Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

October 31, 2019

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

RE: Notice of Exempt Modification
9 Sound Shore Drive Greenwich, CT 06830
Latitude: 41.029711
Longitude: -73.598356
Sprint Site#: CT03XC338– DO Macro

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 148-foot level of the existing 148-foot transmission tower at 9 Sound Shore Drive Greenwich, CT. The 148-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 148-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. 399 dated July 23, 1998. 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 First Selectman – Peter Tesei, Elected Official, and Jodi Couture, Zoning Enforcement Office for the Town of Greenwich, 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: Peter Tesei – Town of Greenwich First Selectman
Jodi Couture – Town of Greenwich Zoning Enforcement Office
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

August 21, 2019

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

RE: Sprint Antenna Site, CT-03XC338, Sound Shore Drive, Greenwich, CT, structure 1281

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: 17159.07 - CT03XC338 - Structural Analysis Rev1 19.02.05
17159.07 - CT03XC338 Greenwich - CD Rev.0 19.07.11 (S&S)

Petition No. 399
Sprint Spectrum, L.P.
Greenwich, Connecticut
Staff Report
July 23, 1998

On Tuesday, July 13, 1998, Connecticut Siting Council (Council) members Pamela B. Katz and Albert E. Gary, and Council staff Fred O. Cunliffe met Sprint Spectrum L. P.'s (Sprint) representatives Karen Johnson, John Tierney, Stephen Kotfila, Julie Cashin, and Jeff York for a site inspection of the proposed modification to an existing Connecticut Light and Power Company's (CL&P) electric transmission line support structure located adjacent to CL&P's Cos Cob substation, at 9 Sound Shore Drive, Greenwich, Connecticut. Sprint is petitioning the Council for a declaratory ruling that modifications to this existing transmission line support structure and placement of equipment at the base of the structure would have no substantial adverse environmental effect. Sprint currently provides coverage to the east from an AT&T tower located off Catoona Lane, Stamford, and to the west from a rooftop co-location in Greenwich.

Sprint proposes to construct a Fort Worth Tower Power Mount (Power Mount), with antennas measuring 60 inches by 6.1 inches by 2.8 inches at a centerline height of 148 feet above ground level (AGL), within the existing CL&P transmission line structure (#1281). Sprint would also install three equipment cabinets measuring approximately 31 inches by 30 inches by 66 inches, on an 8-foot by 11-foot concrete pad within the existing structure's foundation footprint, and construct a six-foot fence topped with three strands of barbed wire around the structure. A GPS antenna would be installed on a 15-foot fence pole. The proposed Power Mount with antennas would extend approximately 18 feet above the top of the 133-foot high transmission line support structure.

Since CL&P transmission line easement is limited to an aerial right-of-way, Sprint will enter into a ground lease agreement with the Connecticut Department of Rail Transportation (ConnDOT) for underlying land use. Access to the CL&P structure would be from Sound Shore Drive over a ConnDOT easement. Utilities would be placed underground within this easement from an existing distribution pole located approximately 130 feet south of the proposed site. Sprint proposes to upgrade the existing broken bituminous concrete surfaces to the structure with gravel. Sprint would place erosion and sediment controls and haybale checks to the south of the structure and restore areas disturbed by construction.

Surrounding land uses include a CL&P substation and transmission lines, Town-owned water tank and abandoned power station, railroad right-of-way, and Interstate 95. The zoning of this area is Waterfront Business. Other existing transmission line structures in the area range in height from 95 feet to 140 feet AGL.

The proposed construction of a Power Mount and associated antennas and equipment within CL&P's existing transmission line structure would not exceed the maximum permissible exposure limit for the worst case radio frequency power density at the base of the structure (2.2056% of the standard). Sprint contends that the proposed modifications to CL&P's existing facility or placement of equipment on ConnDOT land will not cause a substantial adverse environmental effect. Furthermore, Sprint will not have a need to construct a new tower in the project area if the Council determines that no Certificate is required.

N

1:600
1"=50'

10/22/2019 3:35:36 PM

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Tax ID 368/038 Printed 10/22/2019 Card No. 1 of 1

ADMINISTRATIVE INFORMATION

PARCEL NUMBER
02-4585/S

Parent Parcel Number

Property Address
SOUND SHORE DRIVE 0000

Neighborhood
113020 INDIAN HARBOR [2]

Property Class
299 Exempt Commercial

TAXING DISTRICT INFORMATION

Jurisdiction	57	Greenwich, CT
Area	001	
Corporation	057	
District	02	
Section & Plat	236	
Routing Number	7890S0005	

Site Description

Topography:

Public Utilities:
Sewer, Electric

Street or Road:

Neighborhood:

Zoning:
R-6 Multi-Family 7,5[illegible]

Legal Acres:
2.5100

OWNERSHIP

CONNECTICUT STATE OF
%FINANCE DEPT TOWN OF GREENWICH
101 FIELD POINT ROAD
GREENWICH, CT 06830

LOT NO C-1A SOUND SHORE D R S5

TRANSFER OF OWNERSHIP

Date		
04/18/2007	TOWN OF GREENWICH C/O FINANCE DEPT Bk/Pg: 0000, 000	$0
07/31/1989	NA Bk/Pg: 1959, 80	$0

EXEMPT

VALUATION RECORD

Assessment Year		10/01/2005	10/01/2010	10/01/2015	10/01/2015	10/01/2016	10/01/2017	10/01/2018
Reason for Change		2005 Reval	2010 Reval	2015 Prelim	2015 Final	2016 List	2017 List	2018 List
VALUATION	L	2906900	2884800	978900	978900	988500	988500	988500
Market	B	6400	8800	17400	17400	17400	17400	17400
	T	2913300	2893600	996300	996300	1005900	1005900	1005900
VALUATION	L	2034830	2019360	685230	685230	691950	691950	691950
70% Assessed	B	4480	6160	12180	12180	12180	12180	12180
	T	2039310	2025520	697410	697410	704130	704130	704130

LAND DATA AND CALCULATIONS

Land Type	Rating Soil ID -or- Actual Frontage	Measured Acreage -or- Effective Frontage	Table Effective Depth	Prod. Factor -or- Depth Factor -or- Square Feet	Base Rate	Adjusted Rate	Extended Value	Influence Factor	Value
1 Residential Land		2.5100		1.00	856135.00	856135.00	2148900 B	-54%	988500

CKMP: 6548
DBA: Metro-North Electric Substation
GEN: Town of Greenwich is responsible for paying the taxes on this parcel - mailing address must read c/o Finance Dept, Town of Greenwich 101 Field Point Road, Greenwich, Ct. 06830

Permit Number Type	FilingDate	Est. Cost Field Visit Est. SqFt

Supplemental Cards

TRUE TAX VALUE 988500

Supplemental Cards
TOTAL LAND VALUE 988500

IMPROVEMENT DATA

PHYSICAL CHARACTERISTICS

Item Description	Units	Cost	Total	Pct

(LCM: 150.00)

SPECIAL FEATURES

Description	Value
02 : BW	

SUMMARY OF IMPROVEMENTS

ID	Use	Stry Hgt	Const Type	Grade	Year Const	Eff Year	Cond	Base Rate	Feat-ures	Adj Rate	Size or Area	Computed Value	Phys Depr	Obsol Depr	Market Adj	% Comp	Value
01	UTLSHED	10.00	1	Good	1980	1985	GD	44.50	N	100.13	8x 8	6410	3	0	100	100	6200
02	FENCECL	6.00	51C	Avg	1970	1985	AV	18.50	Y	27.75	400	12830	13	0	100	100	11200

Data Collector/Date	Appraiser/Date	Neighborhood	Supplemental Cards
RV 02/22/2000	TOG 10/01/2015	Neigh 113020 AV	

TOTAL IMPROVEMENT VALUE 17400

ADMINISTRATIVE INFORMATION

PARCEL NUMBER
02-1708/S

Parent Parcel Number

Property Address
SOUND SHORE DRIVE 0012

Neighborhood
2300 EAST PUTNAM

Property Class
402 Electical Transformer Station

TAXING DISTRICT INFORMATION

Jurisdiction	57	Greenwich, CT
Area	001	
Corporation	057	
District	02	
Section & Plat	236	
Routing Number	7890S0004Z	

Site Description

Topography:

Public Utilities:
Electric

Street or Road:

Neighborhood:

Zoning:
WB Waterfront Business

Legal Acres:
1.5000

OWNERSHIP

CONNECTICUT LIGHT & POWER CO
PO BOX 270
HARTFORD, CT 06101

LOT NO 15 & 18A SOUND SHORE DR S4Z

Tax ID 368/039 Printed 10/22/2019 Card No. 1 of 1

TRANSFER OF OWNERSHIP

Date		
12/29/1959	NA	$0
	Bk/Pg: 626, 322	

UTILITY

VALUATION RECORD

Assessment Year		10/01/2006	10/01/2010	10/01/2015	10/01/2015	10/01/2016	10/01/2017	10/01/2018
Reason for Change		2006 List	2010 Reval	2015 Prelim	2015 Final	2016 List	2017 List	2018 List
VALUATION	L	2186700	2275300	2383100	2383100	2383100	2383100	2383100
Market	B	150300	72000	93500	93500	93500	93500	93500
	T	2337000	2347300	2476600	2476600	2476600	2476600	2476600
VALUATION	L	1530690	1592710	1668170	1668170	1668170	1668170	1668170
70% Assessed	B	105210	50400	65450	65450	65450	65450	65450
	T	1635900	1643110	1733620	1733620	1733620	1733620	1733620

LAND DATA AND CALCULATIONS

Land Type	Rating Soil ID -or- Actual Frontage	Measured Acreage -or- Effective Frontage	Table 100 Effective Depth	Prod. Factor -or- Depth Factor -or- Square Feet	Base Rate	Adjusted Rate	Extended Value	Influence Factor	Value
1 Primary Commercial				65340.00	104.21	104.21	6808900 1	-65%	2383100

BP18: 15-3958: $55,000 Verizon Replace Antennas
GEN: CL&P Transformer Station.
Improved w/ Jet Generators owned by CT Jet Power
PP Acnt # 01-27287.
added 's' 2/27/14 per e-mail from c mandras
O/O: Owner-Occupied Commercial

Permit Number / Type	FilingDate	Est. Cost / Est. SqFt	Field Visit

Supplemental Cards

TRUE TAX VALUE 2383100

Supplemental Cards
TOTAL LAND VALUE 2383100

IMPROVEMENT DATA

PHYSICAL CHARACTERISTICS

ROOFING

Built-up

WALLS

	B	1	2	U
Frame				
Brick				
Metal				
Guard				

FRAMING

	B	1	2	U
F Res	0	240	0	0

HEATING AND AIR CONDITIONING

	B	1	2	U
Heat	0	240	0	0

(LCM: 150.00)

SPECIAL FEATURES

Description	Value
03 : BW	

SUMMARY OF IMPROVEMENTS

ID	Use	Stry Hgt	Const Type	Grade	Year Const	Eff Year	Cond	Base Rate	Feat-ures	Adj Rate	Size or Area	Computed Value	Phys Depr	Obsol Depr	Market Adj	% Comp	Value
C	HUTLSTOR	0.00		Good	2006	2006	GD	0.00	N	0.00	240	0	0	0	150	100	38900
01	UTLSHED	1.00	1	Fair	1980	1985	AV	44.50	N	30.26	20x 40	24210	13	0	100	100	21100
02	UTLSHED	1.00	1	Fair	1970	1985	AV	44.50	N	30.26	20x 36	21790	13	0	100	100	19000
03	FENCECL	6.00	51C	Avg	1970	1985	AV	18.50	Y	27.75	520	16680	13	0	100	100	14500

Data Collector/Date

bd 08/04/2006

Appraiser/Date

TOG 10/01/2015

Neighborhood

Neigh 2300 AV

Supplemental Cards
TOTAL IMPROVEMENT VALUE 93500

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: CT03XC338

Eversource Struct.: 1281
9 Sound Shore Drive
Greenwich, Connecticut 06830

August 3, 2019

EBI Project Number: 6219003704

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**4.19%**

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

August 3, 2019

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

Emissions Analysis for Site: CT03XC338 - Eversource Struct.: 1281

EBI Consulting was directed to analyze the proposed Sprint facility located at **9 Sound Shore Drive** in **Greenwich, 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 9 Sound Shore Drive in Greenwich, 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 148 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) 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):	148 feet	Height (AGL):	148 feet	Height (AGL):	148 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 %:	**2.39%**	Antenna B1 MPE %:	**2.39%**	Antenna C1 MPE %:	**2.39%**

Site Composite MPE %	
Carrier	MPE %
Sprint (Max at Sector A):	2.39%
Verizon	1.8%
Site Total MPE % :	4.19%

Sprint MPE % Per Sector	
Sprint Sector A Total:	2.39%
Sprint Sector B Total:	2.39%
Sprint Sector C Total:	2.39%
Site Total MPE % :	4.19%

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	148.0	3.55	800 MHz CDMA	533	0.67%
Sprint 1900 MHz PCS	4	1339.86	148.0	8.80	1900 MHz PCS	1000	0.88%
Sprint 2500 MHz BRS	8	639.78	148.0	8.40	2500 MHz BRS	1000	0.84%
						Total:	**2.39%**

• 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:	2.39%
Sector B:	2.39%
Sector C:	2.39%
Sprint Maximum MPE % (Sector A):	2.39%
Site Total:	4.19%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **4.19%** 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.

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.

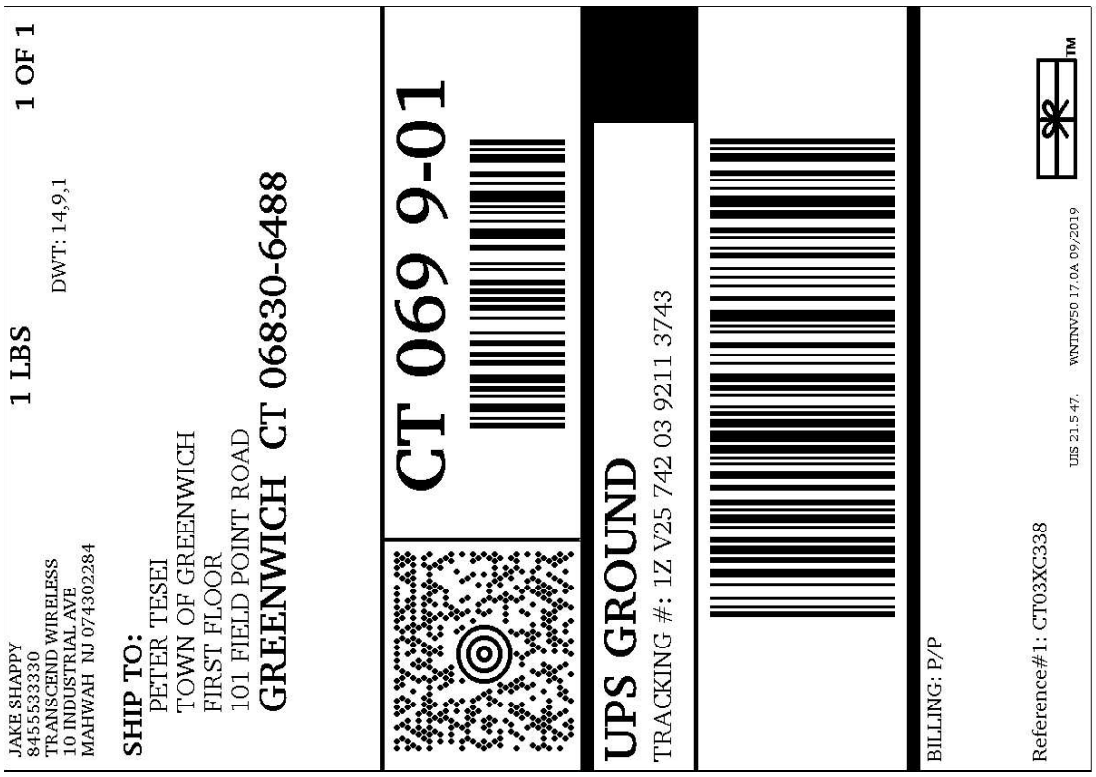
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To 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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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.

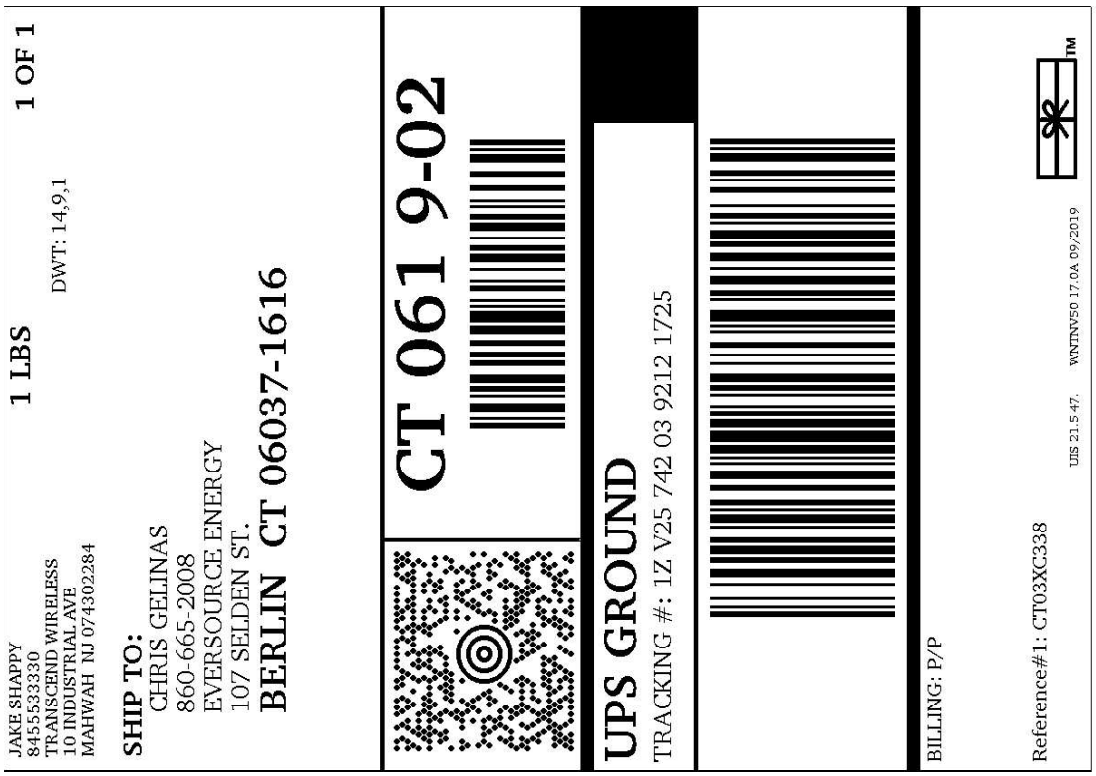
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To 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



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.

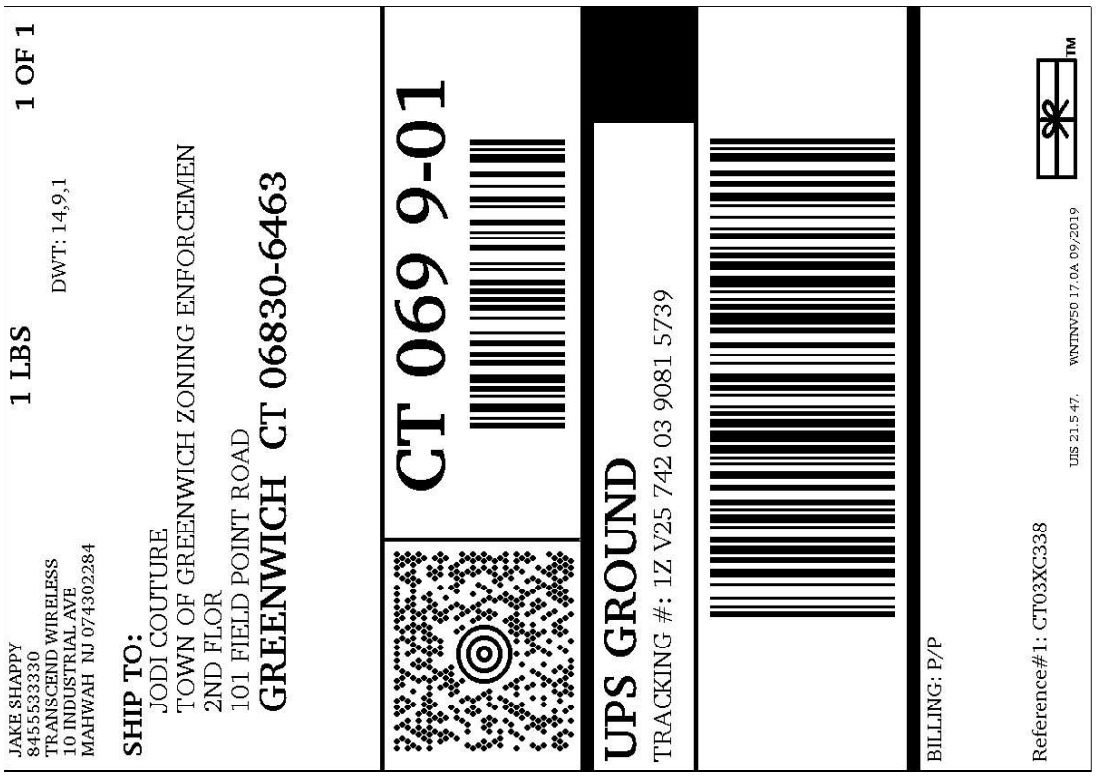
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To 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



WIRELESS COMMUNICATIONS FACILITY

EVERSOURCE STRUCT.: 1281

SITE ID: CT03XC338

9 SOUND SHORE DR

GREENWICH, CT 06830

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." 2018 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.

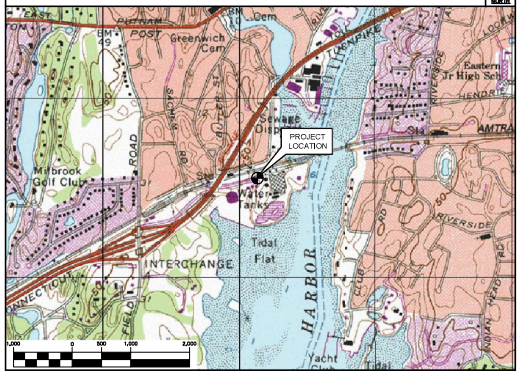
SITE DIRECTIONS

FROM: 5 WAYSIDE ROAD, BURLINGTON, MA 01803 **TO:** 9 SOUND SHORE DR, GREENWICH, CT 06830

1.	START OUT BY GOING TO WAYSIDE ROAD.	0.12 Mi.
2.	TURN LEFT ONTO CAMBRIDGE ST/US-3 S/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).	44.45 Mi.
6.	MERGE ONTO I-84 W/WILBUR CROSS HWY S VIA EXIT 9 TOWARD US-20(PORTIONS TOLL).	40.90 Mi.
7.	TAKE EXIT 57 FOR CT-15 S TOWARD I-91 S/CHARTER OAK BRIDGE/N.Y.CITY.	0.60 Mi.
8.	CONTINUE ONTO CT-15 S/US-5 S.	1.30 Mi.
9.	TAKE EXIT 86 TO MERGE ONTO I-91 S TOWARD NEW HAVEN/NEW YORK CITY.	17.10 Mi.
10.	TAKE EXIT 17 TO MERGE ONTO CT-15 S/WILBER CROSS PKWY.	30.20 Mi.
11.	TAKE EXIT 52 FOR STATE ROUTE 108 S/STATE ROUTE 8 S TOWARD BRIDGEPORT.	0.80 Mi.
12.	KEEP LEFT, FOLLOW SIGNS FOR CT-8 S/BRIDGEPORT AND MERGE ONTO CT-8 S.	5.20 Mi.
13.	TAKE THE INTERSTATE 95 S EXIT TOWARD N.Y.CITY.	0.20 Mi.
14.	MERGE ONTO I-95 S.	25.00 Mi.
15.	TAKE EXIT 4 FOR INDIAN FIELD ROAD TOWARD COS COB.	0.20 Mi.
16.	DRIVE STRAIGHT TO SOUND SHORE DRIVE.	00.4 Mi.

VICINITY MAP

SCALE: 1" = 1000'



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 UNISTRUT EQUIPMENT RACK MOUNTED AT GRADE.
   - B. REMOVE (3) EXISTING PANEL ANTENNAS FROM EXISTING TOWER MOUNT.
   - C. INSTALL (3) PROPOSED 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.
   - G. INSTALL PROPOSED HANDRAIL ON EXISTING PLATFORM.

PROJECT INFORMATION

SITE NAME:	EVERSOURCE STRUCT.: 1281
SITE ID:	CT03XC338
SITE ADDRESS:	9 SOUND SHORE DR GREENWICH, CT 06830
APPLICANT:	SPRINT 5 WAYSIDE ROAD BURLINGTON, MA 01803
CONTACT PERSON:	JAKE SHAPPY (845)553-3330
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41° 01' 46.06"N LONGITUDE: 73° 35' 54.08"W GROUND ELEVATION: ±28' AMSL SITE COORDINATES REFERENCED AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	DESIGN BASIS AND SITE NOTES	0
C-1	COMPOUND PLANS AND ELEVATION	0
C-2	TYPICAL DETAILS	0
C-3	COLOR CODE, CPRI DETAILS AND PLUMBING DIAGRAM	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	07/11/19	TJL	CAG	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

SPRINT
WIRELESS COMMUNICATIONS FACILITY
EVERSOURCE STRUCT.: 1281
SITE ID: CT03XC338
9 SOUND SHORE DR
GREENWICH, CT 06830

DATE: 06/05/19
SCALE: AS NOTED
JOB NO. 17159.07

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:

   ANTENNA MAST

   - WIND LOAD: PER ANSI/TIA 222 G (ANTENNA MOUNTS): 93 MPH

   TRANSMISSION TOWER – TOWER AND TELECOMMUNICATIONS EQUIPMENT

   - WIND LOAD: PER NESC C2-2012 SECTION 25 RULE 250B – 4PSF
   - WIND LOAD: PER NESC C2-2012 SECTION 25 RULE 250C – 110MPH
   - 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
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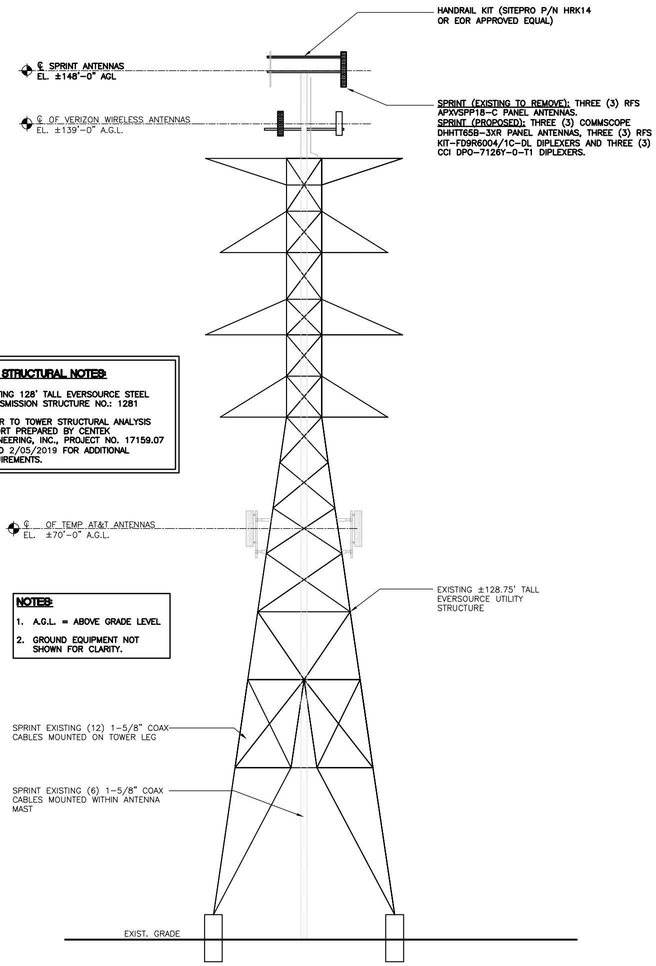
DESIGN BASIS AND SITE NOTES

N-1

Sheet No. 2 of 5



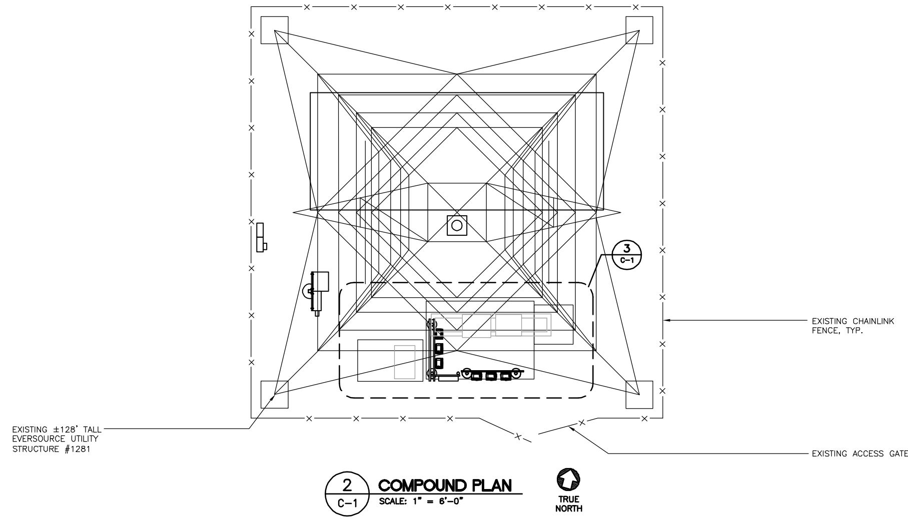
TOWER STRUCTURAL NOTES:

1. EXISTING 128' TALL EVERSOURCE STEEL TRANSMISSION STRUCTURE NO.: 1281
2. REFER TO TOWER STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJECT NO. 17159.07 DATED 2/05/2019 FOR ADDITIONAL REQUIREMENTS.

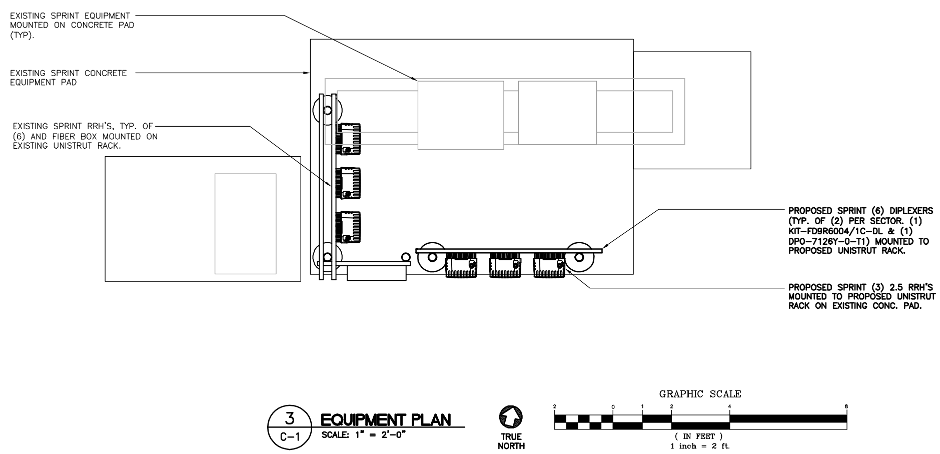
NOTES:

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

1 / C-1 **TOWER ELEVATION**
SCALE: 1" = 7'-0"



2 / C-1 **COMPOUND PLAN**
SCALE: 1" = 6'-0"



3 / C-1 **EQUIPMENT PLAN**
SCALE: 1" = 2'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	07/11/19	T.J.L.	CAG	ISSUED FOR CONSTRUCTION

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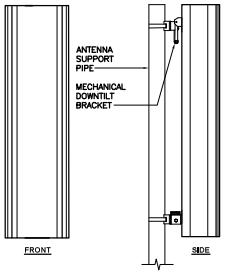
DATE: 06/05/19
SCALE: AS NOTED
JOB NO. 17159.07

COMPOUND PLANS AND ELEVATION

C-1

Sheet No. 3 of 5



BOTTOM

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: DHHTT65B-3XR	72.1"L x 11.9"W x 7.1"D	46 LBS.

1 PROPOSED ANTENNA DETAIL
C-2 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 REMOTE RADIO HEAD DETAIL
C-2 SCALE: NOT TO SCALE

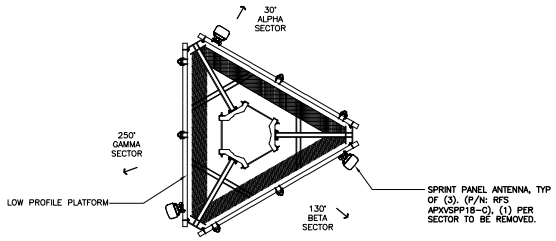
DOP-7126Y-0-T1

KIT-FD9R6004/1C-DL

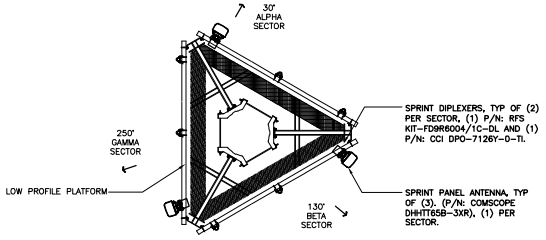
DIPLEXERS		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: KIT-FD9R6004/1C-DL	5.8"L x 6.5"W x 4.6"D	6.4 LBS.
MAKE: CCI MODEL: DPO-7126Y-0-T1	5.94"L x 7.94"W x 4.07"D	7.3 LBS.

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

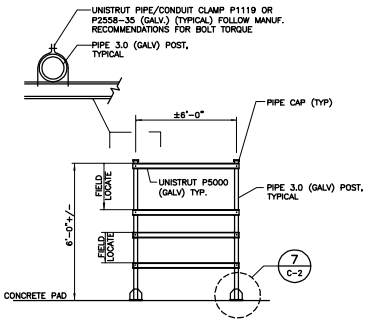
3 DIPLEXER DETAIL
C-2 SCALE: NOT TO SCALE



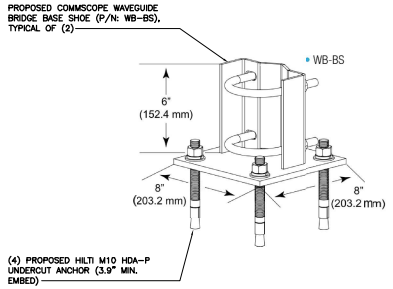
4 EXISTING ANTENNA PLAN
C-2 SCALE: = 1/4" = 1'



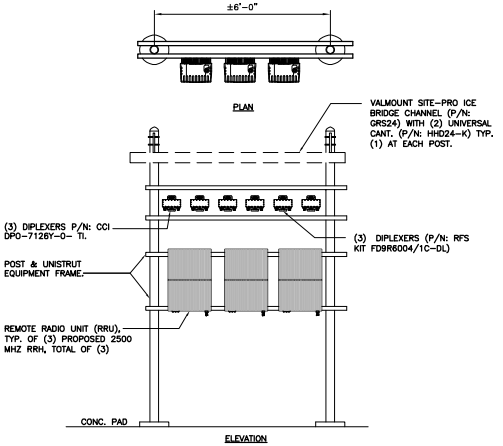
5 PROPOSED ANTENNA PLAN
C-2 SCALE: = 1/4" = 1'



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



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



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

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
A	07/11/19	TJL	CAG	ISSUED FOR CONSTRUCTION

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SPRINT
WIRELESS COMMUNICATIONS FACILITY

EVERSOURCE STRUCT.: 1281
SITE ID: CT03XC338
9 SOUND SHORE DR
GREENWICH, CT 06830

DATE: 06/05/19
SCALE: AS NOTED
JOB NO. 17159.07

TYPICAL DETAILS

C-2

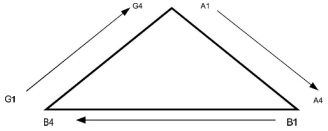
Sheet No. 4 of 5

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	ORG
2500	YEL	RPL	NV-8	RPL

HYBRID	
HYBRID	COLOR
1	GRN
2	BLU
3	BRN
4	WHT
5	RED
6	SLT
7	RPL
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	RPL
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.

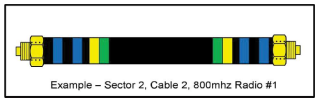
FIGURE 19.1 CABLE COLOR CODE

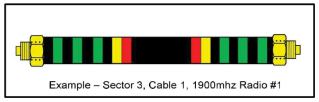
Sector	Cable	First Ring	Second Ring	Third Ring
1 Alpha	1	Green	No Tape	No Tape
1	2	Blue	No Tape	No Tape
1	3	Brown	No Tape	No Tape
1	4	White	No Tape	No Tape
1	5	Red	No Tape	No Tape
1	6	Grey	No Tape	No Tape
1	7	Purple	No Tape	No Tape
1	8	Orange	No Tape	No Tape
2 Beta	1	Green	Green	No Tape
2	2	Blue	Blue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

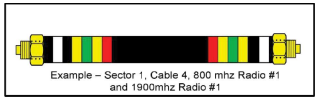
FIGURE 19.2 COLOR CODE

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	RPL

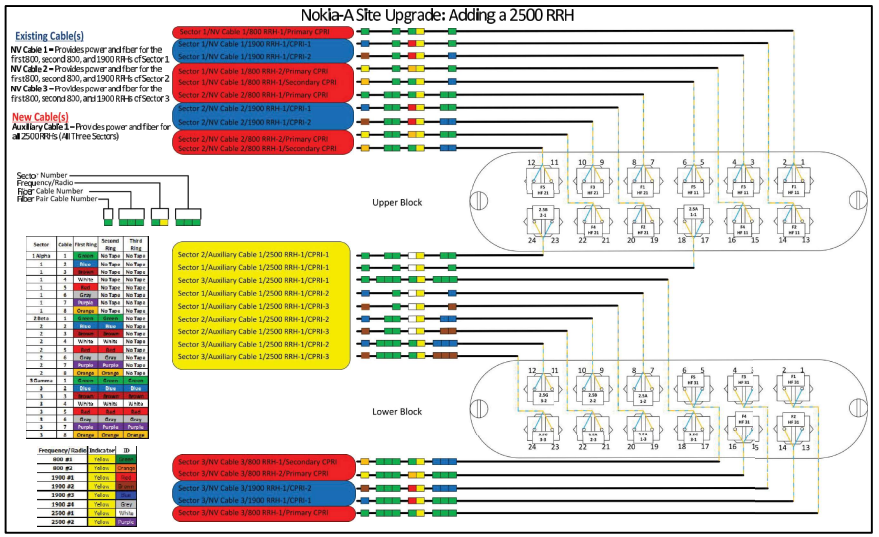
FREQUE	INDICATOR	ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	RPL


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

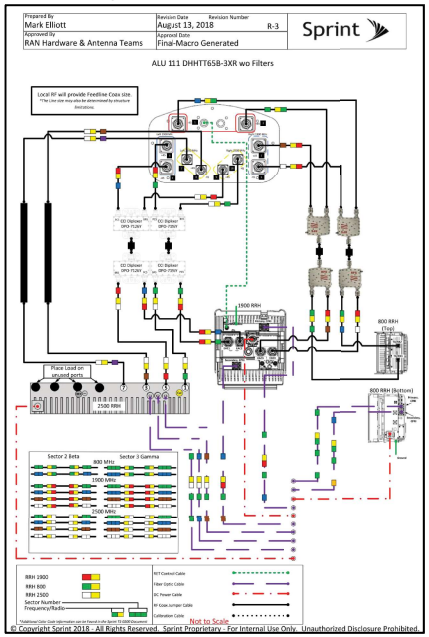

Example – Sector 3, Cable 1, 1900mhz Radio #1


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

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



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



3 C-3 **PLUMBING DIAGRAM**
NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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EVERSOURCE STRUCT.: 1281
SITE ID: CT03XC338
9 SOUND SHORE DR
GREENWICH, CT 06830

DATE: 06/05/19
SCALE: AS NOTED
JOB NO. 17159.07

COLOR CODE
CPRI DETAILS AND
PLUMBING DIAGRAM

C-3

Sheet No. 5 of 6

CENTEK engineering

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Structural Analysis of Antenna Mast and Tower

Sprint Site Ref: CT03XC338

Eversource Structure No. 1281

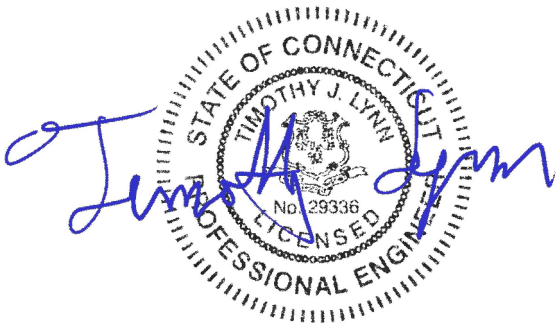
129' Electric Transmission Lattice Tower

9 Sound Shore Drive
Greenwich, CT

CENTEK Project No. 17159.07

~~Date: December 5, 2018~~

Rev 1: February 5, 2019



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

Table of Contents

SECTION 9 - REFERENCE MATERIAL

- RF DATA SHEET
- EQUIPMENT CUT SHEETS

Introduction

The purpose of this report is to analyze the existing 150' FWT Powermount job no. 18404 dated January 5, 1999 and 128.75' utility tower located at 9 Sound Shore Drive in Greenwich, CT for the proposed antenna and equipment upgrade by Sprint.

The loads considered in this analysis consist of the following:

- VERIZON WIRELESS (Existing):
  Antennas: Two (2) Decibel DB854DG65ESX panel antennas, three (3) Andrew HBXX-6516DS panel antennas, three (3) Andrew SBNHH-1D65B panel antennas, one (1) Antel BXA-70063-6CF panel antenna, six (6) RFS FDAP5002/2C-3L Diplexers and three (3) RFS ATSBT-TOP-FM-4G Bias Tee mounted on a (3) T-Arms with a RAD center elevation of 139-ft above grade.
  Coax Cables: Eighteen (18) 1-5/8" ∅ coax cables running on the outside of the powermount as indicated in section 4 of this report
- SPRINT (Existing to Remain):
  Coax Cables: Six (6) 1-5/8" ∅ coax cables running on the inside of the existing powermount. Twelve (12) 1-5/8" ∅ coax cables mounted on Site Pro Super Universal T-Brackets p/n T1200 running on a leg of the existing tower as indicated in section 4 of this report.
- SPRINT (Existing to Remove):
  Antennas: Three (3) RFS APXVSPP18-C panel antennas mounted on an existing 14-ft low profile platform to the powermount with a RAD center elevation of 148-ft above grade.
- **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 an existing 14-ft low profile platform to the powermount with a RAD center elevation of 148-ft above grade. (Handrail to be installed on existing platform. Refer to section 4 for details)

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 within the antenna mast unless specified otherwise.
- 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 existing powermount 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 FWT powermount consisting of a 12-in SCH. 40 pipe (O.D. = 12.75") connected at six points to the existing tower was analyzed for its ability to resist loads prescribed by the TIA/EIA standard. Section 5 of this report details these gravity and lateral wind loads. Load cases and combinations used in RISA-3D for TIA/EIA loading are listed in report Section 6.

Structural analysis of the existing 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 129-ft tall 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 powermount 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 C2-2012 and Eversource Design Criteria.

The utility tower structure, considering existing and future conductor and shield wire loading, with the proposed antenna mast was analyzed under two conditions:

- 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 EVERSOURCE Design Criteria Table, NESC C2-2012 ~ 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 C2-2012, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

- MAST ASSEMBLY ANALYSIS

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

  Load cases considered:

  Load Case 1:
  Wind Speed……..... 93 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**.

FWT Powermount	Stress Ratio (% of capacity)	Result
12” Sch. 40 Pipe	48.6%	**PASS**
L2.5x2.5x1/4 Brace	37.6%	**PASS**
Connection	79.1%	**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 **99.85%** occurs in the utility structure under the **NESC Heavy** loading condition.

  TOWER SECTION:

  The utility structure was found to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle 25AP	99.85%	**PASS**

- FOUNDATION AND ANCHORS

  The existing foundation consists of a 5-ft square x 8.5-ft long reinforced concrete pier with eight (8) rock anchor groups embedded 12-ft into rock The base of the tower is connected to the foundation by four (4) 2.00” ⌀ A36 bolts per leg. Foundation information was obtained from NUSCO drawing no. 01037-60010.

BASE REACTIONS:

From PLS-Tower analysis of utility tower based on NESC/EVERSOURCE prescribed loads.

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	45.37 kips	166.56 kips	192.14 kips
NESC Extreme Wind	54.22 kips	189.12 kips	200.46 kips

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

ANCHOR BOLTS:

The anchor bolts were found to be within allowable limits.

Component	Design Check	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	87.6%	**PASS**

FOUNDATION:

The foundation was found to be within allowable limits.

Foundation	Design Check	Design Limit	Proposed Loading	Result
Reinf. Conc. Pier w/ Rock Anchors	Uplift	1.0 FS (2)	1.28 FS (2)	**PASS**
	OTM (1)	1.0 FS (2)	1.10 FS (2)	**PASS**
	Soil Bearing	50 ksf	28.59 ksf	**PASS**

Note 1: OTM denote overturning moment.
Note 2: FS denotes Factor of Safety.

C o n c l u s i o n

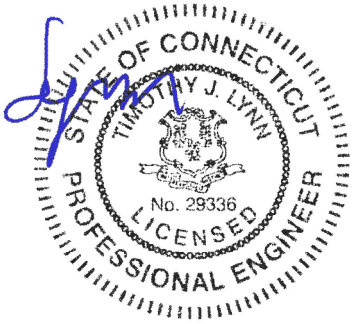
This analysis shows that the subject utility tower **is adequate** to support the proposed equipment upgrade.

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 (Rev. F) 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-222 (Rev. F) with two exceptions:

1. An 85 mph extreme wind speed shall be used for locations in all counties throughout the NU system.
2. The allowable stress increase of TIA Section 3.1.1.1 is allowed for the mast section, but is disallowed for the mast to structure connection design.

   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.

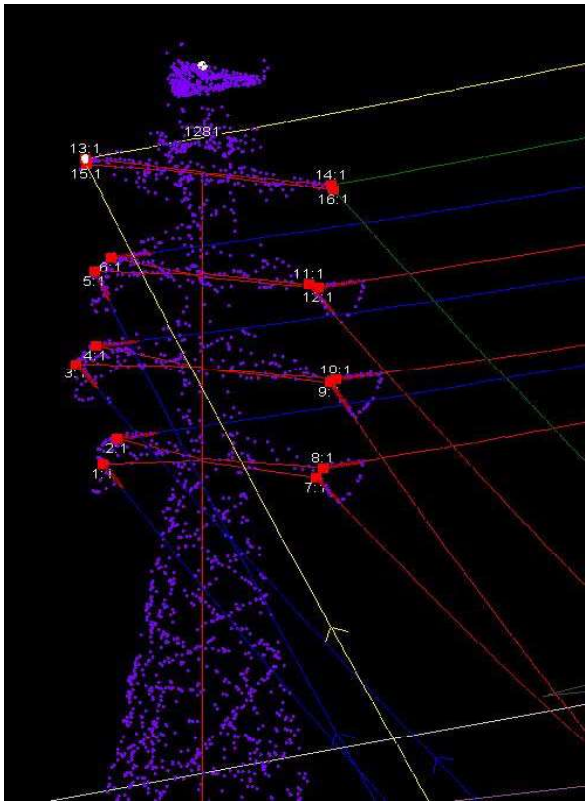
Project: 1740/1750 Lines, Structure 1281
Date: 11/26/18
Engineer: JS
Purpose: Recalculate wire loads for Sprint/Verizon site.

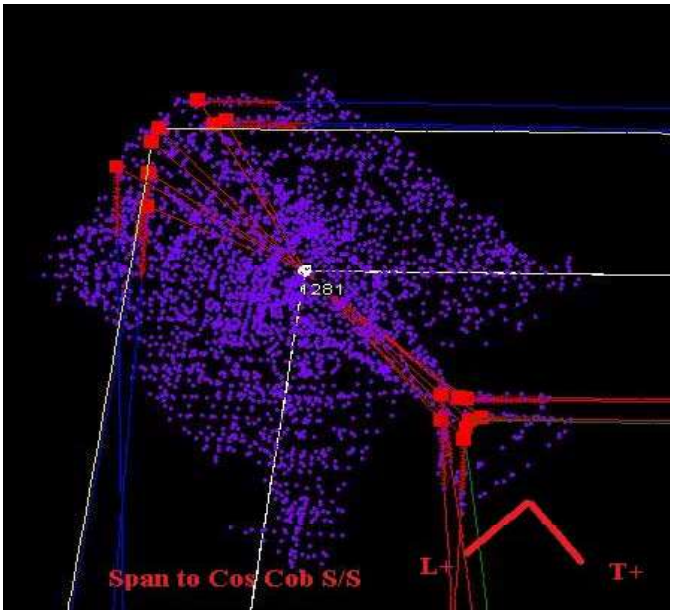
Shield Wires:
1740: Linnet 336 ACSR, sagged in PLS-CADD
1750: AFL DNO-8363 OPGW, sagged in PLS-CADD

Conductors:
1740/1750: 1272 ACSR, sagged in PLS-CADD

NESC 250B

Linnet	1610	1610	1610
OPGW	1298	8213	-2807
1740 Set 1	2332	7785	7437
1740 Set 2	438	7124	-7493
1740 Set 3	3241	9292	7457
1740 Set 4	573	5259	-5419
1750 Set 5	2933	5363	5970
1740 Set 6	520	5739	-5969
1750 Top Phase	2393	10693	-4869
1750 Middle Phase	2366	9228	-2072
1750 Bottom Phase	1702	12051	-5996





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

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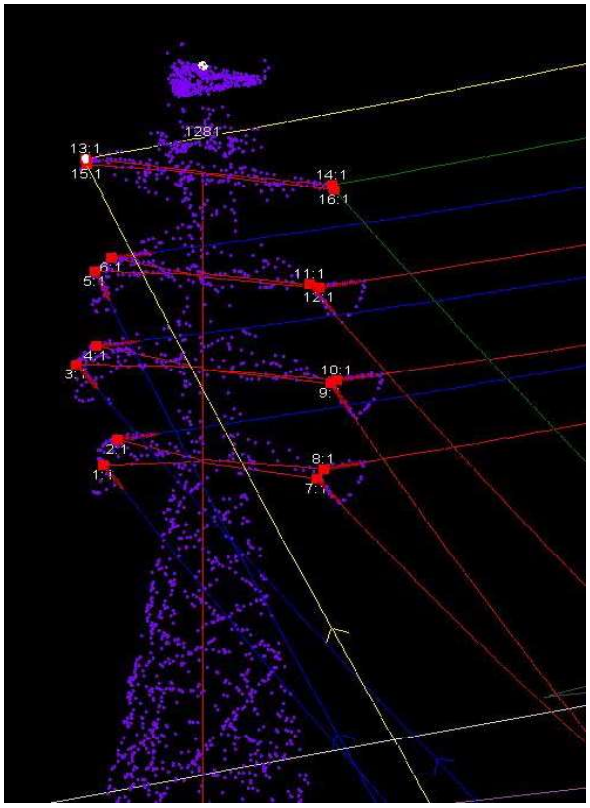
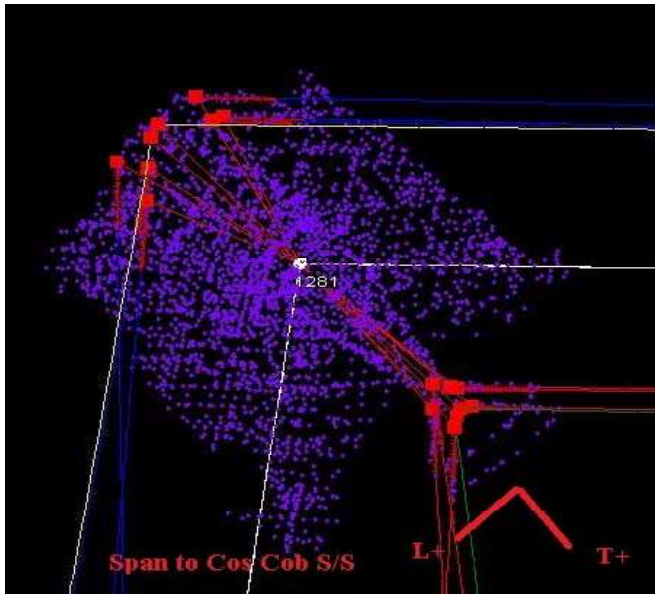
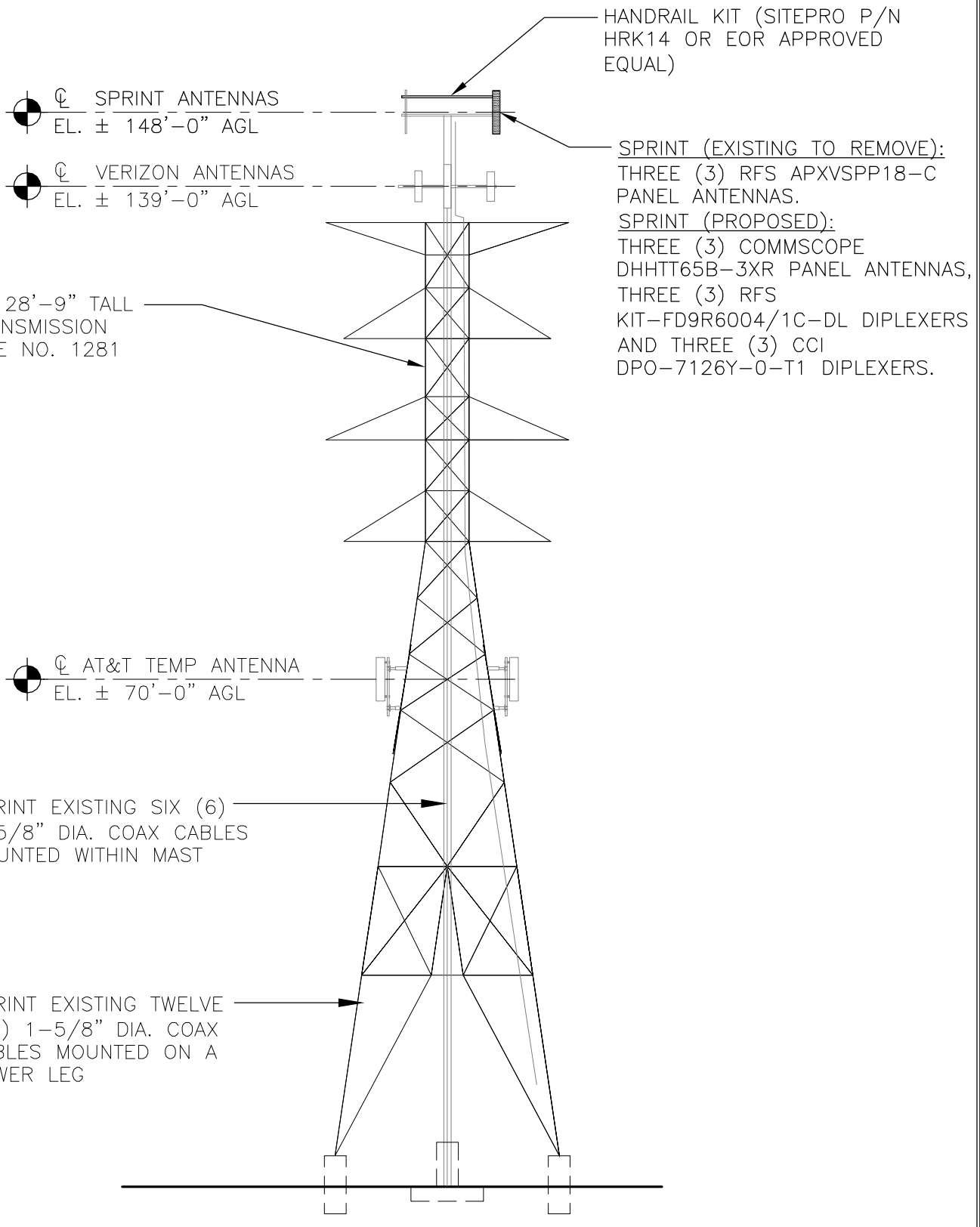
1740/1750: 1272 ACSR, sagged in PLS-CADD

NESC 250C

Linnet	876	5036	-1015
OPGW	681	5012	-2032
1740 Set 1	1333	4079	3425
1740 Set 2	95	4777	-4362
1740 Set 3	1811	4637	3263
1740 Set 4	163	4024	-3498
1750 Set 5	1835	3229	3049
1740 Set 6	124	4322	-3823
1750 Top Phase (Sets 11+12)	1463	7489	-3001
1750 Middle Phase (Sets 9+10)	1390	6685	-1521
1750 Bottom Phase (Sets 7+8)	969	7820	-3146







1
EL-1

TOWER + MAST ELEVATION

SCALE: NOT TO SCALE

REVISIONS		
00	12/5/18	ISSUED FOR REVIEW

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CT03XC338

SOUND SHORE DRIVE
GREENWICH, CT 06830

PROJECT NO:	17159.07
DRAWN BY:	TJL
CHECKED BY:	CAG
SCALE:	AS NOTED
DATE:	12/5/18

TOWER ELEVATION

EL-1

DWG. 1 OF 1

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Subject:	Loads on Equipmnet Structure 1281
Location:	Greenwich, CT
Rev. 0: 12/4/18	Prepared by: T.J.L. Checked by: C.A.G. Job No. 17159.07

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

Wind Speeds

Basic Wind Speed	$V := 93$	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 =	$h := 129$	ft	(User Input)
Height to Center of Antennas =	$z_{Sprint} := 148$	ft	(User Input)
Height to Center of Antennas =	$z_{VZ} := 139$	ft	(User Input)
Height to Center of Mast =	$z_{Mast5} := 135$	ft	(User Input)
Height to Center of Mast =	$z_{Mast4} := 105$	ft	(User Input)
Height to Center of Mast =	$z_{Mast3} := 75$	ft	(User Input)
Height to Center of Mast =	$z_{Mast2} := 45$	ft	(User Input)
Height to Center of Mast =	$z_{Mast1} := 15$	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)

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

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

$K_{iz} := \left(\frac{z_{Sprint}}{33}\right)^{0.1} = 1.162$

$t_{izSprint} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.179$

Velocity Pressure Coefficient Antennas =

$Kz_{Sprint} := 2.01\left(\left(\frac{z_{Sprint}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.375$

Velocity Pressure w/o Ice Antennas =

$qz_{Sprint} := 0.00256 \cdot K_d \cdot Kz_{Sprint} \cdot V^2 \cdot I_{Wind} = 29.749$

Velocity Pressure with Ice Antennas =

$qz_{ice.Sprint} := 0.00256 \cdot K_d \cdot Kz_{Sprint} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 7.477$

$K_{iz} := \left(\frac{z_{VZ}}{33}\right)^{0.1} = 1.155$

$t_{izVZ} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.165$

Velocity Pressure Coefficient Antennas =

$Kz_{VZ} := 2.01\left(\left(\frac{z_{VZ}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.356$

Velocity Pressure w/o Ice Antennas =

$qz_{VZ} := 0.00256 \cdot K_d \cdot Kz_{VZ} \cdot V^2 \cdot I_{Wind} = 29.359$

Velocity Pressure with Ice Antennas =

$qz_{ice.VZ} := 0.00256 \cdot K_d \cdot Kz_{VZ} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 7.379$

$K_{izMast5} := \left(\frac{z_{Mast5}}{33}\right)^{0.1} = 1.151$

$t_{izMast5} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast5} \cdot K_{zt}^{0.35} = 2.159$

Velocity Pressure Coefficient Mast =

$Kz_{Mast5} := 2.01\left(\left(\frac{z_{Mast5}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.348$

Velocity Pressure w/o Ice Mast=

$qz_{Mast5} := 0.00256 \cdot K_d \cdot Kz_{Mast5} \cdot V^2 \cdot I_{Wind} = 29.179$

Velocity Pressure with Ice Mast =

$qz_{ice.Mast5} := 0.00256 \cdot K_d \cdot Kz_{Mast5} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 7.334$

$K_{izMast4} := \left(\frac{z_{Mast4}}{33}\right)^{0.1} = 1.123$

$t_{izMast4} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast4} \cdot K_{zt}^{0.35} = 2.105$

Velocity Pressure Coefficient Mast =

$Kz_{Mast4} := 2.01\left(\left(\frac{z_{Mast4}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.279$

Velocity Pressure w/o Ice Mast=

$qz_{Mast4} := 0.00256 \cdot K_d \cdot Kz_{Mast4} \cdot V^2 \cdot I_{Wind} = 27.675$

Velocity Pressure with Ice Mast =

$qz_{ice.Mast4} := 0.00256 \cdot K_d \cdot Kz_{Mast4} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.956$

$K_{izMast3} := \left(\frac{z_{Mast3}}{33}\right)^{0.1} = 1.086$ $t_{izMast3} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast3} \cdot K_{zt}^{0.35} = 2.035$

Velocity Pressure Coefficient Mast = $Kz_{Mast3} := 2.01\left(\left(\frac{z_{Mast3}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.191$

Velocity Pressure w/o Ice Mast= $qz_{Mast3} := 0.00256 \cdot K_d \cdot Kz_{Mast3} \cdot V^2 \cdot I_{Wind} = 25.782$

Velocity Pressure with Ice Mast = $qz_{ice.Mast3} := 0.00256 \cdot K_d \cdot Kz_{Mast3} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.48$

$K_{izMast2} := \left(\frac{z_{Mast2}}{33}\right)^{0.1} = 1.032$ $t_{izMast2} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast2} \cdot K_{zt}^{0.35} = 1.934$

Velocity Pressure Coefficient Mast = $Kz_{Mast2} := 2.01\left(\left(\frac{z_{Mast2}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.07$

Velocity Pressure w/o Ice Mast= $qz_{Mast2} := 0.00256 \cdot K_d \cdot Kz_{Mast2} \cdot V^2 \cdot I_{Wind} = 23.154$

Velocity Pressure with Ice Mast = $qz_{ice.Mast2} := 0.00256 \cdot K_d \cdot Kz_{Mast2} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 5.82$

$K_{izMast1} := \left(\frac{z_{Mast1}}{33}\right)^{0.1} = 0.924$ $t_{izMast1} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast1} \cdot K_{zt}^{0.35} = 1.733$

Velocity Pressure Coefficient Mast = $Kz_{Mast1} := 2.01\left(\left(\frac{z_{Mast1}}{zg}\right)\right)^{\frac{2}{\alpha}} = 0.849$

Velocity Pressure w/o Ice Mast= $qz_{Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V^2 \cdot I_{Wind} = 18.373$

Velocity Pressure with Ice Mast = $qz_{ice.Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 4.618$

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Subject:	Loads on Equipmnet Structure 1281
Location:	Greenwich, CT
Rev. 0: 12/4/18	Prepared by: T.J.L. Checked by: C.A.G. Job No. 17159.07

Development of Wind & Ice Load on Mast

Mast Data: (12" Sch. 40 Pipe) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 12.75$ in (User Input)

Mast Length = $L_{mast} := 150$ ft (User Input)

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

Velocity Coefficient = $C := \sqrt{I \cdot Kz_{Mast1}} \cdot V \cdot \frac{D_{mast}}{12} = 91$

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

Wind Load (without ice)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.063$ sf/ft

Total Mast Wind Force =	$qz_{Mast5} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 25$	plf	BLC 5
Total Mast Wind Force =	$qz_{Mast4} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 24$	plf	BLC 5
Total Mast Wind Force =	$qz_{Mast3} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 22$	plf	BLC 5
Total Mast Wind Force =	$qz_{Mast2} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 20$	plf	BLC 5
Total Mast Wind Force =	$qz_{Mast1} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 16$	plf	BLC 5

Wind Load (with ice)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast5})}{12} = 1.422$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast5} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 8$ plf BLC 4

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast4})}{12} = 1.413$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast4} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 8$ plf BLC 4

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast3})}{12} = 1.402$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast3} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 7$ plf BLC 4

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast2})}{12} = 1.385$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast2} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 7$ plf BLC 4

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast1})}{12} = 1.351$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast1} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 5$ 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 =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast5}\cdot 2\right)^2 - D_{mast}^2\right] = 101.1$		sq in	
Weight of Ice on Mast =	$W_{ICEmast5} := Id\cdot\frac{Ai_{mast}}{144} = 39$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast4}\cdot 2\right)^2 - D_{mast}^2\right] = 98.2$		sq in	
Weight of Ice on Mast =	$W_{ICEmast4} := Id\cdot\frac{Ai_{mast}}{144} = 38$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast3}\cdot 2\right)^2 - D_{mast}^2\right] = 94.5$		sq in	
Weight of Ice on Mast =	$W_{ICEmast3} := Id\cdot\frac{Ai_{mast}}{144} = 37$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast2}\cdot 2\right)^2 - D_{mast}^2\right] = 89.2$		sq in	
Weight of Ice on Mast =	$W_{ICEmast2} := Id\cdot\frac{Ai_{mast}}{144} = 35$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast1}\cdot 2\right)^2 - D_{mast}^2\right] = 78.8$		sq in	
Weight of Ice on Mast =	$W_{ICEmast1} := Id\cdot\frac{Ai_{mast}}{144} = 31$		plf	**BLC 3**

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 =	$F_{ant} := qz_{Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 975$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izSprint}) \cdot (W_{ant} + 2 \cdot t_{izSprint})}{144} = 8.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 25.9$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 355$	lbs	**BLC 4**

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 =	$V_{ice} := (L_{ant} + 2 \cdot t_{izSprint})(W_{ant} + 2 \cdot t_{izSprint}) \cdot (T_{ant} + 2 \cdot t_{izSprint}) - V_{ant} = 8149$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 264$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 792$	lbs	**BLC 3**

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Location:	Greenwich, CT
Rev. 0: 12/4/18	Prepared by: T.J.L. Checked by: C.A.G. Job No. 17159.07

Development of Wind & Ice Load on Antennas

Antenna Data: (Sprint)

Antenna Model = RFS KIT-F D9R6004/1C-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 = $F_{ant} := qz_{Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 38$ lbs **BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot t_{izSprint}\right) \cdot \left(W_{ant} + 2 \cdot t_{izSprint}\right)}{144} = 0.8$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.3$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qz_{ice.Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 28$ lbs **BLC 4**

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 = $V_{ice} := \left(L_{ant} + 2 \cdot t_{izSprint}\right)\left(W_{ant} + 2 \cdot t_{izSprint}\right) \cdot \left(T_{ant} + 2 \cdot t_{izSprint}\right) - V_{ant} = 814$

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 26$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 79$ lbs **BLC 3**

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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 =	$L_{ant} := 7.94$	in	(User Input)
Antenna Width =	$W_{ant} := 5.94$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.07$	in	(User Input)
Antenna Weight =	$WT_{ant} := 8$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.3$		
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 =	$A_{ant} := SA_{ant} \cdot N_{ant} = 1$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 47$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izSprint}) \cdot (W_{ant} + 2 \cdot t_{izSprint})}{144} = 0.9$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.6$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Sprint} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 32$	lbs	**BLC 4**

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 =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 192$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izSprint})(W_{ant} + 2 \cdot t_{izSprint}) \cdot (T_{ant} + 2 \cdot t_{izSprint}) - V_{ant} = 875$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 28$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 85$	lbs	**BLC 3**

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Development of Wind & Ice Load on Antenna Mounts

Mount Data: (Sprint)

Mount Type: FWT 14' Low Profile Platform w/ Handrail

Mount Shape =	Flat		(User Input)
Mount Projected Surface Area =	$CaAa := 22$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CaAa_{ice} := 26$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 3200$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 4500$	lbs	

Wind Load (without ice)

Total Mount Wind Force = $F_{mnt} := qz_{Sprint} \cdot G_H \cdot CaAa = 884$ lbs **BLC 5**

Wind Load (with ice)

Total Mount Wind Force = $Fi_{mnt} := qz_{ice.Sprint} \cdot G_H \cdot CaAa_{ice} = 262$ lbs **BLC 4**

Gravity Loads (without ice)

Weight of All Mounts = $WT_{mnt} = 3200$ lbs **BLC 2**

Gravity Loads (ice only)

Weight of Ice on All Mounts = $WT_{mnt.ice} - WT_{mnt} = 1300$ lbs **BLC 3**

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Development of Wind & Ice Load on Antennas

Antenna Data: (Verizon)

Antenna Model =	Andrew HBXX-6516DS		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 50.9$	in	(User Input)
Antenna Width =	$W_{ant} := 12$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 31$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.2$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.7$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 644$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izVZ}) \cdot (W_{ant} + 2 \cdot t_{izVZ})}{144} = 6.3$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 18.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 239$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 93$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3970$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izVZ})(W_{ant} + 2 \cdot t_{izVZ}) \cdot (T_{ant} + 2 \cdot t_{izVZ}) - V_{ant} = 5797$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 188$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 564$	lbs	**BLC 3**

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Development of Wind & Ice Load on Antennas

Antenna Data: (Verizon)

Antenna Model =	Andrew SBNHH-1D65B		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)
Antenna Weight =	$WT_{ant} := 41$	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 =	$F_{ant} := qz_{VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 961$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izVZ}) \cdot (W_{ant} + 2 \cdot t_{izVZ})}{144} = 8.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 25.8$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 349$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 123$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6083$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izVZ})(W_{ant} + 2 \cdot t_{izVZ}) \cdot (T_{ant} + 2 \cdot t_{izVZ}) - V_{ant} = 8076$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 262$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 785$	lbs	**BLC 3**

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Development of Wind & Ice Load on Antennas

Antenna Data: (Verizon)

Antenna Model =	Decibel DB854DG65ESX			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 48.5$	in	(User Input)	
Antenna Width =	$W_{ant} := 12.5$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 6$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 18.5$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 2$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 3.9$			
Antenna Force Coefficient =	$Ca_{ant} = 1.26$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 8.4$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 421$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izVZ}) \cdot (W_{ant} + 2 \cdot t_{izVZ})}{144} = 6.2$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 12.3$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 155$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 37$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3638$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izVZ})(W_{ant} + 2 \cdot t_{izVZ}) \cdot (T_{ant} + 2 \cdot t_{izVZ}) - V_{ant} = 5547$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 180$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 360$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data: (Verizon)

Antenna Model =	Antel BXA-70063-6CF			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 71$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.2$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 5.2$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 17$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 1$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.3$			
Antenna Force Coefficient =	$Ca_{ant} = 1.37$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.5$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 5.5$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 300$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izVZ}) \cdot (W_{ant} + 2 \cdot t_{izVZ})}{144} = 8.1$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 8.1$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 111$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 17$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 4135$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izVZ})(W_{ant} + 2 \cdot t_{izVZ}) \cdot (T_{ant} + 2 \cdot t_{izVZ}) - V_{ant} = 7014$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 227$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 227$	lbs	**BLC 3**

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Development of Wind & Ice Load on Antennas

Antenna Data: (Verizon)

Antenna Model =	RFS FDAP50002/2C-3L Diplexer			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 6.5$	in	(User Input)	
Antenna Width =	$W_{ant} := 8.3$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 3.3$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 7$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 6$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 0.8$			
Antenna Force Coefficient =	$Ca_{ant} = 1.2$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.4$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 2.2$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 107$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izVZ}) \cdot (W_{ant} + 2 \cdot t_{izVZ})}{144} = 0.9$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 5.7$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 68$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 42$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 178$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izVZ})(W_{ant} + 2 \cdot t_{izVZ}) \cdot (T_{ant} + 2 \cdot t_{izVZ}) - V_{ant} = 866$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 28$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 168$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data: (Verizon)

Antenna Model =	RFSATSBT-TOP-FM-4G Bias Tee		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 5.63$	in	(User Input)
Antenna Width =	$W_{ant} := 3.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 2$	in	(User Input)
Antenna Weight =	$WT_{ant} := 2$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.5$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.4$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 21$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{izVZ}) \cdot (W_{ant} + 2 \cdot t_{izVZ})}{144} = 0.6$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.7$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.VZ} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 20$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 6$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 42$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{izVZ})(W_{ant} + 2 \cdot t_{izVZ}) \cdot (T_{ant} + 2 \cdot t_{izVZ}) - V_{ant} = 465$		
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 15$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 45$	lbs	**BLC 3**

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Rev. 0: 12/4/18	Prepared by: T.J.L. Checked by: C.A.G. Job No. 17159.07

Development of Wind & Ice Load on Antenna Mounts

Mount Data: (Verizon)

Mount Type: T-Arm Colocation Mount

Mount Shape =	Flat		(User Input)	
Mount Projected Surface Area =	$Aa := 10.65$	sf	(User Input)	
Mount Projected Surface Area w/ Ice =	$Aa_{ice} := 13.7$	sf	(User Input)	$Cd_F := 2$
Mount Weight =	$WT_{mnt} := 750$	lbs	(User Input)	
Mount Weight w/ Ice =	$WT_{mnt.ice} := 950$	lbs		

Wind Load (without ice)

Total Mount Wind Force = $F_{mnt} := qz_{VZ} \cdot G_H \cdot Aa \cdot Cd_F = 844$ lbs **BLC 5**

Wind Load (with ice)

Total Mount Wind Force = $Fi_{mnt} := qz_{ice.VZ} \cdot G_H \cdot Aa_{ice} \cdot Cd_F = 273$ lbs **BLC 4**

Gravity Loads (without ice)

Weight of All Mounts = $WT_{mnt} = 750$ lbs **BLC 2**

Gravity Loads (ice only)

Weight of Ice on All Mounts = $WT_{mnt.ice} - WT_{mnt} = 200$ lbs **BLC 3**

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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 =	$L_{coax} := 139$	ft	(User Input)	
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)	
Total Number of Coax =	$N_{coax} := 24$		(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, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 842.4$

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

Wind Load (without ice)

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

Total Coax Wind Force =	$F_{coax} := Ca_{coax} \cdot qz_{Mast5} \cdot G_H \cdot A_{coax} = 31$ plf		BLC 5,7
Total Coax Wind Force =	$F_{coax} := Ca_{coax} \cdot qz_{Mast4} \cdot G_H \cdot A_{coax} = 30$ plf		BLC 5,7
Total Coax Wind Force =	$F_{coax} := Ca_{coax} \cdot qz_{Mast3} \cdot G_H \cdot A_{coax} = 28$ plf		BLC 5,7
Total Coax Wind Force =	$F_{coax} := Ca_{coax} \cdot qz_{Mast2} \cdot G_H \cdot A_{coax} = 25$ plf		BLC 5,7
Total Coax Wind Force =	$F_{coax} := Ca_{coax} \cdot qz_{Mast1} \cdot G_H \cdot A_{coax} = 20$ plf		BLC 5,7

Wind Load (with ice)

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} D_{coax} + 2 \cdot t_{izMast5})}{12}$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast5} \cdot G_H \cdot AICE_{coax} = 12$ plf BLC 4,6

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} D_{coax} + 2 \cdot t_{izMast4})}{12}$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast4} \cdot G_H \cdot AICE_{coax} = 11$ plf BLC 4,6

Coax projected surface area w/ Ice = $AICE_{coax} := \frac{(NP_{coax} D_{coax} + 2 \cdot t_{izMast3})}{12}$ sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast3} \cdot G_H \cdot AICE_{coax} = 10$ plf BLC 4,6

Coax projected surface area w/ Ice =	$AICE_{coax} := \frac{\left(NP_{coax} D_{coax} + 2 \cdot t_{izMast2}\right)}{12}$	sf/ft	
Total Coax Wind Force w/ Ice =	$Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast2} \cdot G_H \cdot AICE_{coax} = 9$	plf	**BLC 4,6**
Coax projected surface area w/ Ice =	$AICE_{coax} := \frac{\left(NP_{coax} D_{coax} + 2 \cdot t_{izMast1}\right)}{12}$	sf/ft	
Total Coax Wind Force w/ Ice =	$Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast1} \cdot G_H \cdot AICE_{coax} = 7$	plf	**BLC 4,6**
Gravity Loads (without ice)			
Weight of all cables w/o ice	$WT_{coax} := Wt_{coax} \cdot N_{coax} = 25$	plf	**BLC 2**
Gravity Loads (ice only)			
Ice Area per Linear Foot =	$Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot t_{izMast5}\right)^2 - D_{coax}^2\right] = 28.1$	sq in	
Ice Weight All Coax per foot =	$WTi_{coax} := Ne_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 196$	plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot t_{izMast4}\right)^2 - D_{coax}^2\right] = 27$	sq in	
Ice Weight All Coax per foot =	$WTi_{coax} := Ne_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 189$	plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot t_{izMast3}\right)^2 - D_{coax}^2\right] = 25.7$	sq in	
Ice Weight All Coax per foot =	$WTi_{coax} := Ne_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 180$	plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot t_{izMast2}\right)^2 - D_{coax}^2\right] = 23.8$	sq in	
Ice Weight All Coax per foot =	$WTi_{coax} := Ne_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 166$	plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{coax} := \frac{\pi}{4}\left[\left(D_{coax} + 2 \cdot t_{izMast1}\right)^2 - D_{coax}^2\right] = 20.2$	sq in	
Ice Weight All Coax per foot =	$WTi_{coax} := Ne_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 141$	plf	**BLC 3**

Development of Wind & Ice Load on Brace Member

Member Data: L2x2x3/16

Antenna Shape =	Flat		(User Input)		
Height =	$H_{mem} := 2$	in	(User Input)		
Width =	$W_{mem} := 2$	in	(User Input)		
Thickness =	$t_{mem} := 0.1875$	in	(User Input)		
Length =	$L_{mem} := 18$	in	(User Input)		
Member Aspect Ratio =	$Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 9.0$				
Member Force Coefficient =	$Ca_{mem} = 1.47$				

Wind Load (without ice)

Member Projected Surface Area =	$A_{mem} := \frac{H_{mem}}{12} = 0.2$	sf/ft		
Total Member Wind Force =	$F_{mem} := qz_{Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 10$	plf	BLC 5,7	

Wind Load (with ice)

Member Projected Surface Area w/ Ice =	$A_{ICEmem} := \frac{\left(H_{mem} + 2 \cdot t_{izMast5}\right)}{12} = 0.5$	sf/ft		
Total Member Wind Force w/ Ice =	$Fi_{mem} := qz_{ice.Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 8$	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 =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot t_{izMast5}\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot t_{izMast5}\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 36 \quad \text{sq in}$$

Weight of Ice on Member =	$W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 14$	plf	BLC 3	

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Location: Greenwich, CT

Rev. 0: 12/4/18

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Job No. 17159.07

Development of Wind & Ice Load on Brace Member

Member Data: L2.5x2.5x3/16

Antenna Shape = Flat (User Input)

Height = $H_{mem} := 2.5$ in (User Input)

Width = $W_{mem} := 2.5$ in (User Input)

Thickness = $t_{mem} := 0.1875$ in (User Input)

Length = $L_{mem} := 40$ in (User Input)

Member Aspect Ratio = $Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 16.0$

Member Force Coefficient = $Ca_{mem} = 1.7$

Wind Load (without ice)

Member Projected Surface Area = $A_{mem} := \frac{H_{mem}}{12} = 0.2$ sf/ft

Total Member Wind Force = $F_{mem} := qz_{Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 14$ plf **BLC 5,7**

Wind Load (with ice)

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{\left(H_{mem} + 2 \cdot t_{izMast5}\right)}{12} = 0.6$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := qz_{ice.Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 10$ 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 =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot t_{izMast5}\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot t_{izMast5}\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 40 \text{ sq in}$$

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 16$ plf **BLC 3**

Development of Wind & Ice Load on Brace Member

Member Data: L3x3x3/16

Antenna Shape =	Flat		(User Input)	
Height =	$H_{mem} := 3$	in	(User Input)	
Width =	$W_{mem} := 3$	in	(User Input)	
Thickness =	$t_{mem} := 0.1875$	in	(User Input)	
Length =	$L_{mem} := 96$	in	(User Input)	
Member Aspect Ratio =	$Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 32.0$			
Member Force Coefficient =	$Ca_{mem} = 2$			

Wind Load (without ice)

Member Projected Surface Area =	$A_{mem} := \frac{H_{mem}}{12} = 0.3$	sf/ft	
Total Member Wind Force =	$F_{mem} := qz_{Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 20$	plf	**BLC 5,7**

Wind Load (with ice)

Member Projected Surface Area w/ Ice =	$A_{ICEmem} := \frac{\left(H_{mem} + 2 \cdot t_{izMast5}\right)}{12} = 0.6$	sf/ft	
Total Member Wind Force w/ Ice =	$Fi_{mem} := qz_{ice.Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 12$	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 =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot t_{izMast5}\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot t_{izMast5}\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 44 \quad \text{sq in}$$

Weight of Ice on Member =	$W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 17$	plf	**BLC 3**

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Development of Wind & Ice Load on Brace Member

Member Data: L3.5x3.5x1/4

Antenna Shape = Flat (User Input)

Height = $H_{mem} := 3.5$ in (User Input)

Width = $W_{mem} := 3.5$ in (User Input)

Thickness = $t_{mem} := 0.25$ in (User Input)

Length = $L_{mem} := 133$ in (User Input)

Member Aspect Ratio = $Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 38.0$

Member Force Coefficient = $Ca_{mem} = 2$

Wind Load (without ice)

Member Projected Surface Area = $A_{mem} := \frac{H_{mem}}{12} = 0.3$ sf/ft

Total Member Wind Force = $F_{mem} := qz_{Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 23$ plf **BLC 5,7**

Wind Load (with ice)

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{\left(H_{mem} + 2 \cdot t_{izMast5}\right)}{12} = 0.7$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := qz_{ice.Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 13$ 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 =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot t_{izMast5}\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot t_{izMast5}\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 49 \text{ sq in}$$

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 19$ plf **BLC 3**

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Development of Wind & Ice Load on Brace Member

Member Data: L4x4x1/4

Antenna Shape =	Flat		(User Input)	
Height =	$H_{mem} := 4$	in	(User Input)	
Width =	$W_{mem} := 4$	in	(User Input)	
Thickness =	$t_{mem} := 0.25$	in	(User Input)	
Length =	$L_{mem} := 159$	in	(User Input)	
Member Aspect Ratio =	$Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 39.8$			
Member Force Coefficient =	$Ca_{mem} = 2$			

Wind Load (without ice)

Member Projected Surface Area =	$A_{mem} := \frac{H_{mem}}{12} = 0.3$	sf/ft	
Total Member Wind Force =	$F_{mem} := qz_{Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 26$	plf	**BLC 5,7**

Wind Load (with ice)

Member Projected Surface Area w/ Ice =	$A_{ICEmem} := \frac{\left(H_{mem} + 2 \cdot t_{izMast5}\right)}{12} = 0.7$	sf/ft	
Total Member Wind Force w/ Ice =	$Fi_{mem} := qz_{ice.Mast5} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 14$	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 =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot t_{izMast5}\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot t_{izMast5}\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 53 \quad \text{sq in}$$

Weight of Ice on Member =	$W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 21$	plf	**BLC 3**

(Global) Model Settings

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

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

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

(Global) Model Settings, Continued

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

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Powermount	12" FWT Powermount	Column	Pipe	A500 Gr.42	Typical	14.579	279.335	279.335	558.67
2	Brace 1	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
3	Brace 2	L2.5x2.5x3	Beam	Single Angle	A36 Gr.36	Typical	.901	.535	.535	.011
4	Brace 3	L3X3X3	Beam	Single Angle	A36 Gr.36	Typical	1.09	.948	.948	.014
5	Brace 4	L3.5X3.5X4	Beam	Single Angle	A36 Gr.36	Typical	1.7	2	2	.039
6	Brace 5	L4X4X4	Beam	Single Angle	A36 Gr.36	Typical	1.93	3	3	.044
7	6"x3/4" Plate	6"X3/4" PL	Beam	Single Angle	A36 Gr.36	Typical	4.5	.211	13.5	.777
8	L2.5x2.5x1/4	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026

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	Powermount	148	Segment	Segment	Lbyy						Lateral
2	M2	Brace 4	10.25			Lbyy						Lateral
3	M3	Brace 5	13.25			Lbyy						Lateral
4	M4	Brace 3	8.083			Lbyy						Lateral
5	M5	Brace 4	11.083			Lbyy						Lateral
6	M6	Brace 5	11.845			Lbyy						Lateral
7	M7	Brace 5	11.845			Lbyy						Lateral
8	M8	Brace 4	9.7			Lbyy						Lateral
9	M9	Brace 4	9.7			Lbyy						Lateral
10	M10	Brace 2	3.354			Lbyy						Lateral
11	M11	Brace 2	3.354			Lbyy						Lateral
12	M12	Brace 1	1.5			Lbyy						Lateral
13	M13	Brace 2	3.354			Lbyy						Lateral
14	M14	Brace 2	3.354			Lbyy						Lateral
15	M15	Brace 1	1.5			Lbyy						Lateral
16	M16	Brace 2	3.354			Lbyy						Lateral
17	M17	Brace 2	3.354			Lbyy						Lateral
18	M18	Brace 1	1.5			Lbyy						Lateral
19	M19	6"x3/4" Plate	1.5			Lbyy						Lateral
20	M20	L2.5x2.5x1/4	3.354			Lbyy						Lateral
21	M21	L2.5x2.5x1/4	3.354			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	N8			Powermount	Column	Pipe	A500 Gr....	Typical
2	M2	N9	N2			Brace 4	Beam	Single Angle	A36 Gr.36	Typical
3	M3	N2	N10			Brace 5	Beam	Single Angle	A36 Gr.36	Typical
4	M4	N13	N3			Brace 3	Beam	Single Angle	A36 Gr.36	Typical
5	M5	N3	N14			Brace 4	Beam	Single Angle	A36 Gr.36	Typical
6	M6	N11	N2			Brace 5	Beam	Single Angle	A36 Gr.36	Typical
7	M7	N2	N12			Brace 5	Beam	Single Angle	A36 Gr.36	Typical
8	M8	N15	N3			Brace 4	Beam	Single Angle	A36 Gr.36	Typical
9	M9	N3	N16			Brace 4	Beam	Single Angle	A36 Gr.36	Typical
10	M10	N18	N4			Brace 2	Beam	Single Angle	A36 Gr.36	Typical
11	M11	N4	N19			Brace 2	Beam	Single Angle	A36 Gr.36	Typical
12	M12	N4	N17			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
13	M13	N21	N5			Brace 2	Beam	Single Angle	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
14	M14	N5	N22			Brace 2	Beam	Single Angle	A36 Gr.36	Typical
15	M15	N5	N20			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
16	M16	N24	N6			Brace 2	Beam	Single Angle	A36 Gr.36	Typical
17	M17	N6	N25			Brace 2	Beam	Single Angle	A36 Gr.36	Typical
18	M18	N6	N23			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
19	M19	N26	N7			6"x3/4" Plate	Beam	Single Angle	A36 Gr.36	Typical
20	M20	N27	N7			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
21	M21	N28	N7			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	N1	0	0	0	0	
2	N2	0	29.25	0	0	
3	N3	0	44.25	0	0	
4	N4	0	89	0	0	
5	N5	0	103	0	0	
6	N6	0	117	0	0	
7	N7	0	133	0	0	
8	N8	0	148	0	0	
9	N9	0	29.25	10.25	0	
10	N10	0	29.25	-13.25	0	
11	N11	-11.75	29.25	-1.5	0	
12	N12	11.75	29.25	-1.5	0	
13	N13	0	44.25	8.083	0	
14	N14	0	44.25	-11.083	0	
15	N15	-9.583	44.25	-1.5	0	
16	N16	9.583	44.25	-1.5	0	
17	N17	0	89	-1.5	0	
18	N18	-3	89	1.5	0	
19	N19	3	89	1.5	0	
20	N20	0	103	-1.5	0	
21	N21	-3	103	1.5	0	
22	N22	3	103	1.5	0	
23	N23	0	117	-1.5	0	
24	N24	-3	117	1.5	0	
25	N25	3	117	1.5	0	
26	N26	0	133	-1.5	0	
27	N27	-3	133	1.5	0	
28	N28	3	133	1.5	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N2						
3	N3						
4	N4						
5	N5						
6	N6						
7	N7						

Joint Boundary Conditions (Continued)

	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]
8	N8						
9	N9	Reaction	Reaction	Reaction			
10	N10	Reaction	Reaction	Reaction			
11	N11	Reaction	Reaction	Reaction			
12	N12	Reaction	Reaction	Reaction			
13	N13	Reaction	Reaction	Reaction			
14	N14	Reaction	Reaction	Reaction			
15	N15	Reaction	Reaction	Reaction			
16	N16	Reaction	Reaction	Reaction			
17	N17	Reaction	Reaction	Reaction			
18	N18	Reaction	Reaction	Reaction			
19	N19	Reaction	Reaction	Reaction			
20	N20	Reaction	Reaction	Reaction			
21	N21	Reaction	Reaction	Reaction			
22	N23	Reaction	Reaction	Reaction			
23	N24	Reaction	Reaction	Reaction			
24	N22	Reaction	Reaction	Reaction			
25	N25	Reaction	Reaction	Reaction			
26	N28	Reaction	Reaction	Reaction			
27	N26	Reaction	Reaction	Reaction			
28	N27	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.138	148
2	M1	Y	-.021	148
3	M1	Y	-.024	148
4	M1	Y	-3.2	148
5	M1	Y	-.093	139
6	M1	Y	-.123	139
7	M1	Y	-.037	139
8	M1	Y	-.017	139
9	M1	Y	-.042	139
10	M1	Y	-.006	139
11	M1	Y	-.75	139

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.792	148
2	M1	Y	-.079	148
3	M1	Y	-.085	148
4	M1	Y	-1.3	148
5	M1	Y	-.564	139
6	M1	Y	-.785	139
7	M1	Y	-.36	139
8	M1	Y	-.227	139
9	M1	Y	-.168	139
10	M1	Y	-.045	139
11	M1	Y	-.2	139

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.355	148
2	M1	X	.028	148
3	M1	X	.032	148
4	M1	X	.262	148
5	M1	X	.239	139
6	M1	X	.349	139
7	M1	X	.155	139
8	M1	X	.111	139
9	M1	X	.068	139
10	M1	X	.02	139
11	M1	X	.273	139

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.975	148
2	M1	X	.038	148
3	M1	X	.047	148
4	M1	X	.884	148
5	M1	X	.644	139
6	M1	X	.961	139
7	M1	X	.421	139
8	M1	X	.3	139
9	M1	X	.107	139
10	M1	X	.021	139
11	M1	X	.844	139

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.355	148
2	M1	Z	.028	148
3	M1	Z	.032	148
4	M1	Z	.262	148
5	M1	Z	.239	139
6	M1	Z	.349	139
7	M1	Z	.155	139
8	M1	Z	.111	139
9	M1	Z	.068	139
10	M1	Z	.02	139
11	M1	Z	.273	139

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.975	148
2	M1	Z	.038	148
3	M1	Z	.047	148
4	M1	Z	.884	148
5	M1	Z	.644	139
6	M1	Z	.961	139
7	M1	Z	.421	139
8	M1	Z	.3	139

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
9	M1	Z	.107	139
10	M1	Z	.021	139
11	M1	Z	.844	139

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.025	-.025	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.039	-.039	120	0
2	M1	Y	-.038	-.038	90	120
3	M1	Y	-.037	-.037	60	90
4	M1	Y	-.035	-.035	30	60
5	M1	Y	-.031	-.031	0	30
6	M1	Y	-.196	-.196	120	0
7	M1	Y	-.189	-.189	90	120
8	M1	Y	-.18	-.18	60	90
9	M1	Y	-.166	-.166	30	60
10	M1	Y	-.141	-.141	0	30
11	M18	Y	-.014	-.014	0	0
12	M15	Y	-.014	-.014	0	0
13	M12	Y	-.014	-.014	0	0
14	M16	Y	-.016	-.016	0	0
15	M17	Y	-.016	-.016	0	0
16	M13	Y	-.016	-.016	0	0
17	M14	Y	-.016	-.016	0	0
18	M10	Y	-.016	-.016	0	0
19	M11	Y	-.016	-.016	0	0
20	M4	Y	-.017	-.017	0	0
21	M2	Y	-.019	-.019	0	0
22	M9	Y	-.019	-.019	0	0
23	M5	Y	-.019	-.019	0	0
24	M8	Y	-.019	-.019	0	0
25	M6	Y	-.021	-.021	0	0
26	M3	Y	-.021	-.021	0	0
27	M7	Y	-.021	-.021	0	0
28	M20	Y	-.016	-.016	0	0
29	M21	Y	-.016	-.016	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.008	.008	120	0
2	M1	X	.008	.008	90	120
3	M1	X	.007	.007	60	90
4	M1	X	.007	.007	30	60
5	M1	X	.005	.005	0	30
6	M1	X	.012	.012	120	0
7	M1	X	.011	.011	90	120

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
8	M1	X	.01	.01	60	90
9	M1	X	.009	.009	30	60
10	M1	X	.007	.007	0	30
11	M18	X	.008	.008	0	0
12	M15	X	.008	.008	0	0
13	M12	X	.008	.008	0	0
14	M16	X	.01	.01	0	0
15	M17	X	.01	.01	0	0
16	M13	X	.01	.01	0	0
17	M14	X	.01	.01	0	0
18	M10	X	.01	.01	0	0
19	M11	X	.01	.01	0	0
20	M4	X	.012	.012	0	0
21	M2	X	.013	.013	0	0
22	M5	X	.013	.013	0	0
23	M3	X	.014	.014	0	0
24	M20	X	.01	.01	0	0
25	M21	X	.01	.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.025	.025	120	0
2	M1	X	.024	.024	90	120
3	M1	X	.022	.022	60	90
4	M1	X	.02	.02	30	60
5	M1	X	.016	.016	0	30
6	M1	X	.031	.031	120	0
7	M1	X	.03	.03	90	120
8	M1	X	.028	.028	60	90
9	M1	X	.025	.025	30	60
10	M1	X	.02	.02	0	30
11	M18	X	.01	.01	0	0
12	M15	X	.01	.01	0	0
13	M12	X	.01	.01	0	0
14	M16	X	.014	.014	0	0
15	M17	X	.014	.014	0	0
16	M13	X	.014	.014	0	0
17	M14	X	.014	.014	0	0
18	M10	X	.014	.014	0	0
19	M11	X	.014	.014	0	0
20	M4	X	.02	.02	0	0
21	M2	X	.023	.023	0	0
22	M5	X	.023	.023	0	0
23	M3	X	.026	.026	0	0
24	M20	X	.014	.014	0	0
25	M21	X	.014	.014	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.008	.008	120	0
2	M1	Z	.008	.008	90	120

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
3	M1	Z	.007	.007	60	90
4	M1	Z	.007	.007	30	60
5	M1	Z	.005	.005	0	30
6	M1	Z	.012	.012	120	0
7	M1	Z	.011	.011	90	120
8	M1	Z	.01	.01	60	90
9	M1	Z	.009	.009	30	60
10	M1	Z	.007	.007	0	30
11	M16	Z	.01	.01	0	0
12	M17	Z	.01	.01	0	0
13	M13	Z	.01	.01	0	0
14	M14	Z	.01	.01	0	0
15	M10	Z	.01	.01	0	0
16	M11	Z	.01	.01	0	0
17	M8	Z	.013	.013	0	0
18	M9	Z	.013	.013	0	0
19	M6	Z	.014	.014	0	0
20	M7	Z	.014	.014	0	0
21	M20	Z	.01	.01	0	0
22	M21	Z	.01	.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.025	.025	120	0
2	M1	Z	.024	.024	90	120
3	M1	Z	.022	.022	60	90
4	M1	Z	.02	.02	30	60
5	M1	Z	.016	.016	0	30
6	M1	Z	.031	.031	120	0
7	M1	Z	.03	.03	90	120
8	M1	Z	.028	.028	60	90
9	M1	Z	.025	.025	30	60
10	M1	Z	.02	.02	0	30
11	M16	Z	.014	.014	0	0
12	M17	Z	.014	.014	0	0
13	M13	Z	.014	.014	0	0
14	M14	Z	.014	.014	0	0
15	M10	Z	.014	.014	0	0
16	M11	Z	.014	.014	0	0
17	M8	Z	.023	.023	0	0
18	M9	Z	.023	.023	0	0
19	M6	Z	.026	.026	0	0
20	M7	Z	.026	.026	0	0
21	M20	Z	.014	.014	0	0
22	M21	Z	.014	.014	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribu...	Area(M...	Surface...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					11	1		
3	Weight of Ice Only	None					11	29		
4	(x) TIA Wind with Ice	None					11	25		
5	(x) TIA Wind	None					11	25		
6	(z) TIA Wind with Ice	None					11	22		
7	(z) TIA Wind	None					11	22		

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...	BLC	Fac...
1	1.2D + 1.6W (X-direction)	Yes	Y		1	1.2	2	1.2	5	1.6																
2	0.9D + 1.6W (X-direction)	Yes	Y		1	.9	2	.9	5	1.6																
3	1.2D + 1.0Di + 1.0Wi (X-...	Yes	Y		1	1.2	2	1.2	3	1	4	1														
4	1.2D + 1.6W (Z-direction)	Yes	Y		1	1.2	2	1.2	7	1.6																
5	0.9D + 1.6W (Z-direction)	Yes	Y		1	.9	2	.9	7	1.6																
6	1.2D + 1.0Di + 1.0Wi (Z-d...	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	N1	max	0	6	55.755	3	0	2	0	2	0	6	5.599	1
2		min	-.994	2	14.192	5	-.994	5	-5.592	4	0	1	0	4
3	N9	max	0	6	.133	3	0	3	0	6	0	6	0	6
4		min	-.189	1	.027	5	-.563	5	0	1	0	1	0	1
5	N10	max	0	6	.191	6	0	3	0	6	0	6	0	6
6		min	-.276	1	.039	2	-.494	5	0	1	0	1	0	1
7	N11	max	-.019	6	.171	3	-.018	3	0	6	0	6	0	6
8		min	-.522	2	.035	5	-.255	5	0	1	0	1	0	1
9	N12	max	.069	5	.171	6	.067	2	0	6	0	6	0	6
10		min	-.522	2	.035	2	-.255	5	0	1	0	1	0	1
11	N13	max	0	6	.087	3	0	3	0	6	0	6	0	6
12		min	-.129	1	.013	5	-1.464	4	0	1	0	1	0	1
13	N14	max	0	6	.144	6	0	3	0	6	0	6	0	6
14		min	-.204	1	.029	2	-1.665	4	0	1	0	1	0	1
15	N15	max	-.068	6	.126	3	-.059	3	0	6	0	6	0	6
16		min	-1.6	1	.025	5	-.25	1	0	1	0	1	0	1
17	N16	max	.291	4	.126	6	.25	1	0	6	0	6	0	6
18		min	-1.6	1	.025	2	-.224	4	0	1	0	1	0	1
19	N17	max	0	6	.017	6	0	2	0	6	0	6	0	6
20		min	-.012	1	.002	2	-2.366	5	0	1	0	1	0	1
21	N18	max	.528	5	.034	3	.73	2	0	6	0	6	0	6
22		min	-1.498	2	.004	5	-.302	5	0	1	0	1	0	1
23	N19	max	-.115	6	.033	6	-.074	6	0	6	0	6	0	6
24		min	-1.498	2	.003	2	-.73	2	0	1	0	1	0	1
25	N20	max	0	6	.017	6	0	1	0	6	0	6	0	6
26		min	-.012	1	.002	2	-2.204	4	0	1	0	1	0	1
27	N21	max	.492	4	.034	3	.661	1	0	6	0	6	0	6
28		min	-1.359	1	.004	5	-.284	4	0	1	0	1	0	1
29	N23	max	0	6	.013	3	6.075	4	0	6	0	6	0	6
30		min	-.012	1	-.017	4	0	3	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
31	N24	max	3.633	1	.034	6	.641	4	0	6	0	6	0	6
32		min	-1.356	4	0	2	-1.836	1	0	1	0	1	0	1
33	N22	max	-.116	6	.033	6	-.075	6	0	6	0	6	0	6
34		min	-1.359	1	.003	2	-.661	1	0	1	0	1	0	1
35	N25	max	3.634	1	.037	3	1.835	1	0	6	0	6	0	6
36		min	.306	6	.006	5	.136	6	0	1	0	1	0	1
37	N28	max	-.179	6	.034	6	-.106	6	0	6	0	6	0	6
38		min	-8.763	1	-.006	1	-4.365	1	0	1	0	1	0	1
39	N26	max	0	2	.07	4	.003	1	0	6	0	6	0	6
40		min	0	4	.01	2	-16.692	4	0	1	0	1	0	1
41	N27	max	.79	4	.044	3	4.362	1	0	6	0	6	0	6
42		min	-8.765	1	.005	5	-.432	4	0	1	0	1	0	1
43	Totals:	max	0	6	57.223	6	0	3						
44		min	-22.044	1	14.512	2	-22.076	4						

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	0	6	0	6	0	6	0	6	0	6
2		min	0	1	0	1	0	1	0	1	0	1	0	1
3	N2	max	.002	2	-.014	5	.002	5	0	3	0	6	4.758e-04	1
4		min	0	4	-.054	3	0	1	-4.729e-04	4	0	1	0	4
5	N3	max	.005	1	-.02	5	.006	4	1.062e-03	4	0	6	0	6
6		min	0	4	-.078	3	0	3	0	1	0	1	-1.059e-03	1
7	N4	max	.004	2	-.035	5	.003	5	0	3	0	6	1.128e-03	1
8		min	0	4	-.135	3	0	1	-1.137e-03	4	0	1	0	4
9	N5	max	.003	1	-.039	5	.002	4	7.98e-04	4	0	6	0	6
10		min	0	4	-.148	3	0	1	0	1	0	1	-7.761e-04	1
11	N6	max	0	6	-.042	5	0	3	0	3	0	6	2.276e-03	1
12		min	-.009	1	-.16	3	-.007	4	-2.297e-03	4	0	1	0	4
13	N7	max	.016	1	-.045	5	.003	4	9.153e-03	4	0	6	0	6
14		min	0	4	-.169	3	0	1	0	1	0	1	-9.263e-03	1
15	N8	max	3.136	1	-.047	5	3.104	4	2.039e-02	4	0	6	0	6
16		min	0	4	-.175	3	0	1	0	1	0	1	-2.05e-02	1
17	N9	max	0	6	0	6	0	6	3.524e-03	2	3.359e-03	6	4.758e-04	1
18		min	0	1	0	1	0	1	-6.062e-03	6	-7.318e-03	2	0	4
19	N10	max	0	6	0	6	0	6	9.489e-03	6	1.206e-02	2	4.758e-04	1
20		min	0	1	0	1	0	1	-6.018e-03	2	-5.538e-03	6	0	4
21	N11	max	0	6	0	6	0	6	8.886e-04	3	3.957e-03	3	4.126e-03	5
22		min	0	1	0	1	0	1	-9.996e-04	5	-8.545e-03	5	-6.861e-03	3
23	N12	max	0	6	0	6	0	6	8.635e-04	3	8.545e-03	5	6.864e-03	3
24		min	0	1	0	1	0	1	-9.996e-04	5	-3.957e-03	3	-4.126e-03	5
25	N13	max	0	6	0	6	0	6	3.437e-03	2	2.951e-03	6	0	6
26		min	0	1	0	1	0	1	-5.684e-03	6	-6.871e-03	2	-1.059e-03	1
27	N14	max	0	6	0	6	0	6	7.695e-03	6	9.268e-03	2	0	6
28		min	0	1	0	1	0	1	-4.447e-03	2	-4.246e-03	6	-1.059e-03	1
29	N15	max	0	6	0	6	0	6	8.455e-04	6	2.848e-03	3	2.99e-03	5
30		min	0	1	0	1	0	1	1.261e-05	2	-6.156e-03	5	-5.376e-03	3
31	N16	max	0	6	0	6	0	6	8.754e-04	3	6.156e-03	5	5.365e-03	3
32		min	0	1	0	1	0	1	3.362e-04	2	-2.845e-03	3	-2.99e-03	5
33	N17	max	0	6	0	6	0	6	7.586e-03	6	2.696e-04	2	1.128e-03	1

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
34		min	0	1	0	1	0	1	1.911e-03	2	-5.061e-05	6	0	4
35	N18	max	0	6	0	6	0	6	-7.974e-04	2	2.086e-04	3	-7.763e-05	5
36		min	0	1	0	1	0	1	-1.881e-03	6	-5.903e-04	5	-3.395e-03	3
37	N19	max	0	6	0	6	0	6	-5.335e-05	2	5.903e-04	5	3.633e-03	3
38		min	0	1	0	1	0	1	-1.881e-03	6	-4.858e-04	3	7.763e-05	5
39	N20	max	0	6	0	6	0	6	8.326e-03	6	2.503e-04	2	0	6
40		min	0	1	0	1	0	1	2.119e-03	2	-5.061e-05	6	-7.761e-04	1
41	N21	max	0	6	0	6	0	6	3.291e-04	5	2.088e-04	3	-9.307e-04	2
42		min	0	1	0	1	0	1	-1.801e-03	3	-5.863e-04	5	-3.774e-03	3
43	N22	max	0	6	0	6	0	6	3.291e-04	5	5.863e-04	5	3.847e-03	3
44		min	0	1	0	1	0	1	-2.01e-03	3	-4.855e-04	3	9.333e-04	5
45	N23	max	0	6	0	6	0	6	8.943e-03	6	-6.603e-06	5	2.276e-03	1
46		min	0	1	0	1	0	1	2.301e-03	2	-4.188e-04	1	0	4
47	N24	max	0	6	0	6	0	6	-1.331e-03	2	2.392e-04	3	2.278e-04	5
48		min	0	1	0	1	0	1	-2.372e-03	6	-3.895e-04	5	-3.884e-03	3
49	N25	max	0	6	0	6	0	6	3.242e-04	2	3.895e-04	5	4.231e-03	3
50		min	0	1	0	1	0	1	-2.372e-03	6	-4.551e-04	3	-2.278e-04	5
51	N26	max	0	6	0	6	0	6	9.417e-03	3	8.835e-04	1	0	6
52		min	0	1	0	1	0	1	2.505e-03	5	0	4	-9.263e-03	1
53	N27	max	0	6	0	6	0	6	6.875e-03	5	1.373e-04	3	-2.804e-03	2
54		min	0	1	0	1	0	1	-1.225e-03	3	-4.589e-04	5	-4.898e-03	6
55	N28	max	0	6	0	6	0	6	6.638e-03	5	5.716e-04	4	5.33e-03	4
56		min	0	1	0	1	0	1	-4.364e-03	1	-3.498e-04	2	-8.863e-04	2

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

	Member	Shape	Code Check	Loc...	LC	Shea...	Loc.....	L...	phi*Pn...	phi*Pn...	phi*M...	phi*M...	...	Eqn
1	M1	12" FWT Powerm...	.486	132...	1	.059	134...	1	489.665	551.086	180.952	180.952	3...	H1-1b
2	M2	L3.5X3.5X4	.223	5.1...	2	.011	0 z	2	12.016	55.08	2.416	3.831	1...	H2-1
3	M3	L4X4X4	.340	6.6...	2	.014	0 z	2	10.574	62.532	3.138	4.514	1...	H2-1
4	M4	L3X3X3	.223	4.0...	2	.012	0 z	2	8.988	35.316	1.32	2.085	1...	H2-1
5	M5	L3.5X3.5X4	.265	5.5...	2	.012	0 z	2	10.278	55.08	2.416	3.716	1...	H2-1
6	M6	L4X4X4	.264	5.9...	5	.013	0 z	5	13.23	62.532	3.138	4.749	1...	H2-1
7	M7	L4X4X4	.264	5.9...	5	.013	0 z	5	13.23	62.532	3.138	4.749	1...	H2-1
8	M8	L3.5X3.5X4	.201	4.85	5	.010	9.7 z	5	13.418	55.08	2.416	3.908	1...	H2-1
9	M9	L3.5X3.5X4	.201	4.85	5	.010	9.7 z	5	13.418	55.08	2.416	3.908	1...	H2-1
10	M10	L2.5x2.5x3	.071	1.6...	2	.004	3.3... z	5	20.016	29.192	.873	1.818	1...	H2-1
11	M11	L2.5x2.5x3	.101	1.7...	1	.004	3.3... z	5	20.016	29.192	.873	1.818	1...	H2-1
12	M12	L2x2x3	.103	.75	4	.002	0 y	6	20.899	23.393	.558	1.239	1...	H2-1
13	M13	L2.5x2.5x3	.066	1.6...	2	.004	3.3... z	5	20.016	29.192	.873	1.818	1...	H2-1
14	M14	L2.5x2.5x3	.093	1.7...	1	.004	3.3... z	5	20.016	29.192	.873	1.818	1...	H2-1
15	M15	L2x2x3	.096	.75	4	.002	0 y	6	20.899	23.393	.558	1.239	1...	H2-1
16	M16	L2.5x2.5x3	.220	1.7...	1	.004	0 z	5	20.016	29.192	.873	1.818	1...	H2-1
17	M17	L2.5x2.5x3	.160	1.6...	1	.004	3.3... z	5	20.016	29.192	.873	1.818	1...	H2-1
18	M18	L2x2x3	.292	.75	4	.002	0 y	6	20.899	23.393	.558	1.239	1...	H2-1
19	M19	6"X3/4" PL	.058	.75	4	.000	1.5 y	6	101.328	145.8	2.278	18.225	1...	H1-1b
20	M20	L2.5x2.5x4	.264	1.6...	2	.003	3.3... y	6	26.71	38.556	1.114	2.473	1...	H2-1
21	M21	L2.5x2.5x4	.376	1.5...	2	.003	3.3... y	6	26.71	38.556	1.114	2.473	1...	H2-1

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	-.994	18.97	0	0	0	5.599
2	1	N9	-.189	.036	0	0	0	0
3	1	N10	-.276	.052	0	0	0	0
4	1	N11	-.522	.047	-.067	0	0	0
5	1	N12	-.522	.047	.067	0	0	0
6	1	N13	-.129	.018	0	0	0	0
7	1	N14	-.204	.038	0	0	0	0
8	1	N15	-1.6	.034	-.25	0	0	0
9	1	N16	-1.6	.033	.25	0	0	0
10	1	N17	-.012	.002	0	0	0	0
11	1	N18	-1.497	.008	.73	0	0	0
12	1	N19	-1.497	.004	-.73	0	0	0
13	1	N20	-.012	.002	0	0	0	0
14	1	N21	-1.359	.008	.661	0	0	0
15	1	N23	-.012	.002	0	0	0	0
16	1	N24	3.633	0	-1.836	0	0	0
17	1	N22	-1.359	.004	-.661	0	0	0
18	1	N25	3.634	.012	1.835	0	0	0
19	1	N28	-8.763	-.006	-4.365	0	0	0
20	1	N26	0	.014	.003	0	0	0
21	1	N27	-8.765	.023	4.362	0	0	0
22	1	Totals:	-22.044	19.349	0			
23	1	COG (ft):	X: 0	Y: 92.927	Z: -.041			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N1	-.994	14.228	0	0	0	5.599
2	2	N9	-.189	.027	0	0	0	0
3	2	N10	-.276	.039	0	0	0	0
4	2	N11	-.522	.035	-.067	0	0	0
5	2	N12	-.522	.035	.067	0	0	0
6	2	N13	-.129	.013	0	0	0	0
7	2	N14	-.204	.029	0	0	0	0
8	2	N15	-1.599	.026	-.25	0	0	0
9	2	N16	-1.599	.025	.25	0	0	0
10	2	N17	-.012	.002	0	0	0	0
11	2	N18	-1.498	.006	.73	0	0	0
12	2	N19	-1.498	.003	-.73	0	0	0
13	2	N20	-.012	.002	0	0	0	0
14	2	N21	-1.354	.006	.658	0	0	0
15	2	N23	-.012	.002	0	0	0	0
16	2	N24	3.615	0	-1.827	0	0	0
17	2	N22	-1.354	.003	-.658	0	0	0
18	2	N25	3.615	.009	1.826	0	0	0
19	2	N28	-8.749	-.005	-4.358	0	0	0
20	2	N26	0	.01	.003	0	0	0
21	2	N27	-8.751	.017	4.355	0	0	0
22	2	Totals:	-22.044	14.512	0			
23	2	COG (ft):	X: 0	Y: 92.927	Z: -.041			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N1	-.208	55.755	0	0	0	1.172
2	3	N9	-.067	.133	0	0	0	0
3	3	N10	-.093	.191	0	0	0	0
4	3	N11	-.14	.171	-.018	0	0	0
5	3	N12	-.14	.171	.018	0	0	0
6	3	N13	-.048	.087	0	0	0	0
7	3	N14	-.072	.144	0	0	0	0
8	3	N15	-.374	.126	-.059	0	0	0
9	3	N16	-.374	.126	.059	0	0	0
10	3	N17	-.006	.013	0	0	0	0
11	3	N18	-.337	.034	.16	0	0	0
12	3	N19	-.337	.032	-.16	0	0	0
13	3	N20	-.006	.013	0	0	0	0
14	3	N21	-.329	.034	.156	0	0	0
15	3	N23	-.006	.013	0	0	0	0
16	3	N24	.809	.029	-.413	0	0	0
17	3	N22	-.329	.032	-.156	0	0	0
18	3	N25	.809	.037	.413	0	0	0
19	3	N28	-1.994	.026	-.989	0	0	0
20	3	N26	0	.014	0	0	0	0
21	3	N27	-1.994	.044	.989	0	0	0
22	3	Totals:	-5.236	57.223	0			
23	3	COG (ft):	X: 0	Y: 87.486	Z: -.046			

Joint Reactions (By Combination)

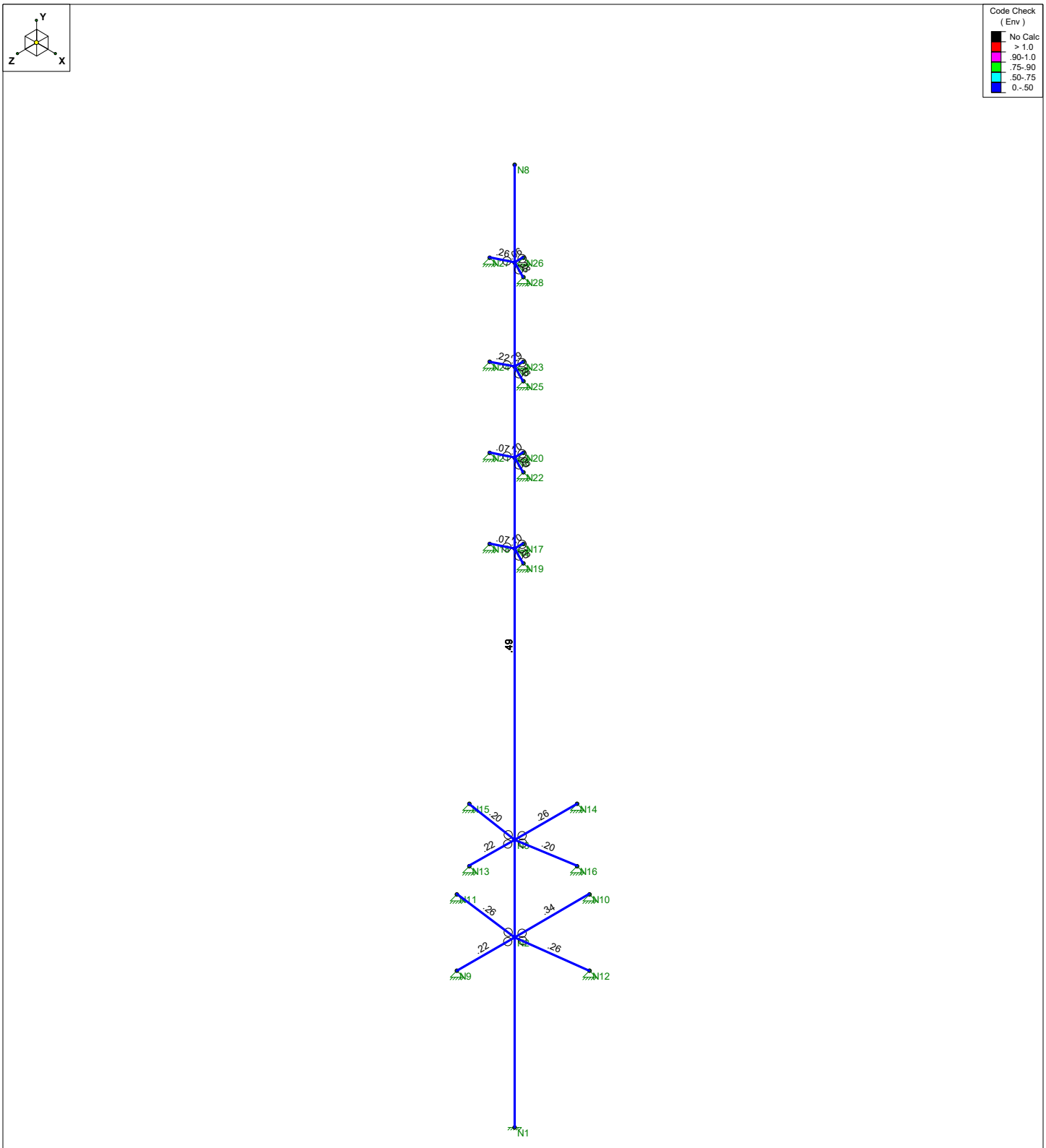
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N1	0	18.922	-.994	-5.592	0	0
2	4	N9	0	.035	-.563	0	0	0
3	4	N10	0	.052	-.494	0	0	0
4	4	N11	-.069	.047	-.255	0	0	0
5	4	N12	.069	.047	-.255	0	0	0
6	4	N13	0	.018	-1.464	0	0	0
7	4	N14	0	.039	-1.665	0	0	0
8	4	N15	-.291	.034	-.224	0	0	0
9	4	N16	.291	.034	-.224	0	0	0
10	4	N17	0	.008	-2.364	0	0	0
11	4	N18	.528	.005	-.301	0	0	0
12	4	N19	-.528	.005	-.301	0	0	0
13	4	N20	0	.009	-2.204	0	0	0
14	4	N21	.492	.005	-.284	0	0	0
15	4	N23	0	-.017	6.075	0	0	0
16	4	N24	-1.356	.008	.641	0	0	0
17	4	N22	-.492	.005	-.284	0	0	0
18	4	N25	1.356	.008	.641	0	0	0
19	4	N28	-.79	.007	-.432	0	0	0
20	4	N26	0	.07	-16.692	0	0	0
21	4	N27	.79	.007	-.432	0	0	0
22	4	Totals:	0	19.349	-22.076			
23	4	COG (ft):	X: 0	Y: 92.927	Z: -.041			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	5	N1	0	14.192	-.994	-5.592	0	0
2	5	N9	0	.027	-.563	0	0	0
3	5	N10	0	.039	-.494	0	0	0
4	5	N11	-.069	.035	-.255	0	0	0
5	5	N12	.069	.035	-.255	0	0	0
6	5	N13	0	.013	-1.464	0	0	0
7	5	N14	0	.029	-1.665	0	0	0
8	5	N15	-.291	.025	-.224	0	0	0
9	5	N16	.291	.025	-.224	0	0	0
10	5	N17	0	.006	-2.366	0	0	0
11	5	N18	.528	.004	-.302	0	0	0
12	5	N19	-.528	.004	-.302	0	0	0
13	5	N20	0	.006	-2.195	0	0	0
14	5	N21	.49	.004	-.283	0	0	0
15	5	N23	0	-.012	6.045	0	0	0
16	5	N24	-1.349	.006	.637	0	0	0
17	5	N22	-.49	.004	-.283	0	0	0
18	5	N25	1.349	.006	.637	0	0	0
19	5	N28	-.788	.005	-.432	0	0	0
20	5	N26	0	.052	-16.665	0	0	0
21	5	N27	.788	.005	-.432	0	0	0
22	5	Totals:	0	14.512	-22.076			
23	5	COG (ft):	X: 0	Y: 92.927	Z: -.041			

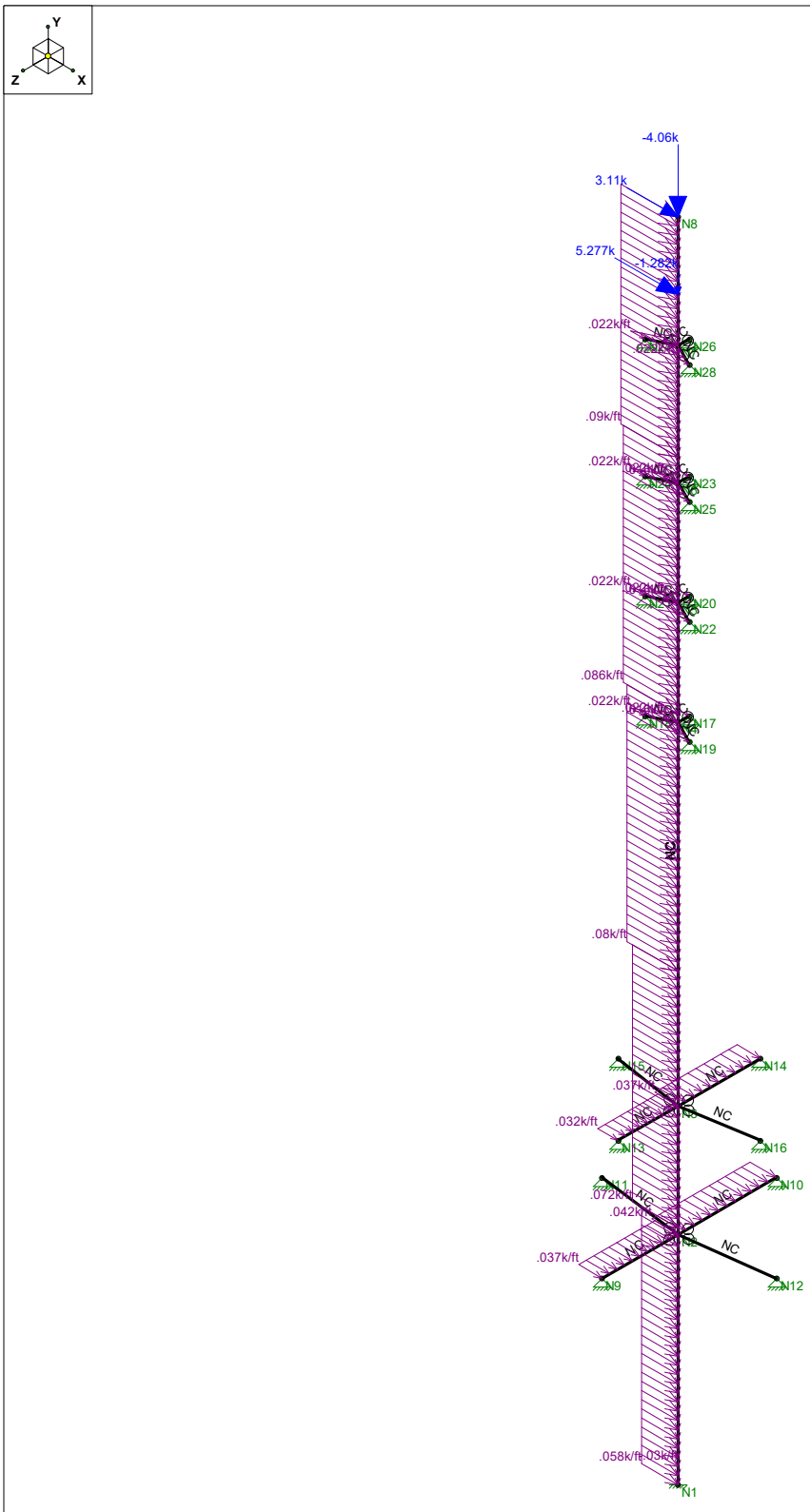
Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	6	N1	0	55.724	-.207	-1.17	0	0
2	6	N9	0	.133	-.15	0	0	0
3	6	N10	0	.191	-.132	0	0	0
4	6	N11	-.019	.171	-.085	0	0	0
5	6	N12	.019	.171	-.085	0	0	0
6	6	N13	0	.086	-.343	0	0	0
7	6	N14	0	.144	-.39	0	0	0
8	6	N15	-.068	.126	-.074	0	0	0
9	6	N16	.068	.126	-.074	0	0	0
10	6	N17	0	.017	-.516	0	0	0
11	6	N18	.115	.033	-.074	0	0	0
12	6	N19	-.115	.033	-.074	0	0	0
13	6	N20	0	.017	-.518	0	0	0
14	6	N21	.116	.033	-.075	0	0	0
15	6	N23	0	0	1.37	0	0	0
16	6	N24	-.306	.034	.136	0	0	0
17	6	N22	-.116	.033	-.075	0	0	0
18	6	N25	.306	.034	.136	0	0	0
19	6	N28	-.179	.034	-.106	0	0	0
20	6	N26	0	.049	-3.782	0	0	0
21	6	N27	.179	.034	-.106	0	0	0
22	6	Totals:	0	57.223	-5.224			
23	6	COG (ft):	X: 0	Y: 87.486	Z: -.046			



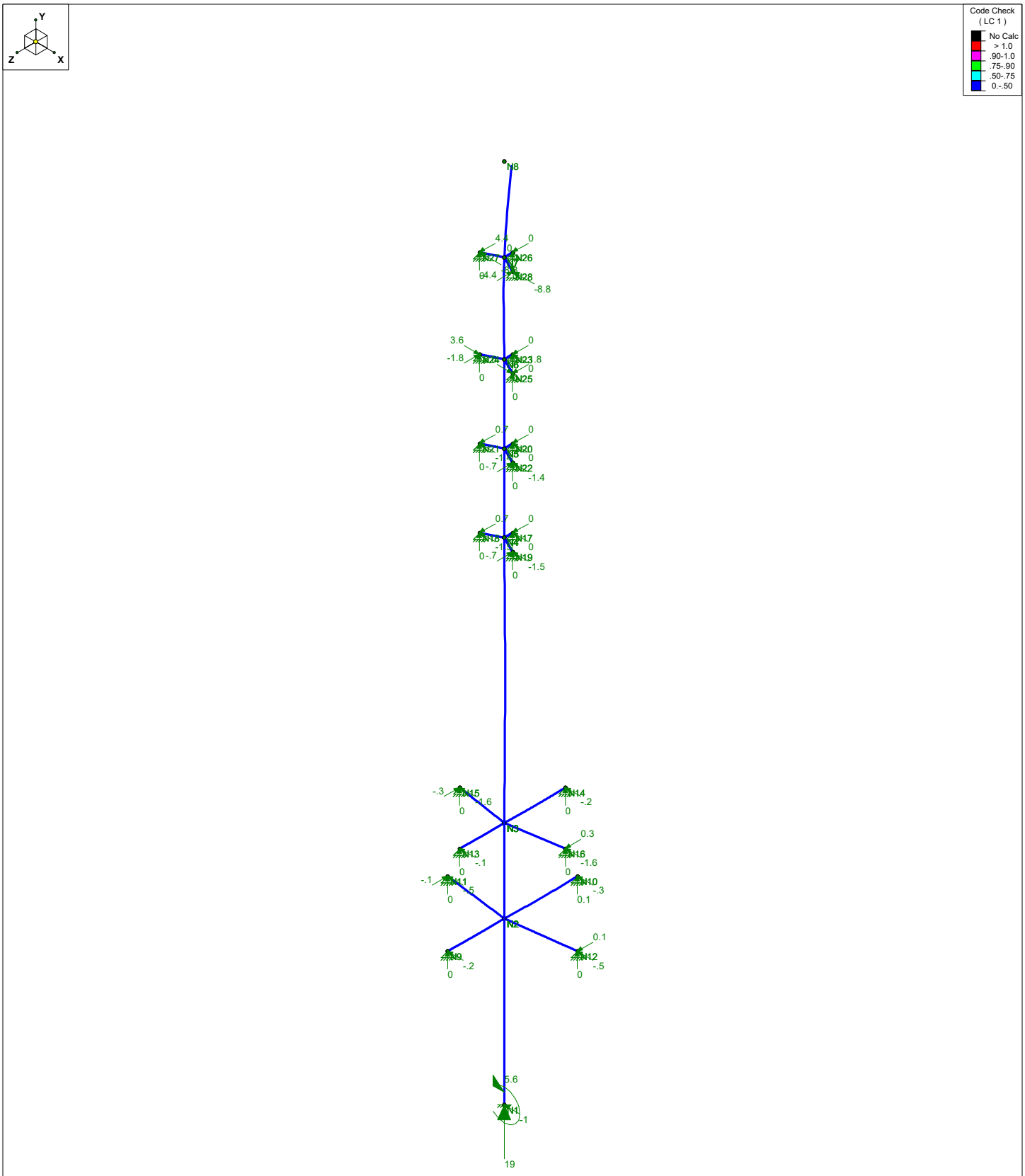
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:29 AM
17159.07 - CT03XC338	Unity Check	TIA-222-G Mast.r3d



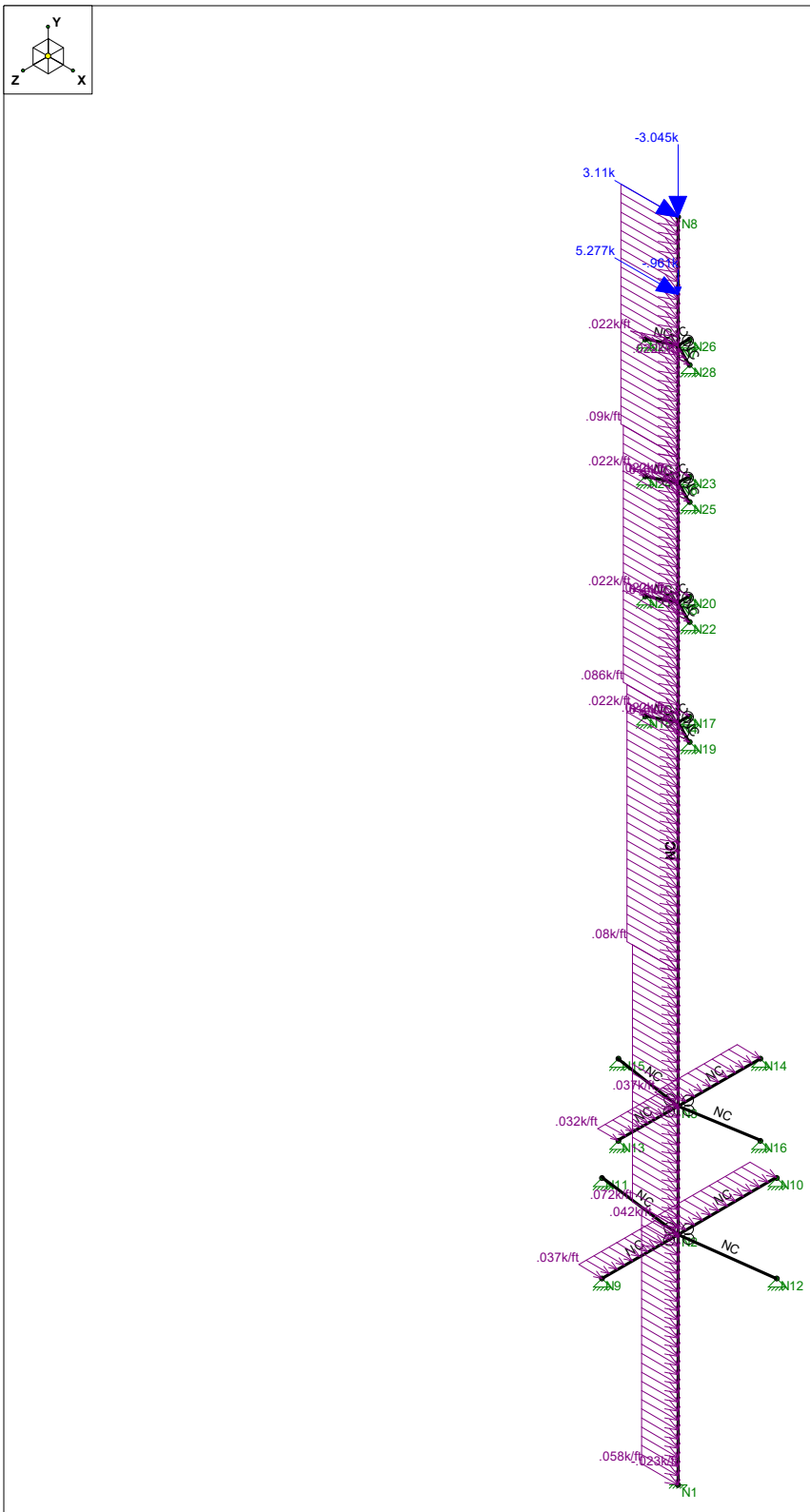
Member Code Checks Displayed
Loads: LC 1, 1.2D + 1.6W (X-direction)

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:30 AM
17159.07 - CT03XC338	LC #1 Loads	TIA-222-G Mast.r3d



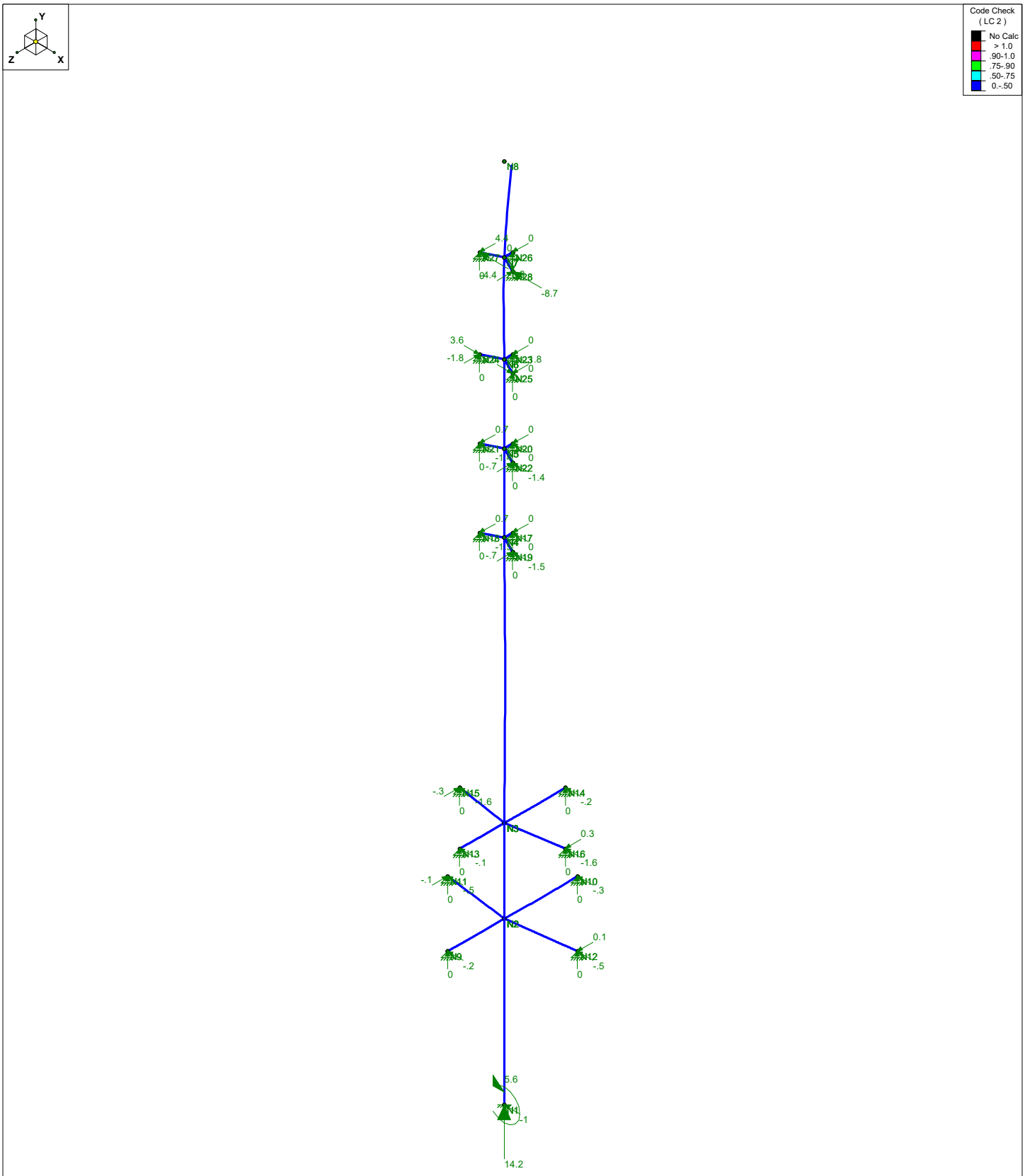
Member Code Checks Displayed
Results for LC 1, 1.2D + 1.6W (X-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:31 AM
17159.07 - CT03XC338	LC #1 Reactions and Deflected Shape	TIA-222-G Mast.r3d



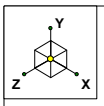
Member Code Checks Displayed
Loads: LC 2, 0.9D + 1.6W (X-direction)

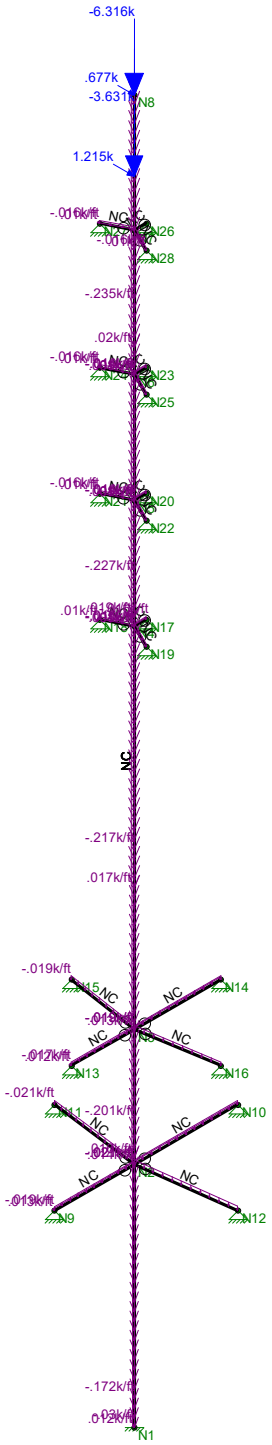
CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:30 AM
17159.07 - CT03XC338	LC #2 Loads	TIA-222-G Mast.r3d



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

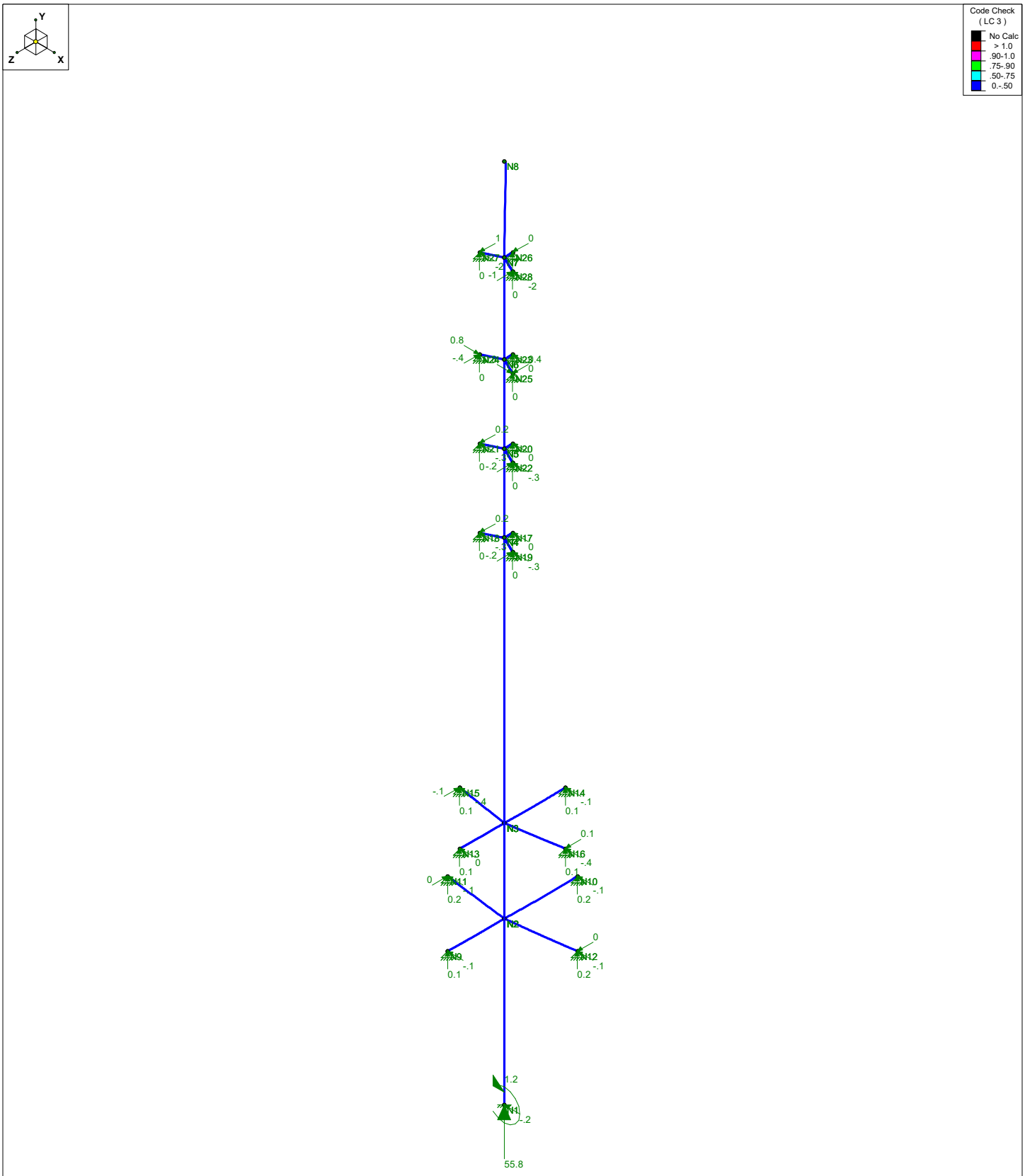
CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:32 AM
17159.07 - CT03XC338	LC #2 Reactions and Deflected Shape	TIA-222-G Mast.r3d





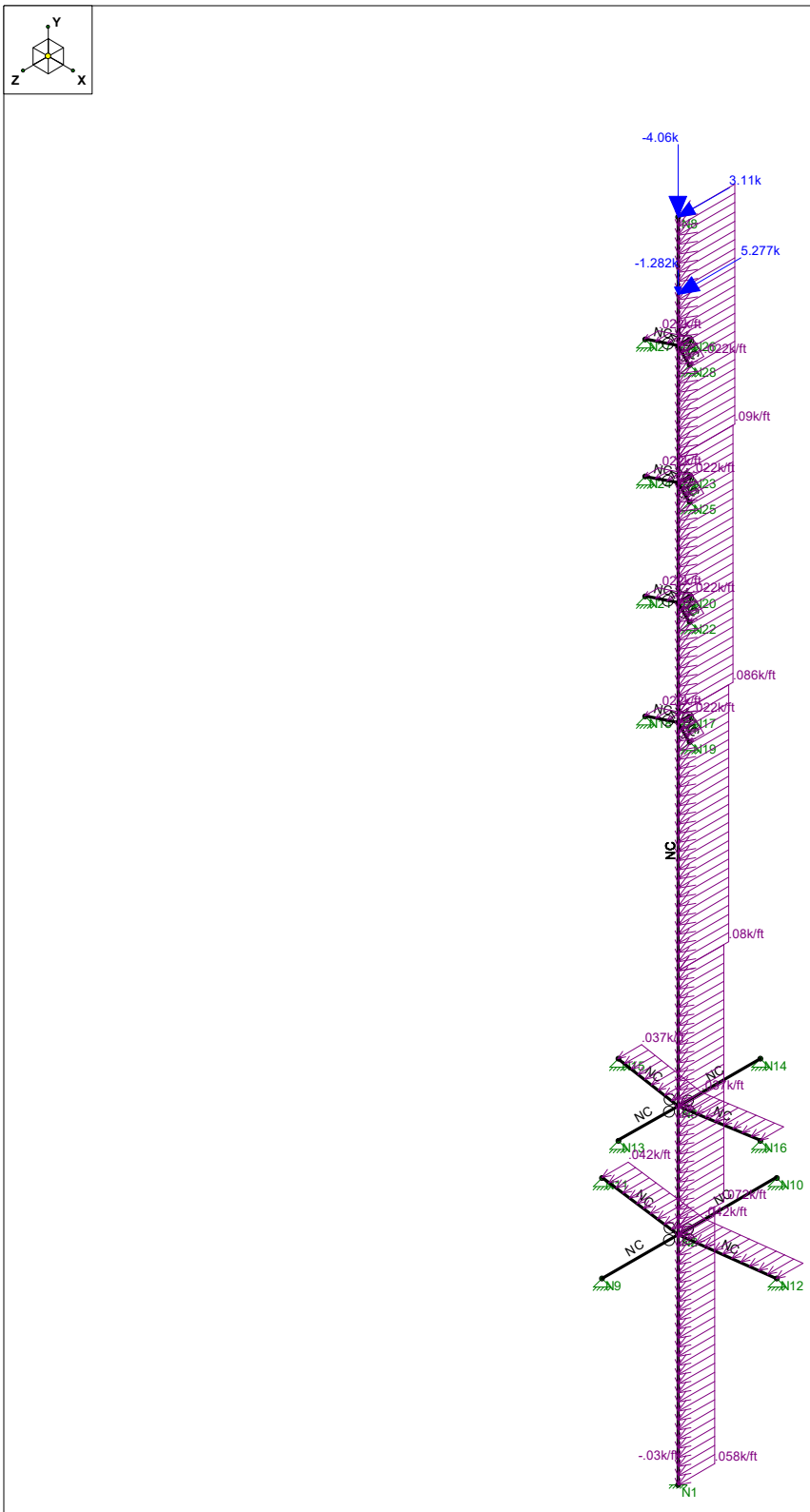
Member Code Checks Displayed
Loads: LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:30 AM
17159.07 - CT03XC338	LC #3 Loads	TIA-222-G Mast.r3d



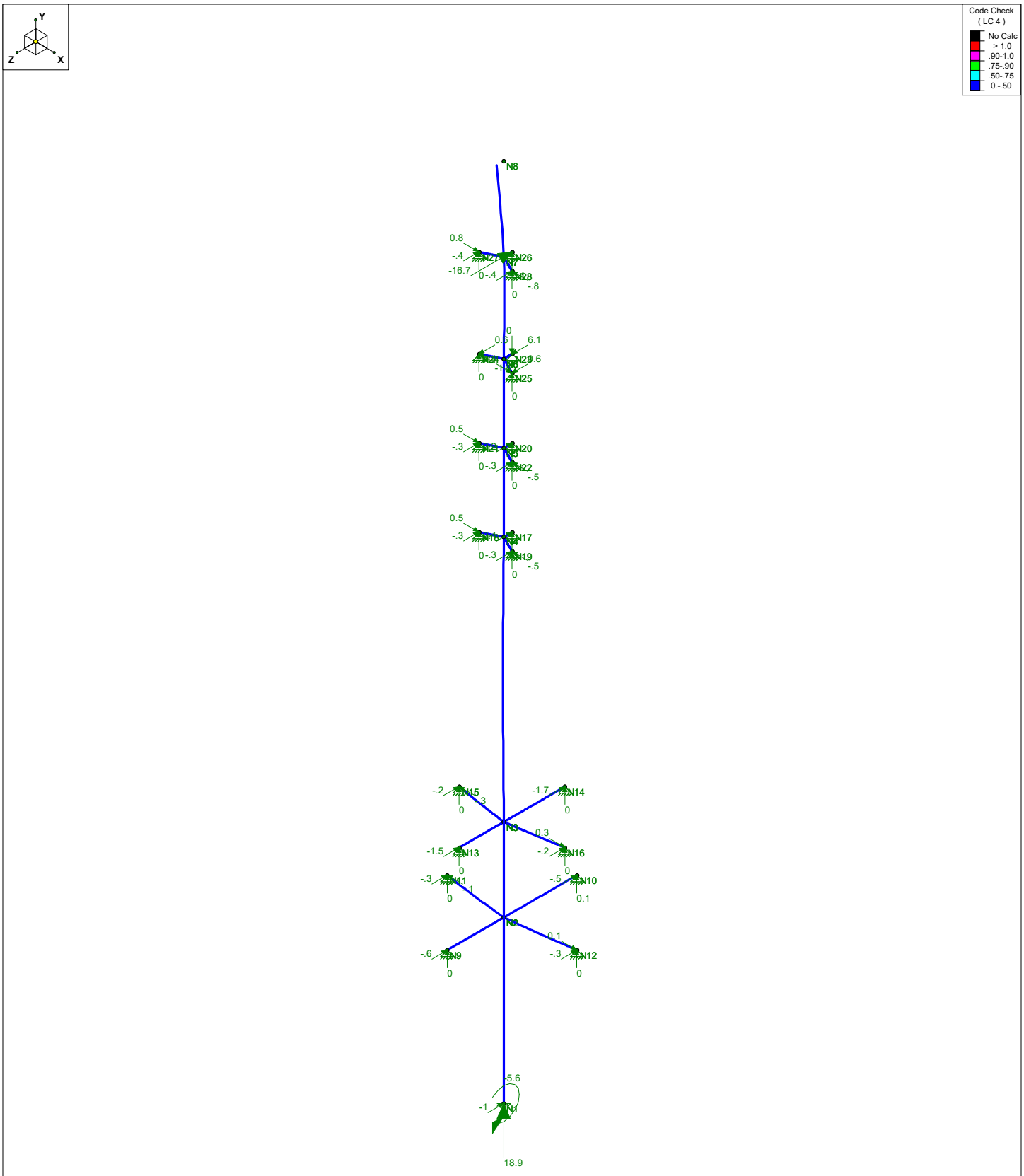
Member Code Checks Displayed
Results for LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:32 AM
17159.07 - CT03XC338	LC #3 Reactions and Deflected Shape	TIA-222-G Mast.r3d



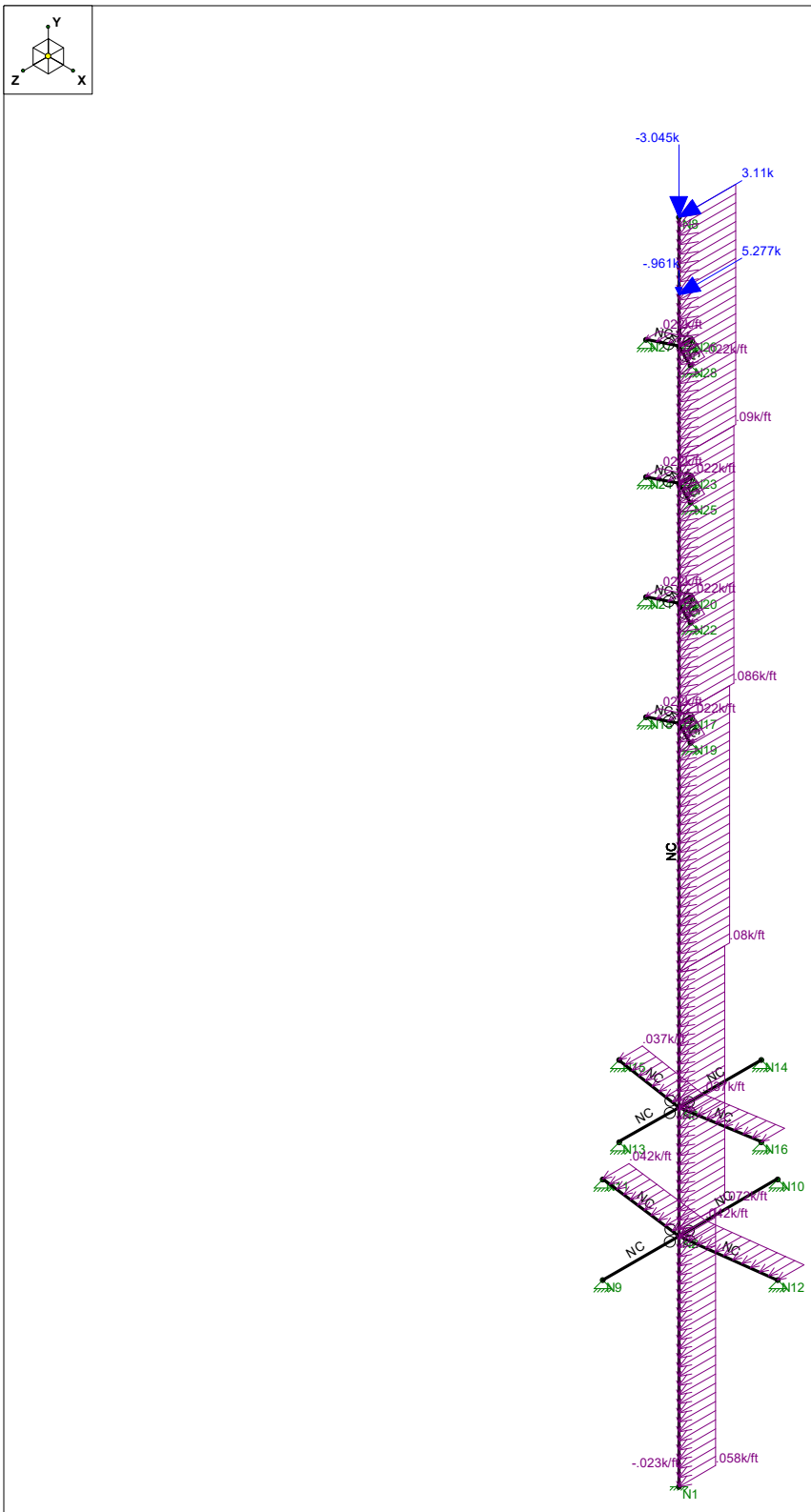
Member Code Checks Displayed
Loads: LC 4, 1.2D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:30 AM
17159.07 - CT03XC338	LC #4 Loads	TIA-222-G Mast.r3d



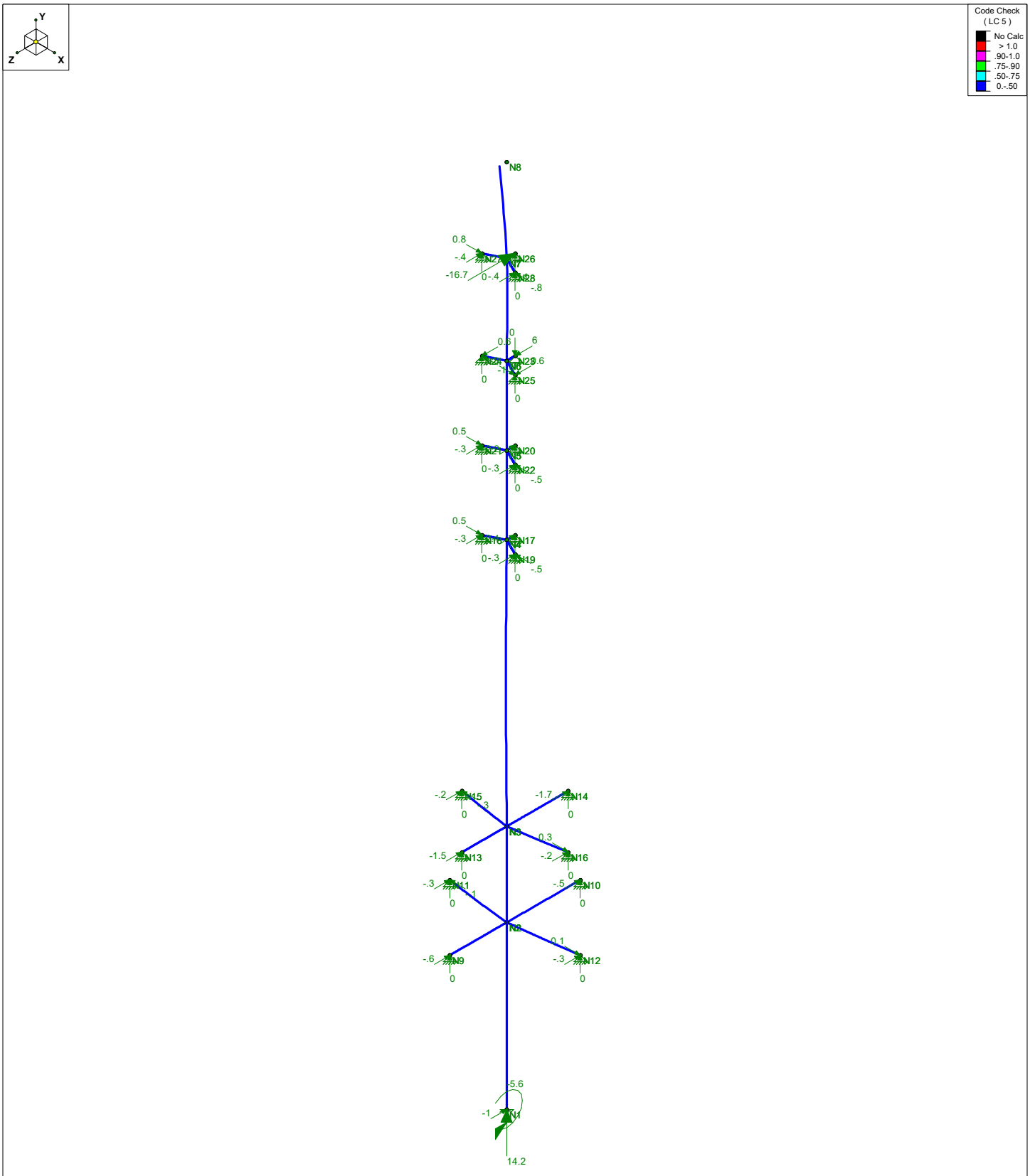
Member Code Checks Displayed
Results for LC 4, 1.2D + 1.6W (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:33 AM
17159.07 - CT03XC338	LC #4 Reactions and Deflected Shape	TIA-222-G Mast.r3d



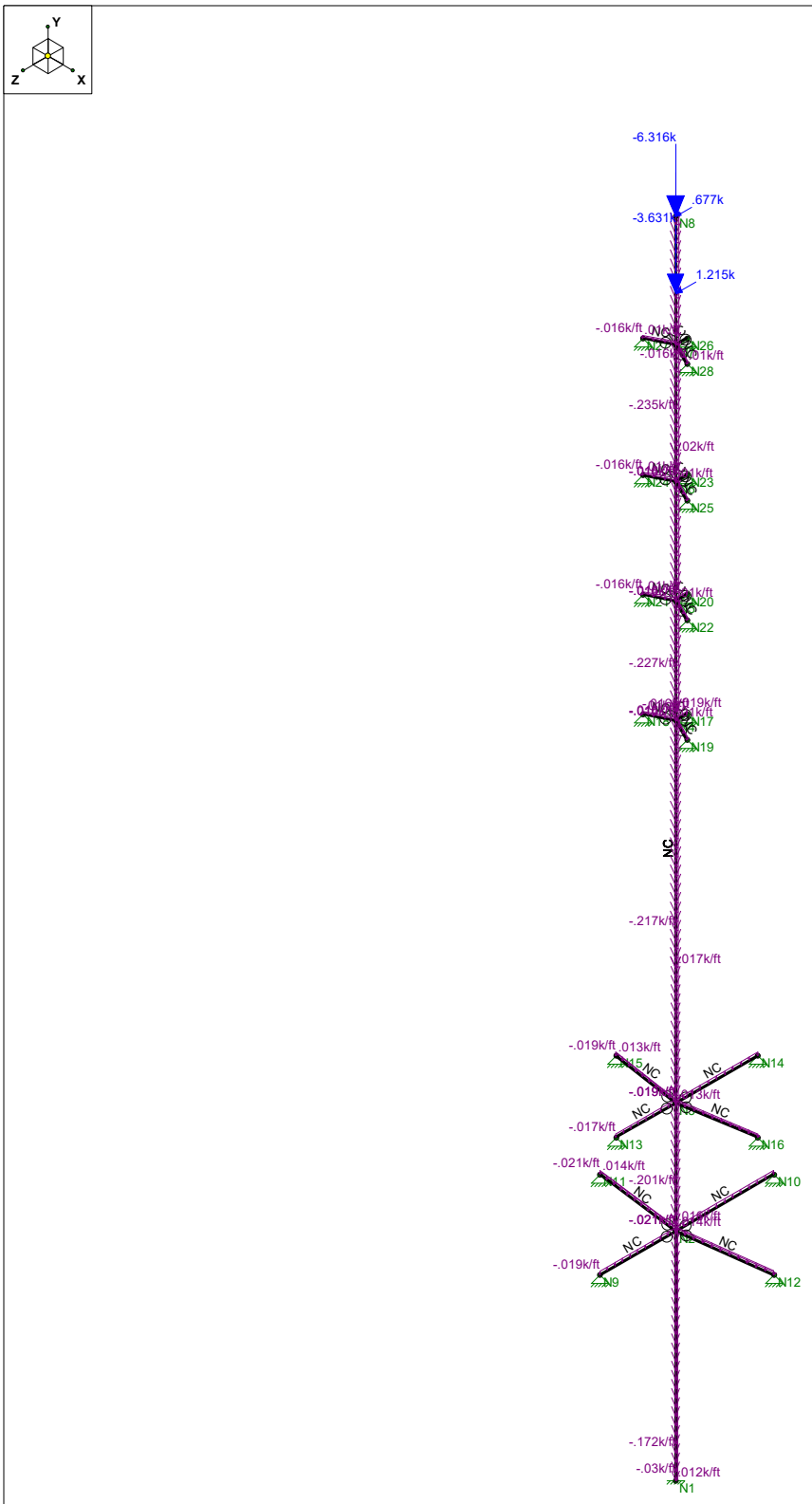
Member Code Checks Displayed
Loads: LC 5, 0.9D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:30 AM
17159.07 - CT03XC338	LC #5 Loads	TIA-222-G Mast.r3d



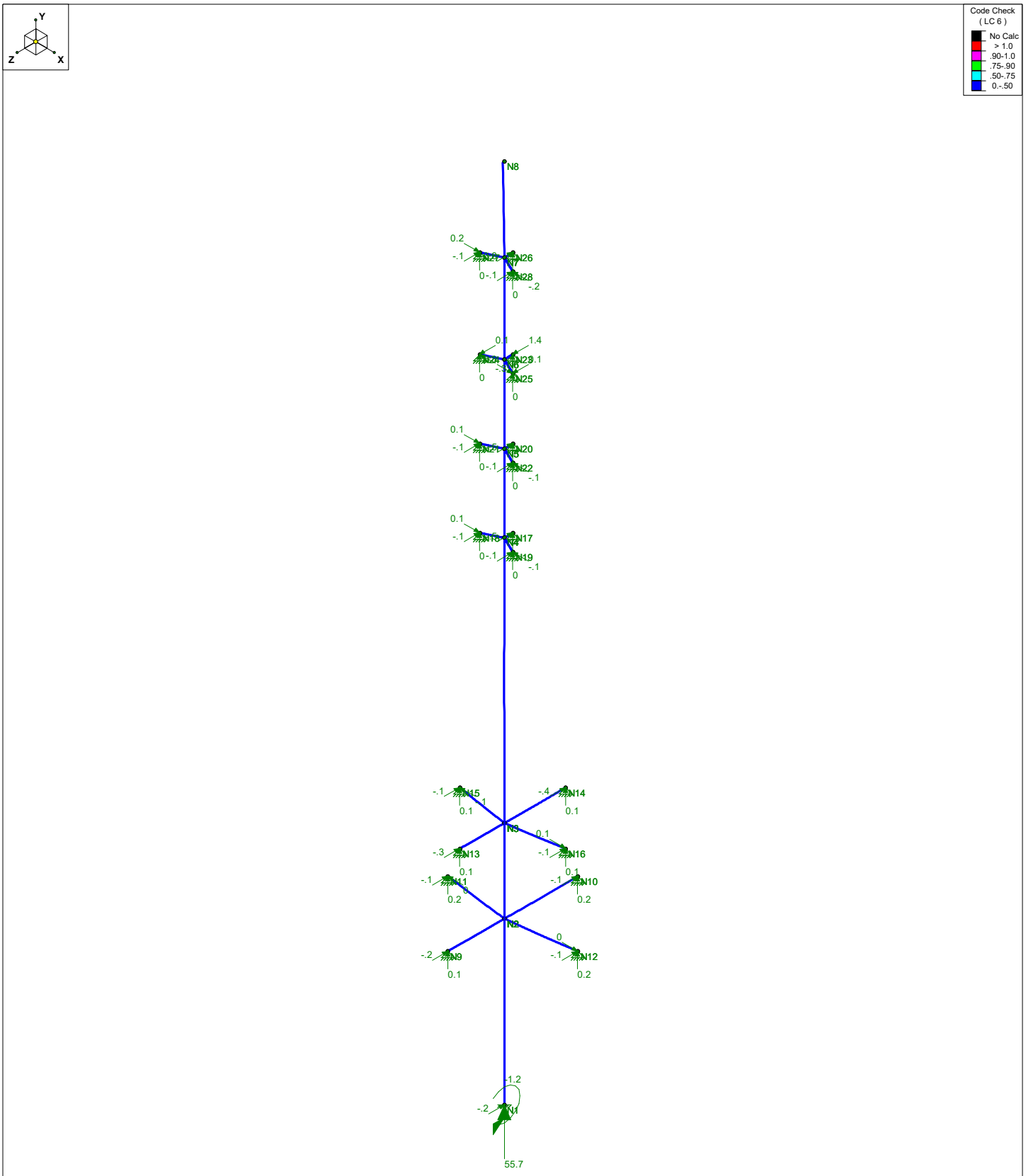
Member Code Checks Displayed
Results for LC 5, 0.9D + 1.6W (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:33 AM
17159.07 - CT03XC338	LC #5 Reactions and Deflected Shape	TIA-222-G Mast.r3d



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

CENTEK Engineering, INC.		
TJL	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:31 AM
17159.07 - CT03XC338	LC #6 Loads	TIA-222-G Mast.r3d



Member Code Checks Displayed
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	Struct. #1281 - Antenna Mast	Dec 5, 2018 at 8:34 AM
17159.07 - CT03XC338	LC #6 Reactions and Deflected Shape	TIA-222-G Mast.r3d

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

Subject:	Connection of Powermount to Tower # 1281
Location:	Greenwhich, CT
Rev. 1: 2/4/19	Prepared by: T.J.L. Checked by: C.A.G. Job No. 17159.07

Powermount Connection to CL&P Tower:

Check Pipe Collar Bolts:

Reactions:

Tension = $Tension := 17.5 \cdot kips$ (Input From Risa-3D LC #4)

Shear = $Shear := 17.5 \cdot kips$ (Input From Risa-3D LC #1)

Bolt Data:

Bolt Type =	ASTMA325	(User Input)
Bolt Diameter =	$D := 0.75 \cdot in$	(User Input)
Number of Bolts =	$N_b := 4$	(User Input)
Design Tensile Strength =	$F_t := 29.8 \cdot kips$	(User Input)
Design Shear Strength =	$F_v := 17.9 \cdot kips$	(User Input)

Plate Data:

Plate Width =	$W_{plt} := 5 \cdot in$	(User Input)
Plate Thickness =	$t_{plt} := 1 \cdot in$	(User Input)
Distance from Bolt to Collar =	$d_{st} := 1.75 \cdot in$	(User Input)
Yield Strength =	$F_y := 36 \cdot ksi$	(User Input)

Weld Data:

Weld Size =	$sw := \frac{5}{16} \cdot in$	(User Input)
Weld Length =	$l_w := 5 \cdot in$	(User Input)
Number of Welds =	$n_w := 2$	(User Input)
Weld Strength =	$F_w := 70 \cdot ksi$	(User Input)

Shear Force = $f_v := \frac{Shear}{N_b} = 4.4 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 24.44 \cdot \%$

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

$Bolt\_Shear = "OK"$

Tension Force = $f_t := \frac{Tension}{N_b} = 4.4 \cdot kips$

Bolt Tenison % of Capacity = $\frac{f_t}{F_t} = 14.68 \cdot \%$

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

$Bolt\_Tension = "OK"$

Check Pipe Collar Plate:

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

Plate Section Modulus = $Z_{plt} := \frac{1}{4} \cdot W_{plt} \cdot t_{plt}^2 = 1.25 \cdot in^3$

Plate Bending Moment = $M := \frac{f_t \cdot N_b}{2} \cdot d_{st} = 15.313 \cdot in \cdot kips$

Plate Bending Stress = $f_b := \frac{M}{Z_{plt}} = 12.25 \cdot ksi$

$Plate\_Bending := if\left(f_b < F_b, "OK", "Overstressed"\right)$

$Plate\_Bending = "OK"$

Check Pipe Collar Weld:

Design Weld Strength = $F_w := 0.45 \cdot F_w = 31.5 \cdot ksi$

Weld Section Modulus = $S_w := \frac{1}{6} \cdot .707 \cdot sw \cdot l_w^2 = 0.921 \cdot in^3$

Weld Area = $A_w := .707 \cdot sw \cdot l_w = 1.105 \cdot in^2$

Plate Stress = $f_w := \frac{\frac{f_t \cdot N_b}{2}}{A_w \cdot n_w} = 3.96 \cdot ksi$

$Weld := if\left(f_w < F_w, "OK", "Overstressed"\right)$

$Weld = "OK"$

Check Pipe Collar to Angle Brace Bolts:

Reactions:

Axial Force in Member = $Axial := 9.8 \cdot kips$ (Input From Risa-3D LC #1)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

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

Number of Bolts = $N_b := 1$ (User Input)

Design Tensile Strength = $F_t := 29.8 \cdot kips$ (User Input)

Design Shear Strength = $F_v := 17.9 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{Axial}{N_b} = 9.8 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 54.75 \cdot \%$

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

$Bolt\_Shear = "OK"$

Check Angle Brace to Tower Bolts:

Reactions:

Axial Force in Member = $Axial := 9.8 \cdot kips$ (Input From Risa-3D LC #1)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

Bolt Diameter = $D := 0.625 \cdot in$ (User Input)

Number of Bolts = $N_b := 1$ (User Input)

Design Tensile Strength = $F_t := 20.7 \cdot kips$ (User Input)

Design Shear Strength = $F_v := 12.4 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{Axial}{N_b} = 9.8 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 79.03 \cdot \%$

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

$Bolt\_Shear = "OK"$

Check Pipe Collar to Plate Brace Bolts:

Reactions:

Axial Force in Member = $Axial := 16.7 \cdot kips$ (Input From Risa-3D LC #4)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

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

Number of Bolts = $N_b := 2$ (User Input)

Design Tensile Strength = $F_t := 29.8 \cdot kips$ (User Input)

Design Shear Strength = $F_v := 17.9 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{Axial}{N_b} = 8.4 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 46.65 \cdot \%$

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

$Bolt\_Shear = "OK"$

Check Plate Brace to Tower Bolts:

Reactions:

Axial Force in Member = $Axial := 16.7 \cdot kips$ (Input From Risa-3D LC #4)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

Bolt Diameter = $D := 0.625 \cdot in$ (User Input)

Number of Bolts = $N_b := 1$ (User Input)

Design Tensile Strength = $F_t := 20.7 \cdot kips$ (User Input)

Design Shear Strength = $F_v := 24.9 \cdot kips$ (User Input) (Bolt is in Double Shear)

Shear Force = $f_v := \frac{Axial}{N_b} = 16.7 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 67.07 \cdot \%$

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

$Bolt\_Shear = "OK"$

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 Structure # 1281
Location:	Greenwich, CT
Rev. 0: 12/4/18	Prepared by: T.J.L Checked by: C.A.G. Job No. 17159.07

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 := 148	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 =	$Kz := 2.01\cdot\left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.375$		(NESC 2007 Table 250-2)
Exposure Factor =	$Es := 0.346\left[\frac{33}{(0.67\cdot TME)}\right]^{\frac{1}{7}} = 0.296$		(NESC 2007 Table 250-3)
Response Term =	$Bs := \frac{1}{\left(1 + 0.375\cdot\frac{TME}{220}\right)} = 0.799$		(NESC 2007 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(2.7\cdot Es\cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.838$		(NESC 2007 Table 250-3)
Wind Pressure =	$qz := 0.00256\cdot Kz\cdot V^2\cdot Grf\cdot I = 35.7$	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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Subject:	Load Analysis of Equipment on Structure # 1281
Location:	Greenwich, CT
Rev. 0: 12/4/18	Prepared by: T.J.L Checked by: C.A.G. Job No. 17159.07

Development of Wind & Ice Load on Antennas

(Sprint)

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 =	$F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1275$	lbs	**BLC 5**

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Subject:	Load Analysis of Equipment on Structure # 1281
Location:	Greenwich, CT
Rev. 0: 12/4/18	Prepared by: T.J.L Checked by: C.A.G. Job No. 17159.07

Development of Wind & Ice Load on Antennas (Sprint)

Antenna Data:

Antenna Model =	RFS KIT-F D9R6004/1C-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 = $F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 56$ lbs **BLC 5**

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Subject:	Load Analysis of Equipment on Structure # 1281
Location:	Greenwich, CT
Rev. 0: 12/4/18	Prepared by: T.J.L Checked by: C.A.G. Job No. 17159.07

Development of Wind & Ice Load on Antennas (Sprint)

Antenna Data:

Antenna Model =	CCI DPO-7126Y-0-T1 Diplexer		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 7.94$	in	(User Input)
Antenna Width =	$W_{ant} := 5.94$	in	(User Input)
Antenna Thickness =	$T_{ant} := 4.07$	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 = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 192$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 2 \cdot Ir\right)\left(W_{ant} + 2 \cdot Ir\right)\left(T_{ant} + 2 \cdot Ir\right) - V_{ant} = 123$ 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 = $SA_{ICEant} := \frac{\left(L_{ant} + 2 \cdot Ir\right) \cdot \left(W_{ant} + 2 \cdot Ir\right)}{144} = 0.4$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.3$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant3} := p \cdot Cd_F \cdot A_{ICEant} = 8$ 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 = $A_{ant} := SA_{ant} \cdot N_{ant} = 1$ sf

Total Antenna Wind Force = $F_{ant3} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 70$ lbs **BLC 5**

Development of Wind & Ice Load on Platform

Platform Data: (Sprint)

Platform Model =	FWT 14' Low Profile Platform w/ Handrail		(User Input)
Platform Shape =	Flat		(User Input)
Platform Area =	$A_{plt} := 22$	sq ft	(User Input from FWT design calcs)
Platform Area w/ Ice =	$A_{ICEplt} := 26$	sq ft	(User Input from FWT design calcs)
Platform Weight =	$WT_{plt} := 3200$	lbs	(User Input from FWT design calcs)
Platform Weight w/ Ice =	$WT_{ICEplt} := 4500$	lbs	(User Input from FWT design calcs)

Wind Load (NESC Extreme)

Total Platform Wind Force = $F_{mnt1} := qz \cdot Cd_F \cdot A_{plt} \cdot m = 1570$ lbs

Wind Load (NESC Heavy)

Total Platform Wind Force w/ Ice = $Fi_{mnt1} := p \cdot Cd_F \cdot A_{ICEplt} = 166$ lbs

Gravity Load (without ice)

Weight of Platform = $Wt_{mnt1} := WT_{plt} = 3200$ lbs

Gravity Load (ice only)

Weight of Ice on Platform = $Wt_{ice.mnt1} := WT_{ICEplt} - WT_{plt} = 1300$ lbs

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Subject: Load Analysis of Equipment on Structure # 1281

Location: Greenwich, CT

Rev. 0: 12/4/18 Prepared by: T.J.L Checked by: C.A.G.
Job No. 17159.07

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Andrew HBXX-6516DS		(Verizon)
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 50.9$	in	(User Input)
Antenna Width =	$W_{ant} := 12$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 31$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.7$	sf
Total Antenna Wind Force =	$F_{ant4} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 908$	lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.7$	sf
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 14.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant4} := p \cdot Cd_F \cdot A_{ICEant} = 90$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant4} := (WT_{ant} \cdot N_{ant}) = 93$	lbs

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3970$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1090$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 35$	lbs
Weight of Ice on All Antennas =	$Wt_{ice.ant4} := W_{ICEant} \cdot N_{ant} = 106$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Andrew SBNHH-1D65B		(Verizon)
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72.0$	in	(User Input)
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)
Antenna Weight =	$WT_{ant} := 41$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

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

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

Total Antenna Wind Force = $F_{ant5} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1274$ lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.5$ sf

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

Total Antenna Wind Force w/ Ice = $Fi_{ant5} := p \cdot Cd_F \cdot A_{ICEant} = 126$ lbs

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant5} := (WT_{ant} \cdot N_{ant}) = 123$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6083$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1544$ cu in

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

Weight of Ice on All Antennas = $Wt_{ice.ant5} := W_{ICEant} \cdot N_{ant} = 150$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Decibel DB854DG65ESX		(Verizon)
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 48.5$	in	(User Input)
Antenna Width =	$W_{ant} := 12.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 6$	in	(User Input)
Antenna Weight =	$WT_{ant} := 18.5$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 2$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 8.4$	sf
Total Antenna Wind Force =	$F_{ant6} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 601$	lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.6$	sf
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 9.3$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant6} := p \cdot Cd_F \cdot A_{ICEant} = 59$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant6} := (WT_{ant} \cdot N_{ant}) = 37$	lbs

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3638$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1040$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 34$	lbs
Weight of Ice on All Antennas =	$Wt_{ice.ant6} := W_{ICEant} \cdot N_{ant} = 67$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Antel BXA-70063-6CF		(Verizon)
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 71$	in	(User Input)
Antenna Width =	$W_{ant} := 11.2$	in	(User Input)
Antenna Thickness =	$T_{ant} := 5.2$	in	(User Input)
Antenna Weight =	$WT_{ant} := 17$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.5$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 5.5$	sf
Total Antenna Wind Force =	$F_{ant7} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 394$	lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.1$	sf
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 6.1$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant7} := p \cdot Cd_F \cdot A_{ICEant} = 39$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant7} := (WT_{ant} \cdot N_{ant}) = 17$	lbs

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 4135$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1311$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 42$	lbs
Weight of Ice on All Antennas =	$Wt_{ice.ant7} := W_{ICEant} \cdot N_{ant} = 42$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS FDAP5002/2C-3L Diplexer		(Verizon)
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 6.5$	in	(User Input)
Antenna Width =	$W_{ant} := 8.3$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 7$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 6$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.4$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 2.2$	sf
Total Antenna Wind Force =	$F_{ant8} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 160$	lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 0.5$	sf
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.9$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant8} := p \cdot Cd_F \cdot A_{ICEant} = 19$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant8} := (WT_{ant} \cdot N_{ant}) = 42$	lbs

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 178$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 122$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 4$	lbs
Weight of Ice on All Antennas =	$Wt_{ice.ant8} := W_{ICEant} \cdot N_{ant} = 24$	lbs

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Subject:	Load Analysis of Equipment on Structure # 1281
Location:	Greenwich, CT
Rev. 0: 12/4/18	Prepared by: T.J.L Checked by: C.A.G. Job No. 17159.07

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS ATSBT-TOP-FM-4G Bias Tee		(Verizon)
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 5.63$	in	(User Input)
Antenna Width =	$W_{ant} := 3.7$	in	(User Input)
Antenna Thickness =	$T_{ant} := 2.0$	in	(User Input)
Antenna Weight =	$WT_{ant} := 2$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.1$	sf
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.4$	sf
Total Antenna Wind Force =	$F_{ant9} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 31$	lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 0.2$	sf
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 0.6$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant9} := p \cdot Cd_F \cdot A_{ICEant} = 4$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$Wt_{ant9} := (WT_{ant} \cdot N_{ant}) = 6$	lbs

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 42$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 52$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 2$	lbs
Weight of Ice on All Antennas =	$Wt_{ice.ant9} := W_{ICEant} \cdot N_{ant} = 5$	lbs

Development of Wind & Ice Load on Platform

Platform Data:

Platform Model =	T-Arm Colocation Mount		(User Input)
Platform Shape =	Flat		(User Input)
Platform Area =	$A_{plt} := 10.65$	sq ft	(User Input)
Platform Area w/ Ice =	$A_{ICEplt} := 13.7$	sq ft	(User Input)
Platform Weight =	$WT_{plt} := 750$	lbs	(User Input)
Platform Weight w/ Ice =	$WT_{ICEplt} := 950$	lbs	(User Input)

Wind Load (NESC Extreme)

Total Platform Wind Force = $F_{mnt2} := qz \cdot Cd_F \cdot A_{plt} \cdot m = 760$ lbs

Wind Load (NESC Heavy)

Total Platform Wind Force w/ Ice = $Fi_{mnt2} := p \cdot Cd_F \cdot A_{ICEplt} = 88$ lbs

Gravity Load (without ice)

Weight of Platform = $Wt_{mnt2} := WT_{plt} = 750$ lbs

Gravity Load (ice only)

Weight of Ice on Platform = $Wt_{ice.mnt2} := WT_{ICEplt} - WT_{plt} = 200$ lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Kathrein 840-10520		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 23.5$	in	(User Input)
Antenna Width =	$W_{ant} := 10.3$	in	(User Input)
Antenna Thickness =	$T_{ant} := 5.9$	in	(User Input)
Antenna Weight =	$WT_{ant} := 19$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant10} := WT_{ant} \cdot N_{ant} = 19$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1428$ cu in

Volume of Ice on Each Antenna = $V_{ice} := \left(L_{ant} + 1\right)\left(W_{ant} + 1\right) \cdot \left(T_{ant} + 1\right) - V_{ant} = 482$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 16$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant10} := W_{ICEant} \cdot N_{ant} = 16$ lbs

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 1.7$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 1.7$ sf

Total Antenna Wind Force = $F_{ant10} := qz \cdot Cd_F \cdot A_{ant} = 96$ lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{\left(L_{ant} + 1\right) \cdot \left(W_{ant} + 1\right)}{144} = 1.9$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 1.9$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant10} := p \cdot Cd_F \cdot A_{ICEant} = 12$ lbs

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	SitePro Tapered Pipe Mount		
Mount Shape =	Round		(User Input)
Pipe Mount Length =	$L_{mnt} := 36$	in	(User Input)
2 inch Pipe Mount Linear Weight =	$W_{mnt} := 3.66$	plf	(User Input)
Pipe Mount Outside Diameter =	$D_{mnt} := 2.375$	in	(User Input)
Number of Mounting Pipes =	$N_{mnt} := 1$		(User Input)
Mount Weight =	$W_{tp.mnt} := 77$	lbs	(User Input)

Gravity Loads (without ice)

Weight Each Pipe Mount = $WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 11$ lbs

Weight of All Mounts = $Wt_{mnt3} := WT_{mnt} \cdot N_{mnt} + W_{tp.mnt} = 88$ lbs

Gravity Load (ice)

Volume of Each Pipe = $V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^{2} \cdot L_{mnt} = 159$ cu in

Volume of Ice on Each Pipe = $V_{ice} := \left[\frac{\pi}{4} \cdot \left[\left(D_{mnt} + 2 \cdot Ir\right)^{2}\right] \cdot \left(L_{mnt} + 2 \cdot Ir\right)\right] - V_{mnt} = 172$ cu in

Weight of Ice each mount (incl, hardware) = $W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 6$ lbs

Weight of Ice on All Mounts = $Wt_{ice.mnt3} := \left(W_{ICEmnt} \cdot N_{mnt} + 5\right) = 11$ lbs

Wind Load (NESC Extreme Wind)

Assumes Mount is Shielded by Antenna

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

Total Mount Wind Force = $F_{mnt3} := qz \cdot Cd_F \cdot A_{mnt} \cdot m = 0$ lbs

Wind Load (NESC Heavy Wind)

Assumes Mount is Shielded by Antenna

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

Total Mount Wind Force = $Fi_{mnt3} := p \cdot Cd_F \cdot A_{ICEmnt} = 0$ lbs

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	SitePro XLD WiMax Tower Mount		
Platform Area =	$A_{plt} := 4.5$	sq ft	(User Input)
Platform Area w/ Ice =	$A_{ICEplt} := 6$	sq ft	(User Input)
Platform Weight =	$WT_{plt} := 160$	lbs	(User Input)
Platform Weight w/ Ice =	$WT_{ICEplt} := 185$	lbs	(User Input)

Wind Load (NESC Extreme)

Total Platform Wind Force = $F_{mnt4} := qz \cdot Cd_F \cdot A_{plt} \cdot m = 321$ lbs

Wind Load (NESC Heavy)

Total Platform Wind Force w/ Ice = $Fi_{mnt4} := p \cdot Cd_F \cdot A_{ICEplt} = 38$ lbs

Gravity Load (without ice)

Weight of Platform = $Wt_{mnt4} := WT_{plt} = 160$ lbs

Gravity Load (ice only)

Weight of Ice on Platform = $Wt_{ice.mnt4} := WT_{ICEplt} - WT_{plt} = 25$ lbs

Total Equipment Loads:

Sprint @ 148-ft AGL

NESC Heavy Wind Vertical = $\left(Wt_{ant1} + Wt_{ice.ant1} + Wt_{ant2} + Wt_{ice.ant2} + Wt_{ant3} + Wt_{ice.ant3} + Wt_{mnt1} + Wt_{ice.mnt1}\right)\cdot 1.5 = 7284$

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant1} + Fi_{ant2} + Fi_{ant3} + Fi_{mnt1}\right)\cdot 2.5 = 768$

NESC Extreme Wind Vertical = $\left(Wt_{ant1} + Wt_{ant2} + Wt_{ant3} + Wt_{mnt1}\right) = 3383$

NESC Extreme Wind Trasnsverse = $\left(F_{ant1} + F_{ant2} + F_{ant3} + F_{mnt1}\right) = 2971$

Verizon @ 139-ft AGL

NESC Heavy Wind Vertical =

NESC_Heavy_Vert := $\left(Wt_{ant4} + Wt_{ice.ant4} + Wt_{ant5} + Wt_{ice.ant5} + Wt_{ant6} + Wt_{ice.ant6} + Wt_{ant7} + Wt_{ice.ant7} + Wt_{ant8} + Wt_{ice.ant8} + Wt_{ant9} + Wt_{ice.ant9}\right.$

NESC_Heavy_Vert = 2494

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant4} + Fi_{ant5} + Fi_{ant6} + Fi_{ant7} + Fi_{ant8} + Fi_{ant9} + Fi_{mnt2}\right)\cdot 2.5 = 1061$

NESC Extreme Wind Vertical = $\left(Wt_{ant4} + Wt_{ant5} + Wt_{ant6} + Wt_{ant7} + Wt_{ant8} + Wt_{ant9} + Wt_{mnt2}\right) = 1068$

NESC Extreme Wind Trasnsverse = $\left(F_{ant4} + F_{ant5} + F_{ant6} + F_{ant7} + F_{ant8} + F_{ant9} + F_{mnt2}\right) = 4127$

AT&T @ 70-ft AGL

NESC Heavy Wind Vertical = $\left(Wt_{ant10} + Wt_{ice.ant10} + Wt_{mnt3} + Wt_{ice.mnt3}\right)\cdot 1.5 = 200$ North Tower Leg - Alpha Sector

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant10} + Fi_{mnt3}\right)\cdot 2.5 = 31$

NESC Extreme Wind Vertical = $\left(Wt_{ant10} + Wt_{mnt3}\right) = 107$

NESC Extreme Wind Trasnsverse = $\left(F_{ant10} + F_{mnt3}\right) = 96$

NESC Heavy Wind Vertical = $\left(Wt_{ant10}\cdot 2 + Wt_{ice.ant10}\cdot 2 + Wt_{mnt4} + Wt_{ice.mnt4}\right)\cdot 1.5 = 381$ East Tower Leg - Beta/Gamma Sectors

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant10}\cdot 2 + Fi_{mnt4}\right)\cdot 2.5 = 158$

NESC Extreme Wind Vertical = $\left(Wt_{ant10}\cdot 2 + Wt_{mnt4}\right) = 198$

NESC Extreme Wind Trasnsverse = $\left(F_{ant10}\cdot 2 + F_{mnt4}\right) = 513$

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Subject:	Coax Cable on Powermount and Tower # 1281
Location:	Greenwich, CT
Rev. 1: 2/4/19	Prepared by: T.J.L Checked by: C.A.G. Job No. 17159.07

Coax Cables

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

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

Radial Ice Density = $Id := 57 \cdot pcf$ *(User Input)*

Basic Windspeed = $V := 110$ mph (User Input NESC 2007 Figure 250-2(e))

Height to Top of Coax Above Grade = $TC := 148$ 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 = $Kz := 2.01 \cdot \left(\frac{0.67TC}{900}\right)^{\frac{2}{9.5}} = 1.263$ (NESC 2007 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TC)}\right]^{\frac{1}{7}} = 0.296$ (NESC 2007 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TC}{220}\right)} = 0.799$ (NESC 2007 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.838$ (NESC 2007 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 32.8$ psf (NESC 2007 Section 250.C.2)

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)*

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

Subject:	Coax Cable on Powermount and Tower # 1281
Location:	Greenwich, CT
Rev. 1: 2/4/19	Prepared by: T.J.L Checked by: C.A.G. Job No. 17159.07

Coax Cable within Powermount

(Below Top of Tower)

Distance Between Coax Cable Attach Points = $Coax_{Span} := \begin{pmatrix} 8 \\ 15 \\ 14 \\ 29.375 \\ 29.875 \\ 32.5 \end{pmatrix} \cdot ft$ *(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 = $N_{coax} := 24$ *(User Input)*

Number of Coax Cables Exterior = $Nex_{coax} := 18$ *(User Input)* (6 Cables inside Powermount 18 on Exterior)

Number of Projected Coax Cables Transverse = $NP_{Tcoax} := 4$ *(User Input)*

Wind Area with Ice Transverse = $A_{Tice} := \left(NP_{Tcoax} \cdot D_{coax} + 2 \cdot Ir\right) = 8.92 \cdot in$

Wind Area without Ice Transverse = $A_T := \left(NP_{Tcoax} \cdot D_{coax}\right) = 7.92 \cdot in$

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 = $W_{ice} := Ai_{coax} \cdot Id \cdot Nex_{coax} = 27.756 \cdot plf$

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 =

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

$$Heavy_{Vert} = \begin{pmatrix} 633 \\ 1186 \\ 1107 \\ 2323 \\ 2362 \\ 2570 \end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix} 95 \\ 178 \\ 167 \\ 349 \\ 355 \\ 387 \end{pmatrix} lb$$

Extreme Vertical Load =

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

Extreme Transverse Load =

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

$$Extreme_{Vert} = \begin{pmatrix} 200 \\ 374 \\ 349 \\ 733 \\ 746 \\ 811 \end{pmatrix} lb \qquad Extreme_{Trans} = \begin{pmatrix} 277 \\ 519 \\ 485 \\ 1017 \\ 1034 \\ 1125 \end{pmatrix} lb$$

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Coax Cable on Powermount

(Above Top of Tower)

Coax Cable Span =	$Coax_{Span} := 15 \cdot ft$	*(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 =	$N_{coax} := 18$	*(User Input)*	(6 Cables inside Powermount 12 on Exterior)
Number of Coax Cables Exterior =	$Nex_{coax} := 12$	*(User Input)*	
Number of Projected Coax Cables Transverse =	$NP_{Tcoax} := 2$	*(User Input)*	

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

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

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

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot Nex_{coax} = 18.504 \cdot plf$

Heavy Vertical Load =

$Heavy_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax} + W_{ice}\right) \cdot Coax_{Span} \cdot OF_{HV}\right]}$ $Heavy_{Vert} = 838\,lb$

Heavy Transverse Load =

$Heavy_{Trans} := \overrightarrow{\left(p \cdot A_{Tice} \cdot Cd_{coax} \cdot Coax_{Span} \cdot OF_{HW}\right)}$ $Heavy_{Trans} = 99\,lb$

Extreme Vertical Load =

$Extreme_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax}\right) \cdot Coax_{Span} \cdot OF_{EV}\right]}$ $Extreme_{Vert} = 281\,lb$

Extreme Transverse Load =

$Extreme_{Trans} := \overrightarrow{\left[\left(qz \cdot psf \cdot m \cdot A_T \cdot Cd_{coax}\right) \cdot Coax_{Span} \cdot OF_{EW}\right]}$ $Extreme_{Trans} = 325\,lb$

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Location:	Greenwich, CT
Rev. 1: 2/4/19	Prepared by: T.J.L Checked by: C.A.G. Job No. 17159.07

Coax Cable on CL&P Tower

Sprint Cables on East Leg

Distance Between Coax Cable Attach Points =

Coax Cable Span =

$$Coax_{Span} := \begin{pmatrix} 10.25 \\ 12.775 \\ 14.025 \\ 14.75 \\ 16.585 \\ 14.625 \\ 13.29 \\ 32.5 \end{pmatrix} \cdot ft$$ *(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)*

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 =

$W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 18.504 \cdot plf$

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 =

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

$$Heavy_{Vert} = \begin{pmatrix} 476 \\ 594 \\ 652 \\ 686 \\ 771 \\ 680 \\ 618 \\ 1510 \end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix} 176 \\ 219 \\ 241 \\ 253 \\ 285 \\ 251 \\ 228 \\ 558 \end{pmatrix} lb$$

Extreme Vertical Load =

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

Extreme Transverse Load =

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

$$Extreme_{Vert} = \begin{pmatrix} 128 \\ 159 \\ 175 \\ 184 \\ 207 \\ 183 \\ 166 \\ 406 \end{pmatrix} lb \qquad Extreme_{Trans} = \begin{pmatrix} 532 \\ 664 \\ 728 \\ 766 \\ 861 \\ 760 \\ 690 \\ 1688 \end{pmatrix} lb$$

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Coax Cable on CL&P Tower

AT &T Cables on North Leg

Distance Between Coax Cable Attach Points =

Coax Cable Span = $Coax_{Span} := \begin{pmatrix} 10 \\ 15 \\ 13 \\ 32 \end{pmatrix} \cdot ft$ *(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 = $N_{coax} := 4$ *(User Input)*

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

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

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

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

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 6.168 \cdot plf$

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 =

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

$Heavy_{Vert} = \begin{pmatrix} 155 \\ 232 \\ 201 \\ 496 \end{pmatrix} lb$ $Heavy_{Trans} = \begin{pmatrix} 66 \\ 99 \\ 86 \\ 212 \end{pmatrix} lb$

Extreme Vertical Load =

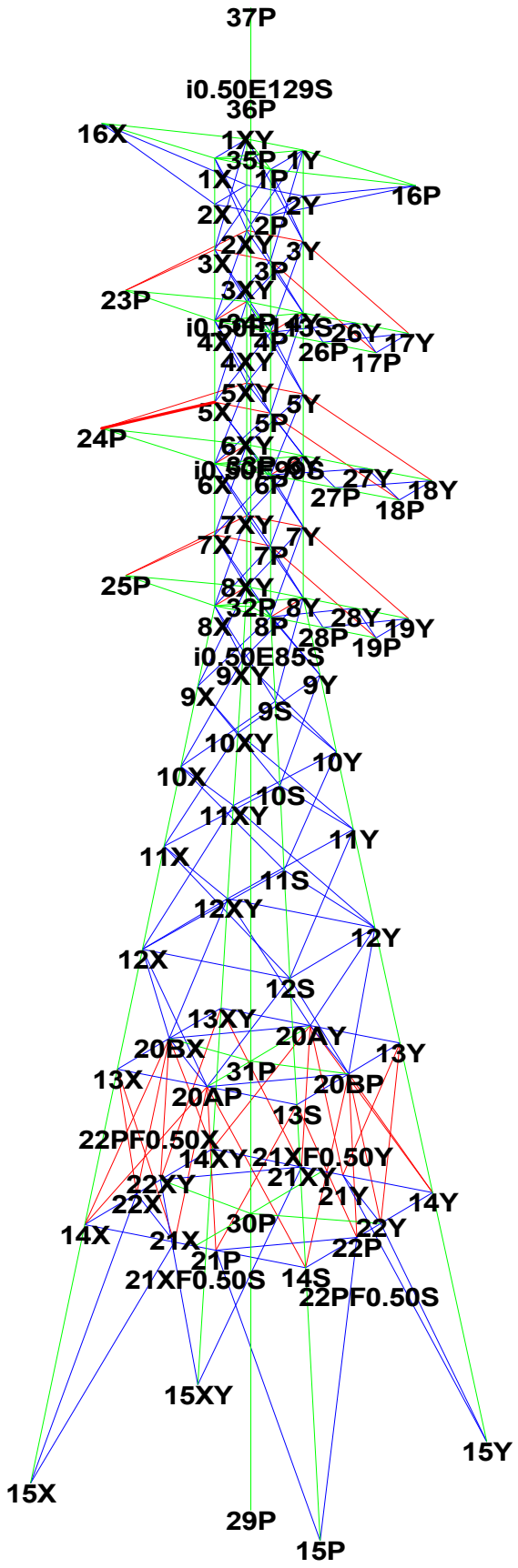
$Extreme_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax}\right) \cdot Coax_{Span} \cdot OF_{EV}\right]}$

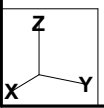
Extreme Transverse Load =

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

$Extreme_{Vert} = \begin{pmatrix} 42 \\ 62 \\ 54 \\ 133 \end{pmatrix} lb$ $Extreme_{Trans} = \begin{pmatrix} 173 \\ 260 \\ 225 \\ 554 \end{pmatrix} lb$

Centek Engineering Inc, Project: "CL&P # 1281"
Tower Version 12.50, 9:29:53 AM Tuesday, December 04, 2018
Undeformed geometry displayed





Project Name : 17159.07 - Greenwich, CT
Project Notes: Structure #1281 / Sprint CT03XC338
Project File : J:\Jobs\1715900.WI\07_CT03XC338 Greenwich\04_Structural\Backup Documentation\Rev (1)\PLS Tower\CL&P # 1281.tow
Date run : 9:20:54 AM Tuesday, February 05, 2019
by : Tower Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

KL/R value of 200.30 exceeds maximum of 200.00 for member "g118P" ??
Problem calculating gross area of longitudinal face for section "1": width is zero at elevation 128.80 (ft) which is not the top of the section. ??
Problem calculating gross area of longitudinal face for section "2": width is zero at elevation -4.25 (ft) which is not the top of the section. ??
Unusual number of fixed joints found: 5. Towers normally have from between 1 and 4 fixed joints. ??
The model has 4 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\07_ct03xc338 greenwich\04_structural\backup documentation\rev (1)\pls tower\cl&p # 1281.lca

*** Analysis Results:

Maximum element usage is 99.85% for Angle "25AP" in load case "NESC Heavy"
Maximum insulator usage is 27.18% for Clamp "11" in load case "NESC Heavy"

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	15P	-20.23	-23.62	-162.79	31.10	4.25	7.34	8.48	0.62	0.00
NESC Heavy	29P	0.16	-1.25	-33.12	1.26	14.22	5.21	15.15	-3.82	0.00
NESC Heavy	15X	27.95	-35.74	166.56	45.37	5.96	-1.03	6.05	-0.06	0.00
NESC Heavy	15XY	-23.48	-15.33	115.34	28.04	-1.68	-1.06	1.99	-0.53	0.00
NESC Heavy	15Y	27.74	-27.94	-192.14	39.38	-2.19	0.08	2.19	-0.58	0.00
NESC Extreme	15P	-24.66	-24.41	-169.35	34.70	1.05	6.11	6.20	0.59	0.00
NESC Extreme	29P	0.20	-2.55	-12.75	2.55	31.04	4.18	31.32	-1.28	0.00
NESC Extreme	15X	34.08	-42.18	189.12	54.22	7.36	0.58	7.38	0.57	0.00
NESC Extreme	15XY	-25.09	-27.36	133.69	37.12	4.29	-0.57	4.33	-0.83	0.00
NESC Extreme	15Y	28.13	-30.06	-200.46	41.17	1.92	-3.14	3.68	-1.04	0.00

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

Load Case	Support Joint	Origin Joint	Leg Member	Force In Leg Dir. (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	15P	14S	14P	165.699	3.631	3.674	-3.664	-0.272	-20.23	-23.62	-162.79
NESC Heavy	15X	14X	14X	-172.236	11.629	11.822	-3.503	11.291	27.95	-35.74	166.56
NESC Heavy	15XY	14XY	14XY	-118.514	6.703	6.740	6.547	-1.601	-23.48	-15.33	115.34
NESC Heavy	15Y	14Y	14Y	196.128	0.517	0.527	0.458	-0.261	27.74	-27.94	-192.14
NESC Extreme	15P	14S	14P	172.870	0.478	0.487	-0.199	-0.444	-24.66	-24.41	-169.35
NESC Extreme	15X	14X	14X	-196.134	15.455	15.740	-6.317	14.417	34.08	-42.18	189.12

NESC Extreme	15XY	14XY	14XY	-138.439	9.276	9.468	5.461	7.734	-25.09	-27.36	133.69			
NESC Extreme	15Y	14Y	14Y	204.638	1.443	1.446	1.297	0.640	28.13	-30.06	-200.46			

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	143.750	84.750	59	188	0.00	6.00	309.150	0.00	28.50	817.275	Problem calculating gross area of longitudinal face for section "1": width is zero at elevation 128.80 (ft) which is not the top of the section. ??
2	84.750	-4.250	52	147	6.00	0.00	1226.814	6.00	0.00	1226.814	Problem calculating gross area of longitudinal face for section "2": width is zero at elevation -4.25 (ft) which is not the top of the section. ??

*** 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 Type	Angle Size	Steel Strength (ksi)	Max Usage %	Cont-rol	Max Use In Comp. %	Comp. Control Member	Comp. Force (kips)	Comp. Control Load Case	L/R Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ	L/R	KL/R	Length (ft)	Curve No.	Angle Comp.	No. Of Member Bolts
1	LEG1	SAE	3.5X3.5X0.25	36.0	89.52	Comp	89.52	3Y	-29.375	NESC Ext	32.813	36.400	54.375	1.000	1.000	1.000	121.04	121.04	7.000	4	4	
2	LEG2	SAE	6X6X0.3125	36.0	83.52	Comp	83.52	5Y	-82.757	NESC Ext	99.083	109.200	203.906	1.000	1.000	1.000	60.50	60.50	6.050	1	12	
3	LEG3	SAE	8X8X0.5	36.0	60.13	Tens	59.72	7Y	-149.092	NESC Ext	249.636	254.800	380.624	1.000	1.000	1.000	52.83	52.83	7.000	1	14	
4	LEG4	SAE	8X8X0.625	36.0	62.80	Comp	62.80	10Y	-182.865	NESC Ext	306.646	291.200	543.749	1.000	1.000	1.000	60.12	60.12	7.915	1	16	
5	LEG5	SAE	8X8X0.75	36.0	56.54	Comp	56.54	14Y	-205.818	NESC Ext	381.402	364.000	815.624	0.250	0.250	0.250	48.48	48.48	25.533	1	20	
6	X1	SAE	2.5X2.5X0.1875	36.0	89.59	Comp	89.59	15AX	-14.006	NESC Ext	15.633	18.200	20.391	0.500	0.500	0.500	131.11	128.51	10.817	5	2	
7	X2	SAU	2.5X2X0.1875	36.0	80.08	Comp	80.08	16AX	-11.454	NESC Ext	14.303	18.200	20.391	0.500	0.500	0.500	129.55	127.32	9.220	5	2	
8	X3	SAU	4X3X0.25	36.0	60.80	Comp	60.80	17AX	-24.087	NESC Hea	39.613	45.500	67.969	0.500	0.750	0.500	100.45	105.33	10.000	2	5	
9	X4	SAU	3.5X2.5X0.25	36.0	52.48	Comp	52.48	18AX	-17.180	NESC Hea	32.738	36.400	54.375	0.500	0.750	0.500	104.34	108.25	8.521	2	4	
10	X5	SAU	4X3.5X0.3125	36.0	64.38	Tens	62.82	19AX	-38.448	NESC Hea	61.204	63.700	118.945	0.500	0.750	0.500	77.55	88.16	9.220	2	7	
11	X6	SAU	5X3.5X0.25	36.0	56.60	Comp	56.60	21BY	-25.093	NESC Hea	44.335	54.600	81.562	0.580	0.580	0.580	95.79	101.84	10.597	2	6	
12	X7	SAU	4X3X0.25	36.0	49.90	Comp	49.90	22AX	-15.461	NESC Hea	30.985	36.400	54.375	0.560	0.560	0.560	126.41	124.92	12.246	5	4	
13	X8	SAU	3.5X3X0.25	36.0	43.31	Tens	42.54	23AX	-9.588	NESC Hea	22.542	27.300	40.781	0.550	0.550	0.550	147.17					

```
140.74 14.070     5     3
    14           X9   SAU          5X3X0.25     36.0 53.73  Comp 53.73    24AX  -11.516NESC Hea   21.431   27.300   40.781 0.550 0.550 0.550 173.71
160.96 17.450     5     3
    15           D1   SAU          5X3X0.25     36.0 99.85  Tens 32.46    25AY  -10.972NESC Hea   33.799   63.700   95.156 1.000 0.500 0.500 127.63
125.86 14.103     5     7
    16           D2   SAE        2X2X0.1875     36.0 38.11  Tens 16.12    26AX   -0.652NESC Hea    4.044   18.200   20.391 0.500 0.500 0.500 256.65
224.16 16.853     5     2
    17           D3   SAU          3X2X0.25     36.0 77.70  Tens 54.88   27AXY   -3.523NESC Hea    6.420   36.400   54.375 1.000 0.500 0.500 264.74
230.33 19.194     5     4
    18           D4   SAU          4X3X0.25     36.0 78.53  Comp 78.53    28AY   -9.022NESC Hea   11.489   45.500   67.969 0.500 1.000 0.500 205.19
205.19 15.321     4     5
    19           D5   SAU        3.5X3X0.25     36.0 83.82  Tens 23.47   29AXY   -6.020NESC Hea   25.652   45.500   67.969 0.250 0.250 0.250 135.61
131.93 28.523     5     5
    20           H1   SAE 1.75X1.75X0.1875     36.0 51.33  Tens 18.18     32X   -0.732NESC Ext    4.027    9.100   10.195 1.000 1.000 1.000 209.91
209.91  6.000     4     1
    21           H2   SAU        4X3.5X0.25     36.0 57.10  Comp 57.10    37AP  -15.588NESC Hea   27.341   27.300   40.781 1.000 0.500 0.500 148.70
137.65 15.738     6     3
    22           H3   SAE        3X3X0.1875     36.0 35.58  Comp 35.58    38BX   -4.093NESC Ext   11.503   18.200   20.391 1.000 1.000 1.000 192.66
164.68  9.569     6     2
    23           H4   SAU          5X3X0.25     36.0 53.26  Comp 53.26    39AP   -9.692NESC Hea   21.560   18.200   27.187 1.000 1.000 1.000 173.07
160.48  9.562     5     2
    24           H5   SAE      3.5X3.5X0.25     36.0 30.26  Comp 30.26     40X   -4.051NESC Ext   13.386   18.200   27.187 1.000 1.000 1.000 233.97
190.09 13.531     6     2
    25          X10   SAE 1.75X1.75X0.1875     36.0  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
    26          X11   SAE        2X2X0.1875     36.0 39.36  Comp 39.36   43CXY   -4.954NESC Hea   12.587   18.200   20.391 1.000 1.000 1.000 129.22
127.06  4.243     5     2
    27          X12   SAU      2.5X2X0.1875     36.0 12.71  Comp 12.71    44BP   -1.848NESC Hea   14.533   18.200   20.391 0.750 0.500 0.500 128.22
126.30  9.125     5     2
    28           H6   SAU          4X3X0.25     36.0 41.49  Tens  0.00    45BP    0.000            35.407   18.200   27.187 1.000 1.000 1.000 110.60
115.30  6.000     3     2
    29           D6   SAU        3X2X0.1875     36.0 38.23  Comp 38.23     46X   -2.957NESC Hea    7.736   18.200   20.391 1.000 0.500 0.500 201.94
182.48 14.775     5     2
    30         HGR1   SAU      2.5X2X0.1875     36.0 44.63  Tens  0.00    49AY    0.000             5.486   18.200   20.391 1.000 0.500 0.500 205.58
205.58 13.585     4     2
    31         HGR2   SAE        3X3X0.1875     36.0 45.47  Tens  0.00    48AY    0.000             8.140   18.200   20.391 1.000 0.500 0.500 195.77
195.77 15.319     4     2
    32           A1   SAE          3X3X0.25     36.0 67.22  Tens 16.31    50XY   -2.969NESC Ext   21.867   18.200   27.187 0.500 0.500 0.500 142.64
137.29 14.073     5     2
    33           A2   SAU        3.5X3X0.25     36.0 49.90  Tens 43.37    53BP  -11.841NESC Hea   33.416   27.300   40.781 1.000 1.000 1.000 106.97
113.49  5.625     3     3
    34           A#   SAE          4X4X0.25     36.0 48.28  Comp 48.28    52BP  -20.386NESC Hea   42.220   45.500   67.969 1.000 1.000 1.000 103.77
111.89  6.875     3     5
    35           H7   SAU      2.5X2X0.1875     36.0 14.97  Comp 14.97     54X   -1.221NESC Hea    8.154    9.100   10.195 1.000 1.000 1.000 168.62
168.62  6.000     4     1
    36           H8   DAE 1.75X1.75X0.1875     36.0 56.74  Comp 56.74     36P   -9.533NESC Ext   19.743   16.800   20.391 1.000 1.000 1.000 134.08
134.08  6.000     4     1
  Pwmnt 12" Std. Pipe Pwmnt    Pipe 12" Std.    42.0  8.62  Comp  8.62   g101P  -22.432NESC Hea  260.146    0.000    0.000 1.000 1.000 1.000 122.32
122.32 44.750     4     0
  PMBR1     L2x2x3/16   SAE        2X2X0.1875     36.0  7.68  Comp  7.68   g108P   -0.783NESC Hea   20.044   16.800   10.195 1.000 1.000 1.000  45.69
82.84  1.500     3     1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize
moments): g107P  ??
  PMBR2 L2.5x2.5x3/16   SAE    2.5X2.5X0.1875     36.0 38.23  Comp 38.23   g111P   -3.897NESC Ext   22.126   16.800   10.195 1.000 1.000 1.000  81.32
100.66  3.354     3     1
  PMBR3     L3x3x3/16   SAE        3X3X0.1875     36.0  1.18  Comp  1.18   g114P   -0.120NESC Hea   11.823   16.800   10.195 1.000 1.000 1.000 162.44
162.44  8.068     4     1
  PMBR4  L3.5x3.5x1/4   SAE      3.5X3.5X0.25     36.0 14.45  Comp 14.45   g116X   -1.964NESC Ext   17.249   16.800   13.594 1.000 1.000 1.000 167.46
167.46  9.685     4     1
  PMBR5      L4x4x1/4   SAE          4X4X0.25     36.0  8.50  Comp  8.50   g120P   -1.156NESC Ext   16.004   16.800   13.594 1.000 1.000 1.000 186.27
```

186.27 12.340 4 1
20a H1 SAE 1.75X1.75X0.1875 36.0 28.02 Comp 28.02 30AY -2.549NESC Hea 13.441 9.100 10.195 0.500 0.500 0.500 104.96
112.48 6.000 3 1
AngleR L2x2x1/4 SAE 2X2X0.25 36.0 48.18 Tens 42.26 42XY -3.846NESC Ext 15.869 9.100 13.594 1.000 1.000 1.000 130.21
130.21 4.243 4 1
BraceR L2.5x2.5x1/4 SAE 2.5X2.5X0.25 36.0 58.01 Comp 58.01 g110X -7.886NESC Ext 29.101 16.800 13.594 1.000 1.000 1.000 81.98
100.99 3.354 3 1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g110P g110X ??
Plate 6"x3/4" PL Bar 6x3/4 36.0 4.85 Tens 0.00 g106P 0.000 109.423 16.800 0.000 1.000 1.000 1.000 83.19
101.59 1.501 3 1

Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max 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.	Hole Diameter (in)
1	LEG1	SAE	3.5X3.5X0.25	36.0	89.52	Comp	73.91	3X	26.902NESC Ext	47.340	36.400	54.375	60.417	7.000	4	2.000	0.75
2	LEG2	SAE	6X6X0.3125	36.0	83.52	Comp	76.75	5X	74.945NESC Ext	97.650	109.200	203.906	183.656	6.050	12	4.000	0.75
3	LEG3	SAE	8X8X0.5	36.0	60.13	Tens	60.13	7X	139.348NESC Ext	231.750	254.800	380.624	395.849	7.000	14	3.500	0.75
4	LEG4	SAE	8X8X0.625	36.0	62.80	Comp	59.83	9X	171.643NESC Ext	286.897	0.000	0.000	0.000	7.915	0	3.500	0.75
5	LEG5	SAE	8X8X0.75	36.0	56.54	Comp	51.91	11X	171.750NESC Ext	330.839	0.000	0.000	0.000	10.131	0	4.000	0.75
6	X1	SAE	2.5X2.5X0.1875	36.0	89.59	Comp	89.11	15AP	15.363NESC Ext	24.669	18.200	20.391	17.241	10.817	2	1.000	0.75
7	X2	SAU	2.5X2X0.1875	36.0	80.08	Comp	69.16	16AP	12.535NESC Ext	18.650	18.200	20.391	18.125	9.220	2	1.000	0.75
8	X3	SAU	4X3X0.25	36.0	60.80	Comp	60.11	17AP	26.561NESC Hea	44.185	45.500	67.969	52.912	10.000	5	1.740	0.75
9	X4	SAU	3.5X2.5X0.25	36.0	52.48	Comp	50.71	18AP	18.460NESC Hea	40.399	36.400	54.375	42.647	8.521	4	1.030	0.75
10	X5	SAU	4X3.5X0.3125	36.0	64.38	Tens	64.38	20AP	38.180NESC Hea	59.307	63.700	118.945	74.976	9.220	7	1.790	0.75
11	X6	SAU	5X3.5X0.25	36.0	56.60	Comp	49.51	21AP	22.368NESC Hea	45.178	54.600	81.562	46.012	10.597	6	1.550	0.75
12	X7	SAU	4X3X0.25	36.0	49.90	Comp	38.57	22BP	14.040NESC Hea	40.581	36.400	54.375	42.206	12.246	4	1.000	0.75
13	X8	SAU	3.5X3X0.25	36.0	43.31	Tens	43.31	23AP	11.823NESC Hea	40.419	27.300	40.781	38.516	14.070	3	1.000	0.75
14	X9	SAU	5X3X0.25	36.0	53.73	Comp	25.78	24AP	7.039NESC Hea	40.581	27.300	40.781	36.250	17.450	3	1.000	0.75
15	D1	SAU	5X3X0.25	36.0	99.85	Tens	99.85	25AP	36.214NESC Hea	36.268	63.700	95.156	72.037	14.103	7	1.710	0.75
16	D2	SAE	2X2X0.1875	36.0	38.11	Tens	38.11	26BX	6.908NESC Ext	18.448	18.200	20.391	18.125	16.853	2	1.000	0.75
17	D3	SAU	3X2X0.25	36.0	77.70	Tens	77.70	27AX	18.944NESC Hea	24.381	36.400	54.375	48.333	19.194	4	1.000	0.75

18		D4	SAU	4X3X0.25	36.0	78.53	Comp	68.59	28AP	31.209NESC	Ext	47.101	45.500	67.969	60.337	15.321	5	1.260	0.75
19		D5	SAU	3.5X3X0.25	36.0	83.82	Tens	83.82	29AX	37.273NESC	Ext	44.469	45.500	67.969	50.906	28.523	5	1.000	0.75
20		H1	SAE	1.75X1.75X0.1875	36.0	51.33	Tens	51.33	33Y	3.392NESC	Hea	15.532	9.100	10.195	6.609	6.000	1	1.000	0.75
21		H2	SAU	4X3.5X0.25	36.0	57.10	Comp	15.18	37AY	4.143NESC	Hea	48.519	27.300	40.781	36.250	15.738	3	1.000	0.75
22		H3	SAE	3X3X0.1875	36.0	35.58	Comp	5.27	38AXY	0.956NESC	Ext	30.760	18.200	20.391	18.125	9.569	2	1.000	0.75
23		H4	SAU	5X3X0.25	36.0	53.26	Comp	44.25	F39C2118X	8.054NESC	Ext	40.581	18.200	27.187	24.167	2.208	2	1.000	0.75
24		H5	SAE	3.5X3.5X0.25	36.0	30.26	Comp	23.13	40P	4.209NESC	Ext	48.681	18.200	27.187	25.677	13.531	2	1.000	0.75
25		X10	SAE	1.75X1.75X0.1875	36.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0	0.000	0
26		X11	SAE	2X2X0.1875	36.0	39.36	Comp	26.91	43BX	3.323NESC	Hea	18.448	18.200	20.391	12.347	4.243	2	1.000	0.75
27		X12	SAU	2.5X2X0.1875	36.0	12.71	Comp	10.46	44CY	1.895NESC	Hea	18.650	18.200	20.391	18.125	9.125	2	1.000	0.75
28		H6	SAU	4X3X0.25	36.0	41.49	Tens	41.49	45BP	7.551NESC	Hea	40.581	18.200	27.187	24.167	6.000	2	1.000	0.75
29		D6	SAU	3X2X0.1875	36.0	38.23	Comp	0.00	46Y	0.000		18.529	18.200	20.391	12.755	14.775	2	1.000	0.75
30		HGR1	SAU	2.5X2X0.1875	36.0	44.63	Tens	44.63	47P	5.692NESC	Hea	18.650	18.200	20.391	12.755	13.250	2	1.000	0.75
31		HGR2	SAE	3X3X0.1875	36.0	45.47	Tens	45.47	48P	8.241NESC	Hea	30.760	18.200	20.391	18.125	15.022	2	1.000	0.75
32		A1	SAE	3X3X0.25	36.0	67.22	Tens	67.22	50P	12.184NESC	Hea	36.997	18.200	27.187	18.125	14.073	2	1.590	0.75
33		A2	SAU	3.5X3X0.25	36.0	49.90	Tens	49.90	53P	16.409NESC	Hea	32.886	36.400	54.375	42.647	11.643	4	2.240	0.75
34		A#	SAE	4X4X0.25	36.0	48.28	Comp	16.82	52P	7.653NESC	Hea	46.393	45.500	67.969	48.262	14.073	5	2.710	0.75
35		H7	SAU	2.5X2X0.1875	36.0	14.97	Comp	4.06	54P	0.370NESC	Ext	21.688	9.100	10.195	9.629	6.000	1	1.000	0.75
36		H8	DAE	1.75X1.75X0.1875	36.0	56.74	Comp	55.01	36X	8.177NESC	Ext	31.823	16.800	20.391	14.864	6.000	1	2.000	0.6875
Pwmnt	12" Std. Pipe	Pwmnt	Pipe	12" Std.	42.0	8.62	Comp	0.00	g121P	0.000		571.199	0.000	0.000	0.000	9.000	0	0.000	0
PMBR1	**L2x2x3/16**	**SAE**		**2X2X0.1875**	**36.0**	**7.68**	**Comp**	**0.00**	**g109P**	**0.000**		**18.827**	**16.800**	**10.195**	**10.343**	**1.500**	**1**	**1.000**	**0.6875 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g107P ??**
PMBR2	L2.5x2.5x3/16	SAE		2.5X2.5X0.1875	36.0	38.23	Comp	31.08	g111X	3.169NESC	Ext	25.048	16.800	10.195	11.328	3.354	1	1.000	0.6875
PMBR3	L3x3x3/16	SAE		3X3X0.1875	36.0	1.18	Comp	0.77	g114P	0.079NESC	Ext	31.139	16.800	10.195	11.328	8.068	1	1.000	0.6875
PMBR4	L3.5x3.5x1/4	SAE		3.5X3.5X0.25	36.0	14.45	Comp	12.91	g116P	1.754NESC	Ext	49.187	16.800	13.594	15.104	9.685	1	1.000	0.6875
PMBR5	L4x4x1/4	SAE		4X4X0.25	36.0	8.50	Comp	7.94	g120X	1.079NESC	Ext	57.287	16.800	13.594	15.104	12.340	1	1.000	0.6875
20a		H1	SAE	1.75X1.75X0.1875	36.0	28.02	Comp	8.33	30BP	0.551NESC	Hea	15.532	9.100	10.195	6.609	6.000	1	1.000	0.75
AngleR	L2x2x1/4	SAE		2X2X0.25	36.0	48.18	Tens	48.18	42Y	4.246NESC	Ext	24.381	9.100	13.594	8.812	4.243	1	1.000	0.75
BraceR	**L2.5x2.5x1/4**	**SAE**		**2.5X2.5X0.25**	**36.0**	**58.01**	**Comp**	**57.18**	**g110P**	**7.772NESC**	**Ext**	**32.987**	**16.800**	**13.594**	**15.104**	**3.354**	**1**	**1.000**	**0.6875 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g110P g110X ??**
Plate	6"x3/4" PL	Bar		6x3/4	36.0	4.85	Tens	4.85	g106P	0.814NESC	Hea	145.800	16.800	0.000	0.000	1.501	1		

1.000 0.6875

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	99.85	25AP	Angle
NESC Extreme	89.59	15AX	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	10.93	NESC Extreme	0.0
2	Clamp	17.61	NESC Heavy	0.0
3	Clamp	17.23	NESC Heavy	0.0
4	Clamp	16.69	NESC Heavy	0.0
5	Clamp	24.85	NESC Heavy	0.0
6	Clamp	15.25	NESC Heavy	0.0
7	Clamp	22.15	NESC Heavy	0.0
8	Clamp	20.78	NESC Heavy	0.0
9	Clamp	24.05	NESC Heavy	0.0
10	Clamp	19.62	NESC Heavy	0.0
11	Clamp	27.18	NESC Heavy	0.0
12	Clamp	1.65	NESC Extreme	0.0
13	Clamp	1.91	NESC Extreme	0.0
14	Clamp	2.36	NESC Heavy	0.0
15	Clamp	3.82	NESC Extreme	0.0
16	Clamp	4.53	NESC Extreme	0.0
17	Clamp	3.70	NESC Heavy	0.0
18	Clamp	3.17	NESC Heavy	0.0
19	Clamp	6.07	NESC Heavy	0.0
20	Clamp	9.38	NESC Heavy	0.0
21	Clamp	10.11	NESC Heavy	0.0
22	Clamp	9.68	NESC Heavy	0.0
23	Clamp	4.63	NESC Heavy	0.0
24	Clamp	4.96	NESC Heavy	0.0
25	Clamp	3.22	NESC Heavy	0.0
26	Clamp	9.06	NESC Extreme	0.0
27	Clamp	17.07	NESC Heavy	0.0
28	Clamp	2.34	NESC Extreme	0.0
29	Clamp	3.05	NESC Heavy	0.0
30	Clamp	2.49	NESC Heavy	0.0
31	Clamp	4.25	NESC Heavy	0.0

*** Weight of structure (lbs):
    Weight of Angles*Section DLF: 38857.7
    Total: 38857.7

*** End of Report

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*****************************************************************************
*                                                                           *
* TOWER - Analysis and Design -  Copyright Power Line Systems, Inc. 1986-2011 *
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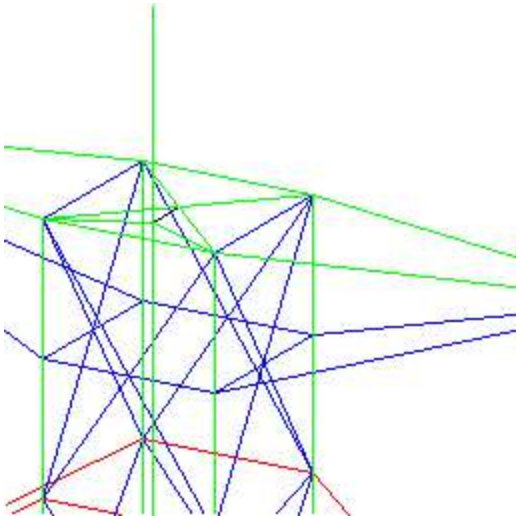
Project Name : 17159.07 - Greenwich, CT
Project Notes: Structure #1281 / Sprint CT03XC338
Project File : J:\Jobs\1715900.WI\07_CT03XC338 Greenwich\04_Structural\Backup Documentation\Rev (1)\PLS Tower\CL&P # 1281.tow
Date run   : 9:20:53 AM Tuesday, February 05, 2019
by   : Tower Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

KL/R value of 200.30 exceeds maximum of 200.00 for member "g118P" ??
Problem calculating gross area of longitudinal face for section "1": width is zero at elevation 128.80 (ft) which is not the top of the section. ??
Problem calculating gross area of longitudinal face for section "2": width is zero at elevation -4.25 (ft) which is not the top of the section. ??
Unusual number of fixed joints found: 5. Towers normally have from between 1 and 4 fixed joints. ??
The model has 4 warnings. ??



Nonlinear convergence parameters: Use Standard Parameters
Tension only member maximum compression load as a percent of compression capacity: 100%
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	XY-Symmetry	3	3	128.8	Free	Free	Free	Free	Free	Free

2P	XY-Symmetry	3	3	124.3	Free	Free	Free	Free	Free	Free
3P	XY-Symmetry	3	3	119.8	Free	Free	Free	Free	Free	Free
4P	XY-Symmetry	3	3	112.8	Free	Free	Free	Free	Free	Free
5P	XY-Symmetry	3	3	104.8	Free	Free	Free	Free	Free	Free
6P	XY-Symmetry	3	3	98.75	Free	Free	Free	Free	Free	Free
7P	XY-Symmetry	3	3	91.75	Free	Free	Free	Free	Free	Free
8P	XY-Symmetry	3	3	84.75	Free	Free	Free	Free	Free	Free
15P	XY-Symmetry	15.44	15.44	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
16P	X-Symmetry	0	16.75	128.8	Free	Free	Free	Free	Free	Free
17P	Y-Symmetry	3	-14.25	112.8	Free	Free	Free	Free	Free	Free
18P	Y-Symmetry	3	-16.75	98.75	Free	Free	Free	Free	Free	Free
19P	Y-Symmetry	3	-14.25	84.75	Free	Free	Free	Free	Free	Free
20AP	Y-Symmetry	9.568	0	40	Free	Free	Free	Free	Free	Free
20BP	X-Symmetry	0	9.568	40	Free	Free	Free	Free	Free	Free
21P	XY-Symmetry	11.77	2.208	25	Free	Free	Free	Free	Free	Free
22P	XY-Symmetry	2.208	11.77	25	Free	Free	Free	Free	Free	Free
23P	None	0	14.25	112.8	Free	Free	Free	Free	Free	Free
24P	None	0	16.75	98.75	Free	Free	Free	Free	Free	Free
25P	None	0	14.25	84.75	Free	Free	Free	Free	Free	Free
26P	Y-Symmetry	3	-8.625	112.8	Free	Free	Free	Free	Free	Free
27P	Y-Symmetry	3	-9.875	98.75	Free	Free	Free	Free	Free	Free
28P	Y-Symmetry	3	-8.625	84.75	Free	Free	Free	Free	Free	Free
29P	None	1.5	0	-4.25	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
30P	None	1.5	0	25	Free	Free	Free	Free	Free	Free
31P	None	1.5	0	40	Free	Free	Free	Free	Free	Free
32P	None	1.5	0	84.75	Free	Free	Free	Free	Free	Free
33P	None	1.5	0	98.75	Free	Free	Free	Free	Free	Free
34P	None	1.5	0	112.8	Free	Free	Free	Free	Free	Free
35P	None	1.5	0	128.8	Free	Free	Free	Free	Free	Free
36P	None	1.5	0	134.8	Free	Free	Free	Free	Free	Free
37P	None	1.5	0	143.8	Free	Free	Free	Free	Free	Free
1X	X-GenXY	3	-3	128.8	Free	Free	Free	Free	Free	Free
1XY	XY-GenXY	-3	-3	128.8	Free	Free	Free	Free	Free	Free
1Y	Y-GenXY	-3	3	128.8	Free	Free	Free	Free	Free	Free
2X	X-GenXY	3	-3	124.3	Free	Free	Free	Free	Free	Free
2XY	XY-GenXY	-3	-3	124.3	Free	Free	Free	Free	Free	Free
2Y	Y-GenXY	-3	3	124.3	Free	Free	Free	Free	Free	Free
3X	X-GenXY	3	-3	119.8	Free	Free	Free	Free	Free	Free
3XY	XY-GenXY	-3	-3	119.8	Free	Free	Free	Free	Free	Free
3Y	Y-GenXY	-3	3	119.8	Free	Free	Free	Free	Free	Free
4X	X-GenXY	3	-3	112.8	Free	Free	Free	Free	Free	Free
4XY	XY-GenXY	-3	-3	112.8	Free	Free	Free	Free	Free	Free
4Y	Y-GenXY	-3	3	112.8	Free	Free	Free	Free	Free	Free
5X	X-GenXY	3	-3	104.8	Free	Free	Free	Free	Free	Free
5XY	XY-GenXY	-3	-3	104.8	Free	Free	Free	Free	Free	Free
5Y	Y-GenXY	-3	3	104.8	Free	Free	Free	Free	Free	Free
6X	X-GenXY	3	-3	98.75	Free	Free	Free	Free	Free	Free
6XY	XY-GenXY	-3	-3	98.75	Free	Free	Free	Free	Free	Free
6Y	Y-GenXY	-3	3	98.75	Free	Free	Free	Free	Free	Free
7X	X-GenXY	3	-3	91.75	Free	Free	Free	Free	Free	Free
7XY	XY-GenXY	-3	-3	91.75	Free	Free	Free	Free	Free	Free
7Y	Y-GenXY	-3	3	91.75	Free	Free	Free	Free	Free	Free
8X	X-GenXY	3	-3	84.75	Free	Free	Free	Free	Free	Free
8XY	XY-GenXY	-3	-3	84.75	Free	Free	Free	Free	Free	Free
8Y	Y-GenXY	-3	3	84.75	Free	Free	Free	Free	Free	Free
15X	X-GenXY	15.44	-15.44	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
15XY	XY-GenXY	-15.44	-15.44	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
15Y	Y-GenXY	-15.44	15.44	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
16X	X-Gen	0	-16.75	128.8	Free	Free	Free	Free	Free	Free

17Y	Y-Gen	-3	-14.25	112.8	Free	Free	Free	Free	Free	Free
18Y	Y-Gen	-3	-16.75	98.75	Free	Free	Free	Free	Free	Free
19Y	Y-Gen	-3	-14.25	84.75	Free	Free	Free	Free	Free	Free
20AY	Y-Gen	-9.568	0	40	Free	Free	Free	Free	Free	Free
20BX	X-Gen	0	-9.568	40	Free	Free	Free	Free	Free	Free
21X	X-GenXY	11.77	-2.208	25	Free	Free	Free	Free	Free	Free
21XY	XY-GenXY	-11.77	-2.208	25	Free	Free	Free	Free	Free	Free
21Y	Y-GenXY	-11.77	2.208	25	Free	Free	Free	Free	Free	Free
22X	X-GenXY	2.208	-11.77	25	Free	Free	Free	Free	Free	Free
22XY	XY-GenXY	-2.208	-11.77	25	Free	Free	Free	Free	Free	Free
22Y	Y-GenXY	-2.208	11.77	25	Free	Free	Free	Free	Free	Free
26Y	Y-Gen	-3	-8.625	112.8	Free	Free	Free	Free	Free	Free
27Y	Y-Gen	-3	-9.875	98.75	Free	Free	Free	Free	Free	Free
28Y	Y-Gen	-3	-8.625	84.75	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.
9S	XY-Symmetry	8P	15P	0	77	Free	Free	Free	Free	Free	Free
10S	XY-Symmetry	8P	15P	0	69.25	Free	Free	Free	Free	Free	Free
11S	XY-Symmetry	8P	15P	0	61.5	Free	Free	Free	Free	Free	Free
12S	XY-Symmetry	8P	15P	0	51.58	Free	Free	Free	Free	Free	Free
13S	XY-Symmetry	8P	15P	0	40	Free	Free	Free	Free	Free	Free
14S	XY-Symmetry	8P	15P	0	25	Free	Free	Free	Free	Free	Free
i0.50E129S	None	1X	1Y	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E113S	None	4X	4Y	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E99S	None	6X	6Y	0.5	0	Free	Free	Free	Free	Free	Free
i0.50E85S	None	8X	8Y	0.5	0	Free	Free	Free	Free	Free	Free
21XF0.50S	Y-Symmetry	21X	21P	0.5	0	Free	Free	Free	Free	Free	Free
22PF0.50S	X-Symmetry	22P	22Y	0.5	0	Free	Free	Free	Free	Free	Free
9X	X-GenXY	8P	15P	0	77	Free	Free	Free	Free	Free	Free
9XY	XY-GenXY	8P	15P	0	77	Free	Free	Free	Free	Free	Free
9Y	Y-GenXY	8P	15P	0	77	Free	Free	Free	Free	Free	Free
10X	X-GenXY	8P	15P	0	69.25	Free	Free	Free	Free	Free	Free
10XY	XY-GenXY	8P	15P	0	69.25	Free	Free	Free	Free	Free	Free
10Y	Y-GenXY	8P	15P	0	69.25	Free	Free	Free	Free	Free	Free
11X	X-GenXY	8P	15P	0	61.5	Free	Free	Free	Free	Free	Free
11XY	XY-GenXY	8P	15P	0	61.5	Free	Free	Free	Free	Free	Free
11Y	Y-GenXY	8P	15P	0	61.5	Free	Free	Free	Free	Free	Free
12X	X-GenXY	8P	15P	0	51.58	Free	Free	Free	Free	Free	Free
12XY	XY-GenXY	8P	15P	0	51.58	Free	Free	Free	Free	Free	Free
12Y	Y-GenXY	8P	15P	0	51.58	Free	Free	Free	Free	Free	Free
13X	X-GenXY	8P	15P	0	40	Free	Free	Free	Free	Free	Free
13XY	XY-GenXY	8P	15P	0	40	Free	Free	Free	Free	Free	Free
13Y	Y-GenXY	8P	15P	0	40	Free	Free	Free	Free	Free	Free
14X	X-GenXY	8P	15P	0	25	Free	Free	Free	Free	Free	Free
14XY	XY-GenXY	8P	15P	0	25	Free	Free	Free	Free	Free	Free
14Y	Y-GenXY	8P	15P	0	25	Free	Free	Free	Free	Free	Free
21XF0.50Y	Y-Gen	21X	21P	0.5	0	Free	Free	Free	Free	Free	Free
22PF0.50X	X-Gen	22P	22Y	0.5	0	Free	Free	Free	Free	Free	Free

The model contains 74 primary and 32 secondary joints for a total of 106 joints.

Steel Material Properties:

Steel	Modulus	Yield	Ultimate	Member	Member	Member	Member	Member	Member

Material Label	of Elasticity (ksi)	Stress Fy (ksi)	Stress All. Fu (ksi)	Stress All. Hyp. 1 (ksi)	Stress All. Hyp. 2 (ksi)	Rupture Hyp. 1 (ksi)	Rupture Hyp. 2 (ksi)	Bearing Hyp. 1 (ksi)	Bearing Hyp. 2 (ksi)
A 36	2.9e+004	36	58	0	0	0	0	0	0
A500-42	2.9e+004	42	58	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	1246
5/8 A325	22

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.	Optimize Cost Factor	Section Modulus (in^3)
SAE	8X8X0.75	8	8	0.75	38.9	11.44	8.83	2.47	2.47	1.58	1	8	4	0	1.0000	0
SAE	8X8X0.625	8	8	0.625	32.7	9.61	10.8	2.49	2.49	1.58	1	8	4	0	1.0000	0
SAE	8X8X0.5	8	8	0.5	26.4	7.75	13.75	2.5	2.5	1.59	1	8	4	0	1.0000	0
SAE	6X6X0.3125	6	6	0.3125	12.5	3.65	16.6	1.89	1.89	1.2	1	6	3	0	1.0000	0
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	3X3X0.25	3	3	0.25	4.9	1.44	9.75	0.93	0.93	0.592	1	3	1.5	0	1.0000	0
SAE	3X3X0.1875	3	3	0.1875	3.71	1.09	13.33	0.939	0.939	0.596	1	3	1.5	0	1.0000	0
SAE	2.5X2.5X0.25	2.5	2.5	0.25	4.1	1.19	7.75	0.769	0.769	0.491	1	2.5	1.25	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	5X3.5X0.25	5	3.5	0.25	7	2.06	17	1.62	1.04	0.77	1	5	1.75	0	1.0000	0
SAU	5X3X0.25	5	3	0.25	6.6	1.94	17	1.62	0.861	0.663	1	5	1.5	0	1.0000	0
SAU	4X3.5X0.3125	4	3.5	0.3125	7.7	2.25	10.4	1.26	1.07	0.73	1	4	1.75	0	1.0000	0
SAU	4X3.5X0.25	4	3.5	0.25	6.2	1.81	13.25	1.27	1.07	0.734	1	4	1.75	0	1.0000	0
SAU	4X3X0.25	4	3	0.25	5.8	1.69	13.25	1.28	0.896	0.651	1	4	1.5	0	1.0000	0
SAU	3.5X3X0.25	3.5	3	0.25	5.4	1.56	11.25	1.11	0.914	0.631	1	3.5	1.5	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	3X2X0.25	3	2	0.25	4.1	1.19	9.75	0.957	0.574	0.435	1	3	1	0	1.0000	0
SAU	3X2X0.1875	3	2	0.1875	3.07	0.9	13.33	0.966	0.583	0.439	1	3	1	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
Pwmnt	Pipe 12" Std.	12.75	12	0	49.6	13.6	1	4.39	4.39	4.39	1	12.75	0	0	0.0000	0
Bar	6x3/4	6	0.75	0	15.3	4.5	8	0.2165	1.732	1.732	1	6	0	0	0.0000	0
DAE	1.75X1.75X0.1875	1.75	1.75	0.1875	4.2	1.24	7	0.537	0.738	0.537	2	3.5	0	0	0.0000	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)
1	LEG1	SAE	3.5X3.5X0.25	A 36	Beam	Leg	None	0.000
2	LEG2	SAE	6X6X0.3125	A 36	Beam	Leg	None	0.000
3	LEG3	SAE	8X8X0.5	A 36	Beam	Leg	None	0.000
4	LEG4	SAE	8X8X0.625	A 36	Beam	Leg	None	0.000
5	LEG5	SAE	8X8X0.75	A 36	Beam	Leg	None	0.000
6	X1	SAE	2.5X2.5X0.1875	A 36	Truss	Crossing Diagonal	None	0.000
7	X2	SAU	2.5X2X0.1875	A 36	Truss	Crossing Diagonal	None	0.000
8	X3	SAU	4X3X0.25	A 36	Truss	Crossing Diagonal	None	0.000
9	X4	SAU	3.5X2.5X0.25	A 36	Truss	Crossing Diagonal	None	0.000
10	X5	SAU	4X3.5X0.3125	A 36	Truss	Crossing Diagonal	None	0.000
11	X6	SAU	5X3.5X0.25	A 36	Truss	Crossing Diagonal	None	0.000
12	X7	SAU	4X3X0.25	A 36	Truss	Crossing Diagonal	None	0.000
13	X8	SAU	3.5X3X0.25	A 36	Truss	Crossing Diagonal	None	0.000
14	X9	SAU	5X3X0.25	A 36	Truss	Crossing Diagonal	None	0.000
15	D1	SAU	5X3X0.25	A 36	Truss	Other	None	0.000
16	D2	SAE	2X2X0.1875	A 36	T-Only	Other	None	0.000
17	D3	SAU	3X2X0.25	A 36	T-Only	Other	None	0.000
18	D4	SAU	4X3X0.25	A 36	T-Only	Other	None	0.000
19	D5	SAU	3.5X3X0.25	A 36	Truss	Other	None	0.000
20	H1	SAE	1.75X1.75X0.1875	A 36	T-Only	Other	None	0.000
21	H2	SAU	4X3.5X0.25	A 36	Truss	Other	None	0.000
22	H3	SAE	3X3X0.1875	A 36	Truss	Other	None	0.000
23	H4	SAU	5X3X0.25	A 36	Truss	Other	None	0.000
24	H5	SAE	3.5X3.5X0.25	A 36	Truss	Other	None	0.000
25	X10	SAE	1.75X1.75X0.1875	A 36	Beam	Other	None	0.000
26	X11	SAE	2X2X0.1875	A 36	Beam	Other	None	0.000
27	X12	SAU	2.5X2X0.1875	A 36	Truss	Other	None	0.000
28	H6	SAU	4X3X0.25	A 36	Truss	Other	None	0.000
29	D6	SAU	3X2X0.1875	A 36	Truss	Other	None	0.000
30	HGR1	SAU	2.5X2X0.1875	A 36	T-Only	Other	None	0.000
31	HGR2	SAE	3X3X0.1875	A 36	T-Only	Other	None	0.000
32	A1	SAE	3X3X0.25	A 36	Beam	Other	None	0.000
33	A2	SAU	3.5X3X0.25	A 36	Beam	Other	None	0.000
34	A#	SAE	4X4X0.25	A 36	Beam	Other	None	0.000
35	H7	SAU	2.5X2X0.1875	A 36	Truss	Other	None	0.000
36	H8	DAE	1.75X1.75X0.1875	A 36	T-Only Beam	Other	None	0.000
Pwmnt	12" Std. Pipe	Pwmnt	Pipe 12" Std.	A500-42	Beam	Other	None	0.000
PMBR1	L2x2x3/16	SAE	2X2X0.1875	A 36	Beam	Other	None	12.000
PMBR2	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	A 36	Beam	Other	None	12.000
PMBR3	L3x3x3/16	SAE	3X3X0.1875	A 36	Beam	Other	None	12.000
PMBR4	L3.5x3.5x1/4	SAE	3.5X3.5X0.25	A 36	Beam	Other	None	12.000
PMBR5	L4x4x1/4	SAE	4X4X0.25	A 36	Beam	Other	None	12.000
20a	H1	SAE	1.75X1.75X0.1875	A 36	Truss	Other	None	0.000
AngleR	L2x2x1/4	SAE	2X2X0.25	A 36	Beam	Other	None	0.000
BraceR	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	A 36	Beam	Other	None	0.000
Plate	6"x3/4" PL	Bar	6x3/4	A 36			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	A 36	212.92	248.41	1234.96
SAE	6X6X0.3125	A 36	56.20	112.40	702.50
SAE	8X8X0.5	A 36	56.00	149.33	1478.40
SAE	8X8X0.625	A 36	94.98	253.29	3105.93
SAE	8X8X0.75	A 36	251.24	669.98	9773.41
SAE	2.5X2.5X0.1875	A 36	106.66	88.88	327.44
SAU	2.5X2X0.1875	A 36	295.39	221.54	812.33
SAU	4X3X0.25	A 36	318.53	371.62	1847.48
SAU	3.5X2.5X0.25	A 36	68.17	68.17	334.01
SAU	4X3.5X0.3125	A 36	147.51	184.39	1135.85
SAU	5X3.5X0.25	A 36	84.78	120.10	593.45
SAU	3.5X3X0.25	A 36	456.32	494.34	2464.10
SAU	5X3X0.25	A 36	346.59	462.12	2287.47
SAE	2X2X0.1875	A 36	190.24	126.82	464.18
SAU	3X2X0.25	A 36	153.55	127.96	629.55
SAE	1.75X1.75X0.1875	A 36	84.00	49.00	178.08
DAE	1.75X1.75X0.1875	A 36	12.00	7.00	50.40
SAU	4X3.5X0.25	A 36	62.95	78.69	390.29
SAE	3X3X0.1875	A 36	145.30	145.30	539.06
SAE	2X2X0.25	A 36	16.97	11.31	54.14
SAU	3X2X0.1875	A 36	59.10	49.25	181.44
SAE	3X3X0.25	A 36	68.29	68.29	334.64
SAE	4X4X0.25	A 36	105.60	140.80	696.94
Pwmnt	Pipe 12" Std.	A500-42	148.00	610.50	7340.80
Bar	6x3/4	A 36	1.50	1.69	22.96
SAE	2.5X2.5X0.25	A 36	6.71	5.59	27.51

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	8X	1.050	3.300	3.300	1.100	1.100	0.000	0.000	1.000	1.000	0.000	0.000	None
2	29P	1.050	3.300	3.300	1.200	1.200	0.000	0.000	1.000	1.000	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.
1P	1		XY-Symmetry	1P	2P	1	4	1	1	1	5/8 A394	0	2	1	Both	0	0	0	0	0	0	0
1X	1		X-GenXY	1X	2X	1	4	1	1	1	5/8 A394	0	2	1	Both	0	0	0	0	0	0	0

1XY	1	XY-GenXY	1XY	2XY	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0	0	0	0
1Y	1	Y-GenXY	1Y	2Y	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0	0	0	0
2P	1	XY-Symmetry	2P	3P	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0	0	0	0
2X	1	X-GenXY	2X	3X	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0	0	0	0
2XY	1	XY-GenXY	2XY	3XY	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0	0	0	0
2Y	1	Y-GenXY	2Y	3Y	1	4	1	1	1 5/8	A394	0	2	1	Both	0	0	0	0	0	0	0	0
3P	1	XY-Symmetry	3P	4P	1	4	1	1	1 5/8	A394	4	2	1	Both	1.875	0	1.25	2.5	0	0	0	
3X	1	X-GenXY	3X	4X	1	4	1	1	1 5/8	A394	4	2	1	Both	1.875	0	1.25	2.5	0	0	0	
3XY	1	XY-GenXY	3XY	4XY	1	4	1	1	1 5/8	A394	4	2	1	Both	1.875	0	1.25	2.5	0	0	0	
3Y	1	Y-GenXY	3Y	4Y	1	4	1	1	1 5/8	A394	4	2	1	Both	1.875	0	1.25	2.5	0	0	0	
4P	2	XY-Symmetry	4P	5P	1	4	1	1	1 5/8	A394	0	4	1	Both	0	0	0	0	0	0	0	0
4X	2	X-GenXY	4X	5X	1	4	1	1	1 5/8	A394	0	4	1	Both	0	0	0	0	0	0	0	0
4XY	2	XY-GenXY	4XY	5XY	1	4	1	1	1 5/8	A394	0	4	1	Both	0	0	0	0	0	0	0	0
4Y	2	Y-GenXY	4Y	5Y	1	4	1	1	1 5/8	A394	0	4	1	Both	0	0	0	0	0	0	0	0
5P	2	XY-Symmetry	5P	6P	1	4	1	1	1 5/8	A394	12	4	1	Both	1.125	3.125	1.25	3.5	12.75	4	0	
5X	2	X-GenXY	5X	6X	1	4	1	1	1 5/8	A394	12	4	1	Both	1.125	3.125	1.25	3.5	12.75	4	0	
5XY	2	XY-GenXY	5XY	6XY	1	4	1	1	1 5/8	A394	12	4	1	Both	1.125	3.125	1.25	3.5	12.75	4	0	
5Y	2	Y-GenXY	5Y	6Y	1	4	1	1	1 5/8	A394	12	4	1	Both	1.125	3.125	1.25	3.5	12.75	4	0	
6P	3	XY-Symmetry	6P	7P	1	4	1	1	1 5/8	A394	0	3.5	1	Both	0	0	0	0	0	0	0	0
6X	3	X-GenXY	6X	7X	1	4	1	1	1 5/8	A394	0	3.5	1	Both	0	0	0	0	0	0	0	0
6XY	3	XY-GenXY	6XY	7XY	1	4	1	1	1 5/8	A394	0	3.5	1	Both	0	0	0	0	0	0	0	0
6Y	3	Y-GenXY	6Y	7Y	1	4	1	1	1 5/8	A394	0	3.5	1	Both	0	0	0	0	0	0	0	0
7P	3	XY-Symmetry	7P	8P	1	4	1	1	1 5/8	A394	14	3.5	2	Both	1.5	4.75	1.25	3	15.25	7.25	0	
7X	3	X-GenXY	7X	8X	1	4	1	1	1 5/8	A394	14	3.5	2	Both	1.5	4.75	1.25	3	15.25	7.25	0	
7XY	3	XY-GenXY	7XY	8XY	1	4	1	1	1 5/8	A394	14	3.5	2	Both	1.5	4.75	1.25	3	15.25	7.25	0	
7Y	3	Y-GenXY	7Y	8Y	1	4	1	1	1 5/8	A394	14	3.5	2	Both	1.5	4.75	1.25	3	15.25	7.25	0	
8P	4	XY-Symmetry	8P	9S	1	4	1	1	1 5/8	A394	0	3.5	1	Both	0	0	0	0	0	0	0	0
8X	4	X-GenXY	8X	9X	1	4	1	1	1 5/8	A394	0	3.5	1	Both	0	0	0	0	0	0	0	0
8XY	4	XY-GenXY	8XY	9XY	1	4	1	1	1 5/8	A394	0	3.5	1	Both	0	0	0	0	0	0	0	0
8Y	4	Y-GenXY	8Y	9Y	1	4	1	1	1 5/8	A394	0	3.5	1	Both	0	0	0	0	0	0	0	0

0	0	0	0																							
	9P	4		XY-Symmetry	9S	10S	1	4	1	1	1	5/8	A394	0	3.5	1	Both	0	0	0						
0	0	0	0																							
	9X	4		X-GenXY	9X	10X	1	4	1	1	1	5/8	A394	0	3.5	1	Both	0	0	0						
0	0	0	0																							
	9XY	4		XY-GenXY	9XY	10XY	1	4	1	1	1	5/8	A394	0	3.5	1	Both	0	0	0						
0	0	0	0																							
	9Y	4		Y-GenXY	9Y	10Y	1	4	1	1	1	5/8	A394	0	3.5	1	Both	0	0	0						
0	0	0	0																							
	10P	4		XY-Symmetry	10S	11S	1	4	1	1	1	5/8	A394	16	3.5	2	Both	1.5	4.75	1.25						
3	15.25	7.25	0																							
	10X	4		X-GenXY	10X	11X	1	4	1	1	1	5/8	A394	16	3.5	2	Both	1.5	4.75	1.25						
3	15.25	7.25	0																							
	10XY	4		XY-GenXY	10XY	11XY	1	4	1	1	1	5/8	A394	16	3.5	2	Both	1.5	4.75	1.25						
3	15.25	7.25	0																							
	10Y	4		Y-GenXY	10Y	11Y	1	4	1	1	1	5/8	A394	16	3.5	2	Both	1.5	4.75	1.25						
3	15.25	7.25	0																							
	11P	5		XY-Symmetry	11S	12S	1	4	1	1	1	5/8	A394	0	4	1	Both	0	0	0						
0	0	0	0																							
	11X	5		X-GenXY	11X	12X	1	4	1	1	1	5/8	A394	0	4	1	Both	0	0	0						
0	0	0	0																							
	11XY	5		XY-GenXY	11XY	12XY	1	4	1	1	1	5/8	A394	0	4	1	Both	0	0	0						
0	0	0	0																							
	11Y	5		Y-GenXY	11Y	12Y	1	4	1	1	1	5/8	A394	0	4	1	Both	0	0	0						
0	0	0	0																							
	12P	5		XY-Symmetry	12S	13S	1	4	0.5	0.5	0.5	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	12X	5		X-GenXY	12X	13X	1	4	0.5	0.5	0.5	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	12XY	5		XY-GenXY	12XY	13XY	1	4	0.5	0.5	0.5	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	12Y	5		Y-GenXY	12Y	13Y	1	4	0.5	0.5	0.5	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	13P	5		XY-Symmetry	13S	14S	1	4	0.5	0.5	0.5	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	13X	5		X-GenXY	13X	14X	1	4	0.5	0.5	0.5	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	13XY	5		XY-GenXY	13XY	14XY	1	4	0.5	0.5	0.5	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	13Y	5		Y-GenXY	13Y	14Y	1	4	0.5	0.5	0.5	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	14P	5		XY-Symmetry	14S	15P	1	4	0.25	0.25	0.25	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	14X	5		X-GenXY	14X	15X	1	4	0.25	0.25	0.25	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	14XY	5		XY-GenXY	14XY	15XY	1	4	0.25	0.25	0.25	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	14Y	5		Y-GenXY	14Y	15Y	1	4	0.25	0.25	0.25	5/8	A394	20	4	2	Both	1.25	4.75	1.25						
3.5	18.25	7.25	0																							
	15AP	6		XY-Symmetry	1P	3X	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	1						
2.25	0	0	0																							
	15AX	6		X-GenXY	1X	3P	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	1						
2.25	0	0	0																							
	15AXY	6		XY-GenXY	1XY	3Y	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	1						
2.25	0	0	0																							
	15AY	6		Y-GenXY	1Y	3XY	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	1						
2.25	0	0	0																							
	15BP	6		XY-Symmetry	3P	1Y	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	1						
2.25	0	0	0																							

15BX	6		X-GenXY	3X	1XY	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	1	2.25
0	0	0																		
15BXY	6		XY-GenXY	3XY	1X	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	1	2.25
0	0	0																		
15BY	6		Y-GenXY	3Y	1P	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	1	2.25
0	0	0																		
16AP	7		XY-Symmetry	3P	4X	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	3.25
0	0	0																		
16AX	7		X-GenXY	3X	4P	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	3.25
0	0	0																		
16AXY	7		XY-GenXY	3XY	4Y	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	3.25
0	0	0																		
16AY	7		Y-GenXY	3Y	4XY	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	3.25
0	0	0																		
16BP	7		XY-Symmetry	4P	3Y	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	3.125
0	0	0																		
16BX	7		X-GenXY	4X	3XY	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	3.125
0	0	0																		
16BXY	7		XY-GenXY	4XY	3X	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	3.125
0	0	0																		
16BY	7		Y-GenXY	4Y	3P	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	3.125
0	0	0																		
17AP	8		XY-Symmetry	4P	5X	2	5	0.5	0.75	0.5	5/8	A394	5	1.74	1	Long only	1	2.75	1	2.25
3.625	2.375	0																		
17AX	8		X-GenXY	4X	5P	2	5	0.5	0.75	0.5	5/8	A394	5	1.74	1	Long only	1	2.75	1	2.25
3.625	2.375	0																		
17AXY	8		XY-GenXY	4XY	5Y	2	5	0.5	0.75	0.5	5/8	A394	5	1.74	1	Long only	1	2.75	1	2.25
3.625	2.375	0																		
17AY	8		Y-GenXY	4Y	5XY	2	5	0.5	0.75	0.5	5/8	A394	5	1.74	1	Long only	1	2.75	1	2.25
3.625	2.375	0																		
17BP	8		XY-Symmetry	5P	4Y	2	5	0.5	0.75	0.5	5/8	A394	5	1.74	1	Long only	1	2.75	1	2.25
3.625	2.375	0																		
17BX	8		X-GenXY	5X	4XY	2	5	0.5	0.75	0.5	5/8	A394	5	1.74	1	Long only	1	2.75	1	2.25
3.625	2.375	0																		
17BXY	8		XY-GenXY	5XY	4X	2	5	0.5	0.75	0.5	5/8	A394	5	1.74	1	Long only	1	2.75	1	2.25
3.625	2.375	0																		
17BY	8		Y-GenXY	5Y	4P	2	5	0.5	0.75	0.5	5/8	A394	5	1.74	1	Long only	1	2.75	1	2.25
3.625	2.375	0																		
18AP	9		XY-Symmetry	5P	6X	2	5	0.5	0.75	0.5	5/8	A394	4	1.03	1	Long only	0.75	2.25	1	4
4.875	1.875	0																		
18AX	9		X-GenXY	5X	6P	2	5	0.5	0.75	0.5	5/8	A394	4	1.03	1	Long only	0.75	2.25	1	4
4.875	1.875	0																		
18AXY	9		XY-GenXY	5XY	6Y	2	5	0.5	0.75	0.5	5/8	A394	4	1.03	1	Long only	0.75	2.25	1	4
4.875	1.875	0																		
18AY	9		Y-GenXY	5Y	6XY	2	5	0.5	0.75	0.5	5/8	A394	4	1.03	1	Long only	0.75	2.25	1	4
4.875	1.875	0																		
18BP	9		XY-Symmetry	6P	5Y	2	5	0.5	0.75	0.5	5/8	A394	4	1.03	1	Long only	0.75	2.25	1	4
4.875	1.875	0																		
18BX	9		X-GenXY	6X	5XY	2	5	0.5	0.75	0.5	5/8	A394	4	1.03	1	Long only	0.75	2.25	1	4
4.875	1.875	0																		
18BXY	9		XY-GenXY	6XY	5X	2	5	0.5	0.75	0.5	5/8	A394	4	1.03	1	Long only	0.75	2.25	1	4
4.875	1.875	0																		
18BY	9		Y-GenXY	6Y	5P	2	5	0.5	0.75	0.5	5/8	A394	4	1.03	1	Long only	0.75	2.25	1	4
4.875	1.875	0																		
19AP	10		XY-Symmetry	6P	7X	2	5	0.5	0.75	0.5	5/8	A394	7	1.79	1	Long only	1	2.75	1.0625	2
4.4375	2.375	0																		
19AX	10		X-GenXY	6X	7P	2	5	0.5	0.75	0.5	5/8	A394	7	1.79	1	Long only	1	2.75	1.0625	2
4.4375	2.375	0																		
19AXY	10		XY-GenXY	6XY	7Y	2	5	0.5	0.75	0.5	5/8	A394	7	1.79	1	Long only	1	2.75	1.0625	

```
2 4.4375   2.375     0
      19AY     10              Y-GenXY        6Y        7XY    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75 1.0625
2 4.4375   2.375     0
      19BP     10          XY-Symmetry        7P         6Y    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75 1.0625
2 4.4375   2.375     0
      19BX     10              X-GenXY        7X        6XY    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75 1.0625
2 4.4375   2.375     0
     19BXY     10             XY-GenXY       7XY         6X    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75 1.0625
2 4.4375   2.375     0
      19BY     10              Y-GenXY        7Y         6P    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75 1.0625
2 4.4375   2.375     0
      20AP     10          XY-Symmetry        7P         8X    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75      1
1.75 4.4375   2.375     0
      20AX     10              X-GenXY        7X         8P    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75      1
1.75 4.4375   2.375     0
     20AXY     10             XY-GenXY       7XY         8Y    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75      1
1.75 4.4375   2.375     0
      20AY     10              Y-GenXY        7Y        8XY    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75      1
1.75 4.4375   2.375     0
      20BP     10          XY-Symmetry        8P         7Y    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75 1.0625
1.75 4.4375   2.375     0
      20BX     10              X-GenXY        8X        7XY    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75 1.0625
1.75 4.4375   2.375     0
     20BXY     10             XY-GenXY       8XY         7X    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75 1.0625
1.75 4.4375   2.375     0
      20BY     10              Y-GenXY        8Y         7P    2     5   0.5  0.75   0.5 5/8 A394     7   1.79       1  Long only      1  2.75 1.0625
1.75 4.4375   2.375     0
      21AP     11          XY-Symmetry        8P         9X    2     5  0.58  0.58  0.58 5/8 A394     6   1.55       1 Short only      1  2.25      1
3.5  4.125   1.125     0
      21AX     11              X-GenXY        8X         9S    2     5  0.58  0.58  0.58 5/8 A394     6   1.55       1 Short only      1  2.25      1
3.5  4.125   1.125     0
     21AXY     11             XY-GenXY       8XY         9Y    2     5  0.58  0.58  0.58 5/8 A394     6   1.55       1 Short only      1  2.25      1
3.5  4.125   1.125     0
      21AY     11              Y-GenXY        8Y        9XY    2     5  0.58  0.58  0.58 5/8 A394     6   1.55       1 Short only      1  2.25      1
3.5  4.125   1.125     0
      21BP     11          XY-Symmetry        9S         8Y    2     5  0.58  0.58  0.58 5/8 A394     6   1.55       1 Short only      1  2.25      1
3.5  4.125   1.125     0
      21BX     11              X-GenXY        9X        8XY    2     5  0.58  0.58  0.58 5/8 A394     6   1.55       1 Short only      1  2.25      1
3.5  4.125   1.125     0
     21BXY     11             XY-GenXY       9XY         8X    2     5  0.58  0.58  0.58 5/8 A394     6   1.55       1 Short only      1  2.25      1
3.5  4.125   1.125     0
      21BY     11              Y-GenXY        9Y         8P    2     5  0.58  0.58  0.58 5/8 A394     6   1.55       1 Short only      1  2.25      1
3.5  4.125   1.125     0
      22AP     12          XY-Symmetry        9S        10X    2     5  0.56  0.56  0.56 5/8 A394     4      1       1 Short only    1.5      0 1.0625
1.75       0       0     0
      22AX     12              X-GenXY        9X        10S    2     5  0.56  0.56  0.56 5/8 A394     4      1       1 Short only    1.5      0 1.0625
1.75       0       0     0
     22AXY     12             XY-GenXY       9XY        10Y    2     5  0.56  0.56  0.56 5/8 A394     4      1       1 Short only    1.5      0 1.0625
1.75       0       0     0
      22AY     12              Y-GenXY        9Y       10XY    2     5  0.56  0.56  0.56 5/8 A394     4      1       1 Short only    1.5      0 1.0625
1.75       0       0     0
      22BP     12          XY-Symmetry       10S         9Y    2     5  0.56  0.56  0.56 5/8 A394     4      1       1 Short only    1.5      0 1.0625
1.75       0       0     0
      22BX     12              X-GenXY       10X        9XY    2     5  0.56  0.56  0.56 5/8 A394     4      1       1 Short only    1.5      0 1.0625
1.75       0       0     0
     22BXY     12             XY-GenXY      10XY         9X    2     5  0.56  0.56  0.56 5/8 A394     4      1       1 Short only    1.5      0 1.0625
1.75       0       0     0
      22BY     12              Y-GenXY       10Y         9S    2     5  0.56  0.56  0.56 5/8 A394     4      1       1 Short only    1.5      0 1.0625
1.75       0       0     0
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23AP	13		XY-Symmetry	10S	11X	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1.0625	2.75	0	0	0
23AX	13		X-GenXY	10X	11S	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1.0625	2.75	0	0	0
23AXY	13		XY-GenXY	10XY	11Y	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1.0625	2.75	0	0	0
23AY	13		Y-GenXY	10Y	11XY	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1.0625	2.75	0	0	0
23BP	13		XY-Symmetry	11S	10Y	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1.0625	2.75	0	0	0
23BX	13		X-GenXY	11X	10XY	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1.0625	2.75	0	0	0
23BXY	13		XY-GenXY	11XY	10X	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1.0625	2.75	0	0	0
23BY	13		Y-GenXY	11Y	10S	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1.0625	2.75	0	0	0
24AP	14		XY-Symmetry	11S	12X	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1	2.25	0	0	0
24AX	14		X-GenXY	11X	12S	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1	2.25	0	0	0
24AXY	14		XY-GenXY	11XY	12Y	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1	2.25	0	0	0
24AY	14		Y-GenXY	11Y	12XY	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1	2.25	0	0	0
24BP	14		XY-Symmetry	12S	11Y	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1	2.25	0	0	0
24BX	14		X-GenXY	12X	11XY	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1	2.25	0	0	0
24BXY	14		XY-GenXY	12XY	11X	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1	2.25	0	0	0
24BY	14		Y-GenXY	12Y	11S	2	5	0.55	0.55	0.55	5/8	A394	3	1	1	Short only	1.5	0	1	2.25	0	0	0
25AP	15		XY-Symmetry	12S	20AP	3	5	1	0.5	0.5	5/8	A394	7	1.71	1	Short only	0.75	2	1.0625	2	7.375	0.875	0
25AX	15		X-GenXY	12X	20AP	3	5	1	0.5	0.5	5/8	A394	7	1.71	1	Short only	0.75	2	1.0625	2	7.375	0.875	0
25AXY	15		XY-GenXY	12XY	20AY	3	5	1	0.5	0.5	5/8	A394	7	1.71	1	Short only	0.75	2	1.0625	2	7.375	0.875	0
25AY	15		Y-GenXY	12Y	20AY	3	5	1	0.5	0.5	5/8	A394	7	1.71	1	Short only	0.75	2	1.0625	2	7.375	0.875	0
25BP	15		XY-Symmetry	20BP	12S	3	5	1	0.5	0.5	5/8	A394	7	1.71	1	Short only	0.75	2	1.0625	2	7.375	0.875	0
25BX	15		X-GenXY	20BX	12X	3	5	1	0.5	0.5	5/8	A394	7	1.71	1	Short only	0.75	2	1.0625	2	7.375	0.875	0
25BXY	15		XY-GenXY	20BX	12XY	3	5	1	0.5	0.5	5/8	A394	7	1.71	1	Short only	0.75	2	1.0625	2	7.375	0.875	0
25BY	15		Y-GenXY	20BP	12Y	3	5	1	0.5	0.5	5/8	A394	7	1.71	1	Short only	0.75	2	1.0625	2	7.375	0.875	0
26AP	16		XY-Symmetry	21P	13S	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	1	0	1	4	0	0	0
26AX	16		X-GenXY	21X	13X	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	1	0	1	4	0	0	0
26AXY	16		XY-GenXY	21XY	13XY	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	1	0	1	4	0	0	0
26AY	16		Y-GenXY	21Y	13Y	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	1	0	1	4	0	0	0
26BP	16		XY-Symmetry	22P	13S	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	1	0	1	4	0	0	0
26BX	16		X-GenXY	22X	13X	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	1	0	1				

4	0	0	0																			
	26BXY	16		XY-GenXY	22XY	13XY	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	1	0	1		
4	0	0	0																			
	26BY	16		Y-GenXY	22Y	13Y	2	5	0.5	0.5	0.5	5/8	A394	2	1	1	Long only	1	0	1		
4	0	0	0																			
	27AP	17		XY-Symmetry	20AP	14S	3	5	1	0.5	0.5	5/8	A394	4	1	1	Short only	0.875	0	1		
2.25	0	0	0																			
	27AX	17		X-GenXY	20AP	14X	3	5	1	0.5	0.5	5/8	A394	4	1	1	Short only	0.875	0	1		
2.25	0	0	0																			
	27AXY	17		XY-GenXY	20AY	14XY	3	5	1	0.5	0.5	5/8	A394	4	1	1	Short only	0.875	0	1		
2.25	0	0	0																			
	27AY	17		Y-GenXY	20AY	14Y	3	5	1	0.5	0.5	5/8	A394	4	1	1	Short only	0.875	0	1		
2.25	0	0	0																			
	27BP	17		XY-Symmetry	14S	20BP	3	5	1	0.5	0.5	5/8	A394	4	1	1	Short only	0.875	0	1		
2.25	0	0	0																			
	27BX	17		X-GenXY	14X	20BX	3	5	1	0.5	0.5	5/8	A394	4	1	1	Short only	0.875	0	1		
2.25	0	0	0																			
	27BXY	17		XY-GenXY	14XY	20BX	3	5	1	0.5	0.5	5/8	A394	4	1	1	Short only	0.875	0	1		
2.25	0	0	0																			
	27BY	17		Y-GenXY	14Y	20BP	3	5	1	0.5	0.5	5/8	A394	4	1	1	Short only	0.875	0	1		
2.25	0	0	0																			
	28AP	18		XY-Symmetry	21X	20AP	3	4	0.5	1	0.5	5/8	A394	5	1.26	1	Long only	2.875	1.375	1		
3.5	5.125	1.75	0																			
	28AX	18		X-GenXY	21P	20AP	3	4	0.5	1	0.5	5/8	A394	5	1.26	1	Long only	2.875	1.375	1		
3.5	5.125	1.75	0																			
	28AXY	18		XY-GenXY	21Y	20AY	3	4	0.5	1	0.5	5/8	A394	5	1.26	1	Long only	2.875	1.375	1		
3.5	5.125	1.75	0																			
	28AY	18		Y-GenXY	21XY	20AY	3	4	0.5	1	0.5	5/8	A394	5	1.26	1	Long only	2.875	1.375	1		
3.5	5.125	1.75	0																			
	28BP	18		XY-Symmetry	20BP	22P	3	4	0.5	1	0.5	5/8	A394	5	1.26	1	Long only	2.875	1.375	1		
3.5	5.125	1.75	0																			
	28BX	18		X-GenXY	20BX	22X	3	4	0.5	1	0.5	5/8	A394	5	1.26	1	Long only	2.875	1.375	1		
3.5	5.125	1.75	0																			
	28BXY	18		XY-GenXY	20BX	22XY	3	4	0.5	1	0.5	5/8	A394	5	1.26	1	Long only	2.875	1.375	1		
3.5	5.125	1.75	0																			
	28BY	18		Y-GenXY	20BP	22Y	3	4	0.5	1	0.5	5/8	A394	5	1.26	1	Long only	2.875	1.375	1		
3.5	5.125	1.75	0																			
	29AP	19		XY-Symmetry	21P	15P	2	5	0.25	0.25	0.25	5/8	A394	5	1	1	Long only	1.5	0	1.0625		
1.75	0	0	0																			
	29AX	19		X-GenXY	21X	15X	2	5	0.25	0.25	0.25	5/8	A394	5	1	1	Long only	1.5	0	1.0625		
1.75	0	0	0																			
	29AXY	19		XY-GenXY	21XY	15XY	2	5	0.25	0.25	0.25	5/8	A394	5	1	1	Long only	1.5	0	1.0625		
1.75	0	0	0																			
	29AY	19		Y-GenXY	21Y	15Y	2	5	0.25	0.25	0.25	5/8	A394	5	1	1	Long only	1.5	0	1.0625		
1.75	0	0	0																			
	29BP	19		XY-Symmetry	15P	22P	2	5	0.25	0.25	0.25	5/8	A394	5	1	1	Long only	1.5	0	1.0625		
1.75	0	0	0																			
	29BX	19		X-GenXY	15X	22X	2	5	0.25	0.25	0.25	5/8	A394	5	1	1	Long only	1.5	0	1.0625		
1.75	0	0	0																			
	29BXY	19		XY-GenXY	15XY	22XY	2	5	0.25	0.25	0.25	5/8	A394	5	1	1	Long only	1.5	0	1.0625		
1.75	0	0	0																			
	29BY	19		Y-GenXY	15Y	22Y	2	5	0.25	0.25	0.25	5/8	A394	5	1	1	Long only	1.5	0	1.0625		
1.75	0	0	0																			
	30AP	20a		Y-Symmetry	2X	2P	3	4	0.5	0.5	0.5	5/8	A394	1	1	1	Long only	0.75	0	1		
0	0	0	0																			
	30AY	20a		Y-Gen	2XY	2Y	3	4	0.5	0.5	0.5	5/8	A394	1	1	1	Long only	0.75	0	1		
0	0	0	0																			
	30BP	20a		X-Symmetry	2P	2Y	3	4	0.5	0.5	0.5	5/8	A394	1	1	1	Long only	0.75	0	1		
0	0	0	0																			

	30BX	20a		X-Gen	2X	2XY	3	4	0.5	0.5	0.5	5/8	A394	1	1	1	Long only	0.75	0	1	
0	0	0	0																		
	31P	20		Y-Symmetry	3X	3P	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1	
0	0	0	0																		
	31Y	20		Y-Gen	3XY	3Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1	
0	0	0	0																		
	32P	20		X-Symmetry	4P	4Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1.0625	
0	0	0	0																		
	32X	20		X-Gen	4X	4XY	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1.0625	
0	0	0	0																		
	33P	20		Y-Symmetry	5X	5P	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1	
0	0	0	0																		
	33Y	20		Y-Gen	5XY	5Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1	
0	0	0	0																		
	34P	20		X-Symmetry	6P	6Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1.0625	
0	0	0	0																		
	34X	20		X-Gen	6X	6XY	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1.0625	
0	0	0	0																		
	35P	20		Y-Symmetry	7X	7P	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1	
0	0	0	0																		
	35Y	20		Y-Gen	7XY	7Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	1	
0	0	0	0																		
	36P	36		X-Symmetry	8P	8Y	3	4	1	1	1	5/8	A325	1	2	1	Long only	0.75	0	1.0625	
0	0	0	0																		
	36X	36		X-Gen	8X	8XY	3	4	1	1	1	5/8	A325	1	2	1	Long only	0.75	0	1.0625	
0	0	0	0																		
	37AP	21		Y-Symmetry	12X	12S	3	6	1	0.5	0.5	5/8	A394	3	1	1	Short only	1.75	0	1	
2	0	0	0																		
	37AY	21		Y-Gen	12XY	12Y	3	6	1	0.5	0.5	5/8	A394	3	1	1	Short only	1.75	0	1	
2	0	0	0																		
	37BP	21		X-Symmetry	12S	12Y	3	6	1	0.5	0.5	5/8	A394	3	1	1	Short only	1.75	0	1	
2	0	0	0																		
	37BX	21		X-Gen	12X	12XY	3	6	1	0.5	0.5	5/8	A394	3	1	1	Short only	1.75	0	1	
2	0	0	0																		
	38AP	22		XY-Symmetry	13X	20AP	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.5	0	1	
3.25	0	0	0																		
	38AX	22		X-GenXY	13S	20AP	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.5	0	1	
3.25	0	0	0																		
	38AXY	22		XY-GenXY	13Y	20AY	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.5	0	1	
3.25	0	0	0																		
	38AY	22		Y-GenXY	13XY	20AY	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.5	0	1	
3.25	0	0	0																		
	38BP	22		XY-Symmetry	13S	20BP	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.5	0	1	
3.25	0	0	0																		
	38BX	22		X-GenXY	13X	20BX	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.5	0	1	
3.25	0	0	0																		
	38BXY	22		XY-GenXY	13XY	20BX	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.5	0	1	
3.25	0	0	0																		
	38BY	22		Y-GenXY	13Y	20BP	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.5	0	1	
3.25	0	0	0																		
	39AP	23		XY-Symmetry	14X	21X	3	5	1	1	1	5/8	A394	2	1	1	Short only	1.5	0	1	
3.25	0	0	0																		
	39AX	23		X-GenXY	14S	21P	3	5	1	1	1	5/8	A394	2	1	1	Short only	1.5	0	1	
3.25	0	0	0																		
	39AXY	23		XY-GenXY	14Y	21Y	3	5	1	1	1	5/8	A394	2	1	1	Short only	1.5	0	1	
3.25	0	0	0																		
	39AY	23		Y-GenXY	14XY	21XY	3	5	1	1	1	5/8	A394	2	1	1	Short only	1.5	0	1	
3.25	0	0	0																		
	39BP	23		XY-Symmetry	14S	22P	3	5	1	1	1	5/8	A394	2	1	1	Short only	1.5	0	1	

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3.25      0       0     0
      39BX     23              X-GenXY       14X        22X    3     5     1     1     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
     39BXY     23             XY-GenXY      14XY       22XY    3     5     1     1     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
      39BY     23              Y-GenXY       14Y        22Y    3     5     1     1     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
     39C1P     23           Y-Symmetry       21X  21XF0.50S    3     4     1     2     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
     39C1Y     23                 Y-Gen      21XY  21XF0.50Y    3     4     1     2     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
  F39C197P     23           Y-Symmetry 21XF0.50S        21P    3     4     1     2     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
  F39C197Y     23                 Y-Gen 21XF0.50Y        21Y    3     4     1     2     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
     39C2P     23           X-Symmetry       22P  22PF0.50S    3     4     1     2     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
     39C2X     23                 X-Gen       22X  22PF0.50X    3     4     1     2     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
 F39C2118P     23           X-Symmetry 22PF0.50S        22Y    3     4     1     2     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
 F39C2118X     23                 X-Gen 22PF0.50X       22XY    3     4     1     2     1 5/8 A394     2      1       1 Short only    1.5     0      1
3.25      0       0     0
       40P     24             XY-Symmetry      20AP       20BP    3     6     1     1     1 5/8 A394     2      1       1  Long only    1.5 2.375 1.0625
2.125     2    1.25     0
       40X     24                 X-GenXY      20AP       20BX    3     6     1     1     1 5/8 A394     2      1       1  Long only    1.5 2.375 1.0625
2.125     2    1.25     0
      40XY     24                XY-GenXY      20AY       20BX    3     6     1     1     1 5/8 A394     2      1       1  Long only    1.5 2.375 1.0625
2.125     2    1.25     0
       40Y     24                 Y-GenXY      20AY       20BP    3     6     1     1     1 5/8 A394     2      1       1  Long only    1.5 2.375 1.0625
2.125     2    1.25     0
       41P     24             XY-Symmetry       21P        22P    3     6     1     1     1 5/8 A394     2      1       1  Long only      2     0 1.0625
2.5       0       0     0
       41X     24                 X-GenXY       21X        22X    3     6     1     1     1 5/8 A394     2      1       1  Long only      2     0 1.0625
2.5       0       0     0
      41XY     24                XY-GenXY      21XY       22XY    3     6     1     1     1 5/8 A394     2      1       1  Long only      2     0 1.0625
2.5       0       0     0
       41Y     24                 Y-GenXY       21Y        22Y    3     6     1     1     1 5/8 A394     2      1       1  Long only      2     0 1.0625
2.5       0       0     0
       42P AngleR             XY-Symmetry        1X i0.50E129S    2     4     1     1     1 5/8 A394     1      1       1  Long only   0.75     0      1
0         0       0     0
       42X AngleR                 X-GenXY        1P i0.50E129S    2     4     1     1     1 5/8 A394     1      1       1  Long only   0.75     0      1
0         0       0     0
      42XY AngleR                XY-GenXY        1Y i0.50E129S    2     4     1     1     1 5/8 A394     1      1       1  Long only   0.75     0      1
0         0       0     0
       42Y AngleR                 Y-GenXY       1XY i0.50E129S    2     4     1     1     1 5/8 A394     1      1       1  Long only   0.75     0      1
0         0       0     0
       43AP     26             XY-Symmetry        4X i0.50E113S    2     5     1     1     1 5/8 A394     2      1       1  Long only  0.875     0      1
1.5       0       0     0
       43AX     26                 X-GenXY        4P i0.50E113S    2     5     1     1     1 5/8 A394     2      1       1  Long only  0.875     0      1
1.5       0       0     0
      43AXY     26                XY-GenXY        4Y i0.50E113S    2     5     1     1     1 5/8 A394     2      1       1  Long only  0.875     0      1
1.5       0       0     0
       43AY     26                 Y-GenXY       4XY i0.50E113S    2     5     1     1     1 5/8 A394     2      1       1  Long only  0.875     0      1
1.5       0       0     0
       43BP     26             XY-Symmetry        6X  i0.50E99S    2     5     1     1     1 5/8 A394     2      1       1  Long only  0.875     0      1
1.5       0       0     0
       43BX     26                 X-GenXY        6P  i0.50E99S    2     5     1     1     1 5/8 A394     2      1       1  Long only  0.875     0      1
1.5       0       0     0
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43BXY	26	XY-GenXY	6Y	i0.50E99S	2	5	1	1	1 5/8	A394	2	1	1	Long only	0.875	0	1	1.5	0	0	0		
43BY	26	Y-GenXY	6XY	i0.50E99S	2	5	1	1	1 5/8	A394	2	1	1	Long only	0.875	0	1	1.5	0	0	0		
43CP	26	XY-Symmetry	8X	i0.50E85S	2	5	1	1	1 5/8	A394	2	1	1	Long only	0.875	0	1	1.5	0	0	0		
43CX	26	X-GenXY	8P	i0.50E85S	2	5	1	1	1 5/8	A394	2	1	1	Long only	0.875	0	1	1.5	0	0	0		
43CXY	26	XY-GenXY	8Y	i0.50E85S	2	5	1	1	1 5/8	A394	2	1	1	Long only	0.875	0	1	1.5	0	0	0		
43CY	26	Y-GenXY	8XY	i0.50E85S	2	5	1	1	1 5/8	A394	2	1	1	Long only	0.875	0	1	1.5	0	0	0		
44P	27	Y-Symmetry	8X	28Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44Y	27	Y-Gen	8XY	28P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44AP	27	Y-Symmetry	28P	19Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44AY	27	Y-Gen	28Y	19P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44BP	27	Y-Symmetry	6X	27Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44BY	27	Y-Gen	6XY	27P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44CP	27	Y-Symmetry	27P	18Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44CY	27	Y-Gen	27Y	18P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44DP	27	Y-Symmetry	4X	26Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44DY	27	Y-Gen	4XY	26P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44EP	27	Y-Symmetry	26P	17Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
44EY	27	Y-Gen	26Y	17P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	4	0	0	0	
45P	28	None	17P	17Y	3	5	1	1	1	5/8	A394	2	1	1	Short only	1.5	0	1	4	0	0	0	
45AP	28	None	18P	18Y	3	5	1	1	1	5/8	A394	2	1	1	Short only	1.5	0	1	4	0	0	0	
45BP	28	None	19P	19Y	3	5	1	1	1	5/8	A394	2	1	1	Short only	1.5	0	1	4	0	0	0	
46P	29	XY-Symmetry	16P	2P	2	5	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1.0625	1.5	0	0	0	
46X	29	X-GenXY	16X	2X	2	5	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1.0625	1.5	0	0	0	
46XY	29	XY-GenXY	16X	2XY	2	5	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1.0625	1.5	0	0	0	
46Y	29	Y-GenXY	16P	2Y	2	5	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1.0625	1.5	0	0	0	
47P	30	Y-Symmetry	3X	17P	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	1.5625	0	0	0	
47Y	30	Y-Gen	3XY	17Y	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	1.5625	0	0	0	
47AP	30	Y-Symmetry	23P	3P	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1.0625	1.75	0	0	0	
47AY	30	Y-Gen	23P	3Y	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1.0625	1.75	0	0	0	
48P	31	Y-Symmetry	5X	18P	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1					

2.75	0	0	0																		
	48Y	31		Y-Gen	5XY	18Y	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	
2.75	0	0	0																		
	48AP	31		Y-Symmetry	24P	5P	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	
1.75	0	0	0																		
	48AY	31		Y-Gen	24P	5Y	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	
1.75	0	0	0																		
	49P	30		Y-Symmetry	7X	19P	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1.0625	
1.5625	0	0	0																		
	49Y	30		Y-Gen	7XY	19Y	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1.0625	
1.5625	0	0	0																		
	49AP	30		Y-Symmetry	25P	7P	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	
1.75	0	0	0																		
	49AY	30		Y-Gen	25P	7Y	3	4	1	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	1	
1.75	0	0	0																		
	50P	32		XY-Symmetry	16P	1P	3	5	0.5	0.5	0.5	5/8	A394	2	1.59	1	Long only	0.75	1.875	2.25	
1.125	2.125	0.875	0																		
	50X	32		X-GenXY	16X	1X	3	5	0.5	0.5	0.5	5/8	A394	2	1.59	1	Long only	0.75	1.875	2.25	
1.125	2.125	0.875	0																		
	50XY	32		XY-GenXY	16X	1XY	3	5	0.5	0.5	0.5	5/8	A394	2	1.59	1	Long only	0.75	1.875	2.25	
1.125	2.125	0.875	0																		
	50Y	32		Y-GenXY	16P	1Y	3	5	0.5	0.5	0.5	5/8	A394	2	1.59	1	Long only	0.75	1.875	2.25	
1.125	2.125	0.875	0																		
	50AP	32		Y-Symmetry	1X	1P	3	6	1	1	1	5/8	A394	2	1.3	1	Long only	1.1875	2	2	
1.25	2.125	0.875	0																		
	50AY	32		Y-Gen	1XY	1Y	3	6	1	1	1	5/8	A394	2	1.3	1	Long only	1.1875	2	2	
1.25	2.125	0.875	0																		
	51P	33		Y-Symmetry	23P	4P	3	5	0.5	0.5	0.5	5/8	A394	4	2.24	1	Short only	0.75	1.75	1	
2.25	6.25	0.375	0																		
	51Y	33		Y-Gen	23P	4Y	3	5	0.5	0.5	0.5	5/8	A394	4	2.24	1	Short only	0.75	1.75	1	
2.25	6.25	0.375	0																		
	51AP	33		Y-Symmetry	4X	4P	3	6	1	1	1	5/8	A394	4	1.54	1	Short only	0.75	1.75	1	
2.25	6.25	0.375	0																		
	51AY	33		Y-Gen	4XY	4Y	3	6	1	1	1	5/8	A394	4	1.54	1	Short only	0.75	1.75	1	
2.25	6.25	0.375	0																		
	51BP	33		Y-Symmetry	4X	26P	3	5	1	1	1	5/8	A394	3	2.1	1	Short only	0.75	1.5	1	
3	4.375	1.125	0																		
	51BY	33		Y-Gen	4XY	26Y	3	5	1	1	1	5/8	A394	3	2.1	1	Short only	0.75	1.5	1	
3	4.375	1.125	0																		
	51CP	33		Y-Symmetry	26P	17P	3	5	1	1	1	5/8	A394	3	2.1	1	Long only	0.75	1.5	1	
3.625	3.875	1.125	0																		
	51CY	33		Y-Gen	26Y	17Y	3	5	1	1	1	5/8	A394	3	2.1	1	Long only	0.75	1.5	1	
3.625	3.875	1.125	0																		
	52P	34		Y-Symmetry	24P	6P	3	5	0.5	0.5	0.5	5/8	A394	5	2.71	1	Long only	1	2.625	1	
2.25	4.125	1.375	0																		
	52Y	34		Y-Gen	24P	6Y	3	5	0.5	0.5	0.5	5/8	A394	5	2.71	1	Long only	1	2.625	1	
2.25	4.125	1.375	0																		
	52AP	34		Y-Symmetry	6X	6P	3	6	1	1	1	5/8	A394	5	1.82	1	Long only	0.5	2.5	1	
2	4.125	1.375	0																		
	52AY	34		Y-Gen	6XY	6Y	3	6	1	1	1	5/8	A394	5	1.82	1	Long only	0.5	2.5	1	
2	4.125	1.375	0																		
	52BP	34		Y-Symmetry	6X	27P	3	5	1	1	1	5/8	A394	5	2	1	Long only	1	2.5	1.5	
5	8.625	1.375	0																		
	52BY	34		Y-Gen	6XY	27Y	3	5	1	1	1	5/8	A394	5	2	1	Long only	1	2.5	1.5	
5	8.625	1.375	0																		
	52CP	34		Y-Symmetry	27P	18P	3	5	1	1	1	5/8	A394	6	2.66	1	Long only	0.75	2.75	1	
2.25	6.875	1.625	0																		
	52CY	34		Y-Gen	27Y	18Y	3	5	1	1	1	5/8	A394	6	2.66	1	Long only	0.75	2.75	1	
2.25	6.875	1.625	0																		

53P	33		Y-Symmetry	25P	8P	3	5	0.5	0.5	0.5	5/8	A394	4	2.24	1	Short only	0.75	1.5	1	3	4.375	0.625	0	
53Y	33		Y-Gen	25P	8Y	3	5	0.5	0.5	0.5	5/8	A394	4	2.24	1	Short only	0.75	1.5	1	3	4.375	0.625	0	
53AP	33		Y-Symmetry	8X	8P	3	6	1	1	1	5/8	A394	4	1	1	Short only	0.75	1.5	1	3	4.375	0.625	0	
53AY	33		Y-Gen	8XY	8Y	3	6	1	1	1	5/8	A394	4	1	1	Short only	0.75	1.5	1	3	4.375	0.625	0	
53BP	33		Y-Symmetry	8X	28P	3	5	1	1	1	5/8	A394	3	2	1	Short only	0.75	1.5	2.6875	4	4.625	0.625	0	
53BY	33		Y-Gen	8XY	28Y	3	5	1	1	1	5/8	A394	3	2	1	Short only	0.75	1.5	2.6875	4	4.625	0.625	0	
53CP	33		Y-Symmetry	28P	19P	3	5	1	1	1	5/8	A394	4	2.21	1	Long only	0.75	2.25	1	3.5	5.875	1.125	0	
53CY	33		Y-Gen	28Y	19Y	3	5	1	1	1	5/8	A394	4	2.21	1	Long only	0.75	2.25	1	3.5	5.875	1.125	0	
54P	35		X-Symmetry	1P	1Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	1.5	0	1.0625	0	0	0	0	
54X	35		X-Gen	1X	1XY	3	4	1	1	1	5/8	A394	1	1	1	Long only	1.5	0	1.0625	0	0	0	0	
g99P	Pwmnt		None	29P	30P	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0	
g100P	Pwmnt		None	30P	31P	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0	
g101P	Pwmnt		None	31P	32P	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0	
g102P	Pwmnt		None	32P	33P	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0	
g103P	Pwmnt		None	33P	34P	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0	
g104P	Pwmnt		None	34P	35P	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0	
g105P	Pwmnt		None	35P	36P	1	4	1	1	1			0	0	0		0	0	0	0	0	0	0	
g106P	Plate		None	35P	i0.50E129S	3	4	1	1	1	5/8	A325	1	1	1	Long only	3	0	1.25	0	0	0	0	
g107P	PMBR1		None	34P	i0.50E113S	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g108P	PMBR1		None	33P	i0.50E99S	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g109P	PMBR1		None	32P	i0.50E85S	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g110P	BraceR		X-Symmetry	1X	35P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g110X	BraceR		X-Gen	1P	35P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g111P	PMBR2		X-Symmetry	4X	34P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g111X	PMBR2		X-Gen	4P	34P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g112P	PMBR2		X-Symmetry	6X	33P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g112X	PMBR2		X-Gen	6P	33P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g113P	PMBR2		X-Symmetry	8X	32P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g113X	PMBR2		X-Gen	8P	32P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0	0	0	0	0	
g114P	PMBR3		None	20AP	31P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0					

0	0	0	0																			
	g115P	PMBR4		None	31P	20AY	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0		
0	0	0	0																			
	g116P	PMBR4		X-Symmetry	20BX	31P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0		
0	0	0	0																			
	g116X	PMBR4		X-Gen	20BP	31P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0		
0	0	0	0																			
	g117P	PMBR4		None	21XF0.50S	30P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0		
0	0	0	0																			
	g118P	PMBR5		None	30P	21XF0.50Y	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0		
0	0	0	0																			
	g120P	PMBR5		X-Symmetry	22XY	30P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0		
0	0	0	0																			
	g120X	PMBR5		X-Gen	22Y	30P	3	4	1	1	1	5/8	A325	1	1	1	Long only	0	0	0		
0	0	0	0																			
	g121P	Pwmnt		None	36P	37P	1	4	1	1	1			0	0	0		0	0	0		
0	0	0	0																			

Member Capacities and Overrides:

Member Label	Override Comp.	Group Override Comp.	Design Override Comp. Capacity	Comp. Control	Design Override Tension Capacity	Tension Control Criterion	L/r Length (ft)	L/r Comp. Capacity (kips)	Connection Shear Capacity (kips)	Connection Bearing Capacity (kips)	Net Section Tension Capacity (kips)	Rupture Warnings or Errors Tension Capacity (kips)	RTE End Dist. Tension Capacity (kips)	RTE Edge Dist. Tension Capacity (kips)	Override Comp. Capacity (kips)	Unsup. Criterion	Criterion (kips)	ship (kips)
1P	1	49.257	L/r	47.340	Net Sect	78	4.50	49.257	0.000	0.000	47.340	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
1X	1	49.257	L/r	47.340	Net Sect	78	4.50	49.257	0.000	0.000	47.340	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
1XY	1	49.257	L/r	47.340	Net Sect	78	4.50	49.257	0.000	0.000	47.340	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
1Y	1	49.257	L/r	47.340	Net Sect	78	4.50	49.257	0.000	0.000	47.340	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
2P	1	49.257	L/r	47.340	Net Sect	78	4.50	49.257	0.000	0.000	47.340	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
2X	1	49.257	L/r	47.340	Net Sect	78	4.50	49.257	0.000	0.000	47.340	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
2XY	1	49.257	L/r	47.340	Net Sect	78	4.50	49.257	0.000	0.000	47.340	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
2Y	1	49.257	L/r	47.340	Net Sect	78	4.50	49.257	0.000	0.000	47.340	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
3P	1	32.813	L/r	36.400	Shear	121	7.00	32.813	36.400	54.375	47.340	60.417	0.000	0.000	0.000	0.000	0.000	Automatic
3X	1	32.813	L/r	36.400	Shear	121	7.00	32.813	36.400	54.375	47.340	60.417	0.000	0.000	0.000	0.000	0.000	Automatic
3XY	1	32.813	L/r	36.400	Shear	121	7.00	32.813	36.400	54.375	47.340	60.417	0.000	0.000	0.000	0.000	0.000	Automatic
3Y	1	32.813	L/r	36.400	Shear	121	7.00	32.813	36.400	54.375	47.340	60.417	0.000	0.000	0.000	0.000	0.000	Automatic
4P	2	91.206	L/r	97.650	Net Sect	80	8.00	91.206	0.000	0.000	97.650	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
4X	2	91.206	L/r	97.650	Net Sect	80	8.00	91.206	0.000	0.000	97.650	0.000	0.000	0.000	0.000	0.000	0.000	Automatic

0.000		0.000	Automatic													
	4XY	2	91.206	L/r	97.650	Net Sect	80	8.00	91.206	0.000	0.000	97.650	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	4Y	2	91.206	L/r	97.650	Net Sect	80	8.00	91.206	0.000	0.000	97.650	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	5P	2	99.083	L/r	97.650	Net Sect	60	6.05	99.083	109.200	203.906	97.650	183.656	0.000	0.000	0.000
0.000		0.000	Automatic													
	5X	2	99.083	L/r	97.650	Net Sect	60	6.05	99.083	109.200	203.906	97.650	183.656	0.000	0.000	0.000
0.000		0.000	Automatic													
	5XY	2	99.083	L/r	97.650	Net Sect	60	6.05	99.083	109.200	203.906	97.650	183.656	0.000	0.000	0.000
0.000		0.000	Automatic													
	5Y	2	99.083	L/r	97.650	Net Sect	60	6.05	99.083	109.200	203.906	97.650	183.656	0.000	0.000	0.000
0.000		0.000	Automatic													
	6P	3	249.636	L/r	231.750	Net Sect	53	7.00	249.636	0.000	0.000	231.750	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	6X	3	249.636	L/r	231.750	Net Sect	53	7.00	249.636	0.000	0.000	231.750	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	6XY	3	249.636	L/r	231.750	Net Sect	53	7.00	249.636	0.000	0.000	231.750	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	6Y	3	249.636	L/r	231.750	Net Sect	53	7.00	249.636	0.000	0.000	231.750	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	7P	3	249.636	L/r	231.750	Net Sect	53	7.00	249.636	254.800	380.624	231.750	395.849	0.000	0.000	0.000
0.000		0.000	Automatic													
	7X	3	249.636	L/r	231.750	Net Sect	53	7.00	249.636	254.800	380.624	231.750	395.849	0.000	0.000	0.000
0.000		0.000	Automatic													
	7XY	3	249.636	L/r	231.750	Net Sect	53	7.00	249.636	254.800	380.624	231.750	395.849	0.000	0.000	0.000
0.000		0.000	Automatic													
	7Y	3	249.636	L/r	231.750	Net Sect	53	7.00	249.636	254.800	380.624	231.750	395.849	0.000	0.000	0.000
0.000		0.000	Automatic													
	8P	4	306.646	L/r	286.897	Net Sect	60	7.92	306.646	0.000	0.000	286.897	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	8X	4	306.646	L/r	286.897	Net Sect	60	7.92	306.646	0.000	0.000	286.897	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	8XY	4	306.646	L/r	286.897	Net Sect	60	7.92	306.646	0.000	0.000	286.897	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	8Y	4	306.646	L/r	286.897	Net Sect	60	7.92	306.646	0.000	0.000	286.897	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	9P	4	306.646	L/r	286.897	Net Sect	60	7.92	306.646	0.000	0.000	286.897	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	9X	4	306.646	L/r	286.897	Net Sect	60	7.92	306.646	0.000	0.000	286.897	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	9XY	4	306.646	L/r	286.897	Net Sect	60	7.92	306.646	0.000	0.000	286.897	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	9Y	4	306.646	L/r	286.897	Net Sect	60	7.92	306.646	0.000	0.000	286.897	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	10P	4	291.200	Shear	286.897	Net Sect	60	7.92	306.646	291.200	543.749	286.897	494.812	0.000	0.000	0.000
0.000		0.000	Automatic													
	10X	4	291.200	Shear	286.897	Net Sect	60	7.92	306.646	291.200	543.749	286.897	494.812	0.000	0.000	0.000
0.000		0.000	Automatic													
	10XY	4	291.200	Shear	286.897	Net Sect	60	7.92	306.646	291.200	543.749	286.897	494.812	0.000	0.000	0.000
0.000		0.000	Automatic													
	10Y	4	291.200	Shear	286.897	Net Sect	60	7.92	306.646	291.200	543.749	286.897	494.812	0.000	0.000	0.000
0.000		0.000	Automatic													
	11P	5	335.162	L/r	330.839	Net Sect	77	10.13	335.162	0.000	0.000	330.839	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	11X	5	335.162	L/r	330.839	Net Sect	77	10.13	335.162	0.000	0.000	330.839	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													
	11XY	5	335.162	L/r	330.839	Net Sect	77	10.13	335.162	0.000	0.000	330.839	0.000	0.000	0.000	0.000
0.000		0.000	Automatic													

11Y	5	335.162	L/r 330.839	Net Sect	77	10.13	335.162	0.000	0.000	330.839	0.000	0.000	0.000	0.000	0.000
		0.000	Automatic												
12P	5	364.000	Shear 330.839	Net Sect	45	11.83	385.718	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
12X	5	364.000	Shear 330.839	Net Sect	45	11.83	385.718	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
12XY	5	364.000	Shear 330.839	Net Sect	45	11.83	385.718	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
12Y	5	364.000	Shear 330.839	Net Sect	45	11.83	385.718	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
13P	5	364.000	Shear 330.839	Net Sect	58	15.32	368.010	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
13X	5	364.000	Shear 330.839	Net Sect	58	15.32	368.010	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
13XY	5	364.000	Shear 330.839	Net Sect	58	15.32	368.010	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
13Y	5	364.000	Shear 330.839	Net Sect	58	15.32	368.010	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
14P	5	364.000	Shear 330.839	Net Sect	48	25.53	381.402	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
14X	5	364.000	Shear 330.839	Net Sect	48	25.53	381.402	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
14XY	5	364.000	Shear 330.839	Net Sect	48	25.53	381.402	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
14Y	5	364.000	Shear 330.839	Net Sect	48	25.53	381.402	364.000	815.624	330.839	672.074	0.000	0.000	0.000	0.000
		0.000	Automatic												
15AP	6	15.633	L/r 17.241	Rupture	131	10.82	15.633	18.200	20.391	24.669	17.241	0.000	0.000	0.000	0.000
		0.000	Automatic												
15AX	6	15.633	L/r 17.241	Rupture	131	10.82	15.633	18.200	20.391	24.669	17.241	0.000	0.000	0.000	0.000
		0.000	Automatic												
15AXY	6	15.633	L/r 17.241	Rupture	131	10.82	15.633	18.200	20.391	24.669	17.241	0.000	0.000	0.000	0.000
		0.000	Automatic												
15AY	6	15.633	L/r 17.241	Rupture	131	10.82	15.633	18.200	20.391	24.669	17.241	0.000	0.000	0.000	0.000
		0.000	Automatic												
15BP	6	15.633	L/r 17.241	Rupture	131	10.82	15.633	18.200	20.391	24.669	17.241	0.000	0.000	0.000	0.000
		0.000	Automatic												
15BX	6	15.633	L/r 17.241	Rupture	131	10.82	15.633	18.200	20.391	24.669	17.241	0.000	0.000	0.000	0.000
		0.000	Automatic												
15BXY	6	15.633	L/r 17.241	Rupture	131	10.82	15.633	18.200	20.391	24.669	17.241	0.000	0.000	0.000	0.000
		0.000	Automatic												
15BY	6	15.633	L/r 17.241	Rupture	131	10.82	15.633	18.200	20.391	24.669	17.241	0.000	0.000	0.000	0.000
		0.000	Automatic												
16AP	7	14.303	L/r 18.125	Rupture	130	9.22	14.303	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000	Automatic												
16AX	7	14.303	L/r 18.125	Rupture	130	9.22	14.303	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000	Automatic												
16AXY	7	14.303	L/r 18.125	Rupture	130	9.22	14.303	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000	Automatic												
16AY	7	14.303	L/r 18.125	Rupture	130	9.22	14.303	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000	Automatic												
16BP	7	14.303	L/r 18.125	Rupture	130	9.22	14.303	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000	Automatic												
16BX	7	14.303	L/r 18.125	Rupture	130	9.22	14.303	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000	Automatic												
16BXY	7	14.303	L/r 18.125	Rupture	130	9.22	14.303	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000	Automatic												
16BY	7	14.303	L/r 18.125	Rupture	130	9.22	14.303	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000	Automatic												
17AP	8	39.613	L/r 44.185	Net Sect	100	10.00	39.613	45.500	67.969	44.185	52.912	0.000	0.000	0.000	0.000

0.000		0.000	Automatic												
17AX	8	39.613	L/r 44.185	Net Sect	100	10.00	39.613	45.500	67.969	44.185	52.912	0.000	0.000	0.000	
0.000		0.000	Automatic												
17AXY	8	39.613	L/r 44.185	Net Sect	100	10.00	39.613	45.500	67.969	44.185	52.912	0.000	0.000	0.000	
0.000		0.000	Automatic												
17AY	8	39.613	L/r 44.185	Net Sect	100	10.00	39.613	45.500	67.969	44.185	52.912	0.000	0.000	0.000	
0.000		0.000	Automatic												
17BP	8	39.613	L/r 44.185	Net Sect	100	10.00	39.613	45.500	67.969	44.185	52.912	0.000	0.000	0.000	
0.000		0.000	Automatic												
17BX	8	39.613	L/r 44.185	Net Sect	100	10.00	39.613	45.500	67.969	44.185	52.912	0.000	0.000	0.000	
0.000		0.000	Automatic												
17BXY	8	39.613	L/r 44.185	Net Sect	100	10.00	39.613	45.500	67.969	44.185	52.912	0.000	0.000	0.000	
0.000		0.000	Automatic												
17BY	8	39.613	L/r 44.185	Net Sect	100	10.00	39.613	45.500	67.969	44.185	52.912	0.000	0.000	0.000	
0.000		0.000	Automatic												
18AP	9	32.738	L/r 36.400	Shear	104	8.52	32.738	36.400	54.375	40.399	42.647	0.000	0.000	0.000	
0.000		0.000	Automatic												
18AX	9	32.738	L/r 36.400	Shear	104	8.52	32.738	36.400	54.375	40.399	42.647	0.000	0.000	0.000	
0.000		0.000	Automatic												
18AXY	9	32.738	L/r 36.400	Shear	104	8.52	32.738	36.400	54.375	40.399	42.647	0.000	0.000	0.000	
0.000		0.000	Automatic												
18AY	9	32.738	L/r 36.400	Shear	104	8.52	32.738	36.400	54.375	40.399	42.647	0.000	0.000	0.000	
0.000		0.000	Automatic												
18BP	9	32.738	L/r 36.400	Shear	104	8.52	32.738	36.400	54.375	40.399	42.647	0.000	0.000	0.000	
0.000		0.000	Automatic												
18BX	9	32.738	L/r 36.400	Shear	104	8.52	32.738	36.400	54.375	40.399	42.647	0.000	0.000	0.000	
0.000		0.000	Automatic												
18BXY	9	32.738	L/r 36.400	Shear	104	8.52	32.738	36.400	54.375	40.399	42.647	0.000	0.000	0.000	
0.000		0.000	Automatic												
18BY	9	32.738	L/r 36.400	Shear	104	8.52	32.738	36.400	54.375	40.399	42.647	0.000	0.000	0.000	
0.000		0.000	Automatic												
19AP	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
19AX	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
19AXY	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
19AY	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
19BP	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
19BX	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
19BXY	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
19BY	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
20AP	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
20AX	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
20AXY	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
20AY	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
20BP	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												
20BX	10	61.204	L/r 59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000	
0.000		0.000	Automatic												

20BXY	10	61.204	L/r	59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000
0.000		0.000	Automatic												
20BY	10	61.204	L/r	59.307	Net Sect	78	9.22	61.204	63.700	118.945	59.307	74.976	0.000	0.000	0.000
0.000		0.000	Automatic												
21AP	11	44.335	L/r	45.178	Net Sect	96	10.60	44.335	54.600	81.562	45.178	46.012	0.000	0.000	0.000
0.000		0.000	Automatic												
21AX	11	44.335	L/r	45.178	Net Sect	96	10.60	44.335	54.600	81.562	45.178	46.012	0.000	0.000	0.000
0.000		0.000	Automatic												
21AXY	11	44.335	L/r	45.178	Net Sect	96	10.60	44.335	54.600	81.562	45.178	46.012	0.000	0.000	0.000
0.000		0.000	Automatic												
21AY	11	44.335	L/r	45.178	Net Sect	96	10.60	44.335	54.600	81.562	45.178	46.012	0.000	0.000	0.000
0.000		0.000	Automatic												
21BP	11	44.335	L/r	45.178	Net Sect	96	10.60	44.335	54.600	81.562	45.178	46.012	0.000	0.000	0.000
0.000		0.000	Automatic												
21BX	11	44.335	L/r	45.178	Net Sect	96	10.60	44.335	54.600	81.562	45.178	46.012	0.000	0.000	0.000
0.000		0.000	Automatic												
21BXY	11	44.335	L/r	45.178	Net Sect	96	10.60	44.335	54.600	81.562	45.178	46.012	0.000	0.000	0.000
0.000		0.000	Automatic												
21BY	11	44.335	L/r	45.178	Net Sect	96	10.60	44.335	54.600	81.562	45.178	46.012	0.000	0.000	0.000
0.000		0.000	Automatic												
22AP	12	30.985	L/r	36.400	Shear	126	12.25	30.985	36.400	54.375	40.581	42.206	0.000	0.000	0.000
0.000		0.000	Automatic												
22AX	12	30.985	L/r	36.400	Shear	126	12.25	30.985	36.400	54.375	40.581	42.206	0.000	0.000	0.000
0.000		0.000	Automatic												
22AXY	12	30.985	L/r	36.400	Shear	126	12.25	30.985	36.400	54.375	40.581	42.206	0.000	0.000	0.000
0.000		0.000	Automatic												
22AY	12	30.985	L/r	36.400	Shear	126	12.25	30.985	36.400	54.375	40.581	42.206	0.000	0.000	0.000
0.000		0.000	Automatic												
22BP	12	30.985	L/r	36.400	Shear	126	12.25	30.985	36.400	54.375	40.581	42.206	0.000	0.000	0.000
0.000		0.000	Automatic												
22BX	12	30.985	L/r	36.400	Shear	126	12.25	30.985	36.400	54.375	40.581	42.206	0.000	0.000	0.000
0.000		0.000	Automatic												
22BXY	12	30.985	L/r	36.400	Shear	126	12.25	30.985	36.400	54.375	40.581	42.206	0.000	0.000	0.000
0.000		0.000	Automatic												
22BY	12	30.985	L/r	36.400	Shear	126	12.25	30.985	36.400	54.375	40.581	42.206	0.000	0.000	0.000
0.000		0.000	Automatic												
23AP	13	22.542	L/r	27.300	Shear	147	14.07	22.542	27.300	40.781	40.419	38.516	0.000	0.000	0.000
0.000		0.000	Automatic												
23AX	13	22.542	L/r	27.300	Shear	147	14.07	22.542	27.300	40.781	40.419	38.516	0.000	0.000	0.000
0.000		0.000	Automatic												
23AXY	13	22.542	L/r	27.300	Shear	147	14.07	22.542	27.300	40.781	40.419	38.516	0.000	0.000	0.000
0.000		0.000	Automatic												
23AY	13	22.542	L/r	27.300	Shear	147	14.07	22.542	27.300	40.781	40.419	38.516	0.000	0.000	0.000
0.000		0.000	Automatic												
23BP	13	22.542	L/r	27.300	Shear	147	14.07	22.542	27.300	40.781	40.419	38.516	0.000	0.000	0.000
0.000		0.000	Automatic												
23BX	13	22.542	L/r	27.300	Shear	147	14.07	22.542	27.300	40.781	40.419	38.516	0.000	0.000	0.000
0.000		0.000	Automatic												
23BXY	13	22.542	L/r	27.300	Shear	147	14.07	22.542	27.300	40.781	40.419	38.516	0.000	0.000	0.000
0.000		0.000	Automatic												
23BY	13	22.542	L/r	27.300	Shear	147	14.07	22.542	27.300	40.781	40.419	38.516	0.000	0.000	0.000
0.000		0.000	Automatic												
24AP	14	21.431	L/r	27.300	Shear	174	17.45	21.431	27.300	40.781	40.581	36.250	0.000	0.000	0.000
0.000		0.000	Automatic												
24AX	14	21.431	L/r	27.300	Shear	174	17.45	21.431	27.300	40.781	40.581	36.250	0.000	0.000	0.000
0.000		0.000	Automatic												
24AXY	14	21.431	L/r	27.300	Shear	174	17.45	21.431	27.300	40.781	40.581	36.250	0.000	0.000	0.000
0.000		0.000	Automatic												
24AY	14	21.431	L/r	27.300	Shear	174	17.45	21.431	27.300	40.781	40.581	36.250	0.000	0.000	0.000

0.000		0.000	Automatic												
24BP	14	21.431	L/r 27.300	Shear	174	17.45	21.431	27.300	40.781	40.581	36.250	0.000	0.000	0.000	
0.000		0.000	Automatic												
24BX	14	21.431	L/r 27.300	Shear	174	17.45	21.431	27.300	40.781	40.581	36.250	0.000	0.000	0.000	
0.000		0.000	Automatic												
24BXY	14	21.431	L/r 27.300	Shear	174	17.45	21.431	27.300	40.781	40.581	36.250	0.000	0.000	0.000	
0.000		0.000	Automatic												
24BY	14	21.431	L/r 27.300	Shear	174	17.45	21.431	27.300	40.781	40.581	36.250	0.000	0.000	0.000	
0.000		0.000	Automatic												
25AP	15	33.799	L/r 36.268	Net Sect	128	14.10	33.799	63.700	95.156	36.268	72.037	0.000	0.000	0.000	
0.000		0.000	Automatic												
25AX	15	33.799	L/r 36.268	Net Sect	128	14.10	33.799	63.700	95.156	36.268	72.037	0.000	0.000	0.000	
0.000		0.000	Automatic												
25AXY	15	33.799	L/r 36.268	Net Sect	128	14.10	33.799	63.700	95.156	36.268	72.037	0.000	0.000	0.000	
0.000		0.000	Automatic												
25AY	15	33.799	L/r 36.268	Net Sect	128	14.10	33.799	63.700	95.156	36.268	72.037	0.000	0.000	0.000	
0.000		0.000	Automatic												
25BP	15	33.799	L/r 36.268	Net Sect	128	14.10	33.799	63.700	95.156	36.268	72.037	0.000	0.000	0.000	
0.000		0.000	Automatic												
25BX	15	33.799	L/r 36.268	Net Sect	128	14.10	33.799	63.700	95.156	36.268	72.037	0.000	0.000	0.000	
0.000		0.000	Automatic												
25BXY	15	33.799	L/r 36.268	Net Sect	128	14.10	33.799	63.700	95.156	36.268	72.037	0.000	0.000	0.000	
0.000		0.000	Automatic												
25BY	15	33.799	L/r 36.268	Net Sect	128	14.10	33.799	63.700	95.156	36.268	72.037	0.000	0.000	0.000	
0.000		0.000	Automatic												
26AP	16	4.044	L/r 18.125	Rupture	257	16.85	4.044	18.200	20.391	18.448	18.125	0.000	0.000	0.000	
0.000		0.000	Automatic												
26AX	16	4.044	L/r 18.125	Rupture	257	16.85	4.044	18.200	20.391	18.448	18.125	0.000	0.000	0.000	
0.000		0.000	Automatic												
26AXY	16	4.044	L/r 18.125	Rupture	257	16.85	4.044	18.200	20.391	18.448	18.125	0.000	0.000	0.000	
0.000		0.000	Automatic												
26AY	16	4.044	L/r 18.125	Rupture	257	16.85	4.044	18.200	20.391	18.448	18.125	0.000	0.000	0.000	
0.000		0.000	Automatic												
26BP	16	4.044	L/r 18.125	Rupture	257	16.85	4.044	18.200	20.391	18.448	18.125	0.000	0.000	0.000	
0.000		0.000	Automatic												
26BX	16	4.044	L/r 18.125	Rupture	257	16.85	4.044	18.200	20.391	18.448	18.125	0.000	0.000	0.000	
0.000		0.000	Automatic												
26BXY	16	4.044	L/r 18.125	Rupture	257	16.85	4.044	18.200	20.391	18.448	18.125	0.000	0.000	0.000	
0.000		0.000	Automatic												
26BY	16	4.044	L/r 18.125	Rupture	257	16.85	4.044	18.200	20.391	18.448	18.125	0.000	0.000	0.000	
0.000		0.000	Automatic												
27AP	17	6.420	L/r 24.381	Net Sect	265	19.19	6.420	36.400	54.375	24.381	48.333	0.000	0.000	0.000	
0.000		0.000	Automatic												
27AX	17	6.420	L/r 24.381	Net Sect	265	19.19	6.420	36.400	54.375	24.381	48.333	0.000	0.000	0.000	
0.000		0.000	Automatic												
27AXY	17	6.420	L/r 24.381	Net Sect	265	19.19	6.420	36.400	54.375	24.381	48.333	0.000	0.000	0.000	
0.000		0.000	Automatic												
27AY	17	6.420	L/r 24.381	Net Sect	265	19.19	6.420	36.400	54.375	24.381	48.333	0.000	0.000	0.000	
0.000		0.000	Automatic												
27BP	17	6.420	L/r 24.381	Net Sect	265	19.19	6.420	36.400	54.375	24.381	48.333	0.000	0.000	0.000	
0.000		0.000	Automatic												
27BX	17	6.420	L/r 24.381	Net Sect	265	19.19	6.420	36.400	54.375	24.381	48.333	0.000	0.000	0.000	
0.000		0.000	Automatic												
27BXY	17	6.420	L/r 24.381	Net Sect	265	19.19	6.420	36.400	54.375	24.381	48.333	0.000	0.000	0.000	
0.000		0.000	Automatic												
27BY	17	6.420	L/r 24.381	Net Sect	265	19.19	6.420	36.400	54.375	24.381	48.333	0.000	0.000	0.000	
0.000		0.000	Automatic												
28AP	18	11.489	L/r 45.500	Shear	205	15.32	11.489	45.500	67.969	47.101	60.337	0.000	0.000	0.000	
0.000		0.000	Automatic												

28AX	18	11.489	L/r	45.500	Shear	205	15.32	11.489	45.500	67.969	47.101	60.337	0.000	0.000	0.000
0.000		0.000	Automatic												
28AXY	18	11.489	L/r	45.500	Shear	205	15.32	11.489	45.500	67.969	47.101	60.337	0.000	0.000	0.000
0.000		0.000	Automatic												
28AY	18	11.489	L/r	45.500	Shear	205	15.32	11.489	45.500	67.969	47.101	60.337	0.000	0.000	0.000
0.000		0.000	Automatic												
28BP	18	11.489	L/r	45.500	Shear	205	15.32	11.489	45.500	67.969	47.101	60.337	0.000	0.000	0.000
0.000		0.000	Automatic												
28BX	18	11.489	L/r	45.500	Shear	205	15.32	11.489	45.500	67.969	47.101	60.337	0.000	0.000	0.000
0.000		0.000	Automatic												
28BXY	18	11.489	L/r	45.500	Shear	205	15.32	11.489	45.500	67.969	47.101	60.337	0.000	0.000	0.000
0.000		0.000	Automatic												
28BY	18	11.489	L/r	45.500	Shear	205	15.32	11.489	45.500	67.969	47.101	60.337	0.000	0.000	0.000
0.000		0.000	Automatic												
29AP	19	25.652	L/r	44.469	Net Sect	136	28.52	25.652	45.500	67.969	44.469	50.906	0.000	0.000	0.000
0.000		0.000	Automatic												
29AX	19	25.652	L/r	44.469	Net Sect	136	28.52	25.652	45.500	67.969	44.469	50.906	0.000	0.000	0.000
0.000		0.000	Automatic												
29AXY	19	25.652	L/r	44.469	Net Sect	136	28.52	25.652	45.500	67.969	44.469	50.906	0.000	0.000	0.000
0.000		0.000	Automatic												
29AY	19	25.652	L/r	44.469	Net Sect	136	28.52	25.652	45.500	67.969	44.469	50.906	0.000	0.000	0.000
0.000		0.000	Automatic												
29BP	19	25.652	L/r	44.469	Net Sect	136	28.52	25.652	45.500	67.969	44.469	50.906	0.000	0.000	0.000
0.000		0.000	Automatic												
29BX	19	25.652	L/r	44.469	Net Sect	136	28.52	25.652	45.500	67.969	44.469	50.906	0.000	0.000	0.000
0.000		0.000	Automatic												
29BXY	19	25.652	L/r	44.469	Net Sect	136	28.52	25.652	45.500	67.969	44.469	50.906	0.000	0.000	0.000
0.000		0.000	Automatic												
29BY	19	25.652	L/r	44.469	Net Sect	136	28.52	25.652	45.500	67.969	44.469	50.906	0.000	0.000	0.000
0.000		0.000	Automatic												
30AP	20a	9.100	Shear	6.609	Rupture	105	6.00	13.441	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
30AY	20a	9.100	Shear	6.609	Rupture	105	6.00	13.441	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
30BP	20a	9.100	Shear	6.609	Rupture	105	6.00	13.441	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
30BX	20a	9.100	Shear	6.609	Rupture	105	6.00	13.441	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
31P	20	4.027	L/r	6.609	Rupture	210	6.00	4.027	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
31Y	20	4.027	L/r	6.609	Rupture	210	6.00	4.027	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
32P	20	4.027	L/r	7.017	Rupture	210	6.00	4.027	9.100	10.195	15.532	7.017	0.000	0.000	0.000
0.000		0.000	Automatic												
32X	20	4.027	L/r	7.017	Rupture	210	6.00	4.027	9.100	10.195	15.532	7.017	0.000	0.000	0.000
0.000		0.000	Automatic												
33P	20	4.027	L/r	6.609	Rupture	210	6.00	4.027	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
33Y	20	4.027	L/r	6.609	Rupture	210	6.00	4.027	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
34P	20	4.027	L/r	7.017	Rupture	210	6.00	4.027	9.100	10.195	15.532	7.017	0.000	0.000	0.000
0.000		0.000	Automatic												
34X	20	4.027	L/r	7.017	Rupture	210	6.00	4.027	9.100	10.195	15.532	7.017	0.000	0.000	0.000
0.000		0.000	Automatic												
35P	20	4.027	L/r	6.609	Rupture	210	6.00	4.027	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
35Y	20	4.027	L/r	6.609	Rupture	210	6.00	4.027	9.100	10.195	15.532	6.609	0.000	0.000	0.000
0.000		0.000	Automatic												
36P	36	16.800	Shear	14.864	Rupture	134	6.00	19.743	16.800	20.391	31.823	14.864	0.000	0.000	0.000

0.000		0.000	Automatic												
36X	36	16.800	Shear	14.864	Rupture	134	6.00	19.743	16.800	20.391	31.823	14.864	0.000	0.000	0.000
0.000		0.000	Automatic												
37AP	21	27.300	Shear	27.300	Shear	149	15.74	27.341	27.300	40.781	48.519	36.250	0.000	0.000	0.000
0.000		0.000	Automatic												
37AY	21	27.300	Shear	27.300	Shear	149	15.74	27.341	27.300	40.781	48.519	36.250	0.000	0.000	0.000
0.000		0.000	Automatic												
37BP	21	27.300	Shear	27.300	Shear	149	15.74	27.341	27.300	40.781	48.519	36.250	0.000	0.000	0.000
0.000		0.000	Automatic												
37BX	21	27.300	Shear	27.300	Shear	149	15.74	27.341	27.300	40.781	48.519	36.250	0.000	0.000	0.000
0.000		0.000	Automatic												
38AP	22	11.503	L/r	18.125	Rupture	193	9.57	11.503	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
38AX	22	11.503	L/r	18.125	Rupture	193	9.57	11.503	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
38AXY	22	11.503	L/r	18.125	Rupture	193	9.57	11.503	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
38AY	22	11.503	L/r	18.125	Rupture	193	9.57	11.503	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
38BP	22	11.503	L/r	18.125	Rupture	193	9.57	11.503	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
38BX	22	11.503	L/r	18.125	Rupture	193	9.57	11.503	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
38BXY	22	11.503	L/r	18.125	Rupture	193	9.57	11.503	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
38BY	22	11.503	L/r	18.125	Rupture	193	9.57	11.503	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
39AP	23	18.200	Shear	18.200	Shear	173	9.56	21.560	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39AX	23	18.200	Shear	18.200	Shear	173	9.56	21.560	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39AXY	23	18.200	Shear	18.200	Shear	173	9.56	21.560	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39AY	23	18.200	Shear	18.200	Shear	173	9.56	21.560	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39BP	23	18.200	Shear	18.200	Shear	173	9.56	21.560	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39BX	23	18.200	Shear	18.200	Shear	173	9.56	21.560	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39BXY	23	18.200	Shear	18.200	Shear	173	9.56	21.560	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39BY	23	18.200	Shear	18.200	Shear	173	9.56	21.560	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39C1P	23	18.200	Shear	18.200	Shear	62	2.21	44.853	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39C1Y	23	18.200	Shear	18.200	Shear	62	2.21	44.853	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
F39C197P	23	18.200	Shear	18.200	Shear	62	2.21	44.853	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
F39C197Y	23	18.200	Shear	18.200	Shear	62	2.21	44.853	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39C2P	23	18.200	Shear	18.200	Shear	62	2.21	44.853	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
39C2X	23	18.200	Shear	18.200	Shear	62	2.21	44.853	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
F39C2118P	23	18.200	Shear	18.200	Shear	62	2.21	44.853	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
F39C2118X	23	18.200	Shear	18.200	Shear	62	2.21	44.853	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												

40P	24	13.386	L/r	18.200	Shear	234	13.53	13.386	18.200	27.187	48.681	25.677	0.000	0.000	0.000	0.000
		0.000		Automatic												
40X	24	13.386	L/r	18.200	Shear	234	13.53	13.386	18.200	27.187	48.681	25.677	0.000	0.000	0.000	0.000
		0.000		Automatic												
40XY	24	13.386	L/r	18.200	Shear	234	13.53	13.386	18.200	27.187	48.681	25.677	0.000	0.000	0.000	0.000
		0.000		Automatic												
40Y	24	13.386	L/r	18.200	Shear	234	13.53	13.386	18.200	27.187	48.681	25.677	0.000	0.000	0.000	0.000
		0.000		Automatic												
41P	24	13.399	L/r	18.200	Shear	234	13.52	13.399	18.200	27.187	48.681	25.677	0.000	0.000	0.000	0.000
		0.000		Automatic												
41X	24	13.399	L/r	18.200	Shear	234	13.52	13.399	18.200	27.187	48.681	25.677	0.000	0.000	0.000	0.000
		0.000		Automatic												
41XY	24	13.399	L/r	18.200	Shear	234	13.52	13.399	18.200	27.187	48.681	25.677	0.000	0.000	0.000	0.000
		0.000		Automatic												
41Y	24	13.399	L/r	18.200	Shear	234	13.52	13.399	18.200	27.187	48.681	25.677	0.000	0.000	0.000	0.000
		0.000		Automatic												
42P	AngleR	9.100	Shear	8.812	Rupture	130	4.24	15.869	9.100	13.594	24.381	8.812	0.000	0.000	0.000	0.000
		0.000		Automatic												
42X	AngleR	9.100	Shear	8.812	Rupture	130	4.24	15.869	9.100	13.594	24.381	8.812	0.000	0.000	0.000	0.000
		0.000		Automatic												
42XY	AngleR	9.100	Shear	8.812	Rupture	130	4.24	15.869	9.100	13.594	24.381	8.812	0.000	0.000	0.000	0.000
		0.000		Automatic												
42Y	AngleR	9.100	Shear	8.812	Rupture	130	4.24	15.869	9.100	13.594	24.381	8.812	0.000	0.000	0.000	0.000
		0.000		Automatic												
43AP	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43AX	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43AXY	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43AY	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43BP	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43BX	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43BXY	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43BY	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43CP	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43CX	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43CXY	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
43CY	26	12.587	L/r	12.347	Rupture	129	4.24	12.587	18.200	20.391	18.448	12.347	0.000	0.000	0.000	0.000
		0.000		Automatic												
44P	27	16.678	L/r	18.125	Rupture	116	8.22	16.678	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000		Automatic												
44Y	27	16.678	L/r	18.125	Rupture	116	8.22	16.678	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000		Automatic												
44AP	27	16.678	L/r	18.125	Rupture	116	8.22	16.678	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000		Automatic												
44AY	27	16.678	L/r	18.125	Rupture	116	8.22	16.678	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000		Automatic												
44BP	27	14.533	L/r	18.125	Rupture	128	9.13	14.533	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000
		0.000		Automatic												
44BY	27	14.533	L/r	18.125	Rupture	128	9.13	14.533	18.200	20.391	18.650	18.125	0.000	0.000	0.000	0.000

0.000		0.000	Automatic												
	44CP	27	14.533	L/r	18.125	Rupture	128	9.13	14.533	18.200	20.391	18.650	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	44CY	27	14.533	L/r	18.125	Rupture	128	9.13	14.533	18.200	20.391	18.650	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	44DP	27	16.678	L/r	18.125	Rupture	116	8.22	16.678	18.200	20.391	18.650	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	44DY	27	16.678	L/r	18.125	Rupture	116	8.22	16.678	18.200	20.391	18.650	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	44EP	27	16.678	L/r	18.125	Rupture	116	8.22	16.678	18.200	20.391	18.650	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	44EY	27	16.678	L/r	18.125	Rupture	116	8.22	16.678	18.200	20.391	18.650	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	45P	28	18.200	Shear	18.200	Shear	111	6.00	35.407	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
	45AP	28	18.200	Shear	18.200	Shear	111	6.00	35.407	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
	45BP	28	18.200	Shear	18.200	Shear	111	6.00	35.407	18.200	27.187	40.581	24.167	0.000	0.000	0.000
0.000		0.000	Automatic												
	46P	29	7.736	L/r	12.755	Rupture	202	14.78	7.736	18.200	20.391	18.529	12.755	0.000	0.000	0.000
0.000		0.000	Automatic												
	46X	29	7.736	L/r	12.755	Rupture	202	14.78	7.736	18.200	20.391	18.529	12.755	0.000	0.000	0.000
0.000		0.000	Automatic												
	46XY	29	7.736	L/r	12.755	Rupture	202	14.78	7.736	18.200	20.391	18.529	12.755	0.000	0.000	0.000
0.000		0.000	Automatic												
	46Y	29	7.736	L/r	12.755	Rupture	202	14.78	7.736	18.200	20.391	18.529	12.755	0.000	0.000	0.000
0.000		0.000	Automatic												
	47P	30	5.767	L/r	12.755	Rupture	201	13.25	5.767	18.200	20.391	18.650	12.755	0.000	0.000	0.000
0.000		0.000	Automatic												
	47Y	30	5.767	L/r	12.755	Rupture	201	13.25	5.767	18.200	20.391	18.650	12.755	0.000	0.000	0.000
0.000		0.000	Automatic												
	47AP	30	5.486	L/r	14.386	Rupture	206	13.59	5.486	18.200	20.391	18.650	14.386	0.000	0.000	0.000
0.000		0.000	Automatic												
	47AY	30	5.486	L/r	14.386	Rupture	206	13.59	5.486	18.200	20.391	18.650	14.386	0.000	0.000	0.000
0.000		0.000	Automatic												
	48P	31	8.465	L/r	18.125	Rupture	192	15.02	8.465	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	48Y	31	8.465	L/r	18.125	Rupture	192	15.02	8.465	18.200	20.391	30.760	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	48AP	31	8.140	L/r	13.978	Rupture	196	15.32	8.140	18.200	20.391	30.760	13.978	0.000	0.000	0.000
0.000		0.000	Automatic												
	48AY	31	8.140	L/r	13.978	Rupture	196	15.32	8.140	18.200	20.391	30.760	13.978	0.000	0.000	0.000
0.000		0.000	Automatic												
	49P	30	5.767	L/r	13.162	Rupture	201	13.25	5.767	18.200	20.391	18.650	13.162	0.000	0.000	0.000
0.000		0.000	Automatic												
	49Y	30	5.767	L/r	13.162	Rupture	201	13.25	5.767	18.200	20.391	18.650	13.162	0.000	0.000	0.000
0.000		0.000	Automatic												
	49AP	30	5.486	L/r	13.978	Rupture	206	13.59	5.486	18.200	20.391	18.650	13.978	0.000	0.000	0.000
0.000		0.000	Automatic												
	49AY	30	5.486	L/r	13.978	Rupture	206	13.59	5.486	18.200	20.391	18.650	13.978	0.000	0.000	0.000
0.000		0.000	Automatic												
	50P	32	18.200	Shear	18.125	Rupture	143	14.07	21.867	18.200	27.187	36.997	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	50X	32	18.200	Shear	18.125	Rupture	143	14.07	21.867	18.200	27.187	36.997	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	50XY	32	18.200	Shear	18.125	Rupture	143	14.07	21.867	18.200	27.187	36.997	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												
	50Y	32	18.200	Shear	18.125	Rupture	143	14.07	21.867	18.200	27.187	36.997	18.125	0.000	0.000	0.000
0.000		0.000	Automatic												

50AP	32	18.200	Shear	18.200	Shear	122	6.00	27.975	18.200	27.187	38.758	21.146	0.000	0.000	0.000	0.000
		0.000		Automatic												
50AY	32	18.200	Shear	18.200	Shear	122	6.00	27.975	18.200	27.187	38.758	21.146	0.000	0.000	0.000	0.000
		0.000		Automatic												
51P	33	32.661	L/r	32.886	Net Sect	111	11.64	32.661	36.400	54.375	32.886	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
51Y	33	32.661	L/r	32.886	Net Sect	111	11.64	32.661	36.400	54.375	32.886	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
51AP	33	31.965	L/r	36.400	Shear	114	6.00	31.965	36.400	54.375	37.138	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
51AY	33	31.965	L/r	36.400	Shear	114	6.00	31.965	36.400	54.375	37.138	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
51BP	33	27.300	Shear	27.300	Shear	107	5.62	33.416	27.300	40.781	33.736	31.985	0.000	0.000	0.000	0.000
		0.000		Automatic												
51BY	33	27.300	Shear	27.300	Shear	107	5.62	33.416	27.300	40.781	33.736	31.985	0.000	0.000	0.000	0.000
		0.000		Automatic												
51CP	33	27.300	Shear	27.300	Shear	107	5.63	33.416	27.300	40.781	37.786	31.985	0.000	0.000	0.000	0.000
		0.000		Automatic												
51CY	33	27.300	Shear	27.300	Shear	107	5.63	33.416	27.300	40.781	37.786	31.985	0.000	0.000	0.000	0.000
		0.000		Automatic												
52P	34	41.627	L/r	45.500	Shear	106	14.07	41.627	45.500	67.969	46.393	48.262	0.000	0.000	0.000	0.000
		0.000		Automatic												
52Y	34	41.627	L/r	45.500	Shear	106	14.07	41.627	45.500	67.969	46.393	48.262	0.000	0.000	0.000	0.000
		0.000		Automatic												
52AP	34	45.317	L/r	35.539	Rupture	91	6.00	45.317	45.500	67.969	51.799	35.539	0.000	0.000	0.000	0.000
		0.000		Automatic												
52AY	34	45.317	L/r	35.539	Rupture	91	6.00	45.317	45.500	67.969	51.799	35.539	0.000	0.000	0.000	0.000
		0.000		Automatic												
52BP	34	42.220	L/r	45.500	Shear	104	6.88	42.220	45.500	67.969	50.706	71.078	0.000	0.000	0.000	0.000
		0.000		Automatic												
52BY	34	42.220	L/r	45.500	Shear	104	6.88	42.220	45.500	67.969	50.706	71.078	0.000	0.000	0.000	0.000
		0.000		Automatic												
52CP	34	42.220	L/r	46.696	Net Sect	104	6.88	42.220	54.600	81.562	46.696	63.970	0.000	0.000	0.000	0.000
		0.000		Automatic												
52CY	34	42.220	L/r	46.696	Net Sect	104	6.88	42.220	54.600	81.562	46.696	63.970	0.000	0.000	0.000	0.000
		0.000		Automatic												
53P	33	32.661	L/r	32.886	Net Sect	111	11.64	32.661	36.400	54.375	32.886	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
53Y	33	32.661	L/r	32.886	Net Sect	111	11.64	32.661	36.400	54.375	32.886	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
53AP	33	31.965	L/r	36.400	Shear	114	6.00	31.965	36.400	54.375	40.419	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
53AY	33	31.965	L/r	36.400	Shear	114	6.00	31.965	36.400	54.375	40.419	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
53BP	33	27.300	Shear	27.300	Shear	107	5.62	33.416	27.300	40.781	34.344	31.985	0.000	0.000	0.000	0.000
		0.000		Automatic												
53BY	33	27.300	Shear	27.300	Shear	107	5.62	33.416	27.300	40.781	34.344	31.985	0.000	0.000	0.000	0.000
		0.000		Automatic												
53CP	33	33.416	L/r	36.400	Shear	107	5.63	33.416	36.400	54.375	37.118	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
53CY	33	33.416	L/r	36.400	Shear	107	5.63	33.416	36.400	54.375	37.118	42.647	0.000	0.000	0.000	0.000
		0.000		Automatic												
54P	35	8.154	L/r	9.100	Shear	169	6.00	8.154	9.100	10.195	21.688	9.629	0.000	0.000	0.000	0.000
		0.000		Automatic												
54X	35	8.154	L/r	9.100	Shear	169	6.00	8.154	9.100	10.195	21.688	9.629	0.000	0.000	0.000	0.000
		0.000		Automatic												
g99P	Pwmnt	437.242	L/r	571.199	Net Sect	80	29.25	437.242	0.000	0.000	571.199	0.000	0.000	0.000	0.000	0.000
		0.000		Automatic												
g100P	Pwmnt	535.971	L/r	571.199	Net Sect	41	15.00	535.971	0.000	0.000	571.199	0.000	0.000	0.000	0.000	0.000

0.000		0.000	Automatic												
g101P	Pwmnt	260.146	L/r 571.199	Net Sect	122	44.75	260.146	0.000	0.000	571.199	0.000	0.000	0.000	0.000	
0.000		0.000	Automatic												
g102P	Pwmnt	540.511	L/r 571.199	Net Sect	38	14.00	540.511	0.000	0.000	571.199	0.000	0.000	0.000	0.000	
0.000		0.000	Automatic												
g103P	Pwmnt	540.511	L/r 571.199	Net Sect	38	14.00	540.511	0.000	0.000	571.199	0.000	0.000	0.000	0.000	
0.000		0.000	Automatic												
g104P	Pwmnt	531.117	L/r 571.199	Net Sect	44	16.00	531.117	0.000	0.000	571.199	0.000	0.000	0.000	0.000	
0.000		0.000	Automatic												
g105P	Pwmnt	565.563	L/r 571.199	Net Sect	16	6.00	565.563	0.000	0.000	571.199	0.000	0.000	0.000	0.000	
0.000		0.000	Automatic												
g106P	Plate	16.800	Shear 16.800	Shear	83	1.50	109.423	16.800	0.000	145.800	0.000	0.000	0.000	0.000	
0.000		0.000	Automatic												
g107P	PMBR1	10.195	Bearing 10.195	Bearing	46	1.50	20.042	16.800	10.195	18.827	10.343	0.000	0.000	0.000	
0.000		0.000	Automatic												
g108P	PMBR1	10.195	Bearing 10.195	Bearing	46	1.50	20.044	16.800	10.195	18.827	10.343	0.000	0.000	0.000	
0.000		0.000	Automatic												
g109P	PMBR1	10.195	Bearing 10.195	Bearing	46	1.50	20.044	16.800	10.195	18.827	10.343	0.000	0.000	0.000	
0.000		0.000	Automatic												
g110P	BraceR	13.594	Bearing 13.594	Bearing	82	3.35	29.101	16.800	13.594	32.987	15.104	0.000	0.000	0.000	
0.000		0.000	Automatic												
g110X	BraceR	13.594	Bearing 13.594	Bearing	82	3.35	29.101	16.800	13.594	32.987	15.104	0.000	0.000	0.000	
0.000		0.000	Automatic												
g111P	PMBR2	10.195	Bearing 10.195	Bearing	81	3.35	22.126	16.800	10.195	25.048	11.328	0.000	0.000	0.000	
0.000		0.000	Automatic												
g111X	PMBR2	10.195	Bearing 10.195	Bearing	81	3.35	22.126	16.800	10.195	25.048	11.328	0.000	0.000	0.000	
0.000		0.000	Automatic												
g112P	PMBR2	10.195	Bearing 10.195	Bearing	81	3.35	22.127	16.800	10.195	25.048	11.328	0.000	0.000	0.000	
0.000		0.000	Automatic												
g112X	PMBR2	10.195	Bearing 10.195	Bearing	81	3.35	22.127	16.800	10.195	25.048	11.328	0.000	0.000	0.000	
0.000		0.000	Automatic												
g113P	PMBR2	10.195	Bearing 10.195	Bearing	81	3.35	22.127	16.800	10.195	25.048	11.328	0.000	0.000	0.000	
0.000		0.000	Automatic												
g113X	PMBR2	10.195	Bearing 10.195	Bearing	81	3.35	22.127	16.800	10.195	25.048	11.328	0.000	0.000	0.000	
0.000		0.000	Automatic												
g114P	PMBR3	10.195	Bearing 10.195	Bearing	162	8.07	11.823	16.800	10.195	31.139	11.328	0.000	0.000	0.000	
0.000		0.000	Automatic												
g115P	PMBR4	13.207	L/r 13.594	Bearing	191	11.07	13.207	16.800	13.594	49.187	15.104	0.000	0.000	0.000	
0.000		0.000	Automatic												
g116P	PMBR4	13.594	Bearing 13.594	Bearing	167	9.68	17.249	16.800	13.594	49.187	15.104	0.000	0.000	0.000	
0.000		0.000	Automatic												
g116X	PMBR4	13.594	Bearing 13.594	Bearing	167	9.68	17.249	16.800	13.594	49.187	15.104	0.000	0.000	0.000	
0.000		0.000	Automatic												
g117P	PMBR4	13.594	Bearing 13.594	Bearing	178	10.27	15.339	16.800	13.594	49.187	15.104	0.000	0.000	0.000	
0.000		0.000	Automatic												
g118P	**PMBR5**	**13.594**	**Bearing 13.594**	**Bearing**	**200**	**13.27**	**13.840**	**16.800**	**13.594**	**57.287**	**15.104**	**0.000**	**0.000**	**0.000**	
0.000		**0.000**	**Automatic KL/R value of 200.30 exceeds maximum of 200.00 for member "g118P" ??**												
g120P	PMBR5	13.594	Bearing 13.594	Bearing	186	12.34	16.004	16.800	13.594	57.287	15.104	0.000	0.000	0.000	
0.000		0.000	Automatic												
g120X	PMBR5	13.594	Bearing 13.594	Bearing	186	12.34	16.004	16.800	13.594	57.287	15.104	0.000	0.000	0.000	
0.000		0.000	Automatic												
g121P	Pwmnt	558.517	L/r 571.199	Net Sect	25	9.00	558.517	0.000	0.000	571.199	0.000	0.000	0.000	0.000	
0.000		0.000	Automatic												

The model contains 335 angle members.

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

Joint	Dead	X-Drag	Y-Drag

Label	Load (kips)	Area (ft^2)	Area (ft^2)
1P	0.117	5.752	4.127
2P	0.0615	3.558	2.426
3P	0.117	7.249	6.224
4P	0.218	10.789	8.992
5P	0.222	10.953	9.482
6P	0.326	12.528	10.018
7P	0.352	11.891	10.866
8P	0.438	14.553	13.193
15P	0.651	16.233	16.233
16P	0.114	7.054	2.102
17P	0.0621	2.786	2.354
18P	0.0805	3.740	2.381
19P	0.0621	2.786	2.354
20AP	0.39	20.837	17.520
20BP	0.403	17.907	21.056
21P	0.22	11.891	8.870
22P	0.22	8.870	11.891
23P	0.1	6.042	2.462
24P	0.15	8.339	2.688
25P	0.1	6.042	2.462
26P	0.053	2.813	1.250
27P	0.0705	3.724	1.250
28P	0.053	2.813	1.250
29P	0.725	15.539	15.539
30P	1.25	27.431	28.453
31P	1.59	34.533	34.802
32P	1.47	31.836	31.648
33P	0.707	15.500	15.312
34P	0.756	16.567	16.375
35P	0.571	12.325	12.375
36P	0.372	7.969	7.969
37P	0.223	4.781	4.781
1X	0.117	5.752	4.127
1XY	0.11	5.439	3.970
1Y	0.11	5.439	3.970
2X	0.0615	3.558	2.426
2XY	0.0615	3.558	2.426
2Y	0.0615	3.558	2.426
3X	0.116	7.249	6.160
3XY	0.116	7.249	6.160
3Y	0.117	7.249	6.224
4X	0.213	10.554	9.179
4XY	0.208	10.242	9.023
4Y	0.213	10.476	8.835
5X	0.222	10.953	9.394
5XY	0.222	10.953	9.394
5Y	0.222	10.953	9.482
6X	0.315	12.098	10.143
6XY	0.31	11.786	9.986
6Y	0.321	12.216	9.861
7X	0.351	11.891	10.802
7XY	0.351	11.891	10.802
7Y	0.352	11.891	10.866
8X	0.433	14.318	13.381
8XY	0.427	14.006	13.224
8Y	0.432	14.240	13.037

15X	0.651	16.233	16.233
15XY	0.651	16.233	16.233
15Y	0.651	16.233	16.233
16X	0.114	7.054	2.102
17Y	0.0621	2.786	2.354
18Y	0.0805	3.740	2.381
19Y	0.0621	2.786	2.354
20AY	0.407	20.837	18.125
20BX	0.403	17.907	21.056
21X	0.22	11.891	8.870
21XY	0.22	11.891	8.870
21Y	0.22	11.891	8.870
22X	0.22	8.870	11.891
22XY	0.261	10.831	12.509
22Y	0.261	10.831	12.509
26Y	0.053	2.813	1.250
27Y	0.0705	3.724	1.250
28Y	0.053	2.813	1.250
9S	0.404	12.387	12.387
10S	0.406	11.747	11.747
11S	0.518	14.852	14.852
12S	0.733	20.933	20.933
13S	0.605	12.807	12.807
14S	0.936	19.747	19.747
i0.50E129S	0.0385	1.012	1.375
i0.50E113S	0.0225	1.004	1.125
i0.50E99S	0.0225	1.000	1.125
i0.50E85S	0.0225	1.000	1.125
21XF0.50S	0.0444	0.920	1.498
22PF0.50S	0.0146	0.000	0.920
9X	0.404	12.387	12.387
9XY	0.404	12.387	12.387
9Y	0.404	12.387	12.387
10X	0.406	11.747	11.747
10XY	0.406	11.747	11.747
10Y	0.406	11.747	11.747
11X	0.518	14.852	14.852
11XY	0.518	14.852	14.852
11Y	0.518	14.852	14.852
12X	0.733	20.933	20.933
12XY	0.733	20.933	20.933
12Y	0.733	20.933	20.933
13X	0.605	12.807	12.807
13XY	0.605	12.807	12.807
13Y	0.605	12.807	12.807
14X	0.936	19.747	19.747
14XY	0.936	19.747	19.747
14Y	0.936	19.747	19.747
21XF0.50Y	0.0584	0.920	2.212
22PF0.50X	0.0146	0.000	0.920
Total	37	1148.254	1068.534

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	10.937	420.113	337.810	139.781	139.112

2	26.071	728.141	730.724	227.007	321.570
Total	37.007	1148.254	1068.534	366.789	460.682

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	10.937	11.483	1715.817	1801.607
2	26.071	27.374	3034.480	3186.204
Total	37.007	38.858	4750.297	4987.812

Section Joint Information:

Section Label	Joint Label	Joint Elevation (ft)
1	1P	128.800
1	2P	124.300
1	1X	128.800
1	2X	124.300
1	1XY	128.800
1	2XY	124.300
1	1Y	128.800
1	2Y	124.300
1	3P	119.800
1	3X	119.800
1	3XY	119.800
1	3Y	119.800
1	4P	112.800
1	4X	112.800
1	4XY	112.800
1	4Y	112.800
1	5P	104.800
1	5X	104.800
1	5XY	104.800
1	5Y	104.800
1	6P	98.750
1	6X	98.750
1	6XY	98.750
1	6Y	98.750
1	7P	91.750
1	7X	91.750
1	7XY	91.750
1	7Y	91.750
1	8P	84.750
1	8X	84.750
1	8XY	84.750
1	8Y	84.750
1	i0.50E129S	128.800
1	i0.50E113S	112.800
1	i0.50E99S	98.750
1	i0.50E85S	84.750
1	28Y	84.750
1	28P	84.750
1	19Y	84.750
1	19P	84.750

1	27Y	98.750
1	27P	98.750
1	18Y	98.750
1	18P	98.750
1	26Y	112.800
1	26P	112.800
1	17Y	112.800
1	17P	112.800
1	16P	128.800
1	16X	128.800
1	23P	112.800
1	24P	98.750
1	25P	84.750
1	32P	84.750
1	33P	98.750
1	34P	112.750
1	35P	128.750
1	36P	134.750
1	37P	143.750
2	8P	84.750
2	9S	77.000
2	8X	84.750
2	9X	77.000
2	8XY	84.750
2	9XY	77.000
2	8Y	84.750
2	9Y	77.000
2	10S	69.250
2	10X	69.250
2	10XY	69.250
2	10Y	69.250
2	11S	61.500
2	11X	61.500
2	11XY	61.500
2	11Y	61.500
2	12S	51.580
2	12X	51.580
2	12XY	51.580
2	12Y	51.580
2	13S	40.000
2	13X	40.000
2	13XY	40.000
2	13Y	40.000
2	14S	25.000
2	14X	25.000
2	14XY	25.000
2	14Y	25.000
2	15P	0.000
2	15X	0.000
2	15XY	0.000
2	15Y	0.000
2	20AP	40.000
2	20AY	40.000
2	20BP	40.000
2	20BX	40.000
2	21P	25.000
2	21X	25.000
2	21XY	25.000
2	21Y	25.000

2	22P	25.000
2	22X	25.000
2	22XY	25.000
2	22Y	25.000
2	21XF0.50S	25.000
2	21XF0.50Y	25.000
2	22PF0.50S	25.000
2	22PF0.50X	25.000
2	29P	-4.250
2	30P	25.000
2	31P	40.000
2	32P	84.750

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	143.750	84.750	59	188	0.00	6.00	309.150	0.00	28.50	817.275	Problem calculating gross area of longitudinal face for section "1": width is zero at elevation 128.80 (ft) which is not the top of the section. ??
2	84.750	-4.250	52	147	6.00	0.00	1226.814	6.00	0.00	1226.814	Problem calculating gross area of longitudinal face for section "2": width is zero at elevation -4.25 (ft) which is not the top of the section. ??

*** 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	16X	C-EX1	No Limit
2	16P	C-EX1	No Limit
3	17P	C-EX1	No Limit
4	17Y	C-EX1	No Limit
5	18P	C-EX1	No Limit
6	18Y	C-EX1	No Limit
7	19P	C-EX1	No Limit
8	19Y	C-EX1	No Limit
9	23P	C-EX1	No Limit
10	24P	C-EX1	No Limit
11	25P	C-EX1	No Limit
12	2Y	C-EX1	No Limit
13	4Y	C-EX1	No Limit
14	6Y	C-EX1	No Limit
15	8Y	C-EX1	No Limit
16	10Y	C-EX1	No Limit
17	12Y	C-EX1	No Limit
18	13Y	C-EX1	No Limit

19	14Y	C-EX1	No Limit
20	30P	C-EX1	No Limit
21	31P	C-EX1	No Limit
22	32P	C-EX1	No Limit
23	33P	C-EX1	No Limit
24	34P	C-EX1	No Limit
25	35P	C-EX1	No Limit
26	36P	C-EX1	No Limit
27	37P	C-EX1	No Limit
28	10XY	C-EX1	No Limit
29	12XY	C-EX1	No Limit
30	13XY	C-EX1	No Limit
31	14XY	C-EX1	No Limit

*** Loads Data

Loads from file: j:\jobs\1715900.wi\07_ct03xc338 greenwich\04_structural\backup documentation\rev (1)\pls tower\cl&p # 1281.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)	143.75 (ft)	
Structure height	148.00 (ft)	
Structure height above ground	143.75 (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 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	34 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	34 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
16X	1610	1610	1610	Shield Wire
16P	1298	8213	-2807	Shield Wire
19P	2332	7785	7437	Conductor - Back
19Y	438	7124	-7493	Conductor - Ahead
18P	3241	9292	7457	Conductor - Back
18Y	573	5259	-5419	Conductor - Ahead
17P	2933	5363	5970	Conductor - Back
17Y	520	5739	-5969	Conductor - Ahead
23P	2393	10693	-4869	Conductor
24P	2366	9228	-2072	Conductor
25P	1702	12051	-5996	Conductor
37P	7284	768	0	Sprint Antennas
36P	2494	1061	0	Verizon Antennas
37P	838	99	0	Coax Cable on Powermount
35P	633	95	0	Coax Cable on Powermount
34P	1186	178	0	Coax Cable on Powermount
33P	1107	167	0	Coax Cable on Powermount
32P	2323	349	0	Coax Cable on Powermount
31P	2362	355	0	Coax Cable on Powermount
30P	2570	387	0	Coax Cable on Powermount

2Y	476	176	0	Coax Cable on Tower
4Y	594	219	0	Coax Cable on Tower
6Y	652	241	0	Coax Cable on Tower
8Y	686	253	0	Coax Cable on Tower
10Y	771	285	0	Coax Cable on Tower
12Y	680	251	0	Coax Cable on Tower
13Y	618	228	0	Coax Cable on Tower
14Y	1510	558	0	Coax Cable on Tower
10XY	200	31	0	AT&T Antennas North Leg
10Y	381	158	0	AT&T Antennas East Leg
10XY	155	66	0	AT&T Coax Cable on Tower
12XY	232	99	0	AT&T Coax Cable on Tower
13XY	201	86	0	AT&T Coax Cable on Tower
14XY	496	212	0	AT&T Coax Cable on Tower

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	143.75	84.75	114.25	10.00	10.00	3.300	4590.7	0.00	3.300	0.0	0	17225
2	84.75	-4.25	40.25	10.00	10.00	3.300	10611.8	0.00	3.300	0.0	0	41061

Point Loads for Load Case "NESC Extreme":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
16X	876	5036	-1015	Shield Wire
16P	681	5012	-2032	Shield Wire
19P	1333	4079	3425	Conductor - Back
19Y	95	4777	-4362	Conductor - Ahead
18P	1811	4637	3263	Conductor - Back
18Y	163	4024	-3498	Conductor - Ahead
17P	1835	3229	3049	Conductor - Back
17Y	124	4322	-3823	Conductor - Ahead
23P	1463	7489	-3001	Conductor
24P	1390	6685	-1521	Conductor
25P	969	7820	-3146	Conductor
37P	3383	2971	0	Sprint Antennas
36P	1068	4127	0	Verizon Antennas
37P	281	325	0	Coax Cable on Powermount
35P	200	277	0	Coax Cable on Powermount
34P	374	519	0	Coax Cable on Powermount
33P	349	485	0	Coax Cable on Powermount
32P	733	1017	0	Coax Cable on Powermount
31P	746	1034	0	Coax Cable on Powermount
30P	811	1125	0	Coax Cable on Powermount
2Y	128	532	0	Coax Cable on Tower
4Y	159	664	0	Coax Cable on Tower
6Y	175	728	0	Coax Cable on Tower
8Y	184	766	0	Coax Cable on Tower
10Y	207	861	0	Coax Cable on Tower
12Y	183	760	0	Coax Cable on Tower
13Y	166	690	0	Coax Cable on Tower

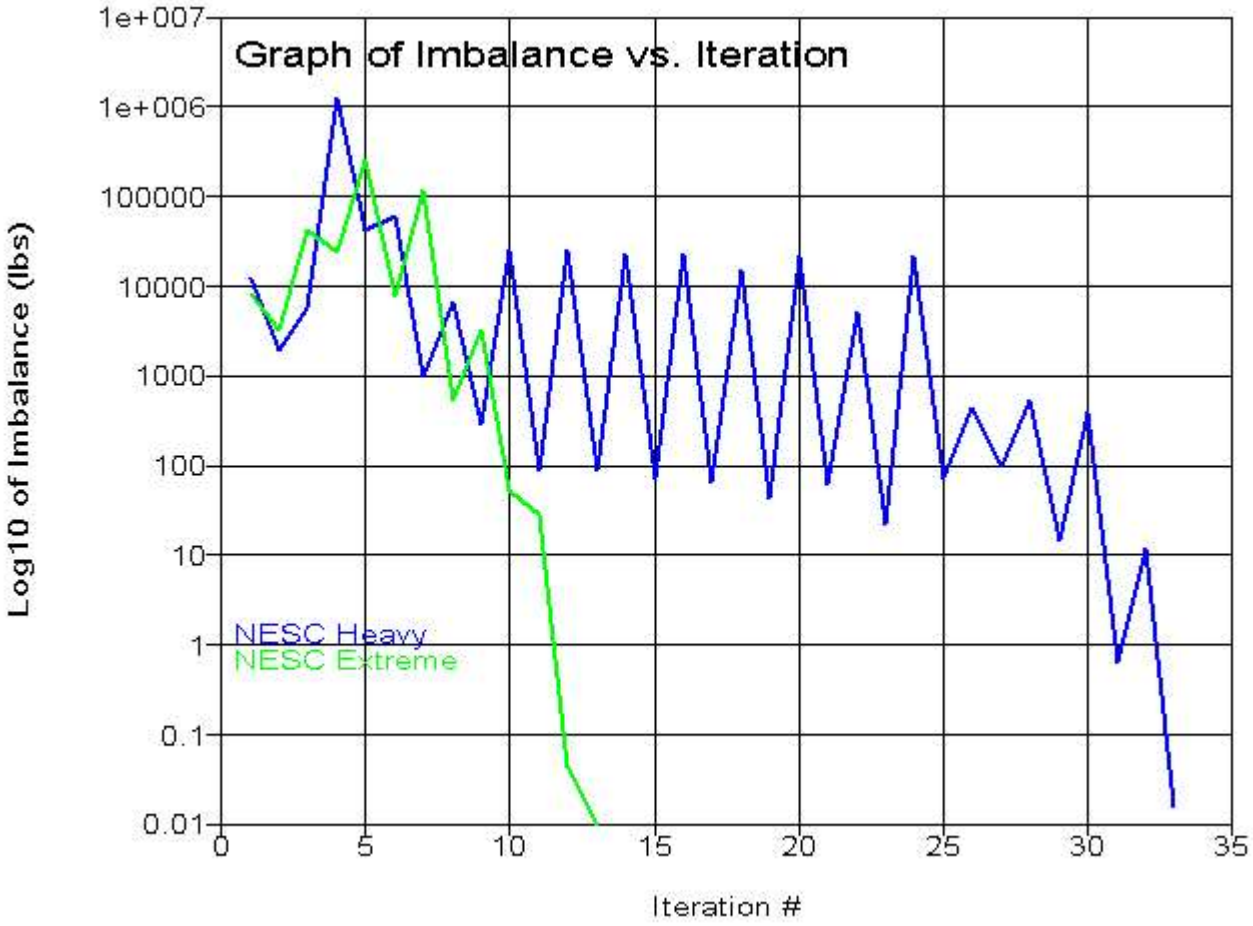
14Y	406	1688	0	Coax Cable on Tower
10XY	107	96	0	AT&T Antennas North Leg
10Y	198	513	0	AT&T Antennas East Leg
10XY	42	173	0	AT&T Coax Cable on Tower
12XY	62	260	0	AT&T Coax Cable on Tower
13XY	54	225	0	AT&T Coax Cable on Tower
14XY	133	554	0	AT&T Coax Cable on Tower

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 Round Face Area (ft^2)	Tran Gross Area (ft^2)	Tran Soli-dity Ratio	Tran Angle Drag Coef	Tran Round Drag Coef	Tran Wind Load (lbs)	Long Adj. Wind Pres. (psf)	Long Angle Face Area (ft^2)	Long Round Face Area (ft^2)	Long Gross Area (ft^2)	Long Soli-dity Ratio	Long Angle Drag Coef	Long Round Drag Coef	Long Wind Load (lbs)	Ice Weight (lbs)	Total Weight (lbs)
1	143.75	84.75	114.25	32.59	32.59	84.07	68.96	309.15	0.495	3.200	2.000	13259.9	0.00	153.76	0.00	817.27	0.188	3.200	2.000	0.0	0	11483
2	84.75	-4.25	40.25	32.59	32.59	272.41	113.48	1226.81	0.315	3.200	2.000	35800.1	0.00	272.41	0.00	1226.81	0.222	3.200	2.000	0.0	0	27374

*** Analysis Results:

Maximum element usage is 99.85% for Angle "25AP" in load case "NESC Heavy"
Maximum insulator usage is 27.18% for Clamp "11" in load case "NESC Heavy"



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)
1	1P	21.96	0.000	-10.816	-6.529	-10.816
1	1X	24.22	11.466	0.000	6.055	11.466
1	1XY	18.85	8.924	0.000	4.233	8.924
1	1Y	21.52	0.000	-10.603	-5.295	-10.603

1	2P	22.60	0.000	-11.133	-7.161	-11.133
1	2X	23.06	10.915	0.000	5.063	10.915
1	2XY	17.07	8.080	0.000	3.269	8.080
1	2Y	23.56	0.000	-11.607	-6.725	-11.607
1	3P	80.35	0.000	-26.366	-16.099	-26.366
1	3X	73.91	26.902	0.000	11.579	26.902
1	3XY	59.72	21.740	0.000	10.911	21.740
1	3Y	89.52	0.000	-29.375	-16.432	-29.375
2	4P	49.06	0.000	-44.749	-31.726	-44.749
2	4X	50.78	49.586	0.000	29.186	49.586
2	4XY	40.30	39.355	0.000	24.028	39.355
2	4Y	58.33	0.000	-53.205	-34.782	-53.205
2	5P	65.73	0.000	-65.124	-49.693	-65.124
2	5X	76.75	74.945	0.000	49.585	74.945
2	5XY	60.42	58.996	0.000	39.775	58.996
2	5Y	83.52	0.000	-82.757	-61.115	-82.757
3	6P	36.02	0.000	-89.919	-75.644	-89.919
3	6X	46.59	107.983	0.000	80.873	107.983
3	6XY	36.26	84.028	0.000	65.007	84.028
3	6Y	46.87	0.000	-116.993	-94.038	-116.993
3	7P	46.50	0.000	-116.092	-105.076	-116.092
3	7X	60.13	139.348	0.000	110.461	139.348
3	7XY	46.87	108.620	0.000	91.309	108.620
3	7Y	59.72	0.000	-149.092	-125.071	-149.092
4	8P	42.96	0.000	-131.734	-125.637	-131.734
4	8X	56.13	161.023	0.000	135.894	161.023
4	8XY	42.51	121.953	0.000	109.690	121.953
4	8Y	56.14	0.000	-172.137	-152.552	-172.137
4	9P	45.60	0.000	-139.836	-137.450	-139.836
4	9X	59.83	171.643	0.000	151.949	171.643
4	9XY	44.59	127.934	0.000	118.874	127.934
4	9Y	59.84	0.000	-183.490	-170.710	-183.490
4	10P	48.28	0.000	-140.579	-140.579	-140.033
4	10X	58.50	167.834	0.000	152.161	167.834
4	10XY	43.61	125.125	0.000	118.888	125.125
4	10Y	62.80	0.000	-182.865	-174.497	-182.865
5	11P	42.20	0.000	-141.441	-141.441	-140.537
5	11X	51.91	171.750	0.000	157.722	171.750
5	11XY	38.86	128.562	0.000	120.884	128.562
5	11Y	55.09	0.000	-184.632	-178.661	-184.632
5	12P	48.74	0.000	-177.406	-177.406	-167.282
5	12X	42.14	139.409	0.000	125.588	139.409
5	12XY	34.89	115.439	0.000	115.439	108.982
5	12Y	55.15	0.000	-200.756	-188.874	-200.756
5	13P	49.04	0.000	-178.496	-178.496	-173.738
5	13X	39.16	129.572	0.000	120.383	129.572
5	13XY	32.25	106.708	0.000	106.708	99.458
5	13Y	56.30	0.000	-204.943	-190.795	-204.943
5	14P	47.93	0.000	-174.459	-174.459	-174.160
5	14X	43.44	143.709	0.000	135.428	143.709
5	14XY	32.48	107.465	0.000	107.465	105.778
5	14Y	56.54	0.000	-205.818	-194.895	-205.818
6	15AP	89.11	15.363	0.000	13.225	15.363
6	15AX	89.59	0.000	-14.006	-11.906	-14.006
6	15AXY	57.69	0.000	-9.019	-0.069	-9.019
6	15AY	48.80	8.414	0.000	0.544	8.414
6	15BP	32.80	5.654	0.000	5.654	4.194
6	15BX	34.02	0.000	-5.318	-5.318	-2.101
6	15BXY	24.83	4.280	0.000	4.280	0.170

6	15BY	35.48	0.000	-5.546	-5.546	-2.647
7	16AP	69.16	12.535	0.000	9.129	12.535
7	16AX	80.08	0.000	-11.454	-8.806	-11.454
7	16AXY	67.03	0.000	-9.586	-2.296	-9.586
7	16AY	42.54	7.710	0.000	0.751	7.710
7	16BP	20.74	3.758	0.000	3.758	1.740
7	16BX	24.48	0.303	-3.501	-3.501	0.303
7	16BXY	25.78	4.673	0.000	4.673	1.946
7	16BY	40.46	0.000	-5.786	-5.786	-4.618
8	17AP	60.11	26.561	0.000	26.561	21.462
8	17AX	60.80	0.000	-24.087	-24.087	-18.570
8	17AXY	35.28	0.000	-13.976	-5.484	-13.976
8	17AY	25.58	11.303	0.000	3.762	11.303
8	17BP	23.42	10.347	0.000	10.347	4.528
8	17BX	15.77	0.709	-6.249	-6.249	0.709
8	17BXY	15.93	7.039	0.000	7.039	2.148
8	17BY	31.29	0.000	-12.394	-12.394	-7.953
9	18AP	50.71	18.460	0.000	18.460	16.895
9	18AX	52.48	0.000	-17.180	-17.180	-14.414
9	18AXY	38.67	0.000	-12.659	-6.243	-12.659
9	18AY	28.56	10.397	0.000	5.341	10.397
9	18BP	23.58	8.583	0.000	8.583	5.331
9	18BX	16.03	0.000	-5.247	-5.247	-0.677
9	18BXY	16.84	6.130	0.000	6.130	0.526
9	18BY	31.05	0.000	-10.164	-10.164	-5.531
10	19AP	64.06	37.991	0.000	37.991	29.118
10	19AX	62.82	0.000	-38.448	-38.448	-27.699
10	19AXY	31.90	0.000	-19.525	-9.820	-19.525
10	19AY	28.97	17.181	0.000	8.466	17.181
10	19BP	30.33	17.986	0.000	17.986	10.299
10	19BX	21.87	0.000	-13.388	-13.388	-3.587
10	19BXY	15.46	9.170	-0.698	9.170	-0.698
10	19BY	21.03	0.000	-12.871	-12.871	-5.364
10	20AP	64.38	38.180	0.000	38.180	29.915
10	20AX	56.65	0.000	-34.672	-34.672	-25.382
10	20AXY	33.98	0.000	-20.798	-11.986	-20.798
10	20AY	25.54	15.150	0.000	6.769	15.150
10	20BP	15.75	9.342	0.000	9.342	1.738
10	20BX	10.51	4.188	-6.434	-6.434	4.188
10	20BXY	27.58	16.355	0.000	16.355	7.248
10	20BY	35.35	0.000	-21.639	-21.639	-14.340
11	21AP	49.51	22.368	0.000	22.368	6.807
11	21AX	47.44	0.000	-21.034	-21.034	-4.480
11	21AXY	18.73	8.462	0.000	8.462	3.816
11	21AY	29.84	0.000	-13.228	-13.228	-7.728
11	21BP	22.10	9.983	-3.100	9.983	-3.100
11	21BX	17.27	3.264	-7.657	-7.657	3.264
11	21BXY	48.81	22.050	0.000	22.050	13.619
11	21BY	56.60	0.000	-25.093	-25.093	-14.446
12	22AP	35.88	13.059	0.000	13.059	2.802
12	22AX	49.90	0.000	-15.461	-15.461	-5.300
12	22AXY	22.39	8.152	0.000	8.152	3.942
12	22AY	22.00	0.000	-6.816	-6.816	-3.170
12	22BP	38.57	14.040	0.000	14.040	6.891
12	22BX	41.33	0.000	-12.807	-12.807	-6.819
12	22BXY	19.02	6.922	0.000	6.922	0.141
12	22BY	29.69	0.000	-9.199	-9.199	-0.490
13	23AP	43.31	11.823	0.000	11.823	5.120
13	23AX	42.54	0.000	-9.588	-9.588	-2.584

13	23AXY	16.11	4.398	0.000	4.398	1.635
13	23AY	25.39	0.000	-5.724	-5.724	-0.301
13	23BP	31.16	8.506	0.000	8.506	2.017
13	23BX	28.15	0.000	-6.345	-6.345	-1.547
13	23BXY	29.89	8.159	0.000	8.159	3.517
13	23BY	37.75	0.000	-8.509	-8.509	-3.358
14	24AP	25.78	7.039	0.000	7.039	1.830
14	24AX	53.73	0.000	-11.516	-11.516	-6.104
14	24AXY	15.02	4.100	-1.330	4.100	-1.330
14	24AY	18.04	0.000	-3.865	-3.865	-1.343
14	24BP	19.16	5.231	0.000	5.231	1.344
14	24BX	30.49	0.000	-6.535	-6.535	-2.427
14	24BXY	20.74	5.662	0.000	5.662	1.804
14	24BY	39.80	0.000	-8.529	-8.529	-2.924
15	25AP	99.85	36.214	0.000	36.214	32.161
15	25AX	56.38	20.448	0.000	15.108	20.448
15	25AXY	28.76	10.429	-3.087	-3.087	10.429
15	25AY	38.69	14.034	-10.972	-10.972	14.034
15	25BP	11.48	1.072	-3.882	1.072	-3.882
15	25BX	61.25	22.213	0.000	22.213	17.128
15	25BXY	34.68	12.576	0.000	9.149	12.576
15	25BY	49.97	18.124	0.000	18.124	1.693
16	26AP	14.70	2.665	0.000	0.000	2.665
16	26AX	17.98	3.259	-0.652	-0.652	3.259
16	26AXY	24.34	4.412	0.000	4.412	3.658
16	26AY	0.00	0.000	0.000	0.000	0.000
16	26BP	19.75	3.580	0.000	0.000	3.580
16	26BX	38.11	6.908	0.000	5.298	6.908
16	26BXY	33.68	6.104	0.000	3.853	6.104
16	26BY	19.99	3.624	0.000	0.139	3.624
17	27AP	0.00	0.000	0.000	0.000	0.000
17	27AX	77.70	18.944	0.000	18.944	15.604
17	27AXY	54.88	6.815	-3.523	-3.523	6.815
17	27AY	22.01	0.000	-1.413	-1.413	0.000
17	27BP	28.35	6.912	0.000	6.912	0.000
17	27BX	10.67	2.602	0.000	1.741	2.602
17	27BXY	28.78	7.017	0.000	7.017	1.827
17	27BY	0.00	0.000	0.000	0.000	0.000
18	28AP	68.59	31.209	0.000	27.373	31.209
18	28AX	0.00	0.000	0.000	0.000	0.000
18	28AXY	1.13	0.514	0.000	0.514	0.000
18	28AY	78.53	14.551	-9.022	-9.022	14.551
18	28BP	21.88	9.956	-2.358	9.956	-2.358
18	28BX	24.80	11.282	0.000	4.957	11.282
18	28BXY	30.11	13.702	0.000	13.702	9.538
18	28BY	0.00	0.000	0.000	0.000	0.000
19	29AP	4.34	1.929	-0.363	-0.363	1.929
19	29AX	83.82	37.273	0.000	29.512	37.273
19	29AXY	43.00	19.122	-6.020	-6.020	19.122
19	29AY	3.21	0.156	-0.824	0.156	-0.824
19	29BP	24.12	10.726	0.000	10.726	0.089
19	29BX	42.24	18.782	0.000	10.532	18.782
19	29BXY	42.13	18.734	0.000	18.734	15.955
19	29BY	6.13	2.727	-0.399	-0.399	2.727
20a	30AP	23.81	0.000	-2.167	-2.167	-0.696
20a	30AY	28.02	0.000	-2.549	-2.549	-1.719
20a	30BP	8.33	0.551	0.000	0.551	0.446
20a	30BX	7.92	0.523	0.000	0.523	0.185
20	31P	39.92	2.639	0.000	2.639	1.567

20	31Y	28.50	1.883	0.000	1.883	1.548
20	32P	14.55	1.021	0.000	0.704	1.021
20	32X	18.18	0.000	-0.732	-0.193	-0.732
20	33P	47.33	3.128	0.000	3.128	1.385
20	33Y	51.33	3.392	0.000	3.392	2.570
20	34P	6.55	0.460	0.000	0.460	0.295
20	34X	5.64	0.396	-0.051	0.396	-0.051
20	35P	17.83	1.179	-0.101	1.179	-0.101
20	35Y	41.52	2.744	0.000	2.744	2.477
36	36P	56.74	0.000	-9.533	-8.570	-9.533
36	36X	55.01	8.177	0.000	7.022	8.177
21	37AP	57.10	0.000	-15.588	-15.588	-15.450
21	37AY	24.72	4.143	-6.750	4.143	-6.750
21	37BP	16.27	2.250	-4.443	-4.443	2.250
21	37BX	38.64	0.000	-10.549	-10.549	-9.991
22	38AP	25.41	0.000	-2.922	-0.296	-2.922
22	38AX	16.31	0.000	-1.876	-0.483	-1.876
22	38AXY	5.27	0.956	-0.187	-0.187	0.956
22	38AY	29.01	0.000	-3.337	-3.308	-3.337
22	38BP	25.21	0.000	-2.900	-0.611	-2.900
22	38BX	35.58	0.000	-4.093	-3.073	-4.093
22	38BXY	32.08	0.000	-3.690	-2.488	-3.690
22	38BY	27.90	0.000	-3.210	-1.487	-3.210
23	39AP	53.26	0.000	-9.692	-9.692	-7.620
23	39AX	5.47	0.996	-0.267	-0.267	0.996
23	39AXY	12.13	2.208	0.000	0.732	2.208
23	39AY	23.41	0.347	-4.260	0.347	-4.260
23	39BP	18.85	0.335	-3.431	-3.431	0.335
23	39BX	7.49	0.000	-1.364	-1.364	-1.321
23	39BXY	19.82	0.000	-3.607	-3.607	-0.842
23	39BY	2.12	0.387	0.000	0.197	0.387
23	39C1P	28.67	5.219	-0.466	-0.466	5.219
23	39C1Y	17.90	3.257	0.000	0.723	3.257
23	F39C197P	24.91	4.534	-0.480	-0.480	4.534
23	F39C197Y	13.94	2.538	0.000	0.701	2.538
23	39C2P	16.39	2.983	0.000	0.083	2.983
23	39C2X	44.16	8.036	0.000	4.876	8.036
23	F39C2118P	16.59	3.020	0.000	0.083	3.020
23	F39C2118X	44.25	8.054	0.000	4.877	8.054
24	40P	23.13	4.209	0.000	3.013	4.209
24	40X	30.26	0.000	-4.051	-2.693	-4.051
24	40XY	3.14	0.571	0.000	0.571	0.370
24	40Y	10.37	0.000	-1.388	-1.388	-0.651
24	41P	5.51	1.003	-0.064	-0.064	1.003
24	41X	7.83	0.000	-1.050	-0.339	-1.050
24	41XY	1.87	0.000	-0.250	-0.093	-0.250
24	41Y	0.31	0.018	-0.042	-0.042	0.018
AngleR	42P	41.04	0.000	-3.734	-3.531	-3.734
AngleR	42X	45.95	4.049	0.000	3.622	4.049
AngleR	42XY	42.26	0.000	-3.846	-2.951	-3.846
AngleR	42Y	48.18	4.246	0.000	4.194	4.246
26	43AP	14.35	0.719	-1.807	-1.807	0.719
26	43AX	10.28	1.269	-0.803	1.269	-0.803
26	43AXY	17.03	0.268	-2.144	-2.144	0.268
26	43AY	10.83	1.337	-0.942	1.337	-0.942
26	43BP	29.25	0.000	-3.682	-3.682	-1.445
26	43BX	26.91	3.323	0.000	3.323	1.128
26	43BXY	35.09	0.000	-4.417	-4.417	-1.971
26	43BY	23.91	2.952	0.000	2.952	1.080

26	43CP	35.07	0.000	-4.414	-4.414	-1.773
26	43CX	26.44	3.265	0.000	3.265	0.883
26	43CXY	39.36	0.000	-4.954	-4.954	-2.193
26	43CY	24.92	3.077	0.000	3.077	0.993
27	44P	5.44	0.986	0.000	0.074	0.986
27	44Y	1.61	0.139	-0.268	0.139	-0.268
27	44AP	1.46	0.264	-0.170	-0.170	0.264
27	44AY	5.89	0.000	-0.982	-0.058	-0.982
27	44BP	12.71	0.000	-1.848	-1.848	-0.012
27	44BY	7.46	1.352	-0.364	1.352	-0.364
27	44CP	10.13	0.309	-1.473	-1.473	0.309
27	44CY	10.46	1.895	0.000	1.895	0.008
27	44DP	2.53	0.195	-0.422	-0.422	0.195
27	44DY	4.94	0.000	-0.824	-0.268	-0.824
27	44EP	4.48	0.811	0.000	0.239	0.811
27	44EY	2.42	0.439	-0.206	0.439	-0.206
28	45P	31.44	5.722	0.000	5.722	3.214
28	45AP	34.77	6.329	0.000	6.329	3.282
28	45BP	41.49	7.551	0.000	7.551	4.153
29	46P	22.72	0.000	-1.757	-1.757	-0.411
29	46X	38.23	0.000	-2.957	-2.957	-1.188
29	46XY	37.00	0.000	-2.862	-2.862	-2.151
29	46Y	36.48	0.000	-2.822	-2.822	-2.263
30	47P	44.63	5.692	0.000	5.692	3.900
30	47Y	8.76	1.117	0.000	1.117	0.630
30	47AP	13.59	1.954	0.000	1.954	1.654
30	47AY	19.25	2.769	0.000	2.769	1.342
31	48P	45.47	8.241	0.000	8.241	5.028
31	48Y	9.64	1.747	0.000	1.747	0.960
31	48AP	15.57	2.176	0.000	1.803	2.176
31	48AY	32.53	4.547	0.000	4.547	1.631
30	49P	34.71	4.569	0.000	4.569	2.971
30	49Y	7.48	0.985	0.000	0.985	0.613
30	49AP	12.66	1.769	0.000	1.443	1.769
30	49AY	14.17	1.981	0.000	1.981	0.343
32	50P	67.22	12.184	0.000	12.184	7.766
32	50X	10.26	0.748	-1.867	-1.867	0.748
32	50XY	31.46	5.702	-2.969	5.702	-2.969
32	50Y	3.53	0.639	0.000	0.639	0.162
32	50AP	20.89	3.801	0.000	3.801	3.699
32	50AY	13.54	2.465	-1.381	2.465	-1.381
33	51P	39.68	13.050	0.000	13.050	8.334
33	51Y	18.20	0.000	-5.943	-5.943	-2.884
33	51AP	1.45	0.529	0.000	0.529	0.360
33	51AY	14.92	0.000	-4.771	-4.771	-2.755
33	51BP	37.21	0.000	-10.158	-10.158	-5.741
33	51BY	23.44	0.000	-6.400	-6.400	-6.157
33	51CP	38.48	0.000	-10.504	-10.504	-6.633
33	51CY	25.60	0.000	-6.988	-6.988	-5.656
34	52P	16.82	7.653	0.000	7.653	5.029
34	52Y	9.60	0.000	-3.997	-3.997	-1.434
34	52AP	13.72	0.000	-6.218	-6.218	-2.829
34	52AY	3.17	0.000	-1.438	-1.438	-1.237
34	52BP	48.28	0.000	-20.386	-20.386	-9.191
34	52BY	13.24	0.000	-5.588	-3.055	-5.588
34	52CP	43.24	0.000	-18.257	-18.257	-9.472
34	52CY	13.91	0.000	-5.873	-5.873	-5.376
33	53P	49.90	16.409	0.000	16.409	8.691
33	53Y	20.82	0.000	-6.800	-6.800	-2.157

33	53AP	3.79	1.378	0.000	1.352	1.378
33	53AY	18.94	0.000	-6.054	-6.054	-4.276
33	53BP	43.37	0.000	-11.841	-11.841	-6.015
33	53BY	29.53	0.000	-8.061	-8.061	-7.289
33	53CP	34.80	0.000	-11.630	-11.630	-6.153
33	53CY	23.85	0.000	-7.970	-7.970	-5.717
35	54P	14.32	0.370	-1.167	-1.167	0.370
35	54X	14.97	0.000	-1.221	-1.221	-1.124
Pwmnt	g99P	7.31	0.000	-31.971	-31.971	-12.217
Pwmnt	g100P	5.10	0.000	-27.315	-27.315	-10.671
Pwmnt	g101P	8.62	0.000	-22.432	-22.432	-9.362
Pwmnt	g102P	3.27	0.000	-17.694	-17.694	-7.470
Pwmnt	g103P	2.85	0.000	-15.417	-15.417	-6.526
Pwmnt	g104P	2.45	0.000	-13.017	-13.017	-5.639
Pwmnt	g105P	2.04	0.000	-11.520	-11.520	-4.937
Plate	g106P	4.85	0.814	0.000	0.814	0.058
PMBR1	g107P	4.17	0.000	-0.425	-0.187	-0.425
PMBR1	g108P	7.68	0.000	-0.783	-0.783	-0.409
PMBR1	g109P	4.93	0.000	-0.503	-0.503	-0.214
BraceR	g110P	57.18	7.772	0.000	3.553	7.772
BraceR	g110X	58.01	0.000	-7.886	-1.846	-7.886
PMBR2	g111P	38.23	0.000	-3.897	-1.104	-3.897
PMBR2	g111X	31.08	3.169	0.000	0.792	3.169
PMBR2	g112P	8.38	0.855	-0.588	-0.588	0.855
PMBR2	g112X	19.58	0.000	-1.996	-1.689	-1.996
PMBR2	g113P	7.84	0.799	0.000	0.642	0.799
PMBR2	g113X	9.08	0.000	-0.926	-0.924	-0.926
PMBR3	g114P	1.18	0.079	-0.120	-0.120	0.079
PMBR4	g115P	3.54	0.482	0.000	0.482	0.142
PMBR4	g116P	12.91	1.754	0.000	0.756	1.754
PMBR4	g116X	14.45	0.000	-1.964	-1.281	-1.964
PMBR4	g117P	2.83	0.000	-0.385	-0.019	-0.385
PMBR5	g118P	0.49	0.000	-0.067	-0.012	-0.067
PMBR5	g120P	8.50	0.000	-1.156	-0.480	-1.156
PMBR5	g120X	7.94	1.079	-0.051	-0.051	1.079
Pwmnt	g121P	1.51	0.000	-8.457	-8.457	-3.759

*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 33

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	-0.07995	0.5953	-0.03853	-0.4851	0.0085	0.8690	2.92	3.595	128.8
2P	-0.07895	0.5577	-0.03777	-0.6050	-0.0496	0.8208	2.921	3.558	124.3
3P	-0.07125	0.5011	-0.03675	-0.7022	-0.0551	0.7721	2.929	3.501	119.8
4P	-0.06837	0.4328	-0.03412	-0.5232	-0.0577	0.6964	2.932	3.433	112.8
5P	-0.05984	0.359	-0.03138	-0.5129	-0.0055	0.6215	2.94	3.359	104.8
6P	-0.05901	0.3085	-0.02832	-0.4438	-0.0544	0.5656	2.941	3.308	98.72
7P	-0.05188	0.2554	-0.02576	-0.4198	-0.0082	0.5160	2.948	3.255	91.72
8P	-0.05326	0.2087	-0.02234	-0.3306	-0.0221	0.4666	2.947	3.209	84.73
15P	0	0	0	0.0000	0.0000	0.0000	15.44	15.44	0
16P	-0.291	0.5511	-0.1692	-0.5597	-0.0097	0.8948	-0.291	17.3	128.6
17P	0.1455	0.4373	0.1175	-0.5576	0.0400	0.7045	3.146	-13.81	112.9
18P	0.1589	0.3155	0.1065	-0.4347	0.0510	0.6360	3.159	-16.43	98.86
19P	0.09742	0.2124	0.07594	-0.4198	0.0373	0.5007	3.097	-14.04	84.83
20AP	-0.04388	0.1077	-0.02029	-0.0450	0.1958	0.3338	9.524	0.1077	39.98
20BP	-0.09606	0.05637	-0.02533	-0.1628	-0.0536	0.3502	-0.09606	9.624	39.97
21P	-0.02782	0.06442	0.02964	0.0000	0.0000	0.0000	11.74	2.272	25.03
22P	-0.07888	0.01286	-0.0323	0.0000	0.0000	0.0000	2.129	11.78	24.97
23P	-0.2182	0.3947	-0.1438	-0.5740	-0.0102	0.7967	-0.2182	14.64	112.7
24P	-0.2133	0.2754	-0.144	-0.5059	-0.0060	0.6804	-0.2133	17.03	98.61
25P	-0.164	0.1827	-0.09444	-0.4013	0.0139	0.6101	-0.164	14.43	84.66
26P	0.07575	0.4353	0.06488	-0.4946	0.0410	0.7221	3.076	-8.19	112.9
27P	0.08133	0.3127	0.05712	-0.3660	0.0520	0.6668	3.081	-9.562	98.81
28P	0.04787	0.2106	0.03745	-0.3374	0.0381	0.5123	3.048	-8.414	84.79
29P	0	0	0	0.0000	0.0000	0.0000	1.5	0	-4.25
30P	-0.02714	0.0527	-0.002431	-0.0834	-0.0756	0.1579	1.473	0.0527	25
31P	-0.04372	0.06501	-0.003484	-0.0440	-0.0346	0.2412	1.456	0.06501	40
32P	-0.02707	0.1959	-0.006224	-0.3355	0.0157	0.4569	1.473	0.1959	84.74
33P	-0.02801	0.2935	-0.007192	-0.4589	-0.0073	0.5157	1.472	0.2935	98.74
34P	-0.03141	0.4142	-0.00826	-0.5069	-0.0093	0.5604	1.469	0.4142	112.7
35P	-0.03611	0.5736	-0.009583	-0.7120	-0.0108	0.5890	1.464	0.5736	128.7
36P	-0.03809	0.6552	-0.01031	-0.8285	-0.0110	0.5890	1.462	0.6552	134.7
37P	-0.04122	0.7907	-0.01153	-0.8791	-0.0111	0.5890	1.459	0.7907	143.7
1X	0.006697	0.5956	0.01934	-0.4640	0.0017	0.8552	3.007	-2.404	128.8
1XY	0.007656	0.5075	0.01838	-0.5071	0.0303	0.8269	-2.992	-2.492	128.8
1Y	-0.07901	0.507	-0.03912	-0.5279	0.0155	0.8306	-3.079	3.507	128.8
2X	0.006442	0.5593	0.01893	-0.6091	0.0369	0.8103	3.006	-2.441	124.3
2XY	0.006964	0.4679	0.01817	-0.5446	0.0034	0.7840	-2.993	-2.532	124.3
2Y	-0.07843	0.4662	-0.03845	-0.5400	-0.0137	0.7883	-3.078	3.466	124.3
3X	0.004387	0.501	0.01885	-0.7141	0.0224	0.7661	3.004	-2.499	119.8
3XY	0.007878	0.4222	0.0181	-0.5712	0.0193	0.7407	-2.992	-2.578	119.8
3Y	-0.0747	0.422	-0.03761	-0.5632	-0.0543	0.7461	-3.075	3.422	119.8
4X	0.005081	0.4334	0.01752	-0.5236	0.0404	0.6969	3.005	-2.567	112.8
4XY	0.005604	0.3592	0.01683	-0.4946	-0.0156	0.6738	-2.994	-2.641	112.8
4Y	-0.06814	0.3579	-0.03496	-0.4916	0.0015	0.6795	-3.068	3.358	112.8
5X	0.001932	0.3585	0.01567	-0.5032	-0.0082	0.6312	3.002	-2.642	104.8
5XY	0.007342	0.2906	0.0153	-0.4661	0.0363	0.6145	-2.993	-2.709	104.8
5Y	-0.06523	0.2911	-0.03206	-0.4706	-0.0558	0.6141	-3.065	3.291	104.8
6X	0.003498	0.3096	0.01303	-0.4418	0.0506	0.5808	3.003	-2.69	98.76
6XY	0.003717	0.2447	0.01321	-0.4060	-0.0050	0.5701	-2.996	-2.755	98.76
6Y	-0.05882	0.2441	-0.02838	-0.4023	0.0054	0.5639	-3.059	3.244	98.72

7X	-0.002097	0.2553	0.01072	-0.4256	0.0171	0.5257	2.998	-2.745	91.76
7XY	0.004536	0.1966	0.01135	-0.3705	0.0362	0.5257	-2.995	-2.803	91.76
7Y	-0.05872	0.197	-0.02529	-0.3756	-0.0353	0.5206	-3.059	3.197	91.72
8X	-0.001438	0.2088	0.007438	-0.3268	0.0381	0.4703	2.999	-2.791	84.76
8XY	-0.002381	0.1565	0.008621	-0.2754	0.0366	0.4813	-3.002	-2.844	84.76
8Y	-0.05159	0.1554	-0.02127	-0.2764	-0.0135	0.4771	-3.052	3.155	84.73
15X	0	0	0	0.0000	0.0000	0.0000	15.44	-15.44	0
15XY	0	0	0	0.0000	0.0000	0.0000	-15.44	-15.44	0
15Y	0	0	0	0.0000	0.0000	0.0000	-15.44	15.44	0
16X	0.2151	0.5529	0.1267	-0.4341	0.0210	0.8774	0.2151	-16.2	128.9
17Y	0.1453	0.3622	0.1157	-0.5618	-0.0161	0.7218	-2.855	-13.89	112.9
18Y	0.1585	0.247	0.1152	-0.5009	-0.0055	0.6668	-2.841	-16.5	98.87
19Y	0.09673	0.1591	0.07146	-0.4001	0.0356	0.5069	-2.903	-14.09	84.82
20AY	-0.04366	0.004836	0.002209	-0.0445	0.0611	0.3466	-9.612	0.004836	40
20BX	0.008292	0.05685	0.004749	-0.0594	-0.0322	0.3465	0.008292	-9.511	40
21X	0.06905	0.07146	-0.006647	0.0000	0.0000	0.0000	11.84	-2.137	24.99
21XY	-0.04184	-0.00986	0.006993	0.0000	0.0000	0.0000	-11.81	-2.218	25.01
21Y	0.02722	-0.01305	-0.01081	0.0000	0.0000	0.0000	-11.74	2.195	24.99
22X	0.008544	0.1325	-0.007703	0.0000	0.0000	0.0000	2.217	-11.64	24.99
22XY	0.009145	0.04144	0.002519	-0.0345	-0.0908	0.1857	-2.199	-11.73	25
22Y	-0.03614	0.04981	0.02606	0.2519	0.0307	-0.0132	-2.244	11.82	25.03
26Y	0.07455	0.3606	0.06287	-0.4915	-0.0152	0.7185	-2.925	-8.264	112.9
27Y	0.07885	0.2456	0.05867	-0.4107	-0.0046	0.6583	-2.921	-9.629	98.81
28Y	0.04685	0.1578	0.03509	-0.3118	0.0364	0.5099	-2.953	-8.467	84.79
9S	-0.05489	0.178	-0.02337	-0.2588	-0.0233	0.4240	4.083	4.316	76.98
10S	-0.06527	0.1541	-0.02437	-0.1949	0.0009	0.3835	5.21	5.429	69.23
11S	-0.06969	0.1381	-0.02327	-0.1579	-0.0018	0.3354	6.343	6.551	61.48
12S	-0.08454	0.12	-0.02367	-0.1146	0.0465	0.2906	7.784	7.989	51.56
13S	-0.09639	0.1074	-0.0208	-0.1217	-0.0164	0.2125	9.472	9.676	39.98
14S	-0.07962	0.06413	-0.0162	-0.2160	-0.1858	0.0866	11.69	11.83	24.98
i0.50E129S	-0.03604	0.5513	-0.01226	-0.5597	-0.0200	0.8297	-0.03604	0.5513	128.8
i0.50E113S	-0.0313	0.3959	-0.008677	-0.5041	-0.0234	0.7466	-0.0313	0.3959	112.8
i0.50E99S	-0.02786	0.2767	-0.007396	-0.4153	-0.0188	0.6557	-0.02786	0.2767	98.74
i0.50E85S	-0.02697	0.1817	-0.006199	-0.2916	-0.0078	0.5360	-0.02697	0.1817	84.74
21XF0.50S	-0.02754	0.06772	-0.0907	-0.0856	0.7758	0.0479	11.74	0.06772	24.91
22PF0.50S	-0.06157	0.03138	-0.3076	0.0000	0.0000	0.0000	-0.06157	11.8	24.69
9X	-0.001623	0.1784	0.007988	-0.2486	0.0601	0.4247	4.136	-3.959	77.01
9XY	0.004916	0.1159	0.01044	-0.1947	0.0297	0.4249	-4.133	-4.022	77.01
9Y	-0.06233	0.1168	-0.02084	-0.1847	-0.0014	0.4201	-4.2	4.254	76.98
10X	0.003192	0.1555	0.007693	-0.2111	0.0349	0.3805	5.278	-5.12	69.26
10XY	0.00493	0.08443	0.01167	-0.1505	0.0518	0.3694	-5.27	-5.191	69.26
10Y	-0.06543	0.0845	-0.0201	-0.1580	-0.0013	0.3712	-5.341	5.36	69.23
11X	0.003869	0.1364	0.006192	-0.1455	0.0538	0.3337	6.417	-6.276	61.51
11XY	0.007306	0.05879	0.01168	-0.1208	0.0254	0.3233	-6.405	-6.354	61.51
11Y	-0.07569	0.0587	-0.01727	-0.1134	0.0180	0.3223	-6.488	6.471	61.48
12X	0.005539	0.125	0.003205	-0.1000	0.0349	0.2846	7.874	-7.744	51.58
12XY	0.008981	0.03174	0.01167	-0.1017	0.0352	0.2692	-7.86	-7.837	51.59
12Y	-0.08297	0.03269	-0.01441	-0.1008	0.0410	0.2747	-7.952	7.902	51.57
13X	0.007228	0.1079	0.001398	-0.1281	0.0270	0.2134	9.576	-9.461	40
13XY	0.009186	0.005984	0.01124	-0.0707	0.0236	0.2081	-9.559	-9.563	40.01
13Y	-0.09546	0.004628	-0.00978	-0.0857	-0.0897	0.1961	-9.664	9.573	39.99
14X	0.008122	0.0733	0.0009716	-0.2000	0.0311	0.1137	11.78	-11.7	25
14XY	0.009899	-0.009781	0.008426	0.0096	0.0261	0.1205	-11.76	-11.78	25.01
14Y	-0.03589	-0.01313	-0.01201	0.0081	-0.2455	0.0862	-11.81	11.76	24.99
21XF0.50Y	-0.02678	-0.01145	-0.07609	-0.0826	-0.4397	0.3357	-11.8	-0.01145	24.92
22PF0.50X	0.008691	0.09383	-0.007788	0.0000	0.0000	0.0000	0.008691	-11.68	24.99

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
15P	-20.23	0.0	-23.62	0.0	0.0	-162.79	0.0	0.0	165.74	0.0	4.25	0.0	7.3	0.0	0.0	0.62	0.0	0.0
29P	0.16	0.0	-1.25	0.0	0.0	-33.12	0.0	0.0	33.14	0.0	14.22	0.0	5.2	0.0	0.0	-3.82	0.0	0.0
15X	27.95	0.0	-35.74	0.0	0.0	166.56	0.0	0.0	172.63	0.0	5.96	0.0	-1.0	0.0	0.0	-0.06	0.0	0.0
15XY	-23.48	0.0	-15.33	0.0	0.0	115.34	0.0	0.0	118.70	0.0	-1.68	0.0	-1.1	0.0	0.0	-0.53	0.0	0.0
15Y	27.74	0.0	-27.94	0.0	0.0	-192.14	0.0	0.0	196.13	0.0	-2.19	0.0	0.1	0.0	0.0	-0.58	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	-0.1848	-0.0000	-0.0000	0.1848	-0.0800	0.5953	-0.0385
2P	0.0000	0.0000	-0.0969	-0.0000	0.0000	0.0969	-0.0789	0.5577	-0.0378
3P	0.0000	0.0000	-0.1842	0.0000	0.0000	0.1842	-0.0713	0.5011	-0.0368
4P	0.0000	0.0000	-0.3433	-0.0000	-0.0000	0.3433	-0.0684	0.4328	-0.0341
5P	0.0000	0.0000	-0.3502	-0.0000	0.0000	0.3502	-0.0598	0.3590	-0.0314
6P	0.0000	0.0000	-0.5133	-0.0000	-0.0000	0.5133	-0.0590	0.3085	-0.0283
7P	0.0000	0.0000	-0.5541	0.0000	0.0000	0.5541	-0.0519	0.2554	-0.0258
8P	0.0000	0.0000	-0.6891	-0.0000	0.0000	0.6891	-0.0533	0.2087	-0.0223
15P	0.0000	0.0000	-1.0248	20.2314	23.6236	-161.7691	0.0000	0.0000	0.0000
16P	-2.8070	8.2130	-1.4781	2.8070	-8.2130	1.4781	-0.2910	0.5511	-0.1692
17P	5.9700	5.4201	-3.0308	-5.9700	-5.4201	3.0308	0.1455	0.4373	0.1175
18P	7.4570	9.3500	-3.3678	-7.4570	-9.3500	3.3678	0.1589	0.3155	0.1065
19P	7.4370	7.8421	-2.4298	-7.4370	-7.8421	2.4298	0.0974	0.2124	0.0759
20AP	0.0000	0.0000	-0.6136	-0.0000	0.0000	0.6136	-0.0439	0.1077	-0.0203
20BP	0.0000	0.0000	-0.6343	0.0000	0.0000	0.6343	-0.0961	0.0564	-0.0253
21P	0.0000	0.0000	-0.3466	0.0000	-0.0000	0.3466	-0.0278	0.0644	0.0296
22P	0.0000	0.0000	-0.3466	-0.0000	0.0000	0.3466	-0.0789	0.0129	-0.0323
23P	-4.8690	10.6930	-2.5509	4.8690	-10.6930	2.5509	-0.2182	0.3947	-0.1438
24P	-2.0720	9.2280	-2.6018	2.0720	-9.2280	2.6018	-0.2133	0.2754	-0.1440
25P	-5.9960	12.0510	-1.8599	5.9960	-12.0510	1.8599	-0.1640	0.1827	-0.0944
26P	0.0000	0.0000	-0.0835	-0.0000	0.0000	0.0835	0.0758	0.4353	0.0649
27P	0.0000	0.0000	-0.1110	-0.0000	0.0000	0.1110	0.0813	0.3127	0.0571
28P	0.0000	0.0000	-0.0835	-0.0000	-0.0000	0.0835	0.0479	0.2106	0.0375
29P	0.0000	0.5128	-1.1425	-0.1647	0.7351	-31.9730	0.0000	0.0000	0.0000
30P	0.0000	1.1628	-4.5426	0.0000	-1.1628	4.5426	-0.0271	0.0527	-0.0024
31P	0.0000	1.4025	-4.8584	-0.0000	-1.4025	4.8584	-0.0437	0.0650	-0.0035
32P	0.0000	1.3790	-4.6369	0.0000	-1.3790	4.6369	-0.0271	0.1959	-0.0062
33P	0.0000	0.6579	-2.2198	0.0000	-0.6579	2.2198	-0.0280	0.2935	-0.0072
34P	0.0000	0.7132	-2.3769	-0.0000	-0.7132	2.3769	-0.0314	0.4142	-0.0083
35P	0.0000	0.4982	-1.5321	0.0000	-0.4982	1.5321	-0.0361	0.5736	-0.0096
36P	0.0000	1.3240	-3.0799	-0.0000	-1.3240	3.0799	-0.0381	0.6552	-0.0103
37P	0.0000	1.0248	-8.4735	-0.0000	-1.0248	8.4735	-0.0412	0.7907	-0.0115
1X	0.0000	0.0764	-0.1848	-0.0000	-0.0764	0.1848	0.0067	0.5956	0.0193
1XY	0.0000	0.0712	-0.1740	-0.0000	-0.0712	0.1740	0.0077	0.5075	0.0184
1Y	0.0000	0.0000	-0.1740	-0.0000	-0.0000	0.1740	-0.0790	0.5070	-0.0391
2X	0.0000	0.0801	-0.0969	-0.0000	-0.0801	0.0969	0.0064	0.5593	0.0189
2XY	0.0000	0.0801	-0.0969	0.0000	-0.0801	0.0969	0.0070	0.4679	0.0182
2Y	0.0000	0.1760	-0.5729	0.0000	-0.1760	0.5729	-0.0784	0.4662	-0.0384
3X	0.0000	0.1146	-0.1835	0.0000	-0.1146	0.1835	0.0044	0.5010	0.0188
3XY	0.0000	0.1146	-0.1835	0.0000	-0.1146	0.1835	0.0079	0.4222	0.0181
3Y	0.0000	0.0000	-0.1842	0.0000	0.0000	0.1842	-0.0747	0.4220	-0.0376
4X	0.0000	0.1579	-0.3355	-0.0000	-0.1579	0.3355	0.0051	0.4334	0.0175

4XY	0.0000	0.1527	-0.3274	-0.0000	-0.1527	0.3274	0.0056	0.3592	0.0168
4Y	0.0000	0.2190	-0.9292	-0.0000	-0.2190	0.9292	-0.0681	0.3579	-0.0350
5X	0.0000	0.1870	-0.3493	-0.0000	-0.1870	0.3493	0.0019	0.3585	0.0157
5XY	0.0000	0.1870	-0.3493	-0.0000	-0.1870	0.3493	0.0073	0.2906	0.0153
5Y	0.0000	0.0000	-0.3502	-0.0000	-0.0000	0.3502	-0.0652	0.2911	-0.0321
6X	0.0000	0.1687	-0.4956	-0.0000	-0.1687	0.4956	0.0035	0.3096	0.0130
6XY	0.0000	0.1687	-0.4875	-0.0000	-0.1687	0.4875	0.0037	0.2447	0.0132
6Y	0.0000	0.2410	-1.1572	-0.0000	-0.2410	1.1572	-0.0588	0.2441	-0.0284
7X	0.0000	0.2025	-0.5534	0.0000	-0.2025	0.5534	-0.0021	0.2553	0.0107
7XY	0.0000	0.2025	-0.5534	0.0000	-0.2025	0.5534	0.0045	0.1966	0.0113
7Y	0.0000	0.0000	-0.5541	0.0000	0.0000	0.5541	-0.0587	0.1970	-0.0253
8X	0.0000	0.2093	-0.6814	-0.0000	-0.2093	0.6814	-0.0014	0.2088	0.0074
8XY	0.0000	0.2093	-0.6732	-0.0000	-0.2093	0.6732	-0.0024	0.1565	0.0086
8Y	0.0000	0.2530	-1.3670	-0.0000	-0.2530	1.3670	-0.0516	0.1554	-0.0213
15X	0.0000	0.4141	-1.0248	-27.9510	35.3253	167.5839	0.0000	0.0000	0.0000
15XY	0.0000	0.4141	-1.0248	23.4782	14.9156	116.3685	0.0000	0.0000	0.0000
15Y	0.0000	0.0000	-1.0248	-27.7449	27.9410	-191.1104	0.0000	0.0000	0.0000
16X	1.6100	1.6794	-1.7901	-1.6100	-1.6794	1.7901	0.2151	0.5529	0.1267
17Y	-5.9690	5.7961	-0.6178	5.9690	-5.7961	0.6178	0.1453	0.3622	0.1157
18Y	-5.4190	5.3170	-0.6998	5.4190	-5.3170	0.6998	0.1585	0.2470	0.1152
19Y	-7.4930	7.1811	-0.5358	7.4930	-7.1811	0.5358	0.0967	0.1591	0.0715
20AY	0.0000	0.0000	-0.6406	-0.0000	-0.0000	0.6406	-0.0437	0.0048	0.0022
20BX	0.0000	0.5955	-0.6343	0.0000	-0.5955	0.6343	0.0083	0.0569	0.0047
21X	0.0000	0.0000	-0.3466	-0.0000	0.0000	0.3466	0.0690	0.0715	-0.0066
21XY	0.0000	0.0000	-0.3466	0.0000	-0.0000	0.3466	-0.0418	-0.0099	0.0070
21Y	0.0000	0.0000	-0.3466	-0.0000	-0.0000	0.3466	0.0272	-0.0130	-0.0108
22X	0.0000	0.3464	-0.3466	0.0000	-0.3464	0.3466	0.0085	0.1325	-0.0077
22XY	0.0000	0.3464	-0.4107	-0.0000	-0.3464	0.4107	0.0091	0.0414	0.0025
22Y	0.0000	0.0000	-0.4107	0.0000	0.0000	0.4107	-0.0361	0.0498	0.0261
26Y	0.0000	0.0000	-0.0835	-0.0000	-0.0000	0.0835	0.0746	0.3606	0.0629
27Y	0.0000	0.0000	-0.1110	-0.0000	0.0000	0.1110	0.0788	0.2456	0.0587
28Y	0.0000	0.0000	-0.0835	-0.0000	-0.0000	0.0835	0.0469	0.1578	0.0351
9S	0.0000	0.0000	-0.6364	0.0000	-0.0000	0.6364	-0.0549	0.1780	-0.0234
10S	0.0000	0.0000	-0.6392	-0.0000	-0.0000	0.6392	-0.0653	0.1541	-0.0244
11S	0.0000	0.0000	-0.8152	0.0000	0.0000	0.8152	-0.0697	0.1381	-0.0233
12S	0.0000	0.0000	-1.1543	0.0000	0.0000	1.1543	-0.0845	0.1200	-0.0237
13S	0.0000	0.0000	-0.9523	-0.0000	-0.0000	0.9523	-0.0964	0.1074	-0.0208
14S	0.0000	0.0000	-1.4748	-0.0000	-0.0000	1.4748	-0.0796	0.0641	-0.0162
i0.50E129S	0.0000	0.0124	-0.0607	-0.0000	-0.0124	0.0607	-0.0360	0.5513	-0.0123
i0.50E113S	0.0000	0.0041	-0.0355	-0.0000	-0.0041	0.0355	-0.0313	0.3959	-0.0087
i0.50E99S	0.0000	0.0000	-0.0355	-0.0000	-0.0000	0.0355	-0.0279	0.2767	-0.0074
i0.50E85S	0.0000	0.0000	-0.0355	-0.0000	-0.0000	0.0355	-0.0270	0.1817	-0.0062
21XF0.50S	0.0000	0.0000	-0.0699	-0.0000	0.0000	0.0699	-0.0275	0.0677	-0.0907
22PF0.50S	0.0000	0.0000	-0.0230	-0.0000	-0.0000	0.0230	-0.0616	0.0314	-0.3076
9X	0.0000	0.3118	-0.6364	-0.0000	-0.3118	0.6364	-0.0016	0.1784	0.0080
9XY	0.0000	0.3118	-0.6364	0.0000	-0.3118	0.6364	0.0049	0.1159	0.0104
9Y	0.0000	0.0000	-0.6364	-0.0000	-0.0000	0.6364	-0.0623	0.1168	-0.0208
10X	0.0000	0.3069	-0.6392	0.0000	-0.3069	0.6392	0.0032	0.1555	0.0077
10XY	0.0000	0.4039	-0.9942	0.0000	-0.4039	0.9942	0.0049	0.0844	0.0117
10Y	0.0000	0.4430	-1.7912	0.0000	-0.4430	1.7912	-0.0654	0.0845	-0.0201
11X	0.0000	0.3835	-0.8152	-0.0000	-0.3835	0.8152	0.0039	0.1364	0.0062
11XY	0.0000	0.3835	-0.8152	0.0000	-0.3835	0.8152	0.0073	0.0588	0.0117
11Y	0.0000	0.0000	-0.8152	0.0000	-0.0000	0.8152	-0.0757	0.0587	-0.0173
12X	0.0000	0.5414	-1.1543	0.0000	-0.5414	1.1543	0.0055	0.1250	0.0032
12XY	0.0000	0.6404	-1.3863	0.0000	-0.6404	1.3863	0.0090	0.0317	0.0117
12Y	0.0000	0.2510	-1.8343	0.0000	-0.2510	1.8343	-0.0830	0.0327	-0.0144
13X	0.0000	0.3809	-0.9523	0.0000	-0.3809	0.9523	0.0072	0.1079	0.0014
13XY	0.0000	0.4669	-1.1533	0.0000	-0.4669	1.1533	0.0092	0.0060	0.0112
13Y	0.0000	0.2280	-1.5703	0.0000	-0.2280	1.5703	-0.0955	0.0046	-0.0098

14X	0.0000	0.5891	-1.4748	-0.0000	-0.5891	1.4748	0.0081	0.0733	0.0010
14XY	0.0000	0.8011	-1.9708	0.0000	-0.8011	1.9708	0.0099	-0.0098	0.0084
14Y	0.0000	0.5580	-2.9848	-0.0000	-0.5580	2.9848	-0.0359	-0.0131	-0.0120
21XF0.50Y	0.0000	0.0000	-0.0919	0.0000	-0.0000	0.0919	-0.0268	-0.0114	-0.0761
22PF0.50X	0.0000	0.0304	-0.0230	-0.0000	-0.0304	0.0230	0.0087	0.0938	-0.0078

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	2.935	50.00	50.00	5.87
2	8.804	50.00	50.00	17.61
3	8.614	50.00	50.00	17.23
4	8.343	50.00	50.00	16.69
5	12.425	50.00	50.00	24.85
6	7.624	50.00	50.00	15.25
7	11.077	50.00	50.00	22.15
8	10.392	50.00	50.00	20.78
9	12.023	50.00	50.00	24.05
10	9.809	50.00	50.00	19.62
11	13.588	50.00	50.00	27.18
12	0.599	50.00	50.00	1.20
13	0.955	50.00	50.00	1.91
14	1.182	50.00	50.00	2.36
15	1.390	50.00	50.00	2.78
16	1.845	50.00	50.00	3.69
17	1.851	50.00	50.00	3.70
18	1.587	50.00	50.00	3.17
19	3.037	50.00	50.00	6.07
20	4.689	50.00	50.00	9.38
21	5.057	50.00	50.00	10.11
22	4.838	50.00	50.00	9.68
23	2.315	50.00	50.00	4.63
24	2.482	50.00	50.00	4.96
25	1.611	50.00	50.00	3.22
26	3.352	50.00	50.00	6.70
27	8.535	50.00	50.00	17.07
28	1.073	50.00	50.00	2.15
29	1.527	50.00	50.00	3.05
30	1.244	50.00	50.00	2.49
31	2.127	50.00	50.00	4.25

*** Analysis Results for Load Case No. 2 "NESC Extreme" - Number of iterations in SAPS 13

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	-0.08648	0.6275	-0.04115	-0.5814	-0.0217	0.3258	2.914	3.628	128.8
2P	-0.08427	0.5816	-0.03992	-0.7252	-0.1075	0.3072	2.916	3.582	124.3
3P	-0.07027	0.515	-0.03838	-0.8227	-0.1296	0.2876	2.93	3.515	119.8
4P	-0.06422	0.4353	-0.03416	-0.5854	-0.1019	0.2567	2.936	3.435	112.8
5P	-0.05021	0.356	-0.03037	-0.5369	-0.0344	0.2267	2.95	3.356	104.8
6P	-0.04767	0.3037	-0.02642	-0.4485	-0.0858	0.2048	2.952	3.304	98.72
7P	-0.03698	0.2512	-0.02342	-0.4076	-0.0349	0.1869	2.963	3.251	91.73
8P	-0.0366	0.207	-0.01966	-0.2992	-0.0353	0.1691	2.963	3.207	84.73
15P	0	0	0	0.0000	0.0000	0.0000	15.44	15.44	0
16P	-0.1706	0.6108	-0.191	-0.6219	-0.0308	0.3645	-0.1706	17.36	128.6
17P	0.01156	0.4379	0.1485	-0.7950	-0.0119	0.2399	3.012	-13.81	112.9
18P	0.02921	0.3071	0.1269	-0.5918	-0.0049	0.2162	3.029	-16.44	98.88
19P	0.01694	0.2087	0.07936	-0.5154	-0.0177	0.1742	3.017	-14.04	84.83
20AP	-0.02326	0.1142	-0.01632	0.0370	0.1619	0.1162	9.545	0.1142	39.98
20BP	-0.04336	0.09572	-0.0161	-0.1433	-0.0367	0.1386	-0.04336	9.664	39.98
21P	-0.351	0.05125	-0.02554	0.0000	0.0000	0.0000	11.42	2.259	24.97
22P	-0.04849	0.3447	0.02257	0.0000	0.0000	0.0000	2.16	12.11	25.02
23P	-0.1201	0.4217	-0.1668	-0.6932	-0.0549	0.2961	-0.1201	14.67	112.6
24P	-0.1045	0.2919	-0.15	-0.5325	-0.0445	0.2517	-0.1045	17.04	98.6
25P	-0.07769	0.198	-0.09274	-0.4033	-0.0214	0.2306	-0.07769	14.45	84.66
26P	-0.01239	0.4366	0.07646	-0.6121	-0.0110	0.2527	2.988	-8.188	112.9
27P	0.002518	0.3056	0.06224	-0.4322	-0.0041	0.2352	3.003	-9.569	98.81
28P	-0.0001501	0.2077	0.03466	-0.3341	-0.0172	0.1743	3	-8.417	84.78
29P	0	0	0	0.0000	0.0000	0.0000	1.5	0	-4.25
30P	-0.01764	0.1017	-0.001088	-0.1030	-0.0364	0.0530	1.482	0.1017	25
31P	-0.02325	0.0993	-0.001495	0.0373	-0.0081	0.0852	1.477	0.0993	40
32P	-0.02654	0.2021	-0.002676	-0.3183	-0.0270	0.1655	1.473	0.2021	84.75
33P	-0.03661	0.2986	-0.003277	-0.4834	-0.0494	0.1854	1.463	0.2986	98.75
34P	-0.05077	0.4278	-0.004112	-0.5163	-0.0622	0.2004	1.449	0.4278	112.7
35P	-0.07005	0.6198	-0.005505	-1.1184	-0.0676	0.2097	1.43	0.6198	128.7
36P	-0.07766	0.7593	-0.007205	-1.4871	-0.0680	0.2092	1.422	0.7593	134.7
37P	-0.08929	1.01	-0.01078	-1.6465	-0.0683	0.2090	1.411	1.01	143.7
1X	-0.05469	0.6275	0.02869	-0.5490	-0.0024	0.3054	2.945	-2.373	128.8
1XY	-0.05431	0.594	0.02168	-0.5929	0.0182	0.3024	-3.054	-2.406	128.8
1Y	-0.08648	0.5934	-0.04746	-0.5882	-0.0053	0.3157	-3.086	3.593	128.8
2X	-0.05226	0.5823	0.02787	-0.7307	-0.0365	0.2902	2.948	-2.418	124.3
2XY	-0.05222	0.5482	0.02109	-0.6894	-0.0977	0.2863	-3.052	-2.452	124.3
2Y	-0.08432	0.5471	-0.04625	-0.6861	-0.0481	0.2983	-3.084	3.547	124.3
3X	-0.04786	0.5149	0.02737	-0.8313	-0.0790	0.2756	2.952	-2.485	119.8
3XY	-0.04128	0.4862	0.02079	-0.7709	-0.0913	0.2688	-3.041	-2.514	119.8
3Y	-0.07741	0.4863	-0.04477	-0.7625	-0.1148	0.2815	-3.077	3.486	119.8
4X	-0.03759	0.4356	0.02399	-0.5638	-0.0108	0.2520	2.962	-2.564	112.8
4XY	-0.03728	0.4092	0.01811	-0.5596	-0.0877	0.2419	-3.037	-2.591	112.8
4Y	-0.0645	0.4085	-0.04013	-0.5663	-0.0239	0.2537	-3.065	3.409	112.8
5X	-0.03391	0.3558	0.02064	-0.5400	-0.0777	0.2264	2.966	-2.644	104.8
5XY	-0.02611	0.3313	0.01552	-0.5248	-0.0169	0.2198	-3.026	-2.669	104.8
5Y	-0.05852	0.3319	-0.03574	-0.5264	-0.0990	0.2279	-3.059	3.332	104.8
6X	-0.0253	0.3042	0.01658	-0.4380	-0.0042	0.2062	2.975	-2.696	98.77
6XY	-0.02524	0.2809	0.01236	-0.4322	-0.0671	0.2040	-3.025	-2.719	98.76
6Y	-0.04772	0.2805	-0.03078	-0.4300	-0.0201	0.2075	-3.048	3.281	98.72

7X	-0.02486	0.2513	0.01342	-0.4148	-0.0429	0.1849	2.975	-2.749	91.76
7XY	-0.01693	0.2297	0.009936	-0.3915	-0.0200	0.1906	-3.017	-2.77	91.76
7Y	-0.04543	0.2304	-0.02696	-0.3953	-0.0618	0.1929	-3.045	3.23	91.72
8X	-0.01689	0.2069	0.009222	-0.2917	-0.0171	0.1633	2.983	-2.793	84.76
8XY	-0.01823	0.1882	0.006677	-0.2771	-0.0154	0.1773	-3.018	-2.812	84.76
8Y	-0.03498	0.1875	-0.02217	-0.2751	-0.0339	0.1783	-3.035	3.188	84.73
15X	0	0	0	0.0000	0.0000	0.0000	15.44	-15.44	0
15XY	0	0	0	0.0000	0.0000	0.0000	-15.44	-15.44	0
15Y	0	0	0	0.0000	0.0000	0.0000	-15.44	15.44	0
16X	0.01905	0.612	0.1614	-0.5675	-0.0013	0.3087	0.01905	-16.14	129
17Y	0.01123	0.4115	0.1419	-0.7898	-0.0885	0.2585	-2.989	-13.84	112.9
18Y	0.02886	0.2828	0.1261	-0.6106	-0.0676	0.2388	-2.971	-16.47	98.88
19Y	0.01646	0.19	0.07356	-0.4989	-0.0161	0.1729	-2.984	-14.06	84.82
20AY	-0.02325	0.07591	-0.009358	0.0374	-0.0569	0.1390	-9.591	0.07591	39.99
20BX	-0.003232	0.09583	-0.000237	-0.0301	0.0024	0.1376	-0.003232	-9.472	40
21X	0.1072	0.0835	-0.002005	0.0000	0.0000	0.0000	11.88	-2.124	25
21XY	-0.04072	0.05204	-0.007898	0.0000	0.0000	0.0000	-11.81	-2.156	24.99
21Y	0.07409	0.03894	0.009002	0.0000	0.0000	0.0000	-11.7	2.247	25.01
22X	-0.004386	0.1968	-0.01849	0.0000	0.0000	0.0000	2.204	-11.57	24.98
22XY	0.002576	0.09564	-0.004108	0.0421	-0.0819	0.1205	-2.205	-11.67	25
22Y	0.00383	0.1087	0.01565	0.1643	0.0476	-0.1836	-2.204	11.88	25.02
26Y	-0.01366	0.4103	0.07023	-0.6078	-0.0879	0.2470	-3.014	-8.215	112.9
27Y	0.0007013	0.2818	0.05923	-0.4503	-0.0670	0.2283	-2.999	-9.593	98.81
28Y	-0.0006509	0.1891	0.0305	-0.3171	-0.0155	0.1776	-3.001	-8.436	84.78
9S	-0.03109	0.1767	-0.01941	-0.2078	-0.0373	0.1599	4.106	4.314	76.98
10S	-0.03512	0.1547	-0.01915	-0.1467	-0.0071	0.1505	5.24	5.43	69.23
11S	-0.03419	0.1404	-0.01704	-0.1189	-0.0176	0.1305	6.379	6.553	61.48
12S	-0.03946	0.1243	-0.01577	-0.0644	0.0087	0.1176	7.829	7.993	51.56
13S	-0.04426	0.1136	-0.01195	-0.1495	0.0296	0.0794	9.524	9.682	39.99
14S	-0.05314	0.04677	-0.01473	-0.2521	-0.0580	0.0150	11.72	11.82	24.99
i0.50E129S	-0.0703	0.6107	-0.01464	-0.6827	-0.0888	0.3146	-0.0703	0.6107	128.8
i0.50E113S	-0.05084	0.4223	-0.007673	-0.5630	-0.1122	0.2498	-0.05084	0.4223	112.8
i0.50E99S	-0.03657	0.2924	-0.006175	-0.4341	-0.1056	0.2391	-0.03657	0.2924	98.74
i0.50E85S	-0.02651	0.1967	-0.005298	-0.2812	-0.0902	0.2005	-0.02651	0.1967	84.74
21XF0.50S	-0.01828	0.07773	-0.105	-0.1037	0.8877	-0.2255	11.75	0.07773	24.89
22PF0.50S	-0.03568	0.4792	-0.1745	0.0000	0.0000	0.0000	-0.03568	12.25	24.83
9X	-0.01659	0.1774	0.008976	-0.1959	0.0130	0.1519	4.121	-3.96	77.01
9XY	-0.009366	0.154	0.006926	-0.1800	-0.0214	0.1504	-4.147	-3.984	77.01
9Y	-0.03914	0.1554	-0.02122	-0.1759	-0.0064	0.1529	-4.177	4.293	76.98
10X	-0.01039	0.1558	0.008117	-0.1632	-0.0097	0.1394	5.265	-5.119	69.26
10XY	-0.008925	0.1299	0.006735	-0.1410	0.0098	0.1262	-5.284	-5.145	69.26
10Y	-0.03593	0.1298	-0.02009	-0.1359	-0.0182	0.1310	-5.311	5.405	69.23
11X	-0.009169	0.1387	0.005948	-0.1011	0.0194	0.1233	6.404	-6.274	61.51
11XY	-0.005458	0.11	0.005539	-0.0973	-0.0125	0.1094	-6.418	-6.303	61.51
11Y	-0.03946	0.1118	-0.01688	-0.0991	0.0069	0.1146	-6.452	6.525	61.48
12X	-0.006639	0.129	0.002389	-0.0638	0.0025	0.1085	7.862	-7.74	51.58
12XY	-0.003605	0.09451	0.003543	-0.0662	0.0066	0.0870	-7.872	-7.774	51.58
12Y	-0.0401	0.09243	-0.01385	-0.0709	0.0162	0.0960	-7.909	7.961	51.57
13X	-0.004489	0.1151	-0.0003251	-0.0839	0.0136	0.0773	9.564	-9.453	40
13XY	-0.002095	0.07695	0.001944	-0.0695	-0.0073	0.0720	-9.571	-9.492	40
13Y	-0.04237	0.07618	-0.008586	-0.0882	-0.0886	0.0648	-9.611	9.645	39.99
14X	-0.005278	0.08545	-0.002166	-0.1928	0.0049	0.0282	11.77	-11.68	25
14XY	0.002818	0.05287	8.59e-005	-0.1173	-0.0038	0.0558	-11.77	-11.72	25
14Y	0.004053	0.03904	-0.01107	-0.1390	-0.1341	0.0415	-11.77	11.81	24.99
21XF0.50Y	-0.01659	0.04698	-0.1573	-0.1023	-0.9934	0.3261	-11.79	0.04698	24.84
22PF0.50X	-0.003308	0.2407	-0.08354	0.0000	0.0000	0.0000	-0.003308	-11.53	24.92

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 %
15P	-24.66	0.0	-24.41	0.0	0.0	-169.35	0.0	0.0	172.87	0.0	1.05	0.0	6.1	0.0	0.0	0.59	0.0	0.0
29P	0.20	0.0	-2.55	0.0	0.0	-12.75	0.0	0.0	13.00	0.0	31.04	0.0	4.2	0.0	0.0	-1.28	0.0	0.0
15X	34.08	0.0	-42.18	0.0	0.0	189.12	0.0	0.0	196.74	0.0	7.36	0.0	0.6	0.0	0.0	0.57	0.0	0.0
15XY	-25.09	0.0	-27.36	0.0	0.0	133.69	0.0	0.0	138.75	0.0	4.29	0.0	-0.6	0.0	0.0	-0.83	0.0	0.0
15Y	28.13	0.0	-30.06	0.0	0.0	-200.46	0.0	0.0	204.64	0.0	1.92	0.0	-3.1	0.0	0.0	-1.04	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	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0865	0.6275	-0.0411
2P	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0843	0.5816	-0.0399
3P	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0703	0.5150	-0.0384
4P	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0642	0.4353	-0.0342
5P	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0502	0.3560	-0.0304
6P	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0477	0.3037	-0.0264
7P	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0370	0.2512	-0.0234
8P	0.0000	0.9132	-0.7211	-0.0000	-0.9132	0.7211	-0.0366	0.2070	-0.0197
15P	0.0000	0.6885	-0.5264	24.6591	23.7256	-168.8260	0.0000	0.0000	0.0000
16P	-2.0320	5.2367	-0.8756	2.0320	-5.2367	0.8756	-0.1706	0.6108	-0.1910
17P	3.0490	3.4537	-2.0296	-3.0490	-3.4537	2.0296	0.0116	0.4379	0.1485
18P	3.2630	4.8617	-2.0056	-3.2630	-4.8617	2.0056	0.0292	0.3071	0.1269
19P	3.4250	4.3037	-1.5276	-3.4250	-4.3037	1.5276	0.0169	0.2087	0.0794
20AP	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0233	0.1142	-0.0163
20BP	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0434	0.0957	-0.0161
21P	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.3510	0.0513	-0.0255
22P	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0485	0.3447	0.0226
23P	-3.0010	7.7137	-1.6576	3.0010	-7.7137	1.6576	-0.1201	0.4217	-0.1668
24P	-1.5210	6.9097	-1.5846	1.5210	-6.9097	1.5846	-0.1045	0.2919	-0.1500
25P	-3.1460	8.0447	-1.1636	3.1460	-8.0447	1.1636	-0.0777	0.1980	-0.0927
26P	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0124	0.4366	0.0765
27P	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	0.0025	0.3056	0.0622
28P	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0002	0.2077	0.0347
29P	0.0000	0.6885	-0.5264	-0.2008	1.8578	-12.2239	0.0000	0.0000	0.0000
30P	0.0000	1.8135	-1.3374	0.0000	-1.8135	1.3374	-0.0176	0.1017	-0.0011
31P	0.0000	1.7225	-1.2724	-0.0000	-1.7225	1.2724	-0.0232	0.0993	-0.0015
32P	0.0000	1.9302	-1.4541	-0.0000	-1.9302	1.4541	-0.0265	0.2021	-0.0027
33P	0.0000	0.7097	-0.5436	-0.0000	-0.7097	0.5436	-0.0366	0.2986	-0.0033
34P	0.0000	0.7437	-0.5686	-0.0000	-0.7437	0.5686	-0.0508	0.4278	-0.0041
35P	0.0000	0.5017	-0.3946	-0.0000	-0.5017	0.3946	-0.0700	0.6198	-0.0055
36P	0.0000	4.3517	-1.2626	0.0000	-4.3517	1.2626	-0.0777	0.7593	-0.0072
37P	0.0000	3.5207	-3.8586	0.0000	-3.5207	3.8586	-0.0893	1.0097	-0.0108
1X	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0547	0.6275	0.0287
1XY	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0543	0.5940	0.0217
1Y	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0865	0.5934	-0.0475
2X	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0523	0.5823	0.0279
2XY	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0522	0.5482	0.0211
2Y	0.0000	0.7567	-0.3226	0.0000	-0.7567	0.3226	-0.0843	0.5471	-0.0463
3X	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0479	0.5149	0.0274
3XY	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0413	0.4862	0.0208
3Y	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0774	0.4863	-0.0448
4X	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0376	0.4356	0.0240

4XY	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0373	0.4092	0.0181
4Y	0.0000	0.8887	-0.3536	-0.0000	-0.8887	0.3536	-0.0645	0.4085	-0.0401
5X	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0339	0.3558	0.0206
5XY	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0261	0.3313	0.0155
5Y	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0585	0.3319	-0.0357
6X	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0253	0.3042	0.0166
6XY	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0252	0.2809	0.0124
6Y	0.0000	0.9527	-0.3696	-0.0000	-0.9527	0.3696	-0.0477	0.2805	-0.0308
7X	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0249	0.2513	0.0134
7XY	0.0000	0.2247	-0.1946	0.0000	-0.2247	0.1946	-0.0169	0.2297	0.0099
7Y	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0454	0.2304	-0.0270
8X	0.0000	0.9132	-0.7211	-0.0000	-0.9132	0.7211	-0.0169	0.2069	0.0092
8XY	0.0000	0.9132	-0.7211	0.0000	-0.9132	0.7211	-0.0182	0.1882	0.0067
8Y	0.0000	1.6792	-0.9051	0.0000	-1.6792	0.9051	-0.0350	0.1875	-0.0222
15X	0.0000	0.6885	-0.5264	-34.0773	41.4883	189.6484	0.0000	0.0000	0.0000
15XY	0.0000	0.6885	-0.5264	25.0852	26.6699	134.2192	0.0000	0.0000	0.0000
15Y	0.0000	0.6885	-0.5264	-28.1273	29.3761	-199.9322	0.0000	0.0000	0.0000
16X	-1.0150	5.2607	-1.0706	1.0150	-5.2607	1.0706	0.0191	0.6120	0.1614
17Y	-3.8230	4.5467	-0.3186	3.8230	-4.5467	0.3186	0.0112	0.4115	0.1419
18Y	-3.4980	4.2487	-0.3576	3.4980	-4.2487	0.3576	0.0289	0.2828	0.1261
19Y	-4.3620	5.0017	-0.2896	4.3620	-5.0017	0.2896	0.0165	0.1900	0.0736
20AY	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0233	0.0759	-0.0094
20BX	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0032	0.0958	-0.0002
21X	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	0.1072	0.0835	-0.0020
21XY	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0407	0.0520	-0.0079
21Y	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.0741	0.0389	0.0090
22X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0044	0.1968	-0.0185
22XY	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.0026	0.0956	-0.0041
22Y	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	0.0038	0.1087	0.0157
26Y	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0137	0.4103	0.0702
27Y	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	0.0007	0.2818	0.0592
28Y	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0007	0.1891	0.0305
9S	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0311	0.1767	-0.0194
10S	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0351	0.1547	-0.0192
11S	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0342	0.1404	-0.0170
12S	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0395	0.1243	-0.0158
13S	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0443	0.1136	-0.0120
14S	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0531	0.0468	-0.0147
i0.50E129S	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0703	0.6107	-0.0146
i0.50E113S	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0508	0.4223	-0.0077
i0.50E99S	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0366	0.2924	-0.0062
i0.50E85S	0.0000	0.2247	-0.1946	-0.0000	-0.2247	0.1946	-0.0265	0.1967	-0.0053
21XF0.50S	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0183	0.0777	-0.1050
22PF0.50S	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0357	0.4792	-0.1745
9X	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0166	0.1774	0.0090
9XY	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0094	0.1540	0.0069
9Y	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0391	0.1554	-0.0212
10X	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0104	0.1558	0.0081
10XY	0.0000	0.9575	-0.6754	0.0000	-0.9575	0.6754	-0.0089	0.1299	0.0067
10Y	0.0000	2.0625	-0.9314	-0.0000	-2.0625	0.9314	-0.0359	0.1298	-0.0201
11X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0092	0.1387	0.0059
11XY	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0055	0.1100	0.0055
11Y	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0395	0.1118	-0.0169
12X	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0066	0.1290	0.0024
12XY	0.0000	0.9485	-0.5884	-0.0000	-0.9485	0.5884	-0.0036	0.0945	0.0035
12Y	0.0000	1.4485	-0.7094	-0.0000	-1.4485	0.7094	-0.0401	0.0924	-0.0139
13X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0045	0.1151	-0.0003
13XY	0.0000	0.9135	-0.5804	0.0000	-0.9135	0.5804	-0.0021	0.0769	0.0019
13Y	0.0000	1.3785	-0.6924	-0.0000	-1.3785	0.6924	-0.0424	0.0762	-0.0086

14X	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0053	0.0855	-0.0022
14XY	0.0000	1.2425	-0.6594	-0.0000	-1.2425	0.6594	0.0028	0.0529	0.0001
14Y	0.0000	2.3765	-0.9324	0.0000	-2.3765	0.9324	0.0041	0.0390	-0.0111
21XF0.50Y	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0166	0.0470	-0.1573
22PF0.50X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0033	0.2407	-0.0835

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)	RLX	RLY	RLZ	L/R	KL/R	Curve No.	Alternate-Unsupported L/R Cap. (kips)	RLOUT	L/R	KL/R	Curve No.
15BX	15BXY	Long only	-2.10	0.17	15.63	0.500	0.500	0.500	131.11	128.51	5	11.66	1.000	166.84	148.81	6
19BX	19BXY	Long only	-3.59	-0.70	61.20	0.500	0.750	0.500	77.55	88.16	2	49.22	1.000	103.40	111.70	3
19BXY	19BX	Long only	-0.70	-3.59	61.20	0.500	0.750	0.500	77.55	88.16	2	49.22	1.000	103.40	111.70	3
20BY	20BP	Long only	-14.34	1.74	61.20	0.500	0.750	0.500	77.55	88.16	2	49.22	1.000	103.40	111.70	3
21BP	21BY	Short only	-3.10	-14.45	44.33	0.580	0.580	0.580	95.79	101.84	2	42.37	1.000	95.79	107.89	3
21BY	21BP	Short only	-14.45	-3.10	44.33	0.580	0.580	0.580	95.79	101.84	2	42.37	1.000	95.79	107.89	3

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	5.464	50.00	50.00	10.93
2	5.685	50.00	50.00	11.37
3	5.034	50.00	50.00	10.07
4	5.949	50.00	50.00	11.90
5	6.189	50.00	50.00	12.38
6	5.515	50.00	50.00	11.03
7	5.708	50.00	50.00	11.42
8	6.643	50.00	50.00	13.29
9	8.441	50.00	50.00	16.88
10	7.250	50.00	50.00	14.50
11	8.716	50.00	50.00	17.43
12	0.823	50.00	50.00	1.65
13	0.957	50.00	50.00	1.91
14	1.022	50.00	50.00	2.04
15	1.908	50.00	50.00	3.82
16	2.263	50.00	50.00	4.53
17	1.613	50.00	50.00	3.23
18	1.543	50.00	50.00	3.09
19	2.553	50.00	50.00	5.11
20	2.253	50.00	50.00	4.51
21	2.141	50.00	50.00	4.28
22	2.417	50.00	50.00	4.83
23	0.894	50.00	50.00	1.79
24	0.936	50.00	50.00	1.87
25	0.638	50.00	50.00	1.28
26	4.531	50.00	50.00	9.06
27	5.223	50.00	50.00	10.45
28	1.172	50.00	50.00	2.34
29	1.116	50.00	50.00	2.23

30	1.082	50.00	50.00	2.16
31	1.407	50.00	50.00	2.81

*** 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 Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Comp. Use %	Comp. Control Member	Comp. Force (kips)	Comp. Control 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 Comp. (ft)	Curve No. Member	No. Of Bolts
1	LEG1	SAE	3.5X3.5X0.25	36.0	89.52	Comp	89.52	3Y	-29.375	NESC Ext	32.813	36.400	54.375	1.000	1.000	1.000	121.04	121.04	7.000	4 4
2	LEG2	SAE	6X6X0.3125	36.0	83.52	Comp	83.52	5Y	-82.757	NESC Ext	99.083	109.200	203.906	1.000	1.000	1.000	60.50	60.50	6.050	1 12
3	LEG3	SAE	8X8X0.5	36.0	60.13	Tens	59.72	7Y	-149.092	NESC Ext	249.636	254.800	380.624	1.000	1.000	1.000	52.83	52.83	7.000	1 14
4	LEG4	SAE	8X8X0.625	36.0	62.80	Comp	62.80	10Y	-182.865	NESC Ext	306.646	291.200	543.749	1.000	1.000	1.000	60.12	60.12	7.915	1 16
5	LEG5	SAE	8X8X0.75	36.0	56.54	Comp	56.54	14Y	-205.818	NESC Ext	381.402	364.000	815.624	0.250	0.250	0.250	48.48	48.48	25.533	1 20
6	X1	SAE	2.5X2.5X0.1875	36.0	89.59	Comp	89.59	15AX	-14.006	NESC Ext	15.633	18.200	20.391	0.500	0.500	0.500	131.11	128.51	10.817	5 2
7	X2	SAU	2.5X2X0.1875	36.0	80.08	Comp	80.08	16AX	-11.454	NESC Ext	14.303	18.200	20.391	0.500	0.500	0.500	129.55	127.32	9.220	5 2
8	X3	SAU	4X3X0.25	36.0	60.80	Comp	60.80	17AX	-24.087	NESC Hea	39.613	45.500	67.969	0.500	0.750	0.500	100.45	105.33	10.000	2 5
9	X4	SAU	3.5X2.5X0.25	36.0	52.48	Comp	52.48	18AX	-17.180	NESC Hea	32.738	36.400	54.375	0.500	0.750	0.500	104.34	108.25	8.521	2 4
10	X5	SAU	4X3.5X0.3125	36.0	64.38	Tens	62.82	19AX	-38.448	NESC Hea	61.204	63.700	118.945	0.500	0.750	0.500	77.55	88.16	9.220	2 7
11	X6	SAU	5X3.5X0.25	36.0	56.60	Comp	56.60	21BY	-25.093	NESC Hea	44.335	54.600	81.562	0.580	0.580	0.580	95.79	101.84	10.597	2 6
12	X7	SAU	4X3X0.25	36.0	49.90	Comp	49.90	22AX	-15.461	NESC Hea	30.985	36.400	54.375	0.560	0.560	0.560	126.41	124.92	12.246	5 4
13	X8	SAU	3.5X3X0.25	36.0	43.31	Tens	42.54	23AX	-9.588	NESC Hea	22.542	27.300	40.781	0.550	0.550	0.550	147.17	140.74	14.070	5 3
14	X9	SAU	5X3X0.25	36.0	53.73	Comp	53.73	24AX	-11.516	NESC Hea	21.431	27.300	40.781	0.550	0.550	0.550	173.71	160.96	17.450	5 3
15	D1	SAU	5X3X0.25	36.0	99.85	Tens	32.46	25AY	-10.972	NESC Hea	33.799	63.700	95.156	1.000	0.500	0.500	127.63	125.86	14.103	5 7
16	D2	SAE	2X2X0.1875	36.0	38.11	Tens	16.12	26AX	-0.652	NESC Hea	4.044	18.200	20.391	0.500	0.500	0.500	256.65	224.16	16.853	5 2
17	D3	SAU	3X2X0.25	36.0	77.70	Tens	54.88	27AXY	-3.523	NESC Hea	6.420	36.400	54.375	1.000	0.500	0.500	264.74	230.33	19.194	5 4
18	D4	SAU	4X3X0.25	36.0	78.53	Comp	78.53	28AY	-9.022	NESC Hea	11.489	45.500	67.969	0.500	1.000	0.500	205.19	205.19	15.321	4 5
19	D5	SAU	3.5X3X0.25	36.0	83.82	Tens	23.47	29AXY	-6.020	NESC Hea	25.652	45.500	67.969	0.250	0.250	0.250	135.61			

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131.93 28.523     5     5
     20            H1   SAE 1.75X1.75X0.1875     36.0 51.33  Tens 18.18     32X   -0.732NESC Ext    4.027    9.100   10.195 1.000 1.000 1.000 209.91
209.91  6.000     4     1
     21            H2   SAU       4X3.5X0.25     36.0 57.10  Comp 57.10     37AP  -15.588NESC Hea   27.341   27.300   40.781 1.000 0.500 0.500 148.70
137.65 15.738     6     3
     22            H3   SAE       3X3X0.1875     36.0 35.58  Comp 35.58     38BX   -4.093NESC Ext   11.503   18.200   20.391 1.000 1.000 1.000 192.66
164.68  9.569     6     2
     23            H4   SAU         5X3X0.25     36.0 53.26  Comp 53.26     39AP   -9.692NESC Hea   21.560   18.200   27.187 1.000 1.000 1.000 173.07
160.48  9.562     5     2
     24            H5   SAE     3.5X3.5X0.25     36.0 30.26  Comp 30.26     40X    -4.051NESC Ext   13.386   18.200   27.187 1.000 1.000 1.000 233.97
190.09 13.531     6     2
     25           X10   SAE 1.75X1.75X0.1875     36.0  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
     26           X11   SAE       2X2X0.1875     36.0 39.36  Comp 39.36    43CXY   -4.954NESC Hea   12.587   18.200   20.391 1.000 1.000 1.000 129.22
127.06  4.243     5     2
     27           X12   SAU     2.5X2X0.1875     36.0 12.71  Comp 12.71     44BP   -1.848NESC Hea   14.533   18.200   20.391 0.750 0.500 0.500 128.22
126.30  9.125     5     2
     28            H6   SAU         4X3X0.25     36.0 41.49  Tens  0.00     45BP    0.000           35.407   18.200   27.187 1.000 1.000 1.000 110.60
115.30  6.000     3     2
     29            D6   SAU       3X2X0.1875     36.0 38.23  Comp 38.23     46X    -2.957NESC Hea    7.736   18.200   20.391 1.000 0.500 0.500 201.94
182.48 14.775     5     2
     30          HGR1   SAU     2.5X2X0.1875     36.0 44.63  Tens  0.00     49AY    0.000            5.486   18.200   20.391 1.000 0.500 0.500 205.58
205.58 13.585     4     2
     31          HGR2   SAE       3X3X0.1875     36.0 45.47  Tens  0.00     48AY    0.000            8.140   18.200   20.391 1.000 0.500 0.500 195.77
195.77 15.319     4     2
     32            A1   SAE         3X3X0.25     36.0 67.22  Tens 16.31     50XY   -2.969NESC Ext   21.867   18.200   27.187 0.500 0.500 0.500 142.64
137.29 14.073     5     2
     33            A2   SAU       3.5X3X0.25     36.0 49.90  Tens 43.37     53BP  -11.841NESC Hea   33.416   27.300   40.781 1.000 1.000 1.000 106.97
113.49  5.625     3     3
     34            A#   SAE         4X4X0.25     36.0 48.28  Comp 48.28     52BP  -20.386NESC Hea   42.220   45.500   67.969 1.000 1.000 1.000 103.77
111.89  6.875     3     5
     35            H7   SAU     2.5X2X0.1875     36.0 14.97  Comp 14.97     54X    -1.221NESC Hea    8.154    9.100   10.195 1.000 1.000 1.000 168.62
168.62  6.000     4     1
     36            H8   DAE 1.75X1.75X0.1875     36.0 56.74  Comp 56.74     36P    -9.533NESC Ext   19.743   16.800   20.391 1.000 1.000 1.000 134.08
134.08  6.000     4     1
  Pwmnt 12" Std. Pipe Pwmnt    Pipe 12" Std.     42.0  8.62  Comp  8.62    g101P  -22.432NESC Hea  260.146    0.000    0.000 1.000 1.000 1.000 122.32
122.32 44.750     4     0
  PMBR1     L2x2x3/16   SAE       2X2X0.1875     36.0  7.68  Comp  7.68    g108P   -0.783NESC Hea   20.044   16.800   10.195 1.000 1.000 1.000  45.69
82.84  1.500     3     1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize
moments): g107P  ??
  PMBR2 L2.5x2.5x3/16   SAE   2.5X2.5X0.1875     36.0 38.23  Comp 38.23    g111P   -3.897NESC Ext   22.126   16.800   10.195 1.000 1.000 1.000   81.32
100.66  3.354     3     1
  PMBR3     L3x3x3/16   SAE       3X3X0.1875     36.0  1.18  Comp  1.18    g114P   -0.120NESC Hea   11.823   16.800   10.195 1.000 1.000 1.000 162.44
162.44  8.068     4     1
  PMBR4  L3.5x3.5x1/4   SAE     3.5X3.5X0.25     36.0 14.45  Comp 14.45    g116X   -1.964NESC Ext   17.249   16.800   13.594 1.000 1.000 1.000 167.46
167.46  9.685     4     1
  PMBR5      L4x4x1/4   SAE         4X4X0.25     36.0  8.50  Comp  8.50    g120P   -1.156NESC Ext   16.004   16.800   13.594 1.000 1.000 1.000 186.27
186.27 12.340     4     1
    20a            H1   SAE 1.75X1.75X0.1875     36.0 28.02  Comp 28.02     30AY   -2.549NESC Hea   13.441    9.100   10.195 0.500 0.500 0.500 104.96
112.48  6.000     3     1
 AngleR      L2x2x1/4   SAE         2X2X0.25     36.0 48.18  Tens 42.26     42XY   -3.846NESC Ext   15.869    9.100   13.594 1.000 1.000 1.000 130.21
130.21  4.243     4     1
 BraceR  L2.5x2.5x1/4   SAE     2.5X2.5X0.25     36.0 58.01  Comp 58.01    g110X   -7.886NESC Ext   29.101   16.800   13.594 1.000 1.000 1.000  81.98
100.99  3.354     3     1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize
moments): g110P g110X  ??
  Plate    6"x3/4" PL   Bar            6x3/4     36.0  4.85  Tens  0.00    g106P    0.000          109.423   16.800    0.000 1.000 1.000 1.000  83.19
101.59  1.501     3     1
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Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max 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.	Hole Diameter (in)	Holes
1	LEG1	SAE	3.5X3.5X0.25	36.0	89.52	Comp	73.91	3X	26.902	NESC Ext	47.340	36.400	54.375	60.417	7.000	4	2.000	0.75
2	LEG2	SAE	6X6X0.3125	36.0	83.52	Comp	76.75	5X	74.945	NESC Ext	97.650	109.200	203.906	183.656	6.050	12	4.000	0.75
3	LEG3	SAE	8X8X0.5	36.0	60.13	Tens	60.13	7X	139.348	NESC Ext	231.750	254.800	380.624	395.849	7.000	14	3.500	0.75
4	LEG4	SAE	8X8X0.625	36.0	62.80	Comp	59.83	9X	171.643	NESC Ext	286.897	0.000	0.000	0.000	7.915	0	3.500	0.75
5	LEG5	SAE	8X8X0.75	36.0	56.54	Comp	51.91	11X	171.750	NESC Ext	330.839	0.000	0.000	0.000	10.131	0	4.000	0.75
6	X1	SAE	2.5X2.5X0.1875	36.0	89.59	Comp	89.11	15AP	15.363	NESC Ext	24.669	18.200	20.391	17.241	10.817	2	1.000	0.75
7	X2	SAU	2.5X2X0.1875	36.0	80.08	Comp	69.16	16AP	12.535	NESC Ext	18.650	18.200	20.391	18.125	9.220	2	1.000	0.75
8	X3	SAU	4X3X0.25	36.0	60.80	Comp	60.11	17AP	26.561	NESC Hea	44.185	45.500	67.969	52.912	10.000	5	1.740	0.75
9	X4	SAU	3.5X2.5X0.25	36.0	52.48	Comp	50.71	18AP	18.460	NESC Hea	40.399	36.400	54.375	42.647	8.521	4	1.030	0.75
10	X5	SAU	4X3.5X0.3125	36.0	64.38	Tens	64.38	20AP	38.180	NESC Hea	59.307	63.700	118.945	74.976	9.220	7	1.790	0.75
11	X6	SAU	5X3.5X0.25	36.0	56.60	Comp	49.51	21AP	22.368	NESC Hea	45.178	54.600	81.562	46.012	10.597	6	1.550	0.75
12	X7	SAU	4X3X0.25	36.0	49.90	Comp	38.57	22BP	14.040	NESC Hea	40.581	36.400	54.375	42.206	12.246	4	1.000	0.75
13	X8	SAU	3.5X3X0.25	36.0	43.31	Tens	43.31	23AP	11.823	NESC Hea	40.419	27.300	40.781	38.516	14.070	3	1.000	0.75
14	X9	SAU	5X3X0.25	36.0	53.73	Comp	25.78	24AP	7.039	NESC Hea	40.581	27.300	40.781	36.250	17.450	3	1.000	0.75
15	D1	SAU	5X3X0.25	36.0	99.85	Tens	99.85	25AP	36.214	NESC Hea	36.268	63.700	95.156	72.037	14.103	7	1.710	0.75
16	D2	SAE	2X2X0.1875	36.0	38.11	Tens	38.11	26BX	6.908	NESC Ext	18.448	18.200	20.391	18.125	16.853	2	1.000	0.75
17	D3	SAU	3X2X0.25	36.0	77.70	Tens	77.70	27AX	18.944	NESC Hea	24.381	36.400	54.375	48.333	19.194	4	1.000	0.75
18	D4	SAU	4X3X0.25	36.0	78.53	Comp	68.59	28AP	31.209	NESC Ext	47.101	45.500	67.969	60.337	15.321	5	1.260	0.75
19	D5	SAU	3.5X3X0.25	36.0	83.82	Tens	83.82	29AX	37.273	NESC Ext	44.469	45.500	67.969	50.906	28.523	5	1.000	0.75
20	H1	SAE	1.75X1.75X0.1875	36.0	51.33	Tens	51.33	33Y	3.392	NESC Hea	15.532	9.100	10.195	6.609	6.000	1	1.000	0.75
21	H2	SAU	4X3.5X0.25	36.0	57.10	Comp	15.18	37AY	4.143	NESC Hea	48.519	27.300	40.781	36.250	15.738	3	1.000	0.75
22	H3	SAE	3X3X0.1875	36.0	35.58	Comp	5.27	38AXY	0.956	NESC Ext	30.760	18.200	20.391	18.125	9.569	2	1.000	0.75
23	H4	SAU	5X3X0.25	36.0	53.26	Comp	44.25	F39C2118X	8.054	NESC Ext	40.581	18.200	27.187	24.167	2.208	2	1.000	0.75

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     24            H5   SAE     3.5X3.5X0.25     36.0 30.26  Comp 23.13       40P   4.209NESC Ext   48.681   18.200   27.187   25.677 13.531     2
1.000     0.75
     25           X10   SAE 1.75X1.75X0.1875     36.0  0.00        0.00             0.000            0.000    0.000    0.000    0.000  0.000     0
0.000        0
     26           X11   SAE       2X2X0.1875     36.0 39.36  Comp 26.91       43BX   3.323NESC Hea   18.448   18.200   20.391   12.347  4.243     2
1.000     0.75
     27           X12   SAU     2.5X2X0.1875     36.0 12.71  Comp 10.46       44CY   1.895NESC Hea   18.650   18.200   20.391   18.125  9.125     2
1.000     0.75
     28            H6   SAU         4X3X0.25     36.0 41.49  Tens 41.49       45BP   7.551NESC Hea   40.581   18.200   27.187   24.167  6.000     2
1.000     0.75
     29            D6   SAU       3X2X0.1875     36.0 38.23  Comp  0.00        46Y   0.000            18.529   18.200   20.391   12.755 14.775     2
1.000     0.75
     30          HGR1   SAU     2.5X2X0.1875     36.0 44.63  Tens 44.63       47P   5.692NESC Hea   18.650   18.200   20.391   12.755 13.250     2
1.000     0.75
     31          HGR2   SAE       3X3X0.1875     36.0 45.47  Tens 45.47       48P   8.241NESC Hea   30.760   18.200   20.391   18.125 15.022     2
1.000     0.75
     32            A1   SAE         3X3X0.25     36.0 67.22  Tens 67.22       50P  12.184NESC Hea   36.997   18.200   27.187   18.125 14.073     2
1.590     0.75
     33            A2   SAU       3.5X3X0.25     36.0 49.90  Tens 49.90       53P  16.409NESC Hea   32.886   36.400   54.375   42.647 11.643     4
2.240     0.75
     34            A#   SAE         4X4X0.25     36.0 48.28  Comp 16.82       52P   7.653NESC Hea   46.393   45.500   67.969   48.262 14.073     5
2.710     0.75
     35            H7   SAU     2.5X2X0.1875     36.0 14.97  Comp  4.06       54P   0.370NESC Ext   21.688    9.100   10.195    9.629  6.000     1
1.000     0.75
     36            H8   DAE 1.75X1.75X0.1875     36.0 56.74  Comp 55.01       36X   8.177NESC Ext   31.823   16.800   20.391   14.864  6.000     1
2.000   0.6875
   Pwmnt 12" Std. Pipe Pwmnt    Pipe 12" Std.     42.0  8.62  Comp  0.00     g121P   0.000          571.199    0.000    0.000    0.000  9.000     0
0.000        0
   PMBR1     L2x2x3/16   SAE       2X2X0.1875     36.0  7.68  Comp  0.00     g109P   0.000           18.827   16.800   10.195   10.343  1.500     1
1.000   0.6875 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g107P
??
   PMBR2 L2.5x2.5x3/16   SAE   2.5X2.5X0.1875     36.0 38.23  Comp 31.08     g111X   3.169NESC Ext   25.048   16.800   10.195   11.328  3.354     1
1.000   0.6875
   PMBR3     L3x3x3/16   SAE       3X3X0.1875     36.0  1.18  Comp  0.77     g114P   0.079NESC Ext   31.139   16.800   10.195   11.328  8.068     1
1.000   0.6875
   PMBR4   L3.5x3.5x1/4   SAE     3.5X3.5X0.25     36.0 14.45  Comp 12.91     g116P   1.754NESC Ext   49.187   16.800   13.594   15.104  9.685     1
1.000   0.6875
   PMBR5      L4x4x1/4   SAE         4X4X0.25     36.0  8.50  Comp  7.94     g120X   1.079NESC Ext   57.287   16.800   13.594   15.104 12.340     1
1.000   0.6875
    20a            H1   SAE 1.75X1.75X0.1875     36.0 28.02  Comp  8.33      30BP   0.551NESC Hea   15.532    9.100   10.195    6.609  6.000     1
1.000     0.75
 AngleR      L2x2x1/4   SAE         2X2X0.25     36.0 48.18  Tens 48.18       42Y   4.246NESC Ext   24.381    9.100   13.594    8.812  4.243     1
1.000     0.75
 BraceR   L2.5x2.5x1/4   SAE     2.5X2.5X0.25     36.0 58.01  Comp 57.18     g110P   7.772NESC Ext   32.987   16.800   13.594   15.104  3.354     1
1.000   0.6875 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g110P
g110X  ??
   Plate    6"x3/4" PL   Bar             6x3/4     36.0  4.85  Tens  4.85     g106P   0.814NESC Hea  145.800   16.800    0.000    0.000  1.501     1
1.000   0.6875
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*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type

NESC Heavy	99.85	25AP	Angle
NESC Extreme	89.59	15AX	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	10.93	NESC Extreme	0.0
2	Clamp	17.61	NESC Heavy	0.0
3	Clamp	17.23	NESC Heavy	0.0
4	Clamp	16.69	NESC Heavy	0.0
5	Clamp	24.85	NESC Heavy	0.0
6	Clamp	15.25	NESC Heavy	0.0
7	Clamp	22.15	NESC Heavy	0.0
8	Clamp	20.78	NESC Heavy	0.0
9	Clamp	24.05	NESC Heavy	0.0
10	Clamp	19.62	NESC Heavy	0.0
11	Clamp	27.18	NESC Heavy	0.0
12	Clamp	1.65	NESC Extreme	0.0
13	Clamp	1.91	NESC Extreme	0.0
14	Clamp	2.36	NESC Heavy	0.0
15	Clamp	3.82	NESC Extreme	0.0
16	Clamp	4.53	NESC Extreme	0.0
17	Clamp	3.70	NESC Heavy	0.0
18	Clamp	3.17	NESC Heavy	0.0
19	Clamp	6.07	NESC Heavy	0.0
20	Clamp	9.38	NESC Heavy	0.0
21	Clamp	10.11	NESC Heavy	0.0
22	Clamp	9.68	NESC Heavy	0.0
23	Clamp	4.63	NESC Heavy	0.0
24	Clamp	4.96	NESC Heavy	0.0
25	Clamp	3.22	NESC Heavy	0.0
26	Clamp	9.06	NESC Extreme	0.0
27	Clamp	17.07	NESC Heavy	0.0
28	Clamp	2.34	NESC Extreme	0.0
29	Clamp	3.05	NESC Heavy	0.0
30	Clamp	2.49	NESC Heavy	0.0
31	Clamp	4.25	NESC Heavy	0.0

Loads At Insulator Attachments For All Load Cases:

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
NESC Heavy	1	Clamp	16X	1.610	1.679	1.790	2.935
NESC Heavy	2	Clamp	16P	-2.807	8.213	1.478	8.804
NESC Heavy	3	Clamp	17P	5.970	5.420	3.031	8.614
NESC Heavy	4	Clamp	17Y	-5.969	5.796	0.618	8.343
NESC Heavy	5	Clamp	18P	7.457	9.350	3.368	12.425
NESC Heavy	6	Clamp	18Y	-5.419	5.317	0.700	7.624
NESC Heavy	7	Clamp	19P	7.437	7.842	2.430	11.077
NESC Heavy	8	Clamp	19Y	-7.493	7.181	0.536	10.392
NESC Heavy	9	Clamp	23P	-4.869	10.693	2.551	12.023
NESC Heavy	10	Clamp	24P	-2.072	9.228	2.602	9.809

NESC Heavy	11	Clamp	25P	-5.996	12.051	1.860	13.588
NESC Heavy	12	Clamp	2Y	0.000	0.176	0.573	0.599
NESC Heavy	13	Clamp	4Y	0.000	0.219	0.929	0.955
NESC Heavy	14	Clamp	6Y	0.000	0.241	1.157	1.182
NESC Heavy	15	Clamp	8Y	0.000	0.253	1.367	1.390
NESC Heavy	16	Clamp	10Y	0.000	0.443	1.791	1.845
NESC Heavy	17	Clamp	12Y	0.000	0.251	1.834	1.851
NESC Heavy	18	Clamp	13Y	0.000	0.228	1.570	1.587
NESC Heavy	19	Clamp	14Y	0.000	0.558	2.985	3.037
NESC Heavy	20	Clamp	30P	0.000	1.163	4.543	4.689
NESC Heavy	21	Clamp	31P	0.000	1.402	4.858	5.057
NESC Heavy	22	Clamp	32P	0.000	1.379	4.637	4.838
NESC Heavy	23	Clamp	33P	0.000	0.658	2.220	2.315
NESC Heavy	24	Clamp	34P	0.000	0.713	2.377	2.482
NESC Heavy	25	Clamp	35P	0.000	0.498	1.532	1.611
NESC Heavy	26	Clamp	36P	0.000	1.324	3.080	3.352
NESC Heavy	27	Clamp	37P	0.000	1.025	8.474	8.535
NESC Heavy	28	Clamp	10XY	0.000	0.404	0.994	1.073
NESC Heavy	29	Clamp	12XY	0.000	0.640	1.386	1.527
NESC Heavy	30	Clamp	13XY	0.000	0.467	1.153	1.244
NESC Heavy	31	Clamp	14XY	0.000	0.801	1.971	2.127
NESC Extreme	1	Clamp	16X	-1.015	5.261	1.071	5.464
NESC Extreme	2	Clamp	16P	-2.032	5.237	0.876	5.685
NESC Extreme	3	Clamp	17P	3.049	3.454	2.030	5.034
NESC Extreme	4	Clamp	17Y	-3.823	4.547	0.319	5.949
NESC Extreme	5	Clamp	18P	3.263	4.862	2.006	6.189
NESC Extreme	6	Clamp	18Y	-3.498	4.249	0.358	5.515
NESC Extreme	7	Clamp	19P	3.425	4.304	1.528	5.708
NESC Extreme	8	Clamp	19Y	-4.362	5.002	0.290	6.643
NESC Extreme	9	Clamp	23P	-3.001	7.714	1.658	8.441
NESC Extreme	10	Clamp	24P	-1.521	6.910	1.585	7.250
NESC Extreme	11	Clamp	25P	-3.146	8.045	1.164	8.716
NESC Extreme	12	Clamp	2Y	0.000	0.757	0.323	0.823
NESC Extreme	13	Clamp	4Y	0.000	0.889	0.354	0.957
NESC Extreme	14	Clamp	6Y	0.000	0.953	0.370	1.022
NESC Extreme	15	Clamp	8Y	0.000	1.679	0.905	1.908
NESC Extreme	16	Clamp	10Y	0.000	2.062	0.931	2.263
NESC Extreme	17	Clamp	12Y	0.000	1.448	0.709	1.613
NESC Extreme	18	Clamp	13Y	0.000	1.378	0.692	1.543
NESC Extreme	19	Clamp	14Y	0.000	2.376	0.932	2.553
NESC Extreme	20	Clamp	30P	0.000	1.813	1.337	2.253
NESC Extreme	21	Clamp	31P	0.000	1.722	1.272	2.141
NESC Extreme	22	Clamp	32P	0.000	1.930	1.454	2.417
NESC Extreme	23	Clamp	33P	0.000	0.710	0.544	0.894
NESC Extreme	24	Clamp	34P	0.000	0.744	0.569	0.936
NESC Extreme	25	Clamp	35P	0.000	0.502	0.395	0.638
NESC Extreme	26	Clamp	36P	0.000	4.352	1.263	4.531
NESC Extreme	27	Clamp	37P	0.000	3.521	3.859	5.223
NESC Extreme	28	Clamp	10XY	0.000	0.957	0.675	1.172
NESC Extreme	29	Clamp	12XY	0.000	0.948	0.588	1.116
NESC Extreme	30	Clamp	13XY	0.000	0.913	0.580	1.082
NESC Extreme	31	Clamp	14XY	0.000	1.242	0.659	1.407

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.	Total Long.	Total Vert.	Transverse Overturning	Longitudinal Overturning	Torsional Moment

	Load (kips)	Load (kips)	Load (kips)	Moment (ft-k)	Moment (ft-k)	(ft-k)
NESC Heavy	88.679	-12.151	47.855	8876.714	-1221.226	294.675
NESC Extreme	77.500	-12.661	20.889	7765.810	-1327.242	56.166

*** Weight of structure (lbs):
Weight of Angles*Section DLF: 38857.7
Total: 38857.7

*** End of Report

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

Subject: Anchor Bolt Analysis for Tower #1281

Location: Greenwich, CT

Prepared by: T.J.L. Checked by: C.A.G.
Job No. 17159.07

Rev. 1: 2/5/19

Tower Anchor Bolt Analysis

Max Leg Reactions:

Uplift = Uplift := 189.1·kips (User Input)

Shear = Shear := 54.2·kips (User Input)

Compression = Compression := 200.5·kips (User Input)

Anchor Bolt Data:

Use AST MA36 (Assumed Conservative Value - Actual Grade Unknown)

Number of Anchor Bolts = N := 4 (User Input)

Bolt Ultimate Strength = $F_u := 58ksi$ (User Input)

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

Diameter of Bolts = D := 2.0in (User Input)

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

Coefficient of Friction = $\mu := 0.55$ (User Input)

Anchor Bolt Area:

Gross Area of Bolt = $A_g := \frac{\pi}{4}\cdot D^2 = 3.142\cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4}\cdot\left(D - \frac{0.9743\cdot in}{n}\right)^2 = 2.498\cdot in^2$ (AISC 13th Ed. pg. 7-83)

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Check Tensile Force:

Maximum Tensile Force (GrossArea) =

$$F_{gross.area} := 1.0 \cdot \left(0.33 \cdot A_g \cdot F_u\right) = 60.1 \cdot kips$$

Maximum Tensile Force (NetArea) =

$$F_{net.area} := 1.0 \cdot \left(0.60 \cdot A_n \cdot F_y\right) = 54 \cdot kips$$

Allowable Tension =

$$AllowableTension := \begin{cases} F_{gross.area} & \text{if } F_{gross.area} < F_{net.area} \\ F_{net.area} & \text{if } F_{net.area} < F_{gross.area} \end{cases}$$

$$AllowableTension = 54 \cdot kips$$

Applied Tension =

$$MaxTension := \frac{Uplift}{N} = 47.27 \cdot kips$$

$$\frac{MaxTension}{F_{net.area}} = 87.6 \cdot \%$$

$$Condition1 := if\left(\frac{MaxTension}{F_{net.area}} \le 1.00, "OK", "Overstressed"\right)$$

Condition1 = "OK"

Check Anchor Bolt Area:

Based on the ASCE 10-97 Design of Latticed Steel Transmission Structures

Required Area =

$$A_{s1} := \frac{Uplift}{F_y} + \frac{Shear}{\mu \cdot .85 \cdot F_y} = 8.5 \cdot in^2$$

$$A_{s2} := \left[\frac{Shear - (0.3 \cdot Compression)}{\mu \cdot .85 \cdot F_y}\right] = -0.354 \cdot in^2$$

Provided Area =

$$A_{sprovided} := A_n \cdot N = 10 \cdot in^2$$

$$Condition2 := if\left(\frac{A_{s1}}{A_{sprovided}} \le 1.00, "OK", "Overstressed"\right)$$

Condition2 = "OK"

$$Condition3 := if\left(\frac{A_{s2}}{A_{sprovided}} \le 1.00, "OK", "Overstressed"\right)$$

Condition3 = "OK"

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Subject: FOUNDATION ANALYSIS

Location: Greenwich, CT

Rev. 1: 2/5/19

Prepared by: T.J.L. Checked by: C.A.G.
Job No. 17159.07

Foundation:

Input Data:

Tower Data

Shear (Compression Leg) =	$Shear_{comp} := 41.2 \cdot 1.1 \cdot kips = 45.3 \cdot kips$	(User Input from PLS Tower)
Shear (Uplift Leg) =	$Shear_{up} := 54.2 \cdot 1.1 \cdot kips = 59.6 \cdot kips$	(User Input from PLS Tower)
Compression =	$Comp := 200.5 \cdot 1.1 \cdot kips = 220.6 \cdot kips$	(User Input from PLS Tower)
Uplift =	$Uplift := 189.1 \cdot 1.1 \cdot kips = 208 \cdot kips$	(User Input from PLS Tower)
Tower Height =	$H_t := 129 \cdot ft$	(User Input)

Footing Data:

Depth to Bottom of Footing =	$D_f := 8 \cdot ft$	(User Input)
Length of Pier =	$L_p := 8.5 \cdot ft$	(User Input)
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)
Width of Pier =	$W_p := 5 \cdot ft$	(User Input)
Depth of Soil =	$D_{soil} := 8 \cdot ft$	(User Input)
Depth of Rock =	$D_{rock} := 12 \cdot ft$	(User Input)

Material Properties:

Concrete Compressive Strength =	$f_c := 3500 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Anchor Bolt Yield Strength =	$f_{ya} := 75000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 4000 \cdot psf$	(User Input)	
Allowable Rock Bearing Capacity =	$q_{rock} := 50000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 100 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Unit Weight of Rock =	$\gamma_{rock} := 160 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 1.0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Rock Anchor Properties:

AST MA615 Grade 60

Bolt Ultimate Strength =	$F_u := 90 \cdot ksi$	(User Input)	
Bolt Yield Strength =	$F_y := 60 \cdot ksi$	(User Input)	
Anchor Diameter =	$d_{ra1} := 1.128 \cdot in$	(User Input)	(1 # 9 and 1 # 11 per Rock Group)
Anchor Diameter =	$d_{ra2} := 1.41 \cdot in$	(User Input)	
Hole Diameter =	$d_{Hole} := 4 \cdot in$	(User Input)	
Grout Strength =	$\tau := 120 \cdot psi$	(User Input)	
Distance to Rock Anchor Group 1 =	$D_{a1} := 24 \cdot in$	(User Input)	
Number of Rock Anchors in Group 1 =	$N_{a1} := 6$	(User Input)	
Total Number of Rock Bolts =	$N_{atot} := 8$	(User Input)	

Check Uplift:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 100 \cdot pcf$

Weight of Concrete = $WT_c := \left(W_p^2 \cdot L_p\right) \cdot \gamma_c = 31.875 \cdot kip$

Base Area 1 of Resisting Pyramid = $B_1 := \left(D_{a1} \cdot 2\right)^2 = 16 ft^2$

Base Area 2 of Resisting Pyramid = $B_2 := \left[\tan\left(\Phi_s\right) \cdot \left(D_{rock} \cdot 0.5\right) \cdot 2 + D_{a1} \cdot 2\right]^2 = 119.4 ft^2$

Base Area 3 of Resisting Pyramid = $B_3 := \left[\tan\left(\Phi_s\right) \cdot \left(D_{rock} \cdot 0.5 + D_{soil}\right) \cdot 2 + D_{a1} \cdot 2\right]^2 = 406.7 ft^2$

Weight of Soil = $WT_{soil} := \left[\frac{D_{soil}}{3} \cdot \left(B_2 + B_3 + \sqrt{B_2 \cdot B_3}\right) - W_p^2 \cdot L_p\right] \cdot \gamma_s = 177.806 \cdot kip$

Weight of Rock = $WT_{rock} := \left[\frac{D_{rock} \cdot 0.5}{3} \cdot \left(B_1 + B_2 + \sqrt{B_1 \cdot B_2}\right)\right] \cdot \gamma_{rock} = 57.324 \cdot kip$

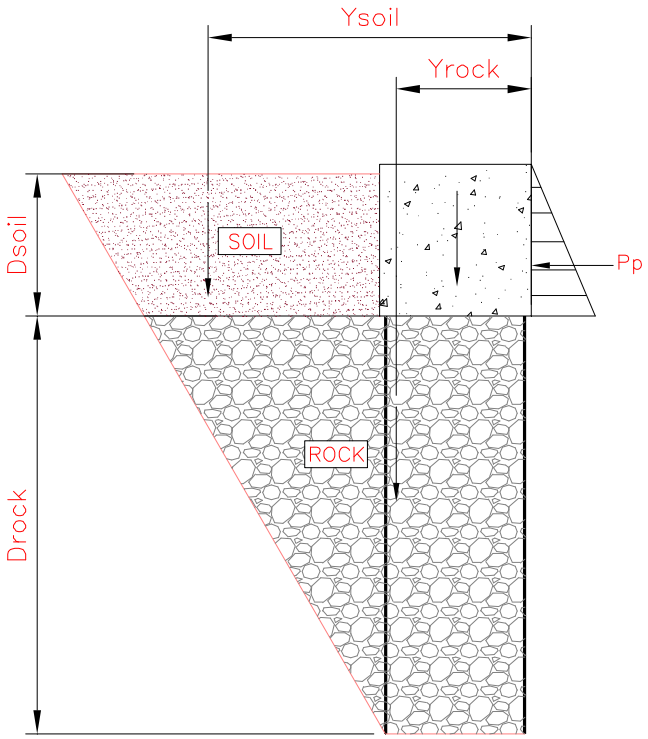
Total Resistance = $WT_{tot} := WT_c + WT_{rock} + WT_{soil} = 267 \cdot kips$

Factor of Safety Actual = $FS := \frac{WT_{tot}}{Uplift} = 1.28$

Factor of Safety Required = $FS_{req} := 1.0$

$Uplift\_Check := if\left(FS \geq FS_{req}, "Okay", "No Good"\right)$

Uplift_Check = "Okay"



Area 1 = $A1 := \frac{1}{2}\cdot\tan(\Phi_s)\cdot D_{soil}^{2} = 18.475\,ft^{2}$ sf

Area 2 = $A2 := \tan(\Phi_s)\cdot D_{rock}\cdot D_{soil} = 55.426\,ft^{2}$ sf

Distance to Centroid 1 = $Y1 := \tan(\Phi_s)\cdot D_{rock} + \frac{1}{3}\cdot\tan(\Phi_s)\cdot D_{soil} = 8.468\,ft$ ft

Distance to Centroid 2 = $Y2 := \frac{1}{2}\cdot\tan(\Phi_s)\cdot D_{rock} = 3.464\,ft$ ft

Distance from Toe to Centroid of Soil = $Y_{soil} := \frac{(A1\cdot Y1 + A2\cdot Y2)}{(A1 + A2)} + W_p = 9.72\,ft$ ft

Area 3 = $A3 := \frac{1}{2}\cdot\tan(\Phi_s)\cdot D_{rock}^{2} = 41.569\,ft^{2}$ sf

Area 4 = $A4 := W_p\cdot D_{rock} = 60\,ft^{2}$ sf

Distance to Centroid 3 = $Y3 := W_p + \frac{1}{3}\cdot\tan(\Phi_s)\cdot D_{rock} = 7.309\,ft$ ft

Distance to Centroid 4 = $Y4 := \frac{W_p}{2} = 2.5\,ft$ ft

Distance from Toe to Centroid of Rock = $Y_{rock} := \frac{(A3\cdot Y3 + A4\cdot Y4)}{(A3 + A4)} = 4.47\,ft$ ft

Check Oveturning:

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

Passive Pressure = $P_{top} := 0 = 0 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 2.4 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.2 \cdot ksf$

$A_p := W_p \cdot (L_p - L_{pag}) = 40 ft^2$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 48 \cdot kip$

Weight of Concrete Pad = $WT_c := \left(W_p^2 \cdot L_p\right) \cdot \gamma_c = 31.875 \cdot kip$

Weight of Soil Wedge at Back Face Corners = $WT_{s2} := 2 \cdot \left[(D_{soil})^3 \cdot \frac{\tan(\Phi_s)}{3} \right] \cdot \gamma_s = 19.707 \cdot kips$

Total Weight of Soil = $WT_{Stot} := (A1 + A2) \cdot W_p \cdot \gamma_s + WT_{s2} = 56.7 \cdot kips$

Total Weight of Rock = $WT_{Rtot} := (A3 + A4) \cdot W_p \cdot \gamma_{rock} = 81.3 \cdot kips$

Resisting Moment = $M_r := (WT_c) \cdot \frac{W_p}{2} + S_u \cdot \frac{L_p}{3} + WT_{Stot} \cdot Y_{soil} + WT_{Rtot} \cdot Y_{rock} = 1129 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := Uplift \cdot \frac{W_p}{2} + Shear_{up} \cdot L_p = 1027 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 1.1$

Factor of Safety Required = $FS_{req} := 1.0$

$OverTurning\_Moment\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

$OverTurning\_Moment\_Check = "Okay"$

Check Bearing Pressure:

Area of the Pier =

$$A_{mat} := W_p^{\,2} = 25\,ft^2$$

Section Modulus of Pier =

$$S := \frac{W_p^{\,3}}{6} = 20.83\cdot ft^3$$

Maximum Bearing Pressure =

$$P_{max} := \frac{WT_c + Comp}{A_{mat}} + \frac{Shear_{comp}\cdot L_p}{S} = 28.588\cdot ksf$$

$$Max\_Pressure\_Check := if\left(P_{max} < q_{rock}, "Okay", "No\ Good"\right)$$

Max_Pressure_Check = "Okay"

Check Rock Anchors:

Rock Anchor Check

Polar Moment of Inertia =

$$I_p := \left(D_{a1}^{\,2}\cdot N_{a1}\right) = 3456\cdot in^2$$

Maximum Tension Force =

$$T_{Max} := \frac{Uplift}{N_{atot}} + \frac{Shear_{up}\cdot L_p\cdot D_{a1}}{I_p} - \frac{WT_c}{N_{atot}} = 64.2\cdot kips$$

Gross Area of Bolt Group =

$$A_g := \frac{\pi}{4}\cdot\left(d_{ra1}^{\,2} + d_{ra2}^{\,2}\right) = 2.561\cdot in^2$$

Allowable Tension =

$$T_{all} := A_g\cdot F_y = 153.6\cdot kips$$

$$\frac{T_{Max}}{T_{all}} = 41.8\cdot\%$$

$$Condition1 := if\left(T_{Max} < T_{all}, "OK", "NG"\right)$$

Condition1 = "OK"

Check Bond Strength:

Bond Strength =

$$Bond\_Strength := d_{Hole}\cdot\pi\cdot\left(D_{rock}\cdot 0.5\right)\cdot\tau = 109\cdot kips$$

$$\frac{T_{Max}}{Bond\_Strength} = 59.2\cdot\%$$

$$Condition2 := if\left(T_{Max} < Bond\_Strength, "OK", "NG"\right)$$

Condition2 = "OK"

Augment ID: CT03XC338Q17.1

RFDS ID: 45765

SprintVision

RF Design Sheet

Site Identification	
Cascade	CT03XC338
SMS Schedule ID	12323122
SMS Schedule Name	DO Macro Upgrade
PID	DOKU_CT03XC338
RRU OEM	ALU
Switch OEM	Alcatel Lucent
RFDS Issue Date	
RFDS Revision Date	2017-11-17 00:00:00.0
RFDS Revision	6

Filter Analysis Complete	YES
RFDS - Issue Date	
Design Status	Complete
Project Description	DO Macro Upgrade - Add 2500 MHz.

Battery Backup Cabinet Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	

Junction Box Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	
Junction Boxes needed at site	

BTS #2 Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	
Needed at site	

Contact Information	
Engineer Email	Bill.M.Hastings@sprint.com
Sprint Badged RF Engineer	Bill Hastings
RF Engineer Email	Bill.M.Hastings@sprint.com
RF Engineer Phone	978-590-9700
RF Manager	Jonathan Hull
RF Manager Email	Jonathan.B.Hull@Sprint.com
RF Manager Phone	617-233-2920

Carrier Count	
2500 LTE	3
1900 LTE	1
1900 EVDO	
1900 Voice	1
800 LTE	1
800 Voice	1

UE Relay Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
UE Relay Azimuth	
Manufacturer	
UE Relay CL Height (meters)	

ALU Top Hat Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	
Top Hat Quantity	

Power Protection Cabinet Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	
Power Protection Cabinet	

Location Details	
Latitude	41.02971388
Longitude	-73.59835277
Market	Southern Connecticut
Region	Northeast
City	Greenwich
State	CT
Zip Code	CT/06830
County	Fairfield

2500MHz	3
1900MHz	3
800MHz	3

GPS Antenna Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	
GPS Antenna needed at site	

Repeater Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	

Growth Cabinet Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	

BTS #1 Model	
Model Number	
Weight (Lbs.)	
Dimensions (In.)	
Manufacturer	
Number of BTS #1	

A&E Drawing Requirements

11/15/2017 (WR): Single diplexer changed to twin diplexer.
11/03/2017 (WR): RFDS revised to replace existing NV dual band antenna with Commscope 10 port tri-band antenna and add diplexers for ground mount 1900/800/2500 RRUs.

Additional RF Notes Special Construction Requirements

11/15/2017 (WR): Single diplexer changed to twin diplexer.
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Additional RF Notes

Keep Existing NV Antenna for 800/1900 and add 1 800/2500 antenna for LTE2.5 8T8R and enhance 2R for 800 MHz

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	TD-RRH8x20-25	TD-RRH8x20-25	TD-RRH8x20-25	N/A	N/A	N/A
Weight (lbs)	76.2	76.2	76.2	N/A	N/A	N/A
Dimensions	26 x 18.6 x 6.7	26 x 18.6 x 6.7	26 x 18.6 x 6.7	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	1	1	1	0	0	0
Filter Model						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Filter Model 2						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A		N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Filter Model 3						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions		N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Trunk Cable 1						
Model Number	Hybriflex	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	1	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	1.54	N/A	N/A	N/A	N/A	N/A
Manufacturer	ALU	N/A	N/A	N/A	N/A	N/A
Trunk Cable 1 Qty						
Power Junction Cylinder Model						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Power Junction Cylinder Qty	0	0	0	0	0	0
Optical Junction Cylinder Qty needed						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Optical Junction Cylinder Qty needed	0	0	0	0	0	0

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Number of RRUs needed	0	0	0	0	0	0
Filter Model						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Filter Model 2						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A		N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Filter Model 3						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions		N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Trunk Cable 1						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Trunk Cable 1 Qty						
Power Junction Cylinder Model						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Power Junction Cylinder Qty	0	0	0	0	0	0
Optical Junction Cylinder Qty needed						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Optical Junction Cylinder Qty needed	0	0	0	0	0	0

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Radio Model						
Model Number	RRH-2x50-800	RRH-2x50-800	RRH-2x50-800	N/A	N/A	N/A
Weight (lbs)	69.1	69.1	69.1	N/A	N/A	N/A
Dimensions	16 x 13 x 10	16 x 13 x 10	16 x 13 x 10	N/A	N/A	N/A
Manufacturer	ALU	ALU	ALU	N/A	N/A	N/A
Number of RRUs needed	1	1	1	0	0	0
Filter Model						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Filter Model 2						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A		N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Filter Model 3						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions		N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Trunk Cable 1						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Trunk Cable 1 Qty						
Power Junction Cylinder Model						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Power Junction Cylinder Qty	0	0	0	0	0	0
Optical Junction Cylinder Qty needed						
Model Number	N/A	N/A	N/A	N/A	N/A	N/A
Weight (Lbs.)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions (In.)	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Optical Junction Cylinder Qty needed	0	0	0	0	0	0

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	Antenna assigned on a different band	Antenna assigned on a different band	Antenna assigned on a different band			
Weight (lbs)	0	0	0	N/A	N/A	N/A
Dimensions	0 x 0 x 0	0 x 0 x 0	0 x 0 x 0	N/A	N/A	N/A
Manufacturer	-	-	-	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qtyl	2.5 Jumper | 8	2.5 Jumper | 8	2.5 Jumper | 8	N/A | 0	N/A | 0	N/A | 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	30	130	250	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	147.9986924	147.9986924	147.9986924	N/A	N/A	N/A
Antenna 1 Electrical DT	2	2	2	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A
Antenna2						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Ant2 Top Jumper Make/Mode/Qtyl	N/A | 0	N/A | 0	N/A | 0	N/A | 0	N/A | 0	N/A | 0
Ant 2 RF Top Jumper Diameter	N/A	N/A	N/A	N/A	N/A	N/A
Ant 2 RF Top Jumper Length(ft)	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Azimuth	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Center Line (ft)	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Electrical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	DHHTT65B-3XR	DHHTT65B-3XR	DHHTT65B-3XR			
Weight (lbs)	48.5	48.5	48.5	N/A	N/A	N/A
Dimensions	72 x 12 x 7.1	72 x 12 x 7.1	72 x 12 x 7.1	N/A	N/A	N/A
Manufacturer	CommScope	CommScope	CommScope	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qtyl	800/1900 Jumper 8	800/1900 Jumper 8	800/1900 Jumper 8	N/A 0	N/A 0	N/A 0
Ant 1 RF requested Diameter	N/A	N/A	N/A	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Azimuth	30	130	250	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	147.9986924	147.9986924	147.9986924	N/A	N/A	N/A
Antenna 1 Electrical DT	3	3	3	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A
Antenna2						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	
Ant2 Top Jumper Make/Mode/Qtyl	N/A 0	N/A 0	N/A 0	N/A 0	N/A 0	N/A
Ant 2 RF Top Jumper Diameter	N/A	N/A	N/A	N/A	N/A	N/A
Ant 2 RF Top Jumper Length(ft)	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Azimuth	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Center Line (ft)	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Electrical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Twist	N/A	N/A	N/A	N/A	N/A	N/A

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1						
Model Number	Antenna assigned on a different band	Antenna assigned on a different band	Antenna assigned on a different band			
Weight (lbs)	0	0	0	N/A	N/A	N/A
Dimensions	0 x 0 x 0	0 x 0 x 0	0 x 0 x 0	N/A	N/A	N/A
Manufacturer	-	-	-	N/A	N/A	N/A
Ant1 Top Jumper Make/Mode/Qtyl	800/1900 Jumper | 4	800/1900 Jumper | 4	800/1900 Jumper | 4	N/A | 0	N/A | 0	N/A | 0
Ant 1 RF requested Diameter	1/2"	1/2"	1/2"	N/A	N/A	N/A
Ant 1 RF requested Top Jumper Length(ft)	8	8	8	N/A	N/A	N/A
Antenna 1 Azimuth	30	130	250	N/A	N/A	N/A
Antenna 1 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Center Line (ft)	147.9986924	147.9986924	147.9986924	N/A	N/A	N/A
Antenna 1 Electrical DT	5	5	5	N/A	N/A	N/A
Antenna 1 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Twist	N/A	N/A	N/A	N/A	N/A	N/A
Antenna2						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	
Ant2 Top Jumper Make/Mode/Qtyl	N/A | 0	N/A | 0	N/A | 0	N/A | 0	N/A | 0	N/A |
Ant 2 RF Top Jumper Diameter	N/A	N/A	N/A	N/A	N/A	N/A
Ant 2 RF Top Jumper Length(ft)	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Azimuth	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Mechanical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Center Line (ft)	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Electrical DT	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Electrical DT 2	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Electrical DT 3	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 Twist	N/A	N/A	N/A	N/A	N/A	N/A

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RF Design Sheet

Band: 2500	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1 Split						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Accept Proposed Ant1 Model Change?	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 band combined with	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Upper Passive Component Model						
Model Number	DPO-7126Y-0-T1 (1.9/2.5 4:2 Diplexer)	DPO-7126Y-0-T1 (1.9/2.5 4:2 Diplexer)	DPO-7126Y-0-T1 (1.9/2.5 4:2 Diplexer)			
Weight (lbs)	7.3	7.3	7.3	N/A	N/A	N/A
Dimensions	6.26 x 4.07 x 7.42	6.26 x 4.07 x 7.42	6.26 x 4.07 x 7.42	N/A	N/A	N/A
Manufacturer	CCI	CCI	CCI	N/A	N/A	N/A
Ant1 Upper Passive Comp Qty needed	1	1	1	0	0	0
Ant1 Upper Pass Comp band combi with	1900MHz	1900MHz	1900MHz			
Antenna 1 Lower Passive Component Model						
Model Number	DPO-7126Y-0-T1 (1.9/2.5 4:2 Diplexer)	DPO-7126Y-0-T1 (1.9/2.5 4:2 Diplexer)	DPO-7126Y-0-T1 (1.9/2.5 4:2 Diplexer)			
Weight (lbs)	7.3	7.3	7.3	N/A	N/A	N/A
Dimensions	6.26 x 4.07 x 7.42	6.26 x 4.07 x 7.42	6.26 x 4.07 x 7.42	N/A	N/A	N/A
Manufacturer	CCI	CCI	CCI	N/A	N/A	N/A
Ant1 Lower Passive Comp Qty needed	1	1	1	0	0	0
Ant1 Low Pass Comp band comb with	1900MHz	1900MHz	1900MHz			
Position Ant 1						
Antenna2 Split						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Accept Proposed Ant2 Model Change?	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 band combined with						
Antenna 2 Upper Passive Component Model						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Ant2 Upper Passive Comp Qty needed	0	0	0	0	0	0
Antenna 2 Lower Passive Component Model						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Ant1 Lower Passive Comp Qty needed	0	0	0	0	0	0
Ant1 Lower Passive Component band combined with						
Position Ant 2						

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RF Design Sheet

Band: 1900	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1 Split						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Accept Proposed Ant1 Model Change?	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 band combined with	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Upper Passive Component Model						
Model Number	KIT-FD9R6004/1C-DL	KIT-FD9R6004/1C-DL	KIT-FD9R6004/1C-DL			
Weight (lbs)	6.4	6.4	6.4	N/A	N/A	N/A
Dimensions	5.8 x 6.5 x 4.6	5.8 x 6.5 x 4.6	5.8 x 6.5 x 4.6	N/A	N/A	N/A
Manufacturer	RFS	RFS	RFS	N/A	N/A	N/A
Ant1 Upper Passive Comp Qty needed	1	1	1	0	0	0
Ant1 Upper Pass Comp band combi with	800MHz	800MHz	800MHz			
Antenna 1 Lower Passive Component Model						
Model Number	KIT-FD9R6004/1C-DL	KIT-FD9R6004/1C-DL	KIT-FD9R6004/1C-DL			
Weight (lbs)	6.4	6.4	6.4	N/A	N/A	N/A
Dimensions	5.8 x 6.5 x 4.6	5.8 x 6.5 x 4.6	5.8 x 6.5 x 4.6	N/A	N/A	N/A
Manufacturer	RFS	RFS	RFS	N/A	N/A	N/A
Ant1 Lower Passive Comp Qty needed	1	1	1	0	0	0
Ant1 Low Pass Comp band comb with	800MHz	800MHz	800MHz			
Position Ant 1						
Antenna2 Split						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Accept Proposed Ant2 Model Change?	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 band combined with						
Antenna 2 Upper Passive Component Model						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Ant2 Upper Passive Comp Qty needed	0	0	0	0	0	0
Antenna 2 Lower Passive Component Model						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Ant1 Lower Passive Comp Qty needed	0	0	0	0	0	0
Ant1 Lower Passive Component band combined with						
Position Ant 2						

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RF Design Sheet

Band: 800	Alpha	Beta	Gamma	Delta	Epsilon	Zeta
Antenna1 Split						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Accept Proposed Ant1 Model Change?	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 band combined with	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 1 Upper Passive Component Model						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Ant1 Upper Passive Comp Qty needed	0	0	0	0	0	0
Ant1 Upper Pass Comp band combi with						
Antenna 1 Lower Passive Component Model						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Ant1 Lower Passive Comp Qty needed	0	0	0	0	0	0
Ant1 Low Pass Comp band comb with						
Position Ant 1						
Antenna2 Split						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Accept Proposed Ant2 Model Change?	N/A	N/A	N/A	N/A	N/A	N/A
Antenna 2 band combined with						
Antenna 2 Upper Passive Component Model						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Ant2 Upper Passive Comp Qty needed	0	0	0	0	0	0
Antenna 2 Lower Passive Component Model						
Model Number						
Weight (lbs)	N/A	N/A	N/A	N/A	N/A	N/A
Dimensions	N/A	N/A	N/A	N/A	N/A	N/A
Manufacturer	N/A	N/A	N/A	N/A	N/A	N/A
Ant1 Lower Passive Comp Qty needed	0	0	0	0	0	0
Ant1 Lower Passive Component band combined with						
Position Ant 2						

Product Specifications

COMMSCOPE®

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 available with DIN 7-16 or 4.3-10 connectors.
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, ±10KA 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	5.94 x 7.94 x 2.02 in. (151 x 201.8 x 51.4 mm)	5.94 x 7.94 x 4.07 in. (151 x 201.8 x 103.4 mm)	5.94 x 7.94 x 8.17 in. (151 x 201.8 x 207.4 mm)
Dimensions enclosure only	3.03 x 7.42 x 1.92 in. (77.0 x 188.5 x 48.8 mm)		
Connectors	3 × 7-16 DIN female or 4.3-10 female (per diplexer)		
Mounting	Pole/Wall mounting bracket		

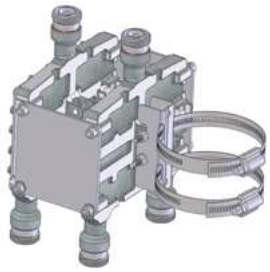
PRODUCT DATASHEET

KIT-FD9R6004/1C-DL

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□□

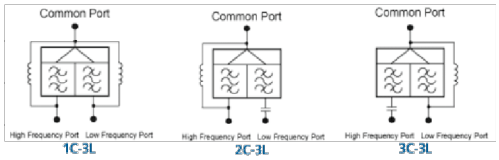
KIT-FD9R6004/1C-DL Installation Instructions

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)	