10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

October 8, 2019

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

RE: Notice of Exempt Modification
Chapel Street Stratford, CT 06614
Latitude: 41.236453
Longitude: -73.122047
Sprint Site#: CT43XC837 – DO Macro

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 87-foot level of the existing 87-foot transmission tower at Chapel Street Stratford, CT. The 87-foot transmission tower and property are owned by The Connecticut Light & Power Company, d/b/a Eversource Energy. Sprint now intends to replace three (3) of its existing antennas with three (3) new 800/1900/2500 MHz antennas. The new antennas will be installed at the same 87-foot level of the tower.

Planned Modifications:
Tower:

Remove
N/A

Remove and Replace:
(3) RFS APXVSPP18-C antennas (Remove) - CommScope DHHTT65B-3XR antennas (Replace)
800/1900/2500 MHz

Install New:
(3) RFS KIT-FD9R6004 / 1C-DL diplexers
(3) CCI DPO-7126Y-0-T1 diplexers

Existing to Remain:
(18) 1-5/8" coax cables

Ground:
Install New: (3) RFS KIT-FD9R6004 / 1C-DL diplexers, (3) CCI DPO-7126Y-0-T1 diplexers (3) 2500 MHz RRHs

This facility was approved by the CSC for Sprint use in Petition No. 543 dated February 14, 2002. This modification complies with this approval. Please see the enclosed.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor – Laura R. Hoydick, Elected Official, and Richard Fredette, Zoning Board Chair for the Town of Stratford, as well as the owner.

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

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

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

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

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

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

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

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

Sincerely,

Jake Shappy
Transcend Wireless
Cell: 845-553-3330
Email: jshappy@transcendwireless.com

Attachments
cc: Laura R. Hoydick – Town of Stratford Mayor
Richard Fredette – Town of Stratford Zoning Board Chair
The Connecticut Light & Power Company, d/b/a Eversource Energy – tower and property owner

EVERSOURCE ENERGY

56 Prospect Street,
Hartford, CT 06103

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

November 20, 2019

Mr. Jake Shappy
Transcend Mobile
10 Industrial Ave, Suite 3
Mahwah, NJ 07430

RE: Sprint Antenna Site, CT-43XC837, Chapel Street, Stratford, CT, structure 280

Dear Mr. Shappy:

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

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

Sincerely,

Joel Szarkowicz
Transmission Line Engineering

REF: 17159.17 - CT43XC837 - Structural Analysis Rev2 18.10.04
17159.17 CT43XC837 Stratford - CD Rev.0 19.07.01 (SS)

Petition No. 543
Sprint PCS
Stratford, Connecticut
Staff Report
February 14, 2002

On February 8, 2002, Connecticut Siting Council (Council) staff S. Derek Phelps and Paul M. Aresta met Sprint representatives Julie Donaldson and Steven Florio for an inspection of a Connecticut Light & Power Company (CL&P) electric transmission line structure (No. 280) located between 645 and 695 Chapel Street in Stratford, Connecticut. Sprint proposes to modify the electric transmission structure for telecommunications use and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) would be required for the proposed modification.

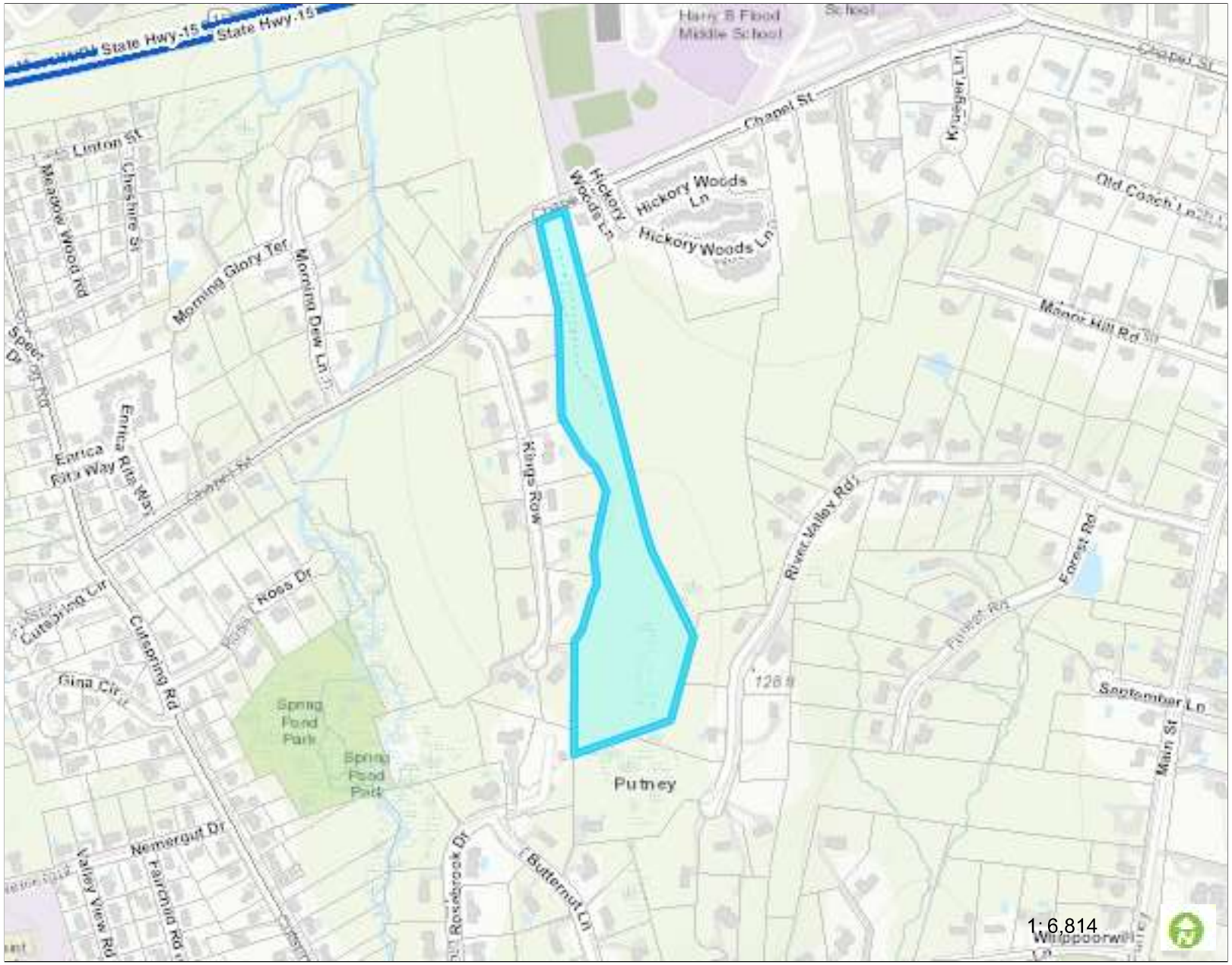
Sprint proposes to attach a total of three antennas, each measuring approximately 58 inches tall by eight inches wide by three inches deep, to three approximately three-inch diameter pipe extensions on the top of an existing approximately 78-foot tall lattice electric transmission structure. The top of the proposed panel antennas would be located at approximately 87 feet above ground level (AGL). A global positioning system antenna would be mounted at a height of 15 feet AGL on a fence post at the base of the structure. Sprint would install four power and/or communications cabinets on a 10-foot by 20-foot concrete pad underneath and within the footprint of the existing lattice structure. The concrete pad could accommodate three future cabinets. The proposed equipment area would be enclosed by a six-foot tall chain link fence with one additional foot of barbed wire. The proposed fence would have vinyl green slats for screening the proposed equipment.

A structural analysis dated December 10, 2001 concluded that no additional reinforcement of the lattice transmission structure is necessary for this proposal. The worst case power density for the proposed telecommunications operations at the site has been calculated to be approximately 27% of the applicable ANSI standard for uncontrolled environments. The proposed site is surrounded by low-density residential development. The closest residences are located approximately 100 feet southwest and 120 feet northeast of the existing lattice transmission tower. Sprint contends that the two residents located closest to the lattice transmission tower were informed of Sprint's proposal, and had no objections.

Sprint contends that the proposed modification would require minimal removal of vegetation; would have no direct impact on wetlands; would not adversely affect the environment or ecology; would have no impact on scenic, historic, or recreational values; and therefore, would not require a Certificate.

Town of Stratford

Map Title



Legend

- Streetname
- Roadways
  - Local
  - Collector
  - Minor Collector
  - Minor Arterial
  - Major Collector
  - PA Other
  - PA Other Expwy
  - PA Interstate

1,135.6 0 567.79 1,135.6 Feet

WGS_1984_Web_Mercator_Auxiliary_Sphere
Created by Greater Bridgeport Regional Council

METROCOG
Connecticut Metropolitan Council of Governments

qPublic.net™ Town of Stratford, CT

Summary

ParcelId	3411
Account Number	0331800
Location Address	CHAPEL ST
Map-Block-Lot	50 /17 /3 /7
	Dev Lot. 11.9 ACRES S/S
Use Class/Description	423R Elec Trsmn
Assessing Neighborhood	6A
Census Tract	0812
Acreage	9.71

Owner

CONNECTICUT LIGHT & POWER CO
PO BOX 270
HARTFORD, CT 06141

Appraised Value

		2018	2017
+	Building Value	$0	$0
+	XF Value	$0	$0
+	OB Value	$0	$0
+	Land Value	$730,300	$730,300
+	Special Land Value		
+	Total Appraised Value	$730,300	$730,300
+	Net Appraised Value	$730,300	$730,300
+	Current Assessment	$511,210	$511,210

Assessment History

		2018	2017
+	Building Value	$0	$0
+	OB/Misc	$0	$0
+	Land	$511,210	$511,210
+	Total Assessment	$511,210	$511,210

Land

Use	Class	Zoning	Area	Value
423R Elec Trsmn	R	RS-3	9.71 AC	$730,300

Sales History

Sales Date	Type of Document	Grantee	Vacant/Improved	Book/Page	Amount
		CONNECTICUT LIGHT & POWER CO	Vacant	0000/0000	$0

Recent Sales in Neighborhood

From:

10/08/2016

To:

10/08/2019

Sales by Neighborhood

Sales by Distance

1500

Feet

Permit Information

Permit ID	Issue Date	Type	Description	Amount	Inspection Date	% Complete	Date Complete	Comments
22524	11-13-2015	BP	Building Permi	$72,000		100		REPL ANTENNAS/CABLES
21787	10-21-2014	BP	Building Permi	$15,000		100		REPL ANTENNAS
21315	04-17-2014	BP	Building Permi	$15,000	9/24/2014 12:00:00 AM	100		SWAP EXISTING ANTENNAS
12215	03-12-2002			$58,120		100		SITE;

Generate Owner List by Radius

Distance:

100

Feet

Show address of: Owner Property

Download format:

Address labels (5160)

International mailing labels that exceed 5 lines are not supported on the Address labels (5160). For international addresses, please use the xlsx, csv or tab download formats.

Download

Additional owner options:

All Owners

Additional mailing label options:

Show parcel id on label

Skip labels:

0

Sketch

Photos

No data available for the following modules: Building Data, Commercial Building, Out Buildings\Extra Features.

Last Data Upload: 10/4/2019, 8:14:13 PM

Version 2.3.8

UPS Internet Shipping: View/Print Label

1. **Ensure there are no other shipping or tracking labels attached to your package.** Select the Print button on the print dialog box that appears. Note: If your browser does not support this function select Print from the File menu to print the label.

2. **Fold the printed label at the solid line below.** Place the label in a UPS Shipping Pouch. If you do not have a pouch, affix the folded label using clear plastic shipping tape over the entire label.

3. **GETTING YOUR SHIPMENT TO UPS**
   Customers with a Daily Pickup
   Your driver will pickup your shipment(s) as usual.

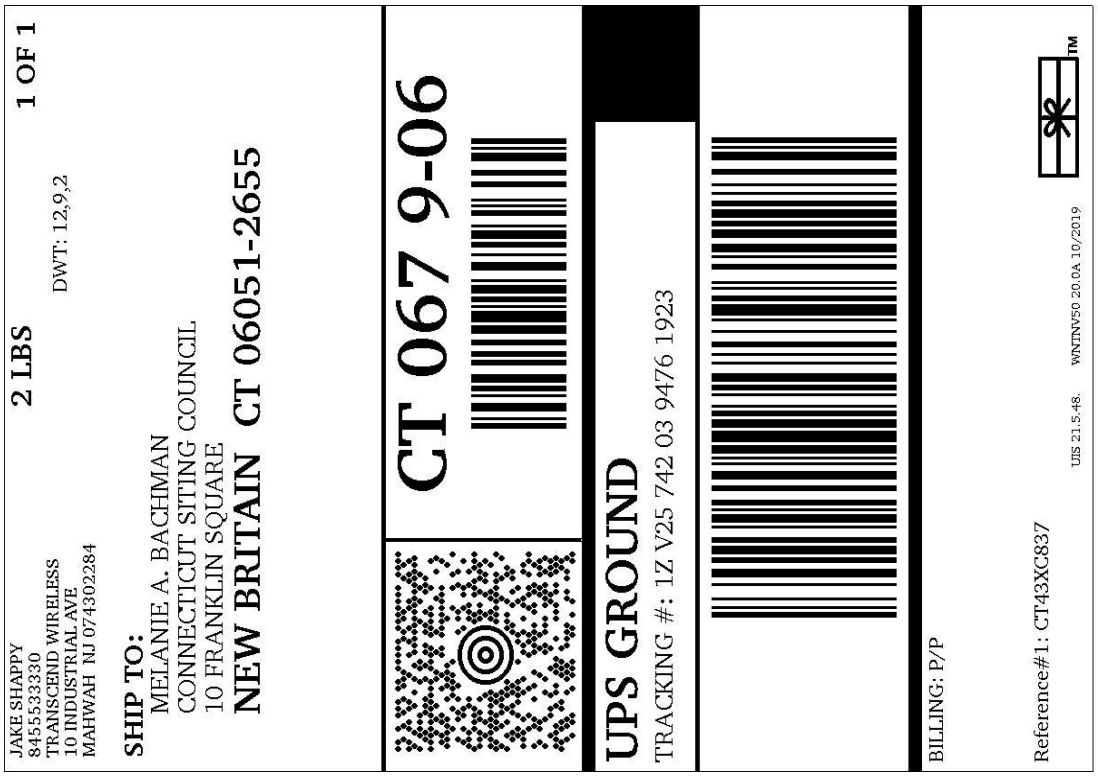
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To find the location nearest you, please visit the 'Find Locations' Quick link at ups.com.
   Schedule a same day or future day Pickup to have a UPS driver pickup all of your Internet Shipping packages.
   Hand the package to any UPS driver in your area.

UPS Access Point™
MICHAELS STORE # 7773
75 INTERSTATE SHOP CTR
RAMSEY ,NJ 07446

UPS Access Point™
THE UPS STORE
115 FRANKLIN TPKE
MAHWAH ,NJ 07430

UPS Access Point™
THE UPS STORE
120 E MAIN ST
RAMSEY ,NJ 07446

FOLD HERE



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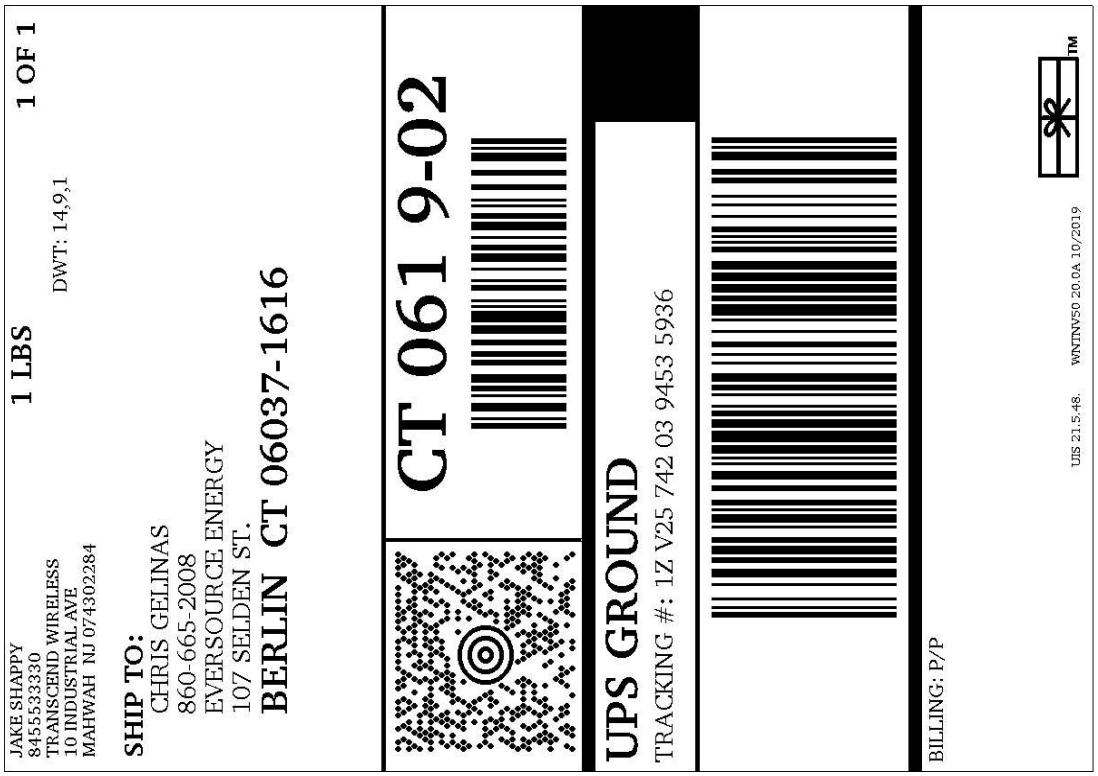

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EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

Sprint Existing Facility

Site ID: CT43XC837

Eversource Struct.: 280
742 Chapel Street
Stratford, Connecticut 06614

August 5, 2019

EBI Project Number: 6219003706

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**7.23%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

August 5, 2019

Sprint
Attn: RF Engineering Manager
1 International Boulevard, Suite 800
Mahwah, New Jersey 07495

Emissions Analysis for Site: CT43XC837 - Eversource Struct.: 280

EBI Consulting was directed to analyze the proposed Sprint facility located at **742 Chapel Street** in **Stratford, Connecticut** for the purpose of determining whether the emissions from the Proposed Sprint Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu W/cm^2$). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits; therefore, it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general population may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general population would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed Sprint Wireless antenna facility located at 742 Chapel Street in Stratford, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since Sprint is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

1) 2 CDMA channels (800 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 50 Watts per Channel.

2) 4 PCS channels (1900 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 8 BRS channels (2500 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

5) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

6) The antennas used in this modeling are the Commscope DHHTT65B-3XR for the 800 MHz / 1900 MHz / 2500 MHz channel(s) in Sector A, the Commscope DHHTT65B-3XR for the 800 MHz / 1900 MHz / 2500 MHz channel(s) in Sector B, the Commscope DHHTT65B-3XR for the 800 MHz / 1900 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

7) The antenna mounting height centerline of the proposed antennas is 85 feet above ground level (AGL).

8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

9) Emissions from additional carriers were not included because emissions data for the site location are not available.

10) All calculations were done with respect to uncontrolled / general population threshold limits.

Sprint Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Commscope DHHTT65B-3XR	Make / Model:	Commscope DHHTT65B-3XR	Make / Model:	Commscope DHHTT65B-3XR
Frequency Bands:	800 MHz / 1900 MHz / 2500 MHz	Frequency Bands:	800 MHz / 1900 MHz / 2500 MHz	Frequency Bands:	800 MHz / 1900 MHz / 2500 MHz
Gain:	13.35 dBd / 15.25 dBd / 15.05 dBd	Gain:	13.35 dBd / 15.25 dBd / 15.05 dBd	Gain:	13.35 dBd / 15.25 dBd / 15.05 dBd
Height (AGL):	85 feet	Height (AGL):	85 feet	Height (AGL):	85 feet
Channel Count:	14	Channel Count:	14	Channel Count:	14
Total TX Power (W):	420 Watts	Total TX Power (W):	420 Watts	Total TX Power (W):	420 Watts
ERP (W):	12,640.40	ERP (W):	12,640.40	ERP (W):	12,640.40
Antenna A1 MPE %:	**7.23%**	Antenna B1 MPE %:	**7.23%**	Antenna C1 MPE %:	**7.23%**

Site Composite MPE %	
Carrier	**MPE %**
Sprint (Max at Sector A):	7.23%
no additional carriers	N/A
Site Total MPE % :	7.23%

Sprint MPE % Per Sector	
Sprint Sector A Total:	7.23%
Sprint Sector B Total:	7.23%
Sprint Sector C Total:	7.23%
Site Total MPE % :	7.23%

Sprint Maximum MPE Power Values (Sector A)

Sprint Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
Sprint 800 MHz CDMA	2	1081.36	85.0	10.76	800 MHz CDMA	533	2.02%
Sprint 1900 MHz PCS	4	1339.86	85.0	26.67	1900 MHz PCS	1000	2.67%
Sprint 2500 MHz BRS	8	639.78	85.0	25.47	2500 MHz BRS	1000	2.55%
						Total:	**7.23%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population exposure to RF Emissions.

The anticipated maximum composite contributions from the Sprint facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

Sprint Sector	Power Density Value (%)
Sector A:	7.23%
Sector B:	7.23%
Sector C:	7.23%
Sprint Maximum MPE % (Sector A):	7.23%
Site Total:	7.23%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **7.23%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Sprint

WIRELESS COMMUNICATIONS FACILITY

EVERSOURCE STRUCT.: 280

SITE ID: CT43XC837

CHAPEL STREET

STRATFORD, CT 06614

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA–222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2016 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD–OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS–BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED" ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE SPRINT CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON–SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT "CALL BEFORE YOU DIG" AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1–800–922–4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH OWNERS ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

SITE DIRECTIONS

FROM: 5 WAYSIDE ROAD
BURLINGTON, MA 01803

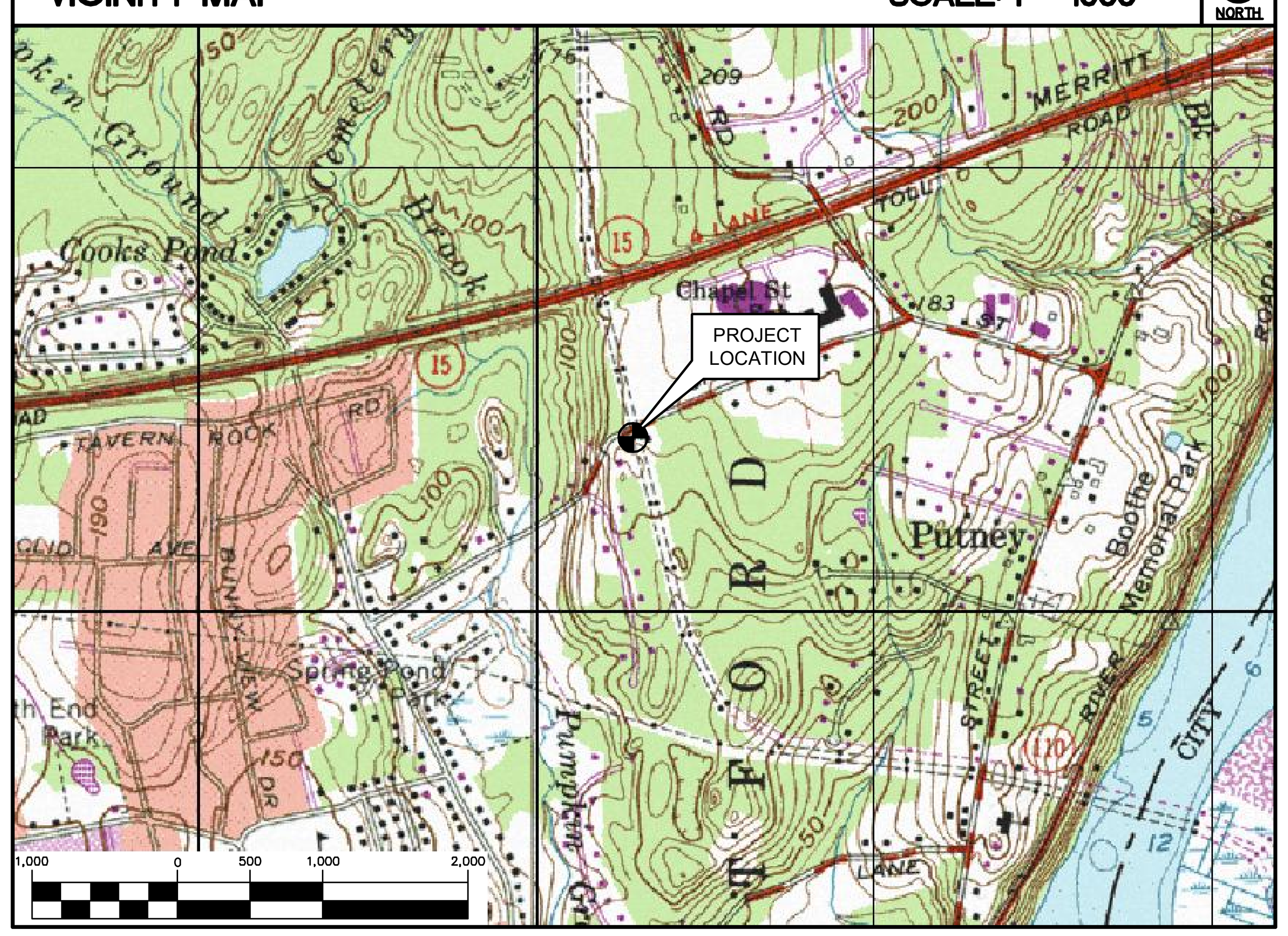
TO: CHAPEL STREET
STRATFORD, CT 06497

1.	START OUT BY GOING TO WAYSIDE ROAD.	0.12 MI.
2.	TURN LEFT ONTO CAMBRIDGE ST/US–3 N/MA	0.12 MI.
3.	MERGE ONTO I–95 S/MA–128 S/YANKEE DIVISION HWY S TOWARD WALTHAM/LOWELL	0.27 MI.
4.	TAKE THE I–90/MASS PIKE EXIT, EXIT 25, TOWARD BOSTON/ALBANY NY.	12.32 MI.
5.	MERGE ONTO I–90 W/MASSACHUSETTS TPKE W TOWARD WORCESTER (PORTIONS TOLL).	0.32 MI.
6.	MERGE ONTO I–84 W/WILBUR CROSS HWY S VIA EXIT 9 TOWARD US–20(PORTIONS TOLL).	44.45 MI.
7.	KEEP LEFT TO TAKE CT–15 S VIA EXIT 57 TOWARD I–91 S/CHARTER OAK BR/NY CITY.	41.73 MI.
8.	MERGE ONTO I–91 S VIA EXIT 86 TOWARD NEW HAVEN/NY CITY.	1.99 MI.
9.	MERGE ONTO CT–15 S VIA EXIT 17 TOWARD E MAIN ST.	17.07 MI.
10.	TAKE EXIT 53 FOR STATE ROUTE 110 TOWARD STRATFORD SHELTON.	27.60 MI.
11.	TURN LEFT ONTO MAIN ST.	0.70 MI.
12.	TAKE A SLIGHT RIGHT TO STAY ON MAIN ST.	0.40 MI.
13.	TURN RIGHT ONTO CHAPEL ST.	0.60 MI.
14.	THE DESTINATION WILL BE ON THE LEFT.	

VICINITY MAP

SCALE: 1" = 1000'

NORTH



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   - A. INSTALLATION OF A PROPOSED UNISTURT EQUIPMENT RACK MOUNTED ON EXISTING CONCRETE PAD.
   - B. REMOVE (3) EXISTING PANEL ANTENNAS FROM TOWER.
   - C. INSTALL (3) PROPOSED 800/1900/2500 BAND 10–PORT PANEL ANTENNAS, (1) PER SECTOR.
   - D. INSTALL (6) PROPOSED DIPLEXERS ON TOWER.
   - E. INSTALL (6) PROPOSED DIPLEXERS ON PROPOSED UNISTRUT RACK
   - F. INSTALL (3) PROPOSED RRH'S ON PROPOSED UNISTRUT RACK.

PROJECT INFORMATION

SITE NAME:	EVERSOURCE STRUCT.: 280
SITE ID:	CT43XC837
SITE ADDRESS:	CHAPEL STREET STRATFORD, CT 06614
APPLICANT:	SPRINT 5 WAYSIDE ROAD BURLINGTON, MA 01803
CONTACT PERSON:	MIKE KITHCART (PROJECT MANAGER) (973)626–5792
ENGINEER:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41° 14' 11.23"N LONGITUDE: 73° 07' 19.37"W GROUND ELEVATION: ±157' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

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N–1	DESIGN BASIS AND SITE NOTES	C
C–1	COMPOUND PLANS, ELEVATION AND ANTENNA CONFIGURATION	C
C–2	TYPICAL DETAILS	C
C–3	COLOR CODE, CPRI DETAILS AND ANTENNA SCHEDULE	C
S–1	REINFORCEMENT DETAILS	C

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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TITLE SHEET

T–1

Sheet No. 1 of 6

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CT STATE BUILDING CODE AND AMENDMENTS.

1. DESIGN CRITERIA:

- WIND LOAD (UTILITY TOWER): 110 MPH (3 SECOND GUSTS) PER NESC C2-2012 SECTION 25 RULE 250C
- WIND LOAD (ANTENNA MAST): 97 MPH (Vasd) (EXPOSURE C/IMPORTANCE FACTOR 1.15 BASED ON ASCE 7-10) PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

1. ALL CONSTRUCTION SHALL BE IN COMPLIANCE WITH THE GOVERNING BUILDING CODE.
2. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
3. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
4. DIMENSIONS AND DETAILS SHALL BE CHECKED AGAINST EXISTING FIELD CONDITIONS.
5. THE CONTRACTOR SHALL VERIFY AND COORDINATE THE SIZE AND LOCATION OF ALL OPENINGS, SLEEVES AND ANCHOR BOLTS AS REQUIRED BY ALL TRADES.
6. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS, ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
7. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
8. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, AND BARRICADES AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY.
9. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY. MAINTAIN EXISTING SITE OPERATIONS, COORDINATE WORK WITH NORTHEAST UTILITIES
10. THE STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER FOUNDATION REMEDIATION WORK IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, TEMPORARY BRACING, GUYS OR TIEDOWNS, WHICH MIGHT BE NECESSARY.
11. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
12. SHOP DRAWINGS, CONCRETE MIX DESIGNS, TEST REPORTS, AND OTHER SUBMITTALS PERTAINING TO STRUCTURAL WORK SHALL BE FORWARDED TO THE OWNER FOR REVIEW BEFORE FABRICATION AND/OR INSTALLATION IS MADE. SHOP DRAWINGS SHALL INCLUDE ERECTION DRAWINGS AND COMPLETE DETAILS OF CONNECTIONS AS WELL AS MANUFACTURER'S SPECIFICATION DATA WHERE APPROPRIATE. SHOP DRAWINGS SHALL BE CHECKED BY THE CONTRACTOR AND BEAR THE CHECKER'S INITIALS BEFORE BEING SUBMITTED FOR REVIEW.
13. NO DRILLING WELDING OR TAPING ON EVERSOURCE OWNED EQUIPMENT.
14. REFER TO DRAWING T1 FOR ADDITIONAL NOTES AND REQUIREMENTS.

STRUCTURAL STEEL

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

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

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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	7/1/19	TJL	CAG	ISSUED FOR CONSTRUCTION

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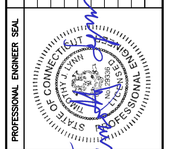

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WIRELESS COMMUNICATIONS FACILITY

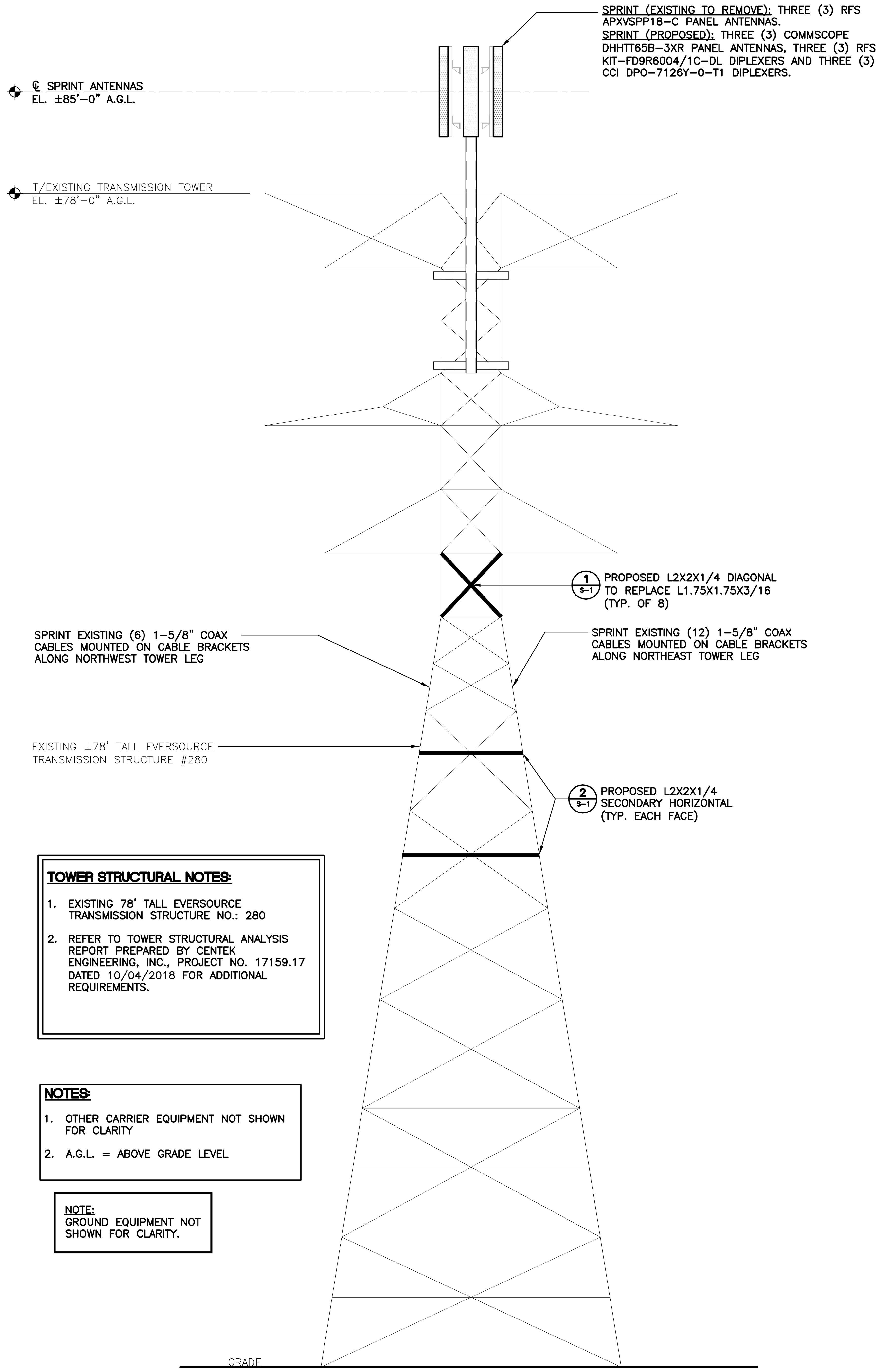
EVERSOURCE STRUCT.: 280
SITE ID: CT43CX837
CHAPEL STREET
STRATFORD, CT 06614

DATE:	01/17/18
SCALE:	AS NOTED
JOB NO.	17159.17

DESIGN BASIS AND SITE NOTES

N-1

Sheet No. 2 of 6



TOWER STRUCTURAL NOTES:

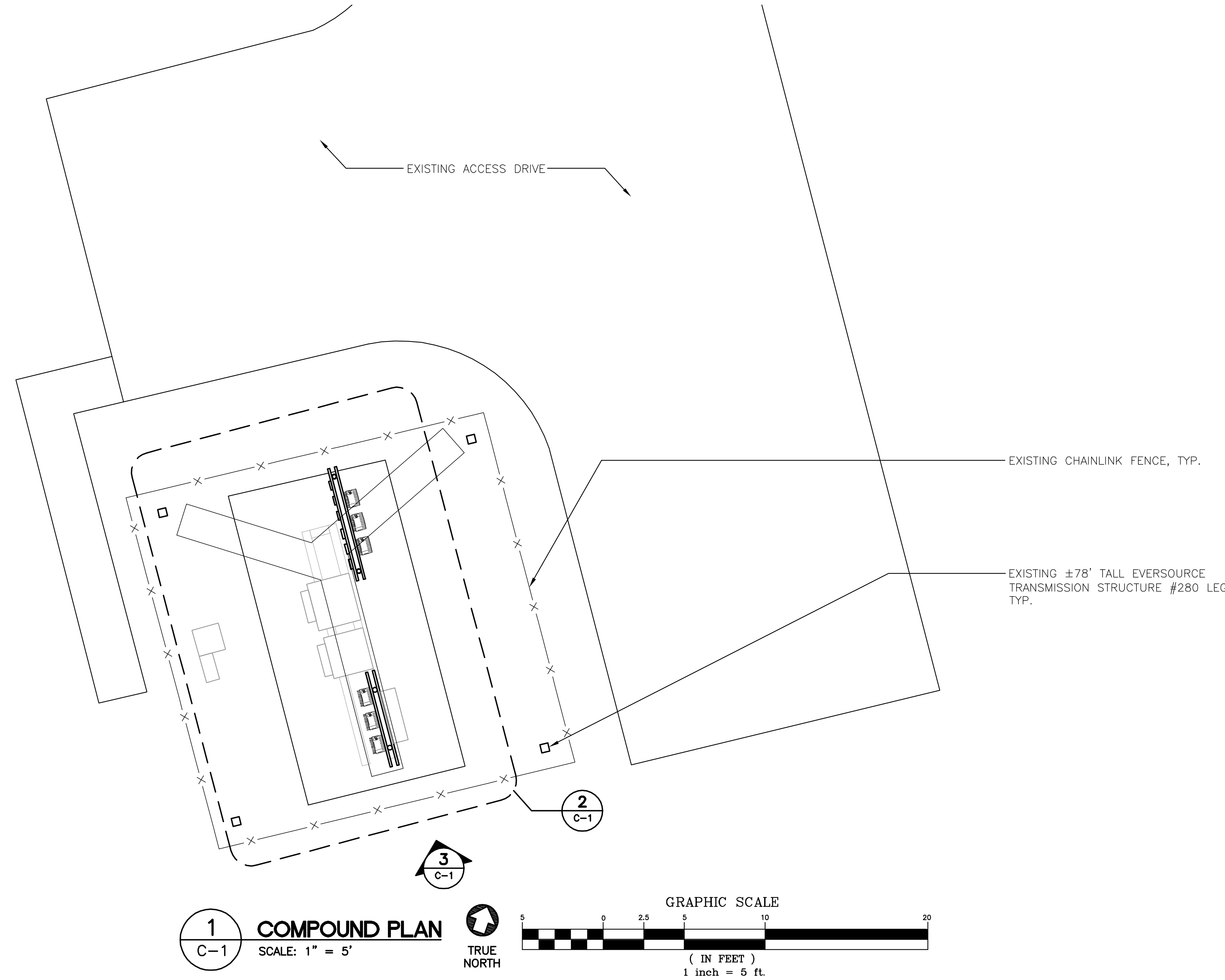
1. EXISTING 78' TALL EVERSOURCE TRANSMISSION STRUCTURE NO.: 280
2. REFER TO TOWER STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJECT NO. 17159.17 DATED 10/04/2018 FOR ADDITIONAL REQUIREMENTS.

NOTES:

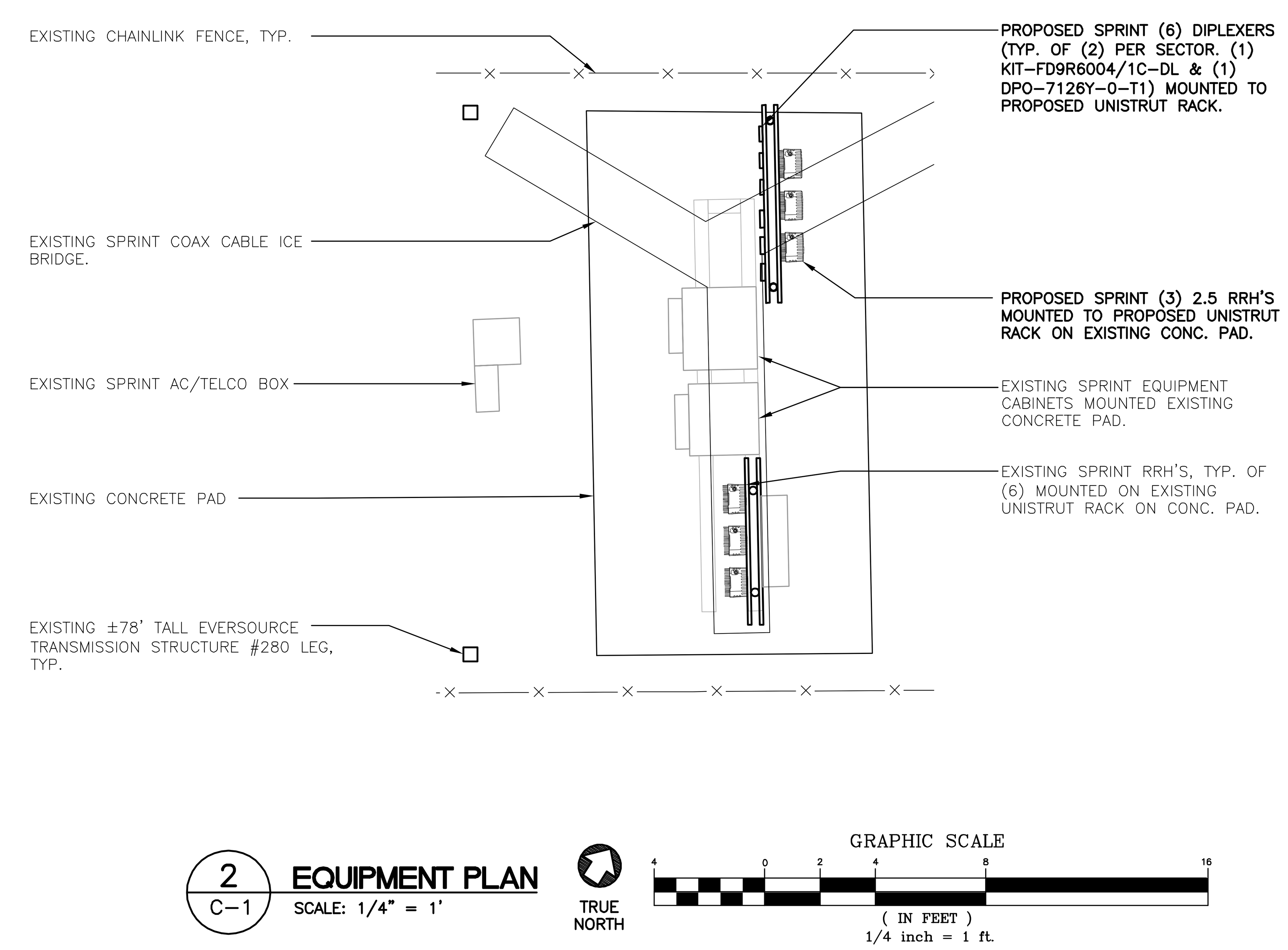
1. OTHER CARRIER EQUIPMENT NOT SHOWN FOR CLARITY
2. A.G.L. = ABOVE GRADE LEVEL

NOTE: GROUND EQUIPMENT NOT SHOWN FOR CLARITY.

3 C-1 **TOWER ELEVATION**
SCALE: 1" = 5'-0"



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



NOTE: TOWER STRUCTURAL NOT SHOWN FOR CLARITY.

2 C-1 **EQUIPMENT PLAN**
SCALE: 1/4" = 1'

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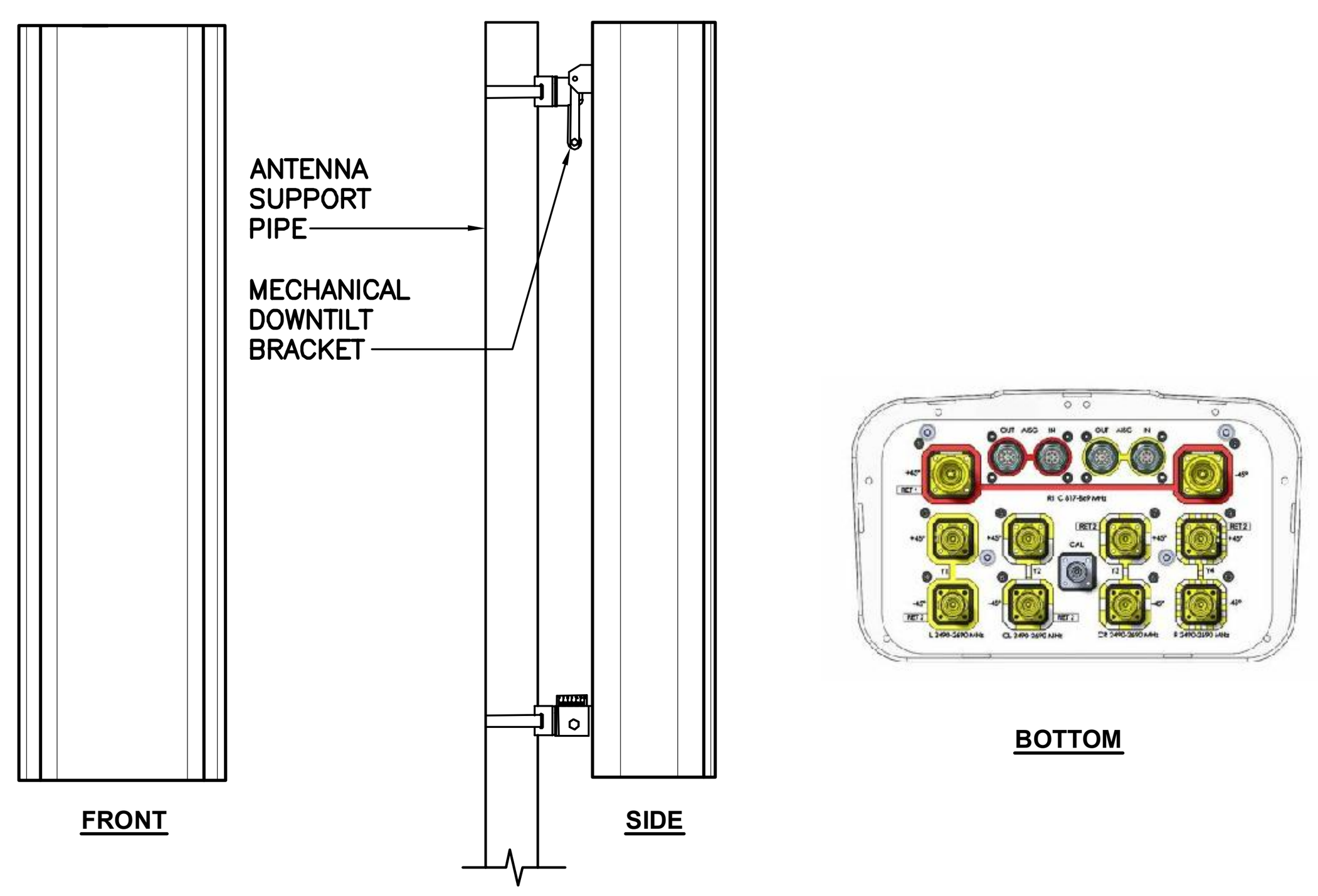
COMPOUND PLANS ELEVATION AND ANTENNA CONFIGURATION

C-1

Sheet No. 3 of 6



ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: DHHT65B-3XR	71.9"L x 13.8"W x 8.2"D	58 LBS.

1 C-2 PROPOSED ANTENNA DETAIL
SCALE: 1/2" = 1'-0"

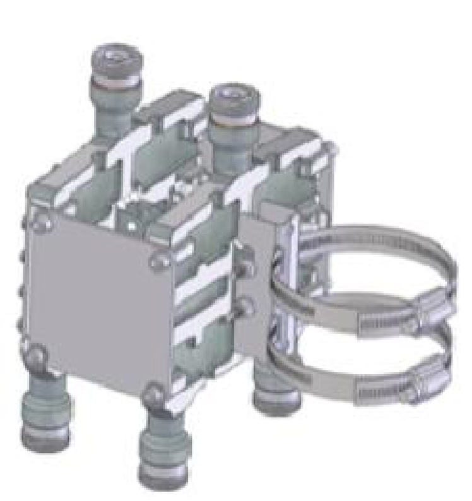
TD-RRH8x20-25

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ALCATEL-LUCENT MODEL: TD-RRH8x20-25	25.3"L x 17.5"W x 5.7"D	66 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.

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

2 C-2 REMOTE RADIO HEAD DETAIL
SCALE: NOT TO SCALE

DOP-7126Y-0-T1

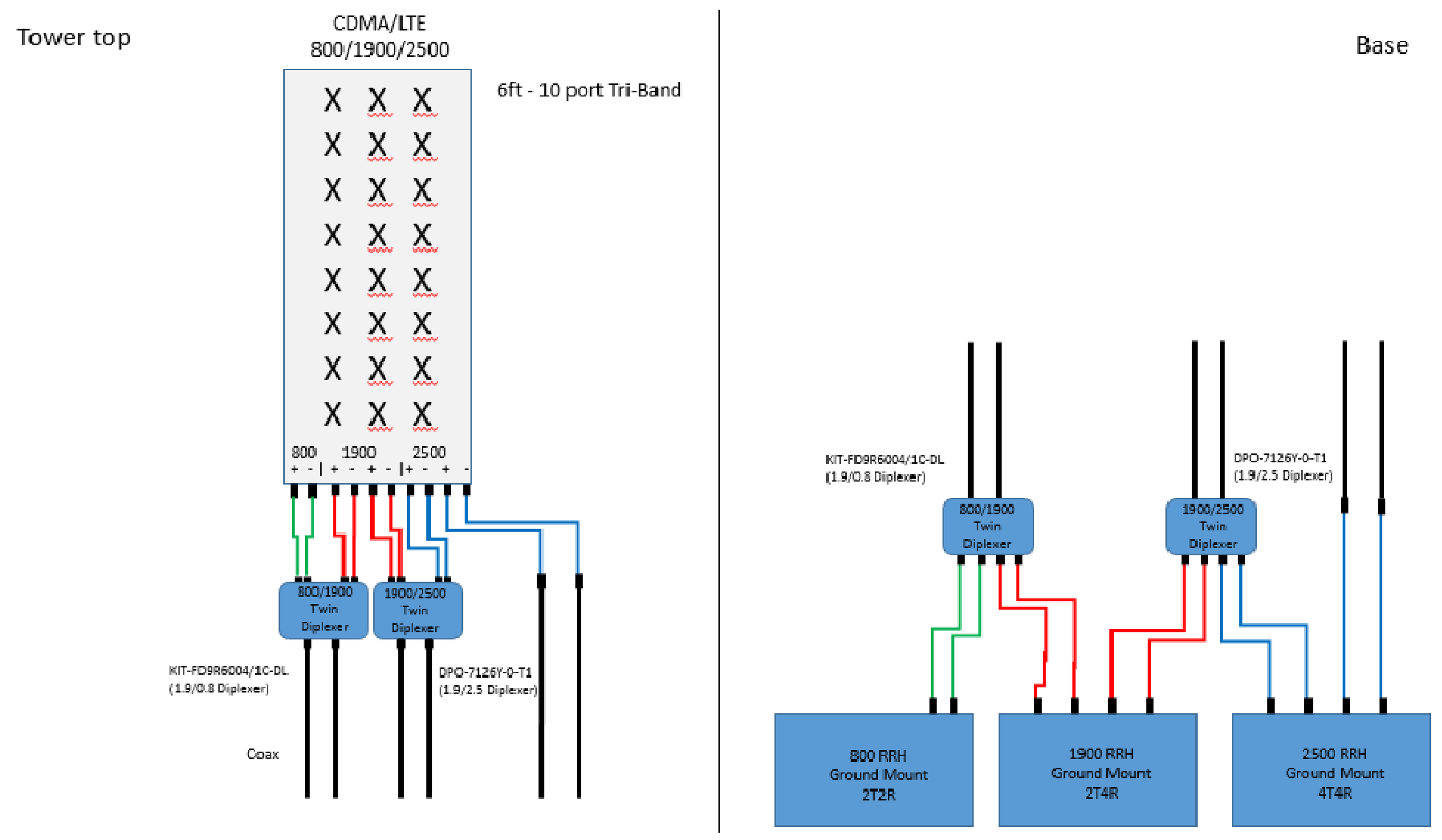


KIT-FD9R6004/1C-DL

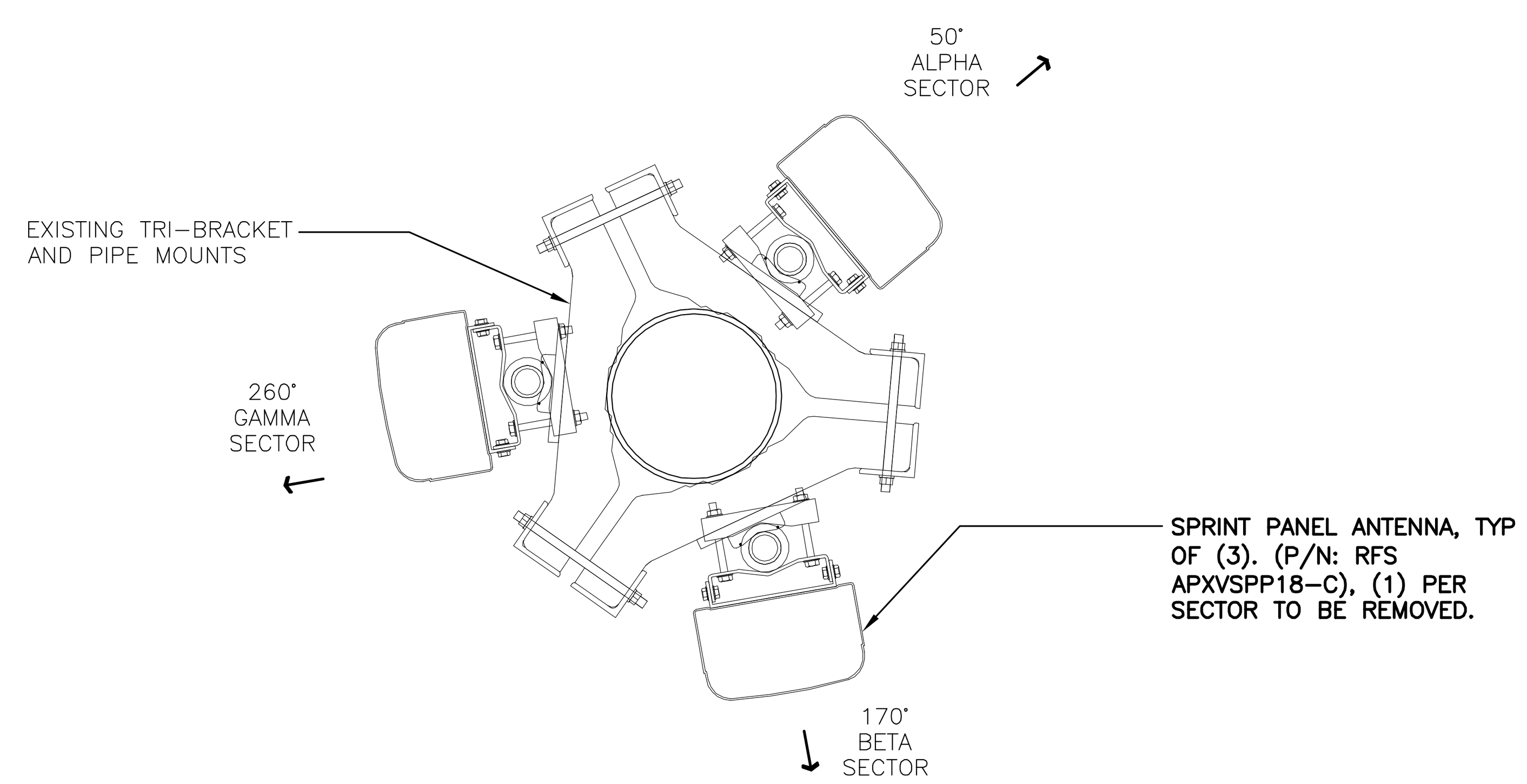
DIPLEXERS		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: KIT-FD9R6004/1C-DL	5.8"L x 6.5"W x 4.6"D	6.4 LBS.
MAKE: CCI MODEL: DPO-7126Y-0-T1	6.26"L x 7.42"W x 4.07"D	7.3 LBS.

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

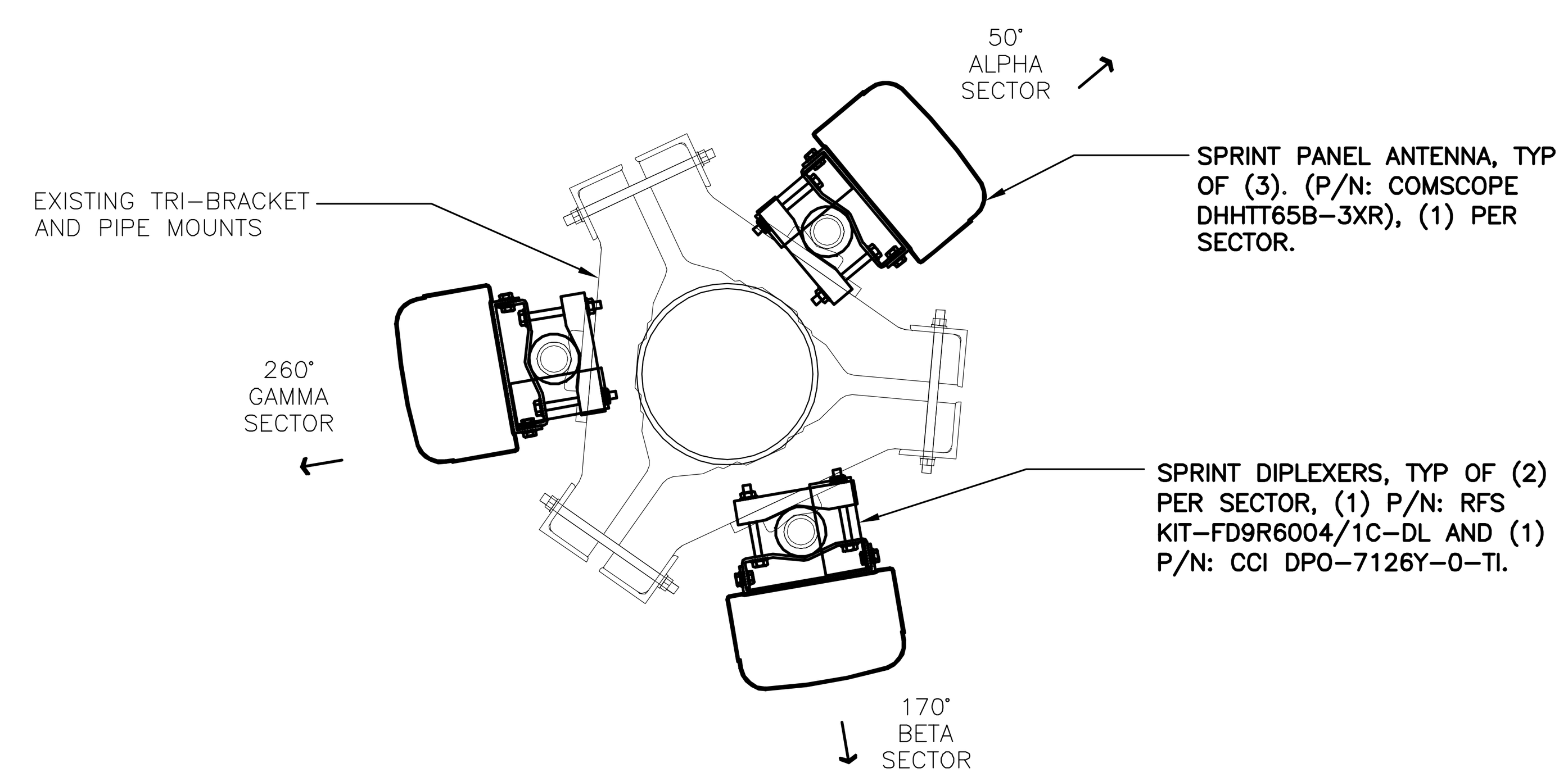
3 C-2 DIPLEXER DETAIL
SCALE: NOT TO SCALE



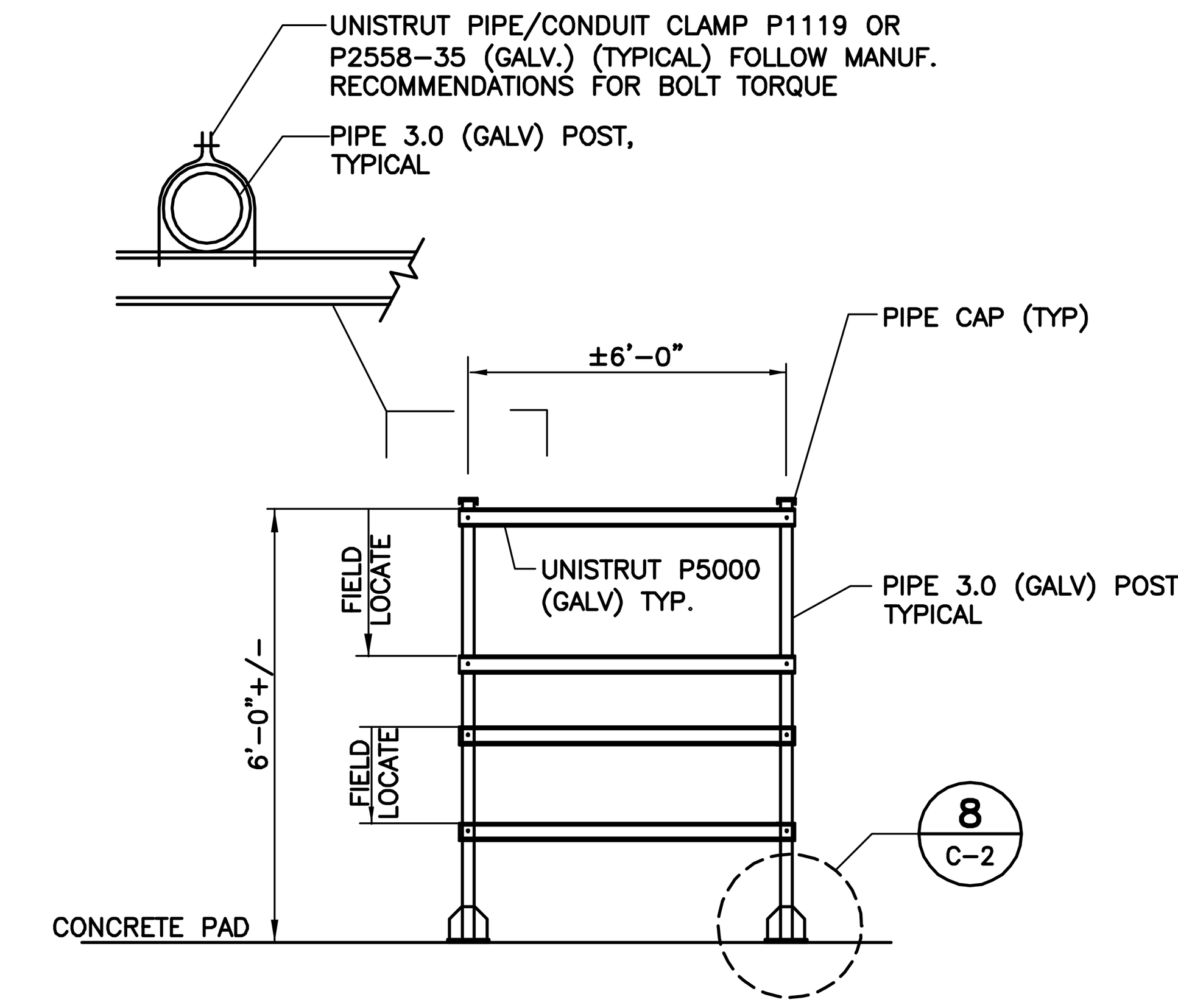
4 C-2 PLUMBING DIAGRAM
NOT TO SCALE



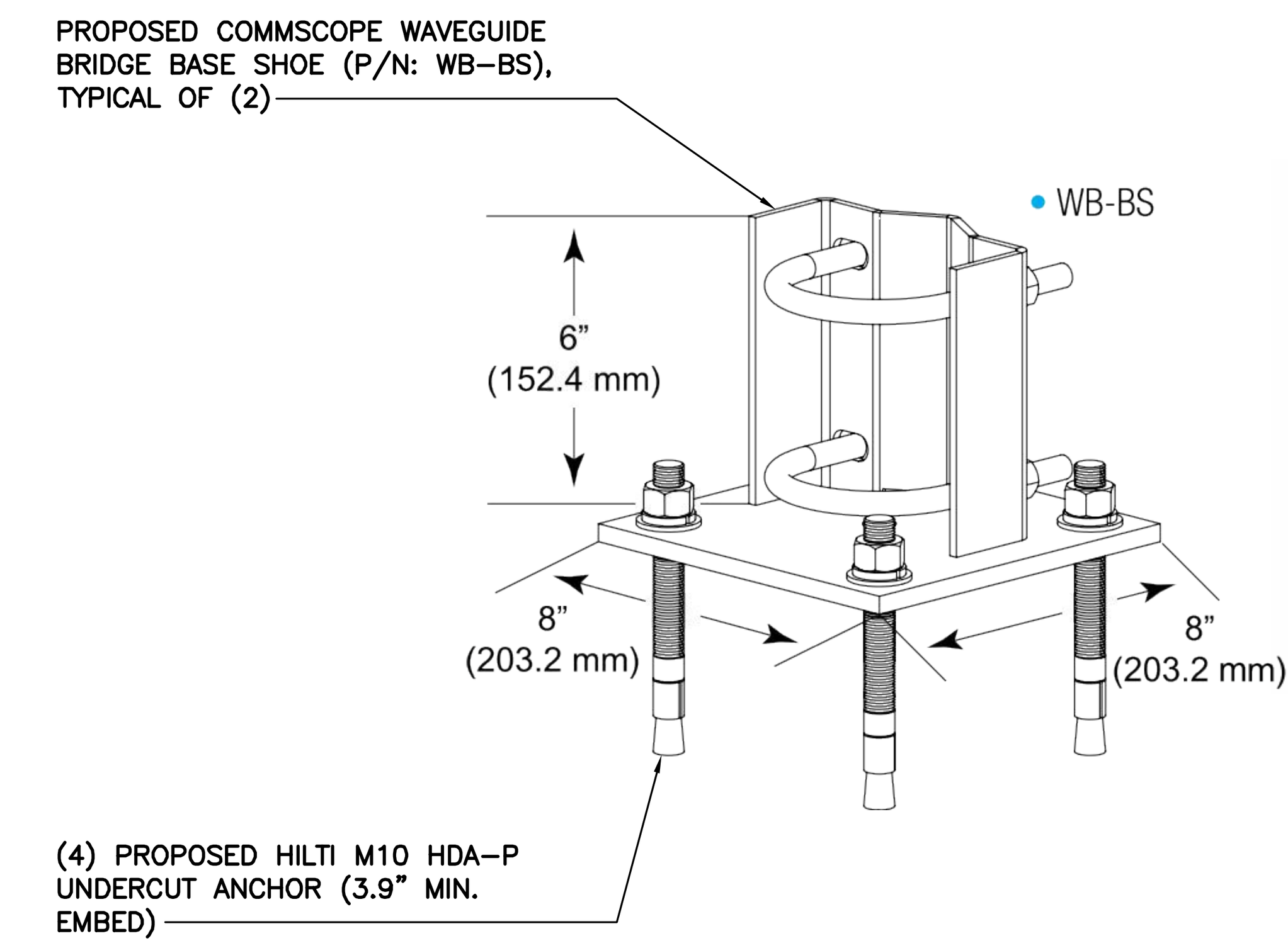
5 C-2 EXISTING ANTENNA PLAN
SCALE: = 1/4" = 1'



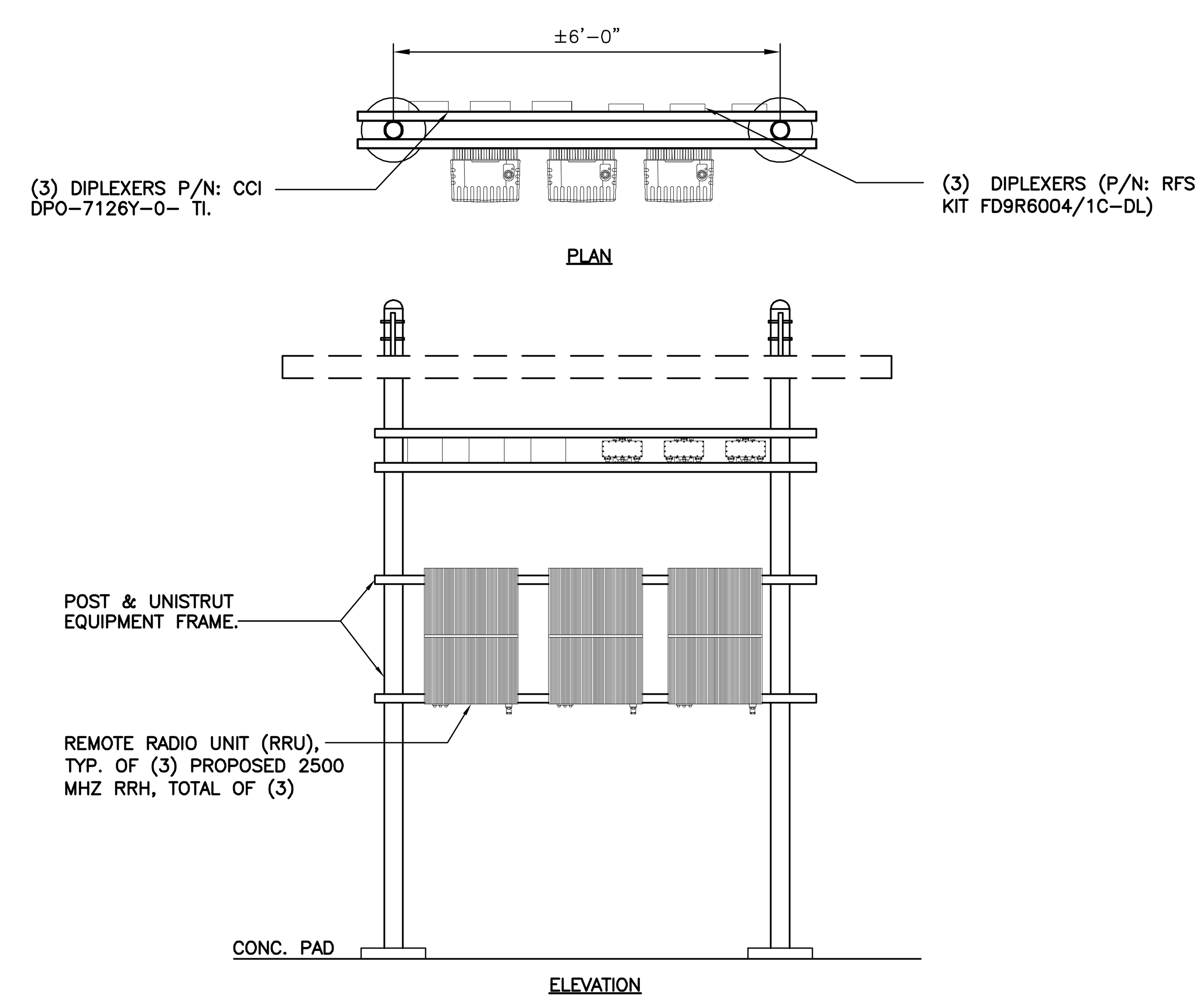
6 C-2 PROPOSED ANTENNA PLAN
SCALE: = 1/4" = 1'



7 C-2 PROPOSED EQUIPMENT MOUNTING FRAME DETAIL
SCALE: NOT TO SCALE



8 C-2 EQUIPMENT FRAME POST ATTACHMENT DETAIL
SCALE: NOT TO SCALE



9 C-2 RRU MOUNTING CONFIG.
SCALE: 1/2" = 1'- 0"

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TYPICAL DETAILS

C-2

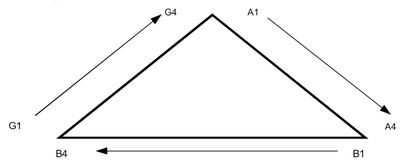
Sheet No. 4 of 6

NV CABLES			
BAND	INDICATOR	PORT	COLOR
800-1	YEL GRN	NV-1	GRN
1900-1	YEL RED	NV-2	BLU
1900-2	YEL BRN	NV-3	BRN
1900-3	YEL BLU	NV-4	WHT
1900-4	YEL SLT	NV-5	RED
800-2	YEL ORG	NV-6	SLT
SPARE	YEL WHT	NV-7	PPL
2500	YEL PPL	NV-8	ORG

HYBRID	
HYBRID	COLOR
1	GRN
2	BLU
3	BRN
4	WHT
5	RED
6	SLT
7	PPL
8	ORG

2.5 Band	
2500 Radio 1	COLOR
YEL WHT	GRN
YEL WHT	BLU
YEL WHT	BRN
YEL WHT	WHT
YEL WHT	RED
YEL WHT	SLT
YEL WHT	PPL
YEL WHT	ORG

Figure 1: Antenna Orientation



NOTES

1. All cables shall be marked at the top and bottom with 2" colored tape, stencil tag colored tape, or colored heat shrink tubing
2. Colored tape may be obtained from Graybar Electronic. UV stabilized tape or heat shrink are preferred.
3. The first ring shall be closest to the end of the cable, and there shall be a 1" space between each ring.
4. The cable color code shall be applied in accordance to Table 19-1.
   A. Table 19-1 only shows 3 sectors, but additional sectors are easily supported by adding the appropriate number of colored rings to the cable color code.
5. After the cable color code is applied, the frequency color code, Table 19-2, must be applied for the specific frequency band in use on a
   A.2" gap shall separate the cable color code from the frequency color code.
   B. The 2" color rings for the frequency code shall be placed next to each other with no spaces.
6. Wrap 2" colored tape a minimum of 3 times around the coax, and keep the tape in the same area as much as possible. This will allow remova
7. Examples of the cable and frequency color codes are shown in Figure 19-1 and Figure 19-2.

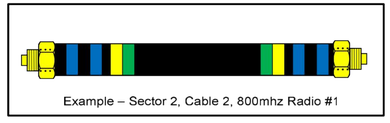
FIGURE 19.1 CABLE COLOR CODE

Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange

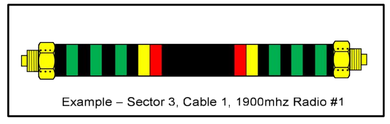
FIGURE 19.2 COLOR CODE

FREQUENC	INDICATOR	ID
800-1	YEL	GRN
1900-1	YEL	RED
1900-2	YEL	BRN
1900-3	YEL	BLU
1900-4	YEL	SLT
800-1	YEL	ORG
RESERVED	YEL	WHT
RESERVED	YEL	PPL

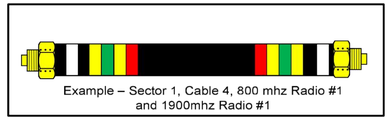
FREQUE	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL



Example – Sector 2, Cable 2, 800mhz Radio #1

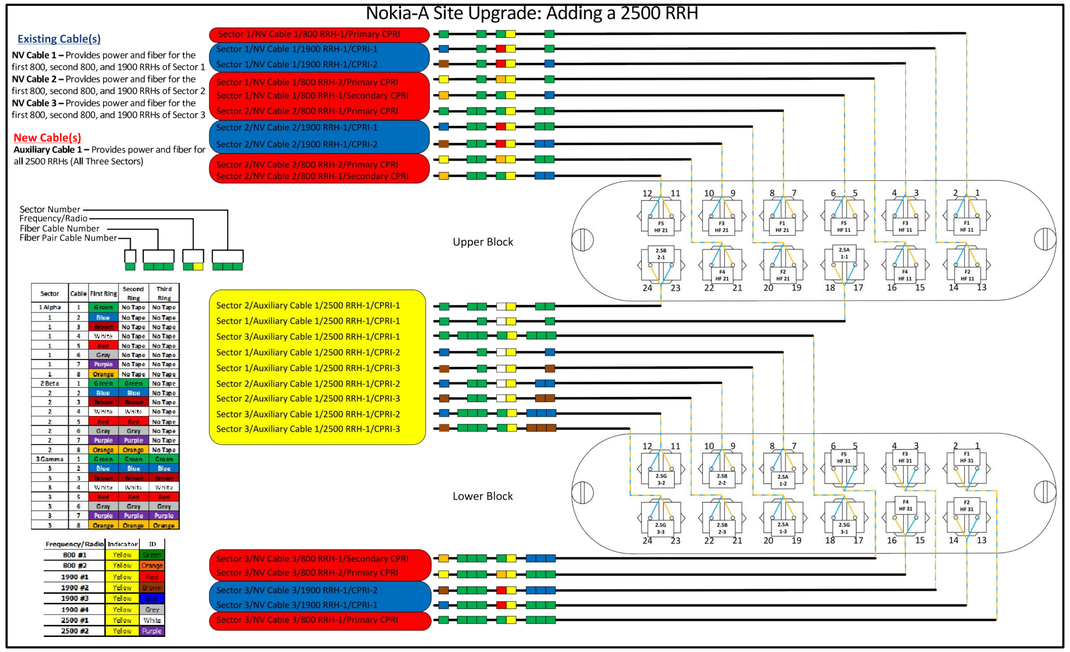


Example – Sector 3, Cable 1, 1900mhz Radio #1



Example – Sector 1, Cable 4, 800 mhz Radio #1 and 1900mhz Radio #1

1 C-3 **COLOR CODE DIAGRAM**
NOT TO SCALE



Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue	No Tape
2	3	Brown	Brown	No Tape
2	4	White	White	No Tape
2	5	Red	Red	No Tape
2	6	Grey	Grey	No Tape
2	7	Purple	Purple	No Tape
2	8	Orange	Orange	No Tape
3 Gamma	1	Green	Green	Green
3	2	Blue	Blue	Blue
3	3	Brown	Brown	Brown
3	4	White	White	White
3	5	Red	Red	Red
3	6	Grey	Grey	Grey
3	7	Purple	Purple	Purple
3	8	Orange	Orange	Orange

Frequency/Radio	Indicator	ID
800 #1	Yellow	Green
800 #2	Yellow	Orange
1900 #1	Yellow	Red
1900 #2	Yellow	Brown
1900 #3	Yellow	Blue
1900 #4	Yellow	Grey
2500 #1	Yellow	White
2500 #2	Yellow	Purple

2 C-3 **CPRI DIAGRAM**
NOT TO SCALE

ANTENNA AND APPURTENANCE SCHEDULE

ANTENNAS					APPURTENANCES		
SECTOR	TECHNOLOGY	(E/P) ANTENNA	ANTENNA ℄ HEIGHT (AGL)	AZIMUTH	(E/P) TMA/DIPLEXER/TRIPLEXER (QTY) [AT TOWER]	(E/P) RRU (QTY) [AT GRADE]	TOTAL QUANTITY AND FEEDER TYPE
ALPHA	800/1900/2500	(P) COMMSCOPE DHHTT65B-3XR	85'	50°	(P) RFS KIT-FD9R6004/1C-DL (1)	(E) RRH4X45 1900 (1)	(18) 1-5/8"ø COAX
					(P) CCI DPO-7126Y-0-T1 (1)	(E) RRH2X50 800 (1)	
						(P) RRH2X50 800 (1)	
						(P) TDRRH8X20-25 (1)	
BETA	800/1900/2500	(P) COMMSCOPE DHHTT65B-3XR	85'	170°	(P) RFS KIT-FD9R6004/1C-DL (1)	(E) RRH4X45 1900 (1)	
					(P) CCI DPO-7126Y-0-T1 (1)	(E) RRH2X50 800 (1)	
						(P) RRH2X50 800 (1)	
						(P) TDRRH8X20-25 (1)	
GAMMA	800/1900/2500	(P) COMMSCOPE DHHTT65B-3XR	85'	260°	(P) RFS KIT-FD9R6004/1C-DL (1)	(E) RRH4X45 1900 (1)	
					(P) CCI DPO-7126Y-0-T1 (1)	(E) RRH2X50 800 (1)	
						(P) RRH2X50 800 (1)	
						(P) TDRRH8X20-25 (1)	

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	7/1/19	TJL	CAG	ISSUED FOR CONSTRUCTION

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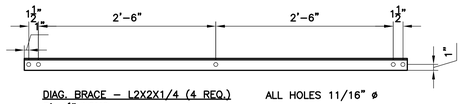
EVERSOURCE STRUCT.: 280
SITE ID: CT43CX837
CHAPEL STREET
STRATFORD, CT 06614

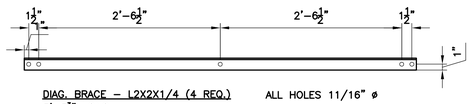
DATE: 01/17/18
SCALE: AS NOTED
JOB NO. 17159.17

COLOR CODE
CPRI DETAILS AND ANTENNA SCHEDULE

C-3

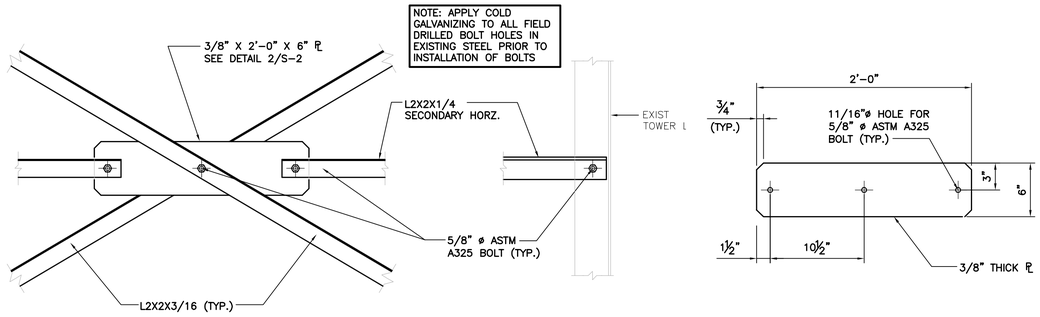
Sheet No. 5 of 6





1 S-1 DIAG. BRACING REPLACEMENT DETAILS

SCALE: 1/2" = 1'-0"



2 S-1 SECONDARY HORZ. DETAILS

SCALE: 1-1/2" = 1'-0"

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STRATFORD, CT 06614

DATE: 01/17/18
SCALE: AS NOTED
JOB NO. 17159.17

REINFORCEMENT DETAILS

S-1

Sheet No. 6 of 6

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Antenna Mast and Tower

Sprint Site Ref: CT43XC837

Eversource Structure No. 280

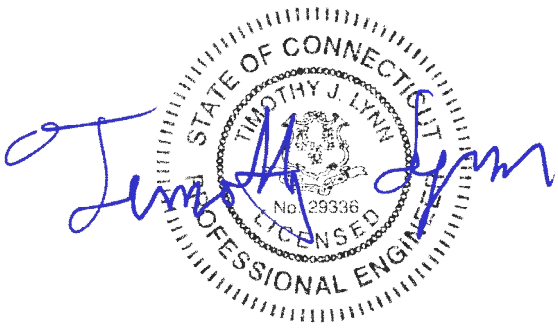
78' Electric Transmission Lattice Tower

742 Chapel Street
Stratford, CT

CENTEK Project No. 17159.17

~~Date: January 24, 2018~~

Rev 2: October 4, 2018



Prepared for:
Transcend Wireless
10 Industrial Ave, Suite 3
Mahwah, NJ 07430

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Introduction

The purpose of this report is to analyze the existing antenna mast and 78' utility tower located at 742 Chapel Street in Stratford, CT for the proposed antenna and equipment upgrade by Sprint.

The proposed loads consist of the following:

- SPRINT (Existing to Remain):
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the Northwest leg of the existing tower. Twelve (12) 1-5/8" ∅ coax cables running on the Northeast leg of the existing tower
- **SPRINT (Existing to Remove)**
  Antennas: Three (3) RFS APXVSPP18-C panel antennas mounted on a pipe mast with RAD center elevation of 85-ft above grade level.
- **SPRINT (Proposed):**
  Antennas: Three (3) Commscope DHHTT65B-3XR panel antennas, three (3) RFS KIT-FD9R6004/1C-DL Diplexers and three (3) CCI DPO-7126Y-0-T1 Diplexers mounted on a pipe mast with RAD center elevation of 85-ft above grade level.

Primary assumptions used in the analysis

- Design steel stresses are defined by AISC-LRFD 14th edition for design of the antenna Mast and antenna supporting elements.
- ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", defines allowable steel stresses for evaluation of the utility tower.
- 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 as indicated in Section 4 of this report.
- Antenna Mast will be properly installed and maintained.
- No residual stresses exist due to incorrect tower 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 tower will be in plumb condition.
- Utility tower 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 antenna mast was independently completed using the current version of RISA-3D computer program licensed to CENTEK Engineering, Inc. 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 existing Sprint mast consisting of a 21-ft long 8-in SCH. 80 (O.D. = 8.63-in) pipe connected at four points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA-222-G standard. Section 5 of this report details these gravity and lateral wind loads. Load cases and combinations used in RISA-3D for TIA/EIA loading are listed in report Section 6.

Structural analysis of the existing Eversource tower structure was completed using the current version of PLS-Tower computer program licensed to CENTEK Engineering, Inc. The NESC program contains a library of all AISC angle shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized.

The existing Eversource lattice tower was analyzed for its ability to resist loads prescribed by the NESC standard. Maximum usage for the tower was calculated considering the additional forces from the Antenna Mast and associated appurtenances. Section 7 of this report details these gravity and lateral wind loads.

Design Basis

Our analysis was performed in accordance with TIA-222-G, ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", NESC C2-2007 and Northeast Utilities Design Criteria.

- UTILITY TOWER 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 NU Design Criteria Table, NESC C2-2007 ~ Construction Grade B, and ASCE Manual No. 10-97, "Design of Latticed Steel Transmission 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 C2-2007, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

- MAST ASSEMBLY ANALYSIS

  Mast, appurtenances and connections to the utility tower were analyzed and designed in accordance with the NU Design Criteria Table, TIA-222-G and AISC standards.

  Load cases considered:

  Load Case 1:
  Wind Speed……..... 97 mph (2016 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

- ANTENNA MAST

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

Component	Design Limit	Stress Ratio (percentage of capacity)	Result
8” Sch. X-Strong	Bending	34.0%	**PASS**
HSS6x6x1/4	Bending	24.0%	**PASS**
Connection	Shear	31.5%	**PASS**

- UTILITY TOWER

  This analysis finds that the subject utility structure is adequate to support the proposed antenna mast and related appurtenances. The tower stresses meet the requirements set forth by the ASCE Manual No. 10-97, “Design of Latticed Steel Transmission Structures”, for the applied NESC Heavy and Hi-Wind load cases. The detailed analysis results are provided in Section 8 of this report. The analysis results are summarized as follows:

  A maximum usage of **97.49%** occurs in the utility structure under the **NESC Extreme** loading condition **with the reinforcements detailed in section 4 of this report.**

  TOWER SECTION:

  The utility structure was found to be within allowable limits **with the reinforcements detailed in section 4 of this report.**

Tower Member	Stress Ratio (% of capacity)	Result
Angle g27XY	97.49%	**PASS**

- FOUNDATION AND ANCHORS

  Information for the existing steel grillage foundation was obtained from NUSCO drawing # 01021-60003B.

  BASE REACTIONS:

  From PLS-Tower analysis of structure based on NESC/NU prescribed loads.

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	5.36 kips	9.74 kips	22.98 kips
NESC Extreme Wind	8.77 kips	29.91 kips	36.01 kips

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

FOUNDATION:

The foundation was found to be within allowable limits.

Foundation	Design Limit	Required FS (1)	Proposed Loading FS (2)	Result
Steel Grillage	Uplift	1.0	1.43	**PASS**

Note 1: FS denotes Factor of Safety
Note 2: 10% increase to PLS base reactions used in foundation analysis per OTRM 051.

Conclusion

This analysis shows that the subject utility tower **with the reinforcements detailed in section 4 of this report is adequate** to support the proposed equipment installation.

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

Analysis Features:

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

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

Graphics Features:

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

Design Features:

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

Results Features:

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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-TOWER

PLS-TOWER is a Microsoft Windows program for the analysis and design of steel latticed towers used in electric power lines or communication facilities. Both self-supporting and guyed towers can be modeled. The program performs design checks of structures under user specified loads. For electric power structures it can also calculate maximum allowable wind and weight spans and interaction diagrams between different ratios of allowable wind and weight spans.

Modeling Features:

- Powerful graphics module (stress usages shown in different colors)
- Graphical selection of joints and members allows graphical editing and checking
- Towers can be shown as lines, wire frames or can be rendered as 3-d polygon surfaces
- Can extract geometry and connectivity information from a DXF CAD drawing
- CAD design drawings, title blocks, drawing borders or photos can be tied to structure model
- XML based post processor interface
- Steel Detailing Neutral File (SDNF) export to link with detailing packages
- Can link directly to line design program PLS-CADD
- Automatic generation of structure files for PLS-CADD
- Databases of steel angles, rounds, bolts, guys, etc.
- Automatic generation of joints and members by symmetries and interpolations
- Automated mast generation (quickly builds model for towers that have regular repeating sections) via graphical copy/paste
- Steel angles and rounds modeled either as truss, beam or tension-only elements
- Guys are easily handled (can be modeled as exact cable elements)

Analysis Features:

- Automatic handling of tension-only members
- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Automatic calculation of tower dead, ice, and wind loads as well as 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
- Minimization of problems caused by unstable joints and mechanisms
- Automatic bandwidth minimization and ability to solve large problems
- Design checks according to (other standards can be added easily):
    - ASCE Standard 10-90

- AS 3995 (Australian Standard 3995)
- BS 8100 (British Standard 8100)
- EN50341-1 (CENELEC, both empirical and analytical methods are available)
- ECCS 1985
- NGT-ECCS
- PN-90/B-03200
- EIA/TIA 222-F
- ANSI/TIA 222-G
- CSA S37-01
- EDF/RTE Resal
- IS 802 (India Standard 802)

Results Features:

- Design summaries printed for each group of members
- 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
- Capability to batch run multiple tower configurations and consolidate the results
- Automated optimum angle member size selection and bolt quantity determination

Tool for interactive angle member sizing and bolt quantity determination.

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/EIA-222 covering the design of telecommunications structures specifies a working strength/allowable stress design approach. This approach applies the loads from extreme weather loading conditions, and designs the structure so that it does not exceed some defined percentage of failure strength (allowable stress).

ANSI Standard C2-2007 (National Electrical Safety Code) covering the design of electric transmission metal structures is based upon an ultimate strength/yield stress design approach. This approach applies a multiplier (overload capacity factor) to the loads possible from extreme weather loading conditions, and designs the structure so that it does not exceed its ultimate strength (yield stress).

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

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

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

Note 1: Prepared from documentation provide from Northeast Utilities.

P C S M a s t

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

1. An 85 mph extreme wind speed shall be used for locations in all counties throughout the NU system.
2. The stress increase of TIA Section 3.1.1.1 is disallowed. The combined wind and ice condition shall consider ½" radial ice in combination with the wind load (0.75 Wi) as specified in TIA section 2.3.16.

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

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

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

The uniform loadings and factors specified for the above components in the table are based upon the National Electrical Safety Code 2007 Edition Extreme Wind (Rule 250C) and Combined Ice and Wind (Rule 250B-Heavy) Loadings. These provide equivalent loadings compared to TIA and its loads and factors with the exceptions noted above. (Note that the NESC does not require the projected wind surfaces of structures and equipment to be increased by the ice covering.)

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

Attachment A
Eversource Design Criteria

		Attachment A NU 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	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	____	4	1	1	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
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 NU					
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 NU					
		* Only for structures installed after 2007						

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) 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	1.6

   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.

   Note: The NESC does not require ice load be included in the supporting structure. (Ice on conductors and shield wire only, and Eversource will provide these loads).

e) Mast reaction loads shall be evaluated for local effects on the transmission structure members at the attachment points.

Project: 1580/1590 Line, Structure 280 Wire Load Recalculation
Date: 6/26/18
Engineer: JS
Purpose: Recalculate wire loads for Sprint site. OPGW recently installed over 1580 circuit. Assume two identical OPGW shield wires on structure.

Shield Wires:
1580: AFL DNO-4963 0.457" dia., 3800# @ NESC 250B Final
1590: Assume same

Conductors:
4/0 Cu for both circuits, tensioned to 4500# @ NESC 250B final

NESC 250B

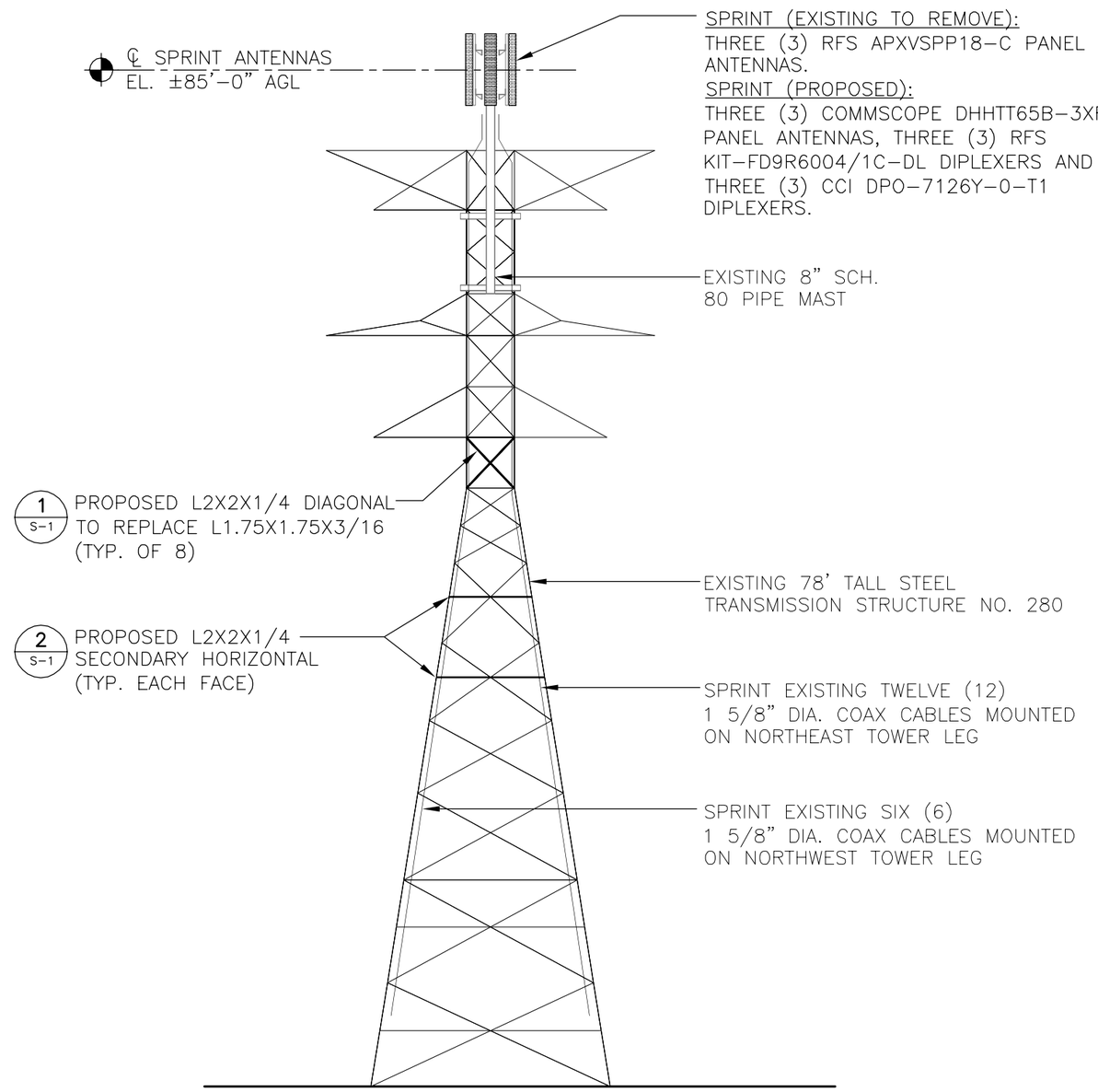
	Vertical	Transverse	Longitudinal
OPGW	719	824	0
Conductor	1060	861	0

NESC 250C

	Vertical	Transverse	Longitudinal
OPGW	171	788	0
Conductor	411	900	0

60 deg F

	Vertical	Transverse	Longitudinal
OPGW	165	0	0
Conductor	424	0	0



1 / EL-1 **TOWER & MAST ELEVATION**

SCALE: NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	8/22/18	TJL	CAG	ISSUED FOR REVIEW

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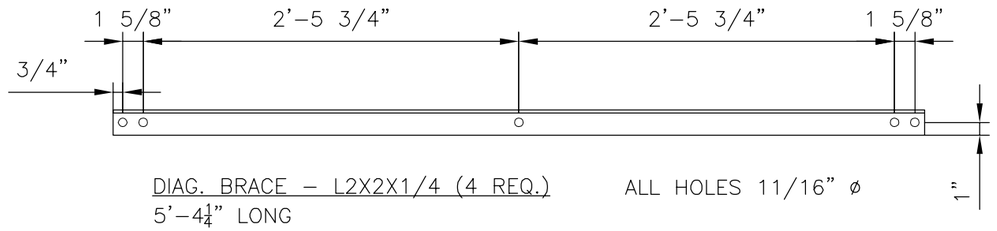
CT43XC837
STRUCTURE 280

742 CHAPEL STREET
STRATFORD CT, 06614

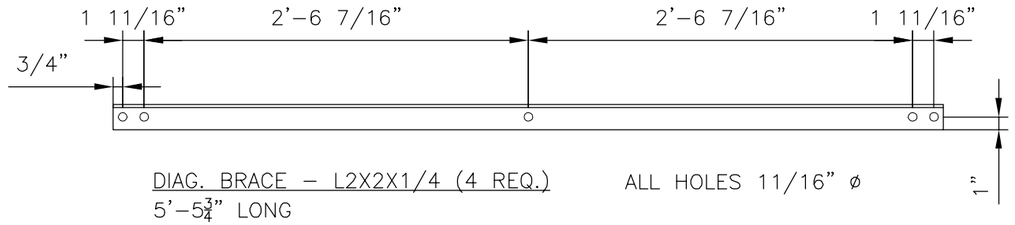
DATE:	8/22/18
SCALE:	AS SHOWN
JOB NO.	17159.17

TOWER / MAST ELEVATION

SHEET NO.
EL-1
Sheet No. 1 of 2



DIAG. BRACE – L2X2X1/4 (4 REQ.) ALL HOLES 11/16" ø
5'-4¼" LONG

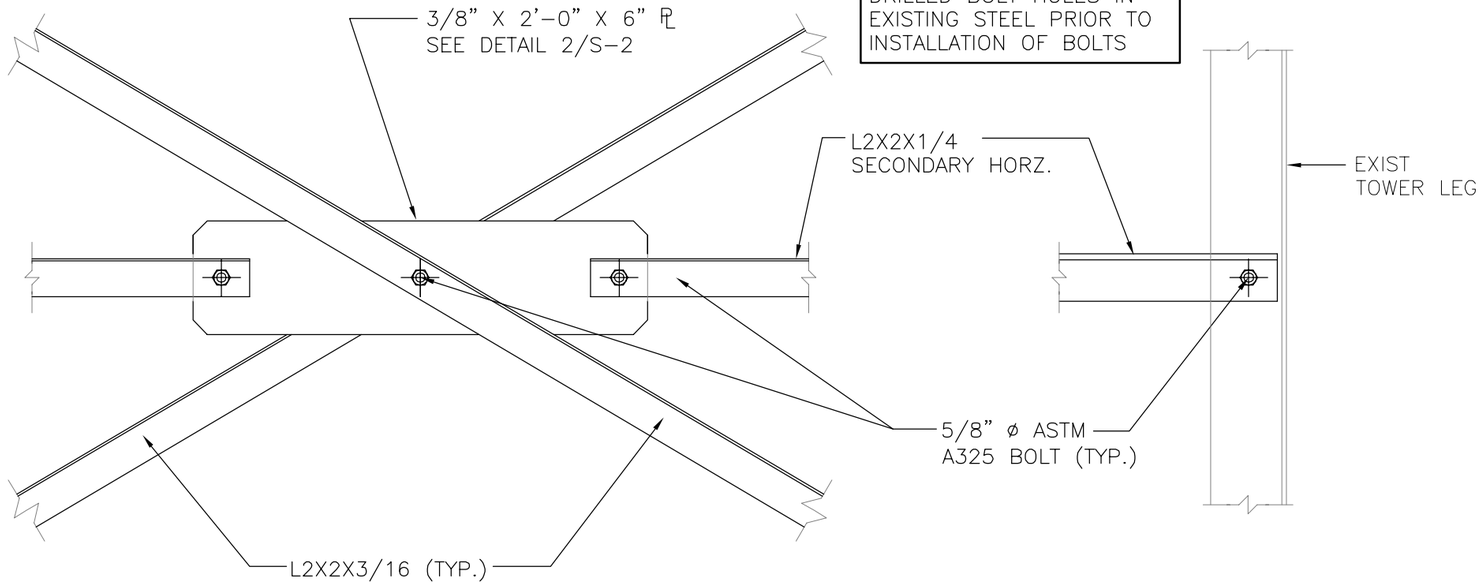


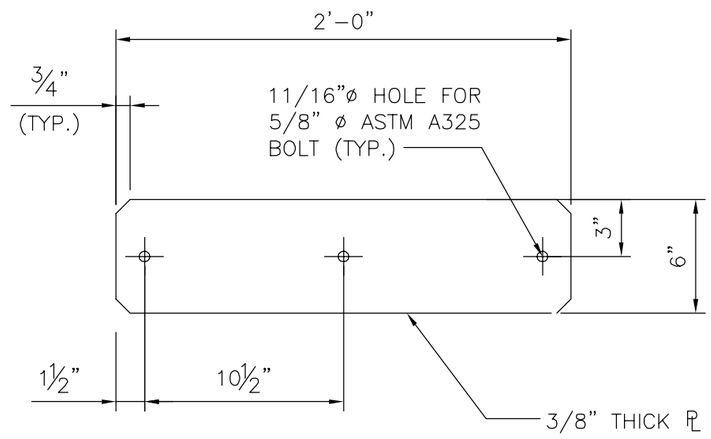
DIAG. BRACE – L2X2X1/4 (4 REQ.) ALL HOLES 11/16" ø
5'-5¾" LONG

1 / S-1 DIAG. BRACING REPLACEMENT DETAILS

SCALE: 3/4" = 1'-0"

NOTE: APPLY COLD GALVANIZING TO ALL FIELD DRILLED BOLT HOLES IN EXISTING STEEL PRIOR TO INSTALLATION OF BOLTS





2 / S-1 SECONDARY HORZ. DETAILS

SCALE: 1-1/2" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	8/22/18	TJL	CAG	ISSUED FOR REVIEW

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DATE:	8/22/18
SCALE:	AS SHOWN
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TOWER REINFORCEMENT DETAILS

SHEET NO.
S-1
Sheet No. 2 of 2

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Subject:	Loads on Equipmnet Structure 280
Location:	Stratford, CT
Rev. 0: 1/24/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.17

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

Wind Speeds

Basic Wind Speed $V := 97$ mph (User Input - 2016 CSBC Appendix N)

Basic Wind Speed with Ice $V_i := 50$ mph (User Input per Annex B of TIA-222-G)

Input

Structure Type = $Structure\_Type := Lattice$ (User Input)

Structure Category = $SC := III$ (User Input)

Exposure Category = $Exp := C$ (User Input)

Structure Height = $h := 78$ ft (User Input)

Height to Center of Antennas = $z_{Sprint} := 85$ ft (User Input)

Height to Center of Mast = $z_{Mast1} := 76.5$ 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 =

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

(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)

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

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

$$K_{iz} := \left(\frac{z_{Sprint}}{33}\right)^{0.1} = 1.099 \qquad t_{izSprint} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.061$$

Velocity Pressure Coefficient Antennas =

$$Kz_{Sprint} := 2.01\left(\left(\frac{z_{Sprint}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.223$$

Velocity Pressure w/o Ice Antennas =

$$qz_{Sprint} := 0.00256 \cdot K_d \cdot Kz_{Sprint} \cdot V^2 \cdot I_{Wind} = 28.797$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.Sprint} := 0.00256 \cdot K_d \cdot Kz_{Sprint} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.653$$

$$K_{izMast1} := \left(\frac{z_{Mast1}}{33}\right)^{0.1} = 1.088 \qquad t_{izMast1} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast1} \cdot K_{zt}^{0.35} = 2.039$$

Velocity Pressure Coefficient Mast =

$$Kz_{Mast1} := 2.01\left(\left(\frac{z_{Mast1}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.196$$

Velocity Pressure w/o Ice Mast=

$$qz_{Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V^2 \cdot I_{Wind} = 28.165$$

Velocity Pressure with Ice Mast =

$$qz_{ice.Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.507$$

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Location:	Stratford, CT
Rev. 0: 1/24/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.17

Development of Wind & Ice Load on Mast

Mast Data: (8" Sch. 80 Pipe) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 8.63$ in (User Input)

Mast Length = $L_{mast} := 21$ ft (User Input)

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

Velocity Coefficient = $C := \sqrt{I \cdot Kz_{Mast1}} \cdot V \cdot \frac{D_{mast}}{12} = 76$

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

Wind Load (without ice)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.719$ sf/ft

Total Mast Wind Force = $qz_{Mast1} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 16$ plf **BLC 5,7**

Wind Load (with ice)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2 \cdot t_{izMast1}\right)}{12} = 1.059$ sf/ft

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

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 = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast1} \cdot 2\right)^2 - D_{mast}^2\right] = 68.4$ sq in

Weight of Ice on Mast = $W_{ICEmast1} := Id \cdot \frac{Ai_{mast}}{144} = 27$ plf **BLC 3**

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Rev. 0: 1/24/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.17

Development of Wind & Ice Load on Antennas

Antenna Data: (Sprint)

Antenna Model =	Commscope DHHTT65B-3XR		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72.1$	in	(User Input)
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)
Antenna Weight =	$WT_{ant} := 46$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.1$		
Antenna Force Coefficient =	$Ca_{ant} = 1.36$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 17.9$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 944$	lbs	**BLC 5,7**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izSprint}) \cdot (W_{ant} + 2 \cdot t_{izSprint})}{144} = 8.5$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 25.4$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 310$	lbs	**BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 138$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6092$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izSprint})(W_{ant} + 2 \cdot t_{izSprint}) \cdot (T_{ant} + 2 \cdot t_{izSprint}) - V_{ant} = 7613$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 247$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 740$	lbs	**BLC 3**

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Development of Wind & Ice Load on Antennas

Antenna Data: (Sprint)

Antenna Model =	RFS KIT-FD9R6004/1C-DL Diplexer		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 5.8$	in	(User Input)
Antenna Width =	$W_{ant} := 6.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 7$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 0.9$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.3$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.8$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 37$	lbs	**BLC 5,7**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izSprint}) \cdot (W_{ant} + 2 \cdot t_{izSprint})}{144} = 0.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.2$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 24$	lbs	**BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 21$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 173$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izSprint})(W_{ant} + 2 \cdot t_{izSprint}) \cdot (T_{ant} + 2 \cdot t_{izSprint}) - V_{ant} = 746$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 24$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 73$	lbs	**BLC 3**

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Subject:	Loads on Equipmnet Structure 280
Location:	Stratford, CT
Rev. 0: 1/24/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.17

Development of Wind & Ice Load on Antennas

Antenna Data: (Sprint)

Antenna Model =	CCI DPO-7126Y-0-T1 Diplexer		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 4.07$	in	(User Input)
Antenna Width =	$W_{ant} := 7.42$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6.26$	in	(User Input)
Antenna Weight =	$WT_{ant} := 8$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 0.5$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.6$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 29$	lbs	**BLC 5,7**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izSprint}) \cdot (W_{ant} + 2 \cdot t_{izSprint})}{144} = 0.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 21$	lbs	**BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 24$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 189$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izSprint})(W_{ant} + 2 \cdot t_{izSprint}) \cdot (T_{ant} + 2 \cdot t_{izSprint}) - V_{ant} = 793$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 26$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 77$	lbs	**BLC 3**

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Development of Wind & Ice Load on Antenna Mounts

Mount Data: (Sprint)

Mount Type: Tri-Bracket and Pipes

Mount Shape =	Flat		(User Input)
Mount Projected Surface Area =	$CaAa := 0$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CaAa_{ice} := 0$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 160$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 200$	lbs	

Wind Load (without ice)

Total Mount Wind Force =	$F_{mnt} := qz_{Sprint} \cdot G_H \cdot CaAa = 0$	lbs	**BLC 5,7**

Wind Load (with ice)

Total Mount Wind Force =	$Fi_{mnt} := qz_{ice.Sprint} \cdot G_H \cdot CaAa_{ice} = 0$	lbs	**BLC 4,6**

Gravity Loads (without ice)

Weight of All Mounts =	$WT_{mnt} = 160$	lbs	**BLC 2**

Gravity Loads (ice only)

Weight of Ice on All Mounts =	$WT_{mnt.ice} - WT_{mnt} = 40$	lbs	**BLC 3**

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Development of Wind & Ice Load on Coax Cables

Coax Cable Data: (Sprint)

Coax Type =	HELIAX 1-5/8"			
Shape =	Round		(User Input)	
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)	
Coax Cable Length =	$L_{coax} := 18$	ft	(User Input)	
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)	
Total Number of Coax =	$N_{coax} := 18$		(User Input)	
Total Number of Exterior Coax =	$Ne_{coax} := 18$		(User Input)	(6 coax within mast)
No. of Coax Projecting Outside Face of Mast =	$NP_{coax} := 4$		(User Input)	
Coax aspect ratio,	$Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 109.1$			
Coax Cable Force Factor Coefficient =	$Ca_{coax} = 1.2$			

Wind Load (without ice)

Coax projected surface area =	$A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.7$	sf/ft	
Total Coax Wind Force =	$F_{coax} := Ca_{coax} \cdot qz_{Mast1} \cdot G_H \cdot A_{coax} = 30$	plf	BLC 5,7

Wind Load (with ice)

Coax projected surface area w/ Ice =	$AICE_{coax} := \frac{(NP_{coax} D_{coax} + 2 \cdot t_{izMast1})}{12} = 1$	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 4,6

Gravity Loads (without ice)

Weight of all cables w/o ice	$WT_{coax} := Wt_{coax} \cdot N_{coax} = 19$	plf	BLC 2

Gravity Loads (ice only)

Ice Area per Linear Foot =	$Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot t_{izMast1})^2 - D_{coax}^2\right] = 25.8$	sq in	
Ice Weight All Coax per foot =	$WTi_{coax} := Ne_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 180$	plf	BLC 3

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Development of Wind & Ice Load on Brace Member

Member Data: HSS6x6x1/4

Antenna Shape =	Flat		(User Input)	
Height =	$H_{mem} := 6$	in	(User Input)	
Width =	$W_{mem} := 6$	in	(User Input)	
Thickness =	$t_{mem} := 0.25$	in	(User Input)	
Length =	$L_{mem} := 42$	in	(User Input)	
Member Aspect Ratio =	$Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 7.0$			
Member Force Coefficient =	$Ca_{mem} = 1.4$			

Wind Load (without ice)

Member Projected Surface Area =	$A_{mem} := \frac{H_{mem}}{12} = 0.5$	sf/ft	
Total Member Wind Force =	$F_{mem} := qz_{Mast1} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 27$	plf	BLC 5,7

Wind Load (with ice)

Member Projected Surface Area w/ Ice =	$A_{ICEmem} := \frac{\left(H_{mem} + 2 \cdot t_{izMast1}\right)}{12} = 0.8$	sf/ft	
Total Member Wind Force w/ Ice =	$Fi_{mem} := qz_{ice.Mast1} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 10$	plf	BLC 4,6

Gravity Load (without ice)

Weight of Member =	Self Weight	plf	BLC 1

Gravity Loads (ice only)

Ice Area per Linear foot =	$Ai_{mem} := \left(W_{mem} + 2 \cdot t_{izMast1}\right) \cdot \left(H_{mem} + 2 \cdot t_{izMast1}\right) - W_{mem} \cdot H_{mem} = 66$	sq in	
Weight of Ice on Member =	$W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 26$	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	Standard Solver

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

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 R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	PIPE 8.0X	Beam	Pipe	A53 Gr. B	Typical	11.9	100	100	199
2	Brace	HSS6x6x4	Beam	Tube	A500 Gr.46	Typical	5.24	28.6	28.6	45.6

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Mast	21	Segment	Segment	Lbyy						Lateral
2	M2	Brace	1			Lbyy						Lateral
3	M3	Brace	4.5			Lbyy						Lateral
4	M4	Brace	1			Lbyy						Lateral
5	M5	Brace	1			Lbyy						Lateral
6	M6	Brace	4.5			Lbyy						Lateral
7	M7	Brace	1			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			Mast	Beam	Pipe	A53 Gr. B	Typical
2	M2	N8	N12			Brace	Beam	Tube	A500 Gr...	Typical
3	M3	N12	N11			Brace	Beam	Tube	A500 Gr...	Typical
4	M4	N11	N7			Brace	Beam	Tube	A500 Gr...	Typical
5	M5	N6	N10			Brace	Beam	Tube	A500 Gr...	Typical
6	M6	N10	N9			Brace	Beam	Tube	A500 Gr...	Typical
7	M7	N9	N5			Brace	Beam	Tube	A500 Gr...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	.5	0	0	
3	N3	0	6	0	0	
4	N4	0	21	0	0	
5	N5	2.25	.5	1	0	
6	N6	-2.25	.5	1	0	
7	N7	2.25	6	1	0	
8	N8	-2.25	6	1	0	
9	N9	2.25	.5	0	0	
10	N10	-2.25	.5	0	0	
11	N11	2.25	6	0	0	
12	N12	-2.25	6	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	N8	Reaction	Reaction	Reaction			
2	N7	Reaction	Reaction	Reaction			
3	N5	Reaction	Reaction	Reaction			
4	N6	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.138	18
2	M1	Y	-.021	18
3	M1	Y	-.024	18
4	M1	Y	-.16	18

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.74	18
2	M1	Y	-.073	18
3	M1	Y	-.077	18
4	M1	Y	-.04	18

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.31	18
2	M1	X	.024	18
3	M1	X	.021	18

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.944	18
2	M1	X	.037	18
3	M1	X	.029	18

Member Point Loads (BLC 6 : (z) TIA Wind with Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.31	18
2	M1	Z	.024	18
3	M1	Z	.021	18

Member Point Loads (BLC 7 : (z) TIA Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.944	18
2	M1	Z	.037	18
3	M1	Z	.029	18

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	-.019	-.019	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.027	-.027	0	0
2	M1	Y	-.18	-.18	0	0
3	M2	Y	-.026	-.026	0	0
4	M3	Y	-.026	-.026	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
5	M4	Y	-.026	-.026	0	0
6	M5	Y	-.026	-.026	0	0
7	M6	Y	-.026	-.026	0	0
8	M7	Y	-.026	-.026	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.006	.006	0	0
2	M1	X	.011	.011	0	0
3	M2	X	.01	.01	0	0
4	M4	X	.01	.01	0	0
5	M5	X	.01	.01	0	0
6	M7	X	.01	.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.016	.016	0	0
2	M1	X	.03	.03	0	0
3	M5	X	.027	.027	0	0
4	M2	X	.027	.027	0	0
5	M7	X	.027	.027	0	0
6	M4	X	.027	.027	0	0

Member Distributed Loads (BLC 6 : (z) TIA Wind with Ice)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.006	.006	0	0
2	M1	Z	.011	.011	0	0
3	M3	Z	.01	.01	0	0
4	M6	Z	.01	.01	0	0

Member Distributed Loads (BLC 7 : (z) TIA Wind)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.016	.016	0	0
2	M1	Z	.03	.03	0	0
3	M3	Z	.027	.027	0	0
4	M6	Z	.027	.027	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					4	1		
3	Weight of Ice Only	None					4	8		
4	(x) TIA Wind with Ice	None					3	6		
5	(x) TIA Wind	None					3	6		
6	(z) TIA Wind with Ice	None					3	4		
7	(z) TIA Wind	None					3	4		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.2D + 1.6W (X-dire...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dire...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-dire...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-dire...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	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	N8	max	3.481	5	2.226	6	1.698	1	0	1	0	1	0	1
2		min	-3.307	1	-2.238	2	-3.936	5	0	1	0	1	0	1
3	N7	max	-.079	3	3.203	1	.364	3	0	1	0	1	0	1
4		min	-3.481	5	1.575	5	-3.936	5	0	1	0	1	0	1
5	N5	max	1.954	5	1.834	3	2.161	5	0	1	0	1	0	1
6		min	-.297	3	-.754	5	-.527	3	0	1	0	1	0	1
7	N6	max	1.638	1	2.041	3	2.161	5	0	1	0	1	0	1
8		min	-1.954	5	-.754	5	-.976	1	0	1	0	1	0	1
9	Totals:	max	0	4	7.804	6	0	3						
10		min	-3.334	1	1.642	2	-3.55	5						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	6	.007	5	.006	3	-7.158e-05	2	0	6	3.375e-04	1
2		min	-.003	1	-.041	3	-.007	5	-6.827e-04	4	-4.503e-05	1	0	5
3	N2	max	0	6	.007	5	.004	3	-7.158e-05	2	0	6	3.374e-04	1
4		min	-.005	1	-.041	3	-.011	5	-6.826e-04	4	-4.503e-05	1	0	5
5	N3	max	.011	1	.008	5	.02	5	3.226e-03	5	1.477e-04	1	0	6
6		min	0	6	-.042	3	-.004	3	-3.54e-04	3	0	6	-1.951e-03	1
7	N4	max	1.674	1	.007	5	1.911	5	1.306e-02	5	1.477e-04	1	0	6
8		min	0	6	-.044	3	-.068	3	-3.609e-04	3	0	6	-1.179e-02	1
9	N5	max	0	3	0	5	0	3	-2.844e-05	2	4.155e-04	1	1.038e-03	3
10		min	0	5	0	3	0	5	-1.709e-03	6	-3.823e-05	5	-4.293e-04	5
11	N6	max	0	5	0	5	0	1	-8.993e-05	5	4.091e-04	2	4.293e-04	5
12		min	0	1	0	3	0	5	-1.849e-03	3	-3.052e-06	6	-9.998e-04	3
13	N7	max	0	5	0	5	0	5	2.064e-03	5	6.813e-05	5	1.177e-03	6
14		min	0	3	0	1	0	3	-2.482e-03	1	-8.871e-04	1	-2.829e-04	2
15	N8	max	0	1	0	2	0	5	2.064e-03	5	-3.681e-06	6	-7.028e-04	2
16		min	0	5	0	6	0	1	-1.356e-03	3	-8.806e-04	2	-1.177e-03	6
17	N9	max	0	5	0	2	0	3	-3.447e-05	2	2.74e-04	1	1.038e-03	3
18		min	-.005	1	-.021	6	0	5	-1.528e-03	6	-2.503e-04	5	-4.293e-04	5
19	N10	max	0	6	-.001	5	0	1	-1.724e-04	5	2.503e-04	5	4.293e-04	5
20		min	-.005	2	-.022	3	0	5	-1.629e-03	3	-2.359e-05	3	-9.998e-04	3
21	N11	max	.011	1	.025	5	0	5	2.233e-03	5	4.459e-04	5	1.177e-03	6
22		min	0	5	-.03	1	0	3	-2.135e-03	1	-5.678e-04	1	-2.829e-04	2
23	N12	max	.011	2	.025	5	0	5	2.233e-03	5	-2.409e-05	6	-7.028e-04	2
24		min	0	6	-.016	3	0	1	-1.209e-03	3	-5.284e-04	2	-1.177e-03	6

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

	Member	Shape	Code Check	Loc...	LC	Shea...	Loc.....		L...	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....		Eqn
1	M1	PIPE_8.0X	.340	6.125	4	.044	5.906		5	307.719	374.85	81.375	81.375	1	H1-1b
2	M2	HSS6x6x4	.146	1	2	.057	0	z	5	216.551	216.936	38.64	38.64	1...	H1-1b
3	M3	HSS6x6x4	.240	2.25	4	.151	4.5	y	1	209.278	216.936	38.64	38.64	1...	H1-1b
4	M4	HSS6x6x4	.162	0	1	.057	0	z	5	216.551	216.936	38.64	38.64	1...	H1-1b
5	M5	HSS6x6x4	.079	1	3	.033	0	y	3	216.551	216.936	38.64	38.64	1...	H1-1b
6	M6	HSS6x6x4	.142	2.25	3	.095	0	y	3	209.278	216.936	38.64	38.64	1...	H1-1b
7	M7	HSS6x6x4	.075	0	5	.032	0	z	5	216.551	216.936	38.64	38.64	1...	H1-1b

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N8	-3.307	-2.102	1.698	0	0	0
2	1	N7	-2.955	3.203	-1.306	0	0	0
3	1	N5	1.289	.085	.584	0	0	0
4	1	N6	1.638	1.002	-.976	0	0	0
5	1	Totals:	-3.334	2.189	0			
6	1	COG (ft):	X: 0	Y: 10.989	Z: .02			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N8	-3.262	-2.238	1.648	0	0	0
2	2	N7	-2.997	3.064	-1.354	0	0	0
3	2	N5	1.331	-.05	.632	0	0	0
4	2	N6	1.593	.866	-.926	0	0	0
5	2	Totals:	-3.334	1.642	0			
6	2	COG (ft):	X: 0	Y: 10.989	Z: .02			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N8	-1.331	1.367	1.04	0	0	0
2	3	N7	-.079	2.562	.364	0	0	0
3	3	N5	-.297	1.834	-.527	0	0	0
4	3	N6	.955	2.041	-.878	0	0	0
5	3	Totals:	-.752	7.804	0			
6	3	COG (ft):	X: 0	Y: 11.217	Z: .012			

Joint Reactions

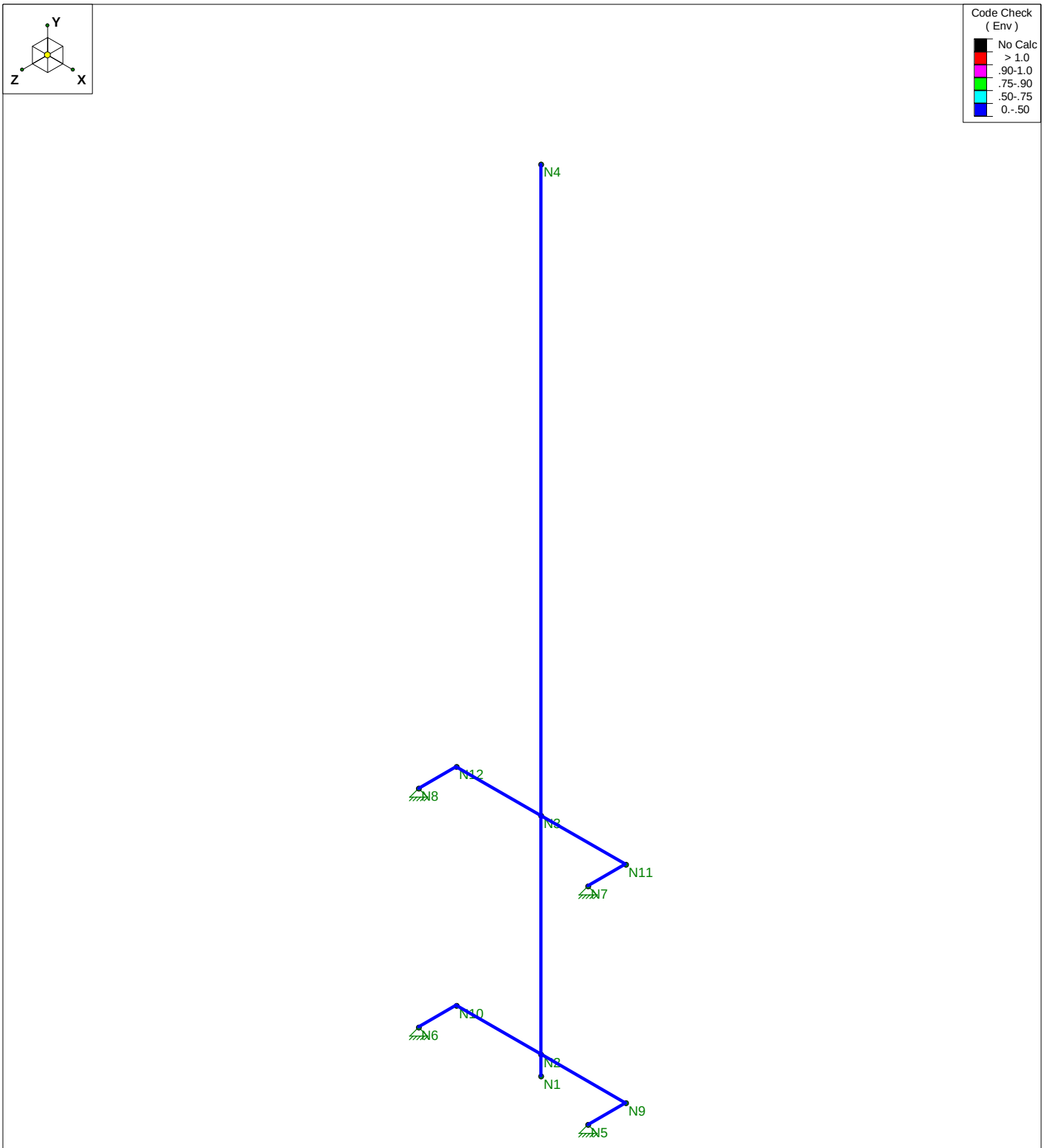
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N8	3.44	1.714	-3.89	0	0	0
2	4	N7	-3.44	1.714	-3.89	0	0	0
3	4	N5	1.913	-.619	2.115	0	0	0
4	4	N6	-1.913	-.619	2.115	0	0	0
5	4	Totals:	0	2.189	-3.55			
6	4	COG (ft):	X: 0	Y: 10.989	Z: .02			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	5	N8	3.481	1.575	-3.936	0	0	0
2	5	N7	-3.481	1.575	-3.936	0	0	0
3	5	N5	1.954	-.754	2.161	0	0	0
4	5	N6	-1.954	-.754	2.161	0	0	0
5	5	Totals:	0	1.642	-3.55			
6	5	COG (ft):	X: 0	Y: 10.989	Z: .02			

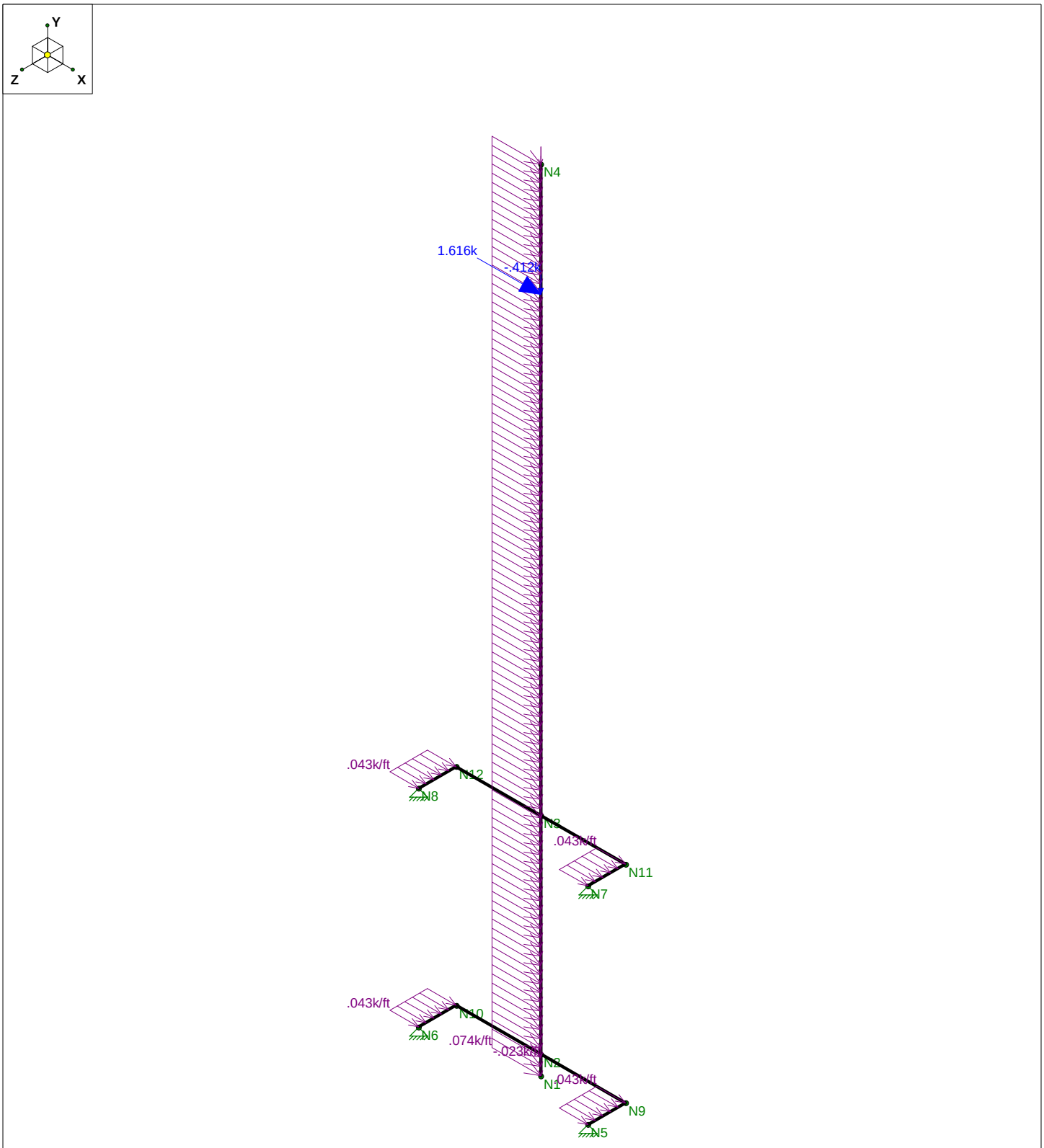
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	6	N8	.188	2.226	-.219	0	0	0
2	6	N7	-.188	2.226	-.219	0	0	0
3	6	N5	-.156	1.676	-.182	0	0	0
4	6	N6	.156	1.676	-.182	0	0	0
5	6	Totals:	0	7.804	-.802			
6	6	COG (ft):	X: 0	Y: 11.217	Z: .012			



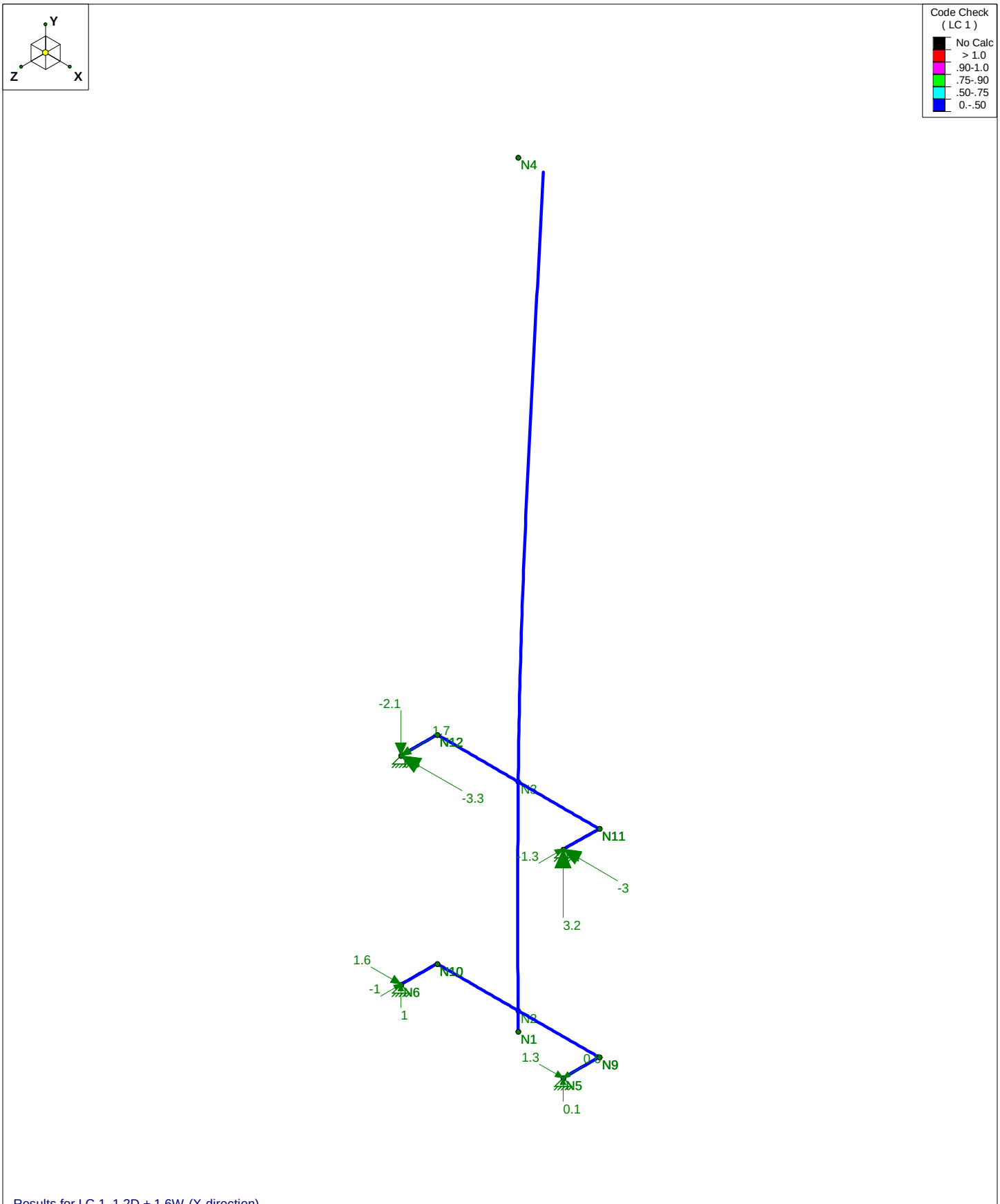
Envelope Only Solution

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:07 AM
17159.17 - CT43XC837	Unity Check	TIA.r3d



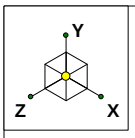
Loads: LC 1, 1.2D + 1.6W (X-direction)

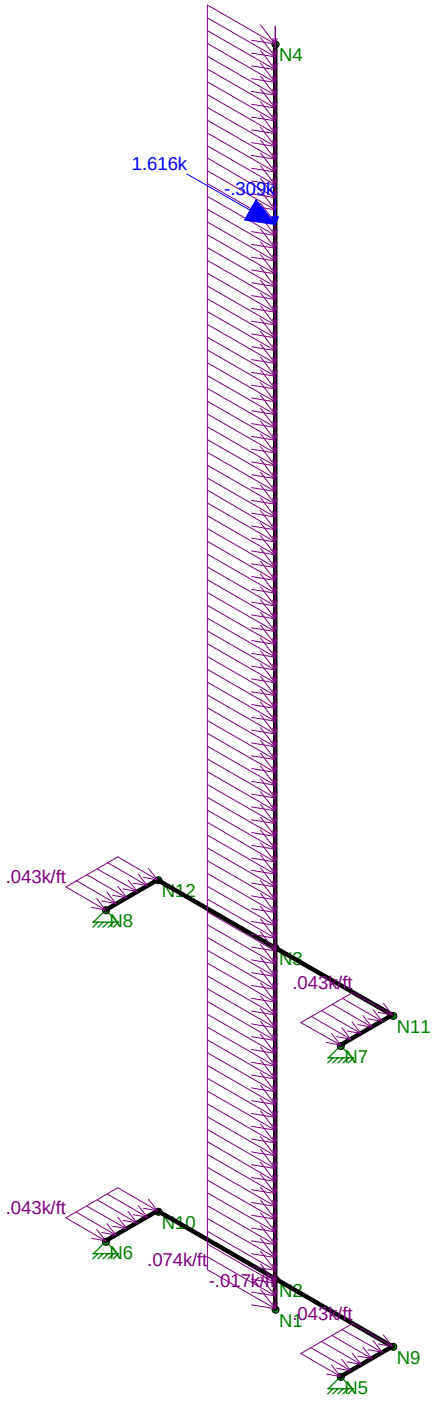
CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:07 AM
17159.17 - CT43XC837	LC #1 Loads	TIA.r3d



Results for LC 1, 1.2D + 1.6W (X-direction)
Reaction and Moment Units are k and k-ft

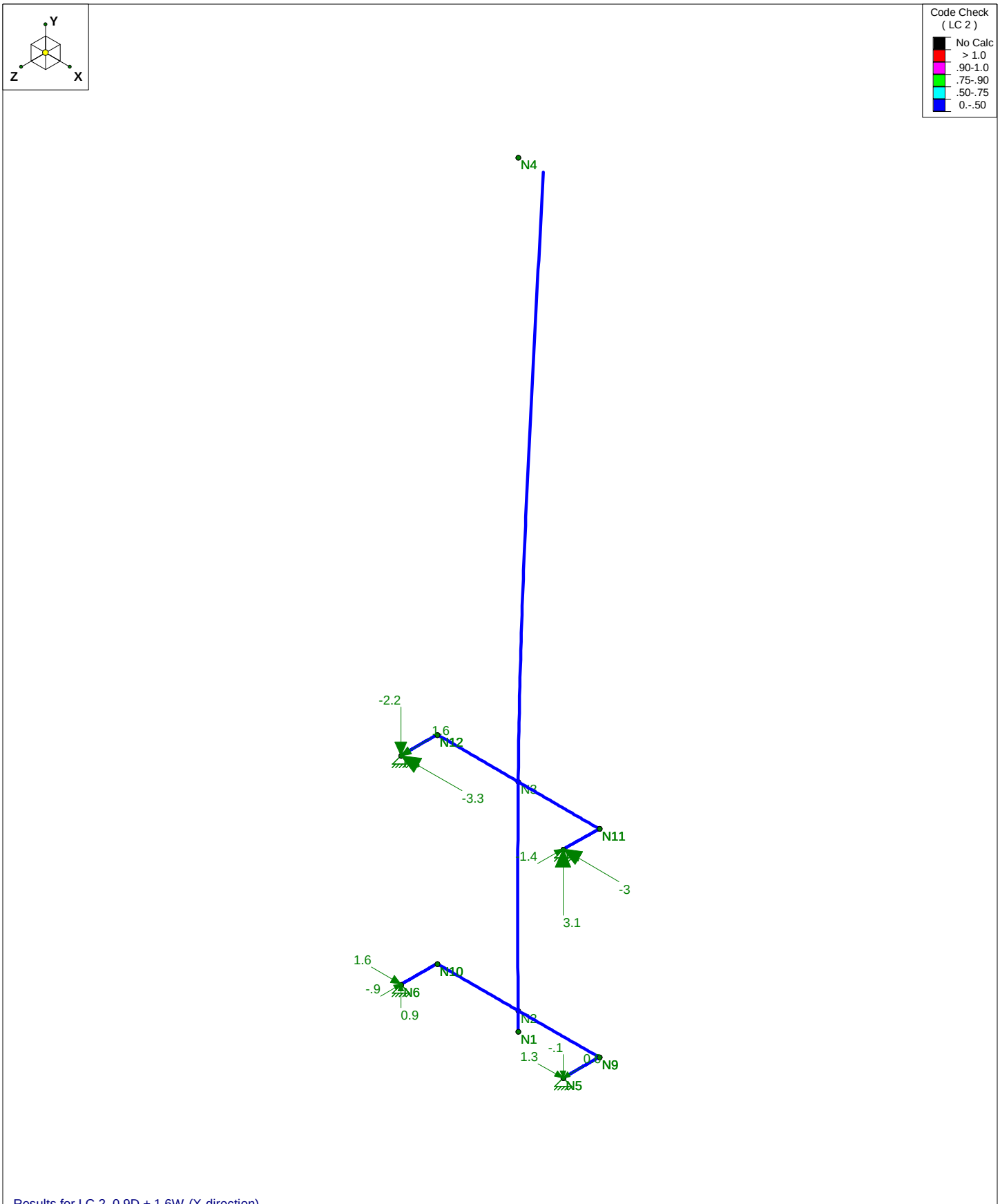
CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:09 AM
17159.17 - CT43XC837	LC #1 Reactions and Deflected Shape	TIA.r3d





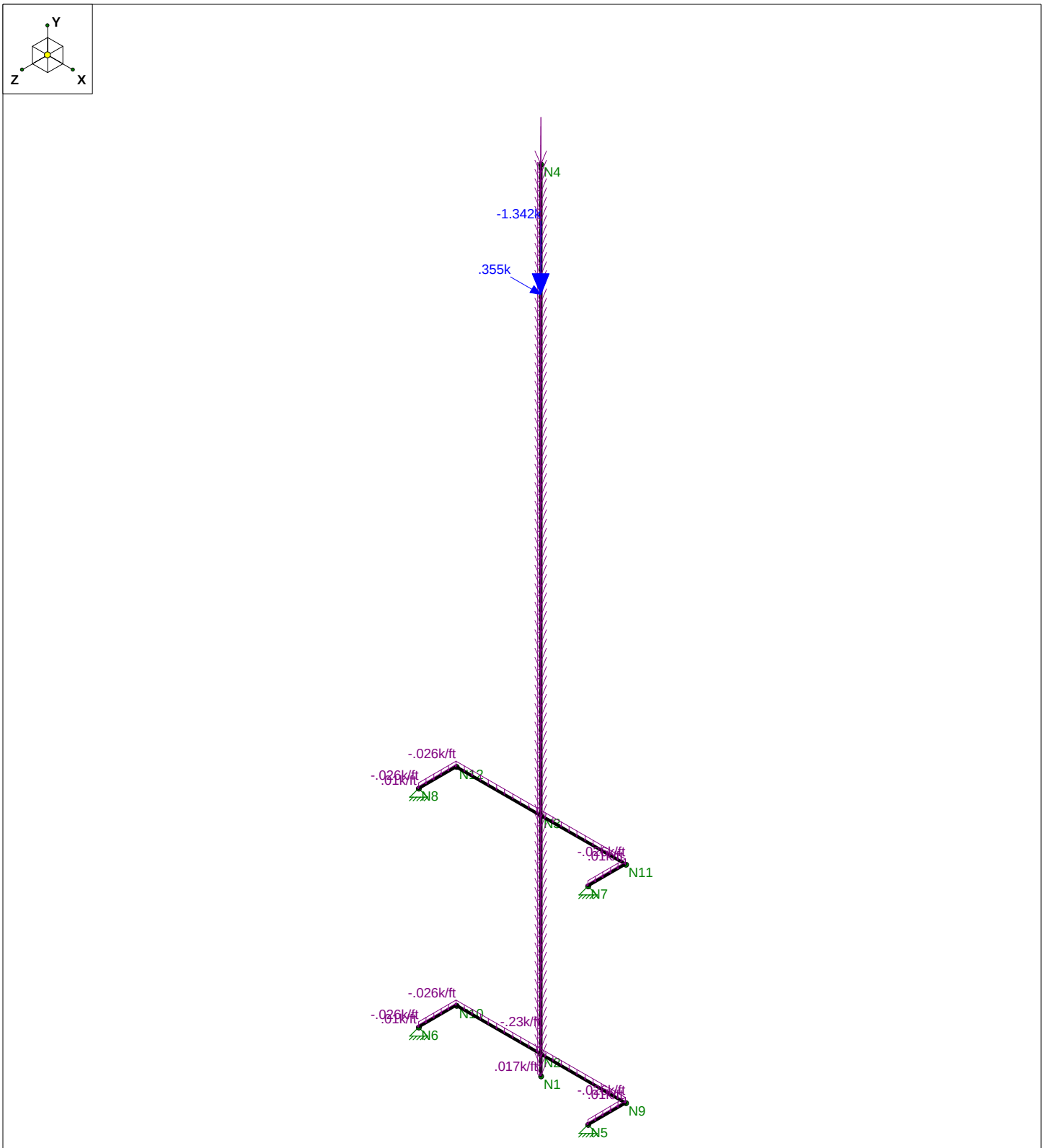
Loads: LC 2, 0.9D + 1.6W (X-direction)

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:08 AM
17159.17 - CT43XC837	LC #2 Loads	TIA.r3d



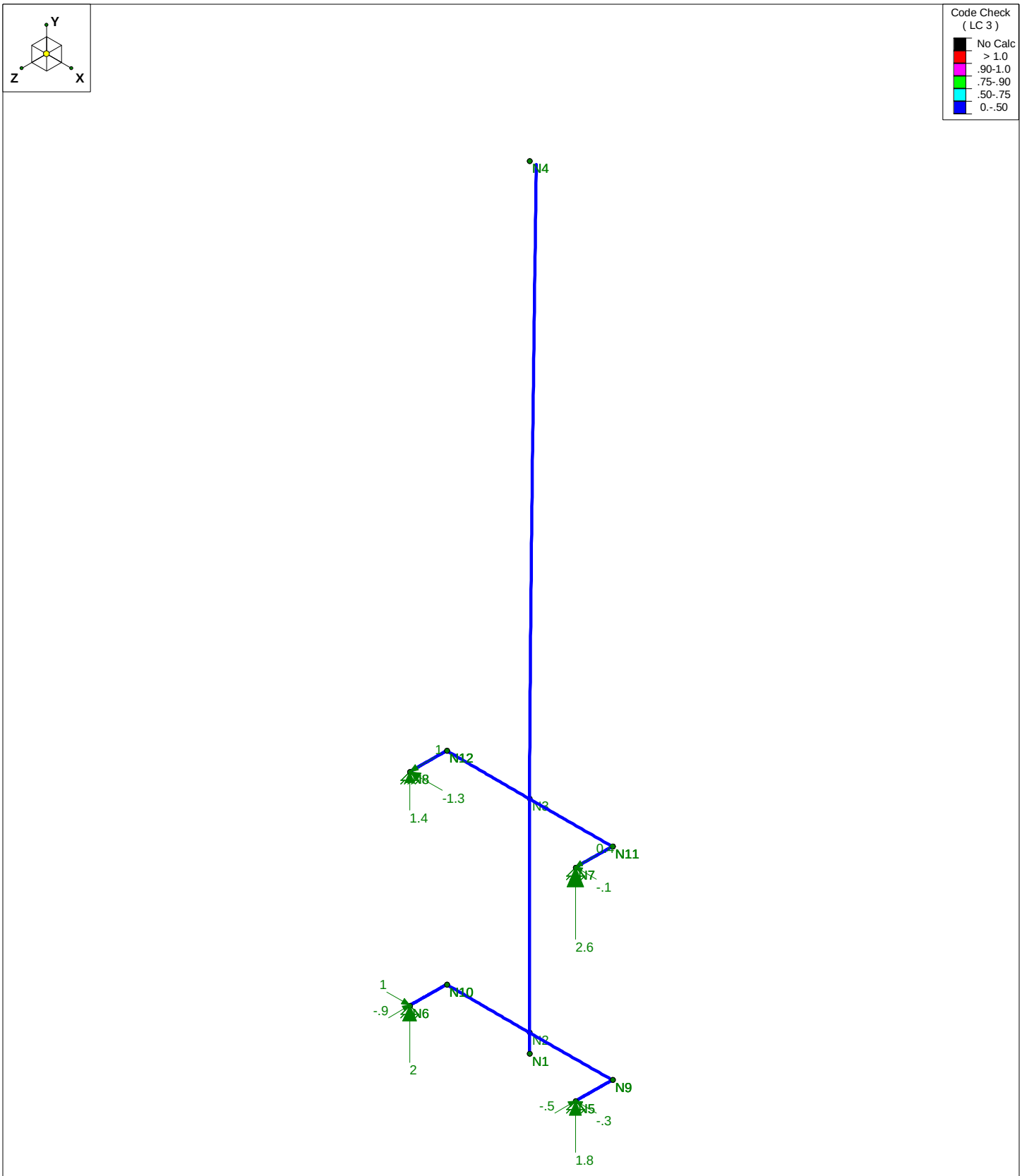
Results for LC 2, 0.9D + 1.6W (X-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:10 AM
17159.17 - CT43XC837	LC #2 Reactions and Deflected Shape	TIA.r3d



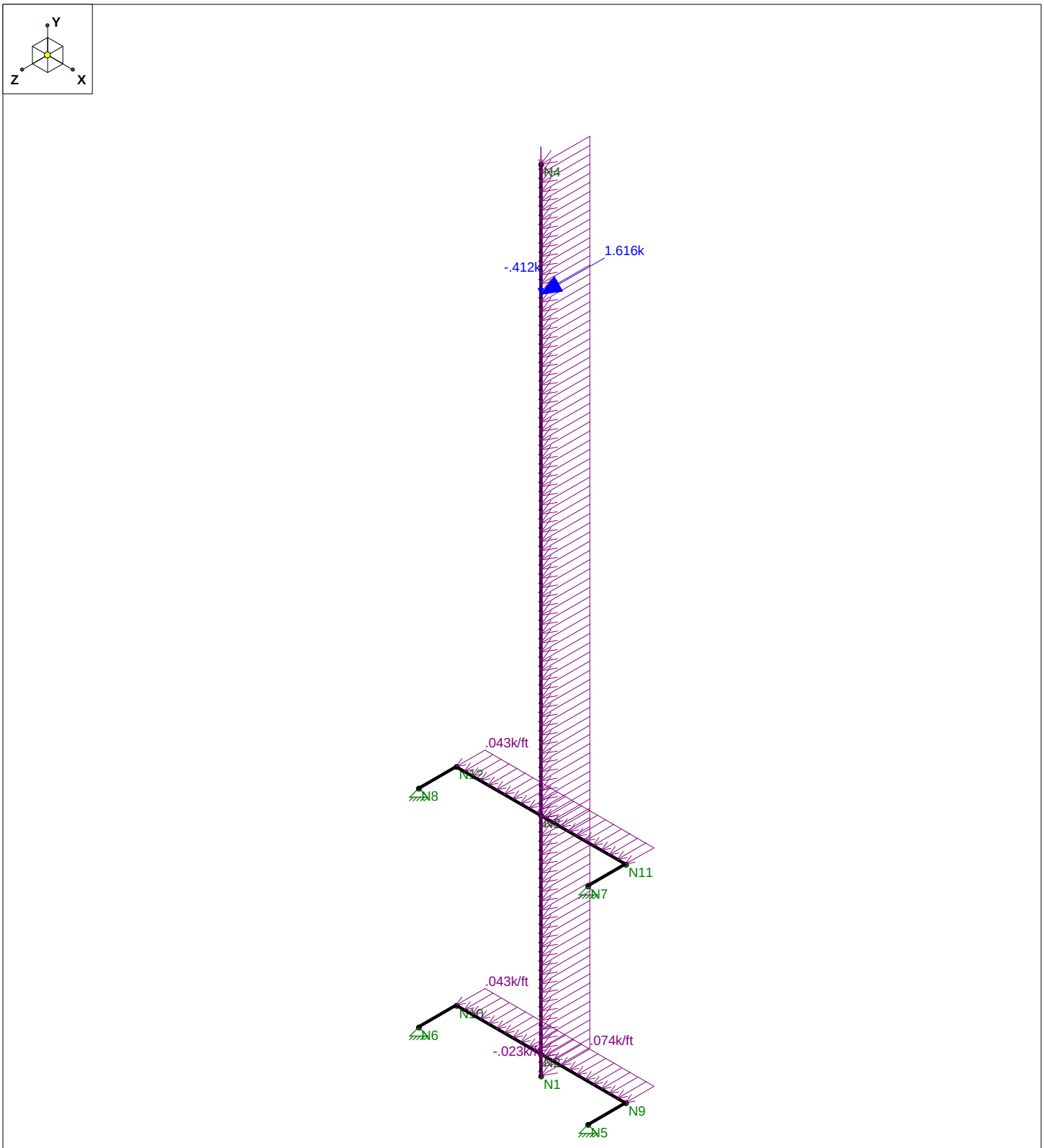
Loads: LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:08 AM
17159.17 - CT43XC837	LC #3 Loads	TIA.r3d



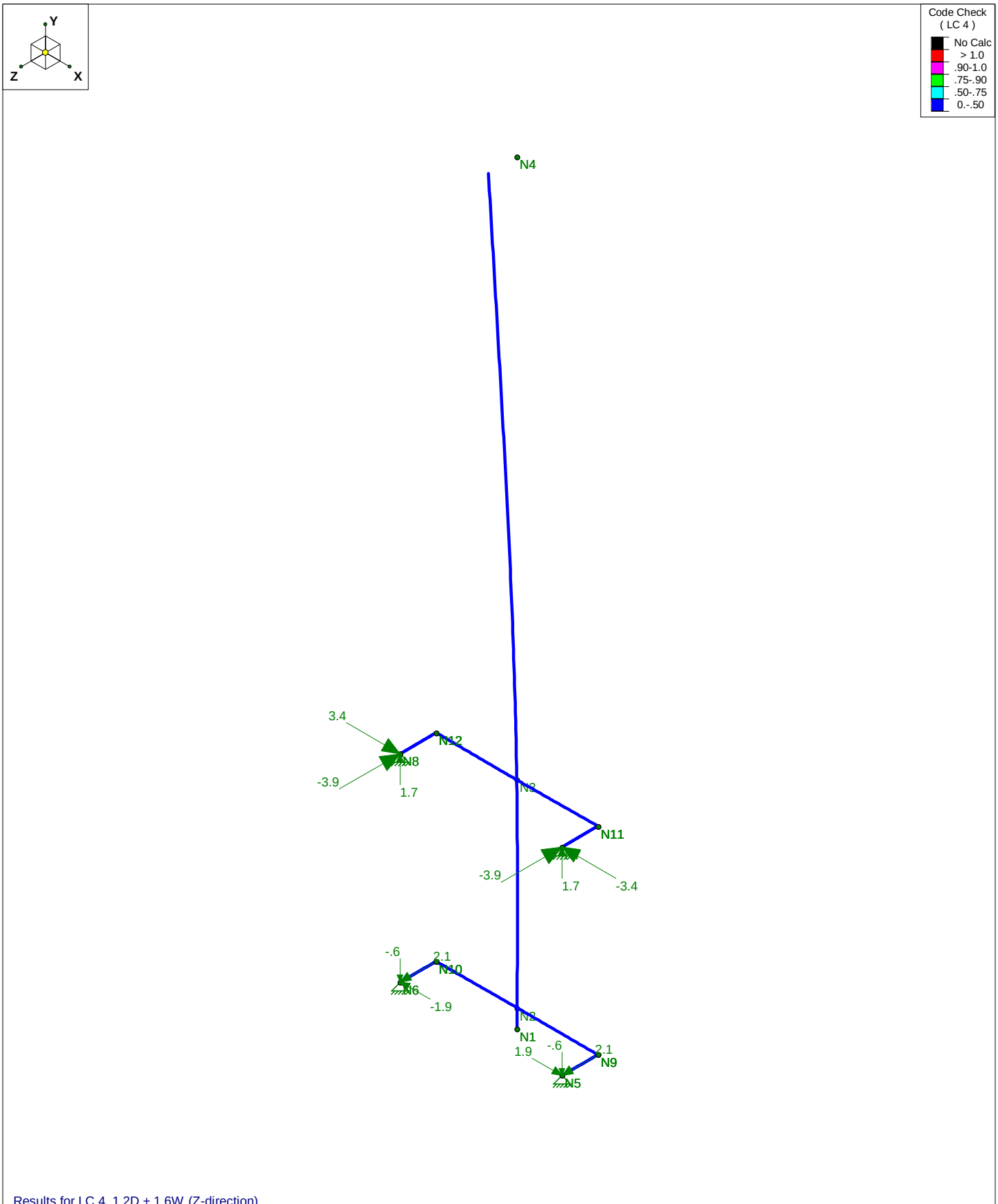
Results for LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:10 AM
17159.17 - CT43XC837	LC #3 Reactions and Deflected Shape	TIA.r3d



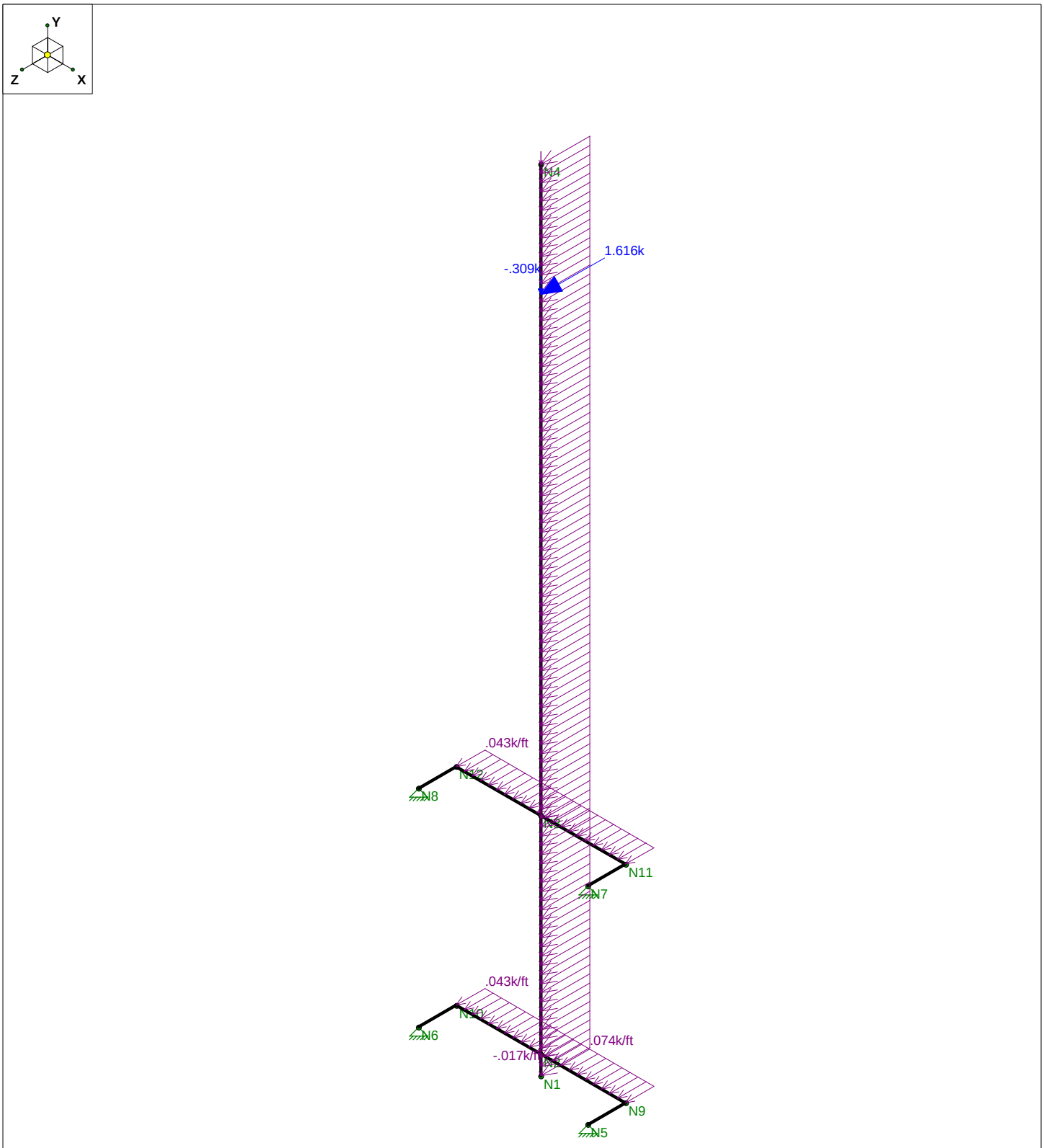
Loads: LC 4, 1.2D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:08 AM
17159.17 - CT43XC837	LC #4 Loads	TIA.r3d



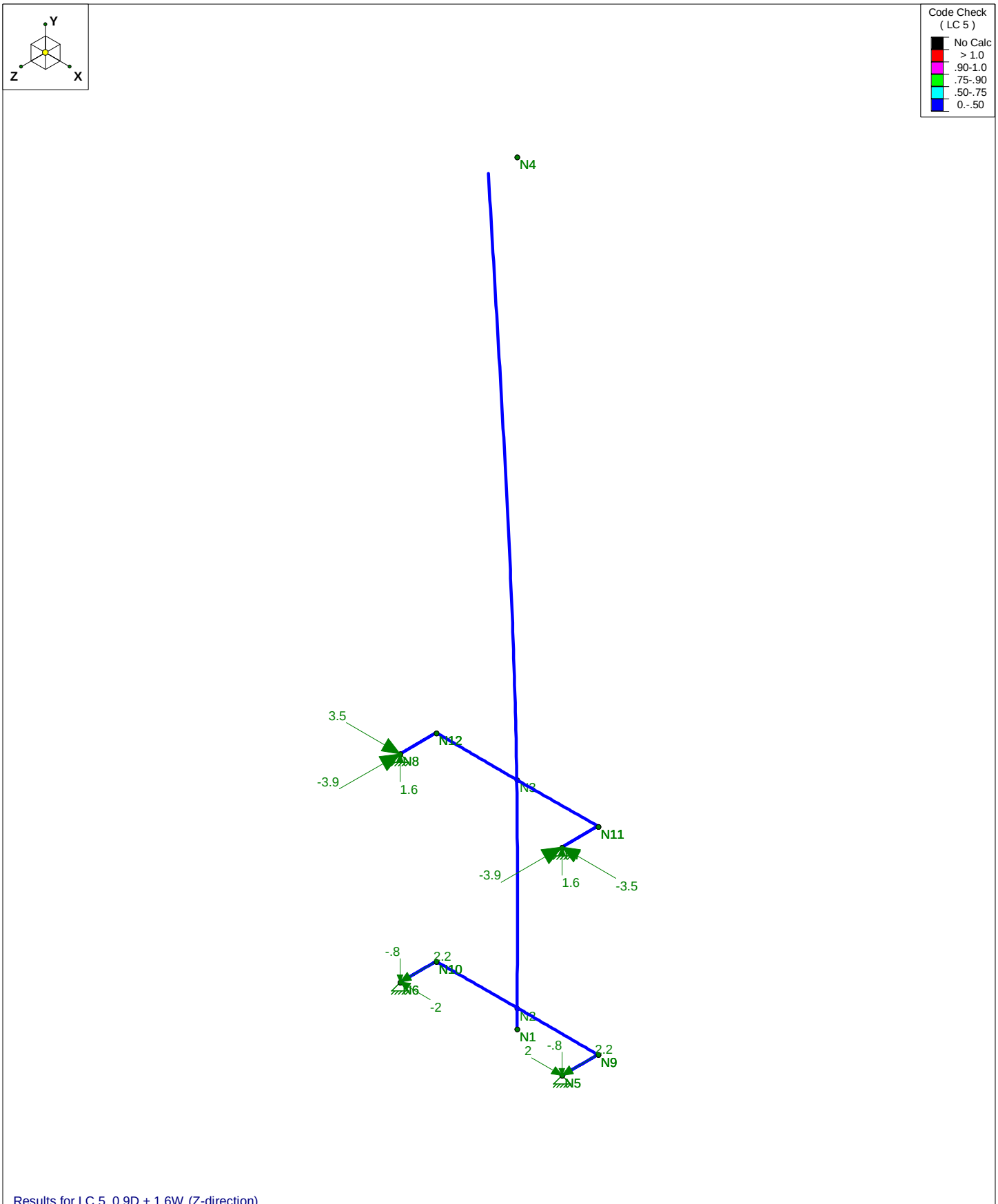
Results for LC 4, 1.2D + 1.6W (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:11 AM
17159.17 - CT43XC837	LC #4 Reactions and Deflected Shape	TIA.r3d



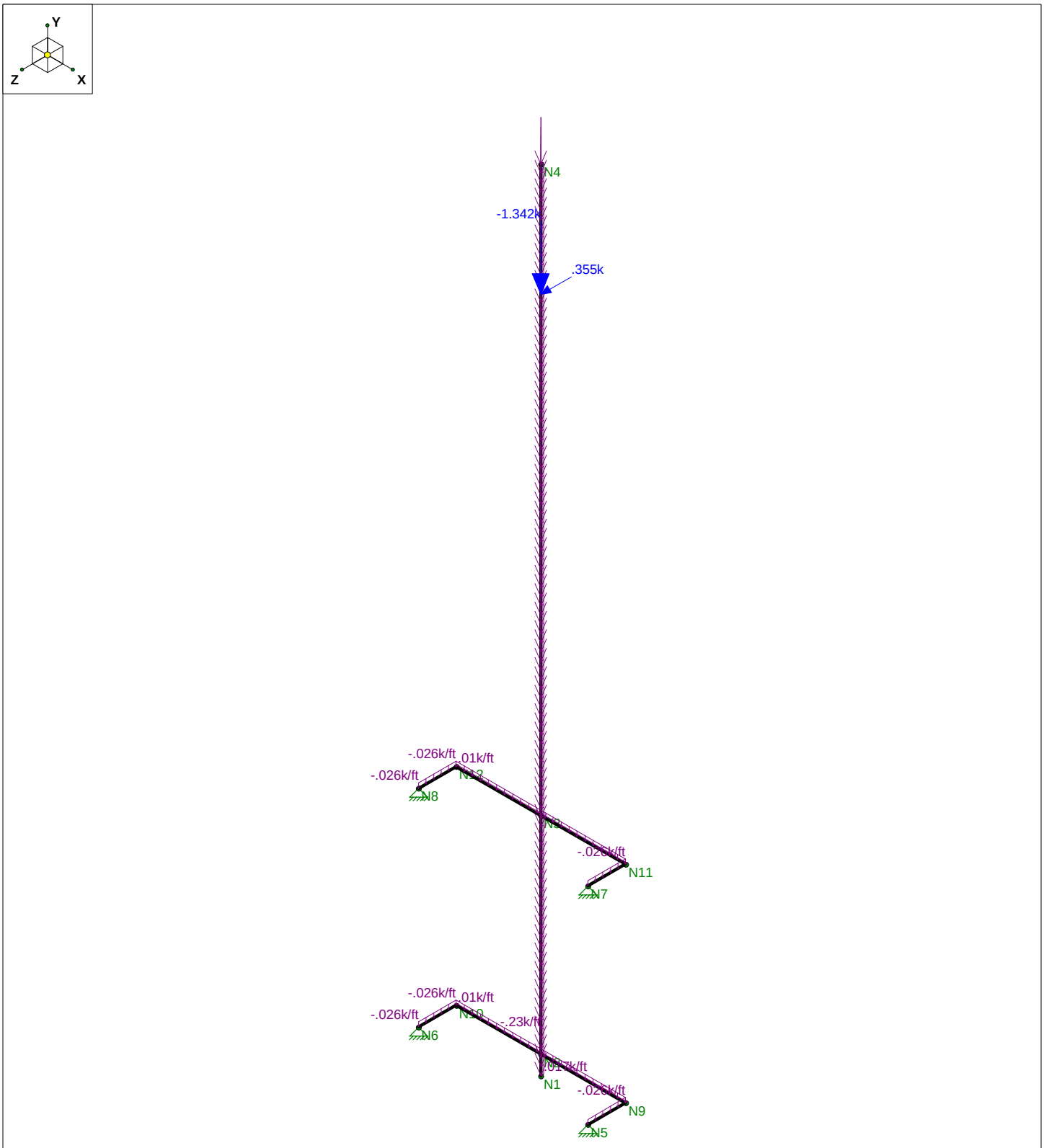
Loads: LC 5, 0.9D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:08 AM
17159.17 - CT43XC837	LC #5 Loads	TIA.r3d



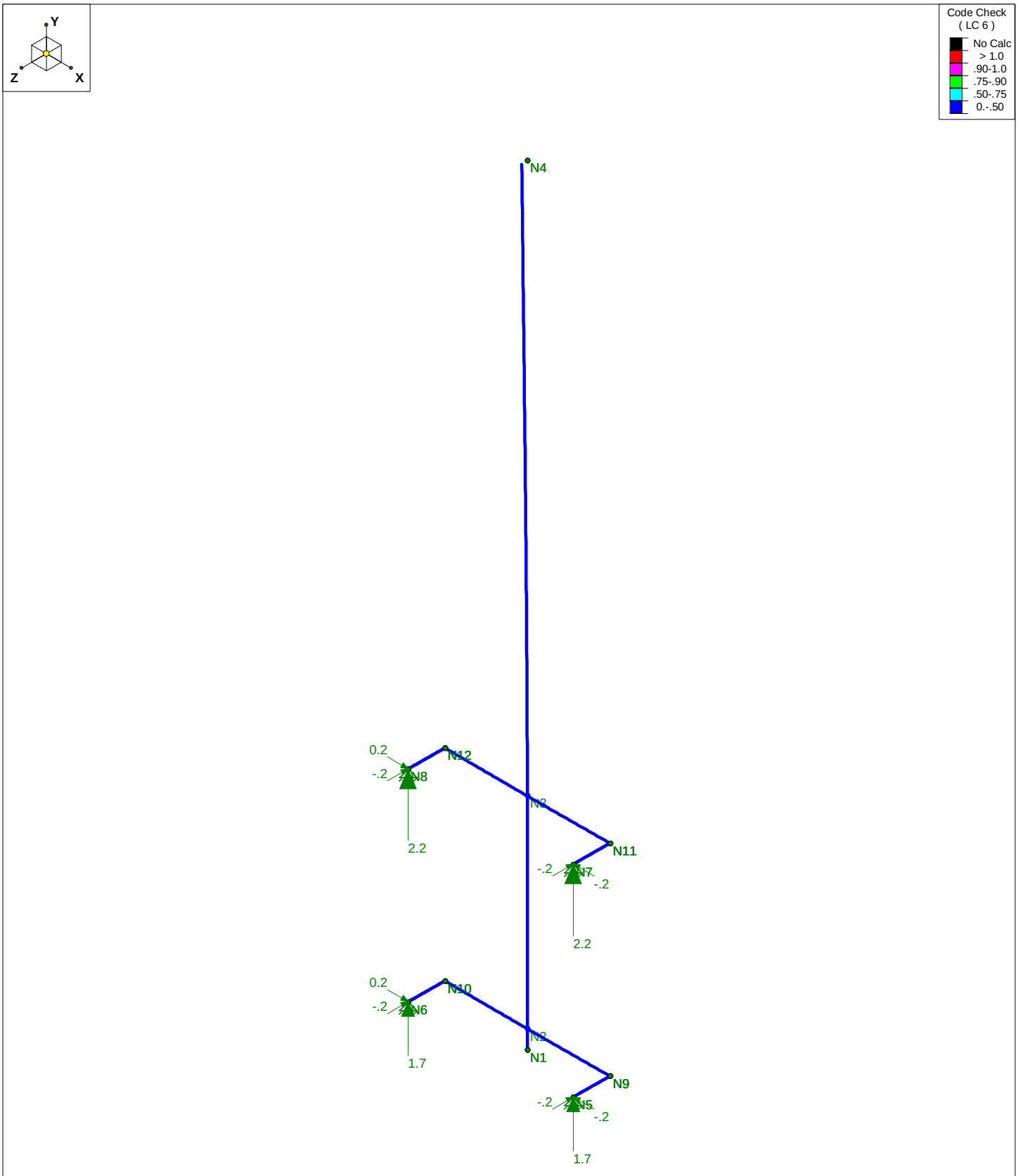
Results for LC 5, 0.9D + 1.6W (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:11 AM
17159.17 - CT43XC837	LC #5 Reactions and Deflected Shape	TIA.r3d



Loads: LC 6, 1.2D + 1.0Di + 1.0Wi (Z-direction)

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:09 AM
17159.17 - CT43XC837	LC #6 Loads	TIA.r3d



Results for LC 6, 1.2D + 1.0Di + 1.0Wi (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Structure Tower # 280 - Mast	Jan 24, 2018 at 11:11 AM
17159.17 - CT43XC837	LC #6 Reactions and Deflected Shape	TIA.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:	Connection of Mast to Tower # 280
Location:	Stratford, CT
Rev. 0: 1/24/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.17

Mast Connection to Tower:

Reactions:

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

Vertical = $Vertical := 3.2 \cdot kips$ (Input From Risa-3D)

Horizontal x-dir = $Horizontal_x := 3.5 \cdot kips$ (Input From Risa-3D)

Horizontal z-dir = $Horizontal_z := 4.0 \cdot kips$ (Input From Risa-3D)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

Bolt Diameter = $D := 0.5 \cdot in$ (User Input)

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

Design Tensile Strength = $F_t := 13.23 \cdot kips$ (User Input)

Design Shear Strength (Slip-Critical Bolt) = $F_v := 4.07 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{\sqrt{Horizontal_z^2 + Vertical^2}}{N_b} = 1.3 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 31.46 \cdot \%$

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

$Bolt\_Shear = "OK"$

Tension Force = $f_t := \frac{Horizontal_x}{N_b} = 0.9 \cdot kips$

Bolt Tenison % of Capacity = $\frac{f_t}{F_t} = 6.61 \cdot \%$

Check Bolt Tension = $Bolt\_Tension := if\left(\frac{f_t}{F_t} \le 1.00, "OK", "Overstressed"\right)$

$Bolt\_Tension = "OK"$

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: Load Analysis of Equipment on Tower # 280

Location: Stratford, CT

Rev. 0: 1/24/18

Prepared by: T.J.L Checked by: C.F.C.
Job No. 17159.17

Basic Components

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2007 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 110	mph	(User Input NESC 2007 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 := 85	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 2007 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2007 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.223$ (NESC 2007 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.32$ (NESC 2007 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.873$ (NESC 2007 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.884$ (NESC 2007 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 33.5$ psf (NESC 2007 Section 250.C.2)

Shape Factors

NUS Design Criteria Issued April 12, 2007

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 =	$Cd_{coax} := 1.45$	(User Input)

Overload Factors

NU Design Criteria Table

Overload Factors for Wind Loads:

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

Overload Factors for Vertical Loads:

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

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

Subject:	Load Analysis of Equipment on Tower # 280
Location:	Stratford, CT
Rev. 0: 1/24/18	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.17

Development of Wind & Ice Load on PCS Mast

PCS Mast Data: (Pipe 8" SCH. 80)

Mast Shape =	Round		(User Input)
Mast Diameter =	$D_{mast} := 8.63$	in	(User Input)
Mast Length =	$L_{mast} := 21$	ft	(User Input)
Mast Thickness =	$t_{mast} := 0.5$	in	(User Input)

Wind Load (NESC Extreme)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 0.719$ sf/ft

Total Mast Wind Force (Above NU Structure) =	$qz \cdot Cd_R \cdot A_{mast} \cdot m = 39$	plf	**BLC 5**
Total Mast Wind Force (Below NU Structure) =	$qz \cdot Cd_R \cdot A_{mast} = 31$	plf	**BLC 5**

Wind Load (NESE Heavy)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot Ir)}{12} = 0.803$ sf/ft

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

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[(D_{mast} + Ir \cdot 2)^2 - D_{mast}^2\right] = 14.3$ sq in

Weight of Ice on Mast =	$W_{ICEmast} := Id \cdot \frac{Ai_{mast}}{144} = 6$	plf	**BLC 3**

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

Subject: Load Analysis of Equipment on Tower # 280

Location: Stratford, CT

Rev. 0: 1/24/18

Prepared by: T.J.L Checked by: C.F.C.
Job No. 17159.17

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Commscope DHHTT65B-3XR		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72.1$	in	(User Input)
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)
Antenna Weight =	$WT_{ant} := 46$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant1} := WT_{ant} \cdot N_{ant} = 138$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6092$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 1546$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 50$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 150$ lbs **BLC 3**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right)}{144} = 6.5$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.6$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 126$ lbs **BLC 4**

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

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

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 17.9$ sf

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1197$ lbs **BLC 5**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS KIT-FD9R6004/1C-DL Diplexer		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 5.8$	in	(User Input)
Antenna Width =	$W_{ant} := 6.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 7$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant2} := WT_{ant} \cdot N_{ant} = 21$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 173$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 112$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 4$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 11$ lbs **BLC 3**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

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

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.1$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 7$ lbs **BLC 4**

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.3$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 0.8$ sf

Total Antenna Wind Force = $F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 53$ lbs **BLC 5**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	CCI DPO-7126Y-0-T1 Diplexer		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 4.07$	in	(User Input)
Antenna Width =	$W_{ant} := 7.42$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6.26$	in	(User Input)
Antenna Weight =	$WT_{ant} := 8$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant3} := WT_{ant} \cdot N_{ant} = 24$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 189$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 121$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 4$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant3} := W_{ICEant} \cdot N_{ant} = 12$ lbs **BLC 3**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right)}{144} = 0.3$ sf

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

Total Antenna Wind Force w/ Ice = $Fi_{ant3} := p \cdot Cd_F \cdot A_{ICEant} = 6$ lbs **BLC 4**

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.2$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 0.6$ sf

Total Antenna Wind Force = $F_{ant3} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 42$ lbs **BLC 5**

Development of Wind & Ice Load on Mounts

Mount Data: (Sprint)

Mount Type = Tri-Sector Chain Mount

Platform Shape = Flat (User Input)

Mount Weight = $WT_{mnt} := 160$ lbs (User Input)

Mount Weight w/ Ice = $WT_{mnt.ice} := 200$ lbs (User Input)

Wind Load (NESC Extreme)

Total Platform Wind Force = $F_{plt} := 0$ (Mount Shielded by Antennas) lbs **BLC 5**

Wind Load (NESC Heavy)

Total Platform Wind Force w/ Ice = $Fi_{plt} := 0$ (Mount Shielded by Antennas) lbs **BLC 4**

Gravity Load (without ice)

Weight of Platform = $WT_{mnt} = 160$ lbs **BLC 2**

Gravity Loads (ice only)

Weight of Ice on Platform = $WT_{mnt.ice} - WT_{mnt} = 40$ lbs **BLC 3**

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

Subject:	Load Analysis of Equipment on Tower # 280
Location:	Stratford, CT
Rev. 0: 1/24/18	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.17

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 1-5/8"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)
Coax Cable Length =	$L_{coax} := 18$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 18$		(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 4$		(User Input)

Wind Load (NESC Extreme)

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

Total Coax Wind Force (Above NU Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} \cdot m = 40$ plf **BLC 5**

Total Coax Wind Force (Below NU Structure) = $F_{coax} := qz \cdot Cd_{coax} \cdot A_{coax} = 32$ plf **BLC 5**

Wind Load (NESC Heavy)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{NP_{coax} \cdot (D_{coax} + 2 \cdot Ir)}{12} = 1$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := p \cdot Cd_{coax} \cdot AICE_{coax} = 6$ plf **BLC 4**

Gravity Loads (without ice)

Weight of all cables w/o ice $WT_{coax} := Wt_{coax} \cdot N_{coax} = 19$ plf **BLC 2**

Gravity Load (ice only)

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

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 27$ plf **BLC 3**

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Development of Wind & Ice Load on Brace Member

Member Data: HSS6x6x1/4

Shape =	Flat		(User Input)
Width =	$W_{mem} := 6$	in	(User Input)
Length =	$L_{mem} := 4.5$	ft	(User Input)
Height =	$H_{mem} := 6$	in	(User Input)

Wind Load (NESC Extreme)

Member Projected Surface Area = $A_{mem} := \frac{W_{mem}}{12} = 0.5$

Total Member Wind Force = $qz \cdot Cd_F \cdot A_{mem} = 27$ plf **BLC 5**

Wind Load (NESE Heavy)

Member Projected Surface Area w/ Ice = $AICE_{mem} := \frac{(W_{mem} + 2 \cdot Ir)}{12} = 0.583$

Total Member Wind Force w/ Ice = $p \cdot Cd_F \cdot AICE_{mem} = 4$ plf **BLC 4**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mem} := (W_{mem} + 2 \cdot Ir) \cdot (H_{mem} + 2 \cdot Ir) - W_{mem} \cdot H_{mem} = 13$ sq in

Weight of Ice on Member = $W_{ICEmem} := Id \cdot \frac{Ai_{mem}}{144} = 5$ plf **BLC 3**

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Subject:	Coax Cable Loads Tower # 280
Location:	Stratford, CT
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Coax Cable on Tower

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 2007 Figure 250-2(e))

Height to Top of Coax Above Grade = $TC := 85$ ft (User Input)

NESC Factor = $kv := 1.43$ (User Input from NESC 2007 Table 250-3 equation)

Importance Factor = $I := 1.0$ (User Input from NESC 2007 Section 250.C.2)

Velocity Pressure Coefficient = $Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.124$ (NESC 2007 Table 250-2)

Exposure Factor = $Es := 0.346\left[\frac{33}{(0.67 \cdot TC)}\right]^{\frac{1}{7}} = 0.32$ (NESC 2007 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TC}{220}\right)} = 0.873$ (NESC 2007 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.884$ (NESC 2007 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 30.8$ psf (NESC 2007 Section 250.C.2)

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Coax Cable on CL&P Tower

(Sprint - NE Leg)

Distance Between Coax Cable Attach Points =

Coax Cable Span = $Coax_{Span} := \begin{pmatrix} 3.5 \\ 7.375 \\ 8.125 \\ 7.375 \\ 9.75 \\ 13.25 \\ 15 \end{pmatrix} \cdot ft$ *(User Input)*

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

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

Number of Coax Cables = $N_{coax} := 12$ *(User Input)*

Number of Projected Coax Cables Transverse = $NP_{Tcoax} := 6$ *(User Input)*

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

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

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

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

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

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

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

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

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 18.179 \cdot plf$

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Heavy Vertical Load =

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

Heavy Transverse Load =

$$Heavy_{Trans} := \overrightarrow{\left(p \cdot A_{Tice} \cdot Cd_{coax} \cdot Coax_{Span} \cdot OF_{HW}\right)}$$

$$Heavy_{Vert} = \begin{pmatrix} 161 \\ 339 \\ 374 \\ 339 \\ 448 \\ 609 \\ 690 \end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix} 60 \\ 127 \\ 140 \\ 127 \\ 167 \\ 228 \\ 258 \end{pmatrix} lb$$

Extreme Vertical Load =

$$Extreme_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax}\right) \cdot Coax_{Span} \cdot OF_{EV}\right]}$$

Extreme Transverse Load =

$$Extreme_{Trans} := \overrightarrow{\left[\left(qz \cdot psf \cdot A_T \cdot Cd_{coax}\right) \cdot Coax_{Span} \cdot OF_{EW}\right]}$$

$$Extreme_{Vert} = \begin{pmatrix} 44 \\ 92 \\ 101 \\ 92 \\ 122 \\ 165 \\ 187 \end{pmatrix} lb \qquad Extreme_{Trans} = \begin{pmatrix} 171 \\ 360 \\ 396 \\ 360 \\ 475 \\ 646 \\ 731 \end{pmatrix} lb$$

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Coax Cable on CL&P Tower

(Sprint - NW Leg)

Distance Between Coax Cable Attach Points =

Coax Cable Span = $Coax_{Span} := \begin{pmatrix} 3.5 \\ 7.375 \\ 8.125 \\ 7.375 \\ 9.75 \\ 13.25 \\ 15 \end{pmatrix} \cdot ft$ *(User Input)*

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

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

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

Number of Projected Coax Cables Transverse = $NP_{Tcoax} := 3$ *(User Input)*

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

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

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

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

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

Wind Area with Ice Transverse = $A_{Tice} := \left(NP_{Tcoax} \cdot D_{coax} + 2 \cdot Ir\right) = 6.94 \cdot in$

Wind Area without Ice Transverse = $A_T := \left(NP_{Tcoax} \cdot D_{coax}\right) = 5.94 \cdot in$

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

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

Heavy Vertical Load =

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

Heavy Transverse Load =

$$Heavy_{Trans} := \overrightarrow{\left(p \cdot A_{Tice} \cdot Cd_{coax} \cdot Coax_{Span} \cdot OF_{HW}\right)}$$

$$Heavy_{Vert} = \begin{pmatrix} 80 \\ 170 \\ 187 \\ 170 \\ 224 \\ 305 \\ 345 \end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix} 32 \\ 68 \\ 75 \\ 68 \\ 90 \\ 123 \\ 139 \end{pmatrix} lb$$

Extreme Vertical Load =

$$Extreme_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax}\right) \cdot Coax_{Span} \cdot OF_{EV}\right]}$$

Extreme Transverse Load =

$$Extreme_{Trans} := \overrightarrow{\left[\left(qz \cdot psf \cdot A_T \cdot Cd_{coax}\right) \cdot Coax_{Span} \cdot OF_{EW}\right]}$$

$$Extreme_{Vert} = \begin{pmatrix} 22 \\ 46 \\ 51 \\ 46 \\ 61 \\ 83 \\ 94 \end{pmatrix} lb \qquad Extreme_{Trans} = \begin{pmatrix} 85 \\ 180 \\ 198 \\ 180 \\ 238 \\ 323 \\ 366 \end{pmatrix} lb$$

(Global) Model Settings

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

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

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 R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Mast	PIPE 8.0X	Beam	Pipe	A53 Gr. B	Typical	11.9	100	100	199
2	Brace	HSS6x6x4	Beam	Tube	A500 Gr.46	Typical	5.24	28.6	28.6	45.6

Hot Rolled Steel Design Parameters

	Label	Shape	Length...	Lbyy[ft]	Lbzz[ft]	Lcomp to...	Lcomp bo...	Kyy	Kzz	Cm-yy	Cm-zz	Cb	y sway	z sway	Function
1	M1	Mast	21			Lbyy									Lateral
2	M2	Brace	1			Lbyy									Lateral
3	M3	Brace	4.5			Lbyy									Lateral
4	M4	Brace	1			Lbyy									Lateral
5	M5	Brace	1			Lbyy									Lateral
6	M6	Brace	4.5			Lbyy									Lateral
7	M7	Brace	1			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			Mast	Beam	Pipe	A53 Gr. B	Typical
2	M2	N8	N12			Brace	Beam	Tube	A500 Gr...	Typical
3	M3	N12	N11			Brace	Beam	Tube	A500 Gr...	Typical
4	M4	N11	N7			Brace	Beam	Tube	A500 Gr...	Typical
5	M5	N6	N10			Brace	Beam	Tube	A500 Gr...	Typical
6	M6	N10	N9			Brace	Beam	Tube	A500 Gr...	Typical
7	M7	N9	N5			Brace	Beam	Tube	A500 Gr...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	.5	0	0	
3	N3	0	6	0	0	
4	N4	0	21	0	0	
5	N5	2.25	.5	1	0	
6	N6	-2.25	.5	1	0	
7	N7	2.25	6	1	0	
8	N8	-2.25	6	1	0	
9	N9	2.25	.5	0	0	
10	N10	-2.25	.5	0	0	
11	N11	2.25	6	0	0	
12	N12	-2.25	6	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	N8	Reaction	Reaction	Reaction			
2	N7	Reaction	Reaction	Reaction			
3	N5	Reaction	Reaction	Reaction			
4	N6	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.138	18
2	M1	Y	-.021	18
3	M1	Y	-.024	18
4	M1	Y	-.16	18

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.15	18
2	M1	Y	-.011	18
3	M1	Y	-.012	18
4	M1	Y	-.04	18

Member Point Loads (BLC 4 : x-dir NESC Heavy Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.126	18
2	M1	X	.007	18
3	M1	X	.006	18

Member Point Loads (BLC 5 : x-dir NESC Extreme Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	1.197	18
2	M1	X	.053	18
3	M1	X	.042	18

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	-.019	-.019	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.006	-.006	0	0
2	M1	Y	-.027	-.027	0	0
3	M2	Y	-.005	-.005	0	0
4	M3	Y	-.005	-.005	0	0
5	M4	Y	-.005	-.005	0	0
6	M5	Y	-.005	-.005	0	0
7	M6	Y	-.005	-.005	0	0
8	M7	Y	-.005	-.005	0	0

Member Distributed Loads (BLC 4 : x-dir NESC Heavy Wind)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.004	.004	0	0
2	M1	X	.006	.006	0	0
3	M2	X	.004	.004	0	0
4	M5	X	.004	.004	0	0
5	M7	X	.004	.004	0	0
6	M4	X	.004	.004	0	0

Member Distributed Loads (BLC 5 : x-dir NESC Extreme Wind)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.031	.031	0	12
2	M1	X	.039	.039	12	0
3	M1	X	.032	.032	0	12
4	M1	X	.04	.04	12	0
5	M2	X	.027	.027	0	0
6	M4	X	.027	.027	0	0
7	M5	X	.027	.027	0	0
8	M7	X	.027	.027	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight (Mast)	None		-1						
2	Weight of Appurtenances	None					4	1		
3	Weight of Ice Only	None					4	8		
4	x-dir NESC Heavy Wind	None					3	6		
5	x-dir NESC Extreme Wind	None					3	8		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	x-dir NESC Heavy ...	Yes			1	1.5	2	1.5	3	1.5	4	2.5												
2	x-dir NESC Extreme...	Yes			1	1	2	1	5	1														
3	Self Weight				1	1																		

Envelope Joint Reactions

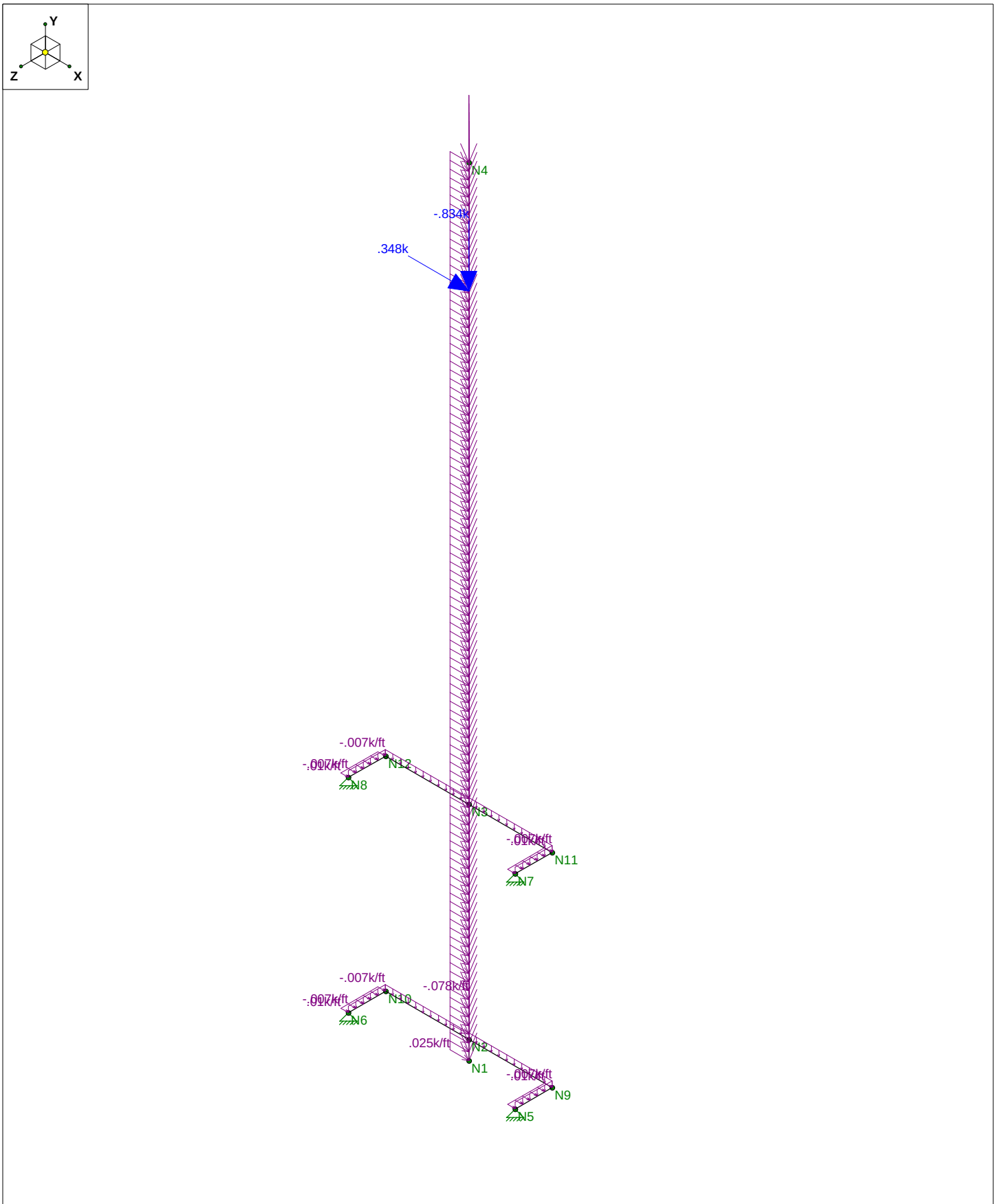
	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N8	max	-1.155	1	.423	1	1.466	2	0	1	0	1	0	1
2		min	-2.898	2	-1.724	2	.764	1	0	1	0	1	0	1
3	N7	max	-.496	1	2.641	2	-.015	1	0	1	0	1	0	1
4		min	-2.613	2	1.686	1	-1.141	2	0	1	0	1	0	1
5	N5	max	1.179	2	.935	1	.516	2	0	1	0	1	0	1
6		min	.04	1	.078	2	-.184	1	0	1	0	1	0	1
7	N6	max	1.465	2	1.148	1	-.566	1	0	1	0	1	0	1
8		min	.698	1	.829	2	-.841	2	0	1	0	1	0	1
9	Totals:	max	-.913	1	4.193	1	0	2						
10		min	-2.867	2	1.824	2	0	1						

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N8	-1.155	.423	.764	0	0	0
2	1	N7	-.496	1.686	-.015	0	0	0
3	1	N5	.04	.935	-.184	0	0	0
4	1	N6	.698	1.148	-.566	0	0	0
5	1	Totals:	-.913	4.193	0			
6	1	COG (ft):	X: 0	Y: 11.222	Z: .016			

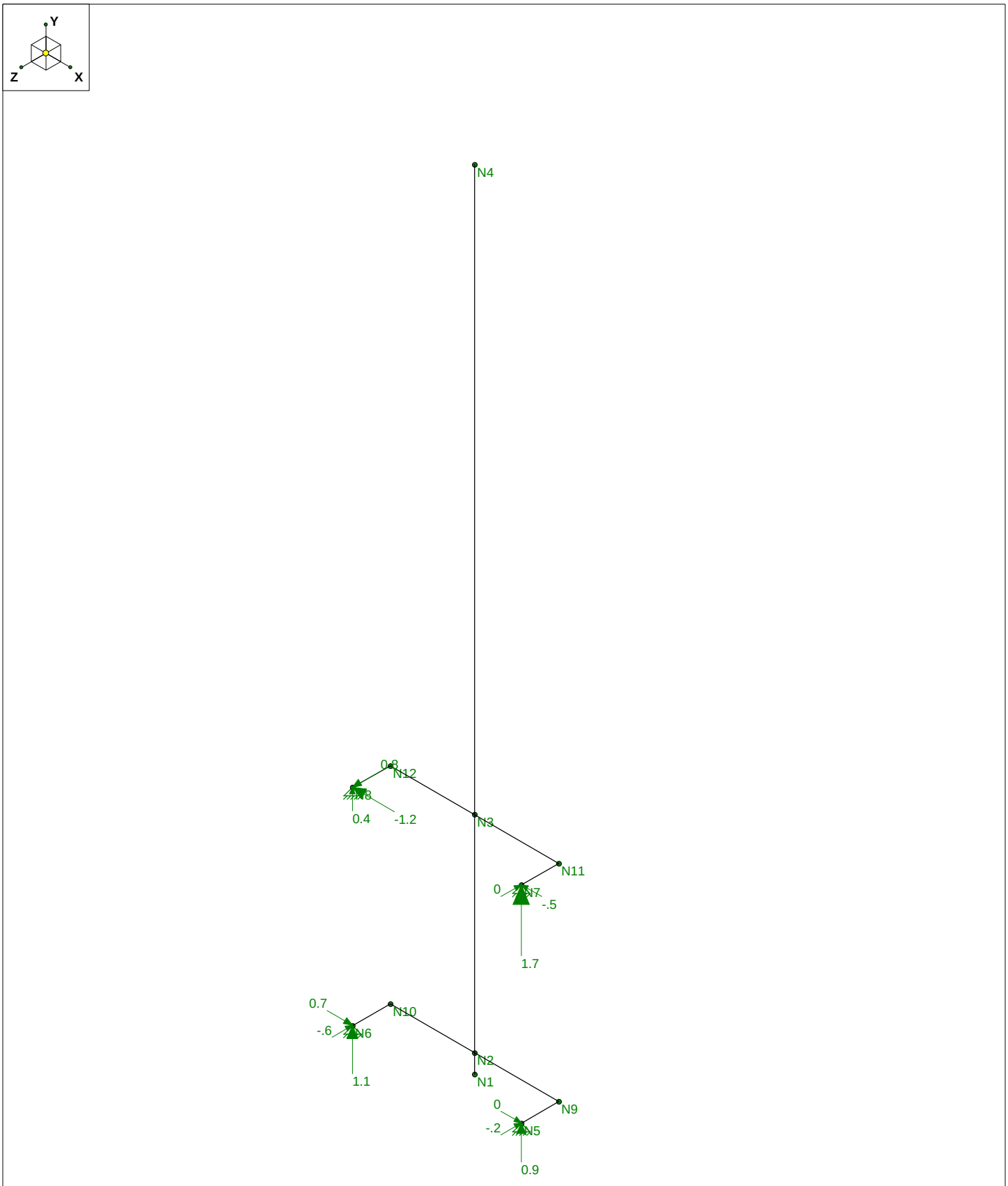
Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N8	-2.898	-1.724	1.466	0	0	0
2	2	N7	-2.613	2.641	-1.141	0	0	0
3	2	N5	1.179	.078	.516	0	0	0
4	2	N6	1.465	.829	-.841	0	0	0
5	2	Totals:	-2.867	1.824	0			
6	2	COG (ft):	X: 0	Y: 10.989	Z: .02			



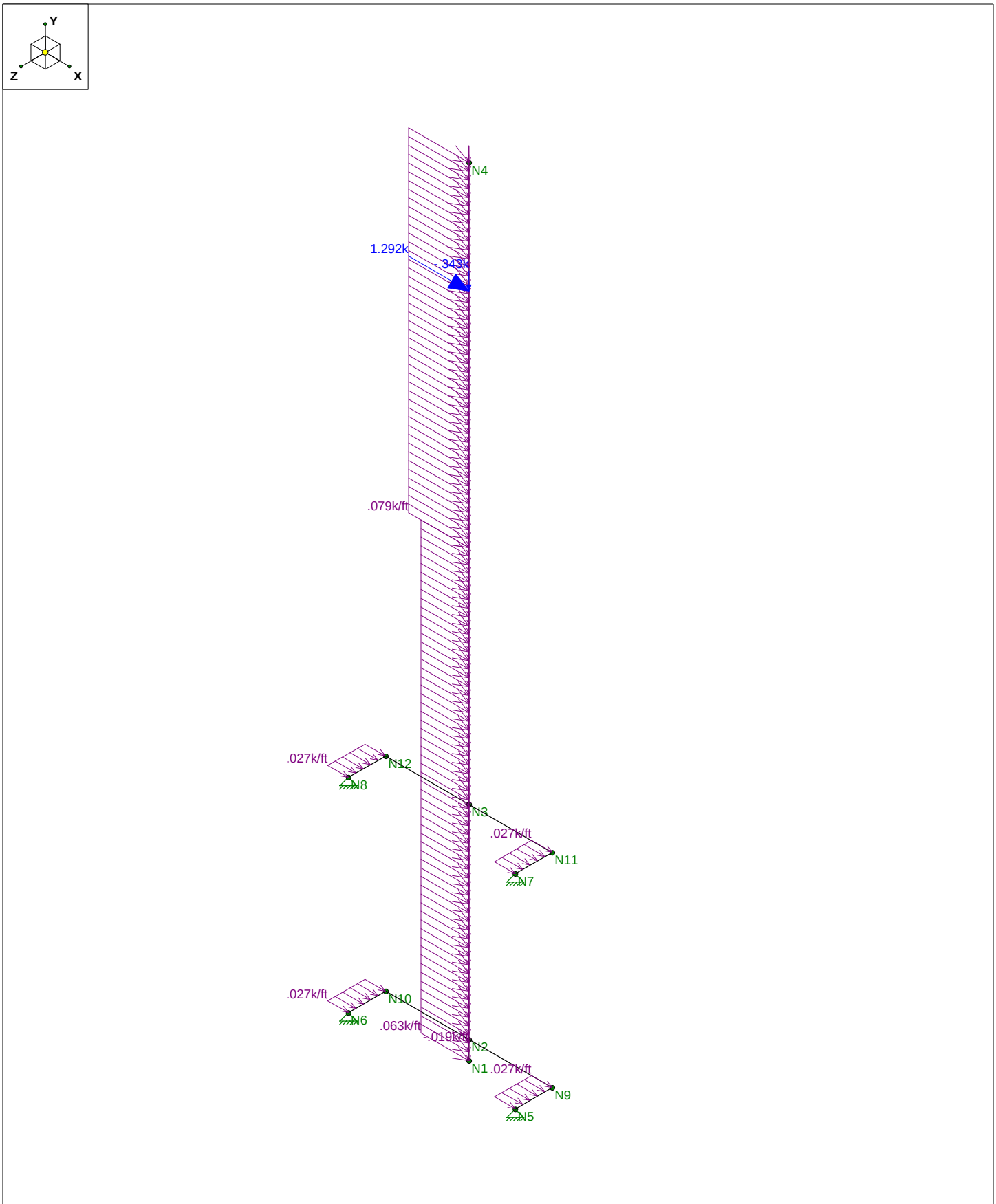
Loads: LC 1, x-dir NESC Heavy Wind on PCS Structure

CENTEK Engineering, Inc.		
tjl, cfc	Structure # 280 - Antenna Mast	Jan 24, 2018 at 10:32 AM
17159.17 - CT43XC837	LC #1 Loads	NESC.r3d



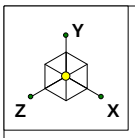
Results for LC 1, x-dir NESC Heavy Wind on PCS Structure
Reaction and Moment Units are k and k-ft

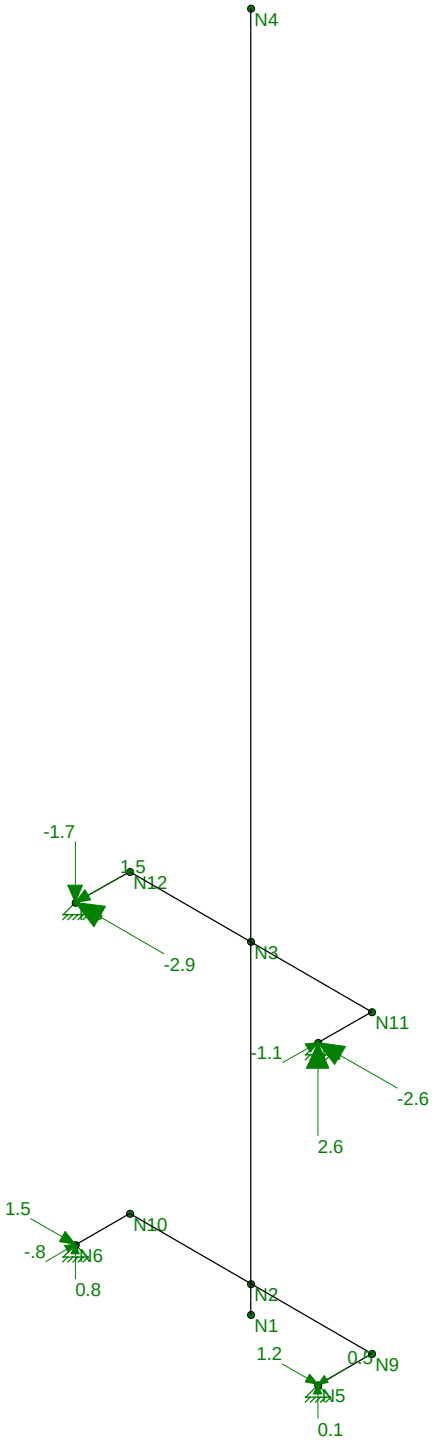
CENTEK Engineering, Inc.		
tjl, cfc	Structure # 280 - Antenna Mast	Jan 24, 2018 at 10:41 AM
17159.17 - CT43XC837	LC #1 Reactions	NESC.r3d



Loads: LC 2, x-dir NESC Extreme Wind on PCS Structure

CENTEK Engineering, Inc.		
tjl, cfc	Structure # 280 - Antenna Mast	Jan 24, 2018 at 10:33 AM
17159.17 - CT43XC837	LC #2 Loads	NESC.r3d

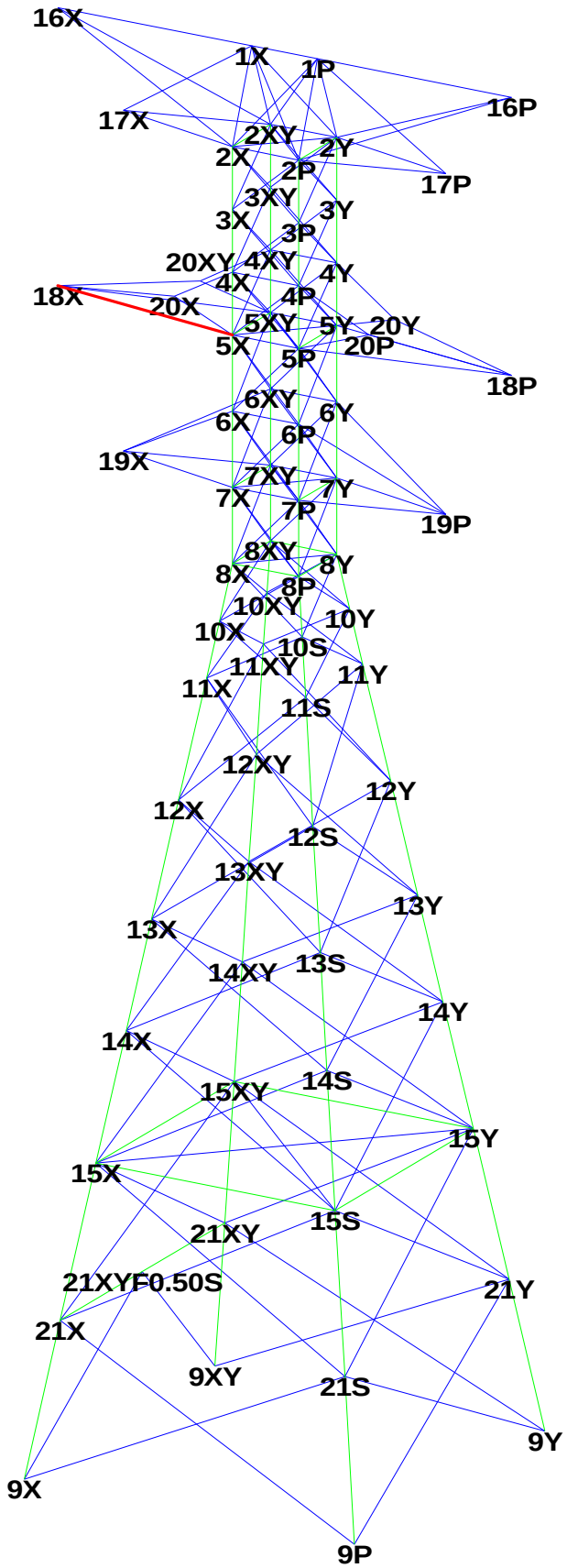


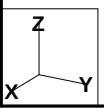


Results for LC 2, x-dir NESC Extreme Wind on PCS Structure
Reaction and Moment Units are k and k-ft

CENTEK Engineering, Inc.		
tjl, cfc	Structure # 280 - Antenna Mast	Jan 24, 2018 at 10:41 AM
17159.17 - CT43XC837	LC #2 Reactions	NESC.r3d

Centek Engineering Inc, Project: "tower #280 reinforced"
Tower Version 12.50, 10:03:50 AM Thursday, October 04, 2018
Undeformed geometry displayed





Project Name : 12014.CO12 - Stratford, CT
Project Notes: CL&P Structure # 280/ Sprint CT43XC837
Project File : J:\Jobs\1715900.WI\17_CT43XC837 Stratford\04_Structural\Calcs\Rev (2)\PLS Tower\tower #280 reinforced.tow
Date run : 10:02:07 AM Thursday, October 04, 2018
by : Tower Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

Angle member "g56P" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
Angle member "g56X" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
Angle member "g57P" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40P" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40X" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40XY" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40Y" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41P" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41X" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41XY" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41Y" ??
KL/R value of 230.76 exceeds maximum of 200.00 for member "g49P" ??
KL/R value of 230.76 exceeds maximum of 200.00 for member "g49Y" ??
KL/R value of 230.76 exceeds maximum of 200.00 for member "g50P" ??
KL/R value of 230.76 exceeds maximum of 200.00 for member "g50X" ??
KL/R value of 418.86 exceeds maximum of 200.00 for member "g55P" ??
KL/R value of 418.86 exceeds maximum of 200.00 for member "g55X" ??
Member "g60P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g60X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g60XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g60Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g61P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g61Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g64P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g64X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g64XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "g64Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71P" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71X" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71XY" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71Y" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g72P" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g72Y" ??
KL/R value of 335.02 exceeds maximum of 200.00 for member "g73P" ??
KL/R value of 335.02 exceeds maximum of 200.00 for member "Fg7373P" ??
KL/R value of 258.82 exceeds maximum of 200.00 for member "g75P" ??
KL/R value of 258.82 exceeds maximum of 200.00 for member "g75Y" ??
The model has 37 warnings. ??

Member check option: ASCE 10
Connection rupture check: ASCE 10
Crossing diagonal check: ASCE 10 [Alternate Unsupported RLOUT = 1]
Included angle check: None
Climbing load check: None
Redundant members checked with: Actual Force

Loads from file: j:\jobs\1715900.wi\17_ct43xc837 stratford\04_structural\calcs\rev (2)\pls tower\cl&p # 280.lca

*** Analysis Results:

Maximum element usage is 97.49% for Angle "g27XY" in load case "NESC Extreme"
Maximum insulator usage is 7.97% for Clamp "24" in load case "NESC Extreme"

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	9P	-3.46	-4.09	-22.98	5.36	0.04	-0.07	0.08	-0.02	0.00
NESC Heavy	9X	1.50	-2.04	9.70	2.53	-0.03	0.04	0.05	0.16	0.00
NESC Heavy	9XY	-1.60	-1.85	9.74	2.44	-0.04	-0.04	0.06	-0.16	0.00
NESC Heavy	9Y	3.56	-3.87	-22.61	5.25	0.03	0.07	0.08	0.02	0.00
NESC Extreme	9P	-5.43	-6.88	-36.01	8.77	0.06	-0.10	0.12	-0.03	0.00
NESC Extreme	9X	4.67	-5.93	29.91	7.55	-0.03	0.08	0.08	0.27	0.00
NESC Extreme	9XY	-4.81	-5.51	29.33	7.31	-0.03	-0.09	0.10	-0.27	0.00
NESC Extreme	9Y	5.57	-6.51	-35.55	8.57	0.05	0.11	0.12	0.03	0.00

Summary of Joint Support Reactions For All Load Cases in Direction of Leg:

Load Case	Support Joint	Origin Joint	Member Leg Dir.	Leg Force In (kips)	Residual Shear Perpendicular To Leg (kips)	Residual Shear Horizontal To Leg - Res. (kips)	Residual Shear Horizontal To Leg - Long. (kips)	Residual Shear Horizontal To Leg - Tran. (kips)	Total Long. Force (kips)	Total Tran. Force (kips)	Total Vert. Force (kips)
NESC Heavy	9P	21S	g70X	23.594	0.467	0.468	-0.216	0.416	-3.46	-4.09	-22.98
NESC Heavy	9X	21X	g70P	-10.011	0.484	0.489	0.053	0.486	1.50	-2.04	9.70
NESC Heavy	9XY	21XY	g70Y	-10.040	0.285	0.290	0.037	0.288	-1.60	-1.85	9.74
NESC Heavy	9Y	21Y	g70XY	23.211	0.255	0.257	0.060	0.250	3.56	-3.87	-22.61
NESC Extreme	9P	21S	g70X	37.046	1.159	1.165	-0.330	1.117	-5.43	-6.88	-36.01
NESC Extreme	9X	21X	g70P	-30.828	1.140	1.151	0.115	1.145	4.67	-5.93	29.91
NESC Extreme	9XY	21XY	g70Y	-30.219	0.808	0.820	0.112	0.813	-4.81	-5.51	29.33
NESC Extreme	9Y	21Y	g70XY	36.557	0.824	0.832	0.121	0.823	5.57	-6.51	-35.55

Overturning Moment Summary For All Load Cases:

Load Case	Transverse Moment (ft-k)	Longitudinal Moment (ft-k)	Resultant Moment (ft-k)
NESC Heavy	650.331	4.175	650.344
NESC Extreme	1308.069	-1.132	1308.069

Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Tran. Face Top Width (ft)	Tran. Face Bot Width (ft)	Tran. Face Gross Area (ft^2)	Long. Face Top Width (ft)	Long. Face Bot Width (ft)	Long. Face Gross Area (ft^2)

```
-------------------------------------------------------------------------------------------------
       1 78.250 50.000    42    145       0.00       4.00    103.000      27.50       4.00    271.740
       2 50.000  0.000    37    104       4.00      20.00    600.000       4.00      20.00    600.000

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress
  Printed capacities do not include the strength factor entered for each load case.
  The Group Summary reports on the member and load case that resulted in maximum usage
  which may not necessarily be the same as that which produces maximum force.
```

Group Summary (Compression Portion):

Group Label	Group Desc.	Angle Size	Angle Type	Steel Strength (ksi)	Max Usage %	Usage Control	Max Cont-rol Use In Comp. %	Comp. Control	Comp. Force (kips)	Comp. Load Case	L/R Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ	L/R	KL/R Comp.	Length (ft)	Curve No.	No. Of Member Bolts
Leg1	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	70.52	Comp	70.52	g5XY	-25.669	NESC Ext	47.089	36.400	56.250	1.000	1.000	1.000	73.49	73.49	4.250	1	4
Leg2	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	93.60	Comp	93.60	g11XY	-34.071	NESC Ext	37.075	36.400	56.250	1.000	1.000	1.000	107.84	107.84	6.237	1	4
Leg3	L4x4x1/4	SAE	4X4X0.25	33.0	84.90	Comp	84.90	g12XY	-34.632	NESC Ext	40.789	0.000	0.000	1.000	1.000	1.000	112.20	112.20	7.433	1	0
Leg4	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	11.45	Comp	11.45	g14X	-1.159	NESC Hea	10.122	18.200	21.094	1.000	1.000	1.000	151.34	151.34	5.385	4	2
Diag1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	86.41	Tens	54.05	g22Y	-4.919	NESC Ext	13.762	9.100	10.547	0.750	0.500	0.500	102.09	106.57	5.836	2	1
Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	36.22	Tens	35.19	g20Y	-3.202	NESC Ext	23.588	9.100	14.062	0.750	0.500	0.500	81.56	91.17	5.315	2	1
Diag3	L2X2X3/16	SAE	2X2X0.1875	33.0	21.56	Cross	21.56	g33Y	-1.213	NESC Ext	5.624	9.100	10.547	1.000	0.576	0.576	190.09	190.09	9.774	4	1
Diag4	L2.25X2.25X3/16	SAE	2.25X2.25X0.1875	33.0	10.58	Comp	10.58	g36P	-0.695	NESC Ext	6.568	9.100	10.547	0.772	0.544	0.544	187.77	187.77	12.771	4	1
Diag5	L2.75X2.75X3/16	SAE	2.75X2.75X0.1875	33.0	8.89	Tens	5.56	g38P	-0.481	NESC Ext	8.653	9.100	10.547	0.771	0.543	0.543	181.51	181.51	15.210	4	1
Diag6	L2X1.5X3/16	SAU	2X1.5X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.000	0	0
Horz1	BAR2X3/16	Bar	2x3/16	33.0	26.89	Tens	0.00	g43Y	0.000		9.858	9.100	10.547	1.000	1.000	1.000	48.00	84.00	4.000	3	1
Horz2	**L2X2X3/16**	**SAE**	**2X2X0.1875**	**33.0**	**81.83**	**Tens**	**52.56**	**g73P**	**-0.952**	**NESC Ext**	**1.811**	**16.800**	**10.547**	**2.000**	**1.000**	**1.000**	**335.02**	**335.02**	**8.613**	**4**	**1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g73P Fg7373P ??**
Horz3	L3X2.5X1/4	SAU	3X2.5X0.25	33.0	12.82	Comp	12.82	g50X	-0.902	NESC Ext	7.041	9.100	14.062	0.500	1.000	0.500	230.76	230.76	14.480	4	1
Inner1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	6.59	Tens	4.39	g52P	-0.400	NESC Ext	13.392	9.100	10.547	0.750	0.500	0.500	98.95	109.48	5.657	3	1
Inner2	L2X1-1/2X3/16	SAU	2X1.5X0.1875	33.0	35.73	Comp	35.73	g55P	-0.361	NESC Ext	1.011	9.100	10.547	0.500	0.750	0.500	418.86	418.86	20.478	4	1
TopCrArm	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	11.13	Comp	11.13	g59Y	-2.026	NESC Hea	19.668	18.200	21.094	1.000	1.000	1.000	96.97	108.48	4.000	3	2
TopArmBr	BAR2X3/16	Bar	2x3/16	33.0	29.19	Tens	0.00	g65X	0.000		7.820	9.100	10.547	1.000	1.000	1.000	110.68	113.01	9.223	2	1

MidCrArm	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	22.88	Comp	22.88	g60P	-4.165NESC Hea	25.411	18.200	28.125	1.000	0.500	0.500	131.46	127.05	11.919	6	2
MidArmBr	BAR2X3/16	Bar	2x3/16	33.0	54.00	Tens	0.00	g69Y	0.000	10.583	9.100	10.547	1.000	1.000	1.000	54.50	70.88	4.542	2	1
BotCrArm	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	9.15	Comp	9.15	g62P	-1.552NESC Hea	16.970	18.200	21.094	1.000	0.500	0.500	123.45	122.12	8.004	6	2
BotArmBr	BAR2X3/16	Bar	2x3/16	33.0	17.66	Tens	0.00	g67Y	0.000	7.936	9.100	10.547	1.000	1.000	1.000	108.75	111.56	9.062	2	1
ShArmBr	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	9.66	Comp	9.66	g64Y	-1.110NESC Hea	11.489	27.300	42.187	0.500	1.000	0.500	211.02	189.40	12.925	5	3
ShieldAr	LL2.5X2X3/16	DAL	2.5X2X0.1875	33.0	43.03	Tens	3.79	g56P	-0.345NESC Ext	14.666	9.100	21.094	1.000	1.000	1.000	177.81	177.81	11.750	4	1
Diag6(R)	L2x2x3/16	SAE	2X2X0.1875	36.0	63.68	Comp	63.68	g71P	-1.142NESC Ext	1.794	16.800	10.195	0.768	0.537	0.537	336.59	336.59	20.580	4	1
Kdown1	L2x2x3/16	SAE	2X2X0.1875	36.0	7.26	Comp	7.26	g75Y	-0.220NESC Ext	3.034	16.800	10.195	1.000	0.500	0.500	258.82	258.82	13.308	4	1
Diag1(R)	L2x2x1/4	SAE	2X2X0.25	36.0	97.49	Tens	77.59	g27Y	-7.061NESC Ext	19.149	9.100	13.594	1.000	0.500	0.500	115.00	117.50	5.836	3	1

Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Tens. Use %	Tension Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Tens. Member (ft)	No. Of Bolts	Hole Diameter (in)	Holes
Leg1	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	70.52	Comp	62.66	g5P	22.809NESC Ext	43.395	36.400	56.250	91.912	4.250	4	2.000	0.75		
Leg2	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	93.60	Comp	78.80	g11P	28.682NESC Ext	43.395	36.400	56.250	50.000	6.237	4	2.000	0.75		
Leg3	L4x4x1/4	SAE	4X4X0.25	33.0	84.90	Comp	58.94	g70P	30.437NESC Ext	51.645	72.800	112.500	100.000	8.889	8	2.000	0.75		
Leg4	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	11.45	Comp	4.73	g14P	0.665NESC Ext	17.096	18.200	21.094	14.062	5.385	2	1.000	0.75		
Diag1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	86.41	Tens	86.41	g18XY	4.921NESC Ext	14.237	9.100	10.547	5.695	5.315	1	1.000	0.75		
Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	36.22	Tens	36.22	g20XY	3.124NESC Ext	22.349	9.100	14.062	8.625	5.315	1	1.000	0.75		
Diag3	L2X2X3/16	SAE	2X2X0.1875	33.0	21.56	Cross	15.08	g33XY	0.975NESC Ext	16.910	9.100	10.547	6.469	9.774	1	1.000	0.75		
Diag4	L2.25X2.25X3/16	SAE	2.25X2.25X0.1875	33.0	10.58	Comp	4.41	g37XY	0.319NESC Ext	19.851	9.100	10.547	7.242	12.771	1	1.000	0.75		
Diag5	L2.75X2.75X3/16	SAE	2.75X2.75X0.1875	33.0	8.89	Tens	8.89	g38X	0.730NESC Ext	25.405	9.100	10.547	8.203	15.210	1	1.000	0.75		
Diag6	L2X1.5X3/16	SAU	2X1.5X0.1875	33.0	0.00		0.00		0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0		
Horz1	BAR2X3/16	Bar	2x3/16	33.0	26.89	Tens	26.89	g42Y	1.872NESC Hea	6.961	9.100	10.547	8.086	4.000	1	1.000	0.75		
Horz2	**L2X2X3/16**	**SAE**	**2X2X0.1875**	**33.0**	**81.83**	**Tens**	**81.83**	**g46P**	**4.660NESC Ext**	**16.910**	**9.100**	**10.547**	**5.695**	**4.000**	**1**	**1.000**	**0.75**	**A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g73P Fg7373P ??**	
Horz3	L3X2.5X1/4	SAU	3X2.5X0.25	33.0	12.82	Comp	2.93	g50P	0.266NESC Ext	33.338	9.100	14.062	10.687	14.480	1				

1.000	0.75																
Inner1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	6.59	Tens	6.59	g52X	0.376NESC Ext	14.237	9.100	10.547	5.695	5.657	1		
1.000	0.75																
Inner2	L2X1-1/2X3/16	SAU	2X1.5X0.1875	33.0	35.73	Comp	3.41	g55X	0.194NESC Ext	14.237	9.100	10.547	5.695	20.478	1		
1.000	0.75																
TopCrArm	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	11.13	Comp	0.77	g58X	0.141NESC Ext	22.613	18.200	21.094	21.094	8.004	2		
1.000	0.75																
TopArmBr	BAR2X3/16	Bar	2x3/16	33.0	29.19	Tens	29.19	g65P	2.032NESC Hea	6.961	9.100	10.547	8.930	9.223	1		
1.000	0.75																
MidCrArm	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	22.88	Comp	0.00	g61Y	0.000	33.301	18.200	28.125	18.750	4.000	2		
1.700	0.75																
MidArmBr	BAR2X3/16	Bar	2x3/16	33.0	54.00	Tens	54.00	g66P	3.759NESC Hea	6.961	9.100	10.547	8.930	8.071	1		
1.000	0.75																
BotCrArm	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	9.15	Comp	1.20	g62XY	0.219NESC Ext	22.613	18.200	21.094	21.094	8.004	2		
1.000	0.75																
BotArmBr	BAR2X3/16	Bar	2x3/16	33.0	17.66	Tens	17.66	g67P	1.229NESC Hea	6.961	9.100	10.547	8.930	9.062	1		
1.000	0.75																
ShArmBr	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	9.66	Comp	0.00	g64Y	0.000	34.136	27.300	42.187	42.187	12.925	3		
1.550	0.75																
ShieldAr	LL2.5X2X3/16	DAL	2.5X2X0.1875	33.0	43.03	Tens	43.03	g57P	3.915NESC Hea	43.937	9.100	21.094	16.312	4.000	1		
1.000	0.75																
Diag6(R)	L2x2x3/16	SAE	2X2X0.1875	36.0	63.68	Comp	17.22	g41X	1.215NESC Ext	18.827	16.800	10.195	7.052	18.078	1		
1.000	0.6875																
Kdown1	L2x2x3/16	SAE	2X2X0.1875	36.0	7.26	Comp	1.23	g75P	0.125NESC Ext	18.827	16.800	10.195	10.343	13.308	1		
1.000	0.6875																
Diag1(R)	L2x2x1/4	SAE	2X2X0.25	36.0	97.49	Tens	97.49	g27XY	6.471NESC Ext	24.381	9.100	13.594	6.637	5.836	1		
1.000	0.75																

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	59.11	g11XY	Angle
NESC Extreme	97.49	g27XY	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	2.39	NESC Heavy	0.0
2	Clamp	2.46	NESC Heavy	0.0
3	Clamp	2.80	NESC Heavy	0.0
4	Clamp	2.84	NESC Heavy	0.0
5	Clamp	2.89	NESC Heavy	0.0
6	Clamp	2.93	NESC Heavy	0.0
7	Clamp	2.82	NESC Heavy	0.0
8	Clamp	2.86	NESC Heavy	0.0
9	Clamp	0.46	NESC Heavy	0.0
10	Clamp	0.56	NESC Extreme	0.0
11	Clamp	0.60	NESC Extreme	0.0

12	Clamp	0.99	NESC Extreme	0.0
13	Clamp	0.91	NESC Extreme	0.0
14	Clamp	1.09	NESC Extreme	0.0
15	Clamp	1.46	NESC Heavy	0.0
16	Clamp	0.66	NESC Heavy	0.0
17	Clamp	0.93	NESC Extreme	0.0
18	Clamp	1.02	NESC Heavy	0.0
19	Clamp	1.36	NESC Extreme	0.0
20	Clamp	1.40	NESC Extreme	0.0
21	Clamp	1.75	NESC Extreme	0.0
22	Clamp	2.35	NESC Heavy	0.0
23	Clamp	7.42	NESC Extreme	0.0
24	Clamp	7.97	NESC Extreme	0.0
25	Clamp	3.70	NESC Extreme	0.0
26	Clamp	2.44	NESC Extreme	0.0

*** Weight of structure (lbs):

Weight of Angles*Section DLF:	6479.3
Total:	6479.3

*** End of Report

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*****************************************************************************
*                                                                           *
* TOWER - Analysis and Design -  Copyright Power Line Systems, Inc. 1986-2011 *
*                                                                           *
*****************************************************************************

Project Name : 12014.CO12 - Stratford, CT
Project Notes: CL&P Structure # 280/ Sprint CT43XC837
Project File : J:\Jobs\1715900.WI\17_CT43XC837 Stratford\04_Structural\Calcs\Rev (2)\PLS Tower\tower #280 reinforced.tow
Date run     : 10:02:07 AM Thursday, October 04, 2018
by           : Tower Version 12.50
Licensed to  : Centek Engineering Inc

Successfully performed nonlinear analysis

Angle member "g56P" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
Angle member "g56X" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
Angle member "g57P" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40P" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40X" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40XY" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40Y" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41P" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41X" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41XY" ??
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41Y" ??
KL/R value of 230.76 exceeds maximum of 200.00 for member "g49P" ??
KL/R value of 230.76 exceeds maximum of 200.00 for member "g49Y" ??
KL/R value of 230.76 exceeds maximum of 200.00 for member "g50P" ??
KL/R value of 230.76 exceeds maximum of 200.00 for member "g50X" ??
KL/R value of 418.86 exceeds maximum of 200.00 for member "g55P" ??
KL/R value of 418.86 exceeds maximum of 200.00 for member "g55X" ??
Member "g60P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g60X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g60XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g60Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g61P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g61Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g64P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g64X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g64XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g64Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71P" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71X" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71XY" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71Y" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g72P" ??
KL/R value of 336.59 exceeds maximum of 200.00 for member "g72Y" ??
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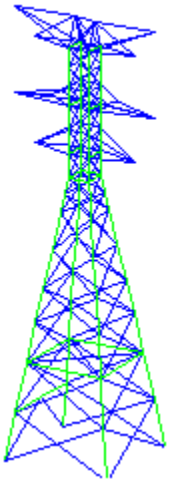
KL/R value of 335.02 exceeds maximum of 200.00 for member "g73P" ??
KL/R value of 335.02 exceeds maximum of 200.00 for member "Fg7373P" ??
KL/R value of 258.82 exceeds maximum of 200.00 for member "g75P" ??
KL/R value of 258.82 exceeds maximum of 200.00 for member "g75Y" ??
The model has 37 warnings. ??



Nonlinear convergence parameters: Use Standard Parameters
Member check option: ASCE 10
Connection rupture check: ASCE 10
Crossing diagonal check: ASCE 10 [Alternate Unsupported RLOUT = 1]
Included angle check: None
Climbing load check: None
Redundant members checked with: Actual Force

Joints Geometry:

Joint Label	Symmetry Code	X Coord. (ft)	Y Coord. (ft)	Z Coord. (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
1P	X-Symmetry	0	2	78.25	Free	Free	Free	Free	Free	Free
2P	XY-Symmetry	2	2	73.25	Free	Free	Free	Free	Free	Free
3P	XY-Symmetry	2	2	69.75	Free	Free	Free	Free	Free	Free
4P	XY-Symmetry	2	2	66.25	Free	Free	Free	Free	Free	Free
5P	XY-Symmetry	2	2	62.75	Free	Free	Free	Free	Free	Free
6P	XY-Symmetry	2	2	58.5	Free	Free	Free	Free	Free	Free
7P	XY-Symmetry	2	2	54.25	Free	Free	Free	Free	Free	Free
8P	XY-Symmetry	2	2	50	Free	Free	Free	Free	Free	Free
9P	XY-Symmetry	10	10	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
16P	X-Symmetry	0	13.75	78.25	Free	Free	Free	Free	Free	Free
17P	X-Symmetry	0	9.75	73.25	Free	Free	Free	Free	Free	Free
18P	X-Symmetry	0	13.75	62.75	Free	Free	Free	Free	Free	Free
19P	X-Symmetry	0	9.75	54.25	Free	Free	Free	Free	Free	Free
20P	XY-Symmetry	1.34	5.89	64	Free	Free	Free	Free	Free	Free
1X	X-Gen	0	-2	78.25	Free	Free	Free	Free	Free	Free
2X	X-GenXY	2	-2	73.25	Free	Free	Free	Free	Free	Free
2XY	XY-GenXY	-2	-2	73.25	Free	Free	Free	Free	Free	Free

2Y	Y-GenXY	-2	2	73.25	Free	Free	Free	Free	Free	Free
3X	X-GenXY	2	-2	69.75	Free	Free	Free	Free	Free	Free
3XY	XY-GenXY	-2	-2	69.75	Free	Free	Free	Free	Free	Free
3Y	Y-GenXY	-2	2	69.75	Free	Free	Free	Free	Free	Free
4X	X-GenXY	2	-2	66.25	Free	Free	Free	Free	Free	Free
4XY	XY-GenXY	-2	-2	66.25	Free	Free	Free	Free	Free	Free
4Y	Y-GenXY	-2	2	66.25	Free	Free	Free	Free	Free	Free
5X	X-GenXY	2	-2	62.75	Free	Free	Free	Free	Free	Free
5XY	XY-GenXY	-2	-2	62.75	Free	Free	Free	Free	Free	Free
5Y	Y-GenXY	-2	2	62.75	Free	Free	Free	Free	Free	Free
6X	X-GenXY	2	-2	58.5	Free	Free	Free	Free	Free	Free
6XY	XY-GenXY	-2	-2	58.5	Free	Free	Free	Free	Free	Free
6Y	Y-GenXY	-2	2	58.5	Free	Free	Free	Free	Free	Free
7X	X-GenXY	2	-2	54.25	Free	Free	Free	Free	Free	Free
7XY	XY-GenXY	-2	-2	54.25	Free	Free	Free	Free	Free	Free
7Y	Y-GenXY	-2	2	54.25	Free	Free	Free	Free	Free	Free
8X	X-GenXY	2	-2	50	Free	Free	Free	Free	Free	Free
8XY	XY-GenXY	-2	-2	50	Free	Free	Free	Free	Free	Free
8Y	Y-GenXY	-2	2	50	Free	Free	Free	Free	Free	Free
9X	X-GenXY	10	-10	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
9XY	XY-GenXY	-10	-10	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
9Y	Y-GenXY	-10	10	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
16X	X-Gen	0	-13.75	78.25	Free	Free	Free	Free	Free	Free
17X	X-Gen	0	-9.75	73.25	Free	Free	Free	Free	Free	Free
18X	X-Gen	0	-13.75	62.75	Free	Free	Free	Free	Free	Free
19X	X-Gen	0	-9.75	54.25	Free	Free	Free	Free	Free	Free
20X	X-GenXY	1.34	-5.89	64	Free	Free	Free	Free	Free	Free
20XY	XY-GenXY	-1.34	-5.89	64	Free	Free	Free	Free	Free	Free
20Y	Y-GenXY	-1.34	5.89	64	Free	Free	Free	Free	Free	Free

Secondary Joints:

Joint Label	Symmetry Code	Origin Joint	End Joint	Fraction	Elevation (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
10S	XY-Symmetry	8P	9P	0	46.88	Free	Free	Free	Free	Free	Free
11S	XY-Symmetry	8P	9P	0	43.75	Free	Free	Free	Free	Free	Free
12S	XY-Symmetry	8P	9P	0	37.08	Free	Free	Free	Free	Free	Free
13S	XY-Symmetry	8P	9P	0	30.58	Free	Free	Free	Free	Free	Free
14S	XY-Symmetry	8P	9P	0	24.5	Free	Free	Free	Free	Free	Free
15S	XY-Symmetry	8P	9P	0	17.25	Free	Free	Free	Free	Free	Free
21S	XY-Symmetry	8P	9P	0	8.67	Free	Free	Free	Free	Free	Free
21XYF0.50S	None	21XY	21X	0.5	0	Free	Free	Free	Free	Free	Free
10X	X-GenXY	8P	9P	0	46.88	Free	Free	Free	Free	Free	Free
10XY	XY-GenXY	8P	9P	0	46.88	Free	Free	Free	Free	Free	Free
10Y	Y-GenXY	8P	9P	0	46.88	Free	Free	Free	Free	Free	Free
11X	X-GenXY	8P	9P	0	43.75	Free	Free	Free	Free	Free	Free
11XY	XY-GenXY	8P	9P	0	43.75	Free	Free	Free	Free	Free	Free
11Y	Y-GenXY	8P	9P	0	43.75	Free	Free	Free	Free	Free	Free
12X	X-GenXY	8P	9P	0	37.08	Free	Free	Free	Free	Free	Free
12XY	XY-GenXY	8P	9P	0	37.08	Free	Free	Free	Free	Free	Free
12Y	Y-GenXY	8P	9P	0	37.08	Free	Free	Free	Free	Free	Free
13X	X-GenXY	8P	9P	0	30.58	Free	Free	Free	Free	Free	Free
13XY	XY-GenXY	8P	9P	0	30.58	Free	Free	Free	Free	Free	Free
13Y	Y-GenXY	8P	9P	0	30.58	Free	Free	Free	Free	Free	Free
14X	X-GenXY	8P	9P	0	24.5	Free	Free	Free	Free	Free	Free
14XY	XY-GenXY	8P	9P	0	24.5	Free	Free	Free	Free	Free	Free
14Y	Y-GenXY	8P	9P	0	24.5	Free	Free	Free	Free	Free	Free

15X	X-GenXY	8P	9P	0	17.25	Free	Free	Free	Free	Free	Free
15XY	XY-GenXY	8P	9P	0	17.25	Free	Free	Free	Free	Free	Free
15Y	Y-GenXY	8P	9P	0	17.25	Free	Free	Free	Free	Free	Free
21X	X-GenXY	8P	9P	0	8.67	Free	Free	Free	Free	Free	Free
21XY	XY-GenXY	8P	9P	0	8.67	Free	Free	Free	Free	Free	Free
21Y	Y-GenXY	8P	9P	0	8.67	Free	Free	Free	Free	Free	Free

The model contains 46 primary and 29 secondary joints for a total of 75 joints.

Steel Material Properties:

Steel Material Label	Modulus of Elasticity (ksi)	Yield Stress Fy (ksi)	Ultimate Stress Fu (ksi)	Member All. Stress Hyp. 1 (ksi)	Member All. Stress Hyp. 2 (ksi)	Member Rupture Hyp. 1 (ksi)	Member Rupture Hyp. 2 (ksi)	Member Bearing Hyp. 1 (ksi)	Member Bearing Hyp. 2 (ksi)
A 36	2.9e+004	36	58	0	0	0	0	0	0
A7	2.9e+004	33	60	0	0	0	0	0	0

Bolt Properties:

Bolt Label	Bolt Diameter (in)	Hole Diameter (in)	Ultimate Shear Capacity (kips)	Default End Distance (in)	Default Bolt Spacing (in)	Shear Capacity Hyp. 1 (kips)	Shear Capacity Hyp. 2 (kips)
5/8 A394	0.625	0.75	9.1	1.125	1.5	0	0
5/8 A325	0.625	0.6875	16.8	1.25	1.5	0	0

Number Bolts Used By Type:

Bolt Type	Number Bolts
5/8 A394	269
5/8 A325	18

Angle Properties:

Angle Type	Angle Size	Long Leg (in)	Short Leg (in)	Thick. (in)	Unit Weight (lbs/ft)	Gross Area (in^2)	w/t Ratio	Radius of Gyration Rx (in)	Radius of Gyration Ry (in)	Radius of Gyration Rz (in)	Number of Angles	Wind Width (in)	Short Edge Dist. (in)	Long Edge Dist. (in)	Optimize Cost Factor	Section Modulus (in^3)
SAE	4X4X0.25	4	4	0.25	6.6	1.94	13.5	1.25	1.25	0.795	1	4	2	0	1.0000	0
SAE	3.5X3.5X0.25	3.5	3.5	0.25	5.8	1.69	11.5	1.09	1.09	0.694	1	3.5	1.75	0	1.0000	0
SAE	2.5X2.5X0.1875	2.5	2.5	0.1875	3.07	0.902	10.67	0.778	0.778	0.495	1	2.5	1.25	0	1.0000	0
SAE	2X2X0.25	2	2	0.25	3.19	0.94	5	0.609	0.609	0.391	1	2	1	0	1.0000	0
SAE	2X2X0.1875	2	2	0.1875	2.44	0.71	8	0.617	0.617	0.394	1	2	1	0	1.0000	0
SAE	1.75X1.75X0.1875	1.75	1.75	0.1875	2.12	0.62	6	0.537	0.537	0.343	1	1.75	0.875	0	1.0000	0
SAU	3.5X2.5X0.25	3.5	2.5	0.25	4.9	1.44	11.25	1.12	0.735	0.544	1	3.5	1.25	0	1.0000	0
SAU	3X2.5X0.25	3	2.5	0.25	4.5	1.31	9.5	0.945	0.753	0.528	1	3	1.25	0	1.0000	0
SAU	2.5X2X0.1875	2.5	2	0.1875	2.75	0.81	10.67	0.793	0.6	0.427	1	2.5	1	0	1.0000	0
SAU	2X1.5X0.1875	2	1.5	0.1875	2.12	0.62	8.33	0.632	0.44	0.322	1	2	0.75	0	1.0000	0
DAL	2.5X2X0.1875	2.5	2	0.1875	5.5	1.62	10.67	0.793	0.923	0.793	2	2.5	1	0	1.0000	0
Bar	2x3/16	2	0	0.1875	1.28	0.375	10.67	1	1	1	1	2	0	0	0.0000	0
SAE	2.25X2.25X0.1875	2.25	2.25	0.1875	2.75	0.809	9.5	0.698	0.698	0.444	1	2.25	1	0	1.0000	0
SAE	2.75X2.75X0.1875	2.75	2.75	0.1875	3.39	0.996	12.33	0.859	0.859	0.546	1	2.75	1.25	0	1.0000	0

Angle Groups:

Group Label	Group Description	Angle Type	Angle Size	Material Type	Element Type	Group Type	Optimize Group	Allow. Add. Angle Width For Optimize (in)
Leg1	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	A7	Beam	Leg	None	0.000
Leg2	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	A7	Beam	Leg	None	0.000
Leg3	L4x4x1/4	SAE	4X4X0.25	A7	Beam	Leg	None	0.000
Leg4	L2.5x2x3/16	SAU	2.5X2X0.1875	A7	Truss	Other	None	0.000
Diag1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	A7	Truss	Crossing Diagonal	None	0.000
Diag2	L2x2x1/4	SAE	2X2X0.25	A7	Truss	Crossing Diagonal	None	0.000
Diag3	L2X2X3/16	SAE	2X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000
Diag4	L2.25X2.25X3/16	SAE	2.25X2.25X0.1875	A7	Truss	Crossing Diagonal	None	0.000
Diag5	L2.75X2.75X3/16	SAE	2.75X2.75X0.1875	A7	Truss	Crossing Diagonal	None	0.000
Diag6	L2X1.5X3/16	SAU	2X1.5X0.1875	A7	T-Only	Other	None	0.000
Horz1	BAR2X3/16	Bar	2x3/16	A7	Truss	Other	None	0.000
Horz2	L2X2X3/16	SAE	2X2X0.1875	A7	Beam	Other	None	0.000
Horz3	L3X2.5X1/4	SAU	3X2.5X0.25	A7	Beam	Other	None	0.000
Inner1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	A7	Truss	Crossing Diagonal	None	0.000
Inner2	L2X1-1/2X3/16	SAU	2X1.5X0.1875	A7	Truss	Other	None	0.000
TopCrArm	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	A7	Truss	Other	None	0.000
TopArmBr	BAR2X3/16	Bar	2x3/16	A7	Truss	Other	None	0.000
MidCrArm	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	A7	Truss	Other	None	0.000
MidArmBr	BAR2X3/16	Bar	2x3/16	A7	Truss	Other	None	0.000
BotCrArm	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	A7	Truss	Other	None	0.000
BotArmBr	BAR2X3/16	Bar	2x3/16	A7	Truss	Other	None	0.000
ShArmBr	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	A7	Truss	Other	None	0.000
ShieldAr	LL2.5X2X3/16	DAL	2.5X2X0.1875	A7	Truss	Other	None	0.000
Diag6(R)	L2x2x3/16	SAE	2X2X0.1875	A 36	Truss	Crossing Diagonal	None	0.000
Kdown1	L2x2x3/16	SAE	2X2X0.1875	A 36	Truss	Other	None	0.000
Diag1(R)	L2x2x1/4	SAE	2X2X0.25	A 36	Truss	Crossing Diagonal	None	0.000

Aggregate Angle Information:

Note: Estimate of surface area reported for painting purposes, not wind loading.

Angle Type	Angle Size	Material Type	Total Length (ft)	Total Surface Area (ft^2)	Total Weight (lbs)
SAE	3.5X3.5X0.25	A7	197.58	230.51	1145.96
SAE	4X4X0.25	A7	100.48	133.97	663.15
SAU	2.5X2X0.1875	A7	21.54	16.16	59.24
SAE	1.75X1.75X0.1875	A7	345.29	201.42	732.00
SAE	2X2X0.25	A7	42.52	28.35	135.64
SAE	2X2X0.25	A 36	46.69	31.13	148.94
SAE	2X2X0.1875	A7	225.74	150.49	550.81
SAE	2.25X2.25X0.1875	A7	102.17	76.62	280.96
SAE	2.75X2.75X0.1875	A7	121.68	111.54	412.48
SAE	2X2X0.1875	A 36	294.72	196.48	719.11
Bar	2x3/16	A7	137.70	45.90	176.26
SAU	3X2.5X0.25	A7	57.92	53.09	260.64
SAU	2X1.5X0.1875	A7	40.96	23.89	86.83
DAL	2.5X2X0.1875	A7	27.50	20.63	151.25
SAE	2.5X2.5X0.1875	A7	80.03	66.69	245.70
SAU	3.5X2.5X0.25	A7	107.38	107.38	526.15

Sections:
The adjustment factors below only apply to dead load and wind areas that are calculated for members in the model.
They do not apply to equipment or to manually input dead load and drag areas.

Section Label	Joint Defining Section Bottom	Dead Load Adjust. Factor	Transverse Drag x Area Factor For Face	Longitudinal Drag x Area Factor For Face	Transverse Area Factor (CD From Code)	Longitudinal Area Factor (CD From Code)	Af Flat Factor For Face EIA Only	Ar Round Factor For Face EIA Only	Transverse Drag x Area Factor For All	Longitudinal Drag x Area Factor For All	SAPS Angle Drag x Area Factor	SAPS Round Drag x Area Factor	Force Solid Face
1	8P	1.000	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	None
2	9P	1.050	3.200	3.200	1.000	1.000	0.000	0.000	0.000	0.000	0.000	0.000	None

Angle Member Connectivity:

Member Label	Group Label	Section Label	Symmetry Code	Origin Joint	End Joint	Ecc. Code	Rest. Code	Ratio RLX	Ratio RLY	Ratio RLZ	Bolt Type	# Bolts	# Bolt Holes	# Shear Planes	Connect Leg	Short Edge Dist. (in)	Long Edge Dist. (in)	End Dist. (in)	Bolt Spacing (in)	Shear Path Length (in)	Tension Path Length (in)	Rest. Coef.
g1P	Leg1		XY-Symmetry	2X	3X	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g1X	Leg1		X-GenXY	2P	3P	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g1XY	Leg1		XY-GenXY	2Y	3Y	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g1Y	Leg1		Y-GenXY	2XY	3XY	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g2P	Leg1		XY-Symmetry	3X	4X	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g2X	Leg1		X-GenXY	3P	4P	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g2XY	Leg1		XY-GenXY	3Y	4Y	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g2Y	Leg1		Y-GenXY	3XY	4XY	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g3P	Leg1		XY-Symmetry	4X	5X	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g3X	Leg1		X-GenXY	4P	5P	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g3XY	Leg1		XY-GenXY	4Y	5Y	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g3Y	Leg1		Y-GenXY	4XY	5XY	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g4P	Leg1		XY-Symmetry	5X	6X	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g4X	Leg1		X-GenXY	5P	6P	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g4XY	Leg1		XY-GenXY	5Y	6Y	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g4Y	Leg1		Y-GenXY	5XY	6XY	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g5P	Leg1		XY-Symmetry	6X	7X	1	4	1	1	1	5/8 A394	4	2	0	Both	1.5625	0	3.625	4	0	0	0

g5X	Leg1		X-GenXY	6P	7P	1	4	1	1	1	5/8	A394	4	2	0	Both	1.5625	0	3.625	4	0	0	0
g5XY	Leg1		XY-GenXY	6Y	7Y	1	4	1	1	1	5/8	A394	4	2	0	Both	1.5625	0	3.625	4	0	0	0
g5Y	Leg1		Y-GenXY	6XY	7XY	1	4	1	1	1	5/8	A394	4	2	0	Both	1.5625	0	3.625	4	0	0	0
g6P	Leg2		XY-Symmetry	7X	8X	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g6X	Leg2		X-GenXY	7P	8P	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g6XY	Leg2		XY-GenXY	7Y	8Y	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g6Y	Leg2		Y-GenXY	7XY	8XY	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g7P	Leg2		XY-Symmetry	8X	10X	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g7X	Leg2		X-GenXY	8P	10S	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g7XY	Leg2		XY-GenXY	8Y	10Y	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g7Y	Leg2		Y-GenXY	8XY	10XY	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g8P	Leg2		XY-Symmetry	10X	11X	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g8X	Leg2		X-GenXY	10S	11S	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g8XY	Leg2		XY-GenXY	10Y	11Y	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g8Y	Leg2		Y-GenXY	10XY	11XY	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g9P	Leg2		XY-Symmetry	11X	12X	1	4	0.5	0.5	0.5			0	0	0		0	0	0	0	0	0	0
g9X	Leg2		X-GenXY	11S	12S	1	4	0.5	0.5	0.5			0	0	0		0	0	0	0	0	0	0
g9XY	Leg2		XY-GenXY	11Y	12Y	1	4	0.5	0.5	0.5			0	0	0		0	0	0	0	0	0	0
g9Y	Leg2		Y-GenXY	11XY	12XY	1	4	0.5	0.5	0.5			0	0	0		0	0	0	0	0	0	0
g10P	Leg2		XY-Symmetry	12X	13X	1	4	0.5	0.5	0.5			0	0	0		0	0	0	0	0	0	0
g10X	Leg2		X-GenXY	12S	13S	1	4	0.5	0.5	0.5			0	0	0		0	0	0	0	0	0	0
g10XY	Leg2		XY-GenXY	12Y	13Y	1	4	0.5	0.5	0.5			0	0	0		0	0	0	0	0	0	0
g10Y	Leg2		Y-GenXY	12XY	13XY	1	4	0.5	0.5	0.5			0	0	0		0	0	0	0	0	0	0
g11P	Leg2		XY-Symmetry	13X	14X	1	4	1	1	1	5/8	A394	4	2	1	Both	1.5625	0	1	5	0	0	0
g11X	Leg2		X-GenXY	13S	14S	1	4	1	1	1	5/8	A394	4	2	1	Both	1.5625	0	1	5	0	0	0
g11XY	Leg2		XY-GenXY	13Y	14Y	1	4	1	1	1	5/8	A394	4	2	1	Both	1.5625	0	1	5	0	0	0
g11Y	Leg2		Y-GenXY	13XY	14XY	1	4	1	1	1	5/8	A394	4	2	1	Both	1.5625	0	1	5	0	0	0
g12P	Leg3		XY-Symmetry	14X	15X	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g12X	Leg3		X-GenXY	14S	15S	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0
g12XY	Leg3		XY-GenXY	14Y	15Y	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0

																		0	0	0	0
g12Y	Leg3	Y-GenXY	14XY	15XY	1	4	1	1	1		0	0	0		0	0	0	0	0	0	0
g13P	Leg3	XY-Symmetry	15X	21X	1	4	0.5	0.5	0.5		0	0	0		0	0	0	0	0	0	0
g13X	Leg3	X-GenXY	15S	21S	1	4	0.5	0.5	0.5		0	0	0		0	0	0	0	0	0	0
g13XY	Leg3	XY-GenXY	15Y	21Y	1	4	0.5	0.5	0.5		0	0	0		0	0	0	0	0	0	0
g13Y	Leg3	Y-GenXY	15XY	21XY	1	4	0.5	0.5	0.5		0	0	0		0	0	0	0	0	0	0
g14P	Leg4	XY-Symmetry	1X	2X	1	4	1	1	1	5/8 A394	2	1	1	Short only	0.875	0	0.875	1.875	0	0	0
g14X	Leg4	X-GenXY	1P	2P	1	4	1	1	1	5/8 A394	2	1	1	Short only	0.875	0	0.875	1.875	0	0	0
g14XY	Leg4	XY-GenXY	1P	2Y	1	4	1	1	1	5/8 A394	2	1	1	Short only	0.875	0	0.875	1.875	0	0	0
g14Y	Leg4	Y-GenXY	1X	2XY	1	4	1	1	1	5/8 A394	2	1	1	Short only	0.875	0	0.875	1.875	0	0	0
g15P	Diag1	XY-Symmetry	1X	2P	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g15X	Diag1	X-GenXY	1P	2X	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g15XY	Diag1	XY-GenXY	1P	2XY	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g15Y	Diag1	Y-GenXY	1X	2Y	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g16P	Diag1	XY-Symmetry	2X	3P	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g16X	Diag1	X-GenXY	2P	3X	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g16XY	Diag1	XY-GenXY	2Y	3XY	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g16Y	Diag1	Y-GenXY	2XY	3Y	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g17P	Diag1	XY-Symmetry	2P	3Y	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g17X	Diag1	X-GenXY	2X	3XY	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g17XY	Diag1	XY-GenXY	2XY	3X	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g17Y	Diag1	Y-GenXY	2Y	3P	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g18P	Diag1	XY-Symmetry	3X	4P	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g18X	Diag1	X-GenXY	3P	4X	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g18XY	Diag1	XY-GenXY	3Y	4XY	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g18Y	Diag1	Y-GenXY	3XY	4Y	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g19P	Diag1	XY-Symmetry	3P	4Y	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g19X	Diag1	X-GenXY	3X	4XY	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g19XY	Diag1	XY-GenXY	3XY	4X	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0
g19Y	Diag1	Y-GenXY	3Y	4P	2	4	0.75	0.5	0.5	5/8 A394	1	1	1	Short only	0.75	0	0.875	0	0	0	0

g20P	Diag2	XY-Symmetry	4X	5P	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0
g20X	Diag2	X-GenXY	4P	5X	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0
g20XY	Diag2	XY-GenXY	4Y	5XY	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0
g20Y	Diag2	Y-GenXY	4XY	5Y	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0
g21P	Diag2	XY-Symmetry	4P	5Y	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0
g21X	Diag2	X-GenXY	4X	5XY	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0
g21XY	Diag2	XY-GenXY	4XY	5X	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0
g21Y	Diag2	Y-GenXY	4Y	5P	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.875	0	0.875	0	0	0
g22P	Diag1	XY-Symmetry	5X	6P	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g22X	Diag1	X-GenXY	5P	6X	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g22XY	Diag1	XY-GenXY	5Y	6XY	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g22Y	Diag1	Y-GenXY	5XY	6Y	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g23P	Diag1	XY-Symmetry	5P	6Y	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g23X	Diag1	X-GenXY	5X	6XY	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g23XY	Diag1	XY-GenXY	5XY	6X	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g23Y	Diag1	Y-GenXY	5Y	6P	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g24P	Diag1	XY-Symmetry	6X	7P	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g24X	Diag1	X-GenXY	6P	7X	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g24XY	Diag1	XY-GenXY	6Y	7XY	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g24Y	Diag1	Y-GenXY	6XY	7Y	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g25P	Diag1	XY-Symmetry	6P	7Y	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g25X	Diag1	X-GenXY	6X	7XY	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g25XY	Diag1	XY-GenXY	6XY	7X	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g25Y	Diag1	Y-GenXY	6Y	7P	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	0	0	0
g26P	Diag1(R)	XY-Symmetry	7X	8P	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.75	0	0	0
g26X	Diag1(R)	X-GenXY	7P	8X	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.75	0	0	0
g26XY	Diag1(R)	XY-GenXY	7Y	8XY	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.75	0	0	0
g26Y	Diag1(R)	Y-GenXY	7XY	8Y	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.75	0	0	0
g27P	Diag1(R)	XY-Symmetry	7P	8Y	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.75	0	0	0
g27X	Diag1(R)	X-GenXY	7X	8XY	2	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.75			

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0      0       0     0
   g27XY Diag1(R)            XY-GenXY        7XY         8X    2     4  0.75   0.5   0.5 5/8 A394     1      1       1 Short only   0.75     0  0.75
0      0       0     0
    g27Y Diag1(R)             Y-GenXY         7Y         8P    2     4  0.75   0.5   0.5 5/8 A394     1      1       1 Short only   0.75     0  0.75
0      0       0     0
    g28P    Diag1          XY-Symmetry         8X        10S    2     4 0.777 0.555 0.555 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g28X    Diag1             X-GenXY         8P        10X    2     4 0.777 0.555 0.555 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
   g28XY    Diag1             XY-GenXY        8Y       10XY    2     4 0.777 0.555 0.555 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g28Y    Diag1             Y-GenXY        8XY        10Y    2     4 0.777 0.555 0.555 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g29P    Diag1          XY-Symmetry         8P        10Y    2     4 0.777 0.555 0.555 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g29X    Diag1             X-GenXY         8X       10XY    2     4 0.777 0.555 0.555 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
   g29XY    Diag1             XY-GenXY       8XY        10X    2     4 0.777 0.555 0.555 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g29Y    Diag1             Y-GenXY         8Y        10S    2     4 0.777 0.555 0.555 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g30P    Diag1          XY-Symmetry        10X        11S    2     4 0.774 0.548 0.548 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g30X    Diag1             X-GenXY        10S        11X    2     4 0.774 0.548 0.548 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
   g30XY    Diag1             XY-GenXY       10Y       11XY    2     4 0.774 0.548 0.548 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g30Y    Diag1             Y-GenXY       10XY        11Y    2     4 0.774 0.548 0.548 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g31P    Diag1          XY-Symmetry        10S        11Y    2     4 0.774 0.548 0.548 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g31X    Diag1             X-GenXY        10X       11XY    2     4 0.774 0.548 0.548 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
   g31XY    Diag1             XY-GenXY       10XY       11X    2     4 0.774 0.548 0.548 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g31Y    Diag1             Y-GenXY        10Y        11S    2     4 0.774 0.548 0.548 5/8 A394     1      1       1 Short only  0.875     0  0.75
0      0       0     0
    g32P    Diag3          XY-Symmetry        11X        12S    2     4 0.788 0.576 0.576 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
    g32X    Diag3             X-GenXY        11S        12X    2     4 0.788 0.576 0.576 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
   g32XY    Diag3             XY-GenXY       11Y       12XY    2     4 0.788 0.576 0.576 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
    g32Y    Diag3             Y-GenXY       11XY        12Y    2     4 0.788 0.576 0.576 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
    g33P    Diag3          XY-Symmetry        11S        12Y    2     4 0.788 0.576 0.576 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
    g33X    Diag3             X-GenXY        11X       12XY    2     4 0.788 0.576 0.576 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
   g33XY    Diag3             XY-GenXY       11XY       12X    2     4 0.788 0.576 0.576 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
    g33Y    Diag3             Y-GenXY        11Y        12S    2     4 0.788 0.576 0.576 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
    g34P    Diag3          XY-Symmetry        12X        13S    2     4 0.779 0.558 0.558 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
    g34X    Diag3             X-GenXY        12S        13X    2     4 0.779 0.558 0.558 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
   g34XY    Diag3             XY-GenXY       12Y       13XY    2     4 0.779 0.558 0.558 5/8 A394     1      1       1 Short only  0.875     0 0.875
0      0       0     0
```

g34Y	Diag3		Y-GenXY	12XY	13Y	2	4	0.779	0.558	0.558	5/8	A394	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g35P	Diag3		XY-Symmetry	12S	13Y	2	4	0.779	0.558	0.558	5/8	A394	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g35X	Diag3		X-GenXY	12X	13XY	2	4	0.779	0.558	0.558	5/8	A394	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g35XY	Diag3		XY-GenXY	12XY	13X	2	4	0.779	0.558	0.558	5/8	A394	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g35Y	Diag3		Y-GenXY	12Y	13S	2	4	0.779	0.558	0.558	5/8	A394	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g36P	Diag4		XY-Symmetry	13X	14S	2	4	0.772	0.544	0.544	5/8	A394	1	1	1	Short	only	1	0	0.875	0	0	0	0	
g36X	Diag4		X-GenXY	13S	14X	2	4	0.772	0.544	0.544	5/8	A394	1	1	1	Short	only	1	0	0.875	0	0	0	0	
g36XY	Diag4		XY-GenXY	13Y	14XY	2	4	0.772	0.544	0.544	5/8	A394	1	1	1	Short	only	1	0	0.875	0	0	0	0	
g36Y	Diag4		Y-GenXY	13XY	14Y	2	4	0.772	0.544	0.544	5/8	A394	1	1	1	Short	only	1	0	0.875	0	0	0	0	
g37P	Diag4		XY-Symmetry	13S	14Y	2	4	0.772	0.544	0.544	5/8	A394	1	1	1	Short	only	1	0	0.875	0	0	0	0	
g37X	Diag4		X-GenXY	13X	14XY	2	4	0.772	0.544	0.544	5/8	A394	1	1	1	Short	only	1	0	0.875	0	0	0	0	
g37XY	Diag4		XY-GenXY	13XY	14X	2	4	0.772	0.544	0.544	5/8	A394	1	1	1	Short	only	1	0	0.875	0	0	0	0	
g37Y	Diag4		Y-GenXY	13Y	14S	2	4	0.772	0.544	0.544	5/8	A394	1	1	1	Short	only	1	0	0.875	0	0	0	0	
g38P	Diag5		XY-Symmetry	14X	15S	2	4	0.771	0.543	0.543	5/8	A394	1	1	1	Short	only	1.25	0	0.875	0	0	0	0	
g38X	Diag5		X-GenXY	14S	15X	2	4	0.771	0.543	0.543	5/8	A394	1	1	1	Short	only	1.25	0	0.875	0	0	0	0	
g38XY	Diag5		XY-GenXY	14Y	15XY	2	4	0.771	0.543	0.543	5/8	A394	1	1	1	Short	only	1.25	0	0.875	0	0	0	0	
g38Y	Diag5		Y-GenXY	14XY	15Y	2	4	0.771	0.543	0.543	5/8	A394	1	1	1	Short	only	1.25	0	0.875	0	0	0	0	
g39P	Diag5		XY-Symmetry	14S	15Y	2	4	0.771	0.543	0.543	5/8	A394	1	1	1	Short	only	1.25	0	0.875	0	0	0	0	
g39X	Diag5		X-GenXY	14X	15XY	2	4	0.771	0.543	0.543	5/8	A394	1	1	1	Short	only	1.25	0	0.875	0	0	0	0	
g39XY	Diag5		XY-GenXY	14XY	15X	2	4	0.771	0.543	0.543	5/8	A394	1	1	1	Short	only	1.25	0	0.875	0	0	0	0	
g39Y	Diag5		Y-GenXY	14Y	15S	2	4	0.771	0.543	0.543	5/8	A394	1	1	1	Short	only	1.25	0	0.875	0	0	0	0	
g40P	Diag6(R)		XY-Symmetry	15X	21S	2	4	0.772	0.543	0.543	5/8	A325	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g40X	Diag6(R)		X-GenXY	15S	21X	2	4	0.772	0.543	0.543	5/8	A325	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g40XY	Diag6(R)		XY-GenXY	15Y	21XY	2	4	0.772	0.543	0.543	5/8	A325	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g40Y	Diag6(R)		Y-GenXY	15XY	21Y	2	4	0.772	0.543	0.543	5/8	A325	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g41P	Diag6(R)		XY-Symmetry	15S	21Y	2	4	0.772	0.543	0.543	5/8	A325	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g41X	Diag6(R)		X-GenXY	15X	21XY	2	4	0.772	0.543	0.543	5/8	A325	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g41XY	Diag6(R)		XY-GenXY	15XY	21X	2	4	0.772	0.543	0.543	5/8	A325	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g41Y	Diag6(R)		Y-GenXY	15Y	21S	2	4	0.772	0.543	0.543	5/8	A325	1	1	1	Short	only	0.875	0	0.875	0	0	0	0	
g42P	Horz1		Y-Symmetry	4X	4P	3	4	1	1	1	5/8	A394	1	1	1	Long	only	1	0	1					

0	0	0	0																		
	g42Y	Horz1		Y-Gen	4XY	4Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	1	
0	0	0	0																		
	g43P	Horz1		Y-Symmetry	6X	6P	3	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	1	
0	0	0	0																		
	g43Y	Horz1		Y-Gen	6XY	6Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	1	
0	0	0	0																		
	g44P	Horz2		X-Symmetry	2P	2Y	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	0.875	
0	0	0	0																		
	g44X	Horz2		X-Gen	2X	2XY	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	0.875	
0	0	0	0																		
	g45P	Horz2		X-Symmetry	5P	5Y	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	0.875	
0	0	0	0																		
	g45X	Horz2		X-Gen	5X	5XY	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	0.875	
0	0	0	0																		
	g46P	Horz2		X-Symmetry	7P	7Y	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g46X	Horz2		X-Gen	7X	7XY	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g47P	Horz2		Y-Symmetry	8X	8P	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	
0	0	0	0																		
	g47Y	Horz2		Y-Gen	8XY	8Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	
0	0	0	0																		
	g48P	Horz2		X-Symmetry	8P	8Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	
0	0	0	0																		
	g48X	Horz2		X-Gen	8X	8XY	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0.875	
0	0	0	0																		
	g49P	Horz3		Y-Symmetry	15X	15S	3	4	0.5	1	0.5	5/8	A394	1	1	1	Long only	1.125	0	0.875	
0	0	0	0																		
	g49Y	Horz3		Y-Gen	15XY	15Y	3	4	0.5	1	0.5	5/8	A394	1	1	1	Long only	1.125	0	0.875	
0	0	0	0																		
	g50P	Horz3		X-Symmetry	15S	15Y	3	4	0.5	1	0.5	5/8	A394	1	1	1	Long only	1.125	0	0.875	
0	0	0	0																		
	g50X	Horz3		X-Gen	15X	15XY	3	4	0.5	1	0.5	5/8	A394	1	1	1	Long only	1.125	0	0.875	
0	0	0	0																		
	g51P	Inner1		X-Symmetry	2X	2Y	3	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g51X	Inner1		X-Gen	2P	2XY	3	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g52P	Inner1		X-Symmetry	5X	5Y	3	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g52X	Inner1		X-Gen	5P	5XY	3	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g53P	Inner1		X-Symmetry	7X	7Y	3	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g53X	Inner1		X-Gen	7P	7XY	3	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g54P	Inner1		X-Symmetry	8X	8Y	3	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g54X	Inner1		X-Gen	8P	8XY	3	4	0.75	0.5	0.5	5/8	A394	1	1	1	Short only	0.75	0	0.875	
0	0	0	0																		
	g55P	Inner2		X-Symmetry	15X	15Y	3	4	0.5	0.75	0.5	5/8	A394	1	1	1	Long only	0.75	0	0.875	
0	0	0	0																		
	g55X	Inner2		X-Gen	15S	15XY	3	4	0.5	0.75	0.5	5/8	A394	1	1	1	Long only	0.75	0	0.875	
0	0	0	0																		
	g56P	ShieldAr		X-Symmetry	16X	1X	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0	
0	0	0	0																		
	g56X	ShieldAr		X-Gen	16P	1P	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0	
0	0	0	0																		

g57P	ShieldAr	None	1X	1P	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	0	0	0	0	0	
g58P	TopCrArm	XY-Symmetry	17X	2X	3	6	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	2.75	0	0	0	
g58X	TopCrArm	X-GenXY	17P	2P	3	6	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	2.75	0	0	0	
g58XY	TopCrArm	XY-GenXY	17P	2Y	3	6	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	2.75	0	0	0	
g58Y	TopCrArm	Y-GenXY	17X	2XY	3	6	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	2.75	0	0	0	
g59P	TopCrArm	Y-Symmetry	2X	2P	3	4	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	2.75	0	0	0	
g59Y	TopCrArm	Y-Gen	2XY	2Y	3	4	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	2.75	0	0	0	
g60P	MidCrArm	XY-Symmetry	18X	5X	3	6	1	0.5	0.5	5/8	A394	2	1.7	1	Long only	0.75	2.25	0	1.125	0	0	0	
g60X	MidCrArm	X-GenXY	18P	5P	3	6	1	0.5	0.5	5/8	A394	2	1.7	1	Long only	0.75	2.25	0	1.125	0	0	0	
g60XY	MidCrArm	XY-GenXY	18P	5Y	3	6	1	0.5	0.5	5/8	A394	2	1.7	1	Long only	0.75	2.25	0	1.125	0	0	0	
g60Y	MidCrArm	Y-GenXY	18X	5XY	3	6	1	0.5	0.5	5/8	A394	2	1.7	1	Long only	0.75	2.25	0	1.125	0	0	0	
g61P	MidCrArm	Y-Symmetry	5X	5P	3	4	1	1	1	5/8	A394	2	1.7	1	Long only	0.75	2.25	0	1.125	0	0	0	
g61Y	MidCrArm	Y-Gen	5XY	5Y	3	4	1	1	1	5/8	A394	2	1.7	1	Long only	0.75	2.25	0	1.125	0	0	0	
g62P	BotCrArm	XY-Symmetry	19X	7X	3	6	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	3	0	0	0	
g62X	BotCrArm	X-GenXY	19P	7P	3	6	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	3	0	0	0	
g62XY	BotCrArm	XY-GenXY	19P	7Y	3	6	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	3	0	0	0	
g62Y	BotCrArm	Y-GenXY	19X	7XY	3	6	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	3	0	0	0	
g63P	BotCrArm	Y-Symmetry	7X	7P	3	4	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	3	0	0	0	
g63Y	BotCrArm	Y-Gen	7XY	7Y	3	4	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	3	0	0	0	
g64P	ShArmBr	XY-Symmetry	16X	2X	2	5	0.5	1	0.5	5/8	A394	3	1.55	1	Long only	1	2.25	0	2.4375	0	0	0	
g64X	ShArmBr	X-GenXY	16P	2P	2	5	0.5	1	0.5	5/8	A394	3	1.55	1	Long only	1	2.25	0	2.4375	0	0	0	
g64XY	ShArmBr	XY-GenXY	16P	2Y	2	5	0.5	1	0.5	5/8	A394	3	1.55	1	Long only	1	2.25	0	2.4375	0	0	0	
g64Y	ShArmBr	Y-GenXY	16X	2XY	2	5	0.5	1	0.5	5/8	A394	3	1.55	1	Long only	1	2.25	0	2.4375	0	0	0	
g65P	TopArmBr	X-Symmetry	17X	1X	2	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	0	1	0	0	0	
g65X	TopArmBr	X-Gen	17P	1P	2	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	0	1	0	0	0	
g66P	MidArmBr	XY-Symmetry	18X	20X	2	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	0	1	0	0	0	
g66X	MidArmBr	X-GenXY	18P	20P	2	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	0	1	0	0	0	
g66XY	MidArmBr	XY-GenXY	18P	20Y	2	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	0	1	0	0	0	
g66Y	MidArmBr	Y-GenXY	18X	20XY	2	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	0	1	0	0	0	
g67P	BotArmBr	XY-Symmetry	19X	6X	2	4	1	1	1	5/8	A394	1	1	1	Long only	1	0	0					

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1      0       0     0
     g67X BotArmBr              X-GenXY        19P         6P    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
    g67XY BotArmBr             XY-GenXY        19P         6Y    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
     g67Y BotArmBr              Y-GenXY        19X        6XY    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
     g68P MidArmBr          XY-Symmetry        20X         5X    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
     g68X MidArmBr              X-GenXY        20P         5P    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
    g68XY MidArmBr             XY-GenXY        20Y         5Y    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
     g68Y MidArmBr              Y-GenXY       20XY        5XY    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
     g69P MidArmBr          XY-Symmetry        20X         4X    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
     g69X MidArmBr              X-GenXY        20P         4P    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
    g69XY MidArmBr             XY-GenXY        20Y         4Y    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
     g69Y MidArmBr              Y-GenXY       20XY        4XY    2     4     1     1     1 5/8 A394     1      1       1  Long only      1     0     0
1      0       0     0
     g70P     Leg3          XY-Symmetry        21X         9X    1     4   0.5   0.5   0.5 5/8 A394     8      2       1        Both   1.75     0     1
2.75      0       0     0
     g70X     Leg3               X-GenXY        21S         9P    1     4   0.5   0.5   0.5 5/8 A394     8      2       1        Both   1.75     0     1
2.75      0       0     0
    g70XY     Leg3              XY-GenXY        21Y         9Y    1     4   0.5   0.5   0.5 5/8 A394     8      2       1        Both   1.75     0     1
2.75      0       0     0
     g70Y     Leg3               Y-GenXY       21XY        9XY    1     4   0.5   0.5   0.5 5/8 A394     8      2       1        Both   1.75     0     1
2.75      0       0     0
     g71P Diag6(R)          XY-Symmetry        21X         9P    2     4 0.768 0.537 0.537 5/8 A325     1      1       1 Short only  0.875     0 0.875
0      0       0     0
     g71X Diag6(R)              X-GenXY        21S         9X    2     4 0.768 0.537 0.537 5/8 A325     1      1       1 Short only  0.875     0 0.875
0      0       0     0
    g71XY Diag6(R)             XY-GenXY        21Y        9XY    2     4 0.768 0.537 0.537 5/8 A325     1      1       1 Short only  0.875     0 0.875
0      0       0     0
     g71Y Diag6(R)              Y-GenXY       21XY         9Y    2     4 0.768 0.537 0.537 5/8 A325     1      1       1 Short only  0.875     0 0.875
0      0       0     0
     g72P Diag6(R)           Y-Symmetry        21S         9Y    2     4 0.768 0.537 0.537 5/8 A325     1      1       1 Short only  0.875     0 0.875
0      0       0     0
     g72Y Diag6(R)                Y-Gen        21Y         9P    2     4 0.768 0.537 0.537 5/8 A325     1      1       1 Short only  0.875     0 0.875
0      0       0     0
     g73P    Horz2                 None       21XY 21XYF0.50S    1     4     2     1     1 5/8 A325     1      1       1 Short only  0.875     0 0.875
0      0       0     0
  Fg7373P    Horz2                 None 21XYF0.50S        21X    1     4     2     1     1 5/8 A325     1      1       1 Short only  0.875     0 0.875
0      0       0     0
     g75P   Kdown1           Y-Symmetry        9XY 21XYF0.50S    2     4     1   0.5   0.5 5/8 A325     1      1       1 Short only      0     0     0
0      0       0     0
     g75Y   Kdown1                Y-Gen         9X 21XYF0.50S    2     4     1   0.5   0.5 5/8 A325     1      1       1 Short only      0     0     0
0      0       0     0
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Member Capacities and Overrides:

Member Label	Group Label	Design Override	Comp. Override	Design Override	Tension Comp.	L/r Length Control	Tension	L/r Control	Connection Comp.	Connection Shear	Connection Bearing	Net Section	Rupture Tension	RTE End Dist.	RTE Edge Dist.	Override Comp.	Override Warnings
								Face									

or Errors

Member	Control	Capacity (kips)	Criterion	Capacity (kips)	Criterion		(ft)	Capacity (kips)	Capacity (kips)	Capacity (kips)	Tension Capacity (kips)	Capacity (kips)	Tension Capacity (kips)	Tension Capacity (kips)	Capacity (kips)
Unsup. (kips)	Criterion	(kips)													
g1P	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g1X	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g1XY	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g1Y	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g2P	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g2X	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g2XY	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g2Y	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g3P	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g3X	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g3XY	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g3Y	Leg1	49.882	L/r	55.770	Net Sect	61	3.50	49.882	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g4P	Leg1	47.089	L/r	55.770	Net Sect	73	4.25	47.089	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g4X	Leg1	47.089	L/r	55.770	Net Sect	73	4.25	47.089	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g4XY	Leg1	47.089	L/r	55.770	Net Sect	73	4.25	47.089	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g4Y	Leg1	47.089	L/r	55.770	Net Sect	73	4.25	47.089	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g5P	Leg1	36.400	Shear	36.400	Shear	73	4.25	47.089	36.400	56.250	43.395	91.912	0.000	0.000	0.000
0.000		0.000	Automatic												
g5X	Leg1	36.400	Shear	36.400	Shear	73	4.25	47.089	36.400	56.250	43.395	91.912	0.000	0.000	0.000
0.000		0.000	Automatic												
g5XY	Leg1	36.400	Shear	36.400	Shear	73	4.25	47.089	36.400	56.250	43.395	91.912	0.000	0.000	0.000
0.000		0.000	Automatic												
g5Y	Leg1	36.400	Shear	36.400	Shear	73	4.25	47.089	36.400	56.250	43.395	91.912	0.000	0.000	0.000
0.000		0.000	Automatic												
g6P	Leg2	47.089	L/r	55.770	Net Sect	73	4.25	47.089	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g6X	Leg2	47.089	L/r	55.770	Net Sect	73	4.25	47.089	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g6XY	Leg2	47.089	L/r	55.770	Net Sect	73	4.25	47.089	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g6Y	Leg2	47.089	L/r	55.770	Net Sect	73	4.25	47.089	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g7P	Leg2	50.836	L/r	55.770	Net Sect	55	3.20	50.836	0.000	0.000	55.770	0.000	0.000	0.000	0.000

0.000		0.000	Automatic												
g7X	Leg2	50.836	L/r	55.770	Net Sect	55	3.20	50.836	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g7XY	Leg2	50.836	L/r	55.770	Net Sect	55	3.20	50.836	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g7Y	Leg2	50.836	L/r	55.770	Net Sect	55	3.20	50.836	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g8P	Leg2	50.836	L/r	55.770	Net Sect	55	3.20	50.836	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g8X	Leg2	50.836	L/r	55.770	Net Sect	55	3.20	50.836	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g8XY	Leg2	50.836	L/r	55.770	Net Sect	55	3.20	50.836	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g8Y	Leg2	50.836	L/r	55.770	Net Sect	55	3.20	50.836	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g9P	Leg2	50.156	L/r	55.770	Net Sect	59	6.84	50.156	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g9X	Leg2	50.156	L/r	55.770	Net Sect	59	6.84	50.156	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g9XY	Leg2	50.156	L/r	55.770	Net Sect	59	6.84	50.156	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g9Y	Leg2	50.156	L/r	55.770	Net Sect	59	6.84	50.156	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g10P	Leg2	50.433	L/r	55.770	Net Sect	58	6.66	50.433	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g10X	Leg2	50.433	L/r	55.770	Net Sect	58	6.66	50.433	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g10XY	Leg2	50.433	L/r	55.770	Net Sect	58	6.66	50.433	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g10Y	Leg2	50.433	L/r	55.770	Net Sect	58	6.66	50.433	0.000	0.000	55.770	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g11P	Leg2	36.400	Shear	36.400	Shear	108	6.24	37.075	36.400	56.250	43.395	50.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g11X	Leg2	36.400	Shear	36.400	Shear	108	6.24	37.075	36.400	56.250	43.395	50.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g11XY	Leg2	36.400	Shear	36.400	Shear	108	6.24	37.075	36.400	56.250	43.395	50.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g11Y	Leg2	36.400	Shear	36.400	Shear	108	6.24	37.075	36.400	56.250	43.395	50.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g12P	Leg3	40.789	L/r	64.020	Net Sect	112	7.43	40.789	0.000	0.000	64.020	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g12X	Leg3	40.789	L/r	64.020	Net Sect	112	7.43	40.789	0.000	0.000	64.020	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g12XY	Leg3	40.789	L/r	64.020	Net Sect	112	7.43	40.789	0.000	0.000	64.020	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g12Y	Leg3	40.789	L/r	64.020	Net Sect	112	7.43	40.789	0.000	0.000	64.020	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g13P	Leg3	55.886	L/r	64.020	Net Sect	66	8.80	55.886	0.000	0.000	64.020	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g13X	Leg3	55.886	L/r	64.020	Net Sect	66	8.80	55.886	0.000	0.000	64.020	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g13XY	Leg3	55.886	L/r	64.020	Net Sect	66	8.80	55.886	0.000	0.000	64.020	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g13Y	Leg3	55.886	L/r	64.020	Net Sect	66	8.80	55.886	0.000	0.000	64.020	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g14P	Leg4	10.122	L/r	14.062	Rupture	151	5.39	10.122	18.200	21.094	17.096	14.062	0.000	0.000	0.000
0.000		0.000	Automatic												
g14X	Leg4	10.122	L/r	14.062	Rupture	151	5.39	10.122	18.200	21.094	17.096	14.062	0.000	0.000	0.000
0.000		0.000	Automatic												

g14XY	Leg4	10.122	L/r	14.062	Rupture	151	5.39	10.122	18.200	21.094	17.096	14.062	0.000	0.000	0.000
0.000		0.000		Automatic											
g14Y	Leg4	10.122	L/r	14.062	Rupture	151	5.39	10.122	18.200	21.094	17.096	14.062	0.000	0.000	0.000
0.000		0.000		Automatic											
g15P	Diag1	9.100	Shear	5.695	Rupture	117	6.71	12.247	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g15X	Diag1	9.100	Shear	5.695	Rupture	117	6.71	12.247	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g15XY	Diag1	9.100	Shear	5.695	Rupture	117	6.71	12.247	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g15Y	Diag1	9.100	Shear	5.695	Rupture	117	6.71	12.247	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g16P	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g16X	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g16XY	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g16Y	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g17P	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g17X	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g17XY	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g17Y	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g18P	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g18X	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g18XY	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g18Y	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g19P	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g19X	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g19XY	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g19Y	Diag1	9.100	Shear	5.695	Rupture	93	5.32	14.594	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000		Automatic											
g20P	Diag2	9.100	Shear	8.625	Rupture	82	5.32	23.588	9.100	14.062	22.349	8.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g20X	Diag2	9.100	Shear	8.625	Rupture	82	5.32	23.588	9.100	14.062	22.349	8.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g20XY	Diag2	9.100	Shear	8.625	Rupture	82	5.32	23.588	9.100	14.062	22.349	8.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g20Y	Diag2	9.100	Shear	8.625	Rupture	82	5.32	23.588	9.100	14.062	22.349	8.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g21P	Diag2	9.100	Shear	8.625	Rupture	82	5.32	23.588	9.100	14.062	22.349	8.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g21X	Diag2	9.100	Shear	8.625	Rupture	82	5.32	23.588	9.100	14.062	22.349	8.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g21XY	Diag2	9.100	Shear	8.625	Rupture	82	5.32	23.588	9.100	14.062	22.349	8.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g21Y	Diag2	9.100	Shear	8.625	Rupture	82	5.32	23.588	9.100	14.062	22.349	8.625	0.000	0.000	0.000

0.000		0.000	Automatic												
g22P	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g22X	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g22XY	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g22Y	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g23P	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g23X	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g23XY	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g23Y	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g24P	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g24X	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g24XY	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g24Y	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g25P	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g25X	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g25XY	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g25Y	Diag1	9.100	Shear	5.695	Rupture	102	5.84	13.762	9.100	10.547	14.237	5.695	0.000	0.000	0.000
0.000		0.000	Automatic												
g26P	Diag1(R)	9.100	Shear	6.637	Rupture	90	5.84	23.793	9.100	13.594	24.381	6.637	0.000	0.000	0.000
0.000		0.000	Automatic												
g26X	Diag1(R)	9.100	Shear	6.637	Rupture	90	5.84	23.793	9.100	13.594	24.381	6.637	0.000	0.000	0.000
0.000		0.000	Automatic												
g26XY	Diag1(R)	9.100	Shear	6.637	Rupture	90	5.84	23.793	9.100	13.594	24.381	6.637	0.000	0.000	0.000
0.000		0.000	Automatic												
g26Y	Diag1(R)	9.100	Shear	6.637	Rupture	90	5.84	23.793	9.100	13.594	24.381	6.637	0.000	0.000	0.000
0.000		0.000	Automatic												
g27P	Diag1(R)	9.100	Shear	6.637	Rupture	90	5.84	23.793	9.100	13.594	24.381	6.637	0.000	0.000	0.000
0.000		0.000	Automatic												
g27X	Diag1(R)	9.100	Shear	6.637	Rupture	90	5.84	23.793	9.100	13.594	24.381	6.637	0.000	0.000	0.000
0.000		0.000	Automatic												
g27XY	Diag1(R)	9.100	Shear	6.637	Rupture	90	5.84	23.793	9.100	13.594	24.381	6.637	0.000	0.000	0.000
0.000		0.000	Automatic												
g27Y	Diag1(R)	9.100	Shear	6.637	Rupture	90	5.84	23.793	9.100	13.594	24.381	6.637	0.000	0.000	0.000
0.000		0.000	Automatic												
g28P	Diag1	9.100	Shear	5.625	Rupture	107	5.50	13.309	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000	Automatic												
g28X	Diag1	9.100	Shear	5.625	Rupture	107	5.50	13.309	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000	Automatic												
g28XY	Diag1	9.100	Shear	5.625	Rupture	107	5.50	13.309	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000	Automatic												
g28Y	Diag1	9.100	Shear	5.625	Rupture	107	5.50	13.309	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000	Automatic												
g29P	Diag1	9.100	Shear	5.625	Rupture	107	5.50	13.309	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000	Automatic												

g29X	Diag1	9.100	Shear	5.625	Rupture	107	5.50	13.309	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g29XY	Diag1	9.100	Shear	5.625	Rupture	107	5.50	13.309	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g29Y	Diag1	9.100	Shear	5.625	Rupture	107	5.50	13.309	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g30P	Diag1	9.100	Shear	5.625	Rupture	122	6.35	11.732	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g30X	Diag1	9.100	Shear	5.625	Rupture	122	6.35	11.732	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g30XY	Diag1	9.100	Shear	5.625	Rupture	122	6.35	11.732	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g30Y	Diag1	9.100	Shear	5.625	Rupture	122	6.35	11.732	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g31P	Diag1	9.100	Shear	5.625	Rupture	122	6.35	11.732	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g31X	Diag1	9.100	Shear	5.625	Rupture	122	6.35	11.732	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g31XY	Diag1	9.100	Shear	5.625	Rupture	122	6.35	11.732	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g31Y	Diag1	9.100	Shear	5.625	Rupture	122	6.35	11.732	9.100	10.547	14.237	5.625	0.000	0.000	0.000
0.000		0.000		Automatic											
g32P	Diag3	6.912	L/r	6.469	Rupture	171	9.77	6.912	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g32X	Diag3	6.912	L/r	6.469	Rupture	171	9.77	6.912	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g32XY	Diag3	6.912	L/r	6.469	Rupture	171	9.77	6.912	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g32Y	Diag3	6.912	L/r	6.469	Rupture	171	9.77	6.912	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g33P	Diag3	6.912	L/r	6.469	Rupture	171	9.77	6.912	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g33X	Diag3	6.912	L/r	6.469	Rupture	171	9.77	6.912	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g33XY	Diag3	6.912	L/r	6.469	Rupture	171	9.77	6.912	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g33Y	Diag3	6.912	L/r	6.469	Rupture	171	9.77	6.912	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g34P	Diag3	5.519	L/r	6.469	Rupture	192	11.29	5.519	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g34X	Diag3	5.519	L/r	6.469	Rupture	192	11.29	5.519	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g34XY	Diag3	5.519	L/r	6.469	Rupture	192	11.29	5.519	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g34Y	Diag3	5.519	L/r	6.469	Rupture	192	11.29	5.519	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g35P	Diag3	5.519	L/r	6.469	Rupture	192	11.29	5.519	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g35X	Diag3	5.519	L/r	6.469	Rupture	192	11.29	5.519	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g35XY	Diag3	5.519	L/r	6.469	Rupture	192	11.29	5.519	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g35Y	Diag3	5.519	L/r	6.469	Rupture	192	11.29	5.519	9.100	10.547	16.910	6.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g36P	Diag4	6.568	L/r	7.242	Rupture	188	12.77	6.568	9.100	10.547	19.851	7.242	0.000	0.000	0.000
0.000		0.000		Automatic											
g36X	Diag4	6.568	L/r	7.242	Rupture	188	12.77	6.568	9.100	10.547	19.851	7.242	0.000	0.000	0.000
0.000		0.000		Automatic											
g36XY	Diag4	6.568	L/r	7.242	Rupture	188	12.77	6.568	9.100	10.547	19.851	7.242	0.000	0.000	0.000

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0.000              0.000           Automatic
    g36Y    Diag4    6.568       L/r    7.242   Rupture  188  12.77    6.568      9.100     10.547   19.851    7.242    0.000    0.000    0.000
0.000              0.000           Automatic
    g37P    Diag4    6.568       L/r    7.242   Rupture  188  12.77    6.568      9.100     10.547   19.851    7.242    0.000    0.000    0.000
0.000              0.000           Automatic
    g37X    Diag4    6.568       L/r    7.242   Rupture  188  12.77    6.568      9.100     10.547   19.851    7.242    0.000    0.000    0.000
0.000              0.000           Automatic
   g37XY    Diag4    6.568       L/r    7.242   Rupture  188  12.77    6.568      9.100     10.547   19.851    7.242    0.000    0.000    0.000
0.000              0.000           Automatic
    g37Y    Diag4    6.568       L/r    7.242   Rupture  188  12.77    6.568      9.100     10.547   19.851    7.242    0.000    0.000    0.000
0.000              0.000           Automatic
    g38P    Diag5    8.653       L/r    8.203   Rupture  182  15.21    8.653      9.100     10.547   25.405    8.203    0.000    0.000    0.000
0.000              0.000           Automatic
    g38X    Diag5    8.653       L/r    8.203   Rupture  182  15.21    8.653      9.100     10.547   25.405    8.203    0.000    0.000    0.000
0.000              0.000           Automatic
   g38XY    Diag5    8.653       L/r    8.203   Rupture  182  15.21    8.653      9.100     10.547   25.405    8.203    0.000    0.000    0.000
0.000              0.000           Automatic
    g38Y    Diag5    8.653       L/r    8.203   Rupture  182  15.21    8.653      9.100     10.547   25.405    8.203    0.000    0.000    0.000
0.000              0.000           Automatic
    g39P    Diag5    8.653       L/r    8.203   Rupture  182  15.21    8.653      9.100     10.547   25.405    8.203    0.000    0.000    0.000
0.000              0.000           Automatic
    g39X    Diag5    8.653       L/r    8.203   Rupture  182  15.21    8.653      9.100     10.547   25.405    8.203    0.000    0.000    0.000
0.000              0.000           Automatic
   g39XY    Diag5    8.653       L/r    8.203   Rupture  182  15.21    8.653      9.100     10.547   25.405    8.203    0.000    0.000    0.000
0.000              0.000           Automatic
    g39Y    Diag5    8.653       L/r    8.203   Rupture  182  15.21    8.653      9.100     10.547   25.405    8.203    0.000    0.000    0.000
0.000              0.000           Automatic
    g40P Diag6(R)    2.273       L/r    7.052   Rupture  299  18.08    2.273     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40P"  ??
    g40X Diag6(R)    2.273       L/r    7.052   Rupture  299  18.08    2.273     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40X"  ??
   g40XY Diag6(R)    2.273       L/r    7.052   Rupture  299  18.08    2.273     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40XY"  ??
    g40Y Diag6(R)    2.273       L/r    7.052   Rupture  299  18.08    2.273     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 298.97 exceeds maximum of 200.00 for member "g40Y"  ??
    g41P Diag6(R)    2.273       L/r    7.052   Rupture  299  18.08    2.273     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41P"  ??
    g41X Diag6(R)    2.273       L/r    7.052   Rupture  299  18.08    2.273     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41X"  ??
   g41XY Diag6(R)    2.273       L/r    7.052   Rupture  299  18.08    2.273     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41XY"  ??
    g41Y Diag6(R)    2.273       L/r    7.052   Rupture  299  18.08    2.273     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 298.97 exceeds maximum of 200.00 for member "g41Y"  ??
    g42P    Horz1    9.100      Shear    6.961  Net Sect   48   4.00    9.858      9.100     10.547    6.961    8.086    0.000    0.000    0.000
0.000              0.000           Automatic
    g42Y    Horz1    9.100      Shear    6.961  Net Sect   48   4.00    9.858      9.100     10.547    6.961    8.086    0.000    0.000    0.000
0.000              0.000           Automatic
    g43P    Horz1    9.100      Shear    6.961  Net Sect   48   4.00    9.858      9.100     10.547    6.961    8.086    0.000    0.000    0.000
0.000              0.000           Automatic
    g43Y    Horz1    9.100      Shear    6.961  Net Sect   48   4.00    9.858      9.100     10.547    6.961    8.086    0.000    0.000    0.000
0.000              0.000           Automatic
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    g44P    Horz2    9.100     Shear    6.469   Rupture  122   4.00   13.406      9.100     10.547   16.910    6.469    0.000    0.000    0.000
0.000              0.000           Automatic
    g44X    Horz2    9.100     Shear    6.469   Rupture  122   4.00   13.406      9.100     10.547   16.910    6.469    0.000    0.000    0.000
0.000              0.000           Automatic
    g45P    Horz2    9.100     Shear    6.469   Rupture  122   4.00   13.406      9.100     10.547   16.910    6.469    0.000    0.000    0.000
0.000              0.000           Automatic
    g45X    Horz2    9.100     Shear    6.469   Rupture  122   4.00   13.406      9.100     10.547   16.910    6.469    0.000    0.000    0.000
0.000              0.000           Automatic
    g46P    Horz2    9.100     Shear    5.695   Rupture  122   4.00   13.406      9.100     10.547   16.910    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g46X    Horz2    9.100     Shear    5.695   Rupture  122   4.00   13.406      9.100     10.547   16.910    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g47P    Horz2    9.100     Shear    6.469   Rupture  122   4.00   13.406      9.100     10.547   16.910    6.469    0.000    0.000    0.000
0.000              0.000           Automatic
    g47Y    Horz2    9.100     Shear    6.469   Rupture  122   4.00   13.406      9.100     10.547   16.910    6.469    0.000    0.000    0.000
0.000              0.000           Automatic
    g48P    Horz2    9.100     Shear    6.469   Rupture  122   4.00   13.406      9.100     10.547   16.910    6.469    0.000    0.000    0.000
0.000              0.000           Automatic
    g48X    Horz2    9.100     Shear    6.469   Rupture  122   4.00   13.406      9.100     10.547   16.910    6.469    0.000    0.000    0.000
0.000              0.000           Automatic
    g49P    Horz3    7.041       L/r    9.100     Shear  231  14.48    7.041      9.100     14.062   33.338   10.687    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 230.76 exceeds maximum of 200.00 for member "g49P"  ??
    g49Y    Horz3    7.041       L/r    9.100     Shear  231  14.48    7.041      9.100     14.062   33.338   10.687    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 230.76 exceeds maximum of 200.00 for member "g49Y"  ??
    g50P    Horz3    7.041       L/r    9.100     Shear  231  14.48    7.041      9.100     14.062   33.338   10.687    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 230.76 exceeds maximum of 200.00 for member "g50P"  ??
    g50X    Horz3    7.041       L/r    9.100     Shear  231  14.48    7.041      9.100     14.062   33.338   10.687    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 230.76 exceeds maximum of 200.00 for member "g50X"  ??
    g51P   Inner1    9.100     Shear    5.695   Rupture   99   5.66   13.392      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g51X   Inner1    9.100     Shear    5.695   Rupture   99   5.66   13.392      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g52P   Inner1    9.100     Shear    5.695   Rupture   99   5.66   13.392      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g52X   Inner1    9.100     Shear    5.695   Rupture   99   5.66   13.392      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g53P   Inner1    9.100     Shear    5.695   Rupture   99   5.66   13.392      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g53X   Inner1    9.100     Shear    5.695   Rupture   99   5.66   13.392      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g54P   Inner1    9.100     Shear    5.695   Rupture   99   5.66   13.392      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g54X   Inner1    9.100     Shear    5.695   Rupture   99   5.66   13.392      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
    g55P   Inner2    1.011       L/r    5.695   Rupture  419  20.48    1.011      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 418.86 exceeds maximum of 200.00 for member "g55P"  ??
    g55X   Inner2    1.011       L/r    5.695   Rupture  419  20.48    1.011      9.100     10.547   14.237    5.695    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 418.86 exceeds maximum of 200.00 for member "g55X"  ??
    g56P ShieldAr    9.100     Shear    9.100     Shear  178  11.75   14.666      9.100     21.094   43.937   16.312    0.000    0.000    0.000
0.000              0.000           Automatic
    g56X ShieldAr    9.100     Shear    9.100     Shear  178  11.75   14.666      9.100     21.094   43.937   16.312    0.000    0.000    0.000
0.000              0.000           Automatic
    g57P ShieldAr    9.100     Shear    9.100     Shear   61   4.00   40.905      9.100     21.094   43.937   16.312    0.000    0.000    0.000
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0.000              0.000           Automatic
    g58P TopCrArm   16.970       L/r   18.200     Shear  123   8.00   16.970     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g58X TopCrArm   16.970       L/r   18.200     Shear  123   8.00   16.970     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
   g58XY TopCrArm   16.970       L/r   18.200     Shear  123   8.00   16.970     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g58Y TopCrArm   16.970       L/r   18.200     Shear  123   8.00   16.970     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g59P TopCrArm   18.200     Shear   18.200     Shear   97   4.00   19.668     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g59Y TopCrArm   18.200     Shear   18.200     Shear   97   4.00   19.668     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g60P MidCrArm   18.200     Shear   18.200     Shear  131  11.92   25.411     18.200     28.125   33.301   18.750    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g60P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g60X MidCrArm   18.200     Shear   18.200     Shear  131  11.92   25.411     18.200     28.125   33.301   18.750    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g60X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g60XY MidCrArm   18.200     Shear   18.200     Shear  131  11.92   25.411     18.200     28.125   33.301   18.750    0.000    0.000    0.000
0.000              0.000           Automatic Member "g60XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g60Y MidCrArm   18.200     Shear   18.200     Shear  131  11.92   25.411     18.200     28.125   33.301   18.750    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g60Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g61P MidCrArm   18.200     Shear   18.200     Shear   88   4.00   32.671     18.200     28.125   33.301   18.750    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g61P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g61Y MidCrArm   18.200     Shear   18.200     Shear   88   4.00   32.671     18.200     28.125   33.301   18.750    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g61Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g62P BotCrArm   16.970       L/r   18.200     Shear  123   8.00   16.970     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g62X BotCrArm   16.970       L/r   18.200     Shear  123   8.00   16.970     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
   g62XY BotCrArm   16.970       L/r   18.200     Shear  123   8.00   16.970     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g62Y BotCrArm   16.970       L/r   18.200     Shear  123   8.00   16.970     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g63P BotCrArm   18.200     Shear   18.200     Shear   97   4.00   19.668     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g63Y BotCrArm   18.200     Shear   18.200     Shear   97   4.00   19.668     18.200     21.094   22.613   21.094    0.000    0.000    0.000
0.000              0.000           Automatic
    g64P  ShArmBr   11.489       L/r   27.300     Shear  211  12.93   11.489     27.300     42.187   34.136   42.187    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g64P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g64X  ShArmBr   11.489       L/r   27.300     Shear  211  12.93   11.489     27.300     42.187   34.136   42.187    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g64X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g64XY  ShArmBr   11.489       L/r   27.300     Shear  211  12.93   11.489     27.300     42.187   34.136   42.187    0.000    0.000    0.000
0.000              0.000           Automatic Member "g64XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g64Y  ShArmBr   11.489       L/r   27.300     Shear  211  12.93   11.489     27.300     42.187   34.136   42.187    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g64Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    g65P TopArmBr    7.820       L/r    6.961  Net Sect  111   9.22    7.820      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000           Automatic
    g65X TopArmBr    7.820       L/r    6.961  Net Sect  111   9.22    7.820      9.100     10.547    6.961    8.930    0.000    0.000    0.000
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0.000              0.000          Automatic
    g66P MidArmBr    8.617       L/r    6.961  Net Sect   97   8.07    8.617      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g66X MidArmBr    8.617       L/r    6.961  Net Sect   97   8.07    8.617      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
   g66XY MidArmBr    8.617       L/r    6.961  Net Sect   97   8.07    8.617      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g66Y MidArmBr    8.617       L/r    6.961  Net Sect   97   8.07    8.617      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g67P BotArmBr    7.936       L/r    6.961  Net Sect  109   9.06    7.936      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g67X BotArmBr    7.936       L/r    6.961  Net Sect  109   9.06    7.936      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
   g67XY BotArmBr    7.936       L/r    6.961  Net Sect  109   9.06    7.936      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g67Y BotArmBr    7.936       L/r    6.961  Net Sect  109   9.06    7.936      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g68P MidArmBr    9.100     Shear    6.961  Net Sect   50   4.14   10.762      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g68X MidArmBr    9.100     Shear    6.961  Net Sect   50   4.14   10.762      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
   g68XY MidArmBr    9.100     Shear    6.961  Net Sect   50   4.14   10.762      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g68Y MidArmBr    9.100     Shear    6.961  Net Sect   50   4.14   10.762      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g69P MidArmBr    9.100     Shear    6.961  Net Sect   55   4.54   10.583      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g69X MidArmBr    9.100     Shear    6.961  Net Sect   55   4.54   10.583      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
   g69XY MidArmBr    9.100     Shear    6.961  Net Sect   55   4.54   10.583      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g69Y MidArmBr    9.100     Shear    6.961  Net Sect   55   4.54   10.583      9.100     10.547    6.961    8.930    0.000    0.000    0.000
0.000              0.000          Automatic
    g70P      Leg3   55.714       L/r   51.645  Net Sect   67   8.89   55.714     72.800    112.500   51.645  100.000    0.000    0.000    0.000
0.000              0.000          Automatic
    g70X      Leg3   55.714       L/r   51.645  Net Sect   67   8.89   55.714     72.800    112.500   51.645  100.000    0.000    0.000    0.000
0.000              0.000          Automatic
   g70XY      Leg3   55.714       L/r   51.645  Net Sect   67   8.89   55.714     72.800    112.500   51.645  100.000    0.000    0.000    0.000
0.000              0.000          Automatic
    g70Y      Leg3   55.714       L/r   51.645  Net Sect   67   8.89   55.714     72.800    112.500   51.645  100.000    0.000    0.000    0.000
0.000              0.000          Automatic
    g71P Diag6(R)    1.794       L/r    7.052   Rupture  337  20.58    1.794     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000          Automatic
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71P"  ??
    g71X Diag6(R)    1.794       L/r    7.052   Rupture  337  20.58    1.794     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000          Automatic
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71X"  ??
   g71XY Diag6(R)    1.794       L/r    7.052   Rupture  337  20.58    1.794     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000          Automatic
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71XY"  ??
    g71Y Diag6(R)    1.794       L/r    7.052   Rupture  337  20.58    1.794     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000          Automatic
KL/R value of 336.59 exceeds maximum of 200.00 for member "g71Y"  ??
    g72P Diag6(R)    1.794       L/r    7.052   Rupture  337  20.58    1.794     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000          Automatic
KL/R value of 336.59 exceeds maximum of 200.00 for member "g72P"  ??
    g72Y Diag6(R)    1.794       L/r    7.052   Rupture  337  20.58    1.794     16.800     10.195   18.827    7.052    0.000    0.000    0.000
0.000              0.000          Automatic
KL/R value of 336.59 exceeds maximum of 200.00 for member "g72Y"  ??
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    g73P    Horz2    1.811       L/r    6.873   Rupture  335   8.61    1.811     16.800     10.547   17.258    6.873    0.000    0.000    0.000
0.000             0.000           Automatic
KL/R value of 335.02 exceeds maximum of 200.00 for member "g73P"  ??
 Fg7373P    Horz2    1.811       L/r    6.873   Rupture  335   8.61    1.811     16.800     10.547   17.258    6.873    0.000    0.000    0.000
0.000             0.000           Automatic
KL/R value of 335.02 exceeds maximum of 200.00 for member "Fg7373P"  ??
    g75P   Kdown1    3.034       L/r   10.195   Bearing  259  13.31    3.034     16.800     10.195   18.827   10.343    0.000    0.000    0.000
0.000             0.000           Automatic
KL/R value of 258.82 exceeds maximum of 200.00 for member "g75P"  ??
    g75Y   Kdown1    3.034       L/r   10.195   Bearing  259  13.31    3.034     16.800     10.195   18.827   10.343    0.000    0.000    0.000
0.000             0.000           Automatic
KL/R value of 258.82 exceeds maximum of 200.00 for member "g75Y"  ??
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The model contains 249 angle members.

Sum of Unfactored Dead Load and Drag Areas From Equipment, Input and Calculated:

Joint Label	Dead Load (kips)	X-Drag Area (ft^2)	Y-Drag Area (ft^2)
1P	0.0782	4.385	2.324
2P	0.0969	5.519	3.725
3P	0.0428	2.306	2.306
4P	0.054	3.106	2.594
5P	0.104	5.529	3.635
6P	0.0578	3.780	3.102
7P	0.0849	4.331	3.649
8P	0.0677	3.177	3.177
9P	0.0795	3.906	3.906
16P	0.0956	4.948	1.571
17P	0.0305	2.383	0.833
18P	0.0687	4.754	0.889
19P	0.0362	3.088	1.200
20P	0.0107	1.378	0.466
1X	0.0782	4.385	2.324
2X	0.0969	5.519	3.725
2XY	0.0969	5.519	3.725
2Y	0.0969	5.519	3.725
3X	0.0428	2.306	2.306
3XY	0.0428	2.306	2.306
3Y	0.0428	2.306	2.306
4X	0.054	3.106	2.594
4XY	0.054	3.106	2.594
4Y	0.054	3.106	2.594
5X	0.104	5.529	3.635
5XY	0.104	5.529	3.635
5Y	0.104	5.529	3.635
6X	0.0578	3.780	3.102
6XY	0.0578	3.780	3.102
6Y	0.0578	3.780	3.102
7X	0.0849	4.331	3.649
7XY	0.0849	4.331	3.649
7Y	0.0849	4.331	3.649
8X	0.0677	3.177	3.177
8XY	0.0677	3.177	3.177
8Y	0.0677	3.177	3.177
9X	0.0707	3.906	3.298
9XY	0.0707	3.906	3.298

9Y	0.0795	3.906	3.906
16X	0.0956	4.948	1.571
17X	0.0305	2.383	0.833
18X	0.0687	4.754	0.889
19X	0.0362	3.088	1.200
20X	0.0107	1.378	0.466
20XY	0.0107	1.378	0.466
20Y	0.0107	1.378	0.466
10S	0.0437	2.245	2.245
11S	0.0664	3.510	3.510
12S	0.0905	4.802	4.802
13S	0.1	5.115	5.115
14S	0.129	6.472	6.472
15S	0.236	10.494	10.494
21S	0.153	7.581	7.581
21XYF0.50S	0.0535	1.463	3.641
10X	0.0437	2.245	2.245
10XY	0.0437	2.245	2.245
10Y	0.0437	2.245	2.245
11X	0.0664	3.510	3.510
11XY	0.0664	3.510	3.510
11Y	0.0664	3.510	3.510
12X	0.0905	4.802	4.802
12XY	0.0905	4.802	4.802
12Y	0.0905	4.802	4.802
13X	0.1	5.115	5.115
13XY	0.1	5.115	5.115
13Y	0.1	5.115	5.115
14X	0.129	6.472	6.472
14XY	0.129	6.472	6.472
14Y	0.129	6.472	6.472
15X	0.236	10.494	10.494
15XY	0.236	10.494	10.494
15Y	0.236	10.494	10.494
21X	0.138	6.849	6.587
21XY	0.138	6.849	6.587
21Y	0.153	7.581	7.581
Total	6.3	332.129	281.191

Unadjusted Dead Load and Drag Areas by Section:

Section Label	Unfactored Dead Load (kips)	X-Drag Area All (ft^2)	Y-Drag Area All (ft^2)	X-Drag Area Face (ft^2)	Y-Drag Area Face (ft^2)
1	2.611	151.257	99.881	70.593	34.689
2	3.684	180.872	181.310	70.233	70.671
Total	6.295	332.129	281.191	140.826	105.360

Angle Member Weights and Surface Areas by Section:

Section Label	Unfactored Weight (kips)	Factored Weight (kips)	Unfactored Surface Area (ft^2)	Factored Surface Area (ft^2)
1	2.611	2.611	597.522	597.522
2	3.684	3.868	896.716	941.552
Total	6.295	6.479	1494.239	1539.074

Section Joint Information:

Section Label	Joint Label	Joint Elevation (ft)
1	2X	73.250
1	3X	69.750
1	2P	73.250
1	3P	69.750
1	2Y	73.250
1	3Y	69.750
1	2XY	73.250
1	3XY	69.750
1	4X	66.250
1	4P	66.250
1	4Y	66.250
1	4XY	66.250
1	5X	62.750
1	5P	62.750
1	5Y	62.750
1	5XY	62.750
1	6X	58.500
1	6P	58.500
1	6Y	58.500
1	6XY	58.500
1	7X	54.250
1	7P	54.250
1	7Y	54.250
1	7XY	54.250
1	8X	50.000
1	8P	50.000
1	8Y	50.000
1	8XY	50.000
1	1X	78.250
1	1P	78.250
1	16X	78.250
1	16P	78.250
1	17X	73.250
1	17P	73.250
1	18X	62.750
1	18P	62.750
1	19X	54.250
1	19P	54.250
1	20X	64.000
1	20P	64.000
1	20Y	64.000
1	20XY	64.000
2	8X	50.000
2	10X	46.875
2	8P	50.000
2	10S	46.875
2	8Y	50.000
2	10Y	46.875
2	8XY	50.000
2	10XY	46.875
2	11X	43.750
2	11S	43.750
2	11Y	43.750

2	11XY	43.750
2	12X	37.083
2	12S	37.083
2	12Y	37.083
2	12XY	37.083
2	13X	30.583
2	13S	30.583
2	13Y	30.583
2	13XY	30.583
2	14X	24.500
2	14S	24.500
2	14Y	24.500
2	14XY	24.500
2	15X	17.250
2	15S	17.250
2	15Y	17.250
2	15XY	17.250
2	21X	8.670
2	21S	8.670
2	21Y	8.670
2	21XY	8.670
2	9X	0.000
2	9P	0.000
2	9Y	0.000
2	9XY	0.000
2	21XYF0.50S	8.670

Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Tran. Face Top Width (ft)	Tran. Face Bot Width (ft)	Tran. Face Gross Area (ft^2)	Long. Face Top Width (ft)	Long. Face Bot Width (ft)	Long. Face Gross Area (ft^2)
1	78.250	50.000	42	145	0.00	4.00	103.000	27.50	4.00	271.740
2	50.000	0.000	37	104	4.00	20.00	600.000	4.00	20.00	600.000

*** Insulator Data

Clamp Properties:

Label	Stock Number	Holding Capacity (lbs)
C-EX1		5e+004

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift) (lbs)
1	16P	C-EX1	No Limit
2	16X	C-EX1	No Limit
3	17P	C-EX1	No Limit
4	17X	C-EX1	No Limit
5	18P	C-EX1	No Limit
6	18X	C-EX1	No Limit

7	19P	C-EX1	No Limit
8	19X	C-EX1	No Limit
9	2P	C-EX1	No Limit
10	4P	C-EX1	No Limit
11	6P	C-EX1	No Limit
12	8P	C-EX1	No Limit
13	11S	C-EX1	No Limit
14	13S	C-EX1	No Limit
15	15S	C-EX1	No Limit
16	2X	C-EX1	No Limit
17	4X	C-EX1	No Limit
18	6X	C-EX1	No Limit
19	8X	C-EX1	No Limit
20	11X	C-EX1	No Limit
21	13X	C-EX1	No Limit
22	15X	C-EX1	No Limit
23	2XY	C-EX1	No Limit
24	2Y	C-EX1	No Limit
25	4XY	C-EX1	No Limit
26	4Y	C-EX1	No Limit

*** Loads Data

Loads from file: j:\jobs\1715900.wi\17_ct43xc837 stratford\04_structural\calcs\rev (2)\pls tower\cl&p # 280.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)	78.25 (ft)	
Structure height	78.25 (ft)	
Structure height above ground	78.25 (ft)	
Tower Shape	Rectangular	

Load distributed evenly among joints in section for section based load cases

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles and Tubular Arms and Towers	SF for Guys and Cables	SF for Insuls.	SF For Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	Joint Displ.
NESC Heavy	1.5000	2.5000	1.00000	1.0000	1.0000	1.0000	26 loads	Wind on Face	4	0	0.000	0.000	0.0	
NESC Extreme	1.0000	1.0000	1.00000	1.0000	1.0000	1.0000	26 loads	NESC 2012	31	0	0.000	0.000	0.0	

Point Loads for Load Case "NESC Heavy":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
16P	719	824	0	Shield Wire
16X	719	824	0	Shield Wire
17P	1060	861	0	Conductor
17X	1060	861	0	Conductor
18P	1060	861	0	Conductor
18X	1060	861	0	Conductor
19P	1060	861	0	Conductor
19X	1060	861	0	Conductor
2X	161	60	0	Coax Cables
4X	339	127	0	Coax Cables
6X	374	140	0	Coax Cables
8X	339	127	0	Coax Cables
11X	448	167	0	Coax Cables
13X	609	228	0	Coax Cables
15X	690	258	0	Coax Cables
2P	80	32	0	Coax Cables
4P	170	68	0	Coax Cables
6P	187	75	0	Coax Cables
8P	170	68	0	Coax Cables
11S	224	90	0	Coax Cables

13S	305	123	0	Coax Cables
15S	345	139	0	Coax Cables
2XY	423	1155	-764	Top Connection
2Y	1686	-496	15	Top Connection
4XY	1148	-698	566	Bottom Connection
4Y	935	-4	184	Bottom Connection

Section Load Case Information (Standard) for "NESC Heavy":

Section Label	Z of Top (ft)	Z of Bottom (ft)	Ave. Elev. Above Ground (ft)	Res. Adj. Wind Pres. (psf)	Tran Adj. Wind Pres. (psf)	Tran Drag Coef	Tran Wind Load (lbs)	Long Adj. Wind Pres. (psf)	Long Drag Coef	Long Wind Load (lbs)	Ice Weight (lbs)	Total Weight (lbs)
1	78.25	50.00	64.13	10.00	10.00	3.200	1110.0	0.00	3.200	0.0	0	3917
2	50.00	0.00	25.00	10.00	10.00	3.200	2261.5	0.00	3.200	0.0	0	5802

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
16P	171	788	0	Shield Wire
16X	171	788	0	Shield Wire
17P	411	900	0	Conductor
17X	411	900	0	Conductor
18P	411	900	0	Conductor
18X	411	900	0	Conductor
19P	411	900	0	Conductor
19X	411	900	0	Conductor
2X	44	171	0	Coax Cables
4X	92	360	0	Coax Cables
6X	101	396	0	Coax Cables
8X	92	360	0	Coax Cables
11X	122	475	0	Coax Cables
13X	165	646	0	Coax Cables
15X	187	731	0	Coax Cables
2P	22	85	0	Coax Cables
4P	46	180	0	Coax Cables
6P	51	198	0	Coax Cables
8P	46	180	0	Coax Cables
11S	61	238	0	Coax Cables
13S	83	323	0	Coax Cables
15S	94	366	0	Coax Cables
2XY	-1724	2898	-1466	Top Connection
2Y	2641	2613	1141	Top Connection
4XY	829	-1465	841	Bottom Connection
4Y	78	-1179	-516	Bottom Connection

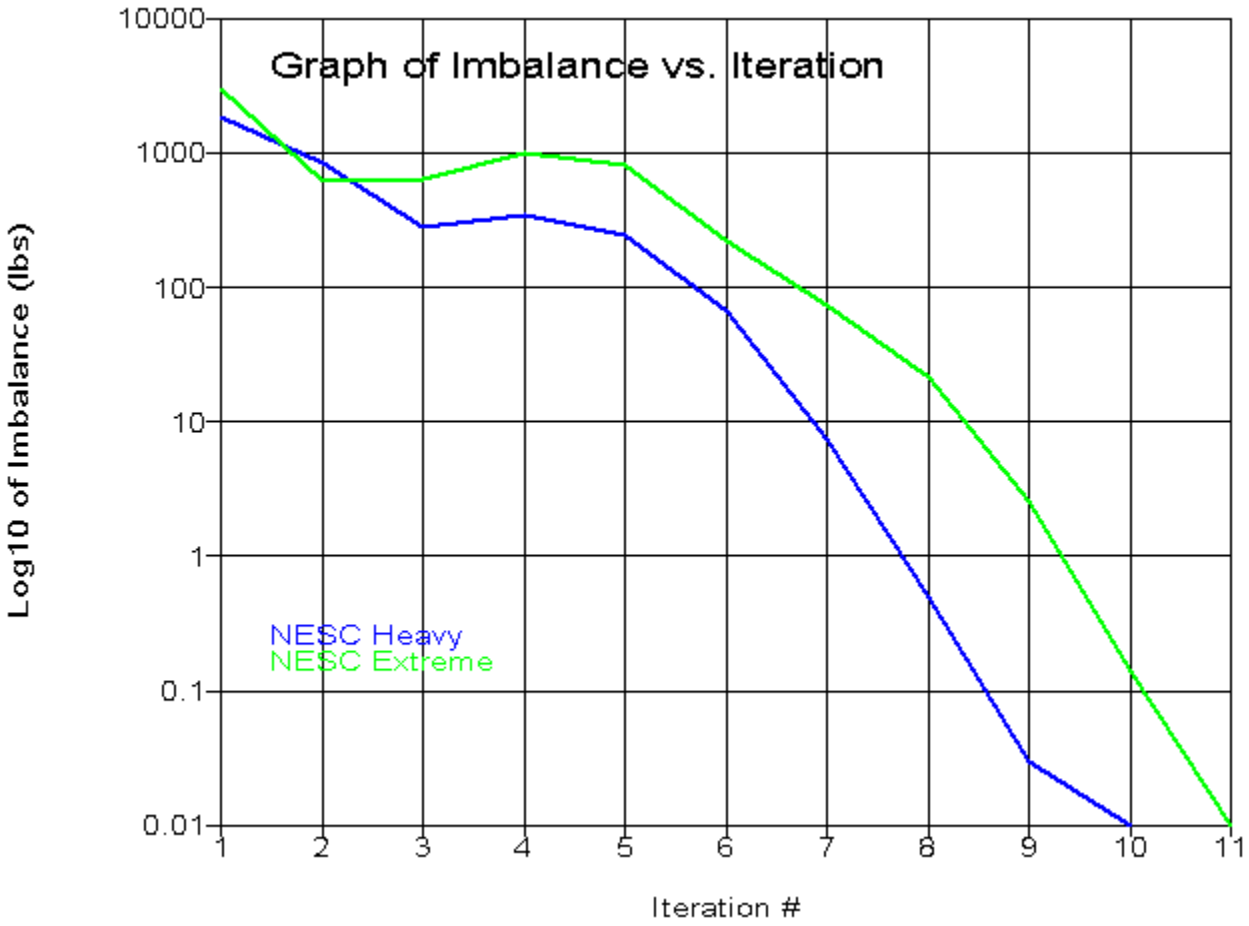
Section Load Case Information (Code) for "NESC Extreme":

Section Label	Z of Top (ft)	Z of Bottom (ft)	Ave. Elev. Above Ground (ft)	Res. Adj. Wind Pres. (psf)	Tran Adj. Wind Pres. (psf)	Tran Angle Face Area (ft^2)	Tran Gross Area (ft^2)	Tran Soli- dity Ratio	Tran Angle Drag Coef	Tran Wind Load (lbs)	Long Adj. Wind Pres. (psf)	Long Angle Face Area (ft^2)	Long Gross Area (ft^2)	Long Soli- dity Ratio	Long Angle Drag Coef	Long Wind Load (lbs)	Ice Weight (lbs)	Total Weight (lbs)

1	78.25	50.00	64.13	30.48	30.48	34.69	103.00	0.337	3.200	3382.9	0.00	70.59	271.74	0.260	3.200	0.0	0	2611
2	50.00	0.00	25.00	30.48	30.48	70.67	600.00	0.118	3.200	6891.9	0.00	70.23	600.00	0.117	3.200	0.0	0	3868

*** Analysis Results:

Maximum element usage is 97.49% for Angle "g27XY" in load case "NESC Extreme"
Maximum insulator usage is 7.97% for Clamp "24" in load case "NESC Extreme"



Angle Forces For All Load Cases:
Positive for tension - negative for compression

Group Label	Angle Label	Max. Usage For All LC %	Max. Tens. For All LC (kips)	Max. Comp. For All LC (kips)	LC 1 (kips)	LC 2 (kips)
Leg1	g1P	5.69	3.176	0.000	1.040	3.176
Leg1	g1X	7.66	0.000	-3.819	-2.919	-3.819
Leg1	g1XY	11.35	0.000	-5.663	-4.565	-5.663
Leg1	g1Y	7.13	3.976	0.000	0.312	3.976

Leg1	g2P	14.58	8.129	0.000	3.134	8.129
Leg1	g2X	17.85	0.000	-8.902	-5.270	-8.902
Leg1	g2XY	22.40	0.000	-11.171	-7.651	-11.171
Leg1	g2Y	15.57	8.686	0.000	1.543	8.686
Leg1	g3P	21.07	11.748	0.000	3.933	11.748
Leg1	g3X	26.57	0.000	-13.253	-7.831	-13.253
Leg1	g3XY	29.83	0.000	-14.881	-10.769	-14.881
Leg1	g3Y	19.31	10.769	0.000	1.192	10.769
Leg1	g4P	30.75	17.148	0.000	7.012	17.148
Leg1	g4X	39.19	0.000	-18.454	-10.299	-18.454
Leg1	g4XY	41.52	0.000	-19.551	-12.955	-19.551
Leg1	g4Y	28.14	15.694	0.000	4.100	15.694
Leg1	g5P	62.66	22.809	0.000	9.340	22.809
Leg1	g5X	67.98	0.000	-24.746	-14.199	-24.746
Leg1	g5XY	70.52	0.000	-25.669	-16.675	-25.669
Leg1	g5Y	58.50	21.294	0.000	6.703	21.294
Leg2	g6P	46.28	25.809	0.000	11.672	25.809
Leg2	g6X	57.84	0.000	-27.237	-15.357	-27.237
Leg2	g6XY	59.01	0.000	-27.786	-17.506	-27.786
Leg2	g6Y	43.16	24.068	0.000	9.059	24.068
Leg2	g7P	57.56	32.103	0.000	14.202	32.103
Leg2	g7X	68.92	0.000	-35.039	-20.671	-35.039
Leg2	g7XY	70.42	0.000	-35.801	-22.760	-35.801
Leg2	g7Y	55.17	30.770	0.000	11.881	30.770
Leg2	g8P	56.88	31.721	0.000	13.727	31.721
Leg2	g8X	69.01	0.000	-35.080	-21.257	-35.080
Leg2	g8XY	71.57	0.000	-36.381	-23.285	-36.381
Leg2	g8Y	55.60	31.010	0.000	11.839	31.010
Leg2	g9P	52.10	29.055	0.000	12.013	29.055
Leg2	g9X	65.52	0.000	-32.861	-20.236	-32.861
Leg2	g9XY	67.93	0.000	-34.073	-21.619	-34.073
Leg2	g9Y	51.93	28.962	0.000	11.065	28.962
Leg2	g10P	52.42	29.235	0.000	11.655	29.235
Leg2	g10X	66.73	0.000	-33.653	-20.955	-33.653
Leg2	g10XY	68.84	0.000	-34.720	-22.031	-34.720
Leg2	g10Y	52.51	29.283	0.000	10.882	29.283
Leg2	g11P	78.80	28.682	0.000	10.682	28.682
Leg2	g11X	91.64	0.000	-33.358	-21.005	-33.358
Leg2	g11XY	93.60	0.000	-34.071	-21.516	-34.071
Leg2	g11Y	78.70	28.648	0.000	10.474	28.648
Leg3	g12P	45.62	29.205	0.000	10.579	29.205
Leg3	g12X	84.78	0.000	-34.583	-21.742	-34.583
Leg3	g12XY	84.90	0.000	-34.632	-21.872	-34.632
Leg3	g12Y	45.13	28.893	0.000	10.272	28.893
Leg3	g13P	45.56	29.167	0.000	9.677	29.167
Leg3	g13X	62.86	0.000	-35.131	-22.447	-35.131
Leg3	g13XY	62.36	0.000	-34.853	-22.124	-34.853
Leg3	g13Y	44.85	28.711	0.000	9.870	28.711
Leg4	g14P	4.73	0.665	0.000	0.100	0.665
Leg4	g14X	11.45	0.000	-1.159	-1.159	-1.108
Leg4	g14XY	9.99	0.000	-1.011	-1.011	-0.613
Leg4	g14Y	1.26	0.177	0.000	0.048	0.177
Diag1	g15P	12.96	0.000	-1.180	-0.942	-1.180
Diag1	g15X	18.06	1.029	0.000	0.625	1.029
Diag1	g15XY	7.74	0.441	0.000	0.441	0.412
Diag1	g15Y	9.65	0.000	-0.878	-0.878	-0.572
Diag1	g16P	23.65	0.000	-2.152	-1.688	-2.152
Diag1	g16X	31.98	1.821	0.000	0.783	1.821
Diag1	g16XY	77.75	4.428	0.000	1.095	4.428

Diag1	g16Y	53.07	0.000	-4.830	-2.226	-4.830
Diag1	g17P	13.74	0.783	-0.042	-0.042	0.783
Diag1	g17X	9.71	0.000	-0.883	-0.155	-0.883
Diag1	g17XY	33.33	1.898	0.000	0.814	1.898
Diag1	g17Y	17.23	0.000	-1.568	-0.018	-1.568
Diag1	g18P	20.97	0.000	-1.908	-0.820	-1.908
Diag1	g18X	39.74	2.263	0.000	1.716	2.263
Diag1	g18XY	86.41	4.921	0.000	2.247	4.921
Diag1	g18Y	49.31	0.000	-4.488	-1.131	-4.488
Diag1	g19P	28.85	1.643	0.000	0.050	1.643
Diag1	g19X	21.84	0.000	-1.987	-0.860	-1.987
Diag1	g19XY	13.78	0.785	0.000	0.104	0.785
Diag1	g19Y	7.67	0.073	-0.698	0.073	-0.698
Diag2	g20P	28.33	0.000	-2.578	-1.300	-2.578
Diag2	g20X	31.29	2.699	0.000	1.616	2.699
Diag2	g20XY	36.22	3.124	0.000	1.199	3.124
Diag2	g20Y	35.19	0.000	-3.202	-1.423	-3.202
Diag2	g21P	6.46	0.355	-0.587	-0.587	0.355
Diag2	g21X	8.91	0.000	-0.810	-0.470	-0.810
Diag2	g21XY	10.04	0.866	-0.235	-0.235	0.866
Diag2	g21Y	14.41	0.000	-1.312	-0.798	-1.312
Diag1	g22P	37.46	0.000	-3.409	-2.271	-3.409
Diag1	g22X	57.87	3.296	0.000	2.078	3.296
Diag1	g22XY	79.43	4.524	0.000	1.777	4.524
Diag1	g22Y	54.05	0.000	-4.919	-2.660	-4.919
Diag1	g23P	9.51	0.542	-0.058	-0.058	0.542
Diag1	g23X	6.82	0.000	-0.621	-0.174	-0.621
Diag1	g23XY	7.18	0.409	-0.157	-0.157	0.409
Diag1	g23Y	5.37	0.000	-0.489	-0.074	-0.489
Diag1	g24P	45.99	0.000	-4.185	-2.546	-4.185
Diag1	g24X	70.82	4.033	0.000	2.248	4.033
Diag1	g24XY	79.42	4.523	0.000	1.912	4.523
Diag1	g24Y	53.70	0.000	-4.886	-2.718	-4.886
Diag1	g25P	4.29	0.129	-0.390	-0.390	0.129
Diag1	g25X	3.75	0.000	-0.341	-0.155	-0.341
Diag1	g25XY	10.70	0.609	-0.107	-0.107	0.609
Diag1	g25Y	8.77	0.000	-0.798	-0.390	-0.798
Diag1(R)	g26P	55.10	0.000	-5.015	-3.771	-5.015
Diag1(R)	g26X	65.92	4.375	0.000	2.360	4.375
Diag1(R)	g26XY	77.13	5.119	0.000	1.745	5.119
Diag1(R)	g26Y	68.06	0.000	-6.194	-4.186	-6.194
Diag1(R)	g27P	66.27	0.000	-6.031	-3.882	-6.031
Diag1(R)	g27X	82.07	5.448	0.000	2.533	5.448
Diag1(R)	g27XY	97.49	6.471	0.000	2.532	6.471
Diag1(R)	g27Y	77.59	0.000	-7.061	-3.888	-7.061
Diag1	g28P	37.29	2.098	0.000	0.626	2.098
Diag1	g28X	22.67	0.000	-2.063	-0.836	-2.063
Diag1	g28XY	14.55	0.000	-1.324	-1.007	-1.324
Diag1	g28Y	18.36	1.033	0.000	0.441	1.033
Diag1	g29P	16.90	0.000	-1.538	-0.985	-1.538
Diag1	g29X	28.84	1.622	0.000	1.012	1.622
Diag1	g29XY	30.43	1.712	0.000	0.395	1.712
Diag1	g29Y	22.60	0.000	-2.056	-1.234	-2.056
Diag1	g30P	24.48	1.377	0.000	0.570	1.377
Diag1	g30X	17.17	0.000	-1.563	-0.563	-1.563
Diag1	g30XY	7.92	0.000	-0.720	-0.416	-0.720
Diag1	g30Y	14.82	0.833	0.000	0.712	0.833
Diag1	g31P	24.92	1.402	0.000	0.833	1.402
Diag1	g31X	13.45	0.000	-1.187	-0.262	-1.187

Diag1	g31XY	12.71	0.000	-1.122	-0.744	-1.122
Diag1	g31Y	17.80	1.001	0.000	0.637	1.001
Diag3	g32P	9.73	0.630	0.000	0.138	0.630
Diag3	g32X	11.97	0.000	-0.827	-0.474	-0.827
Diag3	g32XY	9.87	0.000	-0.682	-0.682	-0.606
Diag3	g32Y	6.06	0.392	0.000	0.274	0.392
Diag3	g33P	14.98	0.000	-0.842	-0.575	-0.842
Diag3	g33X	13.77	0.891	0.000	0.556	0.891
Diag3	g33XY	15.08	0.975	0.000	0.185	0.975
Diag3	g33Y	21.56	0.000	-1.213	-0.719	-1.213
Diag3	g34P	4.37	0.283	0.000	0.137	0.283
Diag3	g34X	5.32	0.000	-0.294	-0.150	-0.294
Diag3	g34XY	4.33	0.000	-0.239	-0.239	-0.129
Diag3	g34Y	4.44	0.287	0.000	0.287	0.150
Diag3	g35P	11.38	0.736	0.000	0.412	0.736
Diag3	g35X	13.78	0.000	-0.581	-0.120	-0.581
Diag3	g35XY	12.40	0.000	-0.523	-0.371	-0.523
Diag3	g35Y	7.49	0.485	0.000	0.314	0.485
Diag4	g36P	10.58	0.000	-0.695	-0.370	-0.695
Diag4	g36X	3.77	0.273	-0.044	-0.044	0.273
Diag4	g36XY	5.00	0.040	-0.240	-0.240	0.040
Diag4	g36Y	2.01	0.032	-0.132	0.032	-0.132
Diag4	g37P	6.73	0.000	-0.324	-0.260	-0.324
Diag4	g37X	3.43	0.248	0.000	0.121	0.248
Diag4	g37XY	4.41	0.319	0.000	0.033	0.319
Diag4	g37Y	10.45	0.000	-0.502	-0.284	-0.502
Diag5	g38P	5.56	0.000	-0.481	-0.191	-0.481
Diag5	g38X	8.89	0.730	0.000	0.254	0.730
Diag5	g38XY	3.18	0.261	-0.081	-0.081	0.261
Diag5	g38Y	3.15	0.000	-0.272	-0.020	-0.272
Diag5	g39P	4.03	0.330	0.000	0.152	0.330
Diag5	g39X	3.18	0.000	-0.201	-0.036	-0.201
Diag5	g39XY	2.24	0.000	-0.141	-0.110	-0.141
Diag5	g39Y	2.22	0.182	0.000	0.132	0.182
Diag6(R)	g40P	52.27	0.000	-1.188	-0.638	-1.188
Diag6(R)	g40X	13.79	0.973	0.000	0.283	0.973
Diag6(R)	g40XY	7.84	0.553	0.000	0.045	0.553
Diag6(R)	g40Y	30.86	0.000	-0.702	-0.347	-0.702
Diag6(R)	g41P	33.40	0.000	-0.549	-0.388	-0.549
Diag6(R)	g41X	17.22	1.215	0.000	0.393	1.215
Diag6(R)	g41XY	12.56	0.886	0.000	0.263	0.886
Diag6(R)	g41Y	14.93	0.000	-0.245	-0.161	-0.245
Horz1	g42P	20.26	1.410	0.000	1.410	0.561
Horz1	g42Y	26.89	1.872	0.000	1.872	0.813
Horz1	g43P	15.83	1.102	0.000	1.102	0.405
Horz1	g43Y	21.33	1.485	0.000	1.485	0.634
Horz2	g44P	17.12	1.108	0.000	1.108	0.326
Horz2	g44X	9.40	0.608	0.000	0.608	0.288
Horz2	g45P	14.03	0.908	0.000	0.908	0.542
Horz2	g45X	11.33	0.733	0.000	0.733	0.134
Horz2	g46P	81.83	4.660	0.000	2.940	4.660
Horz2	g46X	44.41	0.000	-4.042	-1.436	-4.042
Horz2	g47P	1.51	0.000	-0.137	-0.014	-0.137
Horz2	g47Y	1.99	0.129	0.000	0.129	0.044
Horz2	g48P	5.86	0.379	0.000	0.152	0.379
Horz2	g48X	4.97	0.000	-0.452	-0.253	-0.452
Horz3	g49P	2.44	0.000	-0.172	-0.146	-0.172
Horz3	g49Y	1.10	0.100	0.000	0.033	0.100
Horz3	g50P	2.93	0.266	0.000	0.131	0.266

Horz3	g50X	12.82	0.000	-0.902	-0.362	-0.902
Inner1	g51P	3.07	0.152	-0.279	-0.279	0.152
Inner1	g51X	2.46	0.000	-0.223	-0.128	-0.223
Inner1	g52P	4.39	0.000	-0.400	-0.136	-0.400
Inner1	g52X	6.59	0.376	0.000	0.085	0.376
Inner1	g53P	3.53	0.201	0.000	0.201	0.086
Inner1	g53X	3.78	0.215	0.000	0.215	0.094
Inner1	g54P	3.01	0.000	-0.274	-0.096	-0.274
Inner1	g54X	3.53	0.201	0.000	0.102	0.201
Inner2	g55P	35.73	0.000	-0.361	-0.165	-0.361
Inner2	g55X	3.41	0.194	0.000	0.084	0.194
ShieldAr	g56P	12.49	1.137	-0.345	1.137	-0.345
ShieldAr	g56X	31.26	2.845	0.000	2.845	1.397
ShieldAr	g57P	43.03	3.915	0.000	3.915	1.336
TopCrArm	g58P	7.91	0.000	-1.342	-1.342	-0.877
TopCrArm	g58X	2.55	0.141	-0.432	-0.432	0.141
TopCrArm	g58XY	2.56	0.137	-0.434	-0.434	0.137
TopCrArm	g58Y	7.92	0.000	-1.344	-1.344	-0.881
TopCrArm	g59P	7.35	0.000	-1.338	-1.338	-0.468
TopCrArm	g59Y	11.13	0.000	-2.026	-2.026	-0.521
MidCrArm	g60P	22.88	0.000	-4.165	-4.165	-1.958
MidCrArm	g60X	17.81	0.000	-3.242	-3.242	-1.014
MidCrArm	g60XY	17.57	0.000	-3.198	-3.198	-0.925
MidCrArm	g60Y	22.47	0.000	-4.089	-4.089	-1.994
MidCrArm	g61P	11.09	0.000	-2.018	-2.018	-0.838
MidCrArm	g61Y	8.48	0.000	-1.544	-1.544	-0.647
BotCrArm	g62P	9.15	0.000	-1.552	-1.552	-0.833
BotCrArm	g62X	3.63	0.000	-0.617	-0.617	-0.076
BotCrArm	g62XY	3.41	0.219	-0.579	-0.579	0.219
BotCrArm	g62Y	8.68	0.000	-1.473	-1.473	-1.058
BotCrArm	g63P	3.52	0.000	-0.641	-0.641	-0.260
BotCrArm	g63Y	0.31	0.000	-0.057	-0.057	-0.000
ShArmBr	g64P	9.64	0.000	-1.108	-1.108	-0.287
ShArmBr	g64X	9.64	0.000	-1.108	-1.108	-0.286
ShArmBr	g64XY	9.66	0.000	-1.110	-1.110	-0.292
ShArmBr	g64Y	9.66	0.000	-1.110	-1.110	-0.292
TopArmBr	g65P	29.19	2.032	0.000	2.032	0.854
TopArmBr	g65X	29.17	2.030	0.000	2.030	0.853
MidArmBr	g66P	54.00	3.759	0.000	3.759	1.477
MidArmBr	g66X	53.58	3.730	0.000	3.730	1.535
MidArmBr	g66XY	52.92	3.684	0.000	3.684	1.442
MidArmBr	g66Y	52.88	3.681	0.000	3.681	1.511
BotArmBr	g67P	17.66	1.229	0.000	1.229	0.368
BotArmBr	g67X	17.31	1.205	0.000	1.205	0.663
BotArmBr	g67XY	16.70	1.162	0.000	1.162	0.328
BotArmBr	g67Y	16.35	1.138	0.000	1.138	0.622
MidArmBr	g68P	25.41	1.769	0.000	1.769	0.585
MidArmBr	g68X	25.36	1.765	0.000	1.765	0.720
MidArmBr	g68XY	25.05	1.743	0.000	1.743	0.675
MidArmBr	g68Y	24.88	1.732	0.000	1.732	0.601
MidArmBr	g69P	33.24	2.314	0.000	2.314	0.946
MidArmBr	g69X	33.07	2.302	0.000	2.302	1.047
MidArmBr	g69XY	32.66	2.273	0.000	2.273	0.990
MidArmBr	g69Y	32.55	2.266	0.000	2.266	0.967
Leg3	g70P	58.94	30.437	0.000	9.931	30.437
Leg3	g70X	65.51	0.000	-36.496	-23.321	-36.496
Leg3	g70XY	64.73	0.000	-36.064	-22.943	-36.064
Leg3	g70Y	57.68	29.787	0.000	9.987	29.787
Diag6(R)	g71P	63.68	0.000	-1.142	-0.520	-1.142

Diag6(R)	g71X	15.97	1.126	0.000	0.471	1.126
Diag6(R)	g71XY	10.32	0.728	0.000	0.233	0.728
Diag6(R)	g71Y	44.06	0.000	-0.790	-0.322	-0.790
Diag6(R)	g72P	2.09	0.147	0.000	0.064	0.147
Diag6(R)	g72Y	5.64	0.398	0.000	0.251	0.398
Horz2	g73P	52.56	0.000	-0.952	-0.340	-0.952
Horz2	Fg7373P	38.21	0.000	-0.692	-0.236	-0.692
Kdown1	g75P	1.23	0.125	0.000	0.023	0.125
Kdown1	g75Y	7.26	0.000	-0.220	-0.115	-0.220

*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 10

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)
1P	-0.008605	0.201	-0.01839	0.0000	0.0000	0.0000	-0.008605	2.201	78.23
2P	-0.00653	0.1731	-0.0172	-0.3154	-0.0213	0.0019	1.993	2.173	73.23
3P	-0.005162	0.154	-0.01694	-0.3076	-0.0250	0.0030	1.995	2.154	69.73
4P	-0.003727	0.1355	-0.01651	-0.3034	-0.0164	0.0040	1.996	2.135	66.23
5P	-0.002915	0.117	-0.0159	-0.2944	-0.0201	0.0051	1.997	2.117	62.73
6P	-0.0009955	0.09607	-0.01496	-0.2747	-0.0167	0.0060	1.999	2.096	58.49
7P	-0.0008388	0.07634	-0.01368	-0.2534	0.0031	0.0068	1.999	2.076	54.24
8P	-0.0005008	0.0594	-0.01232	-0.1949	-0.0176	0.0090	1.999	2.059	49.99
9P	0	0	0	0.0000	0.0000	0.0000	10	10	0
16P	-0.008711	0.2015	-0.08631	0.0000	0.0000	0.0000	-0.008711	13.95	78.16
17P	-0.006677	0.1728	-0.06503	0.0000	0.0000	0.0000	-0.006677	9.923	73.18
18P	-0.003881	0.1156	-0.1088	0.0000	0.0000	0.0000	-0.003881	13.87	62.64
19P	-0.001626	0.07584	-0.05349	0.0000	0.0000	0.0000	-0.001626	9.826	54.2
20P	-0.005803	0.1241	-0.03737	0.0000	0.0000	0.0000	1.334	6.014	63.96
1X	-0.00859	0.2007	0.003494	0.0000	0.0000	0.0000	-0.00859	-1.799	78.25
2X	-0.006645	0.1734	0.004322	-0.3149	-0.0257	-0.0003	1.993	-1.827	73.25
2XY	-0.006762	0.1734	0.002826	-0.3211	-0.0218	0.0007	-2.007	-1.827	73.25
2Y	-0.006745	0.1731	-0.01881	-0.3165	-0.0242	0.0005	-2.007	2.173	73.23
3X	-0.005199	0.1541	0.004302	-0.3174	-0.0186	0.0008	1.995	-1.846	69.75
3XY	-0.005255	0.1538	0.002859	-0.3227	-0.0300	0.0021	-2.005	-1.846	69.75
3Y	-0.00539	0.1539	-0.01843	-0.3103	-0.0182	0.0012	-2.005	2.154	69.73
4X	-0.004146	0.135	0.00413	-0.3000	-0.0230	0.0020	1.996	-1.865	66.25
4XY	-0.003501	0.1345	0.002802	-0.2998	-0.0186	0.0035	-2.004	-1.865	66.25
4Y	-0.004354	0.1352	-0.01783	-0.3052	-0.0209	0.0018	-2.004	2.135	66.23
5X	-0.002643	0.1173	0.003894	-0.2904	-0.0151	0.0031	1.997	-1.883	62.75
5XY	-0.002785	0.1169	0.002761	-0.2894	-0.0173	0.0049	-2.003	-1.883	62.75
5Y	-0.003091	0.1167	-0.01701	-0.2938	-0.0113	0.0024	-2.003	2.117	62.73
6X	-0.0023	0.09571	0.003341	-0.2783	-0.0088	0.0027	1.998	-1.904	58.5
6XY	-0.000977	0.09529	0.002461	-0.2788	-0.0167	0.0056	-2.001	-1.905	58.5
6Y	-0.002899	0.09579	-0.01584	-0.2744	-0.0086	0.0018	-2.003	2.096	58.48
7X	-0.0009512	0.07647	0.002575	-0.2469	-0.0183	0.0025	1.999	-1.924	54.25
7XY	-0.0006721	0.0761	0.001923	-0.2458	-0.0011	0.0063	-2.001	-1.924	54.25
7Y	-0.00141	0.07606	-0.01435	-0.2537	-0.0225	0.0013	-2.001	2.076	54.24
8X	-0.0002628	0.05943	0.001597	-0.2011	0.0011	0.0006	2	-1.941	50
8XY	-0.0002136	0.05909	0.001172	-0.2017	-0.0109	0.0070	-2	-1.941	50
8Y	-0.0005302	0.05909	-0.0128	-0.1955	0.0051	-0.0002	-2.001	2.059	49.99
9X	0	0	0	0.0000	0.0000	0.0000	10	-10	0
9XY	0	0	0	0.0000	0.0000	0.0000	-10	-10	0
9Y	0	0	0	0.0000	0.0000	0.0000	-10	10	0
16X	-0.008824	0.2006	0.06615	0.0000	0.0000	0.0000	-0.008824	-13.55	78.32
17X	-0.006867	0.1739	0.04207	0.0000	0.0000	0.0000	-0.006867	-9.576	73.29
18X	-0.001584	0.1183	0.03168	0.0000	0.0000	0.0000	-0.001584	-13.63	62.78
19X	-6.446e-005	0.0768	0.03476	0.0000	0.0000	0.0000	-6.446e-005	-9.673	54.28
20X	-0.006874	0.1235	0.023	0.0000	0.0000	0.0000	1.333	-5.767	64.02
20XY	0.001431	0.1232	0.02205	0.0000	0.0000	0.0000	-1.339	-5.767	64.02
20Y	-0.001533	0.1239	-0.03823	0.0000	0.0000	0.0000	-1.342	6.014	63.96
10S	0.0003659	0.04992	-0.0123	-0.1586	-0.0131	0.0138	2.5	2.55	46.86
11S	0.0003361	0.04165	-0.01219	-0.1371	-0.0117	0.0157	3	3.042	43.74
12S	0.002168	0.02843	-0.0111	-0.1003	-0.0027	0.0193	4.069	4.095	37.07
13S	-6.455e-005	0.01799	-0.0102	-0.0734	-0.0050	0.0196	5.107	5.125	30.57

14S	0.001484	0.01178	-0.008203	-0.0511	-0.0071	0.0194	6.081	6.092	24.49
15S	-0.0001053	0.00577	-0.006471	-0.0371	-0.0039	0.0195	7.24	7.246	17.24
21S	0.001703	0.002121	-0.003166	-0.0162	-0.0076	0.0093	8.615	8.615	8.667
21XYF0.50S	5.943e-005	0.07926	-0.0131	0.0068	-0.0003	0.0008	5.943e-005	-8.534	8.657
10X	-0.0004101	0.04968	0.002196	-0.1556	0.0030	-0.0037	2.5	-2.45	46.88
10XY	0.0003022	0.04922	0.001889	-0.1588	-0.0055	0.0102	-2.5	-2.451	46.88
10Y	-0.0009371	0.0495	-0.01273	-0.1578	0.0059	-0.0052	-2.501	2.549	46.86
11X	-0.0002956	0.04166	0.002589	-0.1348	0.0015	-0.0114	3	-2.958	43.75
11XY	0.0003714	0.04097	0.002414	-0.1367	-0.0031	0.0172	-3	-2.959	43.75
11Y	-0.0006239	0.0412	-0.01253	-0.1364	0.0066	-0.0076	-3.001	3.041	43.74
12X	-0.0009591	0.02741	0.003059	-0.0921	-0.0046	-0.0276	4.066	-4.039	37.09
12XY	0.001232	0.02677	0.002982	-0.0921	0.0049	0.0322	-4.065	-4.04	37.09
12Y	-0.002178	0.02778	-0.01133	-0.0995	0.0010	-0.0124	-4.069	4.094	37.07
13X	7.529e-005	0.01827	0.003069	-0.0646	-0.0070	-0.0462	5.107	-5.088	30.59
13XY	0.0002095	0.01744	0.003127	-0.0634	0.0077	0.0498	-5.107	-5.089	30.59
13Y	5.242e-005	0.01743	-0.01026	-0.0724	0.0049	-0.0141	-5.107	5.124	30.57
14X	-0.0005409	0.01095	0.002752	-0.0415	-0.0077	-0.0644	6.079	-6.069	24.5
14XY	0.0008385	0.01043	0.002786	-0.0394	0.0081	0.0672	-6.079	-6.07	24.5
14Y	-0.001588	0.01114	-0.008193	-0.0499	0.0079	-0.0155	-6.082	6.091	24.49
15X	7.248e-005	0.005828	0.002238	-0.0200	-0.0132	-0.0773	7.24	-7.234	17.25
15XY	0.0002105	0.005321	0.002314	-0.0193	0.0139	0.0799	-7.24	-7.235	17.25
15Y	-0.0001554	0.005332	-0.006387	-0.0354	0.0041	-0.0169	-7.24	7.245	17.24
21X	-0.0004048	0.001232	0.001347	0.0057	-0.0268	-0.1800	8.612	-8.612	8.671
21XY	0.0005689	0.001033	0.001362	0.0083	0.0282	0.1808	-8.612	-8.612	8.671
21Y	-0.001869	0.00185	-0.003122	-0.0143	0.0059	-0.0085	-8.615	8.615	8.667

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %(kips)	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
9P	-3.46	0.0	-4.09	0.0	0.0	-22.98	0.0	0.0	23.60	0.0	0.04	0.0	-0.1	0.0	0.0	-0.02	0.0	0.0
9X	1.50	0.0	-2.04	0.0	0.0	9.70	0.0	0.0	10.02	0.0	-0.03	0.0	0.0	0.0	0.0	0.16	0.0	0.0
9XY	-1.60	0.0	-1.85	0.0	0.0	9.74	0.0	0.0	10.04	0.0	-0.04	0.0	-0.0	0.0	0.0	-0.16	0.0	0.0
9Y	3.56	0.0	-3.87	0.0	0.0	-22.61	0.0	0.0	23.21	0.0	0.03	0.0	0.1	0.0	0.0	0.02	0.0	0.0

Joint Displacements, Loads and Member Forces on Joints for Load Case "NESC Heavy":

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0000	0.0000	-0.1174	-0.0000	0.0000	0.1174	-0.0086	0.2010	-0.0184
2P	0.0000	0.0320	-0.2254	0.0000	-0.0320	0.2254	-0.0065	0.1731	-0.0172
3P	0.0000	0.0000	-0.0643	-0.0000	0.0000	0.0643	-0.0052	0.1540	-0.0169
4P	0.0000	0.0680	-0.2510	-0.0000	-0.0680	0.2510	-0.0037	0.1355	-0.0165
5P	0.0000	0.0000	-0.1565	0.0000	0.0000	0.1565	-0.0029	0.1170	-0.0159
6P	0.0000	0.0750	-0.2736	-0.0000	-0.0750	0.2736	-0.0010	0.0961	-0.0150
7P	0.0000	0.0000	-0.1274	0.0000	0.0000	0.1274	-0.0008	0.0763	-0.0137
8P	0.0000	0.0680	-0.2731	0.0000	-0.0680	0.2731	-0.0005	0.0594	-0.0123
9P	0.0000	0.0000	-0.1253	3.4613	4.0929	-22.8568	0.0000	0.0000	0.0000
16P	0.0000	0.8240	-0.8625	-0.0000	-0.8240	0.8625	-0.0087	0.2015	-0.0863
17P	0.0000	0.8610	-1.1057	-0.0000	-0.8610	1.1057	-0.0067	0.1728	-0.0650
18P	0.0000	0.8610	-1.1631	-0.0000	-0.8610	1.1631	-0.0039	0.1156	-0.1088
19P	0.0000	0.8610	-1.1143	-0.0000	-0.8610	1.1143	-0.0016	0.0758	-0.0535
20P	0.0000	0.0000	-0.0161	0.0000	0.0000	0.0161	-0.0058	0.1241	-0.0374
1X	0.0000	0.0133	-0.1174	-0.0000	-0.0133	0.1174	-0.0086	0.2007	0.0035

2X	0.0000	0.1205	-0.3064	-0.0000	-0.1205	0.3064	-0.0066	0.1734	0.0043
2XY	-0.7640	1.2155	-0.5684	0.7640	-1.2155	0.5684	-0.0068	0.1734	0.0028
2Y	0.0150	-0.4960	-1.8314	-0.0150	0.4960	1.8314	-0.0067	0.1731	-0.0188
3X	0.0000	0.0575	-0.0643	0.0000	-0.0575	0.0643	-0.0052	0.1541	0.0043
3XY	0.0000	0.0575	-0.0643	-0.0000	-0.0575	0.0643	-0.0053	0.1538	0.0029
3Y	0.0000	0.0000	-0.0643	0.0000	0.0000	0.0643	-0.0054	0.1539	-0.0184
4X	0.0000	0.1925	-0.4200	0.0000	-0.1925	0.4200	-0.0041	0.1350	0.0041
4XY	0.5660	-0.6325	-1.2290	-0.5660	0.6325	1.2290	-0.0035	0.1345	0.0028
4Y	0.1840	-0.0040	-1.0160	-0.1840	0.0040	1.0160	-0.0044	0.1352	-0.0178
5X	0.0000	0.0771	-0.1565	-0.0000	-0.0771	0.1565	-0.0026	0.1173	0.0039
5XY	0.0000	0.0771	-0.1565	0.0000	-0.0771	0.1565	-0.0028	0.1169	0.0028
5Y	0.0000	0.0000	-0.1565	-0.0000	0.0000	0.1565	-0.0031	0.1167	-0.0170
6X	0.0000	0.2194	-0.4606	0.0000	-0.2194	0.4606	-0.0023	0.0957	0.0033
6XY	0.0000	0.0794	-0.0866	-0.0000	-0.0794	0.0866	-0.0010	0.0953	0.0025
6Y	0.0000	0.0000	-0.0866	0.0000	0.0000	0.0866	-0.0029	0.0958	-0.0158
7X	0.0000	0.0755	-0.1274	-0.0000	-0.0755	0.1274	-0.0010	0.0765	0.0026
7XY	0.0000	0.0755	-0.1274	0.0000	-0.0755	0.1274	-0.0007	0.0761	0.0019
7Y	0.0000	0.0000	-0.1274	-0.0000	0.0000	0.1274	-0.0014	0.0761	-0.0143
8X	0.0000	0.2006	-0.4421	-0.0000	-0.2006	0.4421	-0.0003	0.0594	0.0016
8XY	0.0000	0.0736	-0.1031	0.0000	-0.0736	0.1031	-0.0002	0.0591	0.0012
8Y	0.0000	0.0000	-0.1031	-0.0000	0.0000	0.1031	-0.0005	0.0591	-0.0128
9X	0.0000	0.0821	-0.1113	-1.4983	1.9559	9.8097	0.0000	0.0000	0.0000
9XY	0.0000	0.0821	-0.1113	1.5959	1.7644	9.8545	0.0000	0.0000	0.0000
9Y	0.0000	0.0000	-0.1253	-3.5578	3.8671	-22.4842	0.0000	0.0000	0.0000
16X	0.0000	0.8743	-0.8625	-0.0000	-0.8743	0.8625	-0.0088	0.2006	0.0662
17X	0.0000	0.8877	-1.1057	-0.0000	-0.8877	1.1057	-0.0069	0.1739	0.0421
18X	0.0000	0.8894	-1.1631	-0.0000	-0.8894	1.1631	-0.0016	0.1183	0.0317
19X	0.0000	0.8994	-1.1143	-0.0000	-0.8994	1.1143	-0.0001	0.0768	0.0348
20X	0.0000	0.0149	-0.0161	-0.0000	-0.0149	0.0161	-0.0069	0.1235	0.0230
20XY	0.0000	0.0149	-0.0161	0.0000	-0.0149	0.0161	0.0014	0.1232	0.0220
20Y	0.0000	0.0000	-0.0161	-0.0000	0.0000	0.0161	-0.0015	0.1239	-0.0382
10S	0.0000	0.0000	-0.0688	-0.0000	0.0000	0.0688	0.0004	0.0499	-0.0123
11S	0.0000	0.0900	-0.3286	-0.0000	-0.0900	0.3286	0.0003	0.0416	-0.0122
12S	0.0000	0.0000	-0.1426	-0.0000	0.0000	0.1426	0.0022	0.0284	-0.0111
13S	0.0000	0.1230	-0.4626	-0.0000	-0.1230	0.4626	-0.0001	0.0180	-0.0102
14S	0.0000	0.0000	-0.2036	0.0000	0.0000	0.2036	0.0015	0.0118	-0.0082
15S	0.0000	0.1390	-0.7169	0.0000	-0.1390	0.7169	-0.0001	0.0058	-0.0065
21S	0.0000	0.0000	-0.2405	0.0000	0.0000	0.2405	0.0017	0.0021	-0.0032
21XYF0.50S	0.0000	0.1165	-0.0842	0.0000	-0.1165	0.0842	0.0001	0.0793	-0.0131
10X	0.0000	0.0571	-0.0688	0.0000	-0.0571	0.0688	-0.0004	0.0497	0.0022
10XY	0.0000	0.0571	-0.0688	-0.0000	-0.0571	0.0688	0.0003	0.0492	0.0019
10Y	0.0000	0.0000	-0.0688	0.0000	0.0000	0.0688	-0.0009	0.0495	-0.0127
11X	0.0000	0.2539	-0.5526	0.0000	-0.2539	0.5526	-0.0003	0.0417	0.0026
11XY	0.0000	0.0869	-0.1046	-0.0000	-0.0869	0.1046	0.0004	0.0410	0.0024
11Y	0.0000	0.0000	-0.1046	0.0000	0.0000	0.1046	-0.0006	0.0412	-0.0125
12X	0.0000	0.1181	-0.1426	0.0000	-0.1181	0.1426	-0.0010	0.0274	0.0031
12XY	0.0000	0.1181	-0.1426	-0.0000	-0.1181	0.1426	0.0012	0.0268	0.0030
12Y	0.0000	0.0000	-0.1426	0.0000	0.0000	0.1426	-0.0022	0.0278	-0.0113
13X	0.0000	0.3556	-0.7666	0.0000	-0.3556	0.7666	0.0001	0.0183	0.0031
13XY	0.0000	0.1276	-0.1576	-0.0000	-0.1276	0.1576	0.0002	0.0174	0.0031
13Y	0.0000	0.0000	-0.1576	0.0000	0.0000	0.1576	0.0001	0.0174	-0.0103
14X	0.0000	0.1617	-0.2036	-0.0000	-0.1617	0.2036	-0.0005	0.0109	0.0028
14XY	0.0000	0.1617	-0.2036	0.0000	-0.1617	0.2036	0.0008	0.0104	0.0028
14Y	0.0000	0.0000	-0.2036	-0.0000	0.0000	0.2036	-0.0016	0.0111	-0.0082
15X	0.0000	0.5051	-1.0619	-0.0000	-0.5051	1.0619	0.0001	0.0058	0.0022
15XY	0.0000	0.2471	-0.3719	0.0000	-0.2471	0.3719	0.0002	0.0053	0.0023
15Y	0.0000	0.0000	-0.3719	-0.0000	0.0000	0.3719	-0.0002	0.0053	-0.0064
21X	0.0000	0.1642	-0.2175	0.0000	-0.1642	0.2175	-0.0004	0.0012	0.0013
21XY	0.0000	0.1642	-0.2175	-0.0000	-0.1642	0.2175	0.0006	0.0010	0.0014

21Y	0.0000	0.0000	-0.2405	-0.0000	0.0000	0.2405	-0.0019	0.0019	-0.0031							

Crossing Diagonal Check for Load Case "NESC Heavy" (RLOUT controls):

Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	Original Supported L/R Cap. (kips)	RLX	RLY	RLZ	L/R	KL/R	Curve No.	Alternate Unsupported L/R Cap. (kips)	RLOUT	L/R	KL/R	Curve No.
g17P	g17Y	Short only	-0.04	-0.02	14.59	0.750	0.500	0.500	92.98	99.73	2	12.05	1.000	118.77	119.39	3
g17Y	g17P	Short only	-0.02	-0.04	14.59	0.750	0.500	0.500	92.98	99.73	2	12.05	1.000	118.77	119.39	3
g19X	g19XY	Short only	-0.86	0.10	14.59	0.750	0.500	0.500	92.98	99.73	2	12.05	1.000	118.77	119.39	3
g21P	g21Y	Short only	-0.59	-0.80	23.59	0.750	0.500	0.500	81.56	91.17	2	19.73	1.000	104.73	112.37	3
g21X	g21XY	Short only	-0.47	-0.23	23.59	0.750	0.500	0.500	81.56	91.17	2	19.73	1.000	104.73	112.37	3
g21XY	g21X	Short only	-0.23	-0.47	23.59	0.750	0.500	0.500	81.56	91.17	2	19.73	1.000	104.73	112.37	3
g21Y	g21P	Short only	-0.80	-0.59	23.59	0.750	0.500	0.500	81.56	91.17	2	19.73	1.000	104.73	112.37	3
g23P	g23Y	Short only	-0.06	-0.07	13.76	0.750	0.500	0.500	102.09	106.57	2	10.43	1.000	130.42	130.42	4
g23X	g23XY	Short only	-0.17	-0.16	13.76	0.750	0.500	0.500	102.09	106.57	2	10.43	1.000	130.42	130.42	4
g23XY	g23X	Short only	-0.16	-0.17	13.76	0.750	0.500	0.500	102.09	106.57	2	10.43	1.000	130.42	130.42	4
g23Y	g23P	Short only	-0.07	-0.06	13.76	0.750	0.500	0.500	102.09	106.57	2	10.43	1.000	130.42	130.42	4
g25P	g25Y	Short only	-0.39	-0.39	13.76	0.750	0.500	0.500	102.09	106.57	2	10.43	1.000	130.42	130.42	4
g25X	g25XY	Short only	-0.15	-0.11	13.76	0.750	0.500	0.500	102.09	106.57	2	10.43	1.000	130.42	130.42	4
g25XY	g25X	Short only	-0.11	-0.15	13.76	0.750	0.500	0.500	102.09	106.57	2	10.43	1.000	130.42	130.42	4
g25Y	g25P	Short only	-0.39	-0.39	13.76	0.750	0.500	0.500	102.09	106.57	2	10.43	1.000	130.42	130.42	4
g27P	g27Y	Short only	-3.88	-3.89	23.79	0.750	0.500	0.500	89.56	97.17	2	19.15	1.000	115.00	117.50	3
g27Y	g27P	Short only	-3.89	-3.88	23.79	0.750	0.500	0.500	89.56	97.17	2	19.15	1.000	115.00	117.50	3
g29P	g29Y	Short only	-0.99	-1.23	13.31	0.777	0.555	0.555	106.82	110.12	2	11.55	1.000	122.94	122.94	4
g29Y	g29P	Short only	-1.23	-0.99	13.31	0.777	0.555	0.555	106.82	110.12	2	11.55	1.000	122.94	122.94	4
g31X	g31XY	Short only	-0.26	-0.74	11.73	0.774	0.548	0.548	121.66	121.66	4	8.83	1.000	141.80	141.80	4
g31XY	g31X	Short only	-0.74	-0.26	11.73	0.774	0.548	0.548	121.66	121.66	4	8.83	1.000	141.80	141.80	4
g33P	g33Y	Short only	-0.58	-0.72	6.91	0.788	0.576	0.576	171.46	171.46	4	5.62	1.000	190.09	190.09	4
g33Y	g33P	Short only	-0.72	-0.58	6.91	0.788	0.576	0.576	171.46	171.46	4	5.62	1.000	190.09	190.09	4
g35X	g35XY	Short only	-0.12	-0.37	5.52	0.779	0.558	0.558	191.89	191.89	4	4.21	1.000	219.60	219.60	4
g35XY	g35X	Short only	-0.37	-0.12	5.52	0.779	0.558	0.558	191.89	191.89	4	4.21	1.000	219.60	219.60	4
g36P	g36X	Short only	-0.37	-0.04	6.57	0.772	0.544	0.544	187.77	187.77	4	4.80	1.000	219.55	219.55	4
g36X	g36P	Short only	-0.04	-0.37	6.57	0.772	0.544	0.544	187.77	187.77	4	4.80	1.000	219.55	219.55	4
g36XY	g36Y	Short only	-0.24	0.03	6.57	0.772	0.544	0.544	187.77	187.77	4	4.80	1.000	219.55	219.55	4
g37P	g37Y	Short only	-0.26	-0.28	6.57	0.772	0.544	0.544	187.77	187.77	4	4.80	1.000	219.55	219.55	4
g37Y	g37P	Short only	-0.28	-0.26	6.57	0.772	0.544	0.544	187.77	187.77	4	4.80	1.000	219.55	219.55	4
g38XY	g38Y	Short only	-0.08	-0.02	8.65	0.771	0.543	0.543	181.51	181.51	4	6.31	1.000	212.47	212.47	4
g38Y	g38XY	Short only	-0.02	-0.08	8.65	0.771	0.543	0.543	181.51	181.51	4	6.31	1.000	212.47	212.47	4
g39X	g39XY	Short only	-0.04	-0.11	8.65	0.771	0.543	0.543	181.51	181.51	4	6.31	1.000	212.47	212.47	4
g39XY	g39X	Short only	-0.11	-0.04	8.65	0.771	0.543	0.543	181.51	181.51	4	6.31	1.000	212.47	212.47	4
g40Y	g40XY	Short only	-0.35	0.05	2.27	0.772	0.543	0.543	298.97	298.97	4	1.64	1.000	351.60	351.60	4
g41P	g41Y	Short only	-0.39	-0.16	2.27	0.772	0.543	0.543	298.97	298.97	4	1.64	1.000	351.60	351.60	4
g41Y	g41P	Short only	-0.16	-0.39	2.27	0.772	0.543	0.543	298.97	298.97	4	1.64	1.000	351.60	351.60	4
g51P	g51X	Short only	-0.28	-0.13	13.39	0.750	0.500	0.500	98.95	109.48	3	11.04	1.000	126.41	126.41	4
g51X	g51P	Short only	-0.13	-0.28	13.39	0.750	0.500	0.500	98.95	109.48	3	11.04	1.000	126.41	126.41	4

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %

1	1.193	50.00	50.00	2.39
2	1.228	50.00	50.00	2.46
3	1.401	50.00	50.00	2.80
4	1.418	50.00	50.00	2.84
5	1.447	50.00	50.00	2.89
6	1.464	50.00	50.00	2.93
7	1.408	50.00	50.00	2.82
8	1.432	50.00	50.00	2.86
9	0.228	50.00	50.00	0.46
10	0.260	50.00	50.00	0.52
11	0.284	50.00	50.00	0.57
12	0.281	50.00	50.00	0.56
13	0.341	50.00	50.00	0.68
14	0.479	50.00	50.00	0.96
15	0.730	50.00	50.00	1.46
16	0.329	50.00	50.00	0.66
17	0.462	50.00	50.00	0.92
18	0.510	50.00	50.00	1.02
19	0.485	50.00	50.00	0.97
20	0.608	50.00	50.00	1.22
21	0.845	50.00	50.00	1.69
22	1.176	50.00	50.00	2.35
23	1.544	50.00	50.00	3.09
24	1.897	50.00	50.00	3.79
25	1.494	50.00	50.00	2.99
26	1.033	50.00	50.00	2.07

*** Analysis Results for Load Case No. 2 "NESC Extreme" - Number of iterations in SAPS 11

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)
1P	-0.002858	0.394	-0.02626	0.0000	0.0000	0.0000	-0.002858	2.394	78.22
2P	-0.001787	0.3382	-0.02524	-0.6179	-0.0051	-0.0451	1.998	2.338	73.22
3P	-0.001392	0.3006	-0.02477	-0.6099	-0.0147	-0.0367	1.999	2.301	69.73
4P	-0.000611	0.2639	-0.02394	-0.5929	-0.0003	-0.0284	1.999	2.264	66.23
5P	-0.0009484	0.2283	-0.02281	-0.5711	-0.0115	-0.0200	1.999	2.228	62.73
6P	0.0009946	0.1872	-0.02101	-0.5339	-0.0117	-0.0117	2.001	2.187	58.48
7P	-4.53e-005	0.1495	-0.0187	-0.4840	0.0193	-0.0038	2	2.149	54.23
8P	-0.0002518	0.1169	-0.01621	-0.3777	-0.0217	0.0054	2	2.117	49.98
9P	0	0	0	0.0000	0.0000	0.0000	10	10	0
16P	0.008272	0.3937	-0.1538	0.0000	0.0000	0.0000	0.008272	14.14	78.1
17P	0.005626	0.3397	-0.1108	0.0000	0.0000	0.0000	0.005626	10.09	73.14
18P	0.003201	0.228	-0.155	0.0000	0.0000	0.0000	0.003201	13.98	62.59
19P	0.0007834	0.1493	-0.09053	0.0000	0.0000	0.0000	0.0007834	9.899	54.16
20P	0.02092	0.245	-0.06325	0.0000	0.0000	0.0000	1.361	6.135	63.94
1X	-0.006474	0.3941	0.01656	0.0000	0.0000	0.0000	-0.006474	-1.606	78.27
2X	-0.005554	0.3385	0.01707	-0.6173	-0.0197	-0.0472	1.994	-1.662	73.27
2XY	-0.005608	0.3423	0.01644	-0.6369	-0.0133	-0.0454	-2.006	-1.658	73.27
2Y	-0.001849	0.342	-0.02624	-0.6368	-0.0107	-0.0480	-2.002	2.342	73.22
3X	-0.004544	0.3009	0.01705	-0.6137	-0.0096	-0.0397	1.995	-1.699	69.77
3XY	-0.004439	0.3034	0.01637	-0.6364	-0.0315	-0.0370	-2.004	-1.697	69.77
3Y	-0.001612	0.3032	-0.02562	-0.6313	0.0054	-0.0407	-2.002	2.303	69.72
4X	-0.004069	0.2639	0.01666	-0.5916	-0.0213	-0.0320	1.996	-1.736	66.27
4XY	-0.00265	0.2653	0.01596	-0.5997	-0.0124	-0.0289	-2.003	-1.735	66.27
4Y	-0.002015	0.2654	-0.02462	-0.6016	-0.0095	-0.0331	-2.002	2.265	66.23
5X	-0.002555	0.2286	0.016	-0.5693	-0.0078	-0.0245	1.997	-1.771	62.77
5XY	-0.002581	0.23	0.01537	-0.5717	-0.0160	-0.0207	-2.003	-1.77	62.77
5Y	-0.001053	0.2297	-0.02337	-0.5738	-0.0002	-0.0257	-2.001	2.23	62.73
6X	-0.003307	0.1873	0.01472	-0.5355	-0.0029	-0.0190	1.997	-1.813	58.51
6XY	-0.0001536	0.188	0.01421	-0.5428	-0.0192	-0.0130	-2	-1.812	58.51
6Y	-0.002426	0.1881	-0.02147	-0.5410	0.0049	-0.0207	-2.002	2.188	58.48
7X	-0.00144	0.1496	0.01291	-0.4810	-0.0283	-0.0132	1.999	-1.85	54.26
7XY	-0.0006547	0.1501	0.01254	-0.4837	0.0125	-0.0057	-2.001	-1.85	54.26
7Y	-0.0009506	0.15	-0.01908	-0.4868	-0.0262	-0.0154	-2.001	2.15	54.23
8X	-0.000623	0.117	0.01079	-0.3812	0.0106	-0.0116	1.999	-1.883	50.01
8XY	-0.0005351	0.1172	0.01058	-0.3869	-0.0193	0.0015	-2.001	-1.883	50.01
8Y	-0.0003255	0.1171	-0.01654	-0.3855	0.0163	-0.0144	-2	2.117	49.98
9X	0	0	0	0.0000	0.0000	0.0000	10	-10	0
9XY	0	0	0	0.0000	0.0000	0.0000	-10	-10	0
9Y	0	0	0	0.0000	0.0000	0.0000	-10	10	0
16X	-0.01764	0.3949	0.1427	0.0000	0.0000	0.0000	-0.01764	-13.36	78.39
17X	-0.01304	0.3411	0.09835	0.0000	0.0000	0.0000	-0.01304	-9.409	73.35
18X	-0.006667	0.2303	0.1231	0.0000	0.0000	0.0000	-0.006667	-13.52	62.87
19X	-0.002209	0.1504	0.08148	0.0000	0.0000	0.0000	-0.002209	-9.6	54.33
20X	-0.03187	0.2462	0.0551	0.0000	0.0000	0.0000	1.308	-5.644	64.06
20XY	0.02273	0.247	0.05479	0.0000	0.0000	0.0000	-1.317	-5.643	64.05
20Y	-0.02189	0.2462	-0.0639	0.0000	0.0000	0.0000	-1.362	6.136	63.94
10S	0.0009132	0.09848	-0.01657	-0.3047	-0.0171	0.0154	2.501	2.598	46.86
11S	0.0007376	0.08255	-0.01675	-0.2671	-0.0159	0.0191	3.001	3.083	43.73
12S	0.003533	0.05621	-0.01577	-0.1946	-0.0033	0.0275	4.07	4.123	37.07
13S	-6.215e-005	0.03639	-0.0148	-0.1458	-0.0074	0.0294	5.107	5.143	30.57

14S	0.002383	0.02337	-0.01212	-0.1030	-0.0113	0.0309	6.082	6.103	24.49
15S	-0.0001388	0.01188	-0.00967	-0.0742	-0.0064	0.0324	7.24	7.252	17.24
21S	0.002714	0.003721	-0.004883	-0.0358	-0.0118	0.0152	8.616	8.617	8.665
21XYF0.50S	0.0001487	0.1349	-0.02271	0.0065	-0.0013	0.0018	0.0001487	-8.478	8.647
10X	-0.001338	0.09836	0.01156	-0.2973	0.0085	-0.0164	2.499	-2.402	46.89
10XY	0.0004423	0.09817	0.01145	-0.3090	-0.0132	0.0082	-2.5	-2.402	46.89
10Y	-0.00119	0.09822	-0.01696	-0.3125	0.0138	-0.0227	-2.501	2.598	46.86
11X	-0.001124	0.0828	0.012	-0.2578	0.0053	-0.0280	2.999	-2.917	43.76
11XY	0.0004031	0.08201	0.01201	-0.2670	-0.0094	0.0210	-3	-2.918	43.76
11Y	-0.0008063	0.08206	-0.01713	-0.2720	0.0140	-0.0253	-3.001	3.082	43.73
12X	-0.003056	0.05555	0.01195	-0.1815	-0.0097	-0.0529	4.064	-4.011	37.09
12XY	0.002654	0.05462	0.01195	-0.1849	0.0064	0.0483	-4.064	-4.012	37.09
12Y	-0.003415	0.05506	-0.01611	-0.1977	0.0037	-0.0309	-4.07	4.122	37.07
13X	-0.0001474	0.03682	0.01136	-0.1281	-0.0126	-0.0823	5.107	-5.07	30.59
13XY	4.428e-005	0.03533	0.01139	-0.1285	0.0096	0.0806	-5.107	-5.071	30.59
13Y	0.0001185	0.0353	-0.01496	-0.1458	0.0089	-0.0304	-5.107	5.142	30.57
14X	-0.001825	0.02283	0.009606	-0.0845	-0.0120	-0.1114	6.078	-6.057	24.51
14XY	0.002017	0.02184	0.009514	-0.0811	0.0092	0.1123	-6.078	-6.058	24.51
14Y	-0.002508	0.02217	-0.01218	-0.1018	0.0134	-0.0294	-6.083	6.102	24.49
15X	8.188e-005	0.01196	0.007702	-0.0439	-0.0238	-0.1314	7.24	-7.228	17.26
15XY	0.0004258	0.01101	0.007594	-0.0429	0.0229	0.1349	-7.24	-7.229	17.26
15Y	-0.0002403	0.01104	-0.009629	-0.0711	0.0067	-0.0295	-7.24	7.251	17.24
21X	-0.001188	0.003313	0.00421	0.0052	-0.0433	-0.3051	8.612	-8.609	8.674
21XY	0.0016	0.002905	0.004104	0.0097	0.0463	0.3059	-8.611	-8.61	8.674
21Y	-0.002941	0.00328	-0.004848	-0.0322	0.0095	-0.0144	-8.616	8.616	8.665

Joint Support Reactions for Load Case "NESC Extreme":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
9P	-5.43	0.0	-6.88	0.0	0.0	-36.01	0.0	0.0	37.06	0.0	0.06	0.0	-0.1	0.0	0.0	-0.03	0.0	0.0
9X	4.67	0.0	-5.93	0.0	0.0	29.91	0.0	0.0	30.85	0.0	-0.03	0.0	0.1	0.0	0.0	0.27	0.0	0.0
9XY	-4.81	0.0	-5.51	0.0	0.0	29.33	0.0	0.0	30.23	0.0	-0.03	0.0	-0.1	0.0	0.0	-0.27	0.0	0.0
9Y	5.57	0.0	-6.51	0.0	0.0	-35.55	0.0	0.0	36.57	0.0	0.05	0.0	0.1	0.0	0.0	0.03	0.0	0.0

Joint Displacements, Loads and Member Forces on Joints for Load Case "NESC Extreme":

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0029	0.3940	-0.0263
2P	0.0000	0.1655	-0.0842	0.0000	-0.1655	0.0842	-0.0018	0.3382	-0.0252
3P	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0014	0.3006	-0.0248
4P	0.0000	0.2605	-0.1082	-0.0000	-0.2605	0.1082	-0.0006	0.2639	-0.0239
5P	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0009	0.2283	-0.0228
6P	0.0000	0.2785	-0.1132	-0.0000	-0.2785	0.1132	0.0010	0.1872	-0.0210
7P	0.0000	0.0805	-0.0622	0.0000	-0.0805	0.0622	-0.0000	0.1495	-0.0187
8P	0.0000	0.4468	-0.2127	0.0000	-0.4468	0.2127	-0.0003	0.1169	-0.0162
9P	0.0000	0.1863	-0.1045	5.4316	6.6931	-35.9087	0.0000	0.0000	0.0000
16P	0.0000	0.8685	-0.2332	-0.0000	-0.8685	0.2332	0.0083	0.3937	-0.1538
17P	0.0000	0.9805	-0.4732	-0.0000	-0.9805	0.4732	0.0056	0.3397	-0.1108
18P	0.0000	0.9805	-0.4732	-0.0000	-0.9805	0.4732	0.0032	0.2280	-0.1550
19P	0.0000	0.9805	-0.4732	-0.0000	-0.9805	0.4732	0.0008	0.1493	-0.0905
20P	0.0000	0.0805	-0.0622	0.0000	-0.0805	0.0622	0.0209	0.2450	-0.0632
1X	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0065	0.3941	0.0166

2X	0.0000	0.2515	-0.1062	-0.0000	-0.2515	0.1062	-0.0056	0.3385	0.0171
2XY	-1.4660	2.9785	1.6618	1.4660	-2.9785	-1.6618	-0.0056	0.3423	0.0164
2Y	1.1410	2.6935	-2.7032	-1.1410	-2.6935	2.7032	-0.0018	0.3420	-0.0262
3X	0.0000	0.0805	-0.0622	0.0000	-0.0805	0.0622	-0.0045	0.3009	0.0170
3XY	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0044	0.3034	0.0164
3Y	0.0000	0.0805	-0.0622	0.0000	-0.0805	0.0622	-0.0016	0.3032	-0.0256
4X	0.0000	0.4405	-0.1542	-0.0000	-0.4405	0.1542	-0.0041	0.2639	0.0167
4XY	0.8410	-1.3845	-0.8912	-0.8410	1.3845	0.8912	-0.0027	0.2653	0.0160
4Y	-0.5160	-1.0985	-0.1402	0.5160	1.0985	0.1402	-0.0020	0.2654	-0.0246
5X	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0026	0.2286	0.0160
5XY	0.0000	0.0805	-0.0622	0.0000	-0.0805	0.0622	-0.0026	0.2300	0.0154
5Y	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0011	0.2297	-0.0234
6X	0.0000	0.4765	-0.1632	0.0000	-0.4765	0.1632	-0.0033	0.1873	0.0147
6XY	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0002	0.1880	0.0142
6Y	0.0000	0.0805	-0.0622	0.0000	-0.0805	0.0622	-0.0024	0.1881	-0.0215
7X	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0014	0.1496	0.0129
7XY	0.0000	0.0805	-0.0622	0.0000	-0.0805	0.0622	-0.0007	0.1501	0.0125
7Y	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0010	0.1500	-0.0191
8X	0.0000	0.6268	-0.2587	-0.0000	-0.6268	0.2587	-0.0006	0.1170	0.0108
8XY	0.0000	0.2668	-0.1667	0.0000	-0.2668	0.1667	-0.0005	0.1172	0.0106
8Y	0.0000	0.2668	-0.1667	-0.0000	-0.2668	0.1667	-0.0003	0.1171	-0.0165
9X	0.0000	0.1863	-0.1045	-4.6705	5.7445	30.0157	0.0000	0.0000	0.0000
9XY	0.0000	0.1863	-0.1045	4.8056	5.3198	29.4381	0.0000	0.0000	0.0000
9Y	0.0000	0.1863	-0.1045	-5.5668	6.3243	-35.4443	0.0000	0.0000	0.0000
16X	0.0000	0.8685	-0.2332	-0.0000	-0.8685	0.2332	-0.0176	0.3949	0.1427
17X	0.0000	0.9805	-0.4732	-0.0000	-0.9805	0.4732	-0.0130	0.3411	0.0983
18X	0.0000	0.9805	-0.4732	0.0000	-0.9805	0.4732	-0.0067	0.2303	0.1231
19X	0.0000	0.9805	-0.4732	-0.0000	-0.9805	0.4732	-0.0022	0.1504	0.0815
20X	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0319	0.2462	0.0551
20XY	0.0000	0.0805	-0.0622	0.0000	-0.0805	0.0622	0.0227	0.2470	0.0548
20Y	0.0000	0.0805	-0.0622	-0.0000	-0.0805	0.0622	-0.0219	0.2462	-0.0639
10S	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	0.0009	0.0985	-0.0166
11S	0.0000	0.4243	-0.1655	-0.0000	-0.4243	0.1655	0.0007	0.0825	-0.0168
12S	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	0.0035	0.0562	-0.0158
13S	0.0000	0.5093	-0.1875	-0.0000	-0.5093	0.1875	-0.0001	0.0364	-0.0148
14S	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	0.0024	0.0234	-0.0121
15S	0.0000	0.5523	-0.1985	0.0000	-0.5523	0.1985	-0.0001	0.0119	-0.0097
21S	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	0.0027	0.0037	-0.0049
21XYF0.50S	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	0.0001	0.1349	-0.0227
10X	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	-0.0013	0.0984	0.0116
10XY	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	0.0004	0.0982	0.0115
10Y	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	-0.0012	0.0982	-0.0170
11X	0.0000	0.6613	-0.2265	0.0000	-0.6613	0.2265	-0.0011	0.0828	0.0120
11XY	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	0.0004	0.0820	0.0120
11Y	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	-0.0008	0.0821	-0.0171
12X	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	-0.0031	0.0555	0.0120
12XY	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	0.0027	0.0546	0.0119
12Y	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	-0.0034	0.0551	-0.0161
13X	0.0000	0.8323	-0.2695	0.0000	-0.8323	0.2695	-0.0001	0.0368	0.0114
13XY	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	0.0000	0.0353	0.0114
13Y	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	0.0001	0.0353	-0.0150
14X	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	-0.0018	0.0228	0.0096
14XY	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	0.0020	0.0218	0.0095
14Y	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	-0.0025	0.0222	-0.0122
15X	0.0000	0.9173	-0.2915	-0.0000	-0.9173	0.2915	0.0001	0.0120	0.0077
15XY	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	0.0004	0.0110	0.0076
15Y	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	-0.0002	0.0110	-0.0096
21X	0.0000	0.1863	-0.1045	0.0000	-0.1863	0.1045	-0.0012	0.0033	0.0042
21XY	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	0.0016	0.0029	0.0041

21Y	0.0000	0.1863	-0.1045	-0.0000	-0.1863	0.1045	-0.0029	0.0033 -0.0048

Crossing Diagonal Check for Load Case "NESC Extreme" (RLOUT controls):

Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	Original Supported L/R Cap. (kips)	Original Supported RLX	Original Supported RLY	Original Supported RLZ	Original Supported L/R	Original Supported KL/R	Original Supported Curve No.	Alternate Unsupported L/R Cap. (kips)	Alternate Unsupported RLOUT	Alternate Unsupported L/R	Alternate Unsupported KL/R	Alternate Unsupported Curve No.
g25Y	g25P	Short only	-0.80	0.13	13.76	0.750	0.500	0.500	102.09	106.57	2	10.43	1.000	130.42	130.42	4
g27P	g27Y	Short only	-6.03	-7.06	23.79	0.750	0.500	0.500	89.56	97.17	2	19.15	1.000	115.00	117.50	3
g27Y	g27P	Short only	-7.06	-6.03	23.79	0.750	0.500	0.500	89.56	97.17	2	19.15	1.000	115.00	117.50	3
g29P	g29Y	Short only	-1.54	-2.06	13.31	0.777	0.555	0.555	106.82	110.12	2	11.55	1.000	122.94	122.94	4
g29Y	g29P	Short only	-2.06	-1.54	13.31	0.777	0.555	0.555	106.82	110.12	2	11.55	1.000	122.94	122.94	4
g31X	g31XY	Short only	-1.19	-1.12	11.73	0.774	0.548	0.548	121.66	121.66	4	8.83	1.000	141.80	141.80	4
g31XY	g31X	Short only	-1.12	-1.19	11.73	0.774	0.548	0.548	121.66	121.66	4	8.83	1.000	141.80	141.80	4
g33P	g33Y	Short only	-0.84	-1.21	6.91	0.788	0.576	0.576	171.46	171.46	4	5.62	1.000	190.09	190.09	4
g33Y	g33P	Short only	-1.21	-0.84	6.91	0.788	0.576	0.576	171.46	171.46	4	5.62	1.000	190.09	190.09	4
g35X	g35XY	Short only	-0.58	-0.52	5.52	0.779	0.558	0.558	191.89	191.89	4	4.21	1.000	219.60	219.60	4
g35XY	g35X	Short only	-0.52	-0.58	5.52	0.779	0.558	0.558	191.89	191.89	4	4.21	1.000	219.60	219.60	4
g37P	g37Y	Short only	-0.32	-0.50	6.57	0.772	0.544	0.544	187.77	187.77	4	4.80	1.000	219.55	219.55	4
g37Y	g37P	Short only	-0.50	-0.32	6.57	0.772	0.544	0.544	187.77	187.77	4	4.80	1.000	219.55	219.55	4
g39X	g39XY	Short only	-0.20	-0.14	8.65	0.771	0.543	0.543	181.51	181.51	4	6.31	1.000	212.47	212.47	4
g39XY	g39X	Short only	-0.14	-0.20	8.65	0.771	0.543	0.543	181.51	181.51	4	6.31	1.000	212.47	212.47	4
g41P	g41Y	Short only	-0.55	-0.25	2.27	0.772	0.543	0.543	298.97	298.97	4	1.64	1.000	351.60	351.60	4
g41Y	g41P	Short only	-0.25	-0.55	2.27	0.772	0.543	0.543	298.97	298.97	4	1.64	1.000	351.60	351.60	4

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	0.899	50.00	50.00	1.80
2	0.899	50.00	50.00	1.80
3	1.089	50.00	50.00	2.18
4	1.089	50.00	50.00	2.18
5	1.089	50.00	50.00	2.18
6	1.089	50.00	50.00	2.18
7	1.089	50.00	50.00	2.18
8	1.089	50.00	50.00	2.18
9	0.186	50.00	50.00	0.37
10	0.282	50.00	50.00	0.56
11	0.301	50.00	50.00	0.60
12	0.495	50.00	50.00	0.99
13	0.455	50.00	50.00	0.91
14	0.543	50.00	50.00	1.09
15	0.587	50.00	50.00	1.17
16	0.273	50.00	50.00	0.55
17	0.467	50.00	50.00	0.93
18	0.504	50.00	50.00	1.01
19	0.678	50.00	50.00	1.36
20	0.699	50.00	50.00	1.40
21	0.875	50.00	50.00	1.75
22	0.962	50.00	50.00	1.92

23	3.712	50.00	50.00	7.42
24	3.983	50.00	50.00	7.97
25	1.849	50.00	50.00	3.70
26	1.222	50.00	50.00	2.44

*** Overall summary for all load cases - Usage = Maximum Stress / Allowable Stress
Printed capacities do not include the strength factor entered for each load case.
The Group Summary reports on the member and load case that resulted in maximum usage
which may not necessarily be the same as that which produces maximum force.

Group Summary (Compression Portion):

Group Label	Group Desc.	Angle Curve	Angle No.	Angle Size	Steel Strength	Max Usage	Usage Cont-rol	Max Use In Comp.	Comp. Control	Comp. Force	Comp. Control Load Case	L/R Capacity	Comp. Connect. Shear Capacity	Comp. Connect. Bearing Capacity	RLX	RLY	RLZ	L/R Comp.	KL/R Member	Length Of Bolts	Comp. No.
					(ksi)	%		%		(kips)		(kips)	(kips)	(kips)						(ft)	
Leg1	L3.5x3.5x1/4	SAE		3.5X3.5X0.25	33.0	70.52	Comp	70.52	g5XY	-25.669	NESC Ext	47.089	36.400	56.250	1.000	1.000	1.000	73.49	73.49	4.250	1	4
Leg2	L3.5x3.5x1/4	SAE		3.5X3.5X0.25	33.0	93.60	Comp	93.60	g11XY	-34.071	NESC Ext	37.075	36.400	56.250	1.000	1.000	1.000	107.84	107.84	6.237	1	4
Leg3	L4x4x1/4	SAE		4X4X0.25	33.0	84.90	Comp	84.90	g12XY	-34.632	NESC Ext	40.789	0.000	0.000	1.000	1.000	1.000	112.20	112.20	7.433	1	0
Leg4	L2.5x2x3/16	SAU		2.5X2X0.1875	33.0	11.45	Comp	11.45	g14X	-1.159	NESC Hea	10.122	18.200	21.094	1.000	1.000	1.000	151.34	151.34	5.385	4	2
Diag1	L1.75x1.75x3/16	SAE		1.75X1.75X0.1875	33.0	86.41	Tens	54.05	g22Y	-4.919	NESC Ext	13.762	9.100	10.547	0.750	0.500	0.500	102.09	106.57	5.836	2	1
Diag2	L2x2x1/4	SAE		2X2X0.25	33.0	36.22	Tens	35.19	g20Y	-3.202	NESC Ext	23.588	9.100	14.062	0.750	0.500	0.500	81.56	91.17	5.315	2	1
Diag3	L2X2X3/16	SAE		2X2X0.1875	33.0	21.56	Cross	21.56	g33Y	-1.213	NESC Ext	5.624	9.100	10.547	1.000	0.576	0.576	190.09	190.09	9.774	4	1
Diag4	L2.25X2.25X3/16	SAE		2.25X2.25X0.1875	33.0	10.58	Comp	10.58	g36P	-0.695	NESC Ext	6.568	9.100	10.547	0.772	0.544	0.544	187.77	187.77	12.771	4	1
Diag5	L2.75X2.75X3/16	SAE		2.75X2.75X0.1875	33.0	8.89	Tens	5.56	g38P	-0.481	NESC Ext	8.653	9.100	10.547	0.771	0.543	0.543	181.51	181.51	15.210	4	1
Diag6	L2X1.5X3/16	SAU		2X1.5X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.000	0	0
Horz1	BAR2X3/16	Bar		2x3/16	33.0	26.89	Tens	0.00	g43Y	0.000		9.858	9.100	10.547	1.000	1.000	1.000	48.00	84.00	4.000	3	1
Horz2	**L2X2X3/16**	**SAE**		**2X2X0.1875**	**33.0**	**81.83**	**Tens**	**52.56**	**g73P**	**-0.952**	**NESC Ext**	**1.811**	**16.800**	**10.547**	**2.000**	**1.000**	**1.000**	**335.02**	**335.02**	**8.613**	**4**	**1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g73P Fg7373P ??**
Horz3	L3X2.5X1/4	SAU		3X2.5X0.25	33.0	12.82	Comp	12.82	g50X	-0.902	NESC Ext	7.041	9.100	14.062	0.500	1.000	0.500	230.76	230.76	14.480	4	1
Inner1	L1.75X1.75X3/16	SAE		1.75X1.75X0.1875	33.0	6.59	Tens	4.39	g52P	-0.400	NESC Ext	13.392	9.100	10.547	0.750	0.500	0.500	98.95	109.48	5.657	3	1
Inner2	L2X1-1/2X3/16	SAU		2X1.5X0.1875	33.0	35.73	Comp	35.73	g55P	-0.361	NESC Ext	1.011	9.100	10.547	0.500	0.750	0.500	418.86	418.86	20.478	4	1
TopCrArm	L2.5x2.5x3/16	SAE		2.5X2.5X0.1875	33.0	11.13	Comp	11.13	g59Y	-2.026	NESC Hea	19.668	18.200	21.094	1.000	1.000	1.000	96.97	108.48	4.000	3	2
TopArmBr	BAR2X3/16	Bar		2x3/16	33.0	29.19	Tens	0.00	g65X	0.000		7.820	9.100	10.547	1.000	1.000	1.000	110.68	113.01	9.223	2	1
MidCrArm	L3.5X2.5X1/4	SAU		3.5X2.5X0.25	33.0	22.88	Comp	22.88	g60P	-4.165	NESC Hea	25.411	18.200	28.125	1.000	0.500	0.500	131.46	127.05	11.919	6	2

MidArmBr	BAR2X3/16	Bar	2x3/16	33.0	54.00	Tens	0.00	g69Y	0.000		10.583	9.100	10.547	1.000	1.000	1.000	54.50	70.88	4.542	2	1
BotCrArm	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	9.15	Comp	9.15	g62P	-1.552	NESC Hea	16.970	18.200	21.094	1.000	0.500	0.500	123.45	122.12	8.004	6	2
BotArmBr	BAR2X3/16	Bar	2x3/16	33.0	17.66	Tens	0.00	g67Y	0.000		7.936	9.100	10.547	1.000	1.000	1.000	108.75	111.56	9.062	2	1
ShArmBr	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	9.66	Comp	9.66	g64Y	-1.110	NESC Hea	11.489	27.300	42.187	0.500	1.000	0.500	211.02	189.40	12.925	5	3
ShieldAr	LL2.5X2X3/16	DAL	2.5X2X0.1875	33.0	43.03	Tens	3.79	g56P	-0.345	NESC Ext	14.666	9.100	21.094	1.000	1.000	1.000	177.81	177.81	11.750	4	1
Diag6(R)	L2x2x3/16	SAE	2X2X0.1875	36.0	63.68	Comp	63.68	g71P	-1.142	NESC Ext	1.794	16.800	10.195	0.768	0.537	0.537	336.59	336.59	20.580	4	1
Kdown1	L2x2x3/16	SAE	2X2X0.1875	36.0	7.26	Comp	7.26	g75Y	-0.220	NESC Ext	3.034	16.800	10.195	1.000	0.500	0.500	258.82	258.82	13.308	4	1
Diag1(R)	L2x2x1/4	SAE	2X2X0.25	36.0	97.49	Tens	77.59	g27Y	-7.061	NESC Ext	19.149	9.100	13.594	1.000	0.500	0.500	115.00	117.50	5.836	3	1

Group Summary (Tension Portion):

Group Label	Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Cont-rol	Max Tension Use In Tens. %	Tension Control Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Tens. Member (ft)	No. Of Bolts Tens.	No. Of Holes	Hole Diameter (in)
Leg1	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	70.52	Comp	62.66	g5P	22.809	NESC Ext	43.395	36.400	56.250	91.912	4.250	4	2.000	0.75
Leg2	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	33.0	93.60	Comp	78.80	g11P	28.682	NESC Ext	43.395	36.400	56.250	50.000	6.237	4	2.000	0.75
Leg3	L4x4x1/4	SAE	4X4X0.25	33.0	84.90	Comp	58.94	g70P	30.437	NESC Ext	51.645	72.800	112.500	100.000	8.889	8	2.000	0.75
Leg4	L2.5x2x3/16	SAU	2.5X2X0.1875	33.0	11.45	Comp	4.73	g14P	0.665	NESC Ext	17.096	18.200	21.094	14.062	5.385	2	1.000	0.75
Diag1	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	86.41	Tens	86.41	g18XY	4.921	NESC Ext	14.237	9.100	10.547	5.695	5.315	1	1.000	0.75
Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	36.22	Tens	36.22	g20XY	3.124	NESC Ext	22.349	9.100	14.062	8.625	5.315	1	1.000	0.75
Diag3	L2X2X3/16	SAE	2X2X0.1875	33.0	21.56	Cross	15.08	g33XY	0.975	NESC Ext	16.910	9.100	10.547	6.469	9.774	1	1.000	0.75
Diag4	L2.25X2.25X3/16	SAE	2.25X2.25X0.1875	33.0	10.58	Comp	4.41	g37XY	0.319	NESC Ext	19.851	9.100	10.547	7.242	12.771	1	1.000	0.75
Diag5	L2.75X2.75X3/16	SAE	2.75X2.75X0.1875	33.0	8.89	Tens	8.89	g38X	0.730	NESC Ext	25.405	9.100	10.547	8.203	15.210	1	1.000	0.75
Diag6	L2X1.5X3/16	SAU	2X1.5X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0	0.000	0
Horz1	BAR2X3/16	Bar	2x3/16	33.0	26.89	Tens	26.89	g42Y	1.872	NESC Hea	6.961	9.100	10.547	8.086	4.000	1	1.000	0.75
Horz2	**L2X2X3/16**	**SAE**	**2X2X0.1875**	**33.0**	**81.83**	**Tens**	**81.83**	**g46P**	**4.660**	**NESC Ext**	**16.910**	**9.100**	**10.547**	**5.695**	**4.000**	**1**	**1.000**	**0.75**
Horz3	L3X2.5X1/4	SAU	3X2.5X0.25	33.0	12.82	Comp	2.93	g50P	0.266	NESC Ext	33.338	9.100	14.062	10.687	14.480	1	1.000	0.75
Inner1	L1.75X1.75X3/16	SAE	1.75X1.75X0.1875	33.0	6.59	Tens	6.59	g52X	0.376	NESC Ext	14.237	9.100	10.547	5.695	5.657	1		

A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g73P Fg7373P ??

1.000	0.75															
Inner2	L2X1-1/2X3/16	SAU	2X1.5X0.1875	33.0	35.73	Comp	3.41	g55X	0.194NESC Ext	14.237	9.100	10.547	5.695	20.478	1	
1.000	0.75															
TopCrArm	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	11.13	Comp	0.77	g58X	0.141NESC Ext	22.613	18.200	21.094	21.094	8.004	2	
1.000	0.75															
TopArmBr	BAR2X3/16	Bar	2x3/16	33.0	29.19	Tens	29.19	g65P	2.032NESC Hea	6.961	9.100	10.547	8.930	9.223	1	
1.000	0.75															
MidCrArm	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	22.88	Comp	0.00	g61Y	0.000	33.301	18.200	28.125	18.750	4.000	2	
1.700	0.75															
MidArmBr	BAR2X3/16	Bar	2x3/16	33.0	54.00	Tens	54.00	g66P	3.759NESC Hea	6.961	9.100	10.547	8.930	8.071	1	
1.000	0.75															
BotCrArm	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	9.15	Comp	1.20	g62XY	0.219NESC Ext	22.613	18.200	21.094	21.094	8.004	2	
1.000	0.75															
BotArmBr	BAR2X3/16	Bar	2x3/16	33.0	17.66	Tens	17.66	g67P	1.229NESC Hea	6.961	9.100	10.547	8.930	9.062	1	
1.000	0.75															
ShArmBr	L3.5X2.5X1/4	SAU	3.5X2.5X0.25	33.0	9.66	Comp	0.00	g64Y	0.000	34.136	27.300	42.187	42.187	12.925	3	
1.550	0.75															
ShieldAr	LL2.5X2X3/16	DAL	2.5X2X0.1875	33.0	43.03	Tens	43.03	g57P	3.915NESC Hea	43.937	9.100	21.094	16.312	4.000	1	
1.000	0.75															
Diag6(R)	L2x2x3/16	SAE	2X2X0.1875	36.0	63.68	Comp	17.22	g41X	1.215NESC Ext	18.827	16.800	10.195	7.052	18.078	1	
1.000	0.6875															
Kdown1	L2x2x3/16	SAE	2X2X0.1875	36.0	7.26	Comp	1.23	g75P	0.125NESC Ext	18.827	16.800	10.195	10.343	13.308	1	
1.000	0.6875															
Diag1(R)	L2x2x1/4	SAE	2X2X0.25	36.0	97.49	Tens	97.49	g27XY	6.471NESC Ext	24.381	9.100	13.594	6.637	5.836	1	
1.000	0.75															

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	59.11	g11XY	Angle
NESC Extreme	97.49	g27XY	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	2.39	NESC Heavy	0.0
2	Clamp	2.46	NESC Heavy	0.0
3	Clamp	2.80	NESC Heavy	0.0
4	Clamp	2.84	NESC Heavy	0.0
5	Clamp	2.89	NESC Heavy	0.0
6	Clamp	2.93	NESC Heavy	0.0
7	Clamp	2.82	NESC Heavy	0.0
8	Clamp	2.86	NESC Heavy	0.0
9	Clamp	0.46	NESC Heavy	0.0
10	Clamp	0.56	NESC Extreme	0.0
11	Clamp	0.60	NESC Extreme	0.0
12	Clamp	0.99	NESC Extreme	0.0
13	Clamp	0.91	NESC Extreme	0.0

14	Clamp	1.09	NESC Extreme	0.0
15	Clamp	1.46	NESC Heavy	0.0
16	Clamp	0.66	NESC Heavy	0.0
17	Clamp	0.93	NESC Extreme	0.0
18	Clamp	1.02	NESC Heavy	0.0
19	Clamp	1.36	NESC Extreme	0.0
20	Clamp	1.40	NESC Extreme	0.0
21	Clamp	1.75	NESC Extreme	0.0
22	Clamp	2.35	NESC Heavy	0.0
23	Clamp	7.42	NESC Extreme	0.0
24	Clamp	7.97	NESC Extreme	0.0
25	Clamp	3.70	NESC Extreme	0.0
26	Clamp	2.44	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	1	Clamp	16P	0.000	0.824	0.862	1.193
NESC Heavy	2	Clamp	16X	0.000	0.874	0.862	1.228
NESC Heavy	3	Clamp	17P	0.000	0.861	1.106	1.401
NESC Heavy	4	Clamp	17X	0.000	0.888	1.106	1.418
NESC Heavy	5	Clamp	18P	0.000	0.861	1.163	1.447
NESC Heavy	6	Clamp	18X	0.000	0.889	1.163	1.464
NESC Heavy	7	Clamp	19P	0.000	0.861	1.114	1.408
NESC Heavy	8	Clamp	19X	0.000	0.899	1.114	1.432
NESC Heavy	9	Clamp	2P	0.000	0.032	0.225	0.228
NESC Heavy	10	Clamp	4P	0.000	0.068	0.251	0.260
NESC Heavy	11	Clamp	6P	0.000	0.075	0.274	0.284
NESC Heavy	12	Clamp	8P	0.000	0.068	0.273	0.281
NESC Heavy	13	Clamp	11S	0.000	0.090	0.329	0.341
NESC Heavy	14	Clamp	13S	0.000	0.123	0.463	0.479
NESC Heavy	15	Clamp	15S	0.000	0.139	0.717	0.730
NESC Heavy	16	Clamp	2X	0.000	0.121	0.306	0.329
NESC Heavy	17	Clamp	4X	0.000	0.192	0.420	0.462
NESC Heavy	18	Clamp	6X	0.000	0.219	0.461	0.510
NESC Heavy	19	Clamp	8X	0.000	0.201	0.442	0.485
NESC Heavy	20	Clamp	11X	0.000	0.254	0.553	0.608
NESC Heavy	21	Clamp	13X	0.000	0.356	0.767	0.845
NESC Heavy	22	Clamp	15X	0.000	0.505	1.062	1.176
NESC Heavy	23	Clamp	2XY	-0.764	1.216	0.568	1.544
NESC Heavy	24	Clamp	2Y	0.015	-0.496	1.831	1.897
NESC Heavy	25	Clamp	4XY	0.566	-0.633	1.229	1.494
NESC Heavy	26	Clamp	4Y	0.184	-0.004	1.016	1.033
NESC Extreme	1	Clamp	16P	0.000	0.869	0.233	0.899
NESC Extreme	2	Clamp	16X	0.000	0.869	0.233	0.899
NESC Extreme	3	Clamp	17P	0.000	0.981	0.473	1.089
NESC Extreme	4	Clamp	17X	0.000	0.981	0.473	1.089
NESC Extreme	5	Clamp	18P	0.000	0.981	0.473	1.089
NESC Extreme	6	Clamp	18X	0.000	0.981	0.473	1.089
NESC Extreme	7	Clamp	19P	0.000	0.981	0.473	1.089
NESC Extreme	8	Clamp	19X	0.000	0.981	0.473	1.089
NESC Extreme	9	Clamp	2P	0.000	0.166	0.084	0.186
NESC Extreme	10	Clamp	4P	0.000	0.261	0.108	0.282
NESC Extreme	11	Clamp	6P	0.000	0.279	0.113	0.301
NESC Extreme	12	Clamp	8P	0.000	0.447	0.213	0.495

NESC Extreme	13	Clamp	11S	0.000	0.424	0.166	0.455
NESC Extreme	14	Clamp	13S	0.000	0.509	0.188	0.543
NESC Extreme	15	Clamp	15S	0.000	0.552	0.199	0.587
NESC Extreme	16	Clamp	2X	0.000	0.252	0.106	0.273
NESC Extreme	17	Clamp	4X	0.000	0.441	0.154	0.467
NESC Extreme	18	Clamp	6X	0.000	0.477	0.163	0.504
NESC Extreme	19	Clamp	8X	0.000	0.627	0.259	0.678
NESC Extreme	20	Clamp	11X	0.000	0.661	0.227	0.699
NESC Extreme	21	Clamp	13X	0.000	0.832	0.270	0.875
NESC Extreme	22	Clamp	15X	0.000	0.917	0.292	0.962
NESC Extreme	23	Clamp	2XY	-1.466	2.979	-1.662	3.712
NESC Extreme	24	Clamp	2Y	1.141	2.694	2.703	3.983
NESC Extreme	25	Clamp	4XY	0.841	-1.384	0.891	1.849
NESC Extreme	26	Clamp	4Y	-0.516	-1.098	0.140	1.222

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	8.473	0.001	16.431	525.308	4.256	6.124
NESC Extreme	14.552	0.000	5.838	895.941	-1.085	10.656

*** Weight of structure (lbs):
Weight of Angles*Section DLF: 6479.3
Total: 6479.3

*** End of Report

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:	Foundation Analysis Tower # 280
Location:	Stratford, CT
Rev. 2: 10/4/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.17

Foundation Analysis

Input Data:

Max. Reactions at Tower Leg:

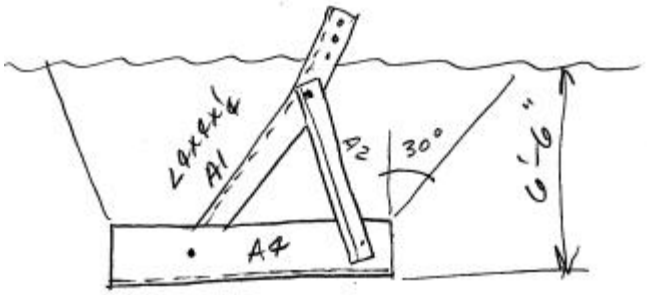
Shear =	Shear := 8.77·1.1·kips = 9.6·kips	(User Input)
Compression =	Comp := 36.01·1.1·kips = 39.6·kips	(User Input)
Uplift =	Uplift := 29.91·1.1·kips = 32.9·kips	(User Input)

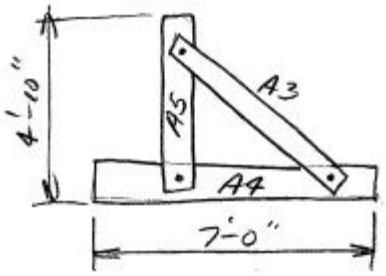
Tower Properties:

Tower Height =	$H_t := 78 \cdot ft$	(User Input)

Foundation Properties:

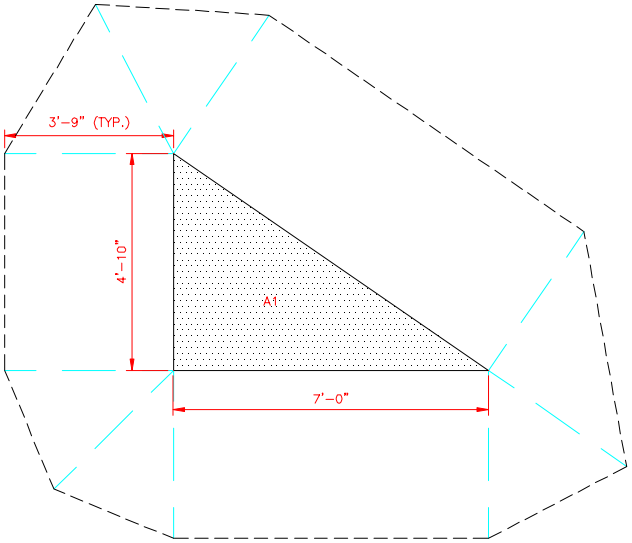
Depth to Steel Grillage =	$D_{sg} := 6.5 \cdot ft$	(User Input)
Steel Grillage Width 1 =	$W_{sg1} := 4.83 \cdot ft$	(User Input)
Steel Grillage Width 2 =	$W_{sg2} := 7 \cdot ft$	(User Input)





Subgrade Properties:

Soil Unit Weight =	$\gamma s := 100 \cdot pcf$	(User Input - Conservative Gravel Fill Used)
Uplift Angle =	$\phi := 30.0 \cdot deg$	(User Input)
	$L := \left(\tan(\phi) \cdot D_{sg}\right) = 3.75\,ft$	



Calculated Data:

Resisting Area Base = $A_1 := \frac{1}{2} \cdot W_{sg1} \cdot W_{sg2} = 16.905\,ft^2$

Resisting Area Top = $A_2 := 128 \cdot ft^2$ (User Input)

Volume of Soil = $V_{soil} := (D_{sg}) \cdot \left(\frac{A_1 + A_2}{2} \right) = 471 \cdot ft^3$

Mass of Soil = $Mass_{Soil} := V_{soil} \cdot \gamma_S = 47 \cdot kips$

Check Uplift:

Required Factor of Safety = $F_S := 1.0$

$ActualFS := \frac{Mass_{Soil}}{Uplift} = 1.43$

$Uplift\_Check := if\left(\frac{Mass_{Soil}}{Uplift} \geq F_S, "OK", "Overstressed" \right)$

Uplift_Check = "OK"

Product Specifications

DHHTT65B-3XR

Multiband Antenna, 790–960, 2 x 1710–2180 and 2 x 2490-2690 MHz, 65° horizontal beamwidth, internal electrical tilt with individual tilt available for the 850 MHz band, 1900 MHz bands and 2500 MHz bands.

Electrical Specifications

Frequency Band, MHz	790–896	870–960	1710–1880	1850–1990	1920–2180	2490–2690
Connector Interface	7-16 DIN Female	7-16 DIN Female	7-16 DIN Female	7-16 DIN Female	7-16 DIN Female	4.1-9.5 DIN Female
Connector Location	Bottom	Bottom	Bottom	Bottom	Bottom	Bottom
Gain, dBi	15.5	15.5	17.3	17.4	17.5	17.2
Beamwidth, Horizontal, degrees	64	63	71	69	66	60
Beamwidth, Vertical, degrees	11.2	10.3	5.6	5.4	5.1	4.3
Beam Tilt, degrees	0–10	0–10	0–8	0–8	0–8	0–8
USLS (First Lobe), dB	15	16	15	16	15	18
Front-to-Back Ratio at 180°, dB	28	31	31	29	25	26
CPR at Boresight, dB	20	19	20	20	18	16
CPR at Sector, dB	9	9	9	9	7	4
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, 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	-150
Input Power per Port, maximum, watts	350	350	300	300	300	250
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	790–896	870–960	1710–1880	1850–1990	1920–2180	2490–2690
Gain by all Beam Tilts, average, dBi	15.0	15.1	17.0	17.1	17.1	17.1
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.3	±0.3	±0.3	±0.6
Gain by Beam Tilt, average, dBi	0 ° | 15.0	0 ° | 15.0	0 ° | 16.8	0 ° | 17.0	0 ° | 17.0	0 ° | 17.1
	5 ° | 15.1	5 ° | 15.1	4 ° | 17.0	4 ° | 17.1	4 ° | 17.1	4 ° | 17.2
	10 ° | 15.0	10 ° | 15.0	8 ° | 17.0	8 ° | 17.1	8 ° | 17.1	8 ° | 17.0
Beamwidth, Horizontal Tolerance, degrees	±2.5	±1.8	±3.2	±2.7	±5	±6.6
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.6	±0.2	±0.2	±0.4	±0.3
USLS, beampeak to 20° above beampeak, dB	16	17	16	17	16	19
Front-to-Back Total Power at 180° ± 30°, dB	24	26	26	25	23	23
CPR at Boresight, dB	21	20	22	22	21	16
CPR at Sector, dB	9	10	13	10	8	5

* 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.

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® multiband with internal RET
Band	Multiband
Brand	DualPol®

Product Specifications

DHHTT65B-3XR

Operating Frequency Band	1710 – 2180 MHz | 2490 – 2690 MHz | 790 – 960 MHz
Performance Note	Outdoor usage

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Copper | Low loss circuit board
Radome Material	ASA, UV stabilized
Reflector Material	Aluminum
RF Connector Interface	4.1-9.5 DIN Female | 7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	10
Wind Loading, frontal	618.0 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241 km/h | 150 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	1832.0 mm | 72.1 in
Width	301.0 mm | 11.9 in
Net Weight	20.6 kg | 45.4 lb

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 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

Depth	299.0 mm | 11.8 in
Length	1954.0 mm | 76.9 in
Width	409.0 mm | 16.1 in
Shipping Weight	33.2 kg | 73.2 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	

DATA SHEET

Outdoor Diplexer

DPO-7126Y-0x1

- Combines the frequencies covering PCS/AWS (1695-2180 MHz) with BRS (2496-2690 MHz)
- High power 250 W per port with low insertion loss in a small, lightweight enclosure
- Low intermodulation with isolation of >50 dB port to port
- High reliability of >500K Hours MTBF and multi-strike lightning protection
- Designed and produced to ISO 9001:2008 certification standards
- Weatherproof enclosure (IP67) with available outdoor pole or wall mounting options

Overview

The CCI Outdoor Diplexer passes the PCS and AWS bands covering 1695-2180 MHz on its low band input port and the full BRS band which covers 2496-2690 MHz on its high band input port. The Diplexer combines the low band and high band signals on to a common port and is specifically intended for use in multi-band systems with limited feeder lines. The Diplexer facilitates the addition of new technologies including LTE and new spectrum to existing sites while providing a high degree of isolation between systems. Decreasing the number of feeder lines lowers tower loading, leasing and installation expenditures and significantly reduces the total cost to upgrade a site.
The CCI Outdoor Diplexer provides full band performance for each band with low insertion loss, low Intermodulation, and high 250 W per port power handling. Excellent return loss performance delivers the best match to the antennas and base station, saving precious transmit power. The CCI Diplexer is available in a single, twin or quad unit configuration.

Technical Description:

The CCI Outdoor Diplexer consists of multiple filters and can be used as either a splitter or combiner to aggregate the PCS/AWS with the BRS bands on to a common feeder line. The fully weatherproof tower mount Diplexer has internal multi-strike lightning protection using a multi-stage surge protection circuit.
The unit has been designed to minimize insertion loss while maximizing isolation. Particular attention has been given to the intermodulation performance of the Diplexer to minimize any passive intermodulation products from occurring. The Diplexer housing is constructed from die cast aluminum and consists of an IP67 moisture proof enclosure, with IP68 immersion proof connectors suited to long-life masthead mounting. The Diplexer can be pole or wall mounted with the included bracket. The RF ports are configured with DIN 7-16.
CCI filter and combiner products are designed and produced to ISO 9001:2008 certification standards for reliability and quality at our state-of-the-art engineering and manufacturing facilities.

SPECIFICATIONS

Outdoor Diplexer

DPO-7126Y-0x1

Electrical

RF Parameters	Ports	Frequency(MHz)	Specification
Return Loss	COMMON	1695 - 2180	18 dB minimum, 20 dB typical
		2496 - 2690	18 dB minimum, 20 dB typical
	PCS/AWS	1695 - 2180	18 dB minimum, 20 dB typical
	BRS	2496 - 2690	18 dB minimum, 20 dB typical
Insertion Loss	COMMON to PCS/AWS	1695 - 2180	0.2 dB typical, 0.25 dB maximum
	COMMON to BRS	2496 - 2690	0.2 dB typical, 0.25 dB maximum
Rejection	COMMON to PCS/AWS	2496 - 2690	50 dB minimum
	COMMON to BRS	1695 - 2180	50 dB minimum
Isolation	PCS/AWS to BRS	1695 - 2180	50 dB minimum
	BRS to PCS/AWS	2496 - 2690	50 dB minimum

General Characteristics	
General Impedance	50 ohms
Continuous Average Power	250 W maximum (input ports), 500 W maximum (Common port)
Peak Envelope Power	1 kW maximum (input ports), 3 kW maximum (Common port)
Intermodulation Performance	<-117 dBm (-160 dBc) at 2 × +43 dBm tones all bands

Environmental

Operating Temperature	-40˚C to +65˚C
Enclosure	Enclosure IP67, Connectors IP68
MTBF	>500,000 hours
Lightning Protection	8/20us, ±20KA maximum, 10 strikes per IEC61000-4-5

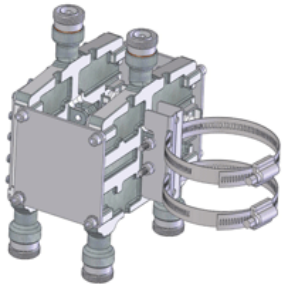
Mechanical

Model	DPO-7126Y-0-S1	DPO-7126Y-0-T1	DPO-7126Y-0-Q1
Modularity	Single	Twin	Quad
Weight with brackets	3.7 lbs (1.6 Kg)	7.3 lbs (3.3 Kg)	14.4 lbs (6.6 Kg)
Dimensions with brackets	6.26 x 7.42 x 2.02 in. (159 x 188.5 x 51.4 mm)	6.26 x 7.42 x 4.07 in. (159 x 188.5 x 103.4 mm)	6.26x 7.42 x 8.17 in. (159 x 188.5 x 207.4 mm)
Dimensions enclosure only	2.95 x 7.42 x 1.95 in. (75 x 188.5 x 48.8 mm)		
Connectors	3 x 7-16 DIN female long neck		
Mounting	Pole/Wall mounting bracket		

RADIO FREQUENCY SYSTEMS
The Clear Choice®

ShareLite™ Wideband Diplexer Kit – In-line 698-960 MHz/1710-2200 MHz, full DC/AISG pass

The ShareLite FD9R6004 Series of diplexers are designed to enable feeder sharing between systems in the 698-960 MHz range and in the 1710-2200 MHz range, including all the new AWS-3 paired spectrum blocks (G, H, I, J).. The diplexer is equipped with in-line connector placement so it can be installed in the BTS cabinet or at the tower top. This is especially valuable in crowded sites or when the feeders are not easily accessible. Due to its wideband design, the FD9R6004 Series can accommodate many combining solutions between 698-960 MHz and 1710-2200 MHz systems such as LTE 700 MHz, Cellular 800 MHz with PCS, GSM900 with GSM1800, or GSM900 with UMTS. This diplexer features a highly selective filter. It provides a high level of isolation between ports, while keeping the insertion loss on both paths at an extremely low level. The FD9R6004 diplexers are available with various DC pass options, helpful in configurations with or without the Tower Mount Amplifiers installed.



FEATURES / BENEFITS

- LTE and AWS-3 ready design
- Extremely Low Insertion Loss
- High level of Rejection between bands – Protection against interferences
- Extremely High Power Handling Capability
- DC/AISG 1.1/2.0 pass through all ports
- Very compact & small size design – Easy installation and reduced tower load
- In-line long-neck connectors for easy connection & waterproofing
- Exceptional reliability & environmental protection (IP 67)
- Equipped with 1 * Breathable Vent – Prevent any humidity inside the product
- Mounting hardware for Wall and Pole mount provided (P/N SEM2-1A)
- Grounding already provided through the mounting bracket

Technical Features

GENERAL SPECIFICATIONS		
Product Type		Diplexer/Cross Band Combiner
Application		LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS, AWS-1, AWS-3
Configuration		ShareLite Kit consisting of (2) in-line long neck connector diplexers (Full DC Pass), (1) mounting hardware SEM2-1A, & (1) assembly kit SEM2-3 disassembled
ELECTRICAL SPECIFICATIONS		
Frequency Range 1	MHz	698 - 960
Frequency Range 2	MHz	1710 - 2200
Return Loss All Ports	dB	19 Min/23 Typ.
Power Handling Continuous, Max	W	1250 at common port; 750 in low frequency path & 500 in high frequency path
Power Handling Peak, Max	W	15000 in low frequency path & 8000 in high frequency path
Impedance	Ω	50.0
Insertion Loss, Path 1	dB	0.07 typ.
Insertion Loss, Path 2	dB	0.13 typ.
Rejection Between Bands Min/Typ	dB	58/64@698-960MHz 57/70@1710-2200MHz
Group Delay, Path 1	ns	3 Max.
Group Delay, Path 2	ns	3 Max.
IMP Level at the COM Port	dBm (dBc)	-112 (-155) @2x43 typ.
DC Pass in Path 1		Yes
DC Pass in Path 2		Yes

MECHANICAL SPECIFICATIONS		
Mounting		Wall Mounting: With 4 screws (maximum 6mm diameter) Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
RF Connectors		In-line long-neck 7-16-Female
Weight	kg (lb)	2.9 (6.4)
Dimensions, H x W x D	mm (in)	147 x 164 x 118 (5.8 x 6.5 x 4.6)
Shipping Dimensions, H x W x D	mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 1 * Dual unit in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 3 * Dual units = 3 * Boxes in 1 * overwrap
Housing		Aluminum
TESTING AND ENVIRONMENTAL		
Temperature Range	°C (°F)	-40 to 60 (-40 to 140)
Environmental		ETSI 300-019-2-4 Class 4.1E
Ingress Protection		IP 67
Lightning Protection		EN/IEC61000-4-5 Level 4

External Document Links

RFS Diplexer Field Test Procedure□□

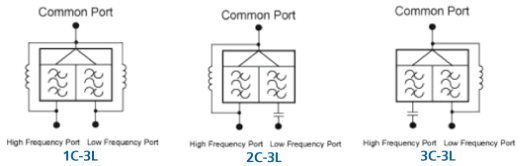
KIT-FD9R6004/1C-DL Installation Instructions

Notes

RADIO FREQUENCY SYSTEMS
The Clear Choice®

ShareLite™ Wideband Diplexer Kit – In-line 698-960 MHz/1710-2200 MHz, full DC/AISG pass

Selection Guide Diplexer 698-960 / 1710-2200MHz					
	Model Number	Full DC Pass	DC Pass High Band	DC Pass Low Band	Mounting Hardware Included
Single	FD9R6004/1C-3L				X
	FD9R6004/2C-3L				X
	FD9R6004/3C-3L				X
Dual	KIT-FD9R6004/1C-DL				X
	KIT-FD9R6004/2C-DL				X
	KIT-FD9R6004/3C-DL				X



The FD9R6004 Series is upgradeable to a Dual Diplexer kit by means of 2 diplexers and mounting hardware kits SEM2-1A and SEM2-3

Mounting Hardware and Ground Cable Ordering Information		
Model Number	**Description**	
SEM2-1A	Mounting Hardware, Pole mount ø40-110mm (Included with the Single and Dual Diplexer) Wall Screws M6 (Not included with the product)	
SEM2-3	Assembly kit for 2 pcs of FD9R6004/xC-3L (Can be ordered separately but included with the Dual Diplexer Kit)	
CA020-2	Ground Cable, 2m, includes lugs (Optional)	
CA030-2	Ground Cable, 3m, includes lugs (Optional)	
SEM6	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	