Robinson+Cole

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Also admitted in Massachusetts

August 20, 2015

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

Re: **Notice of Exempt Modification – Facility Modification**
9 Sound Shore Drive, Greenwich, Connecticut

Dear Ms. Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains nine (9) antennas at the 139-foot level of the existing 148-foot power-mount structure at 9 South Shore Drive in Greenwich, Connecticut (the "Property"). The power-mount structure is owned by Sprint Sites USA ("Sprint"). The electric transmission tower is owned by Eversource. The Council approved Cellco's use of this structure in 2005. Cellco now intends to replace six (6) of its existing antennas with three (3) model SBNHH-1D65B, 700/1900 MHz antennas and three (3) model HBXX-6516DS-VTM, 2100 MHz antennas, all at the same level on the power-mount. Cellco also intends to install six (6) coaxial cable diplexers. Included in Attachment 1 are specifications for Cellco's replacement antennas and diplexers.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Peter J. Tesei, First Selectman for the Town of Greenwich. A copy of this letter is also being sent to Robert Gray at Eversource, the owner of the transmission line tower and Sprint, the owner of the power-mount.

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. Cellco's replacement antennas and diplexers will be located at the 139-foot level of the 148-foot power-mount structure.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, 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 (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case General Power Density table for Cellco's modified facility is included in Attachment 2.

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

6. The power-mount structure and its foundation, with certain modifications, can support Cellco's proposed antenna and equipment modifications. (*See* Tower Analysis Report included in Attachment 3).

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Peter J. Tesei, Greenwich First Selectman
Robert Gray, Eversource
Sprint Sites USA
Tim Parks

ATTACHMENT 1

Product Specifications

COMMSCOPE®

POWERED BY ANDREW.

SBNHH-1D65B

Andrew® Tri-band Antenna, 698–896 and 2x 1695–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.

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

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2180**	**2300–2360**
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS, dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
CPR at Boresight, dB	20	23	20	20	17	21
CPR at Sector, dB	14	10	12	10	9	1
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	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	**698–806**	**806–896**	**1695–1880**	**1850–1990**	**1920–2180**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.6 7 ° | 14.6 14 ° | 14.2	0 ° | 14.5 7 ° | 14.4 14 ° | 13.6	0 ° | 17.4 3 ° | 17.5 7 ° | 17.4	0 ° | 17.8 3 ° | 17.9 7 ° | 17.9	0 ° | 18.1 3 ° | 18.3 7 ° | 18.2	0 ° | 18.2 3 ° | 18.4 7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

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

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® multiband with internal RET
Band	Multiband
Brand	DualPol® | Teletilt®
Operating Frequency Band	1695 – 2360 MHz | 698 – 896 MHz
Performance Note	Outdoor usage

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All specifications are subject to change without notice. See www.commscope.com for the most current information. Revised: June 22, 2015

Product Specifications

COMMSCOPE®

POWERED BY ANDREW

SBNHH-1D65B

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.4 km/h | 150.0 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	1851.0 mm | 72.9 in
Width	301.0 mm | 11.9 in
Net Weight	18.4 kg | 40.6 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
RET System	Teletilt®

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	Designed, manufactured and/or distributed under this quality management system

Included Products

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

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Product Specifications

COMMSCOPE®

on the go

HBXX-6516DS-VTM

DualPol® Quad Teletilt® Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Fully supports PCS 1900, GSM 1800, UMTS 2100, and AWS spectrum
- Each DualPol® array can be independently adjusted for greater flexibility
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Great solution to maximize network coverage and capacity

Electrical Specifications

Frequency Band, MHz	**1710–1880**	**1850–1990**	**1920–2180**
Gain, dBi	17.7	18.0	18.0
Beamwidth, Horizontal, degrees	67	65	63
Beamwidth, Vertical, degrees	7.5	7.0	6.5
Beam Tilt, degrees	0–10	0–10	0–10
USLS, typical, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4:1 | 15.6	1.4:1 | 15.6	1.4:1 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm
Lightning Protection	dc Ground	dc Ground	dc Ground

Mechanical Specifications

Color | Radome Material	Light gray | PVC, UV resistant
Connector Interface | Location | Quantity	7-16 DIN Female | Bottom | 4
Wind Loading, maximum	419.5 N @ 150 km/h 94.3 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1294.00 mm | 50.94 in
Width	305.00 mm | 12.01 in
Net Weight	13.90 kg | 30.64 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	HBXX-6516DS-R2M
Model with Factory Installed AISG 2.0 Actuator	HBXX-6516DS-A2M

Regulatory Compliance/Certifications

Agency	**Classification**
RoHS 2002/95/EC	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)

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Product Specifications

COMMSCOPE®

on the go

HBXX-6516DS-VTM

ISO 9001:2008 Designed, manufactured and/or distributed under this quality management system

Included Products

600899A-2 — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members

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Product Data Sheet FD9R6004/2C-3L

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Product Description

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. 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 ready design**
- **Extremely Low Insertion Loss**
- **High level of Rejection between bands – Protection against interferences**
- **Extremely High Power Handling Capability**
- **Integrated DC block/bypass versions available**
- **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**
- **Kit available for easy dual mount**

Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Application	LTE700, GSM900, UMTS, GSM1800, Cellular 800, PCS
Frequency Range 1, MHz	698-960
Frequency Range 2, MHz	1710-2200
Configuration	Sharelite Single diplexer, outdoor, DC pass in the 1710-2170MHz path, with mounting hardware SEM2-1A
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Return Loss All Ports Min/Typ, dB	19/23
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, Ohms	50
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
IMP Level at the COM Port, Typ, dBm	-112 @ 2x43
DC Pass in Low Frequency Path	No
DC Pass in High Frequency Path	Yes
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
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	1.2 (2.6)
Shipping Weight, kg (lb)	3.2 (7) for 2 * single units in 1 * box, 9.8 (21.6) for 6 * units = 3 * Boxes in 1 * overwrap
Dimensions, H x W x D, mm (in)	147 x 164 x 37 (5.8 x 6.5 x 1.5)
Shipping Dimensions, H x W x D, mm (in)	254 x 406 x 82 (10 x 16 x 3.2) for 2 * Single Units in 1 * box, 280 x 406 x 241 (11 x 16 x 9.5) for 6 * units = 3 * Boxes in 1 * overwrap
Volume, L	0.43
Housing	Aluminum

Notes

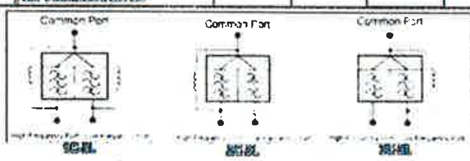
All information contained in the present datasheet is subject to confirmation at time of ordering

ShareLite Wideband Diplexer – In-line 698-960 MHz/1710-2200 MHz, DC pass in high frequency path

Other Documentation

FD9R6004/2C-3L Installation Instructions: Wideband_Diplexer_Installation_Rev5.pdf

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	[illegible]				X
	[illegible]				X
	[illegible]				X



[illegible]

Mounting Hardware and Ground Cable Ordering Information		
Model Number	Description	
[illegible]	Mounting Hardware, Pole mount with 1 [illegible] (Included with the Single and Dual Diplexer) Wall Mount kit. (Not included with the product)	
[illegible]	Assembly kit for 2 pcs of FD9R6004/2C-3L (Can be ordered separately but included with the Dual Diplexer kit)	
[illegible]	Ground Cable, 2m, includes lugs (Optional)	
[illegible]	Ground Cable, 2m, includes lugs (Optional)	
[illegible]	Mounting Hardware for 6 Diplexers, Tower Base (Optional)	

All information contained in the present datasheet is subject to confirmation at time of ordering

ATTACHMENT 2

	General	Power	Density					
Site Name: Greenwich 3								
Tower Height: 1296ft								
CARRIER	**# OF CHAN.**	**WATTS ERP**	**HEIGHT**	**CALC. POWER DENS**	**FREQ.**	**MAX. PERMISS. EXP.**	**FRACTION MPE**	**Total**
*Sprint CDMA/LTE	4	693	148	0.0455	1900	1.0000	4.55%	
*Sprint CDMA/LTE	1	390	148	0.0064	850	0.5667	1.13%	
Verizon PCS	**1**	**1470**	**139**	**0.0274**	**1970**	**1.0000**	**2.74%**	
Verizon Cellular	**9**	**290**	**139**	**0.0486**	**869**	**0.5793**	**8.38%**	
Verizon AWS	**1**	**1750**	**139**	**0.0326**	**2145**	**1.0000**	**3.26%**	
Verizon 700	**1**	**523**	**139**	**0.0097**	**698**	**0.4653**	**2.09%**	
								22.15%
* Source: Siting Council								

ATTACHMENT 3

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Powermount and CL&P Tower

Verizon Wireless Site Ref:
Greenwich 3

CL&P Structure No. 1281
129' Electric Transmission Lattice Tower

9 Sound Shore Drive
Greenwich, CT

CENTEK Project No. 15001.017

~~Date: March 6, 2015~~
Rev 1: April 17, 2015

Prepared for:
Verizon Wireless
99 East River Road, 9th Floor
East Hartford, CT 06108

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

Table of Contents

Introduction

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

The loads considered in this analysis consist of the following:

- VERIZON WIRELESS (Existing to Remain):
  Antennas: Three (3) Decibel DB854DG65ESX panel antennas 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
- VERIZON WIRELESS (Existing to Remove):
  Antennas: One (1) Powerwave P65-16-XL-2, two (2) Andrew LNX-6514DS-T4M and three (3) RYMSA MG D3-800T0 panel antennas mounted on a (3) T-Arms with a RAD center elevation of 139-ft above grade.
- **VERIZON WIRELESS (Proposed):**

  Antennas: Three (3) Andrew HBXX-6516DS panel antennas, three (3) Andrew SBNHH-1D65B panel antennas, 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.
- SPRINT (Existing/Reserved):
  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.
  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.

Primary assumptions used in the analysis

- Allowable steel stresses are defined by AISC-ASD 9th edition for design of the Powermount and antenna supporting elements.
- ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", defines allowable steel stresses for evaluation of the CL&P 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 powermount unless specified otherwise.
- Powermount 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.
- Powermount 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 CL&P 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 CL&P 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 EIA-222-F-1996, ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", NESC C2-2007 and Eversource Design Criteria.

The CL&P 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 C2-2007 ~ Construction Grade B, and ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures".

  Load cases considered:

  Load Case 1: NESC Heavy
  Wind Pressure.................................... 4.0 psf
  Radial Ice Thickness............................ 0.5"
  Vertical Overload Capacity Factor............ 1.50
  Wind Overload Capacity Factor............... 2.50
  Wire Tension Overload Capacity Factor...... 1.65

  Load Case 2: NESC Extreme
  Wind Speed.. 110 mph [(1)]
  Radial Ice Thickness............................ 0"

  Note 1: NESC C2-2007, Section25, Rule 250C: Extreme Wind Loading, 1.25 x Gust Response Factor (wind speed: 3-second gust)

- POWERMOUNT ANALYSIS

  Powermount, appurtenances and connections to the utility tower were analyzed and designed in accordance with the EVERSOURCE Design Criteria Table, TIA/EIA-222-F, and AISC-ASD standards.

  Load cases considered:

  Load Case 1:
  Wind Speed.................................... 85 mph (2)
  Radial Ice Thickness........................... 0"

  Load Case 2:
  Wind Pressure.................................. 75% of 85 mph wind pressure
  Radial Ice Thickness........................... 0.5"

  Note 2: Per EVERSOURCE Mast Design Criteria Exception 1.

Results

- POWERMOUNT

  The existing powermount **with the connection replacement at 134.75-ft ATB was determined to be structurally adequate.**

FWT Powermount	Stress Ratio (% of capacity)	Result
12" Sch. 40 Pipe	57.6%	PASS
L2.5x2.5x1/4 Brace	36.0%	PASS
Connection	69.9%	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 **91.11%** occurs in the utility structure under the **NESC Extreme** loading condition.

  TOWER SECTION:

  The utility structure was found to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle g3P	91.11%	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 CL&P tower based on NESC/EVERSOURCE prescribed loads.

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	48.03 kips	191.13 kips	226.19 kips
NESC Extreme Wind	51.75 kips	187.57 kips	218.36 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	88.5%	**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)	1.27 FS (2)	**PASS**
	OTM (1)	1.0 FS (2)	1.17 FS (2)	**PASS**
	Soil Bearing	50 ksf	32.78 ksf	**PASS**

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

Conclusion

This analysis shows that the subject utility tower with the proposed Powermount brace replacement **is adequate** to support the proposed Verizon equipment upgrade.

Replacement of the existing Powermount connection at 134.75-ft ATB will be required prior to the Verizon equipment upgrade. The Powermount connection reinforcement design is included in this report.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

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

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES

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

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

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

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

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

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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA-3D

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

Modeling Features:

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

Analysis Features:

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

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

Graphics Features:

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

Design Features:

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

PCS Mast

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.

ELECTRIC TRANSMISSION TOWER

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

NU Design Criteria

Condition	Standard	Item	Basic Wind Speed V (MPH)	Pressure Q (PSF)	Height Factor Kz	Gust Factor Gh	Load or Stress Factor	Force Coef - Shape Factor
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
Ice Condition	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	-----	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
Ice Condition	NESC Heavy	Tower/Pole Analysis with Antennas below top of Tower/Pole (on two faces)	-----	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
Ice Condition	NESC Heavy	Conductors:	Conductor loads provided by NU					
High Wind Condtion	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
High Wind Condtion	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
High Wind Condtion	NESC Extreme Wind	Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
High Wind Condtion	NESC Extreme Wind	Conductors:	Conductor loads provided by NU					
NESC Extreme Ice with Wind Conditon*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
NESC Extreme Ice with Wind Conditon*		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
NESC Extreme Ice with Wind Conditon*		Conductors:	Conductor loads provided by NU					

* Only for Structures Installed after 2007

Shape Factor Criteria shall be per TIA Shape Factors.

2) STEP 2 - The electric transmission structure analysis and evaluation shall be performed in accordance with NESC requirements and shall include the mast and antenna loads determined from NESC applied loading conditions (not TIA/EIA Loads) on the structure and mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The structure shall be analyzed using yield stress theory in accordance with Attachment A, "NU 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 NU).
c) Electric Transmission Structure
   i) The loads from the wireless communication equipment components based on NESC and NU 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

   iii) When Coaxial Cables are mounted along side 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	1.3

d) The uniform loadings and factors specified for the above components in Attachment A, "NU 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 NU will provide these loads).
e) Mast reaction loads shall be evaluated for local effects on the transmission structure members at the attachment points.

INPUT DATA

TOWER ID: 1281

Structure Height (ft) : 129

Wind Zone : Central CT (green)

Wind Speed : 110 mph

Tower Type : ○ Suspension ◉ Strain

Extreme Wind Model : PCS Addition

Shield Wire Properties:

	BACK	AHEAD
NAME =	*NONE*	*NONE*
DESCRIPTION =	-	-
STRANDING =	- -	- -
DIAMETER =	0.000 in	0.000 in
WEIGHT =	0.000 lb/ft	0.000 lb/ft

Conductor Properties:

	BACK	AHEAD
NAME =	*BITTERN*	*BITTERN*
	1272.000	1272.000
	45/7 ACSR	45/7 ACSR
DIAMETER =	1.345 in	1.345 in
WEIGHT =	1.432 lb/ft	1.432 lb/ft
Number of Conductors per phase	1	1

Insulator Weight = 0 lbs

Broken Wire Side = AHEAD SPAN

Horizontal Line Tensions:

	BACK		AHEAD	
	Shield	Conductor	Shield	Conductor
NESC HEAVY =	na	6,000	na	6,000
EXTREME WIND =	na	5,621	na	4,646
LONG. WIND =	na	na	na	na
250D COMBINED =	na	na	na	na
NESC W/O OLF =	na	na	na	na
60 DEG F NO WIND =	na	2,421	na	2,092

Line Geometry:

					SUM
LINE ANGLE (deg) =	BACK:	45	AHEAD:	45	**90**
WIND SPAN (ft) =	BACK:	141	AHEAD:	91	**232**
WEIGHT SPAN (ft) =	BACK:	39	AHEAD:	588	**627**

WIRE LOADING AT ATTACHMENTS

TOWER ID: 1281

Wind Span =	232	ft
Weight Span =	627	ft
Total Angle =	90	degrees

Broken Wire Span =	AHEAD SPAN
Type of Insulator Attachment =	STRAIN

1. NESC RULE 250B Heavy Loading:

	INTACT CONDITION			BROKEN WIRE CONDITION		
	Horizontal	Longitudinal	Vertical	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	292 lb	#VALUE!	#VALUE!	18 lb
Conductor =	14,454 lb	0 lb	2,426 lb	7,276 lb	7,000 lb	151 lb

2. NESC RULE 250C Transverse Extreme Wind Loading:

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	0 lb
Conductor =	9,332 lb	793 lb	1,033 lb

3. NESC RULE 250C Longitudinal Extreme Wind Loading:

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	0 lb
Conductor =	#VALUE!	#VALUE!	1,033 lb

4. NESC RULE 250D Extreme Ice & Wind Loading:

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	780 lb
Conductor =	#VALUE!	#VALUE!	2,726 lb

5. NESC RULE 250B w/o OLF's

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	195 lb
Conductor =	#VALUE!	#VALUE!	1,617 lb

6. 60 Deg. F, No Wind

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	0 lb
Conductor =	3,191 lb	233 lb	898 lb

7. Construction

	Horizontal	Longitudinal	Vertical
Shield Wire =	#VALUE!	#VALUE!	0 lb
Conductor =	4,787 lb	349 lb	1,347 lb

NOTE: All loads include required overload factors (OLF's).

LC 1		HORIZONTAL	LONGITUDINAL	VERTICAL
NESC Heavy	shield - back	#VALUE!	#VALUE!	18.18687622
	shield - ahead	#VALUE!	#VALUE!	274.2021338
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**292.38901**
	conductor - back	7275.894634	7000.357134	150.8815733
	conductor - ahead	7178.1863	-7000.357134	2274.829874
	CONDUCTOR - SUM	**14454.08093**	**0**	**2425.711447**
LC 2		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Extreme Wind	shield - back	#VALUE!	#VALUE!	0
	shield - ahead	#VALUE!	#VALUE!	0
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**0**
	conductor - back	5168.274228	4570.8443	64.2252
	conductor - ahead	4163.576165	-3778.000821	968.3184
	CONDUCTOR - SUM	**9331.850393**	**792.8434784**	**1032.5436**
LC 3		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Long. Wind	shield - back	#VALUE!	#VALUE!	0
	shield - ahead	#VALUE!	#VALUE!	0
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**0**
	conductor - back	#VALUE!	#VALUE!	64.2252
	conductor - ahead	#VALUE!	#VALUE!	968.3184
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**1032.5436**
LC 4		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
RULE 250D	shield - back	#VALUE!	#VALUE!	48.49833659
	shield - ahead	#VALUE!	#VALUE!	731.2056901
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**779.7040267**
	conductor - back	#VALUE!	#VALUE!	169.5765993
	conductor - ahead	#VALUE!	#VALUE!	2556.693343
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**2726.269943**
LC 5		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
NESC w/o OLF's	shield - back	#VALUE!	#VALUE!	12.12458415
	shield - ahead	#VALUE!	#VALUE!	182.8014225
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**194.9260067**
	conductor - back	#VALUE!	#VALUE!	100.5877155
	conductor - ahead	#VALUE!	#VALUE!	1516.553249
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**1617.140965**
LC 6		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Raking	shield - back	#VALUE!	#VALUE!	0
	shield - ahead	#VALUE!	#VALUE!	0
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**0**
	conductor - back	1711.905517	1711.905517	55.848
	conductor - ahead	1479.267386	-1479.267386	842.016
	CONDUCTOR - SUM	**3191.172903**	**232.638131**	**897.864**
LC 6		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
60 DEG F NO WIND	shield - back	#VALUE!	#VALUE!	0
	shield - ahead	#VALUE!	#VALUE!	0
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**0**
	conductor - back	2567.858276	2567.858276	83.772
	conductor - ahead	2218.901079	-2218.901079	1263.024
	CONDUCTOR - SUM	**4786.759355**	**348.9571965**	**1346.796**

Northeast Utilities System

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Job :	Spec. Number	Sheet	of
Description:	Computed by	Date	10/27/10
	Checked by	Date	

INPUT DATA

TOWER ID: 1281

Structure Height (ft) : 129

Wind Zone : Central CT (green) **Wind Speed :** 110 mph

Tower Type : ○ Suspension ◉ Strain **Extreme Wind Model :** PCS Addition

Shield Wire Properties:

	BACK	AHEAD
NAME =	*NONE*	*NONE*
DESCRIPTION =	-	-
STRANDING =	-	-
DIAMETER =	0.000 in	0.000 in
WEIGHT =	0.000 lb/ft	0.000 lb/ft

SW (SHIELD WIRE)

[redacted] Properties:

			BACK	AHEAD		
		NAME =	*LINNET*	*LINNET*		
Number of Conductors per phase	1		336 26/7 ACSR	336 26/7 ACSR	1	Number of Conductors per phase
		DIAMETER =	0.720 in	0.720 in		
		WEIGHT =	0.462 lb/ft	0.462 lb/ft		

Insulator Weight = 0 lbs Broken Wire Side = AHEAD SPAN

Horizontal Line Tensions:

	BACK SW		AHEAD SW	
	[redacted]	[redacted]	[redacted]	[redacted]
NESC HEAVY =	na	4,000	na	4,000
EXTREME WIND =	na	3,449	na	3,005
LONG. WIND =	na	na	na	na
250D COMBINED =	na	na	na	na
NESC W/O OLF =	na	na	na	na
60 DEG F NO WIND =	na	2,194	na	1,830

Line Geometry:

					SUM
LINE ANGLE (deg) =	BACK:	45	AHEAD:	45	**90**
WIND SPAN (ft) =	BACK:	141	AHEAD:	91	**232**
WEIGHT SPAN (ft) =	BACK:	39	AHEAD:	588	**627**

Northeast Utilities System

Job :				Page	of
		Spec. Number		Sheet	of
Description:		Computed by		Date	10/27/10
		Checked by		Date	

WIRE LOADING AT ATTACHMENTS

TOWER ID: 1281

Wind Span =	232	ft
Weight Span =	627	ft
Total Angle =	90	degrees

Broken Wire Span =	AHEAD SPAN
Type of Insulator Attachment =	STRAIN

1. NESC RULE 250B Heavy Loading:

	INTACT CONDITION			BROKEN WIRE CONDITION		
	Horizontal	Longitudinal	Vertical	Horizontal	Longitudinal	Vertical
[redacted]e =	#VALUE!	#VALUE!	292 lb	#VALUE!	#VALUE!	18 lb
SW [redacted]r =	9,666 lb	0 lb	1,148 lb	4,869 lb	4,667 lb	71 lb

2. NESC RULE 250C Transverse Extreme Wind Loading:

	Horizontal	Longitudinal	Vertical
[redacted]e =	#VALUE!	#VALUE!	0 lb
SW [redacted] =	5,774 lb	361 lb	333 lb

3. NESC RULE 250C Longitudinal Extreme Wind Loading:

	Horizontal	Longitudinal	Vertical
[redacted]e =	#VALUE!	#VALUE!	0 lb
Conductor =	#VALUE!	#VALUE!	333 lb

4. NESC RULE 250D Extreme Ice & Wind Loading:

	Horizontal	Longitudinal	Vertical
[redacted] =	#VALUE!	#VALUE!	780 lb
Conductor =	#VALUE!	#VALUE!	1,631 lb

5. NESC RULE 250B w/o OLF's

	Horizontal	Longitudinal	Vertical
[redacted] =	#VALUE!	#VALUE!	195 lb
Conductor =	#VALUE!	#VALUE!	765 lb

6. 60 Deg. F, No Wind

	Horizontal	Longitudinal	Vertical
[redacted] =	#VALUE!	#VALUE!	0 lb
Conductor =	2,845 lb	257 lb	290 lb

7. Construction

	Horizontal	Longitudinal	Vertical
[redacted] =	#VALUE!	#VALUE!	0 lb
SW [redacted] =	4,268 lb	386 lb	435 lb

Northeast
Utilities System

			Page	of
Job :	Spec. Number		Sheet	of
Description:	Computed by		Date	10/27/10
	Checked by		Date	

NOTE: All loads include required overload factors (OLF's).

		HORIZONTAL	LONGITUDINAL	VERTICAL
LC 1		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
NESC Heavy	shield - back	#VALUE!	#VALUE!	[illegible]8.18687622
	shield - ahead	#VALUE!	#VALUE!	274.2027338
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**292.38901**
SW	[redacted]or - back	4869.004756	4666.904756	71.40297798
	[redacted]or - ahead	4797.338089	-4666.904756	1076.537206
	C[redacted]R - SUM	**9666.342845**	**0**	**1147.940184**
LC 2		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Extreme Wind	shield - back	#VALUE!	#VALUE!	0
	shield - ahead	#VALUE!	#VALUE!	0
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**0**
SW	[redacted]ctor - back	3124.446772	2804.632982	20.7207
	[redacted]- ahead	2649.988904	-2443.584259	312.4044
	[redacted]OR - SUM	**5774.435676**	**361.0487225**	**333.1251**
LC 3		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Long. Wind	shield - back	#VALUE!	#VALUE!	0
	shield - ahead	#VALUE!	#VALUE!	0
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**0**
	conductor - back	#VALUE!	#VALUE!	20.7207
	conductor - ahead	#VALUE!	#VALUE!	312.4044
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**333.1251**
LC 4		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
RULE 250D	shield - back	#VALUE!	#VALUE!	48.49833659
	shield - ahead	#VALUE!	#VALUE!	731.2056901
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**779.7040267**
	conductor - back	#VALUE!	#VALUE!	101.4351389
	conductor - ahead	#VALUE!	#VALUE!	1529.329787
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**1630.764926**
LC 5		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
NESC w/o OLF's	shield - back	#VALUE!	#VALUE!	12.12458415
	shield - ahead	#VALUE!	#VALUE!	182.8014225
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**194.9260067**
	conductor - back	#VALUE!	#VALUE!	47.60198532
	conductor - ahead	#VALUE!	#VALUE!	717.691471
	CONDUCTOR - SUM	**#VALUE!**	**#VALUE!**	**765.2934563**
LC 6		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
Raking	shield - back	#VALUE!	#VALUE!	0
	shield - ahead	#VALUE!	#VALUE!	0
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**0**
	conductor - back	1551.392278	1551.392278	18.018
	conductor - ahead	1294.00541	-1294.00541	271.656
	CONDUCTOR - SUM	**2845.397687**	**257.3868684**	**289.674**
LC 6		**HORIZONTAL**	**LONGITUDINAL**	**VERTICAL**
60 DEG F NO WIND	shield - back	#VALUE!	#VALUE!	0
	shield - ahead	#VALUE!	#VALUE!	0
	SHIELD - SUM	**#VALUE!**	**#VALUE!**	**0**
SW	[redacted]r - back	2327.088417	2327.088417	27.027
	[redacted]or - ahead	1941.008114	-1941.008114	407.484
	[redacted]R - SUM	**4268.096531**	**386.0803025**	**434.511**

REINFORCEMENT DESIGN

CL&P STRUCT. NO. 1281
9 SOUND SHORE DRIVE
GREENWICH, CT 06830

VICINITY MAP

PROJECT SUMMARY

SITE ADDRESS:	9 SOUND SHORE DRIVE GREENWICH CT, 06830
PROJECT COORDINATES:	LAT: 41°-01'-47.00N LON: 73°-35'-54.11W ELEV: ±22' AMSL
EVERSOURCE CONTACT:	BOB GRAY 860.728.6125
CL&P STRCT NO.:	1281
VERIZON SITE REF.:	GREENWICH 3
VERIZON CONTACT:	BRIAN PAUL 860.305.8446
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	CARLO F. CENTORE, PE 203.488.0580 ext. 122

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	DESIGN BASIS & GENERAL NOTES	0
N-2	STRUCTURAL STEEL NOTES	0
MI-1	MODIFICATION INSPECTION REQUIREMENTS	0
S-1	TOWER ELEVATION AND FEEDLINE PLAN	0
S-2	CONNECTION REINFORCEMENT DETAILS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
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DATE: 4/17/15
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JOB NO. 15001.017

TITLE SHEET

SHEET NO.
T-1
Sheet No. 1 of 6

DESIGN BASIS

1. GOVERNING CODE: 2003 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2005 CT STATE BUILDING CODE AND 2009 AMENDMENTS.

2. TIA/EIA-222-F-1996, ASCE MANUAL NO. 72 - "DESIGN OF STEEL TRANSMISSION POLE STRUCTURES SECOND EDITION", NESC C2-2007 AND NORTHEAST UTILITIES DESIGN CRITERIA.

3. DESIGN CRITERIA

   WIND LOAD: (PCS MAST)
   BASIC WIND SPEED (V) =85 MPH (FASTEST MILE); BASED ON TIA/EIA-222F AND NU MAST DESIGN CRITERIA EXCEPTION 1.

   WIND LOAD: (UTILITY POLE & FOUNDATION)
   BASIC WIND SPEED (V) =110 MPH (3-SECOND GUST) BASED ON NESC C2-2007, SECTION 25 RULE 250C.

GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS AND REINFORCEMENT DESIGN PREPARED BY CENTEK ENGINEERING, INC., FOR VERIZON, DATED 4/17/15.

2. TOWER GEOMETRY AND STRUCTURE MEMBER SIZES WERE OBTAINED FROM THE ORIGINAL TOWER DESIGN DOCUMENTS PREPARED BY LEHIGH STRUCTURAL STEEL CO. CONTRACT NOS. D719, CIRCA 1963.

3. THE TEMPORARY DETACHMENT AND/OR REPLACEMENT OF TOWER MEMBERS SHALL BE DONE ONE AT A TIME AND SHALL BE CONDUCTED ON DAYS WITH LESS THAN 15 MPH WIND PRESENT. NO MEMBER SHALL BE LEFT DISCONNECTED FOR THE NEXT WORKING DAY.

4. ALL STEEL REINFORCEMENT SHOWN HEREIN APPLIES TO ALL SIDES OF THE TOWER.

5. ALL REPLACEMENT STEEL MEMBERS SHALL BE INSTALLED WITH A325-N BOLTS (SIZE TO MATCH EXISTING). UNLESS OTHERWISE NOTED BELOW.

6. THE TOWER STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER REINFORCEMENTS ARE COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURE & SEQUENCE AND TO INSURE THE SAFETY OF THE TOWER STRUCTURE AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES PROVIDING AND MAINTAINING ADEQUATE SHORING, BRACING, UNDERPINNING, TEMPORARY ANCHORS, GUYING, BARRICADES, ETC. AS MAY BE REQUIRED FOR THE PROTECTION OF EXISTING PROPERTY, CONSTRUCTION WORKERS, AND FOR PUBLIC SAFETY. MAINTAIN EXISTING SITE OPERATIONS AND COORDINATE WORK WITH TOWER OWNER.

7. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE GOVERNING BUILDING CODE.

8. 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 SCOPE OF WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.

9. 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. THIS INCLUDES VERIFYING ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK.

10. TOWER REINFORCEMENTS SHALL BE CONDUCTED BY FIELD CREWS EXPERIENCED IN THE ASSEMBLY AND ERECTION OF TRANSMISSION STRUCTURES. ALL SAFETY PROCEDURES, RIGGING AND ERECTION METHODS SHALL BE STANDARD TO THE INDUSTRY AND IN COMPLIANCE WITH OSHA.

11. EXISTING COAXIAL CABLES AND ALL ACCESSORIES SHALL BE RELOCATED AS NECESSARY AND REINSTALLED BY THE CONTRACTOR WITHOUT INTERRUPTION IN SERVICE WHERE THEY ARE IN CONFLICT WITH THE TOWER REINFORCEMENT WORK.

12. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

13. 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.

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DESIGN BASIS AND GENERAL NOTES

SHEET NO.
N-1
Sheet No. 2 of 5

STRUCTURAL STEEL

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

2. MATERIAL SPECIFICATIONS

   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 GRADE B (FY = 35 KSI)

3. FASTENER SPECIFICATIONS

   A. CONNECTION BOLTS---ASTM A325-N, UNLESS OTHERWISE SCHEDULED.
   B. U-BOLTS---ASTM A307
   C. ANCHOR RODS---ASTM F1554
   D. WELDING ELECTRODES---ASTM E70XX FOR A36 & A572_GR50 STEELS, ASTM E80XX FOR A572_GR65 STEEL.

4. 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.

5. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.

6. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.

7. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.

8. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.

9. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.

10. 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.

11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".

12. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES APPEARANCE AND QUALITY OF WELDS, AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING THE SCHEDULED ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1 WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLET J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION" 9TH EDITION. AT THE COMPLETION OF WELDING, ALL DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED.

13. 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.

14. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.

15. 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.

16. LOCK WASHER ARE NOT PERMITTED FOR A325 BOLTED STEEL ASSEMBLIES.

17. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.

18. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.

19. FABRICATE BEAMS WITH MILL CAMBER UP.

20. 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.

21. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.

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STRUCTURAL NOTES

SHEET NO. N-4

MODIFICATION INSPECTION REPORT REQUIREMENTS

PRE-CONSTUCTION		DURING CONSTRUCTION		POST-CONSTRUCTION	
SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM	SCHEDULED ITEM	REPORT ITEM
X	EOR MODIFICATION INSPECTION DRAWING	–	FOUNDATIONS	X	MODIFICATION INSPECTOR RECORD REDLINE DRAWING
X	EOR APPROVED SHOP DRAWINGS	–	EARTHWORK: BACKFILL MATERIAL & COMPACTION	–	POST-INSTALLED ANCHOR ROD PULL-OUT TEST
–	EOR APPROVED POST-INSTALLED ANCHOR MPII	–	REBAR & FORMWORK GEOMETRY VERIFICATION	X	PHOTOGRAPHS
–	FABRICATION INSPECTION	–	CONCRETE TESTING		
–	FABRICATOR CERTIFIED WELDER INSPECTION	X	STEEL INSPECTION		
X	MATERIAL CERTIFICATIONS	–	POST INSTALLED ANCHOR ROD VERIFICATION		
		–	BASE PLATE GROUT VERIFICATION		
		–	CONTRACTOR'S CERTIFIED WELD INSPECTION		
		X	ON-SITE COLD GALVANIZING VERIFICATION		
		X	CONTRACTOR AS-BUILT REDLINE DRAWINGS		

NOTES:
1. REFER TO MODIFICATION INSPECTION NOTES FOR ADDITIONAL REQUIREMENTS
2. "X" DENOTES DOCUMENT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
3. "–" DENOTES DOCUMENT NOT REQUIRED FOR INCLUSION IN MODIFICATION INSPECTION FINAL REPORT.
4. EOR – ENGINEER OF RECORD
4. MPII – "MANUFACTURER'S PRINTED INSTALLATION GUIDELINES"

GENERAL

1. THE MODIFICATION INSPECTION IS A VISUAL INSPECTION OF STRUCTURAL MODIFICATIONS, TO INCLUDE A REVIEW AND COMPILATION OF SPECIFIED SUBMITTALS AND CONSTRUCTION INSPECTIONS, AS AN ASSURANCE OF COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS PREPARED UNDER THE DIRECTION OF THE ENGINEER OF RECORD (EOR).

2. THE MODIFICATION INSPECTION IS TO CONFIRM INSTALLATION CONFIGURATION AND GENERAL WORKMANSHIP AND IS NOT A REVIEW OF THE MODIFICATION DESIGN. OWNERSHIP OF THE MODIFICATION DESIGN EFFECTIVENESS AND INTENT RESIDES WITH THE ENGINEER OF RECORD.

3. TO ENSURE COMPLIANCE WITH THE MODIFICATION INSPECTION REQUIREMENTS THE GENERAL CONTRACTOR (GC) AND THE MODIFICATION INSPECTOR (MI) COMMENCE COMMUNICATION UPON AUTHORIZATION TO PROCEED BY THE CLIENT. EACH PARTY SHALL BE PROACTIVE IN CONTACTING THE OTHER. THE EOR SHALL BE CONTACTED IF SPECIFIC GC/MI CONTACT INFORMATION IS NOT MADE AVAILABLE.

4. THE GC SHALL PROVIDE THE MI WITH A MINIMUM OF 5 BUSINESS DAYS NOTICE OF IMPENDING INSPECTIONS.

5. WHEN POSSIBLE, THE GC AND MI SHALL BE ON SITE DURING THE MODIFICATION INSPECTION TO HAVE ANY NOTED DEFICIENCIES ADDRESSED DURING THE INITIAL MODIFICATION INSPECTION.

MODIFICATION INSPECTOR (MI)

1. THE MI SHALL CONTACT THE GC UPON AUTHORIZATION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE GC IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE MI IS RESPONSIBLE FOR COLLECTION OF ALL INSPECTION AND TEST REPORTS, REVIEWING REPORTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING ON-SITE INSPECTIONS AND COMPILATION & SUBMISSION OF THE MODIFICATION INSPECTION REPORT TO THE CLIENT AND THE EOR.

GENERAL CONTRACTOR (GC)

1. THE GC IS REQUIRED TO CONTACT THE GC UPON AUTHORIZATION TO PROCEED WITH CONSTRUCTION BY THE CLIENT TO:

   – REVIEW THE MODIFICATION INSPECTION REPORT REQUIREMENTS.
   – WORK WITH THE MI IN DEVELOPMENT OF A SCHEDULE FOR ON-SITE INSPECTIONS.
   – DISCUSS CRITICAL INSPECTIONS AND PROJECT CONCERNS.

2. THE GC IS RESPONSIBLE FOR COORDINATING AND SCHEDULING IN ADVANCE ALL REQUIRED INSPECTIONS AND TESTS WITH THE MI.

CORRECTION OF FAILING MODIFICATION INSPECTION

1. SHOULD THE STRUCTURAL MODIFICATION NOT COMPLY WITH THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS, THE GC SHALL WORK WITH THE MODIFICATION INSPECTOR IN A VIABLE REMEDIATION PLAN AS FOLLOWS:

   – CORRECT ALL DEFICIENCIES TO COMPLY WITH THE CONTRACT DOCUMENTS AND COORDINATE WITH THE MI FOR A FOLLOW UP INSPECTION.
   – WITH CLIENT AUTHORIZATION, THE GC MAY WORK WITH THE EOR TO REANALYZE THE MODIFICATION USING THE AS-BUILT CONDITION.

REQUIRED PHOTOGRAPHS

1. THE GC AND MI SHALL AT MINIMUM PHOTO DOCUMENT THE FOLLOWING FOR INCLUSION IN THE MODIFICATION INSPECTION REPORT:

   – PRE-CONSTRUCTION: GENERAL CONDITION OF THE SITE.
   – DURING CONSTRUCTION: RAW MATERIALS, CRITICAL DETAILS, WELD PREPARATION, BOLT INSTALLATION & TORQUE, FINAL INSTALLED CONDITION & SURFACE COATING REPAIRS.
   – POST-CONSTRUCTION: FINAL CONDITION OF THE SITE

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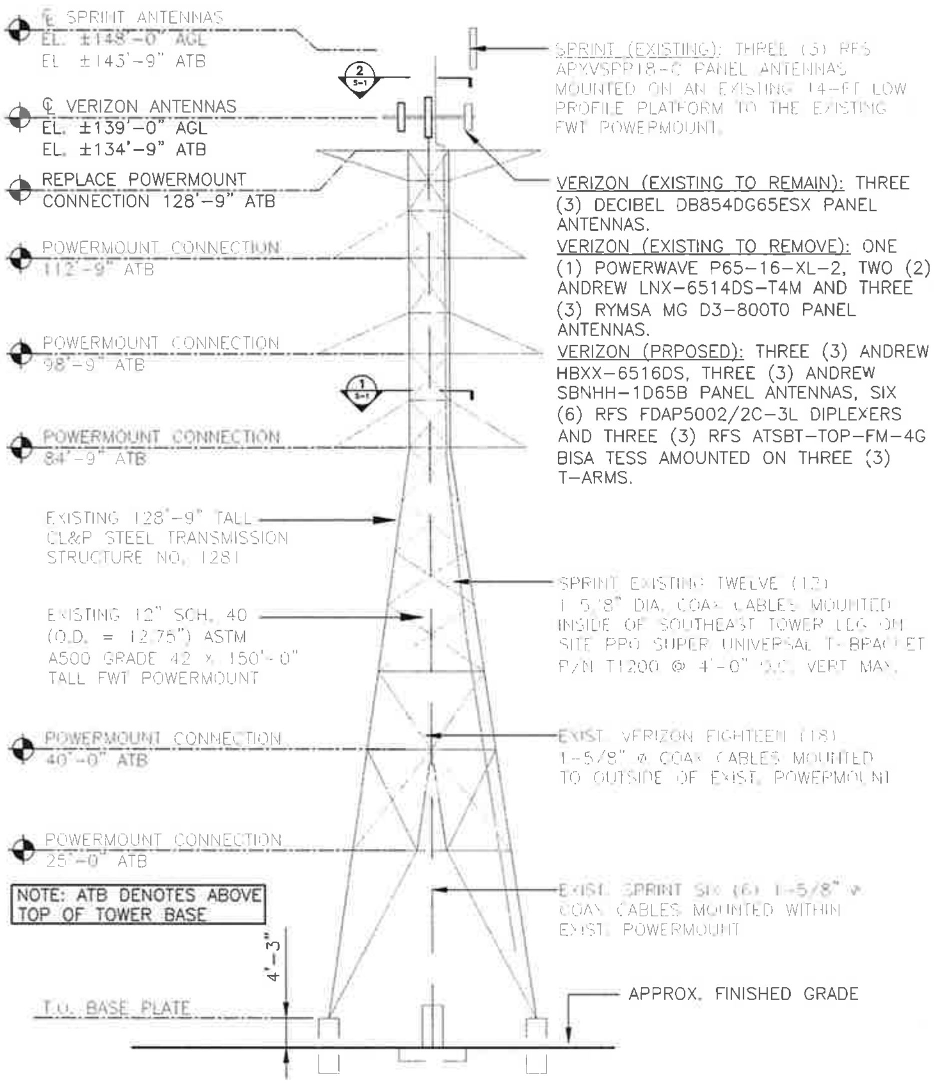
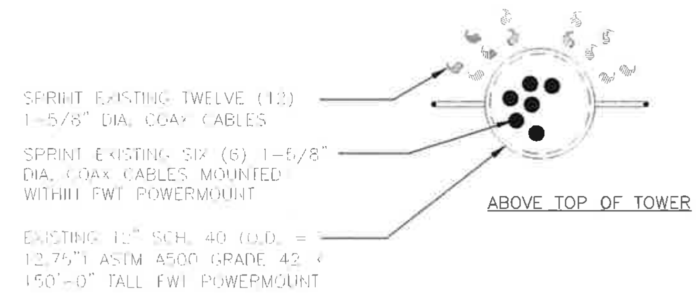
MODIFICATION INSPECTION REQUIREMENTS

SHEET NO. MI-1

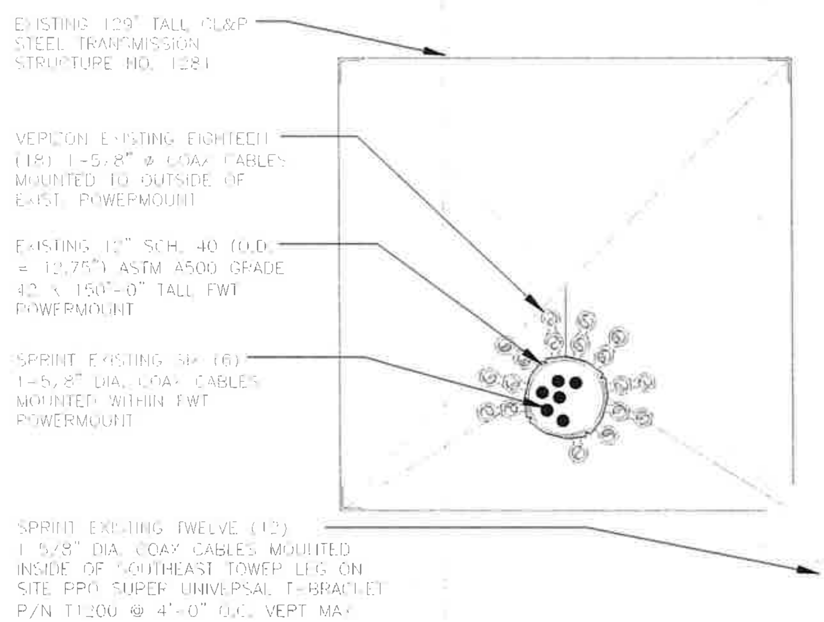
Sheet No. 1 of 1



1 S-1 **TOWER & POWERMOUNT ELEVATION**
SCALE: NOT TO SCALE



3 S-1 **FEEDLINE PLAN - POWERMOUNT**
SCALE: NOT TO SCALE



2 S-1 **FEEDLINE PLAN - TOWER**
SCALE: NOT TO SCALE

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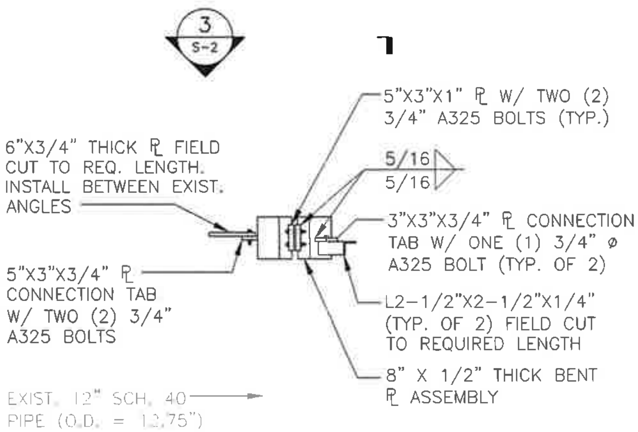
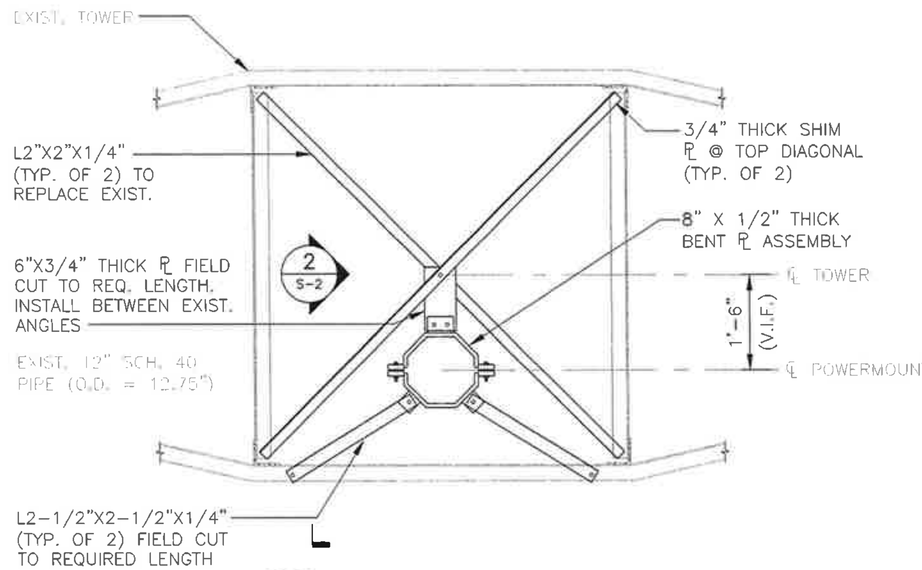
TOWER ELEVATION AND FEEDLINE PLAN

SHEET NO. S-1
Sheet No. 3 of 5



2 / S-2 BRACKET ELEVATION

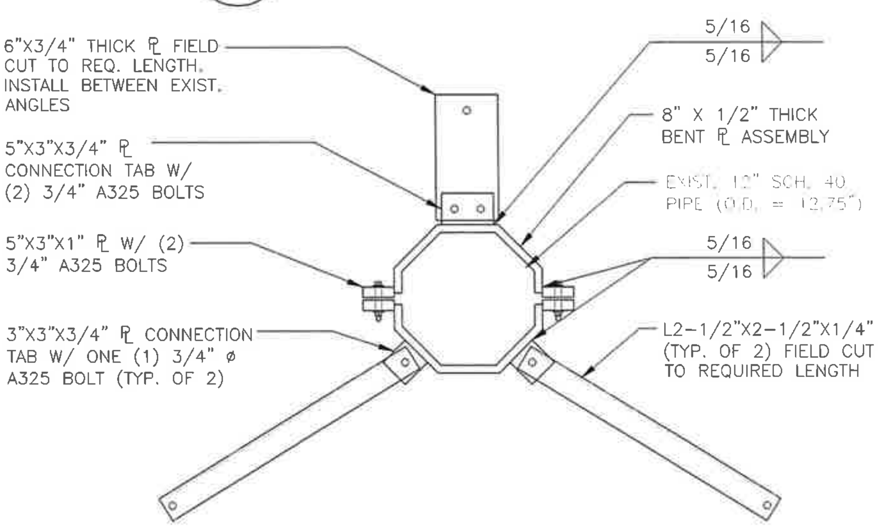
SCALE: 1/2" = 1'-0"



1 / S-2 BRACKET PLAN

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

134'-9" ABOVE TOWER BASE



3 / S-2 BRACKET DETAIL

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

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CONNECTION REINFORCEMENT DETAILS

SHEET NO. S-2

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA/EIA

Wind Speeds

Basic Wind Speed	$V := 85$	mph	(User Input per NU Mast Design Criteria Exception 1)
Basic Wind Speed with Ice	$V_i := 74$	mph	(User Input per TIA/EIA-222-F Section 2.3.16)

Heights above ground level, z

Powermount Section 1	$z_{pmnt1} := 135$	ft	(User Input)
Powermount Section 2	$z_{pmnt2} := 105$	ft	(User Input)
Powermount Section 3	$z_{pmnt3} := 75$	ft	(User Input)
Powermount Section 4	$z_{pmnt4} := 45$	ft	(User Input)
Powermount Section 5	$z_{pmnt5} := 15$	ft	(User Input)
Verizon	$z_{vzw} := 139$	ft	(User Input)
Sprint	$z_{spt} := 148$	ft	(User Input)
Coax	$z_{coax} := 80$	ft	(User Input)

Exposure Coefficients, kz (per TIA/EIA-222-F Section 2.3.3)

Powermount Section 1 $$Kz_{pmnt1} := \left(\frac{z_{pmnt1}}{33}\right)^{\frac{2}{7}} = 1.496$$

Powermount Section 2 $$Kz_{pmnt2} := \left(\frac{z_{pmnt2}}{33}\right)^{\frac{2}{7}} = 1.392$$

Powermount Section 3 $$Kz_{pmnt3} := \left(\frac{z_{pmnt3}}{33}\right)^{\frac{2}{7}} = 1.264$$

Powermount Section 4 $$Kz_{pmnt4} := \left(\frac{z_{pmnt4}}{33}\right)^{\frac{2}{7}} = 1.093$$

Powermount Section 5 $$Kz_{pmnt5} := \left(\frac{z_{pmnt5}}{33}\right)^{\frac{2}{7}} = 0.798$$

Verizon $$Kz_{vzw} := \left(\frac{z_{vzw}}{33}\right)^{\frac{2}{7}} = 1.508$$

Sprint $$Kz_{spt} := \left(\frac{z_{spt}}{33}\right)^{\frac{2}{7}} = 1.535$$

Coax $$Kz_{coax} := \left(\frac{z_{coax}}{33}\right)^{\frac{2}{7}} = 1.288$$

Velocity Pressure without ice, qz (per TIA/EIA-222-F Section 2.3.3)

Powermount Section 1 $qz_{pmnt1} := 0.00256 \cdot Kz_{pmnt1} \cdot V^2 = 27.662$

Powermount Section 2 $qz_{pmnt2} := 0.00256 \cdot Kz_{pmnt2} \cdot V^2 = 25.745$

Powermount Section 3 $qz_{pmnt3} := 0.00256 \cdot Kz_{pmnt3} \cdot V^2 = 23.386$

Powermount Section 4 $qz_{pmnt4} := 0.00256 \cdot Kz_{pmnt4} \cdot V^2 = 20.21$

Powermount Section 5 $qz_{pmnt5} := 0.00256 \cdot Kz_{pmnt5} \cdot V^2 = 14.765$

Verizon $qz_{vzw} := 0.00256 \cdot Kz_{vzw} \cdot V^2 = 27.894$

Sprint $qz_{spt} := 0.00256 \cdot Kz_{spt} \cdot V^2 = 28.398$

Coax $qz_{coax} := 0.00256 \cdot Kz_{coax} \cdot V^2 = 23.821$

Velocity Pressure with ice, qzICE (per TIA/EIA-222-F Section 2.3.3)

Powermount Section 1 $qzICE_{pmnt1} := 0.00256 \cdot Kz_{pmnt1} \cdot V_i^2 = 20.966$

Powermount Section 2 $qzICE_{pmnt2} := 0.00256 \cdot Kz_{pmnt2} \cdot V_i^2 = 19.513$

Powermount Section 3 $qzICE_{pmnt3} := 0.00256 \cdot Kz_{pmnt3} \cdot V_i^2 = 17.725$

Powermount Section 4 $qzICE_{pmnt4} := 0.00256 \cdot Kz_{pmnt4} \cdot V_i^2 = 15.318$

Powermount Section 5 $qzICE_{pmnt5} := 0.00256 \cdot Kz_{pmnt5} \cdot V_i^2 = 11.191$

Verizon $qzICE_{vzw} := 0.00256 \cdot Kz_{vzw} \cdot V_i^2 = 21.141$

Sprint $qzICE_{spt} := 0.00256 \cdot Kz_{spt} \cdot V_i^2 = 21.524$

Coax $qzICE_{coax} := 0.00256 \cdot Kz_{coax} \cdot V_i^2 = 18.054$

TIA/EIA Common Factors:

Gust Response Factor = $G_H := 1.69$ (User Input per TIA/EIA-222-F Section 2.3.4)

Gust Response Factor Multiplier = $m := 1.25$ (User Input per TIA/EIA-222-F Section 2.3.4.4)

Radial Ice Thickness = $Ir := 0.50$ in (User Input per TIA/EIA-222-F Section 2.3.1)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

Development of Wind & Ice Load on Powermonut (per TIA/EIA-222-F-1996 Criteria)

Powermount Data: (12" Std. Pipe)

Powermount Shape =	Round		(User Input)
Powermount Diameter =	$D_{pmnt} := 12$	in	(User Input)
Powermount Length =	$L_{pmnt} := 150$	ft	(User Input)
Powermount Thickness =	$t_{pmnt} := 0.375$	in	(User Input)
Velocity Coefficient =	$C := \sqrt{Kz_{pmnt4} \cdot V \cdot \frac{D_{pmnt}}{12}} = 89$		
Powermount Force Coefficient =	$CF_{pmnt} = 0.59$		(per TIA/EIA-222-F Table 1)

Wind Load (without Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Powermount Projected Surface Area =	$A_{pmnt} := \frac{D_{pmnt}}{12} = 1$	sf/ft	
Total Powermount Section 1 Wind Force =	$qz_{pmnt1} \cdot G_H \cdot CF_{pmnt} \cdot A_{pmnt} = 28$	plf	BLC 5,7
Total Powermount Section 2 Wind Force =	$qz_{pmnt2} \cdot G_H \cdot CF_{pmnt} \cdot A_{pmnt} = 26$	plf	BLC 5,7
Total Powermount Section 3 Wind Force =	$qz_{pmnt3} \cdot G_H \cdot CF_{pmnt} \cdot A_{pmnt} = 23$	plf	BLC 5,7
Total Powermount Section 4 Wind Force =	$qz_{pmnt4} \cdot G_H \cdot CF_{pmnt} \cdot A_{pmnt} = 20$	plf	BLC 5,7
Total Powermount Section 5 Wind Force =	$qz_{pmnt5} \cdot G_H \cdot CF_{pmnt} \cdot A_{pmnt} = 15$	plf	BLC 5,7

Wind Load (with Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Powermount Projected Surface Area w/ Ice =	$AICE_{pmnt} := \frac{(D_{pmnt} + 2 \cdot Ir)}{12} = 1.083$	sf/ft	
Total Powermount Section 1 Wind Force w/ Ice =	$qzICE_{pmnt1} \cdot G_H \cdot CF_{pmnt} \cdot AICE_{pmnt} = 23$	plf	BLC 4,6
Total Powermount Section 2 Wind Force w/ Ice =	$qzICE_{pmnt2} \cdot G_H \cdot CF_{pmnt} \cdot AICE_{pmnt} = 21$	plf	BLC 4,6
Total Powermount Section 3 Wind Force w/ Ice =	$qzICE_{pmnt3} \cdot G_H \cdot CF_{pmnt} \cdot AICE_{pmnt} = 19$	plf	BLC 4,6
Total Powermount Section 4 Wind Force w/ Ice =	$qzICE_{pmnt4} \cdot G_H \cdot CF_{pmnt} \cdot AICE_{pmnt} = 17$	plf	BLC 4,6
Total Powermount Section 5 Wind Force w/ Ice =	$qzICE_{pmnt5} \cdot G_H \cdot CF_{pmnt} \cdot AICE_{pmnt} = 12$	plf	BLC 4,6

Gravity Loads (without Ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot =	$Ai_{pmnt} := \frac{\pi}{4}\left[(D_{pmnt} + Ir \cdot 2)^2 - D_{pmnt}^2\right] = 19.6$	sq in	
Weight of Ice on Powermount =	$W_{ICEpmnt} := Id \cdot \frac{Ai_{pmnt}}{144} = 8$	plf	BLC 3

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

Antenna Data: (Sprint)

Antenna Model =	RFS APXVSPP18-C			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 72$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.8$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 7$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 57$	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 =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.9$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 17.7$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{spt} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1189$	lbs	**BLC 5,7**

Wind Load (with Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.5$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{spt} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 991$	lbs	**BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 171$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5947$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant}+1)(W_{ant}+1) \cdot (T_{ant}+1) - V_{ant} = 1528$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 50$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 149$	lbs	**BLC 3**

Development of Wind & Ice Load on Platform (per TIA/EIA-222-F-1996 Criteria)

Platform Data: (Sprint)

Platform Model =	FWT 14' Low Profile Platform		
Platform Shape =	Flat		(User Input)
Platform Area =	$A_{plt} := 14.2$	sq ft	(User Input from FWT design calcs)
Platform Area w/ Ice =	$A_{ICE.plt} := 15.8$	sq ft	(User Input from FWT design calcs)
Platform Weight =	$WT_{plt} := 3020$	lbs	(User Input from FWT design calcs)
Platform Weight w/ Ice =	$WT_{ICE.plt} := 4300$	lbs	(User Input from FWT design calcs)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Total Platform Wind Force = $F_{plt} := qz_{spt} \cdot G_H \cdot C_a \cdot A_{plt} = 954$ lbs **BLC 5,7**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Total Platform Wind Force w/ Ice = $Fi_{plt} := qzICE_{spt} \cdot G_H \cdot C_a \cdot A_{ICE.plt} = 805$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of Platform = $WT_{plt} = 3020$ lbs **BLC 2**

Gravity Loads (ice only)

Weight of Ice on Platform = $WT_{ICE.plt} - WT_{plt} = 1280$ lbs **BLC 3**

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

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)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.2$		
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)

Wind Load (without Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 =	$F_{ant} := qz_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 840$	lbs	**BLC 5**

Wind Load (with Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 =	$Fi_{ant} := qzICE_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 703$	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 =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1090$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 35$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 106$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

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)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.1$		
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)

Wind Load (without Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 =	$F_{ant} := qz_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1178$	lbs	**BLC 5**

Wind Load (with Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 =	$Fi_{ant} := qzICE_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 981$	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 =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1544$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 50$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 150$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

(per TIA/EIA-222-F-1996 Criteria)

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 =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 3.9$		
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)

Wind Load (without Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 =	$A_{ant} := SA_{ant} \cdot N_{ant} = 12.6$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 834$	lbs	**BLC 5**

Wind Load (with Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 13.9$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 696$	lbs	**BLC 4**

Gravity Load (without Ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 56$	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 =	$V_{ice} := (L_{ant}+1)(W_{ant}+1) \cdot (T_{ant}+1) - V_{ant} = 1040$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 34$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 101$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas (per TIA/EIA-222-F-1996 Criteria)

Antenna Data:

Antenna Model =	RFS FDAP5002/2C-3L		(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)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 0.8$		
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)

Wind Load (without Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 =	$F_{ant} := qz_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 148$	lbs	**BLC 5**

Wind Load (with Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 =	$Fi_{ant} := qzICE_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 145$	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 =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 122$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 4$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 24$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

(per TIA/EIA-222-F-1996 Criteria)

Antenna Data:

Antenna Model =	RFS ATSBT-TOP-FM-4G		(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 =	$T_{ant} := 2$	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 =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)

Wind Load (without Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 = $F_{ant} := qz_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 29$ lbs **BLC 5**

Wind Load (with Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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 = $Fi_{ant} := qzICE_{vzw} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 32$ 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 = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 52$ cu in

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

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 5$ lbs **BLC 3**

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Development of Wind & Ice Load on Platform (per TIA/EIA-222-F-1996 Criteria)

Platform Data:

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

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Total Platform Wind Force = $F_{plt} := qz_{vzw} \cdot G_H \cdot CaA_{plt} = 502$ lbs **BLC 5**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Total Platform Wind Force w/ Ice = $Fi_{plt} := qzICE_{vzw} \cdot G_H \cdot CaA_{ICE.plt} = 489$ lbs **BLC 4**

Gravity Load (without ice)

Weight of Platform = $WT_{plt} = 750$ lbs **BLC 2**

Gravity Loads (ice only)

Weight of Ice on Platform = $WT_{ICE.plt} - WT_{plt} = 200$ lbs **BLC 3**

Development of Wind & Ice Load on Coax Cables — per TIA/EIA-222-F-96 Criteria

Coax Cable Data: (Cables located inside Powermount from grade to antennas)

Coax Type =	HELIAX 1-5/8"		(Sprint)
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)
Coax Cable Length =	$L_{coax} := 148$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 6$		(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 0$		(User Input) (Cables located inside Powermount)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 897$

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$ TIA/EIA-222-F-96 Table 3

Wind Load (without ice) — per TIA/EIA-222-F-96 Section 2.3.2

Coax projected surface area = $A_{coax} := 0$ (Cables within Powermount) sf/ft

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{coax} \cdot G_H \cdot A_{coax} = 0$ plf **BLC 5**

Wind Load (with ice) — per TIA/EIA-222-F-96 Section 2.3.2

Coax projected surface area w/ Ice = $AICE_{coax} := 0$ (Cables within Powermount) sf/ft

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qzICE_{coax} \cdot G_H \cdot AICE_{coax} = 0$ plf **BLC 4**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{coax} := 0$ (Cables within Powermount) sq in

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 0$ plf **BLC 3**

Development of Wind & Ice Load on Coax Cables per TIA/EIA-222-F-96 Criteria

Coax Cable Data: (Cables located on exterior of Powermount from grade to antennas)

Coax Type =	HELIAX 1-5/8"		(Verizon)
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 =	$N_{coax} := 18$		(User Input)
No. of Coax Projecting Outside Face of PCS Mast =	$NP_{coax} := 4$		(User Input)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 842.4$

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$ TIA/EIA-222-F-96 Table 3

Wind Load (without ice) per TIA/EIA-222-F-96 Section 2.3.2

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

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{coax} \cdot G_H \cdot A_{coax} = 32$ plf **BLC 5**

Wind Load (with ice) per TIA/EIA-222-F-96 Section 2.3.2

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

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qzICE_{coax} \cdot G_H \cdot AICE_{coax} = 27$ plf **BLC 4**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

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

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

Development of Wind & Ice Load on Coax Cables per TIA/EIA-222-F-96 Criteria

Coax Cable Data: (Cables located on exterior of Powermount above tower to antennas)

Coax Type = HELIAX 1-5/8" (Sprint)

Shape = Round (User Input)

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

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

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

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

No. of Coax Projecting Outside Face of PCS Mast = $NP_{coax} := 3$ (User Input)

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

Coax Cable Force Factor Coefficient = $Ca_{coax} = 1.2$ TIA/EIA-222-F-96 Table 3

Wind Load (without ice) per TIA/EIA-222-F-96 Section 2.3.2

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

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{coax} \cdot G_H \cdot A_{coax} = 24$ plf **BLC 5**

Wind Load (with ice) per TIA/EIA-222-F-96 Section 2.3.2

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

Total Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qzICE_{coax} \cdot G_H \cdot AICE_{coax} = 21$ plf **BLC 4**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

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

Ice Weight All Coax per foot = $WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 18$ plf **BLC 3**

Development of Wind & Ice Load on Brace Member (per TIA/EIA-222-F-1996 Criteria)

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 = $Ca_{mem} = 1.47$ (per TIA/EIA-222-F-1996 Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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

Total Member Wind Force = $F_{mem} := qz_{pmnt2} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 11$ plf **BLC 5,7**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 0.3$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := qzICE_{pmnt2} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 12$ plf **BLC 4,6**

Gravity Load (without ice)

Weight of Member = **Self Weight** lbs **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := \left[(H_{mem} + 2 \cdot Ir) + (W_{mem} - t_{mem})\right] \cdot (t_{mem} + 2 \cdot Ir) - \left[H_{mem} + (W_{mem} + t_{mem})\right] \cdot t_{mem} = 5$$ sq in

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 2$ plf **BLC 3**

Development of Wind & Ice Load on Brace Member (per TIA/EIA-222-F-1996 Criteria)

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 = $Ca_{mem} = 1.7$ (per TIA/EIA-222-F-1996 Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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

Total Member Wind Force = $F_{mem} := qz_{pmnt2} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 15$ plf **BLC 5,7**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 0.3$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := qzICE_{pmnt2} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 16$ plf **BLC 4,6**

Gravity Load (without ice)

Weight of Member = Self Weight lbs **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := \left[(H_{mem} + 2 \cdot Ir) + (W_{mem} - t_{mem})\right] \cdot (t_{mem} + 2 \cdot Ir) - \left[H_{mem} + (W_{mem} + t_{mem})\right] \cdot t_{mem} = 6$$ sq in

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 2$ plf **BLC 3**

Development of Wind & Ice Load on Brace Member (per TIA/EIA-222-F-1996 Criteria)

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 = $Ca_{mem} = 2$ (per TIA/EIA-222-F-1996 Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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

Total Member Wind Force = $F_{mem} := qz_{pmnt4} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 17$ plf **BLC 5,7**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 0.3$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := qzICE_{pmnt4} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 17$ plf **BLC 4,6**

Gravity Load (without ice)

Weight of Member = Self Weight lbs **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := \left[(H_{mem} + 2 \cdot Ir) + (W_{mem} - t_{mem})\right] \cdot (t_{mem} + 2 \cdot Ir) - \left[H_{mem} + (W_{mem} + t_{mem})\right] \cdot t_{mem} = 7$$ sq in

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

Development of Wind & Ice Load on Brace Member (per TIA/EIA-222-F-1996 Criteria)

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 = $Ca_{mem} = 2$ (per TIA/EIA-222-F-1996 Table 3)

Wind Load (without Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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

Total Member Wind Force = $F_{mem} := qz_{pmnt4} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 20$ plf **BLC 5,7**

Wind Load (with Ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 0.4$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := qzICE_{pmnt4} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 19$ plf **BLC 4,6**

Gravity Load (without Ice)

Weight of Member = Self Weight lbs **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot Ir\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot Ir\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 8$$ sq in

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

Development of Wind & Ice Load on Brace Member (per TIA/EIA-222-F-1996 Criteria)

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 = $Ca_{mem} = 2$ (per TIA/EIA-222-F-1996 Table 3)

Wind Load (without ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

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

Total Member Wind Force = $F_{mem} := qz_{pmnt4} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 23$ plf **BLC 5,7**

Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{(H_{mem} + 2 \cdot Ir)}{12} = 0.4$ sf/ft

Total Member Wind Force w/ Ice = $FI_{mem} := qzICE_{pmnt4} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 22$ plf **BLC 4,6**

Gravity Load (without ice)

Weight of Member = Self Weight lbs **BLC 1**

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := \left[(H_{mem} + 2 \cdot Ir) + (W_{mem} - t_{mem})\right] \cdot (t_{mem} + 2 \cdot Ir) - \left[H_{mem} + (W_{mem} + t_{mem})\right] \cdot t_{mem} = 9$$ sq in

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

CENTEK engineering, INC.
Consulting Engineers
63-2 North Branford Road
Branford, CT 06405
Ph. 203-488-0580 / Fax. 203-488-8587

Subject: **Analysis of TIA/EIA Wind and Ice Loads for Analysis of Powermount Only**
Tabulated Load Cases
Location: **Greenwhich, CT**
Date: 3/6/15 Prepared by: T.J.L. Checked by: C.F.C. Job No. 15001.017

Load Case	Description
1	Self Weight (Powermountt)
2	Weight of Appurtenances
3	Weight of Ice Only on PCS Structure (1)
4	TIA/EIA Wind with Ice on PCS Structure (1)
5	TIA/EIA Wind on PCS Structure (1)

Footnotes:
(1) PCS Structure includes: Powermount and Appurtenances

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Subject: **Analysis of TIA/EIA Wind and Ice Loads for Analysis of Powermount Only**
Load Combinations Table

Location: **Greenwich, CT**

Date: 3/6/15 Prepared by: T.J.L. Checked by: C.F.C. Job No. 15001.017

Load Combination	Description	Envelope Soultion	Wind Factor	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	(X) TIA/EIA Wind + Ice on PCS Structure		1		1	1	2	1	3	1	4	1		
2	(X) TIA/EIA Wind on PCS Structure		1		1	1	2	1	5	1				
3	(Z) TIA/EIA Wind + Ice on PCS Structure		1		1	1	2	1	3	1	6	1		
4	(Z) TIA/EIA Wind on PCS Structure		1		1	1	2	1	7	1				

Footnotes:
(1) BLC = Basic Load Case
(2) PCS Structure includes: Powermount and Appurtenances

Global

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

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

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, Continued

Seismic Code	UBC 1997
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	No
Ct Z	.035
Ct X	.035
T Z (sec)	Not Entered
T X (sec)	Not Entered
R Z	8.5
R X	8.5
Ca	.36
Cv	.54
Nv	1
Occupancy Category	4
Seismic Zone	3
Seismic Detailing Code	ASCE 7-05
Om Z	1
Om X	1
Rho Z	1
Rho X	1

Footing Overturning Safety Factor	1.5
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lamda	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 Design Parameters

	Label	Shape	Leng...	Lbyy[ft]	Lbzz[ft]	Lcomp ...	Lcomp ...	Kyy	Kzz	Cm...	Cm...	Cb	y s...	z s...	Functi...
1	M1	Powermount	148	Segment	Segment										Lateral
2	M2	Brace 4	10.25												Lateral
3	M3	Brace 5	13.25												Lateral
4	M4	Brace 3	8.083												Lateral
5	M5	Brace 4	11.083												Lateral
6	M6	Brace 5	11.845												Lateral
7	M7	Brace 5	11.845												Lateral
8	M8	Brace 4	9.7												Lateral
9	M9	Brace 4	9.7												Lateral
10	M10	Brace 2	3.354												Lateral
11	M11	Brace 2	3.354												Lateral
12	M12	Brace 1	1.5												Lateral
13	M13	Brace 2	3.354												Lateral
14	M14	Brace 2	3.354												Lateral
15	M15	Brace 1	1.5												Lateral
16	M16	Brace 2	3.354												Lateral
17	M17	Brace 2	3.354												Lateral
18	M18	Brace 1	1.5												Lateral
19	M19	6"x3/4" Plate	1.5												Lateral
20	M20	L2.5x2.5x1/4	3.354												Lateral
21	M21	L2.5x2.5x1/4	3.354												Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Powermount	12" FWT Powerm...	Beam	Pipe	A500 Gr.42	Typical	14.579	279.335	279.335	558.67
2	Brace 1	L2x2x3	Beam	Single An...	A36 Gr.36	Typical	.722	.271	.271	.009
3	Brace 2	L2.5x2.5x3	Beam	Single An...	A36 Gr.36	Typical	.901	.535	.535	.011
4	Brace 3	L3x3x3	Beam	Single An...	A36 Gr.36	Typical	1.09	.948	.948	.014
5	Brace 4	L3.5x3.5x4	Beam	Single An...	A36 Gr.36	Typical	1.7	2	2	.039
6	Brace 5	L4x4x4	Beam	Single An...	A36 Gr.36	Typical	1.93	3	3	.044
7	6"x3/4" Plate	6"X3/4" PL	Beam	Single An...	A36 Gr.36	Typical	4.5	.211	13.5	.777
8	L2.5x2.5x1/4	L2.5x2.5x4	Beam	Single An...	A36 Gr.36	Typical	1.19	.692	.692	.026

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N8			Powermount	Beam	Pipe	A500 Gr.42	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 R...
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]	Footing
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]	Footing
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	-.171	148
2	M1	Y	-3.02	148
3	M1	Y	-.093	139
4	M1	Y	-.123	139
5	M1	Y	-.056	139
6	M1	Y	-.042	139
7	M1	Y	-.06	139
8	M1	Y	-.75	139

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.149	148
2	M1	Y	-1.28	148
3	M1	Y	-.106	139
4	M1	Y	-.15	139
5	M1	Y	-.101	139
6	M1	Y	-.024	139
7	M1	Y	-.005	139
8	M1	Y	-.2	139

Member Point Loads (BLC 4 : (X) TIA/EIA Wind with Ice on PCS)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.991	148
2	M1	X	.805	148
3	M1	X	.703	139

Member Point Loads (BLC 4 : (X) TIA/EIA Wind with Ice on PCS) (Continued)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
4	M1	X	.981	139
5	M1	X	.696	139
6	M1	X	.145	139
7	M1	X	.032	139
8	M1	X	.489	139

Member Point Loads (BLC 5 : (X) TIA/EIA Wind on PCS Structur)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	1.189	148
2	M1	X	.954	148
3	M1	X	.84	139
4	M1	X	1.178	139
5	M1	X	.834	139
6	M1	X	.148	139
7	M1	X	.029	139
8	M1	X	.502	139

Member Point Loads (BLC 6 : (Z) TIA/EIA Wind with Ice on PCS)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.991	148
2	M1	Z	.805	148
3	M1	Z	.703	139
4	M1	Z	.981	139
5	M1	Z	.696	139
6	M1	Z	.145	139
7	M1	Z	.032	139
8	M1	Z	.489	139

Member Point Loads (BLC 7 : (Z) TIA/EIA Wind on PCS Structur)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	1.189	148
2	M1	Z	.954	148
3	M1	Z	.84	139
4	M1	Z	1.178	139
5	M1	Z	.834	139
6	M1	Z	.148	139
7	M1	Z	.029	139
8	M1	Z	.502	139

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
No Data to Print ...			

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.006	-.006	0	0
2	M1	Y	-.019	-.019	0	137

Member Distributed Loads (BLC 2 : Weight of Appurtenances) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
3	M1	Y	-.012	-.012	137	148

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.008	-.008	0	0
2	M1	Y	-.027	-.027	0	137
3	M1	Y	-.018	-.018	137	147
4	M18	Y	-.002	-.002	0	0
5	M16	Y	-.002	-.002	0	0
6	M17	Y	-.002	-.002	0	0
7	M15	Y	-.002	-.002	0	0
8	M13	Y	-.002	-.002	0	0
9	M14	Y	-.002	-.002	0	0
10	M12	Y	-.002	-.002	0	0
11	M10	Y	-.002	-.002	0	0
12	M11	Y	-.002	-.002	0	0
13	M4	Y	-.003	-.003	0	0
14	M8	Y	-.003	-.003	0	0
15	M5	Y	-.003	-.003	0	0
16	M9	Y	-.003	-.003	0	0
17	M2	Y	-.003	-.003	0	0
18	M6	Y	-.003	-.003	0	0
19	M3	Y	-.003	-.003	0	0
20	M7	Y	-.003	-.003	0	0

Member Distributed Loads (BLC 4 : (X) TIA/EIA Wind with Ice on PCS)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.012	.012	0	30
2	M1	X	.017	.017	30	60
3	M1	X	.019	.019	60	90
4	M1	X	.021	.021	90	120
5	M1	X	.023	.023	120	148
6	M1	X	.027	.027	0	137
7	M1	X	.021	.021	137	147
8	M18	X	.012	.012	0	0
9	M15	X	.012	.012	0	0
10	M12	X	.012	.012	0	0
11	M16	X	.016	.016	0	0
12	M17	X	.016	.016	0	0
13	M13	X	.016	.016	0	0
14	M14	X	.016	.016	0	0
15	M10	X	.016	.016	0	0
16	M11	X	.016	.016	0	0
17	M4	X	.017	.017	0	0
18	M8	X	.019	.019	0	0
19	M5	X	.019	.019	0	0
20	M9	X	.019	.019	0	0
21	M2	X	.019	.019	0	0
22	M6	X	.022	.022	0	0
23	M3	X	.022	.022	0	0
24	M7	X	.022	.022	0	0

Member Distributed Loads (BLC 5 : (X) TIA/EIA Wind on PCS Structur)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.015	.015	0	30
2	M1	X	.02	.02	30	60
3	M1	X	.023	.023	60	90
4	M1	X	.026	.026	90	120
5	M1	X	.028	.028	120	148
6	M1	X	.032	.032	0	137
7	M1	X	.024	.024	137	147
8	M18	X	.011	.011	0	0
9	M15	X	.011	.011	0	0
10	M12	X	.011	.011	0	0
11	M16	X	.015	.015	0	0
12	M17	X	.015	.015	0	0
13	M13	X	.015	.015	0	0
14	M14	X	.015	.015	0	0
15	M10	X	.015	.015	0	0
16	M11	X	.015	.015	0	0
17	M4	X	.017	.017	0	0
18	M8	X	.02	.02	0	0
19	M5	X	.02	.02	0	0
20	M9	X	.02	.02	0	0
21	M2	X	.02	.02	0	0
22	M6	X	.023	.023	0	0
23	M3	X	.023	.023	0	0
24	M7	X	.023	.023	0	0

Member Distributed Loads (BLC 6 : (Z) TIA/EIA Wind with Ice on PCS)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.012	.012	0	30
2	M1	Z	.017	.017	30	60
3	M1	Z	.019	.019	60	90
4	M1	Z	.021	.021	90	120
5	M1	Z	.023	.023	120	148
6	M1	Z	.027	.027	0	137
7	M1	Z	.021	.021	137	147
8	M16	Z	.016	.016	0	0
9	M17	Z	.016	.016	0	0
10	M13	Z	.016	.016	0	0
11	M14	Z	.016	.016	0	0
12	M10	Z	.016	.016	0	0
13	M11	Z	.016	.016	0	0
14	M8	Z	.019	.019	0	0
15	M9	Z	.019	.019	0	0
16	M6	Z	.022	.022	0	0
17	M7	Z	.022	.022	0	0

Member Distributed Loads (BLC 7 : (Z) TIA/EIA Wind on PCS Structur)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.015	.015	0	30
2	M1	Z	.02	.02	30	60
3	M1	Z	.023	.023	60	90
4	M1	Z	.026	.026	90	120

Member Distributed Loads (BLC 7 : (Z) TIA/EIA Wind on PCS Structur) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
5	M1	Z	.028	.028	120	148
6	M1	Z	.032	.032	0	137
7	M1	Z	.024	.024	137	147
8	M16	Z	.015	.015	0	0
9	M17	Z	.015	.015	0	0
10	M13	Z	.015	.015	0	0
11	M14	Z	.015	.015	0	0
12	M10	Z	.015	.015	0	0
13	M11	Z	.015	.015	0	0
14	M8	Z	.02	.02	0	0
15	M9	Z	.02	.02	0	0
16	M6	Z	.023	.023	0	0
17	M7	Z	.023	.023	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
1	Self Weight (Powermount)	None		-1						
2	Weight of Appurtenances	None					8	3		
3	Weight of Ice Only on PCS Struct	None					8	20		
4	(X) TIA/EIA Wind with Ice on PCS	None					8	24		
5	(X) TIA/EIA Wind on PCS Structur	None					8	24		
6	(Z) TIA/EIA Wind with Ice on PCS	None					8	17		
7	(Z) TIA/EIA Wind on PCS Structur	None					8	17		

Load Combinations

	Description	Solve	PD...	SR...	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	(X) TIA/EIA ...	Yes			1	1	2	1	3	1	4	1								
2	(X) TIA/EIA ...	Yes			1	1	2	1	5	1										
3	(Z) TIA/EIA ...	Yes			1	1	2	1	3	1	6	1								
4	(Z) TIA/EIA ...	Yes			1	1	2	1	7	1										

Envelope Member Section Forces

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
1	M1	1	max	22.827	1	.803	2	0	1	0	1	4.473	4	4.489	2
2			min	15.596	2	0	3	-.802	4	0	1	0	1	0	3
3		2	max	18.55	1	0	3	.437	4	0	1	2.951	4	2.948	2
4			min	12.684	2	-.439	2	0	1	0	1	0	1	0	3
5		3	max	14.333	1	0	3	.398	4	0	1	0	1	0	3
6			min	9.821	2	-.397	2	0	1	0	1	-4.652	4	-4.645	2
7		4	max	10.237	1	1.113	2	0	1	0	1	0	1	0	3
8			min	7.036	2	0	3	-1.145	4	0	1	-8.185	4	-8.06	2
9		5	max	4.62	1	2.143	2	0	1	0	1	0	1	0	1
10			min	3.191	2	0	3	-2.143	4	0	1	0	1	0	1
11	M2	1	max	.423	4	.045	1	0	4	0	1	0	1	0	1
12			min	0	1	.03	4	-.102	2	0	1	0	1	0	1
13		2	max	.423	4	.023	1	0	3	0	1	.061	3	-.04	4
14			min	0	1	.015	4	-.051	2	0	1	-.099	2	-.194	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
15		3	max	.423	4	0	1	0	1	0	1	.082	3	-.054	4
16			min	0	1	0	1	0	1	0	1	-.132	2	-.258	1
17		4	max	.423	4	-.015	2	.051	2	0	1	.061	3	-.04	4
18			min	0	1	-.023	3	0	4	0	1	-.099	2	-.194	1
19		5	max	.423	4	-.03	2	.103	2	0	1	0	1	0	1
20			min	0	1	-.045	1	0	4	0	1	0	1	0	1
21	M3	1	max	0	1	.063	1	0	3	0	1	0	1	0	1
22			min	-.371	4	.044	4	-.152	2	0	1	0	1	0	1
23		2	max	0	1	.032	1	0	3	0	1	.111	3	-.076	4
24			min	-.371	4	.022	4	-.076	2	0	1	-.191	2	-.367	1
25		3	max	0	1	0	1	0	1	0	1	.148	3	-.102	4
26			min	-.371	4	0	1	0	1	0	1	-.255	2	-.49	1
27		4	max	0	1	-.022	2	.076	2	0	1	.111	3	-.076	4
28			min	-.371	4	-.032	1	0	4	0	1	-.191	2	-.367	1
29		5	max	0	1	-.044	2	.152	2	0	1	0	1	0	1
30			min	-.371	4	-.063	1	0	4	0	1	0	1	0	1
31	M4	1	max	1	4	.027	3	0	4	0	1	0	1	0	1
32			min	0	1	.015	2	-.069	1	0	1	0	1	0	1
33		2	max	1	4	.014	3	0	4	0	1	.029	3	-.016	4
34			min	0	1	.007	2	-.034	1	0	1	-.058	2	-.103	1
35		3	max	1	4	0	1	0	1	0	1	.039	3	-.021	4
36			min	0	1	0	1	0	1	0	1	-.077	2	-.137	1
37		4	max	1	4	-.007	4	.034	2	0	1	.029	3	-.016	4
38			min	0	1	-.014	1	0	3	0	1	-.058	2	-.103	1
39		5	max	1	4	-.015	4	.069	1	0	1	0	1	0	1
40			min	0	1	-.027	1	0	3	0	1	0	1	0	1
41	M5	1	max	0	1	.049	1	0	3	0	1	0	1	0	1
42			min	-1.137	4	.032	4	-.111	2	0	1	0	1	0	1
43		2	max	0	1	.024	1	0	3	0	1	.072	3	-.047	4
44			min	-1.137	4	.016	4	-.055	2	0	1	-.116	2	-.226	1
45		3	max	0	1	0	1	0	1	0	1	.095	3	-.063	4
46			min	-1.137	4	0	1	0	1	0	1	-.154	2	-.302	1
47		4	max	0	1	-.016	2	.055	2	0	1	.072	3	-.047	4
48			min	-1.137	4	-.024	3	0	3	0	1	-.116	2	-.226	1
49		5	max	0	1	-.032	2	.111	2	0	1	0	1	0	1
50			min	-1.137	4	-.049	1	0	4	0	1	0	1	0	1
51	M6	1	max	-.062	3	.057	1	.017	2	0	1	0	1	0	1
52			min	-.669	2	.039	4	-.135	4	0	1	0	1	0	1
53		2	max	-.054	3	.028	1	.009	2	0	1	.115	1	-.034	2
54			min	-.601	2	.019	4	-.068	4	0	1	-.151	4	-.292	3
55		3	max	-.046	3	0	1	0	1	0	1	.153	1	-.045	2
56			min	-.534	2	0	1	0	1	0	1	-.202	4	-.389	3
57		4	max	-.038	3	-.019	4	.068	4	0	1	.115	1	-.034	2
58			min	-.466	2	-.028	1	-.009	2	0	1	-.151	4	-.292	3
59		5	max	-.029	3	-.039	4	.135	4	0	1	0	1	0	1
60			min	-.399	2	-.057	1	-.017	2	0	1	0	1	0	1
61	M7	1	max	.399	2	.057	1	-.017	1	0	1	0	1	0	1
62			min	-.035	4	.039	4	-.135	4	0	1	0	1	0	1
63		2	max	.466	2	.028	1	-.008	1	0	1	.063	1	-.088	2
64			min	-.044	4	.019	4	-.068	4	0	1	-.151	4	-.292	3
65		3	max	.534	2	0	1	0	1	0	1	.084	1	-.118	2
66			min	-.053	4	0	1	0	1	0	1	-.202	4	-.389	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
67		4	max	.601	2	-.019	4	.068	4	0	1	.063	1	-.088	2
68			min	-.061	4	-.028	1	.008	1	0	1	-.151	4	-.292	3
69		5	max	.669	2	-.039	4	.135	4	0	1	0	1	0	1
70			min	-.07	4	-.057	1	.016	1	0	1	0	1	0	1
71	M8	1	max	-.186	3	.043	3	.015	2	0	1	0	1	0	1
72			min	-1.301	2	.028	2	-.096	4	0	1	0	1	0	1
73		2	max	-.179	3	.021	3	.007	2	0	1	.073	1	-.017	2
74			min	-1.253	2	.014	2	-.048	4	0	1	-.087	4	-.172	3
75		3	max	-.171	3	0	1	0	1	0	1	.097	1	-.022	2
76			min	-1.205	2	0	1	0	1	0	1	-.116	4	-.229	3
77		4	max	-.164	3	-.014	4	.048	4	0	1	.073	1	-.017	2
78			min	-1.157	2	-.021	1	-.008	2	0	1	-.087	4	-.172	3
79		5	max	-.157	3	-.028	4	.096	4	0	1	0	1	0	1
80			min	-1.109	2	-.043	1	-.015	2	0	1	0	1	0	1
81	M9	1	max	1.109	2	.043	1	-.014	1	0	1	0	1	0	1
82			min	-.186	4	.028	4	-.096	4	0	1	0	1	0	1
83		2	max	1.157	2	.021	1	-.007	1	0	1	.036	1	-.055	2
84			min	-.193	4	.014	4	-.048	4	0	1	-.087	4	-.172	3
85		3	max	1.205	2	0	1	0	1	0	1	.049	1	-.074	2
86			min	-.201	4	0	1	0	1	0	1	-.116	4	-.229	3
87		4	max	1.253	2	-.014	2	.048	4	0	1	.036	1	-.055	2
88			min	-.208	4	-.021	1	.007	1	0	1	-.087	4	-.172	3
89		5	max	1.301	2	-.028	2	.096	4	0	1	0	1	0	1
90			min	-.216	4	-.043	1	.014	1	0	1	0	1	0	1
91	M10	1	max	.421	4	.008	1	-.011	2	0	1	0	1	0	1
92			min	-1.156	2	.005	4	-.024	3	0	1	0	1	0	1
93		2	max	.416	4	.004	1	-.006	2	0	1	-.002	1	-.007	2
94			min	-1.145	2	.003	4	-.012	3	0	1	-.008	4	-.014	3
95		3	max	.41	4	0	1	0	1	0	1	-.002	1	-.01	2
96			min	-1.133	2	0	1	0	1	0	1	-.01	4	-.019	3
97		4	max	.404	4	-.003	2	.012	3	0	1	-.002	1	-.007	2
98			min	-1.122	2	-.004	3	.006	2	0	1	-.008	4	-.014	3
99		5	max	.399	4	-.005	2	.024	3	0	1	0	1	0	1
100			min	-1.111	2	-.008	3	.011	2	0	1	0	1	0	1
101	M11	1	max	1.111	2	.008	1	.012	1	0	1	0	1	0	1
102			min	.332	3	.005	2	-.024	3	0	1	0	1	0	1
103		2	max	1.122	2	.004	1	.006	1	0	1	.009	1	.003	2
104			min	.338	3	.003	2	-.012	3	0	1	-.008	4	-.014	3
105		3	max	1.133	2	0	1	0	1	0	1	.012	1	.004	2
106			min	.344	3	0	1	0	1	0	1	-.01	4	-.019	3
107		4	max	1.145	2	-.003	4	.012	3	0	1	.009	1	.003	2
108			min	.35	3	-.004	3	-.006	1	0	1	-.008	4	-.014	3
109		5	max	1.156	2	-.005	4	.024	3	0	1	0	1	0	1
110			min	.356	3	-.008	1	-.012	1	0	1	0	1	0	1
111	M12	1	max	0	1	.003	1	0	3	0	1	0	1	0	1
112			min	-1.643	4	.002	2	-.009	1	0	1	0	1	0	1
113		2	max	0	1	.002	1	0	3	0	1	0	3	0	4
114			min	-1.643	4	0	2	-.004	1	0	1	-.001	2	-.002	1
115		3	max	0	1	0	1	0	1	0	1	0	3	0	4
116			min	-1.643	4	0	1	0	1	0	1	-.002	2	-.003	1
117		4	max	0	1	0	4	.005	1	0	1	0	3	0	4
118			min	-1.643	4	-.002	3	0	4	0	1	-.001	2	-.002	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
119		5	max	0	1	-.002	4	.009	1	0	1	0	1	0	1
120			min	-1.643	4	-.003	3	0	4	0	1	0	1	0	1
121	M13	1	max	.365	4	.008	1	-.011	2	0	1	0	1	0	1
122			min	-.972	2	.005	4	-.024	3	0	1	0	1	0	1
123		2	max	.359	4	.004	1	-.006	2	0	1	-.002	1	-.007	2
124			min	-.96	2	.003	4	-.012	3	0	1	-.008	4	-.014	3
125		3	max	.353	4	0	1	0	1	0	1	-.002	1	-.01	2
126			min	-.949	2	0	1	0	1	0	1	-.01	4	-.019	3
127		4	max	.348	4	-.003	2	.012	3	0	1	-.002	1	-.007	2
128			min	-.938	2	-.004	3	.006	2	0	1	-.008	4	-.014	3
129		5	max	.342	4	-.005	2	.024	3	0	1	0	1	0	1
130			min	-.927	2	-.008	3	.011	2	0	1	0	1	0	1
131	M14	1	max	.927	2	.008	1	.012	1	0	1	0	1	0	1
132			min	.288	3	.005	2	-.024	3	0	1	0	1	0	1
133		2	max	.938	2	.004	1	.006	1	0	1	.009	1	.003	2
134			min	.294	3	.003	2	-.012	3	0	1	-.008	4	-.014	3
135		3	max	.949	2	0	1	0	1	0	1	.012	1	.004	2
136			min	.3	3	0	1	0	1	0	1	-.01	4	-.019	3
137		4	max	.96	2	-.003	4	.012	3	0	1	.009	1	.003	2
138			min	.306	3	-.004	3	-.006	1	0	1	-.008	4	-.014	3
139		5	max	.972	2	-.005	4	.024	3	0	1	0	1	0	1
140			min	.312	3	-.008	3	-.012	1	0	1	0	1	0	1
141	M15	1	max	0	1	.003	3	0	3	0	1	0	1	0	1
142			min	-1.415	4	.002	2	-.009	1	0	1	0	1	0	1
143		2	max	0	1	.002	3	0	3	0	1	0	3	0	4
144			min	-1.415	4	0	2	-.004	1	0	1	-.001	2	-.002	1
145		3	max	0	1	0	1	0	1	0	1	0	3	0	4
146			min	-1.415	4	0	1	0	1	0	1	-.002	2	-.003	1
147		4	max	0	1	0	4	.005	1	0	1	0	3	0	4
148			min	-1.415	4	-.002	1	0	4	0	1	-.001	2	-.002	1
149		5	max	0	1	-.002	4	.009	1	0	1	0	1	0	1
150			min	-1.415	4	-.003	1	0	4	0	1	0	1	0	1
151	M16	1	max	2.643	2	.008	3	-.011	2	0	1	0	1	0	1
152			min	-.974	4	.005	4	-.024	3	0	1	0	1	0	1
153		2	max	2.654	2	.004	3	-.006	2	0	1	-.002	1	-.007	2
154			min	-.98	4	.003	4	-.012	3	0	1	-.008	4	-.014	3
155		3	max	2.666	2	0	1	0	1	0	1	-.002	1	-.01	2
156			min	-.985	4	0	1	0	1	0	1	-.01	4	-.019	3
157		4	max	2.677	2	-.003	2	.012	3	0	1	-.002	1	-.007	2
158			min	-.991	4	-.004	1	.006	2	0	1	-.008	4	-.014	3
159		5	max	2.688	2	-.005	2	.024	3	0	1	0	1	0	1
160			min	-.996	4	-.008	1	.011	2	0	1	0	1	0	1
161	M17	1	max	-.849	3	.008	3	.012	1	0	1	0	1	0	1
162			min	-2.688	2	.005	4	-.024	3	0	1	0	1	0	1
163		2	max	-.843	3	.004	3	.006	1	0	1	.009	1	.003	2
164			min	-2.677	2	.003	4	-.012	3	0	1	-.008	4	-.014	3
165		3	max	-.837	3	0	1	0	1	0	1	.012	1	.004	2
166			min	-2.666	2	0	1	0	1	0	1	-.01	4	-.019	3
167		4	max	-.831	3	-.003	2	.012	3	0	1	.009	1	.003	2
168			min	-2.654	2	-.004	1	-.006	1	0	1	-.008	4	-.014	3
169		5	max	-.825	3	-.005	2	.024	3	0	1	0	1	0	1
170			min	-2.643	2	-.008	1	-.012	1	0	1	0	1	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear...	LC	z Shear...	LC	Torque[...	LC	y-y Mo...	LC	z-z Mo...	LC
171	M18	1	max	3.947	4	.003	3	0	3	0	1	0	1	0	1
172			min	0	1	.002	4	-.009	1	0	1	0	1	0	1
173		2	max	3.947	4	.002	3	0	3	0	1	0	3	0	4
174			min	0	1	0	4	-.004	1	0	1	-.001	2	-.002	1
175		3	max	3.947	4	0	1	0	1	0	1	0	3	0	4
176			min	0	1	0	1	0	1	0	1	-.002	2	-.003	1
177		4	max	3.947	4	0	2	.005	1	0	1	0	3	0	4
178			min	0	1	-.002	1	0	4	0	1	-.001	2	-.002	1
179		5	max	3.947	4	-.002	2	.009	1	0	1	0	1	0	1
180			min	0	1	-.003	1	0	4	0	1	0	1	0	1
181	M19	1	max	0	1	.011	1	0	1	0	1	0	1	0	1
182			min	-10.979	4	.011	1	0	1	0	1	0	1	0	1
183		2	max	0	1	.006	1	0	1	0	1	0	1	-.003	2
184			min	-10.979	4	.006	1	0	1	0	1	0	1	-.003	1
185		3	max	0	1	0	1	0	1	0	1	0	1	-.004	2
186			min	-10.979	4	0	1	0	1	0	1	0	1	-.004	1
187		4	max	0	1	-.006	1	0	1	0	1	0	1	-.003	2
188			min	-10.979	4	-.006	1	0	1	0	1	0	1	-.003	1
189		5	max	0	1	-.011	1	0	1	0	1	0	1	0	1
190			min	-10.979	4	-.011	1	0	1	0	1	0	1	0	1
191	M20	1	max	.581	4	.007	4	0	1	0	1	0	1	0	1
192			min	-6.417	2	.007	3	0	4	0	1	0	1	0	1
193		2	max	.581	4	.003	4	0	1	0	1	.003	1	-.003	1
194			min	-6.417	2	.003	3	0	4	0	1	.003	3	-.003	4
195		3	max	.581	4	0	1	0	1	0	1	.004	1	-.004	1
196			min	-6.417	2	0	1	0	1	0	1	.004	3	-.004	4
197		4	max	.581	4	-.003	4	0	1	0	1	.003	1	-.003	1
198			min	-6.417	2	-.003	3	0	4	0	1	.003	3	-.003	4
199		5	max	.581	4	-.007	4	0	1	0	1	0	1	0	1
200			min	-6.417	2	-.007	3	0	4	0	1	0	1	0	1
201	M21	1	max	6.417	2	.007	4	0	1	0	1	0	1	0	1
202			min	.493	3	.007	1	0	4	0	1	0	1	0	1
203		2	max	6.417	2	.003	4	0	1	0	1	.003	1	-.003	1
204			min	.493	3	.003	1	0	4	0	1	.003	2	-.003	4
205		3	max	6.417	2	0	1	0	1	0	1	.004	1	-.004	1
206			min	.493	3	0	1	0	1	0	1	.004	2	-.004	4
207		4	max	6.417	2	-.003	4	0	1	0	1	.003	1	-.003	1
208			min	.493	3	-.003	1	0	4	0	1	.003	2	-.003	4
209		5	max	6.417	2	-.007	4	0	1	0	1	0	1	0	1
210			min	.493	3	-.007	1	0	4	0	1	0	1	0	1

Envelope Member Section Stresses

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
1	M1	1	max	1.566	1	.11	2	0	1	0	3	1.229	2	1.225	4	0	1
2			min	1.07	2	0	3	-.11	4	-1.229	2	0	3	0	1	-1.225	4
3		2	max	1.272	1	0	3	.06	4	0	3	.807	2	.808	4	0	1
4			min	.87	2	-.06	2	0	1	-.807	2	0	3	0	1	-.808	4
5		3	max	.983	1	0	3	.055	4	1.272	2	0	3	0	1	1.274	4
6			min	.674	2	-.055	2	0	1	0	3	-1.272	2	-1.274	4	0	1
7		4	max	.702	1	.153	2	0	1	2.207	2	0	3	0	1	2.242	4

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
8			min	.483	2	0	3	-.157	4	0	3	-2.207	2	-2.242	4	0	1
9		5	max	.317	1	.294	2	0	1	0	1	0	1	0	1	0	1
10			min	.219	2	0	3	-.294	4	0	1	0	1	0	1	0	1
11	M2	1	max	.249	4	.062	1	0	3	0	1	0	1	0	1	0	1
12			min	0	1	.041	4	-.141	2	0	1	0	1	0	1	0	1
13		2	max	.249	4	.031	1	0	3	1.734	1	-.361	4	1.108	3	1.992	2
14			min	0	1	.02	4	-.07	2	.361	4	-1.734	1	-1.793	2	-1.231	3
15		3	max	.249	4	0	1	0	1	2.312	1	-.481	4	1.477	3	2.656	2
16			min	0	1	0	1	0	1	.481	4	-2.312	1	-2.39	2	-1.641	3
17		4	max	.249	4	-.02	2	.07	2	1.734	1	-.361	4	1.108	3	1.992	2
18			min	0	1	-.031	3	0	3	.361	4	-1.734	1	-1.793	2	-1.231	3
19		5	max	.249	4	-.041	2	.141	2	0	1	0	1	0	1	0	1
20			min	0	1	-.062	1	0	3	0	1	0	1	0	1	0	1
21	M3	1	max	0	1	.076	1	0	3	0	1	0	1	0	1	0	1
22			min	-.192	4	.052	4	-.183	2	0	1	0	1	0	1	0	1
23		2	max	0	1	.038	1	0	3	2.508	1	-.522	4	1.569	3	2.962	2
24			min	-.192	4	.026	4	-.091	2	.522	4	-2.508	1	-2.695	2	-1.725	3
25		3	max	0	1	0	1	0	1	3.344	1	-.696	4	2.092	3	3.95	2
26			min	-.192	4	0	1	0	1	.696	4	-3.344	1	-3.593	2	-2.3	3
27		4	max	0	1	-.026	2	.091	2	2.508	1	-.522	4	1.569	3	2.962	2
28			min	-.192	4	-.038	1	0	3	.522	4	-2.508	1	-2.695	2	-1.725	3
29		5	max	0	1	-.052	2	.183	2	0	1	0	1	0	1	0	1
30			min	-.192	4	-.076	1	0	3	0	1	0	1	0	1	0	1
31	M4	1	max	.917	4	.058	3	0	3	0	1	0	1	0	1	0	1
32			min	0	1	.032	2	-.147	1	0	1	0	1	0	1	0	1
33		2	max	.917	4	.029	3	0	3	1.664	1	-.26	4	.968	3	2.119	2
34			min	0	1	.016	2	-.073	1	.26	4	-1.664	1	-1.918	2	-1.07	3
35		3	max	.917	4	0	1	0	1	2.219	1	-.347	4	1.291	3	2.826	2
36			min	0	1	0	1	0	1	.347	4	-2.219	1	-2.557	2	-1.426	3
37		4	max	.917	4	-.016	4	.073	2	1.664	1	-.26	4	.968	3	2.119	2
38			min	0	1	-.029	1	0	3	.26	4	-1.664	1	-1.918	2	-1.07	3
39		5	max	.917	4	-.032	4	.147	1	0	1	0	1	0	1	0	1
40			min	0	1	-.058	1	0	3	0	1	0	1	0	1	0	1
41	M5	1	max	0	1	.067	1	0	3	0	1	0	1	0	1	0	1
42			min	-.669	4	.044	4	-.152	2	0	1	0	1	0	1	0	1
43		2	max	0	1	.033	1	0	3	2.028	1	-.422	4	1.295	3	2.329	2
44			min	-.669	4	.022	4	-.076	2	.422	4	-2.028	1	-2.096	2	-1.439	3
45		3	max	0	1	0	1	0	1	2.704	1	-.563	4	1.727	3	3.105	2
46			min	-.669	4	0	1	0	1	.563	4	-2.704	1	-2.794	2	-1.919	3
47		4	max	0	1	-.022	2	.076	2	2.028	1	-.422	4	1.295	3	2.329	2
48			min	-.669	4	-.033	3	0	3	.422	4	-2.028	1	-2.096	2	-1.439	3
49		5	max	0	1	-.044	2	.152	2	0	1	0	1	0	1	0	1
50			min	-.669	4	-.067	1	0	3	0	1	0	1	0	1	0	1
51	M6	1	max	-.032	3	.068	1	.021	2	0	1	0	1	0	1	0	1
52			min	-.347	2	.047	4	-.162	4	0	1	0	1	0	1	0	1
53		2	max	-.028	3	.034	1	.01	2	1.993	3	-.232	2	1.619	1	2.341	4
54			min	-.312	2	.023	4	-.081	4	.232	2	-1.993	3	-2.13	4	-1.78	1
55		3	max	-.024	3	0	1	0	1	2.657	3	-.309	2	2.159	1	3.121	4
56			min	-.277	2	0	1	0	1	.309	2	-2.657	3	-2.839	4	-2.373	1
57		4	max	-.019	3	-.023	4	.081	4	1.993	3	-.232	2	1.619	1	2.341	4
58			min	-.242	2	-.034	1	-.01	2	.232	2	-1.993	3	-2.13	4	-1.78	1
59		5	max	-.015	3	-.047	4	.162	4	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
60			min	-.207	2	-.068	1	-.021	2	0	1	0	1	0	1	0	1
61	M7	1	max	.207	2	.068	1	-.02	1	0	1	0	1	0	1	0	1
62			min	-.018	4	.047	4	-.162	4	0	1	0	1	0	1	0	1
63		2	max	.242	2	.034	1	-.01	1	1.993	3	-.602	2	.889	1	2.341	4
64			min	-.023	4	.023	4	-.081	4	.602	2	-1.993	3	-2.13	4	-.977	1
65		3	max	.277	2	0	1	0	1	2.657	3	-.803	2	1.185	1	3.121	4
66			min	-.027	4	0	1	0	1	.803	2	-2.657	3	-2.839	4	-1.303	1
67		4	max	.312	2	-.023	4	.081	4	1.993	3	-.602	2	.889	1	2.341	4
68			min	-.032	4	-.034	1	.01	1	.602	2	-1.993	3	-2.13	4	-.977	1
69		5	max	.347	2	-.047	4	.162	4	0	1	0	1	0	1	0	1
70			min	-.036	4	-.068	1	.02	1	0	1	0	1	0	1	0	1
71	M8	1	max	-.109	3	.058	3	.021	2	0	1	0	1	0	1	0	1
72			min	-.765	2	.038	2	-.131	4	0	1	0	1	0	1	0	1
73		2	max	-.105	3	.029	3	.01	2	1.54	3	-.15	2	1.324	1	1.754	4
74			min	-.737	2	.019	2	-.066	4	.15	2	-1.54	3	-1.578	4	-1.471	1
75		3	max	-.101	3	0	1	0	1	2.054	3	-.201	2	1.765	1	2.338	4
76			min	-.709	2	0	1	0	1	.201	2	-2.054	3	-2.104	4	-1.961	1
77		4	max	-.097	3	-.019	4	.066	4	1.54	3	-.15	2	1.324	1	1.754	4
78			min	-.681	2	-.029	1	-.01	2	.15	2	-1.54	3	-1.578	4	-1.471	1
79		5	max	-.092	3	-.038	4	.131	4	0	1	0	1	0	1	0	1
80			min	-.653	2	-.058	1	-.021	2	0	1	0	1	0	1	0	1
81	M9	1	max	.653	2	.058	1	-.02	1	0	1	0	1	0	1	0	1
82			min	-.109	4	.038	4	-.131	4	0	1	0	1	0	1	0	1
83		2	max	.681	2	.029	1	-.01	1	1.54	3	-.496	2	.66	1	1.754	4
84			min	-.114	4	.019	4	-.066	4	.496	2	-1.54	3	-1.578	4	-.734	1
85		3	max	.709	2	0	1	0	1	2.054	3	-.662	2	.88	1	2.338	4
86			min	-.118	4	0	1	0	1	.662	2	-2.054	3	-2.104	4	-.978	1
87		4	max	.737	2	-.019	2	.066	4	1.54	3	-.496	2	.66	1	1.754	4
88			min	-.123	4	-.029	1	.01	1	.496	2	-1.54	3	-1.578	4	-.734	1
89		5	max	.765	2	-.038	2	.131	4	0	1	0	1	0	1	0	1
90			min	-.127	4	-.058	1	.02	1	0	1	0	1	0	1	0	1
91	M10	1	max	.468	4	.022	1	-.029	2	0	1	0	1	0	1	0	1
92			min	-1.283	2	.013	4	-.061	3	0	1	0	1	0	1	0	1
93		2	max	.461	4	.011	1	-.014	2	.343	3	-.173	2	-.077	1	.43	4
94			min	-1.27	2	.007	4	-.031	3	.173	2	-.343	3	-.382	4	.087	1
95		3	max	.455	4	0	1	0	1	.457	3	-.231	2	-.103	1	.573	4
96			min	-1.258	2	0	1	0	1	.231	2	-.457	3	-.509	4	.116	1
97		4	max	.449	4	-.007	2	.031	3	.343	3	-.173	2	-.077	1	.43	4
98			min	-1.245	2	-.011	3	.014	2	.173	2	-.343	3	-.382	4	.087	1
99		5	max	.443	4	-.013	2	.061	3	0	1	0	1	0	1	0	1
100			min	-1.233	2	-.022	3	.029	2	0	1	0	1	0	1	0	1
101	M11	1	max	1.233	2	.022	1	.031	1	0	1	0	1	0	1	0	1
102			min	.369	3	.013	2	-.061	3	0	1	0	1	0	1	0	1
103		2	max	1.245	2	.011	1	.015	1	.343	3	.064	2	.451	1	.43	4
104			min	.376	3	.007	2	-.031	3	-.064	2	-.343	3	-.382	4	-.508	1
105		3	max	1.258	2	0	1	0	1	.457	3	.086	2	.601	1	.573	4
106			min	.382	3	0	1	0	1	-.086	2	-.457	3	-.509	4	-.677	1
107		4	max	1.27	2	-.007	4	.031	3	.343	3	.064	2	.451	1	.43	4
108			min	.389	3	-.011	3	-.015	1	-.064	2	-.343	3	-.382	4	-.508	1
109		5	max	1.283	2	-.013	4	.061	3	0	1	0	1	0	1	0	1
110			min	.396	3	-.022	1	-.031	1	0	1	0	1	0	1	0	1
111	M12	1	max	0	1	.011	1	0	3	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
112			min	-2.275	4	.006	2	-.029	1	0	1	0	1	0	1	0	1
113		2	max	0	1	.005	1	0	3	.092	1	-.014	4	.05	3	.111	2
114			min	-2.275	4	.003	2	-.014	1	.014	4	-.092	1	-.096	2	-.058	3
115		3	max	0	1	0	1	0	1	.122	1	-.018	4	.067	3	.148	2
116			min	-2.275	4	0	1	0	1	.018	4	-.122	1	-.128	2	-.077	3
117		4	max	0	1	-.003	4	.014	1	.092	1	-.014	4	.05	3	.111	2
118			min	-2.275	4	-.005	3	0	3	.014	4	-.092	1	-.096	2	-.058	3
119		5	max	0	1	-.006	4	.029	1	0	1	0	1	0	1	0	1
120			min	-2.275	4	-.011	3	0	3	0	1	0	1	0	1	0	1
121	M13	1	max	.405	4	.022	1	-.029	2	0	1	0	1	0	1	0	1
122			min	-1.078	2	.013	4	-.061	3	0	1	0	1	0	1	0	1
123		2	max	.398	4	.011	1	-.014	2	.343	3	-.173	2	-.077	1	.43	4
124			min	-1.066	2	.007	4	-.031	3	.173	2	-.343	3	-.382	4	.087	1
125		3	max	.392	4	0	1	0	1	.457	3	-.231	2	-.103	1	.573	4
126			min	-1.054	2	0	1	0	1	.231	2	-.457	3	-.509	4	.116	1
127		4	max	.386	4	-.007	2	.031	3	.343	3	-.173	2	-.077	1	.43	4
128			min	-1.041	2	-.011	3	.014	2	.173	2	-.343	3	-.382	4	.087	1
129		5	max	.38	4	-.013	2	.061	3	0	1	0	1	0	1	0	1
130			min	-1.029	2	-.022	3	.029	2	0	1	0	1	0	1	0	1
131	M14	1	max	1.029	2	.022	1	.031	1	0	1	0	1	0	1	0	1
132			min	.319	3	.013	2	-.061	3	0	1	0	1	0	1	0	1
133		2	max	1.041	2	.011	1	.015	1	.343	3	.064	2	.451	1	.43	4
134			min	.326	3	.007	2	-.031	3	-.064	2	-.343	3	-.382	4	-.508	1
135		3	max	1.054	2	0	1	0	1	.457	3	.086	2	.601	1	.573	4
136			min	.333	3	0	1	0	1	-.086	2	-.457	3	-.509	4	-.677	1
137		4	max	1.066	2	-.007	4	.031	3	.343	3	.064	2	.451	1	.43	4
138			min	.339	3	-.011	3	-.015	1	-.064	2	-.343	3	-.382	4	-.508	1
139		5	max	1.078	2	-.013	4	.061	3	0	1	0	1	0	1	0	1
140			min	.346	3	-.022	3	-.031	1	0	1	0	1	0	1	0	1
141	M15	1	max	0	1	.011	3	0	3	0	1	0	1	0	1	0	1
142			min	-1.961	4	.006	2	-.029	1	0	1	0	1	0	1	0	1
143		2	max	0	1	.005	3	0	3	.092	1	-.014	4	.05	3	.111	2
144			min	-1.961	4	.003	2	-.014	1	.014	4	-.092	1	-.096	2	-.058	3
145		3	max	0	1	0	1	0	1	.122	1	-.018	4	.067	3	.148	2
146			min	-1.961	4	0	1	0	1	.018	4	-.122	1	-.128	2	-.077	3
147		4	max	0	1	-.003	4	.014	1	.092	1	-.014	4	.05	3	.111	2
148			min	-1.961	4	-.005	1	0	3	.014	4	-.092	1	-.096	2	-.058	3
149		5	max	0	1	-.006	4	.029	1	0	1	0	1	0	1	0	1
150			min	-1.961	4	-.011	1	0	3	0	1	0	1	0	1	0	1
151	M16	1	max	2.934	2	.022	3	-.029	2	0	1	0	1	0	1	0	1
152			min	-1.081	4	.013	4	-.061	3	0	1	0	1	0	1	0	1
153		2	max	2.946	2	.011	3	-.014	2	.343	3	-.173	2	-.077	1	.43	4
154			min	-1.087	4	.007	4	-.031	3	.173	2	-.343	3	-.382	4	.087	1
155		3	max	2.959	2	0	1	0	1	.457	3	-.231	2	-.103	1	.573	4
156			min	-1.093	4	0	1	0	1	.231	2	-.457	3	-.509	4	.116	1
157		4	max	2.971	2	-.007	2	.031	3	.343	3	-.173	2	-.077	1	.43	4
158			min	-1.1	4	-.011	1	.014	2	.173	2	-.343	3	-.382	4	.087	1
159		5	max	2.984	2	-.013	2	.061	3	0	1	0	1	0	1	0	1
160			min	-1.106	4	-.022	1	.029	2	0	1	0	1	0	1	0	1
161	M17	1	max	-.942	3	.022	3	.031	1	0	1	0	1	0	1	0	1
162			min	-2.984	2	.013	4	-.061	3	0	1	0	1	0	1	0	1
163		2	max	-.935	3	.011	3	.015	1	.343	3	.064	2	.451	1	.43	4

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
164			min	-2.971	2	.007	4	-.031	3	-.064	2	-.343	3	-.382	4	-.508	1
165		3	max	-.928	3	0	1	0	1	.457	3	.086	2	.601	1	.573	4
166			min	-2.959	2	0	1	0	1	-.086	2	-.457	3	-.509	4	-.677	1
167		4	max	-.922	3	-.007	2	.031	3	.343	3	.064	2	.451	1	.43	4
168			min	-2.946	2	-.011	1	-.015	1	-.064	2	-.343	3	-.382	4	-.508	1
169		5	max	-.915	3	-.013	2	.061	3	0	1	0	1	0	1	0	1
170			min	-2.934	2	-.022	1	-.031	1	0	1	0	1	0	1	0	1
171	M18	1	max	5.467	4	.011	3	0	3	0	1	0	1	0	1	0	1
172			min	0	1	.006	4	-.029	1	0	1	0	1	0	1	0	1
173		2	max	5.467	4	.005	3	0	3	.092	1	-.014	4	.05	3	.111	2
174			min	0	1	.003	4	-.014	1	.014	4	-.092	1	-.096	2	-.058	3
175		3	max	5.467	4	0	1	0	1	.122	1	-.018	4	.067	3	.148	2
176			min	0	1	0	1	0	1	.018	4	-.122	1	-.128	2	-.077	3
177		4	max	5.467	4	-.003	2	.014	1	.092	1	-.014	4	.05	3	.111	2
178			min	0	1	-.005	1	0	3	.014	4	-.092	1	-.096	2	-.058	3
179		5	max	5.467	4	-.006	2	.029	1	0	1	0	1	0	1	0	1
180			min	0	1	-.011	1	0	3	0	1	0	1	0	1	0	1
181	M19	1	max	0	1	.004	1	0	1	0	1	0	1	0	1	0	1
182			min	-2.44	4	.004	1	0	1	0	1	0	1	0	1	0	1
183		2	max	0	1	.002	1	0	1	.009	1	-.009	2	0	1	0	1
184			min	-2.44	4	.002	1	0	1	.009	2	-.009	1	0	1	0	1
185		3	max	0	1	0	1	0	1	.011	1	-.011	2	0	1	0	1
186			min	-2.44	4	0	1	0	1	.011	2	-.011	1	0	1	0	1
187		4	max	0	1	-.002	1	0	1	.009	1	-.009	2	0	1	0	1
188			min	-2.44	4	-.002	1	0	1	.009	2	-.009	1	0	1	0	1
189		5	max	0	1	-.004	1	0	1	0	1	0	1	0	1	0	1
190			min	-2.44	4	-.004	1	0	1	0	1	0	1	0	1	0	1
191	M20	1	max	.488	4	.013	4	0	1	0	1	0	1	0	1	0	1
192			min	-5.392	2	.013	3	0	1	0	1	0	1	0	1	0	1
193		2	max	.488	4	.007	4	0	1	.055	4	-.055	1	.112	1	-.132	3
194			min	-5.392	2	.007	3	0	1	.055	1	-.055	4	.112	3	-.132	1
195		3	max	.488	4	0	1	0	1	.073	4	-.073	1	.149	1	-.176	3
196			min	-5.392	2	0	1	0	1	.073	1	-.073	4	.149	3	-.176	1
197		4	max	.488	4	-.007	4	0	1	.055	4	-.055	1	.112	1	-.132	3
198			min	-5.392	2	-.007	3	0	1	.055	1	-.055	4	.112	3	-.132	1
199		5	max	.488	4	-.013	4	0	1	0	1	0	1	0	1	0	1
200			min	-5.392	2	-.013	3	0	1	0	1	0	1	0	1	0	1
201	M21	1	max	5.392	2	.013	4	0	1	0	1	0	1	0	1	0	1
202			min	.415	3	.013	1	0	1	0	1	0	1	0	1	0	1
203		2	max	5.392	2	.007	4	0	1	.055	4	-.055	1	.112	1	-.132	2
204			min	.415	3	.007	1	0	1	.055	1	-.055	4	.112	2	-.132	1
205		3	max	5.392	2	0	1	0	1	.073	4	-.073	1	.149	1	-.176	2
206			min	.415	3	0	1	0	1	.073	1	-.073	4	.149	2	-.176	1
207		4	max	5.392	2	-.007	4	0	1	.055	4	-.055	1	.112	1	-.132	2
208			min	.415	3	-.007	1	0	1	.055	1	-.055	4	.112	2	-.132	1
209		5	max	5.392	2	-.013	4	0	1	0	1	0	1	0	1	0	1
210			min	.415	3	-.013	1	0	1	0	1	0	1	0	1	0	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	4	22.827	1	0	2	0	2	0	1	4.489	2
2		min	-.803	2	15.596	2	-.802	4	-4.473	4	0	1	0	4
3	N9	max	0	3	.045	1	0	2	0	1	0	1	0	1
4		min	-.102	2	.03	4	-.423	4	0	1	0	1	0	1
5	N10	max	0	3	.063	3	0	2	0	1	0	1	0	1
6		min	-.152	2	.044	2	-.371	4	0	1	0	1	0	1
7	N11	max	-.045	3	.057	1	-.06	1	0	1	0	1	0	1
8		min	-.666	2	.039	4	-.143	4	0	1	0	1	0	1
9	N12	max	.052	4	.057	1	.068	2	0	1	0	1	0	1
10		min	-.666	2	.039	4	-.143	4	0	1	0	1	0	1
11	N13	max	0	4	.027	3	0	1	0	1	0	1	0	1
12		min	-.069	1	.015	2	-1	4	0	1	0	1	0	1
13	N14	max	0	3	.049	1	0	1	0	1	0	1	0	1
14		min	-.111	2	.032	2	-1.137	4	0	1	0	1	0	1
15	N15	max	-.169	3	.043	1	-.119	3	0	1	0	1	0	1
16		min	-1.288	2	.028	2	-.186	2	0	1	0	1	0	1
17	N16	max	.199	4	.043	1	.186	2	0	1	0	1	0	1
18		min	-1.288	2	.028	2	-.128	4	0	1	0	1	0	1
19	N17	max	0	4	.003	3	0	1	0	1	0	1	0	1
20		min	-.009	1	.002	4	-1.643	4	0	1	0	1	0	1
21	N18	max	.367	4	.008	1	.507	2	0	1	0	1	0	1
22		min	-1.039	2	.005	2	-.209	4	0	1	0	1	0	1
23	N19	max	-.308	3	.008	1	-.181	3	0	1	0	1	0	1
24		min	-1.039	2	.005	4	-.507	2	0	1	0	1	0	1
25	N20	max	0	4	.003	3	0	1	0	1	0	1	0	1
26		min	-.009	1	.002	4	-1.415	4	0	1	0	1	0	1
27	N21	max	.316	4	.008	1	.425	2	0	1	0	1	0	1
28		min	-.874	2	.005	2	-.183	4	0	1	0	1	0	1
29	N23	max	0	4	.003	1	3.947	4	0	1	0	1	0	1
30		min	-.009	1	.002	2	0	2	0	1	0	1	0	1
31	N24	max	2.359	2	.008	1	.415	4	0	1	0	1	0	1
32		min	-.881	4	.005	4	-1.192	2	0	1	0	1	0	1
33	N22	max	-.268	3	.008	1	-.161	3	0	1	0	1	0	1
34		min	-.874	2	.005	2	-.425	2	0	1	0	1	0	1
35	N25	max	2.359	2	.008	1	1.192	2	0	1	0	1	0	1
36		min	.748	3	.005	2	.347	3	0	1	0	1	0	1
37	N28	max	-.441	3	.007	2	-.221	3	0	1	0	1	0	1
38		min	-5.739	2	.007	3	-2.87	2	0	1	0	1	0	1
39	N26	max	0	4	.011	1	0	2	0	1	0	1	0	1
40		min	0	2	.011	1	-10.979	4	0	1	0	1	0	1
41	N27	max	.519	4	.007	4	2.87	2	0	1	0	1	0	1
42		min	-5.739	2	.007	3	-.26	4	0	1	0	1	0	1
43	Totals:	max	0	4	23.296	1	0	1						
44		min	-15.755	2	15.911	2	-14.837	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	2	0	2	0	4	0	4	0	1	0	4
2		min	0	4	0	1	0	2	0	2	0	1	0	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation...	LC	Y Rotation...	LC	Z Rotation...	LC
3	N2	max	.001	2	-.012	2	.001	4	0	2	0	1	2.882e-4	2
4		min	0	4	-.018	1	0	2	-2.867e-4	4	0	1	0	4
5	N3	max	.003	2	-.017	2	.003	4	6.015e-4	4	0	1	0	3
6		min	0	3	-.026	1	0	1	0	2	0	1	-5.989e-4	2
7	N4	max	.002	2	-.031	2	.001	4	0	2	0	1	6.225e-4	2
8		min	0	3	-.045	1	0	1	-6.267e-4	4	0	1	0	4
9	N5	max	.002	2	-.034	2	.001	4	4.229e-4	4	0	1	0	3
10		min	0	3	-.049	1	0	1	0	2	0	1	-4.114e-4	2
11	N6	max	0	4	-.037	2	0	2	0	2	0	1	1.192e-3	2
12		min	-.005	2	-.054	1	-.003	4	-1.204e-3	4	0	1	0	3
13	N7	max	.008	2	-.039	2	.002	4	4.816e-3	4	0	1	0	4
14		min	0	4	-.058	1	0	2	0	2	0	1	-4.873e-3	2
15	N8	max	1.649	2	-.041	2	1.632	4	1.071e-2	4	0	1	0	4
16		min	0	4	-.06	1	0	2	0	2	0	1	-1.077e-2	2
17	N9	max	0	2	0	4	0	4	9.702e-4	2	9.099e-4	3	2.882e-4	2
18		min	0	3	0	1	0	2	-1.667e-3	3	-2.881e-3	2	0	4
19	N10	max	0	2	0	2	0	4	2.536e-3	3	4.832e-3	2	2.882e-4	2
20		min	0	3	0	3	0	2	-1.788e-3	2	-1.468e-3	3	0	4
21	N11	max	0	2	0	4	0	4	3.04e-4	1	1.554e-3	1	1.18e-3	4
22		min	0	3	0	1	0	1	-4.374e-4	4	-3.421e-3	4	-2.141e-3	1
23	N12	max	0	2	0	4	0	4	1.664e-4	1	3.421e-3	4	1.543e-3	1
24		min	0	4	0	1	0	2	-4.374e-4	4	-5.429e-4	1	-1.18e-3	4
25	N13	max	0	1	0	2	0	4	1.016e-3	2	7.384e-4	3	0	3
26		min	0	4	0	3	0	1	-1.485e-3	3	-2.716e-3	2	-5.989e-4	2
27	N14	max	0	2	0	4	0	4	2.118e-3	3	3.649e-3	2	0	3
28		min	0	3	0	1	0	1	-1.219e-3	2	-1.15e-3	3	-5.989e-4	2
29	N15	max	0	2	0	2	0	2	4.736e-4	4	1.206e-3	1	8.171e-4	4
30		min	0	3	0	1	0	3	1.052e-4	2	-2.423e-3	4	-1.759e-3	1
31	N16	max	0	2	0	2	0	4	4.736e-4	4	2.423e-3	4	1.226e-3	1
32		min	0	4	0	1	0	2	2.042e-4	2	-3.358e-4	1	-8.171e-4	4
33	N17	max	0	1	0	4	0	4	2.505e-3	3	1.472e-4	2	6.225e-4	2
34		min	0	4	0	3	0	1	1.685e-3	2	-1.065e-5	3	0	4
35	N18	max	0	2	0	2	0	4	-5.788e-4	2	-1.133e-4	1	-3.243e-4	4
36		min	0	4	0	1	0	2	-8.81e-4	3	-3.004e-4	4	-9.053e-4	1
37	N19	max	0	2	0	4	0	2	-1.655e-4	2	3.004e-4	4	1.295e-3	1
38		min	0	3	0	1	0	3	-8.81e-4	3	-2.563e-4	1	3.243e-4	4
39	N20	max	0	1	0	4	0	4	2.768e-3	3	1.296e-4	2	0	3
40		min	0	4	0	3	0	1	1.865e-3	2	-1.065e-5	3	-4.114e-4	2
41	N21	max	0	2	0	2	0	4	1.478e-5	4	-1.105e-4	1	-8.14e-4	2
42		min	0	4	0	1	0	2	-4.185e-4	1	-2.961e-4	4	-1.184e-3	1
43	N22	max	0	2	0	2	0	2	1.478e-5	4	2.961e-4	4	1.226e-3	1
44		min	0	3	0	1	0	3	-7.868e-4	1	-2.535e-4	1	8.163e-4	4
45	N23	max	0	1	0	2	0	2	2.996e-3	3	-5.869e-6	4	1.192e-3	2
46		min	0	4	0	1	0	4	2.022e-3	2	-2.163e-4	2	0	3
47	N24	max	0	4	0	4	0	2	-8.743e-4	2	-5.179e-5	1	-2.282e-4	4
48		min	0	2	0	1	0	4	-1.374e-3	3	-1.976e-4	3	-1.004e-3	1
49	N25	max	0	3	0	2	0	3	-4.974e-6	2	1.976e-4	3	1.589e-3	1
50		min	0	2	0	1	0	2	-1.374e-3	3	-1.948e-4	1	2.282e-4	4
51	N26	max	0	2	0	1	0	4	3.198e-3	1	4.648e-4	2	0	4
52		min	0	4	0	1	0	2	2.19e-3	2	0	4	-4.873e-3	2
53	N27	max	0	2	0	3	0	4	3.383e-3	4	1.432e-5	3	-1.915e-3	2
54		min	0	4	0	4	0	2	9.809e-4	1	-5.007e-5	2	-2.976e-3	3

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation...	LC	Y Rotation...	LC	Z Rotation...	LC
55	N28	max	0	2	0	3	0	2	3.383e-3	4	7.655e-5	4	2.976e-3	3
56		min	0	3	0	2	0	3	-2.419e-3	2	-5.007e-5	2	-3.473e-5	2

Envelope AISC ASD Steel Code Checks

	Me...	Shape	Code Check	Loc[ft]	LC	Shear ...	Loc[ft]	Dir	LC	Fa ...	Ft [...	Fb y-y [ksi]	Fb ...	C..	C..	C..	AS...
1	M1	12" FW...	.576	132.583	2	.052	134.1..		2	21....	25.2	27.72	27....	1	.6	.85	H1-2
2	M2	L3.5x3....	.053	0	4	.010	10.25	z	2	4.6...	21.6	- Code check ba...					H1-1
3	M3	L4x4x4	.009	0	4	.013	0	z	2	3.6...	21.6	- Code check ba...					H2-1
4	M4	L3x3x3	.168	0	4	.010	0	z	1	5.4...	21.6	- Code check ba...					H1-1
5	M5	L3.5x3....	.031	0	4	.011	0	z	2	3.9...	21.6	- Code check ba...					H2-1
6	M6	L4x4x4	.016	0	2	.011	0	z	4	4.5...	21.6	- Code check ba...					H2-1
7	M7	L4x4x4	.076	11.845	2	.011	0	z	4	4.5...	21.6	- Code check ba...					H1-1
8	M8	L3.5x3....	.035	0	2	.009	9.7	z	4	5.2...	21.6	- Code check ba...					H2-1
9	M9	L3.5x3....	.147	9.7	2	.009	9.7	z	4	5.2...	21.6	- Code check ba...					H1-1
10	M10	L2.5x2....	.059	0	2	.004	3.354	z	3	14....	21.6	- Code check ba...					H2-1
11	M11	L2.5x2....	.087	3.354	2	.004	3.354	z	3	14....	21.6	- Code check ba...					H1-1
12	M12	L2x2x3	.105	0	4	.002	1.5	z	1	18....	21.6	- Code check ba...					H2-1
13	M13	L2.5x2....	.050	0	2	.004	3.354	z	3	14....	21.6	- Code check ba...					H2-1
14	M14	L2.5x2....	.073	3.354	2	.004	3.354	z	3	14....	21.6	- Code check ba...					H1-1
15	M15	L2x2x3	.091	0	4	.002	1.5	z	1	18....	21.6	- Code check ba...					H2-1
16	M16	L2.5x2....	.202	3.354	2	.004	0	z	3	14....	21.6	- Code check ba...					H1-1
17	M17	L2.5x2....	.138	0	2	.004	3.354	z	3	14....	21.6	- Code check ba...					H2-1
18	M18	L2x2x3	.293	0	4	.002	1.5	z	1	18....	21.6	- Code check ba...					H1-1
19	M19	6"X3/4" ...	.113	.75	4	.000	1.5	y	1	15....	21.6	27	23....	1	.6	1	H2-1
20	M20	L2.5x2....	.250	0	2	.001	3.354	y	3	14....	21.6	- Code check ba...					H2-1
21	M21	L2.5x2....	.360	0	2	.001	3.354	y	1	14....	21.6	- Code check ba...					H1-1

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	-.667	22.827	0	0	0	3.731
2	1	N9	-.097	.045	0	0	0	0
3	1	N10	-.146	.063	0	0	0	0
4	1	N11	-.602	.057	-.06	0	0	0
5	1	N12	-.602	.057	.06	0	0	0
6	1	N13	-.069	.027	0	0	0	0
7	1	N14	-.105	.049	0	0	0	0
8	1	N15	-1.118	.043	-.161	0	0	0
9	1	N16	-1.118	.043	.161	0	0	0
10	1	N17	-.009	.003	0	0	0	0
11	1	N18	-.879	.008	.426	0	0	0
12	1	N19	-.879	.008	-.426	0	0	0
13	1	N20	-.009	.003	0	0	0	0
14	1	N21	-.748	.008	.361	0	0	0
15	1	N23	-.009	.003	0	0	0	0
16	1	N24	1.997	.008	-1.012	0	0	0
17	1	N22	-.748	.008	-.361	0	0	0
18	1	N25	1.997	.008	1.012	0	0	0
19	1	N28	-4.875	.007	-2.438	0	0	0
20	1	N26	0	.011	0	0	0	0
21	1	N27	-4.875	.007	2.438	0	0	0
22	1	Totals:	-13.565	23.296	0			
23	1	COG (ft):	X: 0	Y: 91.888	Z: -.04			

Joint Reactions

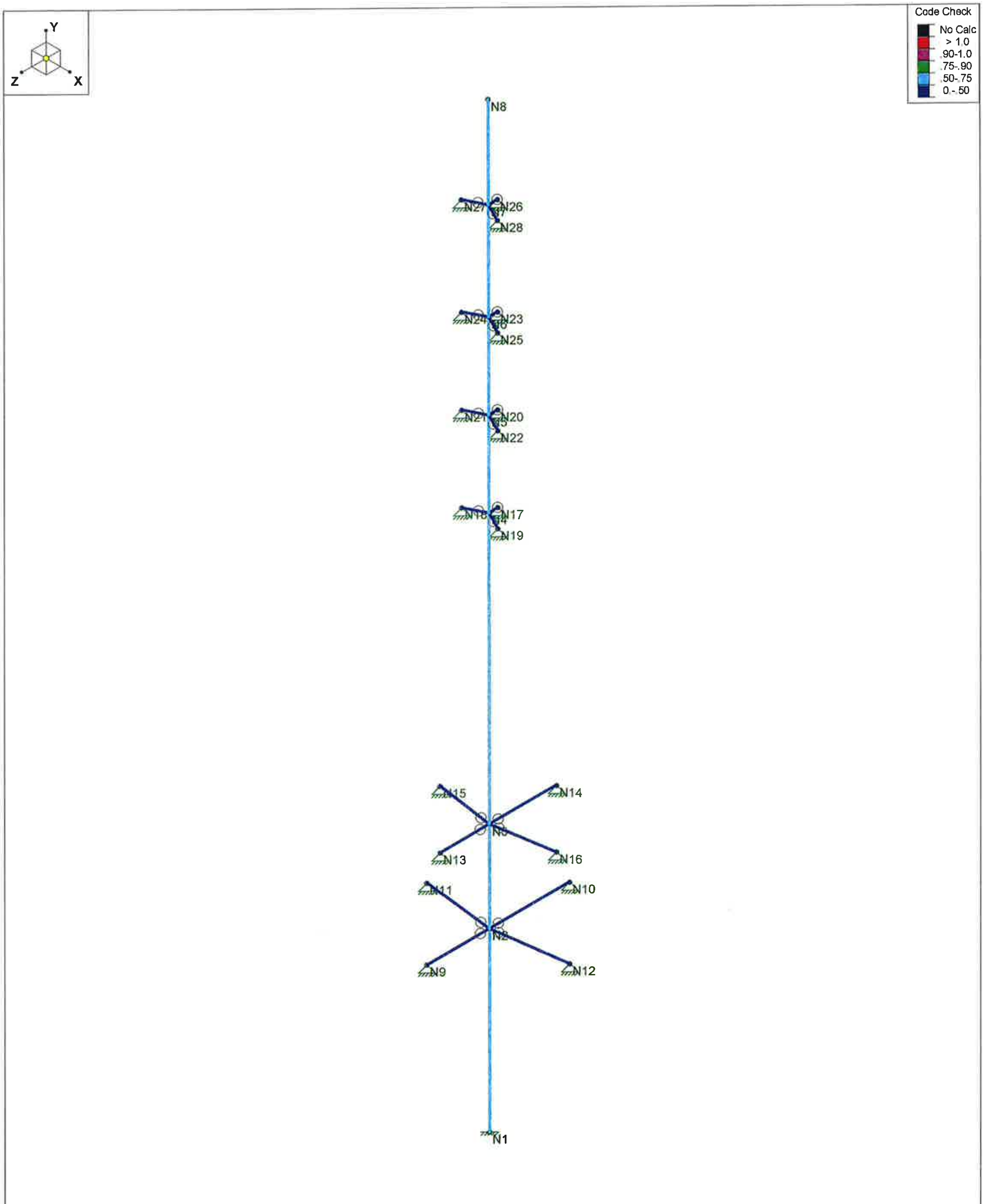
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N1	-.803	15.596	0	0	0	4.489
2	2	N9	-.102	.03	0	0	0	0
3	2	N10	-.152	.044	0	0	0	0
4	2	N11	-.666	.039	-.068	0	0	0
5	2	N12	-.666	.039	.068	0	0	0
6	2	N13	-.069	.015	0	0	0	0
7	2	N14	-.111	.032	0	0	0	0
8	2	N15	-1.288	.028	-.186	0	0	0
9	2	N16	-1.288	.028	.186	0	0	0
10	2	N17	-.008	.002	0	0	0	0
11	2	N18	-1.039	.005	.507	0	0	0
12	2	N19	-1.039	.005	-.507	0	0	0
13	2	N20	-.008	.002	0	0	0	0
14	2	N21	-.874	.005	.425	0	0	0
15	2	N23	-.008	.002	0	0	0	0
16	2	N24	2.359	.005	-1.192	0	0	0
17	2	N22	-.874	.005	-.425	0	0	0
18	2	N25	2.359	.005	1.192	0	0	0
19	2	N28	-5.739	.007	-2.87	0	0	0
20	2	N26	0	.011	0	0	0	0
21	2	N27	-5.739	.007	2.87	0	0	0
22	2	Totals:	-15.755	15.911	0			
23	2	COG (ft):	X: 0	Y: 92.185	Z: -.042			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N1	0	22.827	-.666	-3.716	0	0
2	3	N9	0	.045	-.369	0	0	0
3	3	N10	0	.063	-.324	0	0	0
4	3	N11	-.045	.057	-.136	0	0	0
5	3	N12	.045	.057	-.136	0	0	0
6	3	N13	0	.027	-.853	0	0	0
7	3	N14	0	.049	-.97	0	0	0
8	3	N15	-.169	.043	-.119	0	0	0
9	3	N16	.169	.043	-.119	0	0	0
10	3	N17	0	.003	-1.38	0	0	0
11	3	N18	.308	.008	-.181	0	0	0
12	3	N19	-.308	.008	-.181	0	0	0
13	3	N20	0	.003	-1.201	0	0	0
14	3	N21	.268	.008	-.161	0	0	0
15	3	N23	0	.003	3.352	0	0	0
16	3	N24	-.748	.008	.347	0	0	0
17	3	N22	-.268	.008	-.161	0	0	0
18	3	N25	.748	.008	.347	0	0	0
19	3	N28	-.441	.007	-.221	0	0	0
20	3	N26	0	.011	-9.326	0	0	0
21	3	N27	.441	.007	-.221	0	0	0
22	3	Totals:	0	23.296	-12.677			
23	3	COG (ft):	X: 0	Y: 91.888	Z: -.04			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N1	0	15.596	-.802	-4.473	0	0
2	4	N9	0	.03	-.423	0	0	0
3	4	N10	0	.044	-.371	0	0	0
4	4	N11	-.052	.039	-.143	0	0	0
5	4	N12	.052	.039	-.143	0	0	0
6	4	N13	0	.015	-1	0	0	0
7	4	N14	0	.032	-1.137	0	0	0
8	4	N15	-.199	.028	-.128	0	0	0
9	4	N16	.199	.028	-.128	0	0	0
10	4	N17	0	.002	-1.643	0	0	0
11	4	N18	.367	.005	-.209	0	0	0
12	4	N19	-.367	.005	-.209	0	0	0
13	4	N20	0	.002	-1.415	0	0	0
14	4	N21	.316	.005	-.183	0	0	0
15	4	N23	0	.002	3.947	0	0	0
16	4	N24	-.881	.005	.415	0	0	0
17	4	N22	-.316	.005	-.183	0	0	0
18	4	N25	.881	.005	.415	0	0	0
19	4	N28	-.519	.007	-.26	0	0	0
20	4	N26	0	.011	-10.979	0	0	0
21	4	N27	.519	.007	-.26	0	0	0
22	4	Totals:	0	15.911	-14.837			
23	4	COG (ft):	X: 0	Y: 92.185	Z: -.042			



CENTEK Engineering, INC.		
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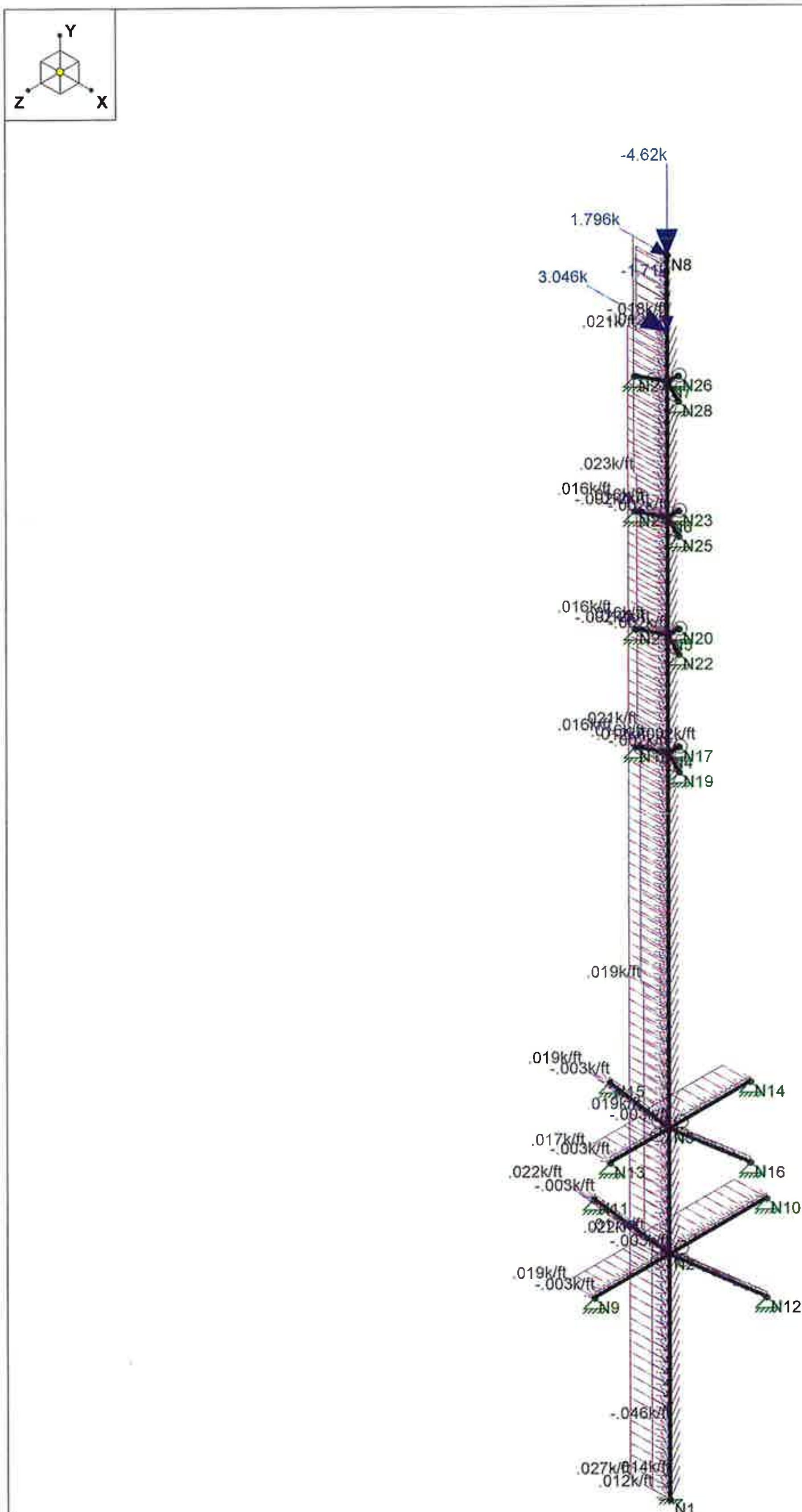
15001.017 - Greenwich 3	Unity Check	EIA-TIA.r3d



CENTEK Engineering, INC.		
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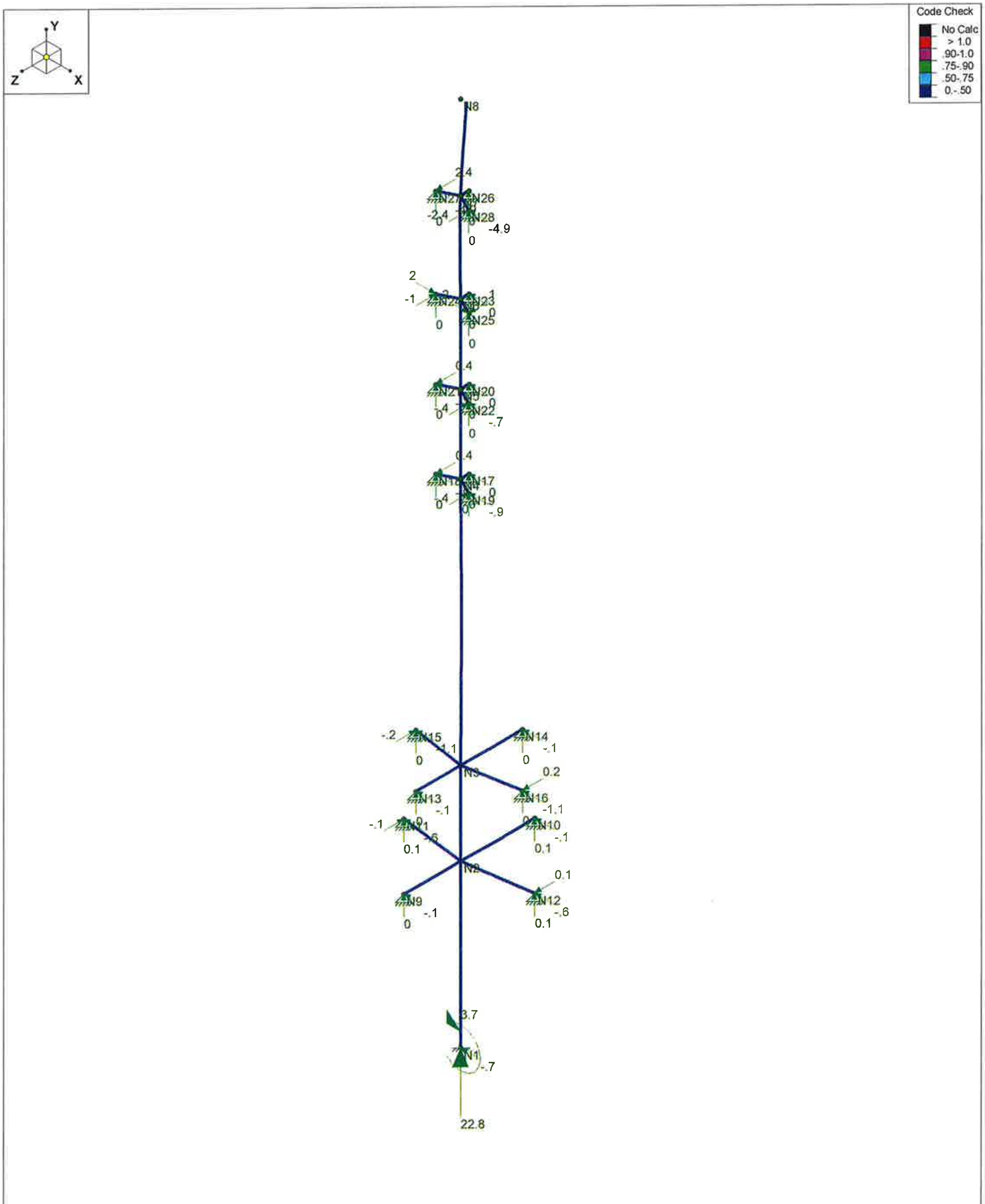
15001.017 - Greenwich 3	LC #1 Loads	EIA-TIA.r3d



CENTEK Engineering, INC.		
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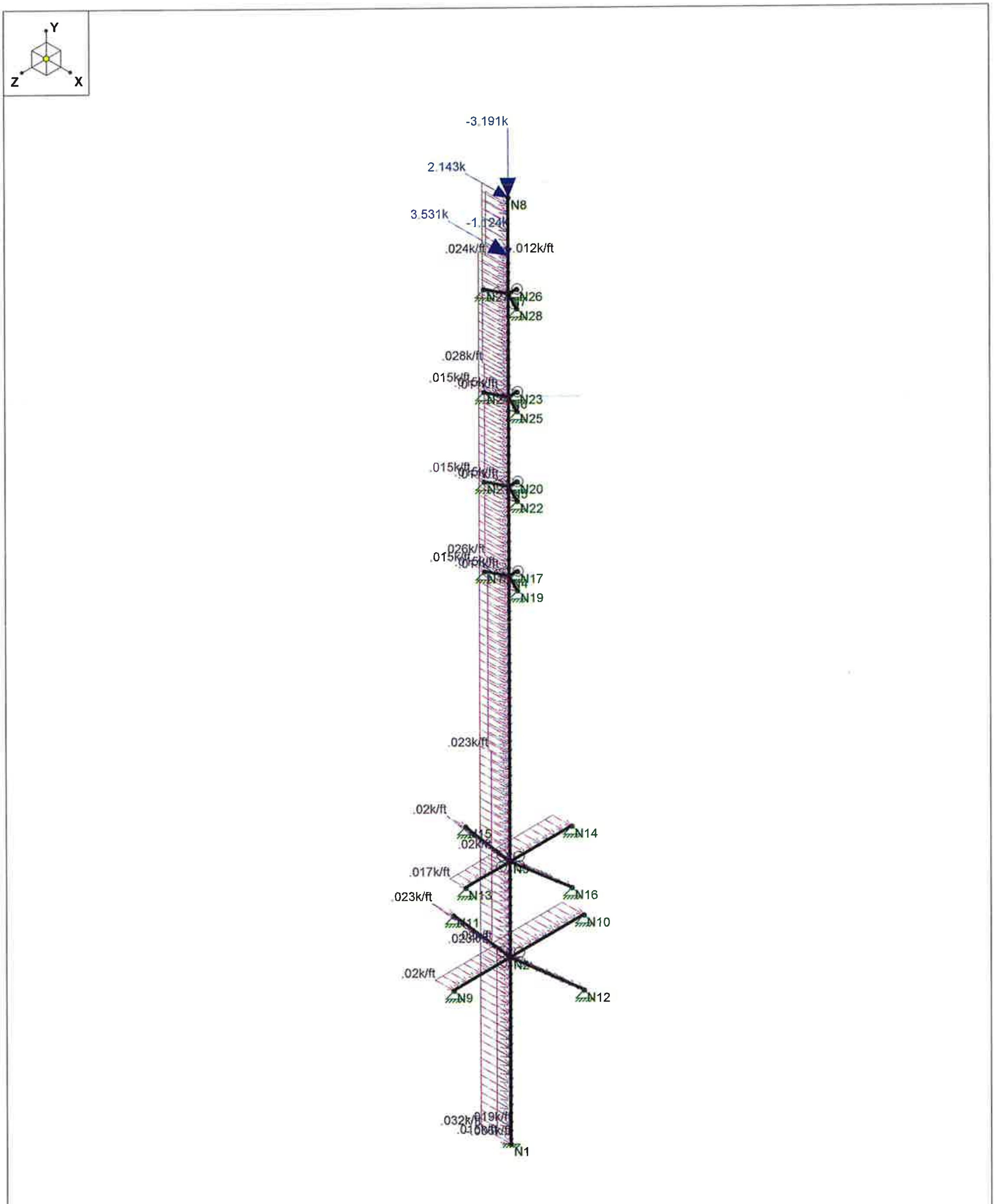

CENTEK Engineering, INC.	CL&P Struct. #1281 - Powermount	
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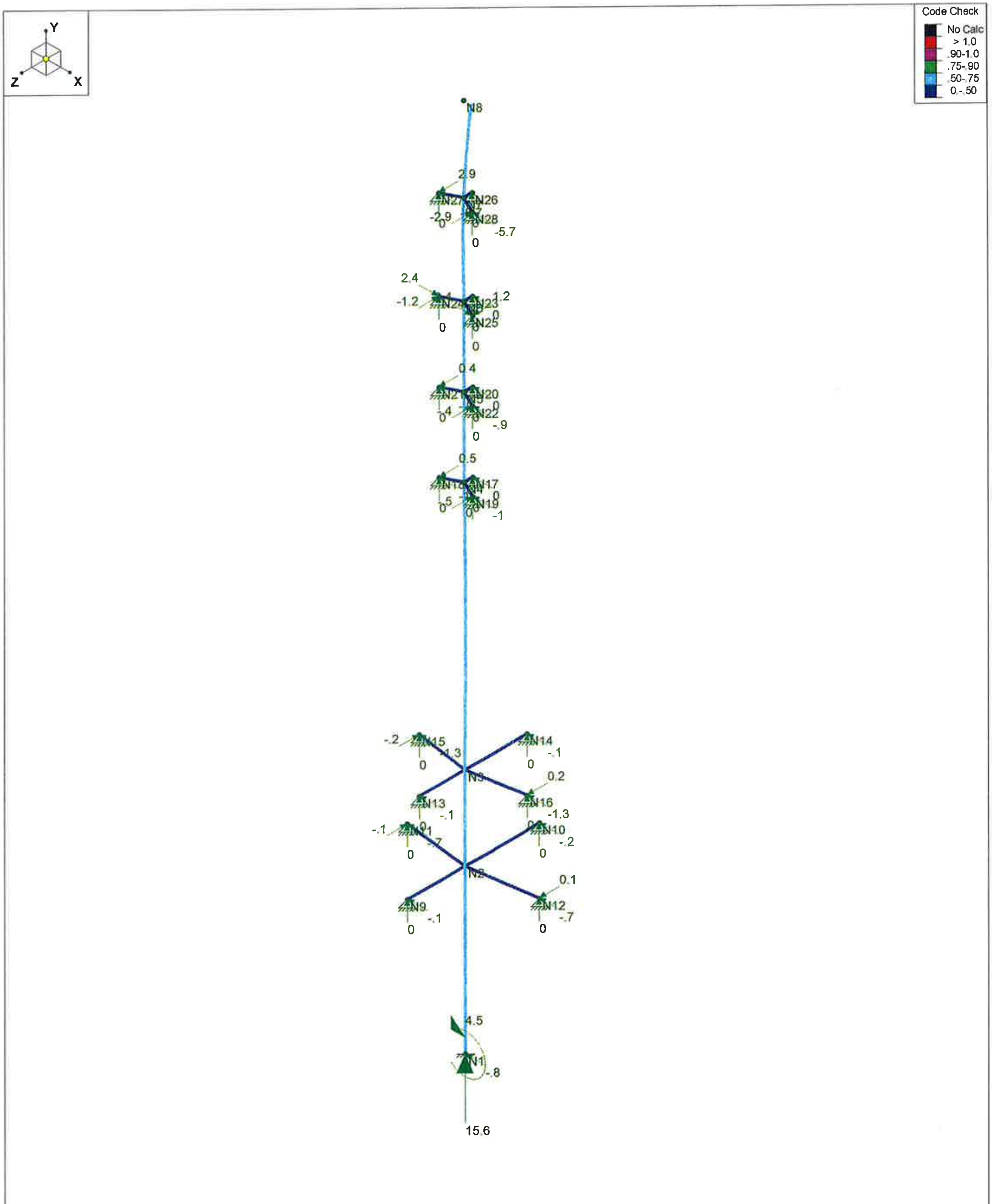

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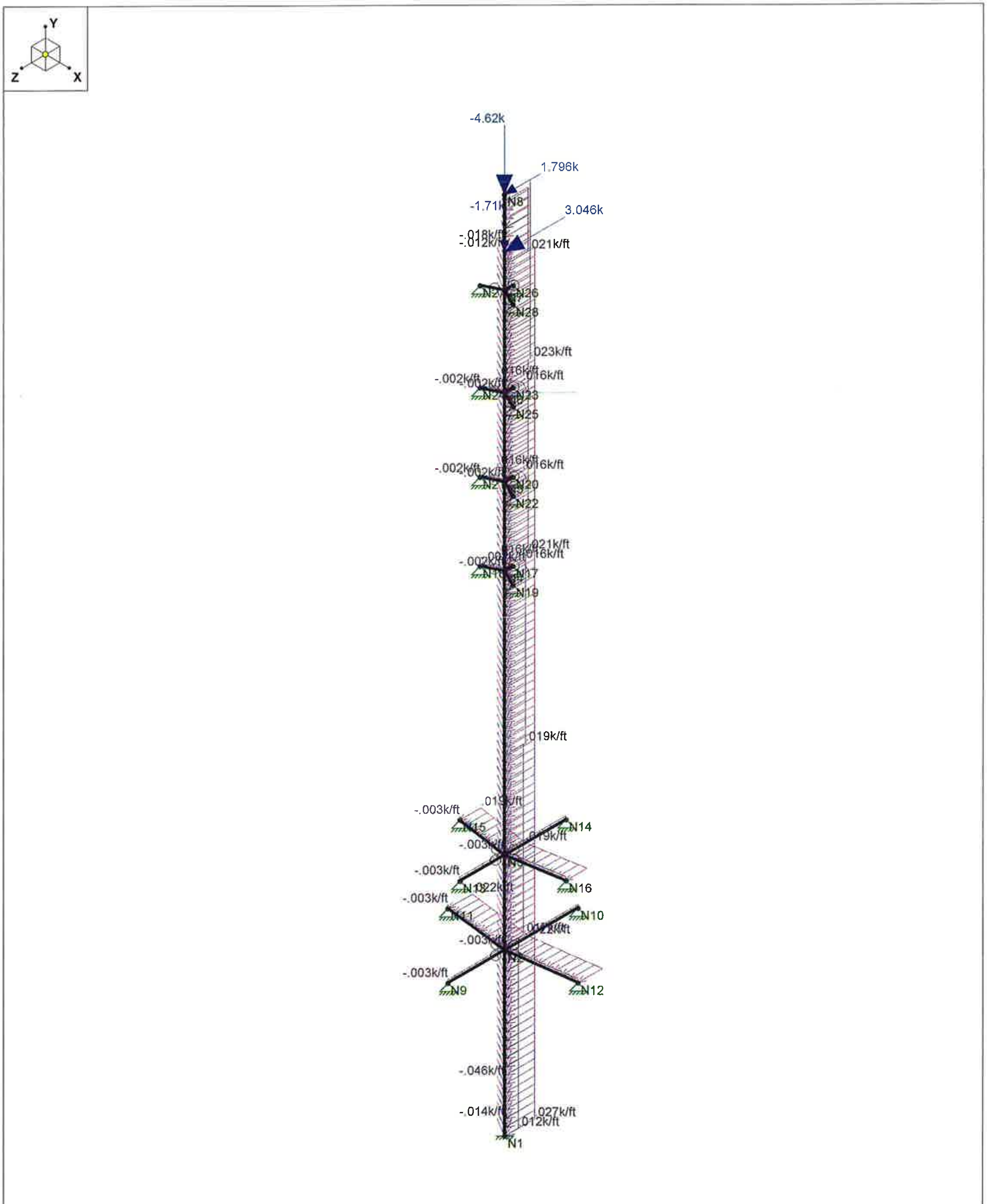

CENTEK Engineering, INC.		
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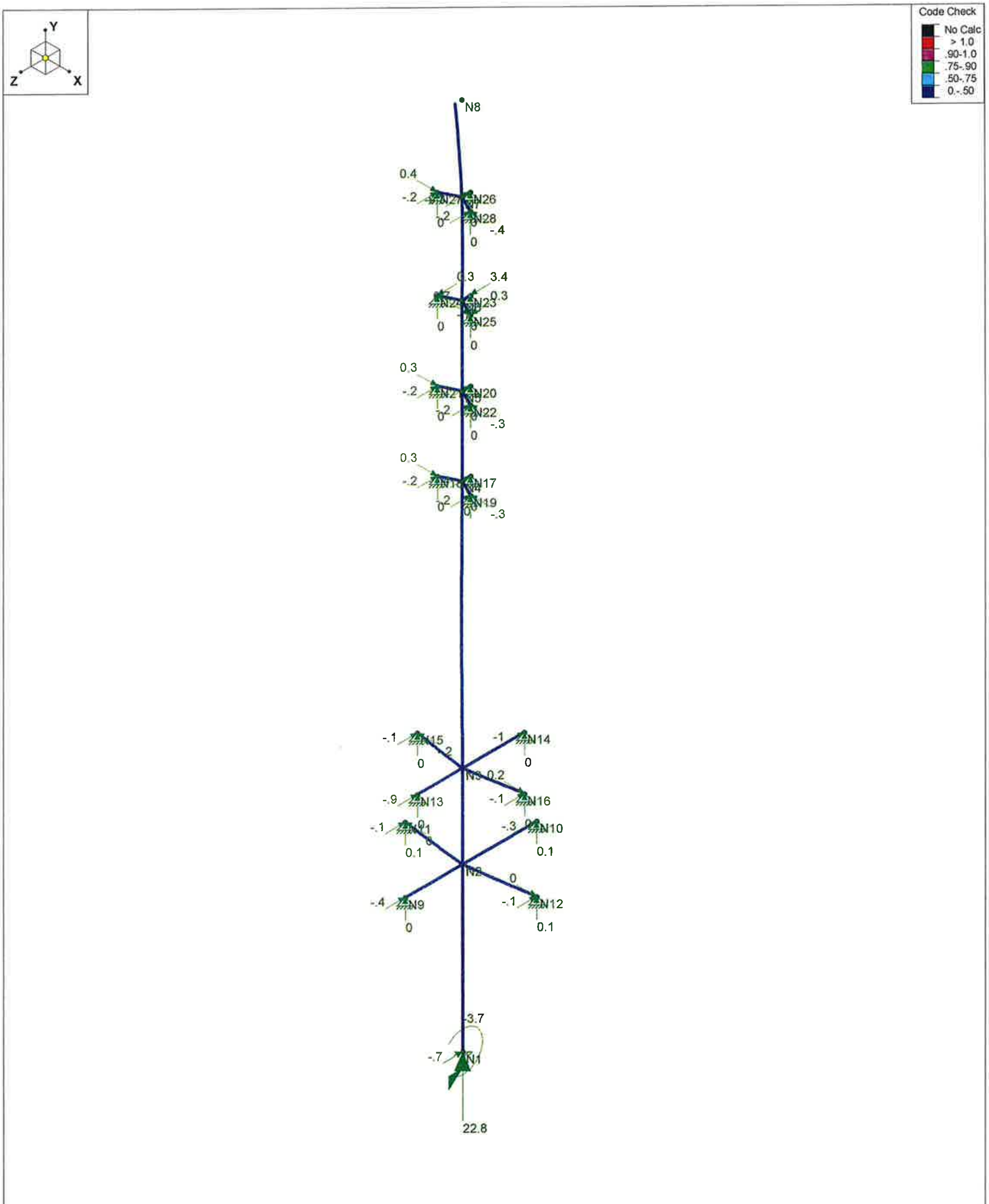

CENTEK Engineering, INC.		
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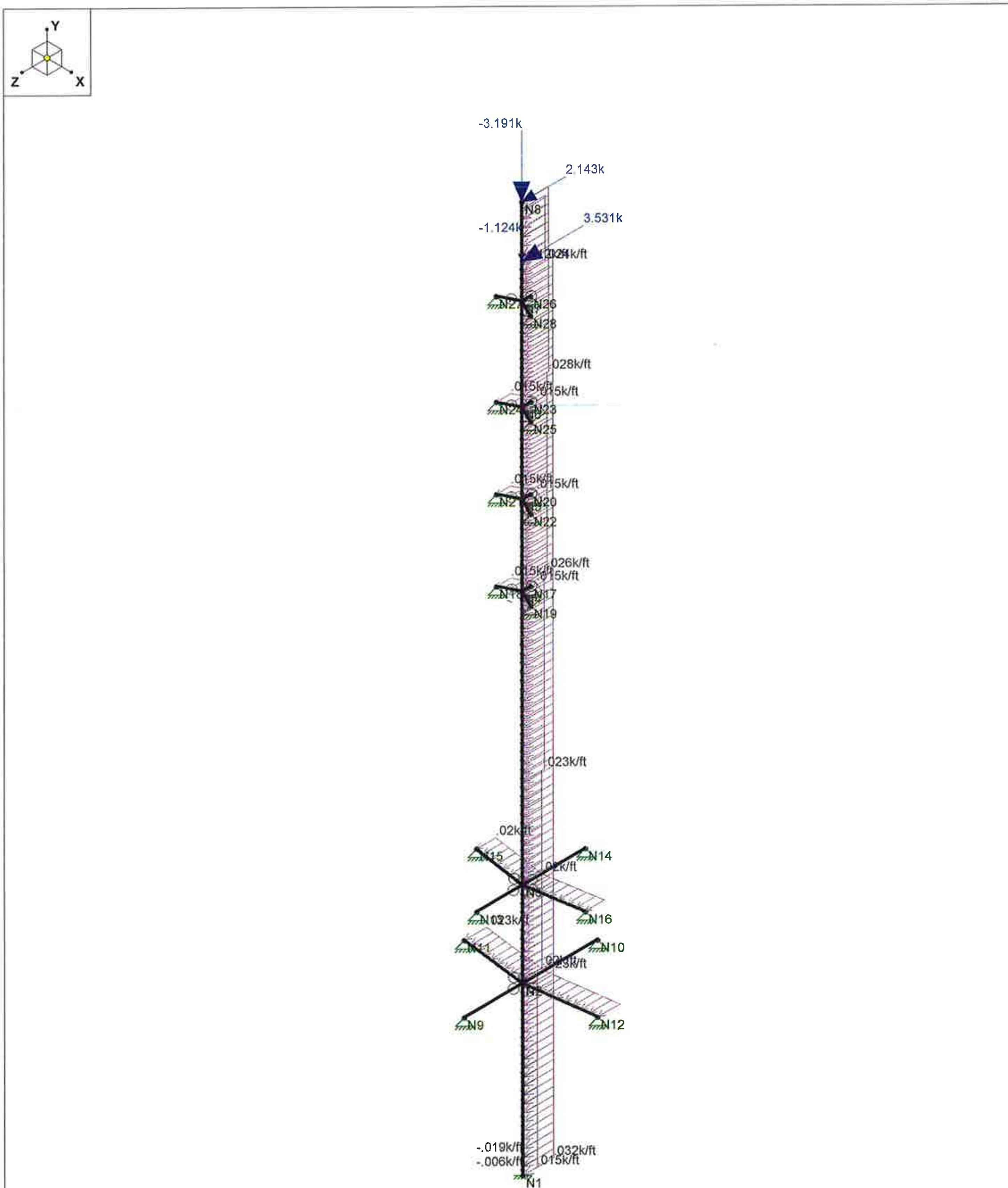

CENTEK Engineering, INC.		
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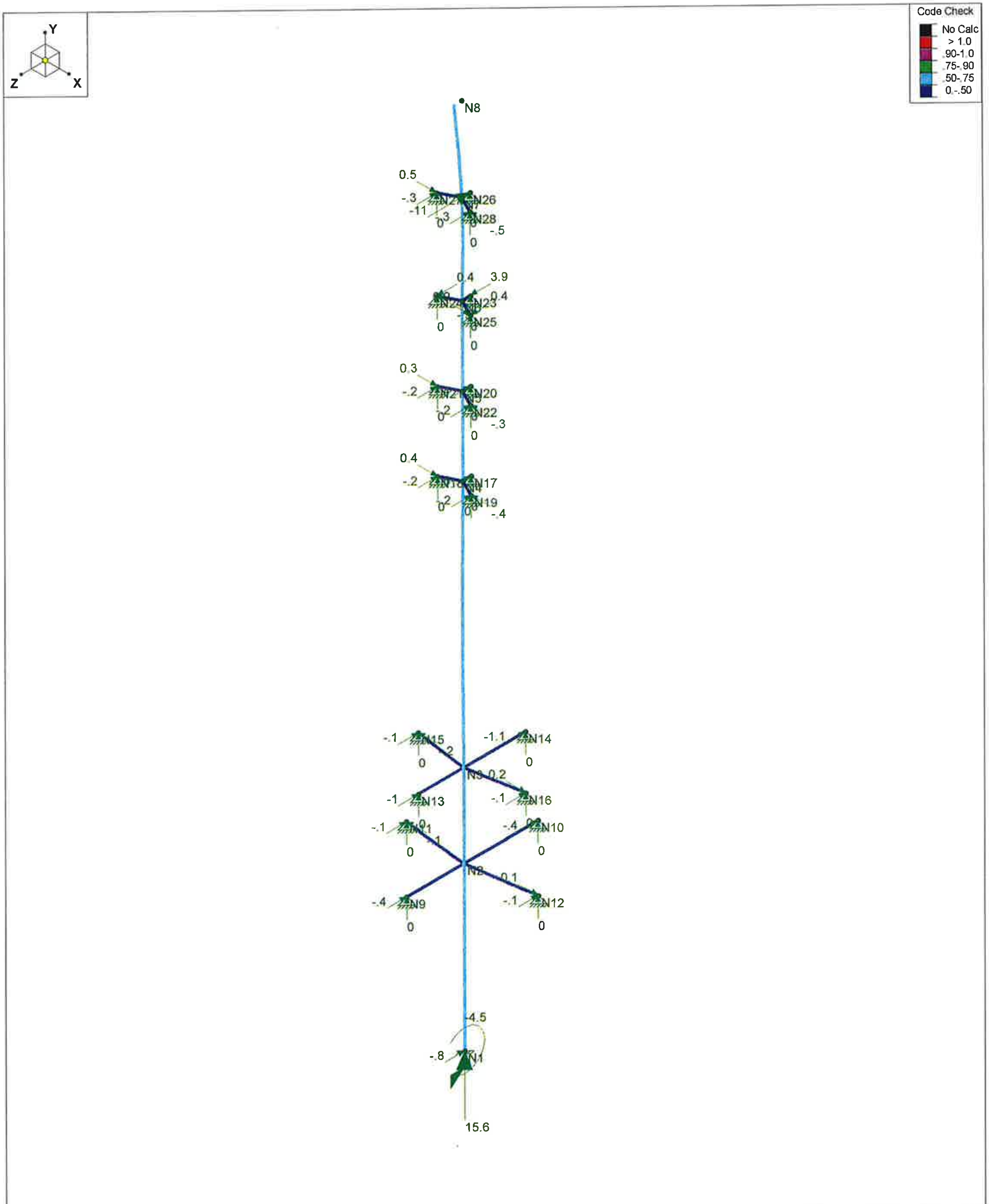


CENTEK Engineering, INC.		
tjl, cfc	CL&P Struct. #1281 - Powermount	Apr 17, 2015 at 8:24 AM
15001.017 - Greenwich 3	LC #4 Reactions and Deflected Shape	EIA-TIA.r3d

Powermount Connection to CL&P Tower:

Check Pipe Collar Bolts:

Reactions:

Tension = $Tension := 11.5 \cdot kips$
(Input From Risa-3D LC #4) (Sum of the forces in brace members)

Shear = $Shear := 11.5 \cdot kips$
(Input From Risa-3D LC #2) (Sum of the forces in brace members)

Bolt Data:

Bolt Type = ASTM A325 (User Input)

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

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

Allowable Tensile Strength = $F_t := 19.4 \cdot kips$ (User Input)

Allowable Shear Strength = $F_v := 9.3 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{Shear}{N_b} = 2.9 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 30.91 \cdot \%$

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

Bolt_Shear = "OK"

Tension Force = $f_t := \frac{Tension}{N_b} = 2.9 \cdot kips$

Bolt Tenison % of Capacity = $\frac{f_t}{F_t} = 14.82 \cdot \%$

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

Bolt_Tension = "OK"

Check Pipe Collar to Angle Brace Bolts:

Reactions:

Axial Force in Member = $Axial := 6.5 \cdot kips$ (Input From Risa-3D LC #2)

Bolt Data:

Bolt Type = ASTM A325 (User Input)

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

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

Allowable Tensile Strength = $F_t := 19.4 \cdot kips$ (User Input)

Allowable Shear Strength = $F_v := 9.3 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{Axial}{N_b} = 6.5 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 69.89 \cdot \%$

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 = $Axial := 6.5 \cdot kips$ (Input From Risa-3D LC #2)

Bolt Data:

Bolt Type = ASTM A325 (User Input)

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

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

Allowable Tensile Strength = $F_t := 19.4 \cdot kips$ (User Input)

Allowable Shear Strength = $F_v := 9.3 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{Axial}{N_b} = 6.5 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 69.89 \cdot \%$

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 = $Axial := 11 \cdot kips$ (Input From Risa-3D LC #4)

Bolt Data:

Bolt Type = ASTM A325 (User Input)

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

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

Allowable Tensile Strength = $F_t := 19.4 \cdot kips$ (User Input)

Allowable Shear Strength = $F_v := 9.3 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{Axial}{N_b} = 5.5 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 59.14 \cdot \%$

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 = $Axial := 11 \cdot kips$ (Input From Risa-3D LC #4)

Bolt Data:

Bolt Type = ASTM A325 (User Input)

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

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

Allowable Tensile Strength = $F_t := 19.4 \cdot kips$ (User Input)

Allowable Shear Strength = $F_v := 18.6 \cdot kips$ (User Input) (Bolt is in Double Shear)

Shear Force = $f_v := \frac{Axial}{N_b} = 11 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 59.14 \cdot \%$

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

$Bolt\_Shear = "OK"$

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 PCS 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

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVSPP18-C		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 11.8$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 57$	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 = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.9$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 17.7$ sf

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1263$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

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

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 19.5$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 125$ lbs **BLC 4**

Gravity Load (without Ice)

Weight of All Antennas = $Wt_{ant1} := (WT_{ant} \cdot N_{ant}) = 171$ lbs **BLC 2**

Gravity Load (Ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5947$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1528$ cu in

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

Weight of Ice on All Antennas = $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 149$ lbs **BLC 3**

Development of Wind & Ice Load on Platform

Platform Data: (Sprint)

Platform Model = FWT 14' Low Profile Platform (User Input)

Platform Shape = Flat (User Input)

Platform Area = $A_{plt} := 14.2$ sq ft (User Input from FWT design calcs)

Platform Area w/ Ice = $A_{ICEplt} := 15.8$ sq ft (User Input from FWT design calcs)

Platform Weight = $WT_{plt} := 3020$ lbs (User Input from FWT design calcs)

Platform Weight w/ Ice = $WT_{ICEplt} := 4300$ lbs (User Input from FWT design calcs)

Wind Load (NESC Extreme)

Total Platform Wind Force = $F_{mnt1} := qz \cdot Cd_F \cdot A_{plt} \cdot m = 1013$ lbs **BLC 5**

Wind Load (NESC Heavy)

Total Platform Wind Force w/ Ice = $Fi_{mnt1} := p \cdot Cd_F \cdot A_{ICEplt} = 101$ lbs **BLC 4**

Gravity Load (without ice)

Weight of Platform = $Wt_{mnt1} := WT_{plt} = 3020$ lbs **BLC 2**

Gravity Load (ice only)

Weight of Ice on Platform = $Wt_{ice.mnt1} := WT_{ICEplt} - WT_{plt} = 1280$ lbs **BLC 3**

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 = $F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 908$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.7$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 14.1$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 90$ lbs **BLC 4**

Gravity Load (without Ice)

Weight of All Antennas = $Wt_{ant2} := (WT_{ant} \cdot N_{ant}) = 93$ lbs **BLC 2**

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 = $Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 106$ lbs **BLC 3**

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 = $F_{ant3} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1274$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

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

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

Total Antenna Wind Force w/ Ice = $Fi_{ant3} := p \cdot Cd_F \cdot A_{ICEant} = 126$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant3} := (WT_{ant} \cdot N_{ant}) = 123$ lbs **BLC 2**

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 = $Wt_{ice.ant3} := W_{ICEant} \cdot N_{ant} = 150$ lbs **BLC 3**

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 =	$N_{ant} := 3$		(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 = $A_{ant} := SA_{ant} \cdot N_{ant} = 12.6$ sf

Total Antenna Wind Force = $F_{ant4} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 901$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4.6$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 13.9$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant4} := p \cdot Cd_F \cdot A_{ICEant} = 89$ lbs **BLC 4**

Gravity Load (without Ice)

Weight of All Antennas = $Wt_{ant4} := (WT_{ant} \cdot N_{ant}) = 56$ lbs **BLC 2**

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 = $Wt_{ice.ant4} := W_{ICEant} \cdot N_{ant} = 101$ lbs **BLC 3**

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 = $F_{ant5} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 160$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant}+1) \cdot (W_{ant}+1)}{144} = 0.5$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.9$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant5} := p \cdot Cd_F \cdot A_{ICEant} = 19$ lbs **BLC 4**

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant5} := (WT_{ant} \cdot N_{ant}) = 42$ lbs **BLC 2**

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 = $Wt_{ice.ant5} := W_{ICEant} \cdot N_{ant} = 24$ lbs **BLC 3**

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 = $F_{ant6} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 31$ lbs **BLC 5**

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 0.2$ sf

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

Total Antenna Wind Force w/ Ice = $Fi_{ant6} := p \cdot Cd_F \cdot A_{ICEant} = 4$ lbs **BLC 4**

Gravity Load (without Ice)

Weight of All Antennas = $Wt_{ant6} := (WT_{ant} \cdot N_{ant}) = 6$ lbs **BLC 2**

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 = $Wt_{ice.ant6} := W_{ICEant} \cdot N_{ant} = 5$ lbs **BLC 3**

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 **BLC 5**

Wind Load (NESC Heavy)

Total Platform Wind Force w/ Ice = $Fi_{mnt2} := p \cdot Cd_F \cdot A_{ICEplt} = 88$ lbs **BLC 4**

Gravity Load (without ice)

Weight of Platform = $Wt_{mnt2} := WT_{plt} = 750$ lbs **BLC 2**

Gravity Load (ice only)

Weight of Ice on Platform = $Wt_{ice.mnt2} := WT_{ICEplt} - WT_{plt} = 200$ lbs **BLC 3**

Total Equipment Loads:

Sprint @ 148-ft AGL

NESC Heavy Wind Vertical = $\left(Wt_{ant1} + Wt_{ice.ant1} + Wt_{mnt1} + Wt_{ice.mnt1}\right) \cdot 1.5 = 6929$

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant1} + Fi_{mnt1}\right) \cdot 2.5 = 564$

NESC Extreme Wind Vertical = $\left(Wt_{ant1} + Wt_{mnt1}\right) = 3191$

NESC Extreme Wind Trasnsverse = $\left(F_{ant1} + F_{mnt1}\right) = 2276$

Verizon @ 139-ft AGL

NESC Heavy Wind Vertical =

$$\left(Wt_{ant2} + Wt_{ice.ant2} + Wt_{ant3} + Wt_{ice.ant3} + Wt_{ant4} + Wt_{ice.ant4} + Wt_{ant5} + Wt_{ice.ant5} + Wt_{ant6} + Wt_{ice.ant6} + Wt_{mnt2} + Wt_{ice.mnt2}\right) \cdot 1.5 = 2483$$

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant2} + Fi_{ant3} + Fi_{ant4} + Fi_{ant5} + Fi_{ant6} + Fi_{mnt2}\right) \cdot 2.5 = 1038$

NESC Extreme Wind Vertical = $\left(Wt_{ant2} + Wt_{ant3} + Wt_{ant4} + Wt_{ant5} + Wt_{ant6} + Wt_{mnt2}\right) = 1070$

NESC Extreme Wind Trasnsverse = $\left(F_{ant2} + F_{ant3} + F_{ant4} + F_{ant5} + F_{ant6} + F_{mnt2}\right) = 4034$

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)* (6 Cables inside Powermount 18 on Exterior)
Number of Projected Coax Cables Transverse =	$NP_{Tcoax} := 4$	*(User Input)*
Extreme Wind Pressure =	$qz := 35.7 \cdot psf$	*(User Input)*
Heavy Wind Pressure =	$p := 4 \cdot psf$	*(User Input)*
Radial Ice Thickness =	$Ir := 0.5 \cdot in$	*(User Input)*
Radial Ice Density =	$Id := 56 \cdot pcf$	*(User Input)*
Shape Factor =	$Cd_{coax} := 1.6$	*(User Input)*
Overload Factor for NESC Heavy Wind Load =	$OF_{HW} := 2.5$	*(User Input)*
Overload Factor for NESC Extreme Wind Load =	$OF_{EW} := 1.0$	*(User Input)*
Overload Factor for NESC Heavy Vertical Load =	$OF_{HV} := 1.5$	*(User Input)*
Overload Factor for NESC Extreme Vertical Load =	$OF_{EV} := 1.0$	*(User Input)*

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

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 = $W_{ice} := Ai_{coax} \cdot Id \cdot N_{coax} = 36.359 \cdot plf$

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 =

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

$$Heavy_{Vert} = \begin{pmatrix} 736 \\ 1380 \\ 1288 \\ 2702 \\ 2748 \\ 2989 \end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix} 95 \\ 178 \\ 167 \\ 349 \\ 355 \\ 387 \end{pmatrix} lb$$

Extreme Vertical Load =

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

Extreme Transverse Load =

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

$$Extreme_{Vert} = \begin{pmatrix} 200 \\ 374 \\ 349 \\ 733 \\ 746 \\ 811 \end{pmatrix} lb \qquad Extreme_{Trans} = \begin{pmatrix} 302 \\ 565 \\ 528 \\ 1107 \\ 1126 \\ 1225 \end{pmatrix} lb$$

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

Extreme Wind Pressure = $qz := 35.7\cdot psf$ *(User Input)*

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

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

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

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

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

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

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

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

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

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

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

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax}\cdot Id\cdot N_{coax} = 27.269\cdot plf$

Heavy Vertical Load =

$$Heavy_{Vert} := \overrightarrow{\left[(N_{coax}\cdot W_{coax} + W_{ice})\cdot Coax_{Span}\cdot OF_{HV}\right]}$$ $Heavy_{Vert} = 1035\, lb$

Heavy Transverse Load =

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

Extreme Vertical Load =

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

Extreme Transverse Load =

$$Extreme_{Trans} := \overrightarrow{\left[(qz\cdot A_T\cdot Cd_{coax})\cdot Coax_{Span}\cdot OF_{EW}\right]}$$ $Extreme_{Trans} = 283\, lb$

Coax Cable on CL&P Tower

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)*

Extreme Wind Pressure = $qz := 35.7 \cdot psf$ *(User Input)*

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

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

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

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

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

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

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

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

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

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

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

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

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 =

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

$$Heavy_{Vert} = \begin{pmatrix} 471 \\ 588 \\ 645 \\ 678 \\ 763 \\ 673 \\ 611 \\ 1495 \end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix} 176 \\ 219 \\ 241 \\ 253 \\ 285 \\ 251 \\ 228 \\ 558 \end{pmatrix} lb$$

Extreme Vertical Load =

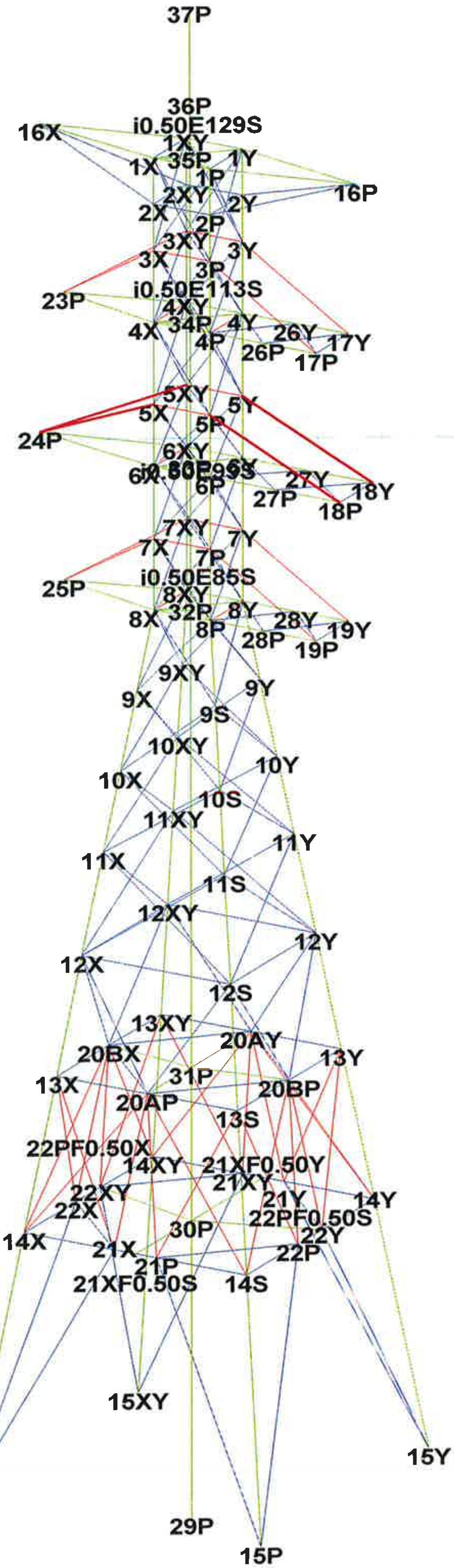
$$Extreme_{Vert} := \overrightarrow{\left[\left(N_{coax} \cdot W_{coax}\right) \cdot Coax_{Span} \cdot OF_{EV}\right]}$$

Extreme Transverse Load =

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

$$Extreme_{Vert} = \begin{pmatrix} 128 \\ 159 \\ 175 \\ 184 \\ 207 \\ 183 \\ 166 \\ 406 \end{pmatrix} lb \qquad Extreme_{Trans} = \begin{pmatrix} 580 \\ 722 \\ 793 \\ 834 \\ 938 \\ 827 \\ 752 \\ 1838 \end{pmatrix} lb$$

/er Version 12.50, 10:52:30 AM Friday, April 17, 2015
leformed geometry displayed



Project Name : 15001.017 - Greenwich, CT
Project Notes: CL&P Structure #1281 / Verizon - Greenwich 3
Project File : J:\Jobs\1500100.WI\017 - Greenwich 3 CT\Backup Documentation\Calcs\Rev (1)\PLS Tower\CL&P # 1281.tow
Date run : 10:51:37 AM Friday, April 17, 2015
by : Tower Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

Angle member "36P" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
Angle member "36X" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
Member "5P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "5X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "5XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "5Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "7P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "7Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "10P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "14P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "17AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "17BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "51CP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "51CY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "53CY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Unable to calculate rupture capacity for member "g106P" because it has a long and short edge distance of 0. ??
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 121 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\1500100.wi\017 - greenwich 3 ct\backup documentation\calcs\rev (1)\pls tower\cl&p # 1281.lca

*** Analysis Results:

Maximum element usage is 91.11% for Angle "3P" in load case "NESC Extreme"
Maximum insulator usage is 29.57% for Clamp "10" 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	-33.29	-34.62	-226.19	48.03	-2.33	-1.81	2.96	-0.81	0.00
NESC Heavy	29P	-0.11	-1.14	-34.18	1.14	10.13	-0.91	10.17	-0.20	0.00
NESC Heavy	15X	35.45	-31.23	191.13	47.24	0.26	0.11	0.28	-0.17	0.00
NESC Heavy	15XY	-33.84	-28.33	184.59	44.13	-0.79	0.19	0.81	0.12	0.00
NESC Heavy	15Y	31.79	-32.76	-218.71	45.65	-2.80	-4.12	4.98	-0.14	0.00
NESC Extreme	15P	-31.49	-32.19	-218.36	45.03	0.83	7.40	7.45	0.77	0.00
NESC Extreme	29P	0.24	-2.55	-13.38	2.57	31.04	4.87	31.42	-1.42	0.00
NESC Extreme	15X	33.12	-39.75	179.02	51.75	7.42	0.67	7.45	0.55	0.00
NESC Extreme	15XY	-34.02	-34.85	187.57	48.70	2.89	-0.31	2.91	-0.64	0.00
NESC Extreme	15Y	26.67	-28.25	-189.93	38.85	-0.82	-2.75	2.87	-0.50	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	231.230	1.409	1.426	0.084	1.423	-33.29	-34.62	-226.19
NESC Heavy	15X	14X	14X	-196.728	7.902	8.047	-7.395	3.173	35.45	-31.23	191.13
NESC Heavy	15XY	14XY	14XY	-189.673	6.763	6.860	6.748	1.232	-33.84	-28.33	184.59
NESC Heavy	15Y	14Y	14Y	223.417	0.728	0.729	0.314	0.658	31.79	-32.76	-218.71
NESC Extreme	15P	14S	14P	222.956	0.577	0.581	-0.563	0.142	-31.49	-32.19	-218.36
NESC Extreme	15X	14X	14X	-185.755	14.832	15.117	-6.846	13.478	33.12	-39.75	179.02
NESC Extreme	15XY	14XY	14XY	-193.554	9.573	9.776	6.487	7.314	-34.02	-34.85	187.57

NESC Extreme 15Y 14Y 14Y 193.858 1.264 1.270 1.213 0.376 26.67 -28.25 -189.93

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
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 "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. ??

*** 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 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 Comp.	Length Comp. Member (ft)	Curve No.	No. Of Bolts
1	LEG1	SAE	3.5X3.5X0.25	36.0	91.11	Comp	91.11	3P	-29.896	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	87.04	Comp	87.04	5Y	-86.243	NESC Hea	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	68.17	Comp	68.17	7Y	-170.177	NESC Hea	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	72.28	Comp	72.28	10Y	-210.490	NESC Hea	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	63.38	Comp	63.38	11Y	-212.421	NESC Hea	335.162	0.000	0.000	1.000	1.000	1.000	76.95	76.95	10.131	1	0
6	X1	SAE	2.5X2.5X0.1875	36.0	87.42	Comp	87.42	15AX	-13.666	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	86.15	Comp	86.15	16AX	-12.322	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	57.81	Comp	57.81	17AX	-22.902	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	59.94	Comp	59.94	18AXY	-19.623	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	54.57	Comp	54.57	19AX	-33.399	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	27.03	Cross	26.77	21BY	-11.342	NESC Hea	42.374	54.600	81.562	1.000	0.580	0.580	95.79	107.89	10.597	3	6
12	X7	SAU	4X3X0.25	36.0	17.56	Comp	17.56	22BX	-5.440	NESC Ext	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	11.99	Tens	6.55	23BY	-1.476	NESC Ext	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	21.68	Comp	21.68	24AX	-4.647NESC Ext	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	77.83	Tens	6.41	25AXY	-2.165NESC 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	40.15	Tens	0.00	26BY	0.000	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	56.67	Tens	38.50	27BP	-2.472NESC 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	72.85	Comp	72.85	28AX	-8.369NESC 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	76.77	Tens	20.44	29AP	-5.243NESC 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	49.94	Tens	0.00	35Y	0.000	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	54.27	Comp	54.27	37BX	-14.816NESC 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	37.78	Comp	37.78	38BXY	-4.345NESC 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	47.27	Tens	37.90	39AP	-6.898NESC Ext	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	19.73	Comp	19.73	40X	-2.641NESC 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	11.69	Comp	11.69	43CXY	-1.471NESC Ext	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	8.95	Comp	8.95	44P	-1.492NESC Ext	16.678	18.200	20.391	0.750	0.500	0.500	115.57	116.67	8.224	2	2
28	H6	SAU	4X3X0.25	36.0	37.58	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	25.43	Comp	25.43	46XY	-1.967NESC 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	31.60	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	31.69	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	37.41	Tens	17.51	50X	-3.186NESC Hea	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	29.56	Comp	29.56	53P	-9.655NESC Hea	32.661	36.400	54.375	0.500	0.500	0.500	110.71	115.36	11.643	3	4
34	A#	SAE	4X4X0.25	36.0	25.05	Comp	25.05	52Y	-10.427NESC Hea	41.627	45.500	67.969	0.500	0.500	0.500	106.21	113.11	14.073	3	5
35	H7	SAU	2.5X2X0.1875	36.0	19.88	Comp	19.88	54P	-1.621NESC 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	84.60	Tens	67.36	36P	-11.316NESC Hea	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	8.72	Comp	8.72	g101P	-22.684NESC 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	4.75	Comp	4.75	g107P	-0.484NESC Ext	20.042	16.800	10.195	1.000	1.000	1.000	45.71	82.86	1.501	3	1
PMBR2	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	36.0	33.07	Comp	33.07	g111P	-3.371NESC 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	0.93	Comp	0.93	g114P	-0.095NESC 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	15.03	Comp	15.03	g116X	-2.043NESC 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**	**8.49**	**Comp**	**8.49**	**g120P**	**-1.155NESC Ext**	**16.004**	**16.800**	**13.594**	**1.000**	**1.000**	**1.000**	**186.27**	**186.27**	**12.340**	**4**	**1**

A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g118P ??

20a H1 SAE 1.75X1.75X0.1875 36.0 19.70 Comp 19.70 30AY -1.792NESC 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 40.54 Tens 36.41 42XY -3.314NESC 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 59.19 Comp 59.19 g110X -8.046NESC 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 ??
Plate 6"x3/4" PL Bar 6x3/4 36.0 5.46 Comp 5.46 g106P -0.918NESC Ext 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 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. Holes	Hole Diameter (in)
1	LEG1	SAE	3.5X3.5X0.25	36.0	91.11	Comp	72.66	3XY	26.449	NESC Ext	48.465	36.400	54.375	60.417	7.000	4	2.000	0.6875
2	LEG2	SAE	6X6X0.3125	36.0	87.04	Comp	79.01	5XY	79.374	NESC Ext	100.462	109.200	203.906	226.562	6.050	12	4.000	0.6875
3	LEG3	SAE	8X8X0.5	36.0	68.17	Comp	66.37	7X	156.422	NESC Hea	235.687	254.800	380.624	422.916	7.000	14	3.500	0.6875
4	LEG4	SAE	8X8X0.625	36.0	72.28	Comp	66.44	9XY	193.874	NESC Hea	291.819	0.000	0.000	0.000	7.915	0	3.500	0.6875
5	LEG5	SAE	8X8X0.75	36.0	63.38	Comp	56.84	11XY	191.876	NESC Hea	337.589	0.000	0.000	0.000	10.131	0	4.000	0.6875
6	X1	SAE	2.5X2.5X0.1875	36.0	87.42	Comp	76.04	15AP	13.736	NESC Ext	25.048	18.200	20.391	18.063	10.817	2	1.000	0.6875
7	X2	SAU	2.5X2X0.1875	36.0	86.15	Comp	64.38	16AP	11.668	NESC Ext	19.030	18.200	20.391	18.125	9.220	2	1.000	0.6875
8	X3	SAU	4X3X0.25	36.0	57.81	Comp	49.93	17AP	22.500	NESC Hea	45.066	45.500	67.969	60.417	10.000	5	1.740	0.6875
9	X4	SAU	3.5X2.5X0.25	36.0	59.94	Comp	54.92	18AY	19.989	NESC Hea	40.920	36.400	54.375	42.647	8.521	4	1.030	0.6875
10	X5	SAU	4X3.5X0.3125	36.0	54.57	Comp	54.35	19AP	32.851	NESC Hea	60.440	63.700	118.945	112.337	9.220	7	1.790	0.6875
11	X6	SAU	5X3.5X0.25	36.0	27.03	Cross	27.03	21BXY	12.424	NESC Ext	45.962	54.600	81.562	72.500	10.597	6	1.550	0.6875
12	X7	SAU	4X3X0.25	36.0	17.56	Comp	12.54	22BP	4.566	NESC Ext	41.087	36.400	54.375	44.391	12.246	4	1.000	0.6875
13	X8	SAU	3.5X3X0.25	36.0	11.99	Tens	11.99	23AP	3.273	NESC Ext	40.925	27.300	40.781	38.516	14.070	3	1.000	0.6875
14	X9	SAU	5X3X0.25	36.0	21.68	Comp	3.01	24AP	0.823	NESC Hea	41.087	27.300	40.781	36.250	17.450	3	1.000	0.6875
15	D1	SAU	5X3X0.25	36.0	77.83	Tens	77.83	25AP	28.900	NESC Ext	37.133	63.700	95.156	74.632	14.103	7	1.710	0.6875
16	D2	SAE	2X2X0.1875	36.0	40.15	Tens	40.15	26BXY	7.277	NESC Ext	18.827	18.200	20.391	18.125	16.853	2	1.000	0.6875
17	D3	SAU	3X2X0.25	36.0	56.67	Tens	56.67	27AX	14.105	NESC Ext	24.887	36.400	54.375	48.333	19.194	4	1.000	0.6875
18	D4	SAU	4X3X0.25	36.0	72.85	Comp	63.27	28AP	28.786	NESC Ext	47.739	45.500	67.969	60.417	15.321	5		

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1.260   0.6875
    19          D5   SAU       3.5X3X0.25     36.0 76.77  Tens 76.77      29AX  34.526NESC Ext   44.975   45.500   67.969   53.634 28.523    5
1.000   0.6875
    20          H1   SAE 1.75X1.75X0.1875     36.0 49.94  Tens 49.94       33Y   3.508NESC Hea   15.911    9.100   10.195    7.024  6.000    1
1.000   0.6875
    21          H2   SAU         4X3.5X0.25   36.0 54.27  Comp  6.39      37BP   1.744NESC Ext   49.025   27.300   40.781   36.250 15.738    3
1.000   0.6875
    22          H3   SAE        3X3X0.1875    36.0 37.78  Comp  0.63      38BP   0.115NESC Hea   31.139   18.200   20.391   18.125  9.569    2
1.000   0.6875
    23          H4   SAU          5X3X0.25    36.0 47.27  Tens 47.27 F39C2118X   8.602NESC Ext   41.087   18.200   27.187   24.167  2.208    2
1.000   0.6875
    24          H5   SAE       3.5X3.5X0.25   36.0 19.73  Comp 15.30       40P   2.784NESC Ext   49.187   18.200   27.187   25.677 13.531    2
1.000   0.6875
    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 11.69  Comp 10.31      43AP   1.358NESC Ext   18.827   18.200   20.391   13.170  4.243    2
1.000   0.6875
    27         X12   SAU      2.5X2X0.1875    36.0  8.95  Comp  8.11      44AY   1.470NESC Ext   19.030   18.200   20.391   18.125  8.224    2
1.000   0.6875
    28          H6   SAU          4X3X0.25    36.0 37.58  Tens 37.58       45P   6.840NESC Hea   41.087   18.200   27.187   24.167  6.000    2
1.000   0.6875
    29          D6   SAU        3X2X0.1875    36.0 25.43  Comp  0.00       46Y   0.000            18.908   18.200   20.391   13.577 14.775    2
1.000   0.6875
    30        HGR1   SAU      2.5X2X0.1875    36.0 31.60  Tens 31.60       47Y   4.291NESC Hea   19.030   18.200   20.391   13.577 13.250    2
1.000   0.6875
    31        HGR2   SAE        3X3X0.1875    36.0 31.69  Tens 31.69       48Y   5.743NESC Hea   31.139   18.200   20.391   18.125 15.022    2
1.000   0.6875
    32          A1   SAE          3X3X0.25    36.0 37.41  Tens 37.41       50P   6.780NESC Hea   37.802   18.200   27.187   18.125 14.073    2
1.590   0.6875
    33          A2   SAU        3.5X3X0.25    36.0 29.56  Comp 28.37      53BP   7.746NESC Hea   35.356   27.300   40.781   31.985  5.625    3
2.000   0.6875
    34          A#   SAE          4X4X0.25    36.0 25.05  Comp 15.25      52BP   6.938NESC Hea   51.718   45.500   67.969   71.078  6.875    5
2.000   0.6875
    35          H7   SAU      2.5X2X0.1875    36.0 19.88  Comp  7.72       54X   0.702NESC Hea   22.067    9.100   10.195    9.629  6.000    1
1.000   0.6875
    36          H8   DAE 1.75X1.75X0.1875     36.0 84.60  Tens 84.60       36X  12.576NESC Hea   35.999   16.800   20.391   14.864  6.000    1
1.000   0.6875
  Pwmnt 12" Std. Pipe Pwmnt    Pipe 12" Std.   42.0  8.72  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  4.75  Comp  0.68     g107P  0.070NESC Hea   18.827   16.800   10.195   10.343  1.501    1
1.000   0.6875
  PMBR2 L2.5x2.5x3/16   SAE    2.5X2.5X0.1875   36.0 33.07  Comp 24.10     g111X  2.457NESC Ext   25.048   16.800   10.195   11.328  3.354    1
1.000   0.6875
  PMBR3     L3x3x3/16   SAE        3X3X0.1875   36.0  0.93  Comp  0.83     g114P  0.085NESC 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 15.03  Comp 13.57     g116P  1.844NESC Ext   49.187   16.800   13.594   15.104  9.685    1
1.000   0.6875
  PMBR5      L4x4x1/4   SAE          4X4X0.25   36.0  8.49  Comp  8.05     g120X  1.094NESC Ext   57.287   16.800   13.594   15.104 12.340    1
1.000   0.6875 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g118P
??
    20a         H1   SAE 1.75X1.75X0.1875   36.0 19.70  Comp  7.85      30BP  0.551NESC Hea   15.911    9.100   10.195    7.024  6.000    1
1.000   0.6875
 AngleR      L2x2x1/4   SAE          2X2X0.25   36.0 40.54  Tens 40.54       42X  3.689NESC Ext   24.887    9.100   13.594    9.366  4.243    1
1.000   0.6875
 BraceR  L2.5x2.5x1/4   SAE      2.5X2.5X0.25   36.0 59.19  Comp 42.99     g110P  5.844NESC 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
??
  Plate    6"x3/4" PL   Bar              6x3/4   36.0  5.46  Comp  2.36     g106P  0.396NESC 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	87.04	5Y	Angle
NESC Extreme	91.11	3P	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	19.65	NESC Heavy	0.0
2	Clamp	19.51	NESC Heavy	0.0
3	Clamp	20.20	NESC Heavy	0.0
4	Clamp	20.61	NESC Heavy	0.0
5	Clamp	20.20	NESC Heavy	0.0
6	Clamp	20.62	NESC Heavy	0.0
7	Clamp	20.20	NESC Heavy	0.0
8	Clamp	20.61	NESC Heavy	0.0
9	Clamp	29.53	NESC Heavy	0.0
10	Clamp	29.57	NESC Heavy	0.0
11	Clamp	29.53	NESC Heavy	0.0
12	Clamp	1.81	NESC Extreme	0.0
13	Clamp	2.09	NESC Extreme	0.0
14	Clamp	2.33	NESC Heavy	0.0
15	Clamp	4.00	NESC Extreme	0.0
16	Clamp	3.57	NESC Extreme	0.0
17	Clamp	3.69	NESC Heavy	0.0
18	Clamp	3.20	NESC Extreme	0.0
19	Clamp	6.04	NESC Heavy	0.0
20	Clamp	10.21	NESC Heavy	0.0
21	Clamp	10.89	NESC Heavy	0.0
22	Clamp	10.43	NESC Heavy	0.0
23	Clamp	4.98	NESC Heavy	0.0
24	Clamp	5.34	NESC Heavy	0.0
25	Clamp	3.42	NESC Heavy	0.0
26	Clamp	8.96	NESC Extreme	0.0
27	Clamp	16.71	NESC Heavy	0.0

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

*** End of Report

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

```
Project Name : 15001.017 - Greenwich, CT
Project Notes: CL&P Structure #1281 / Verizon - Greenwich 3
Project File : J:\Jobs\1500100.WI\017 - Greenwich 3 CT\Backup Documentation\Calcs\Rev (1)\PLS Tower\CL&P # 1281.tow
Date run     : 10:51:36 AM Friday, April 17, 2015
by           : Tower Version 12.50
Licensed to  : Centek Engineering Inc
```

Successfully performed nonlinear analysis

```
Angle member "36P" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
Angle member "36X" has 1.00 bolt holes, but double angles should have at least 2 holes. ??
Member "5P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "5X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "5XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "5Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "7P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "7X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "7XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "7Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "10P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "10X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "10XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "10Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "12P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "12X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "12XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "12Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "13P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "13X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "13XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "13Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "14P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
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and spacing distances will be checked. ??
Member "14X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "14XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "14Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "17BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "18BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "19AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "19AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "19AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "19AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "19BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "19BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "19BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "20AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "20AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??

Member "20AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "20AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "20BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "20BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "20BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "20BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "21AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "21AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "21AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "21AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "21BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "21BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "21BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "21BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "25AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "25AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "25AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "25AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "25BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "25BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "25BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "25BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "28AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "28AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "28AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "28AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "28BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "28BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

Member "28BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge

and spacing distances will be checked. ??
Member "28BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "40P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "40X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "40XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "40Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "50P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "50X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "50XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "50AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "50AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "51P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "51Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "51AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "51AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "51BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "51BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "51CP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "51CY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "52P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "52Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "52AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "52AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "52CP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "52CY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "53P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "53CP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Member "53CY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
Unable to calculate rupture capacity for member "g106P" because it has a long and short edge distance of 0. ??
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 121 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	Modulus of Elasticity (ksi)	Yield Stress Fy (ksi)	Ultimate Stress Fu (ksi)	Stress All. Hyp. 1 (ksi)	Stress All. Hyp. 2 (ksi)	Stress 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	0.6875	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	1248
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. (in)	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	3.350	3.350	1.100	1.100	0.000	0.000	1.000	1.000	0.000	0.000	None
2	29P	1.050	3.500	3.500	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. Path 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															
	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															
	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															
	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															
	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															
	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															
	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															
	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															
	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															
	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															
	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	0	0	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	0	0	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	0	0	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	0	0	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															
	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															
	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															
	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															
	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	0	0	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	0	0	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	0	0	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	0	0	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															
	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															
	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															
	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														
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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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															

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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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     0        0      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     0        0      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     0        0      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     0        0      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     0        0      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     0        0      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     0        0      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     0        0      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	1	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	1	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

																			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	0	0	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	0	0	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	0	0	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	0	0	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

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	8P	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	8Y	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	6P	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	6Y	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	4P	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	4Y	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	3P	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	3Y	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	3X	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	3XY	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	5P	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	5Y	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	5X	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	5XY	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	7P	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	7Y	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	7X	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	7XY	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	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	0	0	0														
51P	33	Y-Symmetry	23P	4X	3	5	0.5	0.5	0.5	5/8 A394	4	2.24	1	Short only	0.75	1.75	1
2.25	0	0	0														
51Y	33	Y-Gen	23P	4XY	3	5	0.5	0.5	0.5	5/8 A394	4	2.24	1	Short only	0.75	1.75	1
2.25	0	0	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	0	0	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	0	0	0														
51BP	33	Y-Symmetry	4P	26P	3	5	1	1	1	5/8 A394	3	2.1	1	Short only	0.75	1.75	2.6875
3	0	0	0														
51BY	33	Y-Gen	4Y	26Y	3	5	1	1	1	5/8 A394	3	2.1	1	Short only	0.75	1.75	2.6875
3	0	0	0														
51CP	33	Y-Symmetry	26P	17P	3	5	1	1	1	5/8 A394	4	2.13	1	Long only	0.75	2.25	1
3.5	0	0	0														
51CY	33	Y-Gen	26Y	17Y	3	5	1	1	1	5/8 A394	4	2.13	1	Long only	0.75	2.25	1
3.5	0	0	0														
52P	34	Y-Symmetry	24P	6X	3	5	0.5	0.5	0.5	5/8 A394	5	2.71	1	Long only	1	2.625	1
2.25	0	0	0														
52Y	34	Y-Gen	24P	6XY	3	5	0.5	0.5	0.5	5/8 A394	5	2.71	1	Long only	1	2.625	1
2.25	0	0	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	0	0	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	0	0	0														
52BP	34	Y-Symmetry	6P	27P	3	5	1	1	1	5/8 A394	5	2	1	Long only	1	2.5	1.5
5	0	0	0														
52BY	34	Y-Gen	6Y	27Y	3	5	1	1	1	5/8 A394	5	2	1	Long only	1	2.5	1.5
5	0	0	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	0	0	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	0	0	0														

53P	33	Y-Symmetry	25P	8X	3	5	0.5	0.5	0.5	5/8	A394	4	2.24	1	Short only	0.75	1.5	1	3	0	0	0
53Y	33	Y-Gen	25P	8XY	3	5	0.5	0.5	0.5	5/8	A394	4	2.24	1	Short only	0.75	1.5	1	3	0	0	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	0	0	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	0	0	0
53BP	33	Y-Symmetry	8P	28P	3	5	1	1	1	5/8	A394	3	2	1	Short only	0.75	1.5	2.6875	4	0	0	0
53BY	33	Y-Gen	8Y	28Y	3	5	1	1	1	5/8	A394	3	2	1	Short only	0.75	1.5	2.6875	4	0	0	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	0	0	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	0	0	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	0	0	0	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	Group Label	Design Comp. Capacity (kips)	Comp. Control Criterion	Design Tension Capacity (kips)	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 Tension Capacity (kips)	RTE End Dist. Tension Capacity (kips)	RTE Edge Dist. Tension Capacity (kips)	Override Comp. Capacity (kips)	Override Tension Capacity (kips)	Override Unsup. (kips)	Tension Face Membership
1P	1	49.257	L/r	48.465	Net Sect	78	4.50	49.257	0.000	0.000	48.465	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
1X	1	49.257	L/r	48.465	Net Sect	78	4.50	49.257	0.000	0.000	48.465	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
1XY	1	49.257	L/r	48.465	Net Sect	78	4.50	49.257	0.000	0.000	48.465	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
1Y	1	49.257	L/r	48.465	Net Sect	78	4.50	49.257	0.000	0.000	48.465	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
2P	1	49.257	L/r	48.465	Net Sect	78	4.50	49.257	0.000	0.000	48.465	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
2X	1	49.257	L/r	48.465	Net Sect	78	4.50	49.257	0.000	0.000	48.465	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
2XY	1	49.257	L/r	48.465	Net Sect	78	4.50	49.257	0.000	0.000	48.465	0.000	0.000	0.000	0.000	0.000	0.000	Automatic
2Y	1	49.257	L/r	48.465	Net Sect	78	4.50	49.257	0.000	0.000	48.465	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	48.465	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	48.465	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	48.465	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	48.465	60.417	0.000	0.000	0.000	0.000	0.000	Automatic

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      4P      2   91.206        L/r  100.462  Net Sect    80    8.00    91.206       0.000      0.000  100.462    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      4X      2   91.206        L/r  100.462  Net Sect    80    8.00    91.206       0.000      0.000  100.462    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
     4XY      2   91.206        L/r  100.462  Net Sect    80    8.00    91.206       0.000      0.000  100.462    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      4Y      2   91.206        L/r  100.462  Net Sect    80    8.00    91.206       0.000      0.000  100.462    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      5P      2   99.083        L/r  100.462  Net Sect    60    6.05    99.083     109.200    203.906  100.462  226.562     0.000     0.000     0.000
0.000             0.000           Automatic    Member "5P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      5X      2   99.083        L/r  100.462  Net Sect    60    6.05    99.083     109.200    203.906  100.462  226.562     0.000     0.000     0.000
0.000             0.000           Automatic    Member "5X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     5XY      2   99.083        L/r  100.462  Net Sect    60    6.05    99.083     109.200    203.906  100.462  226.562     0.000     0.000     0.000
0.000             0.000           Automatic   Member "5XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      5Y      2   99.083        L/r  100.462  Net Sect    60    6.05    99.083     109.200    203.906  100.462  226.562     0.000     0.000     0.000
0.000             0.000           Automatic    Member "5Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      6P      3  249.636        L/r  235.687  Net Sect    53    7.00   249.636       0.000      0.000  235.687    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      6X      3  249.636        L/r  235.687  Net Sect    53    7.00   249.636       0.000      0.000  235.687    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
     6XY      3  249.636        L/r  235.687  Net Sect    53    7.00   249.636       0.000      0.000  235.687    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      6Y      3  249.636        L/r  235.687  Net Sect    53    7.00   249.636       0.000      0.000  235.687    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      7P      3  249.636        L/r  235.687  Net Sect    53    7.00   249.636     254.800    380.624  235.687  422.916     0.000     0.000     0.000
0.000             0.000           Automatic    Member "7P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      7X      3  249.636        L/r  235.687  Net Sect    53    7.00   249.636     254.800    380.624  235.687  422.916     0.000     0.000     0.000
0.000             0.000           Automatic    Member "7X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     7XY      3  249.636        L/r  235.687  Net Sect    53    7.00   249.636     254.800    380.624  235.687  422.916     0.000     0.000     0.000
0.000             0.000           Automatic   Member "7XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      7Y      3  249.636        L/r  235.687  Net Sect    53    7.00   249.636     254.800    380.624  235.687  422.916     0.000     0.000     0.000
0.000             0.000           Automatic    Member "7Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      8P      4  306.646        L/r  291.819  Net Sect    60    7.92   306.646       0.000      0.000  291.819    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      8X      4  306.646        L/r  291.819  Net Sect    60    7.92   306.646       0.000      0.000  291.819    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
     8XY      4  306.646        L/r  291.819  Net Sect    60    7.92   306.646       0.000      0.000  291.819    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      8Y      4  306.646        L/r  291.819  Net Sect    60    7.92   306.646       0.000      0.000  291.819    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      9P      4  306.646        L/r  291.819  Net Sect    60    7.92   306.646       0.000      0.000  291.819    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      9X      4  306.646        L/r  291.819  Net Sect    60    7.92   306.646       0.000      0.000  291.819    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
     9XY      4  306.646        L/r  291.819  Net Sect    60    7.92   306.646       0.000      0.000  291.819    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
      9Y      4  306.646        L/r  291.819  Net Sect    60    7.92   306.646       0.000      0.000  291.819    0.000     0.000     0.000     0.000
0.000             0.000           Automatic
     10P      4  291.200      Shear  291.200     Shear    60    7.92   306.646     291.200    543.749  291.819  604.166     0.000     0.000     0.000
0.000             0.000           Automatic    Member "10P" will not be checked for block shear since more than one gage line exists (long edge
```

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distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    10X      4  291.200     Shear  291.200     Shear   60   7.92  306.646    291.200    543.749  291.819  604.166    0.000    0.000    0.000
0.000           0.000           Automatic   Member "10X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   10XY      4  291.200     Shear  291.200     Shear   60   7.92  306.646    291.200    543.749  291.819  604.166    0.000    0.000    0.000
0.000           0.000           Automatic  Member "10XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    10Y      4  291.200     Shear  291.200     Shear   60   7.92  306.646    291.200    543.749  291.819  604.166    0.000    0.000    0.000
0.000           0.000           Automatic   Member "10Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    11P      5  335.162       L/r  337.589  Net Sect   77  10.13  335.162      0.000      0.000  337.589    0.000    0.000    0.000    0.000
0.000           0.000           Automatic
    11X      5  335.162       L/r  337.589  Net Sect   77  10.13  335.162      0.000      0.000  337.589    0.000    0.000    0.000    0.000
0.000           0.000           Automatic
   11XY      5  335.162       L/r  337.589  Net Sect   77  10.13  335.162      0.000      0.000  337.589    0.000    0.000    0.000    0.000
0.000           0.000           Automatic
    11Y      5  335.162       L/r  337.589  Net Sect   77  10.13  335.162      0.000      0.000  337.589    0.000    0.000    0.000    0.000
0.000           0.000           Automatic
    12P      5  364.000     Shear  337.589  Net Sect   45  11.83  385.718    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic   Member "12P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    12X      5  364.000     Shear  337.589  Net Sect   45  11.83  385.718    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic   Member "12X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   12XY      5  364.000     Shear  337.589  Net Sect   45  11.83  385.718    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic  Member "12XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    12Y      5  364.000     Shear  337.589  Net Sect   45  11.83  385.718    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic   Member "12Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    13P      5  364.000     Shear  337.589  Net Sect   58  15.32  368.010    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic   Member "13P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    13X      5  364.000     Shear  337.589  Net Sect   58  15.32  368.010    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic   Member "13X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   13XY      5  364.000     Shear  337.589  Net Sect   58  15.32  368.010    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic  Member "13XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    13Y      5  364.000     Shear  337.589  Net Sect   58  15.32  368.010    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic   Member "13Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    14P      5  364.000     Shear  337.589  Net Sect   48  25.53  381.402    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic   Member "14P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    14X      5  364.000     Shear  337.589  Net Sect   48  25.53  381.402    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic   Member "14X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   14XY      5  364.000     Shear  337.589  Net Sect   48  25.53  381.402    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic  Member "14XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    14Y      5  364.000     Shear  337.589  Net Sect   48  25.53  381.402    364.000    815.624  337.589  906.249    0.000    0.000    0.000
0.000           0.000           Automatic   Member "14Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   15AP      6   15.633       L/r   18.063   Rupture  131  10.82   15.633     18.200     20.391   25.048   18.063    0.000    0.000    0.000
0.000           0.000           Automatic
   15AX      6   15.633       L/r   18.063   Rupture  131  10.82   15.633     18.200     20.391   25.048   18.063    0.000    0.000    0.000
0.000           0.000           Automatic
```

15AXY	6	15.633	0.000	L/r	18.063	Automatic	Rupture	131	10.82	15.633	18.200	20.391	25.048	18.063	0.000	0.000	0.000	0.000	
15AY	6	15.633	0.000	L/r	18.063	Automatic	Rupture	131	10.82	15.633	18.200	20.391	25.048	18.063	0.000	0.000	0.000	0.000	
15BP	6	15.633	0.000	L/r	18.063	Automatic	Rupture	131	10.82	15.633	18.200	20.391	25.048	18.063	0.000	0.000	0.000	0.000	
15BX	6	15.633	0.000	L/r	18.063	Automatic	Rupture	131	10.82	15.633	18.200	20.391	25.048	18.063	0.000	0.000	0.000	0.000	
15BXY	6	15.633	0.000	L/r	18.063	Automatic	Rupture	131	10.82	15.633	18.200	20.391	25.048	18.063	0.000	0.000	0.000	0.000	
15BY	6	15.633	0.000	L/r	18.063	Automatic	Rupture	131	10.82	15.633	18.200	20.391	25.048	18.063	0.000	0.000	0.000	0.000	
16AP	7	14.303	0.000	L/r	18.125	Automatic	Rupture	130	9.22	14.303	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000	
16AX	7	14.303	0.000	L/r	18.125	Automatic	Rupture	130	9.22	14.303	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000	
16AXY	7	14.303	0.000	L/r	18.125	Automatic	Rupture	130	9.22	14.303	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000	
16AY	7	14.303	0.000	L/r	18.125	Automatic	Rupture	130	9.22	14.303	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000	
16BP	7	14.303	0.000	L/r	18.125	Automatic	Rupture	130	9.22	14.303	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000	
16BX	7	14.303	0.000	L/r	18.125	Automatic	Rupture	130	9.22	14.303	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000	
16BXY	7	14.303	0.000	L/r	18.125	Automatic	Rupture	130	9.22	14.303	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000	
16BY	7	14.303	0.000	L/r	18.125	Automatic	Rupture	130	9.22	14.303	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000	
17AP	**8**	**39.613**	**0.000**	**L/r**	**45.066**	**Automatic**	**Net Sect**	**100**	**10.00**	**39.613**	**45.500**	**67.969**	**45.066**	**60.417**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "17AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
17AX	**8**	**39.613**	**0.000**	**L/r**	**45.066**	**Automatic**	**Net Sect**	**100**	**10.00**	**39.613**	**45.500**	**67.969**	**45.066**	**60.417**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "17AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
17AXY	**8**	**39.613**	**0.000**	**L/r**	**45.066**	**Automatic**	**Net Sect**	**100**	**10.00**	**39.613**	**45.500**	**67.969**	**45.066**	**60.417**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "17AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
17AY	**8**	**39.613**	**0.000**	**L/r**	**45.066**	**Automatic**	**Net Sect**	**100**	**10.00**	**39.613**	**45.500**	**67.969**	**45.066**	**60.417**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "17AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
17BP	**8**	**39.613**	**0.000**	**L/r**	**45.066**	**Automatic**	**Net Sect**	**100**	**10.00**	**39.613**	**45.500**	**67.969**	**45.066**	**60.417**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "17BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
17BX	**8**	**39.613**	**0.000**	**L/r**	**45.066**	**Automatic**	**Net Sect**	**100**	**10.00**	**39.613**	**45.500**	**67.969**	**45.066**	**60.417**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "17BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
17BXY	**8**	**39.613**	**0.000**	**L/r**	**45.066**	**Automatic**	**Net Sect**	**100**	**10.00**	**39.613**	**45.500**	**67.969**	**45.066**	**60.417**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "17BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
17BY	**8**	**39.613**	**0.000**	**L/r**	**45.066**	**Automatic**	**Net Sect**	**100**	**10.00**	**39.613**	**45.500**	**67.969**	**45.066**	**60.417**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "17BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
18AP	**9**	**32.738**	**0.000**	**L/r**	**36.400**	**Automatic**	**Shear**	**104**	**8.52**	**32.738**	**36.400**	**54.375**	**40.920**	**42.647**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "18AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
18AX	**9**	**32.738**	**0.000**	**L/r**	**36.400**	**Automatic**	**Shear**	**104**	**8.52**	**32.738**	**36.400**	**54.375**	**40.920**	**42.647**	**0.000**	**0.000**	**0.000**	**0.000**	**Member "18AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**

18AXY 9 32.738 L/r 36.400 Shear 104 8.52 32.738 36.400 54.375 40.920 42.647 0.000 0.000 0.000
0.000 0.000 Automatic Member "18AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

18AY 9 32.738 L/r 36.400 Shear 104 8.52 32.738 36.400 54.375 40.920 42.647 0.000 0.000 0.000
0.000 0.000 Automatic Member "18AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

18BP 9 32.738 L/r 36.400 Shear 104 8.52 32.738 36.400 54.375 40.920 42.647 0.000 0.000 0.000
0.000 0.000 Automatic Member "18BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

18BX 9 32.738 L/r 36.400 Shear 104 8.52 32.738 36.400 54.375 40.920 42.647 0.000 0.000 0.000
0.000 0.000 Automatic Member "18BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

18BXY 9 32.738 L/r 36.400 Shear 104 8.52 32.738 36.400 54.375 40.920 42.647 0.000 0.000 0.000
0.000 0.000 Automatic Member "18BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

18BY 9 32.738 L/r 36.400 Shear 104 8.52 32.738 36.400 54.375 40.920 42.647 0.000 0.000 0.000
0.000 0.000 Automatic Member "18BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

19AP 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000
0.000 0.000 Automatic Member "19AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

19AX 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000
0.000 0.000 Automatic Member "19AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

19AXY 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000
0.000 0.000 Automatic Member "19AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

19AY 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000
0.000 0.000 Automatic Member "19AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

19BP 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000
0.000 0.000 Automatic Member "19BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

19BX 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000
0.000 0.000 Automatic Member "19BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

19BXY 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000
0.000 0.000 Automatic Member "19BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

19BY 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000
0.000 0.000 Automatic Member "19BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

20AP 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 105.729 0.000 0.000 0.000
0.000 0.000 Automatic Member "20AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

20AX 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 105.729 0.000 0.000 0.000
0.000 0.000 Automatic Member "20AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

20AXY 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 105.729 0.000 0.000 0.000
0.000 0.000 Automatic Member "20AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

20AY 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 105.729 0.000 0.000 0.000
0.000 0.000 Automatic Member "20AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

20BP 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000
0.000 0.000 Automatic Member "20BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??

20BX 10 61.204 L/r 60.440 Net Sect 78 9.22 61.204 63.700 118.945 60.440 112.337 0.000 0.000 0.000

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0.000          0.000          Automatic  Member "20BX" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    20BXY    10   61.204      L/r   60.440  Net Sect   78    9.22   61.204     63.700    118.945   60.440  112.337    0.000    0.000    0.000
0.000          0.000          Automatic Member "20BXY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     20BY    10   61.204      L/r   60.440  Net Sect   78    9.22   61.204     63.700    118.945   60.440  112.337    0.000    0.000    0.000
0.000          0.000          Automatic  Member "20BY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     21AP    11   44.335      L/r   45.962  Net Sect   96   10.60   44.335     54.600     81.562   45.962   72.500    0.000    0.000    0.000
0.000          0.000          Automatic  Member "21AP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     21AX    11   44.335      L/r   45.962  Net Sect   96   10.60   44.335     54.600     81.562   45.962   72.500    0.000    0.000    0.000
0.000          0.000          Automatic  Member "21AX" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    21AXY    11   44.335      L/r   45.962  Net Sect   96   10.60   44.335     54.600     81.562   45.962   72.500    0.000    0.000    0.000
0.000          0.000          Automatic Member "21AXY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     21AY    11   44.335      L/r   45.962  Net Sect   96   10.60   44.335     54.600     81.562   45.962   72.500    0.000    0.000    0.000
0.000          0.000          Automatic  Member "21AY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     21BP    11   44.335      L/r   45.962  Net Sect   96   10.60   44.335     54.600     81.562   45.962   72.500    0.000    0.000    0.000
0.000          0.000          Automatic  Member "21BP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     21BX    11   44.335      L/r   45.962  Net Sect   96   10.60   44.335     54.600     81.562   45.962   72.500    0.000    0.000    0.000
0.000          0.000          Automatic  Member "21BX" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    21BXY    11   44.335      L/r   45.962  Net Sect   96   10.60   44.335     54.600     81.562   45.962   72.500    0.000    0.000    0.000
0.000          0.000          Automatic Member "21BXY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     21BY    11   44.335      L/r   45.962  Net Sect   96   10.60   44.335     54.600     81.562   45.962   72.500    0.000    0.000    0.000
0.000          0.000          Automatic  Member "21BY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     22AP    12   30.985      L/r   36.400     Shear  126  12.25   30.985     36.400     54.375   41.087   44.391    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   41.087   44.391    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   41.087   44.391    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   41.087   44.391    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   41.087   44.391    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   41.087   44.391    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   41.087   44.391    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   41.087   44.391    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   40.925   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   40.925   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   40.925   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   40.925   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   40.925   38.516    0.000    0.000    0.000
0.000          0.000           Automatic
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23BX	13	22.542	L/r	27.300	Shear	147	14.07	22.542	27.300	40.781	40.925	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	40.925	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	40.925	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	41.087	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	41.087	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	41.087	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	41.087	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	41.087	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	41.087	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	41.087	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	41.087	36.250	0.000	0.000	0.000	0.000	0.000	Automatic	
25AP	**15**	**33.799**	**L/r**	**37.133**	**Net Sect**	**128**	**14.10**	**33.799**	**63.700**	**95.156**	**37.133**	**74.632**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic**	**Member "25AP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
25AX	**15**	**33.799**	**L/r**	**37.133**	**Net Sect**	**128**	**14.10**	**33.799**	**63.700**	**95.156**	**37.133**	**74.632**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic**	**Member "25AX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
25AXY	**15**	**33.799**	**L/r**	**37.133**	**Net Sect**	**128**	**14.10**	**33.799**	**63.700**	**95.156**	**37.133**	**74.632**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic**	**Member "25AXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
25AY	**15**	**33.799**	**L/r**	**37.133**	**Net Sect**	**128**	**14.10**	**33.799**	**63.700**	**95.156**	**37.133**	**74.632**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic**	**Member "25AY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
25BP	**15**	**33.799**	**L/r**	**37.133**	**Net Sect**	**128**	**14.10**	**33.799**	**63.700**	**95.156**	**37.133**	**74.632**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic**	**Member "25BP" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
25BX	**15**	**33.799**	**L/r**	**37.133**	**Net Sect**	**128**	**14.10**	**33.799**	**63.700**	**95.156**	**37.133**	**74.632**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic**	**Member "25BX" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
25BXY	**15**	**33.799**	**L/r**	**37.133**	**Net Sect**	**128**	**14.10**	**33.799**	**63.700**	**95.156**	**37.133**	**74.632**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic**	**Member "25BXY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
25BY	**15**	**33.799**	**L/r**	**37.133**	**Net Sect**	**128**	**14.10**	**33.799**	**63.700**	**95.156**	**37.133**	**74.632**	**0.000**	**0.000**	**0.000**	**0.000**	**0.000**	**Automatic**	**Member "25BY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**
26AP	16	4.044	L/r	18.125	Rupture	257	16.85	4.044	18.200	20.391	18.827	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	18.827	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	18.827	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	18.827	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	18.827	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	18.827	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	18.827	18.125	0.000	0.000	0.000				

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0.000          0.000          Automatic
     26BY    16   4.044       L/r  18.125  Rupture  257  16.85   4.044   18.200   20.391   18.827   18.125   0.000   0.000   0.000
0.000          0.000          Automatic
     27AP    17   6.420       L/r  24.887  Net Sect 265  19.19   6.420   36.400   54.375   24.887   48.333   0.000   0.000   0.000
0.000          0.000          Automatic
     27AX    17   6.420       L/r  24.887  Net Sect 265  19.19   6.420   36.400   54.375   24.887   48.333   0.000   0.000   0.000
0.000          0.000          Automatic
    27AXY    17   6.420       L/r  24.887  Net Sect 265  19.19   6.420   36.400   54.375   24.887   48.333   0.000   0.000   0.000
0.000          0.000          Automatic
     27AY    17   6.420       L/r  24.887  Net Sect 265  19.19   6.420   36.400   54.375   24.887   48.333   0.000   0.000   0.000
0.000          0.000          Automatic
     27BP    17   6.420       L/r  24.887  Net Sect 265  19.19   6.420   36.400   54.375   24.887   48.333   0.000   0.000   0.000
0.000          0.000          Automatic
     27BX    17   6.420       L/r  24.887  Net Sect 265  19.19   6.420   36.400   54.375   24.887   48.333   0.000   0.000   0.000
0.000          0.000          Automatic
    27BXY    17   6.420       L/r  24.887  Net Sect 265  19.19   6.420   36.400   54.375   24.887   48.333   0.000   0.000   0.000
0.000          0.000          Automatic
     27BY    17   6.420       L/r  24.887  Net Sect 265  19.19   6.420   36.400   54.375   24.887   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   47.739   60.417   0.000   0.000   0.000
0.000          0.000          Automatic  Member "28AP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     28AX    18  11.489       L/r  45.500    Shear  205  15.32  11.489   45.500   67.969   47.739   60.417   0.000   0.000   0.000
0.000          0.000          Automatic  Member "28AX" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    28AXY    18  11.489       L/r  45.500    Shear  205  15.32  11.489   45.500   67.969   47.739   60.417   0.000   0.000   0.000
0.000          0.000          Automatic Member "28AXY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     28AY    18  11.489       L/r  45.500    Shear  205  15.32  11.489   45.500   67.969   47.739   60.417   0.000   0.000   0.000
0.000          0.000          Automatic  Member "28AY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     28BP    18  11.489       L/r  45.500    Shear  205  15.32  11.489   45.500   67.969   47.739   60.417   0.000   0.000   0.000
0.000          0.000          Automatic  Member "28BP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     28BX    18  11.489       L/r  45.500    Shear  205  15.32  11.489   45.500   67.969   47.739   60.417   0.000   0.000   0.000
0.000          0.000          Automatic  Member "28BX" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    28BXY    18  11.489       L/r  45.500    Shear  205  15.32  11.489   45.500   67.969   47.739   60.417   0.000   0.000   0.000
0.000          0.000          Automatic Member "28BXY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     28BY    18  11.489       L/r  45.500    Shear  205  15.32  11.489   45.500   67.969   47.739   60.417   0.000   0.000   0.000
0.000          0.000          Automatic  Member "28BY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     29AP    19  25.652       L/r  44.975  Net Sect 136  28.52  25.652   45.500   67.969   44.975   53.634   0.000   0.000   0.000
0.000          0.000          Automatic
     29AX    19  25.652       L/r  44.975  Net Sect 136  28.52  25.652   45.500   67.969   44.975   53.634   0.000   0.000   0.000
0.000          0.000          Automatic
    29AXY    19  25.652       L/r  44.975  Net Sect 136  28.52  25.652   45.500   67.969   44.975   53.634   0.000   0.000   0.000
0.000          0.000          Automatic
     29AY    19  25.652       L/r  44.975  Net Sect 136  28.52  25.652   45.500   67.969   44.975   53.634   0.000   0.000   0.000
0.000          0.000          Automatic
     29BP    19  25.652       L/r  44.975  Net Sect 136  28.52  25.652   45.500   67.969   44.975   53.634   0.000   0.000   0.000
0.000          0.000          Automatic
     29BX    19  25.652       L/r  44.975  Net Sect 136  28.52  25.652   45.500   67.969   44.975   53.634   0.000   0.000   0.000
0.000          0.000          Automatic
    29BXY    19  25.652       L/r  44.975  Net Sect 136  28.52  25.652   45.500   67.969   44.975   53.634   0.000   0.000   0.000
0.000          0.000          Automatic
     29BY    19  25.652       L/r  44.975  Net Sect 136  28.52  25.652   45.500   67.969   44.975   53.634   0.000   0.000   0.000
0.000          0.000          Automatic
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30AP	20a	9.100	0.000	Shear	7.024	Automatic	Rupture	105	6.00	13.441	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
30AY	20a	9.100	0.000	Shear	7.024	Automatic	Rupture	105	6.00	13.441	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
30BP	20a	9.100	0.000	Shear	7.024	Automatic	Rupture	105	6.00	13.441	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
30BX	20a	9.100	0.000	Shear	7.024	Automatic	Rupture	105	6.00	13.441	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
31P	20	4.027	0.000	L/r	7.024	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
31Y	20	4.027	0.000	L/r	7.024	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
32P	20	4.027	0.000	L/r	7.432	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.432	0.000	0.000	0.000	0.000
32X	20	4.027	0.000	L/r	7.432	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.432	0.000	0.000	0.000	0.000
33P	20	4.027	0.000	L/r	7.024	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
33Y	20	4.027	0.000	L/r	7.024	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
34P	20	4.027	0.000	L/r	7.432	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.432	0.000	0.000	0.000	0.000
34X	20	4.027	0.000	L/r	7.432	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.432	0.000	0.000	0.000	0.000
35P	20	4.027	0.000	L/r	7.024	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
35Y	20	4.027	0.000	L/r	7.024	Automatic	Rupture	210	6.00	4.027	9.100	10.195	15.911	7.024	0.000	0.000	0.000	0.000
36P	36	16.800	0.000	Shear	14.864	Automatic	Rupture	134	6.00	19.743	16.800	20.391	35.999	14.864	0.000	0.000	0.000	0.000
36X	36	16.800	0.000	Shear	14.864	Automatic	Rupture	134	6.00	19.743	16.800	20.391	35.999	14.864	0.000	0.000	0.000	0.000
37AP	21	27.300	0.000	Shear	27.300	Automatic	Shear	149	15.74	27.341	27.300	40.781	49.025	36.250	0.000	0.000	0.000	0.000
37AY	21	27.300	0.000	Shear	27.300	Automatic	Shear	149	15.74	27.341	27.300	40.781	49.025	36.250	0.000	0.000	0.000	0.000
37BP	21	27.300	0.000	Shear	27.300	Automatic	Shear	149	15.74	27.341	27.300	40.781	49.025	36.250	0.000	0.000	0.000	0.000
37BX	21	27.300	0.000	Shear	27.300	Automatic	Shear	149	15.74	27.341	27.300	40.781	49.025	36.250	0.000	0.000	0.000	0.000
38AP	22	11.503	0.000	L/r	18.125	Automatic	Rupture	193	9.57	11.503	18.200	20.391	31.139	18.125	0.000	0.000	0.000	0.000
38AX	22	11.503	0.000	L/r	18.125	Automatic	Rupture	193	9.57	11.503	18.200	20.391	31.139	18.125	0.000	0.000	0.000	0.000
38AXY	22	11.503	0.000	L/r	18.125	Automatic	Rupture	193	9.57	11.503	18.200	20.391	31.139	18.125	0.000	0.000	0.000	0.000
38AY	22	11.503	0.000	L/r	18.125	Automatic	Rupture	193	9.57	11.503	18.200	20.391	31.139	18.125	0.000	0.000	0.000	0.000
38BP	22	11.503	0.000	L/r	18.125	Automatic	Rupture	193	9.57	11.503	18.200	20.391	31.139	18.125	0.000	0.000	0.000	0.000
38BX	22	11.503	0.000	L/r	18.125	Automatic	Rupture	193	9.57	11.503	18.200	20.391	31.139	18.125	0.000	0.000	0.000	0.000
38BXY	22	11.503	0.000	L/r	18.125	Automatic	Rupture	193	9.57	11.503	18.200	20.391	31.139	18.125	0.000	0.000	0.000	0.000
38BY	22	11.503	0.000	L/r	18.125	Automatic	Rupture	193	9.57	11.503	18.200	20.391	31.139	18.125	0.000	0.000	0.000	0.000
39AP	23	18.200	0.000	Shear	18.200	Automatic	Shear	173	9.56	21.560	18.200	27.187	41.087	24.167	0.000	0.000	0.000	0.000
39AX	23	18.200		Shear	18.200		Shear	173	9.56	21.560	18.200	27.187	41.087	24.167	0.000	0.000	0.000	

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0.000              0.000          Automatic
   39AXY      23   18.200      Shear   18.200     Shear  173    9.56   21.560     18.200     27.187   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   41.087   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   49.187   25.677    0.000     0.000     0.000
0.000              0.000          Automatic   Member "40P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     40X      24   13.386      L/r   18.200      Shear  234  13.53   13.386     18.200     27.187   49.187   25.677    0.000     0.000     0.000
0.000              0.000          Automatic   Member "40X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
    40XY      24   13.386      L/r   18.200      Shear  234  13.53   13.386     18.200     27.187   49.187   25.677    0.000     0.000     0.000
0.000              0.000          Automatic  Member "40XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     40Y      24   13.386      L/r   18.200      Shear  234  13.53   13.386     18.200     27.187   49.187   25.677    0.000     0.000     0.000
0.000              0.000          Automatic   Member "40Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     41P      24   13.399      L/r   18.200      Shear  234  13.52   13.399     18.200     27.187   49.187   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   49.187   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   49.187   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   49.187   25.677    0.000     0.000     0.000
0.000              0.000          Automatic
     42P AngleR     9.100      Shear    9.100     Shear  130    4.24   15.869      9.100     13.594   24.887    9.366    0.000     0.000     0.000
0.000              0.000          Automatic
     42X AngleR     9.100      Shear    9.100     Shear  130    4.24   15.869      9.100     13.594   24.887    9.366    0.000     0.000     0.000
0.000              0.000          Automatic
    42XY AngleR     9.100      Shear    9.100     Shear  130    4.24   15.869      9.100     13.594   24.887    9.366    0.000     0.000     0.000
0.000              0.000          Automatic
     42Y AngleR     9.100      Shear    9.100     Shear  130    4.24   15.869      9.100     13.594   24.887    9.366    0.000     0.000     0.000
0.000              0.000          Automatic
    43AP      26   12.587      L/r   13.170    Rupture  129    4.24   12.587     18.200     20.391   18.827   13.170    0.000     0.000     0.000
0.000              0.000          Automatic
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43AX	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43AXY	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43AY	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43BP	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43BX	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43BXY	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43BY	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43CP	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43CX	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43CXY	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
43CY	26	12.587	0.000	L/r Automatic	13.170	Rupture	129	4.24	12.587	18.200	20.391	18.827	13.170	0.000	0.000	0.000	0.000
44P	27	16.678	0.000	L/r Automatic	18.125	Rupture	116	8.22	16.678	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44Y	27	16.678	0.000	L/r Automatic	18.125	Rupture	116	8.22	16.678	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44AP	27	16.678	0.000	L/r Automatic	18.125	Rupture	116	8.22	16.678	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44AY	27	16.678	0.000	L/r Automatic	18.125	Rupture	116	8.22	16.678	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44BP	27	14.533	0.000	L/r Automatic	18.125	Rupture	128	9.13	14.533	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44BY	27	14.533	0.000	L/r Automatic	18.125	Rupture	128	9.13	14.533	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44CP	27	14.533	0.000	L/r Automatic	18.125	Rupture	128	9.13	14.533	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44CY	27	14.533	0.000	L/r Automatic	18.125	Rupture	128	9.13	14.533	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44DP	27	16.678	0.000	L/r Automatic	18.125	Rupture	116	8.22	16.678	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44DY	27	16.678	0.000	L/r Automatic	18.125	Rupture	116	8.22	16.678	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44EP	27	16.678	0.000	L/r Automatic	18.125	Rupture	116	8.22	16.678	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
44EY	27	16.678	0.000	L/r Automatic	18.125	Rupture	116	8.22	16.678	18.200	20.391	19.030	18.125	0.000	0.000	0.000	0.000
45P	28	18.200	0.000	Shear Automatic	18.200	Shear	111	6.00	35.407	18.200	27.187	41.087	24.167	0.000	0.000	0.000	0.000
45AP	28	18.200	0.000	Shear Automatic	18.200	Shear	111	6.00	35.407	18.200	27.187	41.087	24.167	0.000	0.000	0.000	0.000
45BP	28	18.200	0.000	Shear Automatic	18.200	Shear	111	6.00	35.407	18.200	27.187	41.087	24.167	0.000	0.000	0.000	0.000
46P	29	7.736	0.000	L/r Automatic	13.577	Rupture	202	14.78	7.736	18.200	20.391	18.908	13.577	0.000	0.000	0.000	0.000
46X	29	7.736	0.000	L/r Automatic	13.577	Rupture	202	14.78	7.736	18.200	20.391	18.908	13.577	0.000	0.000	0.000	0.000
46XY	29	7.736	0.000	L/r Automatic	13.577	Rupture	202	14.78	7.736	18.200	20.391	18.908	13.577	0.000	0.000	0.000	0.000
46Y	29	7.736		L/r	13.577	Rupture	202	14.78	7.736	18.200	20.391	18.908	13.577	0.000	0.000	0.000	

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0.000          0.000         Automatic
      47P    30    5.767       L/r   13.577   Rupture  201  13.25    5.767     18.200     20.391   19.030   13.577    0.000    0.000    0.000
0.000          0.000         Automatic
      47Y    30    5.767       L/r   13.577   Rupture  201  13.25    5.767     18.200     20.391   19.030   13.577    0.000    0.000    0.000
0.000          0.000         Automatic
     47AP    30    5.486       L/r   15.209   Rupture  206  13.59    5.486     18.200     20.391   19.030   15.209    0.000    0.000    0.000
0.000          0.000         Automatic
     47AY    30    5.486       L/r   15.209   Rupture  206  13.59    5.486     18.200     20.391   19.030   15.209    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   31.139   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   31.139   18.125    0.000    0.000    0.000
0.000          0.000         Automatic
     48AP    31    8.140       L/r   14.801   Rupture  196  15.32    8.140     18.200     20.391   31.139   14.801    0.000    0.000    0.000
0.000          0.000         Automatic
     48AY    31    8.140       L/r   14.801   Rupture  196  15.32    8.140     18.200     20.391   31.139   14.801    0.000    0.000    0.000
0.000          0.000         Automatic
      49P    30    5.767       L/r   13.985   Rupture  201  13.25    5.767     18.200     20.391   19.030   13.985    0.000    0.000    0.000
0.000          0.000         Automatic
      49Y    30    5.767       L/r   13.985   Rupture  201  13.25    5.767     18.200     20.391   19.030   13.985    0.000    0.000    0.000
0.000          0.000         Automatic
     49AP    30    5.486       L/r   14.801   Rupture  206  13.59    5.486     18.200     20.391   19.030   14.801    0.000    0.000    0.000
0.000          0.000         Automatic
     49AY    30    5.486       L/r   14.801   Rupture  206  13.59    5.486     18.200     20.391   19.030   14.801    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   37.802   18.125    0.000    0.000    0.000
0.000          0.000         Automatic   Member "50P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      50X    32   18.200     Shear   18.125   Rupture  143  14.07   21.867     18.200     27.187   37.802   18.125    0.000    0.000    0.000
0.000          0.000         Automatic   Member "50X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     50XY    32   18.200     Shear   18.125   Rupture  143  14.07   21.867     18.200     27.187   37.802   18.125    0.000    0.000    0.000
0.000          0.000         Automatic  Member "50XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      50Y    32   18.200     Shear   18.125   Rupture  143  14.07   21.867     18.200     27.187   37.802   18.125    0.000    0.000    0.000
0.000          0.000         Automatic   Member "50Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     50AP    32   18.200     Shear   18.200     Shear  122   6.00   27.975     18.200     27.187   39.417   21.146    0.000    0.000    0.000
0.000          0.000         Automatic  Member "50AP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     50AY    32   18.200     Shear   18.200     Shear  122   6.00   27.975     18.200     27.187   39.417   21.146    0.000    0.000    0.000
0.000          0.000         Automatic  Member "50AY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      51P    33   32.661       L/r   34.020  Net Sect  111  11.64   32.661     36.400     54.375   34.020   42.647    0.000    0.000    0.000
0.000          0.000         Automatic   Member "51P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      51Y    33   32.661       L/r   34.020  Net Sect  111  11.64   32.661     36.400     54.375   34.020   42.647    0.000    0.000    0.000
0.000          0.000         Automatic   Member "51Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     51AP    33   31.965       L/r   36.400     Shear  114   6.00   31.965     36.400     54.375   37.918   42.647    0.000    0.000    0.000
0.000          0.000         Automatic  Member "51AP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     51AY    33   31.965       L/r   36.400     Shear  114   6.00   31.965     36.400     54.375   37.918   42.647    0.000    0.000    0.000
0.000          0.000         Automatic  Member "51AY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     51BP    33   27.300     Shear   27.300     Shear  107   5.62   33.416     27.300     40.781   34.800   31.985    0.000    0.000    0.000
0.000          0.000         Automatic  Member "51BP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
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     51BY      33   27.300      Shear   27.300      Shear  107    5.62    33.416       27.300      40.781   34.800   31.985     0.000     0.000     0.000
0.000              0.000            Automatic  Member "51BY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     51CP      33   33.416        L/r   36.400      Shear  107    5.63    33.416       36.400      54.375   38.683   42.647     0.000     0.000     0.000
0.000              0.000            Automatic  Member "51CP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     51CY      33   33.416        L/r   36.400      Shear  107    5.63    33.416       36.400      54.375   38.683   42.647     0.000     0.000     0.000
0.000              0.000            Automatic  Member "51CY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      52P      34   41.627        L/r   45.500      Shear  106   14.07    41.627       45.500      67.969   47.765   60.417     0.000     0.000     0.000
0.000              0.000            Automatic   Member "52P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      52Y      34   41.627        L/r   45.500      Shear  106   14.07    41.627       45.500      67.969   47.765   60.417     0.000     0.000     0.000
0.000              0.000            Automatic   Member "52Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     52AP      34   45.317        L/r   35.539    Rupture   91    6.00    45.317       45.500      67.969   52.721   35.539     0.000     0.000     0.000
0.000              0.000            Automatic  Member "52AP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     52AY      34   45.317        L/r   35.539    Rupture   91    6.00    45.317       45.500      67.969   52.721   35.539     0.000     0.000     0.000
0.000              0.000            Automatic  Member "52AY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     52BP      34   42.220        L/r   45.500      Shear  104    6.88    42.220       45.500      67.969   51.718   71.078     0.000     0.000     0.000
0.000              0.000            Automatic  Member "52BP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     52BY      34   42.220        L/r   45.500      Shear  104    6.88    42.220       45.500      67.969   51.718   71.078     0.000     0.000     0.000
0.000              0.000            Automatic  Member "52BY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     52CP      34   42.220        L/r   48.043   Net Sect  104    6.88    42.220       54.600      81.562   48.043   63.970     0.000     0.000     0.000
0.000              0.000            Automatic  Member "52CP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     52CY      34   42.220        L/r   48.043   Net Sect  104    6.88    42.220       54.600      81.562   48.043   63.970     0.000     0.000     0.000
0.000              0.000            Automatic  Member "52CY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      53P      33   32.661        L/r   34.020   Net Sect  111   11.64    32.661       36.400      54.375   34.020   42.647     0.000     0.000     0.000
0.000              0.000            Automatic   Member "53P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      53Y      33   32.661        L/r   34.020   Net Sect  111   11.64    32.661       36.400      54.375   34.020   42.647     0.000     0.000     0.000
0.000              0.000            Automatic   Member "53Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     53AP      33   31.965        L/r   36.400      Shear  114    6.00    31.965       36.400      54.375   40.925   42.647     0.000     0.000     0.000
0.000              0.000            Automatic  Member "53AP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     53AY      33   31.965        L/r   36.400      Shear  114    6.00    31.965       36.400      54.375   40.925   42.647     0.000     0.000     0.000
0.000              0.000            Automatic  Member "53AY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     53BP      33   27.300      Shear   27.300      Shear  107    5.62    33.416       27.300      40.781   35.356   31.985     0.000     0.000     0.000
0.000              0.000            Automatic  Member "53BP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     53BY      33   27.300      Shear   27.300      Shear  107    5.62    33.416       27.300      40.781   35.356   31.985     0.000     0.000     0.000
0.000              0.000            Automatic  Member "53BY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     53CP      33   33.416        L/r   36.400      Shear  107    5.63    33.416       36.400      54.375   38.237   42.647     0.000     0.000     0.000
0.000              0.000            Automatic  Member "53CP" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
     53CY      33   33.416        L/r   36.400      Shear  107    5.63    33.416       36.400      54.375   38.237   42.647     0.000     0.000     0.000
0.000              0.000            Automatic  Member "53CY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
      54P      35    8.154        L/r    9.100      Shear  169    6.00     8.154        9.100      10.195   22.067    9.629     0.000     0.000     0.000
```

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0.000          0.000            Automatic
     54X    35    8.154       L/r    9.100    Shear  169   6.00    8.154     9.100    10.195   22.067    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            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                                                                        Unable to calculate
rupture capacity for member "g106P" because it has a long and short edge distance of 0.  ??
   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
```

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    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 Label	Dead Load (kips)	X-Drag Area (ft^2)	Y-Drag Area (ft^2)
1P	0.117	5.752	4.127
2P	0.0615	3.558	2.426
3P	0.116	7.249	6.160
4P	0.213	10.554	9.179
5P	0.222	10.953	9.394
6P	0.315	12.098	10.143
7P	0.351	11.891	10.802
8P	0.433	14.318	13.381
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	0.117	7.249	6.224
3XY	0.117	7.249	6.224
3Y	0.116	7.249	6.160
4X	0.218	10.789	8.992
4XY	0.213	10.476	8.835
4Y	0.208	10.242	9.023
5X	0.222	10.953	9.482
5XY	0.222	10.953	9.482
5Y	0.222	10.953	9.394
6X	0.326	12.528	10.018

6XY	0.321	12.216	9.861
6Y	0.31	11.786	9.986
7X	0.352	11.891	10.866
7XY	0.352	11.891	10.866
7Y	0.351	11.891	10.802
8X	0.438	14.553	13.193
8XY	0.432	14.240	13.037
8Y	0.427	14.006	13.224
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	158.944
2	26.071	728.141	730.724	227.007	321.570
Total	37.007	1148.254	1068.534	366.789	480.514

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
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 "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. ??

*** 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	2P	C-EX1	No Limit
13	4P	C-EX1	No Limit
14	6P	C-EX1	No Limit
15	8P	C-EX1	No Limit
16	10S	C-EX1	No Limit
17	12S	C-EX1	No Limit
18	13S	C-EX1	No Limit
19	14S	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

*** Loads Data

Loads from file: j:\jobs\1500100.wi\017 - greenwich 3 ct\backup documentation\calcs\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 Tubular Arms and Towers	SF for Guys and Cables	SF for Insuls.	SF For Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	Joint Displ.
NESC Heavy	1.5000	2.5000	1.00000	1.0000	1.0000	1.0000	28 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	28 loads	NESC 2007	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	1148	9666	0	Shield Wire
16P	1148	9666	0	Shield Wire
17P	151	7276	7000	Conductor - Back
17Y	2275	7178	-7000	Conductor - Ahead
18P	151	7276	7000	Conductor - Back
18Y	2275	7178	-7000	Conductor - Ahead
19P	151	7276	7000	Conductor - Back
19Y	2275	7178	-7000	Conductor - Ahead
23P	2426	14454	0	Conductor
24P	2426	14454	0	Conductor
25P	2426	14454	0	Conductor
37P	6929	564	0	Sprint Antennas
36P	2483	1038	0	Verizon Antennas
37P	1035	99	0	Coax Cable on Powermount
35P	736	95	0	Coax Cable on Powermount
34P	1380	178	0	Coax Cable on Powermount
33P	1288	167	0	Coax Cable on Powermount
32P	2702	349	0	Coax Cable on Powermount
31P	2748	355	0	Coax Cable on Powermount
30P	2989	387	0	Coax Cable on Powermount

2P	471	176	0	Coax Cable on Tower
4P	588	219	0	Coax Cable on Tower
6P	645	241	0	Coax Cable on Tower
8P	678	253	0	Coax Cable on Tower
10S	763	285	0	Coax Cable on Tower
12S	673	251	0	Coax Cable on Tower
13S	611	228	0	Coax Cable on Tower
14S	1495	558	0	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	3.350	5324.6	0.00	3.350	0.0	0	17225
2	84.75	-4.25	40.25	10.00	10.00	3.500	11254.9	0.00	3.500	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	333	5774	361	Shield Wire
16P	333	5774	361	Shield Wire
17P	64	5168	4571	Conductor - Back
17Y	968	4164	-3778	Conductor - Ahead
18P	64	5168	4571	Conductor - Back
18Y	968	4164	-3778	Conductor - Ahead
19P	64	5168	4571	Conductor - Back
19Y	968	4164	-3778	Conductor - Ahead
23P	1033	9332	793	Conductor
24P	1033	9332	793	Conductor
25P	1033	9332	793	Conductor
37P	3191	2276	0	Sprint Antennas
36P	1070	4034	0	Verizon Antennas
37P	281	283	0	Coax Cable on Powermount
35P	200	302	0	Coax Cable on Powermount
34P	374	565	0	Coax Cable on Powermount
33P	349	528	0	Coax Cable on Powermount
32P	733	1107	0	Coax Cable on Powermount
31P	746	1126	0	Coax Cable on Powermount
30P	811	1225	0	Coax Cable on Powermount
2P	128	580	0	Coax Cable on Tower
4P	159	722	0	Coax Cable on Tower
6P	175	793	0	Coax Cable on Tower
8P	184	834	0	Coax Cable on Tower
10S	207	938	0	Coax Cable on Tower
12S	183	827	0	Coax Cable on Tower
13S	166	752	0	Coax Cable on Tower
14S	406	1838	0	Coax Cable on Tower

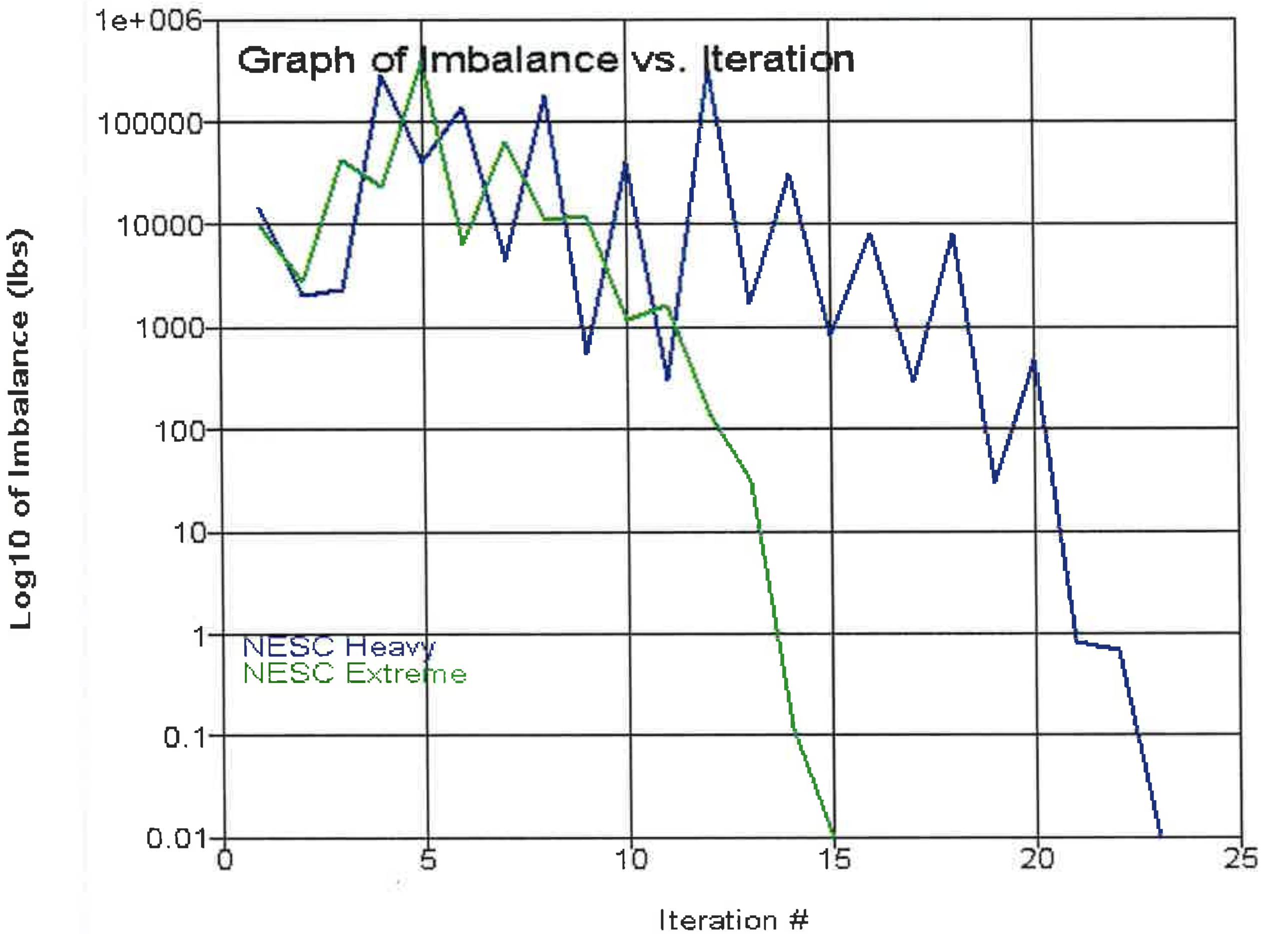
Section Load Case Information (Code) for "NESC Extreme":

Section Total	Z	Z	Ave.	Res.	Tran	Tran	Tran	Tran	Tran	Tran	Tran	Tran	Long	Long	Long	Long	Long	Long	Long	Long	Ice

Label	Top of (ft)	Bottom of (ft)	Elev. Above Ground (ft)	Adj. Wind Pres. (psf)	Adj. Wind Pres. (psf)	Angle Face Area (ft^2)	Round Face Area (ft^2)	Gross Area (ft^2)	Solidity Ratio	Angle Drag Coef	Round Drag Coef	Wind Load (lbs)	Adj. Wind Pres. (psf)	Angle Face Area (ft^2)	Round Face Area (ft^2)	Gross Area (ft^2)	Solidity Ratio	Angle Drag Coef	Round Drag Coef	Wind Load (lbs)	Weight (lbs)	Weight (lbs)
1	143.75	84.75	114.25	32.59	32.59	105.88	68.96	309.15	0.566	3.200	2.000	15534.6	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 91.11% for Angle "3P" in load case "NESC Extreme"
Maximum insulator usage is 29.57% for Clamp "10" 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	23.68	0.000	-11.664	-10.438	-11.664
1	1X	23.10	11.197	0.000	10.155	11.197
1	1XY	21.45	10.395	0.000	8.921	10.395
1	1Y	21.34	0.000	-10.510	-9.631	-10.510

1	2P	24.97	0.000	-12.300	-11.590	-12.300
1	2X	22.16	10.739	0.000	9.476	10.739
1	2XY	20.67	10.016	0.000	8.225	10.016
1	2Y	21.98	0.000	-10.825	-10.301	-10.825
1	3P	91.11	0.000	-29.896	-26.256	-29.896
1	3X	72.66	26.447	0.000	22.862	26.447
1	3XY	72.66	26.449	0.000	21.976	26.449
1	3Y	85.18	0.000	-27.951	-26.890	-27.951
2	4P	59.65	0.000	-54.405	-52.287	-54.405
2	4X	48.48	48.702	0.000	47.217	48.702
2	4XY	50.25	50.486	0.000	45.872	50.486
2	4Y	57.31	0.000	-52.271	-52.271	-51.233
2	5P	85.15	0.000	-84.368	-84.368	-83.780
2	5X	76.63	76.980	0.000	76.980	74.093
2	5XY	79.01	79.374	0.000	75.632	79.374
2	5Y	87.04	0.000	-86.243	-86.243	-79.426
3	6P	50.75	0.000	-126.688	-126.688	-120.733
3	6X	49.61	116.917	0.000	116.917	106.640
3	6XY	49.14	115.812	0.000	115.812	115.604
3	6Y	51.16	0.000	-127.708	-127.708	-112.622
3	7P	67.14	0.000	-167.612	-167.612	-157.203
3	7X	66.37	156.422	0.000	156.422	138.477
3	7XY	65.78	155.041	0.000	155.041	150.729
3	7Y	68.17	0.000	-170.177	-170.177	-145.272
4	8P	63.90	0.000	-195.947	-195.947	-181.561
4	8X	62.18	181.463	0.000	181.463	156.865
4	8XY	62.21	181.554	0.000	181.554	173.328
4	8Y	64.58	0.000	-198.019	-198.019	-165.962
4	9P	68.51	0.000	-210.086	-210.086	-192.301
4	9X	66.33	193.572	0.000	193.572	165.408
4	9XY	66.44	193.874	0.000	193.874	184.195
4	9Y	69.28	0.000	-212.448	-212.448	-175.631
4	10P	71.81	0.000	-209.121	-209.121	-191.585
4	10X	65.13	189.653	0.000	189.653	160.677
4	10XY	65.38	190.385	0.000	190.385	180.255
4	10Y	72.28	0.000	-210.490	-210.490	-174.170
5	11P	62.96	0.000	-211.016	-211.016	-192.025
5	11X	56.62	191.158	0.000	191.158	164.425
5	11XY	56.84	191.876	0.000	191.876	183.178
5	11Y	63.38	0.000	-212.421	-212.421	-175.096
5	12P	60.07	0.000	-218.645	-214.196	-218.645
5	12X	51.07	172.424	0.000	172.424	131.255
5	12XY	51.59	174.164	0.000	174.164	159.916
5	12Y	59.00	0.000	-214.762	-214.762	-190.586
5	13P	61.23	0.000	-222.873	-219.851	-222.873
5	13X	48.06	162.247	0.000	162.247	121.484
5	13XY	48.45	163.556	0.000	163.556	149.038
5	13Y	59.95	0.000	-218.227	-218.227	-194.921
5	14P	61.79	0.000	-224.898	-224.898	-223.751
5	14X	50.47	170.377	0.000	170.377	134.491
5	14XY	50.34	169.942	0.000	169.942	158.883
5	14Y	60.35	0.000	-219.680	-219.680	-195.343
6	15AP	76.04	13.736	0.000	11.571	13.736
6	15AX	87.42	0.000	-13.666	-11.327	-13.666
6	15AXY	63.92	0.000	-9.993	-9.471	-9.993
6	15AY	58.00	10.476	0.000	10.367	10.476
6	15BP	10.93	1.975	0.000	0.954	1.975
6	15BX	24.55	0.000	-2.863	-1.466	-2.863
6	15BXY	8.96	0.356	-1.045	-1.045	0.356

6	15BY	3.14	0.568	0.000	0.568	0.148
7	16AP	64.38	11.668	0.000	8.553	11.668
7	16AX	86.15	0.000	-12.322	-9.138	-12.322
7	16AXY	72.51	0.000	-10.371	-10.215	-10.371
7	16AY	57.84	10.483	0.000	9.641	10.483
7	16BP	5.90	0.000	-0.785	-0.785	-0.497
7	16BX	2.40	0.436	-0.196	0.436	-0.196
7	16BXY	12.89	2.337	0.000	0.830	2.337
7	16BY	14.12	0.000	-1.878	-1.075	-1.878
8	17AP	49.93	22.500	0.000	22.500	19.458
8	17AX	57.81	0.000	-22.902	-22.902	-20.376
8	17AXY	52.88	0.000	-20.947	-20.947	-17.135
8	17AY	47.24	21.290	0.000	21.290	18.120
8	17BP	3.98	0.000	-1.165	-0.902	-1.165
8	17BX	2.28	0.664	-0.903	0.664	-0.903
8	17BXY	7.80	3.513	0.000	0.629	3.513
8	17BY	5.17	0.000	-1.512	-0.846	-1.512
9	18AP	49.28	17.938	0.000	17.938	16.618
9	18AX	55.42	0.000	-18.144	-18.144	-17.598
9	18AXY	59.94	0.000	-19.623	-19.623	-15.532
9	18AY	54.92	19.989	0.000	19.989	16.627
9	18BP	2.01	0.138	-0.477	-0.477	0.138
9	18BX	6.41	0.073	-2.099	0.073	-2.099
9	18BXY	5.11	1.861	0.000	0.100	1.861
9	18BY	1.74	0.000	-0.413	-0.413	-0.164
10	19AP	54.35	32.851	0.000	32.851	28.462
10	19AX	54.57	0.000	-33.399	-33.399	-29.444
10	19AXY	51.47	0.000	-31.502	-31.502	-24.944
10	19AY	51.65	31.219	0.000	31.219	25.688
10	19BP	6.05	3.654	0.000	3.654	2.723
10	19BX	11.34	0.000	-5.580	-3.141	-5.580
10	19BXY	5.71	0.408	-2.810	-2.810	0.408
10	19BY	5.74	3.469	0.000	3.469	3.154
10	20AP	51.37	31.047	0.000	31.047	27.329
10	20AX	52.27	0.000	-31.989	-31.989	-29.593
10	20AXY	53.16	0.000	-32.538	-32.538	-24.949
10	20AY	52.72	31.863	0.000	31.863	26.415
10	20BP	15.77	0.000	-7.761	-7.761	-7.039
10	20BX	11.44	6.913	0.000	6.913	3.603
10	20BXY	15.86	9.588	0.000	7.227	9.588
10	20BY	16.10	0.000	-7.925	-7.925	-6.647
11	21AP	2.95	1.356	0.000	1.356	0.394
11	21AX	7.15	0.000	-3.168	-3.168	-1.956
11	21AXY	5.93	2.099	-2.513	-2.513	2.099
11	21AY	4.21	0.000	-1.868	-0.041	-1.868
11	21BP	24.40	0.000	-10.340	-10.340	-8.315
11	21BX	23.24	10.683	0.000	10.683	7.978
11	21BXY	27.03	12.424	0.000	12.221	12.424
11	21BY	26.77	0.000	-11.342	-11.342	-11.292
12	22AP	2.41	0.877	0.000	0.877	0.544
12	22AX	4.13	0.000	-1.279	-1.134	-1.279
12	22AXY	1.64	0.598	-0.279	-0.279	0.598
12	22AY	5.77	0.265	-1.789	0.265	-1.789
12	22BP	12.54	4.566	0.000	4.204	4.566
12	22BX	17.56	0.000	-5.440	-5.075	-5.440
12	22BXY	13.06	0.000	-4.047	-4.047	-2.583
12	22BY	9.84	3.584	0.000	3.584	2.563
13	23AP	11.99	3.273	0.000	0.861	3.273
13	23AX	6.14	0.000	-1.385	-1.385	-0.753

13	23AXY	4.01	0.484	-0.904	-0.904	0.484
13	23AY	1.84	0.502	0.000	0.092	0.502
13	23BP	1.74	0.137	-0.392	-0.392	0.137
13	23BX	4.14	1.131	0.000	1.131	0.154
13	23BXY	8.47	2.312	0.000	1.886	2.312
13	23BY	6.55	0.000	-1.476	-1.091	-1.476
14	24AP	3.01	0.823	0.000	0.823	0.186
14	24AX	21.68	0.000	-4.647	-1.635	-4.647
14	24AXY	8.79	0.000	-1.884	-0.987	-1.884
14	24AY	1.52	0.416	-0.322	0.416	-0.322
14	24BP	4.07	0.000	-0.872	-0.872	-0.456
14	24BX	6.23	0.000	-1.335	-1.015	-1.335
14	24BXY	1.85	0.504	-0.377	-0.377	0.504
14	24BY	6.96	0.000	-1.491	-1.036	-1.491
15	25AP	77.83	28.900	0.000	1.726	28.900
15	25AX	52.23	19.393	-1.788	-1.788	19.393
15	25AXY	28.08	10.426	-2.165	-2.165	10.426
15	25AY	39.16	14.542	-0.093	-0.093	14.542
15	25BP	5.61	0.000	-1.895	-1.895	-1.226
15	25BX	60.85	22.596	0.000	22.596	18.791
15	25BXY	59.01	21.913	0.000	21.913	16.837
15	25BY	3.58	1.328	0.000	0.283	1.328
16	26AP	24.53	4.446	0.000	4.446	0.674
16	26AX	21.08	3.821	0.000	3.821	3.214
16	26AXY	22.30	4.042	0.000	4.012	4.042
16	26AY	11.42	2.070	0.000	2.070	0.608
16	26BP	16.16	2.929	0.000	0.000	2.929
16	26BX	37.95	6.878	0.000	6.254	6.878
16	26BXY	40.15	7.277	0.000	6.543	7.277
16	26BY	18.17	3.293	0.000	0.450	3.293
17	27AP	0.00	0.000	0.000	0.000	0.000
17	27AX	56.67	14.105	0.000	5.325	14.105
17	27AXY	35.86	8.925	0.000	3.691	8.925
17	27AY	0.00	0.000	0.000	0.000	0.000
17	27BP	38.50	0.000	-2.472	-2.472	0.000
17	27BX	27.24	6.780	0.000	6.780	2.679
17	27BXY	25.20	6.270	0.000	6.270	4.027
17	27BY	0.00	0.000	0.000	0.000	0.000
18	28AP	63.27	28.786	0.000	3.427	28.786
18	28AX	72.85	0.000	-8.369	-8.369	0.000
18	28AXY	35.67	0.000	-4.098	-4.098	0.000
18	28AY	29.20	13.286	-1.398	-1.398	13.286
18	28BP	3.71	0.000	-0.426	0.000	-0.426
18	28BX	30.79	14.010	0.000	14.010	12.658
18	28BXY	26.85	12.219	0.000	12.219	11.307
18	28BY	0.00	0.000	0.000	0.000	0.000
19	29AP	20.44	0.000	-5.243	-5.243	-0.092
19	29AX	76.77	34.526	0.000	7.287	34.526
19	29AXY	40.22	18.089	0.000	2.132	18.089
19	29AY	11.17	0.000	-2.864	-2.864	-0.156
19	29BP	3.53	1.588	-0.407	-0.407	1.588
19	29BX	48.12	21.642	0.000	21.642	20.296
19	29BXY	43.98	19.779	0.000	19.779	19.114
19	29BY	5.30	2.382	-0.033	-0.033	2.382
20a	30AP	18.64	0.000	-1.696	-1.696	-0.623
20a	30AY	19.70	0.000	-1.792	-1.792	-0.427
20a	30BP	7.85	0.551	0.000	0.551	0.316
20a	30BX	3.32	0.233	-0.046	0.233	-0.046
20	31P	14.97	1.052	0.000	1.052	0.935

20	31Y	37.47	2.632	0.000	2.632	1.048
20	32P	16.13	1.199	0.000	1.199	1.193
20	32X	16.18	1.202	0.000	1.202	0.160
20	33P	22.11	1.553	0.000	1.553	1.192
20	33Y	49.94	3.508	0.000	3.508	1.320
20	34P	2.46	0.183	0.000	0.096	0.183
20	34X	24.04	1.786	0.000	1.786	0.740
20	35P	18.10	1.272	0.000	1.172	1.272
20	35Y	35.19	2.472	0.000	2.472	0.511
36	36P	67.36	0.000	-11.316	-11.316	-10.028
36	36X	84.60	12.576	0.000	12.576	10.800
21	37AP	49.49	0.005	-13.512	0.005	-13.512
21	37AY	26.72	0.542	-7.295	0.542	-7.295
21	37BP	6.39	1.744	0.000	1.671	1.744
21	37BX	54.27	0.000	-14.816	-14.816	-11.930
22	38AP	26.32	0.000	-3.028	-3.028	-2.920
22	38AX	26.09	0.090	-3.001	-3.001	0.090
22	38AXY	15.52	0.000	-1.786	-1.786	-0.409
22	38AY	28.55	0.000	-3.284	-3.079	-3.284
22	38BP	22.95	0.115	-2.640	0.115	-2.640
22	38BX	35.32	0.000	-4.063	-3.706	-4.063
22	38BXY	37.78	0.000	-4.345	-3.894	-4.345
22	38BY	27.10	0.000	-3.118	-1.349	-3.118
23	39AP	37.90	0.000	-6.898	-3.675	-6.898
23	39AX	14.50	2.639	0.000	0.037	2.639
23	39AXY	4.17	0.758	-0.291	-0.291	0.758
23	39AY	27.45	0.000	-4.995	-3.075	-4.995
23	39BP	3.18	0.580	0.000	0.580	0.078
23	39BX	19.75	0.000	-3.594	-3.594	-1.303
23	39BXY	18.48	0.000	-3.363	-3.363	-2.001
23	39BY	3.18	0.578	0.000	0.234	0.578
23	39C1P	27.60	5.024	0.000	0.748	5.024
23	39C1Y	13.05	2.375	-0.180	-0.180	2.375
23	F39C197P	23.85	4.341	0.000	0.721	4.341
23	F39C197Y	9.01	1.641	-0.208	-0.208	1.641
23	39C2P	15.61	2.841	0.000	0.368	2.841
23	39C2X	47.17	8.585	0.000	7.028	8.585
23	F39C2118P	15.82	2.879	0.000	0.368	2.879
23	F39C2118X	47.27	8.602	0.000	7.029	8.602
24	40P	15.30	2.784	0.000	2.036	2.784
24	40X	19.73	0.000	-2.641	-2.165	-2.641
24	40XY	8.99	0.000	-1.203	-0.359	-1.203
24	40Y	5.13	0.934	-0.080	-0.080	0.934
24	41P	5.32	0.969	-0.033	-0.033	0.969
24	41X	7.47	0.000	-1.001	-0.177	-1.001
24	41XY	1.97	0.000	-0.264	-0.062	-0.264
24	41Y	0.80	0.000	-0.107	-0.107	-0.014
AngleR	42P	27.29	0.000	-2.483	-0.848	-2.483
AngleR	42X	40.54	3.689	0.000	0.858	3.689
AngleR	42XY	36.41	0.000	-3.314	-0.579	-3.314
AngleR	42Y	35.46	3.227	0.000	1.151	3.227
26	43AP	10.31	1.358	0.000	0.563	1.358
26	43AX	3.84	0.000	-0.484	-0.139	-0.484
26	43AXY	6.52	0.859	0.000	0.618	0.859
26	43AY	5.22	0.000	-0.657	-0.099	-0.657
26	43BP	4.21	0.000	-0.530	-0.290	-0.530
26	43BX	5.18	0.682	0.000	0.424	0.682
26	43BXY	6.13	0.000	-0.771	-0.366	-0.771
26	43BY	7.16	0.943	0.000	0.408	0.943

26	43CP	8.41	0.000	-1.059	-1.059	-0.937
26	43CX	7.28	0.958	0.000	0.736	0.958
26	43CXY	11.69	0.000	-1.471	-1.455	-1.471
26	43CY	7.90	1.040	0.000	0.550	1.040
27	44P	8.95	0.000	-1.492	-1.192	-1.492
27	44Y	6.99	0.000	-1.166	-1.166	-0.341
27	44AP	6.46	1.170	0.000	1.170	0.344
27	44AY	8.11	1.470	0.000	1.185	1.470
27	44BP	5.21	0.000	-0.758	-0.282	-0.758
27	44BY	2.87	0.520	-0.255	-0.255	0.520
27	44CP	3.33	0.293	-0.485	0.293	-0.485
27	44CY	4.24	0.769	0.000	0.312	0.769
27	44DP	3.46	0.000	-0.577	-0.187	-0.577
27	44DY	3.06	0.554	-0.172	-0.172	0.554
27	44EP	3.21	0.201	-0.536	0.201	-0.536
27	44EY	3.31	0.599	0.000	0.218	0.599
28	45P	37.58	6.840	0.000	6.840	4.147
28	45AP	37.33	6.794	0.000	6.794	4.077
28	45BP	33.74	6.141	0.000	6.141	3.516
29	46P	25.02	0.000	-1.935	-1.935	-1.067
29	46X	24.77	0.000	-1.916	-1.916	-0.880
29	46XY	25.43	0.000	-1.967	-1.967	-0.618
29	46Y	24.45	0.000	-1.891	-1.891	-0.407
30	47P	3.24	0.441	0.000	0.317	0.441
30	47Y	31.60	4.291	0.000	4.291	2.186
30	47AP	14.53	2.210	0.000	2.210	1.390
30	47AY	15.83	2.408	0.000	2.408	0.785
31	48P	3.44	0.623	0.000	0.561	0.623
31	48Y	31.69	5.743	0.000	5.743	2.892
31	48AP	20.69	3.062	0.000	3.062	1.047
31	48AY	22.02	3.259	0.000	3.259	1.849
30	49P	3.50	0.490	0.000	0.369	0.490
30	49Y	31.12	4.352	0.000	4.352	2.224
30	49AP	16.57	2.452	0.000	2.452	0.968
30	49AY	15.84	2.344	0.000	2.344	1.317
32	50P	37.41	6.780	0.000	6.780	3.201
32	50X	17.51	0.000	-3.186	-3.186	-3.157
32	50XY	17.03	0.000	-3.100	-3.100	-1.600
32	50Y	37.39	6.778	0.000	6.778	4.387
32	50AP	6.70	1.220	0.000	1.220	0.578
32	50AY	7.09	1.291	0.000	1.291	1.231
33	51P	28.95	0.000	-9.456	-9.456	-7.768
33	51Y	29.34	0.000	-9.583	-9.583	-4.038
33	51AP	3.08	0.000	-0.983	-0.983	-0.916
33	51AY	9.35	0.000	-2.990	-2.990	-0.153
33	51BP	26.05	7.111	0.000	7.111	4.154
33	51BY	14.78	4.036	0.000	3.716	4.036
33	51CP	18.83	6.854	0.000	6.854	4.634
33	51CY	9.45	3.438	0.000	3.438	2.965
34	52P	24.73	0.000	-10.296	-10.296	-7.805
34	52Y	25.05	0.000	-10.427	-10.427	-4.685
34	52AP	2.87	0.000	-1.301	-1.301	-1.047
34	52AY	9.08	0.000	-4.113	-4.113	-0.999
34	52BP	15.25	6.938	0.000	6.938	3.777
34	52BY	7.88	3.585	0.000	2.186	3.585
34	52CP	13.58	6.524	0.000	6.524	4.269
34	52CY	4.52	2.170	0.000	1.737	2.170
33	53P	29.56	0.000	-9.655	-9.655	-7.390
33	53Y	29.16	0.000	-9.523	-9.523	-4.505

33	53AP	5.19	0.000	-1.658	-1.272	-1.658
33	53AY	9.44	0.000	-3.017	-3.017	-0.248
33	53BP	28.37	7.746	0.000	7.746	4.731
33	53BY	16.90	4.614	0.000	4.338	4.614
33	53CP	16.89	6.147	0.000	6.147	3.997
33	53CY	7.45	2.711	0.000	2.711	2.323
35	54P	19.88	0.221	-1.621	-1.621	0.221
35	54X	7.72	0.702	-0.311	0.702	-0.311
Pwmnt	g99P	7.56	0.000	-33.038	-33.038	-12.848
Pwmnt	g100P	5.21	0.000	-27.935	-27.935	-11.263
Pwmnt	g101P	8.72	0.000	-22.684	-22.684	-9.952
Pwmnt	g102P	3.28	0.000	-17.706	-17.706	-7.926
Pwmnt	g103P	2.84	0.000	-15.370	-15.370	-6.807
Pwmnt	g104P	2.43	0.000	-12.899	-12.899	-5.717
Pwmnt	g105P	2.01	0.000	-11.343	-11.343	-4.763
Plate	g106P	5.46	0.396	-0.918	0.396	-0.918
PMBR1	g107P	4.75	0.070	-0.484	0.070	-0.484
PMBR1	g108P	0.61	0.014	-0.063	-0.063	0.014
PMBR1	g109P	4.02	0.000	-0.410	-0.410	-0.322
BraceR	g110P	42.99	5.844	0.000	2.689	5.844
BraceR	g110X	59.19	0.000	-8.046	-1.793	-8.046
PMBR2	g111P	33.07	0.000	-3.371	-0.509	-3.371
PMBR2	g111X	24.10	2.457	0.000	0.699	2.457
PMBR2	g112P	12.53	1.277	0.000	0.547	1.277
PMBR2	g112X	14.37	0.000	-1.465	-0.862	-1.465
PMBR2	g113P	6.83	0.697	0.000	0.411	0.697
PMBR2	g113X	12.01	0.000	-1.225	-1.118	-1.225
PMBR3	g114P	0.93	0.085	-0.095	-0.095	0.085
PMBR4	g115P	1.73	0.235	0.000	0.235	0.131
PMBR4	g116P	13.57	1.844	0.000	0.902	1.844
PMBR4	g116X	15.03	0.000	-2.043	-1.488	-2.043
PMBR4	g117P	2.80	0.106	-0.381	0.106	-0.381
PMBR5	g118P	0.29	0.005	-0.040	0.005	-0.040
PMBR5	g120P	8.49	0.000	-1.155	-0.560	-1.155
PMBR5	g120X	8.05	1.094	-0.017	-0.017	1.094
Pwmnt	g121P	1.49	0.000	-8.297	-8.297	-3.589

*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 23

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	-0.001193	0.7907	-0.05612	-0.8493	-0.0144	0.0519	2.999	3.791	128.7
2P	-0.0006806	0.722	-0.05464	-0.9103	-0.0288	0.0515	2.999	3.722	124.2
3P	0.002274	0.6495	-0.05299	-0.9033	0.0031	0.0503	3.002	3.65	119.7
4P	-0.001477	0.547	-0.04849	-0.7926	-0.0468	0.0496	2.999	3.547	112.8
5P	0.002591	0.4386	-0.0438	-0.7437	0.0450	0.0458	3.003	3.439	104.8
6P	-0.002602	0.3651	-0.03853	-0.6413	-0.0395	0.0447	2.997	3.365	98.71
7P	0.002193	0.2893	-0.03417	-0.5953	0.0230	0.0384	3.002	3.289	91.72
8P	-0.004769	0.2236	-0.02864	-0.4517	0.0035	0.0324	2.995	3.224	84.72
15P	0	0	0	0.0000	0.0000	0.0000	15.44	15.44	0
16P	-0.01278	0.7887	-0.2762	-0.9456	-0.0123	0.0502	-0.01278	17.54	128.5
17P	-0.01047	0.5475	-0.2146	-0.8243	-0.0472	0.0290	2.99	14.8	112.6
18P	-0.01434	0.3657	-0.2075	-0.6750	-0.0396	0.0389	2.986	17.12	98.54
19P	-0.01301	0.2248	-0.1371	-0.5518	0.0035	0.0434	2.987	14.47	84.61
20AP	-0.007229	0.03767	-0.005363	-0.0263	0.0274	0.0316	9.561	0.03767	39.99
20BP	-0.01305	0.03261	-0.03045	-0.2200	-0.0463	0.0440	-0.01305	9.601	39.97
21P	0.2084	-0.002328	0.02471	0.0000	0.0000	0.0000	11.98	2.206	25.02
22P	0.01062	-0.2045	-0.02554	0.0000	0.0000	0.0000	2.219	11.57	24.97
23P	0.01075	0.5493	0.1904	-0.8105	0.0044	0.0386	0.01075	-13.7	113
24P	0.01178	0.367	0.1825	-0.6592	0.0069	0.0425	0.01178	-16.38	98.93
25P	0.008588	0.225	0.1169	-0.5392	0.0071	0.0451	0.008588	-14.02	84.87
26P	-0.007002	0.5473	-0.1323	-0.8642	-0.0469	0.0501	2.993	9.172	112.7
27P	-0.009163	0.3654	-0.1244	-0.7268	-0.0394	0.0532	2.991	10.24	98.63
28P	-0.008732	0.2244	-0.08208	-0.5773	0.0035	0.0440	2.991	8.849	84.67
29P	0	0	0	0.0000	0.0000	0.0000	1.5	0	-4.25
30P	-0.001223	0.03248	-0.002468	-0.0293	-0.0217	0.0085	1.499	0.03248	25
31P	-0.007204	0.03387	-0.003532	-0.0263	-0.0158	0.0179	1.493	0.03387	40
32P	-0.001835	0.2224	-0.006503	-0.4900	0.0097	0.0382	1.498	0.2224	84.74
33P	-0.0003788	0.3643	-0.00785	-0.6711	0.0049	0.0399	1.5	0.3643	98.74
34P	0.0006791	0.5455	-0.009569	-0.7891	0.0042	0.0404	1.501	0.5455	112.7
35P	0.001456	0.7891	-0.01195	-1.0117	0.0028	0.0409	1.501	0.7891	128.7
36P	0.001673	0.9014	-0.01317	-1.1154	0.0029	0.0409	1.502	0.9014	134.7
37P	0.001994	1.081	-0.01516	-1.1589	0.0029	0.0409	1.502	1.081	143.7
1X	0.003876	0.7912	0.0343	-0.8487	-0.0007	0.0447	3.004	-2.209	128.8
1XY	0.003699	0.786	0.03442	-0.8563	0.0250	0.0452	-2.996	-2.214	128.8
1Y	-0.0007764	0.7855	-0.05558	-0.8686	-0.0070	0.0434	-3.001	3.786	128.7
2X	0.003375	0.7232	0.03388	-0.9101	0.0388	0.0429	3.003	-2.277	124.3
2XY	0.0033	0.7179	0.03412	-0.8997	-0.0358	0.0460	-2.997	-2.282	124.3
2Y	-0.0008622	0.7166	-0.05417	-0.8922	0.0409	0.0409	-3.001	3.717	124.2
3X	-0.0001559	0.6498	0.03361	-0.9112	0.0043	0.0422	3	-2.35	119.8
3XY	0.006956	0.6458	0.03394	-0.8992	-0.0011	0.0453	-2.993	-2.354	119.8
3Y	-0.005056	0.6461	-0.05267	-0.8912	0.0118	0.0396	-3.005	3.646	119.7
4X	0.00309	0.5477	0.03109	-0.7941	0.0538	0.0400	3.003	-2.452	112.8
4XY	0.00269	0.5435	0.03155	-0.7950	-0.0449	0.0455	-2.997	-2.457	112.8
4Y	-0.001875	0.5426	-0.04806	-0.7923	0.0527	0.0366	-3.002	3.543	112.8
5X	-0.002381	0.4385	0.02827	-0.7409	-0.0345	0.0387	2.998	-2.561	104.8
5XY	0.006964	0.4343	0.02883	-0.7416	0.0452	0.0442	-2.993	-2.566	104.8
5Y	-0.006947	0.435	-0.04338	-0.7486	-0.0354	0.0382	-3.007	3.435	104.8
6X	0.00203	0.3656	0.02431	-0.6418	0.0496	0.0361	3.002	-2.634	98.77
6XY	0.001436	0.3611	0.02495	-0.6438	-0.0365	0.0449	-2.999	-2.639	98.77
6Y	-0.002632	0.3604	-0.03799	-0.6412	0.0489	0.0377	-3.003	3.36	98.71

7X	-0.004189	0.2892	0.02109	-0.5955	-0.0077	0.0315	2.996	-2.711	91.77
7XY	0.006159	0.2847	0.02176	-0.5952	0.0210	0.0470	-2.994	-2.715	91.77
7Y	-0.008561	0.2852	-0.03361	-0.5943	-0.0121	0.0401	-3.009	3.285	91.72
8X	0.001233	0.224	0.01652	-0.4489	0.0049	0.0265	3.001	-2.776	84.77
8XY	-0.0008635	0.2195	0.01724	-0.4490	0.0102	0.0493	-3.001	-2.78	84.77
8Y	-0.002879	0.219	-0.02799	-0.4549	0.0086	0.0420	-3.003	3.219	84.72
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	0.01567	0.7913	0.2412	-0.8682	0.0111	0.0516	0.01567	-15.96	129
17Y	-0.0113	0.5421	-0.2215	-0.8799	0.0533	0.0705	-3.011	14.79	112.6
18Y	-0.01516	0.3597	-0.2184	-0.7451	0.0493	0.0690	-3.015	17.11	98.53
19Y	-0.01376	0.2193	-0.1431	-0.6018	0.0087	0.0576	-3.014	14.47	84.61
20AY	-0.007255	0.0269	-0.002564	-0.0263	0.0154	0.0452	-9.575	0.0269	40
20BX	-0.0015	0.03281	0.0139	-0.1442	0.0026	0.0426	-0.0015	-9.535	40.01
21X	0.1077	0.01146	0.01475	0.0000	0.0000	0.0000	11.88	-2.197	25.01
21XY	-0.03162	0.001813	0.005195	0.0000	0.0000	0.0000	-11.8	-2.206	25.01
21Y	0.06892	-0.01013	-0.01764	0.0000	0.0000	0.0000	-11.7	2.198	24.98
22X	-0.001403	0.1219	-0.003367	0.0000	0.0000	0.0000	2.207	-11.65	25
22XY	-0.001013	0.03255	0.009966	-0.0812	-0.0053	-0.0030	-2.209	-11.74	25.01
22Y	0.01951	0.03898	-0.004665	0.0054	-0.0108	-0.1555	-2.188	11.81	25
26Y	-0.005166	0.5424	-0.1343	-0.9071	0.0528	0.0440	-3.005	9.167	112.7
27Y	-0.007534	0.3601	-0.1275	-0.7807	0.0490	0.0507	-3.008	10.24	98.62
28Y	-0.008077	0.2192	-0.08357	-0.6148	0.0086	0.0581	-3.008	8.844	84.67
9S	-0.0001054	0.173	-0.02954	-0.3236	-0.0115	0.0393	4.137	4.311	76.97
10S	-0.006585	0.1329	-0.03019	-0.2658	0.0159	0.0414	5.269	5.408	69.22
11S	-0.005017	0.1012	-0.02848	-0.2042	-0.0146	0.0361	6.408	6.514	61.47
12S	-0.01063	0.06985	-0.02727	-0.1642	0.0350	0.0380	7.858	7.939	51.55
13S	-0.01301	0.03674	-0.02464	-0.1729	-0.0524	0.0112	9.556	9.605	39.98
14S	0.008617	-0.004493	-0.01707	-0.0810	-0.0598	0.0072	11.78	11.77	24.98
i0.50E129S	0.00143	0.7882	-0.01259	-0.8584	0.0038	0.0479	0.00143	0.7882	128.8
i0.50E113S	0.0006804	0.5452	-0.009382	-0.7822	0.0041	0.0397	0.0006804	0.5452	112.8
i0.50E99S	-0.0003736	0.3629	-0.007484	-0.6258	0.0028	0.0495	-0.0003736	0.3629	98.74
i0.50E85S	-0.001803	0.2206	-0.006217	-0.4383	0.0026	0.0611	-0.001803	0.2206	84.74
21XF0.50S	-0.001268	0.008325	-0.03076	-0.0293	0.2476	-0.2061	11.77	0.008325	24.97
22PF0.50S	0.01474	-0.08272	-0.08395	0.0000	0.0000	0.0000	0.01474	11.69	24.92
9X	-0.004763	0.1729	0.01804	-0.3250	0.0313	0.0309	4.133	-3.965	77.02
9XY	0.004558	0.1671	0.01906	-0.3242	-0.0162	0.0368	-4.133	-3.971	77.02
9Y	-0.01067	0.1673	-0.02852	-0.3207	0.0258	0.0270	-4.148	4.305	76.97
10X	-0.00142	0.1329	0.01889	-0.2647	-0.0076	0.0362	5.274	-5.142	69.27
10XY	0.0006042	0.126	0.02015	-0.2632	0.0213	0.0236	-5.275	-5.149	69.27
10Y	-0.007459	0.1259	-0.02879	-0.2663	0.0015	0.0183	-5.283	5.401	69.22
11X	-0.002913	0.1012	0.01789	-0.2031	0.0262	0.0306	6.41	-6.312	61.52
11XY	0.001482	0.09319	0.01938	-0.2038	-0.0140	0.0217	-6.411	-6.32	61.52
11Y	-0.01227	0.09317	-0.02672	-0.2032	0.0252	0.0149	-6.425	6.506	61.47
12X	-0.003291	0.06992	0.01651	-0.1668	0.0043	0.0289	7.866	-7.799	51.6
12XY	0.001155	0.06049	0.0183	-0.1680	0.0064	0.0151	-7.868	-7.808	51.6
12Y	-0.01113	0.06059	-0.02499	-0.1660	0.0119	0.0105	-7.88	7.929	51.56
13X	-0.002623	0.03861	0.01497	-0.1330	0.0065	0.0214	9.566	-9.53	40.01
13XY	-0.0003194	0.02785	0.01701	-0.1339	0.0020	0.0127	-9.569	-9.541	40.02
13Y	-0.01263	0.02634	-0.02193	-0.1664	-0.0564	0.0041	-9.581	9.595	39.98
14X	-0.002653	0.01271	0.01113	-0.0646	0.0043	0.0160	11.77	-11.76	25.01
14XY	-0.0003916	0.002389	0.01306	-0.0450	-0.0061	0.0033	-11.77	-11.77	25.01
14Y	0.01961	-0.01031	-0.02167	-0.0586	-0.0631	-0.0079	-11.75	11.76	24.98
21XF0.50Y	-0.0002518	-0.004516	-0.1588	-0.0292	-1.0013	0.2347	-11.77	-0.004516	24.84
22PF0.50X	-0.001321	0.08229	-0.000306	0.0000	0.0000	0.0000	-0.001321	-11.69	25

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	-33.29	0.0	-34.62	0.0	0.0	-226.19	0.0	0.0	231.23	0.0	-2.33	0.0	-1.8	0.0	0.0	-0.81	0.0	0.0
29P	-0.11	0.0	-1.14	0.0	0.0	-34.18	0.0	0.0	34.20	0.0	10.13	0.0	-0.9	0.0	0.0	-0.20	0.0	0.0
15X	35.45	0.0	-31.23	0.0	0.0	191.13	0.0	0.0	196.89	0.0	0.26	0.0	0.1	0.0	0.0	-0.17	0.0	0.0
15XY	-33.84	0.0	-28.33	0.0	0.0	184.59	0.0	0.0	189.79	0.0	-0.79	0.0	0.2	0.0	0.0	0.12	0.0	0.0
15Y	31.79	0.0	-32.76	0.0	0.0	-218.71	0.0	0.0	223.42	0.0	-2.80	0.0	-4.1	0.0	0.0	-0.14	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	-0.0012	0.7907	-0.0561
2P	0.0000	0.1760	-0.5679	0.0000	-0.1760	0.5679	-0.0007	0.7220	-0.0546
3P	0.0000	0.0000	-0.1835	0.0000	0.0000	0.1835	0.0023	0.6495	-0.0530
4P	0.0000	0.2190	-0.9235	-0.0000	-0.2190	0.9235	-0.0015	0.5470	-0.0485
5P	0.0000	0.0000	-0.3493	0.0000	0.0000	0.3493	0.0026	0.4386	-0.0438
6P	0.0000	0.2410	-1.1406	-0.0000	-0.2410	1.1406	-0.0026	0.3651	-0.0385
7P	0.0000	0.0000	-0.5534	0.0000	-0.0000	0.5534	0.0022	0.2893	-0.0342
8P	0.0000	0.2530	-1.3594	-0.0000	-0.2530	1.3594	-0.0048	0.2236	-0.0286
15P	0.0000	0.0000	-1.0248	33.2850	34.6249	-225.1667	0.0000	0.0000	0.0000
16P	0.0000	9.6660	-1.3281	-0.0000	-9.6660	1.3281	-0.0128	0.7887	-0.2762
17P	7.0000	7.2760	-0.2488	-7.0000	-7.2760	0.2488	-0.0105	0.5475	-0.2146
18P	7.0000	7.2760	-0.2778	-7.0000	-7.2760	0.2778	-0.0143	0.3657	-0.2075
19P	7.0000	7.2760	-0.2488	-7.0000	-7.2760	0.2488	-0.0130	0.2248	-0.1371
20AP	0.0000	0.0000	-0.6136	-0.0000	0.0000	0.6136	-0.0072	0.0377	-0.0054
20BP	0.0000	0.0000	-0.6343	-0.0000	0.0000	0.6343	-0.0130	0.0326	-0.0305
21P	0.0000	0.0000	-0.3466	0.0000	-0.0000	0.3466	0.2084	-0.0023	0.0247
22P	0.0000	0.0000	-0.3466	-0.0000	0.0000	0.3466	0.0106	-0.2045	-0.0255
23P	0.0000	14.5365	-2.5839	0.0000	-14.5365	2.5839	0.0108	0.5493	0.1904
24P	0.0000	14.5441	-2.6618	0.0000	-14.5441	2.6618	0.0118	0.3670	0.1825
25P	0.0000	14.5365	-2.5839	0.0000	-14.5365	2.5839	0.0086	0.2250	0.1169
26P	0.0000	0.0000	-0.0835	-0.0000	0.0000	0.0835	-0.0070	0.5473	-0.1323
27P	0.0000	0.0000	-0.1110	-0.0000	-0.0000	0.1110	-0.0092	0.3654	-0.1244
28P	0.0000	0.0000	-0.0835	-0.0000	0.0000	0.0835	-0.0087	0.2244	-0.0821
29P	0.0000	0.5439	-1.1425	0.1100	0.5930	-33.0389	0.0000	0.0000	0.0000
30P	0.0000	1.2098	-4.9616	0.0000	-1.2098	4.9616	-0.0012	0.0325	-0.0025
31P	0.0000	1.4660	-5.2444	-0.0000	-1.4660	5.2444	-0.0072	0.0339	-0.0035
32P	0.0000	1.4302	-5.0159	-0.0000	-1.4302	5.0159	-0.0018	0.2224	-0.0065
33P	0.0000	0.6653	-2.4008	-0.0000	-0.6653	2.4008	-0.0004	0.3643	-0.0079
34P	0.0000	0.7213	-2.5709	-0.0000	-0.7213	2.5709	0.0007	0.5455	-0.0096
35P	0.0000	0.5043	-1.6351	-0.0000	-0.5043	1.6351	0.0015	0.7891	-0.0119
36P	0.0000	1.3050	-3.0689	0.0000	-1.3050	3.0689	0.0017	0.9014	-0.0132
37P	0.0000	0.8232	-8.3155	0.0000	-0.8232	8.3155	0.0020	1.0812	-0.0152
1X	0.0000	0.0775	-0.1848	-0.0000	-0.0775	0.1848	0.0039	0.7912	0.0343
1XY	0.0000	0.0723	-0.1740	-0.0000	-0.0723	0.1740	0.0037	0.7860	0.0344
1Y	0.0000	0.0000	-0.1740	-0.0000	0.0000	0.1740	-0.0008	0.7855	-0.0556
2X	0.0000	0.0813	-0.0969	0.0000	-0.0813	0.0969	0.0034	0.7232	0.0339
2XY	0.0000	0.0813	-0.0969	0.0000	-0.0813	0.0969	0.0033	0.7179	0.0341
2Y	0.0000	0.0000	-0.0969	0.0000	-0.0000	0.0969	-0.0009	0.7166	-0.0542
3X	0.0000	0.1527	-0.1842	0.0000	-0.1527	0.1842	-0.0002	0.6498	0.0336
3XY	0.0000	0.1527	-0.1842	0.0000	-0.1527	0.1842	0.0070	0.6458	0.0339
3Y	0.0000	0.0000	-0.1835	0.0000	-0.0000	0.1835	-0.0051	0.6461	-0.0527
4X	0.0000	0.2091	-0.3433	-0.0000	-0.2091	0.3433	0.0031	0.5477	0.0311

4XY	0.0000	0.2039	-0.3352	-0.0000	-0.2039	0.3352	0.0027	0.5435	0.0316
4Y	0.0000	0.0000	-0.3274	-0.0000	0.0000	0.3274	-0.0019	0.5426	-0.0481
5X	0.0000	0.2434	-0.3502	0.0000	-0.2434	0.3502	-0.0024	0.4385	0.0283
5XY	0.0000	0.2434	-0.3502	0.0000	-0.2434	0.3502	0.0070	0.4343	0.0288
5Y	0.0000	0.0000	-0.3493	0.0000	0.0000	0.3493	-0.0069	0.4350	-0.0434
6X	0.0000	0.2387	-0.5133	-0.0000	-0.2387	0.5133	0.0020	0.3656	0.0243
6XY	0.0000	0.2387	-0.5052	-0.0000	-0.2387	0.5052	0.0014	0.3611	0.0250
6Y	0.0000	0.0000	-0.4875	0.0000	0.0000	0.4875	-0.0026	0.3604	-0.0380
7X	0.0000	0.2859	-0.5541	0.0000	-0.2859	0.5541	-0.0042	0.2892	0.0211
7XY	0.0000	0.2859	-0.5541	0.0000	-0.2859	0.5541	0.0062	0.2847	0.0218
7Y	0.0000	0.0000	-0.5534	0.0000	0.0000	0.5534	-0.0086	0.2852	-0.0336
8X	0.0000	0.3125	-0.6891	-0.0000	-0.3125	0.6891	0.0012	0.2240	0.0165
8XY	0.0000	0.3125	-0.6810	-0.0000	-0.3125	0.6810	-0.0009	0.2195	0.0172
8Y	0.0000	0.0000	-0.6732	-0.0000	-0.0000	0.6732	-0.0029	0.2190	-0.0280
15X	0.0000	0.4392	-1.0248	-35.4502	30.7898	192.1592	0.0000	0.0000	0.0000
15XY	0.0000	0.4392	-1.0248	33.8436	27.8879	185.6159	0.0000	0.0000	0.0000
15Y	0.0000	0.0000	-1.0248	-31.7885	32.7607	-217.6805	0.0000	0.0000	0.0000
16X	0.0000	9.7364	-1.3281	0.0000	-9.7364	1.3281	0.0157	0.7913	0.2412
17Y	-7.0000	7.1780	-2.3728	7.0000	-7.1780	2.3728	-0.0113	0.5421	-0.2215
18Y	-7.0000	7.1780	-2.4018	7.0000	-7.1780	2.4018	-0.0152	0.3597	-0.2184
19Y	-7.0000	7.1780	-2.3728	7.0000	-7.1780	2.3728	-0.0138	0.2193	-0.1431
20AY	0.0000	0.0000	-0.6406	-0.0000	-0.0000	0.6406	-0.0073	0.0269	-0.0026
20BX	0.0000	0.6316	-0.6343	0.0000	-0.6316	0.6343	-0.0015	0.0328	0.0139
21X	0.0000	0.0000	-0.3466	-0.0000	0.0000	0.3466	0.1077	0.0115	0.0148
21XY	0.0000	0.0000	-0.3466	0.0000	-0.0000	0.3466	-0.0316	0.0018	0.0052
21Y	0.0000	0.0000	-0.3466	-0.0000	0.0000	0.3466	0.0689	-0.0101	-0.0176
22X	0.0000	0.3674	-0.3466	-0.0000	-0.3674	0.3466	-0.0014	0.1219	-0.0034
22XY	0.0000	0.3674	-0.4107	0.0000	-0.3674	0.4107	-0.0010	0.0325	0.0100
22Y	0.0000	0.0000	-0.4107	0.0000	-0.0000	0.4107	0.0195	0.0390	-0.0047
26Y	0.0000	0.0000	-0.0835	-0.0000	-0.0000	0.0835	-0.0052	0.5424	-0.1343
27Y	0.0000	0.0000	-0.1110	-0.0000	-0.0000	0.1110	-0.0075	0.3601	-0.1275
28Y	0.0000	0.0000	-0.0835	-0.0000	0.0000	0.0835	-0.0081	0.2192	-0.0836
9S	0.0000	0.0000	-0.6364	0.0000	-0.0000	0.6364	-0.0001	0.1730	-0.0295
10S	0.0000	0.2850	-1.4022	0.0000	-0.2850	1.4022	-0.0066	0.1329	-0.0302
11S	0.0000	0.0000	-0.8152	0.0000	-0.0000	0.8152	-0.0050	0.1012	-0.0285
12S	0.0000	0.2510	-1.8273	0.0000	-0.2510	1.8273	-0.0106	0.0699	-0.0273
13S	0.0000	0.2280	-1.5633	0.0000	-0.2280	1.5633	-0.0130	0.0367	-0.0246
14S	0.0000	0.5580	-2.9698	0.0000	-0.5580	2.9698	0.0086	-0.0045	-0.0171
i0.50E129S	0.0000	0.0126	-0.0607	0.0000	-0.0126	0.0607	0.0014	0.7882	-0.0126
i0.50E113S	0.0000	0.0042	-0.0355	0.0000	-0.0042	0.0355	0.0007	0.5452	-0.0094
i0.50E99S	0.0000	0.0000	-0.0355	-0.0000	-0.0000	0.0355	-0.0004	0.3629	-0.0075
i0.50E85S	0.0000	0.0000	-0.0355	-0.0000	-0.0000	0.0355	-0.0018	0.2206	-0.0062
21XF0.50S	0.0000	0.0000	-0.0699	-0.0000	0.0000	0.0699	-0.0013	0.0083	-0.0308
22PF0.50S	0.0000	0.0000	-0.0230	-0.0000	-0.0000	0.0230	0.0147	-0.0827	-0.0840
9X	0.0000	0.3307	-0.6364	0.0000	-0.3307	0.6364	-0.0048	0.1729	0.0180
9XY	0.0000	0.3307	-0.6364	0.0000	-0.3307	0.6364	0.0046	0.1671	0.0191
9Y	0.0000	0.0000	-0.6364	-0.0000	0.0000	0.6364	-0.0107	0.1673	-0.0285
10X	0.0000	0.3255	-0.6392	0.0000	-0.3255	0.6392	-0.0014	0.1329	0.0189
10XY	0.0000	0.3255	-0.6392	-0.0000	-0.3255	0.6392	0.0006	0.1260	0.0202
10Y	0.0000	0.0000	-0.6392	-0.0000	-0.0000	0.6392	-0.0075	0.1259	-0.0288
11X	0.0000	0.4067	-0.8152	0.0000	-0.4067	0.8152	-0.0029	0.1012	0.0179
11XY	0.0000	0.4067	-0.8152	0.0000	-0.4067	0.8152	0.0015	0.0932	0.0194
11Y	0.0000	0.0000	-0.8152	-0.0000	0.0000	0.8152	-0.0123	0.0932	-0.0267
12X	0.0000	0.5742	-1.1543	0.0000	-0.5742	1.1543	-0.0033	0.0699	0.0165
12XY	0.0000	0.5742	-1.1543	0.0000	-0.5742	1.1543	0.0012	0.0605	0.0183
12Y	0.0000	0.0000	-1.1543	-0.0000	-0.0000	1.1543	-0.0111	0.0606	-0.0250
13X	0.0000	0.4040	-0.9523	0.0000	-0.4040	0.9523	-0.0026	0.0386	0.0150
13XY	0.0000	0.4040	-0.9523	0.0000	-0.4040	0.9523	-0.0003	0.0279	0.0170
13Y	0.0000	0.0000	-0.9523	-0.0000	0.0000	0.9523	-0.0126	0.0263	-0.0219

14X	0.0000	0.6248	-1.4748	-0.0000	-0.6248	1.4748	-0.0027	0.0127	0.0111
14XY	0.0000	0.6248	-1.4748	-0.0000	-0.6248	1.4748	-0.0004	0.0024	0.0131
14Y	0.0000	0.0000	-1.4748	0.0000	0.0000	1.4748	0.0196	-0.0103	-0.0217
21XF0.50Y	0.0000	0.0000	-0.0919	0.0000	-0.0000	0.0919	-0.0003	-0.0045	-0.1588
22PF0.50X	0.0000	0.0322	-0.0230	-0.0000	-0.0322	0.0230	-0.0013	0.0823	-0.0003

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

Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	Original Supported L/R Cap. (kips)	RLX	RLY	RLZ	L/R	KL/R	Curve No.	Alternate Unsupported L/R Cap. (kips)	RLOUT	L/R	KL/R	Curve No.
15BX	15BXY	Long only	-1.47	-1.04	15.63	0.500	0.500	0.500	131.11	128.51	5	11.66	1.000	166.84	148.81	6
15BXY	15BX	Long only	-1.04	-1.47	15.63	0.500	0.500	0.500	131.11	128.51	5	11.66	1.000	166.84	148.81	6
16BP	16BY	Short only	-0.79	-1.07	14.30	0.500	0.500	0.500	129.55	127.32	5	13.31	1.000	139.51	132.00	6
16BY	16BP	Short only	-1.07	-0.79	14.30	0.500	0.500	0.500	129.55	127.32	5	13.31	1.000	139.51	132.00	6
17BP	17BY	Long only	-0.90	-0.85	39.61	0.500	0.750	0.500	100.45	105.33	2	29.26	1.000	133.93	128.57	6
17BY	17BP	Long only	-0.85	-0.90	39.61	0.500	0.750	0.500	100.45	105.33	2	29.26	1.000	133.93	128.57	6
18BP	18BY	Long only	-0.48	-0.41	32.74	0.500	0.750	0.500	104.34	108.25	2	23.74	1.000	139.11	131.75	6
18BY	18BP	Long only	-0.41	-0.48	32.74	0.500	0.750	0.500	104.34	108.25	2	23.74	1.000	139.11	131.75	6
19BX	19BXY	Long only	-3.14	-2.81	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	-2.81	-3.14	61.20	0.500	0.750	0.500	77.55	88.16	2	49.22	1.000	103.40	111.70	3
20BP	20BY	Long only	-7.76	-7.92	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	-7.92	-7.76	61.20	0.500	0.750	0.500	77.55	88.16	2	49.22	1.000	103.40	111.70	3
21AXY	21AY	Short only	-2.51	-0.04	44.33	0.580	0.580	0.580	95.79	101.84	2	42.37	1.000	95.79	107.89	3
21AY	21AXY	Short only	-0.04	-2.51	44.33	0.580	0.580	0.580	95.79	101.84	2	42.37	1.000	95.79	107.89	3
21BP	21BY	Short only	-10.34	-11.34	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	-11.34	-10.34	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 Heavy":

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	9.827	50.00	50.00	19.65
2	9.757	50.00	50.00	19.51
3	10.100	50.00	50.00	20.20
4	10.303	50.00	50.00	20.61
5	10.100	50.00	50.00	20.20
6	10.310	50.00	50.00	20.62
7	10.100	50.00	50.00	20.20
8	10.303	50.00	50.00	20.61
9	14.764	50.00	50.00	29.53
10	14.786	50.00	50.00	29.57
11	14.764	50.00	50.00	29.53
12	0.595	50.00	50.00	1.19
13	0.949	50.00	50.00	1.90
14	1.166	50.00	50.00	2.33
15	1.383	50.00	50.00	2.77
16	1.431	50.00	50.00	2.86
17	1.844	50.00	50.00	3.69
18	1.580	50.00	50.00	3.16
19	3.022	50.00	50.00	6.04

20	5.107	50.00	50.00	10.21
21	5.445	50.00	50.00	10.89
22	5.216	50.00	50.00	10.43
23	2.491	50.00	50.00	4.98
24	2.670	50.00	50.00	5.34
25	1.711	50.00	50.00	3.42
26	3.335	50.00	50.00	6.67
27	8.356	50.00	50.00	16.71

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	0.03637	0.7125	-0.05291	-0.7127	0.0381	0.2306	3.036	3.713	128.7
2P	0.03364	0.6576	-0.05151	-0.8109	0.0246	0.2231	3.034	3.658	124.2
3P	0.03173	0.5856	-0.0498	-0.8909	0.0667	0.2147	3.032	3.586	119.8
4P	0.02157	0.4945	-0.04493	-0.6937	0.0166	0.2027	3.022	3.495	112.8
5P	0.01855	0.4029	-0.04029	-0.6184	0.0908	0.1906	3.019	3.403	104.8
6P	0.008467	0.3418	-0.03519	-0.5274	0.0161	0.1826	3.008	3.342	98.71
7P	0.007143	0.2806	-0.03116	-0.4778	0.0656	0.1717	3.007	3.281	91.72
8P	-0.00434	0.2283	-0.02606	-0.3487	0.0460	0.1609	2.996	3.228	84.72
15P	0	0	0	0.0000	0.0000	0.0000	15.44	15.44	0
16P	-0.01967	0.7002	-0.2233	-0.7318	0.0437	0.2361	-0.01967	17.45	128.6
17P	-0.01661	0.4945	-0.1944	-0.6866	0.0162	0.1805	2.983	14.74	112.6
18P	-0.03627	0.342	-0.1773	-0.5212	0.0160	0.1761	2.964	17.09	98.57
19P	-0.03766	0.229	-0.1137	-0.3851	0.0461	0.1719	2.962	14.48	84.64
20AP	-0.02473	0.118	-0.02041	0.0351	0.1988	0.1712	9.543	0.118	39.98
20BP	-0.05055	0.09316	-0.02013	-0.1799	-0.0302	0.1880	-0.05055	9.661	39.98
21P	-0.3615	0.05127	-0.02868	0.0000	0.0000	0.0000	11.41	2.259	24.97
22P	-0.05961	0.3442	0.01767	0.0000	0.0000	0.0000	2.148	12.11	25.02
23P	0.08325	0.4873	0.1692	-0.7539	0.0625	0.2085	0.08325	-13.76	113
24P	0.07522	0.3347	0.1527	-0.5730	0.0567	0.2046	0.07522	-16.42	98.9
25P	0.05109	0.2215	0.09202	-0.4460	0.0476	0.1974	0.05109	-14.03	84.84
26P	0.00162	0.4944	-0.1234	-0.7968	0.0160	0.1956	3.002	9.119	112.7
27P	-0.01458	0.3419	-0.1106	-0.6262	0.0158	0.1897	2.985	10.22	98.64
28P	-0.02079	0.2287	-0.07265	-0.4863	0.0457	0.1708	2.979	8.854	84.68
29P	0	0	0	0.0000	0.0000	0.0000	1.5	0	-4.25
30P	-0.02015	0.101	-0.001134	-0.0985	-0.0400	0.0587	1.48	0.101	25
31P	-0.02471	0.09768	-0.001563	0.0354	0.0039	0.0893	1.475	0.09768	40
32P	0.005404	0.2237	-0.00288	-0.3789	0.0536	0.1498	1.505	0.2237	84.75
33P	0.01816	0.3374	-0.003629	-0.5613	0.0556	0.1614	1.518	0.3374	98.75
34P	0.03189	0.4886	-0.004694	-0.6234	0.0596	0.1687	1.532	0.4886	112.7
35P	0.04822	0.7071	-0.006426	-1.1592	0.0635	0.1741	1.548	0.7071	128.7
36P	0.05447	0.8476	-0.008148	-1.4718	0.0638	0.1744	1.554	0.8476	134.7
37P	0.06377	1.092	-0.01156	-1.6002	0.0640	0.1745	1.564	1.092	143.7
1X	0.05982	0.713	0.02707	-0.6474	0.0955	0.2268	3.06	-2.287	128.8
1XY	0.05995	0.6882	0.03307	-0.7107	0.0952	0.2287	-2.94	-2.312	128.8
1Y	0.03637	0.6878	-0.04631	-0.7043	0.0275	0.2238	-2.964	3.688	128.8
2X	0.05457	0.6583	0.02637	-0.8280	0.0943	0.2191	3.055	-2.342	124.3
2XY	0.05465	0.6326	0.03246	-0.7919	0.0256	0.2220	-2.945	-2.367	124.3
2Y	0.0336	0.632	-0.045	-0.7937	0.0974	0.2134	-2.966	3.632	124.3
3X	0.04629	0.5858	0.02598	-0.8954	0.0691	0.2121	3.046	-2.414	119.8
3XY	0.05391	0.5642	0.03206	-0.8539	0.0585	0.2137	-2.946	-2.436	119.8
3Y	0.02397	0.564	-0.04348	-0.8469	0.0817	0.2043	-2.976	3.564	119.8
4X	0.04255	0.4951	0.02279	-0.6635	0.1150	0.2001	3.043	-2.505	112.8
4XY	0.04254	0.4744	0.02887	-0.6693	0.0157	0.2016	-2.957	-2.526	112.8
4Y	0.02121	0.474	-0.03891	-0.6830	0.1010	0.1896	-2.979	3.474	112.8
5X	0.02949	0.4028	0.01965	-0.6250	0.0243	0.1879	3.029	-2.597	104.8
5XY	0.03869	0.3829	0.02558	-0.6199	0.0999	0.1901	-2.961	-2.617	104.8
5Y	0.009253	0.3829	-0.03451	-0.6178	0.0184	0.1820	-2.991	3.383	104.8
6X	0.02799	0.3422	0.01572	-0.5204	0.0985	0.1774	3.028	-2.658	98.77
6XY	0.02777	0.3224	0.02135	-0.5182	0.0209	0.1825	-2.972	-2.678	98.77
6Y	0.008442	0.322	-0.02966	-0.5236	0.0908	0.1750	-2.992	3.322	98.72

7X	0.01628	0.2803	0.01268	-0.4794	0.0430	0.1661	3.016	-2.72	91.76
7XY	0.02576	0.2614	0.01802	-0.4741	0.0707	0.1756	-2.974	-2.739	91.77
7Y	-0.002516	0.2613	-0.02588	-0.4713	0.0361	0.1691	-3.003	3.261	91.72
8X	0.0154	0.2287	0.00856	-0.3459	0.0501	0.1545	3.015	-2.771	84.76
8XY	0.01363	0.21	0.01352	-0.3426	0.0526	0.1688	-2.986	-2.79	84.76
8Y	-0.002636	0.2098	-0.02117	-0.3472	0.0474	0.1629	-3.003	3.21	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	0.1183	0.7026	0.1985	-0.7137	0.1031	0.2491	0.1183	-16.05	129
17Y	-0.01708	0.4738	-0.1886	-0.6930	0.1013	0.2099	-3.017	14.72	112.6
18Y	-0.03673	0.3219	-0.1746	-0.5395	0.0910	0.1975	-3.037	17.07	98.58
19Y	-0.03806	0.2103	-0.1095	-0.3904	0.0474	0.1757	-3.038	14.46	84.64
20AY	-0.0247	0.06703	-0.004274	0.0355	-0.0228	0.1933	-9.593	0.06703	40
20BX	0.001037	0.09331	0.002473	-0.0509	0.0173	0.1870	0.001037	-9.475	40
21X	0.1055	0.085	-0.005026	0.0000	0.0000	0.0000	11.88	-2.123	24.99
21XY	-0.05186	0.03966	-0.0004505	0.0000	0.0000	0.0000	-11.82	-2.168	25
21Y	0.08714	0.01799	-0.003544	0.0000	0.0000	0.0000	-11.68	2.226	25
22X	-0.003891	0.1961	-0.01701	0.0000	0.0000	0.0000	2.204	-11.57	24.98
22XY	0.002255	0.09419	-0.001445	0.0210	-0.0774	0.1336	-2.206	-11.68	25
22Y	-0.002478	0.1067	0.01846	0.1831	0.0486	-0.1588	-2.21	11.88	25.02
26Y	0.003022	0.4739	-0.1171	-0.8000	0.1007	0.1907	-2.997	9.099	112.7
27Y	-0.01331	0.322	-0.1058	-0.6401	0.0906	0.1878	-3.013	10.2	98.64
28Y	-0.02046	0.2102	-0.06793	-0.4904	0.0472	0.1854	-3.02	8.835	84.68
9S	-0.00787	0.1938	-0.0263	-0.2322	0.0256	0.1539	4.13	4.331	76.97
10S	-0.02052	0.1675	-0.02638	-0.1722	0.0489	0.1446	5.255	5.443	69.22
11S	-0.02605	0.1503	-0.02414	-0.1348	0.0260	0.1254	6.387	6.563	61.48
12S	-0.039	0.1314	-0.02281	-0.0771	0.0504	0.1140	7.83	8	51.56
13S	-0.05138	0.1179	-0.01863	-0.1628	0.0608	0.0757	9.517	9.687	39.98
14S	-0.06427	0.04708	-0.02024	-0.2598	-0.0686	0.0085	11.71	11.82	24.98
i0.50E129S	0.04803	0.7004	-0.01359	-0.7752	0.0428	0.2326	0.04803	0.7004	128.8
i0.50E113S	0.0319	0.4846	-0.005597	-0.6578	-0.0117	0.1902	0.0319	0.4846	112.8
i0.50E99S	0.01817	0.3321	-0.004321	-0.5111	-0.0230	0.2029	0.01817	0.3321	98.75
i0.50E85S	0.005438	0.2184	-0.003814	-0.3366	-0.0275	0.2016	0.005438	0.2184	84.75
21XF0.50S	-0.02084	0.07906	-0.1103	-0.0993	0.9337	-0.2108	11.75	0.07906	24.89
22PF0.50S	-0.04551	0.4905	-0.1852	0.0000	0.0000	0.0000	-0.04551	12.26	24.81
9X	0.00713	0.1931	0.008096	-0.2280	0.0643	0.1477	4.145	-3.944	77.01
9XY	0.01563	0.1691	0.01431	-0.2280	0.0221	0.1438	-4.122	-3.968	77.01
9Y	-0.01701	0.1688	-0.02014	-0.2329	0.0611	0.1369	-4.155	4.306	76.98
10X	0.007814	0.1681	0.007109	-0.1852	0.0263	0.1379	5.283	-5.107	69.26
10XY	0.009536	0.1378	0.01452	-0.1865	0.0501	0.1205	-5.266	-5.137	69.26
10Y	-0.02139	0.1372	-0.01898	-0.1792	0.0381	0.1151	-5.297	5.412	69.23
11X	0.004199	0.1481	0.004887	-0.1211	0.0514	0.1217	6.417	-6.265	61.5
11XY	0.008457	0.1129	0.01313	-0.1300	0.0138	0.1047	-6.404	-6.3	61.51
11Y	-0.03211	0.1137	-0.01576	-0.1383	0.0543	0.1006	-6.445	6.526	61.48
12X	0.001999	0.1355	0.00129	-0.0784	0.0262	0.1079	7.871	-7.733	51.58
12XY	0.005641	0.09149	0.011	-0.0981	0.0301	0.0835	-7.863	-7.777	51.59
12Y	-0.03946	0.08922	-0.01278	-0.0967	0.0584	0.0834	-7.908	7.958	51.57
13X	-0.0002265	0.1189	-0.001367	-0.0958	0.0325	0.0767	9.568	-9.45	40
13XY	0.002389	0.06807	0.00912	-0.0949	0.0132	0.0690	-9.566	-9.501	40.01
13Y	-0.04956	0.06687	-0.007615	-0.1383	-0.0650	0.0579	-9.618	9.635	39.99
14X	-0.004751	0.08681	-0.003017	-0.1997	0.0128	0.0285	11.77	-11.68	25
14XY	0.00275	0.04067	0.006085	-0.1045	0.0031	0.0505	-11.77	-11.73	25.01
14Y	-0.002115	0.01769	-0.01245	-0.1415	-0.1513	0.0284	-11.77	11.79	24.99
21XF0.50Y	-0.01836	0.02983	-0.2068	-0.0974	-1.3125	0.4288	-11.79	0.02983	24.79
22PF0.50X	-0.003099	0.2335	-0.07686	0.0000	0.0000	0.0000	-0.003099	-11.54	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	-31.49	0.0	-32.19	0.0	0.0	-218.36	0.0	0.0	222.96	0.0	0.83	0.0	7.4	0.0	0.0	0.77	0.0	0.0
29P	0.24	0.0	-2.55	0.0	0.0	-13.38	0.0	0.0	13.62	0.0	31.04	0.0	4.9	0.0	0.0	-1.42	0.0	0.0
15X	33.12	0.0	-39.75	0.0	0.0	179.02	0.0	0.0	186.35	0.0	7.42	0.0	0.7	0.0	0.0	0.55	0.0	0.0
15XY	-34.02	0.0	-34.85	0.0	0.0	187.57	0.0	0.0	193.79	0.0	2.89	0.0	-0.3	0.0	0.0	-0.64	0.0	0.0
15Y	26.67	0.0	-28.25	0.0	0.0	-189.93	0.0	0.0	193.86	0.0	-0.82	0.0	-2.8	0.0	0.0	-0.50	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	0.2633	-0.1946	-0.0000	-0.2633	0.1946	0.0364	0.7125	-0.0529
2P	0.0000	0.8433	-0.3226	0.0000	-0.8433	0.3226	0.0336	0.6576	-0.0515
3P	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0317	0.5856	-0.0498
4P	0.0000	0.9853	-0.3536	0.0000	-0.9853	0.3536	0.0216	0.4945	-0.0449
5P	0.0000	0.2633	-0.1946	-0.0000	-0.2633	0.1946	0.0186	0.4029	-0.0403
6P	0.0000	1.0563	-0.3696	0.0000	-1.0563	0.3696	0.0085	0.3418	-0.0352
7P	0.0000	0.2633	-0.1946	-0.0000	-0.2633	0.1946	0.0071	0.2806	-0.0312
8P	0.0000	1.7858	-0.9051	-0.0000	-1.7858	0.9051	-0.0043	0.2283	-0.0261
15P	0.0000	0.6885	-0.5264	31.4891	31.5055	-217.8349	0.0000	0.0000	0.0000
16P	0.3610	6.0373	-0.5276	-0.3610	-6.0373	0.5276	-0.0197	0.7002	-0.2233
17P	4.5710	5.4313	-0.2586	-4.5710	-5.4313	0.2586	-0.0166	0.4945	-0.1944
18P	4.5710	5.4313	-0.2586	-4.5710	-5.4313	0.2586	-0.0363	0.3420	-0.1773
19P	4.5710	5.4313	-0.2586	-4.5710	-5.4313	0.2586	-0.0377	0.2290	-0.1137
20AP	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0247	0.1180	-0.0204
20BP	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0505	0.0932	-0.0201
21P	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.3615	0.0513	-0.0287
22P	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0596	0.3442	0.0177
23P	0.7930	9.5953	-1.2276	-0.7930	-9.5953	1.2276	0.0833	0.4873	0.1692
24P	0.7930	9.5953	-1.2276	-0.7930	-9.5953	1.2276	0.0752	0.3347	0.1527
25P	0.7930	9.5953	-1.2276	-0.7930	-9.5953	1.2276	0.0511	0.2215	0.0920
26P	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0016	0.4944	-0.1234
27P	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	-0.0146	0.3419	-0.1106
28P	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	-0.0208	0.2287	-0.0726
29P	0.0000	0.6885	-0.5264	-0.2392	1.8658	-12.8546	0.0000	0.0000	0.0000
30P	0.0000	1.9135	-1.3374	-0.0000	-1.9135	1.3374	-0.0202	0.1010	-0.0011
31P	0.0000	1.8145	-1.2724	0.0000	-1.8145	1.2724	-0.0247	0.0977	-0.0016
32P	0.0000	2.0588	-1.4541	0.0000	-2.0588	1.4541	0.0054	0.2237	-0.0029
33P	0.0000	0.7913	-0.5436	-0.0000	-0.7913	0.5436	0.0182	0.3374	-0.0036
34P	0.0000	0.8283	-0.5686	-0.0000	-0.8283	0.5686	0.0319	0.4886	-0.0047
35P	0.0000	0.5653	-0.3946	-0.0000	-0.5653	0.3946	0.0482	0.7071	-0.0064
36P	0.0000	4.2973	-1.2646	0.0000	-4.2973	1.2646	0.0545	0.8476	-0.0081
37P	0.0000	2.8223	-3.6666	0.0000	-2.8223	3.6666	0.0638	1.0924	-0.0116
1X	0.0000	0.2633	-0.1946	-0.0000	-0.2633	0.1946	0.0598	0.7130	0.0271
1XY	0.0000	0.2633	-0.1946	-0.0000	-0.2633	0.1946	0.0600	0.6882	0.0331
1Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0364	0.6878	-0.0463
2X	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0546	0.6583	0.0264
2XY	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0546	0.6326	0.0325
2Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0336	0.6320	-0.0450
3X	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0463	0.5858	0.0260
3XY	0.0000	0.2633	-0.1946	-0.0000	-0.2633	0.1946	0.0539	0.5642	0.0321
3Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0240	0.5640	-0.0435
4X	0.0000	0.2633	-0.1946	-0.0000	-0.2633	0.1946	0.0426	0.4951	0.0228

4XY	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0425	0.4744	0.0289
4Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0212	0.4740	-0.0389
5X	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0295	0.4028	0.0197
5XY	0.0000	0.2633	-0.1946	-0.0000	-0.2633	0.1946	0.0387	0.3829	0.0256
5Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0093	0.3829	-0.0345
6X	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0280	0.3422	0.0157
6XY	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0278	0.3224	0.0214
6Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0084	0.3220	-0.0297
7X	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0163	0.2803	0.0127
7XY	0.0000	0.2633	-0.1946	-0.0000	-0.2633	0.1946	0.0258	0.2614	0.0180
7Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	-0.0025	0.2613	-0.0259
8X	0.0000	0.9518	-0.7211	0.0000	-0.9518	0.7211	0.0154	0.2287	0.0086
8XY	0.0000	0.9518	-0.7211	-0.0000	-0.9518	0.7211	0.0136	0.2100	0.0135
8Y	0.0000	0.9518	-0.7211	-0.0000	-0.9518	0.7211	-0.0026	0.2098	-0.0212
15X	0.0000	0.6885	-0.5264	-33.1232	39.0665	179.5443	0.0000	0.0000	0.0000
15XY	0.0000	0.6885	-0.5264	34.0194	34.1580	188.0987	0.0000	0.0000	0.0000
15Y	0.0000	0.6885	-0.5264	-26.6661	27.5665	-189.4030	0.0000	0.0000	0.0000
16X	0.3610	6.0373	-0.5276	-0.3610	-6.0373	0.5276	0.1183	0.7026	0.1985
17Y	-3.7780	4.4273	-1.1626	3.7780	-4.4273	1.1626	-0.0171	0.4738	-0.1886
18Y	-3.7780	4.4273	-1.1626	3.7780	-4.4273	1.1626	-0.0367	0.3219	-0.1746
19Y	-3.7780	4.4273	-1.1626	3.7780	-4.4273	1.1626	-0.0381	0.2103	-0.1095
20AY	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0247	0.0670	-0.0043
20BX	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	0.0010	0.0933	0.0025
21X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.1055	0.0850	-0.0050
21XY	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0519	0.0397	-0.0005
21Y	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	0.0871	0.0180	-0.0035
22X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0039	0.1961	-0.0170
22XY	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	0.0023	0.0942	-0.0014
22Y	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0025	0.1067	0.0185
26Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0030	0.4739	-0.1171
27Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	-0.0133	0.3220	-0.1058
28Y	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	-0.0205	0.2102	-0.0679
9S	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0079	0.1938	-0.0263
10S	0.0000	1.6265	-0.7334	-0.0000	-1.6265	0.7334	-0.0205	0.1675	-0.0264
11S	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0260	0.1503	-0.0241
12S	0.0000	1.5155	-0.7094	-0.0000	-1.5155	0.7094	-0.0390	0.1314	-0.0228
13S	0.0000	1.4405	-0.6924	-0.0000	-1.4405	0.6924	-0.0514	0.1179	-0.0186
14S	0.0000	2.5265	-0.9324	0.0000	-2.5265	0.9324	-0.0643	0.0471	-0.0202
i0.50E129S	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0480	0.7004	-0.0136
i0.50E113S	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0319	0.4846	-0.0056
i0.50E99S	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0182	0.3321	-0.0043
i0.50E85S	0.0000	0.2633	-0.1946	0.0000	-0.2633	0.1946	0.0054	0.2184	-0.0038
21XF0.50S	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0208	0.0791	-0.1103
22PF0.50S	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0455	0.4905	-0.1852
9X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.0071	0.1931	0.0081
9XY	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	0.0156	0.1691	0.0143
9Y	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0170	0.1688	-0.0201
10X	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	0.0078	0.1681	0.0071
10XY	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.0095	0.1378	0.0145
10Y	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0214	0.1372	-0.0190
11X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.0042	0.1481	0.0049
11XY	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	0.0085	0.1129	0.0131
11Y	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0321	0.1137	-0.0158
12X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.0020	0.1355	0.0013
12XY	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.0056	0.0915	0.0110
12Y	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0395	0.0892	-0.0128
13X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0002	0.1189	-0.0014
13XY	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.0024	0.0681	0.0091
13Y	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0496	0.0669	-0.0076

14X	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0048	0.0868	-0.0030
14XY	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	0.0027	0.0407	0.0061
14Y	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0021	0.0177	-0.0125
21XF0.50Y	0.0000	0.6885	-0.5264	-0.0000	-0.6885	0.5264	-0.0184	0.0298	-0.2068
22PF0.50X	0.0000	0.6885	-0.5264	0.0000	-0.6885	0.5264	-0.0031	0.2335	-0.0769

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

					Original							Alternate				
					Supported							Unsupported				
Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	L/R Cap. (kips)	RLX	RLY	RLZ	L/R	KL/R	Curve No.	L/R Cap. (kips)	RLOUT	L/R	KL/R	Curve No.
15BX	15BXY	Long only	-2.86	0.36	15.63	0.500	0.500	0.500	131.11	128.51	5	11.66	1.000	166.84	148.81	6
16BP	16BY	Short only	-0.50	-1.88	14.30	0.500	0.500	0.500	129.55	127.32	5	13.31	1.000	139.51	132.00	6
16BY	16BP	Short only	-1.88	-0.50	14.30	0.500	0.500	0.500	129.55	127.32	5	13.31	1.000	139.51	132.00	6
17BP	17BY	Long only	-1.16	-1.51	39.61	0.500	0.750	0.500	100.45	105.33	2	29.26	1.000	133.93	128.57	6
17BY	17BP	Long only	-1.51	-1.16	39.61	0.500	0.750	0.500	100.45	105.33	2	29.26	1.000	133.93	128.57	6
19BX	19BXY	Long only	-5.58	0.41	61.20	0.500	0.750	0.500	77.55	88.16	2	49.22	1.000	103.40	111.70	3
20BP	20BY	Long only	-7.04	-6.65	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	-6.65	-7.04	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	-8.31	-11.29	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	-11.29	-8.31	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	6.071	50.00	50.00	12.14
2	6.071	50.00	50.00	12.14
3	7.104	50.00	50.00	14.21
4	5.935	50.00	50.00	11.87
5	7.104	50.00	50.00	14.21
6	5.935	50.00	50.00	11.87
7	7.104	50.00	50.00	14.21
8	5.935	50.00	50.00	11.87
9	9.706	50.00	50.00	19.41
10	9.706	50.00	50.00	19.41
11	9.706	50.00	50.00	19.41
12	0.903	50.00	50.00	1.81
13	1.047	50.00	50.00	2.09
14	1.119	50.00	50.00	2.24
15	2.002	50.00	50.00	4.00
16	1.784	50.00	50.00	3.57
17	1.673	50.00	50.00	3.35
18	1.598	50.00	50.00	3.20
19	2.693	50.00	50.00	5.39
20	2.335	50.00	50.00	4.67
21	2.216	50.00	50.00	4.43
22	2.520	50.00	50.00	5.04
23	0.960	50.00	50.00	1.92
24	1.005	50.00	50.00	2.01
25	0.689	50.00	50.00	1.38

26	4.480	50.00	50.00	8.96
27	4.627	50.00	50.00	9.25

*** 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 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 Comp. Member	Length Comp. (ft)	Curve No.	No. Of Bolts
1	LEG1	SAE	3.5X3.5X0.25	36.0	91.11	Comp	91.11	3P	-29.896	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	87.04	Comp	87.04	5Y	-86.243	NESC Hea	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	68.17	Comp	68.17	7Y	-170.177	NESC Hea	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	72.28	Comp	72.28	10Y	-210.490	NESC Hea	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	63.38	Comp	63.38	11Y	-212.421	NESC Hea	335.162	0.000	0.000	1.000	1.000	1.000	76.95	76.95	10.131	1	0
6	X1	SAE	2.5X2.5X0.1875	36.0	87.42	Comp	87.42	15AX	-13.666	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	86.15	Comp	86.15	16AX	-12.322	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	57.81	Comp	57.81	17AX	-22.902	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	59.94	Comp	59.94	18AXY	-19.623	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	54.57	Comp	54.57	19AX	-33.399	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	27.03	Cross	26.77	21BY	-11.342	NESC Hea	42.374	54.600	81.562	1.000	0.580	0.580	95.79	107.89	10.597	3	6
12	X7	SAU	4X3X0.25	36.0	17.56	Comp	17.56	22BX	-5.440	NESC Ext	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	11.99	Tens	6.55	23BY	-1.476	NESC Ext	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	21.68	Comp	21.68	24AX	-4.647	NESC Ext	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	77.83	Tens	6.41	25AXY	-2.165	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	40.15	Tens	0.00	26BY	0.000		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	56.67	Tens	38.50	27BP	-2.472	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	72.85	Comp	72.85	28AX	-8.369	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	76.77	Tens	20.44	29AP	-5.243	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 49.94  Tens  0.00     35Y    0.000            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 54.27  Comp 54.27    37BX  -14.816NESC 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 37.78  Comp 37.78   38BXY   -4.345NESC 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 47.27  Tens 37.90    39AP   -6.898NESC Ext   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 19.73  Comp 19.73     40X   -2.641NESC 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 11.69  Comp 11.69   43CXY   -1.471NESC Ext   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  8.95  Comp  8.95     44P   -1.492NESC Ext   16.678    18.200    20.391 0.750 0.500 0.500 115.57
116.67  8.224     2     2
   28            H6    SAU          4X3X0.25    36.0 37.58  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 25.43  Comp 25.43    46XY   -1.967NESC 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 31.60  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 31.69  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 37.41  Tens 17.51     50X   -3.186NESC Hea   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 29.56  Comp 29.56     53P   -9.655NESC Hea   32.661    36.400    54.375 0.500 0.500 0.500 110.71
115.36 11.643     3     4
   34            A#    SAE          4X4X0.25    36.0 25.05  Comp 25.05     52Y  -10.427NESC Hea   41.627    45.500    67.969 0.500 0.500 0.500 106.21
113.11 14.073     3     5
   35            H7    SAU     2.5X2X0.1875     36.0 19.88  Comp 19.88     54P   -1.621NESC 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 84.60  Tens 67.36     36P  -11.316NESC Hea   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  8.72  Comp  8.72   g101P  -22.684NESC 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  4.75  Comp  4.75   g107P   -0.484NESC Ext   20.042    16.800    10.195 1.000 1.000 1.000  45.71
82.86  1.501      3     1
  PMBR2 L2.5x2.5x3/16  SAE   2.5X2.5X0.1875     36.0 33.07  Comp 33.07   g111P   -3.371NESC 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  0.93  Comp  0.93   g114P   -0.095NESC 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 15.03  Comp 15.03   g116X   -2.043NESC 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  8.49  Comp  8.49   g120P   -1.155NESC Ext   16.004    16.800    13.594 1.000 1.000 1.000 186.27
186.27 12.340     4     1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize
moments): g118P  ??
   20a           H1    SAE 1.75X1.75X0.1875     36.0 19.70  Comp 19.70    30AY   -1.792NESC 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 40.54  Tens 36.41    42XY   -3.314NESC 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 59.19  Comp 59.19   g110X   -8.046NESC 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  ??
  Plate    6"x3/4" PL  Bar              6x3/4     36.0  5.46  Comp  5.46   g106P   -0.918NESC Ext  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 Label	Group 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.	No. Of Holes	Hole Diameter (in)
1	LEG1	SAE	3.5X3.5X0.25	36.0	91.11	Comp	72.66	3XY	26.449	NESC Ext	48.465	36.400	54.375	60.417	7.000	4	2.000	0.6875
2	LEG2	SAE	6X6X0.3125	36.0	87.04	Comp	79.01	5XY	79.374	NESC Ext	100.462	109.200	203.906	226.562	6.050	12	4.000	0.6875
3	LEG3	SAE	8X8X0.5	36.0	68.17	Comp	66.37	7X	156.422	NESC Hea	235.687	254.800	380.624	422.916	7.000	14	3.500	0.6875
4	LEG4	SAE	8X8X0.625	36.0	72.28	Comp	66.44	9XY	193.874	NESC Hea	291.819	0.000	0.000	0.000	7.915	0	3.500	0.6875
5	LEG5	SAE	8X8X0.75	36.0	63.38	Comp	56.84	11XY	191.876	NESC Hea	337.589	0.000	0.000	0.000	10.131	0	4.000	0.6875
6	X1	SAE	2.5X2.5X0.1875	36.0	87.42	Comp	76.04	15AP	13.736	NESC Ext	25.048	18.200	20.391	18.063	10.817	2	1.000	0.6875
7	X2	SAU	2.5X2X0.1875	36.0	86.15	Comp	64.38	16AP	11.668	NESC Ext	19.030	18.200	20.391	18.125	9.220	2	1.000	0.6875
8	X3	SAU	4X3X0.25	36.0	57.81	Comp	49.93	17AP	22.500	NESC Hea	45.066	45.500	67.969	60.417	10.000	5	1.740	0.6875
9	X4	SAU	3.5X2.5X0.25	36.0	59.94	Comp	54.92	18AY	19.989	NESC Hea	40.920	36.400	54.375	42.647	8.521	4	1.030	0.6875
10	X5	SAU	4X3.5X0.3125	36.0	54.57	Comp	54.35	19AP	32.851	NESC Hea	60.440	63.700	118.945	112.337	9.220	7	1.790	0.6875
11	X6	SAU	5X3.5X0.25	36.0	27.03	Cross	27.03	21BXY	12.424	NESC Ext	45.962	54.600	81.562	72.500	10.597	6	1.550	0.6875
12	X7	SAU	4X3X0.25	36.0	17.56	Comp	12.54	22BP	4.566	NESC Ext	41.087	36.400	54.375	44.391	12.246	4	1.000	0.6875
13	X8	SAU	3.5X3X0.25	36.0	11.99	Tens	11.99	23AP	3.273	NESC Ext	40.925	27.300	40.781	38.516	14.070	3	1.000	0.6875
14	X9	SAU	5X3X0.25	36.0	21.68	Comp	3.01	24AP	0.823	NESC Hea	41.087	27.300	40.781	36.250	17.450	3	1.000	0.6875
15	D1	SAU	5X3X0.25	36.0	77.83	Tens	77.83	25AP	28.900	NESC Ext	37.133	63.700	95.156	74.632	14.103	7	1.710	0.6875
16	D2	SAE	2X2X0.1875	36.0	40.15	Tens	40.15	26BXY	7.277	NESC Ext	18.827	18.200	20.391	18.125	16.853	2	1.000	0.6875
17	D3	SAU	3X2X0.25	36.0	56.67	Tens	56.67	27AX	14.105	NESC Ext	24.887	36.400	54.375	48.333	19.194	4	1.000	0.6875
18	D4	SAU	4X3X0.25	36.0	72.85	Comp	63.27	28AP	28.786	NESC Ext	47.739	45.500	67.969	60.417	15.321	5	1.260	0.6875
19	D5	SAU	3.5X3X0.25	36.0	76.77	Tens	76.77	29AX	34.526	NESC Ext	44.975	45.500	67.969	53.634	28.523	5	1.000	0.6875
20	H1	SAE	1.75X1.75X0.1875	36.0	49.94	Tens	49.94	33Y	3.508	NESC Hea	15.911	9.100	10.195	7.024	6.000	1	1.000	0.6875
21	H2	SAU	4X3.5X0.25	36.0	54.27	Comp	6.39	37BP	1.744	NESC Ext	49.025	27.300	40.781	36.250	15.738	3	1.000	0.6875
22	H3	SAE	3X3X0.1875	36.0	37.78	Comp	0.63	38BP	0.115	NESC Hea	31.139	18.200	20.391	18.125	9.569	2	1.000	0.6875
23	H4	SAU	5X3X0.25	36.0	47.27	Tens	47.27	F39C2118X	8.602	NESC Ext	41.087	18.200	27.187	24.167	2.208	2	1.000	0.6875

```
    24          H5   SAE    3.5X3.5X0.25    36.0 19.73  Comp 15.30     40P   2.784NESC Ext   49.187   18.200   27.187   25.677 13.531    2
1.000   0.6875
    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 11.69  Comp 10.31    43AP   1.358NESC Ext   18.827   18.200   20.391   13.170  4.243    2
1.000   0.6875
    27         X12   SAU     2.5X2X0.1875   36.0  8.95  Comp  8.11    44AY   1.470NESC Ext   19.030   18.200   20.391   18.125  8.224    2
1.000   0.6875
    28          H6   SAU         4X3X0.25   36.0 37.58  Tens 37.58     45P   6.840NESC Hea   41.087   18.200   27.187   24.167  6.000    2
1.000   0.6875
    29          D6   SAU       3X2X0.1875   36.0 25.43  Comp  0.00     46Y   0.000           18.908   18.200   20.391   13.577 14.775    2
1.000   0.6875
    30        HGR1   SAU     2.5X2X0.1875   36.0 31.60  Tens 31.60     47Y   4.291NESC Hea   19.030   18.200   20.391   13.577 13.250    2
1.000   0.6875
    31        HGR2   SAE       3X3X0.1875   36.0 31.69  Tens 31.69     48Y   5.743NESC Hea   31.139   18.200   20.391   18.125 15.022    2
1.000   0.6875
    32          A1   SAE         3X3X0.25   36.0 37.41  Tens 37.41     50P   6.780NESC Hea   37.802   18.200   27.187   18.125 14.073    2
1.590   0.6875
    33          A2   SAU       3.5X3X0.25   36.0 29.56  Comp 28.37    53BP   7.746NESC Hea   35.356   27.300   40.781   31.985  5.625    3
2.000   0.6875
    34          A#   SAE         4X4X0.25   36.0 25.05  Comp 15.25    52BP   6.938NESC Hea   51.718   45.500   67.969   71.078  6.875    5
2.000   0.6875
    35          H7   SAU     2.5X2X0.1875   36.0 19.88  Comp  7.72     54X   0.702NESC Hea   22.067    9.100   10.195    9.629  6.000    1
1.000   0.6875
    36          H8   DAE 1.75X1.75X0.1875   36.0 84.60  Tens 84.60     36X  12.576NESC Hea   35.999   16.800   20.391   14.864  6.000    1
1.000   0.6875
  Pwmnt 12" Std. Pipe Pwmnt   Pipe 12" Std.   42.0  8.72  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  4.75  Comp  0.68   g107P   0.070NESC Hea   18.827   16.800   10.195   10.343  1.501    1
1.000   0.6875
  PMBR2 L2.5x2.5x3/16   SAE   2.5X2.5X0.1875   36.0 33.07  Comp 24.10   g111X   2.457NESC Ext   25.048   16.800   10.195   11.328  3.354    1
1.000   0.6875
  PMBR3     L3x3x3/16   SAE       3X3X0.1875   36.0  0.93  Comp  0.83   g114P   0.085NESC 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 15.03  Comp 13.57   g116P   1.844NESC Ext   49.187   16.800   13.594   15.104  9.685    1
1.000   0.6875
  PMBR5      L4x4x1/4   SAE         4X4X0.25   36.0  8.49  Comp  8.05   g120X   1.094NESC Ext   57.287   16.800   13.594   15.104 12.340    1
1.000   0.6875 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g118P
??
   20a          H1   SAE 1.75X1.75X0.1875   36.0 19.70  Comp  7.85    30BP   0.551NESC Hea   15.911    9.100   10.195    7.024  6.000    1
1.000   0.6875
 AngleR      L2x2x1/4   SAE         2X2X0.25   36.0 40.54  Tens 40.54     42X   3.689NESC Ext   24.887    9.100   13.594    9.366  4.243    1
1.000   0.6875
 BraceR  L2.5x2.5x1/4   SAE     2.5X2.5X0.25   36.0 59.19  Comp 42.99   g110P   5.844NESC 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
??
  Plate    6"x3/4" PL   Bar             6x3/4   36.0  5.46  Comp  2.36   g106P   0.396NESC Hea  145.800   16.800    0.000    0.000  1.501    1
1.000   0.6875


*** Maximum Stress Summary for Each Load Case
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Summary of Maximum Usages by Load Case:

```
    Load Case Maximum Element Element
                Usage %   Label    Type
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```

NESC Heavy	87.04	5Y	Angle
NESC Extreme	91.11	3P	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	19.65	NESC Heavy	0.0
2	Clamp	19.51	NESC Heavy	0.0
3	Clamp	20.20	NESC Heavy	0.0
4	Clamp	20.61	NESC Heavy	0.0
5	Clamp	20.20	NESC Heavy	0.0
6	Clamp	20.62	NESC Heavy	0.0
7	Clamp	20.20	NESC Heavy	0.0
8	Clamp	20.61	NESC Heavy	0.0
9	Clamp	29.53	NESC Heavy	0.0
10	Clamp	29.57	NESC Heavy	0.0
11	Clamp	29.53	NESC Heavy	0.0
12	Clamp	1.81	NESC Extreme	0.0
13	Clamp	2.09	NESC Extreme	0.0
14	Clamp	2.33	NESC Heavy	0.0
15	Clamp	4.00	NESC Extreme	0.0
16	Clamp	3.57	NESC Extreme	0.0
17	Clamp	3.69	NESC Heavy	0.0
18	Clamp	3.20	NESC Extreme	0.0
19	Clamp	6.04	NESC Heavy	0.0
20	Clamp	10.21	NESC Heavy	0.0
21	Clamp	10.89	NESC Heavy	0.0
22	Clamp	10.43	NESC Heavy	0.0
23	Clamp	4.98	NESC Heavy	0.0
24	Clamp	5.34	NESC Heavy	0.0
25	Clamp	3.42	NESC Heavy	0.0
26	Clamp	8.96	NESC Extreme	0.0
27	Clamp	16.71	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	0.000	9.736	1.328	9.827
NESC Heavy	2	Clamp	16P	0.000	9.666	1.328	9.757
NESC Heavy	3	Clamp	17P	7.000	7.276	0.249	10.100
NESC Heavy	4	Clamp	17Y	-7.000	7.178	2.373	10.303
NESC Heavy	5	Clamp	18P	7.000	7.276	0.278	10.100
NESC Heavy	6	Clamp	18Y	-7.000	7.178	2.402	10.310
NESC Heavy	7	Clamp	19P	7.000	7.276	0.249	10.100
NESC Heavy	8	Clamp	19Y	-7.000	7.178	2.373	10.303
NESC Heavy	9	Clamp	23P	0.000	14.536	2.584	14.764
NESC Heavy	10	Clamp	24P	0.000	14.544	2.662	14.786
NESC Heavy	11	Clamp	25P	0.000	14.536	2.584	14.764
NESC Heavy	12	Clamp	2P	0.000	0.176	0.568	0.595
NESC Heavy	13	Clamp	4P	0.000	0.219	0.924	0.949
NESC Heavy	14	Clamp	6P	0.000	0.241	1.141	1.166

NESC Heavy	15	Clamp	8P	0.000	0.253	1.359	1.383
NESC Heavy	16	Clamp	10S	0.000	0.285	1.402	1.431
NESC Heavy	17	Clamp	12S	0.000	0.251	1.827	1.844
NESC Heavy	18	Clamp	13S	0.000	0.228	1.563	1.580
NESC Heavy	19	Clamp	14S	0.000	0.558	2.970	3.022
NESC Heavy	20	Clamp	30P	0.000	1.210	4.962	5.107
NESC Heavy	21	Clamp	31P	0.000	1.466	5.244	5.445
NESC Heavy	22	Clamp	32P	0.000	1.430	5.016	5.216
NESC Heavy	23	Clamp	33P	0.000	0.665	2.401	2.491
NESC Heavy	24	Clamp	34P	0.000	0.721	2.571	2.670
NESC Heavy	25	Clamp	35P	0.000	0.504	1.635	1.711
NESC Heavy	26	Clamp	36P	0.000	1.305	3.069	3.335
NESC Heavy	27	Clamp	37P	0.000	0.823	8.316	8.356
NESC Extreme	1	Clamp	16X	0.361	6.037	0.528	6.071
NESC Extreme	2	Clamp	16P	0.361	6.037	0.528	6.071
NESC Extreme	3	Clamp	17P	4.571	5.431	0.259	7.104
NESC Extreme	4	Clamp	17Y	-3.778	4.427	1.163	5.935
NESC Extreme	5	Clamp	18P	4.571	5.431	0.259	7.104
NESC Extreme	6	Clamp	18Y	-3.778	4.427	1.163	5.935
NESC Extreme	7	Clamp	19P	4.571	5.431	0.259	7.104
NESC Extreme	8	Clamp	19Y	-3.778	4.427	1.163	5.935
NESC Extreme	9	Clamp	23P	0.793	9.595	1.228	9.706
NESC Extreme	10	Clamp	24P	0.793	9.595	1.228	9.706
NESC Extreme	11	Clamp	25P	0.793	9.595	1.228	9.706
NESC Extreme	12	Clamp	2P	0.000	0.843	0.323	0.903
NESC Extreme	13	Clamp	4P	0.000	0.985	0.354	1.047
NESC Extreme	14	Clamp	6P	0.000	1.056	0.370	1.119
NESC Extreme	15	Clamp	8P	0.000	1.786	0.905	2.002
NESC Extreme	16	Clamp	10S	0.000	1.626	0.733	1.784
NESC Extreme	17	Clamp	12S	0.000	1.515	0.709	1.673
NESC Extreme	18	Clamp	13S	0.000	1.440	0.692	1.598
NESC Extreme	19	Clamp	14S	0.000	2.526	0.932	2.693
NESC Extreme	20	Clamp	30P	0.000	1.913	1.337	2.335
NESC Extreme	21	Clamp	31P	0.000	1.814	1.272	2.216
NESC Extreme	22	Clamp	32P	0.000	2.059	1.454	2.520
NESC Extreme	23	Clamp	33P	0.000	0.791	0.544	0.960
NESC Extreme	24	Clamp	34P	0.000	0.828	0.569	1.005
NESC Extreme	25	Clamp	35P	0.000	0.565	0.395	0.689
NESC Extreme	26	Clamp	36P	0.000	4.297	1.265	4.480
NESC Extreme	27	Clamp	37P	0.000	2.822	3.667	4.627

Overturning Moments For User Input Concentrated Loads:

Moments are static equivalents based on central axis of 0,0 (i.e. a single pole).

Load Case	Total Tran. Load (kips)	Total Long. Load (kips)	Total Vert. Load (kips)	Transverse Overturning Moment (ft-k)	Longitudinal Overturning Moment (ft-k)	Torsional Moment (ft-k)
NESC Heavy	111.499	0.000	45.066	11580.307	54.229	20.625
NESC Extreme	86.270	5.480	16.224	8750.134	577.259	75.277

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

*** End of Report

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Subject:	Anchor Bolt Analysis for CL&P Tower # 1281
Location:	Greenwich, CT
Rev. 1: 4/17/15	Prepared by: T.J.L. Checked by: C.F.C. Job No. 15001.017

Tower Anchor Bolt Analysis

Max Leg Reactions:

Uplift =	$Uplift := 191.13 \cdot kips$	(User Input)
Shear =	$Shear := 48.03 \cdot kips$	(User Input)
Compression =	$Compression := 226.19 \cdot kips$	(User Input)

Anchor Bolt Data:

Use ASTM A36 (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)

Check Tensile Force:

Maximum Tensile Force (Gross Area) = $F_{gross.area} := 1.0 \cdot (0.33 \cdot A_g \cdot F_u) = 60.1 \cdot kips$

Maximum Tensile Force (Net Area) = $F_{net.area} := 1.0 \cdot (0.60 \cdot A_n \cdot F_y) = 54 \cdot kips$

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

$AllowableTension = 54 \cdot kips$

Applied Tension = $MaxTension := \frac{Uplift}{N} = 47.78 \cdot kips$

$\frac{MaxTension}{F_{net.area}} = 88.5 \cdot \%$

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

$Condition1 = \text{"OK"}$

Check Anchor Bolt Area: Based on the ASCE 10-97 Design of Latticed Steel Transmission Structures

Required Area = $A_{s1} := \frac{Uplift}{F_y} + \frac{Shear}{\mu \cdot .85 \cdot F_y} = 8.2 \cdot in^2$

$A_{s2} := \left[\frac{Shear - (0.3 \cdot Compression)}{\mu \cdot .85 \cdot F_y}\right] = -1.178 \cdot in^2$

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

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

$Condition2 = \text{"OK"}$

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

$Condition3 = \text{"OK"}$

Foundation:

Input Data:

Tower Data

Shear (Compression Leg) =	$Shear_{comp} := 48.03 \cdot 1.1 \cdot kips = 52.8 \cdot kips$	(User Input from PLS Tower)
Shear (Uplift Leg) =	$Shear_{up} := 47.24 \cdot 1.1 \cdot kips = 52 \cdot kips$	(User Input from PLS Tower)
Compression =	$Comp := 226.19 \cdot 1.1 \cdot kips = 248.8 \cdot kips$	(User Input from PLS Tower)
Uplift =	$Uplift := 191.13 \cdot 1.1 \cdot kips = 210.2 \cdot kips$	(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:

ASTM A615 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 = $WT_c := (W_p{}^2 \cdot L_p) \cdot \gamma_c = 31.875 \cdot kip$

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

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

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

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

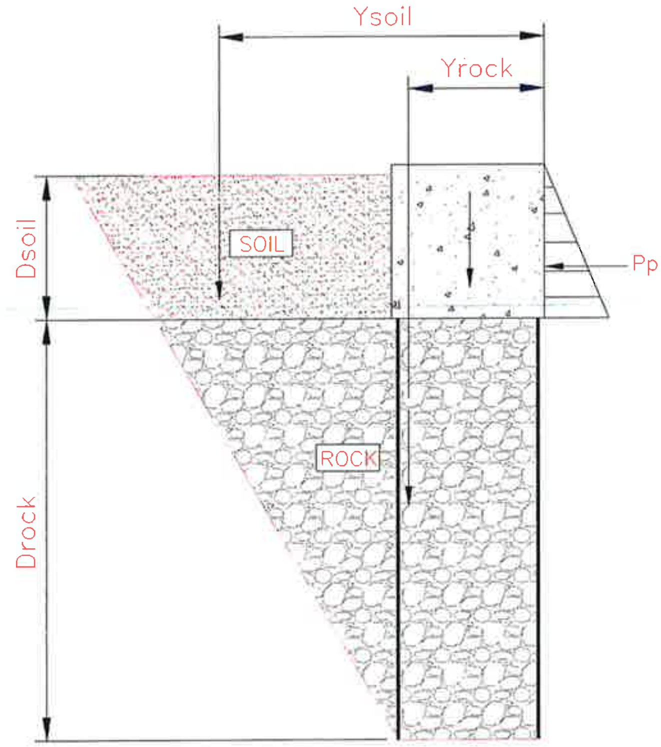
Total Resistance = $WT_{tot} := WT_c + WT_{rock} + WT_{soil} = 267 \cdot kips$

Factor of Safety Actual = $FS := \frac{WT_{tot}}{Uplift} = 1.27$

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

Uplift_Check := if(FS ≥ FS_{req}, "Okay", "No Good")

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 = $M_{ot} := Uplift \cdot \frac{W_p}{2} + Shear_{up} \cdot L_p = 967 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 1.17$

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 = $P_{max} := \frac{WT_c + Comp}{A_{mat}} + \frac{Shear_{comp} \cdot L_p}{S} = 32.783 \cdot ksf$

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

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 = $T_{Max} := \frac{Uplift}{N_{atot}} + \frac{Shear_{up} \cdot L_p \cdot D_{a1}}{I_p} - \frac{WT_c}{N_{atot}} = 59.1 \cdot kips$

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

$\frac{T_{Max}}{T_{all}} = 38.5 \cdot \%$

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

Condition1 = "OK"

Check Bond Strength:

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

$\frac{T_{Max}}{Bond\_Strength} = 54.4 \cdot \%$

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

Condition2 = "OK"

SITE NAME	GREENWICH 3 CT	ECP - CELL #	5-0159
LATITUDE	41-01-46.96 N	LONGITUDE	73-35-54.06 W
NOTES: Please Order Appropriate RET Cables. Replace 700, AWS, and PCS antennas. Adjust azimuths and antenna tilts as needed. Lease for PCS LTE TRDU for future LTE use.		SAVE BUTTON	0009
		STRUCTURE TYPE	UTILITY TOWER

700 LTE - Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	ALU 700 MHz TRDU		ALU 700 MHz TRDU		ALU 700 MHz TRDU	
ANTENNA TYPE	P65-16-XL-2_2_790_-2		LNX-6514DS-T4M-750_4		LNX-6514DS-T4M-750_4	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	0		120		240	
DOWN TILT (ELEC° + MECH°)	2 Elec + 2 Mech		4 Elec + 4 Mech		4 Elec + 6 Mech	
RAD CTR (FT AGL)	139		139		139	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL	N/A		N/A		N/A	
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX						
700 LTE - Future Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	ALU 700MHz TRDU		ALU 700MHz TRDU		ALU 700MHz TRDU	
ANTENNA TYPE	**SBNHH-1D65B**		**SBNHH-1D65B**		**SBNHH-1D65B**	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	**350**		120		240	
DOWN TILT (ELEC° + MECH°)	**2 Elec + 0 Mech**		**4 Elec + 0 Mech**		**6 Elec + 0 Mech**	
RAD CTR (FT AGL)	139		139		139	
TMA - QTY / MODEL						
BIAS-T BOTTOM - QTY/MODEL	**1**	**ATSBT-BOTTOM-FM**	**1**	**ATSBT-BOTTOM-FM**	**1**	**ATSBT-BOTTOM-FM**
BIAS-T TOP - QTY/MODEL	**1**	**ATSBT-TOP-FM-4G**	**1**	**ATSBT-TOP-FM-4G**	**1**	**ATSBT-TOP-FM-4G**
DIPLEXER - QTY / MODEL	N/A		N/A		N/A	
RRH - QTY/MODEL						
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX						
1900 PCS CDMA - Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	PCS Mod 4.0B		PCS Mod 4.0B		PCS Mod 4.0B	
ANTENNA TYPE	MG D3-800T0		MG D3-800T0		MG D3-800T0	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	0		120		240	
DOWN TILT (ELEC° + MECH°)	0 Elec + 2 Mech		0 Elec + 4 Mech		0 Elec + 4 Mech	
RAD CTR (FT AGL)	139		139		139	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
1900 PCS LTE - Future Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	**ALU 1900MHz TRDU**		**ALU 1900MHz TRDU**		**ALU 1900MHz TRDU**	
ANTENNA TYPE	**SBNHH-1D65B**		**SBNHH-1D65B**		**SBNHH-1D65B**	
QTY OF ANTENNAS PER FACE	**0**		**0**		**0**	
ORIENTATION (DEG)	0		120		240	
DOWN TILT (ELEC° + MECH°)	**2 Elec + 0 Mech**		**2 Elec + 0 Mech**		**2 Elec + 0 Mech**	
RAD CTR (FT AGL)	139		139		139	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	**2**	**FDAP5002/2C-3L**	**2**	**FDAP5002/2C-3L**	**2**	**FDAP5002/2C-3L**
RRH - QTY/MODEL	N/A		N/A		N/A	
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX						
2100 AWS LTE - Current Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	ALU 2100MHz TRDU		ALU 2100MHz TRDU		ALU 2100MHz TRDU	
ANTENNA TYPE	MG D3-800T0		MG D3-800T0		MG D3-800T0	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	0		120		240	
DOWN TILT (ELEC° + MECH°)	0 Elec + 2 Mech		0 Elec + 4 Mech		0 Elec + 4 Mech	
RAD CTR (FT AGL)	139		139		139	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL						
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX						
2100 AWS LTE - Future Config	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	ALU 2100MHz TRDU		ALU 2100MHz TRDU		ALU 2100MHz TRDU	
ANTENNA TYPE	**HBXX-6516DS-A2M**		**HBXX-6516DS-A2M**		**HBXX-6516DS-A2M**	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	**350**		120		240	
DOWN TILT (ELEC° + MECH°)	**2 Elec + 0 Mech**		**2 Elec + 0 Mech**		**2 Elec + 0 Mech**	
RAD CTR (FT AGL)	139		139		139	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL						
RRH - QTY/MODEL		**Diplexed w/ PCS**		**Diplexed w/ PCS**		**Diplexed w/ PCS**
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX						
850 Cellular - No Change	ALPHA		BETA		GAMMA	
EQUIPMENT TYPE	Cellular Modcell 4.0B		Cellular Modcell 4.0B		Cellular Modcell 4.0B	
ANTENNA TYPE	DB854DG65ESX		DB854DG65ESX		DB854DG65ESX	
QTY OF ANTENNAS PER FACE	1		1		1	
ORIENTATION (DEG)	0		120		240	
DOWN TILT (ELEC° + MECH°)	0 Elec + 2 Mech		0 Elec + 2 Mech		0 Elec + 4 Mech	
RAD CTR (FT AGL)	139		139		139	
TMA - QTY / MODEL						
DIPLEXER - QTY / MODEL	N/A		N/A		N/A	
RRH - QTY/MODEL						
SECTOR DISTRIBUTION BOX						
MAIN DISTRIBUTION BOX						

NUMBER OF CABLES NEEDED						Fiber Lines Model number			
TOTAL # FIBER LINES	0	TOTAL # OF MAINLINES			18	FIBER LINE MODEL #			N/A
TOTAL # TOP JUMPERS	0	TOTAL # OF TOP JUMPERS			18	FIBER TOP JUMPER MODEL #			N/A
Equipment Cable Ordering		**MAIN CABLE #**	18	+	0	**TOP JUMPER #**	0	+	0

TX / RX FREQUENCIES			TX POWER OUTPUT	
Cellular A-Band	**PCS F / AWS-Band**	**700 Mhz C - Blo**	Cellular (Watts)	20
TX - 869-880,890-891.5 MHz	TX - 1970-1975 / 2145-2155	TX - 746-757	PCS (Watts)	16
RX - 824-835,845-846.5 MHz	RX - 1890-1895 / 1745-1755	RX - 776-787	LTE/ AWS (Watts)	40

ALPHA				BETA				GAMMA			
Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code	Ant.	Freq.	Func.	Color Code
A1	800	Tx1/Rx0	RED	A7	800	Tx2/Rx0	BLUE	A13	800	Tx3/Rx0	GREEN
A2	1900	Tx1/Rx0	RED/ WHITE	A8	1900	Tx2/Rx0	BLUE/ WHITE	A14	1900	Tx3/Rx0	GREEN/WHITE
A3	700	Tx1/Rx0	RED/ ORANGE	A9	700	Tx2/Rx0	BLUE/ ORANGE	A15	700	Tx3/Rx0	GREEN/ORANGE
A4	700	Tx4/Rx1	RED/RED/ ORANGE	A10	700	Tx5/Rx1	BLUE/BLUE/ ORANGE	A16	700	Tx6/Rx1	GREEN/GREEN/ ORANGE
A5	1900	Tx4/Rx1	RED/RED/ WHITE	A11	1900	Tx5/Rx1	BLUE/BLUE/ WHITE	A17	1900	Tx6/Rx1	GREEN/GREEN/ WHITE
A6	800	Tx4/Rx1	RED/RED	A12	800	Tx5/Rx1	BLUE/BLUE	A18	800	Tx6/Rx1	GREEN/GREEN
F1-A	1700	Tx/Rx	RED/ BROWN	F1-B	1700	Tx/Rx	BLUE/BROWN	F1-C	1700	Tx/Rx	GREEN/BROWN
F1-D	1700	Tx/Rx	RED/RED/ BROWN	F1-E	1700	Tx/Rx	BLUE/BLUE/BROW N	F1-F	1700	Tx/Rx	GREEN/GREEN/BROWN

RF ENGINEER	RF MANAGER	INITIALS	DATE
Prepared By: Ryan Ulanday	Robert Hesselbach		1/29/2015

Product Specifications

HBXX-6516DS-VTM

Andrew® Quad Port Teletilt® Antenna, 1710–2180 MHz, 65° horizontal beamwidth, RET compatible

- Each DualPol® array can be independently adjusted for greater flexibility
- Excellent gain, VSWR, front-to-back ratio, and PIM specifications for robust network performance
- Ideal choice for site collocations and tough zoning restrictions
- Great solution to maximize network coverage and capacity

Electrical Specifications

Frequency Band, MHz	**1710–1880**	**1850–1990**	**1920–2180**
Gain, dBi	17.7	18.0	18.0
Beamwidth, Horizontal, degrees	67	66	64
Beamwidth, Vertical, degrees	7.5	7.0	6.6
Beam Tilt, degrees	0–10	0–10	0–10
USLS, dB	18	18	18
Front-to-Back Ratio at 180°, dB	30	30	30
CPR at Boresight, dB	22	22	21
CPR at Sector, dB	8	9	9
Isolation, dB	30	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153
Input Power per Port, maximum, watts	350	350	350
Polarization	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	**1710–1880**	**1850–1990**	**1920–2180**
Gain by all Beam Tilts, average, dBi	17.2	17.2	17.5
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.3	±0.5
Gain by Beam Tilt, average, dBi	0 ° | 17.0 5 ° | 17.3 10 ° | 17.0	0 ° | 17.1 5 ° | 17.4 10 ° | 17.0	0 ° | 17.4 5 ° | 17.7 10 ° | 17.2
Beamwidth, Horizontal Tolerance, degrees	±2.7	±2.3	±3.5
Beamwidth, Vertical Tolerance, degrees	±0.5	±0.4	±0.4
USLS, dB	18	19	19
Front-to-Back Total Power at 180° ± 30°, dB	26	26	26
CPR at Boresight, dB	22	22	22
CPR at Sector, dB	9	9	9

* 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® quad
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2180 MHz

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All specifications are subject to change without notice. See www.commscope.com for the most current information. Revised: December 5, 2014

Product Specifications

COMMSCOPE®

POWERED BY ANDREW

HBXX-6516DS-VTM

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Low loss circuit board
Radome Material	PVC, UV resistant
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	4
Wind Loading, maximum	419.0 N @ 150 km/h 94.2 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	166.0 mm | 6.5 in
Length	1294.0 mm | 50.9 in
Width	305.0 mm | 12.0 in
Net Weight	13.9 kg | 30.6 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	HBXX-6516DS-R2M
Model with Factory Installed AISG 2.0 Actuator	HBXX-6516DS-A2M
RET System	Teletilt®

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	Designed, manufactured and/or distributed under this quality management system

Included Products

600899A-2 — Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

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All specifications are subject to change without notice. See www.commscope.com for the most current information. Revised: December 5, 2014

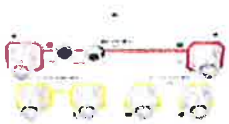
Product Specifications

COMMSCOPE®

POWERED BY ANDREW

SBNHH-1D65B

Andrew® Tri-band Antenna, 698–896 and 2 x 1710–2360 MHz, 65° horizontal beamwidth, internal RET. Both high bands share the same electrical tilt.



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

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**	**1710–1880**	**1850–1990**	**1920–2180**	**2300–2360**
Gain, dBi	14.9	14.7	17.7	18.2	18.6	18.6
Beamwidth, Horizontal, degrees	68	66	69	66	63	58
Beamwidth, Vertical, degrees	12.1	10.7	5.6	5.2	5.0	4.5
Beam Tilt, degrees	0–14	0–14	0–7	0–7	0–7	0–7
USLS, dB	14	13	15	15	15	13
Front-to-Back Ratio at 180°, dB	27	29	28	28	28	27
CPR at Boresight, dB	20	23	20	20	17	21
CPR at Sector, dB	14	10	12	10	9	1
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	-153
Input Power per Port, maximum, watts	350	350	350	350	350	300
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	**698–806**	**806–896**	**1710–1880**	**1850–1990**	**1920–2180**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.5	14.3	17.4	17.9	18.2	18.3
Gain by all Beam Tilts Tolerance, dB	±0.5	±0.8	±0.4	±0.3	±0.5	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 14.6 7 ° | 14.6 14 ° | 14.2	0 ° | 14.5 7 ° | 14.4 14 ° | 13.6	0 ° | 17.4 3 ° | 17.5 7 ° | 17.4	0 ° | 17.8 3 ° | 17.9 7 ° | 17.9	0 ° | 18.1 3 ° | 18.3 7 ° | 18.2	0 ° | 18.2 3 ° | 18.4 7 ° | 18.4
Beamwidth, Horizontal Tolerance, degrees	±2.2	±3.4	±2	±4.6	±5.7	±4.3
Beamwidth, Vertical Tolerance, degrees	±0.8	±1	±0.3	±0.2	±0.3	±0.2
USLS, dB	16	14	16	16	16	15
Front-to-Back Total Power at 180° ± 30°, dB	25	26	27	26	26	26
CPR at Boresight, dB	22	23	21	20	20	22
CPR at Sector, dB	13	11	16	12	11	4

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

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol® multiband with internal RET
Band	Multiband
Brand	DualPol® | Teletilt®
Operating Frequency Band	1710 – 2360 MHz | 698 – 896 MHz

Mechanical Specifications

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Product Specifications

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SBNHH-1D65B

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum | Low loss circuit board
Radome Material	Fiberglass, UV resistant
Reflector Material	Aluminum
RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	6
Wind Loading, maximum	617.7 N @ 150 km/h 138.9 lbf @ 150 km/h
Wind Speed, maximum	241.4 km/h | 150.0 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	1828.0 mm | 72.0 in
Width	301.0 mm | 11.9 in
Net Weight	18.4 kg | 40.6 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
RET System	Teletilt®

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	Designed, manufactured and/or distributed under this quality management system

Included Products

BSAMNT-1 — Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

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DECIBEL®
Base Station Antennas

DB854DG65ESX

13 dBd, ± 45° Diversity Panel Antenna
806-896 MHz

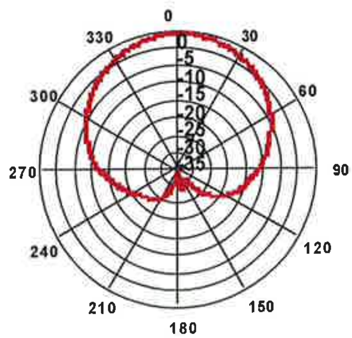
806-896 MHz

MaxGain™

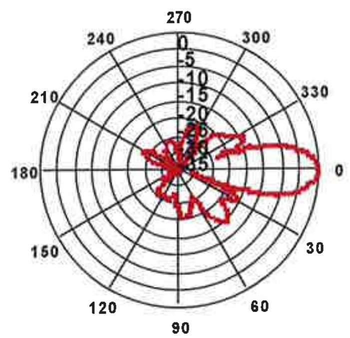
GEN3XPOL™

65°

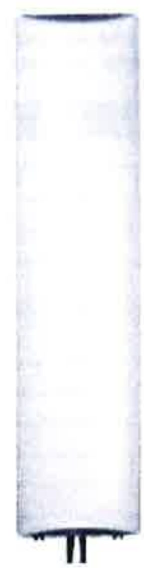
- Features air dielectric feed system for maximum array efficiency and lowest loss
- No fasteners, rivets, soldering or welding in critical element-to-transformer circuit
- Strong first upper side lobe suppression
- Excellent gain per unit length of antenna



Horizontal 840 MHz (Tilt=0)



Vertical 840 MHz (Tilt=0)



ELECTRICAL

Frequency (MHz):	806-896
Polarization:	+45°/-45°
Gain (dBd/dBi):	13/15.1
Azimuth BW:	65°
Elevation BW:	14°
Beam Tilt:	0°
USLS* (dB):	>18
Front-to-Back Ratio* (dB):	30
Isolation (dB):	>30
VSWR:	<1.33:1
IM Suppression - Two 20 Watt Carriers:	-150 dBc
Impedance:	50 Ohms
Max Input Power:	500 Watts
Lightning Protection:	DC Ground
Opt Electrical Tilt:	6°, Variable 2°-12°

MECHANICAL

Weight:	18.5 lbs (8.4 kg)
Dimensions (LxWxD):	48.5 X 12.5 X 6 in (1232 X 318 X 152 mm)
Max. Wind Area:	1.83 ft² (0.17 m²)
Max. Wind Load (@ 100mph):	100 lbf (445 N)
Max. Wind Speed:	150 mph (241 km/h)
Radiator Material:	Aluminum
Reflector Material:	Aluminum
Radome Material:	ABS, UV Resistant
Mounting Hardware Material:	Galvanized Steel
Connector Type:	7-16 DIN - Female (Bottom)
Color:	Light Gray
Standard Mounting Hardware:	DB380 Pipe Mount Kit, Included
Downtilt Mounting Hardware:	DB5083, optional
Opt. Mounting Hardware:	DB5084-AZ Azimuth Wall Mount

ANDREW®

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Date: 4/14/2004
* - Indicates Typical Values

Product Data Sheet FDAP5002/2C-3L

ShareLite AWS/PCS Low Loss Diplexer, DC pass in AWS path

Product Description

The FDAP Series of ShareLite diplexers are designed to enable feeder sharing between systems in the AWS and the PCS bands. The RFS innovative cavity filter design provides a very low insertion loss while keeping the product extremely compact and lightweight. The usage of highly selective filters also guarantees a high isolation level of 50dB between ports, ensuring an interference-free environment for any technology deployed. The filter design also has built-in lightning protection for additional reliability. Designed to withstand the most severe outdoor environments, it also features a IP67 class protection with a vented enclosure to avoid any possible effects of condensation and pressure instability, thus providing a long lasting, extremely reliable solution for any network.

Features/Benefits

- **Extremely low insertion loss**
- **High level of rejection between bands – Protects against interferences**
- **Compact design – Eases installation and reduces tower loading**
- **Exceptional reliability and environmental protection (IP67)**

Technical Specifications

Product Type	Diplexer/Cross Band Coupler
Frequency Range 1, MHz	1850-1910 & 1930-1990
Frequency Range 2, MHz	1710-1755 & 2110-2155
Application	AWS, PCS
Configuration	Sharelite Single/Double diplexer, outdoor/indoor, DC pass in AWS path
Mounting	Wall Mounting: With 4 screws (maximum 6mm diameter); Pole Mounting: With included clamp set 40-110mm (1.57-4.33)
Return Loss All Ports, Min, dB	20
Power Handling Continuous, Max, W	500
Impedance, Ohms	50
Insertion Loss, Path 1, dB	.20
Insertion Loss, Path 2, dB	.20
Rejection between Bands, Min, dB	50
IMP Level at the COM Port, Max, dBm	-112 @ 2x43
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	IEC61000-4-5 Level 4 / 20kA, 8/20us
Connectors	In-line long-neck 7-16-Female
Weight, kg (lb)	2.9 (6.4)
Dimensions, H x W x D, mm (in)	165 x 210 x 85 (6.5 x 8.3 x 3.3)
Housing	Aluminum

Notes

Other Documentation

AWS/PCS Single or Dual Diplexer Installation Instructions: AWS-PCS_Diplexer_Installation_Rev5.pdf

All information contained in the present datasheet is subject to confirmation at time of ordering

Product Specifications

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ATSBT-TOP-FM-4G

Teletilt® Top Smart Bias Tee

- Injects AISG power and control signals onto a coaxial cable line
- Reduces cable and site lease costs by eliminating the need for AISG home run cables
- AISG 1.1 and 2.0 compliant
- Operates at 10-30 Vdc
- Weatherproof AISG connectors
- Intuitive schematics simplify and ensure proper installation
- Enhanced lightning protection plus grounding stud for additional surge protection
- 7-16 DIN female connector (BTS)
- 7-16 DIN male connector (ANT)

General Specifications

Smart Bias Tee Type	10–30 V Top
Brand	Teletilt®
Operating Frequency Band	694 – 2690 MHz

Electrical Specifications

EU Certification	CE
Protocol	AISG 1.1 | AISG 2.0
Antenna Interface Signal	dc Blocked | RF
BTS Interface Signal	AISG data | dc | RF
Interface Protocol Signal	Data | dc
Voltage Range	10–30 Vdc
VSWR | Return Loss	1.17:1 | 22 dB, typical
Power Consumption, maximum	0.6 W
RF Power, maximum	250 W @ 1850 MHz 500 W @ 850 MHz
Impedance	50 ohm
Insertion Loss, typical	0.1 dB
3rd Order IMD	-158.0 dBc (relative to carrier)
3rd Order IMD Test Method	Two +43 dBm carriers
Electromagnetic Compatibility (EMC)	CFR 47 Part 15, Subpart B, Class B | EN 55022, Class B | ICES-003 Issue 4 CAN/CSA-CEI/IEC CISPR 22:02

Mechanical Specifications

Antenna Interface	7-16 DIN Male
BTS Interface	7-16 DIN Female
AISG Input Connector	8-pin DIN Female
Color	Silver
Grounding Lug Thread Size	M8
Material Type	Aluminum
Lightning Surge Capability	5 times @ -3 kA 5 times @ 3 kA

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Product Specifications

COMMSCOPE® POWERED BY ANDREW

Lightning Surge Capability Test Method	IEC 61000-4-5, Level X
Lightning Surge Capability Waveform	1.2/50 voltage and 8/20 current combination waveform

Environmental Specifications

Ingress Protection Test Method	IEC 60529:2001, IP66
Operating Temperature	-40 °C to +70 °C (-40 °F to +158 °F)

Interface Port Drawing

Dimensions

Width	94.0 mm | 3.7 in
Depth	50.0 mm | 2.0 in
Height	143.00 mm | 5.63 in
Net Weight	0.8 kg | 1.8 lb

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption

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