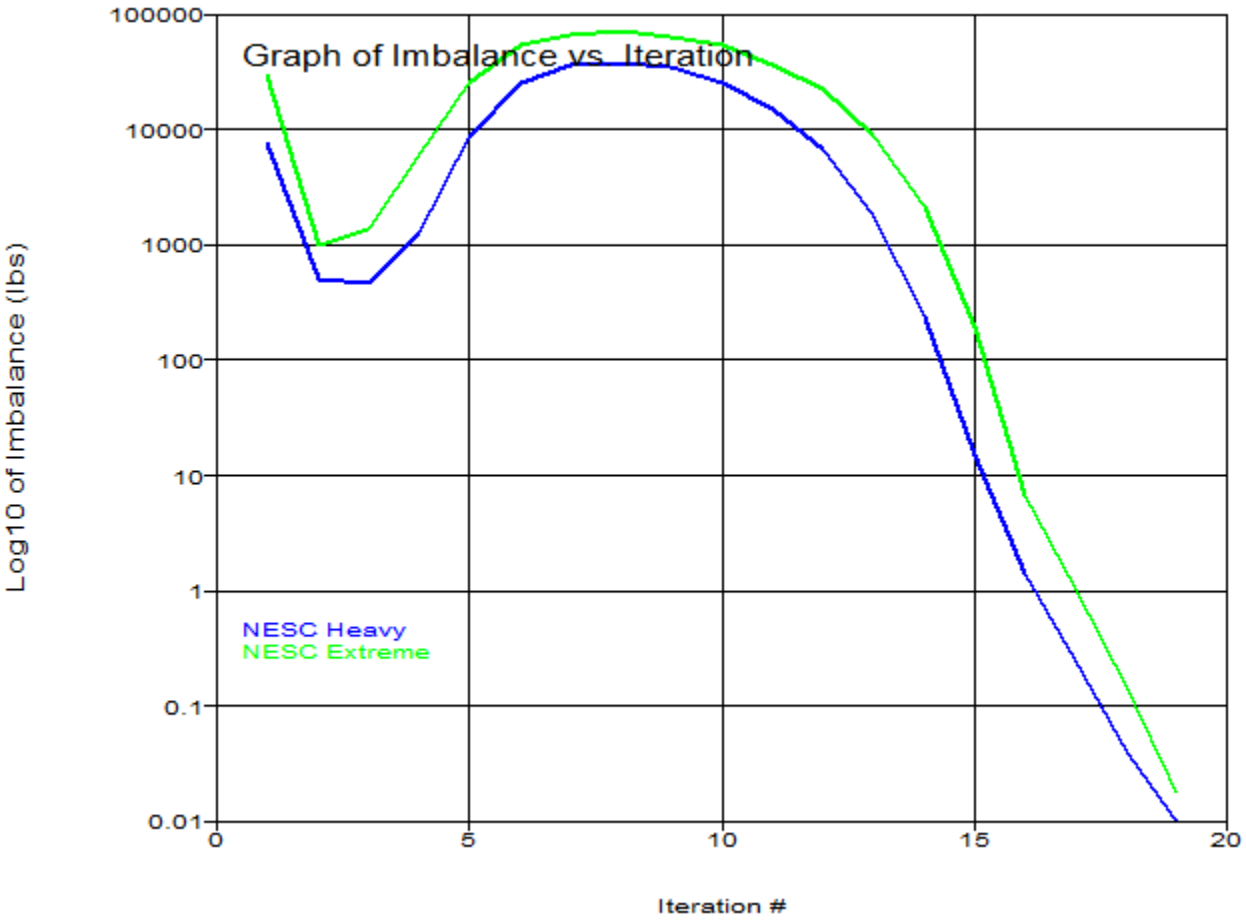
Notes: Does not include loads from equipment, arms, guys, braces, etc. or user input loads.
Wind load is calculated for the undeformed shape of a pole.

Pole Label	Top Joint	Bottom Joint	Section Top Z (ft)	Section Bottom Z (ft)	Section Average Elevation (ft)	Outer Diameter (in)	Reynolds Number	Drag Coef.	Adjusted Wind Pressure (psf)	Adjusted Ice Thickness (in)	Pole Vert. Load (lbs)	Pole Wind Load (lbs)	Pole Vertical Load (lbs)	Ice Wind Load (lbs)	Tran. Long. Wind Load (lbs)
1255	1255:t	1255:Arm1	95.00	94.50	94.75	15.724	1.32e+06	1.000	31.21	0.00	21.81	20.45	0.00	0.00	20.45 0.00
1255	1255:Arm1	1255:ConnBot	94.50	94.00	94.25	15.813	1.32e+06	1.000	31.21	0.00	21.94	20.56	0.00	0.00	20.56 0.00
1255	1255:ConnBot	1255:WVGD9	94.00	90.00	92.00	16.212	1.36e+06	1.000	31.21	0.00	179.99	168.66	0.00	0.00	168.66 0.00

1255	1255:WVGD9	1255:Arm2	90.00	89.00	89.50	16.656	1.39e+06	1.000	31.21	0.00	46.25	43.32	0.00	0.00
1255	1255:Arm2		89.00	84.50	86.75	17.143	1.43e+06	1.000	31.21	0.00	214.30	200.64	0.00	0.00
1255		1255:WVGD8	84.50	80.00	82.25	17.941	1.5e+06	1.000	31.21	0.00	224.42	209.98	0.00	0.00
1255	1255:WVGD8	1255:Arm3	80.00	77.00	78.50	18.607	1.56e+06	1.000	31.21	0.00	155.24	145.17	0.00	0.00
1255	1255:Arm3		77.00	73.50	75.25	19.183	1.6e+06	1.000	31.21	0.00	186.80	174.62	0.00	0.00
1255		1255:WVGD7	73.50	70.00	71.75	19.804	1.66e+06	1.000	31.21	0.00	192.92	180.27	0.00	0.00
1255	1255:WVGD7	1255:Arm4	70.00	65.00	67.50	20.558	1.72e+06	1.000	31.21	0.00	286.23	267.33	0.00	0.00
1255	1255:Arm4	1255:WVGD6	65.00	60.00	62.50	21.444	1.79e+06	1.000	31.21	0.00	298.73	278.86	0.00	0.00
1255	1255:WVGD6		60.00	56.50	58.25	22.198	1.86e+06	1.000	31.21	0.00	216.55	202.06	0.00	0.00
1255			56.50	53.00	54.75	22.819	1.91e+06	1.000	31.21	0.00	222.67	207.72	0.00	0.00
1255		1255:WVGD5	53.00	50.00	51.50	23.146	1.94e+06	1.000	31.21	0.00	481.42	180.59	0.00	0.00
1255	1255:WVGD5		50.00	45.00	47.50	23.605	1.97e+06	1.000	31.21	0.00	491.20	306.96	0.00	0.00
1255		1255:WVGD4	45.00	40.00	42.50	24.492	2.05e+06	1.000	31.21	0.00	509.88	318.49	0.00	0.00
1255	1255:WVGD4		40.00	35.00	37.50	25.379	2.12e+06	1.000	31.21	0.00	528.63	330.02	0.00	0.00
1255		1255:WVGD3	35.00	30.00	32.50	26.266	2.2e+06	1.000	31.21	0.00	547.38	341.55	0.00	0.00
1255	1255:WVGD3		30.00	25.00	27.50	27.152	2.27e+06	1.000	31.21	0.00	566.13	353.09	0.00	0.00
1255		1255:WVGD2	25.00	20.00	22.50	28.039	2.35e+06	1.000	31.21	0.00	584.88	364.62	0.00	0.00
1255	1255:WVGD2		20.00	18.92	19.46	28.579	2.39e+06	1.000	31.21	0.00	129.16	80.50	0.00	0.00
1255			18.92	15.00	16.96	28.647	2.4e+06	1.000	31.21	0.00	936.53	291.83	0.00	0.00
1255		1255:WVGD1	15.00	10.00	12.50	29.063	2.43e+06	1.000	31.21	0.00	606.63	377.93	0.00	0.00
1255	1255:WVGD1		10.00	5.00	7.50	29.950	2.5e+06	1.000	31.21	0.00	625.27	389.46	0.00	0.00
1255		1255:g	5.00	0.00	2.50	30.837	2.58e+06	1.000	31.21	0.00	644.02	400.99	0.00	0.00

*** Analysis Results:

Maximum element usage is 99.96% for Steel Pole "1255" in load case "NESC Extreme"
Maximum insulator usage is 36.88% for Clamp "Clamp18" in load case "NESC Extreme"



*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 19

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

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1255:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
1255:t	0.01514	5.036	-0.1796	-5.4729	0.0145	0.0004	0.01514	5.036	94.82
1255:Arm1	0.01502	4.988	-0.1774	-5.4722	0.0145	0.0004	0.01502	4.988	94.32
1255:ConnBot	0.01489	4.941	-0.1751	-5.4692	0.0145	0.0004	0.01489	4.941	93.82
1255:WVGD9	0.01388	4.561	-0.1569	-5.4233	0.0145	0.0004	0.01388	4.561	89.84
1255:Arm2	0.01362	4.466	-0.1524	-5.4079	0.0145	0.0004	0.01362	4.466	88.85
1255:WVGD8	0.01137	3.637	-0.1138	-5.1350	0.0142	0.0003	0.01137	3.637	79.89
1255:Arm3	0.01064	3.371	-0.102	-5.0097	0.0140	0.0003	0.01064	3.371	76.9
1255:WVGD7	0.00897	2.781	-0.07678	-4.6353	0.0133	0.0002	0.00897	2.781	69.92
1255:Arm4	0.007835	2.39	-0.06127	-4.3191	0.0127	0.0002	0.007835	2.39	64.94
1255:WVGD6	0.006759	2.028	-0.04791	-3.9599	0.0119	0.0002	0.006759	2.028	59.95
1255:WVGD5	0.004828	1.405	-0.02793	-3.1942	0.0102	0.0001	0.004828	1.405	49.97
1255:WVGD4	0.003188	0.901	-0.01486	-2.5669	0.0086	0.0001	0.003188	0.901	39.99
1255:WVGD3	0.00185	0.508	-0.006756	-1.9276	0.0067	0.0000	0.00185	0.508	29.99
1255:WVGD2	0.0008478	0.2263	-0.002408	-1.2940	0.0047	0.0000	0.0008478	0.2263	20
1255:WVGD1	0.0002173	0.05631	-0.0005627	-0.6416	0.0024	0.0000	0.0002173	0.05631	9.999
Davit1:O	0.01504	4.991	-0.1147	-5.4722	0.0145	0.0004	0.01504	4.334	94.39
Davit1:End	0.01549	5.128	0.3549	-5.4385	0.0146	0.0004	0.01549	-0.5289	96.05
Davit2:O	0.015	4.985	-0.24	-5.4722	0.0145	0.0004	0.015	5.642	94.26
Davit2:End	0.01515	5.078	-0.7255	-5.5326	0.0145	0.0004	0.01515	10.73	94.97
Davit3:O	0.01365	4.47	-0.08668	-5.4079	0.0145	0.0004	0.01365	3.772	88.91
Davit3:End	0.01439	4.692	0.6544	-5.3584	0.0145	0.0004	0.01439	-4.005	91.65
Davit4:O	0.0136	4.463	-0.2182	-5.4079	0.0145	0.0004	0.0136	5.161	88.78
Davit4:End	0.01387	4.617	-0.9868	-5.4761	0.0145	0.0003	0.01387	13.31	90.01
Davit5:O	0.01066	3.374	-0.03331	-5.0097	0.0140	0.0003	0.01066	2.588	76.97
Davit5:End	0.01135	3.578	0.6537	-4.9603	0.0140	0.0003	0.01135	-5.208	79.65
Davit6:O	0.01062	3.368	-0.1706	-5.0097	0.0140	0.0003	0.01062	4.155	76.83
Davit6:End	0.01089	3.513	-0.8826	-5.0781	0.0140	0.0003	0.01089	12.3	78.12
Davit7:O	0.007852	2.393	0.004635	-4.3191	0.0127	0.0002	0.007852	1.518	65

Davit7:End	0.008455	2.565	0.5974	-4.2688	0.0127	0.0002	0.008455	-6.31	67.6
Davit8:O	0.007817	2.388	-0.1272	-4.3191	0.0127	0.0002	0.007817	3.263	64.87
Davit8:End	0.008099	2.517	-0.741	-4.3873	0.0127	0.0002	0.008099	11.39	66.26

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift Usage %	Result. Usage %	Result. Force (kips)	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 %
1255:g	-0.09	0.0	-13.30	0.0	0.0	-41.85	0.0	0.0	43.91	0.0	1069.22	0.0	-4.2	0.0	0.0	-0.01	0.0	0.0

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. Res. Usage (ksi)	Max. At Pt. %
1255	1255:t	Origin	0.00	60.43	0.18	-2.16	-0.00	0.00	-0.0	0.72	7.75	-0.00	0.06	0.00	1.25	0.00	2.17	3.3	4
1255	1255:Arm1	End	0.50	59.86	0.18	-2.13	3.87	-0.00	-0.0	0.72	7.75	-0.00	0.06	0.00	1.25	0.00	2.16	3.3	4
1255	1255:Arm1	Origin	0.50	59.86	0.18	-2.13	6.04	-0.00	0.0	-5.19	10.91	-0.00	-0.40	0.00	1.76	0.00	3.07	4.7	4
1255	1255:ConnBot	End	1.00	59.29	0.18	-2.10	11.50	-0.00	0.0	-5.19	10.91	-0.00	-0.40	2.63	0.67	0.00	3.24	5.0	2
1255	1255:ConnBot	Origin	1.00	59.29	0.18	-2.10	11.50	-0.00	0.0	-6.10	3.24	-0.00	-0.47	2.63	0.20	0.00	3.12	4.8	2
1255	1255:WVGD9	End	5.00	54.73	0.17	-1.88	24.44	-0.02	0.0	-6.10	3.24	-0.00	-0.45	5.11	0.19	0.00	5.57	8.6	2
1255	1255:WVGD9	Origin	5.00	54.73	0.17	-1.88	24.44	-0.02	0.0	-6.80	3.45	-0.01	-0.50	5.11	0.20	0.00	5.62	8.7	2
1255	1255:Arm2	End	6.00	53.60	0.16	-1.83	27.90	-0.02	0.0	-6.80	3.45	-0.01	-0.50	5.71	0.20	0.00	6.21	9.6	2
1255	1255:Arm2	Origin	6.00	53.60	0.16	-1.83	33.11	-0.03	0.0	-11.76	6.22	-0.01	-0.86	6.77	0.36	0.00	7.66	11.8	2
1255	Tube 1	End	10.50	48.55	0.15	-1.59	61.11	-0.07	0.0	-11.76	6.22	-0.01	-0.82	11.37	0.35	0.00	12.20	18.8	2
1255	Tube 1	Origin	10.50	48.55	0.15	-1.59	61.11	-0.07	0.0	-12.15	6.34	-0.01	-0.85	11.37	0.35	0.00	12.23	18.8	2
1255	1255:WVGD8	End	15.00	43.64	0.14	-1.37	89.63	-0.13	0.0	-12.15	6.34	-0.01	-0.81	15.22	0.34	0.00	16.05	24.7	2
1255	1255:WVGD8	Origin	15.00	43.64	0.14	-1.37	89.63	-0.13	0.0	-13.00	6.57	-0.02	-0.87	15.22	0.35	0.00	16.10	24.8	2
1255	1255:Arm3	End	18.00	40.45	0.13	-1.22	109.35	-0.18	0.0	-13.00	6.57	-0.02	-0.84	17.52	0.34	0.00	18.37	28.3	2
1255	1255:Arm3	Origin	18.00	40.45	0.13	-1.22	114.72	-0.18	0.0	-18.05	9.31	-0.02	-1.17	18.38	0.48	0.00	19.57	30.1	2
1255	Tube 1	End	21.50	36.85	0.12	-1.07	147.31	-0.26	0.0	-18.05	9.31	-0.02	-1.13	22.10	0.46	0.00	23.24	35.8	2
1255	Tube 1	Origin	21.50	36.85	0.12	-1.07	147.31	-0.26	0.0	-18.41	9.37	-0.02	-1.15	22.10	0.47	0.00	23.27	35.8	2
1255	1255:WVGD7	End	25.00	33.37	0.11	-0.92	180.11	-0.34	0.0	-18.41	9.37	-0.02	-1.12	25.35	0.45	0.00	26.48	40.7	2
1255	1255:WVGD7	Origin	25.00	33.37	0.11	-0.92	180.11	-0.34	0.0	-19.37	9.58	-0.03	-1.18	25.35	0.46	0.00	26.54	40.8	2
1255	1255:Arm4	End	30.00	28.68	0.09	-0.74	228.01	-0.47	0.0	-19.37	9.58	-0.03	-1.13	29.39	0.44	0.00	30.53	47.5	2
1255	1255:Arm4	Origin	30.00	28.68	0.09	-0.74	232.96	-0.47	0.0	-24.69	12.27	-0.03	-1.44	30.03	0.57	0.00	31.48	49.0	2
1255	1255:WVGD6	End	35.00	24.34	0.08	-0.57	294.29	-0.64	0.0	-24.69	12.27	-0.03	-1.38	34.87	0.54	0.00	36.26	57.8	2
1255	1255:WVGD6	Origin	35.00	24.34	0.08	-0.57	294.29	-0.64	0.0	-25.72	12.42	-0.04	-1.43	34.87	0.55	0.00	36.32	57.9	2
1255	Tube 1	End	38.50	21.53	0.07	-0.48	337.75	-0.76	0.0	-25.72	12.42	-0.04	-1.39	37.81	0.53	0.00	39.22	63.5	2
1255	Tube 1	Origin	38.50	21.53	0.07	-0.48	337.75	-0.76	0.0	-26.16	12.43	-0.04	-1.42	37.81	0.53	0.00	39.24	63.5	2
1255	SpliceT	End	42.00	18.93	0.06	-0.40	381.24	-0.90	0.0	-26.16	12.43	-0.04	-1.38	40.39	0.52	0.00	41.78	68.8	2
1255	SpliceT	Origin	42.00	18.93	0.06	-0.40	381.24	-0.90	0.0	-26.78	12.45	-0.04	-1.41	40.39	0.52	0.00	41.81	68.8	2
1255	1255:WVGD5	End	45.00	16.86	0.06	-0.34	418.58	-1.02	0.0	-26.78	12.45	-0.04	-0.95	29.96	0.35	0.00	30.91	47.6	2
1255	1255:WVGD5	Origin	45.00	16.86	0.06	-0.34	418.58	-1.02	0.0	-28.14	12.62	-0.04	-0.99	29.96	0.35	0.00	30.96	47.6	2
1255	Tube 2	End	50.00	13.67	0.05	-0.25	481.69	-1.25	0.0	-28.14	12.62	-0.04	-0.96	31.93	0.34	0.00	32.89	50.6	2
1255	Tube 2	Origin	50.00	13.67	0.05	-0.25	481.69	-1.24	0.0	-29.04	12.67	-0.05	-0.99	31.93	0.34	0.00	32.92	50.6	2
1255	1255:WVGD4	End	55.00	10.81	0.04	-0.18	545.06	-1.49	0.0	-29.04	12.67	-0.05	-0.95	33.55	0.33	0.00	34.51	53.1	2
1255	1255:WVGD4	Origin	55.00	10.81	0.04	-0.18	545.06	-1.49	0.0	-30.48	12.84	-0.05	-1.00	33.55	0.33	0.00	34.55	53.2	2
1255	Tube 2	End	60.00	8.29	0.03	-0.12	609.25	-1.75	0.0	-30.48	12.84	-0.05	-0.96	34.92	0.32				

0.00 35.89 55.2 2
1255 Tube 2 Origin 60.00 8.29 0.03 -0.12 609.25 -1.75 0.0 -31.44 12.88 -0.06 -0.99 34.92 0.32
0.00 35.92 55.3 2
1255 1255:WVGD3 End 65.00 6.10 0.02 -0.08 673.64 -2.04 0.0 -31.44 12.88 -0.06 -0.96 36.04 0.31
0.00 37.00 56.9 2
1255 1255:WVGD3 Origin 65.00 6.10 0.02 -0.08 673.64 -2.04 0.0 -32.94 13.03 -0.06 -1.01 36.04 0.32
0.00 37.05 57.0 2
1255 Tube 2 End 70.00 4.24 0.02 -0.05 738.78 -2.34 0.0 -32.94 13.03 -0.06 -0.97 36.97 0.31
0.00 37.95 58.4 2
1255 Tube 2 Origin 70.00 4.24 0.02 -0.05 738.78 -2.34 0.0 -33.97 13.06 -0.07 -1.00 36.97 0.31
0.00 37.98 58.4 2
1255 1255:WVGD2 End 75.00 2.72 0.01 -0.03 804.09 -2.67 0.0 -33.97 13.06 -0.07 -0.97 37.73 0.30
0.00 38.70 59.5 2
1255 1255:WVGD2 Origin 75.00 2.72 0.01 -0.03 804.09 -2.67 0.0 -35.12 13.18 -0.07 -1.01 37.73 0.30
0.00 38.74 59.6 2
1255 SpliceT End 76.08 2.43 0.01 -0.03 818.36 -2.75 0.0 -35.12 13.18 -0.07 -1.00 37.88 0.30
0.00 38.88 59.8 2
1255 SpliceT Origin 76.08 2.43 0.01 -0.03 818.36 -2.75 0.0 -36.00 13.20 -0.07 -1.02 37.88 0.30
0.00 38.90 59.9 2
1255 SpliceB End 80.00 1.52 0.01 -0.01 870.07 -3.03 0.0 -36.00 13.20 -0.07 -1.03 40.43 0.30
0.00 41.46 63.8 2
1255 SpliceB Origin 80.00 1.52 0.01 -0.01 870.07 -3.03 0.0 -37.30 13.21 -0.08 -1.06 40.43 0.30
0.00 41.50 63.8 2
1255 1255:WVGD1 End 85.00 0.68 0.00 -0.01 936.14 -3.40 0.0 -37.30 13.21 -0.08 -1.03 40.88 0.29
0.00 41.91 64.5 2
1255 1255:WVGD1 Origin 85.00 0.68 0.00 -0.01 936.14 -3.40 0.0 -38.91 13.31 -0.08 -1.07 40.88 0.29
0.00 41.96 64.5 2
1255 Tube 3 End 90.00 0.17 0.00 -0.00 1002.70 -3.80 0.0 -38.91 13.31 -0.08 -1.04 41.22 0.28
0.00 42.27 65.0 2
1255 Tube 3 Origin 90.00 0.17 0.00 -0.00 1002.70 -3.80 0.0 -40.04 13.31 -0.08 -1.07 41.22 0.28
0.00 42.30 65.1 2
1255 1255:g End 95.00 0.00 0.00 0.00 1069.22 -4.22 0.0 -40.04 13.31 -0.08 -1.04 41.46 0.27
0.00 42.51 66.0 2

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. Max. Usage (ksi)	At Pt. %
Davit1	Davit1:O	Origin	0.00	59.90	0.18	-1.38	-2.80	0.00	0.0	-1.04	0.58	-0.00	-0.15	1.96	0.00	0.00	2.11	3.2 1
Davit1	#Davit1:0	End	2.57	60.72	0.18	1.45	-1.32	0.00	0.0	-1.04	0.58	-0.00	-0.19	1.54	0.00	0.00	1.74	2.7 1
Davit1	#Davit1:0	Origin	2.57	60.72	0.18	1.45	-1.32	0.00	0.0	-1.01	0.51	-0.00	-0.19	1.54	0.00	0.00	1.74	2.7 1
Davit1	Davit1:End	End	5.14	61.54	0.19	4.26	-0.00	0.00	0.0	-1.01	0.51	-0.00	-0.27	0.00	0.29	0.00	0.57	0.9 3
Davit2	Davit2:O	Origin	0.00	59.83	0.18	-2.88	-4.95	-0.00	-0.0	0.62	1.00	0.00	0.09	3.47	0.00	0.00	3.56	5.5 1
Davit2	#Davit2:0	End	2.57	60.38	0.18	-5.78	-2.39	-0.00	-0.0	0.62	1.00	0.00	0.12	2.80	0.00	0.00	2.91	4.5 1
Davit2	#Davit2:0	Origin	2.57	60.38	0.18	-5.78	-2.39	-0.00	0.0	0.63	0.93	0.00	0.12	2.80	0.00	0.00	2.91	4.5 1
Davit2	Davit2:End	End	5.14	60.93	0.18	-8.71	0.00	0.00	0.0	0.63	0.93	0.00	0.17	0.00	0.52	0.00	0.92	1.4 3
Davit3	Davit3:O	Origin	0.00	53.63	0.16	-1.04	-14.29	0.01	0.0	-1.83	1.84	-0.00	-0.12	2.59	0.00	0.00	2.71	4.2 1
Davit3	#Davit3:0	End	4.12	54.97	0.17	3.42	-6.70	0.00	0.0	-1.83	1.84	-0.00	-0.16	2.23	0.00	0.00	2.39	3.7 1
Davit3	#Davit3:0	Origin	4.12	54.97	0.17	3.42	-6.70	0.00	0.0	-1.75	1.63	-0.00	-0.16	2.23	0.00	0.00	2.39	3.7 1
Davit3	Davit3:End	End	8.25	56.31	0.17	7.85	-0.00	0.00	0.0	-1.75	1.63	-0.00	-0.24	0.00	0.46	0.00	0.84	1.3 3
Davit4	Davit4:O	Origin	0.00	53.56	0.16	-2.62	-19.51	-0.01	-0.0	0.76	2.48	0.00	0.05	3.54	0.00	0.00	3.59	5.5 1
Davit4	#Davit4:0	End	4.12	54.48	0.16	-7.21	-9.27	-0.00	-0.0	0.76	2.48	0.00	0.07	3.08	0.00	0.00	3.15	4.8 1
Davit4	#Davit4:0	Origin	4.12	54.48	0.16	-7.21	-9.27	-0.00	0.0	0.80	2.25	0.00	0.07	3.08	0.00	0.00	3.15	4.9 1
Davit4	Davit4:End	End	8.25	55.40	0.17	-11.84	0.00	0.00	0.0	0.80	2.25	0.00	0.11	0.00	0.64	0.00	1.12	1.7 3
Davit5	Davit5:O	Origin	0.00	40.49	0.13	-0.40	-14.24	0.01	0.0	-1.82	1.83	-0.00	-0.12	2.58	0.00	0.00	2.70	4.2 1
Davit5	#Davit5:0	End	4.12	41.72	0.13	3.73	-6.68	0.00	0.0	-1.82	1.83	-0.00	-0.16	2.22	0.00	0.00	2.38	3.7 1
Davit5	#Davit5:0	Origin	4.12	41.72	0.13	3.73	-6.68	0.00	0.0	-1.74	1.62	-0.00	-0.16	2.22	0.00	0.00	2.38	3.7 1
Davit5	Davit5:End	End	8.25	42.94	0.14	7.84	-0.00	0.00	0.0	-1.74	1.62	-0.00	-0.24	0.00	0.46	0.00	0.84	1.3 3

Davit6	Davit6:O	Origin	0.00	40.42	0.13	-2.05	-19.59	-0.01	-0.0	0.74	2.49	0.00	0.05	3.55	0.00	0.00	3.60	5.5	1
Davit6	#Davit6:0	End	4.12	41.29	0.13	-6.30	-9.31	-0.00	-0.0	0.74	2.49	0.00	0.07	3.10	0.00	0.00	3.16	4.9	1
Davit6	#Davit6:0	Origin	4.12	41.29	0.13	-6.30	-9.31	-0.00	0.0	0.78	2.26	0.00	0.07	3.10	0.00	0.00	3.17	4.9	1
Davit6	Davit6:End	End	8.25	42.16	0.13	-10.59	0.00	0.00	0.0	0.78	2.26	0.00	0.11	0.00	0.65	0.00	1.12	1.7	3
Davit7	Davit7:O	Origin	0.00	28.71	0.09	0.06	-14.53	0.01	0.0	-1.80	1.87	-0.00	-0.12	2.63	0.00	0.00	2.75	4.2	1
Davit7	#Davit7:0	End	4.12	29.75	0.10	3.62	-6.82	0.00	0.0	-1.80	1.87	-0.00	-0.16	2.27	0.00	0.00	2.43	3.7	1
Davit7	#Davit7:0	Origin	4.12	29.75	0.10	3.62	-6.82	0.00	0.0	-1.73	1.65	-0.00	-0.15	2.27	0.00	0.00	2.42	3.7	1
Davit7	Davit7:End	End	8.25	30.78	0.10	7.17	-0.00	0.00	0.0	-1.73	1.65	-0.00	-0.24	0.00	0.47	0.00	0.85	1.3	3
Davit8	Davit8:O	Origin	0.00	28.65	0.09	-1.53	-19.50	-0.01	-0.0	0.73	2.48	0.00	0.05	3.54	0.00	0.00	3.58	5.5	1
Davit8	#Davit8:0	End	4.12	29.42	0.10	-5.19	-9.27	-0.00	-0.0	0.73	2.48	0.00	0.07	3.08	0.00	0.00	3.15	4.8	1
Davit8	#Davit8:0	Origin	4.12	29.42	0.10	-5.19	-9.27	-0.00	0.0	0.78	2.25	0.00	0.07	3.08	0.00	0.00	3.15	4.8	1
Davit8	Davit8:End	End	8.25	30.20	0.10	-8.89	0.00	0.00	0.0	0.78	2.25	0.00	0.11	0.00	0.64	0.00	1.12	1.7	3

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
Clamp1	1.114	80.00	80.00	1.39	0.00	0.00	0.00	1.39
Clamp2	1.099	80.00	80.00	1.37	0.00	0.00	0.00	1.37
Clamp3	2.303	80.00	80.00	2.88	0.00	0.00	0.00	2.88
Clamp4	2.300	80.00	80.00	2.88	0.00	0.00	0.00	2.88
Clamp5	2.295	80.00	80.00	2.87	0.00	0.00	0.00	2.87
Clamp6	2.303	80.00	80.00	2.88	0.00	0.00	0.00	2.88
Clamp7	2.309	80.00	80.00	2.89	0.00	0.00	0.00	2.89
Clamp8	2.293	80.00	80.00	2.87	0.00	0.00	0.00	2.87
Clamp9	0.525	80.00	80.00	0.66	0.00	0.00	0.00	0.66
Clamp10	0.525	80.00	80.00	0.66	0.00	0.00	0.00	0.66
Clamp11	0.525	80.00	80.00	0.66	0.00	0.00	0.00	0.66
Clamp12	0.525	80.00	80.00	0.66	0.00	0.00	0.00	0.66
Clamp13	0.525	80.00	80.00	0.66	0.00	0.00	0.00	0.66
Clamp14	0.525	80.00	80.00	0.66	0.00	0.00	0.00	0.66
Clamp15	0.525	80.00	80.00	0.66	0.00	0.00	0.00	0.66
Clamp16	0.525	80.00	80.00	0.66	0.00	0.00	0.00	0.66
Clamp17	0.525	80.00	80.00	0.66	0.00	0.00	0.00	0.66
Clamp18	7.774	80.00	80.00	9.72	0.00	0.00	0.00	9.72
Clamp19	4.404	80.00	80.00	5.51	0.00	0.00	0.00	5.51
Clamp20	7.774	80.00	80.00	9.72	0.00	0.00	0.00	9.72

*** Analysis Results for Load Case No. 2 "NESC Extreme" - Number of iterations in SAPS 19

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

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1255:g	0	0	0	0.0000	0.0000	0.0000	0	0	0
1255:t	0.00362	7.771	-0.4232	-8.6365	0.0035	0.0002	0.00362	7.771	94.58
1255:Arm1	0.00359	7.695	-0.4176	-8.6340	0.0035	0.0002	0.00359	7.695	94.08
1255:ConnBot	0.00356	7.62	-0.4119	-8.6253	0.0035	0.0002	0.00356	7.62	93.59
1255:WVGD9	0.003321	7.024	-0.3672	-8.5084	0.0035	0.0002	0.003321	7.024	89.63
1255:Arm2	0.003261	6.876	-0.3562	-8.4727	0.0035	0.0002	0.003261	6.876	88.64
1255:WVGD8	0.002728	5.585	-0.263	-7.9652	0.0034	0.0001	0.002728	5.585	79.74
1255:Arm3	0.002554	5.175	-0.2348	-7.7476	0.0033	0.0001	0.002554	5.175	76.77
1255:WVGD7	0.002158	4.266	-0.1755	-7.1314	0.0032	0.0001	0.002158	4.266	69.82
1255:Arm4	0.001887	3.666	-0.1393	-6.6265	0.0030	0.0001	0.001887	3.666	64.86
1255:WVGD6	0.00163	3.113	-0.1084	-6.0652	0.0029	0.0001	0.00163	3.113	59.89
1255:WVGD5	0.001167	2.159	-0.06248	-4.8904	0.0025	0.0000	0.001167	2.159	49.94
1255:WVGD4	0.0007723	1.387	-0.03246	-3.9364	0.0021	0.0000	0.0007723	1.387	39.97
1255:WVGD3	0.000449	0.7842	-0.01402	-2.9645	0.0016	0.0000	0.000449	0.7842	29.99
1255:WVGD2	0.0002061	0.3503	-0.004366	-1.9972	0.0011	0.0000	0.0002061	0.3503	20
1255:WVGD1	5.295e-05	0.08745	-0.0006463	-0.9946	0.0006	0.0000	5.295e-05	0.08745	9.999
Davit1:O	0.003598	7.703	-0.3189	-8.6340	0.0035	0.0002	0.003598	7.046	94.18
Davit1:End	0.003732	7.94	0.4186	-8.6442	0.0035	0.0002	0.003732	2.283	96.12
Davit2:O	0.003582	7.688	-0.5162	-8.6340	0.0035	0.0002	0.003582	8.345	93.98
Davit2:End	0.003591	7.812	-1.281	-8.6486	0.0035	0.0002	0.003591	13.47	94.42
Davit3:O	0.003269	6.884	-0.2534	-8.4727	0.0035	0.0002	0.003269	6.186	88.75
Davit3:End	0.003486	7.266	0.903	-8.4665	0.0035	0.0002	0.003486	-1.432	91.9
Davit4:O	0.003253	6.869	-0.459	-8.4727	0.0035	0.0002	0.003253	7.566	88.54
Davit4:End	0.003276	7.076	-1.662	-8.5016	0.0035	0.0002	0.003276	15.77	89.34
Davit5:O	0.002562	5.182	-0.1288	-7.7476	0.0033	0.0001	0.002562	4.396	76.87
Davit5:End	0.002761	5.525	0.9309	-7.7410	0.0033	0.0001	0.002761	-3.262	79.93
Davit6:O	0.002546	5.168	-0.3408	-7.7476	0.0033	0.0001	0.002546	5.954	76.66
Davit6:End	0.002579	5.365	-1.44	-7.7772	0.0033	0.0001	0.002579	14.15	77.56
Davit7:O	0.001894	3.672	-0.03829	-6.6265	0.0030	0.0001	0.001894	2.797	64.96
Davit7:End	0.002062	3.956	0.8709	-6.6187	0.0030	0.0001	0.002062	-4.919	67.87
Davit8:O	0.001881	3.661	-0.2402	-6.6265	0.0030	0.0001	0.001881	4.536	64.76
Davit8:End	0.001924	3.838	-1.179	-6.6565	0.0030	0.0001	0.001924	12.71	65.82

Joint Support Reactions for Load Case "NESC Extreme":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift Usage %	Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
1255:g	-0.02	0.0	-22.32	0.0	0.0	-20.42	0.0	0.0	30.25	0.0	1665.17	0.0	-1.0	0.0	0.0	-0.00	0.0	0.0

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Trans. Mom. (Local Mx) (ft-k)	Long. Mom. (Local My) (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Tran. Shear (kips)	Long. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. Res. (ksi)	Max. At Usage Pt. %
1255	1255:t	Origin	0.00	93.25	0.04	-5.08	0.00	0.00	-0.0	4.43	29.18	-0.00	0.35	0.00	4.72	0.00	8.19	12.6 4
1255	1255:Arm1	End	0.50	92.34	0.04	-5.01	14.59	-0.00	-0.0	4.43	29.18	-0.00	0.34	0.00	4.70	0.00	8.14	12.5 4
1255	1255:Arm1	Origin	0.50	92.34	0.04	-5.01	16.64	-0.00	0.0	2.69	34.92	-0.00	0.21	0.00	5.62	0.00	9.74	15.0 4
1255	1255:ConnBot	End	1.00	91.44	0.04	-4.94	34.10	-0.00	0.0	2.69	34.92	-0.00	0.21	0.00	5.59	0.00	9.68	14.9 4
1255	1255:ConnBot	Origin	1.00	91.44	0.04	-4.94	34.10	-0.00	0.0	-1.85	5.85	-0.00	-0.14	7.79	0.36	0.00	7.96	12.2 2
1255	1255:WVGD9	End	5.00	84.29	0.04	-4.41	57.52	-0.00	0.0	-1.85	5.85	-0.00	-0.14	12.02	0.34	0.00	12.17	18.7 2
1255	1255:WVGD9	Origin	5.00	84.29	0.04	-4.41	57.52	-0.00	0.0	-2.05	6.25	-0.00	-0.15	12.02	0.37	0.00	12.19	18.7 2
1255	1255:Arm2	End	6.00	82.51	0.04	-4.27	63.77	-0.01	0.0	-2.05	6.25	-0.00	-0.15	13.04	0.36	0.00	13.20	20.3 2
1255	1255:Arm2	Origin	6.00	82.51	0.04	-4.27	70.21	-0.01	0.0	-3.81	9.58	-0.00	-0.28	14.36	0.56	0.00	14.67	22.6 2
1255	Tube 1	End	10.50	74.65	0.04	-3.70	113.31	-0.02	0.0	-3.81	9.58	-0.00	-0.27	21.07	0.53	0.00	21.35	32.8 2
1255	Tube 1	Origin	10.50	74.65	0.04	-3.70	113.31	-0.02	0.0	-4.07	9.79	-0.00	-0.28	21.07	0.54	0.00	21.37	32.9 2
1255	1255:WVGD8	End	15.00	67.02	0.03	-3.16	157.39	-0.03	0.0	-4.07	9.79	-0.00	-0.27	26.72	0.52	0.00	27.01	41.5 2
1255	1255:WVGD8	Origin	15.00	67.02	0.03	-3.16	157.39	-0.03	0.0	-4.39	10.25	-0.00	-0.29	26.72	0.54	0.00	27.03	41.6 2
1255	1255:Arm3	End	18.00	62.10	0.03	-2.82	188.14	-0.04	0.0	-4.39	10.25	-0.00	-0.28	30.13	0.53	0.00	30.43	46.8 2
1255	1255:Arm3	Origin	18.00	62.10	0.03	-2.82	194.68	-0.04	0.0	-6.27	13.59	-0.00	-0.41	31.18	0.70			

0.00 31.61 48.6 2																	
1255	Tube 1	End	21.50	56.54	0.03	-2.45	242.24	-0.06	0.0	-6.27	13.59	-0.00	-0.39	36.32	0.68		
0.00 36.73 56.5 2																	
1255	Tube 1	Origin	21.50	56.54	0.03	-2.45	242.24	-0.06	0.0	-6.53	13.75	-0.01	-0.41	36.32	0.68		
0.00 36.74 56.5 2																	
1255	1255:WVGD7	End	25.00	51.20	0.03	-2.11	290.37	-0.08	0.0	-6.53	13.75	-0.01	-0.40	40.84	0.66		
0.00 41.25 63.5 2																	
1255	1255:WVGD7	Origin	25.00	51.20	0.03	-2.11	290.37	-0.08	0.0	-6.96	14.23	-0.01	-0.42	40.84	0.69		
0.00 41.28 63.5 2																	
1255	1255:Arm4	End	30.00	44.00	0.02	-1.67	361.50	-0.11	0.0	-6.96	14.23	-0.01	-0.40	46.56	0.66		
0.00 46.98 72.3 2																	
1255	1255:Arm4	Origin	30.00	44.00	0.02	-1.67	367.79	-0.11	0.0	-9.12	17.61	-0.01	-0.53	47.37	0.81		
0.00 47.93 73.7 2																	
1255	1255:WVGD6	End	35.00	37.35	0.02	-1.30	455.86	-0.15	0.0	-9.12	17.61	-0.01	-0.51	53.98	0.78		
0.00 54.50 83.9 2																	
1255	1255:WVGD6	Origin	35.00	37.35	0.02	-1.30	455.86	-0.15	0.0	-9.62	18.07	-0.01	-0.54	53.98	0.80		
0.00 54.53 83.9 2																	
1255	Tube 1	End	38.50	33.06	0.02	-1.08	519.10	-0.18	0.0	-9.62	18.07	-0.01	-0.52	58.07	0.78		
0.00 58.61 91.3 2																	
1255	Tube 1	Origin	38.50	33.06	0.02	-1.08	519.10	-0.18	0.0	-9.97	18.22	-0.01	-0.54	58.07	0.78		
0.00 58.63 91.4 2																	
1255	SpliceT	End	42.00	29.08	0.02	-0.89	582.88	-0.21	0.0	-9.97	18.22	-0.01	-0.53	61.70	0.76		
0.00 62.24 98.3 2																	
1255	SpliceT	Origin	42.00	29.08	0.02	-0.89	582.88	-0.21	0.0	-10.44	18.38	-0.01	-0.55	61.70	0.77		
0.00 62.26 98.4 2																	
1255	1255:WVGD5	End	45.00	25.91	0.01	-0.75	638.01	-0.24	0.0	-10.44	18.38	-0.01	-0.37	45.63	0.52		
0.00 46.01 70.8 2																	
1255	1255:WVGD5	Origin	45.00	25.91	0.01	-0.75	638.01	-0.24	0.0	-11.15	18.86	-0.01	-0.39	45.63	0.53		
0.00 46.03 70.8 2																	
1255	Tube 2	End	50.00	21.03	0.01	-0.55	732.30	-0.30	0.0	-11.15	18.86	-0.01	-0.38	48.50	0.51		
0.00 48.88 75.2 2																	
1255	Tube 2	Origin	50.00	21.03	0.01	-0.55	732.30	-0.30	0.0	-11.81	19.11	-0.01	-0.40	48.50	0.52		
0.00 48.91 75.2 2																	
1255	1255:WVGD4	End	55.00	16.65	0.01	-0.39	827.85	-0.36	0.0	-11.81	19.11	-0.01	-0.39	50.91	0.50		
0.00 51.30 78.9 2																	
1255	1255:WVGD4	Origin	55.00	16.65	0.01	-0.39	827.85	-0.36	0.0	-12.59	19.64	-0.01	-0.41	50.91	0.51		
0.00 51.33 79.0 2																	
1255	Tube 2	End	60.00	12.78	0.01	-0.26	926.03	-0.42	0.0	-12.59	19.64	-0.01	-0.40	53.02	0.49		
0.00 53.42 82.2 2																	
1255	Tube 2	Origin	60.00	12.78	0.01	-0.26	926.03	-0.42	0.0	-13.30	19.89	-0.01	-0.42	53.02	0.50		
0.00 53.45 82.2 2																	
1255	1255:WVGD3	End	65.00	9.41	0.01	-0.17	1025.49	-0.49	0.0	-13.30	19.89	-0.01	-0.41	54.80	0.48		
0.00 55.21 84.9 2																	
1255	1255:WVGD3	Origin	65.00	9.41	0.01	-0.17	1025.49	-0.49	0.0	-14.13	20.42	-0.02	-0.43	54.80	0.50		
0.00 55.24 85.0 2																	
1255	Tube 2	End	70.00	6.55	0.00	-0.10	1127.58	-0.56	0.0	-14.13	20.42	-0.02	-0.42	56.37	0.48		
0.00 56.79 87.4 2																	
1255	Tube 2	Origin	70.00	6.55	0.00	-0.10	1127.58	-0.56	0.0	-14.88	20.68	-0.02	-0.44	56.37	0.49		
0.00 56.82 87.4 2																	
1255	1255:WVGD2	End	75.00	4.20	0.00	-0.05	1230.97	-0.65	0.0	-14.88	20.68	-0.02	-0.43	57.69	0.47		
0.00 58.12 89.4 2																	
1255	1255:WVGD2	Origin	75.00	4.20	0.00	-0.05	1230.97	-0.65	0.0	-15.45	21.10	-0.02	-0.44	57.69	0.48		
0.00 58.14 89.4 2																	
1255	SpliceT	End	76.08	3.76	0.00	-0.04	1253.83	-0.66	0.0	-15.45	21.10	-0.02	-0.44	57.96	0.48		
0.00 58.41 89.9 2																	
1255	SpliceT	Origin	76.08	3.76	0.00	-0.04	1253.83	-0.66	0.0	-16.08	21.24	-0.02	-0.46	57.96	0.48		
0.00 58.43 89.9 2																	
1255	SpliceB	End	80.00	2.36	0.00	-0.02	1337.01	-0.73	0.0	-16.08	21.24	-0.02	-0.46	62.05	0.48		
0.00 62.52 96.2 2																	
1255	SpliceB	Origin	80.00	2.36	0.00	-0.02	1337.01	-0.73	0.0	-17.01	21.46	-0.02	-0.48	62.05	0.49		
0.00 62.54 96.2 2																	
1255	1255:WVGD1	End	85.00	1.05	0.00	-0.01	1444.32	-0.83	0.0	-17.01	21.46	-0.02	-0.47	62.99	0.47		
0.00 63.47 97.6 2																	
1255	1255:WVGD1	Origin	85.00	1.05	0.00	-0.01	1444.32	-0.83	0.0	-17.94	21.96	-0.02	-0.50	62.99	0.48		
0.00 63.49 97.7 2																	
1255	Tube 3	End	90.00	0.26	0.00	-0.00	1554.14	-0.93	0.0	-17.94	21.96	-0.02	-0.48	63.81	0.47		
0.00 64.30 98.9 2																	
1255	Tube 3	Origin	90.00	0.26	0.00	-0.00	1554.14	-0.93	0.0	-18.76	22.21	-0.02	-0.50	63.81	0.47		
0.00 64.32 99.0 2																	
1255	1255:g	End	95.00	0.00	0.00	0.00	1665.17	-1.03	0.0	-18.76	22.21	-0.02	-0.49	64.48	0.46		
0.00 64.97 100.0 2																	

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

Element Label	Joint Label	Joint Position	Rel. Dist. (ft)	Trans. Defl. (in)	Long. Defl. (in)	Vert. Defl. (in)	Vert. Mom. (ft-k)	Horz. Mom. (ft-k)	Tors. Mom. (ft-k)	Axial Force (kips)	Vert. Shear (kips)	Horz. Shear (kips)	P/A (ksi)	M/S. (ksi)	V/Q. (ksi)	T/R. (ksi)	Res. Max. At Usage (ksi)	Pt. %
Davit1	Davit1:O	Origin	0.00	92.43	0.04	-3.83	0.77	0.00	0.0	-0.77	-0.13	-0.00	-0.11	0.54	0.00	0.00		
0.65 1.0 1																		
Davit1	#Davit1:0	End	2.57	93.86	0.04	0.60	0.43	0.00	0.0	-0.77	-0.13	-0.00	-0.15	0.50	0.00	0.00		
0.64 1.0 1																		
Davit1	#Davit1:0	Origin	2.57	93.86	0.04	0.60	0.43	0.00	0.0	-0.76	-0.17	-0.00	-0.14	0.50	0.00	0.00		
0.64 1.0 1																		
Davit1	Davit1:End	End	5.14	95.28	0.04	5.02	-0.00	0.00	0.0	-0.76	-0.17	-0.00	-0.20	0.00	0.09	0.00		

0.26 0.4 3

Davit2	Davit2:O	Origin	0.00	92.26	0.04	-6.19	-1.24	-0.00	-0.0	0.69	0.27	0.00	0.10	0.87	0.00	0.00	0.97	1.5
1																		
Davit2	#Davit2:0	End	2.57	93.00	0.04	-10.78	-0.56	-0.00	-0.0	0.69	0.27	0.00	0.13	0.66	0.00	0.00	0.79	1.2
1																		
Davit2	#Davit2:0	Origin	2.57	93.00	0.04	-10.78	-0.56	-0.00	0.0	0.69	0.22	0.00	0.13	0.66	0.00	0.00	0.79	1.2
1																		
Davit2	Davit2:End	End	5.14	93.74	0.04	-15.37	0.00	0.00	0.0	0.69	0.22	0.00	0.18	0.00	0.12	0.00	0.28	0.4
3																		
Davit3	Davit3:O	Origin	0.00	82.61	0.04	-3.04	-2.04	0.00	0.0	-1.71	0.31	-0.00	-0.11	0.37	0.00	0.00	0.48	0.7
1																		
Davit3	#Davit3:0	End	4.12	84.90	0.04	3.90	-0.78	0.00	0.0	-1.71	0.31	-0.00	-0.15	0.26	0.00	0.00	0.41	0.6
1																		
Davit3	#Davit3:0	Origin	4.12	84.90	0.04	3.90	-0.78	0.00	0.0	-1.65	0.19	-0.00	-0.15	0.26	0.00	0.00	0.41	0.6
1																		
Davit3	Davit3:End	End	8.25	87.19	0.04	10.84	-0.00	0.00	0.0	-1.65	0.19	-0.00	-0.23	0.00	0.05	0.00	0.25	0.4
3																		
Davit4	Davit4:O	Origin	0.00	82.42	0.04	-5.51	-8.45	-0.00	-0.0	1.36	1.10	0.00	0.09	1.53	0.00	0.00	1.62	2.5
1																		
Davit4	#Davit4:0	End	4.12	83.67	0.04	-12.72	-3.90	-0.00	-0.0	1.36	1.10	0.00	0.12	1.30	0.00	0.00	1.42	2.2
1																		
Davit4	#Davit4:0	Origin	4.12	83.67	0.04	-12.72	-3.90	-0.00	0.0	1.37	0.95	0.00	0.12	1.30	0.00	0.00	1.42	2.2
1																		
Davit4	Davit4:End	End	8.25	84.91	0.04	-19.94	-0.00	0.00	0.0	1.37	0.95	0.00	0.19	0.00	0.27	0.00	0.50	0.8
3																		
Davit5	Davit5:O	Origin	0.00	62.19	0.03	-1.55	-2.14	0.00	0.0	-1.71	0.32	-0.00	-0.11	0.39	0.00	0.00	0.50	0.8
1																		
Davit5	#Davit5:0	End	4.12	64.24	0.03	4.81	-0.82	0.00	0.0	-1.71	0.32	-0.00	-0.15	0.27	0.00	0.00	0.43	0.7
1																		
Davit5	#Davit5:0	Origin	4.12	64.24	0.03	4.81	-0.82	0.00	0.0	-1.65	0.20	-0.00	-0.15	0.27	0.00	0.00	0.42	0.6
1																		
Davit5	Davit5:End	End	8.25	66.29	0.03	11.17	-0.00	0.00	0.0	-1.65	0.20	-0.00	-0.23	0.00	0.06	0.00	0.25	0.4
3																		
Davit6	Davit6:O	Origin	0.00	62.01	0.03	-4.09	-8.64	-0.00	-0.0	1.34	1.13	0.00	0.09	1.57	0.00	0.00	1.65	2.5
1																		
Davit6	#Davit6:0	End	4.12	63.19	0.03	-10.68	-3.99	-0.00	-0.0	1.34	1.13	0.00	0.12	1.33	0.00	0.00	1.45	2.2
1																		
Davit6	#Davit6:0	Origin	4.12	63.19	0.03	-10.68	-3.99	-0.00	0.0	1.36	0.97	0.00	0.12	1.33	0.00	0.00	1.45	2.2
1																		
Davit6	Davit6:End	End	8.25	64.38	0.03	-17.28	-0.00	0.00	0.0	1.36	0.97	0.00	0.19	0.00	0.28	0.00	0.51	0.8
3																		
Davit7	Davit7:O	Origin	0.00	44.07	0.02	-0.46	-2.49	0.00	0.0	-1.70	0.36	-0.00	-0.11	0.45	0.00	0.00	0.57	0.9
1																		
Davit7	#Davit7:0	End	4.12	45.77	0.02	5.00	-0.99	0.00	0.0	-1.70	0.36	-0.00	-0.15	0.33	0.00	0.00	0.48	0.7
1																		
Davit7	#Davit7:0	Origin	4.12	45.77	0.02	5.00	-0.99	0.00	0.0	-1.65	0.24	-0.00	-0.15	0.33	0.00	0.00	0.48	0.7
1																		
Davit7	Davit7:End	End	8.25	47.48	0.02	10.45	-0.00	0.00	0.0	-1.65	0.24	-0.00	-0.23	0.00	0.07	0.00	0.26	0.4
3																		
Davit8	Davit8:O	Origin	0.00	43.93	0.02	-2.88	-8.75	-0.00	-0.0	1.33	1.14	0.00	0.09	1.59	0.00	0.00	1.67	2.6
1																		
Davit8	#Davit8:0	End	4.12	44.99	0.02	-8.51	-4.05	-0.00	-0.0	1.33	1.14	0.00	0.12	1.35	0.00	0.00	1.46	2.3
1																		
Davit8	#Davit8:0	Origin	4.12	44.99	0.02	-8.51	-4.05	-0.00	0.0	1.35	0.98	0.00	0.12	1.35	0.00	0.00	1.47	2.3
1																		
Davit8	Davit8:End	End	8.25	46.06	0.02	-14.15	-0.00	0.00	0.0	1.35	0.98	0.00	0.19	0.00	0.28	0.00	0.52	0.8
3																		

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Holding Usage %	Input Hardware Capacity (kips)	Factored Hardware Capacity (kips)	Hardware Usage %	Max. Usage %
Clamp1	0.770	80.00	80.00	0.96	0.00	0.00	0.00	0.96
Clamp2	0.722	80.00	80.00	0.90	0.00	0.00	0.00	0.90
Clamp3	1.632	80.00	80.00	2.04	0.00	0.00	0.00	2.04
Clamp4	1.635	80.00	80.00	2.04	0.00	0.00	0.00	2.04
Clamp5	1.632	80.00	80.00	2.04	0.00	0.00	0.00	2.04
Clamp6	1.636	80.00	80.00	2.04	0.00	0.00	0.00	2.04
Clamp7	1.638	80.00	80.00	2.05	0.00	0.00	0.00	2.05
Clamp8	1.639	80.00	80.00	2.05	0.00	0.00	0.00	2.05
Clamp9	0.287	80.00	80.00	0.36	0.00	0.00	0.00	0.36
Clamp10	0.287	80.00	80.00	0.36	0.00	0.00	0.00	0.36
Clamp11	0.287	80.00	80.00	0.36	0.00	0.00	0.00	0.36
Clamp12	0.287	80.00	80.00	0.36	0.00	0.00	0.00	0.36
Clamp13	0.287	80.00	80.00	0.36	0.00	0.00	0.00	0.36
Clamp14	0.287	80.00	80.00	0.36	0.00	0.00	0.00	0.36
Clamp15	0.287	80.00	80.00	0.36	0.00	0.00	0.00	0.36
Clamp16	0.287	80.00	80.00	0.36	0.00	0.00	0.00	0.36
Clamp17	0.287	80.00	80.00	0.36	0.00	0.00	0.00	0.36

Clamp18	29.508	80.00	80.00	36.88	0.00	0.00	0.00	36.88
Clamp19	4.455	80.00	80.00	5.57	0.00	0.00	0.00	5.57
Clamp20	29.508	80.00	80.00	36.88	0.00	0.00	0.00	36.88

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

Summary of Steel Pole Usages:

Steel Pole Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
1255	99.96	NESC Extreme	2.5	25	10156.2

Base Plate Results by Bend Line:

Pole Label	Load Case	Bend Line #	Start X (ft)	Start Y (ft)	End X (ft)	End Y (ft)	Length (in)	Bending Stress (ksi)	Bolt Mom. Sum (ft-k)	# Bolts Acting	Bolt Max Load (kips)	Min Plate Thickness (in)	Actual Thickness (in)	Usage %
1255	NESC Heavy	1	1.673	0.170	0.170	1.673	25.500	9.858	31.424	2	104.135	1.270	3.000	17.92
1255	NESC Heavy	2	1.303	-1.063	1.303	1.063	25.500	7.239	23.074	3	33.247	1.088	3.000	13.16
1255	NESC Heavy	3	0.170	-1.673	1.673	-0.170	25.500	8.961	28.565	2	-97.605	1.211	3.000	16.29
1255	NESC Heavy	4	-1.063	-1.303	1.063	-1.303	25.500	33.336	106.260	3	-97.605	2.336	3.000	60.61
1255	NESC Heavy	5	-1.673	-0.170	-0.170	-1.673	25.500	8.887	28.328	2	-97.366	1.206	3.000	16.16
1255	NESC Heavy	6	-1.303	1.063	-1.303	-1.063	25.500	7.330	23.364	3	34.044	1.095	3.000	13.33
1255	NESC Heavy	7	-0.170	1.673	-1.673	0.170	25.500	9.933	31.661	2	104.374	1.275	3.000	18.06
1255	NESC Heavy	8	1.063	1.303	-1.063	1.303	25.500	35.651	113.637	3	104.374	2.415	3.000	64.82
1255	NESC Heavy	9	1.521	0.897	-0.442	1.710	25.500	14.690	46.825	2	104.254	1.550	3.000	26.71
1255	NESC Heavy	10	1.710	-0.442	0.897	1.521	25.500	3.463	11.038	2	33.247	0.753	3.000	6.30
1255	NESC Heavy	11	0.897	-1.521	1.710	0.442	25.500	2.863	9.125	2	-27.275	0.684	3.000	5.21
1255	NESC Heavy	12	-0.442	-1.710	1.521	-0.897	25.500	13.760	43.859	2	-97.605	1.501	3.000	25.02
1255	NESC Heavy	13	-1.521	-0.897	0.442	-1.710	25.500	13.736	43.782	2	-97.486	1.499	3.000	24.97
1255	NESC Heavy	14	-1.710	0.442	-0.897	-1.521	25.500	2.815	8.973	2	-26.478	0.679	3.000	5.12
1255	NESC Heavy	15	-0.897	1.521	-1.710	-0.442	25.500	3.575	11.397	2	34.044	0.765	3.000	6.50
1255	NESC Heavy	16	0.442	1.710	-1.521	0.897	25.500	14.714	46.901	2	104.374	1.552	3.000	26.75
1255	NESC Extreme	1	1.673	0.170	0.170	1.673	25.500	14.875	47.414	2	158.661	1.560	3.000	27.05
1255	NESC Extreme	2	1.303	-1.063	1.303	1.063	25.500	10.915	34.791	3	48.629	1.336	3.000	19.85
1255	NESC Extreme	3	0.170	-1.673	1.673	-0.170	25.500	14.434	46.009	2	-155.522	1.537	3.000	26.24
1255	NESC Extreme	4	-1.063	-1.303	1.063	-1.303	25.500	53.172	169.487	3	-155.522	2.950	3.000	96.68
1255	NESC Extreme	5	-1.673	-0.170	-0.170	-1.673	25.500	14.416	45.952	2	-155.464	1.536	3.000	26.21
1255	NESC Extreme	6	-1.303	1.063	-1.303	-1.063	25.500	10.937	34.862	3	48.823	1.338	3.000	19.89
1255	NESC Extreme	7	-0.170	1.673	-1.673	0.170	25.500	14.893	47.472	2	158.719	1.561	3.000	27.08
1255	NESC Extreme	8	1.063	1.303	-1.063	1.303	25.500	54.266	172.972	3	158.719	2.980	3.000	98.67
1255	NESC Extreme	9	1.521	0.897	-0.442	1.710	25.500	22.376	71.323	2	158.690	1.914	3.000	40.68
1255	NESC Extreme	10	1.710	-0.442	0.897	1.521	25.500	4.949	15.776	2	48.629	0.900	3.000	9.00
1255	NESC Extreme	11	0.897	-1.521	1.710	0.442	25.500	4.647	14.814	2	-45.626	0.872	3.000	8.45
1255	NESC Extreme	12	-0.442	-1.710	1.521	-0.897	25.500	21.931	69.905	2	-155.522	1.894	3.000	39.87
1255	NESC Extreme	13	-1.521	-0.897	0.442	-1.710	25.500	21.925	69.886	2	-155.493	1.894	3.000	39.86
1255	NESC Extreme	14	-1.710	0.442	-0.897	-1.521	25.500	4.636	14.776	2	-45.432	0.871	3.000	8.43
1255	NESC Extreme	15	-0.897	1.521	-1.710	-0.442	25.500	4.977	15.863	2	48.823	0.902	3.000	9.05
1255	NESC Extreme	16	0.442	1.710	-1.521	0.897	25.500	22.382	71.342	2	158.719	1.914	3.000	40.69

Summary of Tubular Davit Usages:

Tubular Davit Label	Maximum Usage %	Load Case	Height AGL (ft)	Segment Number	Weight (lbs)
Davit1	3.25	NESC Heavy	94.8	1	93.0
Davit2	5.48	NESC Heavy	94.8	1	93.0
Davit3	4.17	NESC Heavy	89.5	1	313.4
Davit4	5.52	NESC Heavy	89.5	1	313.4
Davit5	4.16	NESC Heavy	77.5	1	313.4
Davit6	5.54	NESC Heavy	77.5	1	313.4
Davit7	4.24	NESC Heavy	65.5	1	313.4
Davit8	5.51	NESC Heavy	65.5	1	313.4

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	68.83	1255	Steel Pole
NESC Extreme	99.96	1255	Steel Pole

Summary of Steel Pole Usages by Load Case:

Load Case	Maximum Usage %	Steel Pole Label	Height AGL (ft)	Segment Number
NESC Heavy	68.83	1255	51.5	14
NESC Extreme	99.96	1255	2.5	25

Summary of Base Plate Usages by Load Case:

Load Case	Pole Label	Bend Line	Length	Vertical Load	X Moment	Y Moment	Bending Stress	Bolt Moment	# Bolts Acting On	Max Bolt Load For	Minimum Plate	Usage

	#	(in)	(kips)	(ft-k)	(ft-k)	(ksi)	Sum Bend Line (ft-k)	Bend Line (kips)	Thickness (in)	%
NESC Heavy	1255	8 25.500	40.610	1069.223	-4.224	35.651	113.637	3	104.374	2.415	64.82
NESC Extreme	1255	8 25.500	19.183	1665.168	-1.031	54.266	172.972	3	158.719	2.980	98.67

Summary of Tubular Davit Usages by Load Case:

Load Case	Maximum Tubular Davit Usage %	Label	Height AGL (ft)	Segment Number
NESC Heavy	5.54	Davit6	77.5	1
NESC Extreme	2.58	Davit8	65.5	1

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
Clamp1	Clamp	1.39	NESC Heavy	0.0
Clamp2	Clamp	1.37	NESC Heavy	0.0
Clamp3	Clamp	2.88	NESC Heavy	0.0
Clamp4	Clamp	2.88	NESC Heavy	0.0
Clamp5	Clamp	2.87	NESC Heavy	0.0
Clamp6	Clamp	2.88	NESC Heavy	0.0
Clamp7	Clamp	2.89	NESC Heavy	0.0
Clamp8	Clamp	2.87	NESC Heavy	0.0
Clamp9	Clamp	0.66	NESC Heavy	0.0
Clamp10	Clamp	0.66	NESC Heavy	0.0
Clamp11	Clamp	0.66	NESC Heavy	0.0
Clamp12	Clamp	0.66	NESC Heavy	0.0
Clamp13	Clamp	0.66	NESC Heavy	0.0
Clamp14	Clamp	0.66	NESC Heavy	0.0
Clamp15	Clamp	0.66	NESC Heavy	0.0
Clamp16	Clamp	0.66	NESC Heavy	0.0
Clamp17	Clamp	0.66	NESC Heavy	0.0
Clamp18	Clamp	36.88	NESC Extreme	0.0
Clamp19	Clamp	5.57	NESC Extreme	0.0
Clamp20	Clamp	36.88	NESC Extreme	0.0

Loads At Insulator Attachments For All Load Cases:

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
NESC Heavy	Clamp1	Clamp	Davit1:End	0.000	0.791	0.785	1.114
NESC Heavy	Clamp2	Clamp	Davit2:End	0.000	0.752	0.802	1.099
NESC Heavy	Clamp3	Clamp	Davit3:End	0.000	1.107	2.020	2.303
NESC Heavy	Clamp4	Clamp	Davit4:End	0.000	1.124	2.007	2.300
NESC Heavy	Clamp5	Clamp	Davit5:End	0.000	1.119	2.004	2.295
NESC Heavy	Clamp6	Clamp	Davit6:End	0.000	1.119	2.013	2.303
NESC Heavy	Clamp7	Clamp	Davit7:End	0.000	1.121	2.019	2.309
NESC Heavy	Clamp8	Clamp	Davit8:End	0.000	1.142	1.988	2.293
NESC Heavy	Clamp9	Clamp	1255:WVGD1	0.000	0.096	0.516	0.525
NESC Heavy	Clamp10	Clamp	1255:WVGD2	0.000	0.096	0.516	0.525
NESC Heavy	Clamp11	Clamp	1255:WVGD3	0.000	0.096	0.516	0.525
NESC Heavy	Clamp12	Clamp	1255:WVGD4	0.000	0.096	0.516	0.525
NESC Heavy	Clamp13	Clamp	1255:WVGD5	0.000	0.096	0.516	0.525
NESC Heavy	Clamp14	Clamp	1255:WVGD6	0.000	0.096	0.516	0.525
NESC Heavy	Clamp15	Clamp	1255:WVGD7	0.000	0.096	0.516	0.525
NESC Heavy	Clamp16	Clamp	1255:WVGD8	0.000	0.096	0.516	0.525
NESC Heavy	Clamp17	Clamp	1255:WVGD9	0.000	0.096	0.516	0.525
NESC Heavy	Clamp18	Clamp	1255:t	0.000	7.774	0.000	7.774
NESC Heavy	Clamp19	Clamp	1255:Arm1	0.000	1.030	4.282	4.404
NESC Heavy	Clamp20	Clamp	1255:ConnBot	0.000	-7.774	0.000	7.774
NESC Extreme	Clamp1	Clamp	Davit1:End	0.000	0.761	0.116	0.770
NESC Extreme	Clamp2	Clamp	Davit2:End	0.000	0.708	0.139	0.722
NESC Extreme	Clamp3	Clamp	Davit3:End	0.000	1.448	0.752	1.632
NESC Extreme	Clamp4	Clamp	Davit4:End	0.000	1.456	0.743	1.635
NESC Extreme	Clamp5	Clamp	Davit5:End	0.000	1.453	0.743	1.632
NESC Extreme	Clamp6	Clamp	Davit6:End	0.000	1.454	0.749	1.636
NESC Extreme	Clamp7	Clamp	Davit7:End	0.000	1.455	0.752	1.638
NESC Extreme	Clamp8	Clamp	Davit8:End	0.000	1.466	0.734	1.639
NESC Extreme	Clamp9	Clamp	1255:WVGD1	0.000	0.261	0.119	0.287
NESC Extreme	Clamp10	Clamp	1255:WVGD2	0.000	0.261	0.119	0.287
NESC Extreme	Clamp11	Clamp	1255:WVGD3	0.000	0.261	0.119	0.287
NESC Extreme	Clamp12	Clamp	1255:WVGD4	0.000	0.261	0.119	0.287
NESC Extreme	Clamp13	Clamp	1255:WVGD5	0.000	0.261	0.119	0.287
NESC Extreme	Clamp14	Clamp	1255:WVGD6	0.000	0.261	0.119	0.287
NESC Extreme	Clamp15	Clamp	1255:WVGD7	0.000	0.261	0.119	0.287
NESC Extreme	Clamp16	Clamp	1255:WVGD8	0.000	0.261	0.119	0.287
NESC Extreme	Clamp17	Clamp	1255:WVGD9	0.000	0.261	0.119	0.287
NESC Extreme	Clamp18	Clamp	1255:t	0.000	29.508	0.000	29.508
NESC Extreme	Clamp19	Clamp	1255:Arm1	0.000	3.916	2.125	4.455
NESC Extreme	Clamp20	Clamp	1255:ConnBot	0.000	-29.508	0.000	29.508

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	10.169	0.000	22.564	827.205	0.000	0.000
NESC Extreme	16.466	0.000	7.924	1347.172	0.000	0.000

*** Weight of structure (lbs):
    Weight of Tubular Davit Arms: 2066.2
    Weight of Steel Poles: 10156.2
    Total: 12222.5

*** End of Report

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Subject: Anchor Bolt Analysis Pole #1255

Location: Greenwich, CT

Rev. 4: 6/29/20

Prepared by: T.J.L. Checked by: C.A.G.
Job No. 19158.00

Anchor Bolt Analysis:

Input Data:

Bolt Force:

Maximum Tensile Force = $T_{Max} := 158.7 \cdot kips$ (User Input from PLS-Pole)

Maximum Shear Force at Base = $V_{base} := 22.3 \cdot kips$ (User Input from PLS-Pole)

Anchor Bolt Data:

Use AST MA615 Grade 75

Number of Anchor Bolts = $N := 12$ (User Input)

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

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

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

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

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

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

Anchor Bolt Analysis:

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

Maximum Shear Force per Bolt = $V_{Max} := \frac{V_{base}}{N} = 1.9 \cdot kips$

Shear Stress per Bolt = $f_v := \frac{V_{Max}}{A_s} = 572.2\,psi$

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

Shear Stress Permitted = $F_v := 0.35 F_y = 26.25 \cdot ksi$

Permitted Axial Tensile Stress in Conjuction with Shear = $F_{tv} := F_t \cdot \sqrt{1 - \left(\frac{f_v}{F_v}\right)^2} = 74.98 \cdot ksi$

Bolt Tension % of Capacity = $\frac{T_{Max}}{F_{tv} \cdot A_s} = 65.17 \cdot \%$

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

Condition1 = "OK"

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Subject: CAISSON FOUNDATION ANALYSIS

Location: Greenwich, CT

Rev. 4: 6/29/20

Prepared by: TJL Checked by: C.F.C.
Job No. 19158.00

Caisson Foundation:

Input Data:

Shear Force =	$S := 22.3k \cdot 1.1 = 24.5 \cdot k$	*USER INPUT-FROM PLS-Pole*
Overturning Moment =	$M := 1665.2ft \cdot k \cdot 1.1 = 1832 \cdot ft \cdot k$	*USER INPUT-FROM PLS-Pole*
Applied Axial Load =	$A1 := 20.4k \cdot 1.1 = 22.4 \cdot k$	*USER INPUT-FROM PLS-Pole*
Bending Moment =	$Mu := 1888ft \cdot k$	*USER INPUT--FROM LPILE*
Moment Capacity =	$Mn := 10523ft \cdot k$	*USER INPUT--FROM LPILE*
Foundation Diameter =	$d := 10ft$	*USER INPUT*
Overall Length of Caisson =	$L_c := 15.5ft$	*USER INPUT*
Depth From Top of Caisson to Grade =	$L_{pag} := 0.5ft$	*USER INPUT*
Number of Rebar =	$n := 24$	*USER INPUT*
Area of Rebar =	$Ar := 1.56in^2$	*USER INPUT*
Rebar Yield Strength =	$fy := 60ksi$	*USER INPUT*
Concrete Comp Strength =	$f'c := 3.5ksi$	*USER INPUT*

Check Moment Capacity:

Factor of Safety =	$FS := \frac{0.9 \cdot Mn}{Mu} = 5.02$	
Factor of Safety Required =	$FS_{reqd} := 1.0$	
	$FOSCheck := if(FS \geq FS_{reqd}, "OK", "NO GOOD")$	
	$FOSCheck = "OK"$	

==========

LPILE Plus for Windows, Version 5.0 (5.0.47)

Analysis of Individual Piles and Drilled Shafts
Subjected to Lateral Loading Using the p-y Method

==========

This program is licensed to:

TJL
Centek Engineering

Files Used for Analysis

Path to file locations: J:\Jobs\1915800.WI\04_Structural\Backup Documentation\Rev(4)\L-Pile\
Name of input data file: Caisson Analysis.lpd
Name of output file: Caisson Analysis.lpo
Name of plot output file: Caisson Analysis.lpp
Name of runtime file: Caisson Analysis.lpr

Time and Date of Analysis

Date: June 29, 2020 Time: 16:10:36

Problem Title

19158.00 / CT5150 - Old Greenwich RR / Structure # 1255

Program Options

Units Used in Computations - US Customary Units: Inches, Pounds

Basic Program Options:

Analysis Type 3:
- Computation of Nonlinear Bending Stiffness and Ultimate Bending Moment
  Capacity with Pile Response Computed Using Nonlinear EI

Computation Options:
- Only internally-generated p-y curves used in analysis
- Analysis does not use p-y multipliers (individual pile or shaft action only)
- Analysis assumes no shear resistance at pile tip
- Analysis for fixed-length pile or shaft only
- Analysis includes computation of foundation stiffness matrix elements
- Output summary table of values for pile-head deflection, maximum
bending moment, and shear force only
- Analysis assumes no soil movements acting on pile
- No additional p-y curves to be computed at user-specified depths

Solution Control Parameters:
- Number of pile increments = 100
- Maximum number of iterations allowed = 100
- Deflection tolerance for convergence = 1.0000E-04 in
- Maximum allowable deflection = 1.0000E+02 in

Printing Options:
- Only summary tables of pile-head deflection, maximum bending moment,
  and maximum shear force are to be printed in output file.

Pile Structural Properties and Geometry

Pile Length = 186.00 in

Depth of ground surface below top of pile = 6.00 in

Slope angle of ground surface = 0.00 deg.

Structural properties of pile defined using 2 points

Point No.	Point Depth in	Pile Diameter in	Moment of Inertia in**4	Pile Area Sq.in	Modulus of Elasticity lbs/Sq.in
1	0.0000	120.00000	10178760.	11309.7000	3300000.
2	186.0000	120.00000	10178760.	11309.7000	3300000.

Please note that because this analysis makes computations of ultimate
moment capacity and pile response using nonlinear bending stiffness
that the above values of moment of inertia and modulus of are not used
for any computations other than total stress due to combined axial
loading and bending.

Soil and Rock Layering Information

The soil profile is modelled using 1 layers

Layer 1 is sand, p-y criteria by Reese et al., 1974
Distance from top of pile to top of layer   =   6.000 in
Distance from top of pile to bottom of layer =   186.000 in
p-y subgrade modulus k for top of soil layer =   90.000 lbs/in**3
p-y subgrade modulus k for bottom of layer   =   90.000 lbs/in**3

(Depth of lowest layer extends   0.00 in below pile tip)

Effective Unit Weight of Soil vs. Depth

Effective unit weight of soil with depth defined using 2 points

Point No.	Depth X in	Eff. Unit Weight lbs/in**3
1	6.00	0.05800
2	186.00	0.05800

Shear Strength of Soils

Shear strength parameters with depth defined using 2 points

Point No.	Depth X in	Cohesion c lbs/in**2	Angle of Friction Deg.	E50 or k_rm	RQD %
1	6.000	0.00000	30.00	------	------
2	186.000	0.00000	30.00	------	------

Notes:

(1) Cohesion = uniaxial compressive strength for rock materials.
(2) Values of E50 are reported for clay strata.
(3) Default values will be generated for E50 when input values are 0.
(4) RQD and k_rm are reported only for weak rock strata.

Loading Type

Static loading criteria was used for computation of p-y curves.

Pile-head Loading and Pile-head Fixity Conditions

Number of loads specified = 1

Load Case Number 1

Pile-head boundary conditions are Shear and Moment (BC Type 1)
Shear force at pile head = 24552.000 lbs
Bending moment at pile head = 21980244.000 in-lbs
Axial load at pile head = 22462.000 lbs

Non-zero moment at pile head for this load case indicates the pile-head may rotate under the applied pile-head loading, but is not a free-head (zero moment) condition.

Computations of Nominal Moment Capacity and Nonlinear Bending Stiffness

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Number of sections = 1

Pile Section No. 1

The sectional shape is a circular drilled shaft (bored pile).

Outside Diameter = 120.0000 in

Material Properties:

Compressive Strength of Concrete = 3.000 kip/in**2
Yield Stress of Reinforcement = 60. kip/in**2
Modulus of Elasticity of Reinforcement = 29000. kip/in**2
Number of Reinforcing Bars = 24
Area of Single Bar = 1.56000 in**2
Number of Rows of Reinforcing Bars = 13

Area of Steel = 37.440 in**2
Area of Shaft = 11309.734 in**2
Percentage of Steel Reinforcement = 0.331 percent
Cover Thickness (edge to bar center) = 4.000 in

Unfactored Axial Squash Load Capacity = 30990.75 kip

Distribution and Area of Steel Reinforcement

Row Number	Area of Reinforcement in**2	Distance to Centroidal Axis in
1	1.560	56.000
2	3.120	54.092
3	3.120	48.497
4	3.120	39.598
5	3.120	28.000
6	3.120	14.494
7	3.120	0.000
8	3.120	-14.494
9	3.120	-28.000
10	3.120	-39.598
11	3.120	-48.497
12	3.120	-54.092
13	1.560	-56.000

Axial Thrust Force = 22462.00 lbs

Bending Moment in-lbs	Bending Stiffness lb-in2	Bending Curvature rad/in	Maximum Strain in/in	Neutral Axis Position inches	Max. Concrete Stress psi	Max. Steel Stress psi
16820477.	3.364095E+13	5.000000E-07	0.00003073	61.46812499	94.33040510	833.28781
33438172.	3.343817E+13	0.00000100	0.00006084	60.84090650	184.98104	1648.38629
49853449.	3.323563E+13	0.00000150	0.00009095	60.63156188	273.92567	2463.47294
66066309.	3.303315E+13	0.00000200	0.00012105	60.52668035	361.16433	3278.54746
66066309.	2.642652E+13	0.00000250	0.00006074	24.29445684	180.11125	6648.65188
66066309.	2.202210E+13	0.00000300	0.00007218	24.05933440	213.21589	7998.83791
66066309.	1.887609E+13	0.00000350	0.00008398	23.99501503	247.17329	

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21467.43804
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33558.13057
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41595.98885
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42933.79747
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54949.40365					
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97307241.	3.538445E+12	0.00002750	0.00063482	23.08444440	1554.03342
60000.00000					
98560293.	3.458256E+12	0.00002850	0.00065337	22.92518556	1588.26816
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99810214.	3.383397E+12	0.00002950	0.00067195	22.77790010	1621.97012
60000.00000					
1.010570E+08	3.313344E+12	0.00003050	0.00069056	22.64142215	1655.13639
60000.00000					
1.023006E+08	3.247639E+12	0.00003150	0.00070921	22.51473963	1687.76437
60000.00000					
1.031305E+08	3.173247E+12	0.00003250	0.00072655	22.35552728	1717.42961
60000.00000					
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60000.00000					
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60000.00000					
1.051861E+08	2.962990E+12	0.00003550	0.00078100	21.99999869	1807.43544
60000.00000					
1.063551E+08	2.913837E+12	0.00003650	0.00080025	21.92455709	1838.12172
60000.00000					
1.071208E+08	2.856555E+12	0.00003750	0.00081704	21.78785384	1864.16768
60000.00000					
1.078844E+08	2.802191E+12	0.00003850	0.00083387	21.65901482	1889.77530

60000.00000
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60000.00000
1.089666E+08 2.690533E+12 0.00004050 0.00086554 21.37124240 1936.45569
60000.00000
1.094102E+08 2.636391E+12 0.00004150 0.00088095 21.22778714 1958.52671
60000.00000
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60000.00000
1.107312E+08 2.488342E+12 0.00004450 0.00092735 20.83923876 2022.51377
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1.120371E+08 2.358675E+12 0.00004750 0.00097395 20.50423086 2083.12434
60000.00000
1.124689E+08 2.318947E+12 0.00004850 0.00098953 20.40276110 2102.56943
60000.00000
1.128991E+08 2.280790E+12 0.00004950 0.00100514 20.30587971 2121.63214
60000.00000
1.133275E+08 2.244109E+12 0.00005050 0.00102077 20.21331847 2140.31070
60000.00000
1.137542E+08 2.208819E+12 0.00005150 0.00103643 20.12482703 2158.60309
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1.140575E+08 2.172524E+12 0.00005250 0.00105132 20.02514899 2175.55593
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60000.00000
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1.190234E+08 1.576469E+12 0.00007550 0.00138066 18.28693449 2454.00656
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  60000.00000
  1.262735E+08  4.866032E+11    0.00025950    0.00370063   14.26059902    2503.55740
  60000.00000

Unfactored (Nominal) Moment Capacity at Concrete Strain of 0.003 =  126273.53221
in-kip



------------------------------------------------------------------------------
             Computed Values of Load Distribution and Deflection
                 for Lateral Loading for Load Case Number  1
------------------------------------------------------------------------------

Pile-head boundary conditions are Shear and Moment (Pile-head Condition Type 1)
Specified shear force at pile head  =       24552.000 lbs
Specified moment at pile head       =    21980244.000 in-lbs
Specified axial load at pile head   =       22462.000 lbs



**** WARNING - POSSIBLE SOLUTION ERROR 5501 ****
```

Force and moment imbalances may be too large.

The cause of the imbalance may be due to extreme changes in magnitude
of nonlinear bending stiffness within three nodal points of the top of the pile
which may affect the finite difference computation of shear force.

Please examine curves and printed output for deflection, moment, shear force,
and number of iterations to determine if computed values are reasonable.
If the shear force shows large changes, increase the number of nodal points
(pile increments) and repeat the analysis.

Maximum moment imbalance for pile = 2.1551 in-lbs
Maximum lateral force imbalance for pile = 0.5772813 lbs

Summary of Pile Response(s)

Definition of Symbols for Pile-Head Loading Conditions:

Type 1 = Shear and Moment, y = pile-head displacment in
Type 2 = Shear and Slope, M = Pile-head Moment lbs-in
Type 3 = Shear and Rot. Stiffness, V = Pile-head Shear Force lbs
Type 4 = Deflection and Moment, S = Pile-head Slope, radians
Type 5 = Deflection and Slope, R = Rot. Stiffness of Pile-head in-lbs/rad

Load Type	Pile-Head Condition 1	Pile-Head Condition 2	Axial Load lbs	Pile-Head Deflection in	Maximum Moment in-lbs	Maximum Shear lbs
1	V= 24552.	M= 2.20E+07	22462.0000	4.6981	2.2658E+07	-294726.

Computed Pile-head Stiffness Matrix Members
K22, K23, K32, K33 for Superstructure

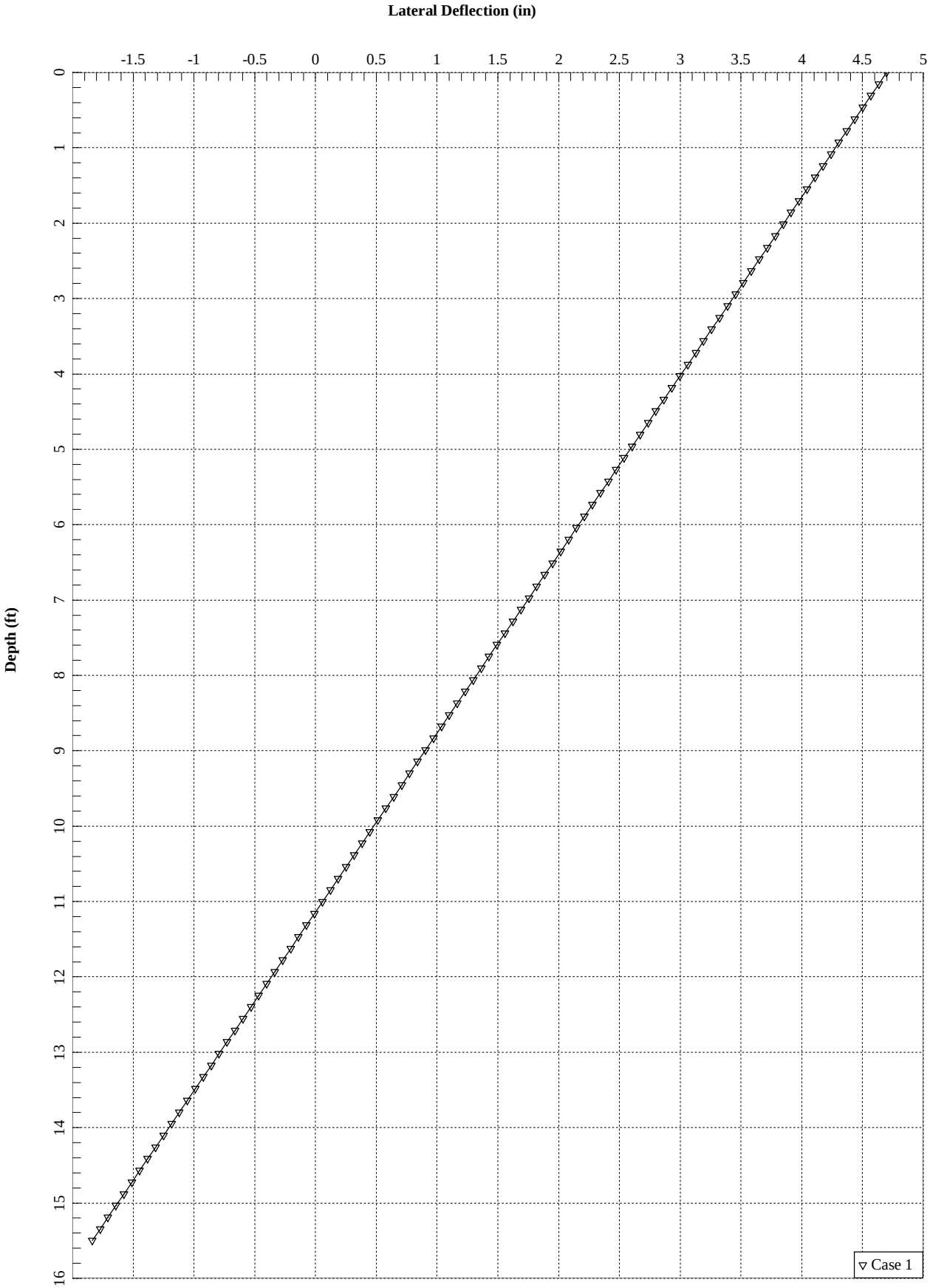
Top y in	Shear React. lbs	Mom. React. in-lbs	K22 lbs/in	K32 in-lbs/in
0.00173480	2455.20004	307884.45130	1415265.	1.774756E+08
0.00522227	7390.88845	926824.53349	1415265.	1.774756E+08
0.00827709	11714.28104	1468982.	1415265.	1.774756E+08
0.01044453	14781.77691	1853649.	1415265.	1.774756E+08
0.01212572	17161.11154	2152020.	1415265.	1.774756E+08
0.01349936	19105.16950	2395807.	1415265.	1.774756E+08
0.01466075	20748.84708	2601925.	1415265.	1.774756E+08
0.01566680	22172.66536	2780474.	1415265.	1.774756E+08

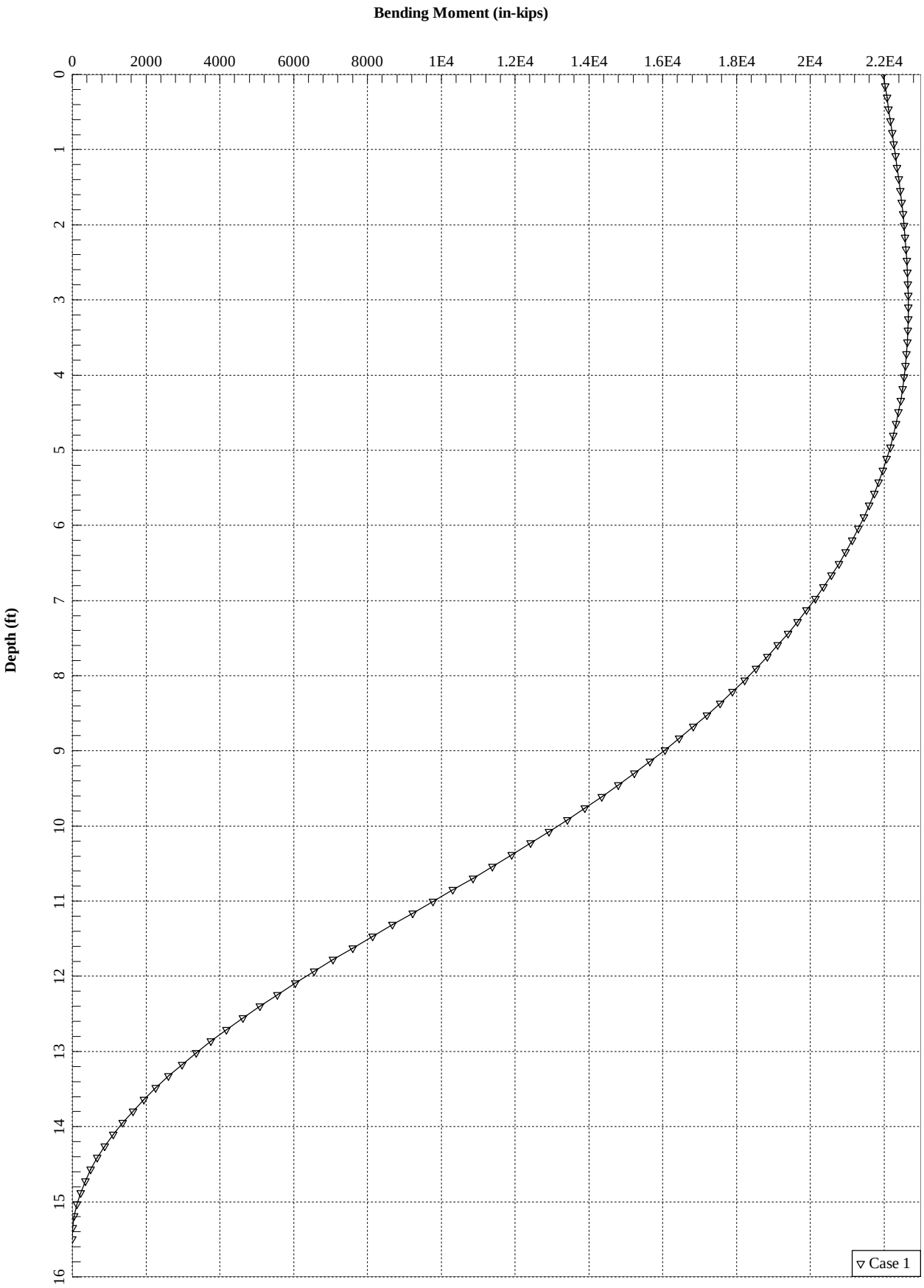
0.01655419	23428.56208	2937964.	1415265.	1.774756E+08
0.01734799	24551.99999	3078844.	1415265.	1.774756E+08

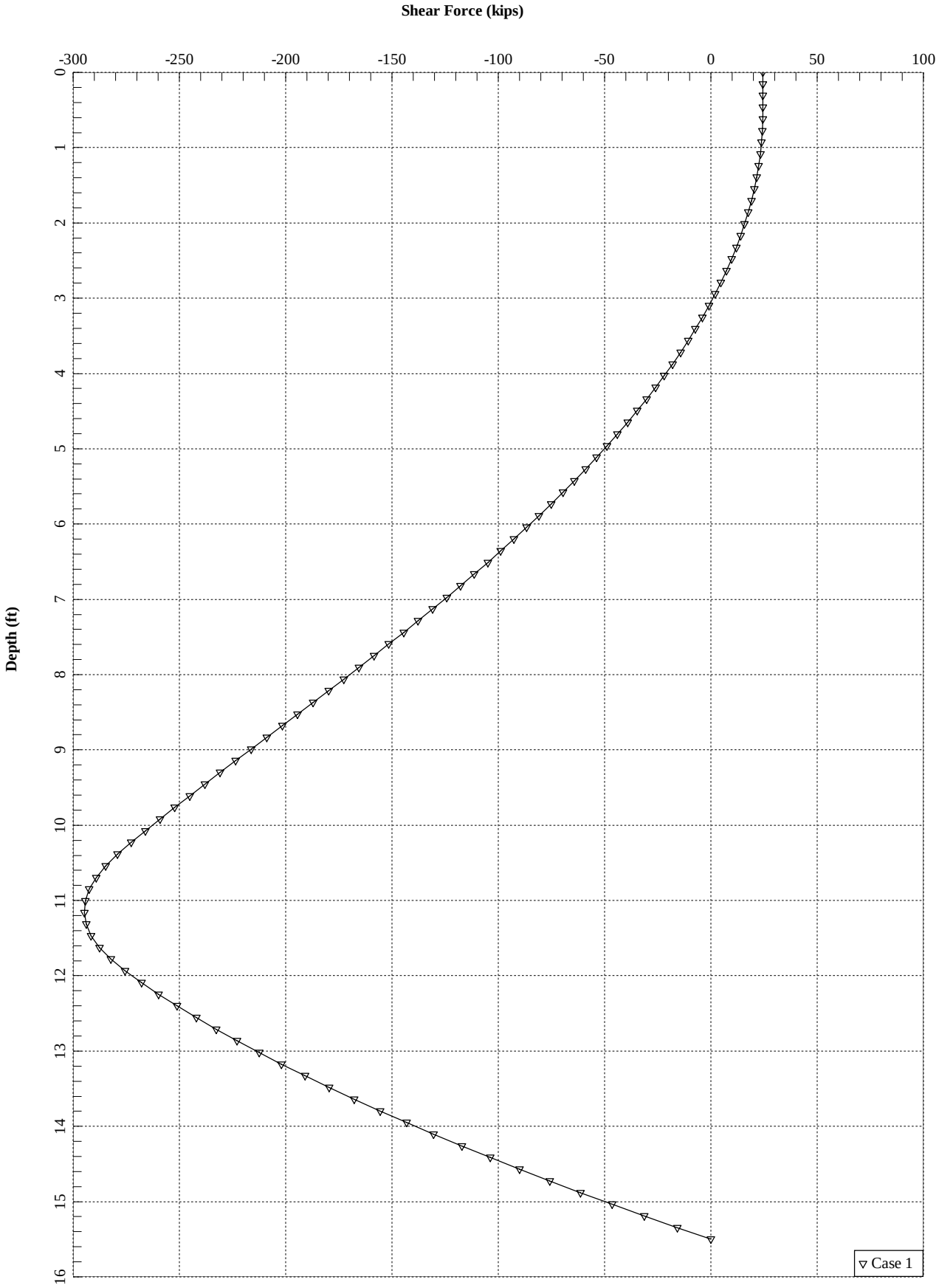
Top Rota. rad	Shear React. lbs	Mom. React. in-lbs	K23 lbs/rad	K33 in-lbs/rad
0.00008842	15693.24640	2198024.	1.774756E+08	2.485755E+10
0.00026619	47241.37827	6616713.	1.774756E+08	2.485755E+10
0.00042189	74875.81304	10487242.	1.774756E+08	2.485755E+10
0.00053237	94482.75654	13233426.	1.774756E+08	2.485755E+10
0.00061806	109691.08344	15363531.	1.774756E+08	2.485755E+10
0.00068808	122117.19133	17103954.	1.774756E+08	2.485755E+10
0.00074728	132623.31859	18575461.	1.774746E+08	2.485741E+10
0.00079857	141724.14723	19850138.	1.774731E+08	2.485720E+10
0.00084381	149751.65454	20974483.	1.774715E+08	2.485697E+10
0.00088428	156932.51129	21980244.	1.774699E+08	2.485675E+10

K22 = abs(Shear Reaction/Top y)
K23 = abs(Shear Reaction/Top Rotation)
K32 = abs(Moment Reaction/Top y)
K33 = abs(Moment Reaction/Top Rotation)

The analysis ended normally.


Lateral Deflection (in)
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Case 1


Bending Moment (in-kips)
0
2000
4000
6000
8000
1E4
1.2E4
1.4E4
1.6E4
1.8E4
2E4
2.2E4
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Case 1


Shear Force (kips)
-300
-250
-200
-150
-100
-50
0
50
100
Depth (ft)
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
Case 1

Section 1 - RFDS GENERAL INFORMATION

RFDS NAME:	CT5150	DATE:	5/21/2019	RF DESIGN ENG:	Rahimuddin Mohammed	RF PERF ENG:	
ISSUE:	Bronze Standard	Approved? (Y/N):	Yes	RF DESIGN PHONE:	202 999 2776	RF PERF PHONE:	
REVISION:	Preliminary	RF MANAGER:	John Benedetto	RF DESIGN EMAIL:	rd855w@att.com	RF PERF EMAIL:	

RFDS PROGRAM TYPE:	2020 LTE Multi Carrier		
RFDS TECHNOLOGY:	LTE		
STATE/STATUS:	Preliminary/Submitted for Approval		
RFDS ID:	4031748		
Created By:	rd855w	Updated By:	rx855w
Created:	6/25/2020	Updated:	6/25/2020
EXPIRATION DATE:			
ESTIMATED SQIN:		Calculation ID:	

De-Scope SOW - 2 Ant solution.
4T4R4X Software Retrofit(700 B-C), LTE 4C[AWS J], LTE 5C[850 B(U)]
* Previous RFDS ID # 3137111 *

ADDITIONAL WORKFLOW NOTIFICATIONS:			
RFDS VERSION:	1.00		
UMTS FREQUENCY:	850		
LTE FREQUENCY:	700,850,1900,AWS,WCS		
5G FREQUENCY:	850		
IPLAN JOB # 1:	NER-RCTB-19-03008	PRD || SUB GRP #1:	Antenna Modifications|| 4T4R4X Software Retrofit
IPLAN JOB # 2:	NER-RCTB-19-02655	PRD || SUB GRP #2:	LTE Next Carrier || LTE 4C
IPLAN JOB # 3:	NER-RCTB-19-02759	PRD || SUB GRP #3:	LTE Next Carrier || LTE 5C
IPLAN JOB # 4:		PRD || SUB GRP #4:	
IPLAN JOB # 5:		PRD || SUB GRP #5:	
IPLAN JOB # 6:		PRD || SUB GRP #6:	
IPLAN JOB # 7:		PRD || SUB GRP #7:	
IPLAN JOB # 8:		PRD || SUB GRP #8:	

Section 2 - LOCATION INFORMATION

USID:	14242	FA LOCATION CODE:	10071192	LOCATION NAME:	OLD GREENWICH RAILROAD STATION		
REGION:	NORTHEAST	MARKET CLUSTER:	NEW ENGLAND	MARKET:	CONNECTICUT		
ADDRESS:	OLD GREENWICH STATION	CITY:	OLD GREENWICH	STATE:	CT		
ZIP CODE:	06870	COUNTY:	FAIRFIELD	LONG (DEC. DEG.):	-73.5632989		
LATITUDE (D-M-S):	41d 2m2.01084s	LONGITUDE (D-M-S):	-73d -33m-47.87604s	LAT (DEC. DEG.):	41.0338919		

ORACLE PRJT # 1:	2051A0PQS5	PACE JOB #1:	MRCTB040768
ORACLE PRJT # 2:	2051A0PQJ1	PACE JOB #2:	MRCTB040537
ORACLE PRJT # 3:	2051A0PQDR	PACE JOB #3:	MRCTB040703
ORACLE PRJT # 4:		PACE JOB #4:	
ORACLE PRJT # 5:		PACE JOB #5:	
ORACLE PRJT # 6:		PACE JOB #6:	
ORACLE PRJT # 7:		PACE JOB #7:	
ORACLE PRJT # 8:		PACE JOB #8:	
BORDER CELL WITH CONTOUR COORD:		SEARCH RING NAME:	
AM STUDY REQ'D (Y/N):	No	SEARCH RING ID:	
FREQ COORD:		BTA:	MSA / RSA:
		LAC(UMTS):	05089
RF DISTRICT:	TBD		
RF ZONE:	TBD	RNC(UMTS):	BRIDGEPORT RNC06 ERICSSON 3820
		MME POOL ID(LTE):	FF01
PARENT NAME(UMTS):	BRPTCT04CRBR06		

DIRECTIONS, ACCESS AND EQUIPMENT LOCATION:

OLD GREENWICH RR STATION CT-150
I-95 NORTH TO EXIT 5 RIVERSIDE, OLD GREENWICH. AT THE END OF THE RAMP TURN RIGHT ONTO ROUTE 1. GO 3/10 OF A MILE AND TURN RIGHT ONTO SOUND BEACH AVE. FOLLOW DOWN TO FORK IN RD AND STAY TO THE RIGHT. GO UNDER TRAIN TRACKS AND TAKE YOUR FIST LEFT INTO OLD GREENWICH RAIL ROAD STATION. STAY IN THE LOWER PARKING LOT AND GO TO THE REAR OF THE LOT AND YOU WILL SEE OUR SHELTER. DEMARC IS IN THE TELCO BOX ON THE OUTSIDE OF SHELTER.
ADDRESS: SOUND BEACH AVE OLD GREENWICH, CT
CONTACT:
SECURITY: NONE
ACCESS: 24/7
POWER COMPANY: UNITED ILLUMINATING (800) 722-5584 METER # 02 502 668
FIRE: (203) 622-3950 POLICE: (203) 622-8000
T-1 CIRCUIT NUMBERS HCGS 673971AND HCGS 673972
SNET: (800) 448-1008 AND (203) 420-3131 (24-HR REPAIR)
POTS LINE 203 637-2896

Section 3 - LICENSE COVERAGE/FILING INFORMATION

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

CGSA CALL SIGNS:

Section 4 - TOWER/REGULATORY INFORMATION

STRUCTURE AT&T OWNED?:	Yes	GROUND ELEVATION (ft):	0	STRUCTURE TYPE:	UTILITY
ADDITIONAL REGULATORY?:	Yes	HEIGHT OVERALL (ft):		FCC ASR NUMBER:	NR
SUB-LEASE RIGHTS?:	Yes	STRUCTURE HEIGHT (ft):	0.00		
LIGHTING TYPE:	NOT REQUIRED				

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

Section 5 - E-911 INFORMATION - existing

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911				INTRADO_MIAMI		0		
SECTOR B				INTRADO_MIAMI		0		
SECTOR C				INTRADO_MIAMI		0		
SECTOR D	CONNECTICUT STATE POLICE-G TROOP	1319				0		
SECTOR E	CONNECTICUT STATE POLICE-G TROOP	1319				0		
SECTOR F	CONNECTICUT STATE POLICE-G TROOP	1319				0		
OMNI								

Section 5 - E-911 INFORMATION - final

	PSAP NAME:	PSAP ID:	E911 PHASE:	MPC SVC PROVIDER:	LMU REQUIRED:	ESRN:	DATE LIVE PH1:	DATE LIVE PH2:
SECTOR A E-911				INTRADO_MIAMI		0		
SECTOR B				INTRADO_MIAMI		0		
SECTOR C				INTRADO_MIAMI		0		
SECTOR D	CONNECTICUT STATE POLICE-G TROOP	1319				0		
SECTOR E	CONNECTICUT STATE POLICE-G TROOP	1319				0		
SECTOR F	CONNECTICUT STATE POLICE-G TROOP	1319				0		
OMNI								

Section 6/7 - BBU INFORMATION - existing

	BBU 1	BBU 2	BBU 3
BBU ID:	172457	222814	360129
TECHNOLOGY:	UMTS	UMTS	LTE
BBU NAME:	CTUS150	CTV5150	CTL05150
CELL ID / BCF:	CTUS150	CTU5150	CTL05150
BTA/TID:	321V	321U	321L
4-9 DIGIT SITE ID:	5150	5150	5150
COW OR TOY?:	No	No	No
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL
BTS LOCATION ID:	INTERNAL	INTERNAL	INTERNAL
BASE STATION TYPE:	BASE	OVERLAY	BASE
EQUIPMENT NAME:	OLD GREENWICH RAILROAD STATION	OLD GREENWICH RAILROAD STATION	OLD GREENWICH RAILROAD STATION
DISASTER PRIORITY:	2	0	3
EQUIPMENT VENDOR:	ERICSSON	ERICSSON	ERICSSON
EQUIPMENT TYPE (Model):	3206 INDOOR	3206 INDOOR	4601 INDOOR MU
BASEBAND CONFIGURATION:			
MARKET STATE CODE:			CT
NODE B NUMBER:	0	0	5150
SIDEHAUL SWITCH VENDOR:			
SIDEHAUL SWITCH MODEL:			
SIDEHAUL SWITCH NAME:			
CSS - CTS COMMON ID:	CTUS150	CTV5150	CTL05150
CSS - SECONDARY FUNCTION ID:			

Section 6/7 - BBU INFORMATION - final

	BBU 1	BBU 2	BBU 3	BBU 4
BBU ID:	222814	741373	360129	0
TECHNOLOGY:	UMTS	LTE	LTE	5G
BBU NAME:	CTV5150	CTL04150R	CTL05150	CTCN005150
CELL ID / BCF:	CTUS150	CTL04150R	CTL05150	CTCN005150
BTA/TID:	321W	321L	321L	321L
4-9 DIGIT SITE ID:	5150	54150	55150	14005150
COW OR TOY?:	No	No	No	No
CELL SITE TYPE:	SECTORIZED	SECTORIZED	SECTORIZED	SECTORIZED
SITE TYPE:	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL	MACRO-CONVENTIONAL
BTS LOCATION ID:	INTERNAL	INTERNAL	INTERNAL	INTERNAL
BASE STATION TYPE:	OVERLAY	BASE	BASE	BASE
EQUIPMENT NAME:	OLD GREENWICH RAILROAD STATION	OLD GREENWICH RAILROAD STATION	OLD GREENWICH RAILROAD STATION	OLD GREENWICH RAILROAD STATION
DISASTER PRIORITY:	0	3	3	3
EQUIPMENT VENDOR:	ERICSSON	ERICSSON	ERICSSON	ERICSSON
EQUIPMENT TYPE (Model):	3206 INDOOR	BASEBAND 6630	BASEBAND 6630	BASEBAND 6630
BASEBAND CONFIGURATION:		1x6601 / 1x6630 / 1xMU03		xxxx / 1x6630 / xxxx + IDUa
MARKET STATE CODE:		CT	CT	CTC
NODE B NUMBER:	0	4150	5150	5150
SIDEHAUL SWITCH VENDOR:				
SIDEHAUL SWITCH MODEL:				
SIDEHAUL SWITCH NAME:				
CSS - CTS COMMON ID:	CTV5150	CTL04150R	CTL05150	
CSS - SECONDARY FUNCTION ID:				

Section 8 - RBS/SECTOR ASSOCIATION - existing

	BBU 1	BBU 2	BBU 3
CTS Common ID	CTUS150	CTVS150	CTL05150
Soft Sector IDs	CTUS1504	CTVS1501	CTL05150_3A_1
	CTUS1505	CTVS1502	CTL05150_3B_1
	CTUS1506	CTVS1503	CTL05150_3C_1
	CTUS1507	CTVS150A	CTL05150_7A_1
	CTUS1508	CTVS150B	CTL05150_7B_1
	CTUS1509	CTVS150C	CTL05150_7C_1
			CTL05150_9A_1
			CTL05150_9B_1
			CTL05150_9C_1

Section 8 - RBS/SECTOR ASSOCIATION - final

	BBU 1	BBU 2	BBU 3	BBU 4
CTS Common ID	CTVS150	CTL04150R	CTL05150	CTCN005150
Soft Sector IDs	CTVS1501	CTL04150_2A_2	CTL05150_3A_1	CTCN005150_N005A_1
	CTVS1502	CTL04150_2B_2	CTL05150_3B_1	CTCN005150_N005B_1
	CTVS1503	CTL04150_2C_2	CTL05150_3C_1	CTCN005150_N005C_1
		CTL04150_9A_1	CTL05150_7A_1	
		CTL04150_9A_2	CTL05150_7B_1	
		CTL04150_9B_1	CTL05150_7C_1	
		CTL04150_9B_2	CTL05150_9A_1	
		CTL04150_9C_1	CTL05150_9B_1	
		CTL04150_9C_2	CTL05150_9C_1	

Section 9 - SOFT SECTOR ID - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	5G 1ST 850
USEID (excluding Hard Sector)	14242.850.3G.1	14242.1900.3G.1	14242.850.3G.2							
SECTOR A SOFT SECTOR ID	CTVS1501	CTUS1507	CTVS150A	CTL05150_7A_1		CTL05150_9A_1	CTL05150_3A_1			
SECTOR B	CTVS1502	CTUS1508	CTVS150B	CTL05150_7B_1		CTL05150_9B_1	CTL05150_3B_1			
SECTOR C	CTVS1503	CTUS1509	CTVS150C	CTL05150_7C_1		CTL05150_9C_1	CTL05150_3C_1			
SECTOR D		CTUS1504								
SECTOR E		CTUS1505								
SECTOR F		CTUS1506								
OMNI										

Section 9 - SOFT SECTOR ID - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	5G 1ST 850
USEID (excluding Hard Sector)	14242.850.3G.1									
SECTOR A SOFT SECTOR ID	CTVS1501			CTL05150_7A_1	CTL05150_8A_1	CTL04150_9A_1	CTL05150_3A_1	CTL04150_9A_2	CTL04150_2A_2	CTCN005150_N005A_1
SECTOR B	CTVS1502			CTL05150_7B_1	CTL05150_8B_1	CTL04150_9B_1	CTL05150_3B_1	CTL04150_9B_2	CTL04150_2B_2	CTCN005150_N005B_1
SECTOR C	CTVS1503			CTL05150_7C_1	CTL05150_8C_1	CTL04150_9C_1	CTL05150_3C_1	CTL04150_9C_2	CTL04150_2C_2	CTCN005150_N005C_1
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 9 - Cell Number - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	5G 1ST 850
USEID (excluding Hard Sector)	14242.850.3G.1	14242.1900.3G.1	14242.850.3G.2							
SECTOR A CELL NUMBER				15		8	149			
SECTOR B				16		9	150			
SECTOR C				17		10	151			
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 9 - Cell Number - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	5G 1ST 850
USEID (excluding Hard Sector)	14242.850.3G.1									
SECTOR A CELL NUMBER				15	1	8	149	178	192	25
SECTOR B				16	2	9	150	179	193	49
SECTOR C				17	3	10	151	180	194	73
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 10 - CID/SAC - existing

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	5G 1ST 850
SECTOR A CID/SAC	51501	51507	41501							
SECTOR B	51502	51508	41502							
SECTOR C	51503	51509	41503							
SECTOR D		51504								
SECTOR E		51505								
SECTOR F		51506								
OMNI										

Section 10 - CID/SAC - final

	UMTS 1ST 850	UMTS 1ST 1900	UMTS 2ND 850	LTE 1ST 700	LTE 1ST 850	LTE 1ST 1900	LTE 1ST WCS	LTE 2ND 1900	LTE 4TH AWS	5G 1ST 850
SECTOR A CID/SAC	51501									
SECTOR B	51502									
SECTOR C	51503									
SECTOR D										
SECTOR E										
SECTOR F										
OMNI										

Section 11 - CURRENT RADIO COUNTS existing

Section 12 - CURRENT T1 COUNTS existing

Section 13 - NEW/PROPOSED RADIO COUNTS

Section 14 - NEW/PROPOSED T1 COUNTS

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

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	QS66512-2					
ANTENNA VENDOR	Powerwave	Quintel					
ANTENNA SIZE (H x W x D)	55X11X5	72X12X9.6					
ANTENNA WEIGHT	35	111					
AZIMUTH	0	30					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109					
ANTENNA TIP HEIGHT	111	112					
MECHANICAL DOWNTILT	0	2					
FEEDER AMOUNT	2	4					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	1 Powerwave 7020 (DB)	Built-in					
SURGE ARRESTOR (QTY/MODEL)	None	10 APTDC-BDFDM-0BW Broadband					
DIPLEXER (QTY/MODEL)	2 Powerwave LGP21901	4 CCI Pentaplexer SPX-0726-O					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)	1 Powerwave 7070	LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 LGP17201 Single Fullband	2 TMA2117F00V1-1 (Twin PCS-					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1900860						
PDU FOR TMAS (QTY/MODEL)	1 Powerwave LGP 18104	LTE RRH					
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)	1 RRUS-11 B12						
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)	1 RRUS-32 B2						
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)	1 RRUS-32 B30						
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1		14242.A.850.3G.1	CTV51501	CTV51501		UMTS 850	7770.00.850.05	13.5	0	5	None	Andrew 1-1/4	120.03	850 RXAIT			No		313.33		1	
	PORT 2		14242.A.850.3G.2	CTV5150A	CTV5150A	Decom	UMTS 850	7770.00.850.05	13.5	0	5	Bottom	Andrew 1-1/4	120.03	850 RXAIT			No		313.33		1	
	PORT 3		14242.A.1900.3G.1	CTU51507	CTU51507	Decom	UMTS 1900	7770.00.1900.00	16.5	0	0	None	Andrew 1-1/4	120.03				No		628.06		2	
	PORT 4		14242.A.1900.3G.2	CTU51504	CTU51504	Decom	UMTS 1900	7770.00.1900.00	16.5	0	0	Bottom	Andrew 1-1/4	120.03				No		628.06		2	
	PORT 5		14242.A.850.2S.G.1	321GS1501	321GS1501		GSM 850	7770.00.850.05	13.5	0	5	NONE	Andrew 1-1/4	120.03	850 RXAIT	1	850 LLC	No		313.33		1	
ANTENNA POSITION 2	PORT 1		14242.A.700.4G.1	CTL05150_7A_1	CTL05150_7A_1		LTE 700	2_719MHz_02DT	14	30	2	BOTTOM	Andrew 1-1/4	120.03						1475.7065		3	
	PORT 3		14242.A.1900.4G.1	CTL05150_9A_1	CTL05150_9A_1		LTE 1900	2_1930MHz_02DT	17	30	2	BOTTOM	Andrew 1-1/4	120.03						3664.3757		4	
	PORT 4		14242.A.WCS.4G.1	CTL05106_3A_1	CTL05106_3A_1		LTE WCS	2_2350MHz_03DT	17.8	30	3	BOTTOM	Andrew 1-1/4	120.03						1285.2866		4	

Section 15B - CURRENT TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	QS66512-2					
ANTENNA VENDOR	Powerwave	Quintel					
ANTENNA SIZE (H x W x D)	55X11X5	72X12X9.6					
ANTENNA WEIGHT	35	111					
AZIMUTH	120	150					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109					
ANTENNA TIP HEIGHT	111	112					
MECHANICAL DOWNTILT	0	0					
FEEDER AMOUNT	2	4					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	1 Powerwave 7020 (DB)	Built-in					
SURGE ARRESTOR (QTY/MODEL)	None	10 APTDC-BDFDM-0BW Broadband					
DIPLEXER (QTY/MODEL)	2 Powerwave LGP21901	4 CCI Pentaplexer SPX-0726-O					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 LGP17201 Single Fullband	2 TMA2117F00V1-1 (Twin PCS-					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1900B60						
PDU FOR TMAS (QTY/MODEL)		LTE RRH					
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 RRUS-11 B12					
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)		1 RRUS-32 B2					
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1		14242.B.850.3G.1	CTV51502	CTV51502		UMTS 850	7770.00.850.05	13.5	120	5	None	Andrew 1-1/4	120.03	850 RXAIT			No		313.33		9	
	PORT 2		14242.B.850.3G.2	CTV5150B	CTV5150B	Decom	UMTS 850	7770.00.850.05	13.5	120	5	Bottom	Andrew 1-1/4	120.03	850 RXAIT			No		313.33		9	
	PORT 3		14242.B.1900.3G.1	CTU51508	CTU51508	Decom	UMTS 1900	7770.00.1900.02	16.5	120	2	None	Andrew 1-1/4	120.03				No		628.06		10	
	PORT 4		14242.B.1900.3G.2	CTU51505	CTU51505	Decom	UMTS 1900	7770.00.1900.02	16.5	120	2	Bottom	Andrew 1-1/4	120.03				No		628.06		10	
	PORT 5		14242.B.850.2S.G.1	321GS1502	321GS1502		GSM 850	7770.00.850.05	13.5	120	5	NONE	Andrew 1-1/4	120.03	850 RXAIT	1	850 LLC	No		313.33		9	
ANTENNA POSITION 2	PORT 1		14242.B.700.4G.1	CTL05150_7B_1	CTL05150_7B_1		LTE 700	2_719MHz_02DT	14	150	2	BOTTOM	Andrew 1-1/4	120.03						1475.7065		11	
	PORT 3		14242.B.1900.4G.1	CTL05150_9B_1	CTL05150_9B_1		LTE 1900	2_1930MHz_02DT	17	150	2	BOTTOM	Andrew 1-1/4	120.03						3664.3757		12	
	PORT 4		14242.B.WCS.4G.1	CTL05106_3B_1	CTL05106_3B_1		LTE WCS	2_2350MHz_03DT	17.8	150	3	BOTTOM	Andrew 1-1/4	120.03						1285.2866		12	

Section 15C - CURRENT TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	7770	QS66512-2					
ANTENNA VENDOR	Powerwave	Quintel					
ANTENNA SIZE (H x W x D)	55X11X5	72X12X9.6					
ANTENNA WEIGHT	35	111					
AZIMUTH	240	270					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109					
ANTENNA TIP HEIGHT	111	112					
MECHANICAL DOWNTILT	0	0					
FEEDER AMOUNT	2	4					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	1 Powerwave 7020 (DB)	Built-in					
SURGE ARRESTOR (QTY/MODEL)	None	10 APTDC-BDFDM-0BW Broadband					
DIPLEXER (QTY/MODEL)	2 Powerwave LGP21901	4 CCI Pentaplexer SPX-0726-O					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)		LTE RRH					
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	2 LGP17201 Single Fullband	2 TMA2117F00V1-1 (Twin PCS-					
CURRENT INJECTORS FOR TMA (QTY/MODEL)	2 Polyphaser 1900B60						
PDU FOR TMAS (QTY/MODEL)		LTE RRH					
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		1 RRUS-11 B12					
RRH - 850 band (QTY/MODEL)							
RRH - 1900 band (QTY/MODEL)		1 RRUS-32 B2					
RRH - AWS band (QTY/MODEL)							
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)							
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1							
Local Market Note 2							
Local Market Note 3							

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1		14242.C.850.3G.1	CTV51503	CTV51503		UMTS 850	7770.00.850.02	13.5	240	2	None	Andrew 1-1/4	120.03	850 RXAIT			No		313.33		17	
	PORT 2		14242.C.850.3G.2	CTV5150C	CTV5150C	Decom	UMTS 850	7770.00.850.02	13.5	240	2	Bottom	Andrew 1-1/4	120.03	850 RXAIT			No		313.33		17	
	PORT 3		14242.C.1900.3G.1	CTU51509	CTU51509	Decom	UMTS 1900	7770.00.1900.02	16.5	240	2	None	Andrew 1-1/4	120.03				No		628.06		18	
	PORT 4		14242.C.1900.3G.2	CTU51506	CTU51506	Decom	UMTS 1900	7770.00.1900.02	16.5	240	2	Bottom	Andrew 1-1/4	120.03				No		628.06		18	
	PORT 5		14242.C.850.2S.G.1	321GS1503	321GS1503		GSM 850	7770.00.850.02	13.5	240	2	NONE	Andrew 1-1/4	120.03	850 RXAIT	1	850 LLC	No		313.33		17	
ANTENNA POSITION 2	PORT 1		14242.C.700.4G.1	CTL05150_7C_1	CTL05150_7C_1		LTE 700	2_719MHz_02DT	14	270	2	BOTTOM	Andrew 1-1/4	120.03						1475.7065		19	
	PORT 3		14242.C.1900.4G.1	CTL05150_9C_1	CTL05150_9C_1		LTE 1900	2_1930MHz_02DT	17	270	2	BOTTOM	Andrew 1-1/4	120.03						3664.3757		20	
	PORT 4		14242.C.WCS.4G.1	CTL05106_3C_1	CTL05106_3C_1		LTE WCS	2_2350MHz_03DT	17.8	270	3	BOTTOM	Andrew 1-1/4	120.03						1285.2866		20	

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

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL	SBNHH-1D65A	NNH-65A-R6					
ANTENNA VENDOR	Andrew	Andrew					
ANTENNA SIZE (H x W x D)	55X11.9X7.1	55.1X19.6X7.8					
ANTENNA WEIGHT	33.5	72.8					
AZIMUTH	30	30					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109					
ANTENNA TIP HEIGHT	111	111					
MECHANICAL DOWNTILT	0	2					
FEEDER AMOUNT	2	4					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (w/hich antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	Built-in	Built-in					
SURGE ARRESTOR (QTY/MODEL)		12 TSXDC-4310FM					
DIPLEXER (QTY/MODEL)	2 TBC0038F1V94-1	4 TBC0038F1V94-1					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1 TMABP07823V G12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		with another band					
RRH - 850 band (QTY/MODEL)		1 4449 B5/B12					
RRH - 1900 band (QTY/MODEL)	with another band						
RRH - AWS band (QTY/MODEL)		1 8843 B2/B66A					
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)	2 1001940 BTS Side	2 1001940 BTS Side					
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Antenna and radios as per PD. - Replace UMTS antenna with hex port.						
Local Market Note 2							
Local Market Note 3	xxxxx / 2x6630 / 1xXMU03 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Aloll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RX/AIT KIT MODULE?	TRIPLEXER or LLC (Q'TY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1			CTVS1501	CTVS1501		UMTS 850	7770.00.850.05	13.5	0	5	None	Andrew 1-1/4	120.03				No		313.33		1	
	PORT 3			CTL04150_9A_1	CTL04150_9A_1		LTE 1900	1D65A_1930MHz_02DT	16	30	2	BOTTOM	Andrew 1-1/4	120.03						3664.3757		4	
	PORT 4			CTL04150_9A_2	CTL04150_9A_2		LTE 1900	1D65A_1930MHz_02DT	16	30	2	BOTTOM	Andrew 1-1/4	120.03						3664.3757		4	
ANTENNA POSITION 2	PORT 1			CTL05150_7A_1	CTL05150_7A_1		LTE 700	R6_725MHz_02DT	13.2	30	2	BOTTOM	Andrew 1-1/4	120.03						1475.7065		7	
	PORT 2			CTL05150_8A_1	CTL05150_8A_1		LTE 850	R6_850MHz_02DT	13.1	30	2	BOTTOM	Andrew 1-1/4	120.03						1000		7	
	PORT 3			CTL04150_2A_2	CTL04150_2A_2		LTE AWS	R6_2170MHz_02DT	17.4	30	2	BOTTOM	Andrew 1-1/4	120.03						1837.0724		8	
	PORT 4			CTL05150_3A_1	CTL05150_3A_1		LTE WCS	R6_2355MHz_03DT	16.7	30	3	BOTTOM	Andrew 1-1/4	120.03						1285.2866		4	
	PORT 5			CTCN005150_N005A_1	CTCN005150_N005A_1		5G 850	R6_850MHz_02DT	13.1	30	2	BOTTOM	Andrew 1-1/4	120.03						1000		7	

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

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL	SBNHH-1D65A	NNH4-65A-R6					
ANTENNA VENDOR	Andrew	Andrew					
ANTENNA SIZE (H x W x D)	55X11.9X7.1	55.1X19.6X7.8					
ANTENNA WEIGHT	33.5	72.8					
AZIMUTH	150	150					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109					
ANTENNA TIP HEIGHT	111	111					
MECHANICAL DOWNTILT	0	0					
FEEDER AMOUNT	2	4					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (w/hich antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	Built-in	Built-in					
SURGE ARRESTOR (QTY/MODEL)		12 TSXDC-4310FM					
DIPLEXER (QTY/MODEL)	2 TBC0038F1V94-1	4 TBC0038F1V94-1					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1 TMABP07823V G12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		with another band					
RRH - 850 band (QTY/MODEL)		1 4449 B5/B12					
RRH - 1900 band (QTY/MODEL)	with another band						
RRH - AWS band (QTY/MODEL)		1 8843 B2/B66A					
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)	2 1001940 BTS Side	2 1001940 BTS Side					
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Antenna and radios as per PD. - Replace UMTS antenna with hex port.						
Local Market Note 2							
Local Market Note 3	xxxxx / 2x6630 / 1xXMU03 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RX/AIT KIT MODULE?	TRIPLEXER or LLC (Q'TY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1			CTV51502	CTV51502		UMTS 850	7770.00.850.05	13.5	120	5	None	Andrew 1-1/4	120.03				No		313.33		9	
	PORT 3			CTL04150_9B_1	CTL04150_9B_1		LTE 1900	1D65A_1930MHz_05DT	15.6	150	5	BOTTOM	Andrew 1-1/4	120.03						3664.3757		12	
	PORT 4			CTL04150_9B_2	CTL04150_9B_2		LTE 1900	1D65A_1930MHz_05DT	15.6	150	5	BOTTOM	Andrew 1-1/4	120.03						3664.3757		12	
ANTENNA POSITION 2	PORT 1			CTL05150_7B_1	CTL05150_7B_1		LTE 700	R6_725MHz_02DT	13.2	150	2	BOTTOM	Andrew 1-1/4	120.03						1475.7065		15	
	PORT 2			CTL05150_8B_1	CTL05150_8B_1		LTE 850	R6_850MHz_02DT	13.1	150	2	BOTTOM	Andrew 1-1/4	120.03						1000		15	
	PORT 3			CTL04150_2B_2	CTL04150_2B_2		LTE AWS	R6_2170MHz_05DT	17.6	150	5	BOTTOM	Andrew 1-1/4	120.03						1837.0724		16	
	PORT 4			CTL05150_3B_1	CTL05150_3B_1		LTE WCS	R6_2355MHz_03DT	16.7	150	3	BOTTOM	Andrew 1-1/4	120.03						1285.2866		12	
	PORT 5			CTCN005150_N005B_1	CTCN005150_N005B_1		5G 850	R6_850MHz_02DT	13.1	150	2	BOTTOM	Andrew 1-1/4	120.03						1000		15	

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

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
Existing Antenna?							
ANTENNA MAKE - MODEL	SBNHH-1D65A	NNH4-65A-R6					
ANTENNA VENDOR	Andrew	Andrew					
ANTENNA SIZE (H x W x D)	55X11.9X7.1	55.1X19.6X7.8					
ANTENNA WEIGHT	33.5	72.8					
AZIMUTH	270	270					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109					
ANTENNA TIP HEIGHT	111	111					
MECHANICAL DOWNTILT	0	0					
FEEDER AMOUNT	2	4					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (w/hich antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	Built-in	Built-in					
SURGE ARRESTOR (QTY/MODEL)		12 TSXDC-4310FM					
DIPLEXER (QTY/MODEL)	2 TBC0038F1V94-1	4 TBC0038F1V94-1					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1 TMABP07823V G12A						
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		with another band					
RRH - 850 band (QTY/MODEL)		1 4449 B5/B12					
RRH - 1900 band (QTY/MODEL)	with another band						
RRH - AWS band (QTY/MODEL)		1 8843 B2/B66A					
RRH - WCS band (QTY/MODEL)							
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)	2 1001940 BTS Side	2 1001940 BTS Side					
Additional Component 2 (QTY/MODEL)							
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Antenna and radios as per PD. - Replace UMTS antenna with hex port.						
Local Market Note 2							
Local Market Note 3	xxxxx / 2x6630 / 1xXMU03 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Aloll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RX/AIT KIT MODULE?	TRIPLEXER or LLC (Q'TY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1			CTV51503	CTV51503		UMTS 850	7770.00.850.02	13.5	240	2	None	Andrew 1-1/4	120.03				No		313.33		17	
	PORT 3			CTL04150_9C_1	CTL04150_9C_1		LTE 1900	1D65A_1930MHz_02DT	16	270	2	BOTTOM	Andrew 1-1/4	120.03						3664.3757		20	
	PORT 4			CTL04150_9C_2	CTL04150_9C_2		LTE 1900	1D65A_1930MHz_02DT	16	270	2	BOTTOM	Andrew 1-1/4	120.03						3864.3757		20	
ANTENNA POSITION 2	PORT 1			CTL05150_7C_1	CTL05150_7C_1		LTE 700	R6_725MHz_02DT	13.2	270	2	BOTTOM	Andrew 1-1/4	120.03						1475.7065		23	
	PORT 2			CTL05150_8C_1	CTL05150_8C_1		LTE 850	R6_850MHz_02DT	13.1	270	2	BOTTOM	Andrew 1-1/4	120.03						1000		23	
	PORT 3			CTL04150_2C_2	CTL04150_2C_2		LTE AWS	R6_2170MHz_02DT	17.4	270	2	BOTTOM	Andrew 1-1/4	120.03						1837.0724		24	
	PORT 4			CTL05150_3C_1	CTL05150_3C_1		LTE WCS	R6_2355MHz_02DT	16.8	270	2	BOTTOM	Andrew 1-1/4	120.03						1285.2866		20	
	PORT 5			CTCN005150_N005C_1	CTCN005150_N005C_1		5G 850	R6_850MHz_02DT	13.1	270	2	BOTTOM	Andrew 1-1/4	120.03						1000		23	

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

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

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	SBNHH-1D65A	NNH4-65A-R6					
ANTENNA VENDOR	Andrew	Andrew					
ANTENNA SIZE (H x W x D)	55X11.9X7.1	55.1X19.6X7.8					
ANTENNA WEIGHT	33.5	72.8					
AZIMUTH	30	30					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109					
ANTENNA TIP HEIGHT	111	111					
MECHANICAL DOWNTILT	0	2					
FEEDER AMOUNT	2	4					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (w/hich antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	Built-in	Built-in					
SURGE ARRESTOR (QTY/MODEL)		12 TSXDC-4310FM					
DIPLEXER (QTY/MODEL)	2 TBC0038F1V94-1	4 TBC0038F1V94-1					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1 TMABP07823V G12A	2 TMA2117F00V1-1					
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		with another band					
RRH - 850 band (QTY/MODEL)		1 4449 B5/B12					
RRH - 1900 band (QTY/MODEL)	with another band						
RRH - AWS band (QTY/MODEL)		1 8843 B2/B66A					
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)	2 1001940 BTS Side	2 1001940 BTS Side					
Additional Component 2 (QTY/MODEL)	1 Powerwave 7070	4 APTDC-BDFDM-DBW Broadband					
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Antenna and radios as per PD. - Replace UMTS antenna with hex port.						
Local Market Note 2							
Local Market Note 3	xxxxx / 2x6630 / 1xXMU03 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Aloll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RX/AIT KIT MODULE?	TRIPLEXER or LLC (Q'TY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1	14242.A.850.3G.1		CTVS1501	CTVS1501		UMTS 850	7770.00.850.05_02DT	13.5	0	5	None	Andrew 1-1/4	120.03				No		313.33		1	
	PORT 3	14242.A.1900.4G.mp1		CTL04150_9A_1	CTL04150_9A_1		LTE 1900	1D65A_1930MHz_02DT	16	30	2	BOTTOM	Andrew 1-1/4	120.03						3664.3757		4	
	PORT 4	14242.A.1900.4G.mp2		CTL04150_9A_2	CTL04150_9A_2		LTE 1900	1D65A_1930MHz_02DT	16	30	2	BOTTOM	Andrew 1-1/4	120.03						3864.3757		4	
ANTENNA POSITION 2	PORT 1	14242.A.700.4G.1		CTL05150_7A_1	CTL05150_7A_1		LTE 700	R6_725MHz_02DT	13.2	30	2	BOTTOM	Andrew 1-1/4	120.03						1475.7065		7	
	PORT 2	14242.A.850.4G.mp1		CTL05150_8A_1	CTL05150_8A_1		LTE 850	R6_850MHz_02DT	13.1	30	2	BOTTOM	Andrew 1-1/4	120.03						1000		7	
	PORT 3	14242.A.AWS.4G.mp4		CTL04150_2A_2	CTL04150_2A_2		LTE AWS	R6_2170MHz_02DT	17.4	30	2	BOTTOM	Andrew 1-1/4	120.03						1837.0724		8	
	PORT 4	14242.A.WCS.4G.1		CTL05150_3A_1	CTL05150_3A_1		LTE WCS	R6_2355MHz_03DT	16.7	30	3	BOTTOM	Andrew 1-1/4	120.03						1285.2866		4	
	PORT5	14242.A.850.5G.mp1		CTCN005150_N005A_1	CTCN005150_N005A_1		5G 850	R6_850MHz_02DT	13.1	30	2	BOTTOM	Andrew 1-1/4	120.03						1000		7	

Section 17B - FINAL TOWER CONFIGURATION - SECTOR B

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	SBNHH-1D65A	NNHH-65A-R6					
ANTENNA VENDOR	Andrew	Andrew					
ANTENNA SIZE (H x W x D)	55X11.9X7.1	55.1X19.6X7.8					
ANTENNA WEIGHT	33.5	72.8					
AZIMUTH	150	150					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109					
ANTENNA TIP HEIGHT	111	111					
MECHANICAL DOWNTILT	0	0					
FEEDER AMOUNT	2	4					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	Built-in	Built-in					
SURGE ARRESTOR (QTY/MODEL)	12	TSXDC-4310FM					
DIPLEXER (QTY/MODEL)	2 TBC0038F1V94-1	4 TBC0038F1V94-1					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1 TMABP07823VG12A	2 TMA2117F00V1-1					
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		with another band					
RRH - 850 band (QTY/MODEL)		1 4449 B5/B12					
RRH - 1900 band (QTY/MODEL)	with another band						
RRH - AWS band (QTY/MODEL)		1 8843 B2/B66A					
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)	2 1001940 BTS Side	2 1001940 BTS Side					
Additional Component 2 (QTY/MODEL)		4 APTDC-BDFDM-08W Broadband					
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Antenna and radios as per PD. - Replace UMTS antenna with hex port.						
Local Market Note 2							
Local Market Note 3	xxxxx / 2x6630 / 1xXMU03 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RX/AIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(css-ng)
ANTENNA POSITION 1	PORT 1	14242.B.850.3G.1		CTV51502	CTV51502		UMTS 850	7770.00.850.05	13.5	120	5	None	Andrew 1-1/4	120.03				No		313.33		9	
	PORT 3	14242.B.1900.4G.tmp1		CTL04150_9B_1	CTL04150_9B_1		LTE 1900	1D65A_1930MHz_05DT	15.6	150	5	BOTTOM	Andrew 1-1/4	120.03						3664.3757		12	
	PORT 4	14242.B.1900.4G.tmp2		CTL04150_9B_2	CTL04150_9B_2		LTE 1900	1D65A_1930MHz_05DT	15.6	150	5	BOTTOM	Andrew 1-1/4	120.03						3664.3757		12	
ANTENNA POSITION 2	PORT 1	14242.B.700.4G.1		CTL05150_7B_1	CTL05150_7B_1		LTE 700	R6_725MHz_02DT	13.2	150	2	BOTTOM	Andrew 1-1/4	120.03						1475.7065		15	
	PORT 2	14242.B.850.4G.tmp1		CTL05150_8B_1	CTL05150_8B_1		LTE 850	R6_850MHz_02DT	13.1	150	2	BOTTOM	Andrew 1-1/4	120.03						1000		15	
	PORT 3	14242.B.AWS.4G.tmp4		CTL04150_2B_2	CTL04150_2B_2		LTE AWS	R6_2170MHz_03DT	17.6	150	5	BOTTOM	Andrew 1-1/4	120.03						3837.0724		16	
	PORT 4	14242.B.WCS.4G.1		CTL05150_3B_1	CTL05150_3B_1		LTE WCS	R6_2355MHz_03DT	16.7	150	3	BOTTOM	Andrew 1-1/4	120.03						1285.2866		12	
	PORT 5	14242.B.850.5G.tmp1		CTCN005150_N005B_1	CTCN005150_N005B_1		5G 850	R6_850MHz_02DT	13.1	150	2	BOTTOM	Andrew 1-1/4	120.03						1000		15	

Section 17C - FINAL TOWER CONFIGURATION - SECTOR C

ANTENNA POSITION is LEFT to RIGHT from BACK OF ANTENNA (unless otherwise specified)	ANTENNA POSITION 1	ANTENNA POSITION 2	ANTENNA POSITION 3	ANTENNA POSITION 4	ANTENNA POSITION 5	ANTENNA POSITION 6	ANTENNA POSITION 7
ANTENNA MAKE - MODEL	SBNHH-1D65A	NNH4-65A-R6					
ANTENNA VENDOR	Andrew	Andrew					
ANTENNA SIZE (H x W x D)	55X11.9X7.1	55.1X19.6X7.8					
ANTENNA WEIGHT	33.5	72.8					
AZIMUTH	270	270					
MAGNETIC DECLINATION							
RADIATION CENTER (feet)	109	109					
ANTENNA TIP HEIGHT	111	111					
MECHANICAL DOWNTILT	0	0					
FEEDER AMOUNT	2	4					
VERTICAL SEPARATION from ANTENNA ABOVE (TIP to TIP)							
VERTICAL SEPARATION from ANTENNA BELOW (TIP to TIP)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to LEFT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from CLOSEST ANTENNA to RIGHT (CENTERLINE to CENTERLINE)							
HORIZONTAL SEPARATION from ANOTHER ANTENNA (which antenna # / # of inches)							
Antenna RET Motor (QTY/MODEL)	Built-in	Built-in					
SURGE ARRESTOR (QTY/MODEL)	12	TSXDC-4310FM					
DIPLEXER (QTY/MODEL)	2 TBC0038F1V94-1	4 TBC0038F1V94-1					
DUPLEXER (QTY/MODEL)							
Antenna RET CONTROL UNIT (QTY/MODEL)							
DC BLOCK (QTY/MODEL)							
TMA/LNA (QTY/MODEL)	1 TMABP07823VG12A	2 TMA2117F00V1-1					
CURRENT INJECTORS FOR TMA (QTY/MODEL)							
PDU FOR TMAS (QTY/MODEL)							
FILTER (QTY/MODEL)							
SQUID (QTY/MODEL)							
FIBER TRUNK (QTY/MODEL)							
DC TRUNK (QTY/MODEL)							
REPEATER (QTY/MODEL)							
RRH - 700 band (QTY/MODEL)		with another band					
RRH - 850 band (QTY/MODEL)		1 4449 B5/B12					
RRH - 1900 band (QTY/MODEL)	with another band						
RRH - AWS band (QTY/MODEL)		1 8843 B2/B66A					
RRH - WCS band (QTY/MODEL)		1 RRUS-32 B30					
Additional RRH #1 - any band (QTY/MODEL)							
Additional RRH #2 - any band (QTY/MODEL)							
Additional Component 1 (QTY/MODEL)	2 1001940 BTS Side	2 1001940 BTS Side					
Additional Component 2 (QTY/MODEL)		4 APTDC-BDFDM-08W Broadband					
Additional Component 3 (QTY/MODEL)							
Local Market Note 1	- Antenna and radios as per PD. - Replace UMTS antenna with hex port.						
Local Market Note 2							
Local Market Note 3	xxxxx / 2x6630 / 1xXMU03 + IDLe						

PORT SPECIFIC FIELDS	PORT NUMBER	USEID (CSSng)	USEID (Atoll)	ATOLL TXID	ATOLL CELL ID	TX/RX?	TECHNOLOGY / FREQUENCY	ANTENNA ATOLL	ANTENNA GAIN	ELECTRICAL AZIMUTH	ELECTRICAL TILT	RRH LOCATION (Top/Bottom/ Integrated/None)	FEEDERS TYPE	FEEDER LENGTH (feet)	RXAIT KIT MODULE?	TRIPLEXER or LLC (QTY)	TRIPLEXER or LLC (MODEL)	SCPA/MCPA MODULE?	HATCHPLATE POWER (Watts)	ERP (Watts)	Antenna RET Name	CABLE NUMBER	CABLE ID(cssng)
ANTENNA POSITION 1	PORT 1	14242.C.850.3G.1		CTV51503	CTV51503		UMTS 850	7770.00.850.02	13.5	240	2	None	Andrew 1-1/4	120.03				No		313.33		17	
	PORT 3	14242.C.1900.4G.tmp1		CTL04150_9C_1	CTL04150_9C_1		LTE 1900	1D65A_1930MHz_02DT	16	270	2	BOTTOM	Andrew 1-1/4	120.03						3664.3757		20	
	PORT 4	14242.C.1900.4G.tmp2		CTL04150_9C_2	CTL04150_9C_2		LTE 1900	1D65A_1930MHz_02DT	16	270	2	BOTTOM	Andrew 1-1/4	120.03						3664.3757		20	
ANTENNA POSITION 2	PORT 1	14242.C.700.4G.1		CTL05150_7C_1	CTL05150_7C_1		LTE 700	R6_725MHz_02DT	13.2	270	2	BOTTOM	Andrew 1-1/4	120.03						1475.7065		23	
	PORT 2	14242.C.850.4G.tmp1		CTL05150_8C_1	CTL05150_8C_1		LTE 850	R6_850MHz_02DT	13.1	270	2	BOTTOM	Andrew 1-1/4	120.03						1000		23	
	PORT 3	14242.C.AWS.4G.tmp4		CTL04150_2C_2	CTL04150_2C_2		LTE AWS	R6_2170MHz_02DT	17.4	270	2	BOTTOM	Andrew 1-1/4	120.03						3837.0724		24	
	PORT 4	14242.C.WCS.4G.1		CTL05150_3C_1	CTL05150_3C_1		LTE WCS	R6_2355MHz_02DT	16.8	270	2	BOTTOM	Andrew 1-1/4	120.03						1285.2866		20	
	PORT 5	14242.C.850.5G.tmp1		CTCN005150_N005C_1	CTCN005150_N005C_1		5G 850	R6_850MHz_02DT	13.1	270	2	BOTTOM	Andrew 1-1/4	120.03						1000		23	

NNH4-65A-R6

12-port sector antenna, 4x 698–896 and 8x 1695–2360 MHz, 65° HPBW, 6x RET.

- Interleaved dipole technology providing for attractive, low wind load mechanical package
- Array configuration provides capability for 4T4R (4x MIMO) on Low band and Dual 4T4R (4x MIMO) on High band
- Optimized SPR performance across all operating bands
- Excellent wind loading characteristics

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Effective Projective Area (EPA), frontal	0.48 m^2 | 5.167 ft^2
Effective Projective Area (EPA), lateral	0.16 m^2 | 1.722 ft^2
Grounding Type	RF connector body grounded to reflector and mounting bracket
Performance Note	Outdoor usage | Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN
Radome Material	Fiberglass, UV resistant
Radiator Material	Aluminum | Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	8
RF Connector Quantity, low band	4
RF Connector Quantity, total	12

Remote Electrical Tilt (RET) Information, General

RET Hardware	CommRET v2
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male

Dimensions

Width	498 mm | 19.606 in
Length	1400 mm | 55.118 in

Depth	197 mm | 7.756 in

NNH4-65A-R6

Wind Loading at Velocity, lateral	169.0 N @ 150 km/h | 38.0 lbf @ 150 km/h
Wind Loading at Velocity, maximum	148.4 lbf @ 150 km/h | 660.0 N @ 150 km/h
Wind Speed, maximum	241 km/h | 149.75 mph

Packaging and Weights

Width, packed	608 mm | 23.937 in
Depth, packed	352 mm | 13.858 in
Length, packed	1582 mm | 62.283 in
Net Weight, without mounting kit	33.5 kg | 73.855 lb
Weight, gross	46.7 kg | 102.956 lb

Regulatory Compliance/Certifications

Agency	Classification
CHINA-ROHS	Below maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
REACH-SVHC	Compliant as per SVHC revision on www.commscope.com/ProductCompliance
ROHS	Compliant

Included Products

BSAMNT-3	Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

SBNHH-1D65A

6-port sector antenna, 2x 698–896 and 4x 1695–2360 MHz, 65° HPBW, 2x RET. Both high bands share the same electrical tilt.

- Interleaved dipole technology providing for attractive, low wind load mechanical package

Electrical Specifications

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain, dBi	13.4	13.5	16.5	16.7	17.2	17.5
Beamwidth, Horizontal, degrees	66	61	70	65	62	61
Beamwidth, Vertical, degrees	17.6	15.9	7.1	6.6	6.2	5.5
Beam Tilt, degrees	0–18	0–18	0–10	0–10	0–10	0–10
USLS (First Lobe), dB	16	13	13	13	12	12
Front-to-Back Ratio at 180°, dB	25	27	28	28	27	29
Isolation, Cross Polarization, dB	25	25	25	25	25	25
Isolation, Inter-band, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port at 50°C, maximum, watts	300	300	250	250	250	200
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

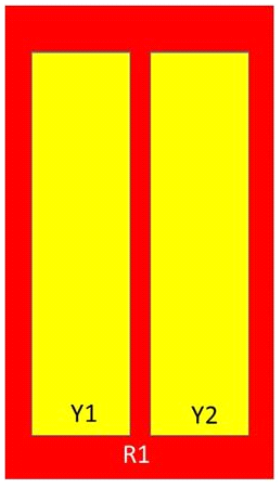
Electrical Specifications, BASTA*

Frequency Band, MHz	698–806	806–896	1695–1880	1850–1990	1920–2200	2300–2360
Gain by all Beam Tilts, average, dBi	13.1	13.1	16.1	16.5	16.7	17.2
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.5	±0.5	±0.3	±0.5	±0.4
Gain by Beam Tilt, average, dBi	0 ° | 13.4 9 ° | 13.1 18 ° | 12.7	0 ° | 13.4 9 ° | 13.1 18 ° | 12.7	0 ° | 16.0 5 ° | 16.2 10 ° | 16.1	0 ° | 16.3 5 ° | 16.5 10 ° | 16.5	0 ° | 16.5 5 ° | 16.8 10 ° | 16.6	0 ° | 17.0 5 ° | 17.3 10 ° | 16.9
Beamwidth, Horizontal Tolerance, degrees	±3.1	±5.4	±2.8	±4	±6.6	±4.6
Beamwidth, Vertical Tolerance, degrees	±1.8	±1.4	±0.3	±0.4	±0.5	±0.3
USLS, beampeak to 20° above beampeak, dB	15	14	15	15	15	14
Front-to-Back Total Power at 180° ± 30°, dB	22	21	26	26	24	25
CPR at Boresight, dB	22	16	22	25	21	22
CPR at Sector, dB	10	6	12	8	5	4

* CommScope® supports NGMN recommendations on Base Station Antenna Standards (BASTA). To learn more about the benefits of BASTA, download the whitepaper Time to Raise the Bar on BSAs.

Array Layout

SBNHH-1D65A



(Sizes of colored boxes are not true depictions of array sizes)

Array	Freq (MHz)	Conns	RET (MRET)	AISG RET UID
R1	698-896	1-2	1	ARxxxxxxxxxxxxxxxxx.1
Y1	1695-2360	3-4	2	ARxxxxxxxxxxxxxxxxx.2
Y2	1695-2360	5-6		

General Specifications

Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Antenna Type	Sector
Band	Multiband
Performance Note	Outdoor usage | Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN

Mechanical Specifications

RF Connector Quantity, total	6
RF Connector Quantity, low band	2
RF Connector Quantity, high band	4
RF Connector Interface	7-16 DIN Female
Color	Light gray
Grounding Type	RF connector inner conductor and body grounded to reflector and mounting bracket
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
RF Connector Location	Bottom
Wind Loading, frontal	206.0 N @ 150 km/h | 47.4 lbf @ 150 km/h
Wind Loading, lateral	169.0 N @ 150 km/h | 38.0 lbf @ 150 km/h
Wind Loading, maximum	396.0 N @ 150 km/h | 89.0 lbf @ 150 km/h
Effective Projected Area (EPA), frontal	0.19 m^2 | 2.05 ft^2
Effective Projected Area (EPA), lateral	0.16 m^2 | 1.72 ft^2
Wind Speed, maximum	241 km/h | 150 mph

SBNHH-1D65A

Dimensions

Length	1413.0 mm | 55.6 in
Width	301.0 mm | 11.9 in
Depth	180.0 mm | 7.1 in
Net Weight, without mounting kit	15.2 kg | 33.5 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Internal RET	High band (1) | Low band (1)
Power Consumption, idle state, maximum	2 W
Power Consumption, normal conditions, maximum	13 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male

Packed Dimensions

Length	1589.0 mm | 62.6 in
Width	390.0 mm | 15.4 in
Depth	296.0 mm | 11.7 in
Shipping Weight	26.1 kg | 57.5 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
China RoHS SJ/T 11364-2014	Above Maximum Concentration Value (MCV)

Included Products

BSAMNT-3 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

August 21, 2019
February 21, 2020 (Rev.1)
May 7, 2020 (Rev.2)

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:		
	Site Number:	CT5150 (LTE 4C/5C)
	FA Number:	10071192
	PACE Number:	MRCTB040537
	PT Number:	2051A0PQJ1
	Site Name:	OLD GREENWICH RAILROAD STATION
	Site Address:	Old Greenwich Station Old Greenwich, CT 06870

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by SAI Communications to perform a mount analysis on the new AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading:

- (6) TMA2117F00V1-1 TMA's (11.9"x9.9"x4.7" – Wt. = 26 lbs. /each)
- **(3) SBNHH-1D65A Antennas (55.6"x11.9"x7.1" - Wt. = 34 lbs. /each)**
- **(3) NNHH-65A-R4 Antennas (55.1"x19.6"x7.8" - Wt. = 69 lbs. /each)**
- **(3) TMABPD7823VG12A TMA's (10.7"x11.1"x3.8" – Wt. = 25 lbs. /each)**

**Proposed equipment shown in bold.*

Mount fabrication drawings prepared by SitePro1, P/N RMV5-272, dated April 15, 2011 were used to perform this analysis. HDG conducted a ground audit of the existing AT&T antenna mounts on May 28, 2019.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R13.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 120 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.12 in was used for this analysis.
- HDG considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- AT&T policy forbids walking on or suspending below T-arm mounts. This analysis does not include live load conditions for this mount.

Based on our evaluation, we have determined that the New SitePro1 RMV5-272 mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
New (LTE 4C/5C) Mount Rating	6	LC7	36%	**PASS**

Reference Documents:

- Fabrication drawings prepared by SitePro1, P/N RMV5-2XX, dated April 15, 2011.

This determination was based on the following limitations and assumptions:

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

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

Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Vice President

STATE OF CONNECTICUT
DANIEL HAMM
24178
LICENSED
PROFESSIONAL ENGINEER

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:
*Note: Existing mount to be removed.

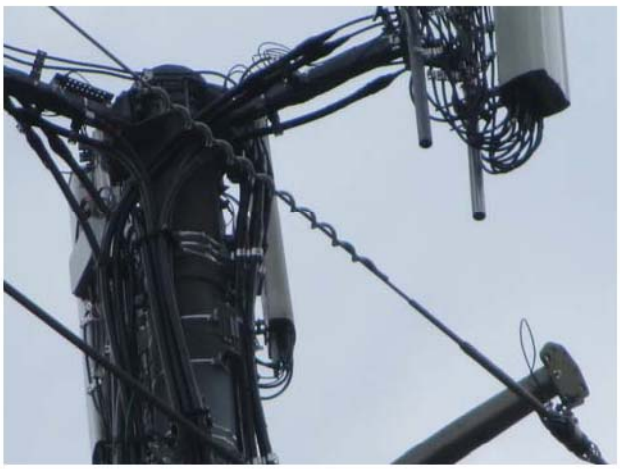





p: 978.557.5553 f: 978.336.5586 a: 45 Beechwood Drive, N. Andover, MA 01845
p: 203.208.3919 f: 203.234.6398 a: 110 Washington Avenue, 4th Floor, North Haven CT 06473





p: 978.557.5553 f: 978.336.5586 a: 45 Beechwood Drive, N. Andover, MA 01845
p: 203.208.3919 f: 203.234.6398 a: 110 Washington Avenue, 4th Floor, North Haven CT 06473

HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 5/7/2020
Project Name: OLD GREENWICH RAILROAD STATION
Project No.: CT5150
Designed By: ID **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

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

z=	103.5	(ft)
z_g=	900	(ft)
α=	9.5	
K_z=	**1.275**	

$Kzmin \le Kz \le 2.01$

Table 2-4

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

2.6.6.2 Topographic Factor:

Table 2-5

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

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

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

K_{zt}= **#DIV/0!**

K_h=	#DIV/0!	
K_c=		(from Table 2-4)
K_t=		(from Table 2-5)
f=		(from Table 2-5)
z=	103.5	
z_s=	25	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	1.00	(from 2.6.8)

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

Category= **1**

2.6.10 Design Ice Thickness

Max Ice Thickness =
Importance Factor =

t_i =	1.00	in
I=	1.0	(from Table 2-3)
K_{iz} =	1.12	(from Sec. 2.6.10)

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

t_{iz} = 1.12 in

Date: 5/7/2020
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2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

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

h=	103	G_h=	0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

2.6.9.4 Structures Supported on Other Structures

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

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

2.6.11.2 Design Wind Force on Appurtenances

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

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

		K_z=	1.275	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**44.60**	K_e=	1.00	(from 2.6.8)
$q_{z\,(ice)}$=	**7.74**	K_d=	0.95	(from Table 2-2)
$q_{z\,(30)}$=	**2.79**	V_{max}=	120	mph (Ultimate Wind Speed)
		$V_{max\,(ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

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

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HUDSON Design Group LLC

Determine Ca:

Table 2-9

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

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

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

Ice Thickness = 1.12 in | **Angle =** 0 (deg) | **Equivalent Angle =** 180 (deg)

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	4.67	1.30	266	57	17
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.81	1.21	406	82	25
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	2.82	1.21	15	5	1
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	2.53	1.20	21	6	1
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	50	12	3
2" Pipe	2.4	12.0		0.20	0.20	1.20	11	4	1
3" Pipe	3.5	12.0		0.29	0.29	1.20	16	5	1
HSS 4x4	4.0	12.0		0.33	0.33	2.00	30	10	2

Date: 5/7/2020
Project Name: OLD GREENWICH RAILROAD STATION
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HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.12	in.	Equivalent Angle =	210	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	266	175	243
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	406	187	351
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	44	23
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	21	44	27

WIND LOADS WITH ICE:

SBNHH-1D65A Antenna	57.8	14.1	9.3	5.68	3.75	4.09	6.19	1.27	1.36	56	40	52
NNHH-65A-R4 Antenna	57.3	21.8	10.0	8.70	4.00	2.63	5.71	1.21	1.34	81	42	71
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	7
TMA2117F00V1-1 TMA	14.1	6.9	12.1	0.68	1.19	2.04	1.16	1.20	1.20	6	11	8

WIND LOADS AT 30 MPH:

SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	15
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	25	12	22
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	1
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	1	3	2

Date: 5/7/2020
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HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.12	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	266	175	197
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	406	187	242
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	44	37
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	21	44	38

WIND LOADS WITH ICE:

SBNHH-1D65A Antenna	57.8	14.1	9.3	5.68	3.75	4.09	6.19	1.27	1.36	56	40	44
NNHH-65A-R4 Antenna	57.3	21.8	10.0	8.70	4.00	2.63	5.71	1.21	1.34	81	42	51
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	10
TMA2117F00V1-1 TMA	14.1	6.9	12.1	0.68	1.19	2.04	1.16	1.20	1.20	6	11	10

WIND LOADS AT 30 MPH:

SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	12
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	25	12	15
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	2
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	1	3	2

Date: 5/7/2020
Project Name: OLD GREENWICH RAILROAD STATION
Project No.: CT5150
Designed By: ID Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.12	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	266	175	175
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	406	187	187
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	44	44
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	21	44	44

WIND LOADS WITH ICE:

SBNHH-1D65A Antenna	57.8	14.1	9.3	5.68	3.75	4.09	6.19	1.27	1.36	56	40	40
NNHH-65A-R4 Antenna	57.3	21.8	10.0	8.70	4.00	2.63	5.71	1.21	1.34	81	42	42
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	11
TMA2117F00V1-1 TMA	14.1	6.9	12.1	0.68	1.19	2.04	1.16	1.20	1.20	6	11	11

WIND LOADS AT 30 MPH:

SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	11
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	25	12	12
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	3
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	1	3	3

Date: 5/7/2020
Project Name: OLD GREENWICH RAILROAD STATION
Project No.: CT5150
Designed By: ID Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.12	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	266	175	197
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	406	187	242
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	44	37
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	21	44	38

WIND LOADS WITH ICE:

SBNHH-1D65A Antenna	57.8	14.1	9.3	5.68	3.75	4.09	6.19	1.27	1.36	56	40	44
NNHH-65A-R4 Antenna	57.3	21.8	10.0	8.70	4.00	2.63	5.71	1.21	1.34	81	42	51
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	10
TMA2117F00V1-1 TMA	14.1	6.9	12.1	0.68	1.19	2.04	1.16	1.20	1.20	6	11	10

WIND LOADS AT 30 MPH:

SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	12
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	25	12	15
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	2
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	1	3	2

Date: 5/7/2020
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Project No.: CT5150
Designed By: ID Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.12	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	266	175	243
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	406	187	351
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	15	44	23
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	21	44	27

WIND LOADS WITH ICE:

SBNHH-1D65A Antenna	57.8	14.1	9.3	5.68	3.75	4.09	6.19	1.27	1.36	56	40	52
NNHH-65A-R4 Antenna	57.3	21.8	10.0	8.70	4.00	2.63	5.71	1.21	1.34	81	42	71
TMABPD7823VG12A TMA	12.9	6.0	13.3	0.54	1.20	2.14	0.97	1.20	1.20	5	11	7
TMA2117F00V1-1 TMA	14.1	6.9	12.1	0.68	1.19	2.04	1.16	1.20	1.20	6	11	8

WIND LOADS AT 30 MPH:

SBNHH-1D65A Antenna	55.6	11.9	7.1	4.59	2.74	4.67	7.83	1.30	1.43	17	11	15
NNHH-65A-R4 Antenna	55.1	19.6	7.8	7.50	2.98	2.81	7.06	1.21	1.40	25	12	22
TMABPD7823VG12A TMA	10.7	3.8	11.1	0.28	0.82	2.82	0.96	1.21	1.20	1	3	1
TMA2117F00V1-1 TMA	11.9	4.7	9.9	0.39	0.82	2.53	1.20	1.20	1.20	1	3	2

Date: 5/7/2020
Project Name: OLD GREENWICH RAILROAD STATION
Project No.: CT5150
Designed By: ID **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice:	1.12	in.
Density of ice:	56	pcf

SBNHH-1D65A Antenna

Weight of ice based on total radial SF area:

Height (in):	55.6	
Width (in):	11.9	
Depth (in):	7.1	
Total weight of ice on object:	95	lbs
Weight of object:	34.0	lbs
Combined weight of ice and object:	129	lbs

NNHH-65A-R4 Antenna

Weight of ice based on total radial SF area:

Height (in):	55.1	
Width (in):	19.6	
Depth (in):	7.8	
Total weight of ice on object:	140	lbs
Weight of object:	69.0	lbs
Combined weight of ice and object:	209	lbs

TMABPD7823VG12A TMA

Weight of ice based on total radial SF area:

Height (in):	10.7	
Width (in):	3.8	
Depth (in):	11.1	
Total weight of ice on object:	16	lbs
Weight of object:	25.0	lbs
Combined weight of ice and object:	41	lbs

TMA2117F00V1-1 TMA

Weight of ice based on total radial SF area:

Height (in):	11.9	
Width (in):	4.7	
Depth (in):	9.9	
Total weight of ice on object:	16	lbs
Weight of object:	26.0	lbs
Combined weight of ice and object:	42	lbs

2" pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:	5	plf

2-1/2" pipe

Per foot weight of ice:

diameter (in):	2.88	
Per foot weight of ice on object:	5	plf

3" pipe

Per foot weight of ice:

diameter (in):	3.5	
Per foot weight of ice on object:	6	plf

HSS 4x4

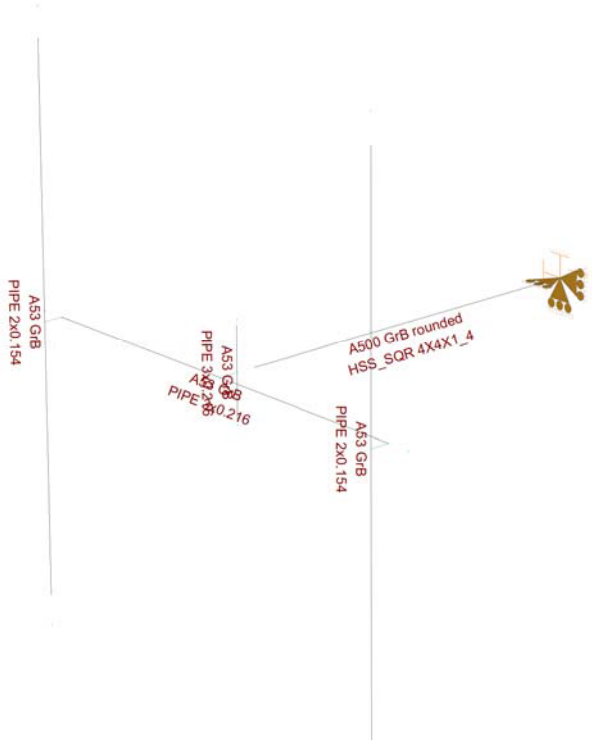
Weight of ice based on total radial SF area:

Height (in):	4	
Width (in):	4	
Per foot weight of ice on object:	9	plf

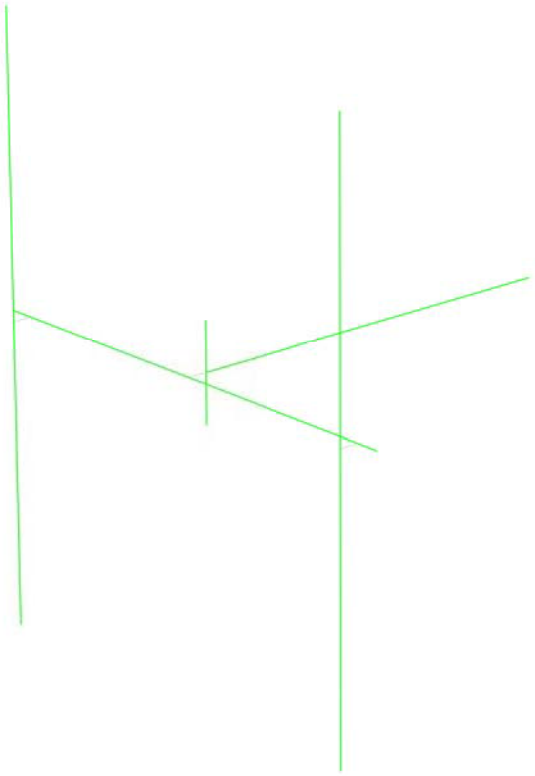
HUDSON
Design Group LLC

Mount Calculations
(Proposed Conditions)

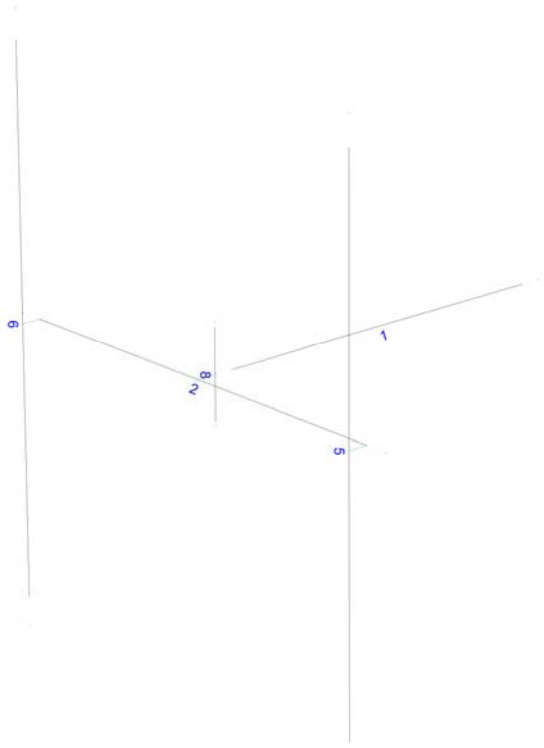

Y
Z
X


A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 3x0.216
A500 GrB rounded
HSS_SQR 4X4X1_4
A53 GrB
PIPE 2x0.154


Y
Z
X




Y
Z
X


6
1
8
2
5


Y
Z
X

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Load data

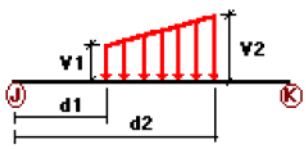
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

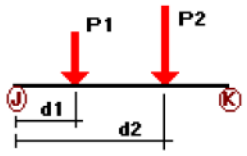
Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load Right End of Mount	No	LL
LL3	250 lb Live Load Left End of Mount	No	LL
LLa1	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No	LL
LLa4	250 lb Live Load Antenna 4	No	LL

Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	2	z	-0.045	0.00	0.00	No	0.00	No
W30	1	z	-0.03	0.00	0.00	No	0.00	No
	2	z	-0.045	0.00	0.00	No	0.00	No
W60	1	x	-0.03	0.00	0.00	No	0.00	No
	2	x	-0.045	0.00	0.00	No	0.00	No
	5	x	-0.011	0.00	0.00	No	0.00	No
	6	x	-0.011	0.00	0.00	No	0.00	No
W90	1	x	-0.03	0.00	0.00	No	0.00	No
	5	x	-0.011	0.00	0.00	No	0.00	No
	6	x	-0.011	0.00	0.00	No	0.00	No
W120	1	x	-0.03	0.00	0.00	No	0.00	No
	2	x	-0.045	0.00	0.00	No	0.00	No
	5	x	-0.011	0.00	0.00	No	0.00	No
	6	x	-0.011	0.00	0.00	No	0.00	No
W150	1	z	0.03	0.00	0.00	No	0.00	No
	2	z	0.045	0.00	0.00	No	0.00	No
Di	1	y	-0.009	0.00	0.00	No	0.00	No
	2	y	-0.01	0.00	0.00	No	0.00	No
	5	y	-0.005	0.00	0.00	No	0.00	No
	6	y	-0.005	0.00	0.00	No	0.00	No
WL0	2	z	-0.016	0.00	0.00	No	0.00	No
	8	z	-0.016	0.00	0.00	No	0.00	No
WL30	1	z	-0.03	0.00	0.00	No	0.00	No
	2	z	-0.016	0.00	0.00	No	0.00	No
	5	z	-0.011	0.00	0.00	No	0.00	No
	6	z	-0.011	0.00	0.00	No	0.00	No
	8	z	-0.016	0.00	0.00	No	0.00	No
WL60	1	x	-0.03	0.00	0.00	No	0.00	No
	5	x	-0.011	0.00	0.00	No	0.00	No
	6	x	-0.011	0.00	0.00	No	0.00	No
	8	x	-0.016	0.00	0.00	No	0.00	No
WL90	1	x	-0.03	0.00	0.00	No	0.00	No
	2	x	-0.016	0.00	0.00	No	0.00	No
	5	x	-0.011	0.00	0.00	No	0.00	No
	6	x	-0.011	0.00	0.00	No	0.00	No
	8	x	-0.016	0.00	0.00	No	0.00	No
WL120	1	x	-0.03	0.00	0.00	No	0.00	No
	2	x	-0.016	0.00	0.00	No	0.00	No
	5	x	-0.011	0.00	0.00	No	0.00	No
	6	x	-0.011	0.00	0.00	No	0.00	No
	8	x	-0.016	0.00	0.00	No	0.00	No
WL150	1	z	0.03	0.00	0.00	No	0.00	No
	2	z	0.016	0.00	0.00	No	0.00	No
	5	z	0.011	0.00	0.00	No	0.00	No
	6	z	0.011	0.00	0.00	No	0.00	No
	8	z	0.016	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	5	y	-0.017	0.50	No
		y	-0.017	4.50	No
		y	-0.025	3.00	No
	6	y	-0.035	0.50	No
		y	-0.035	4.50	No
		y	-0.026	3.00	No
		y	-0.026	3.00	No
Wo	5	z	-0.133	0.50	No
		z	-0.133	4.50	No
		z	-0.015	3.00	No
	6	z	-0.204	0.50	No
		z	-0.204	4.50	No
		z	-0.021	3.00	No
W30	5	3	-0.122	0.50	No
		3	-0.122	4.50	No
		3	-0.023	3.00	No
	6	3	-0.176	0.50	No
		3	-0.176	4.50	No
		3	-0.027	3.00	No
W60	5	3	-0.099	0.50	No
		3	-0.099	4.50	No
		3	-0.037	3.00	No
	6	3	-0.121	0.50	No
		3	-0.121	4.50	No
		3	-0.038	3.00	No
W90	5	x	-0.088	0.50	No
		x	-0.088	4.50	No
		x	-0.044	3.00	No
	6	x	-0.094	0.50	No
		x	-0.094	4.50	No
		x	-0.044	3.00	No
W120	5	2	-0.099	0.50	No
		2	-0.099	4.50	No
		2	-0.037	3.00	No
	6	2	-0.121	0.50	No
		2	-0.121	4.50	No
		2	-0.038	3.00	No
W150	5	2	-0.122	0.50	No
		2	-0.122	4.50	No
		2	-0.023	3.00	No
	6	2	-0.176	0.50	No
		2	-0.176	4.50	No
		2	-0.027	3.00	No
Di	5	y	-0.048	0.50	No
		y	-0.048	4.50	No
		y	-0.016	3.00	No
	6	y	-0.07	0.50	No
		y	-0.07	4.50	No
		y	-0.016	3.00	No
		y	-0.016	3.00	No
WI0	5	z	-0.029	0.50	No
		z	-0.029	4.50	No
		z	-0.005	3.00	No
	6	z	-0.041	0.50	No
		z	-0.041	4.50	No
		z	-0.006	3.00	No
WI30	5	3	-0.026	0.50	No
		3	-0.026	4.50	No
		3	-0.007	3.00	No
	6	3	-0.036	0.50	No

		3	-0.036	4.50	No
		3	-0.008	3.00	No
WI60	5	3	-0.022	0.50	No
		3	-0.022	4.50	No
		3	-0.01	3.00	No
	6	3	-0.026	0.50	No
		3	-0.026	4.50	No
		3	-0.01	3.00	No
WI90	5	x	-0.02	0.50	No
		x	-0.02	4.50	No
		x	-0.011	3.00	No
	6	x	-0.021	0.50	No
		x	-0.021	4.50	No
		x	-0.011	3.00	No
WI120	5	2	-0.022	0.50	No
		2	-0.022	4.50	No
		2	-0.01	3.00	No
	6	2	-0.026	0.50	No
		2	-0.026	4.50	No
		2	-0.01	3.00	No
WI150	5	2	-0.026	0.50	No
		2	-0.026	4.50	No
		2	-0.007	3.00	No
	6	2	-0.036	0.50	No
		2	-0.036	4.50	No
		2	-0.008	3.00	No
WL0	5	z	-0.009	0.50	No
		z	-0.009	4.50	No
		z	-0.001	3.00	No
	6	z	-0.013	0.50	No
		z	-0.013	4.50	No
		z	-0.001	3.00	No
WL30	5	3	-0.008	0.50	No
		3	-0.008	4.50	No
		3	-0.001	3.00	No
	6	3	-0.011	0.50	No
		3	-0.011	4.50	No
		3	-0.002	3.00	No
WL60	5	3	-0.007	0.50	No
		3	-0.007	4.50	No
		3	-0.002	3.00	No
	6	3	-0.008	0.50	No
		3	-0.008	4.50	No
		3	-0.002	3.00	No
WL90	5	x	-0.006	0.50	No
		x	-0.006	4.50	No
		x	-0.003	3.00	No
	6	x	-0.006	0.50	No
		x	-0.006	4.50	No
		x	-0.003	3.00	No
WL120	5	2	-0.007	0.50	No
		2	-0.007	4.50	No
		2	-0.002	3.00	No
	6	2	-0.008	0.50	No
		2	-0.008	4.50	No
		2	-0.002	3.00	No
WL150	5	2	-0.008	0.50	No
		2	-0.008	4.50	No
		2	-0.001	3.00	No
	6	2	-0.011	0.50	No

2	-0.011	4.50	No
2	-0.002	3.00	No

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load Right End of Mount	No	0.00	0.00	0.00
LL3	250 lb Live Load Left End of Mount	No	0.00	0.00	0.00
LLa1	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	250 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	0.00	0.00	0.00
Di	0.00	0.00	0.00
WI0	0.00	0.00	0.00
WI30	0.00	0.00	0.00
WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00

WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LL3	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

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Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC38=1.2D+1.5LL1
LC39=1.2D+1.5LL2
LC40=1.2D+1.5LL3
LC41=1.2D+WL0+1.5LLa1
LC42=1.2D+WL30+1.5LLa1
LC43=1.2D+WL60+1.5LLa1
LC44=1.2D+WL90+1.5LLa1
LC45=1.2D+WL120+1.5LLa1
LC46=1.2D+WL150+1.5LLa1
LC47=1.2D-WL0+1.5LLa1
LC48=1.2D-WL30+1.5LLa1
LC49=1.2D-WL60+1.5LLa1
LC50=1.2D-WL90+1.5LLa1
LC51=1.2D-WL120+1.5LLa1
LC52=1.2D-WL150+1.5LLa1
LC53=1.2D+WL0+1.5LLa2

LC54=1.2D+WL30+1.5LLa2
LC55=1.2D+WL60+1.5LLa2
LC56=1.2D+WL90+1.5LLa2
LC57=1.2D+WL120+1.5LLa2
LC58=1.2D+WL150+1.5LLa2
LC59=1.2D-WL0+1.5LLa2
LC60=1.2D-WL30+1.5LLa2
LC61=1.2D-WL60+1.5LLa2
LC62=1.2D-WL90+1.5LLa2
LC63=1.2D-WL120+1.5LLa2
LC64=1.2D-WL150+1.5LLa2
LC65=1.2D+WL0+1.5LLa3
LC66=1.2D+WL30+1.5LLa3
LC67=1.2D+WL60+1.5LLa3
LC68=1.2D+WL90+1.5LLa3
LC69=1.2D+WL120+1.5LLa3
LC70=1.2D+WL150+1.5LLa3
LC71=1.2D-WL0+1.5LLa3
LC72=1.2D-WL30+1.5LLa3
LC73=1.2D-WL60+1.5LLa3
LC74=1.2D-WL90+1.5LLa3
LC75=1.2D-WL120+1.5LLa3
LC76=1.2D-WL150+1.5LLa3
LC77=1.2D+WL0+1.5LLa4
LC78=1.2D+WL30+1.5LLa4
LC79=1.2D+WL60+1.5LLa4
LC80=1.2D+WL90+1.5LLa4
LC81=1.2D+WL120+1.5LLa4
LC82=1.2D+WL150+1.5LLa4
LC83=1.2D-WL0+1.5LLa4
LC84=1.2D-WL30+1.5LLa4
LC85=1.2D-WL60+1.5LLa4
LC86=1.2D-WL90+1.5LLa4
LC87=1.2D-WL120+1.5LLa4
LC88=1.2D-WL150+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 4X4X1_4	**1**	LC10 at 100.00%	**0.30**	**OK**	
	PIPE 2x0.154	**5**	LC1 at 46.88%	0.23	OK	
		6	LC7 at 46.88%	**0.36**	**OK**	
	PIPE 3x0.216	**2**	LC1 at 50.00%	**0.26**	**OK**	
		8	LC43 at 50.00%	0.00	OK	

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Geometry data

GLOSSARY

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	-4.00	0
2	0.00	0.00	0.00	0
3	2.25	0.00	0.20	0
4	-2.25	0.00	0.20	0
5	2.25	0.00	0.40	0
6	-2.25	0.00	0.40	0
7	2.25	3.00	0.40	0
8	-2.25	3.00	0.40	0
9	2.25	-3.00	0.40	0
10	-2.25	-3.00	0.40	0
11	0.00	0.00	0.20	0
12	0.00	0.50	0.00	0
13	0.00	-0.50	0.00	0
14	-2.50	0.00	0.20	0
15	2.50	0.00	0.20	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
1	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	2	1		HSS_SQR 4X4X1_4	A500 GrB rounded	0.00	0.00	0.00
2	15	14		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
5	7	9		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	8	10		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
8	13	12		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
5	315.00	0	0.00	0.00	0.00
6	315.00	0	0.00	0.00	0.00

EVERSOURCE ENERGY

56 Prospect Street,
Hartford, CT 06103

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

October 28, 2020

Mr. Tim Burks
SAI Communications
12 Industrial Way
Salem, NH 03079

RE: AT&T Antenna Site CT5150, Sound Beach Avenue, Greenwich CT, Eversource Structure 1255

Dear Mr. Burks:

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

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

Sincerely,

Richard Badon

Richard Badon
Transmission Line Engineering

Ref: 19158.00 - CT5150 Structural Analysis Rev4 20.06.29
CT5150_LTE_3C_4C_CD_REV.1_10.19.20

CT5150 – SOUND BEACH AVE – PARCEL MAP

Petition No. 467
AT&T Wireless PCS, Inc.
Greenwich, Connecticut
Staff Report
June 20, 2000

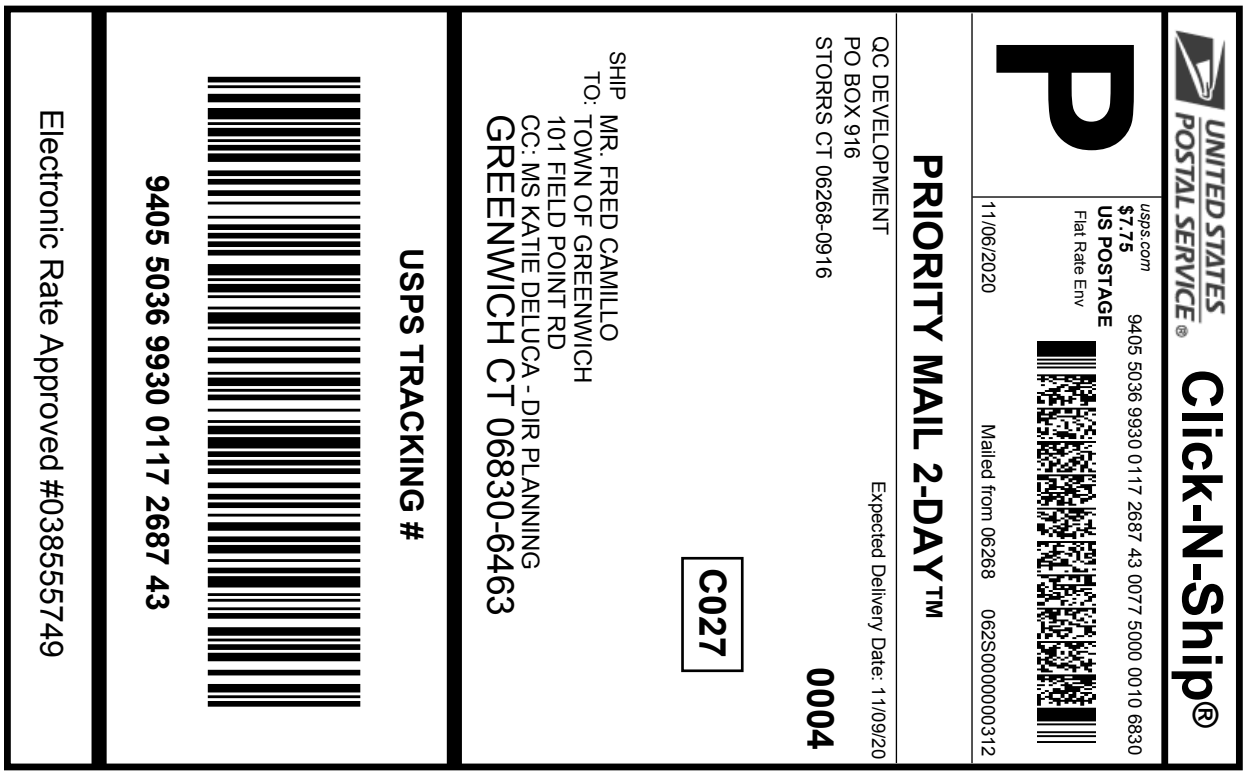
On June 16, 2000, Connecticut Siting Council (Council) member Edward S. Wilensky, and Fred Cunliffe of Council staff met AT&T Wireless PCS (AT&T) representatives Michael Austin, Carmen Chapman, and Lisa Hazen for inspection of a Connecticut Light & Power Company (CL&P) electric transmission line structure (no. 1255) located off Sound Beach Avenue at the Old Greenwich Railroad Station. AT&T, with the agreement of CL&P, proposes to modify the transmission structure for telecommunications use and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification.

AT&T proposes to attach a 14-inch diameter by 10-foot high mast to an existing 95-foot tall monopole electric transmission structure. A total of six, four-foot high panel antennas, in a triangular layout, would extend out four feet from the top of the tower. The total height of the structure with antennas would be 107 feet. A structural analysis concludes no additional reinforcement is necessary for this proposal. Also, AT&T has an agreement with the Connecticut Department of Transportation to construct a 12-foot by 20-foot equipment building adjacent to the base of the existing CL&P structure. Clearing of vegetation is necessary and Council staff recommends that no trees be cleared beyond 25 feet of CL&P's structure. AT&T proposes to plant trees west of the building providing screening to the railroad station parking lot. The proposed site is south of the Old Greenwich Railroad Station and east of a golf course. A fence with vegetation borders the golf course, which would not be disturbed.

An existing parking lot off Sound Beach Avenue would be used by AT&T to access the structure. Utilities would be routed underground approximately 30 feet from an existing utility distribution pole to the site.

The worst case power density for the telecommunications operations at the site has been calculated to be less than 3% of the applicable standard for uncontrolled environments.

AT&T contends that the proposed installation will not cause a substantial adverse environmental effect, and for this reason would not require a Certificate.



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TOWN OF GREENWICH
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CC: MS KATIE DELUCA - DIR PLANNING
GREENWICH CT 06830-6463

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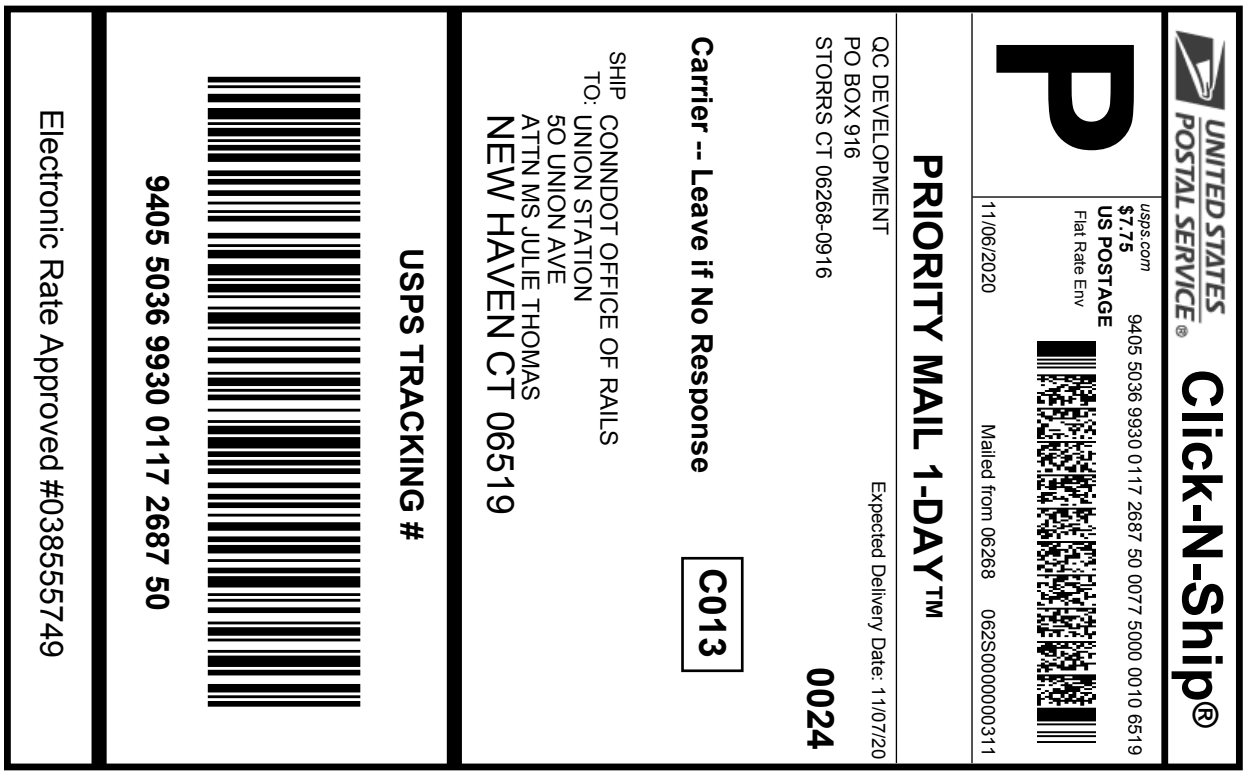

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UNION STATION
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ATTN MS JULIE THOMAS
NEW HAVEN CT 06519

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PO BOX 270
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EVERSOURCE ENERGY
PO BOX 270
REAL ESTATE DEPARTMENT
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