Transcend Wireless

10 Industrial Ave,
Suite 3
Mahwah NJ 07430

Phone: 201.684.0055
Fax: 201.684.0066

September 27, 2019

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

RE: Notice of Exempt Modification
494 Windsor Ave. Windsor, CT 06095
Latitude: 41.822
Longitude: - 72.654722
Sprint Site#: CT03XC055 – DO Macro

Dear Ms. Bachman:

Sprint currently maintains three (3) antennas at the 131.25-foot level of the existing 131.25-foot transmission tower at 242 Pent Rd. Beacon Falls, CT. The 131.25-foot lattice tower is owned by The Connecticut Light & Power Company, d/b/a Eversource Energy and property is owned by Windsor Shopping Center LLP c/o Sprint Spectrum LLP. Sprint now intends to replace three (3) of its existing antennas with three (3) new 800/1900/2500 MHz antennas. The new antennas will be installed at the same 131.25-foot level of the tower.

Planned Modifications:
Tower:

Remove
N/A

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

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

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

Ground:

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

This facility was approved by the CSC for Sprint use in Petition No. 371 dated April 23, 1997. This modification complies with this approval. Please see the enclosed.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor - Donald S. Trinks, Elected Official, and Robert Ruzzo, Zoning Enforcement Officer for the Town of Windsor, as well as the owner.

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

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

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

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

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

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

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

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

Sincerely,

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

Attachments
cc: Donald S. Trinks – Town of Windsor Mayor
Robert Ruzzo– Town of Beacon Falls Zoning Enforcement Officer
Windsor Shopping Center LLP c/o Sprint Spectrum LLP – property owner
The Connecticut Light & Power Company, d/b/a Eversource Energy – tower owner

Petition No. 371
Sprint Personal Communications System
Windsor, Connecticut
Staff Report
April 23, 1997

On April 17, 1997, William H. Smith and Edward S. Wilensky of the Connecticut Siting Council (Council), Executive Director Joel M. Rinebold and Robert K. Erling of the Council staff met Stephen M. Howard and Scott Chasse of Sprint Personal Communications System (Sprint), Kevin Washburn of Clough, Harbour and Associates, and Richard Madej of the Connecticut Light and Power Company (CL&P) for a field review of this petition in Windsor, Connecticut. Sprint is petitioning the Council for a determination that no Certificate of Environmental Compatibility and Public Need would be required for the proposed modifications to the existing CL&P Manchester-North Bloomfield-Northwest Hartford 115 kV electric transmission line, because the proposed construction would not have a substantial adverse environmental effect.

Sprint proposes to install a 123-foot power mount pole within an existing 110-foot CL&P transmission line structure off of Windsor Avenue in Windsor, Connecticut. This new monopole would extend approximately 12 feet three inches above the existing transmission line structure. Other existing steel lattice structures on this line are 116- and 99- feet in height, and the steel monopoles on an existing 345 kV line immediately north of this line are 125 and 120 feet in height. To the west are wood pole structures 75 feet in height. Sprint would attach its antennas to a 14-foot wide platform approximately 123 feet above ground level on the power mount pole, and install communication equipment on an 8-foot by 11-foot concrete pad adjacent to the existing tower. Both the tower and equipment would be surrounded by a 6-foot chain link fence. Access to the proposed site would be via the parking lot of an existing service station adjacent to the proposed site. No clearing of vegetation would be required.

A potential alternate site, structure # 10133, is approximately 500 feet east of the proposed tower on the same line. This structure is approximately 6 feet higher than the proposed tower and is located immediately north of the Windsor Shopping Plaza. The alternate site is adjacent to the dumpsters of a food store and is partially within a paved area. The Town of Windsor has recommended approval of the alternate site.

The installation and operation of the proposed PCS antennas would not increase the total radio frequency electromagnetic power density of the proposed site to a level at or above the State standards for the proposed antenna frequencies. Based on conservative assumptions, the power density at the base of the proposed tower would constitute 2.44 percent of the maximum permissible exposure for the proposed frequencies, as defined by the Federal Communications Commission. As mitigation measures during construction, staff recommends the use of erosion and sedimentation measures consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended, the placement of vegetative screening on all sides of the fence, and the installation of a gate to control access.

EVERSOURCE ENERGY

56 Prospect Street,
Hartford, CT 06103

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

August 9, 2019

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

RE: Sprint Antenna Site, CT-03XC037, Pent Road, Beacon Falls, CT, structure 326

Dear Mr. Shappy:

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

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

Sincerely,

Joel Szarkowicz
Transmission Line Engineering

REF: 17159.02 - CT03XC037 - Structural Analysis Rev2 19.01.31
17159.02 CT03XC037 Beacon Falls - CD Rev.0 19.07.12 (S&S)

Town of Beacon Falls

Geographic Information System (GIS)

Date Printed: 7/25/2019

MAP DISCLAIMER - NOTICE OF LIABILITY

This map is for assessment purposes only. It is not for legal description or conveyances. All information is subject to verification by any user. The Town of Beacon Falls and its mapping contractors assume no legal responsibility for the information contained herein.

Approximate Scale: 1 inch = 100 feet

0 100 Feet

N W E S

Tax ID 005-001-0006 Printed 04/26/2019 Card No. 1 of 1

GRISKA CAROL & DARLENE
PO BOX 71
BEACON FALLS, CT 06403
Census: 3411

Neighborhood Number
2
Neighborhood Name
River Area
TAXING DISTRICT INFORMATION

Jurisdiction Name	BEACON FALLS
Area	006
Routing Number	005-001-0006

Transfer of Ownership

Owner	Consideration	Transfer Date	Deed Type	Deed Book	Page
GRISKA FRANK A & HELEN E	0	07/31/2001	QC	123	1102
	0	01/17/1957		23	497

Site Description

Topography
Rolling
Public Utilities
Electric
Street or Road
Paved
Neighborhood
Static
Zoning:
R-1
Legal Acres:
1.5900

Valuation Record

Assessment Year		2006	2011	2016					
Reason for Change		2006 Reval	2011 Reval	2016 Reval					
2016 Market	L	123960	97340	92780					
	I	103170	86840	84730					
	T	227130	184180	177510					
70% Assessed	L	86770	68140	64950					
	I	72220	60790	59310					
	T	158990	128930	124260					

Land Size

Land Type	Rating, Soil ID - or - Actual Frontage	Acreage - or - Effective Frontage	Square Feet - or - Effective Depth	Influence Factor
Homesite		1.0300		
Res Excess Acres		0.5600		

Tax ID 005-001-0006 Printed 04/26/2019

Physical Characteristics

Style: Ranch
Occupancy: Single family

Story Height: 1.0
Finished Area: 888
Attic: None
Basement: Full

ROOFING

Material: Asphalt shingles
Type: Gable
Framing: Std for class
Pitch: Not available

FLOORING

Slab B
Sub and joists 1.0
Unfinished B
Vinyl 1.0

EXTERIOR COVER

Vinyl 1.0

INTERIOR FINISH

Unfinished B
Plaster 1.0

ACCOMMODATION

Finished Rooms 5
Bedrooms 3

HEATING AND AIR CONDITIONING

Primary Heat: Forced Hot Air-oil

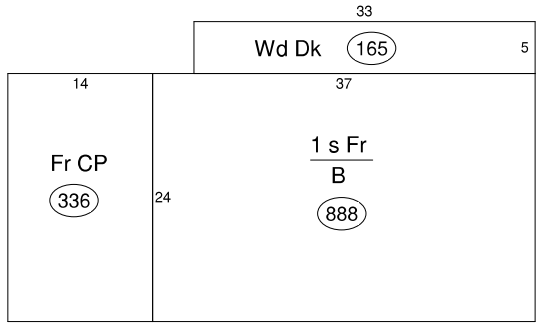
	Lower /Bsmt	Full Upper	Part Upper
Air Cond	0	888	0	0

PLUMBING

	#	TF
3 Fixt. Baths	2	6
Kit Sink	1	1
Water Heat	1	1
TOTAL		8

REMODELING AND MODERNIZATION

	Amount	Date



Special Features

Description

Summary of Improvements

ID	USE	Story Height	Const Type	Grade	Year Cons	Eff Year	Cond	Size or Area
D	DWELL	0.00		AVG	1962	1982	AV	1776
G01	ICP	0.00	1					14x 24

UPS Internet Shipping: View/Print Label

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

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

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

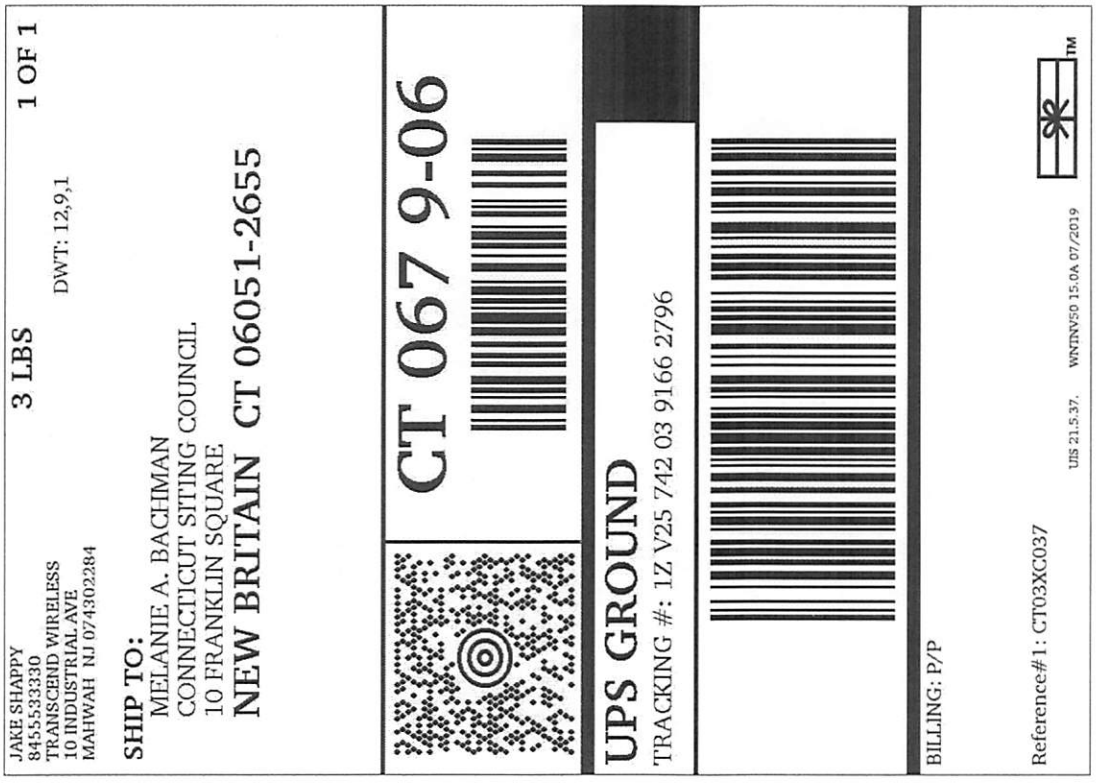
   Customers without a Daily Pickup
   Take your package to any location of The UPS Store®, UPS Access Point(TM) location, UPS Drop Box, UPS Customer Center, Staples® or Authorized Shipping Outlet near you. Items sent via UPS Return Services(SM) (including via Ground) are also accepted at Drop Boxes. To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

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

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

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

FOLD HERE



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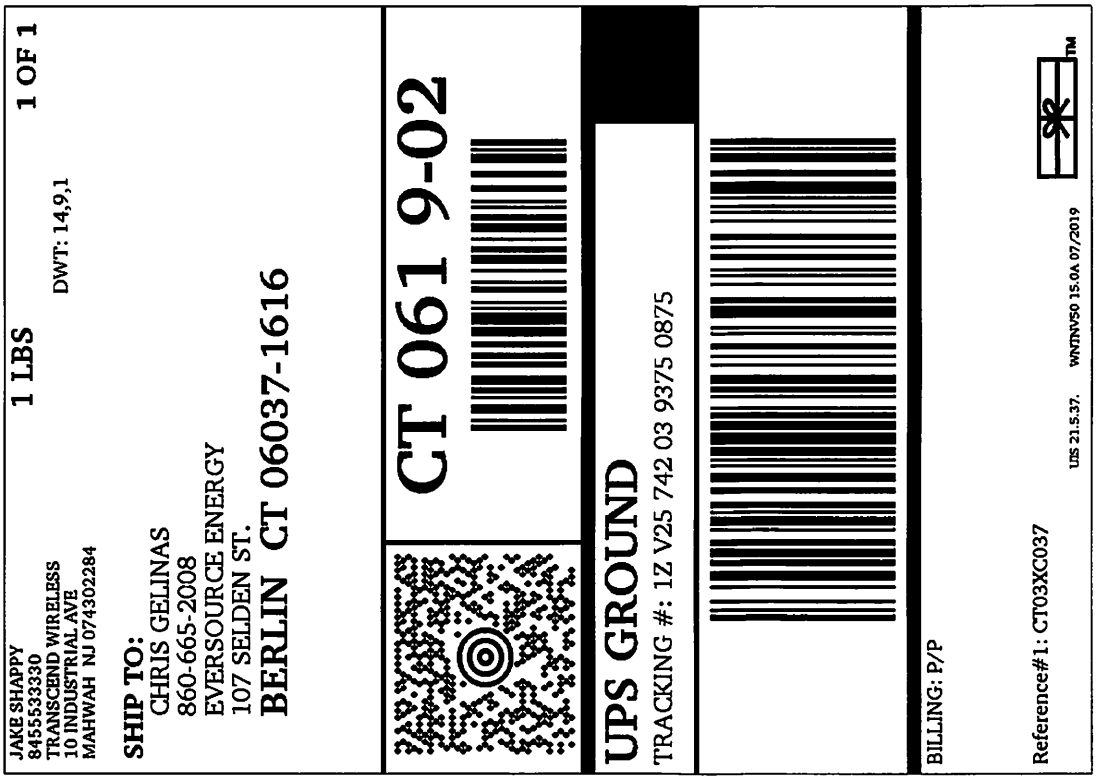

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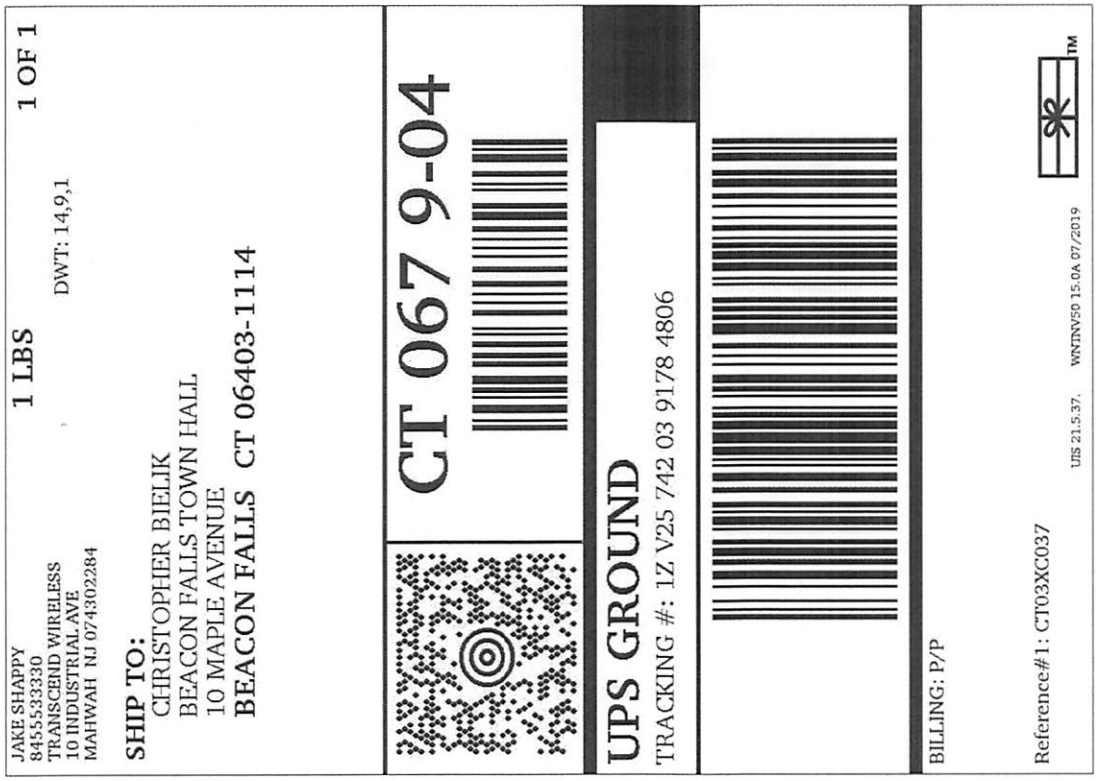

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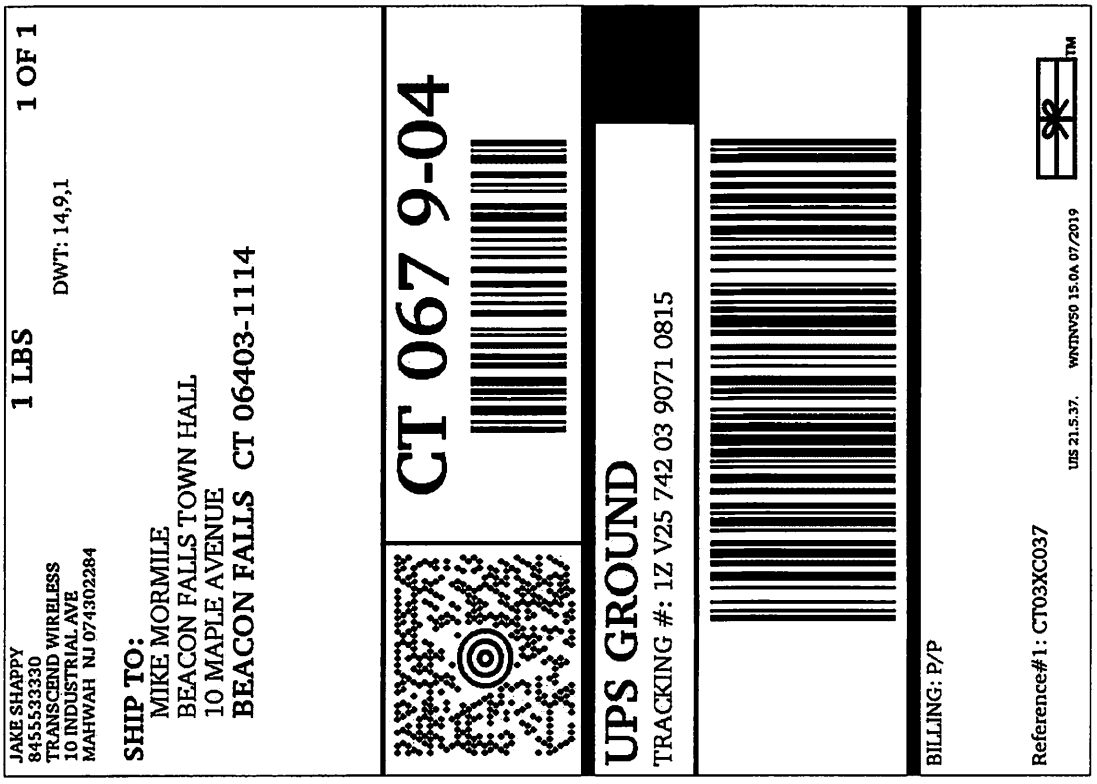

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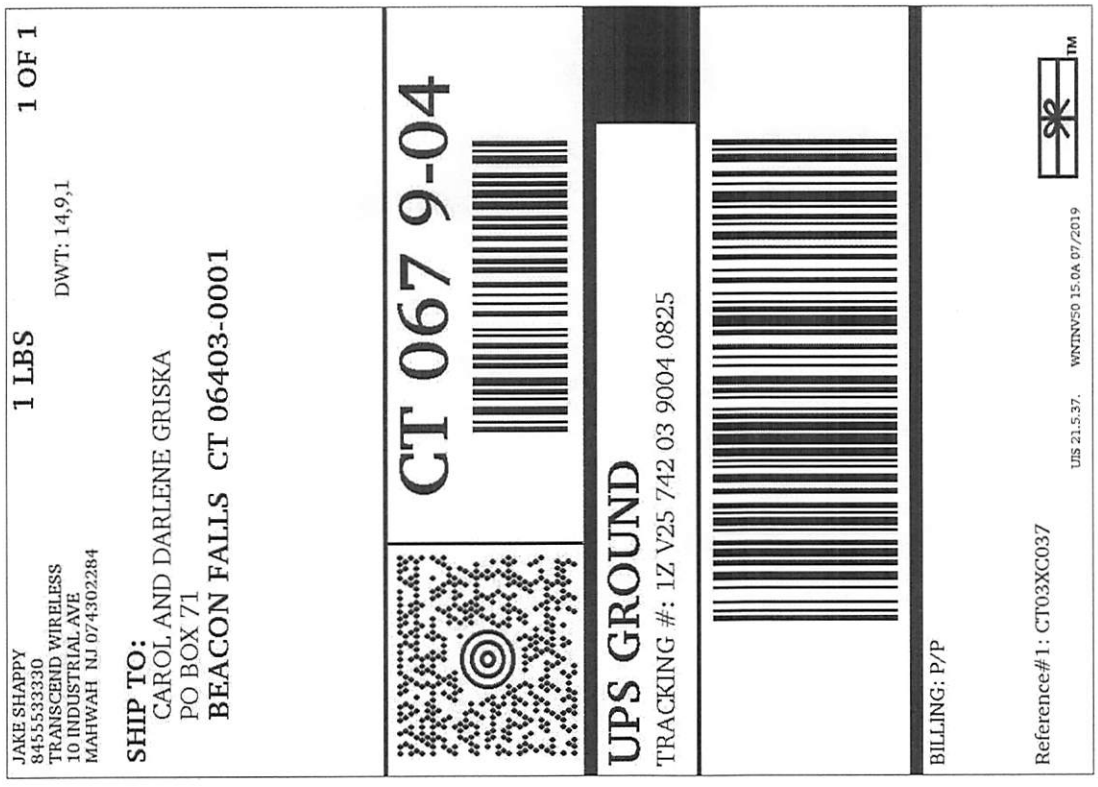


WIRELESS COMMUNICATIONS FACILITY

EVERSOURCE STRUCT.: 326

SITE ID: CT03XC037

236 PENT ROAD

BEACON FALLS, CT 06403

GENERAL NOTES

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

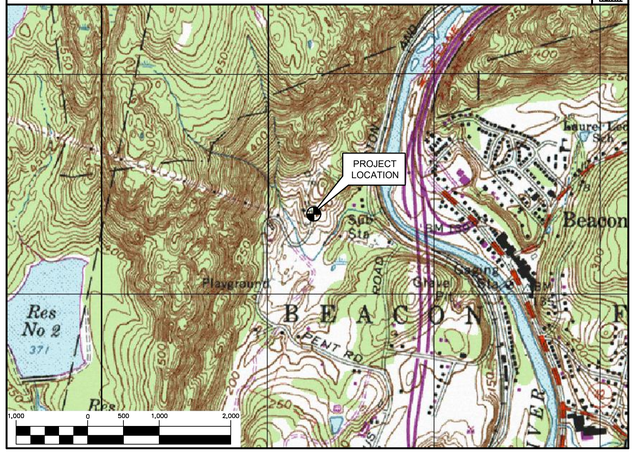
SITE DIRECTIONS

FROM: 5 WAYSIDE ROAD, BURLINGTON, MA 01803 **TO:** 236 PENT ROAD, BEACON FALLS, CT 06403

1.	START OUT BY GOING TO WAYSIDE ROAD.	0.10 MI.
2.	TURN LEFT ONTO CAMBRIDGE ST/US-3 N/MA	0.10 MI.
3.	MERGE ONTO I-95 S/US-3 N TOWARD WALTHAM/LOWELL	0.30 MI.
4.	TAKE THE I-90/MASS PIKE EXIT, EXIT 25, TOWARD BOSTON/ALBANY NY.	12.10 MI.
5.	MERGE ONTO I-90 W/MASSACHUSETTS TPKE W TOWARD WORCESTER.	44.45 MI.
6.	MERGE ONTO I-84 W/WILBUR CROSS HWY S VIA EXIT 9 TOWARD US-20.	73.9 MI.
7.	TAKE EXIT 19 TO MERGE ONTO CT-8 S TOWARD NAUGATUCK/BRIDGEPORT.	7.8 MI.
8.	TAKE EXIT 24 TOWARD CT42/BEACON FALLS/OXFORD/R.R. STATION.	0.50 MI.
9.	TURN RIGHT ONTO STATE HWY 852.	0.20 MI.
10.	TURN RIGHT ONTO DEPOT ST.	<0.10 MI.
11.	TURN RIGHT ONTO RAILROAD AVE.	0.10 MI.
12.	TURN LEFT ONTO LOPUS ROAD.	0.50 MI.
13.	TURN LEFT ONTO LOPUS ROAD EXT.	<0.10 MI.
14.	TURN RIGHT ONTO PENT ROAD.	0.90 MI

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

1. THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:
   - A. INSTALLATION OF A PROPOSED UNISTRUT EQUIPMENT RACK MOUNTED AT GRADE.
   - B. REMOVE (2) EXISTING PANEL ANTENNAS FROM EXISTING TOWER MOUNT.
   - C. INSTALL (3) PROPOSED 10-PORT PANEL ANTENNAS, (1) PER SECTOR.
   - D. INSTALL (6) PROPOSED DIPLEXERS ON TOWER.
   - E. INSTALL (6) PROPOSED DIPLEXERS ON PROPOSED UNISTRUT RACK.
   - F. INSTALL (7) PROPOSED RRH'S ON PROPOSED UNISTRUT RACK.

PROJECT INFORMATION

SITE NAME:	EVERSOURCE STRUCT.: 326
SITE ID:	CT03XC037
SITE ADDRESS:	236 PENT ROAD BEACON FALLS, CT 06403
APPLICANT:	SPRINT 5 WAYSIDE ROAD BURLINGTON, MA 01803
CONTACT PERSON:	MIKE KITHCART (PROJECT MANAGER) (973)626-5792
ENGINEER:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD RD. BRANFORD, CT 06405
PROJECT COORDINATES:	LATITUDE: 41° 26' 40.19"N LONGITUDE: 73° 04' 21.45"W GROUND ELEVATION: ±200' AMSL SITE COORDINATES REFERENCED AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
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C-1	COMPOUND PLANS AND ELEVATION	0
C-2	TYPICAL DETAILS	0
C-3	COAX CABLE ROUTING DETAILS	0
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0	07/12/19	TJL	CAG	ISSUED FOR CONSTRUCTION

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EVERSOURCE STRUCT.: 326
SITE ID: CT03XC037
236 PENT ROAD
BEACON FALLS, CT 06403

DATE: 02/1/18
SCALE: AS NOTED
JOB NO. 17159.02

TITLE SHEET

T-1

Sheet No. 1 of 6

DESIGN BASIS:

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

1. DESIGN CRITERIA:

ANTENNA MAST

- WIND LOAD: PER ANSI/TIA 222 G (ANTENNA MOUNTS): 97 MPH

TRANSMISSION TOWER

- WIND LOAD: PER NESC C2-2012 SECTION 25 RULE 250B – 4PSF
- SEISMIC LOAD (DOES NOT CONTROL): PER ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES.

GENERAL NOTES:

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

STRUCTURAL STEEL

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

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

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

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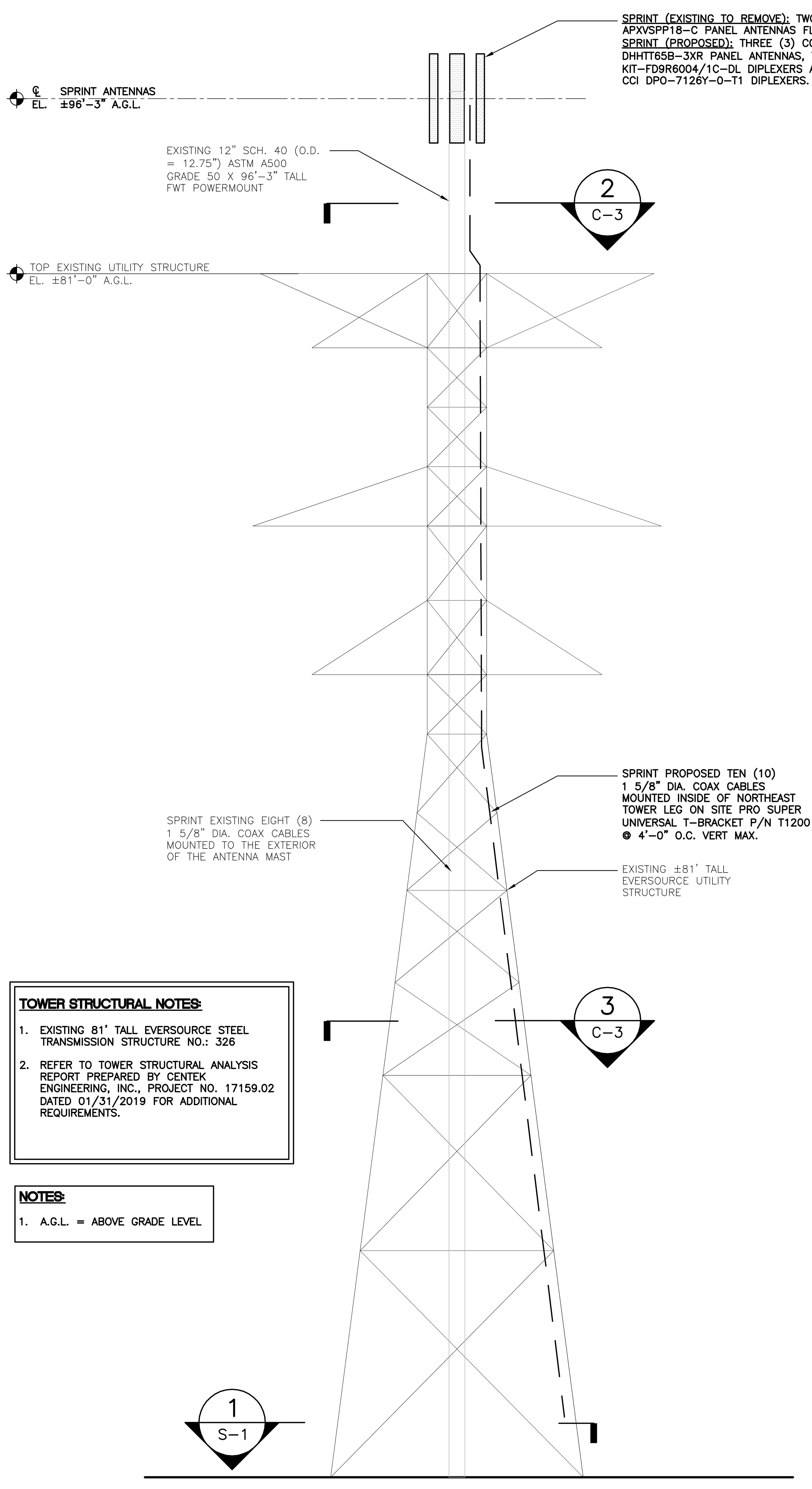
DESIGN BASIS AND SITE NOTES

N-1



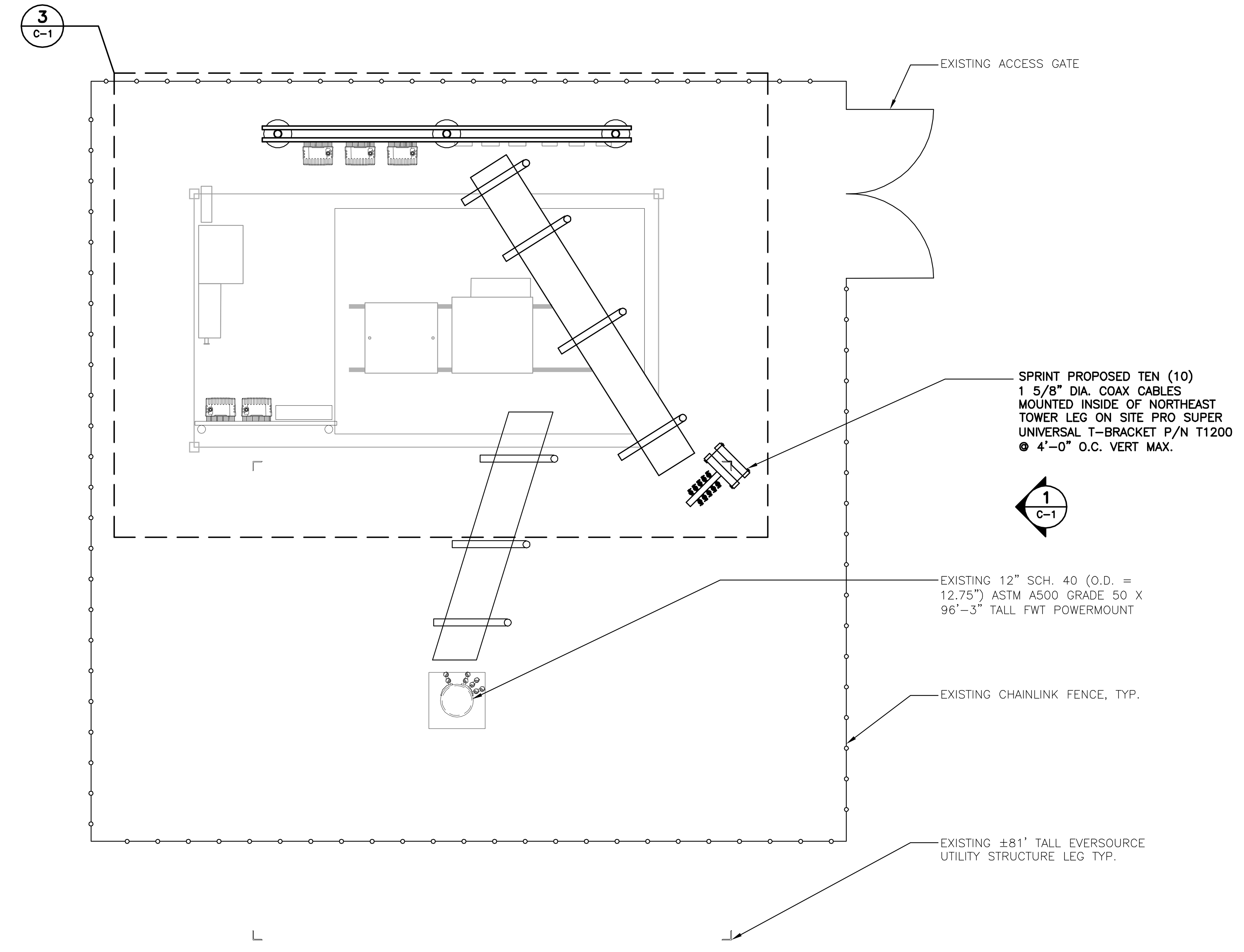
1 C–1 **SOUTHEAST TOWER ELEVATION**
SCALE: 1" = 5'–0"

TOWER STRUCTURAL NOTES:

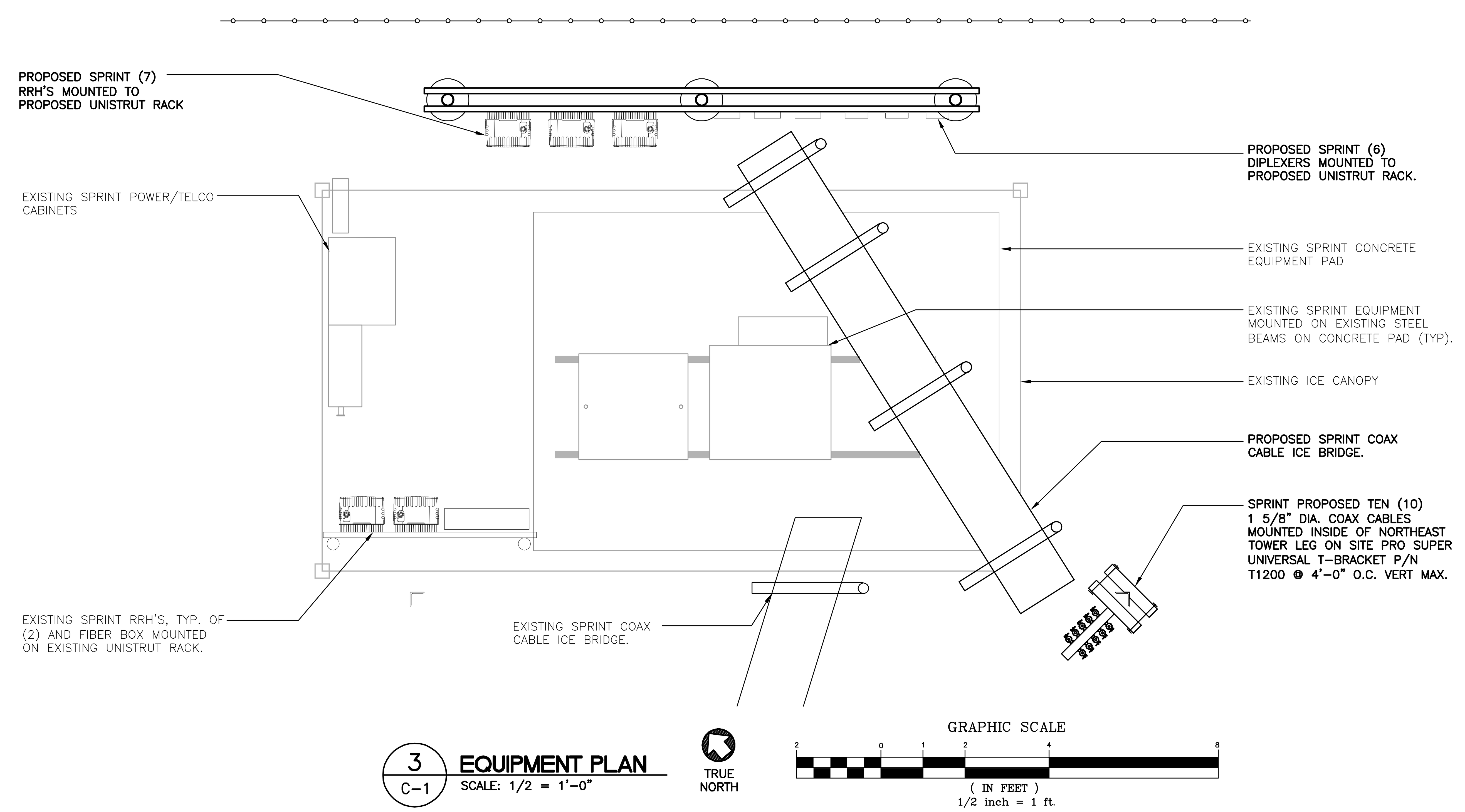
1. EXISTING 81' TALL EVERSOURCE STEEL TRANSMISSION STRUCTURE NO.: 326
2. REFER TO TOWER STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING, INC., PROJECT NO. 17159.02 DATED 01/31/2019 FOR ADDITIONAL REQUIREMENTS.

NOTES:

1. A.G.L. = ABOVE GRADE LEVEL



2 C–1 **COMPOUND PLAN**
SCALE: 1" = 3'–0"



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

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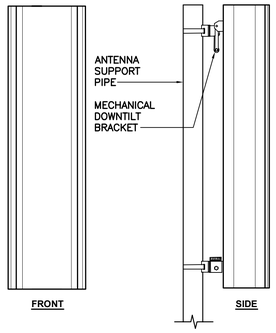
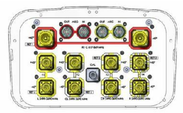
COMPOUND PLANS AND ELEVATION

C-1

Sheet No. 3 of 6



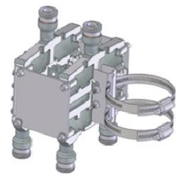


BOTTOM

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: COMMSCOPE MODEL: DHHTT65B-3XR	71.9"L x 13.8"W x 8.2"D	58 LBS.

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

DOP-7126Y-0-T1



KIT-FD9R6004/1C-DL

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

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

3 / C-2 DIPLEXER DETAIL
SCALE: NOT TO SCALE

FZHN

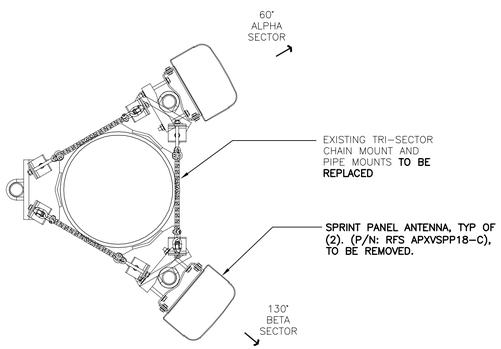
RRH-2x50-800

RRH-4x45-1900

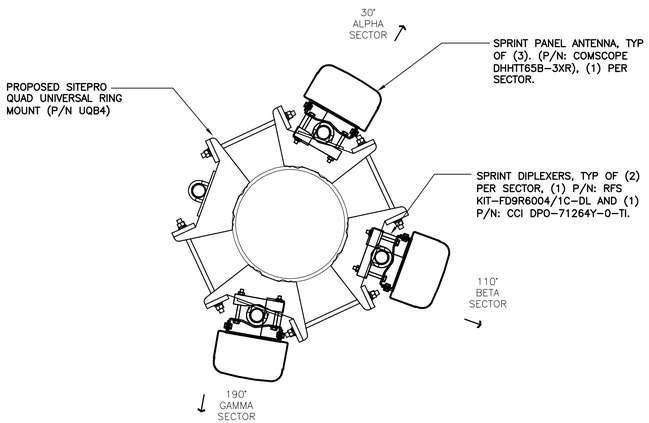
RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: NOKIA MODEL: FZHN	16.63"L x 14.57"W x 5.94"D	44 LBS.	ABOVE: XX" MIN. BELOW: XX" MIN. FRONT: XX" MIN.
MAKE: ALCATEL-LUCENT MODEL: RRH-2x50-800	15.7"L x 13.0"W x 9.8"D	53 LBS.	ABOVE: 16" MIN. BELOW: 12" MIN. FRONT: 36" MIN.
MAKE: ALCATEL-LUCENT MODEL: RRH-4x45-1900	25.0"L x 11.1"W x 11.4"D	60 LBS.	ABOVE: XX" MIN. BELOW: XX" MIN. FRONT: XX" MIN.

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

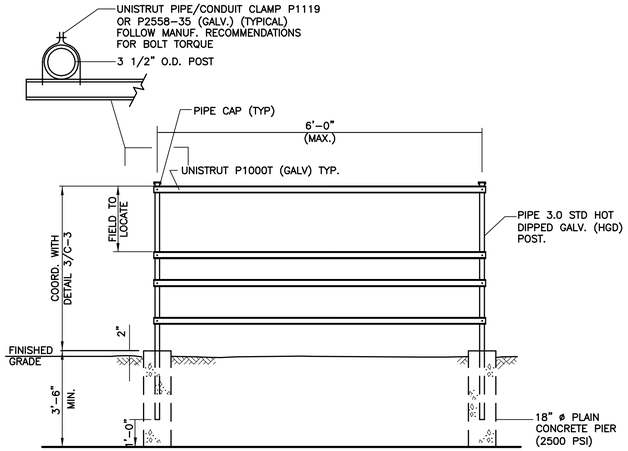
2 / C-2 REMOTE RADIO HEAD DETAIL
SCALE: NOT TO SCALE



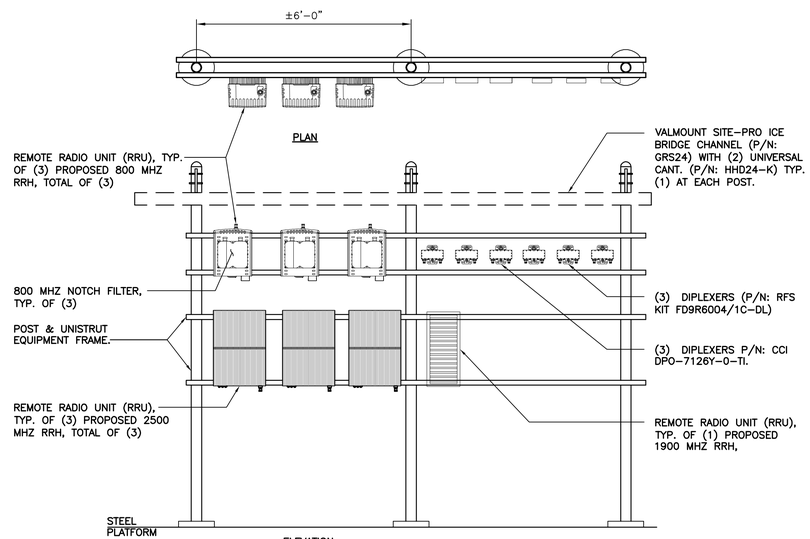
4 / C-2 EXISTING ANTENNA PLAN
SCALE: = 1" = 1'



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



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



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

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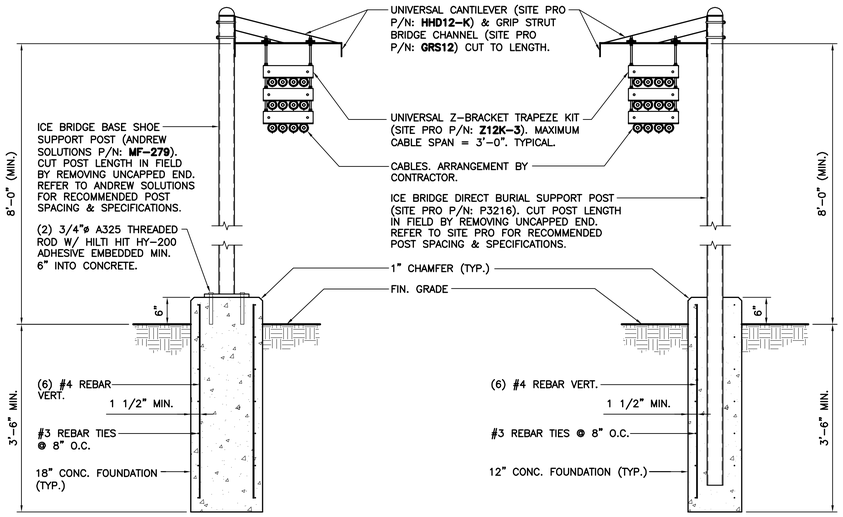
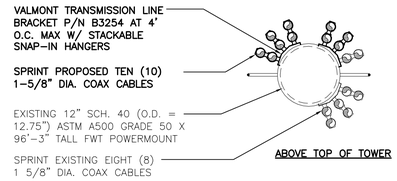
TYPICAL DETAILS

C-2

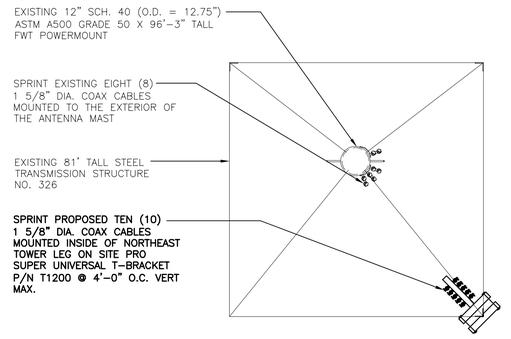
Sheet No. 4 of 6



1 / C-3 **ICE BRIDGE DETAIL**
SCALE: 3/4" = 1'- 0"



2 / C-3 **FEEDLINE PLAN - MAST**
SCALE: = 1/4" = 1'



3 / C-3 **FEEDLINE PLAN - TOWER**
SCALE: = NTS

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COAX CABLE ROUTING DETAILS

C-3

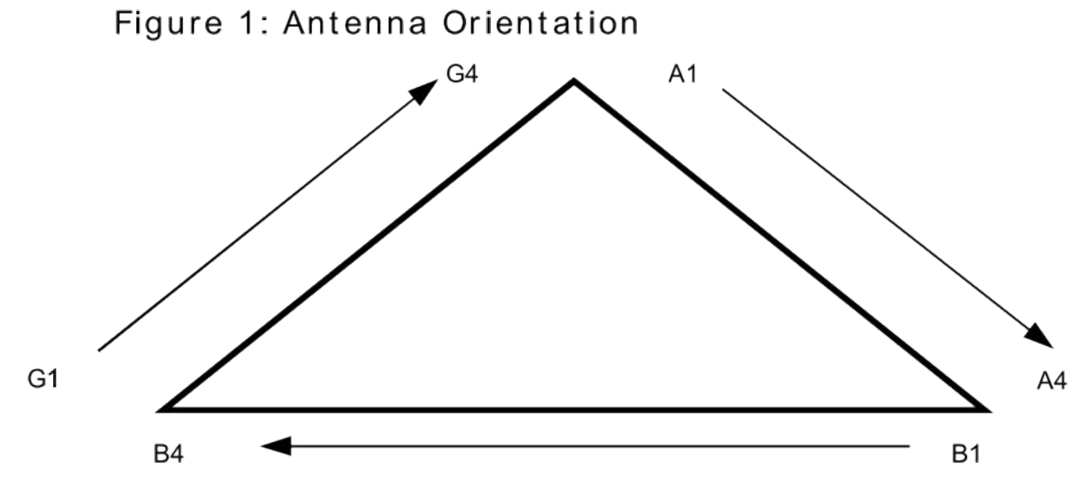
Sheet No. 5 of 6

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

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

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

Figure 1: Antenna Orientation



NOTES

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

FIGURE 19.1 CABLE COLOR CODE

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

FIGURE 19.2 COLOR CODE

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

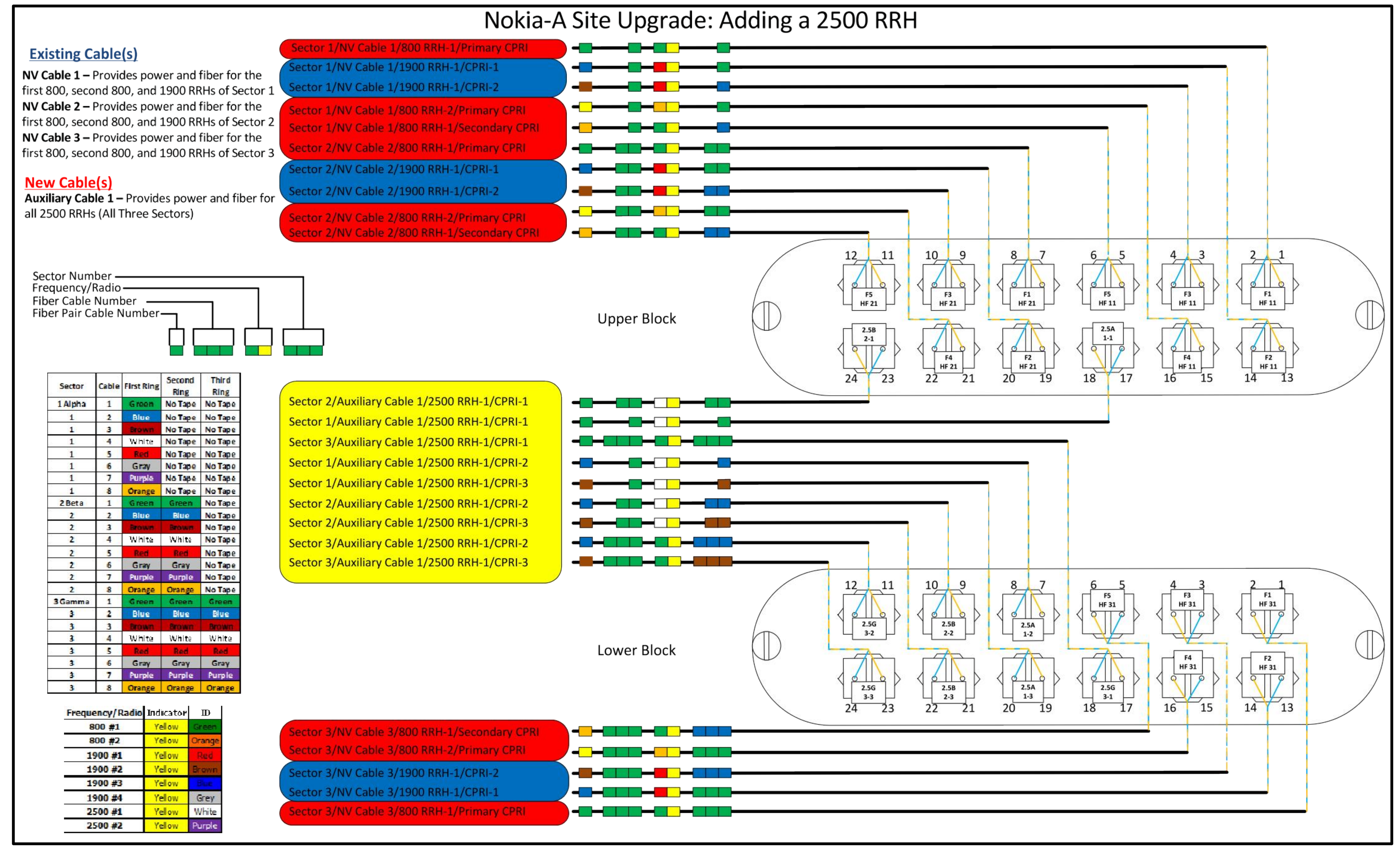
FREQUE	INDICATOR		ID
2500 -1	YEL	WHT	GRN
2500 -2	YEL	WHT	RED
2500 -3	YEL	WHT	BRN
2500 -4	YEL	WHT	BLU
2500 -5	YEL	WHT	SLT
2500 -6	YEL	WHT	ORG
2500 -7	YEL	WHT	WHT
2500 -8	YEL	WHT	PPL

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

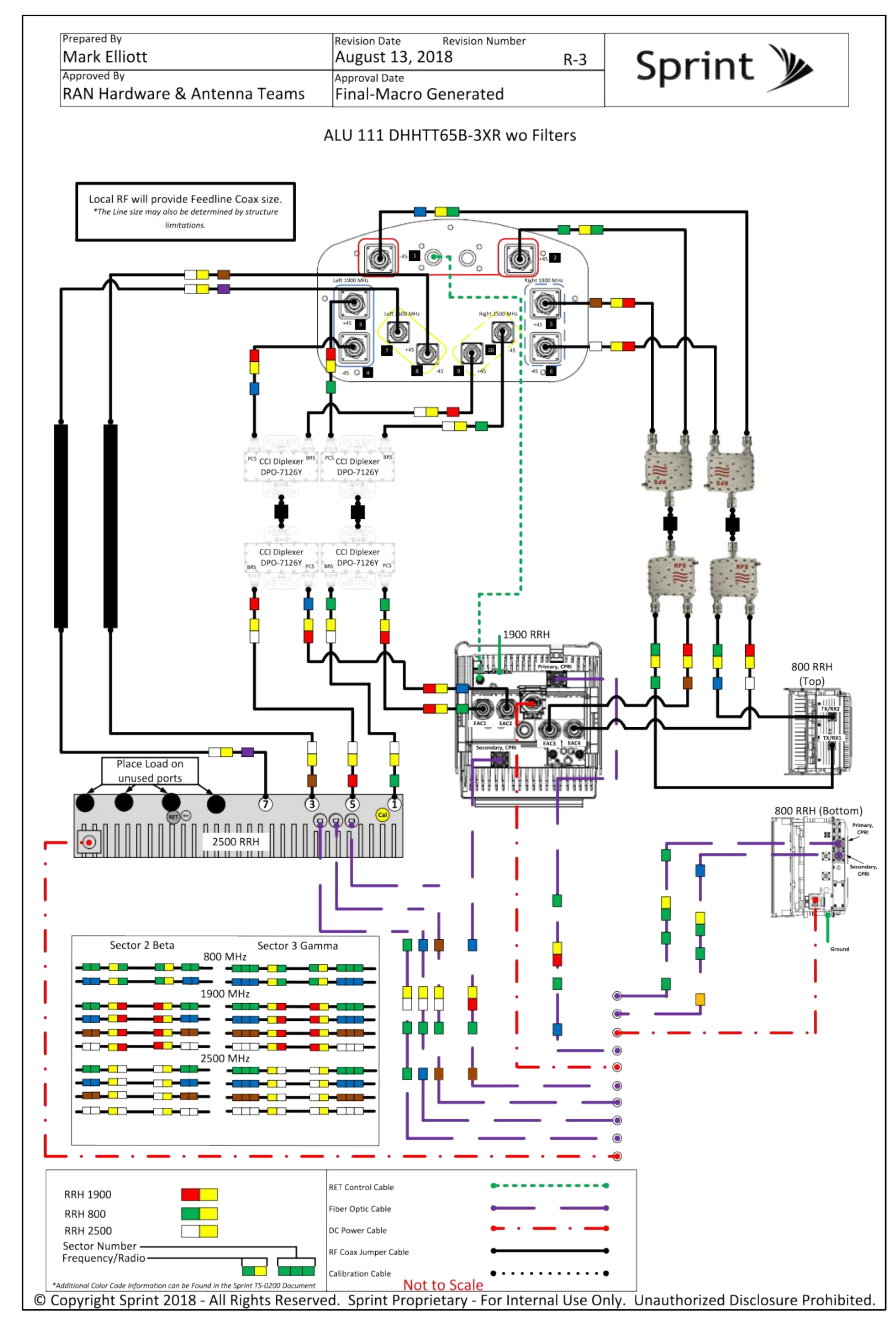
Example – Sector 3, Cable 1, 1900mhz Radio #1

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

1 C-4 **COLOR CODE DIAGRAM**
NOT TO SCALE



2 C-4 **CPRI DIAGRAM**
NOT TO SCALE



3 C-4 **PLUMBING DIAGRAM**
NOT TO SCALE

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	07/12/19	TJL	CAG	ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

Sprint

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

SPRINT
WIRELESS COMMUNICATIONS FACILITY
EVERSOURCE STRUCT.: 326
SITE ID: CT03XC037
236 PENT ROAD
BEACON FALLS, CT 06403

DATE: 02/1/18
SCALE: AS NOTED
JOB NO. 17159.02

COLOR CODE CPRI DETAILS AND PLUMBING DIAGRAM

C-4

Sheet No. 6 of 6

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Antenna Mast and Tower

Sprint Site Ref: CT03XC037

Eversource Structure No. 326

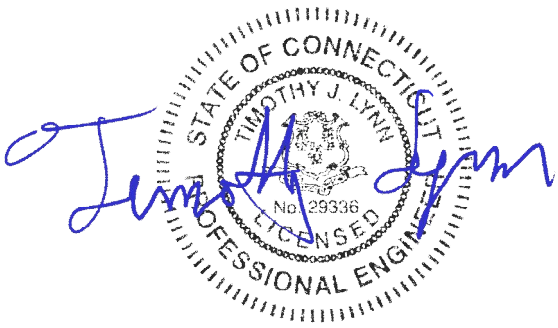
81' Electric Transmission Lattice Tower

236 Pent Road
Beacon Falls, CT

CENTEK Project No. 17159.02

~~Date: January 2, 2018~~

Rev 2: January 31, 2019



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

Table of Contents

Introduction

The purpose of this report is to analyze the existing 96.25' FWT Powermount job no. 19006000 dated March 19, 1999 and 81' Eversource tower located at 326 Pent Road in Beacon Falls, CT for the Sprint antenna and equipment upgrade.

The loads considered in this analysis consist of the following:

- SPRINT (EXISTING TO REMAIN):
  Coax Cables: Eight (8) 1-5/8" ∅ coax cables mounted to the exterior of the existing powermount.
  Mast: 12" Sch. 40 (O.D. = 12.75") x 96'-3" tall ASTM A500 Gr. 50 FWT powermount.
- SPRINT (EXISTING TO REMOVE):
  Antennas: Two (2) RFS APXVSPP18-C panel antennas flush mounted to the existing powermount with a RAD center elevation of 96.25-ft above grade.
- **SPRINT (Proposed):**
  Antennas: Three (3) Commscope DHHTT65B-3XR panel antennas, three (3) RFS KIT-FD9R6004/1C-DL Diplexers and three (3) CCI DPO-7126Y-0-T1 Diplexers flush mounted to the existing powermount with a RAD center elevation of 96.25-ft above grade.
  Coax Cables: Ten (10) 1-5/8" ∅ coax cables running on the outside of the tower as indicated in section 4 of this report.

Primary assumptions used in the analysis

- Design steel stresses are defined by AISC-LRFD 14th edition for design of the antenna Mast and antenna supporting elements.
- ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", defines allowable steel stresses for evaluation of the utility tower.
- All utility tower members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- All coaxial cable will be installed as indicated in Section 4 of this report.
- Antenna Mast will be properly installed and maintained.
- No residual stresses exist due to incorrect tower erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Antenna Mast and utility tower will be in plumb condition.
- Utility tower was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

Analysis

Structural analysis of the antenna mast was independently completed using the current version of RISA-3D computer program licensed to CENTEK Engineering, Inc. The RISA-3D program contains a library of all AISC shapes and corresponding section properties are computed and applied directly within the program. The program's Steel Code Check option was also utilized.

The existing Antenna Mast consisting of a 12" Sch. 40 pipe conforming to ASTM A500 Grade 50 (Fy = 50ksi) connected at five elevations to the existing tower was analyzed for its ability to resist loads prescribed by the TIA-222-G standard. Section 5 of this report details these gravity and lateral wind loads. Load cases and combinations used in RISA-3D for TIA/EIA loading are listed in report Section 6.

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

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

Design Basis

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

- UTILITY TOWER ANALYSIS

  The purpose of this analysis is to determine the adequacy of the existing utility structure to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the NU Design Criteria Table, NESC C2-2007 ~ Construction Grade B, and ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures".

  Load cases considered:

  Load Case 1: NESC Heavy

Wind Pressure……..	4.0 psf
Radial Ice Thickness……	0.5"
Vertical Overload Capacity Factor……	1.50
Wind Overload Capacity Factor……	2.50
Wire Tension Overload Capacity Factor……	1.65

- MAST ASSEMBLY ANALYSIS

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

  Load cases considered:

  Load Case 1:
  Wind Speed……..... 97 mph (2016 CSBC Appendix-N)
  Radial Ice Thickness…….. 0”

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

R e s u l t s

- POWERMOUNT

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

Component	Design Limit	Stress Ratio (percentage of capacity)	Result
12” Sch. 40 Pipe	Bending	15.3%	**PASS**
L2x2x3/16 Brace	Bending	37.2%	**PASS**
Connection	Shear	70.2%	**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 **91.61%** occurs in the utility structure under the **NESC Heavy** loading condition.

  TOWER SECTION:

  The utility structure was found to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle g9xy	91.61%	**PASS**

- FOUNDATION AND ANCHORS

The existing foundation consists of one (1) 1.5-ft square tapering to 2.42-ft square x 6.0-ft long reinforced concrete pier on one 5-ft square x 1.5-ft thick reinforced concrete pad per leg. The base of the tower is connected to the foundation by one anchor stub per leg. Foundation information was obtained from NUSCO drawings # 01145-60001.

BASE REACTIONS:

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

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	9.93 kips	40.12 kips	54.20 kips

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

FOUNDATION:

The foundation was found to be within allowable limits.

Foundation	Design Limit	Allowable Limit	Proposed Loading (2)	Result
Reinf. Conc. Pad & Pier	Uplift	1.0 FS (1)	1.03 FS (1)	**PASS**

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

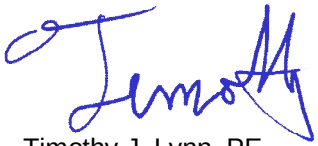
C o n c l u s i o n

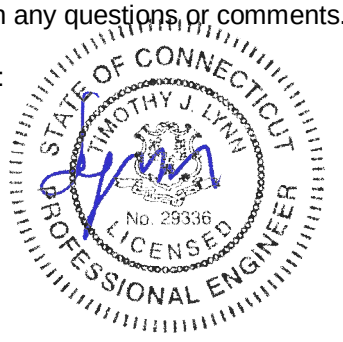
This analysis shows that the subject utility tower **is adequate** to support the proposed equipment installation.

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:





Timothy J. Lynn, PE
Structural Engineer

STANDARD CONDITIONS FOR FURNISHING OF PROFESSIONAL ENGINEERING SERVICES ON EXISTING STRUCTURES

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

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

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

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

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

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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA-3D

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

Modeling Features:

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

Analysis Features:

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

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

Graphics Features:

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

Design Features:

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

Results Features:

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

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ PLS-TOWER

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

Modeling Features:

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

Analysis Features:

- Automatic handling of tension-only members
- Automatic distribution of loads in 2-part suspension insulators (v-strings, horizontal vees, etc.)
- Automatic calculation of tower dead, ice, and wind loads as well as drag coefficients according to:
  - ASCE 74-1991
  - NESC 2002
  - NESC 2007
  - IEC 60826:2003
  - EN50341-1:2001 (CENELEC)
  - EN50341-3-9:2001 (UK NNA)
  - EN50341-3-17:2001 (Portugal NNA)
  - ESAA C(b)1-2003 (Australia)
  - TPNZ (New Zealand)
  - REE (Spain)
  - EIA/TIA 222-F
  - ANSI/TIA 222-G
  - CSA S37-01
- Automated microwave antenna loading as per EIA/TIA 222-F and ANSI/TIA 222-G
- Minimization of problems caused by unstable joints and mechanisms
- Automatic bandwidth minimization and ability to solve large problems
- Design checks according to (other standards can be added easily):
  - ASCE Standard 10-90

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

Results Features:

- Design summaries printed for each group of members
- Easy to interpret text, spreadsheet and graphics design summaries
- Automatic determination of allowable wind and weight spans
- Automatic determination of interaction diagrams between allowable wind and weight spans
- Capability to batch run multiple tower configurations and consolidate the results
- Automated optimum angle member size selection and bolt quantity determination

Tool for interactive angle member sizing and bolt quantity determination.

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

Introduction

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

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

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

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

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

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

Note 1: Prepared from documentation provide from Northeast Utilities.

P C S M a s t

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

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

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

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

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

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

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

Attachment A
Eversource Design Criteria

		Attachment A NU Design Criteria	Basic Wind Speed	Pressure	Height factor	Gust Factor	Load or Stress Factor	Force Coef. - Shape Factor
			V (MPH)	Q (PSF)	Kz	Gh		
Ice Condition	TIA/EIA	Antenna Mount	TIA	TIA (0.75Wi)	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Heavy	Tower/Pole Analysis with antennas extending above top of Tower/Pole (Yield Stress)	____	4	1	1	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole (on two faces)	____	4	1	1	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
High Wind Condition	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Apply a 1.25 X Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250C: Extreme Wind Loading Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
NESC Extreme Ice with Wind Condition *		Tower/Pole Analysis with antennas extending above top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load 1.25 X Gust Response Factor Apply a 1.25 X Gust Response Factor to all telecommunication equipment projected above top of tower/pole and apply a 1.0 x Gust Response Factor to the tower/pole structure					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with antennas below top of Tower/Pole	For wind speed use OTRM 060 Map 1, Rule 250D: Extreme Ice with Wind Loading 4 PSF Wind Load Height above ground is based on overall height to top of tower/pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor Loads Provided by NU					
		* Only for structures installed after 2007						

mount as specified below, and shall include the wireless communication mast and antenna loads per NESC criteria)

The strength reduction factor obtained from the field investigation shall be applied to the members or connections that are showing signs of deterioration from their original condition

With the written approval of Eversource Transmission Line Engineering on a case by case the existing structures may be analyzed initially using the current NESC code, then it is permitted to use the original design code with the original conductor load should the existing tower fail the current NESC code.

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

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

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

c) Electric Transmission Structure

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

   ii) Shape Factor Multiplier:

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

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

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

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

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

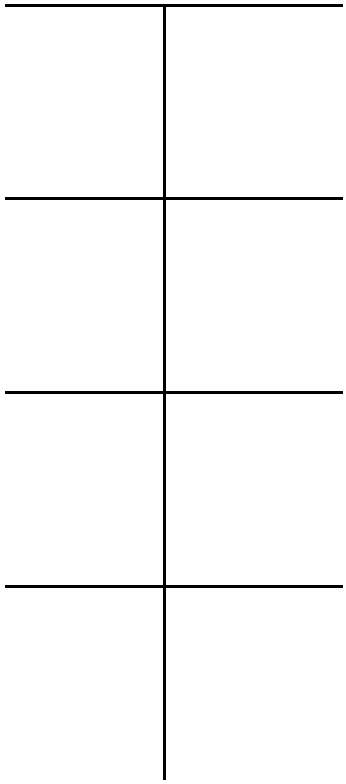
e) Mast reaction loads shall be evaluated for local effects on the transmission structure members at the attachment points.

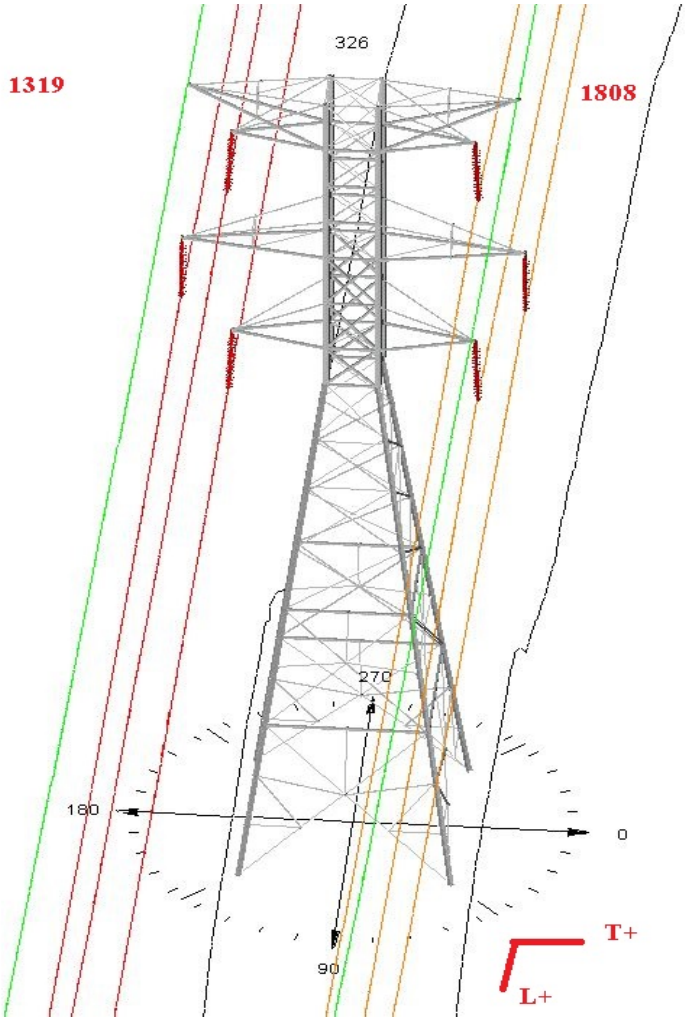
Project: Lines 1319 & 1808, Structure 326
Date: 12/12/2018
Engineer: JS
Purpose Recalculate wire loads for Sprint site.

All Conductors: 795 "Drake" ACSS, sagged in PLS-CADD
1319 Shield Wire: AFL DNO-4963, sagged in PLS-CADD
1808 Shield Wire: 19#10 Alumoweld, sagged in PLS-CADD

NESC 250B, Heavy

1319 Line				**1808 Line**	
OPGW	**V**	-195		-152 **V**	**Alumoweld**
	T	-1334		-1366 **T**	
	L	1240		741 **L**	
Top Phase:	**V**	803		942 **V**	
	T	-1892		-1771 **T**	
	L	194		89 **L**	
Mid Phase:	**V**	990		853 **V**	
	T	-1845		-1822 **T**	
	L	195		75 **L**	
Bot Phase:	**V**	1064		1032 **V**	
	T	-1908		-1780 **T**	
	L	202.65		125 **L**	





This is the same view as the tree on page 1.

EUIPMENT UPGRADE

STRUCT. NO. 326
SPRINT - CT03XC037
236 PENT ROAD
BEACON FALLS, CT 06403

VICINITY MAP

NORTH

PROJECT SUMMARY

SITE ADDRESS:	236 PENT ROAD BEACON FALLS, CT 06403
PROJECT COORDINATES:	LAT: 41°–26'–40.24N LON: 73°–04'–21.52W ELEV:±203' AMSL
EVERSOURCE STRUCT NO:	326
EVERSOURCE CONTACT:	JOEL SZARKOICZ 860.728.4503
SPRINT SITE REF.:	CT03XC037
SPRINT CONTACT:	MIKE KITHCART 973.626.5792
ANTENNA CL HEIGHT:	96'–3"
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	TIOMTHY J. LYNN, PE 203.433.7507

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T–1	TITLE SHEET	2
N–1	DESIGN BASIS & GENERAL NOTES	2
S–1	TOWER ELEVATION & FEEDLINE PLAN	2

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	1/31/19	TJL	CAG	ISSUED FOR CONSTRUCTION
1	2/12/18	TJL	CFC	REVISED – UPDATED DESIGN BASIS
0	1/2/18	TJL	CFC	ISSUED FOR REVIEW

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SPRINT
FOUNDATION REINFORCEMENT DESIGN

CT03XC037
STRUCTURE 326

236 PENT ROAD
BEACON FALLS, CT 06403

DATE:	1/2/18
SCALE:	AS SHOWN
JOB NO.	17159.02

TITLE SHEET

SHEET NO.
T–1
Sheet No. _ of 3

DESIGN BASIS

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

1. DESIGN CRITERIA:

- WIND LOAD (UTILITY TOWER): 110 MPH (3 SECOND GUST) PER NESC C2-2012 SECTION 25 RULE 250C
- WIND LOAD (ANTENNA MAST): 97 MPH (Vasd) (EXPOSURE C/IMPORTANCE FACTOR 1.15 BASED ON ASCE 7-10) PER 2015 INTERNATIONAL BUILDING CODE (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.

GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS AND REINFORCEMENT DESIGN PREPARED BY CENTEK ENGINEERING, INC., FOR SPRINT, REVISION #2, DATED 1/31/19.

2. TOWER GEOMETRY AND STRUCTURE MEMBER SIZES WERE OBTAINED FROM THE ORIGINAL TOWER DESIGN DOCUMENTS PREPARED BY AMERICAN BRIDGE CO. ORDER NO. J3926, DATED MARCH 27, 1947 WITH MODIFICATOINS PER DRAWINGS PREPARED BY NORRIS IRON WORKS, INC. ORDER NO. D3408 DATED OCTOBER 12, 1959. FOUNDATION INFORMATION WAS OBTAINED FROM THE ORIGINAL DESIGN DOCUMENTS PREPARED BY NORTHEAST UTILITIES SERVICE CO., DWG. NO. 01145-60001 DATED AUGUST 19, 1947.

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

4. 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.

5. 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.

6. 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.

7. 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.

8. NO DRILLING WELDING OR TAPING IS PERMITTED ON CL&P OWNED EQUIPMENT.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	1/31/19	TJL	CAG	ISSUED FOR CONSTRUCTION
1	2/12/18	TJL	CFC	REVISED - UPDATED DESIGN BASIS
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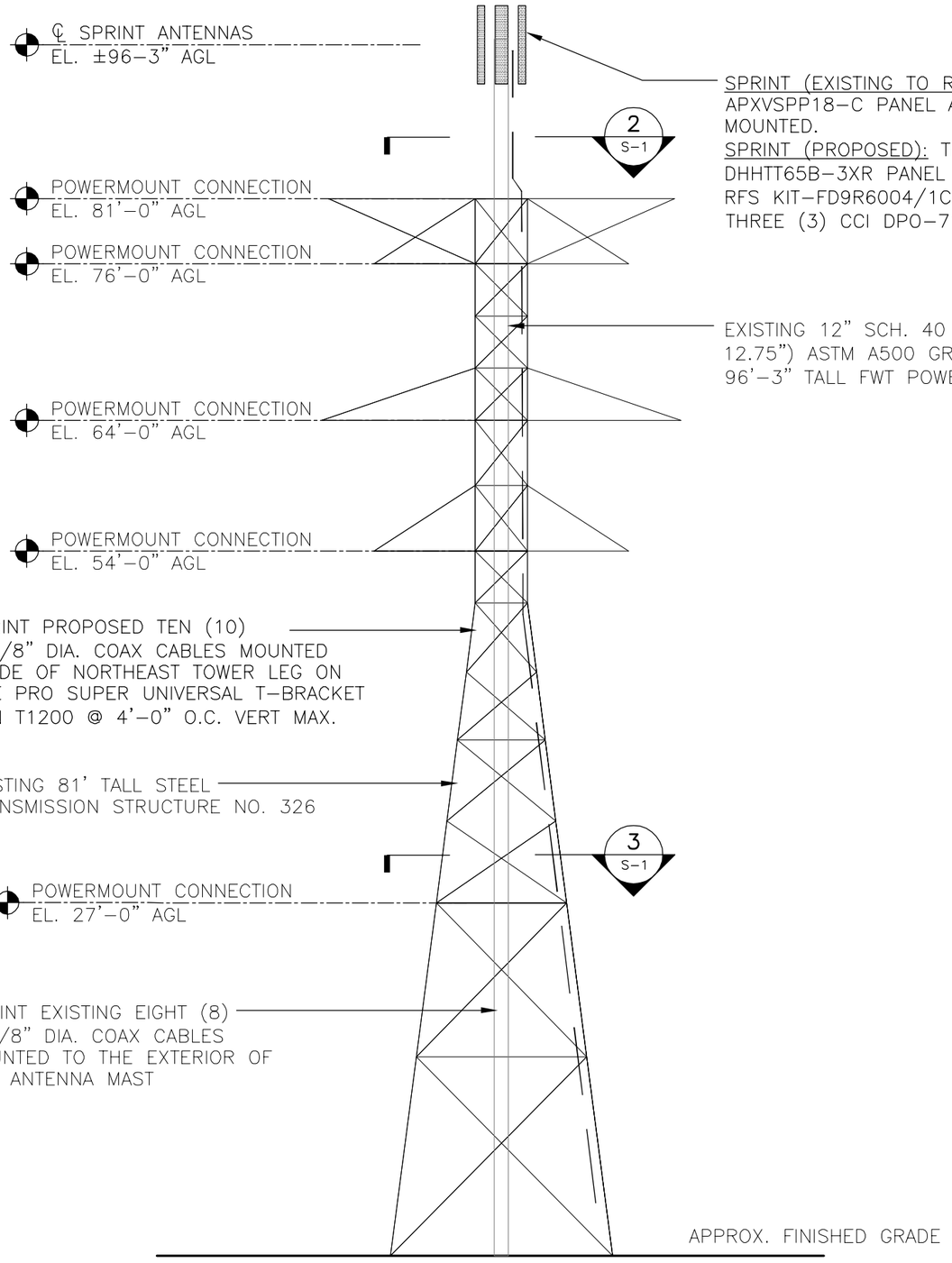
STRUCTURE 326

236 PENT ROAD
BEACON FALLS, CT 06403

DATE:	1/2/18
SCALE:	AS SHOWN
JOB NO.	17159.02

DESIGN BASIS AND GENERAL NOTES

SHEET NO.
N-1
Sheet No. 2 of 3

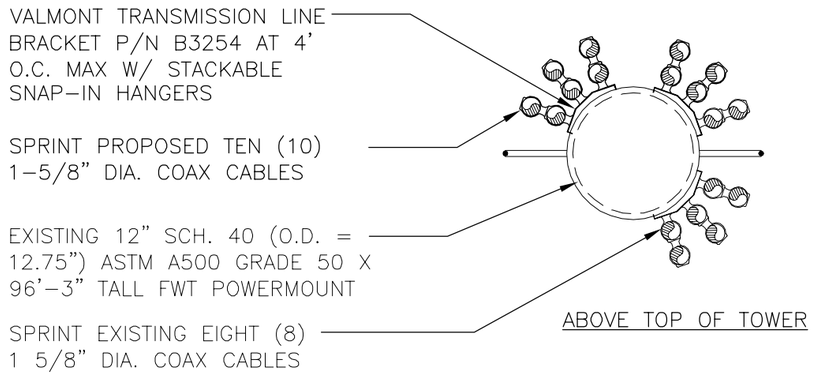


SPRINT (EXISTING TO REMOVE): TWO (2) RFS APXVSPP18–C PANEL ANTENNAS FLUSH MOUNTED.
SPRINT (PROPOSED): THREE (3) COMMSCOPE DHHTT65B–3XR PANEL ANTENNAS, THREE (3) RFS KIT–FD9R6004/1C–DL DIPLEXERS AND THREE (3) CCI DPO–7126Y–0–T1 DIPLEXERS.

EXISTING 12" SCH. 40 (O.D. = 12.75") ASTM A500 GRADE 50 X 96'–3" TALL FWT POWERMOUNT

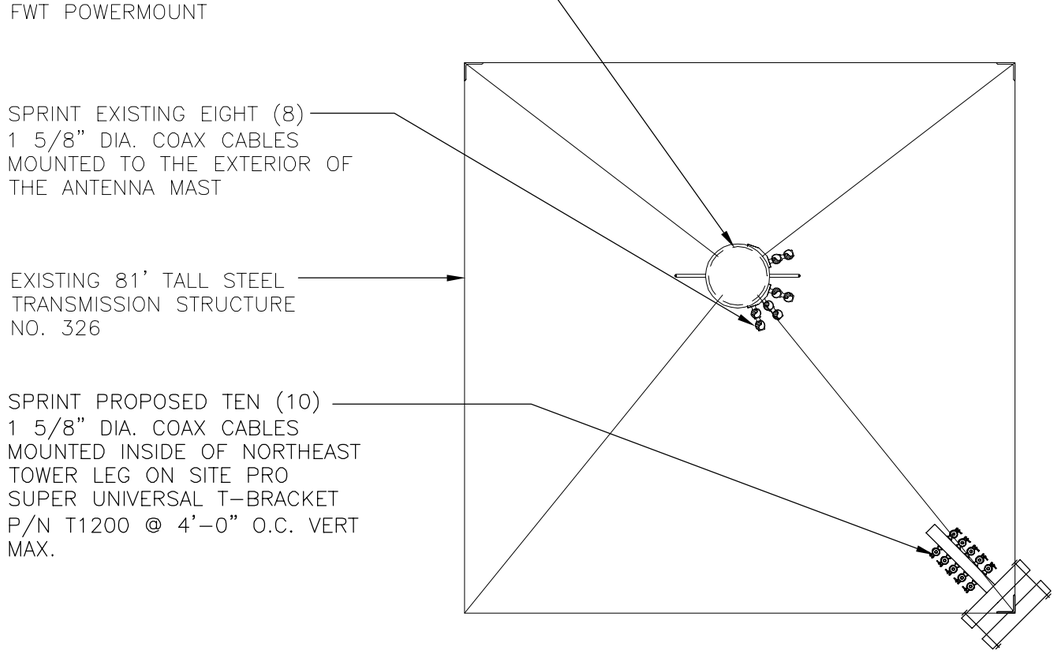
1 S–1 TOWER & POWERMOUNT ELEVATION

SCALE: NOT TO SCALE



2 S–1 FEEDLINE PLAN - TOWER

SCALE: NOT TO SCALE



3 S–1 FEEDLINE PLAN - TOWER

SCALE: NOT TO SCALE

APPROX. NORTH

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	1/31/19	TJL	CAG	ISSUED FOR CONSTRUCTION
1	12/12/18	TJL	CFC	REVISED - UPDATED DESIGN BASIS
0	1/2/18	TJL	CFC	ISSUED FOR REVIEW

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SPRINT
FOUNDATION REINFORCEMENT DESIGN

CT03XC037
STRUCTURE 326

226 PENT ROAD
BEACON FALLS, CT 06403

DATE:	1/2/18
SCALE:	AS SHOWN
JOB NO.	17159.02

TOWER ELEVATION AND FEEDLINE PLAN

SHEET NO.
S–1
Sheet No. 3 of 3

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Subject:	Loads on Equipmnet Structure 326
Location:	Beacon Falls, CT
Rev. 0: 1/2/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.02

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

Wind Speeds

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

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

Input

Structure Type = Structure_Type := Lattice (User Input)

Structure Category = SC := III (User Input)

Exposure Category = Exp := C (User Input)

Structure Height = $h := 81$ ft (User Input)

Height to Center of Antennas = $z_{T\text{-}Mo} := 96.25$ ft (User Input)

Height to Center of Mast = $z_{Mast5} := 90$ ft (User Input)

Height to Center of Mast = $z_{Mast4} := 70$ ft (User Input)

Height to Center of Mast = $z_{Mast3} := 50$ ft (User Input)

Mast Based on Max 20-ft Section per 2.6.9.1.3

Height to Center of Mast = $z_{Mast2} := 30$ ft (User Input)

Height to Center of Mast = $z_{Mast1} := 10$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ in (User Input per Annex B of TIA-222-G)

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

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H := 1.35$ (User Input)

Output

Wind Direction Probability Factor =

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

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

Importance Factors =

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

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

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

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

$K_{iz} := \left(\frac{z_{T\text{-}Mo}}{33}\right)^{0.1} = 1.113$ $t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.087$

Velocity Pressure CoefficientAntennas = $Kz_{T\text{-}Mo} := 2.01\left(\left(\frac{z_{T\text{-}Mo}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.255$

Velocity Pressure w/o Ice Antennas = $qz_{T\text{-}Mo} := 0.00256 \cdot K_d \cdot Kz_{T\text{-}Mo} \cdot V^2 \cdot I_{Wind} = 29.56$

Velocity Pressure with Ice Antennas = $qz_{ice.T\text{-}Mo} := 0.00256 \cdot K_d \cdot Kz_{T\text{-}Mo} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.83$

$K_{izMast5} := \left(\frac{z_{Mast5}}{33}\right)^{0.1} = 1.106$ $t_{izMast5} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast5} \cdot K_{zt}^{0.35} = 2.073$

Velocity Pressure Coefficient Mast = $Kz_{Mast5} := 2.01\left(\left(\frac{z_{Mast5}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.238$

Velocity Pressure w/o Ice Mast= $qz_{Mast5} := 0.00256 \cdot K_d \cdot Kz_{Mast5} \cdot V^2 \cdot I_{Wind} = 29.145$

Velocity Pressure with Ice Mast = $qz_{ice.Mast5} := 0.00256 \cdot K_d \cdot Kz_{Mast5} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.734$

$K_{izMast4} := \left(\frac{z_{Mast4}}{33}\right)^{0.1} = 1.078$ $t_{izMast4} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast4} \cdot K_{zt}^{0.35} = 2.021$

Velocity Pressure Coefficient Mast = $Kz_{Mast4} := 2.01\left(\left(\frac{z_{Mast4}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.174$

Velocity Pressure w/o Ice Mast= $qz_{Mast4} := 0.00256 \cdot K_d \cdot Kz_{Mast4} \cdot V^2 \cdot I_{Wind} = 27.643$

Velocity Pressure with Ice Mast = $qz_{ice.Mast4} := 0.00256 \cdot K_d \cdot Kz_{Mast4} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.387$

$K_{izMast3} := \left(\frac{z_{Mast3}}{33}\right)^{0.1} = 1.042$ $t_{izMast3} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast3} \cdot K_{zt}^{0.35} = 1.955$

Velocity Pressure Coefficient Mast = $Kz_{Mast3} := 2.01\left(\left(\frac{z_{Mast3}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.094$

Velocity Pressure w/o Ice Mast= $qz_{Mast3} := 0.00256 \cdot K_d \cdot Kz_{Mast3} \cdot V^2 \cdot I_{Wind} = 25.753$

Velocity Pressure with Ice Mast = $qz_{ice.Mast3} := 0.00256 \cdot K_d \cdot Kz_{Mast3} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 5.95$

$K_{izMast2} := \left(\frac{z_{Mast2}}{33}\right)^{0.1} = 0.991$ $t_{izMast2} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast2} \cdot K_{zt}^{0.35} = 1.857$

Velocity Pressure Coefficient Mast = $Kz_{Mast2} := 2.01\left(\left(\frac{z_{Mast2}}{zg}\right)\right)^{\frac{2}{\alpha}} = 0.982$

Velocity Pressure w/o Ice Mast= $qz_{Mast2} := 0.00256 \cdot K_d \cdot Kz_{Mast2} \cdot V^2 \cdot I_{Wind} = 23.127$

Velocity Pressure with Ice Mast = $qz_{ice.Mast2} := 0.00256 \cdot K_d \cdot Kz_{Mast2} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 5.343$

$K_{izMast1} := \left(\frac{z_{Mast1}}{33}\right)^{0.1} = 0.887$ $t_{izMast1} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast1} \cdot K_{zt}^{0.35} = 1.664$

Velocity Pressure Coefficient Mast = $Kz_{Mast1} := 2.01\left(\left(\frac{z_{Mast1}}{zg}\right)\right)^{\frac{2}{\alpha}} = 0.779$

Velocity Pressure w/o Ice Mast= $qz_{Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V^2 \cdot I_{Wind} = 18.352$

Velocity Pressure with Ice Mast = $qz_{ice.Mast1} := 0.00256 \cdot K_d \cdot Kz_{Mast1} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 4.24$

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

Subject: Loads on Equipmnet Structure 326

Location: Beacon Falls, CT

Rev. 0: 1/2/18

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 17159.02

Development of Wind & Ice Load on Mast

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

Mast Shape = Round (User Input)

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

Mast Length = $L_{mast} := 96.25$ ft (User Input)

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

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

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

Wind Load (without ice)

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

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

Wind Load (with ice)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast5})}{12} = 1.408$ sf/ft

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

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast4})}{12} = 1.399$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast4} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 7$ plf BLC 4

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast3})}{12} = 1.388$ sf/ft

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

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast2})}{12} = 1.372$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast2} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 6$ plf BLC 4

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast1})}{12} = 1.34$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast1} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 5$ plf BLC 4

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast5}\cdot 2\right)^2 - D_{mast}^2\right] = 96.5$		sq in	
Weight of Ice on Mast =	$W_{ICEmast5} := Id\cdot\frac{Ai_{mast}}{144} = 38$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast4}\cdot 2\right)^2 - D_{mast}^2\right] = 93.8$		sq in	
Weight of Ice on Mast =	$W_{ICEmast4} := Id\cdot\frac{Ai_{mast}}{144} = 36$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast3}\cdot 2\right)^2 - D_{mast}^2\right] = 90.3$		sq in	
Weight of Ice on Mast =	$W_{ICEmast3} := Id\cdot\frac{Ai_{mast}}{144} = 35$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast2}\cdot 2\right)^2 - D_{mast}^2\right] = 85.2$		sq in	
Weight of Ice on Mast =	$W_{ICEmast2} := Id\cdot\frac{Ai_{mast}}{144} = 33$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast1}\cdot 2\right)^2 - D_{mast}^2\right] = 75.4$		sq in	
Weight of Ice on Mast =	$W_{ICEmast1} := Id\cdot\frac{Ai_{mast}}{144} = 29$		plf	**BLC 3**

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Subject:	Loads on Equipmnet Structure 326
Location:	Beacon Falls, CT
Rev. 0: 1/2/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.02

Development of Wind & Ice Load on Antennas

Antenna Data:

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

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 6$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 17.9$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 969$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 8.5$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 25.5$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 320$	lbs	**BLC 4**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6092$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 7730$		cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 251$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 752$	lbs	**BLC 3**

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Location:	Beacon Falls, CT
Rev. 0: 1/2/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.02

Development of Wind & Ice Load on Antennas

Antenna Data:

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

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.3$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.8$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 38$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 0.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2.2$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 25$	lbs	**BLC 4**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 173$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 761$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 25$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 74$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

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

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 0.2$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 0.6$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 30$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 0.7$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 2$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 22$	lbs	**BLC 4**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 189$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 808$		cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 26$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 79$	lbs	**BLC 3**

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Subject:	Loads on Equipmnet Structure 326
Location:	Beacon Falls, CT
Rev. 0: 1/2/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.02

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Tri-Sector Chain Mount		
Mount Shape =	Flat		(User Input)
Mount Projected Surface Area =	$CaAa := 0$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CaAa_{ice} := 0$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 250$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 300$	lbs	

Wind Load (without ice)

Total Mount Wind Force =	$F_{mnt} := qz_{T\text{-}Mo} \cdot G_H \cdot CaAa = 0$	lbs	**BLC 5**

Wind Load (with ice)

Total Mount Wind Force =	$Fi_{mnt} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot CaAa_{ice} = 0$	lbs	**BLC 4**

Gravity Loads (without ice)

Weight of All Mounts =	$WT_{mnt} = 250$	lbs	**BLC 2**

Gravity Loads (ice only)

Weight of Ice on All Mounts =	$WT_{mnt.ice} - WT_{mnt} = 50$	lbs	**BLC 3**

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Subject: Loads on Equipmnet Structure 326

Location: Beacon Falls, CT

Rev. 0: 1/2/18

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 17159.02

Development of Wind & Ice Load on Coax Cables

Coax Cable Data: (Above Top of Tower)

Coax Type =	HELIAX 1-5/8"			
Shape =	Round		(User Input)	
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)	
Coax Cable Length =	$L_{coax} := 100$	ft	(User Input)	
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)	
Total Number of Coax =	$N_{coax} := 18$		(User Input)	
Total Number of Exterior Coax =	$Ne_{coax} := 18$		(User Input)	
No. of Coax Projecting Outside Face of Mast =	$NP_{coax} := 4$		(User Input)	
Coax aspect ratio,	$Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 606.1$			
Coax Cable Force Factor Coefficient =	$Ca_{coax} = 1.2$			

Wind Load (without ice)

Coax projected surface area =	$A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.7$	sf/ft	
Total Coax Wind Force =	$F_{coax} := Ca_{coax} \cdot qz_{Mast4} \cdot G_H \cdot A_{coax} = 30$	plf	**BLC 5**

Wind Load (with ice)

Coax projected surface area w/ Ice =	$AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot t_{iz})}{12} = 1$	sf/ft	
Total Coax Wind Force w/ Ice =	$Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast4} \cdot G_H \cdot AICE_{coax} = 10$	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 =	$Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot t_{iz})^2 - D_{coax}^2\right] = 26.7$	sq in	
Ice Weight All Coax per foot =	$WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 187$	plf	**BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data: (Below Top of Tower)

Coax Type =	HELIAX 1-5/8"		
Shape =	Round		(User Input)
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)
Coax Cable Length =	$L_{coax} := 100$	ft	(User Input)
Weight of Coax per foot =	$Wt_{coax} := 1.04$	plf	(User Input)
Total Number of Coax =	$N_{coax} := 8$		(User Input)
Total Number of Exterior Coax =	$Ne_{coax} := 8$		(User Input)
No. of Coax Projecting Outside Face of Mast =	$NP_{coax} := 2$		(User Input)
Coax aspect ratio,	$Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 606.1$		
Coax Cable Force Factor Coefficient =	$Ca_{coax} = 1.2$		

Wind Load (without ice)

Coax projected surface area =	$A_{coax} := \frac{(NP_{coax} D_{coax})}{12} = 0.3$	sf/ft		
Total Coax Wind Force =	$F_{coax} := Ca_{coax} \cdot qz_{Mast4} \cdot G_H \cdot A_{coax} = 15$	plf	**BLC 5**	

Wind Load (with ice)

Coax projected surface area w/ Ice =	$AICE_{coax} := \frac{(NP_{coax} \cdot D_{coax} + 2 \cdot t_{iz})}{12} = 0.7$	sf/ft		
Total Coax Wind Force w/ Ice =	$Fi_{coax} := Ca_{coax} \cdot qz_{ice.Mast4} \cdot G_H \cdot AICE_{coax} = 7$	plf	**BLC 4**	

Gravity Loads (without ice)

Weight of all cables w/o ice	$WT_{coax} := Wt_{coax} \cdot N_{coax} = 8$	plf	**BLC 2**	

Gravity Loads (ice only)

Ice Area per Linear Foot =	$Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot t_{iz})^2 - D_{coax}^2\right] = 26.7$	sq in		
Ice Weight All Coax per foot =	$WTi_{coax} := N_{coax} \cdot Id \cdot \frac{Ai_{coax}}{144} = 83$	plf	**BLC 3**	

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Subject:	Loads on Equipmnet Structure 326
Location:	Beacon Falls, CT
Rev. 0: 1/2/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.02

Development of Wind & Ice Load on Brace Member

Member Data: L2x2x3/16

Antenna Shape = Flat (User Input)

Height = $H_{mem} := 2$ in (User Input)

Width = $W_{mem} := 2$ in (User Input)

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

Length = $L_{mem} := 24$ in (User Input)

Member Aspect Ratio = $Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 12.0$

Member Force Coefficient = $Ca_{mem} = 1.57$

Wind Load (without ice)

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

Total Member Wind Force = $F_{mem} := qz_{Mast4} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 10$ plf **BLC 5**

Wind Load (with ice)

Member Projected Surface Area w/ Ice = $A_{ICEmem} := \frac{\left(H_{mem} + 2 \cdot t_{izMast5}\right)}{12} = 0.5$ sf/ft

Total Member Wind Force w/ Ice = $Fi_{mem} := qz_{ice.Mast4} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 7$ plf **BLC 4**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot t_{izMast5}\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot t_{izMast5}\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 34 \text{ sq in}$$

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 13$ plf **BLC 3**

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Location:	Beacon Falls, CT
Rev. 0: 1/2/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.02

Development of Wind & Ice Load on Brace Member

Member Data: L3x3x3/16

Antenna Shape = Flat (User Input)

Height = $H_{mem} := 3$ in (User Input)

Width = $W_{mem} := 3$ in (User Input)

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

Length = $L_{mem} := 96$ in (User Input)

Member Aspect Ratio = $Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 32.0$

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

Wind Load (without ice)

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

Total Member Wind Force = $F_{mem} := qz_{Mast4} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 19$ plf **BLC 5**

Wind Load (with ice)

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

Total Member Wind Force w/ Ice = $Fi_{mem} := qz_{ice.Mast4} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 10$ plf **BLC 4**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot t_{izMast5}\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot t_{izMast5}\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 42 \text{ sq in}$$

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

(Global) Model Settings

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

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

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

(Global) Model Settings, Continued

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

Hot Rolled Steel Properties

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

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design R...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Powermount	12" FWT Powe..	Beam	Pipe	A500 Gr. 50	Typical	14.579	279.335	279.335	558.67
2	Brace 1	L2x2x3	Beam	Single Angle	A36 Gr.36	Typical	.722	.271	.271	.009
3	Brace 2	L3x3x3	Beam	Single Angle	A36 Gr.36	Typical	1.09	.948	.948	.014

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Powermount	96.25	Segment	Segment	Lbyy						Lateral
2	M2	Brace 2	7.918			Lbyy						Lateral
3	M3	Brace 2	6.279			Lbyy						Lateral
4	M4	Brace 2	7.918			Lbyy						Lateral
5	M5	Brace 2	6.279			Lbyy						Lateral
6	M6	Brace 1	2.167			Lbyy						Lateral
7	M7	Brace 1	2.167			Lbyy						Lateral
8	M8	Brace 1	1.167			Lbyy						Lateral
9	M9	Brace 1	2.167			Lbyy						Lateral
10	M10	Brace 1	2.167			Lbyy						Lateral
11	M11	Brace 1	1.167			Lbyy						Lateral
12	M12	Brace 1	2.167			Lbyy						Lateral
13	M13	Brace 1	2.167			Lbyy						Lateral
14	M14	Brace 1	1.167			Lbyy						Lateral
15	M15	Brace 1	2.167			Lbyy						Lateral
16	M16	Brace 1	2.167			Lbyy						Lateral
17	M17	Brace 1	1.167			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design Rul...
1	M1	N1	N7			Powermount	Beam	Pipe	A500 Gr....	Typical
2	M2	N8	N2			Brace 2	Beam	Single Angle	A36 Gr.36	Typical
3	M3	N2	N9			Brace 2	Beam	Single Angle	A36 Gr.36	Typical
4	M4	N10	N2			Brace 2	Beam	Single Angle	A36 Gr.36	Typical
5	M5	N2	N11			Brace 2	Beam	Single Angle	A36 Gr.36	Typical
6	M6	N13	N3			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
7	M7	N3	N14			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
8	M8	N3	N12			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
9	M9	N16	N4			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
10	M10	N4	N17			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
11	M11	N4	N15			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
12	M12	N19	N5			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
13	M13	N5	N20			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
14	M14	N5	N18			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
15	M15	N22	N6			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
16	M16	N6	N23			Brace 1	Beam	Single Angle	A36 Gr.36	Typical
17	M17	N6	N21			Brace 1	Beam	Single Angle	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0	0	0	
2	N2	0	27	0	0	
3	N3	0	54	0	0	
4	N4	0	64	0	0	
5	N5	0	76	0	0	
6	N6	0	81	0	0	
7	N7	0	96.25	0	0	
8	N8	4.985	27	-6.152	0	
9	N9	4.985	27	3.818	0	
10	N10	-4.985	27	-6.152	0	
11	N11	-4.985	27	3.818	0	
12	N12	0	54	-1.167	0	
13	N13	-2	54	.833	0	
14	N14	2	54	.833	0	
15	N15	0	64	-1.167	0	
16	N16	-2	64	.833	0	
17	N17	2	64	.833	0	
18	N18	0	76	-1.167	0	
19	N19	-2	76	.833	0	
20	N20	2	76	.833	0	
21	N21	0	81	-1.167	0	
22	N22	-2	81	.833	0	
23	N23	2	81	.833	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction
2	N2						
3	N3						
4	N4						
5	N5						
6	N6						
7	N7						
8	N8	Reaction	Reaction	Reaction			
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	N18	Reaction	Reaction	Reaction			
18	N19	Reaction	Reaction	Reaction			
19	N21	Reaction	Reaction	Reaction			
20	N22	Reaction	Reaction	Reaction			
21	N17	Reaction	Reaction	Reaction			
22	N20	Reaction	Reaction	Reaction			
23	N23	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.138	96.25
2	M1	Y	-.021	96.25
3	M1	Y	-.024	96.25
4	M1	Y	-.25	96.25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.752	96.25
2	M1	Y	-.074	96.25
3	M1	Y	-.079	96.25
4	M1	Y	-.05	96.25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.32	96.25
2	M1	X	.025	96.25
3	M1	X	.022	96.25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.969	96.25
2	M1	X	.038	96.25
3	M1	X	.03	96.25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.32	96.25
2	M1	Z	.025	96.25
3	M1	Z	.022	96.25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.969	96.25
2	M1	Z	.038	96.25
3	M1	Z	.03	96.25

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.008	-.008	0	81
2	M1	Y	-.019	-.019	81	93

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.083	-.083	0	81
2	M1	Y	-.187	-.187	81	93
3	M1	Y	-.029	-.029	0	20

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
4	M1	Y	-.033	-.033	20	40
5	M1	Y	-.035	-.035	40	60
6	M1	Y	-.036	-.036	60	80
7	M1	Y	-.038	-.038	80	96.25
8	M15	Y	-.013	-.013	0	0
9	M17	Y	-.013	-.013	0	0
10	M16	Y	-.013	-.013	0	0
11	M12	Y	-.013	-.013	0	0
12	M14	Y	-.013	-.013	0	0
13	M13	Y	-.013	-.013	0	0
14	M9	Y	-.013	-.013	0	0
15	M11	Y	-.013	-.013	0	0
16	M10	Y	-.013	-.013	0	0
17	M6	Y	-.013	-.013	0	0
18	M8	Y	-.013	-.013	0	0
19	M7	Y	-.013	-.013	0	0
20	M2	Z	-.016	-.016	0	0
21	M3	Z	-.016	-.016	0	0
22	M4	Z	-.016	-.016	0	0
23	M5	Z	-.016	-.016	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.007	.007	0	81
2	M1	X	.01	.01	81	93
3	M1	X	.005	.005	0	20
4	M1	X	.006	.006	20	40
5	M1	X	.007	.007	40	60
6	M1	X	.007	.007	60	80
7	M1	X	.008	.008	80	96.25
8	M17	X	.007	.007	0	0
9	M14	X	.007	.007	0	0
10	M11	X	.007	.007	0	0
11	M8	X	.007	.007	0	0
12	M2	X	.01	.01	0	0
13	M3	X	.01	.01	0	0
14	M4	X	.01	.01	0	0
15	M5	X	.01	.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.015	.015	0	81
2	M1	X	.03	.03	81	93
3	M1	X	.016	.016	0	20
4	M1	X	.02	.02	20	40
5	M1	X	.022	.022	40	60
6	M1	X	.024	.024	60	80
7	M1	X	.025	.025	80	96.25
8	M17	X	.01	.01	0	0
9	M14	X	.01	.01	0	0
10	M11	X	.01	.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
11	M8	X	.01	.01	0	0
12	M2	X	.019	.019	0	0
13	M3	X	.019	.019	0	0
14	M4	X	.019	.019	0	0
15	M5	X	.019	.019	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.007	.007	0	81
2	M1	Z	.01	.01	81	93
3	M1	Z	.005	.005	0	20
4	M1	Z	.006	.006	20	40
5	M1	Z	.007	.007	40	60
6	M1	Z	.007	.007	60	80
7	M1	Z	.008	.008	80	96.25
8	M12	Z	.007	.007	0	0
9	M13	Z	.007	.007	0	0
10	M9	Z	.007	.007	0	0
11	M10	Z	.007	.007	0	0
12	M6	Z	.007	.007	0	0
13	M7	Z	.007	.007	0	0
14	M15	Z	.007	.007	0	0
15	M16	Z	.007	.007	0	0
16	M2	Z	.01	.01	0	0
17	M3	Z	.01	.01	0	0
18	M4	Z	.01	.01	0	0
19	M5	Z	.01	.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,...	End Magnitude[k/ft,F...	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.015	.015	0	81
2	M1	Z	.03	.03	81	93
3	M1	Z	.016	.016	0	20
4	M1	Z	.02	.02	20	40
5	M1	Z	.022	.022	40	60
6	M1	Z	.024	.024	60	80
7	M1	Z	.025	.025	80	96.25
8	M12	Z	.01	.01	0	0
9	M13	Z	.01	.01	0	0
10	M9	Z	.01	.01	0	0
11	M10	Z	.01	.01	0	0
12	M6	Z	.01	.01	0	0
13	M7	Z	.01	.01	0	0
14	M15	Z	.01	.01	0	0
15	M16	Z	.01	.01	0	0
16	M2	Z	.019	.019	0	0
17	M3	Z	.019	.019	0	0
18	M4	Z	.019	.019	0	0
19	M5	Z	.019	.019	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut...	Area(Me...	Surface(...
1	Self Weight	None								
2	Weight of Appurtenances	None					4	2		
3	Weight of Ice Only	None					4	23		
4	(x) TIA Wind with Ice	None					3	15		
5	(x) TIA Wind	None					3	15		
6	(z) TIA Wind with Ice	None					3	19		
7	(z) TIA Wind	None					3	19		

Load Combinations

	Description	So...	P...	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.2D + 1.6W (X-dire...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-dire...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-dire...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-dire...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0...	Yes	Y		1	1.2	2	1.2	3	1	6	1												

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0	4	14.913	3	0	3	.012	3	0	1	2.896	2
2		min	-.653	2	1.177	5	-.654	5	-2.905	5	0	1	0	4
3	N8	max	.448	4	0	6	.402	1	0	1	0	1	0	1
4		min	-.446	1	0	3	-.673	4	0	1	0	1	0	1
5	N9	max	-.078	6	0	5	-.029	3	0	1	0	1	0	1
6		min	-.749	1	0	3	-.522	4	0	1	0	1	0	1
7	N10	max	-.063	6	0	6	.024	3	0	1	0	1	0	1
8		min	-.448	4	0	2	-.673	4	0	1	0	1	0	1
9	N11	max	.557	4	0	3	.501	1	0	1	0	1	0	1
10		min	-.749	1	0	6	-.522	4	0	1	0	1	0	1
11	N12	max	0	6	.008	6	.002	3	0	1	0	1	0	1
12		min	-.009	2	0	1	-1.124	5	0	1	0	1	0	1
13	N13	max	.215	5	.014	3	.27	2	0	1	0	1	0	1
14		min	-.648	2	0	4	-.107	5	0	1	0	1	0	1
15	N14	max	-.052	6	.014	6	-.029	6	0	1	0	1	0	1
16		min	-.648	2	0	1	-.27	2	0	1	0	1	0	1
17	N15	max	0	6	.008	6	0	1	0	1	0	1	0	1
18		min	-.009	2	0	1	-.605	4	0	1	0	1	0	1
19	N16	max	.116	4	.014	3	.125	1	0	1	0	1	0	1
20		min	-.301	1	0	4	-.065	4	0	1	0	1	0	1
21	N18	max	0	6	.008	3	5.752	4	0	1	0	1	0	1
22		min	-.009	2	-.001	4	0	3	0	1	0	1	0	1
23	N19	max	3.268	1	.014	6	.441	4	0	1	0	1	0	1
24		min	-1.1	4	0	1	-1.362	1	0	1	0	1	0	1
25	N21	max	0	6	.011	6	.001	1	0	1	0	1	0	1
26		min	-.009	2	0	1	-8.692	4	0	1	0	1	0	1
27	N22	max	1.662	4	.015	3	2.072	1	0	1	0	1	0	1
28		min	-4.975	1	0	4	-.709	4	0	1	0	1	0	1
29	N17	max	-.027	6	.014	6	-.019	6	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
30		min	-.301	1	0	1	-.125	1	0	1	0	1	0	1
31	N20	max	3.269	1	.015	3	1.361	1	0	1	0	1	0	1
32		min	.238	6	0	5	.092	6	0	1	0	1	0	1
33	N23	max	-.362	6	.014	6	-.158	6	0	1	0	1	0	1
34		min	-4.974	1	0	1	-2.073	1	0	1	0	1	0	1
35	Totals:	max	0	4	15.056	6	.454	3						
36		min	-8.391	1	1.178	5	-8.594	5						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	2	0	5	0	5	0	5	0	1	0	4
2		min	0	4	0	3	0	3	0	3	0	1	0	2
3	N2	max	.003	1	-.001	5	.003	4	7.142e-05	4	0	1	0	6
4		min	0	6	-.013	3	0	3	-1.519e-07	3	0	1	-7.097e-05	1
5	N3	max	.001	2	-.002	5	0	5	5.996e-07	3	0	1	1.693e-04	1
6		min	0	5	-.022	3	0	3	-1.733e-04	4	0	1	0	6
7	N4	max	0	1	-.002	5	0	4	8.329e-05	4	0	1	0	6
8		min	0	5	-.025	3	0	1	-1.515e-07	3	0	1	-6.884e-05	1
9	N5	max	0	6	-.002	5	0	3	2.527e-08	3	0	1	2.363e-04	1
10		min	-.006	1	-.027	3	-.005	4	-2.656e-04	4	0	1	0	6
11	N6	max	.009	1	-.003	5	.007	4	1.483e-03	4	0	1	0	5
12		min	0	5	-.028	3	0	1	0	2	0	1	-1.54e-03	1
13	N7	max	.937	1	-.003	5	.925	4	6.611e-03	4	0	1	0	5
14		min	0	5	-.03	3	0	2	0	2	0	1	-6.668e-03	1
15	N8	max	0	1	0	3	0	4	2.419e-03	1	5.077e-03	1	1.889e-03	1
16		min	0	4	0	6	0	1	-2.696e-04	6	-8.047e-04	6	-2.308e-04	6
17	N9	max	0	1	0	3	0	4	9.831e-04	5	2.612e-03	4	1.09e-03	3
18		min	0	6	0	5	0	3	-8.466e-04	3	-2.015e-03	3	-1.19e-03	5
19	N10	max	0	4	0	2	0	4	2.35e-03	1	5.077e-03	1	1.586e-03	5
20		min	0	6	0	6	0	3	-1.886e-03	5	-4.116e-03	4	-1.975e-03	1
21	N11	max	0	1	0	6	0	4	1.644e-04	3	7.045e-04	3	1.995e-04	3
22		min	0	4	0	3	0	1	-9.125e-04	4	-2.612e-03	4	-1.285e-03	4
23	N12	max	0	2	0	1	0	5	1.616e-03	6	1.226e-04	2	1.693e-04	1
24		min	0	6	0	6	0	3	1.121e-04	2	-1.828e-05	6	0	6
25	N13	max	0	2	0	4	0	5	-8.794e-05	2	1.129e-04	3	1.173e-04	5
26		min	0	5	0	3	0	2	-4.175e-04	3	-2.572e-04	5	-9.642e-04	3
27	N14	max	0	2	0	1	0	2	3.22e-05	2	2.572e-04	5	9.759e-04	3
28		min	0	6	0	6	0	6	-4.155e-04	6	-1.212e-04	3	-1.173e-04	5
29	N15	max	0	2	0	1	0	4	1.806e-03	6	7.747e-05	1	0	6
30		min	0	6	0	6	0	1	1.312e-04	2	-1.828e-05	6	-6.884e-05	1
31	N16	max	0	1	0	4	0	4	9.026e-05	5	1.151e-04	3	1.677e-05	5
32		min	0	4	0	3	0	1	-4.379e-04	3	-2.418e-04	4	-1.067e-03	3
33	N17	max	0	1	0	1	0	1	9.026e-05	5	2.418e-04	4	1.062e-03	3
34		min	0	6	0	6	0	6	-4.49e-04	3	-1.187e-04	3	-1.677e-05	5
35	N18	max	0	2	0	4	0	3	1.99e-03	6	0	5	2.363e-04	1
36		min	0	6	0	3	0	4	1.517e-04	2	-3.867e-04	1	0	6
37	N19	max	0	4	0	1	0	1	-1.199e-04	2	1.361e-04	3	1.304e-04	5
38		min	0	1	0	6	0	4	-5.087e-04	6	-5.314e-05	5	-1.148e-03	3
39	N20	max	0	6	0	5	0	6	4.778e-05	2	8.802e-05	1	1.164e-03	3
40		min	0	1	0	3	0	1	-5.087e-04	6	-9.786e-05	3	-1.304e-04	5

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
41	N21	max	0	2	0	1	0	4	2.052e-03	6	6.854e-04	1	0	5
42		min	0	6	0	6	0	1	1.594e-04	2	-1.828e-05	6	-1.54e-03	1
43	N22	max	0	1	0	4	0	4	1.276e-03	5	8.785e-05	3	-3.18e-04	2
44		min	0	4	0	3	0	1	-3.753e-04	3	-4.818e-04	4	-1.248e-03	6
45	N23	max	0	1	0	1	0	1	1.276e-03	5	4.818e-04	4	1.248e-03	6
46		min	0	6	0	6	0	6	-6.135e-04	3	-1.461e-04	3	-1.371e-04	2

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

	Member	Shape	Code Check	Loc...	LC	Shea...	Loc.....		L...	phi*Pn...	phi*Pn...	phi*Mn...	phi*Mn.....		Eqn
1	M1	12" FWT ...	.153	81....	1	.036	80....		4	577.349	656.055	215.419	215.419	4...	H1-1b
2	M2	L3x3x3	.217	3.877	1	.009	0	z	1	9.366	35.316	1.32	2.098	1...	H2-1
3	M3	L3x3x3	.149	3.205	4	.007	0	z	5	14.561	35.316	1.32	2.275	1...	H2-1
4	M4	L3x3x3	.176	3.959	1	.009	0	z	1	9.366	35.316	1.32	2.098	1...	H2-1
5	M5	L3x3x3	.149	3.205	4	.007	0	z	4	14.561	35.316	1.32	2.275	1...	H2-1
6	M6	L2x2x3	.030	0	2	.002	2.167	z	4	18.491	23.393	.558	1.209	1	H2-1
7	M7	L2x2x3	.038	0	2	.002	2.167	z	4	18.491	23.393	.558	1.209	1	H2-1
8	M8	L2x2x3	.048	0	5	.001	0	z	1	21.85	23.393	.558	1.239	1	H2-1
9	M9	L2x2x3	.023	1.061	4	.002	2.167	z	4	18.491	23.393	.558	1.232	1...	H2-1
10	M10	L2x2x3	.023	1.106	4	.002	2.167	z	5	18.491	23.393	.558	1.232	1...	H2-1
11	M11	L2x2x3	.026	0	4	.001	0	z	1	21.85	23.393	.558	1.239	1	H2-1
12	M12	L2x2x3	.191	0	1	.002	0	z	5	18.491	23.393	.558	1.209	1	H2-1
13	M13	L2x2x3	.151	0	1	.002	2.167	z	5	18.491	23.393	.558	1.209	1	H2-1
14	M14	L2x2x3	.263	0	4	.001	1.167	z	2	21.85	23.393	.558	1.239	1	H2-1
15	M15	L2x2x3	.230	0	1	.002	2.167	z	5	18.491	23.393	.558	1.209	1	H2-1
16	M16	L2x2x3	.291	0	1	.002	0	z	4	18.491	23.393	.558	1.209	1	H2-1
17	M17	L2x2x3	.372	0	4	.001	0	z	2	21.85	23.393	.558	1.239	1	H2-1

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	-.653	1.571	0	0	0	2.896
2	1	N8	-.446	0	.402	0	0	0
3	1	N9	-.749	0	-.501	0	0	0
4	1	N10	-.446	0	-.402	0	0	0
5	1	N11	-.749	0	.501	0	0	0
6	1	N12	-.009	0	0	0	0	0
7	1	N13	-.648	0	.27	0	0	0
8	1	N14	-.648	0	-.27	0	0	0
9	1	N15	-.009	0	0	0	0	0
10	1	N16	-.301	0	.125	0	0	0
11	1	N18	-.009	0	0	0	0	0
12	1	N19	3.268	0	-1.362	0	0	0
13	1	N21	-.009	0	.001	0	0	0
14	1	N22	-4.975	0	2.072	0	0	0
15	1	N17	-.301	0	-.125	0	0	0
16	1	N20	3.269	0	1.361	0	0	0
17	1	N23	-4.974	0	-2.073	0	0	0
18	1	Totals:	-8.391	1.571	0			
19	1	COG (ft):	X: 0	Y: 67.041	Z: 0			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N1	-.653	1.178	0	0	0	2.896
2	2	N8	-.446	0	.402	0	0	0
3	2	N9	-.749	0	-.501	0	0	0
4	2	N10	-.446	0	-.402	0	0	0
5	2	N11	-.749	0	.501	0	0	0
6	2	N12	-.009	0	0	0	0	0
7	2	N13	-.648	0	.27	0	0	0
8	2	N14	-.648	0	-.27	0	0	0
9	2	N15	-.009	0	0	0	0	0
10	2	N16	-.301	0	.125	0	0	0
11	2	N18	-.009	0	0	0	0	0
12	2	N19	3.267	0	-1.361	0	0	0
13	2	N21	-.009	0	.001	0	0	0
14	2	N22	-4.974	0	2.071	0	0	0
15	2	N17	-.301	0	-.125	0	0	0
16	2	N20	3.267	0	1.36	0	0	0
17	2	N23	-4.973	0	-2.072	0	0	0
18	2	Totals:	-8.391	1.178	0			
19	2	COG (ft):	X: 0	Y: 67.041	Z: 0			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N1	-.159	14.913	0	.012	0	.706
2	3	N8	-.174	0	.23	0	0	0
3	3	N9	-.134	0	-.029	0	0	0
4	3	N10	-.071	0	.024	0	0	0
5	3	N11	-.263	0	.227	0	0	0
6	3	N12	-.004	.008	.002	0	0	0
7	3	N13	-.154	.014	.064	0	0	0
8	3	N14	-.153	.014	-.064	0	0	0
9	3	N15	-.004	.008	-.001	0	0	0
10	3	N16	-.067	.014	.028	0	0	0
11	3	N18	-.004	.008	0	0	0	0
12	3	N19	.71	.013	-.296	0	0	0
13	3	N21	-.004	.008	0	0	0	0
14	3	N22	-1.081	.015	.45	0	0	0
15	3	N17	-.067	.014	-.028	0	0	0
16	3	N20	.71	.015	.296	0	0	0
17	3	N23	-1.081	.013	-.45	0	0	0
18	3	Totals:	-2.001	15.056	.454			
19	3	COG (ft):	X: 0	Y: 56.443	Z: .004			

Joint Reactions (By Combination)

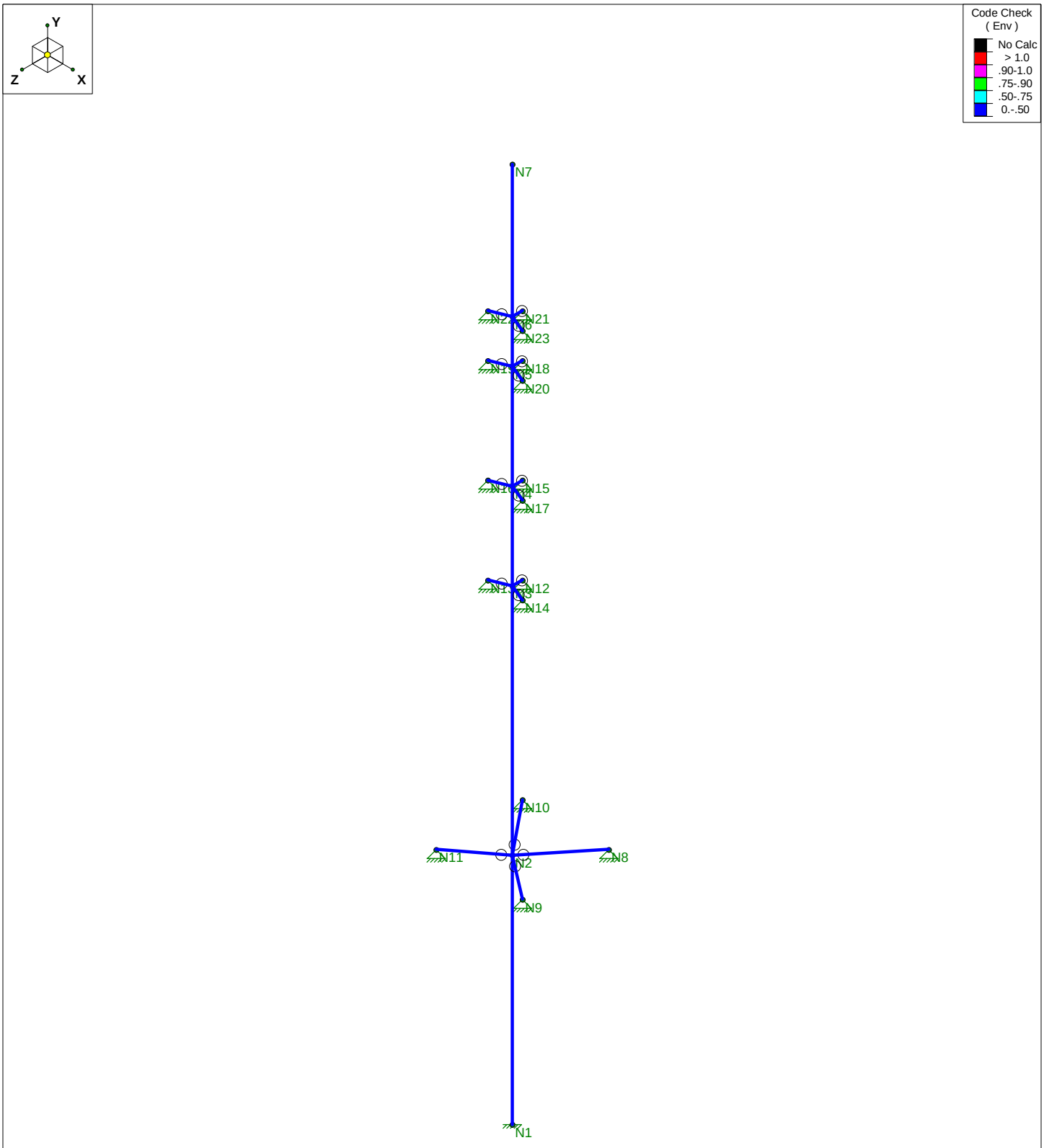
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N1	0	1.57	-.654	-2.905	0	0
2	4	N8	.448	0	-.673	0	0	0
3	4	N9	-.557	0	-.522	0	0	0
4	4	N10	-.448	0	-.673	0	0	0
5	4	N11	.557	0	-.522	0	0	0
6	4	N12	0	0	-1.124	0	0	0
7	4	N13	.215	0	-.107	0	0	0
8	4	N14	-.215	0	-.107	0	0	0
9	4	N15	0	0	-.605	0	0	0
10	4	N16	.116	0	-.065	0	0	0
11	4	N18	0	-.001	5.752	0	0	0
12	4	N19	-1.1	0	.441	0	0	0
13	4	N21	0	.002	-8.692	0	0	0
14	4	N22	1.662	0	-.709	0	0	0
15	4	N17	-.116	0	-.065	0	0	0
16	4	N20	1.1	0	.441	0	0	0
17	4	N23	-1.662	0	-.709	0	0	0
18	4	Totals:	0	1.571	-8.594			
19	4	COG (ft):	X: 0	Y: 67.041	Z: 0			

Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	5	N1	0	1.177	-.654	-2.905	0	0
2	5	N8	.448	0	-.673	0	0	0
3	5	N9	-.557	0	-.522	0	0	0
4	5	N10	-.448	0	-.673	0	0	0
5	5	N11	.557	0	-.522	0	0	0
6	5	N12	0	0	-1.124	0	0	0
7	5	N13	.215	0	-.107	0	0	0
8	5	N14	-.215	0	-.107	0	0	0
9	5	N15	0	0	-.605	0	0	0
10	5	N16	.116	0	-.065	0	0	0
11	5	N18	0	-.001	5.749	0	0	0
12	5	N19	-1.099	0	.441	0	0	0
13	5	N21	0	.002	-8.69	0	0	0
14	5	N22	1.661	0	-.709	0	0	0
15	5	N17	-.116	0	-.065	0	0	0
16	5	N20	1.099	0	.441	0	0	0
17	5	N23	-1.661	0	-.709	0	0	0
18	5	Totals:	0	1.178	-8.594			
19	5	COG (ft):	X: 0	Y: 67.041	Z: 0			

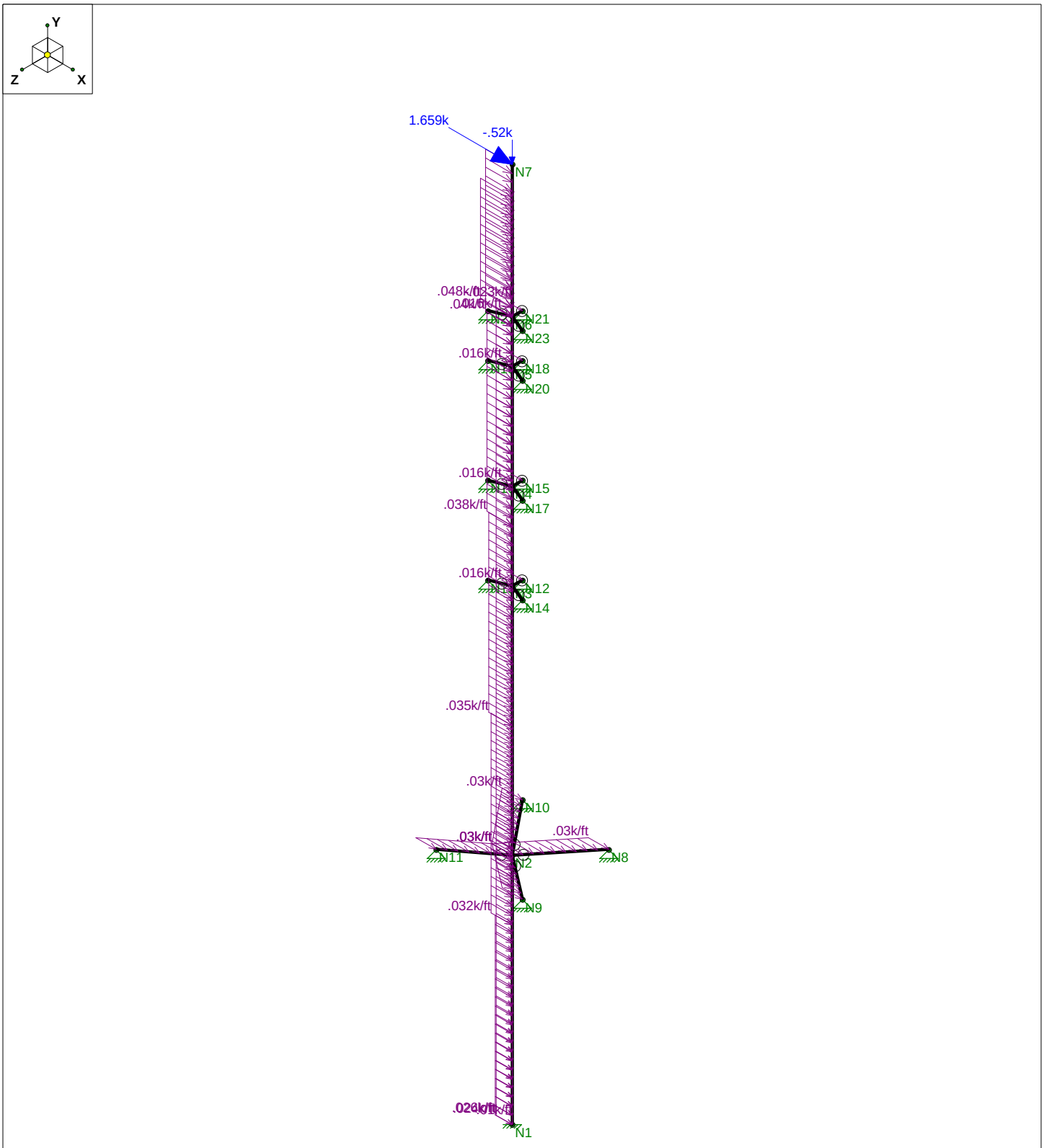
Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	6	N1	0	14.912	-.158	-.697	0	0
2	6	N8	.063	0	-.054	0	0	0
3	6	N9	-.078	0	-.041	0	0	0
4	6	N10	-.063	0	-.054	0	0	0
5	6	N11	.078	0	-.041	0	0	0
6	6	N12	0	.008	-.27	0	0	0
7	6	N13	.052	.014	-.029	0	0	0
8	6	N14	-.052	.014	-.029	0	0	0
9	6	N15	0	.008	-.14	0	0	0
10	6	N16	.027	.014	-.019	0	0	0
11	6	N18	0	.005	1.244	0	0	0
12	6	N19	-.238	.014	.092	0	0	0
13	6	N21	0	.011	-1.893	0	0	0
14	6	N22	.362	.014	-.158	0	0	0
15	6	N17	-.027	.014	-.019	0	0	0
16	6	N20	.238	.014	.092	0	0	0
17	6	N23	-.362	.014	-.158	0	0	0
18	6	Totals:	0	15.056	-1.635			
19	6	COG (ft):	X: 0	Y: 56.443	Z: .004			



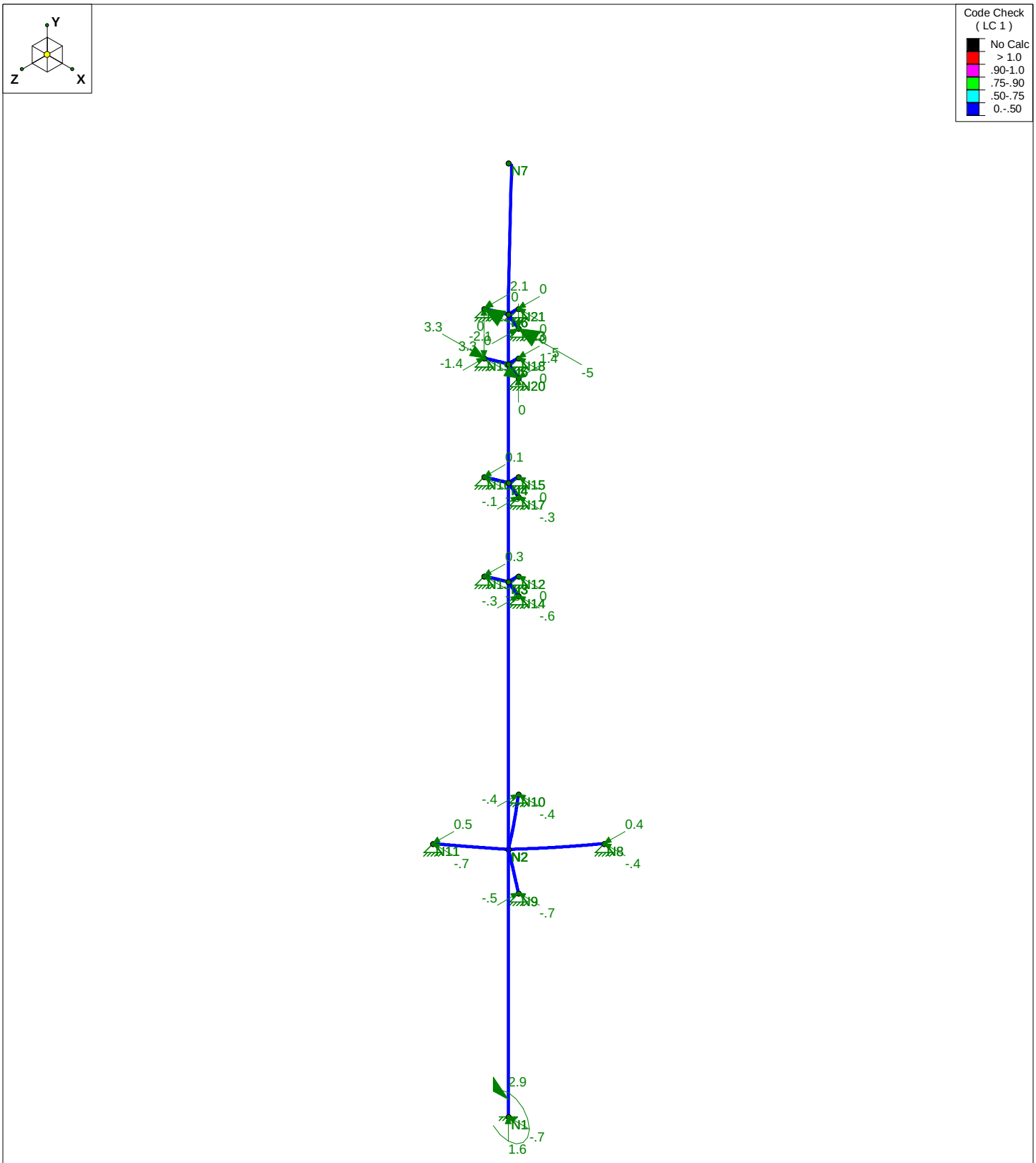
Envelope Only Solution

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:48 PM
17159.02 - CT03XC037	Unity Check	Antenna Mast.r3d



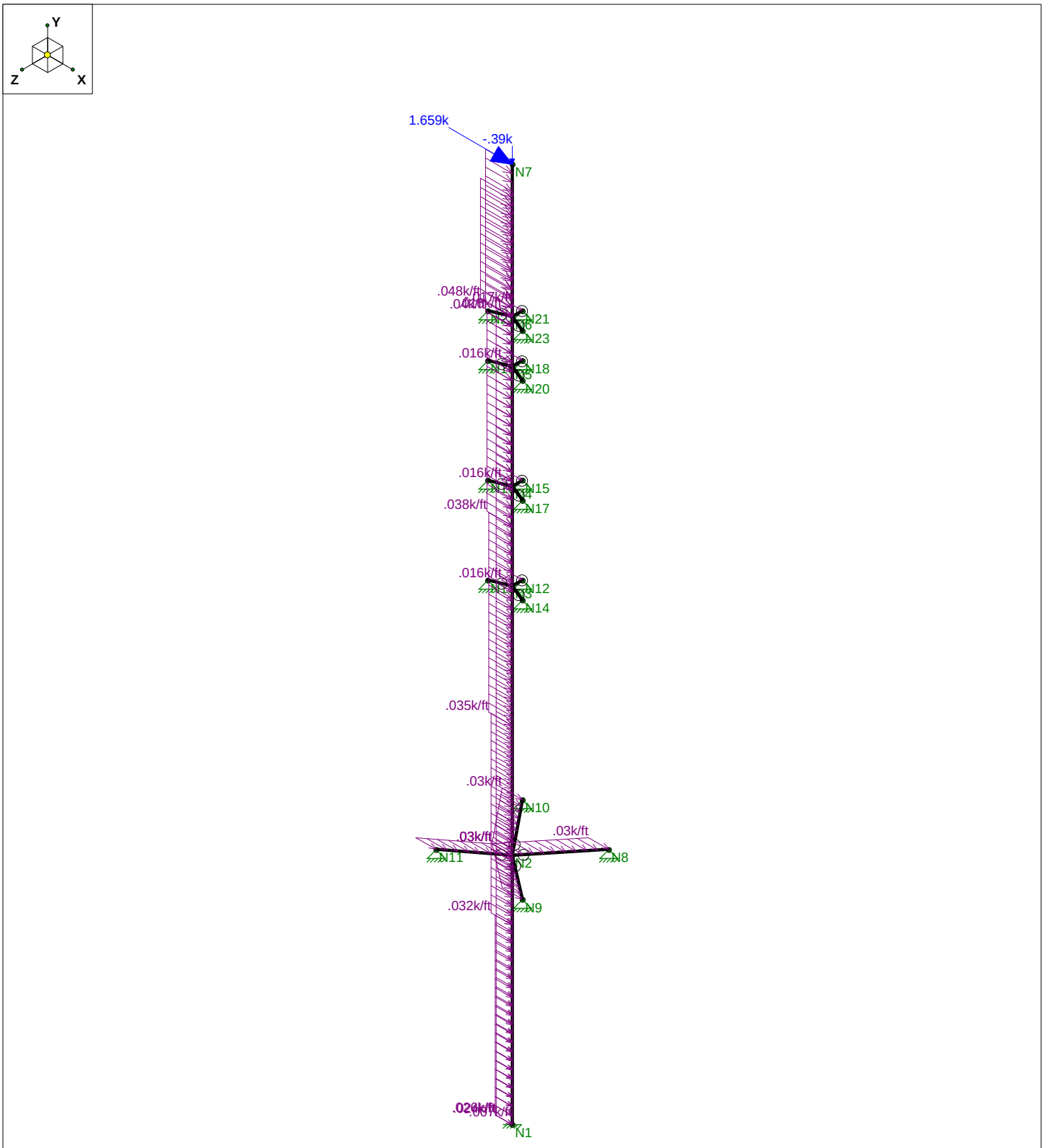
Loads: LC 1, 1.2D + 1.6W (X-direction)

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:48 PM
17159.02 - CT03XC037	LC #1 Loads	Antenna Mast.r3d



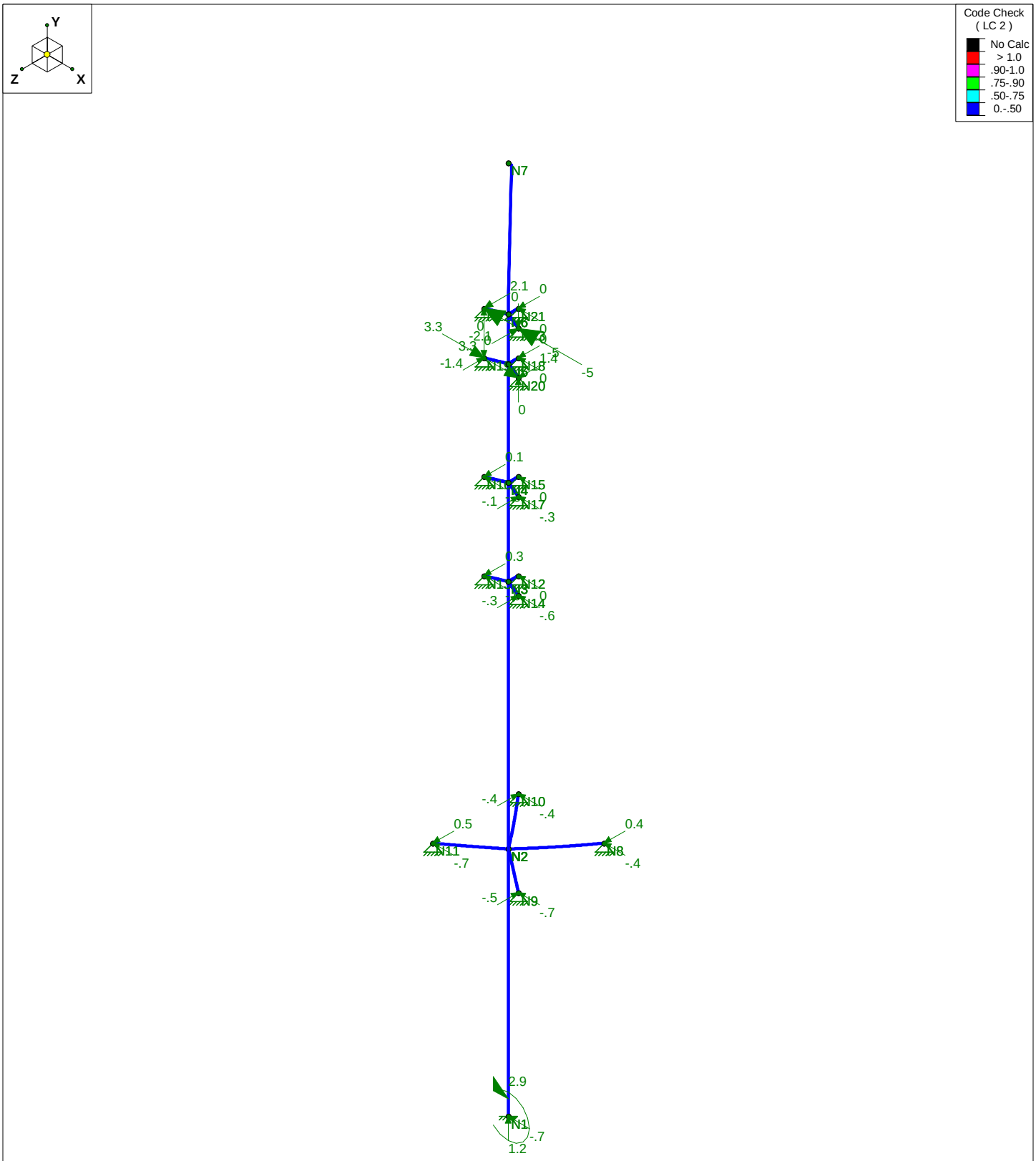
Results for LC 1, 1.2D + 1.6W (X-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:50 PM
17159.02 - CT03XC037	LC #1 Reactions and Deflected Shape	Antenna Mast.r3d



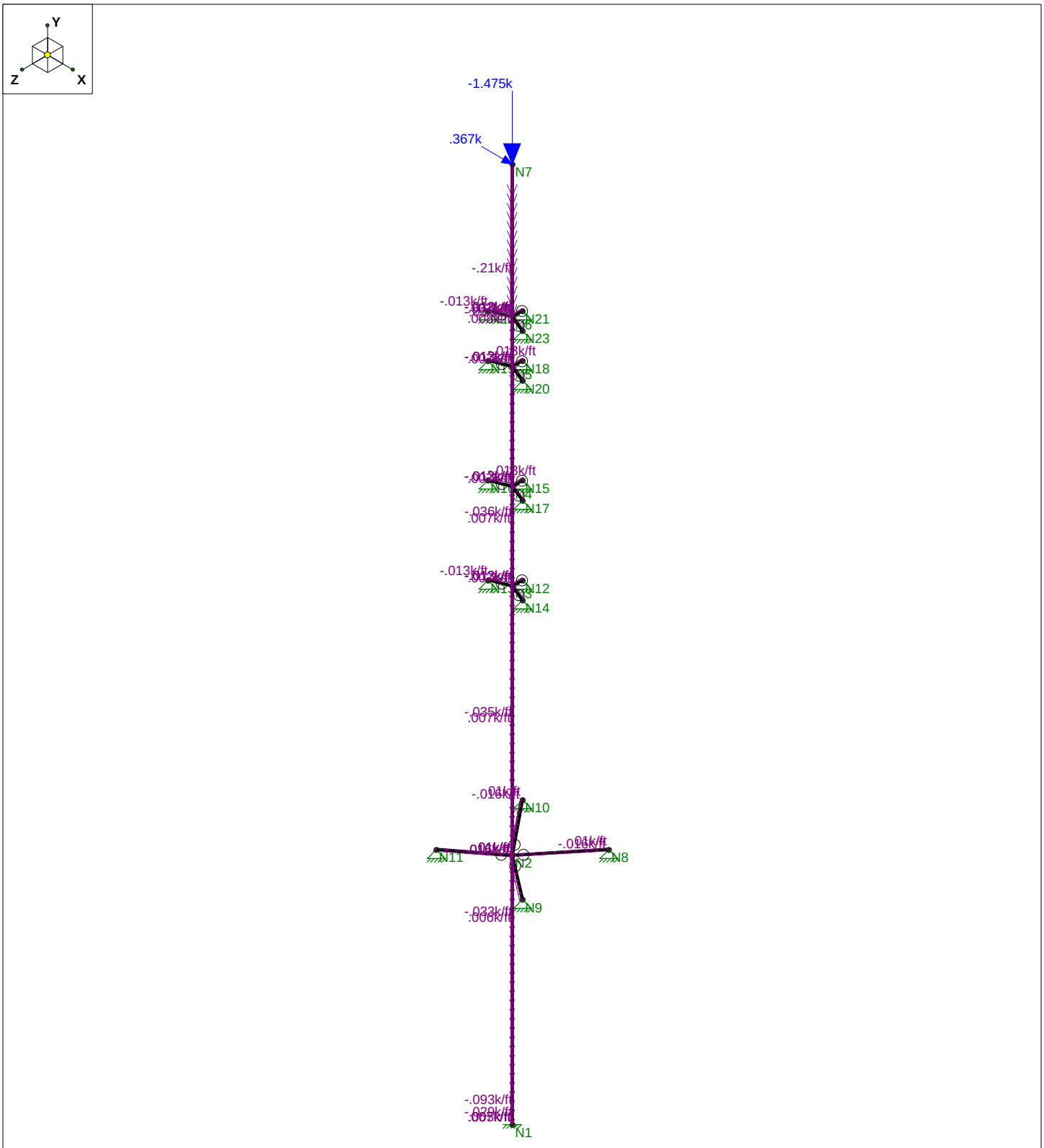
Loads: LC 2, 0.9D + 1.6W (X-direction)

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:49 PM
17159.02 - CT03XC037	LC #2 Loads	Antenna Mast.r3d



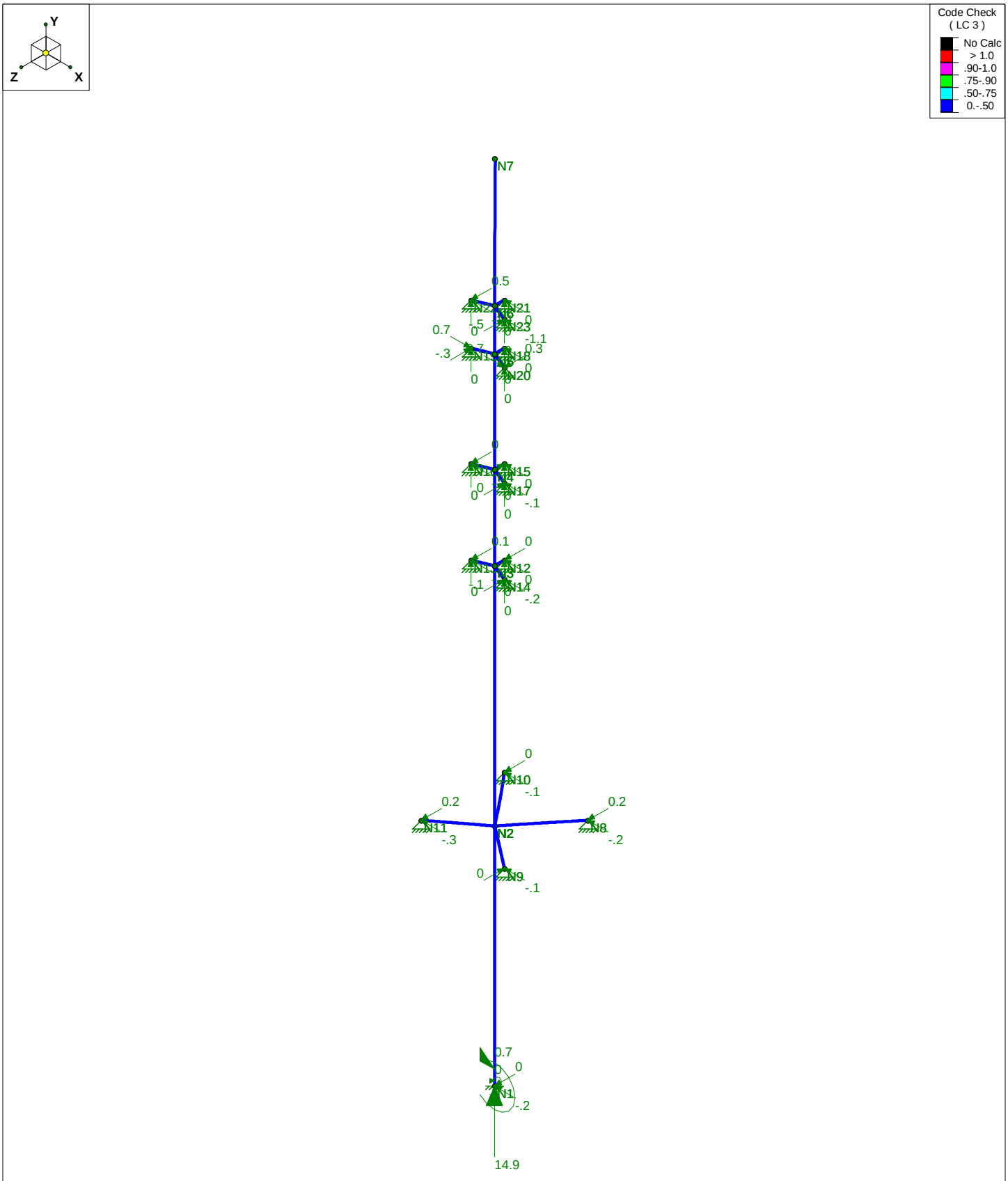
Results for LC 2, 0.9D + 1.6W (X-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:50 PM
17159.02 - CT03XC037	LC #2 Reactions and Deflected Shape	Antenna Mast.r3d



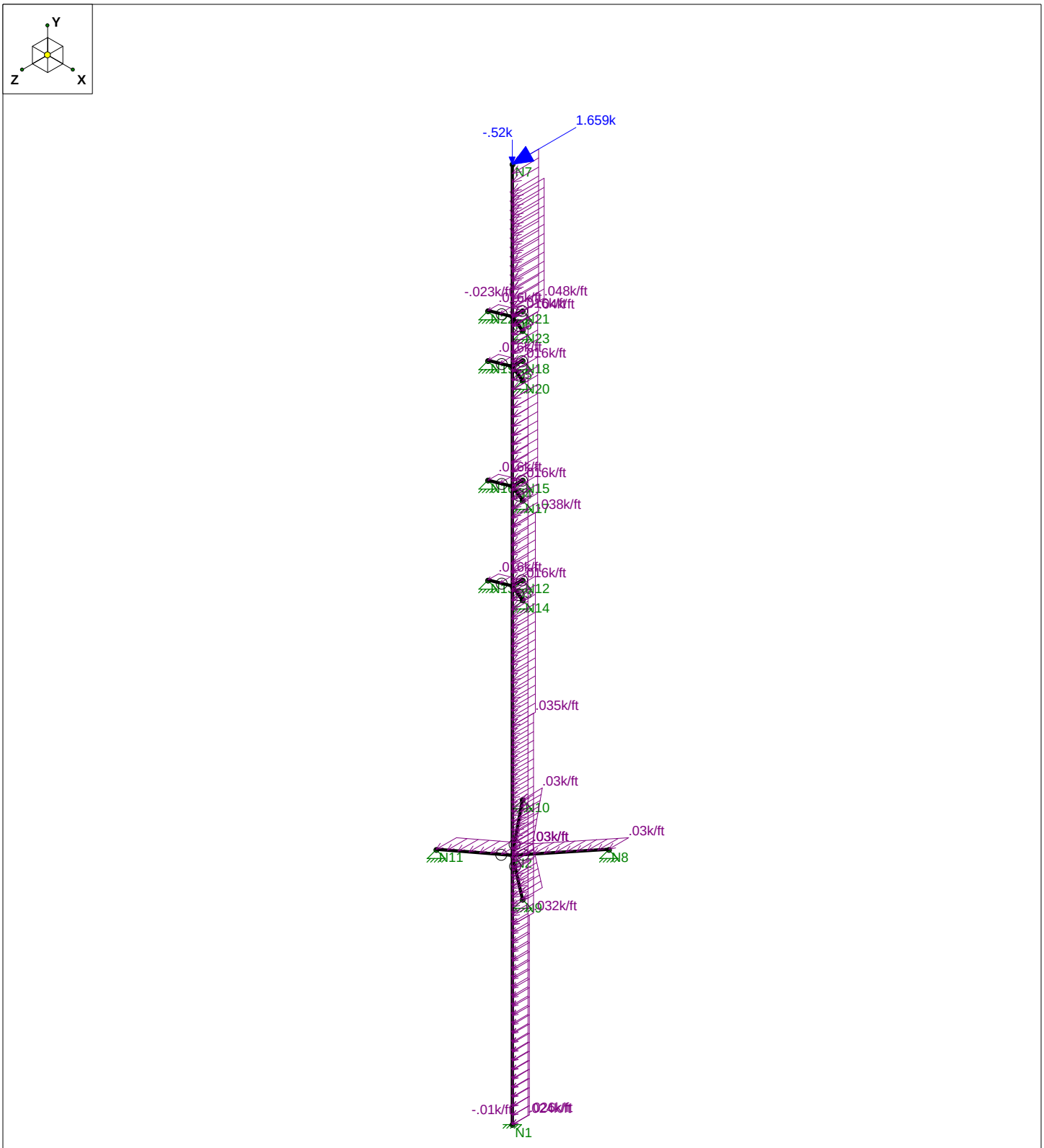
Loads: LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:49 PM
17159.02 - CT03XC037	LC #3 Loads	Antenna Mast.r3d



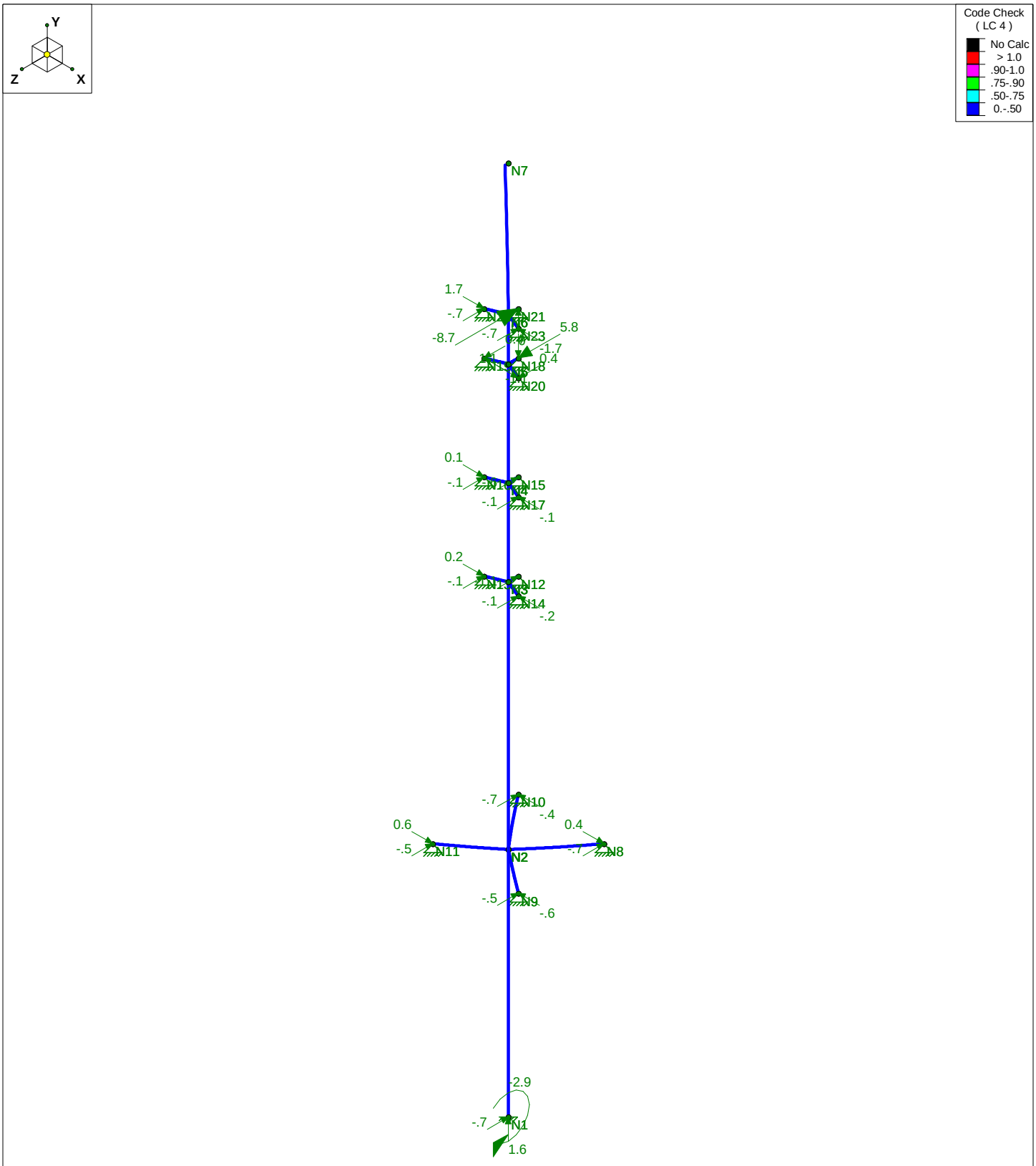
Results for LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:51 PM
17159.02 - CT03XC037	LC #3 Reactions and Deflected Shape	Antenna Mast.r3d



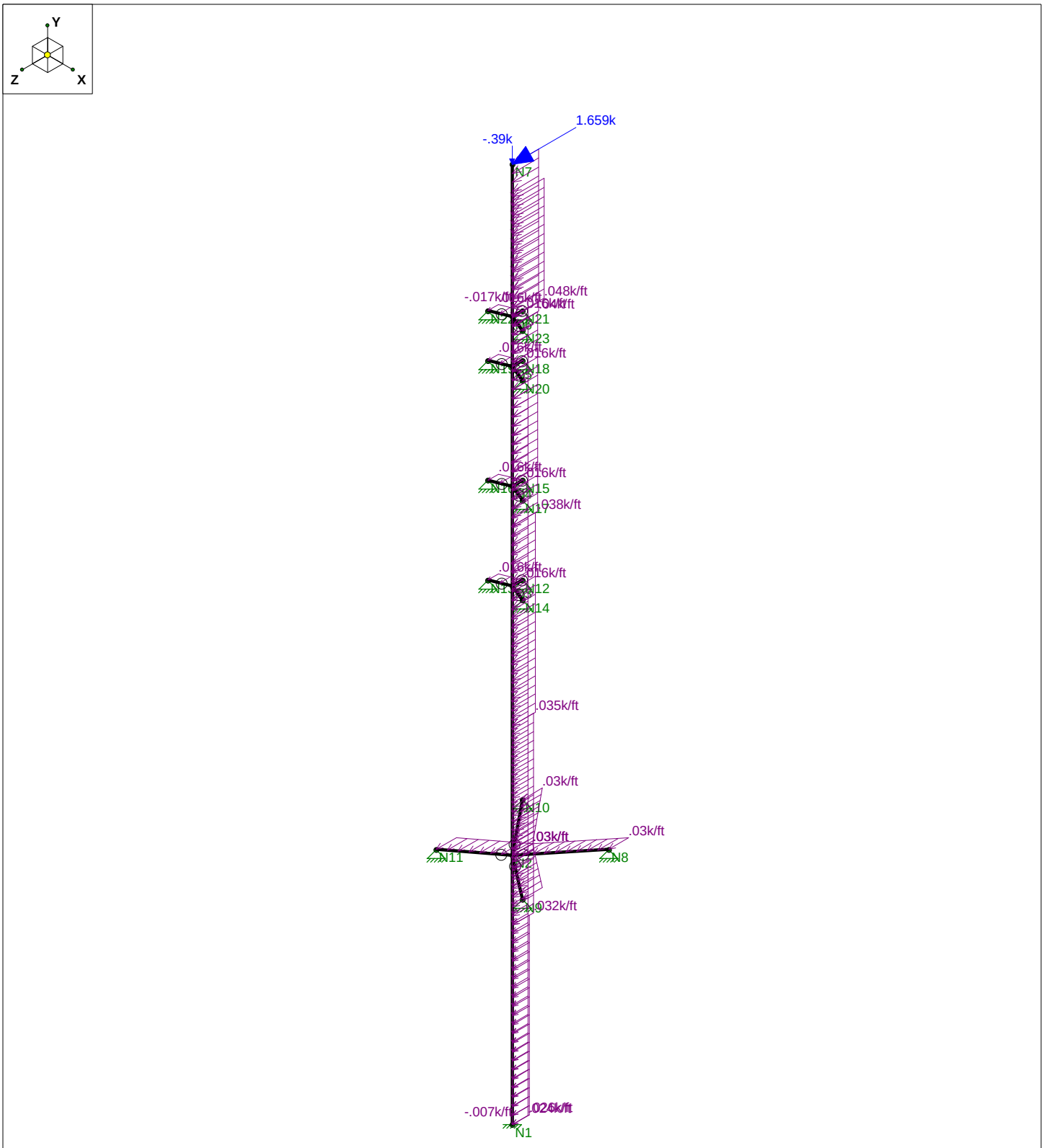
Loads: LC 4, 1.2D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:49 PM
17159.02 - CT03XC037	LC #4 Loads	Antenna Mast.r3d



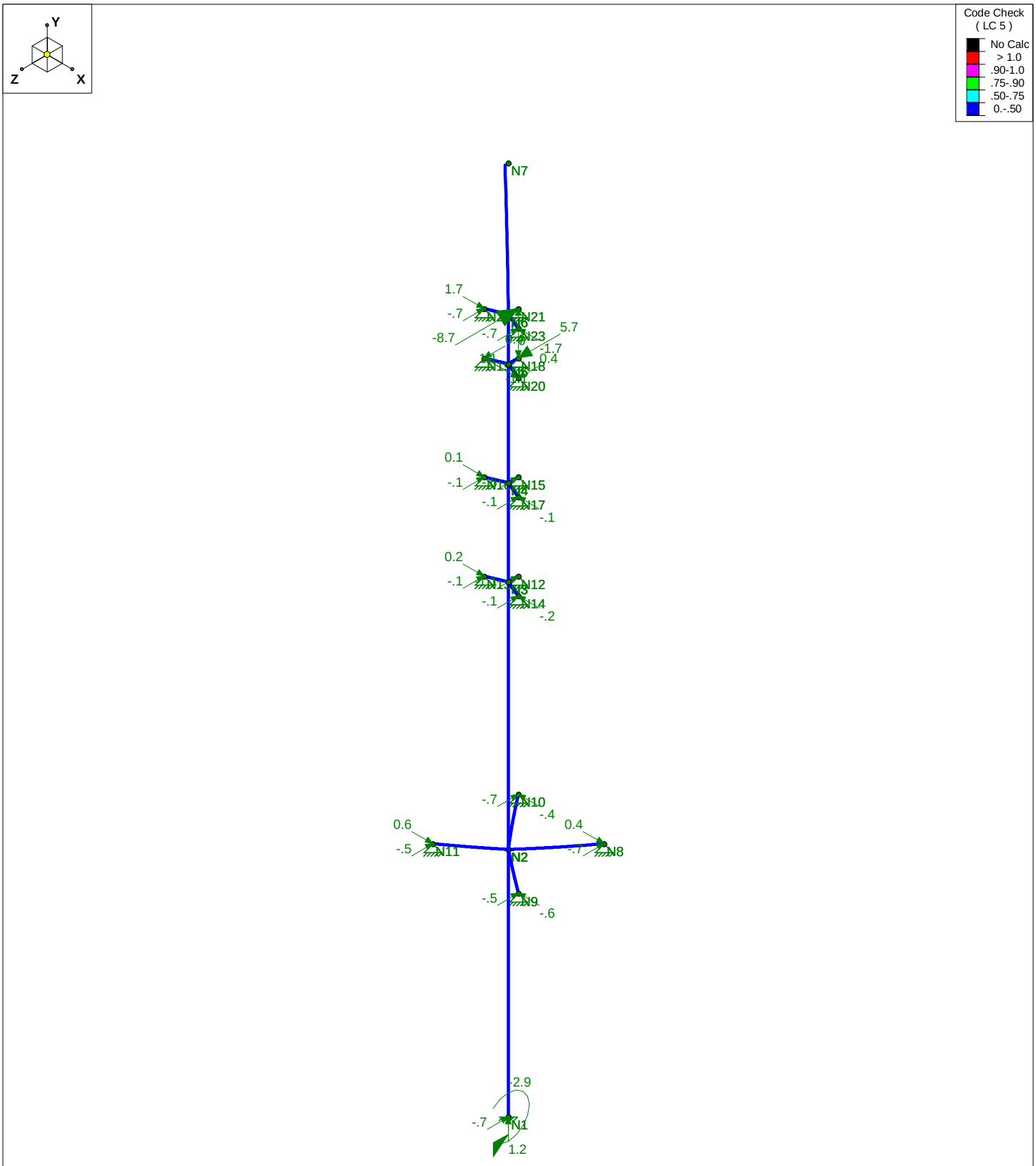
Results for LC 4, 1.2D + 1.6W (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:51 PM
17159.02 - CT03XC037	LC #4 Reactions and Deflected Shape	Antenna Mast.r3d



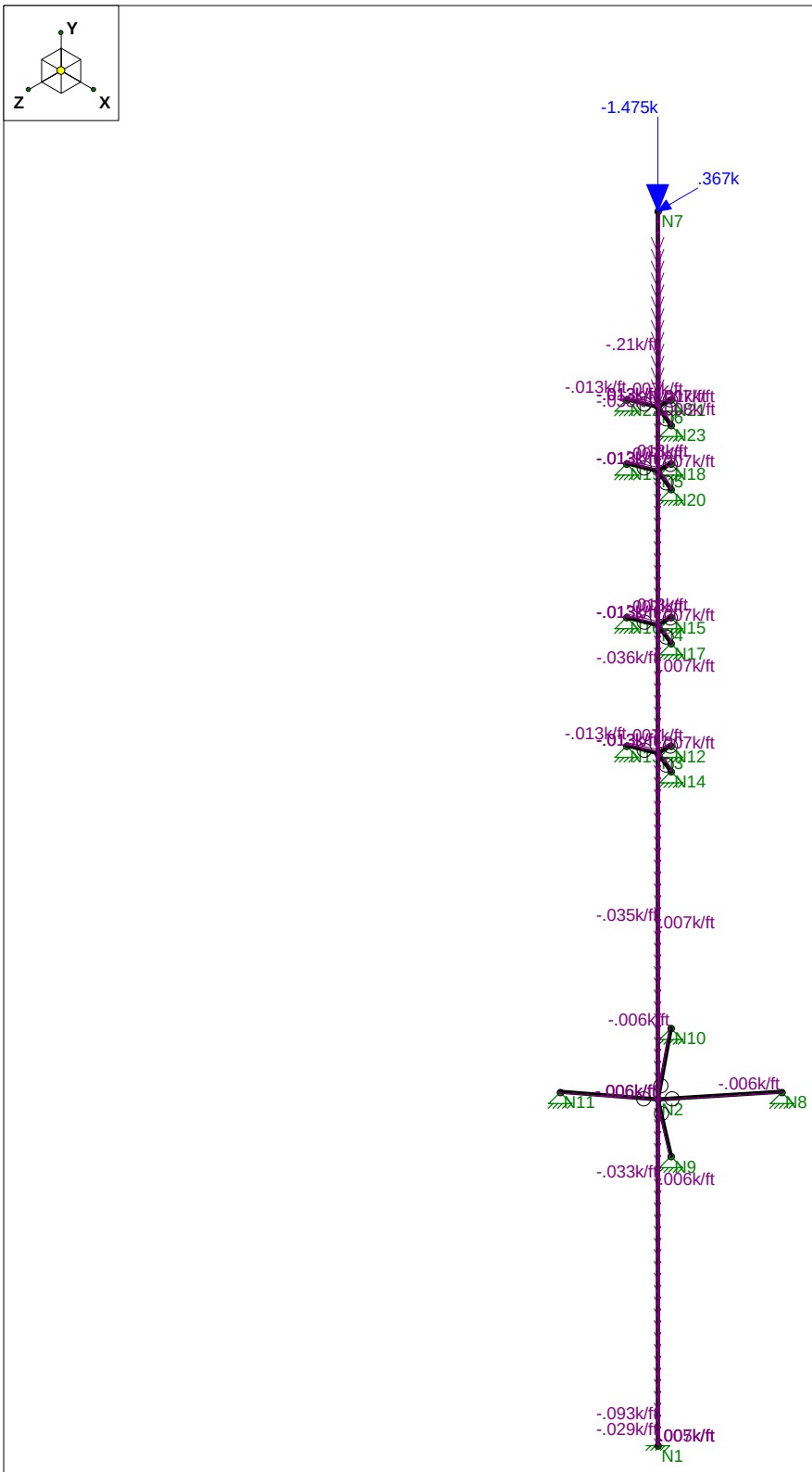
Loads: LC 5, 0.9D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:49 PM
17159.02 - CT03XC037	LC #5 Loads	Antenna Mast.r3d



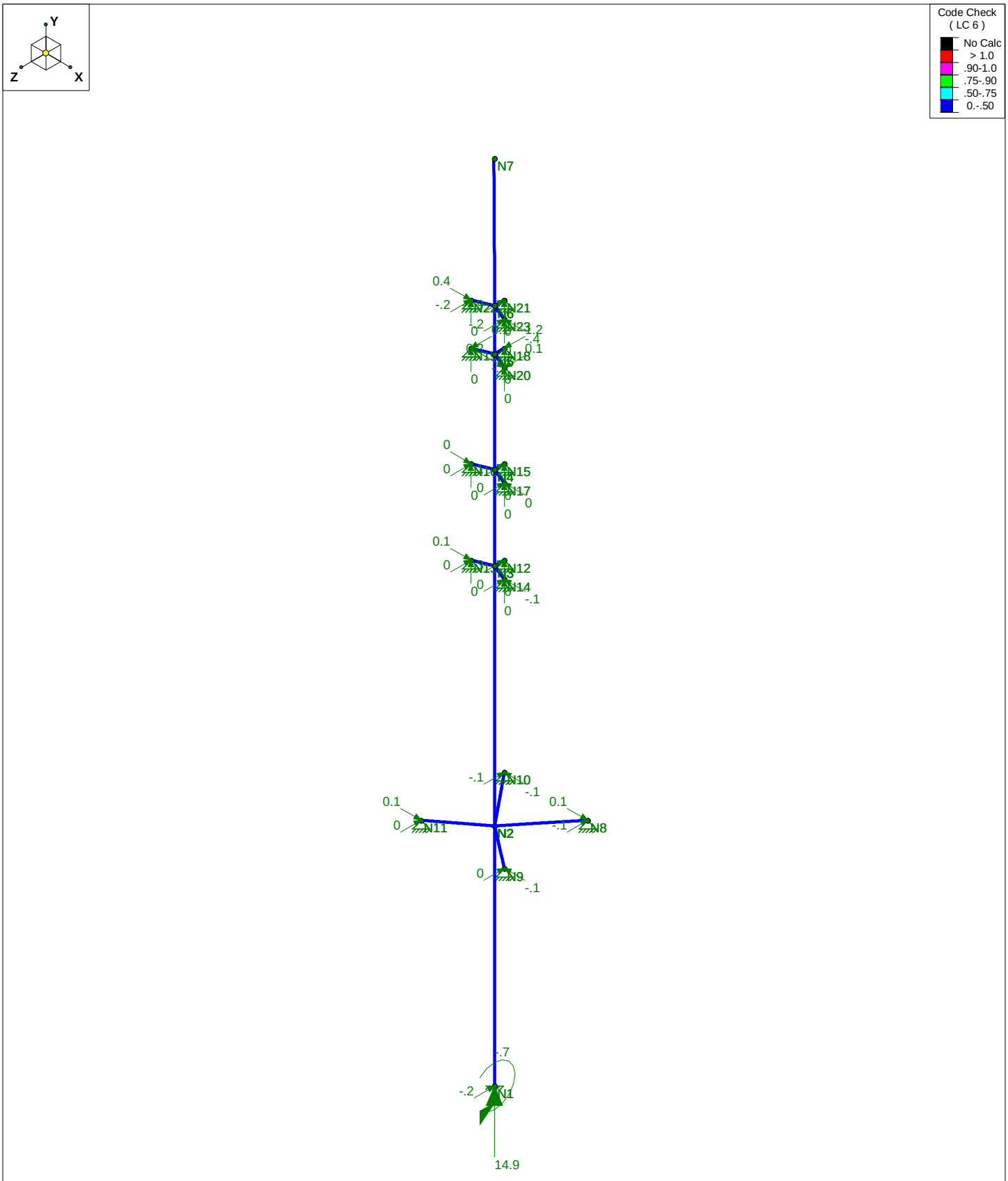
Results for LC 5, 0.9D + 1.6W (Z-direction)
Reaction and Moment Units are k and k-ft

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:52 PM
17159.02 - CT03XC037	LC #5 Reactions and Deflected Shape	Antenna Mast.r3d



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

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:49 PM
17159.02 - CT03XC037	LC #6 Loads	Antenna Mast.r3d



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

CENTEK Engineering, INC.		
tjl, cfc	Struct. #326 - Antenna Mast	Jan 2, 2018 at 2:53 PM
17159.02 - CT03XC037	LC #6 Reactions and Deflected Shape	Antenna Mast.r3d

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

Subject:	Connection of Antenna Mast to Tower # 326
Location:	Beacon Falls, CT
Rev. 0: 1/2/18	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.02

Antenna Mast Connection to Tower:

Pipe Collar:

Reactions:

Horz = $Horz := 10.3 \cdot kips$ (User Input)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

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

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

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

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

Check Pipe Collar Bolts:

Tension Force = $f_t := \frac{Horz}{N_b} = 2.6 \cdot kips$

Bolt Tenison % of Capacity = $\frac{f_t}{F_t} = 12.44 \cdot \%$

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

Bolt_Tension = "OK"

Angle Brace

Reactions:

Force = $Fab := 8.7 \cdot kips$ (User Input)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

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

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

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

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

Check Angle Brace Bolts:

Shear Force = $f_v := \frac{Fab}{N_b} = 8.7 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 70.16 \cdot \%$

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

Bolt_Shear = "OK"

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

Subject:	Load Analysis of Antenna Mast Structure # 326
Location:	Beacon Falls, CT
Rev. 2: 1/31/19	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.02

Basic Components

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2012 Figure 250-1 & Table 250-1)
Radial Ice Thickness =	Ir := 0.50	in	(User Input)
Radial Ice Density =	Id := 56.0	pcf	(User Input)

Shape Factors

Shape Factor for Round Members =	$Cd_R := 1.3$	(User Input)
Shape Factor for Flat Members =	$Cd_F := 1.6$	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	$Cd_{coax} := 1.45$	(User Input)

Overload Factors

Overload Factors for Wind Loads:

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

Overload Factors for Vertical Loads:

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

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Subject:	Load Analysis of Antenna Mast Structure # 326
Location:	Beacon Falls, CT
Rev. 2: 1/31/19	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.02

Development of Wind & Ice Load on Antennas

Antenna Data:

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

Gravity Load (without ice)

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

Gravity Load (ice only)

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

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

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

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

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

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

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

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

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Subject: Load Analysis of Antenna Mast Structure # 326

Location: Beacon Falls, CT

Rev. 2: 1/31/19

Prepared by: T.J.L Checked by: C.F.C.
Job No. 17159.02

Development of Wind & Ice Load on Antennas

Antenna Data:

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

Gravity Load (without ice)

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

Gravity Load (ice only)

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

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

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

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

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

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

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

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

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

Subject:	Load Analysis of Antenna Mast Structure # 326
Location:	Beacon Falls, CT
Rev. 2: 1/31/19	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.02

Development of Wind & Ice Load on Antennas

Antenna Data:

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

Gravity Load (without ice)

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

Gravity Load (ice only)

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

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

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

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

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

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

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

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

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Subject:	Load Analysis of Antenna Mast Structure # 326
Location:	Beacon Falls, CT
Rev. 2: 1/31/19	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.02

Development of Wind & Ice Load on Platform

Platform Data:

Platform Model =	Tri-Sector Chain Mount		
Mount Shape =	Flat		
Mount Projected Surface Area =	$CdAa := 0$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CdAa_{ice} := 0$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 250$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 300$	lbs	(User Input)

Gravity Loads (without ice)

Weight of All Mounts = $Wt_{mnt1} := WT_{mnt} = 250$ lbs

Gravity Load (ice only)

Weight of Ice on All Mounts = $Wt_{ice.mnt1} := \left(WT_{mnt.ice} - WT_{mnt}\right) = 50$ lbs

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt1} := p \cdot CdAa_{ice} = 0$ lbs

Total Equipment Loads:

NESC Heavy Wind Vertical =

$$\left(Wt_{ant1} + Wt_{ice.ant1} + Wt_{ant2} + Wt_{ice.ant2} + Wt_{ant3} + Wt_{ice.ant3} + Wt_{mnt1} + Wt_{ice.mnt1}\right)\cdot 1.5 = 984$$

NESC Heavy Wind Trasnsverse =

$$\left(Fi_{ant1} + Fi_{ant2} + Fi_{ant3} + Fi_{mnt1}\right)\cdot 2.5 = 346$$

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Subject:	Coax Cable on Antenna Mast Tower # 326
Location:	Beacon Falls, CT
Rev. 2: 1/31/19	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.02

Coax Cable on Antenna Mast

Basic Components

Heavy Wind Pressure =	$p := 4.00 \cdot psf$	(User Input NESC 2012 Figure 250-1 & Table 250-1)
Radial Ice Thickness =	$Ir := 0.50in$	(User Input)
Radial Ice Density =	$Id := 56.0 \cdot pcf$	(User Input)

Shape Factors

Shape Factor for Round Members =	$Cd_R := 1.3$	(User Input)
Shape Factor for Flat Members =	$Cd_F := 1.6$	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	$Cd_{coax} := 1.6$	(User Input)

Overload Factors

Overload Factor for NESC Heavy Wind Transverse Load =	$OF_{HWT} := 2.5$	*(User Input)*
Overload Factor for NESC Heavy Wind Vertical Load =	$OF_{HWV} := 1.5$	*(User Input)*

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Subject:	Coax Cable on Antenna Mast Tower # 326
Location:	Beacon Falls, CT
Rev. 2: 1/31/19	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.02

Distance Between Coax Cable Attach Points =

$$Coax_{Span} := \begin{pmatrix} 3 \\ 10 \\ 8.5 \\ 11 \\ 18.5 \\ 35 \end{pmatrix} \cdot ft$$ *(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 = $N_{coax} := 8$ *(User Input)*

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

Number of External Coax Cables = $NX_{coax} := 8$ *(User Input)*

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

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

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

Weight of Ice on All Coax Cables = $W_{ice} := Ai_{coax} \cdot Id \cdot NX_{coax} = 12.12 \cdot plf$

Heavy Wind Vertical Load =

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

Heavy Wind Transverse Load =

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

$$Heavy\_WInd_{Vert} = \begin{pmatrix} 92 \\ 307 \\ 261 \\ 337 \\ 567 \\ 1073 \end{pmatrix} lb \qquad Heavy\_Wind_{Trans} = \begin{pmatrix} 20 \\ 66 \\ 56 \\ 73 \\ 122 \\ 231 \end{pmatrix} lb$$

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Subject:	Coax Cable on Tower # 326
Location:	Beacon Falls, CT
Rev. 2: 1/31/19	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.02

Coax Cable on Tower Legt

Basic Components

Heavy Wind Pressure =	$p := 4.00 \cdot psf$	(User Input NESC 2012 Figure 250-1 & Table 250-1)
Radial Ice Thickness =	$Ir := 0.50in$	(User Input)
Radial Ice Density =	$Id := 56.0 \cdot pcf$	(User Input)

Shape Factors

Shape Factor for Round Members =	$Cd_R := 1.3$	(User Input)
Shape Factor for Flat Members =	$Cd_F := 1.6$	(User Input)
Shape Factor for Coax Cables Attached to Outside of Pole =	$Cd_{coax} := 1.6$	(User Input)

Overload Factors

Overload Factor for NESC Heavy Wind Transverse Load =	$OF_{HWT} := 2.5$	*(User Input)*
Overload Factor for NESC Heavy Wind Vertical Load =	$OF_{HWV} := 1.5$	*(User Input)*

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Subject:	Coax Cable on Tower # 326
Location:	Beacon Falls, CT
Rev. 2: 1/31/19	Prepared by: T.J.L Checked by: C.F.C. Job No. 17159.02

Distance Between Coax Cable Attach Points =

$$Coax_{Span} := \begin{pmatrix} 12 \\ 8.5 \\ 9 \\ 9.5 \\ 10.5 \\ 15 \\ 15 \end{pmatrix} \cdot ft$$ *(User Input)*

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

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

Number of Coax Cables = $N_{coax} := 10$ *(User Input)*

Number of Projected Coax Cables = $NP_{coax} := 5$ *(User Input)*

Number of External Coax Cables = $NX_{coax} := 10$ *(User Input)*

Wind Area without Ice = $A := \left(NP_{coax} \cdot D_{coax}\right) = 9.9 \cdot in$

Wind Area with Ice = $A_{ice} := \left(NP_{coax} \cdot D_{coax} + 2 \cdot Ir\right) = 10.9 \cdot in$

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 = $W_{ice} := Ai_{coax} \cdot Id \cdot NX_{coax} = 15.149 \cdot plf$

Heavy Wind Vertical Load =

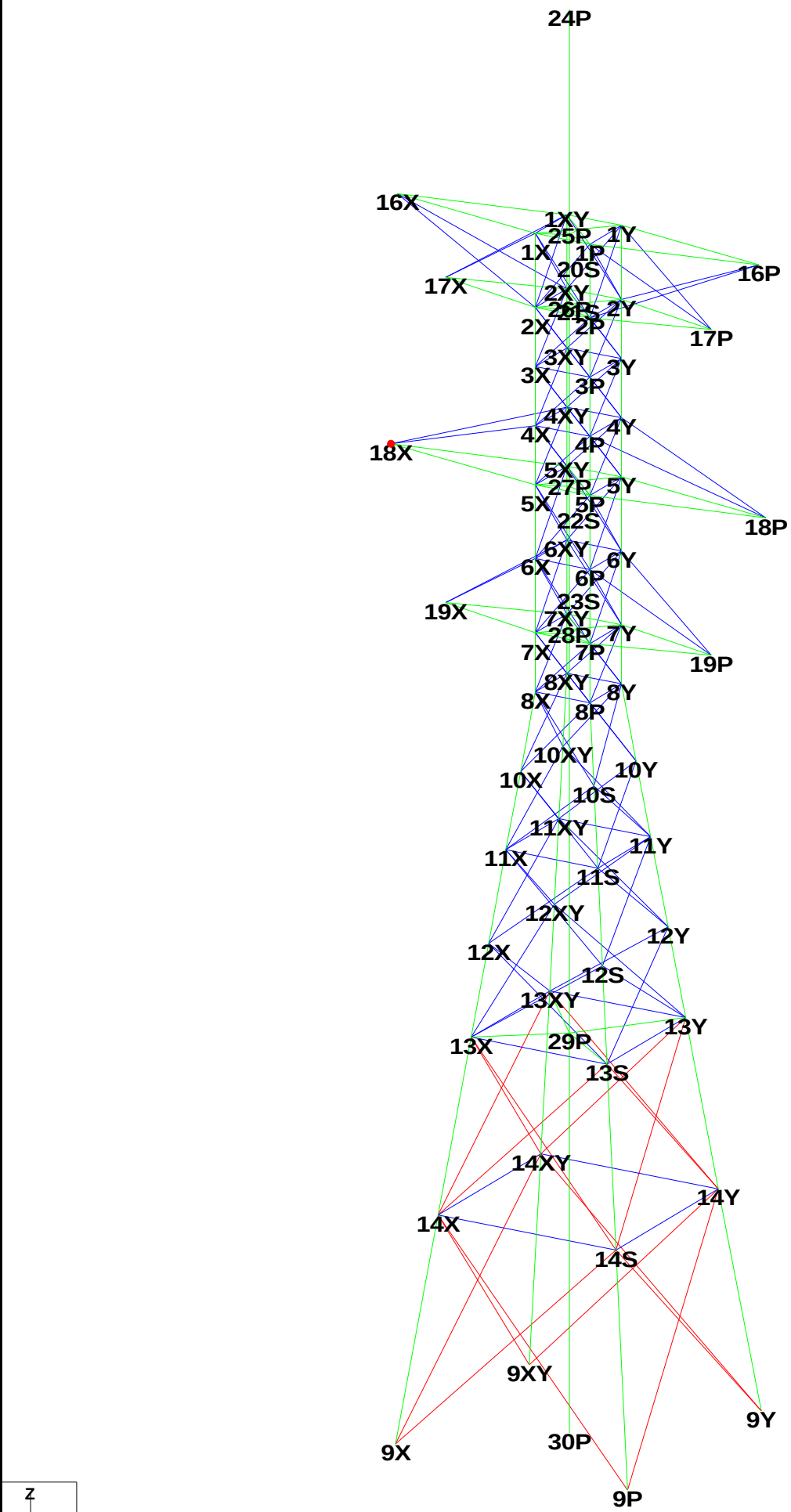
$$\overrightarrow{Heavy\_WInd_{Vert} := \left[\left(N_{coax} \cdot W_{coax} + W_{ice}\right) \cdot Coax_{Span} \cdot OF_{HWV}\right]}$$

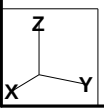
Heavy Wind Transverse Load =

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

$$Heavy\_WInd_{Vert} = \begin{pmatrix} 460 \\ 326 \\ 345 \\ 364 \\ 402 \\ 575 \\ 575 \end{pmatrix} lb \qquad Heavy\_Wind_{Trans} = \begin{pmatrix} 174 \\ 124 \\ 131 \\ 138 \\ 153 \\ 218 \\ 218 \end{pmatrix} lb$$

Centek Engineering Inc, Project: "CL&P # 326"
Tower Version 12.50, 1:34:29 PM Tuesday, January 02, 2018
Undeformed geometry displayed





Project Name : 17159.02 - Beacon Falls, CT
Project Notes: Structure #326 / Sprint - CT03XC037
Project File : J:\Jobs\1715900.WI\02_CT03XC037 Beacon Falls\04_Structural\Calcs\Rev (2)\PLS Tower\CL&P # 326.tow
Date run   : 8:57:36 AM Thursday, January 31, 2019
by   : Tower Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

Member "g7P" will not be checked for block 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 "g7X" will not be checked for block 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 "g7XY" will not be checked for block 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 "g7Y" will not be checked for block 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 "g13P" will not be checked for block 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 "g13X" will not be checked for block 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 "g13XY" will not be checked for block 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 "g13Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g52P" ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g52Y" ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g53P" ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g53X" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62P" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62X" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62XY" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62Y" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71P" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71X" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71XY" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71Y" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72P" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72X" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72XY" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72Y" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73P" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73X" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73XY" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73Y" ??
Unusual number of fixed joints found: 5. Towers normally have from between 1 and 4 fixed joints. ??
The model has 29 warnings. ??

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

Loads from file: j:\jobs\1715900.wi\02_ct03xc037 beacon falls\04_structural\calcs\rev (2)\pls tower\cl&p # 326.lca

*** Analysis Results:

Maximum element usage is 91.16% for Angle "g9XY" in load case "NESC Heavy"
Maximum insulator usage is 7.14% for Clamp "21" 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	9P	-7.06	-6.98	-54.20	9.93	0.13	0.09	0.16	-0.00	0.00
NESC Heavy	30P	0.19	-0.44	-14.36	0.47	4.51	1.94	4.91	-1.01	0.00
NESC Heavy	9X	6.62	-6.18	32.29	9.06	0.14	0.02	0.14	-0.01	0.00
NESC Heavy	9XY	-7.18	-5.08	40.12	8.79	0.02	-0.02	0.03	-0.02	0.00
NESC Heavy	9Y	4.57	-4.11	-35.34	6.14	0.01	0.09	0.10	-0.01	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	9P	14S	g13P	55.102	0.065	0.066	0.010	-0.065	-7.06	-6.98	-54.20
NESC Heavy	9X	14X	g13X	-33.398	3.077	3.128	-2.421	1.981	6.62	-6.18	32.29
NESC Heavy	9XY	14XY	g13XY	-41.029	1.951	1.964	1.959	-0.139	-7.18	-5.08	40.12
NESC Heavy	9Y	14Y	g13Y	35.862	0.483	0.487	0.028	-0.487	4.57	-4.11	-35.34

*** 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	Length (ft)	Comp. No.	No. Of Bolts	Member Comp.
Leg1	L4x4x1/4	SAE	4X4X0.25	33.0	51.23	Tens	42.49	g5P	-22.736	NESC Hea	53.509	54.600	84.375	1.000	1.000	1.000	75.47	75.47	5.000	1	6	
Leg2	L4x4x5/16	SAE	4X4X0.3125	33.0	91.16	Tens	85.89	g11P	-49.800	NESC Hea	57.983	72.800	140.625	1.000	1.000	1.000	96.41	96.41	6.355	1	8	
Diag1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	37.91	Cross	37.91	g29P	-4.163	NESC Hea	10.982	18.200	28.125	0.787	1.000	0.573	161.13	145.30	7.103	6	2	
Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	23.24	Comp	23.24	g16X	-4.229	NESC Hea	22.933	18.200	28.125	0.750	0.500	0.500	86.81	95.10	5.657	2	2	
Diag3	L2.5x2x1/4	SAU	2.5X2X0.25	33.0	51.01	Comp	51.01	g26X	-9.284	NESC Hea	26.806	18.200	28.125	0.750	0.500	0.500	80.05	90.04	5.657	2	2	
Diag4	L2x2x3/16	SAE	2X2X0.1875	33.0	27.49	Cross	27.49	g33P	-2.092	NESC Hea	7.612	18.200	21.094	0.777	1.000	0.554						

190.56 163.39 9.798   6   2
    Diag5 L1.75x1.75x3/16   SAE 1.75X1.75X0.1875   33.0 28.78 Comp 28.78   g38Y -0.515NESC Hea   1.790   18.200   21.094 0.782 0.437 0.437
375.62 314.82 21.495   5   2
    Diag6   L2x2x1/4   SAE   2X2X0.25   33.0 80.55 Comp 80.55   g36X -3.535NESC Hea   4.389   18.200   28.125 0.783 0.566 0.566
287.38 247.58 16.544   5   2
    Horz1   L2x2x1/4   SAE   2X2X0.25   33.0 3.43 Comp 3.43   g40X -0.606NESC Hea   17.680   18.200   28.125 1.000 1.000 1.000
122.76 122.14 4.000   5   2
    Horz2   L2.5x2.5x1/4   SAE   2.5X2.5X0.25   33.0 30.36 Tens 29.10   g47X -5.296NESC Hea   25.851   18.200   28.125 1.000 1.000 1.000
97.76 108.88 4.000   3   2
    Horz3 L1.75x1.75x3/16   SAE 1.75X1.75X0.1875   33.0 19.23 Comp 19.23   g53X -0.616NESC Hea   3.201   9.100   10.547 1.000 1.000 1.000
235.45 235.45 6.730   4   1
    Horz4   L2.5x2.5x3/16   SAE   2.5X2.5X0.1875   33.0 73.45 Comp 73.45   g57X -5.737NESC Hea   7.811   18.200   21.094 1.000 0.500 0.500
201.05 181.80 13.035   5   2
   Inner1 L1.75x1.75x1/4   SAE   1.75X1.75X0.25   33.0 14.27 Tens 10.56   g61P -0.961NESC Hea   18.292   9.100   14.062 1.000 1.000 1.000
99.53 104.65 2.828   2   1
 ShieldAr   L2x2x1/4   SAE   2X2X0.25   33.0 34.79 Comp 34.79   g62P -2.336NESC Hea   6.715   18.200   28.125 1.000 0.500 0.500
225.15 200.16 11.426   5   2
  ShArmBr   L2.5x2.5x1/4   SAE   2.5X2.5X0.25   33.0 14.24 Comp 14.24   g70P -2.088NESC Hea   14.662   18.200   28.125 0.500 0.500 0.500
152.41 152.41 12.472   4   2
 TopCrArm   L2.5x2.5x1/4   SAE   2.5X2.5X0.25   33.0 21.37 Comp 21.37   g64P -2.306NESC Hea   10.791   18.200   28.125 1.000 1.000 1.000
195.61 177.66 8.004   5   2
 TopArmBr   L2x2x1/4   SAE   2X2X0.25   33.0 6.76 Tens 0.00   g71Y   0.000   3.207   18.200   28.125 1.000 1.000 1.000
289.64 289.64 9.437   4   2
 MidCrArm   L2.5x2.5x1/4   SAE   2.5X2.5X0.25   33.0 27.44 Comp 27.44   g66P -3.222NESC Hea   11.740   18.200   28.125 1.000 0.500 0.500
185.99 170.33 11.919   5   2
 MidArmBr   L2x2x1/4   SAE   2X2X0.25   33.0 10.17 Tens 0.00   g72Y   0.000   1.807   18.200   28.125 1.000 1.000 1.000
385.85 385.85 12.572   4   2
 BotCrArm   L2.5x2.5x1/4   SAE   2.5X2.5X0.25   33.0 22.94 Comp 22.94   g68P -2.475NESC Hea   10.791   18.200   28.125 1.000 1.000 1.000
195.61 177.66 8.004   5   2
 BotArmBr   L2x2x1/4   SAE   2X2X0.25   33.0 8.57 Tens 0.00   g73Y   0.000   3.207   18.200   28.125 1.000 1.000 1.000
289.64 289.64 9.437   4   2
    Pwmnt   12" Std. Pipe Pwmnt   Pipe 12" Std.   50.0 2.56 Comp 2.56   g74P -13.254NESC Hea 517.731   0.000   0.000 1.000 1.000 1.000
73.92 73.92 27.042   1   0
    PMBR1   L2x2x3/16   SAE   2X2X0.1875   36.0 13.55 Tens 13.52   g80X -1.378NESC Hea   18.610   16.800   10.195 1.000 1.000 1.000
65.99 92.99 2.167   3   1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P ??
    PMBR2   L3x3x3/16   SAE   3X3X0.1875   36.0 16.35 Comp 16.35   g88X -1.667NESC Hea   19.523   16.800   10.195 1.000 1.000 1.000
126.41 126.41 6.278   4   1

Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Tension Use In Tens. %	Tension Control Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Tens. Member (ft)	No. Of Bolts	Hole Diameter (in)
	Leg1	L4x4x1/4	SAE	4X4X0.25	33.0	51.23	Tens	51.23	g5XY	20.118NESC Hea		39.270	54.600	84.375	84.375	5.000	6	4.000 0.75
	Leg2	L4x4x5/16	SAE	4X4X0.3125	33.0	91.16	Tens	91.16	g9XY	47.943NESC Hea		52.594	0.000	0.000	0.000	5.295	0	3.440 0.75
	Diag1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	37.91	Cross	15.81	g29X	2.878NESC Hea		18.488	18.200	28.125	23.250	7.103	2	1.000 0.75

Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	23.24	Comp	19.37	g18P	3.525NESC Hea	22.349	18.200	28.125	21.875	5.657	2	1.000	0.75
Diag3	L2.5x2x1/4	SAU	2.5X2X0.25	33.0	51.01	Comp	43.07	g27X	7.839NESC Hea	22.201	18.200	28.125	19.875	5.657	2	1.000	0.75
Diag4	L2x2x3/16	SAE	2X2X0.1875	33.0	27.49	Cross	16.02	g31Y	2.512NESC Hea	16.910	18.200	21.094	15.680	8.014	2	1.000	0.75
Diag5	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	28.78	Comp	27.71	g39XY	3.946NESC Hea	14.237	18.200	21.094	15.504	21.495	2	1.000	0.75
Diag6	L2x2x1/4	SAE	2X2X0.25	33.0	80.55	Comp	33.21	g37XY	5.293NESC Hea	22.349	18.200	28.125	15.937	16.544	2	1.000	0.75
Horz1	L2x2x1/4	SAE	2X2X0.25	33.0	3.43	Comp	0.97	g40P	0.176NESC Hea	22.349	18.200	28.125	19.781	4.000	2	1.000	0.75
Horz2	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	30.36	Tens	30.36	g47P	5.526NESC Hea	29.774	18.200	28.125	20.719	4.000	2	1.000	0.75
Horz3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	19.23	Comp	3.71	g53P	0.272NESC Hea	14.237	9.100	10.547	7.312	6.730	1	1.000	0.75
Horz4	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	73.45	Comp	10.76	g54P	1.491NESC Hea	22.613	18.200	21.094	13.852	9.969	2	1.000	0.75
Inner1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	14.27	Tens	14.27	g61Y	1.083NESC Hea	18.488	9.100	14.062	7.594	2.828	1	1.000	0.75
ShieldAr	L2x2x1/4	SAE	2X2X0.25	33.0	34.79	Comp	10.29	g62XY	1.873NESC Hea	22.349	18.200	28.125	18.844	11.426	2	1.000	0.75
ShArmBr	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	14.24	Comp	12.57	g70Y	2.287NESC Hea	29.774	18.200	28.125	21.875	12.472	2	1.000	0.75
TopCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	21.37	Comp	3.69	g65Y	0.671NESC Hea	29.774	18.200	28.125	22.969	4.000	2	1.000	0.75
TopArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	6.76	Tens	6.76	g71XY	1.230NESC Hea	22.349	18.200	28.125	20.906	9.437	2	1.000	0.75
MidCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	27.44	Comp	0.00	g67Y	0.000	29.774	18.200	28.125	22.969	4.000	2	1.000	0.75
MidArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	10.17	Tens	10.17	g72XY	1.852NESC Hea	22.349	18.200	28.125	20.906	12.572	2	1.000	0.75
BotCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	22.94	Comp	4.97	g69P	0.904NESC Hea	29.774	18.200	28.125	22.969	4.000	2	1.000	0.75
BotArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	8.57	Tens	8.57	g73XY	1.560NESC Hea	22.349	18.200	28.125	20.906	9.437	2	1.000	0.75
Pwmnt	12" Std. Pipe	Pwmnt	Pipe 12" Std.	50.0	2.56	Comp	0.00	g79P	0.000	679.999	0.000	0.000	0.000	15.250	0	0.000	0
PMBR1	**L2x2x3/16**	**SAE**	**2X2X0.1875**	**36.0**	**13.55**	**Tens**	**13.55**	**g80P**	**1.381NESC Hea**	**18.827**	**16.800**	**10.195**	**10.343**	**2.167**	**1**	**1.000**	**0.6875 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P ??**
PMBR2	L3x3x3/16	SAE	3X3X0.1875	36.0	16.35	Comp	7.17	g88P	0.731NESC Hea	31.139	16.800	10.195	11.328	6.278	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	91.16	g9XY	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	3.11	NESC Heavy	0.0
2	Clamp	3.71	NESC Heavy	0.0
3	Clamp	4.11	NESC Heavy	0.0
4	Clamp	4.28	NESC Heavy	0.0
5	Clamp	4.15	NESC Heavy	0.0
6	Clamp	4.40	NESC Heavy	0.0
7	Clamp	4.22	NESC Heavy	0.0
8	Clamp	4.55	NESC Heavy	0.0
9	Clamp	3.52	NESC Heavy	0.0
10	Clamp	0.38	NESC Heavy	0.0
11	Clamp	0.30	NESC Heavy	0.0
12	Clamp	0.34	NESC Heavy	0.0
13	Clamp	0.30	NESC Heavy	0.0
14	Clamp	0.35	NESC Heavy	0.0
15	Clamp	0.69	NESC Heavy	0.0
16	Clamp	0.83	NESC Heavy	0.0
17	Clamp	2.29	NESC Heavy	0.0
18	Clamp	1.93	NESC Heavy	0.0
19	Clamp	2.50	NESC Heavy	0.0
20	Clamp	4.38	NESC Heavy	0.0
21	Clamp	7.14	NESC Heavy	0.0
22	Clamp	1.23	NESC Heavy	0.0
23	Clamp	0.92	NESC Heavy	0.0
24	Clamp	1.08	NESC Heavy	0.0
25	Clamp	1.12	NESC Heavy	0.0
26	Clamp	1.12	NESC Heavy	0.0
27	Clamp	1.58	NESC Heavy	0.0
28	Clamp	2.03	NESC Heavy	0.0

*** Weight of structure (lbs):

Weight of Angles*Section DLF:	12983.1
Total:	12983.1

*** End of Report

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*****************************************************************************
*                                                                           *
* TOWER - Analysis and Design -  Copyright Power Line Systems, Inc. 1986-2011 *
*                                                                           *
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Project Name : 17159.02 - Beacon Falls, CT
Project Notes: Structure #326 / Sprint - CT03XC037
Project File : J:\Jobs\1715900.WI\02_CT03XC037 Beacon Falls\04_Structural\Calcs\Rev (2)\PLS Tower\CL&P # 326.tow
Date run     : 8:57:35 AM Thursday, January 31, 2019
by           : Tower Version 12.50
Licensed to  : Centek Engineering Inc

Successfully performed nonlinear analysis

Member "g7P" will not be checked for block 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 "g7X" will not be checked for block 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 "g7XY" will not be checked for block 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 "g7Y" will not be checked for block 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 "g13P" will not be checked for block 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 "g13X" will not be checked for block 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 "g13XY" will not be checked for block 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 "g13Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g52P" ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g52Y" ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g53P" ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g53X" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62P" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62X" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62XY" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62Y" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71P" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71X" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71XY" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71Y" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72P" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72X" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72XY" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72Y" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73P" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73X" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73XY" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73Y" ??
Unusual number of fixed joints found: 5.  Towers normally have from between 1 and 4 fixed joints. ??
The model has 29 warnings.  ??
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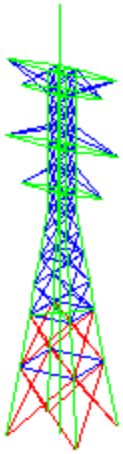

Nonlinear convergence parameters: Use Standard Parameters
Tension only member maximum compression load as a percent of compression capacity: 100%
Member check option: ASCE 10
Connection rupture check: ASCE 10
Crossing diagonal check: ASCE 10 [Alternate Unsupported RLOUT = 1]
Included angle check: None
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	2	2	81	Free	Free	Free	Free	Free	Free
2P	XY-Symmetry	2	2	76	Free	Free	Free	Free	Free	Free
3P	XY-Symmetry	2	2	72	Free	Free	Free	Free	Free	Free
4P	XY-Symmetry	2	2	68	Free	Free	Free	Free	Free	Free
5P	XY-Symmetry	2	2	64	Free	Free	Free	Free	Free	Free
6P	XY-Symmetry	2	2	59	Free	Free	Free	Free	Free	Free
7P	XY-Symmetry	2	2	54	Free	Free	Free	Free	Free	Free
8P	XY-Symmetry	2	2	50	Free	Free	Free	Free	Free	Free
9P	XY-Symmetry	8.5	8.5	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
16P	X-Symmetry	0	13.25	81	Free	Free	Free	Free	Free	Free
17P	X-Symmetry	0	9.75	76	Free	Free	Free	Free	Free	Free
18P	X-Symmetry	0	13.75	64	Free	Free	Free	Free	Free	Free
19P	X-Symmetry	0	9.75	54	Free	Free	Free	Free	Free	Free
24P	None	1.167	0	96.25	Free	Free	Free	Free	Free	Free
25P	None	1.167	0	81	Free	Free	Free	Free	Free	Free
26P	None	1.167	0	76	Free	Free	Free	Free	Free	Free
27P	None	1.167	0	64	Free	Free	Free	Free	Free	Free
28P	None	1.167	0	54	Free	Free	Free	Free	Free	Free
29P	None	1.167	0	27.04	Free	Free	Free	Free	Free	Free
30P	None	1.167	0	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
1X	X-GenXY	2	-2	81	Free	Free	Free	Free	Free	Free
1XY	XY-GenXY	-2	-2	81	Free	Free	Free	Free	Free	Free

1Y	Y-GenXY	-2	2	81	Free	Free	Free	Free	Free	Free
2X	X-GenXY	2	-2	76	Free	Free	Free	Free	Free	Free
2XY	XY-GenXY	-2	-2	76	Free	Free	Free	Free	Free	Free
2Y	Y-GenXY	-2	2	76	Free	Free	Free	Free	Free	Free
3X	X-GenXY	2	-2	72	Free	Free	Free	Free	Free	Free
3XY	XY-GenXY	-2	-2	72	Free	Free	Free	Free	Free	Free
3Y	Y-GenXY	-2	2	72	Free	Free	Free	Free	Free	Free
4X	X-GenXY	2	-2	68	Free	Free	Free	Free	Free	Free
4XY	XY-GenXY	-2	-2	68	Free	Free	Free	Free	Free	Free
4Y	Y-GenXY	-2	2	68	Free	Free	Free	Free	Free	Free
5X	X-GenXY	2	-2	64	Free	Free	Free	Free	Free	Free
5XY	XY-GenXY	-2	-2	64	Free	Free	Free	Free	Free	Free
5Y	Y-GenXY	-2	2	64	Free	Free	Free	Free	Free	Free
6X	X-GenXY	2	-2	59	Free	Free	Free	Free	Free	Free
6XY	XY-GenXY	-2	-2	59	Free	Free	Free	Free	Free	Free
6Y	Y-GenXY	-2	2	59	Free	Free	Free	Free	Free	Free
7X	X-GenXY	2	-2	54	Free	Free	Free	Free	Free	Free
7XY	XY-GenXY	-2	-2	54	Free	Free	Free	Free	Free	Free
7Y	Y-GenXY	-2	2	54	Free	Free	Free	Free	Free	Free
8X	X-GenXY	2	-2	50	Free	Free	Free	Free	Free	Free
8XY	XY-GenXY	-2	-2	50	Free	Free	Free	Free	Free	Free
8Y	Y-GenXY	-2	2	50	Free	Free	Free	Free	Free	Free
9X	X-GenXY	8.5	-8.5	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
9XY	XY-GenXY	-8.5	-8.5	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
9Y	Y-GenXY	-8.5	8.5	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
16X	X-Gen	0	-13.25	81	Free	Free	Free	Free	Free	Free
17X	X-Gen	0	-9.75	76	Free	Free	Free	Free	Free	Free
18X	X-Gen	0	-13.75	64	Free	Free	Free	Free	Free	Free
19X	X-Gen	0	-9.75	54	Free	Free	Free	Free	Free	Free

Secondary Joints:

Joint Label	Symmetry Code	Origin Joint	End Joint	Fraction	Elevation X (ft)	Disp. Y Rest.	Disp. Z Rest.	Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
10S	XY-Symmetry	8P	9P	0	44.71	Free	Free	Free	Free	Free	Free
11S	XY-Symmetry	8P	9P	0	39.5	Free	Free	Free	Free	Free	Free
12S	XY-Symmetry	8P	9P	0	33.29	Free	Free	Free	Free	Free	Free
13S	XY-Symmetry	8P	9P	0	27.04	Free	Free	Free	Free	Free	Free
14S	XY-Symmetry	8P	9P	0	15.25	Free	Free	Free	Free	Free	Free
20S	None	1P	1XY	0.5	0	Free	Free	Free	Free	Free	Free
21S	None	2P	2XY	0.5	0	Free	Free	Free	Free	Free	Free
22S	None	5P	5XY	0.5	0	Free	Free	Free	Free	Free	Free
23S	None	7P	7XY	0.5	0	Free	Free	Free	Free	Free	Free
10X	X-GenXY	8P	9P	0	44.71	Free	Free	Free	Free	Free	Free
10XY	XY-GenXY	8P	9P	0	44.71	Free	Free	Free	Free	Free	Free
10Y	Y-GenXY	8P	9P	0	44.71	Free	Free	Free	Free	Free	Free
11X	X-GenXY	8P	9P	0	39.5	Free	Free	Free	Free	Free	Free
11XY	XY-GenXY	8P	9P	0	39.5	Free	Free	Free	Free	Free	Free
11Y	Y-GenXY	8P	9P	0	39.5	Free	Free	Free	Free	Free	Free
12X	X-GenXY	8P	9P	0	33.29	Free	Free	Free	Free	Free	Free
12XY	XY-GenXY	8P	9P	0	33.29	Free	Free	Free	Free	Free	Free
12Y	Y-GenXY	8P	9P	0	33.29	Free	Free	Free	Free	Free	Free
13X	X-GenXY	8P	9P	0	27.04	Free	Free	Free	Free	Free	Free
13XY	XY-GenXY	8P	9P	0	27.04	Free	Free	Free	Free	Free	Free
13Y	Y-GenXY	8P	9P	0	27.04	Free	Free	Free	Free	Free	Free
14X	X-GenXY	8P	9P	0	15.25	Free	Free	Free	Free	Free	Free
14XY	XY-GenXY	8P	9P	0	15.25	Free	Free	Free	Free	Free	Free

14Y	Y-GenXY	8P	9P	0	15.25	Free	Free	Free	Free	Free	Free

The model contains 51 primary and 24 secondary joints for a total of 75 joints.

Steel Material Properties:

Steel Material Label	Modulus of Elasticity (ksi)	Yield Stress Fy (ksi)	Ultimate Stress Fu (ksi)	Member All. Stress Hyp. 1 (ksi)	Member All. Stress Hyp. 2 (ksi)	Member Rupture Hyp. 1 (ksi)	Member Rupture Hyp. 2 (ksi)	Member Bearing Hyp. 1 (ksi)	Member Bearing Hyp. 2 (ksi)
A 36	2.9e+004	36	58	0	0	0	0	0	0
A7	2.9e+004	33	60	0	0	0	0	0	0
A500-50	2.9e+004	50	62	0	0	0	0	0	0

Bolt Properties:

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

Number Bolts Used By Type:

Bolt Type	Number Bolts
5/8 A394	506
5/8 A325	16

Angle Properties:

Angle Type	Angle Size	Long Leg (in)	Short Leg (in)	Thick. (in)	Unit Weight (lbs/ft)	Gross Area (in^2)	w/t Ratio	Radius of Gyration Rx (in)	Radius of Gyration Ry (in)	Radius of Gyration Rz (in)	Number of Angles	Wind Width (in)	Short Edge Dist. (in)	Long Edge Dist. (in)	Optimize Cost Factor	Section Modulus (in^3)
SAE	4X4X0.3125	4	4	0.3125	8.2	2.4	10.6	1.24	1.24	0.791	1	4	2	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	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	1.75X1.75X0.25	1.75	1.75	0.25	2.77	0.81	4.25	0.529	0.529	0.341	1	1.75	0.875	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	2.5X2X0.25	2.5	2	0.25	3.62	1.06	7.75	0.784	0.592	0.424	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

Angle Groups:

Group Label	Group Description	Angle Type	Angle Size	Material Type	Element Type	Group Type	Optimize Group	Allow. Add. Angle Width For Optimize (in)

Leg1	L4x4x1/4	SAE	4X4X0.25	A7	Beam	Leg	None	0.000
Leg2	L4x4x5/16	SAE	4X4X0.3125	A7	Beam	Leg	None	0.000
Diag1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	A7	Truss	Crossing Diagonal	None	0.000
Diag2	L2x2x1/4	SAE	2X2X0.25	A7	Truss	Crossing Diagonal	None	0.000
Diag3	L2.5x2x1/4	SAU	2.5X2X0.25	A7	Truss	Crossing Diagonal	None	0.000
Diag4	L2x2x3/16	SAE	2X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000
Diag5	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	A7	T-Only	Other	None	0.000
Diag6	L2x2x1/4	SAE	2X2X0.25	A7	T-Only	Other	None	0.000
Horz1	L2x2x1/4	SAE	2X2X0.25	A7	Truss	Other	None	0.000
Horz2	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	A7	Truss	Other	None	0.000
Horz3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	A7	Truss	Other	None	0.000
Horz4	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	A7	Truss	Other	None	0.000
Inner1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	A7	Beam	Other	None	0.000
ShieldAr	L2x2x1/4	SAE	2X2X0.25	A7	Beam	Other	None	0.000
ShArmBr	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	A7	Truss	Other	None	0.000
TopCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	A7	Beam	Other	None	0.000
TopArmBr	L2x2x1/4	SAE	2X2X0.25	A7	Truss	Other	None	0.000
MidCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	A7	Beam	Other	None	0.000
MidArmBr	L2x2x1/4	SAE	2X2X0.25	A7	Truss	Other	None	0.000
BotCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	A7	Beam	Other	None	0.000
BotArmBr	L2x2x1/4	SAE	2X2X0.25	A7	Truss	Other	None	0.000
Pwmnt	12" Std. Pipe	Pwmnt	Pipe 12" Std.	A500-50	Beam	Other	None	0.000
PMBR1	L2x2x3/16	SAE	2X2X0.1875	A 36	Beam	Other	None	12.000
PMBR2	L3x3x3/16	SAE	3X3X0.1875	A 36	Beam	Other	None	12.000

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	4X4X0.25	A7	88.00	117.33	580.80
SAE	4X4X0.3125	A7	239.35	319.14	1962.69
SAE	1.75X1.75X0.25	A7	153.31	89.43	424.66
SAE	2X2X0.25	A7	544.54	363.02	1737.07
SAU	2.5X2X0.25	A7	147.70	110.78	534.69
SAE	2X2X0.1875	A7	142.49	95.00	347.68
SAE	1.75X1.75X0.1875	A7	198.88	116.01	421.62
SAE	2.5X2.5X0.25	A7	273.60	228.00	1121.75
SAE	2.5X2.5X0.1875	A7	92.02	76.68	282.49
Pwmnt	Pipe 12" Std.	A500-50	96.25	397.03	4774.00
SAE	2X2X0.1875	A 36	22.00	14.67	53.68
SAE	3X3X0.1875	A 36	28.39	28.39	105.33

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 For Face EIA Only	Ar Round For Face EIA Only	Transverse Drag x Area Factor For All	Longitudinal Drag x Area Factor For All	SAPS Angle Drag x Area Factor	SAPS Round Drag x Area Factor	Force Solid Face
1	8P	1.000	3.200	3.200	1.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	None
2	9P	1.100	3.300	3.300	1.000	1.000	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	# Holes	# Shear Planes	Connect Leg	Short Edge Dist. (in)	Long Edge Dist. (in)	End Dist. (in)	Bolt Spacing (in)	Shear Path Length (in)	Tension Path Length (in)	Rest. Coef.
g1P	Leg1		XY-Symmetry	1P	2P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g1X	Leg1		X-GenXY	1X	2X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g1XY	Leg1		XY-GenXY	1XY	2XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g1Y	Leg1		Y-GenXY	1Y	2Y	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g2P	Leg1		XY-Symmetry	2P	3P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g2X	Leg1		X-GenXY	2X	3X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g2XY	Leg1		XY-GenXY	2XY	3XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g2Y	Leg1		Y-GenXY	2Y	3Y	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g3P	Leg1		XY-Symmetry	3P	4P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g3X	Leg1		X-GenXY	3X	4X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g3XY	Leg1		XY-GenXY	3XY	4XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g3Y	Leg1		Y-GenXY	3Y	4Y	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g4P	Leg1		XY-Symmetry	4P	5P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g4X	Leg1		X-GenXY	4X	5X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g4XY	Leg1		XY-GenXY	4XY	5XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g4Y	Leg1		Y-GenXY	4Y	5Y	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g5P	Leg1		XY-Symmetry	5P	6P	1	4	1	1	1	5/8 A394	6	4	1	Both	1.75	0	1.25	0	0	0	0
g5X	Leg1		X-GenXY	5X	6X	1	4	1	1	1	5/8 A394	6	4	1	Both	1.75	0	1.25	0	0	0	0
g5XY	Leg1		XY-GenXY	5XY	6XY	1	4	1	1	1	5/8 A394	6	4	1	Both	1.75	0	1.25	0	0	0	0
g5Y	Leg1		Y-GenXY	5Y	6Y	1	4	1	1	1	5/8 A394	6	4	1	Both	1.75	0	1.25	0	0	0	0
g6P	Leg2		XY-Symmetry	6P	7P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g6X	Leg2		X-GenXY	6X	7X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g6XY	Leg2		XY-GenXY	6XY	7XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0

g6Y	Leg2	Y-GenXY	6Y	7Y	1	4	1	1	1	5/8	A394	0	4	0		0	0	0	0	0	0	0
g7P	Leg2	XY-Symmetry	7P	8P	1	4	1	1	1	5/8	A394	10	4	1	Both	1.1875	2.3125	4.75	2.25	0	0	0
g7X	Leg2	X-GenXY	7X	8X	1	4	1	1	1	5/8	A394	10	4	1	Both	1.1875	2.3125	4.75	2.25	0	0	0
g7XY	Leg2	XY-GenXY	7XY	8XY	1	4	1	1	1	5/8	A394	10	4	1	Both	1.1875	2.3125	4.75	2.25	0	0	0
g7Y	Leg2	Y-GenXY	7Y	8Y	1	4	1	1	1	5/8	A394	10	4	1	Both	1.1875	2.3125	4.75	2.25	0	0	0
g8P	Leg2	XY-Symmetry	8P	10S	1	4	1	1	1	5/8	A394	0	3.55	0		0	0	0	0	0	0	0
g8X	Leg2	X-GenXY	8X	10X	1	4	1	1	1	5/8	A394	0	3.55	0		0	0	0	0	0	0	0
g8XY	Leg2	XY-GenXY	8XY	10XY	1	4	1	1	1	5/8	A394	0	3.55	0		0	0	0	0	0	0	0
g8Y	Leg2	Y-GenXY	8Y	10Y	1	4	1	1	1	5/8	A394	0	3.55	0		0	0	0	0	0	0	0
g9P	Leg2	XY-Symmetry	10S	11S	1	4	1	1	1	5/8	A394	0	3.44	0		0	0	0	0	0	0	0
g9X	Leg2	X-GenXY	10X	11X	1	4	1	1	1	5/8	A394	0	3.44	0		0	0	0	0	0	0	0
g9XY	Leg2	XY-GenXY	10XY	11XY	1	4	1	1	1	5/8	A394	0	3.44	0		0	0	0	0	0	0	0
g9Y	Leg2	Y-GenXY	10Y	11Y	1	4	1	1	1	5/8	A394	0	3.44	0		0	0	0	0	0	0	0
g10P	Leg2	XY-Symmetry	11S	12S	1	4	1	1	1	5/8	A394	0	3.74	0		0	0	0	0	0	0	0
g10X	Leg2	X-GenXY	11X	12X	1	4	1	1	1	5/8	A394	0	3.74	0		0	0	0	0	0	0	0
g10XY	Leg2	XY-GenXY	11XY	12XY	1	4	1	1	1	5/8	A394	0	3.74	0		0	0	0	0	0	0	0
g10Y	Leg2	Y-GenXY	11Y	12Y	1	4	1	1	1	5/8	A394	0	3.74	0		0	0	0	0	0	0	0
g11P	Leg2	XY-Symmetry	12S	13S	1	4	1	1	1	5/8	A394	8	3.24	1	Both	2	0	1.5	2	0	0	0
g11X	Leg2	X-GenXY	12X	13X	1	4	1	1	1	5/8	A394	8	3.24	1	Both	2	0	1.5	2	0	0	0
g11XY	Leg2	XY-GenXY	12XY	13XY	1	4	1	1	1	5/8	A394	8	3.24	1	Both	2	0	1.5	2	0	0	0
g11Y	Leg2	Y-GenXY	12Y	13Y	1	4	1	1	1	5/8	A394	8	3.24	1	Both	2	0	1.5	2	0	0	0
g12P	Leg2	XY-Symmetry	13S	14S	1	4	0.5	0.5	0.5	5/8	A394	0	4	0		0	0	0	0	0	0	0
g12X	Leg2	X-GenXY	13X	14X	1	4	0.5	0.5	0.5	5/8	A394	0	4	0		0	0	0	0	0	0	0
g12XY	Leg2	XY-GenXY	13XY	14XY	1	4	0.5	0.5	0.5	5/8	A394	0	4	0		0	0	0	0	0	0	0
g12Y	Leg2	Y-GenXY	13Y	14Y	1	4	0.5	0.5	0.5	5/8	A394	0	4	0		0	0	0	0	0	0	0
g13P	Leg2	XY-Symmetry	14S	9P	1	4	0.33	0.33	0.33	5/8	A394	10	4	1	Both	0.75	1.625	1.4375	3.125	0	0	0
g13X	Leg2	X-GenXY	14X	9X	1	4	0.33	0.33	0.33	5/8	A394	10	4	1	Both	0.75	1.625	1.4375	3.125	0	0	0
g13XY	Leg2	XY-GenXY	14XY	9XY	1	4	0.33	0.33	0.33	5/8	A394	10	4	1	Both	0.75	1.625	1.4375	3.125	0	0	0
g13Y	Leg2	Y-GenXY	14Y	9Y	1	4	0.33	0.33	0.33	5/8	A394	10	4	1	Both	0.75	1.625	1.4375	3.125	0	0	0
g14P	Diag1	XY-Symmetry	1P	2X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Long only	0.75	0	0.875	2.6875			

0	0	0																		
	g14X	Diag1	X-GenXY	1X	2P	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.75	0	0.875	2.6875	
0	0	0																		
	g14XY	Diag1	XY-GenXY	1XY	2Y	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.75	0	0.875	2.6875	
0	0	0																		
	g14Y	Diag1	Y-GenXY	1Y	2XY	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.75	0	0.875	2.6875	
0	0	0																		
	g15P	Diag1	XY-Symmetry	1P	2Y	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.75	0	0.875	2.6875	
0	0	0																		
	g15X	Diag1	X-GenXY	1X	2XY	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.75	0	0.875	2.6875	
0	0	0																		
	g15XY	Diag1	XY-GenXY	1XY	2X	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.75	0	0.875	2.6875	
0	0	0																		
	g15Y	Diag1	Y-GenXY	1Y	2P	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.75	0	0.875	2.6875	
0	0	0																		
	g16P	Diag2	XY-Symmetry	2P	3X	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g16X	Diag2	X-GenXY	2X	3P	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g16XY	Diag2	XY-GenXY	2XY	3Y	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g16Y	Diag2	Y-GenXY	2Y	3XY	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g17P	Diag2	XY-Symmetry	2P	3Y	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g17X	Diag2	X-GenXY	2X	3XY	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g17XY	Diag2	XY-GenXY	2XY	3X	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g17Y	Diag2	Y-GenXY	2Y	3P	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g18P	Diag2	XY-Symmetry	3P	4X	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g18X	Diag2	X-GenXY	3X	4P	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g18XY	Diag2	XY-GenXY	3XY	4Y	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g18Y	Diag2	Y-GenXY	3Y	4XY	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g19P	Diag2	XY-Symmetry	3P	4Y	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g19X	Diag2	X-GenXY	3X	4XY	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g19XY	Diag2	XY-GenXY	3XY	4X	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g19Y	Diag2	Y-GenXY	3Y	4P	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.3125	
0	0	0																		
	g20P	Diag2	XY-Symmetry	4P	5X	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.4063	
0	0	0																		
	g20X	Diag2	X-GenXY	4X	5P	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.4063	
0	0	0																		
	g20XY	Diag2	XY-GenXY	4XY	5Y	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.4063	
0	0	0																		
	g20Y	Diag2	Y-GenXY	4Y	5XY	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.4063	
0	0	0																		
	g21P	Diag2	XY-Symmetry	4P	5Y	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.4063	
0	0	0																		
	g21X	Diag2	X-GenXY	4X	5XY	2	5	0.75	0.5	0.5	5/8 A394	2	1	1	Long only	0.875	0	0.875	2.4063	
0	0	0																		

g21XY	Diag2	XY-GenXY	4XY	5X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	0.875	2.4063	0	0
g21Y	Diag2	Y-GenXY	4Y	5P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Long only	0.875	0	0.875	2.4063	0	0
g22P	Diag3	XY-Symmetry	5P	6X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.5938	0	0
g22X	Diag3	X-GenXY	5X	6P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.5938	0	0
g22XY	Diag3	XY-GenXY	5XY	6Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.5938	0	0
g22Y	Diag3	Y-GenXY	5Y	6XY	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.5938	0	0
g23P	Diag3	XY-Symmetry	5P	6Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.5938	0	0
g23X	Diag3	X-GenXY	5X	6XY	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.5938	0	0
g23XY	Diag3	XY-GenXY	5XY	6X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.5938	0	0
g23Y	Diag3	Y-GenXY	5Y	6P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.5938	0	0
g24P	Diag3	XY-Symmetry	6P	7X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.8125	0	0
g24X	Diag3	X-GenXY	6X	7P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.8125	0	0
g24XY	Diag3	XY-GenXY	6XY	7Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.8125	0	0
g24Y	Diag3	Y-GenXY	6Y	7XY	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.8125	0	0
g25P	Diag3	XY-Symmetry	6P	7Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.8125	0	0
g25X	Diag3	X-GenXY	6X	7XY	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.8125	0	0
g25XY	Diag3	XY-GenXY	6XY	7X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.8125	0	0
g25Y	Diag3	Y-GenXY	6Y	7P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2.8125	0	0
g26P	Diag3	XY-Symmetry	7P	8X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2	0	0
g26X	Diag3	X-GenXY	7X	8P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2	0	0
g26XY	Diag3	XY-GenXY	7XY	8Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2	0	0
g26Y	Diag3	Y-GenXY	7Y	8XY	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2	0	0
g27P	Diag3	XY-Symmetry	7P	8Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2	0	0
g27X	Diag3	X-GenXY	7X	8XY	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2	0	0
g27XY	Diag3	XY-GenXY	7XY	8X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2	0	0
g27Y	Diag3	Y-GenXY	7Y	8P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.875	0	0.875	2	0	0
g28P	Diag1	XY-Symmetry	8P	10X	2	5	0.787	0.573	0.573	5/8	A394	2	1	1	Long only	0.875	0	1	2.25	0	0
g28X	Diag1	X-GenXY	8X	10S	2	5	0.787	0.573	0.573	5/8	A394	2	1	1	Long only	0.875	0	1	2.25	0	0
g28XY	Diag1	XY-GenXY	8XY	10Y	2	5	0.787	0.573	0.573	5/8	A394	2	1	1	Long only	0.875	0	1	2.25	0	0
g28Y	Diag1	Y-GenXY	8Y	10XY	2	5	0.787	0.573	0.573	5/8	A394	2	1	1	Long only	0.875	0	1	2.25		

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0       0     0
   g29P    Diag1          XY-Symmetry     8P   10Y    2     5 0.787 0.573 0.573 5/8 A394     2      1       1  Long only  0.875      0       1    2.25
0       0     0
   g29X    Diag1              X-GenXY     8X  10XY    2     5 0.787 0.573 0.573 5/8 A394     2      1       1  Long only  0.875      0       1    2.25
0       0     0
  g29XY    Diag1             XY-GenXY    8XY   10X    2     5 0.787 0.573 0.573 5/8 A394     2      1       1  Long only  0.875      0       1    2.25
0       0     0
   g29Y    Diag1              Y-GenXY     8Y   10S    2     5 0.787 0.573 0.573 5/8 A394     2      1       1  Long only  0.875      0       1    2.25
0       0     0
   g30P    Diag4          XY-Symmetry    10S   11X    2     5 0.776 0.552 0.552 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g30X    Diag4              X-GenXY    10X   11S    2     5 0.776 0.552 0.552 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
  g30XY    Diag4             XY-GenXY   10XY   11Y    2     5 0.776 0.552 0.552 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g30Y    Diag4              Y-GenXY    10Y  11XY    2     5 0.776 0.552 0.552 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g31P    Diag4          XY-Symmetry    10S   11Y    2     5 0.776 0.552 0.552 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g31X    Diag4              X-GenXY    10X  11XY    2     5 0.776 0.552 0.552 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
  g31XY    Diag4             XY-GenXY   10XY   11X    2     5 0.776 0.552 0.552 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g31Y    Diag4              Y-GenXY    10Y   11S    2     5 0.776 0.552 0.552 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g32P    Diag4          XY-Symmetry    11S   12X    2     5 0.777 0.554 0.554 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g32X    Diag4              X-GenXY    11X   12S    2     5 0.777 0.554 0.554 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
  g32XY    Diag4             XY-GenXY   11XY   12Y    2     5 0.777 0.554 0.554 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g32Y    Diag4              Y-GenXY    11Y  12XY    2     5 0.777 0.554 0.554 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g33P    Diag4          XY-Symmetry    11S   12Y    2     5 0.777 0.554 0.554 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g33X    Diag4              X-GenXY    11X  12XY    2     5 0.777 0.554 0.554 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
  g33XY    Diag4             XY-GenXY   11XY   12X    2     5 0.777 0.554 0.554 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g33Y    Diag4              Y-GenXY    11Y   12S    2     5 0.777 0.554 0.554 5/8 A394     2      1       1  Long only      1      0       1   1.875
0       0     0
   g34P    Diag2          XY-Symmetry    12S   13X    2     4 0.772 0.545 0.545 5/8 A394     1      1       1  Long only      1      0       1       0
0       0     0
   g34X    Diag2              X-GenXY    12X   13S    2     4 0.772 0.545 0.545 5/8 A394     1      1       1  Long only      1      0       1       0
0       0     0
  g34XY    Diag2             XY-GenXY   12XY   13Y    2     4 0.772 0.545 0.545 5/8 A394     1      1       1  Long only      1      0       1       0
0       0     0
   g34Y    Diag2              Y-GenXY    12Y  13XY    2     4 0.772 0.545 0.545 5/8 A394     1      1       1  Long only      1      0       1       0
0       0     0
   g35P    Diag2          XY-Symmetry    12S   13Y    2     4 0.772 0.545 0.545 5/8 A394     1      1       1  Long only      1      0       1       0
0       0     0
   g35X    Diag2              X-GenXY    12X  13XY    2     4 0.772 0.545 0.545 5/8 A394     1      1       1  Long only      1      0       1       0
0       0     0
  g35XY    Diag2             XY-GenXY   12XY   13X    2     4 0.772 0.545 0.545 5/8 A394     1      1       1  Long only      1      0       1       0
0       0     0
   g35Y    Diag2              Y-GenXY    12Y   13S    2     4 0.772 0.545 0.545 5/8 A394     1      1       1  Long only      1      0       1       0
0       0     0
   g36P    Diag6          XY-Symmetry    13S   14X    2     5 0.783 0.566 0.566 5/8 A394     2      1       1  Long only  0.875      0       1  1.4375
0       0     0
```

g36X	Diag6	X-GenXY	13X	14S	2	5	0.783	0.566	0.566	5/8	A394	2	1	1	Long only	0.875	0	1	1.4375	0	0
g36XY	Diag6	XY-GenXY	13XY	14Y	2	5	0.783	0.566	0.566	5/8	A394	2	1	1	Long only	0.875	0	1	1.4375	0	0
g36Y	Diag6	Y-GenXY	13Y	14XY	2	5	0.783	0.566	0.566	5/8	A394	2	1	1	Long only	0.875	0	1	1.4375	0	0
g37P	Diag6	XY-Symmetry	13S	14Y	2	5	0.783	0.566	0.566	5/8	A394	2	1	1	Long only	0.875	0	1	1.4375	0	0
g37X	Diag6	X-GenXY	13X	14XY	2	5	0.783	0.566	0.566	5/8	A394	2	1	1	Long only	0.875	0	1	1.4375	0	0
g37XY	Diag6	XY-GenXY	13XY	14X	2	5	0.783	0.566	0.566	5/8	A394	2	1	1	Long only	0.875	0	1	1.4375	0	0
g37Y	Diag6	Y-GenXY	13Y	14S	2	5	0.783	0.566	0.566	5/8	A394	2	1	1	Long only	0.875	0	1	1.4375	0	0
g38P	Diag5	XY-Symmetry	14S	9X	2	5	0.782	0.437	0.437	5/8	A394	2	1	1	Long only	0.9375	0	1.46875	1.4375	0	0
g38X	Diag5	X-GenXY	14X	9P	2	5	0.782	0.437	0.437	5/8	A394	2	1	1	Long only	0.9375	0	1.46875	1.4375	0	0
g38XY	Diag5	XY-GenXY	14XY	9Y	2	5	0.782	0.437	0.437	5/8	A394	2	1	1	Long only	0.9375	0	1.46875	1.4375	0	0
g38Y	Diag5	Y-GenXY	14Y	9XY	2	5	0.782	0.437	0.437	5/8	A394	2	1	1	Long only	0.9375	0	1.46875	1.4375	0	0
g39P	Diag5	XY-Symmetry	14S	9Y	2	5	0.782	0.437	0.437	5/8	A394	2	1	1	Long only	0.9375	0	1.46875	1.4375	0	0
g39X	Diag5	X-GenXY	14X	9XY	2	5	0.782	0.437	0.437	5/8	A394	2	1	1	Long only	0.9375	0	1.46875	1.4375	0	0
g39XY	Diag5	XY-GenXY	14XY	9X	2	5	0.782	0.437	0.437	5/8	A394	2	1	1	Long only	0.9375	0	1.46875	1.4375	0	0
g39Y	Diag5	Y-GenXY	14Y	9P	2	5	0.782	0.437	0.437	5/8	A394	2	1	1	Long only	0.9375	0	1.46875	1.4375	0	0
g40P	Horz1	X-Symmetry	1P	1Y	3	5	1	1	1	5/8	A394	2	1	1	Long only	1	0	1	1.75	0	0
g40X	Horz1	X-Gen	1X	1XY	3	5	1	1	1	5/8	A394	2	1	1	Long only	1	0	1	1.75	0	0
g41P	Horz2	X-Symmetry	2P	2Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g41X	Horz2	X-Gen	2X	2XY	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g42P	Horz2	X-Symmetry	3P	3Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g42X	Horz2	X-Gen	3X	3XY	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g43P	Horz2	X-Symmetry	4P	4Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g43X	Horz2	X-Gen	4X	4XY	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g44P	Horz2	X-Symmetry	5P	5Y	3	6	1	1	1	5/8	A394	3	1	1	Long only	1.25	0	0.875	1.75	0	0
g44X	Horz2	X-Gen	5X	5XY	3	6	1	1	1	5/8	A394	3	1	1	Long only	1.25	0	0.875	1.75	0	0
g45P	Horz2	Y-Symmetry	3X	3P	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g45Y	Horz2	Y-Gen	3XY	3Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g46P	Horz2	Y-Symmetry	4X	4P	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g46Y	Horz2	Y-Gen	4XY	4Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75	0	0
g47P	Horz2	X-Symmetry	6P	6Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75		

0	0	0																		
	g47X	Horz2	X-Gen	6X	6XY	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75
0	0	0																		
	g48P	Horz2	X-Symmetry	7P	7Y	3	6	1	1	1	5/8	A394	3	1	1	Long only	1.25	0	0.875	1.75
0	0	0																		
	g48X	Horz2	X-Gen	7X	7XY	3	6	1	1	1	5/8	A394	3	1	1	Long only	1.25	0	0.875	1.75
0	0	0																		
	g49P	Horz2	Y-Symmetry	6X	6P	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75
0	0	0																		
	g49Y	Horz2	Y-Gen	6XY	6Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.75
0	0	0																		
	g50P	Horz2	X-Symmetry	8P	8Y	3	6	1	1	1	5/8	A394	3	1	1	Long only	1.25	0	0.875	1.625
0	0	0																		
	g50X	Horz2	X-Gen	8X	8XY	3	6	1	1	1	5/8	A394	3	1	1	Long only	1.25	0	0.875	1.625
0	0	0																		
	g51P	Horz2	Y-Symmetry	8X	8P	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.625
0	0	0																		
	g51Y	Horz2	Y-Gen	8XY	8Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0.875	1.625
0	0	0																		
	g52P	Horz3	Y-Symmetry	11X	11S	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g52Y	Horz3	Y-Gen	11XY	11Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g53P	Horz3	X-Symmetry	11S	11Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g53X	Horz3	X-Gen	11X	11XY	3	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g54P	Horz4	Y-Symmetry	13X	13S	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	1	1.375
0	0	0																		
	g54Y	Horz4	Y-Gen	13XY	13Y	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	1	1.375
0	0	0																		
	g55P	Horz4	X-Symmetry	13S	13Y	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	1	1.375
0	0	0																		
	g55X	Horz4	X-Gen	13X	13XY	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	1	1.375
0	0	0																		
	g56P	Horz4	Y-Symmetry	14X	14S	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	1	1.375
0	0	0																		
	g56Y	Horz4	Y-Gen	14XY	14Y	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	1	1.375
0	0	0																		
	g57P	Horz4	X-Symmetry	14S	14Y	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	1	1.375
0	0	0																		
	g57X	Horz4	X-Gen	14X	14XY	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	1	1.375
0	0	0																		
	g58P	Inner1	XY-Symmetry	1X	20S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0
0	0	0																		
	g58X	Inner1	X-GenXY	1P	20S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0
0	0	0																		
	g58XY	Inner1	XY-GenXY	1Y	20S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0
0	0	0																		
	g58Y	Inner1	Y-GenXY	1XY	20S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0
0	0	0																		
	g59P	Inner1	XY-Symmetry	2X	21S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0
0	0	0																		
	g59X	Inner1	X-GenXY	2P	21S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0
0	0	0																		
	g59XY	Inner1	XY-GenXY	2Y	21S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0
0	0	0																		
	g59Y	Inner1	Y-GenXY	2XY	21S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0
0	0	0																		

g60P	Inner1	XY-Symmetry	5X	22S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0	0	0
g60X	Inner1	X-GenXY	5P	22S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0	0	0
g60XY	Inner1	XY-GenXY	5Y	22S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0	0	0
g60Y	Inner1	Y-GenXY	5XY	22S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0	0	0
g61P	Inner1	XY-Symmetry	7X	23S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0	0	0
g61X	Inner1	X-GenXY	7P	23S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0	0	0
g61XY	Inner1	XY-GenXY	7Y	23S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0	0	0
g61Y	Inner1	Y-GenXY	7XY	23S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.75	0	0.875	0	0	0
g62P	ShieldAr	XY-Symmetry	16X	1X	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	0.75	0	0	1.75	0	0
g62X	ShieldAr	X-GenXY	16P	1P	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	0.75	0	0	1.75	0	0
g62XY	ShieldAr	XY-GenXY	16P	1Y	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	0.75	0	0	1.75	0	0
g62Y	ShieldAr	Y-GenXY	16X	1XY	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	0.75	0	0	1.75	0	0
g63P	ShieldAr	Y-Symmetry	1X	1P	3	6	1	1	1	5/8	A394	2	1	1	Long only	0.75	0	0	1.75	0	0
g63Y	ShieldAr	Y-Gen	1XY	1Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	0.75	0	0	1.75	0	0
g64P	TopCrArm	XY-Symmetry	17X	2X	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g64X	TopCrArm	X-GenXY	17P	2P	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g64XY	TopCrArm	XY-GenXY	17P	2Y	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g64Y	TopCrArm	Y-GenXY	17X	2XY	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g65P	TopCrArm	Y-Symmetry	2X	2P	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g65Y	TopCrArm	Y-Gen	2XY	2Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g66P	MidCrArm	XY-Symmetry	18X	5X	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g66X	MidCrArm	X-GenXY	18P	5P	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g66XY	MidCrArm	XY-GenXY	18P	5Y	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g66Y	MidCrArm	Y-GenXY	18X	5XY	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g67P	MidCrArm	Y-Symmetry	5X	5P	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g67Y	MidCrArm	Y-Gen	5XY	5Y	3	6	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g68P	BotCrArm	XY-Symmetry	19X	7X	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g68X	BotCrArm	X-GenXY	19P	7P	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g68XY	BotCrArm	XY-GenXY	19P	7Y	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75	0	0
g68Y	BotCrArm	Y-GenXY	19X	7XY	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	0	1.75		

```
0       0     0
   g69P BotCrArm          Y-Symmetry     7X    7P    3     6     1     1     1 5/8 A394     2      1       1  Long only   1.25      0       0    1.75
0       0     0
   g69Y BotCrArm               Y-Gen    7XY    7Y    3     6     1     1     1 5/8 A394     2      1       1  Long only   1.25      0       0    1.75
0       0     0
   g70P  ShArmBr         XY-Symmetry    16X    2X    2     4   0.5   0.5   0.5 5/8 A394     2      1       1  Long only   1.25      0   0.875       2
0       0     0
   g70X  ShArmBr             X-GenXY    16P    2P    2     4   0.5   0.5   0.5 5/8 A394     2      1       1  Long only   1.25      0   0.875       2
0       0     0
  g70XY  ShArmBr            XY-GenXY    16P    2Y    2     4   0.5   0.5   0.5 5/8 A394     2      1       1  Long only   1.25      0   0.875       2
0       0     0
   g70Y  ShArmBr             Y-GenXY    16X   2XY    2     4   0.5   0.5   0.5 5/8 A394     2      1       1  Long only   1.25      0   0.875       2
0       0     0
   g71P TopArmBr         XY-Symmetry    17X    1X    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
   g71X TopArmBr             X-GenXY    17P    1P    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
  g71XY TopArmBr            XY-GenXY    17P    1Y    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
   g71Y TopArmBr             Y-GenXY    17X   1XY    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
   g72P MidArmBr         XY-Symmetry    18X    4X    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
   g72X MidArmBr             X-GenXY    18P    4P    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
  g72XY MidArmBr            XY-GenXY    18P    4Y    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
   g72Y MidArmBr             Y-GenXY    18X   4XY    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
   g73P BotArmBr         XY-Symmetry    19X    6X    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
   g73X BotArmBr             X-GenXY    19P    6P    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
  g73XY BotArmBr            XY-GenXY    19P    6Y    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
   g73Y BotArmBr             Y-GenXY    19X   6XY    2     4     1     1     1 5/8 A394     2      1       1  Long only      1      0   0.875       2
0       0     0
   g74P    Pwmnt                None    30P   29P    1     4     1     1     1                0      0       0                 0      0       0       0
0       0     0
   g75P    Pwmnt                None    29P   28P    1     4     1     1     1                0      0       0                 0      0       0       0
0       0     0
   g76P    Pwmnt                None    28P   27P    1     4     1     1     1                0      0       0                 0      0       0       0
0       0     0
   g77P    Pwmnt                None    27P   26P    1     4     1     1     1                0      0       0                 0      0       0       0
0       0     0
   g78P    Pwmnt                None    26P   25P    1     4     1     1     1                0      0       0                 0      0       0       0
0       0     0
   g79P    Pwmnt                None    25P   24P    1     4     1     1     1                0      0       0                 0      0       0       0
0       0     0
   g80P    PMBR1          X-Symmetry     1X   25P    3     4     1     1     1 5/8 A325     1      1       1  Long only      0      0       0       0
0       0     0
   g80X    PMBR1               X-Gen     1P   25P    3     4     1     1     1 5/8 A325     1      1       1  Long only      0      0       0       0
0       0     0
   g81P    PMBR1                None    25P   20S    3     4     1     1     1 5/8 A325     1      1       1  Long only      0      0       0       0
0       0     0
   g82P    PMBR1          X-Symmetry     2X   26P    3     4     1     1     1 5/8 A325     1      1       1  Long only      0      0       0       0
0       0     0
   g82X    PMBR1               X-Gen     2P   26P    3     4     1     1     1 5/8 A325     1      1       1  Long only      0      0       0       0
0       0     0
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g83P	PMBR1	None	26P	21S	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g84P	PMBR1	X-Symmetry	5X	27P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g84X	PMBR1	X-Gen	5P	27P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g85P	PMBR1	None	27P	22S	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g86P	PMBR1	X-Symmetry	7X	28P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g86X	PMBR1	X-Gen	7P	28P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g87P	PMBR1	None	28P	23S	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g88P	PMBR2	X-Symmetry	13X	29P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g88X	PMBR2	X-Gen	13S	29P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g89P	PMBR2	X-Symmetry	13XY	29P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	
g89X	PMBR2	X-Gen	13Y	29P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0	

Member Capacities and Overrides:

Member Label	Group Label	Design Comp. Capacity Control	Design Tension Capacity Control	Tension Face	L/r Length Criterion	L/r Unsup. (ft)	Connection Comp. Capacity (kips)	Connection Shear Capacity (kips)	Connection Bearing Capacity (kips)	Net Section Tension Capacity (kips)	Rupture Tension Capacity (kips)	RTE End Dist. Capacity (kips)	RTE Edge Dist. Capacity (kips)	Override Comp. Capacity (kips)	Override Warnings or Errors
g1P	Leg1	53.509 L/r	39.270	Net Sect	75	5.00	53.509	0.000	0.000	39.270	0.000	0.000	0.000	0.000	0.000 Automatic
g1X	Leg1	53.509 L/r	39.270	Net Sect	75	5.00	53.509	0.000	0.000	39.270	0.000	0.000	0.000	0.000	0.000 Automatic
g1XY	Leg1	53.509 L/r	39.270	Net Sect	75	5.00	53.509	0.000	0.000	39.270	0.000	0.000	0.000	0.000	0.000 Automatic
g1Y	Leg1	53.509 L/r	39.270	Net Sect	75	5.00	53.509	0.000	0.000	39.270	0.000	0.000	0.000	0.000	0.000 Automatic
g2P	Leg1	57.293 L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000	0.000 Automatic
g2X	Leg1	57.293 L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000	0.000 Automatic
g2XY	Leg1	57.293 L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000	0.000 Automatic
g2Y	Leg1	57.293 L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000	0.000 Automatic
g3P	Leg1	57.293 L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000	0.000 Automatic
g3X	Leg1	57.293 L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000	

0.000		0.000		Automatic											
g3XY	Leg1	57.293	L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3Y	Leg1	57.293	L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g4P	Leg1	57.293	L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g4X	Leg1	57.293	L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g4XY	Leg1	57.293	L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g4Y	Leg1	57.293	L/r	39.270	Net Sect	60	4.00	57.293	0.000	0.000	39.270	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g5P	Leg1	53.509	L/r	39.270	Net Sect	75	5.00	53.509	54.600	84.375	39.270	84.375	0.000	0.000	0.000
0.000		0.000		Automatic											
g5X	Leg1	53.509	L/r	39.270	Net Sect	75	5.00	53.509	54.600	84.375	39.270	84.375	0.000	0.000	0.000
0.000		0.000		Automatic											
g5XY	Leg1	53.509	L/r	39.270	Net Sect	75	5.00	53.509	54.600	84.375	39.270	84.375	0.000	0.000	0.000
0.000		0.000		Automatic											
g5Y	Leg1	53.509	L/r	39.270	Net Sect	75	5.00	53.509	54.600	84.375	39.270	84.375	0.000	0.000	0.000
0.000		0.000		Automatic											
g6P	Leg2	66.065	L/r	48.262	Net Sect	76	5.00	66.065	0.000	0.000	48.262	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g6X	Leg2	66.065	L/r	48.262	Net Sect	76	5.00	66.065	0.000	0.000	48.262	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g6XY	Leg2	66.065	L/r	48.262	Net Sect	76	5.00	66.065	0.000	0.000	48.262	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g6Y	Leg2	66.065	L/r	48.262	Net Sect	76	5.00	66.065	0.000	0.000	48.262	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g7P	**Leg2**	**70.793**	**L/r**	**48.262**	**Net Sect**	**61**	**4.00**	**70.793**	**91.000**	**175.781**	**48.262**	**218.290**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**	**Member "g7P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**										
g7X	**Leg2**	**70.793**	**L/r**	**48.262**	**Net Sect**	**61**	**4.00**	**70.793**	**91.000**	**175.781**	**48.262**	**218.290**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**	**Member "g7X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**										
g7XY	**Leg2**	**70.793**	**L/r**	**48.262**	**Net Sect**	**61**	**4.00**	**70.793**	**91.000**	**175.781**	**48.262**	**218.290**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**	**Member "g7XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**										
g7Y	**Leg2**	**70.793**	**L/r**	**48.262**	**Net Sect**	**61**	**4.00**	**70.793**	**91.000**	**175.781**	**48.262**	**218.290**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**	**Member "g7Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**										
g8P	Leg2	63.989	L/r	51.743	Net Sect	82	5.38	63.989	0.000	0.000	51.743	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g8X	Leg2	63.989	L/r	51.743	Net Sect	82	5.38	63.989	0.000	0.000	51.743	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g8XY	Leg2	63.989	L/r	51.743	Net Sect	82	5.38	63.989	0.000	0.000	51.743	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g8Y	Leg2	63.989	L/r	51.743	Net Sect	82	5.38	63.989	0.000	0.000	51.743	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g9P	Leg2	64.468	L/r	52.594	Net Sect	80	5.30	64.468	0.000	0.000	52.594	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g9X	Leg2	64.468	L/r	52.594	Net Sect	80	5.30	64.468	0.000	0.000	52.594	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g9XY	Leg2	64.468	L/r	52.594	Net Sect	80	5.30	64.468	0.000	0.000	52.594	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g9Y	Leg2	64.468	L/r	52.594	Net Sect	80	5.30	64.468	0.000	0.000	52.594	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g10P	Leg2	58.267	L/r	50.273	Net Sect	96	6.31	58.267	0.000	0.000	50.273	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											

g10X	Leg2	58.267	L/r	50.273	Net Sect	96	6.31	58.267	0.000	0.000	50.273	0.000	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g10XY	Leg2	58.267	L/r	50.273	Net Sect	96	6.31	58.267	0.000	0.000	50.273	0.000	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g10Y	Leg2	58.267	L/r	50.273	Net Sect	96	6.31	58.267	0.000	0.000	50.273	0.000	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g11P	Leg2	57.983	L/r	54.141	Net Sect	96	6.35	57.983	72.800	140.625	54.141	187.500	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g11X	Leg2	57.983	L/r	54.141	Net Sect	96	6.35	57.983	72.800	140.625	54.141	187.500	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g11XY	Leg2	57.983	L/r	54.141	Net Sect	96	6.35	57.983	72.800	140.625	54.141	187.500	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g11Y	Leg2	57.983	L/r	54.141	Net Sect	96	6.35	57.983	72.800	140.625	54.141	187.500	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g12P	Leg2	60.318	L/r	48.262	Net Sect	91	11.99	60.318	0.000	0.000	48.262	0.000	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g12X	Leg2	60.318	L/r	48.262	Net Sect	91	11.99	60.318	0.000	0.000	48.262	0.000	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g12XY	Leg2	60.318	L/r	48.262	Net Sect	91	11.99	60.318	0.000	0.000	48.262	0.000	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g12Y	Leg2	60.318	L/r	48.262	Net Sect	91	11.99	60.318	0.000	0.000	48.262	0.000	0.000	0.000	0.000	0.000
0.000	0.000	Automatic														
g13P	**Leg2**	**65.444**	**L/r**	**48.262**	**Net Sect**	**78**	**15.51**	**65.444**	**91.000**	**175.781**	**48.262**	**137.867**	**0.000**	**0.000**	**0.000**	
0.000	**0.000**	**Automatic**	**Member "g13P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**													
g13X	**Leg2**	**65.444**	**L/r**	**48.262**	**Net Sect**	**78**	**15.51**	**65.444**	**91.000**	**175.781**	**48.262**	**137.867**	**0.000**	**0.000**	**0.000**	
0.000	**0.000**	**Automatic**	**Member "g13X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**													
g13XY	**Leg2**	**65.444**	**L/r**	**48.262**	**Net Sect**	**78**	**15.51**	**65.444**	**91.000**	**175.781**	**48.262**	**137.867**	**0.000**	**0.000**	**0.000**	
0.000	**0.000**	**Automatic**	**Member "g13XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**													
g13Y	**Leg2**	**65.444**	**L/r**	**48.262**	**Net Sect**	**78**	**15.51**	**65.444**	**91.000**	**175.781**	**48.262**	**137.867**	**0.000**	**0.000**	**0.000**	
0.000	**0.000**	**Automatic**	**Member "g13Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**													
g14P	Diag1	16.629	L/r	18.200	Shear	113	6.40	16.629	18.200	28.125	18.488	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g14X	Diag1	16.629	L/r	18.200	Shear	113	6.40	16.629	18.200	28.125	18.488	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g14XY	Diag1	16.629	L/r	18.200	Shear	113	6.40	16.629	18.200	28.125	18.488	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g14Y	Diag1	16.629	L/r	18.200	Shear	113	6.40	16.629	18.200	28.125	18.488	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g15P	Diag1	16.629	L/r	18.200	Shear	113	6.40	16.629	18.200	28.125	18.488	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g15X	Diag1	16.629	L/r	18.200	Shear	113	6.40	16.629	18.200	28.125	18.488	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g15XY	Diag1	16.629	L/r	18.200	Shear	113	6.40	16.629	18.200	28.125	18.488	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g15Y	Diag1	16.629	L/r	18.200	Shear	113	6.40	16.629	18.200	28.125	18.488	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g16P	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g16X	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g16XY	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g16Y	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000	
0.000	0.000	Automatic														
g17P	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000	

0.000		0.000	Automatic												
g17X	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g17XY	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g17Y	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g18P	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g18X	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g18XY	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g18Y	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g19P	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g19X	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g19XY	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g19Y	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g20P	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g20X	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g20XY	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g20Y	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g21P	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g21X	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g21XY	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g21Y	Diag2	18.200	Shear	18.200	Shear	87	5.66	22.933	18.200	28.125	22.349	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g22P	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g22X	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g22XY	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g22Y	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g23P	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g23X	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g23XY	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g23Y	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g24P	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												
g24X	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000	Automatic												

g24XY	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g24Y	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g25P	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g25X	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g25XY	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g25Y	Diag3	18.200	Shear	18.200	Shear	91	6.40	25.305	18.200	28.125	22.201	21.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g26P	Diag3	18.200	Shear	18.200	Shear	80	5.66	26.806	18.200	28.125	22.201	19.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g26X	Diag3	18.200	Shear	18.200	Shear	80	5.66	26.806	18.200	28.125	22.201	19.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g26XY	Diag3	18.200	Shear	18.200	Shear	80	5.66	26.806	18.200	28.125	22.201	19.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g26Y	Diag3	18.200	Shear	18.200	Shear	80	5.66	26.806	18.200	28.125	22.201	19.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g27P	Diag3	18.200	Shear	18.200	Shear	80	5.66	26.806	18.200	28.125	22.201	19.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g27X	Diag3	18.200	Shear	18.200	Shear	80	5.66	26.806	18.200	28.125	22.201	19.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g27XY	Diag3	18.200	Shear	18.200	Shear	80	5.66	26.806	18.200	28.125	22.201	19.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g27Y	Diag3	18.200	Shear	18.200	Shear	80	5.66	26.806	18.200	28.125	22.201	19.875	0.000	0.000	0.000
0.000		0.000		Automatic											
g28P	Diag1	12.219	L/r	18.200	Shear	143	7.10	12.219	18.200	28.125	18.488	23.250	0.000	0.000	0.000
0.000		0.000		Automatic											
g28X	Diag1	12.219	L/r	18.200	Shear	143	7.10	12.219	18.200	28.125	18.488	23.250	0.000	0.000	0.000
0.000		0.000		Automatic											
g28XY	Diag1	12.219	L/r	18.200	Shear	143	7.10	12.219	18.200	28.125	18.488	23.250	0.000	0.000	0.000
0.000		0.000		Automatic											
g28Y	Diag1	12.219	L/r	18.200	Shear	143	7.10	12.219	18.200	28.125	18.488	23.250	0.000	0.000	0.000
0.000		0.000		Automatic											
g29P	Diag1	12.219	L/r	18.200	Shear	143	7.10	12.219	18.200	28.125	18.488	23.250	0.000	0.000	0.000
0.000		0.000		Automatic											
g29X	Diag1	12.219	L/r	18.200	Shear	143	7.10	12.219	18.200	28.125	18.488	23.250	0.000	0.000	0.000
0.000		0.000		Automatic											
g29XY	Diag1	12.219	L/r	18.200	Shear	143	7.10	12.219	18.200	28.125	18.488	23.250	0.000	0.000	0.000
0.000		0.000		Automatic											
g29Y	Diag1	12.219	L/r	18.200	Shear	143	7.10	12.219	18.200	28.125	18.488	23.250	0.000	0.000	0.000
0.000		0.000		Automatic											
g30P	Diag4	11.794	L/r	15.680	Rupture	135	8.01	11.794	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g30X	Diag4	11.794	L/r	15.680	Rupture	135	8.01	11.794	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g30XY	Diag4	11.794	L/r	15.680	Rupture	135	8.01	11.794	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g30Y	Diag4	11.794	L/r	15.680	Rupture	135	8.01	11.794	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g31P	Diag4	11.794	L/r	15.680	Rupture	135	8.01	11.794	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g31X	Diag4	11.794	L/r	15.680	Rupture	135	8.01	11.794	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g31XY	Diag4	11.794	L/r	15.680	Rupture	135	8.01	11.794	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g31Y	Diag4	11.794	L/r	15.680	Rupture	135	8.01	11.794	18.200	21.094	16.910	15.680	0.000	0.000	0.000

0.000		0.000		Automatic											
g32P	Diag4	8.505	L/r	15.680	Rupture	165	9.80	8.505	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g32X	Diag4	8.505	L/r	15.680	Rupture	165	9.80	8.505	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g32XY	Diag4	8.505	L/r	15.680	Rupture	165	9.80	8.505	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g32Y	Diag4	8.505	L/r	15.680	Rupture	165	9.80	8.505	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g33P	Diag4	8.505	L/r	15.680	Rupture	165	9.80	8.505	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g33X	Diag4	8.505	L/r	15.680	Rupture	165	9.80	8.505	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g33XY	Diag4	8.505	L/r	15.680	Rupture	165	9.80	8.505	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g33Y	Diag4	8.505	L/r	15.680	Rupture	165	9.80	8.505	18.200	21.094	16.910	15.680	0.000	0.000	0.000
0.000		0.000		Automatic											
g34P	Diag2	7.783	L/r	9.100	Shear	186	11.12	7.783	9.100	14.062	22.349	10.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g34X	Diag2	7.783	L/r	9.100	Shear	186	11.12	7.783	9.100	14.062	22.349	10.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g34XY	Diag2	7.783	L/r	9.100	Shear	186	11.12	7.783	9.100	14.062	22.349	10.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g34Y	Diag2	7.783	L/r	9.100	Shear	186	11.12	7.783	9.100	14.062	22.349	10.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g35P	Diag2	7.783	L/r	9.100	Shear	186	11.12	7.783	9.100	14.062	22.349	10.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g35X	Diag2	7.783	L/r	9.100	Shear	186	11.12	7.783	9.100	14.062	22.349	10.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g35XY	Diag2	7.783	L/r	9.100	Shear	186	11.12	7.783	9.100	14.062	22.349	10.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g35Y	Diag2	7.783	L/r	9.100	Shear	186	11.12	7.783	9.100	14.062	22.349	10.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g36P	Diag6	4.389	L/r	15.937	Rupture	287	16.54	4.389	18.200	28.125	22.349	15.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g36X	Diag6	4.389	L/r	15.937	Rupture	287	16.54	4.389	18.200	28.125	22.349	15.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g36XY	Diag6	4.389	L/r	15.937	Rupture	287	16.54	4.389	18.200	28.125	22.349	15.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g36Y	Diag6	4.389	L/r	15.937	Rupture	287	16.54	4.389	18.200	28.125	22.349	15.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g37P	Diag6	4.389	L/r	15.937	Rupture	287	16.54	4.389	18.200	28.125	22.349	15.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g37X	Diag6	4.389	L/r	15.937	Rupture	287	16.54	4.389	18.200	28.125	22.349	15.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g37XY	Diag6	4.389	L/r	15.937	Rupture	287	16.54	4.389	18.200	28.125	22.349	15.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g37Y	Diag6	4.389	L/r	15.937	Rupture	287	16.54	4.389	18.200	28.125	22.349	15.937	0.000	0.000	0.000
0.000		0.000		Automatic											
g38P	Diag5	1.790	L/r	14.237	Net Sect	376	21.49	1.790	18.200	21.094	14.237	15.504	0.000	0.000	0.000
0.000		0.000		Automatic											
g38X	Diag5	1.790	L/r	14.237	Net Sect	376	21.49	1.790	18.200	21.094	14.237	15.504	0.000	0.000	0.000
0.000		0.000		Automatic											
g38XY	Diag5	1.790	L/r	14.237	Net Sect	376	21.49	1.790	18.200	21.094	14.237	15.504	0.000	0.000	0.000
0.000		0.000		Automatic											
g38Y	Diag5	1.790	L/r	14.237	Net Sect	376	21.49	1.790	18.200	21.094	14.237	15.504	0.000	0.000	0.000
0.000		0.000		Automatic											
g39P	Diag5	1.790	L/r	14.237	Net Sect	376	21.49	1.790	18.200	21.094	14.237	15.504	0.000	0.000	0.000
0.000		0.000		Automatic											

g39X	Diag5	1.790	L/r	14.237	Net Sect	376	21.49	1.790	18.200	21.094	14.237	15.504	0.000	0.000	0.000
0.000		0.000		Automatic											
g39XY	Diag5	1.790	L/r	14.237	Net Sect	376	21.49	1.790	18.200	21.094	14.237	15.504	0.000	0.000	0.000
0.000		0.000		Automatic											
g39Y	Diag5	1.790	L/r	14.237	Net Sect	376	21.49	1.790	18.200	21.094	14.237	15.504	0.000	0.000	0.000
0.000		0.000		Automatic											
g40P	Horz1	17.680	L/r	18.200	Shear	123	4.00	17.680	18.200	28.125	22.349	19.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g40X	Horz1	17.680	L/r	18.200	Shear	123	4.00	17.680	18.200	28.125	22.349	19.781	0.000	0.000	0.000
0.000		0.000		Automatic											
g41P	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g41X	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g42P	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g42X	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g43P	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g43X	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g44P	Horz2	25.851	L/r	27.300	Shear	98	4.00	25.851	27.300	42.187	29.774	29.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g44X	Horz2	25.851	L/r	27.300	Shear	98	4.00	25.851	27.300	42.187	29.774	29.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g45P	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g45Y	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g46P	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g46Y	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g47P	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g47X	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g48P	Horz2	25.851	L/r	27.300	Shear	98	4.00	25.851	27.300	42.187	29.774	29.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g48X	Horz2	25.851	L/r	27.300	Shear	98	4.00	25.851	27.300	42.187	29.774	29.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g49P	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g49Y	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	20.719	0.000	0.000	0.000
0.000		0.000		Automatic											
g50P	Horz2	25.851	L/r	27.300	Shear	98	4.00	25.851	27.300	42.187	29.774	27.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g50X	Horz2	25.851	L/r	27.300	Shear	98	4.00	25.851	27.300	42.187	29.774	27.469	0.000	0.000	0.000
0.000		0.000		Automatic											
g51P	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	19.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g51Y	Horz2	18.200	Shear	18.200	Shear	98	4.00	25.851	18.200	28.125	29.774	19.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g52P	**Horz3**	**3.201**	**L/r**	**7.312**	**Rupture**	**235**	**6.73**	**3.201**	**9.100**	**10.547**	**14.237**	**7.312**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											
KL/R value of 235.45 exceeds maximum of 200.00 for member "g52P" ??															
g52Y	**Horz3**	**3.201**	**L/r**	**7.312**	**Rupture**	**235**	**6.73**	**3.201**	**9.100**	**10.547**	**14.237**	**7.312**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											

KL/R value of 235.45 exceeds maximum of 200.00 for member "g52Y" ??

g53P	**Horz3**	**3.201**	**L/r**	**7.312**	**Rupture**	**235**	**6.73**	**3.201**	**9.100**	**10.547**	**14.237**	**7.312**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											

KL/R value of 235.45 exceeds maximum of 200.00 for member "g53P" ??

g53X	**Horz3**	**3.201**	**L/r**	**7.312**	**Rupture**	**235**	**6.73**	**3.201**	**9.100**	**10.547**	**14.237**	**7.312**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											

KL/R value of 235.45 exceeds maximum of 200.00 for member "g53X" ??

g54P	Horz4	12.150	L/r	13.852	Rupture	154	9.97	12.150	18.200	21.094	22.613	13.852	0.000	0.000	0.000
0.000		0.000		Automatic											
g54Y	Horz4	12.150	L/r	13.852	Rupture	154	9.97	12.150	18.200	21.094	22.613	13.852	0.000	0.000	0.000
0.000		0.000		Automatic											
g55P	Horz4	12.150	L/r	13.852	Rupture	154	9.97	12.150	18.200	21.094	22.613	13.852	0.000	0.000	0.000
0.000		0.000		Automatic											
g55X	Horz4	12.150	L/r	13.852	Rupture	154	9.97	12.150	18.200	21.094	22.613	13.852	0.000	0.000	0.000
0.000		0.000		Automatic											
g56P	Horz4	7.811	L/r	13.852	Rupture	201	13.04	7.811	18.200	21.094	22.613	13.852	0.000	0.000	0.000
0.000		0.000		Automatic											
g56Y	Horz4	7.811	L/r	13.852	Rupture	201	13.04	7.811	18.200	21.094	22.613	13.852	0.000	0.000	0.000
0.000		0.000		Automatic											
g57P	Horz4	7.811	L/r	13.852	Rupture	201	13.04	7.811	18.200	21.094	22.613	13.852	0.000	0.000	0.000
0.000		0.000		Automatic											
g57X	Horz4	7.811	L/r	13.852	Rupture	201	13.04	7.811	18.200	21.094	22.613	13.852	0.000	0.000	0.000
0.000		0.000		Automatic											
g58P	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g58X	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g58XY	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g58Y	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g59P	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g59X	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g59XY	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g59Y	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g60P	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g60X	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g60XY	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g60Y	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g61P	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g61X	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g61XY	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g61Y	Inner1	9.100	Shear	7.594	Rupture	100	2.83	18.292	9.100	14.062	18.488	7.594	0.000	0.000	0.000
0.000		0.000		Automatic											
g62P	**ShieldAr**	**6.715**	**L/r**	**18.200**	**Shear**	**225**	**11.43**	**6.715**	**18.200**	**28.125**	**22.349**	**18.844**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											

KL/R value of 200.16 exceeds maximum of 200.00 for member "g62P" ??

g62X	**ShieldAr**	**6.715**	**L/r**	**18.200**	**Shear**	**225**	**11.43**	**6.715**	**18.200**	**28.125**	**22.349**	**18.844**	**0.000**	**0.000**	**0.000**

0.000 0.000 Automatic
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62X" ??
g62XY ShieldAr 6.715 L/r 18.200 Shear 225 11.43 6.715 18.200 28.125 22.349 18.844 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62XY" ??
g62Y ShieldAr 6.715 L/r 18.200 Shear 225 11.43 6.715 18.200 28.125 22.349 18.844 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62Y" ??
g63P ShieldAr 17.777 L/r 18.200 Shear 123 4.00 17.777 18.200 28.125 22.349 18.844 0.000 0.000 0.000
0.000 0.000 Automatic
g63Y ShieldAr 17.777 L/r 18.200 Shear 123 4.00 17.777 18.200 28.125 22.349 18.844 0.000 0.000 0.000
0.000 0.000 Automatic
g64P TopCrArm 10.791 L/r 18.200 Shear 196 8.00 10.791 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g64X TopCrArm 10.791 L/r 18.200 Shear 196 8.00 10.791 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g64XY TopCrArm 10.791 L/r 18.200 Shear 196 8.00 10.791 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g64Y TopCrArm 10.791 L/r 18.200 Shear 196 8.00 10.791 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g65P TopCrArm 18.200 Shear 18.200 Shear 98 4.00 25.851 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g65Y TopCrArm 18.200 Shear 18.200 Shear 98 4.00 25.851 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g66P MidCrArm 11.740 L/r 18.200 Shear 186 11.92 11.740 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g66X MidCrArm 11.740 L/r 18.200 Shear 186 11.92 11.740 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g66XY MidCrArm 11.740 L/r 18.200 Shear 186 11.92 11.740 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g66Y MidCrArm 11.740 L/r 18.200 Shear 186 11.92 11.740 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g67P MidCrArm 18.200 Shear 18.200 Shear 98 4.00 25.851 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g67Y MidCrArm 18.200 Shear 18.200 Shear 98 4.00 25.851 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g68P BotCrArm 10.791 L/r 18.200 Shear 196 8.00 10.791 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g68X BotCrArm 10.791 L/r 18.200 Shear 196 8.00 10.791 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g68XY BotCrArm 10.791 L/r 18.200 Shear 196 8.00 10.791 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g68Y BotCrArm 10.791 L/r 18.200 Shear 196 8.00 10.791 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g69P BotCrArm 18.200 Shear 18.200 Shear 98 4.00 25.851 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g69Y BotCrArm 18.200 Shear 18.200 Shear 98 4.00 25.851 18.200 28.125 29.774 22.969 0.000 0.000 0.000
0.000 0.000 Automatic
g70P ShArmBr 14.662 L/r 18.200 Shear 152 12.47 14.662 18.200 28.125 29.774 21.875 0.000 0.000 0.000
0.000 0.000 Automatic
g70X ShArmBr 14.662 L/r 18.200 Shear 152 12.47 14.662 18.200 28.125 29.774 21.875 0.000 0.000 0.000
0.000 0.000 Automatic
g70XY ShArmBr 14.662 L/r 18.200 Shear 152 12.47 14.662 18.200 28.125 29.774 21.875 0.000 0.000 0.000
0.000 0.000 Automatic
g70Y ShArmBr 14.662 L/r 18.200 Shear 152 12.47 14.662 18.200 28.125 29.774 21.875 0.000 0.000 0.000
0.000 0.000 Automatic
g71P TopArmBr 3.207 L/r 18.200 Shear 290 9.44 3.207 18.200 28.125 22.349 20.906 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71P" ??

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   g71X TopArmBr    3.207       L/r   18.200     Shear  290   9.44    3.207     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71X"  ??
  g71XY TopArmBr    3.207       L/r   18.200     Shear  290   9.44    3.207     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71XY"  ??
   g71Y TopArmBr    3.207       L/r   18.200     Shear  290   9.44    3.207     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71Y"  ??
   g72P MidArmBr    1.807       L/r   18.200     Shear  386  12.57    1.807     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72P"  ??
   g72X MidArmBr    1.807       L/r   18.200     Shear  386  12.57    1.807     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72X"  ??
  g72XY MidArmBr    1.807       L/r   18.200     Shear  386  12.57    1.807     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72XY"  ??
   g72Y MidArmBr    1.807       L/r   18.200     Shear  386  12.57    1.807     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72Y"  ??
   g73P BotArmBr    3.207       L/r   18.200     Shear  290   9.44    3.207     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73P"  ??
   g73X BotArmBr    3.207       L/r   18.200     Shear  290   9.44    3.207     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73X"  ??
  g73XY BotArmBr    3.207       L/r   18.200     Shear  290   9.44    3.207     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73XY"  ??
   g73Y BotArmBr    3.207       L/r   18.200     Shear  290   9.44    3.207     18.200     28.125   22.349   20.906    0.000    0.000    0.000
0.000              0.000           Automatic
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73Y"  ??
   g74P    Pwmnt  517.731       L/r  679.999  Net Sect   74  27.04  517.731      0.000      0.000  679.999    0.000    0.000    0.000    0.000
0.000              0.000           Automatic
   g75P    Pwmnt  518.738       L/r  679.999  Net Sect   74  26.96  518.738      0.000      0.000  679.999    0.000    0.000    0.000    0.000
0.000              0.000           Automatic
   g76P    Pwmnt  657.809       L/r  679.999  Net Sect   27  10.00  657.809      0.000      0.000  679.999    0.000    0.000    0.000    0.000
0.000              0.000           Automatic
   g77P    Pwmnt  648.046       L/r  679.999  Net Sect   33  12.00  648.046      0.000      0.000  679.999    0.000    0.000    0.000    0.000
0.000              0.000           Automatic
   g78P    Pwmnt  674.451       L/r  679.999  Net Sect   14   5.00  674.451      0.000      0.000  679.999    0.000    0.000    0.000    0.000
0.000              0.000           Automatic
   g79P    Pwmnt  628.394       L/r  679.999  Net Sect   42  15.25  628.394      0.000      0.000  679.999    0.000    0.000    0.000    0.000
0.000              0.000           Automatic
   g80P    PMBR1   10.195   Bearing   10.195   Bearing   66   2.17   18.610     16.800     10.195   18.827   10.343    0.000    0.000    0.000
0.000              0.000           Automatic
   g80X    PMBR1   10.195   Bearing   10.195   Bearing   66   2.17   18.610     16.800     10.195   18.827   10.343    0.000    0.000    0.000
0.000              0.000           Automatic
   g81P    PMBR1   10.195   Bearing   10.195   Bearing   36   1.17   20.699     16.800     10.195   18.827   10.343    0.000    0.000    0.000
0.000              0.000           Automatic
   g82P    PMBR1   10.195   Bearing   10.195   Bearing   66   2.17   18.610     16.800     10.195   18.827   10.343    0.000    0.000    0.000
0.000              0.000           Automatic
   g82X    PMBR1   10.195   Bearing   10.195   Bearing   66   2.17   18.610     16.800     10.195   18.827   10.343    0.000    0.000    0.000
0.000              0.000           Automatic
   g83P    PMBR1   10.195   Bearing   10.195   Bearing   36   1.17   20.699     16.800     10.195   18.827   10.343    0.000    0.000    0.000
0.000              0.000           Automatic
   g84P    PMBR1   10.195   Bearing   10.195   Bearing   66   2.17   18.610     16.800     10.195   18.827   10.343    0.000    0.000    0.000
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0.000		0.000		Automatic											
g84X	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g85P	PMBR1	10.195	Bearing	10.195	Bearing	36	1.17	20.699	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g86P	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g86X	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g87P	PMBR1	10.195	Bearing	10.195	Bearing	36	1.17	20.699	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g88P	PMBR2	10.195	Bearing	10.195	Bearing	126	6.28	19.523	16.800	10.195	31.139	11.328	0.000	0.000	0.000
0.000		0.000		Automatic											
g88X	PMBR2	10.195	Bearing	10.195	Bearing	126	6.28	19.523	16.800	10.195	31.139	11.328	0.000	0.000	0.000
0.000		0.000		Automatic											
g89P	PMBR2	10.195	Bearing	10.195	Bearing	159	7.92	12.277	16.800	10.195	31.139	11.328	0.000	0.000	0.000
0.000		0.000		Automatic											
g89X	PMBR2	10.195	Bearing	10.195	Bearing	159	7.92	12.277	16.800	10.195	31.139	11.328	0.000	0.000	0.000
0.000		0.000		Automatic											

The model contains 270 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	0.0868	4.017	2.829
2P	0.13	5.955	4.537
3P	0.0789	3.359	3.359
4P	0.0989	4.394	3.732
5P	0.118	5.446	4.333
6P	0.115	5.228	4.908
7P	0.12	5.230	4.534
8P	0.095	3.883	3.883
9P	0.109	5.245	5.245
16P	0.0876	4.440	1.455
17P	0.0629	3.152	1.314
18P	0.089	4.517	1.162
19P	0.0629	3.152	1.314
24P	0.378	8.102	8.102
25P	0.509	11.091	10.994
26P	0.428	9.365	9.267
27P	0.552	12.021	11.924
28P	0.923	19.967	19.870
29P	1.39	31.180	31.180
30P	0.671	14.366	14.366
1X	0.0868	4.017	2.829
1XY	0.0842	3.850	2.759
1Y	0.0842	3.850	2.759
2X	0.13	5.955	4.537
2XY	0.128	5.788	4.468
2Y	0.128	5.788	4.468
3X	0.0789	3.359	3.359
3XY	0.0789	3.359	3.359
3Y	0.0789	3.359	3.359
4X	0.0989	4.394	3.732
4XY	0.0989	4.394	3.732

4Y	0.0989	4.394	3.732
5X	0.118	5.446	4.333
5XY	0.116	5.279	4.263
5Y	0.116	5.279	4.263
6X	0.115	5.228	4.908
6XY	0.115	5.228	4.908
6Y	0.115	5.228	4.908
7X	0.12	5.230	4.534
7XY	0.117	5.064	4.465
7Y	0.117	5.064	4.465
8X	0.095	3.883	3.883
8XY	0.095	3.883	3.883
8Y	0.095	3.883	3.883
9X	0.109	5.245	5.245
9XY	0.109	5.245	5.245
9Y	0.109	5.245	5.245
16X	0.0876	4.440	1.455
17X	0.0629	3.152	1.314
18X	0.089	4.517	1.162
19X	0.0629	3.152	1.314
10S	0.083	3.772	3.772
11S	0.105	4.848	4.848
12S	0.111	4.878	4.878
13S	0.206	8.507	8.361
14S	0.251	10.948	10.948
20S	0.0171	0.583	0.681
21S	0.0171	0.583	0.681
22S	0.0171	0.583	0.681
23S	0.0171	0.583	0.681
10X	0.083	3.772	3.772
10XY	0.083	3.772	3.772
10Y	0.083	3.772	3.772
11X	0.105	4.848	4.848
11XY	0.105	4.848	4.848
11Y	0.105	4.848	4.848
12X	0.111	4.878	4.878
12XY	0.111	4.878	4.878
12Y	0.111	4.878	4.878
13X	0.206	8.507	8.361
13XY	0.209	8.507	8.652
13Y	0.209	8.507	8.652
14X	0.251	10.948	10.948
14XY	0.251	10.948	10.948
14Y	0.251	10.948	10.948
Total	12.3	440.453	399.618

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	5.980	220.615	179.780	72.904	94.599
2	6.366	219.838	219.838	62.795	120.170
Total	12.346	440.453	399.618	135.699	214.770

Angle Member Weights and Surface Areas by Section:

Section	Unfactored	Factored	Unfactored	Factored

Label	Weight (kips)	Weight (kips)	Surface Area (ft^2)	Surface Area (ft^2)
1	5.980	5.980	931.589	931.589
2	6.366	7.003	948.131	1042.944
Total	12.346	12.983	1879.720	1974.533

Section Joint Information:

Section Label	Joint Label	Joint Elevation (ft)
1	1P	81.000
1	2P	76.000
1	1X	81.000
1	2X	76.000
1	1XY	81.000
1	2XY	76.000
1	1Y	81.000
1	2Y	76.000
1	3P	72.000
1	3X	72.000
1	3XY	72.000
1	3Y	72.000
1	4P	68.000
1	4X	68.000
1	4XY	68.000
1	4Y	68.000
1	5P	64.000
1	5X	64.000
1	5XY	64.000
1	5Y	64.000
1	6P	59.000
1	6X	59.000
1	6XY	59.000
1	6Y	59.000
1	7P	54.000
1	7X	54.000
1	7XY	54.000
1	7Y	54.000
1	8P	50.000
1	8X	50.000
1	8XY	50.000
1	8Y	50.000
1	20S	81.000
1	21S	76.000
1	22S	64.000
1	23S	54.000
1	16X	81.000
1	16P	81.000
1	17X	76.000
1	17P	76.000
1	18X	64.000
1	18P	64.000
1	19X	54.000
1	19P	54.000
1	28P	54.000
1	27P	64.000

1	26P	76.000
1	25P	81.000
1	24P	96.250
2	8P	50.000
2	10S	44.708
2	8X	50.000
2	10X	44.708
2	8XY	50.000
2	10XY	44.708
2	8Y	50.000
2	10Y	44.708
2	11S	39.500
2	11X	39.500
2	11XY	39.500
2	11Y	39.500
2	12S	33.292
2	12X	33.292
2	12XY	33.292
2	12Y	33.292
2	13S	27.042
2	13X	27.042
2	13XY	27.042
2	13Y	27.042
2	14S	15.250
2	14X	15.250
2	14XY	15.250
2	14Y	15.250
2	9P	0.000
2	9X	0.000
2	9XY	0.000
2	9Y	0.000
2	30P	0.000
2	29P	27.042
2	28P	54.000

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	96.250	50.000	49	180	0.00	4.00	154.500	0.00	4.00	506.813
2	50.000	0.000	31	90	4.00	17.00	525.000	4.00	17.00	525.000

*** Insulator Data

Clamp Properties:

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

Clamp Insulator Connectivity:

Clamp Label	Structure And Tip Attach	Property Set	Min. Required Vertical Load (uplift)

			(lbs)
1	16P	C-EX1	No Limit
2	16X	C-EX1	No Limit
3	17P	C-EX1	No Limit
4	17X	C-EX1	No Limit
5	18P	C-EX1	No Limit
6	18X	C-EX1	No Limit
7	19P	C-EX1	No Limit
8	19X	C-EX1	No Limit
9	24P	C-EX1	No Limit
10	2Y	C-EX1	No Limit
11	4Y	C-EX1	No Limit
12	6Y	C-EX1	No Limit
13	8Y	C-EX1	No Limit
14	11Y	C-EX1	No Limit
15	13Y	C-EX1	No Limit
16	14Y	C-EX1	No Limit
17	25P	C-EX1	No Limit
18	26P	C-EX1	No Limit
19	27P	C-EX1	No Limit
20	28P	C-EX1	No Limit
21	29P	C-EX1	No Limit
22	1P	C-EX1	No Limit
23	3P	C-EX1	No Limit
24	5P	C-EX1	No Limit
25	7P	C-EX1	No Limit
26	10S	C-EX1	No Limit
27	12S	C-EX1	No Limit
28	14S	C-EX1	No Limit

*** Loads Data

Loads from file: j:\jobs\1715900.wi\02_ct03xc037 beacon falls\04_structural\calcs\rev (2)\pls tower\cl&p # 326.lca

Insulator dead and wind loads are already included in the point loads printed below.

Loading Method Parameters:

Structure Height Summary (used for calculating wind/ice adjust with height):
  Z of ground for wind height adjust 0.00 (ft) and structure Z coordinate that will be put on the centerline ground profile in PLS-CADD.
  Ground elevation shift 0.00 (ft)
  Z of ground with shift 0.00 (ft)
  Z of structure top (highest joint) 96.25 (ft)
  Structure height 96.25 (ft)
  Structure height above ground 96.25 (ft)

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	22 loads	Wind on Face	4	0	0.000	56.000	0.0	

Point Loads for Load Case "NESC Heavy":

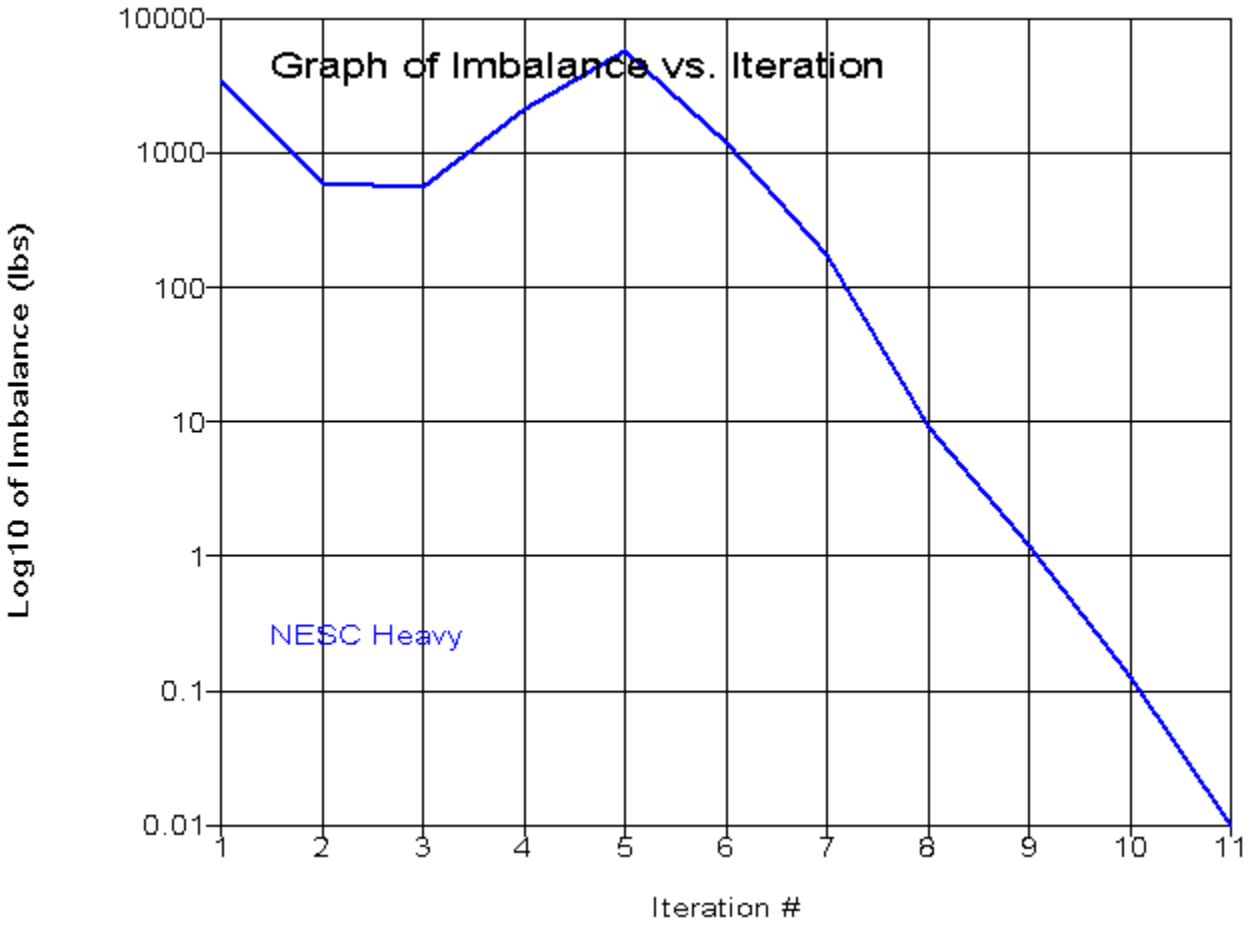
Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
16P	-152	1366	741	Shield Wire
16X	-195	1334	1240	Shield Wire
17P	942	1771	89	Conductor
17X	803	1892	194	Conductor
18P	853	1822	75	Conductor
18X	990	1845	195	Conductor
19P	1032	1780	125	Conductor
19X	1064	1908	202.65	Conductor
24P	984	346	0	Sprint Antennas
24P	92	20	0	Coax Cables - Antenna Mast
25P	307	66	0	Coax Cables - Antenna Mast
26P	261	56	0	Coax Cables - Antenna Mast
27P	337	73	0	Coax Cables - Antenna Mast
28P	567	122	0	Coax Cables - Antenna Mast
29P	1073	231	0	Coax Cables - Antenna Mast
1P	460	174	0	Coax Cables - Tower
3P	326	124	0	Coax Cables - Tower
5P	345	131	0	Coax Cables - Tower
7P	364	138	0	Coax Cables - Tower
10S	402	153	0	Coax Cables - Tower
12S	575	218	0	Coax Cables - Tower
14S	575	218	0	Coax Cables - 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	96.25	50.00	73.13	10.00	10.00	3.200	3027.2	0.00	3.200	0.0	0	8970
2	50.00	0.00	25.00	10.00	10.00	3.300	3965.6	0.00	3.300	0.0	0	10504

*** Analysis Results:

Maximum element usage is 91.16% for Angle "g9XY" in load case "NESC Heavy"
Maximum insulator usage is 7.14% for Clamp "21" 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)
Leg1	g1P	4.33	0.000	-2.318	-2.318
Leg1	g1X	3.72	1.461	0.000	1.461
Leg1	g1XY	3.42	1.341	0.000	1.341
Leg1	g1Y	3.93	0.000	-2.103	-2.103

Leg1	g2P	12.25	0.000	-7.017	-7.017
Leg1	g2X	9.24	3.628	0.000	3.628
Leg1	g2XY	16.27	6.391	0.000	6.391
Leg1	g2Y	7.73	0.000	-4.430	-4.430
Leg1	g3P	21.79	0.000	-12.487	-12.487
Leg1	g3X	15.42	6.057	0.000	6.057
Leg1	g3XY	27.78	10.911	0.000	10.911
Leg1	g3Y	12.56	0.000	-7.195	-7.195
Leg1	g4P	30.59	0.000	-17.525	-17.525
Leg1	g4X	21.20	8.324	0.000	8.324
Leg1	g4XY	38.84	15.252	0.000	15.252
Leg1	g4Y	18.37	0.000	-10.527	-10.527
Leg1	g5P	42.49	0.000	-22.736	-22.736
Leg1	g5X	30.58	12.007	0.000	12.007
Leg1	g5XY	51.23	20.118	0.000	20.118
Leg1	g5Y	25.16	0.000	-13.465	-13.465
Leg2	g6P	49.04	0.000	-32.400	-32.400
Leg2	g6X	36.07	17.409	0.000	17.409
Leg2	g6XY	58.75	28.354	0.000	28.354
Leg2	g6Y	30.29	0.000	-20.009	-20.009
Leg2	g7P	59.28	0.000	-41.970	-41.970
Leg2	g7X	49.41	23.847	0.000	23.847
Leg2	g7XY	79.25	38.247	0.000	38.247
Leg2	g7Y	38.26	0.000	-27.086	-27.086
Leg2	g8P	78.04	0.000	-49.937	-49.937
Leg2	g8X	55.45	28.689	0.000	28.689
Leg2	g8XY	89.68	46.402	0.000	46.402
Leg2	g8Y	53.77	0.000	-34.404	-34.404
Leg2	g9P	79.96	0.000	-51.546	-51.546
Leg2	g9X	56.16	29.538	0.000	29.538
Leg2	g9XY	91.16	47.943	0.000	47.943
Leg2	g9Y	57.32	0.000	-36.952	-36.952
Leg2	g10P	83.12	0.000	-48.432	-48.432
Leg2	g10X	55.47	27.884	0.000	27.884
Leg2	g10XY	90.07	45.279	0.000	45.279
Leg2	g10Y	62.15	0.000	-36.214	-36.214
Leg2	g11P	85.89	0.000	-49.800	-49.800
Leg2	g11X	52.43	28.385	0.000	28.385
Leg2	g11XY	85.38	46.223	0.000	46.223
Leg2	g11Y	64.88	0.000	-37.622	-37.622
Leg2	g12P	81.34	0.000	-49.063	-49.063
Leg2	g12X	56.29	27.169	0.000	27.169
Leg2	g12XY	83.69	40.392	0.000	40.392
Leg2	g12Y	61.59	0.000	-37.151	-37.151
Leg2	g13P	83.91	0.000	-54.913	-54.913
Leg2	g13X	58.14	28.059	0.000	28.059
Leg2	g13XY	80.92	39.056	0.000	39.056
Leg2	g13Y	55.43	0.000	-36.273	-36.273
Diag1	g14P	12.77	2.324	0.000	2.324
Diag1	g14X	18.75	0.000	-3.119	-3.119
Diag1	g14XY	10.86	0.000	-1.807	-1.807
Diag1	g14Y	13.02	2.370	0.000	2.370
Diag1	g15P	1.79	0.000	-0.225	-0.225
Diag1	g15X	4.65	0.847	0.000	0.847
Diag1	g15XY	2.30	0.000	-0.382	-0.382
Diag1	g15Y	4.99	0.000	-0.629	-0.629
Diag2	g16P	16.52	3.006	0.000	3.006
Diag2	g16X	23.24	0.000	-4.229	-4.229
Diag2	g16XY	9.96	0.000	-1.812	-1.812

Diag2	g16Y	12.74	2.319	0.000	2.319
Diag2	g17P	4.74	0.000	-0.862	-0.862
Diag2	g17X	13.16	2.395	0.000	2.395
Diag2	g17XY	3.54	0.000	-0.644	-0.644
Diag2	g17Y	5.04	0.000	-0.918	-0.918
Diag2	g18P	19.37	3.525	0.000	3.525
Diag2	g18X	22.16	0.000	-4.033	-4.033
Diag2	g18XY	8.83	0.000	-1.607	-1.607
Diag2	g18Y	14.59	2.656	0.000	2.656
Diag2	g19P	8.60	0.000	-1.565	-1.565
Diag2	g19X	15.35	2.793	0.000	2.793
Diag2	g19XY	1.31	0.000	-0.239	-0.239
Diag2	g19Y	8.72	0.000	-1.588	-1.588
Diag2	g20P	14.99	2.729	0.000	2.729
Diag2	g20X	23.18	0.000	-4.219	-4.219
Diag2	g20XY	10.49	0.000	-1.909	-1.909
Diag2	g20Y	14.67	2.671	0.000	2.671
Diag2	g21P	10.82	0.000	-1.969	-1.969
Diag2	g21X	18.12	3.298	0.000	3.298
Diag2	g21XY	1.28	0.234	0.000	0.234
Diag2	g21Y	11.95	0.000	-2.175	-2.175
Diag3	g22P	25.97	4.727	0.000	4.727
Diag3	g22X	41.44	0.000	-7.543	-7.543
Diag3	g22XY	16.33	0.000	-2.973	-2.973
Diag3	g22Y	24.72	4.499	0.000	4.499
Diag3	g23P	23.01	0.000	-4.187	-4.187
Diag3	g23X	31.64	5.758	0.000	5.758
Diag3	g23XY	11.09	2.019	0.000	2.019
Diag3	g23Y	24.41	0.000	-4.442	-4.442
Diag3	g24P	23.97	4.362	0.000	4.362
Diag3	g24X	39.84	0.000	-7.252	-7.252
Diag3	g24XY	19.22	0.000	-3.498	-3.498
Diag3	g24Y	27.84	5.067	0.000	5.067
Diag3	g25P	24.99	0.000	-4.548	-4.548
Diag3	g25X	33.06	6.017	0.000	6.017
Diag3	g25XY	12.92	2.352	0.000	2.352
Diag3	g25Y	28.18	0.000	-5.128	-5.128
Diag3	g26P	31.49	5.731	0.000	5.731
Diag3	g26X	51.01	0.000	-9.284	-9.284
Diag3	g26XY	26.23	0.000	-4.774	-4.774
Diag3	g26Y	34.82	6.337	0.000	6.337
Diag3	g27P	35.01	0.000	-6.371	-6.371
Diag3	g27X	43.07	7.839	0.000	7.839
Diag3	g27XY	15.97	2.906	0.000	2.906
Diag3	g27Y	30.12	0.000	-5.482	-5.482
Diag1	g28P	4.08	0.000	-0.448	-0.448
Diag1	g28X	7.09	0.000	-0.779	-0.779
Diag1	g28XY	10.84	1.972	0.000	1.972
Diag1	g28Y	11.28	0.000	-1.379	-1.379
Diag1	g29P	37.91	0.000	-4.163	-4.163
Diag1	g29X	15.81	2.878	0.000	2.878
Diag1	g29XY	7.21	1.312	0.000	1.312
Diag1	g29Y	2.90	0.000	-0.319	-0.319
Diag4	g30P	2.79	0.437	0.000	0.437
Diag4	g30X	0.79	0.123	0.000	0.123
Diag4	g30XY	5.47	0.857	0.000	0.857
Diag4	g30Y	12.11	0.000	-1.428	-1.428
Diag4	g31P	1.42	0.000	-0.167	-0.167
Diag4	g31X	5.76	0.000	-0.580	-0.580

Diag4	g31XY	16.00	0.000	-1.611	-1.611
Diag4	g31Y	16.02	2.512	0.000	2.512
Diag4	g32P	3.62	0.000	-0.276	-0.276
Diag4	g32X	8.78	0.000	-0.668	-0.668
Diag4	g32XY	5.56	0.872	0.000	0.872
Diag4	g32Y	8.35	0.000	-0.710	-0.710
Diag4	g33P	27.49	0.000	-2.092	-2.092
Diag4	g33X	10.93	1.714	0.000	1.714
Diag4	g33XY	5.49	0.860	0.000	0.860
Diag4	g33Y	0.20	0.032	0.000	0.032
Diag2	g34P	6.32	0.575	0.000	0.575
Diag2	g34X	0.06	0.006	0.000	0.006
Diag2	g34XY	4.06	0.370	0.000	0.370
Diag2	g34Y	9.29	0.000	-0.723	-0.723
Diag2	g35P	3.78	0.000	-0.294	-0.294
Diag2	g35X	9.34	0.000	-0.524	-0.524
Diag2	g35XY	21.09	0.000	-1.183	-1.183
Diag2	g35Y	16.01	1.457	0.000	1.457
Diag6	g36P	7.24	0.000	-0.318	-0.318
Diag6	g36X	80.55	0.000	-3.535	-3.535
Diag6	g36XY	7.97	1.270	0.000	1.270
Diag6	g36Y	19.80	0.000	-0.869	-0.869
Diag6	g37P	0.00	0.000	0.000	0.000
Diag6	g37X	26.80	4.272	0.000	4.272
Diag6	g37XY	33.21	5.293	0.000	5.293
Diag6	g37Y	4.65	0.000	-0.204	-0.204
Diag5	g38P	20.64	2.938	0.000	2.938
Diag5	g38X	0.00	0.000	0.000	0.000
Diag5	g38XY	5.17	0.736	0.000	0.736
Diag5	g38Y	28.78	0.000	-0.515	-0.515
Diag5	g39P	0.00	0.000	0.000	0.000
Diag5	g39X	22.37	3.185	0.000	3.185
Diag5	g39XY	27.71	3.946	0.000	3.946
Diag5	g39Y	0.87	0.000	-0.016	-0.016
Horz1	g40P	0.97	0.176	0.000	0.176
Horz1	g40X	3.43	0.000	-0.606	-0.606
Horz2	g41P	4.37	0.796	0.000	0.796
Horz2	g41X	0.94	0.000	-0.170	-0.170
Horz2	g42P	9.44	1.719	0.000	1.719
Horz2	g42X	8.47	0.000	-1.541	-1.541
Horz2	g43P	13.03	2.372	0.000	2.372
Horz2	g43X	13.18	0.000	-2.398	-2.398
Horz2	g44P	15.90	4.341	0.000	4.341
Horz2	g44X	12.08	0.000	-3.123	-3.123
Horz2	g45P	3.14	0.572	0.000	0.572
Horz2	g45Y	3.24	0.000	-0.590	-0.590
Horz2	g46P	11.47	2.088	0.000	2.088
Horz2	g46Y	5.32	0.968	0.000	0.968
Horz2	g47P	30.36	5.526	0.000	5.526
Horz2	g47X	29.10	0.000	-5.296	-5.296
Horz2	g48P	26.50	7.235	0.000	7.235
Horz2	g48X	23.55	0.000	-6.088	-6.088
Horz2	g49P	13.23	2.407	0.000	2.407
Horz2	g49Y	0.24	0.000	-0.044	-0.044
Horz2	g50P	1.41	0.385	0.000	0.385
Horz2	g50X	2.23	0.000	-0.578	-0.578
Horz2	g51P	0.64	0.116	0.000	0.116
Horz2	g51Y	0.62	0.000	-0.113	-0.113
Horz3	g52P	1.79	0.131	0.000	0.131

Horz3	g52Y	1.29	0.000	-0.041	-0.041
Horz3	g53P	3.71	0.272	0.000	0.272
Horz3	g53X	19.23	0.000	-0.616	-0.616
Horz4	g54P	10.76	1.491	0.000	1.491
Horz4	g54Y	0.61	0.000	-0.074	-0.074
Horz4	g55P	0.74	0.000	-0.090	-0.090
Horz4	g55X	24.89	0.000	-3.024	-3.024
Horz4	g56P	2.06	0.000	-0.161	-0.161
Horz4	g56Y	5.78	0.000	-0.452	-0.452
Horz4	g57P	0.55	0.000	-0.043	-0.043
Horz4	g57X	73.45	0.000	-5.737	-5.737
Inner1	g58P	3.63	0.000	-0.330	-0.330
Inner1	g58X	9.86	0.749	0.000	0.749
Inner1	g58XY	5.42	0.000	-0.493	-0.493
Inner1	g58Y	11.35	0.862	0.000	0.862
Inner1	g59P	0.21	0.016	0.000	0.016
Inner1	g59X	1.76	0.133	0.000	0.133
Inner1	g59XY	3.07	0.000	-0.279	-0.279
Inner1	g59Y	0.10	0.000	-0.009	-0.009
Inner1	g60P	0.59	0.000	-0.053	-0.053
Inner1	g60X	2.16	0.000	-0.197	-0.197
Inner1	g60XY	1.50	0.000	-0.136	-0.136
Inner1	g60Y	2.12	0.000	-0.193	-0.193
Inner1	g61P	10.56	0.000	-0.961	-0.961
Inner1	g61X	11.44	0.869	0.000	0.869
Inner1	g61XY	9.31	0.000	-0.847	-0.847
Inner1	g61Y	14.27	1.083	0.000	1.083
ShieldAr	g62P	34.79	0.000	-2.336	-2.336
ShieldAr	g62X	8.48	0.000	-0.570	-0.570
ShieldAr	g62XY	10.29	1.873	0.000	1.873
ShieldAr	g62Y	4.15	0.755	0.000	0.755
ShieldAr	g63P	2.57	0.000	-0.457	-0.457
ShieldAr	g63Y	9.46	1.721	0.000	1.721
TopCrArm	g64P	21.37	0.000	-2.306	-2.306
TopCrArm	g64X	0.80	0.145	0.000	0.145
TopCrArm	g64XY	0.37	0.068	0.000	0.068
TopCrArm	g64Y	10.24	0.000	-1.105	-1.105
TopCrArm	g65P	8.73	0.000	-1.590	-1.590
TopCrArm	g65Y	3.69	0.671	0.000	0.671
MidCrArm	g66P	27.44	0.000	-3.222	-3.222
MidCrArm	g66X	3.70	0.000	-0.434	-0.434
MidCrArm	g66XY	4.99	0.000	-0.585	-0.585
MidCrArm	g66Y	16.97	0.000	-1.992	-1.992
MidCrArm	g67P	1.18	0.000	-0.214	-0.214
MidCrArm	g67Y	10.64	0.000	-1.936	-1.936
BotCrArm	g68P	22.94	0.000	-2.475	-2.475
BotCrArm	g68X	1.21	0.220	0.000	0.220
BotCrArm	g68XY	1.26	0.000	-0.136	-0.136
BotCrArm	g68Y	12.87	0.000	-1.389	-1.389
BotCrArm	g69P	4.97	0.904	0.000	0.904
BotCrArm	g69Y	10.44	0.000	-1.900	-1.900
ShArmBr	g70P	14.24	0.000	-2.088	-2.088
ShArmBr	g70X	6.41	0.000	-0.940	-0.940
ShArmBr	g70XY	5.66	1.030	0.000	1.030
ShArmBr	g70Y	12.57	2.287	0.000	2.287
TopArmBr	g71P	5.84	1.064	0.000	1.064
TopArmBr	g71X	3.78	0.688	0.000	0.688
TopArmBr	g71XY	6.76	1.230	0.000	1.230
TopArmBr	g71Y	3.26	0.593	0.000	0.593

MidArmBr	g72P	9.64	1.754	0.000	1.754
MidArmBr	g72X	6.50	1.184	0.000	1.184
MidArmBr	g72XY	10.17	1.852	0.000	1.852
MidArmBr	g72Y	9.46	1.721	0.000	1.721
BotArmBr	g73P	6.79	1.236	0.000	1.236
BotArmBr	g73X	2.86	0.521	0.000	0.521
BotArmBr	g73XY	8.57	1.560	0.000	1.560
BotArmBr	g73Y	5.12	0.933	0.000	0.933
Pwmnt	g74P	2.56	0.000	-13.254	-13.254
Pwmnt	g75P	1.90	0.000	-9.845	-9.845
Pwmnt	g76P	1.08	0.000	-7.135	-7.135
Pwmnt	g77P	0.81	0.000	-5.220	-5.220
Pwmnt	g78P	0.52	0.000	-3.487	-3.487
Pwmnt	g79P	0.26	0.000	-1.636	-1.636
PMBR1	g80P	13.55	1.381	0.000	1.381
PMBR1	g80X	13.52	0.000	-1.378	-1.378
PMBR1	g81P	0.36	0.000	-0.037	-0.037
PMBR1	g82P	12.20	0.000	-1.244	-1.244
PMBR1	g82X	5.86	0.597	0.000	0.597
PMBR1	g83P	3.06	0.000	-0.312	-0.312
PMBR1	g84P	2.34	0.000	-0.238	-0.238
PMBR1	g84X	0.40	0.040	0.000	0.040
PMBR1	g85P	0.50	0.000	-0.051	-0.051
PMBR1	g86P	12.79	1.304	0.000	1.304
PMBR1	g86X	8.56	0.000	-0.873	-0.873
PMBR1	g87P	2.33	0.237	0.000	0.237
PMBR2	g88P	7.17	0.731	0.000	0.731
PMBR2	g88X	16.35	0.000	-1.667	-1.667
PMBR2	g89P	11.06	0.000	-1.127	-1.127
PMBR2	g89X	6.19	0.631	0.000	0.631

*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 11

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	0.07977	0.419	-0.03058	-0.6243	0.1510	0.1383	2.08	2.419	80.97
2P	0.06798	0.3666	-0.03009	-0.6057	0.1422	0.1355	2.068	2.367	75.97
3P	0.05874	0.3253	-0.02936	-0.5837	0.1317	0.1286	2.059	2.325	71.97
4P	0.04977	0.285	-0.02826	-0.5652	0.1249	0.1217	2.05	2.285	67.97
5P	0.04129	0.2461	-0.02682	-0.5585	0.1295	0.1146	2.041	2.246	63.97
6P	0.03142	0.2002	-0.02458	-0.4970	0.1016	0.1028	2.031	2.2	58.98
7P	0.02259	0.1582	-0.02206	-0.4707	0.1132	0.0928	2.023	2.158	53.98
8P	0.01611	0.128	-0.01953	-0.3816	0.0535	0.0869	2.016	2.128	49.98
9P	0	0	0	0.0000	0.0000	0.0000	8.5	8.5	0
16P	0.05542	0.4138	-0.1437	-0.5960	0.1461	0.1172	0.05542	13.66	80.86
17P	0.04968	0.3615	-0.1071	-0.6074	0.1411	0.1337	0.04968	10.11	75.89
18P	0.01645	0.2412	-0.1401	-0.5856	0.1277	0.1188	0.01645	13.99	63.86
19P	0.0078	0.1542	-0.08609	-0.5175	0.1024	0.1077	0.0078	9.904	53.91
24P	0.121	0.5973	-0.004781	-0.7028	0.1384	0.0932	1.288	0.5973	96.25
25P	0.08451	0.4174	-0.003613	-0.6215	0.1379	0.0930	1.252	0.4174	81
26P	0.0726	0.3648	-0.003278	-0.5912	0.1370	0.0908	1.24	0.3648	76
27P	0.0452	0.2446	-0.002486	-0.5472	0.1236	0.0813	1.212	0.2446	64
28P	0.02571	0.1571	-0.001903	-0.4367	0.0997	0.0710	1.193	0.1571	54
29P	-0.001899	0.0326	-0.0009285	-0.1410	0.0168	0.0384	1.165	0.0326	27.04
30P	0	0	0	0.0000	0.0000	0.0000	1.167	0	0
1X	0.08936	0.4193	0.01047	-0.5676	0.1549	0.1434	2.089	-1.581	81.01
1XY	0.08947	0.4094	0.01992	-0.5897	0.1311	0.1405	-1.911	-1.591	81.02
1Y	0.07977	0.4094	-0.02108	-0.6010	0.1317	0.1308	-1.92	2.409	80.98
2X	0.07743	0.367	0.01063	-0.5833	0.1472	0.1405	2.077	-1.633	76.01
2XY	0.07747	0.3575	0.02009	-0.5871	0.1375	0.1373	-1.923	-1.643	76.02
2Y	0.06791	0.3573	-0.02061	-0.5938	0.1351	0.1317	-1.932	2.357	75.98
3X	0.06764	0.3255	0.0106	-0.5923	0.1403	0.1316	2.068	-1.675	72.01
3XY	0.06784	0.3166	0.01985	-0.5811	0.1390	0.1320	-1.932	-1.683	72.02
3Y	0.05857	0.3163	-0.02008	-0.5792	0.1337	0.1284	-1.941	2.316	71.98
4X	0.05815	0.285	0.01038	-0.5709	0.1324	0.1227	2.058	-1.715	68.01
4XY	0.05845	0.2766	0.01929	-0.5620	0.1344	0.1268	-1.942	-1.723	68.02
4Y	0.04952	0.2765	-0.01936	-0.5621	0.1300	0.1252	-1.95	2.276	67.98
5X	0.04908	0.2463	0.009988	-0.5225	0.1388	0.1136	2.049	-1.754	64.01
5XY	0.04946	0.2383	0.0184	-0.5321	0.1228	0.1216	-1.951	-1.762	64.02
5Y	0.0408	0.2379	-0.01841	-0.5409	0.1185	0.1221	-1.959	2.238	63.98
6X	0.03836	0.2	0.009146	-0.5145	0.1159	0.1002	2.038	-1.8	59.01
6XY	0.03899	0.1928	0.01683	-0.4993	0.1151	0.1129	-1.961	-1.807	59.02
6Y	0.03079	0.1926	-0.017	-0.4969	0.1146	0.1147	-1.969	2.193	58.98
7X	0.02867	0.1582	0.00808	-0.4382	0.1073	0.0890	2.029	-1.842	54.01
7XY	0.02938	0.1513	0.01497	-0.4530	0.1126	0.1056	-1.971	-1.849	54.01
7Y	0.02177	0.1509	-0.01538	-0.4561	0.0850	0.1088	-1.978	2.151	53.98
8X	0.02191	0.1281	0.006829	-0.4014	0.1092	0.0840	2.022	-1.872	50.01
8XY	0.02199	0.1212	0.01289	-0.3823	0.0754	0.0997	-1.978	-1.879	50.01
8Y	0.01608	0.1211	-0.01371	-0.3854	0.0989	0.1033	-1.984	2.121	49.99
9X	0	0	0	0.0000	0.0000	0.0000	8.5	-8.5	0
9XY	0	0	0	0.0000	0.0000	0.0000	-8.5	-8.5	0
9Y	0	0	0	0.0000	0.0000	0.0000	-8.5	8.5	0
16X	0.1213	0.4153	0.133	-0.6100	0.1471	0.1694	0.1213	-12.83	81.13
17X	0.09675	0.3631	0.09498	-0.5901	0.1404	0.1421	0.09675	-9.387	76.09
18X	0.07436	0.2437	0.1227	-0.5296	0.1311	0.1227	0.07436	-13.51	64.12

19X	0.04311	0.1554	0.07624	-0.4950	0.1103	0.1059	0.04311	-9.595	54.08
10S	0.01225	0.09886	-0.01981	-0.2889	0.0536	0.0884	2.7	2.787	44.69
11S	0.003415	0.07471	-0.02005	-0.2410	0.0540	0.0842	3.368	3.44	39.48
12S	0.0003779	0.05339	-0.01872	-0.1753	0.0271	0.0769	4.172	4.225	33.27
13S	-0.007593	0.03651	-0.0173	-0.1415	0.0510	0.0718	4.977	5.021	27.02
14S	-0.007371	0.0156	-0.01138	-0.0828	-0.0481	0.0302	6.51	6.533	15.24
20S	0.08452	0.4143	-0.001936	-0.5926	0.0786	0.1547	0.08452	0.4143	81
21S	0.07262	0.3622	-0.001784	-0.5831	0.0801	0.1413	0.07262	0.3622	76
22S	0.04521	0.2424	-0.001167	-0.5293	0.0681	0.1198	0.04521	0.2424	64
23S	0.0257	0.1551	-0.0009722	-0.4257	0.0505	0.1064	0.0257	0.1551	54
10X	0.01292	0.09739	0.007486	-0.2887	0.0742	0.0866	2.701	-2.591	44.72
10XY	0.0184	0.09055	0.01379	-0.2766	0.0656	0.0860	-2.67	-2.597	44.72
10Y	0.005959	0.08956	-0.01369	-0.2783	0.0581	0.0857	-2.682	2.778	44.69
11X	0.01071	0.07472	0.007911	-0.2342	0.0481	0.0809	3.376	-3.29	39.51
11XY	0.01095	0.06574	0.01434	-0.2275	0.0658	0.0783	-3.354	-3.299	39.51
11Y	0.003323	0.06566	-0.01354	-0.2238	0.0400	0.0780	-3.362	3.431	39.49
12X	0.004368	0.0524	0.007459	-0.1861	0.0559	0.0667	4.176	-4.12	33.3
12XY	0.00853	0.04342	0.01342	-0.1655	0.0295	0.0737	-4.164	-4.129	33.31
12Y	-0.005257	0.04273	-0.01202	-0.1690	0.0569	0.0748	-4.177	4.215	33.28
13X	0.002738	0.03598	0.006769	-0.1253	0.0222	0.0596	4.987	-4.949	27.05
13XY	0.003896	0.02592	0.01203	-0.1228	0.0393	0.0653	-4.981	-4.959	27.05
13Y	-0.00755	0.02586	-0.0104	-0.1185	0.0007	0.0630	-4.992	5.01	27.03
14X	-0.0008886	0.01569	0.004194	-0.0883	0.0172	0.0307	6.517	-6.502	15.25
14XY	0.001974	0.006826	0.007702	-0.0471	0.0025	0.0365	-6.516	-6.511	15.26
14Y	-0.007345	0.00659	-0.006407	-0.0498	-0.0194	0.0307	-6.525	6.524	15.24

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Uplift Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
9P	-7.06	0.0	-6.98	0.0	0.0	-54.20	0.0	0.0	55.10	0.0	0.13	0.0	0.1	0.0	0.0	-0.00	0.0	0.0
30P	0.19	0.0	-0.44	0.0	0.0	-14.36	0.0	0.0	14.37	0.0	4.51	0.0	1.9	0.0	0.0	-1.01	0.0	0.0
9X	6.62	0.0	-6.18	0.0	0.0	32.29	0.0	0.0	33.54	0.0	0.14	0.0	0.0	0.0	0.0	-0.01	0.0	0.0
9XY	-7.18	0.0	-5.08	0.0	0.0	40.12	0.0	0.0	41.08	0.0	0.02	0.0	-0.0	0.0	0.0	-0.02	0.0	0.0
9Y	4.57	0.0	-4.11	0.0	0.0	-35.34	0.0	0.0	35.87	0.0	0.01	0.0	0.1	0.0	0.0	-0.01	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	0.1740	-0.5903	0.0000	-0.1740	0.5903	0.0798	0.4190	-0.0306
2P	0.0000	0.0000	-0.1956	0.0000	0.0000	0.1956	0.0680	0.3666	-0.0301
3P	0.0000	0.1240	-0.4443	-0.0000	-0.1240	0.4443	0.0587	0.3253	-0.0294
4P	0.0000	0.0000	-0.1484	-0.0000	0.0000	0.1484	0.0498	0.2850	-0.0283
5P	0.0000	0.1310	-0.5225	0.0000	-0.1310	0.5225	0.0413	0.2461	-0.0268
6P	0.0000	0.0000	-0.1722	-0.0000	0.0000	0.1722	0.0314	0.2002	-0.0246
7P	0.0000	0.1380	-0.5439	0.0000	-0.1380	0.5439	0.0226	0.1582	-0.0221
8P	0.0000	0.0000	-0.1488	-0.0000	0.0000	0.1488	0.0161	0.1280	-0.0195
9P	0.0000	0.0000	-0.1801	7.0562	6.9812	-54.0206	0.0000	0.0000	0.0000
16P	0.7410	1.3660	0.0206	-0.7410	-1.3660	-0.0206	0.0554	0.4138	-0.1437
17P	0.0890	1.7710	-1.0364	-0.0890	-1.7710	1.0364	0.0497	0.3615	-0.1071
18P	0.0750	1.8220	-0.9865	-0.0750	-1.8220	0.9865	0.0165	0.2412	-0.1401
19P	0.1250	1.7800	-1.1264	-0.1250	-1.7800	1.1264	0.0078	0.1542	-0.0861
24P	0.0000	0.6252	-1.6433	-0.0000	-0.6252	1.6433	0.1210	0.5973	-0.0048

25P	0.0000	0.4102	-1.0704	-0.0000	-0.4102	1.0704	0.0845	0.4174	-0.0036
26P	0.0000	0.3450	-0.9035	0.0000	-0.3450	0.9035	0.0726	0.3648	-0.0033
27P	0.0000	0.4470	-1.1655	-0.0000	-0.4470	1.1655	0.0452	0.2446	-0.0025
28P	0.0000	0.7646	-2.0522	0.0000	-0.7646	2.0522	0.0257	0.1571	-0.0019
29P	0.0000	1.1777	-3.3696	0.0000	-1.1777	3.3696	-0.0019	0.0326	-0.0009
30P	0.0000	0.4741	-1.1066	-0.1852	-0.0375	-13.2543	0.0000	0.0000	0.0000
1X	0.0000	0.0613	-0.1303	0.0000	-0.0613	0.1303	0.0894	0.4193	0.0105
1XY	0.0000	0.0613	-0.1263	-0.0000	-0.0613	0.1263	0.0895	0.4094	0.0199
1Y	0.0000	0.0000	-0.1263	0.0000	0.0000	0.1263	0.0798	0.4094	-0.0211
2X	0.0000	0.1026	-0.1956	0.0000	-0.1026	0.1956	0.0774	0.3670	0.0106
2XY	0.0000	0.1026	-0.1917	0.0000	-0.1026	0.1917	0.0775	0.3575	0.0201
2Y	0.0000	0.0000	-0.1917	-0.0000	0.0000	0.1917	0.0679	0.3573	-0.0206
3X	0.0000	0.0862	-0.1183	0.0000	-0.0862	0.1183	0.0676	0.3255	0.0106
3XY	0.0000	0.0862	-0.1183	-0.0000	-0.0862	0.1183	0.0678	0.3166	0.0199
3Y	0.0000	0.0000	-0.1183	0.0000	0.0000	0.1183	0.0586	0.3163	-0.0201
4X	0.0000	0.0981	-0.1484	0.0000	-0.0981	0.1484	0.0582	0.2850	0.0104
4XY	0.0000	0.0981	-0.1484	0.0000	-0.0981	0.1484	0.0585	0.2766	0.0193
4Y	0.0000	0.0000	-0.1484	0.0000	0.0000	0.1484	0.0495	0.2765	-0.0194
5X	0.0000	0.0911	-0.1775	0.0000	-0.0911	0.1775	0.0491	0.2463	0.0100
5XY	0.0000	0.0911	-0.1735	0.0000	-0.0911	0.1735	0.0495	0.2383	0.0184
5Y	0.0000	0.0000	-0.1735	0.0000	0.0000	0.1735	0.0408	0.2379	-0.0184
6X	0.0000	0.1237	-0.1722	0.0000	-0.1237	0.1722	0.0384	0.2000	0.0091
6XY	0.0000	0.1237	-0.1722	0.0000	-0.1237	0.1722	0.0390	0.1928	0.0168
6Y	0.0000	0.0000	-0.1722	0.0000	0.0000	0.1722	0.0308	0.1926	-0.0170
7X	0.0000	0.0949	-0.1799	0.0000	-0.0949	0.1799	0.0287	0.1582	0.0081
7XY	0.0000	0.0949	-0.1759	0.0000	-0.0949	0.1759	0.0294	0.1513	0.0150
7Y	0.0000	0.0000	-0.1759	-0.0000	0.0000	0.1759	0.0218	0.1509	-0.0154
8X	0.0000	0.0999	-0.1488	-0.0000	-0.0999	0.1488	0.0219	0.1281	0.0068
8XY	0.0000	0.0999	-0.1488	0.0000	-0.0999	0.1488	0.0220	0.1212	0.0129
8Y	0.0000	0.0000	-0.1488	0.0000	0.0000	0.1488	0.0161	0.1211	-0.0137
9X	0.0000	0.1361	-0.1801	-6.6196	6.0428	32.4738	0.0000	0.0000	0.0000
9XY	0.0000	0.1361	-0.1801	7.1756	4.9409	40.3043	0.0000	0.0000	0.0000
9Y	0.0000	0.0000	-0.1801	-4.5653	4.1070	-35.1559	0.0000	0.0000	0.0000
16X	1.2400	1.3806	0.0636	-1.2400	-1.3806	-0.0636	0.1213	0.4153	0.1330
17X	0.1940	1.9341	-0.8974	-0.1940	-1.9341	0.8974	0.0967	0.3631	0.0950
18X	0.1950	1.8822	-1.1235	-0.1950	-1.8822	1.1235	0.0744	0.2437	0.1227
19X	0.2027	1.9501	-1.1584	-0.2026	-1.9501	1.1584	0.0431	0.1554	0.0762
10S	0.0000	0.1530	-0.5390	-0.0000	-0.1530	0.5390	0.0122	0.0989	-0.0198
11S	0.0000	0.0000	-0.1738	0.0000	0.0000	0.1738	0.0034	0.0747	-0.0201
12S	0.0000	0.2180	-0.7586	-0.0000	-0.2180	0.7586	0.0004	0.0534	-0.0187
13S	0.0000	0.0000	-0.3394	0.0000	0.0000	0.3394	-0.0076	0.0365	-0.0173
14S	0.0000	0.2180	-0.9893	-0.0000	-0.2180	0.9893	-0.0074	0.0156	-0.0114
20S	0.0000	0.0000	-0.0256	0.0000	0.0000	0.0256	0.0845	0.4143	-0.0019
21S	0.0000	0.0000	-0.0256	0.0000	0.0000	0.0256	0.0726	0.3622	-0.0018
22S	0.0000	0.0000	-0.0256	0.0000	0.0000	0.0256	0.0452	0.2424	-0.0012
23S	0.0000	0.0000	-0.0256	0.0000	0.0000	0.0256	0.0257	0.1551	-0.0010
10X	0.0000	0.0972	-0.1370	-0.0000	-0.0972	0.1370	0.0129	0.0974	0.0075
10XY	0.0000	0.0972	-0.1370	0.0000	-0.0972	0.1370	0.0184	0.0906	0.0138
10Y	0.0000	0.0000	-0.1370	0.0000	0.0000	0.1370	0.0060	0.0896	-0.0137
11X	0.0000	0.1283	-0.1738	0.0000	-0.1283	0.1738	0.0107	0.0747	0.0079
11XY	0.0000	0.1283	-0.1738	0.0000	-0.1283	0.1738	0.0109	0.0657	0.0143
11Y	0.0000	0.0000	-0.1738	-0.0000	0.0000	0.1738	0.0033	0.0657	-0.0135
12X	0.0000	0.1264	-0.1836	0.0000	-0.1264	0.1836	0.0044	0.0524	0.0075
12XY	0.0000	0.1264	-0.1836	0.0000	-0.1264	0.1836	0.0085	0.0434	0.0134
12Y	0.0000	0.0000	-0.1836	0.0000	0.0000	0.1836	-0.0053	0.0427	-0.0120
13X	0.0000	0.2101	-0.3394	0.0000	-0.2101	0.3394	0.0027	0.0360	0.0068
13XY	0.0000	0.2101	-0.3444	0.0000	-0.2101	0.3444	0.0039	0.0259	0.0120
13Y	0.0000	0.0000	-0.3444	-0.0000	0.0000	0.3444	-0.0076	0.0259	-0.0104
14X	0.0000	0.2916	-0.4143	-0.0000	-0.2916	0.4143	-0.0009	0.0157	0.0042

14XY	0.0000	0.2916	-0.4143	0.0000	-0.2916	0.4143	0.0020	0.0068	0.0077
14Y	0.0000	0.0000	-0.4143	-0.0000	0.0000	0.4143	-0.0073	0.0066	-0.0064

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	Original Supported L/R	Original Supported KL/R	Original Supported Curve No.	Alternate Unsupported L/R Cap. (kips)	Alternate Unsupported RLOUT	Alternate Unsupported L/R	Alternate Unsupported KL/R	Alternate Unsupported Curve No.
g15P	g15Y	Long only	-0.23	-0.63	16.63	0.750	0.500	0.500	112.66	114.50	2	12.62	1.000	145.25	135.53	6
g15Y	g15P	Long only	-0.63	-0.23	16.63	0.750	0.500	0.500	112.66	114.50	2	12.62	1.000	145.25	135.53	6
g17P	g17Y	Long only	-0.86	-0.92	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g17Y	g17P	Long only	-0.92	-0.86	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g19P	g19Y	Long only	-1.56	-1.59	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g19Y	g19P	Long only	-1.59	-1.56	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g21P	g21Y	Long only	-1.97	-2.17	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g21Y	g21P	Long only	-2.17	-1.97	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g23P	g23Y	Short only	-4.19	-4.44	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g23Y	g23P	Short only	-4.44	-4.19	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g25P	g25Y	Short only	-4.55	-5.13	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g25Y	g25P	Short only	-5.13	-4.55	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g27P	g27Y	Short only	-6.37	-5.48	26.81	0.750	0.500	0.500	80.05	90.04	2	24.22	1.000	86.58	103.29	3
g27Y	g27P	Short only	-5.48	-6.37	26.81	0.750	0.500	0.500	80.05	90.04	2	24.22	1.000	86.58	103.29	3
g28P	g28X	Long only	-0.45	-0.78	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g28X	g28P	Long only	-0.78	-0.45	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g29P	g29Y	Long only	-4.16	-0.32	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g29Y	g29P	Long only	-0.32	-4.16	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g31X	g31XY	Long only	-0.58	-1.61	11.79	0.776	0.552	0.552	134.73	131.26	5	10.07	1.000	155.86	142.05	6
g31XY	g31X	Long only	-1.61	-0.58	11.79	0.776	0.552	0.552	134.73	131.26	5	10.07	1.000	155.86	142.05	6
g32P	g32X	Long only	-0.28	-0.67	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g32X	g32P	Long only	-0.67	-0.28	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g33P	g33Y	Long only	-2.09	0.03	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g35X	g35XY	Long only	-0.52	-1.18	7.78	0.772	0.545	0.545	185.93	185.93	4	5.61	1.000	219.03	219.03	4
g35XY	g35X	Long only	-1.18	-0.52	7.78	0.772	0.545	0.545	185.93	185.93	4	5.61	1.000	219.03	219.03	4

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	1.554	50.00	50.00	3.11
2	1.857	50.00	50.00	3.71
3	2.054	50.00	50.00	4.11
4	2.141	50.00	50.00	4.28
5	2.073	50.00	50.00	4.15
6	2.201	50.00	50.00	4.40
7	2.110	50.00	50.00	4.22
8	2.277	50.00	50.00	4.55
9	1.758	50.00	50.00	3.52
10	0.192	50.00	50.00	0.38
11	0.148	50.00	50.00	0.30
12	0.172	50.00	50.00	0.34
13	0.149	50.00	50.00	0.30

14	0.174	50.00	50.00	0.35
15	0.344	50.00	50.00	0.69
16	0.414	50.00	50.00	0.83
17	1.146	50.00	50.00	2.29
18	0.967	50.00	50.00	1.93
19	1.248	50.00	50.00	2.50
20	2.190	50.00	50.00	4.38
21	3.569	50.00	50.00	7.14
22	0.615	50.00	50.00	1.23
23	0.461	50.00	50.00	0.92
24	0.539	50.00	50.00	1.08
25	0.561	50.00	50.00	1.12
26	0.560	50.00	50.00	1.12
27	0.789	50.00	50.00	1.58
28	1.013	50.00	50.00	2.03

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

Group Summary (Compression Portion):

Group Label	Group Desc.	Angle Curve	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Cont-rol Use In Comp. %	Comp. Member	Comp. Force (kips)	Comp. Control Load Case	L/R Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ	L/R	KL/R	Length (ft)	Comp. No.	Member Comp.	Bolts Of No.
Leg1	L4x4x1/4	SAE		4X4X0.25	33.0	51.23	Tens	42.49	g5P	-22.736	NESC Hea	53.509	54.600	84.375	1.000	1.000	1.000	75.47	75.47	5.000	1	6	
Leg2	L4x4x5/16	SAE		4X4X0.3125	33.0	91.16	Tens	85.89	g11P	-49.800	NESC Hea	57.983	72.800	140.625	1.000	1.000	1.000	96.41	96.41	6.355	1	8	
Diag1	L1.75x1.75x1/4	SAE		1.75X1.75X0.25	33.0	37.91	Cross	37.91	g29P	-4.163	NESC Hea	10.982	18.200	28.125	0.787	1.000	0.573	161.13	145.30	7.103	6	2	
Diag2	L2x2x1/4	SAE		2X2X0.25	33.0	23.24	Comp	23.24	g16X	-4.229	NESC Hea	22.933	18.200	28.125	0.750	0.500	0.500	86.81	95.10	5.657	2	2	
Diag3	L2.5x2x1/4	SAU		2.5X2X0.25	33.0	51.01	Comp	51.01	g26X	-9.284	NESC Hea	26.806	18.200	28.125	0.750	0.500	0.500	80.05	90.04	5.657	2	2	
Diag4	L2x2x3/16	SAE		2X2X0.1875	33.0	27.49	Cross	27.49	g33P	-2.092	NESC Hea	7.612	18.200	21.094	0.777	1.000	0.554	190.56	163.39	9.798	6	2	
Diag5	L1.75x1.75x3/16	SAE		1.75X1.75X0.1875	33.0	28.78	Comp	28.78	g38Y	-0.515	NESC Hea	1.790	18.200	21.094	0.782	0.437	0.437	375.62	314.82	21.495	5	2	
Diag6	L2x2x1/4	SAE		2X2X0.25	33.0	80.55	Comp	80.55	g36X	-3.535	NESC Hea	4.389	18.200	28.125	0.783	0.566	0.566	287.38	247.58	16.544	5	2	
Horz1	L2x2x1/4	SAE		2X2X0.25	33.0	3.43	Comp	3.43	g40X	-0.606	NESC Hea	17.680	18.200	28.125	1.000	1.000	1.000	122.76	122.14	4.000	5	2	
Horz2	L2.5x2.5x1/4	SAE		2.5X2.5X0.25	33.0	30.36	Tens	29.10	g47X	-5.296	NESC Hea	25.851	18.200	28.125	1.000	1.000	1.000	97.76	108.88	4.000	3	2	
Horz3	L1.75x1.75x3/16	SAE		1.75X1.75X0.1875	33.0	19.23	Comp	19.23	g53X	-0.616	NESC Hea	3.201	9.100	10.547	1.000	1.000	1.000	235.45	235.45	6.730	4	1	
Horz4	L2.5x2.5x3/16	SAE		2.5X2.5X0.1875	33.0	73.45	Comp	73.45	g57X	-5.737	NESC Hea	7.811	18.200	21.094	1.000	0.500	0.500	201.05	181.80	13.035	5	2	
Inner1	L1.75x1.75x1/4	SAE		1.75X1.75X0.25	33.0	14.27	Tens	10.56	g61P	-0.961	NESC Hea	18.292	9.100	14.062	1.000	1.000	1.000	99.53	104.65	2.828	2	1	
ShieldAr	L2x2x1/4	SAE		2X2X0.25	33.0	34.79	Comp	34.79	g62P	-2.336	NESC Hea	6.715	18.200	28.125	1.000	0.500	0.500	225.15	200.16	11.426	5	2	
ShArmBr	L2.5x2.5x1/4	SAE		2.5X2.5X0.25	33.0	14.24	Comp	14.24	g70P	-2.088	NESC Hea	14.662	18.200	28.125	0.500	0.500	0.500	152.41	152.41	12.472	4	2	
TopCrArm	L2.5x2.5x1/4	SAE		2.5X2.5X0.25	33.0	21.37	Comp	21.37	g64P	-2.306	NESC Hea	10.791	18.200	28.125	1.000	1.000	1.000	195.61	177.66	8.004	5	2	
TopArmBr	L2x2x1/4	SAE		2X2X0.25	33.0	6.76	Tens	0.00	g71Y	0.000		3.207	18.200	28.125	1.000	1.000	1.000	289.64	289.64	9.437	4	2	
MidCrArm	L2.5x2.5x1/4	SAE		2.5X2.5X0.25	33.0	27.44	Comp	27.44	g66P	-3.222	NESC Hea	11.740	18.200	28.125	1.000	0.500	0.500	185.99	170.33	11.919	5	2	
MidArmBr	L2x2x1/4	SAE		2X2X0.25	33.0	10.17	Tens	0.00	g72Y	0.000		1.807	18.200	28.125	1.000	1.000	1.000						

385.85 385.85 12.572 4 2
BotCrArm L2.5x2.5x1/4 SAE 2.5X2.5X0.25 33.0 22.94 Comp 22.94 g68P -2.475NESC Hea 10.791 18.200 28.125 1.000 1.000 1.000
195.61 177.66 8.004 5 2
BotArmBr L2x2x1/4 SAE 2X2X0.25 33.0 8.57 Tens 0.00 g73Y 0.000 3.207 18.200 28.125 1.000 1.000 1.000
289.64 289.64 9.437 4 2
Pwmnt 12" Std. Pipe Pwmnt Pipe 12" Std. 50.0 2.56 Comp 2.56 g74P -13.254NESC Hea 517.731 0.000 0.000 1.000 1.000 1.000
73.92 73.92 27.042 1 0
PMBR1 L2x2x3/16 SAE 2X2X0.1875 36.0 13.55 Tens 13.52 g80X -1.378NESC Hea 18.610 16.800 10.195 1.000 1.000 1.000
65.99 92.99 2.167 3 1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P ??
PMBR2 L3x3x3/16 SAE 3X3X0.1875 36.0 16.35 Comp 16.35 g88X -1.667NESC Hea 19.523 16.800 10.195 1.000 1.000 1.000
126.41 126.41 6.278 4 1

Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Control	Max Use In Tens. %	Tension Member	Tension Force (kips)	Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Tens. Member (ft)	No. Of Bolts	Hole Of Diameter (in)	Holes
Leg1	L4x4x1/4	SAE	4X4X0.25	33.0	51.23	Tens	51.23	g5XY	20.118	NESC Hea	39.270	54.600	84.375	84.375	5.000	6	4.000	0.75
Leg2	L4x4x5/16	SAE	4X4X0.3125	33.0	91.16	Tens	91.16	g9XY	47.943	NESC Hea	52.594	0.000	0.000	0.000	5.295	0	3.440	0.75
Diag1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	37.91	Cross	15.81	g29X	2.878	NESC Hea	18.488	18.200	28.125	23.250	7.103	2	1.000	0.75
Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	23.24	Comp	19.37	g18P	3.525	NESC Hea	22.349	18.200	28.125	21.875	5.657	2	1.000	0.75
Diag3	L2.5x2x1/4	SAU	2.5X2X0.25	33.0	51.01	Comp	43.07	g27X	7.839	NESC Hea	22.201	18.200	28.125	19.875	5.657	2	1.000	0.75
Diag4	L2x2x3/16	SAE	2X2X0.1875	33.0	27.49	Cross	16.02	g31Y	2.512	NESC Hea	16.910	18.200	21.094	15.680	8.014	2	1.000	0.75
Diag5	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	28.78	Comp	27.71	g39XY	3.946	NESC Hea	14.237	18.200	21.094	15.504	21.495	2	1.000	0.75
Diag6	L2x2x1/4	SAE	2X2X0.25	33.0	80.55	Comp	33.21	g37XY	5.293	NESC Hea	22.349	18.200	28.125	15.937	16.544	2	1.000	0.75
Horz1	L2x2x1/4	SAE	2X2X0.25	33.0	3.43	Comp	0.97	g40P	0.176	NESC Hea	22.349	18.200	28.125	19.781	4.000	2	1.000	0.75
Horz2	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	30.36	Tens	30.36	g47P	5.526	NESC Hea	29.774	18.200	28.125	20.719	4.000	2	1.000	0.75
Horz3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	19.23	Comp	3.71	g53P	0.272	NESC Hea	14.237	9.100	10.547	7.312	6.730	1	1.000	0.75
Horz4	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	73.45	Comp	10.76	g54P	1.491	NESC Hea	22.613	18.200	21.094	13.852	9.969	2	1.000	0.75
Inner1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	14.27	Tens	14.27	g61Y	1.083	NESC Hea	18.488	9.100	14.062	7.594	2.828	1	1.000	0.75
ShieldAr	L2x2x1/4	SAE	2X2X0.25	33.0	34.79	Comp	10.29	g62XY	1.873	NESC Hea	22.349	18.200	28.125	18.844	11.426	2	1.000	0.75
ShArmBr	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	14.24	Comp	12.57	g70Y	2.287	NESC Hea	29.774	18.200	28.125	21.875	12.472	2	1.000	0.75
TopCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	21.37	Comp	3.69	g65Y	0.671	NESC Hea	29.774	18.200	28.125	22.969	4.000	2	1.000	0.75

TopArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	6.76	Tens	6.76	g71XY	1.230NESC Hea	22.349	18.200	28.125	20.906	9.437	2	1.000	0.75
MidCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	27.44	Comp	0.00	g67Y	0.000	29.774	18.200	28.125	22.969	4.000	2	1.000	0.75
MidArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	10.17	Tens	10.17	g72XY	1.852NESC Hea	22.349	18.200	28.125	20.906	12.572	2	1.000	0.75
BotCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	22.94	Comp	4.97	g69P	0.904NESC Hea	29.774	18.200	28.125	22.969	4.000	2	1.000	0.75
BotArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	8.57	Tens	8.57	g73XY	1.560NESC Hea	22.349	18.200	28.125	20.906	9.437	2	1.000	0.75
Pwmnt	12" Std. Pipe Pwmnt	Pipe	12" Std.	50.0	2.56	Comp	0.00	g79P	0.000	679.999	0.000	0.000	0.000	15.250	0	0.000	0
PMBR1	**L2x2x3/16**	**SAE**	**2X2X0.1875**	**36.0**	**13.55**	**Tens**	**13.55**	**g80P**	**1.381NESC Hea**	**18.827**	**16.800**	**10.195**	**10.343**	**2.167**	**1**	**1.000**	**0.6875**
PMBR2	L3x3x3/16	SAE	3X3X0.1875	36.0	16.35	Comp	7.17	g88P	0.731NESC Hea	31.139	16.800	10.195	11.328	6.278	1	1.000	0.6875

A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P ??

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	91.16	g9XY	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	3.11	NESC Heavy	0.0
2	Clamp	3.71	NESC Heavy	0.0
3	Clamp	4.11	NESC Heavy	0.0
4	Clamp	4.28	NESC Heavy	0.0
5	Clamp	4.15	NESC Heavy	0.0
6	Clamp	4.40	NESC Heavy	0.0
7	Clamp	4.22	NESC Heavy	0.0
8	Clamp	4.55	NESC Heavy	0.0
9	Clamp	3.52	NESC Heavy	0.0
10	Clamp	0.38	NESC Heavy	0.0
11	Clamp	0.30	NESC Heavy	0.0
12	Clamp	0.34	NESC Heavy	0.0
13	Clamp	0.30	NESC Heavy	0.0
14	Clamp	0.35	NESC Heavy	0.0
15	Clamp	0.69	NESC Heavy	0.0
16	Clamp	0.83	NESC Heavy	0.0
17	Clamp	2.29	NESC Heavy	0.0
18	Clamp	1.93	NESC Heavy	0.0
19	Clamp	2.50	NESC Heavy	0.0
20	Clamp	4.38	NESC Heavy	0.0
21	Clamp	7.14	NESC Heavy	0.0
22	Clamp	1.23	NESC Heavy	0.0

23	Clamp	0.92	NESC	Heavy	0.0
24	Clamp	1.08	NESC	Heavy	0.0
25	Clamp	1.12	NESC	Heavy	0.0
26	Clamp	1.12	NESC	Heavy	0.0
27	Clamp	1.58	NESC	Heavy	0.0
28	Clamp	2.03	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	16P	0.741	1.366	-0.021	1.554
NESC Heavy	2	Clamp	16X	1.240	1.381	-0.064	1.857
NESC Heavy	3	Clamp	17P	0.089	1.771	1.036	2.054
NESC Heavy	4	Clamp	17X	0.194	1.934	0.897	2.141
NESC Heavy	5	Clamp	18P	0.075	1.822	0.986	2.073
NESC Heavy	6	Clamp	18X	0.195	1.882	1.123	2.201
NESC Heavy	7	Clamp	19P	0.125	1.780	1.126	2.110
NESC Heavy	8	Clamp	19X	0.203	1.950	1.158	2.277
NESC Heavy	9	Clamp	24P	0.000	0.625	1.643	1.758
NESC Heavy	10	Clamp	2Y	0.000	0.000	0.192	0.192
NESC Heavy	11	Clamp	4Y	0.000	0.000	0.148	0.148
NESC Heavy	12	Clamp	6Y	0.000	0.000	0.172	0.172
NESC Heavy	13	Clamp	8Y	0.000	0.000	0.149	0.149
NESC Heavy	14	Clamp	11Y	0.000	0.000	0.174	0.174
NESC Heavy	15	Clamp	13Y	0.000	0.000	0.344	0.344
NESC Heavy	16	Clamp	14Y	0.000	0.000	0.414	0.414
NESC Heavy	17	Clamp	25P	0.000	0.410	1.070	1.146
NESC Heavy	18	Clamp	26P	0.000	0.345	0.903	0.967
NESC Heavy	19	Clamp	27P	0.000	0.447	1.165	1.248
NESC Heavy	20	Clamp	28P	0.000	0.765	2.052	2.190
NESC Heavy	21	Clamp	29P	0.000	1.178	3.370	3.569
NESC Heavy	22	Clamp	1P	0.000	0.174	0.590	0.615
NESC Heavy	23	Clamp	3P	0.000	0.124	0.444	0.461
NESC Heavy	24	Clamp	5P	0.000	0.131	0.522	0.539
NESC Heavy	25	Clamp	7P	0.000	0.138	0.544	0.561
NESC Heavy	26	Clamp	10S	0.000	0.153	0.539	0.560
NESC Heavy	27	Clamp	12S	0.000	0.218	0.759	0.789
NESC Heavy	28	Clamp	14S	0.000	0.218	0.989	1.013

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	15.788	2.862	12.005	1059.491	231.385	14.985

*** Weight of structure (lbs):
Weight of Angles*Section DLF: 12983.1
Total: 12983.1

*** End of Report

CENTEK engineering
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Subject:	Foundation Analysis Tower # 326
Location:	Beacon Falls, CT
Rev. 2: 1/31/19	Prepared by: T.J.L. Checked by: C.F.C. Job No. 17159.02

Foundation Analysis

Input Data:

Max. Reactions at Tower Leg:

Shear (Compression Leg) = $Shear_{comp} := 9.93 \cdot 1.1 \cdot kips = 10.9 \cdot kips$ (User Input)

Shear (Uplift Leg) = $Shear_{up} := 0.06 \cdot 1.1 \cdot kips = 0.1 \cdot kips$ (User Input)

Compression = $Comp := 54.2 \cdot 1.1 \cdot kips = 59.6 \cdot kips$ (User Input)

Uplift = $Uplift := 40.1 \cdot 1.1 \cdot kips = 44.1 \cdot kips$ (User Input)

Tower Properties:

Tower Height = $H_t := 81 \cdot ft$ (User Input)

Foundation Properties: (Refer to NUSCO drawing 01145-60001)

Pier Height = $P_H := 6 \cdot ft$ (User Input)

Pier Width Top = $P_{w1} := 1.5 \cdot ft$ (User Input)

Pier Width Botttom = $P_{w2} := 2.42 \cdot ft$ (User Input)

Pier Projection Above Grade = $P_P := 0.5 \cdot ft$ (User Input)

Pad Width = $Pd_w := 5 \cdot ft$ (User Input)

Pad Thickness = $Pd_t := 1.5 \cdot ft$ (User Input)

Subgrade Properties:

Concrete Unit Weight = $\gamma c := 150 \cdot pcf$ (User Input)

Water Unit Weight = $\gamma w := 62.4 \cdot pcf$ (User Input)

Soil Unit Weight = $\gamma s := 100 \cdot pcf$ (User Input)

Uplift Angle = $\phi := 30.0 \cdot deg$ (User Input)

Ultimate Soil Bearing Capacity = $BC_{soil} := 9000 \cdot psf$ (User Input)

Coefficient of Friction = $\mu := 0.45$ (User Input)

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

Calculated Data:

Volume of the Concrete Pad = $V_{pad} := Pd_w^2 \cdot Pd_t = 37.5 \cdot ft^3$

Volume of the Concrete Pier = $V_{pier} := \frac{(P_H)}{3} \cdot \left(P_{w1}^2 + P_{w2}^2 + \sqrt{P_{w1}^2 \cdot P_{w2}^2}\right) = 23.47 \cdot ft^3$

Resisting Pyramid Base 1 = $B_1 := Pd_w^2 = 25 ft^2$

Resisting Pyramid Base 2 = $B_2 := \left[2 \cdot \tan(\phi) \cdot (P_H - P_P) + Pd_w\right]^2 = 129 ft^2$

Volume of Soil = $V_{soil} := \left[\frac{(P_H - P_P)}{3} \cdot \left(B_1 + B_2 + \sqrt{B_1 \cdot B_2}\right)\right] - V_{pier} = 363 \cdot ft^3$

Total Vdlume ofConcrete = $V_{Conc} := V_{pad} + V_{pier} = 61 \cdot ft^3$

Mass of Concrete = $Mass_{Conc} := V_{Conc} \cdot \gamma c = 9.1 \cdot kips$

Mass of Soil = $Mass_{Soil} := V_{soil} \cdot \gamma s = 36 \cdot kips$

Total Mass = $Mass_{tot} := Mass_{Conc} + Mass_{Soil} = 45 \cdot kips$

Check Uplift:

Required Factor of Safety = $F_S := 1.0$

$ActualFS := \frac{Mass_{tot}}{Uplift} = 1.03$

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

Uplift_Check = "OK"

Check Bearing:

Cross Sectional Area of Pad = $A_{pad} := Pd_w^2 = 25 ft^2$

Section Modulus of Pad = $S_{pad} := \frac{(Pd_w)^3}{6} = 21 \cdot ft^3$

Residual Mass of Concrete = $Mass_{Concr} := V_{Conc} \cdot (\gamma c - \gamma s) = 3 \cdot kips$

$Bearing := \frac{Comp + Mass_{Concr}}{A_{pad}} + \frac{\left[Shear_{comp} \cdot (P_H + Pd_t)\right]}{S_{pad}} = 6.44 \cdot ksf$

$Bearing\_Check := if\left(Bearing \leq BC_{soil}, "OK", "No Good"\right)$

Bearing_Check = "OK"

Check Sliding:

Sliding Resistance = $S_R := \mu \cdot \left(Mass_{Conc} + Comp\right) = 30.945 \cdot kips$

$Sliding\_Check := if\left(Shear_{comp} \leq S_R, "OK", "No Good"\right)$

Sliding_Check = "OK"

Product Specifications

DHHTT65B-3XR

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

Electrical Specifications

Frequency Band, MHz	790–896	870–960	1710–1880	1850–1990	1920–2180	2490–2690
Connector Interface	7-16 DIN Female	7-16 DIN Female	7-16 DIN Female	7-16 DIN Female	7-16 DIN Female	4.1-9.5 DIN Female
Connector Location	Bottom	Bottom	Bottom	Bottom	Bottom	Bottom
Gain, dBi	15.5	15.5	17.3	17.4	17.5	17.2
Beamwidth, Horizontal, degrees	64	63	71	69	66	60
Beamwidth, Vertical, degrees	11.2	10.3	5.6	5.4	5.1	4.3
Beam Tilt, degrees	0–10	0–10	0–8	0–8	0–8	0–8
USLS (First Lobe), dB	15	16	15	16	15	18
Front-to-Back Ratio at 180°, dB	28	31	31	29	25	26
CPR at Boresight, dB	20	19	20	20	18	16
CPR at Sector, dB	9	9	9	9	7	4
Isolation, dB	25	25	25	25	25	25
Isolation, Intersystem, dB	30	30	30	30	30	30
VSWR | Return Loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-150
Input Power per Port, maximum, watts	350	350	300	300	300	250
Polarization	±45°	±45°	±45°	±45°	±45°	±45°
Impedance	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm	50 ohm

Electrical Specifications, BASTA*

Frequency Band, MHz	790–896	870–960	1710–1880	1850–1990	1920–2180	2490–2690
Gain by all Beam Tilts, average, dBi	15.0	15.1	17.0	17.1	17.1	17.1
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3	±0.3	±0.3	±0.3	±0.6
Gain by Beam Tilt, average, dBi	0 ° | 15.0	0 ° | 15.0	0 ° | 16.8	0 ° | 17.0	0 ° | 17.0	0 ° | 17.1
	5 ° | 15.1	5 ° | 15.1	4 ° | 17.0	4 ° | 17.1	4 ° | 17.1	4 ° | 17.2
	10 ° | 15.0	10 ° | 15.0	8 ° | 17.0	8 ° | 17.1	8 ° | 17.1	8 ° | 17.0
Beamwidth, Horizontal Tolerance, degrees	±2.5	±1.8	±3.2	±2.7	±5	±6.6
Beamwidth, Vertical Tolerance, degrees	±0.8	±0.6	±0.2	±0.2	±0.4	±0.3
USLS, beampeak to 20° above beampeak, dB	16	17	16	17	16	19
Front-to-Back Total Power at 180° ± 30°, dB	24	26	26	25	23	23
CPR at Boresight, dB	21	20	22	22	21	16
CPR at Sector, dB	9	10	13	10	8	5

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

General Specifications

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

Product Specifications

DHHTT65B-3XR

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

Mechanical Specifications

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

Dimensions

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

Remote Electrical Tilt (RET) Information

Input Voltage	10–30 Vdc
Power Consumption, idle state, maximum	2.0 W
Power Consumption, normal conditions, maximum	13.0 W
Protocol	3GPP/AISG 2.0 (Multi-RET)
RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	1 female | 1 male

Packed Dimensions

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

Regulatory Compliance/Certifications

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

DATA SHEET

Outdoor Diplexer

DPO-7126Y-0x1

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

Overview

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

Technical Description:

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

SPECIFICATIONS

Outdoor Diplexer

DPO-7126Y-0x1

Electrical

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

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

Environmental

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

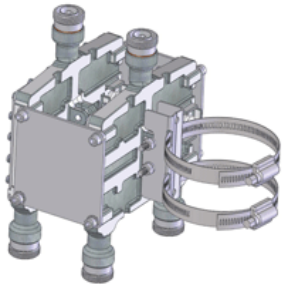
Mechanical

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

RADIO FREQUENCY SYSTEMS
The Clear Choice®

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

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



FEATURES / BENEFITS

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

Technical Features

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

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

External Document Links

RFS Diplexer Field Test Procedure□□

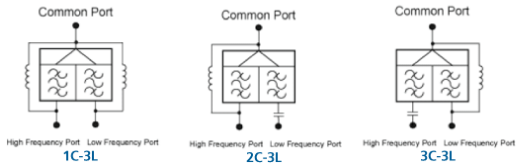
KIT-FD9R6004/1C-DL Installation Instructions

Notes

RADIO FREQUENCY SYSTEMS
The Clear Choice®

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

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



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

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