NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Denise Sabo
199 Brickyard Rd Farmington, CT 06032
860-209-4690
denise@northeastsitesolutions.com

June 22, 2017

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

RE: Notice of Exempt Modification
640 Westport Turnpike, Fairfield CT 06824
Latitude: 41.20161600
Longitude: -73.33205500
T-Mobile Site#: CT11360A_L700

Dear Ms. Bachman:

T-Mobile currently maintains two (2) antennas at the 96-foot level of the existing 81-foot transmission pole (#910) located at 640 Westport Turnpike, Fairfield CT. The electric transmission pole (#910) is owned by CL&P d/b/a Eversource. The property which holds the utility easement is owned by Lee Calvin W & Anne S. T-Mobile now intends to install three (3) new 700MHz antenna and three (3) new 1900/2100MHz antenna. The new antennas would be installed at the 96-foot level of the tower. T-Mobile also intends to make the following modifications.

Planned Modifications:

Remove:
(2) RR90 Antenna
(1) Dish Antenna (flush mounted)
(1) 7/8" Coax

Remove and Replace:
Remove existing (1) 6" SCH40 42ft antenna mast and replace with (1) MAST- HSS 16x0.5x100ft

Install New:
Site Pro Triple T-Arm
(3) APX16DWV Antenna
(3) Commscope LNX 6515DS Antenna
(14) 1-5/8" Coax
(3) Smart Bias-T

Existing to Remain:
(4) 1-5/8" Coax

NORTHEAST SITE SOLUTIONS

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This facility was approved by the CT Siting Council. Per the attached Petition No. 471 – Dated July 25, 2000. T-Mobile (formally Voicestream) received approval to install with a 98' centerline on the existing 81' tall CL&P transmission structure. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to First Selectman Mike Tetreau, Elected Official and Joe Devonshuk, Planning Director for the Town of Fairfield, as well as the property owner and the tower 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, T-Mobile 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,

Denise Sabo
Mobile: 860-209-4690
Fax: 413-521-0558
Office: 199 Brickyard Rd, Farmington, CT 06032
Email: denise@northeastsitesolutions.com

Attachments
cc: Mike Tetreau – First Selectman - as elected official
Joe Devonshuk- Planning Director
CL&P d/b/a Eversource - as tower owner
Lee Calvin W & Anne S - **Utility Easement**

Exhibit A

Petition No. 471
VoiceStream Wireless
Fairfield, Connecticut
Staff Report
July 25, 2000

On July 18, 2000, Gerald J. Heffernan of the Connecticut Siting Council (Council) and Robert K. Erling of the Council staff met Chetan Dhaduk, Brian Ragovzine, and J. Brendan Sharkey of VoiceStream Wireless (VoiceStream) for the field review off of Route 136 in Fairfield, Connecticut. VoiceStream is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need would be required for the proposed modification of existing Connecticut Light and Power Company (CL&P) transmission line structure number 910 because the proposed modification would not have a significant environmental effect.

VoiceStream proposes to attach a 17 foot four-inch extension on a three-inch diameter pipe mast to an existing 81 foot tall steel lattice electric transmission structure. A total of four panel antennas, each 56 inches in height, would be installed in a "pipe mast" configuration which results in a more slender antenna profile without adding unnecessary stress to the tower structure. A structural analysis has been performed which indicates this transmission tower does have the capacity to safely support the new antennas. To transfer the wind shear from the pipe support and antennas to the existing tower, special connections from the pipe support will be made at various levels of the tower. The total height of the structure with all antennas would be 98 feet, four inches. Spacing required for this antenna design includes a minimum distance of six feet above the CL&P static line and two feet of distance between the antennas.

VoiceStream would construct a fenced 22-foot by 22.5-foot equipment compound beneath the tower, to contain the equipment cabinets. Landscaping would be installed to screen the chain link fencing. Access to the tower would be from Route 136, which is immediately to the west.

The nearest residence is approximately 200 feet south of tower number 910. Surrounding properties are well screened by mature trees. The zoning of this site is AAA residential. VoiceStream investigated using other structures along this transmission line, but found that extensive trenching for power and telephone access would be required, involving extensive clearing of vegetation. Additionally, these alternatives would involve extensions on the structures to clear obstructions created by trees in the area.

To lessen visibility of the compound, Staff recommends VoiceStream submit plans for an architecturally treated wooden fence and for the placement of evergreens for screening around the outside of this fence.

The worst case radiofrequency power density for the telecommunications operations at this site has been calculated to be less than 6 percent of the applicable standard for uncontrolled environments.

Electric power would be brought in underground from existing service on Route 136 for a distance of approximately 50 feet. Telephone service would be provided via microwave from a site to be determined.

Exhibit B

640 WESTPORT TURNPIKE

Location	640 WESTPORT TURNPIKE	**Mblu**	258/ 12/ / /
Acct#	15297	**Owner**	LEE CALVIN W & ANNE S (SV)
Assessment	$446,810	**Appraisal**	$638,300
PID	20914	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$266,900	$371,400	$638,300
Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$186,830	$259,980	$446,810

Owner of Record

Owner	LEE CALVIN W & ANNE S (SV)	**Sale Price**	$310,000
Co-Owner		**Certificate**	
Address	640 WESTPORT TURNPIKE FAIRFIELD , CT 06824-1670	**Book & Page**	1047/ 25
		Sale Date	05/14/1991

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
LEE CALVIN W & ANNE S (SV)	$310,000		1047/ 25	05/14/1991

Building Information

Building 1 : Section 1

Year Built:	1979
Living Area:	2,474
Replacement Cost:	$356,394
Building Percent Good:	73
Replacement Cost Less Depreciation:	$260,200

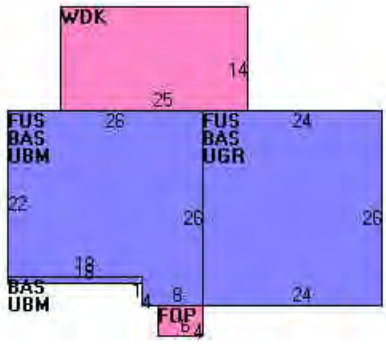
Building Attributes	
Field	**Description**

Style	Colonial
Stories:	2 Stories
Occupancy	1
Exterior Wall 1	Wood Shingle
Exterior Wall 2	
Roof Structure:	Gable/Hip
Roof Cover	Asphalt
Interior Wall 1	Drywall
Interior Wall 2	
Interior Flr 1	Hardwood
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	1
Total Xtra Fixtrs:	
Total Rooms:	8
Bath Style:	Average
Kitchen Style:	Average
FCPZ	

Building Photo

(http://images.vgsi.com/photos/FairfieldCTPhotos//\02\04\57/2

Building Layout



Building Sub-Areas (sq ft)			
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,246	1,246
FUS	Upper Story, Finished	1,228	1,228
FOP	Porch, Open, Finished	24	0
UBM	Basement, Unfinished	622	0
UGR	Garage, Under	624	0
WDK	Deck, Wood	350	0
		4,094	2,474

Extra Features

Extra Features				
Code	**Description**	**Size**	**Value**	**Bldg #**
FPL3	2.0 STORY FIREPLACE	1 UNITS	$5,500	1

Land

Land Use

Use Code	1010
Description	Single Fam MDL-01
Zone	AAA
Neighborhood	0057
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	2.1
Depth	0
Assessed Value	$259,980
Appraised Value	$371,400

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
SHD1	SHED FRAME			80 S.F.	$1,200	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$266,900	$371,400	$638,300
2014	$235,900	$412,600	$648,500
2013	$235,900	$412,600	$648,500

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$186,830	$259,980	$446,810
2014	$165,130	$288,820	$453,950
2013	$165,130	$288,820	$453,950


725 WESTPORT TURNPIKE
675
2580600000
MILTON GARY
675 WESTPORT TURNPIKE
2580590000
ASPETUCK LAND TRUST,INC.
667 WESTPORT TURNPIKE
EASTON RD
136
State Hwy 136
2580580000
JOHNSON NICHOLAS C & NOBLE DAVID E (TRS
645 WESTPORT TURNPIKE
2580120000
LEE CALVIN W & ANNE S (SV)
640 WESTPORT TURNPIKE
640
609
2580550000
JOHNSON NICHOLAS C & NOBLE DAVID E (TRS)
609 WESTPORT TURNPIKE
2580110000
KRISHNAN KAMAL & KADAVATH SPRETHA (SV)
578 WESTPORT TURNPIKE
260
2580160000
DASILVA ROSALIE M TRUSTEE
260 GILBERT HIGHWAY
2580170000
BERNIER MARK A & ROBIN L
300 GILBERT HIGHWAY
258017A0000
DEVEJIAN MARTHA E
350 GILBERT HIGHWAY

Exhibit C

ANTENNA UPGRADES
BY

T-MOBILE NORTHEAST LLC

SITE NUMBER: CT11360A
SITE NAME: Westport/Rt 136
SITE ADDRESS: 640 Westport Turnpike, Fairfield, CT 06824
CL&P STRUCTURE # 910
(704Bu CONFIGURATION)

PROJECT SCOPE:

T-MOBILE, A WIRELESS TELECOMMUNICATIONS PROVIDER PROPOSES TO UPGRADE THEIR EXISTING FACILITY AS FOLLOWS:
REPLACE THE EXISTING ANTENNA MAST WITH A NEW MAST.
REPLACE (2) EXISTING ANTENNAS WITH (6) NEW ANTENNAS
ADD (3) RRUS, (3) SMART BIAS TEES AND (4) TMAS.

PROJECT NOTES:

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION: HANDICAPPED ACCESS IS NOT REQUIRED. POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED.NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES, ORDINANCES AND SPECIFICATIONS.
4. REFER TO STRUCTURAL ANALYSIS REPORT BY CENTEK ENGINEERING DATED MAY 05, 2017 FOR STRUCTURAL EVALUATION OF THE TOWER AND CONDITION.

APPLICABLE STATE ADOPTION CODES:

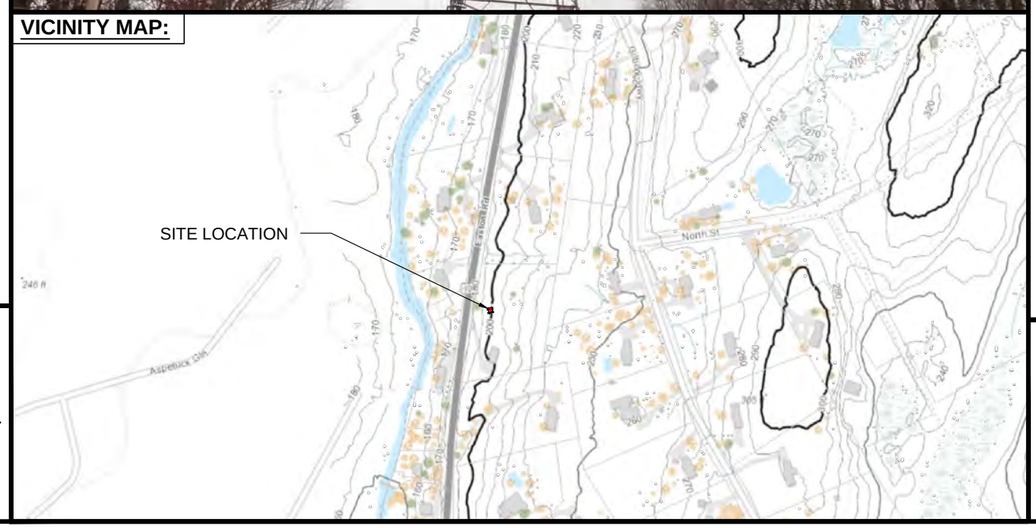
2016 CONNECTICUT STATE BUILDING CODE (CSBC).

ANSI/TIA-222-G-2005 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.

2014 NATIONAL ELECTRICAL CODE (NFPA 70) FOR POWER AND GROUNDING REQUIREMENTS.

SITE IMAGE:

VICINITY MAP:



PROJECT INFORMATION:

ADDRESS:	640 WESTPORT TURNPIKE FAIRFIELD, CT 06824
ZONING DISTRICT:	AAA
PARCEL ID:	20914
STRUCTURE TYPE:	TRANSMISSION TOWER
LATITUDE:	N 41°12'05.41"
LONGITUDE:	W 73°19'55.57"
GROUND ELEVATION:	196.6' AMSL
T-MOBILE ANTENNAS HEIGHTS POINT OF STRUCTURE:	96' AGL (292.6' AMSL) 100' AGL (296.6' AMSL)

PROJECT TEAM:

APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 860-692-7100
LANDLOARD:	EVERSOURCE CL&P 56 PROSPECT STREET HARTFORD, CT 06103
DEVELOPER:	NORTHEAST SITE SOLUTIONS 420 MAIN STREET, BLDG 4 STURBRIDGE , MA 01566 SHELDON FREINCLE SHELDON@NORTHEASTSITE SOLUTIONS.COM 201-776-8521
CONSULTANTS:	FORESITE LLC 462 WALNUT ST NEWTON, MA 02460 SAEED MOSSAVAT SMOSSAVAT@FORESITELLC.COM 617-212-3123

SHEET INDEX:

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE , MA 01566

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL

REV	DESCRIPTION	DATE
A	PRELIMINARY	01/20/17
0	ISSUED FOR PERMITTING	06/02/17

SITE NUMBER: CT11360A
SITE NAME: WESTPORT/RT 136
SITE ADDRESS: 640 WESTPORT TURNPIKE
FAIRFIELD, CT 06824

SHEET TITLE:
T-1: TITLE SHEET

NOTES AND DISCLAIMERS:

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE CLIENT'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.

5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.

6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

7. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS DURING CONSTRUCTION.

8. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJEC

9. THE CONTRACTOR SHALL NOTIFY THE CLIENT'S REPRESENTATIVE IN WRITING WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE CLIENT'S REPRESENTATIVE.

10. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

A. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS, AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS BUILDING CODES" OR LATEST EDITION.

B. AWS: AMERICAN WELDING SOCIETY INC. AS PUBLISHED IN "STANDARD D1.1–08, STRUCTURAL WELDING CODE" OR LATEST EDITION.

C. AISC: AMERICAN INSTITUTE FOR STEEL CONSTRUCTION AS PUBLISHED IN "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"; "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).

11. BOLTING:

A. BOLTS SHALL BE CONFORMING TO ASTM A325 HIGH STRENGTH, HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.

B. BOLTS SHALL BE 3/4"ø MINIMUM (UNLESS OTHERWISE NOTED)

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

12. FABRICATION:

A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS STANDARDS AND CODES (LATEST EDITION).

B. ALL STRUCTURAL STEEL SHALL BE HOT–DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 (LATEST EDITION), UNLESS OTHERWISE NOTED.

13. ERECTION OF STEEL:

A. PROVIDE ALL ERECTION EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION BUT ARE NECESSARY FOR ITS PROPER ERECTION.

B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED LINES AND ELEVATIONS AND RIGIDLY FASTENED IN PLACE WITH SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING.

C. TEMPORARY BRACING, GUYING AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SAFE AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

14. ANTENNA INSTALLATION:

A. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CLIENT'S REPRESENTATIVE SPECIFICATIONS.

B. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

C. INSTALL COAXIAL / FIBER CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS.

15. ANTENNA AND COAXIAL / FIBER CABLE GROUNDING:

A. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE #221213 OR EQUAL.

B. ALL COAXIAL / FIBER CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL / FIBER CABLE (NOT WITHIN BENDS).

16. RELATED WORK, FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

A. FLASHING OF OPENING INTO OUTSIDE WALLS

B. SEALING AND CAULKING ALL OPENINGS

C. PAINTING

D. CUTTING AND PATCHING

17. REQUIREMENTS OF REGULATORY AGENCIES:

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, AND SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

C. TIA–EIA – 222 (LATEST EDITION). STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

D. FAA – FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460–IH, OBSTRUCTION MARKING AND LIGHTING.

E. FCC – FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.

F. AISC – AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS (LATEST EDITION).

G. NEC – NATIONAL ELECTRICAL CODE – ON TOWER LIGHTING KITS.

H. UL – UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

I. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

J. 2009 LIFE SAFETY CODE NFPA – 101.

APPLICANT:

T-Mobile

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

420 MAIN STREET, BLDG 4
STURBRIDGE , MA 01566

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors

462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

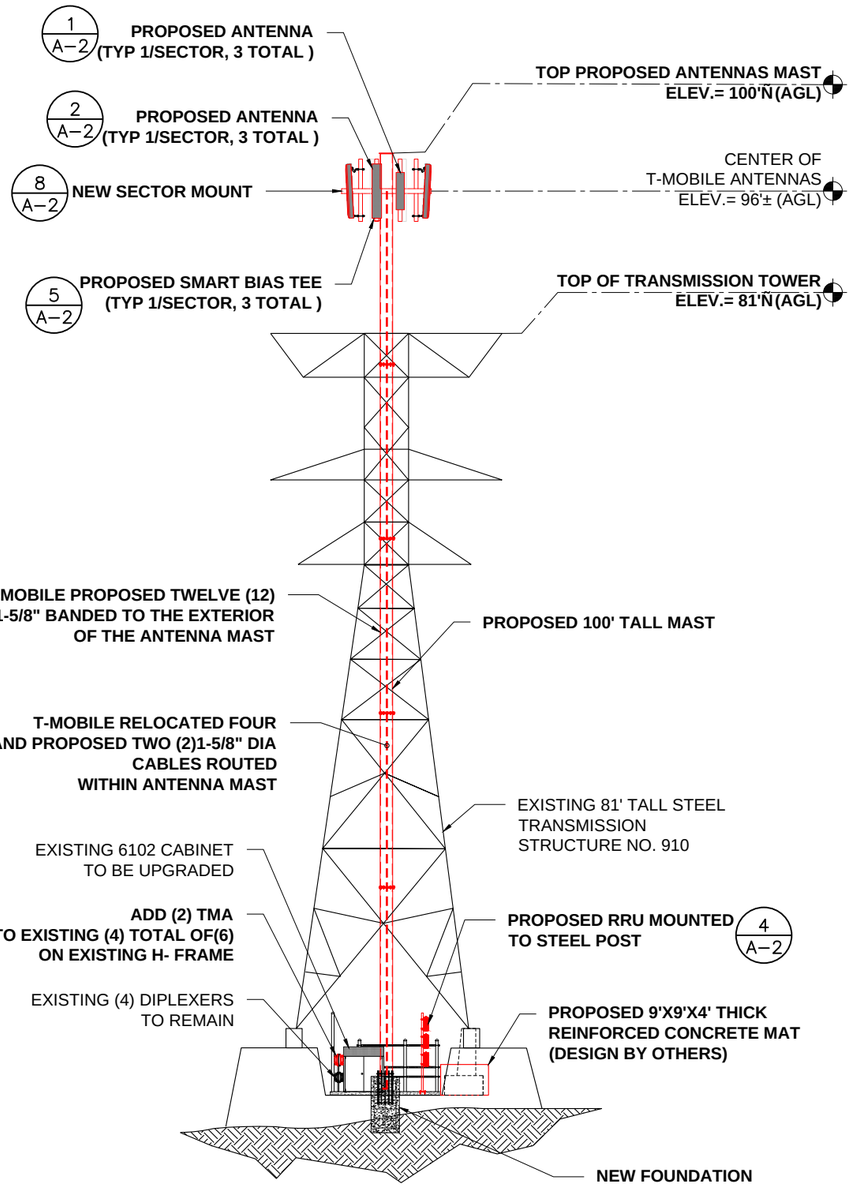
PROFESSIONAL SEAL

REV	DESCRIPTION	DATE
A	PRELIMINARY	01/20/17
0	ISSUED FOR PERMITTING	06/02/17

SITE NUMBER: CT11360A
SITE NAME: WESTPORT/RT 136
SITE ADDRESS: 640 WESTPORT TURNPIKE
FAIRFIELD, CT 06824

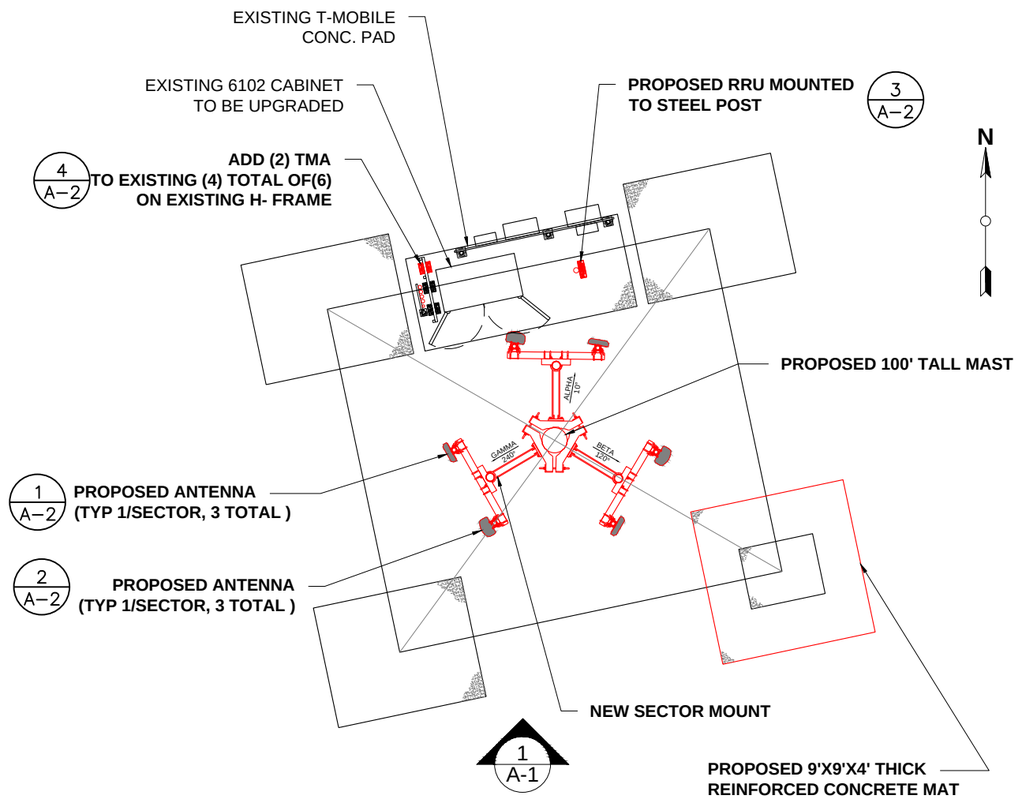
SHEET TITLE:
N-1: NOTES AND DISCLAIMERS

REFER TO STRUCTURAL ANALYSIS REPORT BY CENTEK ENGINEERING DATED MAY 05, 2017 FOR STRUCTURAL EVALUATION OF THE TOWER AND CONDITION.



ELEVATION 1 A–1
SCALE 3/4"=1'-0"

SITE PLAN 3 A–1
SCALE 1"=200'



COMPOUND PLAN 2 A–1
SCALE 1-1/2"=1'-0"

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER
NSS NORTHEAST SITE SOLUTIONS
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420 MAIN STREET, BLDG 4
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CONSULTANT:
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Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL
STATE OF CONNECTICUT HOSSEIN VAHEDI NO. ARI. 11162 LICENSED ARCHITECT

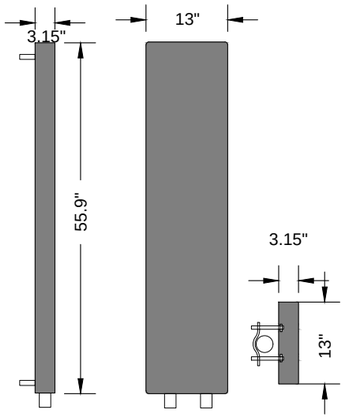
REV	DESCRIPTION	DATE
A	PRELIMINARY	01/20/17
0	ISSUED FOR PERMITTING	06/02/17

SITE NUMBER: CT11360A
SITE NAME: WESTPORT/RT 136
SITE ADDRESS: 640 WESTPORT TURNPIKE
FAIRFIELD, CT 06824

SHEET TITLE:
A-1: PLANS AND ELEVATIONS

ADD: (3) ANTENNAS

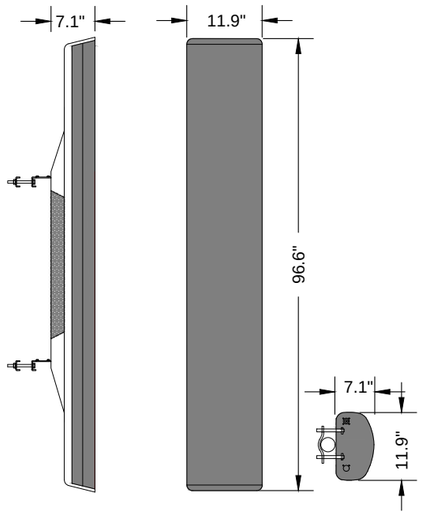
MANUFACTURER: RFS
MODEL APX16DWV-16DWVS-E-A20
FOOTPRINT: 55.9"HX13.0"WX3.15"D
WEIGHT: 40.7 LBS



RFS ANTENNA DETAILS (1 / A–2)
N.T.S

ADD: (3) ANTENNAS

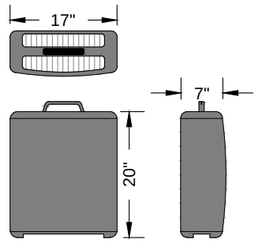
MANUFACTURER: COMMSCOPE
MODEL LNX-6515DS-VTM
FOOTPRINT: 96.6"HX11.9"WX7.1"D
WEIGHT: 43.7 LBS



COMMSCOPE ANTENNA DETAILS (2 / A–2)
N.T.S

ADD: (3) RRUS

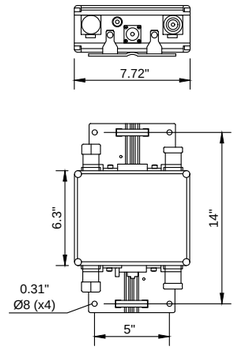
MANUFACTURER: ERICSSON
MODEL: RRUS11 B12
FOOTPRINT: 20"HX17"WX7"D
WEIGHT: 50.6 LBS



RRU DETAILS (3 / A–2)
N.T.S

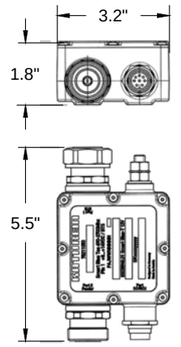
ADD: (3) TWIN TMAS

MODEL: GENERIC AWS
/ PCS DIPLEXERS
FOOTPRINT: 7.6"HX7.3"WX2.8"D
WEIGHT: 7.9 LBS

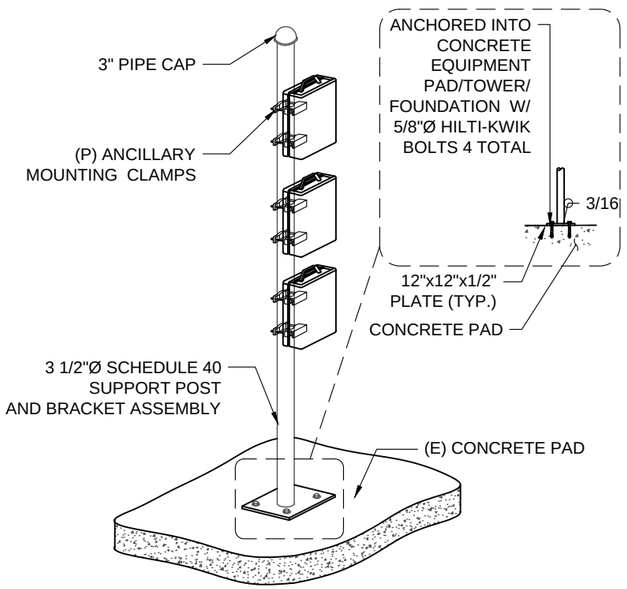


DIPLEXER DETAILS (4 / A–2)
N.T.S

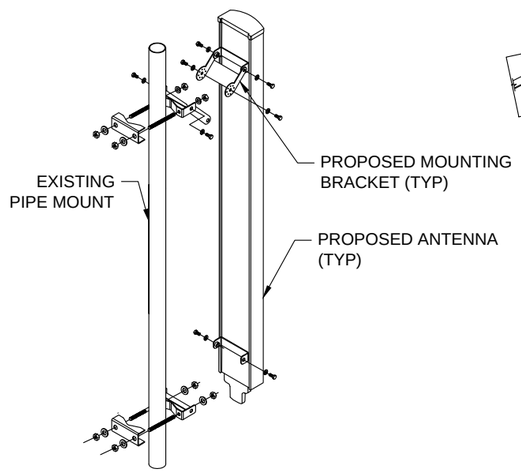
ADD: (3) SMART BIAS TEES



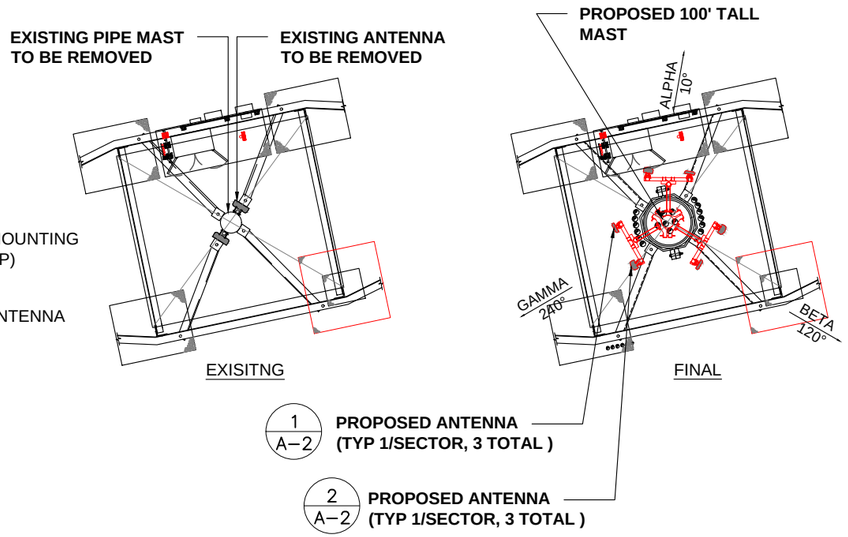
SMART BIAS TEES DETAILS (5 / A–2)
N.T.S



RRU MOUNTING DETAILS (6 / A–2)
N.T.S



ANTENNA MOUNTING DETAIL (7 / A–2)
N.T.S



ANTENNA PLAN (8 / A–2)
N.T.S

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE , MA 01566

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL
STATE OF CONNECTICUT · HOSSEIN VAHEDI · NO. ARI. 11162 · LICENSED ARCHITECT

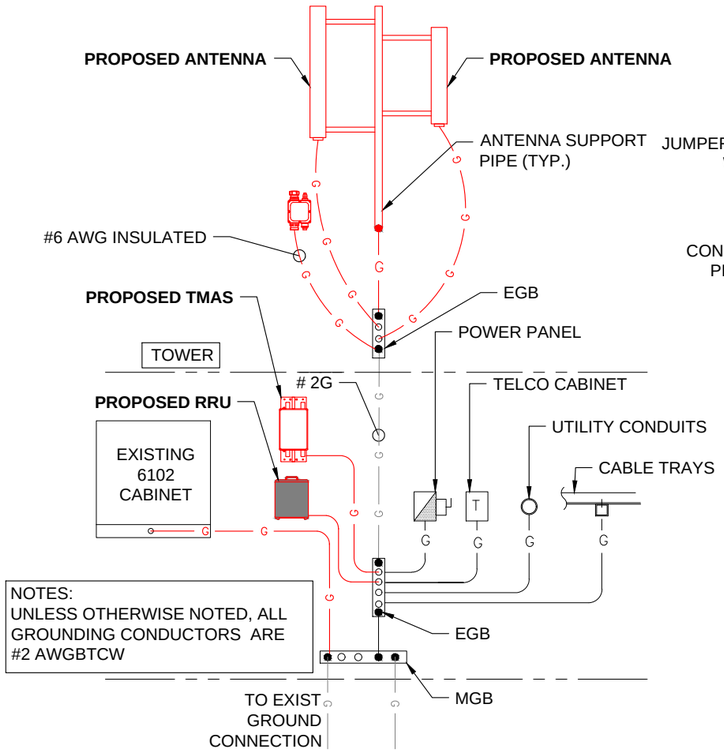
REV	DESCRIPTION	DATE
A	PRELIMINARY	01/20/17
0	ISSUED FOR PERMITTING	06/02/17

SITE NUMBER: CT11360A
SITE NAME: WESTPORT/RT 136
SITE ADDRESS: 640 WESTPORT TURNPIKE
FAIRFIELD, CT 06824

SHEET TITLE:
A-2: ANTENNAS, EQUIPMENT AND DETAILS

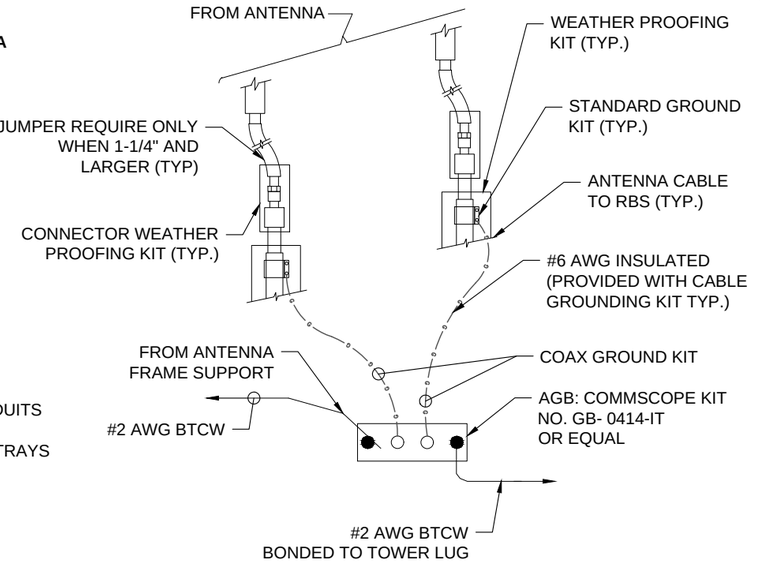
ELECTRICAL & GROUNDING NOTES

1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PRODUCED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) ND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLING BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE ARE PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELECOM CABINET AND RBS CABINET AS INDICATED ON DRAWING A -1. PROVIDE FULL LENGTH PULL ROPE INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NAME 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUNDING COAX CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURES COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSTALLATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE GROUND.
14. ALL GROUND CONNECTION TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AS RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY BOND ANY METER OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PROCEDURES (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN RBS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTION.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20 BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.



GROUNDING RISER DIAGRAM (1 / E–1)

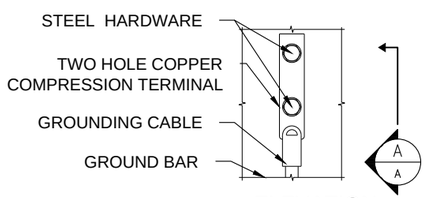
SCALE: N.T.S



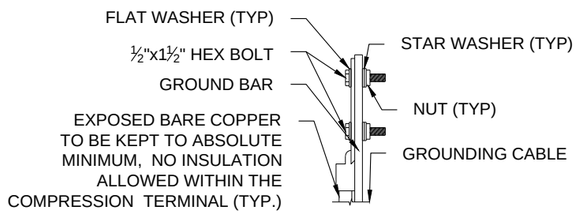
NOTES:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB

TOWER TOP CABLE GROUNDING DETAIL (2 / E–1)

SCALE: N.T.S



ELEVATION



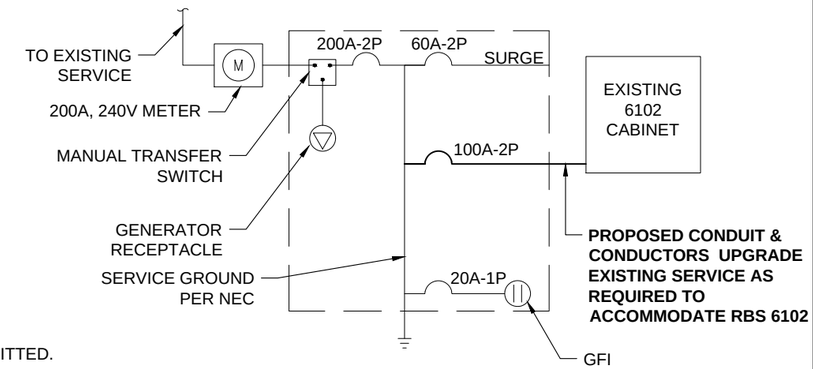
SECTION A-A

NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR CONNECTIOS DETAIL (3 / E–1)

SCALE: N.T.S

NOTES:
G.C TO VERIFY THAT THE EXISTING CONDUCTS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORKS AS REQUIRED



ONE LINE POWER DIAGRAM (4 / E–1)

SCALE: N.T.S

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE , MA 01566

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL

REV	DESCRIPTION	DATE
A	PRELIMINARY	01/20/17
0	ISSUED FOR PERMITTING	06/02/17

SITE NUMBER: CT11360A
SITE NAME: WESTPORT/RT 136
SITE ADDRESS: 640 WESTPORT TURNPIKE
FAIRFIELD, CT 06824

SHEET TITLE:
E-1: GROUNDING DETAILS

Exhibit D

CENTEK engineering

Centered on Solutions℠

Structural Design of Antenna Mast and Analysis of Eversource Tower

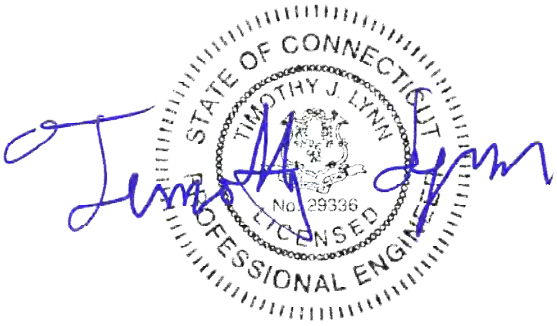
T-Mobile Site Ref: CT11360A

Eversource Structure No. 910
81' Electric Transmission Lattice Tower

Westport Turnpike
Fairfield, CT

CENTEK Project No. 16159.11

~~Date: February 13, 2017~~
Rev 1: May 5, 2017



Prepared for:
T-Mobile Towers
4 Sylvan Way
Parsippany, NJ 07054

T a b l e o f C o n t e n t s

Introduction

The purpose of this report is to design a proposed antenna mast and analyze the existing 81' tower located on Westport Turnpike in Fairfield, CT for the proposed T-Mobile antenna upgrade.

The existing and proposed loads consist of the following:

- T-MOBILE (Existing to be Removed):
  Antennas: Two (2) EMS RR-90-17-02DP panel antennas and one (1) microwave dish flush mounted to the existing mast with a RAD center elevation of 96-ft above grade.
  Coax Cables: One (1) 7/8" ∅ coax cable running on a leg of the existing tower as indicated in section 4 of this report.
  Mast: Pipe 6" Sch. 40 (O.D. = 6.625").
- T-MOBILE (Existing to Relocate):
  Coax Cables: Four (4) 1-5/8" ∅ coax cables running on a leg of the existing tower to be relocated to the proposed antenna mast.
- **T-MOBILE (Proposed):**
  Antennas: Three (3) RFS APX16DWV-16DWVS-E-A20 and three (3) Andrew LNX-6515DS panel antennas mounted on Site Pro Triple T-Arm p/n RMV5-272 with a RAD center elevation of 96-ft above grade.
  Coax Cables: Fourteen (14) 1-5/8" ∅ coax cables running on the proposed antenna mast.
  Mast: HSS16x0.5 x 100-ft Long.

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 design 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 proposed Antenna Mast consisting of a HSS16x0.5 pipe conforming to ASTM A500 Grade 42 (Fy = 42ksi) connected at five elevations to the existing tower was designed for its ability to resist loads prescribed by the TIA-222-G standard. Section 5 of this report details these gravity and lateral wind loads. Load cases and combinations used in RISA-3D for TIA/EIA loading are listed in report Section 6.

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

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

Design Basis

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

- UTILITY TOWER ANALYSIS

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

  Load cases considered:

  Load Case 1: NESC Heavy

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

  Load Case 2: NESC Extreme

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

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

- MAST ASSEMBLY ANALYSIS

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

  Load cases considered:

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

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

R e s u l t s

- MAST ASSEMBLY

  Replacement of the existing antenna mast with a **HSS16x0.5 Pipe x 100-ft long** conforming to ASTM A500, Grade 42, F_y = 42 ksi specifications will be required.

Member	Stress Ratio (% of capacity)	Result
HSS16x0.5	20.9%	**PASS**
L2-1/2x2-1/2x1/4 Brace	30.8%	**PASS**
Mast Connection to Tower	58.1%	**PASS**

- UTILITY TOWER

  This analysis finds that the subject utility structure is adequate to support the existing PCS 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 9 of this report. The analysis results are summarized as follows:

  A maximum usage of **81.07%** occurs in the utility tower under the **NESC Extreme** loading condition.

  TOWER SECTION:

  The utility structure was found to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle g11Y	81.07%	**PASS**

- FOUNDATION AND ANCHORS

  The existing foundation consists of four (4) 1.67-ft square tapering to 2.33-ft square x 5.25-ft long reinforced concrete piers on four (4) 5.0-ft square x 2.0-ft thick reinforced concrete pads. The base of the tower is connected to the foundation by one (1) anchor stub angle per leg embedded into the concrete foundation. Foundation information was obtained from NUSCO drawing # 01064-60003. Three (3) of the four (4) foundations have been previously reinforced with 8’ square concrete blocks.

BASE REACTIONS:

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

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	5.91 kips	19.59 kips	30.39 kips
NESC Extreme Wind	11.17 kips	39.31 kips	47.64 kips

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

FOUNDATION:

The foundation **with the proposed reinforcements detailed in Section 4 of this report** was found to be within allowable limits.

Foundation	Design Limit	Allowable Limit	Proposed Loading (2)	Result
Reinforced Conc. Pad and Pier	Uplift	1.0 FS (1)	1.02 FS (1)	**PASS**
	Bearing	7.0 ksf	3.97 ksf	**PASS**

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

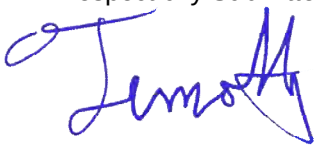
Conclusions and Recommendations

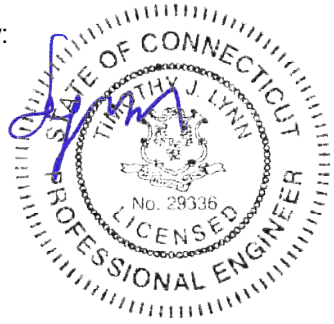
This analysis shows that the subject utility tower **with the proposed reinforcements detailed in Section 4 of this report is adequate** to support the proposed T-Mobile equipment installation.

The analysis is based, in part on the information provided to this office by Eversource and T-Mobile. 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-222 (Rev. G) 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-222 (Rev. G):

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

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

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

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

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

Attachment A

NU Design Criteria

			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 (.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	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole (on two faces)	-----	4	1.00	1.00	2.50	1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
High Wind Condtion	TIA/EIA	Antenna Mount	85	TIA	TIA	TIA	TIA, Section 3.1.1.1 disallowed for connection design	TIA
	NESC Extreme Wind	Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250C: Extreme Wind Loading Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
NESC Extreme Ice with Wind Conditon*		Tower/Pole Analysis with antennas extending above top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load 1.25 x Gust Response Factor Height above ground level based on top of Mast/Antenna					1.6 Flat Surfaces 1.3 Round Surfaces
		Tower/Pole Analysis with Antennas below top of Tower/Pole	Use NESC C2-2007, Section 25, Rule 250D: Extreme Ice with Wind Loading 4PSF Wind Load Height above ground level based on top of Tower/Pole					1.6 Flat Surfaces 1.3 Round Surfaces
		Conductors:	Conductor loads provided by NU					
		* Only for Structures Installed after 2007						

Shape Factor Criteria shall be per TIA Shape Factors.

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

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

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

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

c) Electric Transmission Structure

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

ii) Shape Factor Multiplier:

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

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

Mount Type	Cable Cd	Pole Cd
Coaxial Cables on outside periphery (One layer)	1.45	1.45
Coaxial Cables mounted on stand offs	1.6	1.3

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

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

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

TITLE Omnipoint Site 360A, Fairfield, CT. 03/09/2000

STRUCT #910

FIBER OPTIC CONDUCTOR (SHIELD WIRE)

	AHEAD	BACK
	OPGW-120	OPGW-120
	6-Groove 10/9 FOCAS	6-Groove 10/9 FOCAS
DIAM =	0.738	0.738
WEIGHT =	0.518	0.518
TENSION (LBS)	AHEAD 6,000	BACK 6,000

LOADCASE	NESC HEAVY
WIND (PSF)	4
ICE (IN)	0.50
OLF ANG	1.65
OLF WIND	2.50
OLF WT	1.50

STR	ANGLE	WIND SPAN	WGT SPAN	NESC HEAVY H	L	V
BACK	0	364	298	527	-9900	576
AHEAD	0	364	298	527	9900	576
TOTALS	**0.0**	**728**	**596**	**1054**	**0**	**1151**

TITLE Omnipoint Site 360A, Fairfield, CT. 03/09/2000

STRUCT #910

Fiber Optic CONDUCTOR (Shield Wire)

	AHEAD	BACK
	OPGW-120	OPGW-120
	6-Groove 10/9 FOCAS	6-Groove 10/9 FOCAS
DIAM =	0.738	0.738
WEIGHT =	0.518	0.518
TENSION (LBS)	AHEAD 4,442	BACK 4,442

LOADCASE	HI WIND
WIND (PSF)	20
ICE (IN)	0.00
OLF ANG	1.15
OLF WIND	1.15
OLF WT	1.15

STR	ANGLE	WIND SPAN	WGT SPAN	HI WIND H	HI WIND L	HI WIND V
BACK	0	364	298	515	-5108	178
AHEAD	0	364	298	515	5108	178
TOTALS	**0.0**	**728**	**596**	**1030**	**0**	**355**

TITLE Omnipoint Site CT-360A, Fairfield, CT. 03/09/2000
STRUCT #910

CONDUCTOR

	AHEAD		BACK	
	DOVE		DOVE	
	556		556	
	26/7 ACSR		26/7 ACSR	
DIAM =	0.927		0.927	
WEIGHT =	0.765		0.765	
TENSION (LBS)	AHEAD	7,000	BACK	7,000

LOADCASE	NESC HEAVY
WIND (PSF)	4
ICE (IN)	0.50
OLF ANG	1.65
OLF WIND	2.50
OLF WT	1.50

STR	ANGLE	WIND SPAN	WGT SPAN	NESC HEAVY H	L	V
BACK	0	364	298	585	-11550	739
AHEAD	0	364	298	585	11550	739
TOTALS	**0.0**	**728**	**596**	**1169**	**0**	**1477**

TITLE OMNIPOINT SITE CT-360A, FAIRFIELD, CT. 03/09/2000

STRUCT #910

CONDUCTOR

	AHEAD		BACK	
	DOVE		DOVE	
	556		556	
	26/7 ACSR		26/7 ACSR	
DIAM =	0.927		0.927	
WEIGHT =	0.765		0.765	
TENSION (LBS)	AHEAD	5,403	BACK	5,403

LOADCASE	HI WIND
WIND (PSF)	20
ICE (IN)	0.00
OLF ANG	1.15
OLF WIND	1.15
OLF WT	1.15

STR	ANGLE	WIND SPAN	WGT SPAN	HI WIND H	HI WIND L	HI WIND V
BACK	0	364	298	647	-6213	262
AHEAD	0	364	298	647	6213	262
TOTALS	**0.0**	**728**	**596**	**1293**	**0**	**524**

TITLE OMNIPOINT SITE CT-360A, FAIRFIELD, CT 03/09/2000

STRUCT #910

SHIELD WIRE CONDUCTOR

	AHEAD	BACK
	11/32 CW	11/32 CW
	0.000	0.000
	7 #9 Cu Weld	7 #9 Cu Weld
DIAM =	0.343	0.343
WEIGHT =	0.257	0.257
TENSION (LBS)	AHEAD 3,600	BACK 3,600

LOADCASE	NESC HEAVY
WIND (PSF)	4
ICE (IN)	0.50
OLF ANG	1.65
OLF WIND	2.50
OLF WT	1.50

STR	ANGLE	WIND SPAN	WGT SPAN	NESC HEAVY H	L	V
BACK	0	364	298	407	-5940	349
AHEAD	0	364	298	407	5940	349
TOTALS	**0.0**	**728**	**596**	**815**	**0**	**698**

TITLE Omnipoint Site CT-360A, Fairfield, CT 03/09/2000

STRUCT #910

SHIELD WIRE CONDUCTOR

	AHEAD		BACK	
	11/32 CW		11/32 CW	
	0.000		0.000	
	7 #9 Cu Weld		7 #9 Cu Weld	
DIAM =	0.343		0.343	
WEIGHT =	0.257		0.257	
TENSION (LBS)	AHEAD	2,089	BACK	2,089

LOADCASE	HI WIND
WIND (PSF)	20
ICE (IN)	0.00
OLF ANG	1.15
OLF WIND	1.15
OLF WT	1.15

STR	ANGLE	WIND SPAN	WGT SPAN	HI WIND H	HI WIND L	HI WIND V
BACK	0	364	298	239	-2402	88
AHEAD	0	364	298	239	2402	88
TOTALS	**0.0**	**728**	**596**	**479**	**0**	**176**

ANTENNA MAST DESIGN

STRUCT. NO. 910
T-MOBILE CT11360A
WESTPORT TURNPIKE
FAIRFIELD, CT 06824

VICINITY MAP

NORTH

PROJECT SUMMARY

SITE ADDRESS:	WESTPORT TURNPIKE FAIRFIELD, CT 06824
PROJECT COORDINATES:	LAT: 41°–12'–05.80N LON: 73°–19'–55.40W ELEV:±195' AMSL
EVERSOURCE STRUCT NO:	911
EVERSOURCE CONTACT:	ROBERT GRAY 860.728.6125
T–MOBILE SITE REF.:	CT11360A
T–MOBILE CONTACT:	MARK RICHARD 860.692.7143
ANTENNA CL HEIGHT:	96'–0"
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD ROAD BRANFORD, CT 06405
CENTEK CONTACT:	CARLO F. CENTORE, PE 203.488.0580 ext. 122

SHEET INDEX

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	5/5/17	TJL	CFC	ISSUED FOR CONSTRUCTION
0	2/13/17	TJL	CFC	ISSUED FOR EVERSOURCE REVIEW

PROFESSIONAL ENGINEER SEAL

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

T-MOBILE
ANTENNA MAST DESIGN

CT11360A
EVERSOURCE STRUCTURE 910

WESTPORT TURNPIKE
FAIRFIELD, CT 06824

DATE:	2/13/17
SCALE:	AS SHOWN
JOB NO.	16159.11

TITLE SHEET

SHEET NO.
T-1
Sheet No. 1 of 12

DESIGN BASIS

1. GOVERNING CODE: 2012 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2016 CT STATE SUPPLEMENT.

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

3. DESIGN CRITERIA

   WIND LOAD: (ANTENNA MAST)
   NOMINAL DESIGN WIND SPEED (V) = 97 MPH (2016 CSBC: APPENDIX 'N')

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

GENERAL NOTES

1. REFER TO STRUCTURAL ANALYSIS AND REINFORCEMENT DESIGN PREPARED BY CENTEK ENGINEERING, INC., FOR T-MOBILE DATED 2/13/17.

2. TOWER GEOMETRY AND STRUCTURE MEMBER SIZES WERE OBTAINED FROM THE ORIGINAL TOWER DESIGN DRAWINGS PREPARED BY AMERICAN BRIDGE CO. DATED AUGUST 22, 1949.

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

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

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

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

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

8. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS SCOPE OF WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.

9. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK. THIS INCLUDES VERIFYING ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA. CONTRACTOR SHALL TAKE FIELD MEASUREMENTS NECESSARY TO ASSURE PROPER FIT OF ALL FINISHED WORK.

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

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

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

13. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	5/5/17	TJL	CFC	ISSUED FOR CONSTRUCTION
0	2/13/17	TJL	CFC	ISSUED FOR EVERSOURCE REVIEW

PROFESSIONAL ENGINEER SEAL

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

T-MOBILE
ANTENNA MAST DESIGN

CT11360A
EVERSOURCE STRUCTURE 910

WESTPORT TURNPIKE
FAIRFIELD, CT 06824

DATE:	2/13/17
SCALE:	AS SHOWN
JOB NO.	16159.11

DESIGN BASIS AND GENERAL NOTES

SHEET NO.
N-1
Sheet No. 2 of 12

EARTHWORK NOTES

1. COMPACTED GRAVEL FILL SHALL BE FURNISHED AND PLACED AS A FOUNDATION FOR STRUCTURES, WHERE SHOWN ON THE CONTRACT DRAWINGS OR DIRECTED BY THE ENGINEER.

2. CRUSHED STONE FILL SHALL BE PLACED IN 12" MAX. LIFTS AND CONSOLIDATED USING A HAND OPERATED VIBRATORY PLATE COMPACTOR WITH A MINIMUM OF 2 PASSES OF COMPACTOR PER LIFT.

3. COMPACTED GRAVEL FILL TO BE WELL GRADED BANK RUN GRAVEL MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1 ½"	100
No. 4	40–70
No. 100	5–20
No. 200	4–8

4. CRUSHED STONE TO BE UNIFORMLY GRADED, CLEAN, HARD PROCESS AGGREGATE MEETING THE FOLLOWING GRADATION REQUIREMENTS:

SIEVE DESIGNATION	% PASSING
1"	100
¾"	90–100
½"	0–15
⅜"	0–5

5. SELECT BACKFILL FOR FOUNDATION WALLS SHALL BE FREE OF ORGANIC MATERIAL, TOPSOIL, DEBRIS AND BOULDERS LARGER THAN 6".

6. GRAVEL AND GRANULAR FILL SHALL BE INSTALLED IN 10" MAX. LIFTS. COMPACTED TO 95% MIN. AT MAX. DRY DENSITY.

7. NON WOVEN GEOTEXTILE FOR SEPARATION PURPOSES SHALL BE MIRAFI 140N, OR ENGINEER APPROVED EQUAL.

FOUNDATION CONSTRUCTION NOTES

1. ALL FOOTINGS SHALL BE PLACED ON SUITABLE, COMPACTED SOIL HAVING ADEQUATE BEARING CAPACITY AND FREE OF ORGANIC CONTENT, CLAY, OR OTHER UNSUITABLE MATERIAL. ADDITIONAL EXCAVATION MAY BE REQUIRED BELOW FOOTING ELEVATIONS INDICATED IF UNSUITABLE MATERIAL IS ENCOUNTERED.

2. SUBGRADE PREPARATION: IF UNSUITABLE SOIL IS ENCOUNTERED, REMOVE ALL UNSUITABLE MATERIALS FROM BELOW PROPOSED STRUCTURE FOUNDATIONS AND COMPACT EXPOSED SOIL SURFACES. PLACE AND COMPACT APPROVED GRAVEL FILL. PLACEMENT OF ALL COMPACTED FILL MUST BE UNDER SUPERVISION OF AN APPROVED TESTING LABORATORY. FILL SHALL BE COMPACTED IN LAYERS NOT TO EXCEED 10" BEFORE COMPACTION. DETERMINE MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D1557–70 AND MAKE ONE (1) FIELD DENSITY TEST IN ACCORDANCE WITH ASTM D2167–66 FOR EACH 50 CUBIC YARDS OF COMPACTED FILL. BUT NOT LESS THAN ONE (1) PER LAYER, TO INSURE COMPACTION TO 95% OF MAX. DRY DENSITY.

3. ALL SOIL SURROUNDING AND UNDER ALL FOOTINGS SHALL BE KEPT REASONABLY DRY AND PROTECTED FROM FREEZING AND FROST ACTION DURING THE COURSE OF CONSTRUCTION.

4. WHERE GROUNDWATER IS ENCOUNTERED, DEWATERING SHALL BE ACCOMPLISHED CONTINUOUSLY AND COMPLETELY DURING FOUNDATION CONSTRUCTION. PROVIDE CRUSHED STONE AS REQUIRED TO STABILIZE FOOTING SUBGRADE.

5. ALL FOOTINGS ARE TO REST ON FIRM SOIL, REGARDLESS OF ELEVATIONS SHOWN ON THE DRAWINGS, BUT IN NO CASE MAY FOOTING ELEVATIONS BE HIGHER THAN INDICATED ON THE FOUNDATION PLAN, UNLESS SPECIFICALLY DIRECTED BY THE ENGINEER.

6. FOUNDATION WATERPROOFING AND DAMPPROOFING SHALL COMPLY WITH BUILDING CODE REQUIREMENTS UNLESS A MORE SUBSTANTIAL SYSTEM IS INDICATED OR SPECIFIED.

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EARTHWORK & FOUNDATION CONSTRUCTION NOTES

SHEET NO.
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Sheet No. 3 of 12

CONCRETE CONSTRUCTION

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE FOLLOWING STANDARDS:

   ACI 211 – STANDARD PRACTICE FOR SELECTING PROPORTIONS FOR NORMAL AND HEAVYWEIGHT CONCRETE.

   ACI 301 – SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS.

   ACI 302 – GUIDE FOR CONCRETE FLOOR AND SLAB CONSTRUCTION

   ACI 304 – RECOMMENDED PRACTICE FOR MEASURING, MIXING, TRANSPORTING, AND PLACING CONCRETE.

   ACI 306.1 – STANDARD SPECIFICATION FOR COLD WEATHER CONCRETING

   ACI 318 – BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.

2. CONCRETE SHALL BE AIR ENTRAINED AND SHALL DEVELOP COMPRESSIVE STRENGTH IN 28 DAYS AS FOLLOWS:

   ALL CONCRETE 4,000 PSI

3. REINFORCING STEEL SHALL BE 60,000 PSI YIELD STRENGTH.

4. ALL DETAILING, FABRICATION, AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, MUST FOLLOW THE LATEST ACI CODE AND LATEST ACI "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES".

5. CONCRETE COVER OVER REINFORCING SHALL BE 3 INCHES.

6. NO STEEL WIRE, METAL FORM TIES, OR ANY OTHER METAL SHALL REMAIN WITHIN THE REQUIRED COVER OF ANY CONCRETE SURFACE.

7. ALL REINFORCEMENT SHALL BE CONTINUOUS. SPLICES WILL NOT BE ALLOWED.

8. NO TACK WELDING OF REINFORCING WILL BE PERMITTED.

9. NO CALCIUM CHLORIDE OR ADMIXTURES CONTAINING MORE THAN 1 % CHLORIDE BY WEIGHT OF ADMIXTURE SHALL BE USED IN THE CONCRETE.

10. TOP OF FOOTING SURFACES SHALL RECEIVE A UNIFORM FLOAT FINISH. CURE FOOTING SURFACE WITH SONNEBORN KURE–N–SEAL WB OR APPROVED EQUAL, APPLIED AS RECOMMENDED BY MANUFACTURER.

11. PREPARATION OF SURFACES WHERE NEW CONCRETE WILL INTERFACE WITH EXISTING CAISSON:
    THE PERIMETER OF THE EXISTING CAISSON SHALL BE THOROUGHLY CLEANED OF ALL DIRT AND DELETERIOUS MATERIALS PRIOR TO APPLICATION OF BONDING AGENT. CONTRACTOR SHALL NOTIFY NORTHEAST UTILITIES 24 HOURS IN ADVANCE OF CLEANING.

    SIKADUR 32, HI–MOD OR ENGINEER APPROVED EQUAL SHALL BE APPLIED, IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, TO ALL INTERFACING SURFACES BEFORE CONCRETE IS PLACED.

    CAULK JOINT BETWEEN EXISTING CONCRETE PIER AND NEW CONCRETE WITH SIKAFLEX 1–A BY SIKA CORP. OR ENGINEER APRROVED EQUAL.

    SUBMIT MANUFACTURER'S PRODUCT SPECIFICATION DATA AND INSTALLATION INSTRUCTIONS FOR REVIEW AND APPROVAL BY OWNER.

12. NEW CONCRETE FOOTING SHALL BE ALLOWED TO CURE AT LEAST 14 DAYS BEFORE WIRELESS ANTENNA MOUNT, ANTENNAS, AND CABLES ARE INSTALLED.

13. INSPECTION AND TESTING OF CONCRETE WORK SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY, APPROVED AND PAID BY THE OWNER. THE INSPECTOR SHALL OBSERVE THE CONDITION OF SOILS AND FORMWORK BEFORE FOOTINGS ARE PLACED, SIZE, SPACING AND LOCATION OF REINFORCEMENT, AND PLACEMENT OF CONCRETE.

14. THE TESTING COMPANY SHALL ALSO OBTAIN A MINIMUM OF THREE (3) COMPRESSIVE STRENGTH TEST SPECIMENS FOR EACH CONCRETE MIX DESIGN. ONE SPECIMEN TESTED AT 7 DAYS, ONE AT 28 DAYS, AND ONE HELD IN RESERVE FOR FUTURE TESTING, IF NEEDED.

15. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE OWNER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

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CONCRETE CONSTRUCTION NOTES

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STRUCTURAL STEEL

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

2. MATERIAL SPECIFICATIONS

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI).
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 GRADE B (FY = 35 KSI)

3. FASTENER SPECIFICATIONS

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

4. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.

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

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

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

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

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

10. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.

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

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

13. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.

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

15. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.

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

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

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

19. FABRICATE BEAMS WITH MILL CAMBER UP.

20. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.

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

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STRUCTURAL NOTES

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MODIFICATION INSPECTION REPORT REQUIREMENTS

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

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

GENERAL

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

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

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

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

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

MODIFICATION INSPECTOR (MI)

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

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

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

GENERAL CONTRACTOR (GC)

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

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

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

CORRECTION OF FAILING MODIFICATION INSPECTION

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

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

REQUIRED PHOTOGRAPHS

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

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

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MODIFICATION INSPECTION REQUIREMENTS

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MI-1
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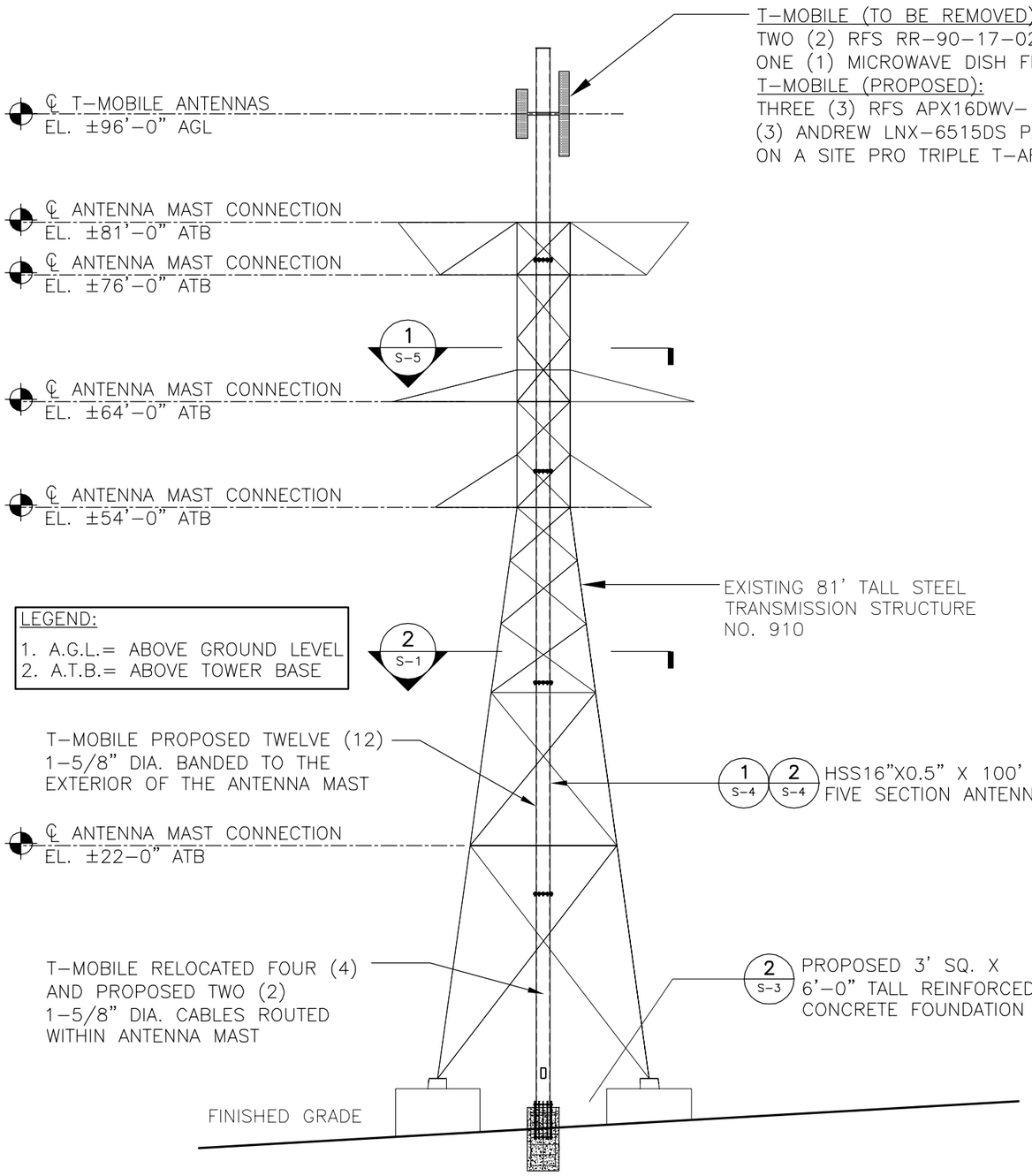
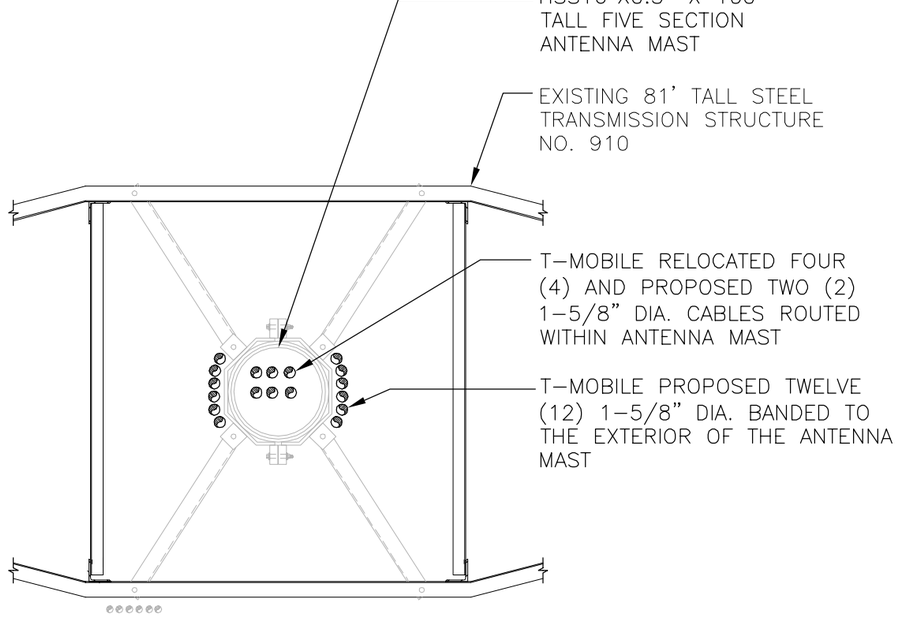


1 S-1 **TOWER & ANTENNA MAST ELEVATION**

SCALE: NOT TO SCALE



2 S-1 **FEEDLINE PLAN**

SCALE: NOT TO SCALE

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TOWER ELEVATION AND FEEDLINE PLAN

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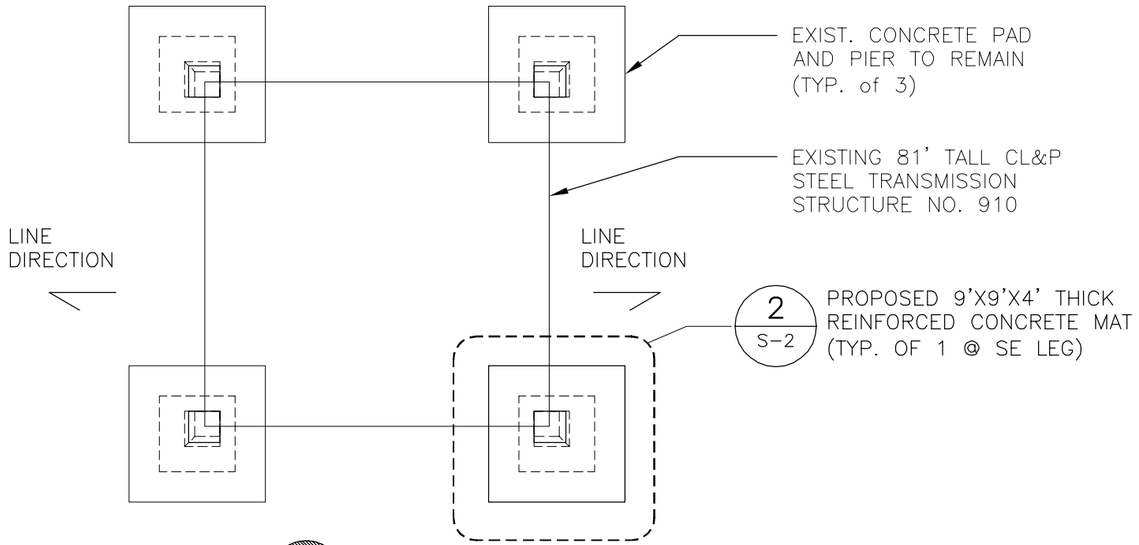
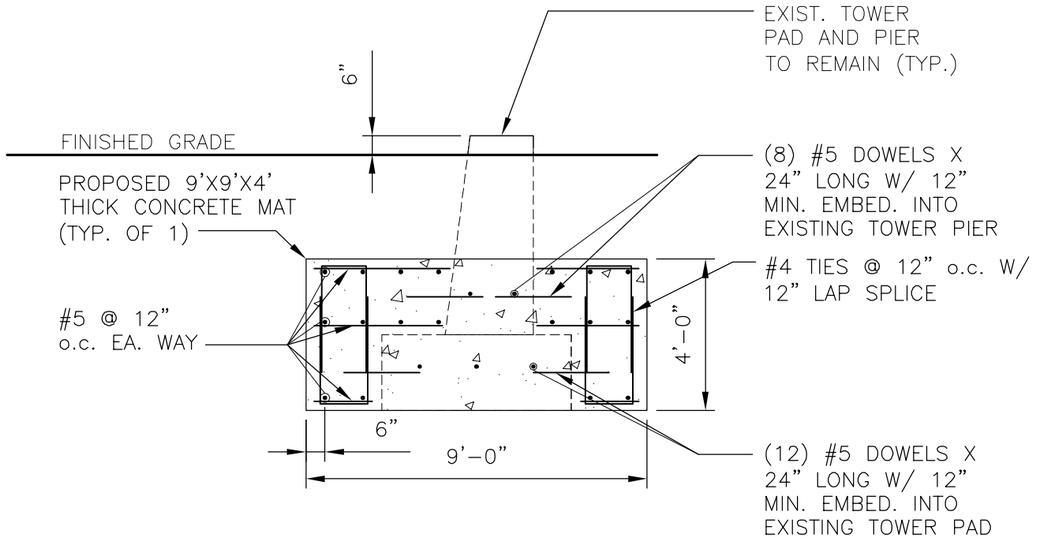
FOUNDATION PLAN NOTES:

1. THE CONTRACTOR SHALL LIMIT THE FOUNDATION REINFORCEMENT WORK TO ONE TOWER LEG AT A TIME. CONSTRUCTION SHALL BE CONDUCTED IN WIND SPEEDS LESS THAN 15 MPH AND IN LOW ICE ACCUMULATION PERIODS. IF HIGHER WIND SPEED OR ICE EVENT IS EXPECTED, THE EXCAVATION AREA SHALL BE FILLED WITH COMPACT FILL MATERIAL.
2. CONTRACTOR SHALL USE EXTREME CAUTION DURING EXCAVATION OF EXISTING FOUNDATION STRUCTURE. IMPLEMENT HAND DIGGING WHERE PRACTICABLE.
3. PROTECT EXISTING TOWER GROUND WIRE(S) FROM DAMAGE DUE TO NEW CONSTRUCTION. CONTRACTOR SHALL NOTIFY NU IF GROUNDING SYSTEM BECOMES DAMAGED OR DISCONNECTED.
4. NOTIFY EVERSOURCE REPRESENTATIVE TO BE PRESENT UPON COMPLETION OF REBAR PLACEMENT.



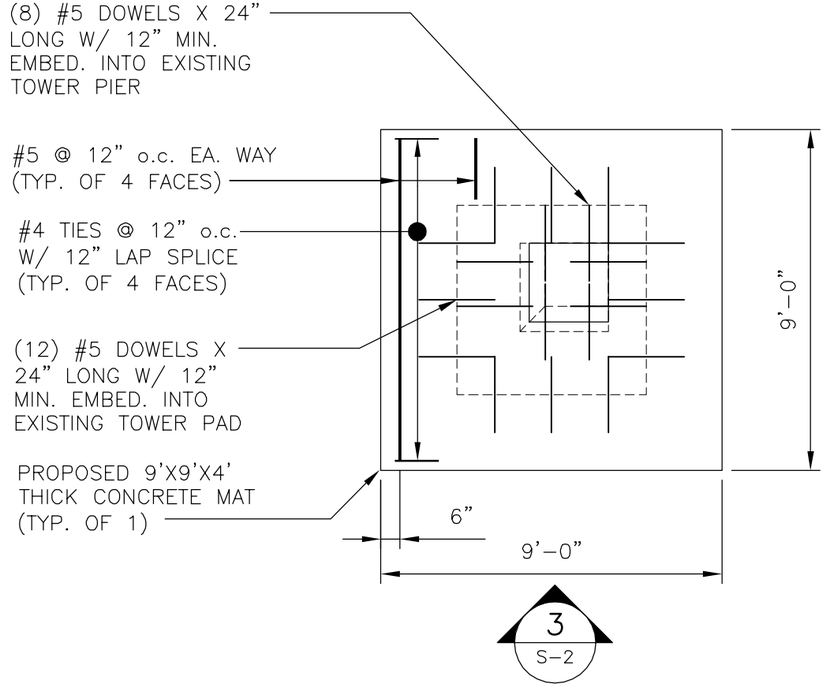
1 S-2 KEY PLAN

SCALE: NOT TO SCALE



3 S-2 FOUNDATION REINFORCEMENT DETAIL

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



2 S-2 FOUNDATION REINFORCEMENT PLAN

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

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TOWER FOUNDATION REINFORCEMENT DETAILS

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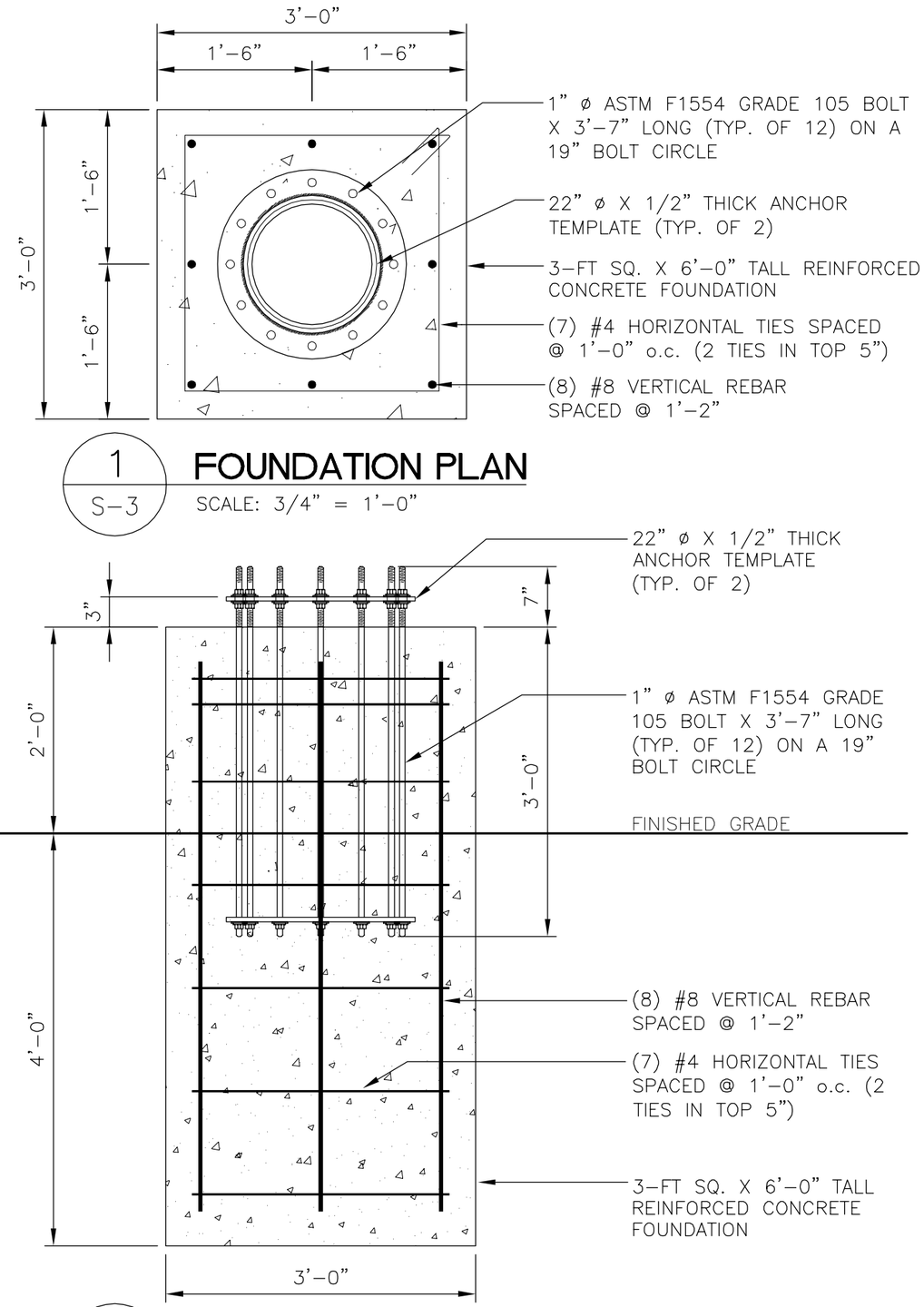

1 / S-3 **FOUNDATION PLAN**

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

2 / S-3 **FOUNDATION ELEVATION**

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

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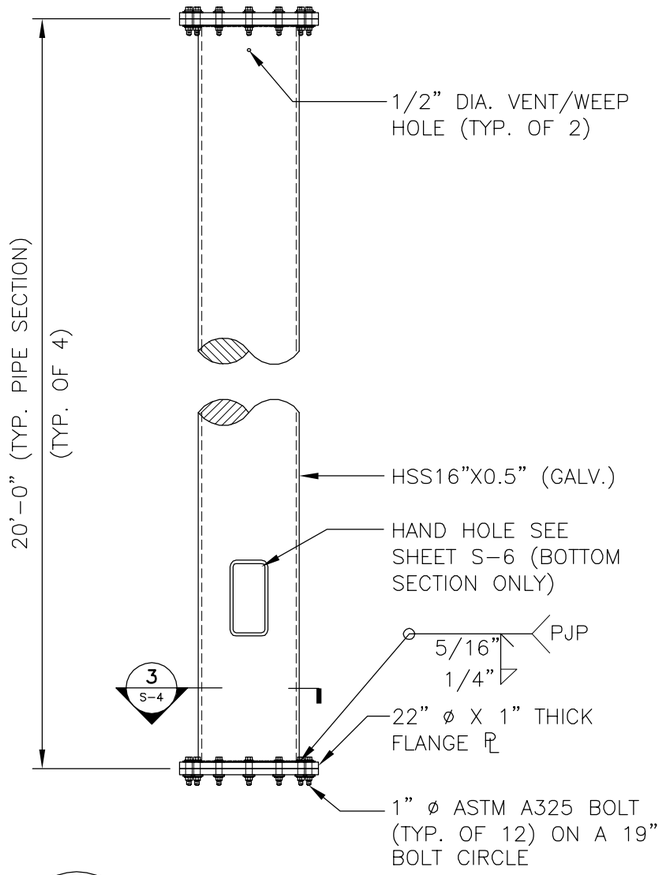
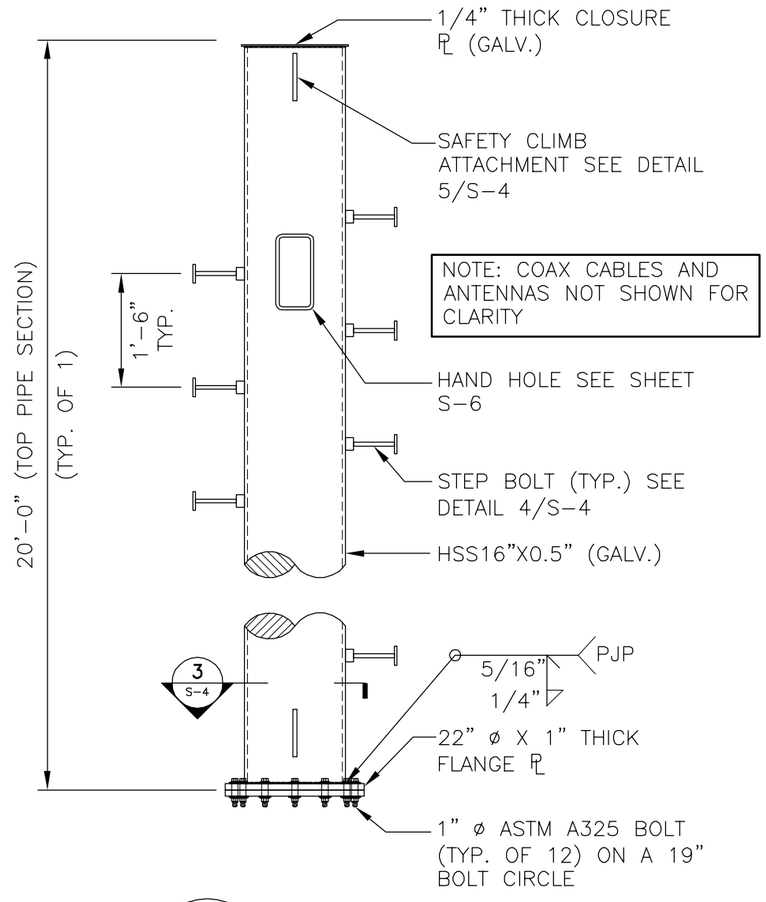


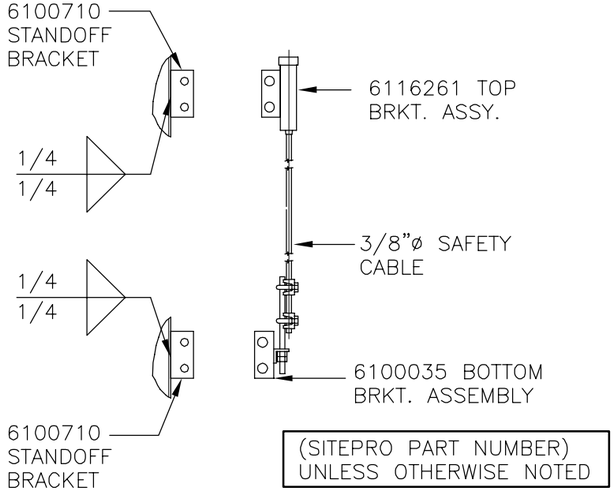
2 / S-4 TYP. PIPE ELEVATION

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



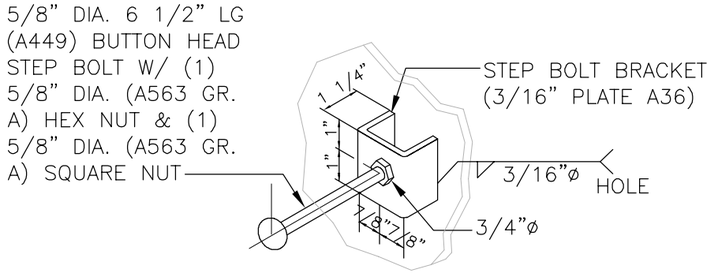
1 / S-4 TOP PIPE ELEVATION

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



5 / S-4 SAFETY CLIMB DETAIL

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



4 / S-4 STEP BOLT DETAIL

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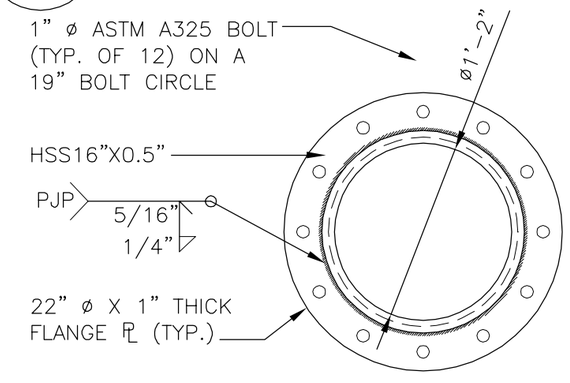

3 / S-4 FLANGE PL DETAIL

SCALE: 1" = 1'-0"

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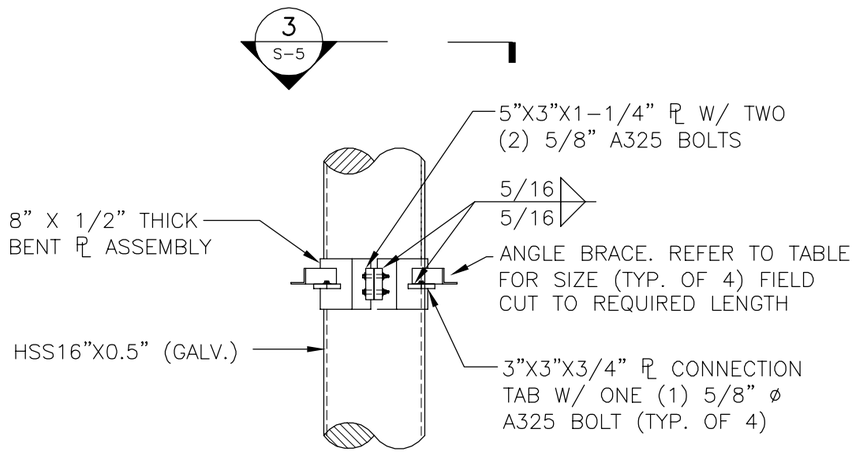
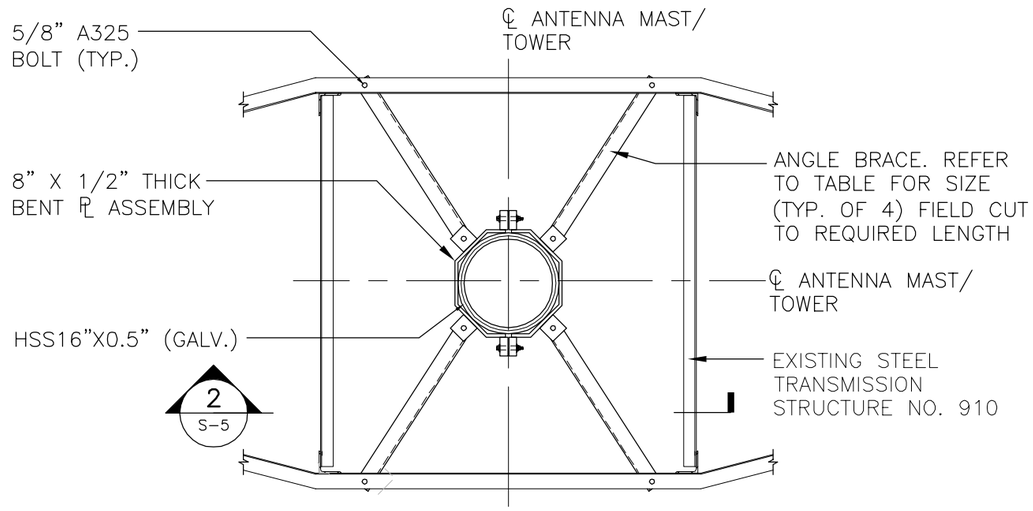




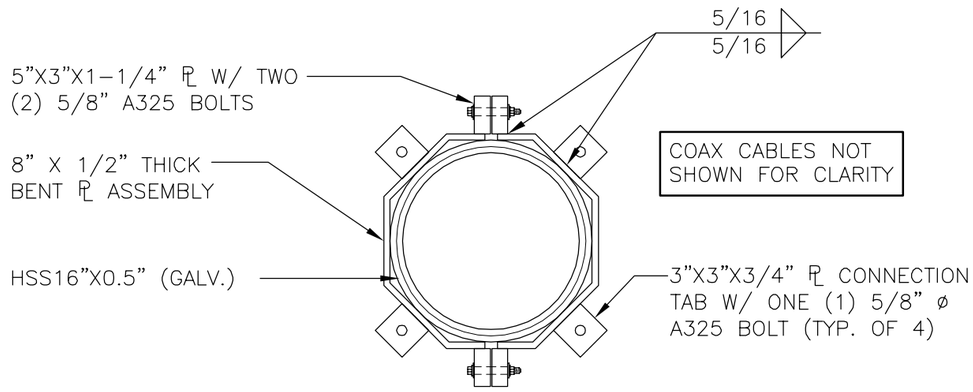
2 S-5 BRACKET ELEVATION

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

1 S-5 BRACKET PLAN

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

CONNECTION ELEVATION	ANGLE BRACE SIZE
81-FT (ATB)	L2-1/2X2-1/2-1/4
76-FT (ATB)	L2-1/2X2-1/2-1/4
64-FT (ATB)	L2-1/2X2-1/2-1/4
54-FT (ATB)	L2-1/2X2-1/2-1/4
22-FT (ATB)	L3-1/2X3-1/2-1/4



3 S-5 BRACKET DETAIL

SCALE: 1" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	5/5/17	TJL	CFC	ISSUED FOR CONSTRUCTION
0	2/13/17	TJL	CFC	ISSUED FOR EVERSOURCE REVIEW

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ANTENNA MAST DESIGN

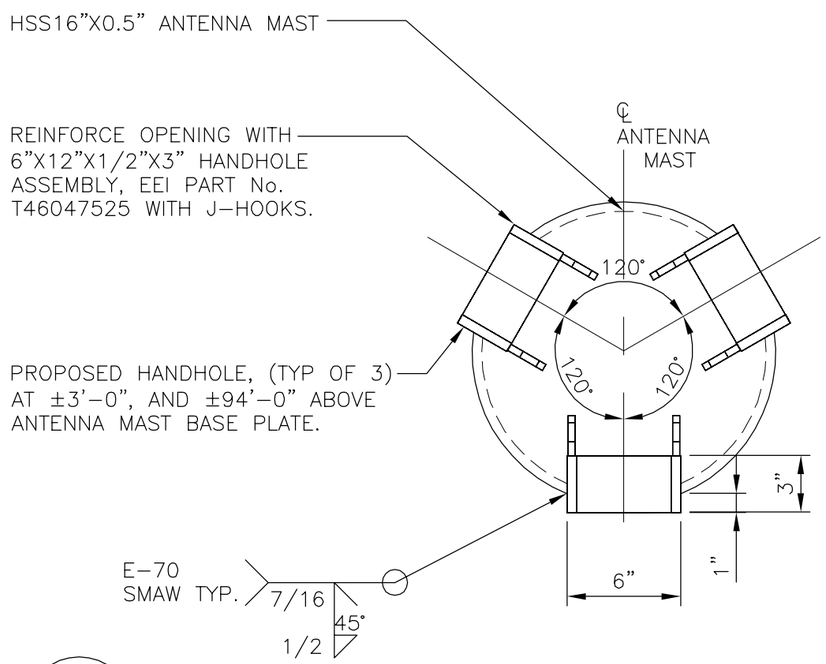
CT11360A
EVERSOURCE STRUCTURE 910

WESTPORT TURNPIKE
FAIRFIELD, CT 06824

DATE:	2/13/17
SCALE:	AS SHOWN
JOB NO.	16159.11

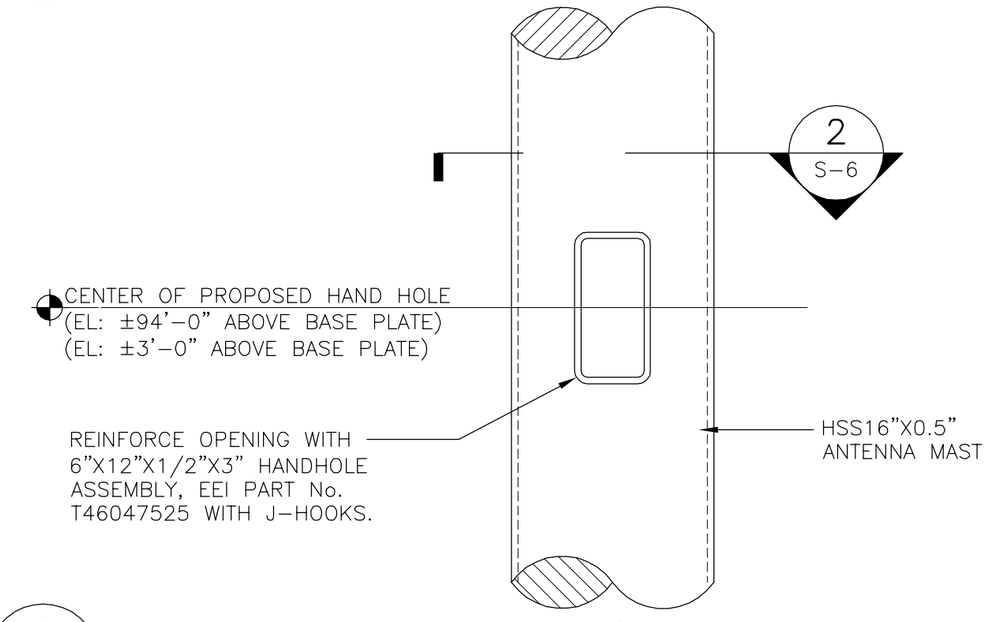
ANTENNA MAST CONNECTION DETAILS

SHEET NO.
S-5
Sheet No. 11 of 12



2 / S-6 **PROPOSED HAND HOLE (SECTION)**

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



1 / S-6 **PROPOSED HAND HOLE (ELEVATION)**

SCALE: 1" = 1'-0"

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
1	5/5/17	TJL	CFC	ISSUED FOR CONSTRUCTION
0	2/13/17	TJL	CFC	ISSUED FOR EVERSOURCE REVIEW

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HAND HOLE DETAILS

SHEET NO.
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Sheet No. 12 of 12

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Subject:	Loads on AT&T Equipmnet Structure 910
Location:	Fairfield, CT
Rev. 0: 2/13/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16159.11

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 =	$z_{T\text{-}Mo} := 96$	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)
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)

Mast Based on Max 20-ft Section per 2.6.9.1.3

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)

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

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

$K_{iz} := \left(\frac{z_{T\text{-}Mo}}{33}\right)^{0.1} = 1.113$

$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.086$

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

Velocity Pressure w/o Ice Antennas = $qz_{T\text{-}Mo} := 0.00256 \cdot K_d \cdot Kz_{T\text{-}Mo} \cdot V^2 \cdot I_{Wind} = 29.544$

Velocity Pressure with Ice Antennas = $qz_{ice.T\text{-}Mo} := 0.00256 \cdot K_d \cdot Kz_{T\text{-}Mo} \cdot V_i^2 \cdot I_{Wind\_w\_Ice} = 6.826$

$K_{izMast5} := \left(\frac{z_{Mast5}}{33}\right)^{0.1} = 1.106$

$t_{izMast5} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{izMast5} \cdot K_{zt}^{0.35} = 2.073$

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

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

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

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

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

Development of Wind & Ice Load on Mast

Mast Data: (HSS16x0.5) (User Input)

Mast Shape = Round (User Input)

Mast Diameter = $D_{mast} := 16$ in (User Input)

Mast Length = $L_{mast} := 100$ ft (User Input)

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

Velocity Coefficient = $C := \sqrt{I \cdot Kz_{Mast1}} \cdot V \cdot \frac{D_{mast}}{12} = 114$

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

Wind Load (without ice)

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.333$ sf/ft

Total Mast Wind Force =	$qz_{Mast5} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 31$	plf	**BLC 5**
Total Mast Wind Force =	$qz_{Mast4} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 30$	plf	**BLC 5**
Total Mast Wind Force =	$qz_{Mast3} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 28$	plf	**BLC 5**
Total Mast Wind Force =	$qz_{Mast2} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 25$	plf	**BLC 5**
Total Mast Wind Force =	$qz_{Mast1} \cdot G_H \cdot CF_{mast} \cdot A_{mast} = 20$	plf	**BLC 5**

Wind Load (with ice)

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast5})}{12} = 1.679$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast5} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 9$ plf **BLC 4**

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast4})}{12} = 1.67$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast4} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 9$ plf **BLC 4**

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast3})}{12} = 1.659$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast3} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 8$ plf **BLC 4**

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast2})}{12} = 1.643$ sf/ft

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

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{(D_{mast} + 2 \cdot t_{izMast1})}{12} = 1.611$ sf/ft

Total Mast Wind Force w/ Ice = $qz_{ice.Mast1} \cdot G_H \cdot CF_{mast} \cdot AICE_{mast} = 6$ 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 =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast5}\cdot 2\right)^2 - D_{mast}^2\right] = 117.7$		sq in	
Weight of Ice on Mast =	$W_{ICEmast5} := Id\cdot\frac{Ai_{mast}}{144} = 46$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast4}\cdot 2\right)^2 - D_{mast}^2\right] = 114.4$		sq in	
Weight of Ice on Mast =	$W_{ICEmast4} := Id\cdot\frac{Ai_{mast}}{144} = 45$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast3}\cdot 2\right)^2 - D_{mast}^2\right] = 110.2$		sq in	
Weight of Ice on Mast =	$W_{ICEmast3} := Id\cdot\frac{Ai_{mast}}{144} = 43$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast2}\cdot 2\right)^2 - D_{mast}^2\right] = 104.2$		sq in	
Weight of Ice on Mast =	$W_{ICEmast2} := Id\cdot\frac{Ai_{mast}}{144} = 41$		plf	**BLC 3**
Ice Area per Linear Foot =	$Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + t_{izMast1}\cdot 2\right)^2 - D_{mast}^2\right] = 92.3$		sq in	
Weight of Ice on Mast =	$W_{ICEmast1} := Id\cdot\frac{Ai_{mast}}{144} = 36$		plf	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APX16DWV-16DWVS		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)
Antenna Width =	$W_{ant} := 13$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 45$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 15.1$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 773$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 7.2$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 21.5$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 254$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 135$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5265$		cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 171$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 512$	lbs	**BLC 3**

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Andrew LNX-6515DS			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 96.4$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 45$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 3$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 8.1$			
Antenna Force Coefficient =	$Ca_{ant} = 1.44$			

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 8$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 23.9$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ant} = 1369$	lbs	**BLC 5**

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 11.2$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 33.7$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot A_{ICEant} = 446$	lbs	**BLC 4**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 135$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 8145$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 327$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 980$	lbs	**BLC 3**

Development of Wind & Ice Load on Antenna Mounts

Mount Data:

Mount Type:	Site Pro Monopole Triple T-Arm			
Mount Shape =	Flat		(User Input)	
Mount Projected Surface Area =	$CaAa := 10$	sf	(User Input)	
Mount Projected Surface Area w/ Ice =	$CaAa_{ice} := 17$	sf	(User Input)	
Mount Weight =	$WT_{mnt} := 875$	lbs	(User Input)	
Mount Weight w/ Ice =	$WT_{mnt.ice} := 1500$	lbs		

Wind Load (without ice)

Total Mount Wind Force =	$F_{mnt} := qz_{T\text{-}Mo} \cdot G_H \cdot CaAa = 399$	lbs	**BLC 5**

Wind Load (with ice)

Total Mount Wind Force =	$Fi_{mnt} := qz_{ice.T\text{-}Mo} \cdot G_H \cdot CaAa_{ice} = 157$	lbs	**BLC 4**

Gravity Loads (without ice)

Weight of All Mounts =	$WT_{mnt} = 875$	lbs	**BLC 2**

Gravity Loads (ice only)

Weight of Ice on All Mounts =	$WT_{mnt.ice} - WT_{mnt} = 625$	lbs	**BLC 3**

Development of Wind & Ice Load on Coax Cables

Coax Cable Data:

Coax Type =	HELIAX 1-5/8"			
Shape =	Round		(User Input)	
Coax Outside Diameter =	$D_{coax} := 1.98$	in	(User Input)	
Coax Cable Length =	$L_{coax} := 100$	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 =	$Ne_{coax} := 12$		(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	$WT_{coax} := Wt_{coax} \cdot N_{coax} = 19$	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 Brace Member

Member Data: L2.5x2.5x1/4

Antenna Shape = Flat (User Input)

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

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

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

Length = $L_{mem} := 42$ in (User Input)

Member Aspect Ratio = $Ar_{mem} := \frac{L_{mem}}{W_{mem}} = 16.8$

Member Force Coefficient = $Ca_{mem} = 1.73$

Wind Load (without ice)

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

Total Member Wind Force = $F_{mem} := qz_{Mast4} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 13$ 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 = $Fi_{mem} := qz_{ice.Mast4} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 8$ plf **BLC 4**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot t_{izMast5}\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot t_{izMast5}\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 38 \text{ sq in}$$

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 15$ plf **BLC 3**

Development of Wind & Ice Load on Brace Member

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

Antenna Shape =	Flat		(User Input)
Height =	$H_{mem} := 3.5$	in	(User Input)
Width =	$W_{mem} := 3.5$	in	(User Input)
Thickness =	$t_{mem} := 0.25$	in	(User Input)
Length =	$L_{mem} := 42$	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 = $A_{mem} := \frac{H_{mem}}{12} = 0.3$ sf/ft

Total Member Wind Force = $F_{mem} := qz_{Mast4} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 17$ 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 = $Fi_{mem} := qz_{ice.Mast4} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 9$ plf **BLC 4**

Gravity Load (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear foot =

$$Ai_{mem} := \left[\left(H_{mem} + 2 \cdot t_{izMast5}\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot t_{izMast5}\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 46 \text{ sq in}$$

Weight of Ice on Member = $W_{ICE.mem} := Id \cdot \frac{Ai_{mem}}{144} = 18$ plf **BLC 3**

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

Subject: **Analysis of TIA/EIA Wind and Ice Loads for Analysis of Mast Only**
Tabulated Load Cases
Location: **Fairfield, CT**
Date: 2/13/17 Prepared by: T.J.L. Checked by: C.F.C. Job No. 16159.11

Load Case	Description
1	Self Weight (Mast)
2	Weight of Appurtenances
3	Weight of Ice Only
4	TIA Wind with Ice X-direction
5	TIA Wind X-direction
6	TIA Wind with Ice Z-direction
7	TIA Wind Z-direction

Footnotes:

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

Location: **Fairfield, CT**

Date: 2/13/17 Prepared by: T.J.L. Checked by: C.F.C. Job No. 16159.11

Load Combination	Description	Envelope Soultion	Wind Factor	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.2D + 1.6W (X-direction)		1		1	1.2	2	1.2	5	1.6				
2	0.9D + 1.6W (X-direction)		1		1	0.9	2	0.9	5	1.6				
3	1.2D + 1.0Di + 1.0Wi (X-direction)		1		1	1.2	2	1.2	3	1.0	4	1.0		
4	1.2D + 1.6W (Z-direction)		1		1	1.2	2	1.2	7	1.6				
5	0.9D + 1.6W (Z-direction)		1		1	0.9	2	0.9	7	1.6				
6	1.2D + 1.0Di + 1.0Wi (Z-direction)		1		1	1.2	2	1.2	3	1.0	6	1.0		

Footnotes:
BLC = Basic Load Case
D = Dead Load
Di = Dead Load of Ice
W = Wind Load
W = Wind Load w/ Ice

Global

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

Hot Rolled Steel Code	AISC 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-97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-02
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building

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

Global, Continued

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

Footing Overturning Safety Factor	1.5
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	0
Footing Concrete f'c (ksi)	3
Footing Concrete Ec (ksi)	4000
Lamda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	3.5
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

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

Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp t...	Lcomp b...	L-torqu...	Kyy	Kzz	Cb	Function
1	M1	Antenna Mast	100	Segment	Segment			Segment				Lateral
2	M2	L3.5x3.5x1/4	9.82									Lateral
3	M3	L3.5x3.5x1/4	9.82									Lateral
4	M4	L3.5x3.5x1/4	9.82									Lateral
5	M5	L3.5x3.5x1/4	9.82									Lateral
6	M6	L2.5x2.5x1/4	3.536									Lateral
7	M7	L2.5x2.5x1/4	3.536									Lateral
8	M8	L2.5x2.5x1/4	3.536									Lateral
9	M9	L2.5x2.5x1/4	3.536									Lateral
10	M10	L2.5x2.5x1/4	3.536									Lateral
11	M11	L2.5x2.5x1/4	3.536									Lateral
12	M12	L2.5x2.5x1/4	3.536									Lateral
13	M13	L2.5x2.5x1/4	3.536									Lateral
14	M14	L2.5x2.5x1/4	3.536									Lateral
15	M15	L2.5x2.5x1/4	3.536									Lateral
16	M16	L2.5x2.5x1/4	3.536									Lateral
17	M17	L2.5x2.5x1/4	3.536									Lateral
18	M18	L2.5x2.5x1/4	3.536									Lateral
19	M19	L2.5x2.5x1/4	3.536									Lateral
20	M20	L2.5x2.5x1/4	3.536									Lateral
21	M21	L2.5x2.5x1/4	3.536									Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design ...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	Antenna Mast	HSS16x0.500	Beam	Pipe	A500 Gr.42	Typical	22.7	685	685	1370
2	L3.5x3.5x1/4	L3.5x3.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.7	2	2	.039
3	L2.5x2.5x1/4	L2.5x2.5x4	Beam	Single Angle	A36 Gr.36	Typical	1.19	.692	.692	.026

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design R...
1	M1	N1	N8			Antenna Mast	Beam	Pipe	A500 Gr.42	Typical
2	M2	N2	N9			L3.5x3.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
3	M3	N2	N10			L3.5x3.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
4	M4	N2	N11			L3.5x3.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
5	M5	N2	N12			L3.5x3.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
6	M6	N4	N17			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
7	M7	N4	N18			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
8	M8	N4	N19			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
9	M9	N4	N20			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
10	M10	N5	N21			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
11	M11	N5	N22			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
12	M12	N5	N23			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
13	M13	N5	N24			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
14	M14	N6	N25			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
15	M15	N6	N26			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
16	M16	N6	N27			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
17	M17	N6	N28			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
18	M18	N7	N29			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Shape	Type	Design List	Material	Design R...
19	M19	N7	N30			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
20	M20	N7	N31			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical
21	M21	N7	N32			L2.5x2.5x1/4	Beam	Single Angle	A36 Gr.36	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From ...
1	N1	0	0	0	0	
2	N2	0	22	0	0	
3	N4	0	54	0	0	
4	N5	0	64	0	0	
5	N6	0	76	0	0	
6	N7	0	81	0	0	
7	N8	0	100	0	0	
8	N9	6.944	22	6.944	0	
9	N10	6.944	22	-6.944	0	
10	N11	-6.944	22	6.944	0	
11	N12	-6.944	22	-6.944	0	
12	N17	2.5	54	2.5	0	
13	N18	2.5	54	-2.5	0	
14	N19	-2.5	54	2.5	0	
15	N20	-2.5	54	-2.5	0	
16	N21	2.5	64	2.5	0	
17	N22	2.5	64	-2.5	0	
18	N23	-2.5	64	2.5	0	
19	N24	-2.5	64	-2.5	0	
20	N25	2.5	76	2.5	0	
21	N26	2.5	76	-2.5	0	
22	N27	-2.5	76	2.5	0	
23	N28	-2.5	76	-2.5	0	
24	N29	2.5	81	2.5	0	
25	N30	2.5	81	-2.5	0	
26	N31	-2.5	81	2.5	0	
27	N32	-2.5	81	-2.5	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	N12	Reaction	Reaction	Reaction				
2	N11	Reaction	Reaction	Reaction				
3	N9	Reaction	Reaction	Reaction				
4	N10	Reaction	Reaction	Reaction				
5	N18	Reaction	Reaction	Reaction				
6	N22	Reaction	Reaction	Reaction				
7	N19	Reaction	Reaction	Reaction				
8	N23	Reaction	Reaction	Reaction				
9	N17	Reaction	Reaction	Reaction				
10	N20	Reaction	Reaction	Reaction				
11	N21	Reaction	Reaction	Reaction				
12	N25	Reaction	Reaction	Reaction				
13	N1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	

Joint Boundary Conditions (Continued)

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
14	N5							
15	N31	Reaction	Reaction	Reaction				
16	N32	Reaction	Reaction	Reaction				
17	N29	Reaction	Reaction	Reaction				
18	N30	Reaction	Reaction	Reaction				
19	N27	Reaction	Reaction	Reaction				
20	N28	Reaction	Reaction	Reaction				
21	N26	Reaction	Reaction	Reaction				
22	N24	Reaction	Reaction	Reaction				

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.135	96
2	M1	Y	-.135	96
3	M1	Y	-.875	96

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.512	96
2	M1	Y	-.98	96
3	M1	Y	-.625	96

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.254	96
2	M1	X	.446	96
3	M1	X	.157	96

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.773	96
2	M1	X	1.369	96
3	M1	X	.399	96

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.254	96
2	M1	Z	.446	96
3	M1	Z	.157	96

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.773	96
2	M1	Z	1.369	96
3	M1	Z	.399	96

Joint Loads and Enforced Displacements

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

Member Distributed Loads (BLC 2 : Weight of Appurtenances)

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

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Y	-.046	-.046	80	100
2	M1	Y	-.045	-.045	60	80
3	M1	Y	-.043	-.043	40	60
4	M1	Y	-.041	-.041	20	40
5	M1	Y	-.036	-.036	0	20
6	M1	Y	-.187	-.187	0	0
7	M2	Y	-.018	-.018	0	0
8	M3	Y	-.018	-.018	0	0
9	M4	Y	-.018	-.018	0	0
10	M5	Y	-.018	-.018	0	0
11	M6	Y	-.015	-.015	0	0
12	M7	Y	-.015	-.015	0	0
13	M8	Y	-.015	-.015	0	0
14	M9	Y	-.015	-.015	0	0
15	M10	Y	-.015	-.015	0	0
16	M11	Y	-.015	-.015	0	0
17	M12	Y	-.015	-.015	0	0
18	M13	Y	-.015	-.015	0	0
19	M14	Y	-.015	-.015	0	0
20	M15	Y	-.015	-.015	0	0
21	M16	Y	-.015	-.015	0	0
22	M17	Y	-.015	-.015	0	0
23	M18	Y	-.015	-.015	0	0
24	M19	Y	-.015	-.015	0	0
25	M20	Y	-.015	-.015	0	0
26	M21	Y	-.015	-.015	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.009	.009	80	100
2	M1	X	.009	.009	60	80
3	M1	X	.008	.008	40	60
4	M1	X	.007	.007	20	40
5	M1	X	.006	.006	0	20
6	M1	X	.007	.007	0	0
7	M4	X	.009	.009	0	0
8	M5	X	.009	.009	0	0
9	M2	X	.009	.009	0	0
10	M3	X	.009	.009	0	0
11	M8	X	.008	.008	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
12	M9	X	.008	.008	0	0
13	M6	X	.008	.008	0	0
14	M7	X	.008	.008	0	0
15	M12	X	.008	.008	0	0
16	M13	X	.008	.008	0	0
17	M10	X	.008	.008	0	0
18	M11	X	.008	.008	0	0
19	M16	X	.008	.008	0	0
20	M17	X	.008	.008	0	0
21	M14	X	.008	.008	0	0
22	M15	X	.008	.008	0	0
23	M20	X	.008	.008	0	0
24	M21	X	.008	.008	0	0
25	M18	X	.008	.008	0	0
26	M19	X	.008	.008	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.031	.031	80	100
2	M1	X	.03	.03	60	80
3	M1	X	.028	.028	40	60
4	M1	X	.025	.025	20	40
5	M1	X	.02	.02	0	20
6	M1	X	.015	.015	0	0
7	M4	X	.017	.017	0	0
8	M5	X	.017	.017	0	0
9	M2	X	.017	.017	0	0
10	M3	X	.017	.017	0	0
11	M8	X	.013	.013	0	0
12	M9	X	.013	.013	0	0
13	M6	X	.013	.013	0	0
14	M7	X	.013	.013	0	0
15	M12	X	.013	.013	0	0
16	M13	X	.013	.013	0	0
17	M10	X	.013	.013	0	0
18	M11	X	.013	.013	0	0
19	M16	X	.013	.013	0	0
20	M17	X	.013	.013	0	0
21	M14	X	.013	.013	0	0
22	M15	X	.013	.013	0	0
23	M20	X	.013	.013	0	0
24	M21	X	.013	.013	0	0
25	M18	X	.013	.013	0	0
26	M19	X	.013	.013	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.009	.009	80	100
2	M1	Z	.009	.009	60	80
3	M1	Z	.008	.008	40	60
4	M1	Z	.007	.007	20	40

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
5	M1	Z	.006	.006	0	20
6	M1	Z	.007	.007	0	0
7	M4	Z	.009	.009	0	0
8	M5	Z	.009	.009	0	0
9	M2	Z	.009	.009	0	0
10	M3	Z	.009	.009	0	0
11	M8	Z	.008	.008	0	0
12	M9	Z	.008	.008	0	0
13	M6	Z	.008	.008	0	0
14	M7	Z	.008	.008	0	0
15	M12	Z	.008	.008	0	0
16	M13	Z	.008	.008	0	0
17	M10	Z	.008	.008	0	0
18	M11	Z	.008	.008	0	0
19	M16	Z	.008	.008	0	0
20	M17	Z	.008	.008	0	0
21	M14	Z	.008	.008	0	0
22	M15	Z	.008	.008	0	0
23	M20	Z	.008	.008	0	0
24	M21	Z	.008	.008	0	0
25	M18	Z	.008	.008	0	0
26	M19	Z	.008	.008	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.031	.031	80	100
2	M1	Z	.03	.03	60	80
3	M1	Z	.028	.028	40	60
4	M1	Z	.025	.025	20	40
5	M1	Z	.02	.02	0	20
6	M1	Z	.015	.015	0	0
7	M4	Z	.017	.017	0	0
8	M5	Z	.017	.017	0	0
9	M2	Z	.017	.017	0	0
10	M3	Z	.017	.017	0	0
11	M8	Z	.013	.013	0	0
12	M9	Z	.013	.013	0	0
13	M6	Z	.013	.013	0	0
14	M7	Z	.013	.013	0	0
15	M12	Z	.013	.013	0	0
16	M13	Z	.013	.013	0	0
17	M10	Z	.013	.013	0	0
18	M11	Z	.013	.013	0	0
19	M16	Z	.013	.013	0	0
20	M17	Z	.013	.013	0	0
21	M14	Z	.013	.013	0	0
22	M15	Z	.013	.013	0	0
23	M20	Z	.013	.013	0	0
24	M21	Z	.013	.013	0	0
25	M18	Z	.013	.013	0	0
26	M19	Z	.013	.013	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gravity	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Weight of Appurtenances	None					3	1		
3	Weight of Ice Only	None					3	26		
4	(x) TIA Wind with Ice	None					3	26		
5	(x) TIA Wind	None					3	26		
6	(z) TIA Wind with Ice	None					3	26		
7	(z) TIA Wind	None					3	26		

Load Combinations

	Description	Solve	PDelta	S...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...	BLC	Fac...
1	1.2D + 1.6W (X-direction)	Yes	Y		1	1.2	2	1.2	5	1.6										
2	0.9D + 1.6W (X-direction)	Yes	Y		1	.9	2	.9	5	1.6										
3	1.2D + 1.0Di + 1.0Wi (X-...	Yes	Y		1	1.2	2	1.2	3	1	4	1								
4	1.2D + 1.6W (Z-direction)	Yes	Y		1	1.2	2	1.2	7	1.6										
5	0.9D + 1.6W (Z-direction)	Yes	Y		1	.9	2	.9	7	1.6										
6	1.2D + 1.0Di + 1.0Wi (Z-...	Yes	Y		1	1.2	2	1.2	3	1	6	1								

Envelope Member Section Forces

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torqu...	LC	y-y Mo...	LC	z-z Mo...	LC
1	M1	1	max	39.012	3	.47	1	0	1	0	1	1.303	4	1.303	1
2			min	9.898	2	0	4	-.47	4	0	1	0	1	0	4
3		2	max	30.035	3	.834	2	0	1	0	1	1.749	5	1.749	2
4			min	7.63	2	0	4	-.834	5	0	1	0	1	0	4
5		3	max	21.427	3	0	4	.814	4	0	1	1.15	4	1.15	1
6			min	5.465	2	-.814	1	0	1	0	1	0	1	0	4
7		4	max	12.479	3	0	4	.473	5	0	1	.006	5	.006	2
8			min	3.248	2	-.473	2	0	1	0	1	0	1	0	4
9		5	max	0	1	.009	1	0	1	0	1	0	1	0	1
10			min	0	1	0	4	-.009	4	0	1	0	1	0	1
11	M2	1	max	.732	1	.122	3	.094	1	0	1	0	1	0	1
12			min	.173	3	.026	5	-.094	5	0	1	0	1	0	1
13		2	max	.779	1	.061	3	.047	1	0	1	.2	3	.09	2
14			min	.188	3	.013	5	-.047	5	0	1	-.09	5	-.2	6
15		3	max	.827	1	0	1	0	1	0	1	.267	3	.12	2
16			min	.204	3	0	1	0	1	0	1	-.12	5	-.267	6
17		4	max	.874	1	-.013	2	.047	4	0	1	.2	3	.09	2
18			min	.219	3	-.061	3	-.047	2	0	1	-.09	5	-.2	6
19		5	max	.921	1	-.026	2	.094	4	0	1	0	1	0	1
20			min	.235	3	-.122	3	-.094	2	0	1	0	1	0	1
21	M3	1	max	.732	1	.122	3	-.031	3	0	1	0	1	0	1
22			min	-.732	4	.026	5	-.094	5	0	1	0	1	0	1
23		2	max	.779	1	.061	3	-.016	3	0	1	.119	3	-.156	2
24			min	-.779	4	.013	5	-.047	5	0	1	-.09	5	-.2	3
25		3	max	.827	1	0	1	0	1	0	1	.158	6	-.208	2
26			min	-.827	4	0	1	0	1	0	1	-.12	5	-.267	3
27		4	max	.874	1	-.013	5	.047	4	0	1	.119	3	-.156	2
28			min	-.874	4	-.061	3	.016	3	0	1	-.09	2	-.2	3
29		5	max	.921	1	-.026	5	.094	4	0	1	0	1	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torqu...	LC	y-y Mo...	LC	z-z Mo...	LC
30			min	-.921	4	-.122	3	.031	3	0	1	0	1	0	1
31	M4	1	max	.732	4	.122	3	.094	1	0	1	0	1	0	1
32			min	-.732	1	.026	2	.031	3	0	1	0	1	0	1
33		2	max	.779	4	.061	3	.047	1	0	1	.2	3	.09	2
34			min	-.779	1	.013	2	.016	6	0	1	.156	2	-.119	3
35		3	max	.827	4	0	1	0	1	0	1	.267	3	.12	2
36			min	-.827	1	0	1	0	1	0	1	.208	2	-.158	3
37		4	max	.874	4	-.013	5	-.016	3	0	1	.2	3	.09	2
38			min	-.874	1	-.061	3	-.047	4	0	1	.156	2	-.119	3
39		5	max	.921	4	-.026	2	-.031	3	0	1	0	1	0	1
40			min	-.921	1	-.122	6	-.094	4	0	1	0	1	0	1
41	M5	1	max	-.173	6	.122	6	.094	5	0	1	0	1	0	1
42			min	-.732	1	.026	2	-.094	1	0	1	0	1	0	1
43		2	max	-.188	6	.061	6	.047	5	0	1	.2	6	.09	5
44			min	-.779	1	.013	2	-.047	1	0	1	-.09	2	-.2	3
45		3	max	-.204	6	0	1	0	1	0	1	.267	6	.12	5
46			min	-.827	1	0	1	0	1	0	1	-.12	2	-.267	3
47		4	max	-.219	6	-.013	5	.047	2	0	1	.2	6	.09	5
48			min	-.874	1	-.061	3	-.047	4	0	1	-.09	2	-.2	3
49		5	max	-.235	6	-.026	2	.094	2	0	1	0	1	0	1
50			min	-.921	1	-.122	3	-.094	4	0	1	0	1	0	1
51	M6	1	max	.739	4	.035	3	.026	1	0	1	0	1	0	1
52			min	.165	3	.006	2	-.026	5	0	1	0	1	0	1
53		2	max	.752	4	.018	6	.013	1	0	1	.021	3	.009	2
54			min	.17	3	.003	2	-.013	5	0	1	-.009	5	-.021	6
55		3	max	.765	4	0	1	0	1	0	1	.028	3	.012	2
56			min	.175	3	0	1	0	1	0	1	-.012	5	-.028	6
57		4	max	.778	4	-.003	5	.013	4	0	1	.021	3	.009	2
58			min	.18	3	-.018	3	-.013	2	0	1	-.009	5	-.021	6
59		5	max	.791	1	-.006	5	.026	4	0	1	0	1	0	1
60			min	.185	3	-.035	3	-.026	2	0	1	0	1	0	1
61	M7	1	max	.739	1	.035	6	-.01	6	0	1	0	1	0	1
62			min	-.739	4	.006	2	-.026	1	0	1	0	1	0	1
63		2	max	.752	1	.018	6	-.005	6	0	1	.012	6	-.015	2
64			min	-.752	4	.003	2	-.013	1	0	1	-.009	2	-.021	3
65		3	max	.765	1	0	1	0	1	0	1	.016	6	-.02	2
66			min	-.765	4	0	1	0	1	0	1	-.012	2	-.028	3
67		4	max	.778	1	-.003	5	.013	5	0	1	.012	6	-.015	2
68			min	-.778	4	-.018	3	.005	3	0	1	-.009	2	-.021	3
69		5	max	.791	1	-.006	5	.026	5	0	1	0	1	0	1
70			min	-.791	4	-.035	3	.01	3	0	1	0	1	0	1
71	M8	1	max	.739	4	.035	3	.026	1	0	1	0	1	0	1
72			min	-.739	1	.006	5	.01	6	0	1	0	1	0	1
73		2	max	.752	4	.018	3	.013	1	0	1	.021	3	.009	2
74			min	-.752	1	.003	5	.005	6	0	1	.015	5	-.012	3
75		3	max	.765	4	0	1	0	1	0	1	.028	3	.012	2
76			min	-.765	1	0	1	0	1	0	1	.02	5	-.016	3
77		4	max	.778	4	-.003	2	-.005	3	0	1	.021	3	.009	2
78			min	-.778	1	-.018	6	-.013	5	0	1	.015	5	-.012	3
79		5	max	.791	4	-.006	2	-.01	3	0	1	0	1	0	1
80			min	-.791	1	-.035	6	-.026	5	0	1	0	1	0	1
81	M9	1	max	-.165	3	.035	6	.026	4	0	1	0	1	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torqu...	LC	y-y Mo...	LC	z-z Mo...	LC
82			min	-.739	1	.006	5	-.026	2	0	1	0	1	0	1
83		2	max	-.17	3	.018	6	.013	4	0	1	.021	6	.009	5
84			min	-.752	1	.003	5	-.013	2	0	1	-.009	2	-.021	3
85		3	max	-.175	3	0	1	0	1	0	1	.028	6	.012	5
86			min	-.765	1	0	1	0	1	0	1	-.012	2	-.028	3
87		4	max	-.18	3	-.003	2	.013	1	0	1	.021	6	.009	5
88			min	-.778	1	-.018	3	-.013	5	0	1	-.009	2	-.021	3
89		5	max	-.185	3	-.006	2	.026	1	0	1	0	1	0	1
90			min	-.791	1	-.035	3	-.026	5	0	1	0	1	0	1
91	M10	1	max	.059	1	.035	3	.026	1	0	1	0	1	0	1
92			min	.019	3	.006	2	-.026	5	0	1	0	1	0	1
93		2	max	.072	1	.018	3	.013	1	0	1	.021	3	.009	2
94			min	.024	3	.003	2	-.013	5	0	1	-.009	5	-.021	6
95		3	max	.085	1	0	1	0	1	0	1	.028	3	.012	2
96			min	.029	3	0	1	0	1	0	1	-.012	5	-.028	6
97		4	max	.098	1	-.003	5	.013	4	0	1	.021	3	.009	2
98			min	.034	3	-.018	3	-.013	2	0	1	-.009	5	-.021	6
99		5	max	.111	1	-.006	5	.026	4	0	1	0	1	0	1
100			min	.039	3	-.035	3	-.026	2	0	1	0	1	0	1
101	M11	1	max	.059	1	.035	6	-.01	3	0	1	0	1	0	1
102			min	-.059	4	.006	2	-.026	5	0	1	0	1	0	1
103		2	max	.072	1	.018	6	-.005	3	0	1	.012	3	-.015	2
104			min	-.072	4	.003	2	-.013	5	0	1	-.009	2	-.021	6
105		3	max	.085	1	0	1	0	1	0	1	.016	3	-.02	2
106			min	-.085	4	0	1	0	1	0	1	-.012	2	-.028	6
107		4	max	.098	1	-.003	5	.013	1	0	1	.012	3	-.015	2
108			min	-.098	4	-.018	3	.005	6	0	1	-.009	2	-.021	6
109		5	max	.111	1	-.006	5	.026	1	0	1	0	1	0	1
110			min	-.111	4	-.035	3	.01	6	0	1	0	1	0	1
111	M12	1	max	.059	4	.035	3	.026	1	0	1	0	1	0	1
112			min	-.059	1	.006	2	.01	6	0	1	0	1	0	1
113		2	max	.072	4	.018	6	.013	1	0	1	.021	3	.009	2
114			min	-.072	1	.003	5	.005	6	0	1	.015	5	-.012	6
115		3	max	.085	4	0	1	0	1	0	1	.028	3	.012	2
116			min	-.085	1	0	1	0	1	0	1	.02	5	-.016	6
117		4	max	.098	4	-.003	2	-.005	3	0	1	.021	3	.009	2
118			min	-.098	1	-.018	3	-.013	5	0	1	.015	5	-.012	6
119		5	max	.111	4	-.006	2	-.01	3	0	1	0	1	0	1
120			min	-.111	1	-.035	3	-.026	5	0	1	0	1	0	1
121	M13	1	max	-.019	3	.035	6	.026	4	0	1	0	1	0	1
122			min	-.059	4	.006	5	-.026	2	0	1	0	1	0	1
123		2	max	-.024	3	.018	6	.013	4	0	1	.021	6	.009	5
124			min	-.072	4	.003	5	-.013	2	0	1	-.009	2	-.021	3
125		3	max	-.029	3	0	1	0	1	0	1	.028	6	.012	5
126			min	-.085	4	0	1	0	1	0	1	-.012	2	-.028	3
127		4	max	-.034	3	-.003	2	.013	1	0	1	.021	6	.009	5
128			min	-.098	4	-.018	6	-.013	5	0	1	-.009	2	-.021	3
129		5	max	-.039	3	-.006	2	.026	1	0	1	0	1	0	1
130			min	-.111	4	-.035	3	-.026	5	0	1	0	1	0	1
131	M14	1	max	-1.046	3	.035	6	.026	1	0	1	0	1	0	1
132			min	-4.946	4	.006	2	-.026	4	0	1	0	1	0	1
133		2	max	-1.041	3	.018	6	.013	1	0	1	.021	3	.009	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torqu...	LC	y-y Mo...	LC	z-z Mo...	LC
134			min	-4.933	4	.003	2	-.013	4	0	1	-.009	5	-.021	6
135		3	max	-1.036	3	0	1	0	1	0	1	.028	3	.012	2
136			min	-4.92	4	0	1	0	1	0	1	-.012	5	-.028	6
137		4	max	-1.031	3	-.003	5	.013	5	0	1	.021	3	.009	2
138			min	-4.907	4	-.018	3	-.013	2	0	1	-.009	5	-.021	6
139		5	max	-1.026	3	-.006	5	.026	5	0	1	0	1	0	1
140			min	-4.894	4	-.035	3	-.026	2	0	1	0	1	0	1
141	M15	1	max	4.946	4	.035	3	-.01	3	0	1	0	1	0	1
142			min	-4.946	1	.006	5	-.026	4	0	1	0	1	0	1
143		2	max	4.933	4	.018	3	-.005	3	0	1	.012	3	-.015	2
144			min	-4.933	1	.003	5	-.013	4	0	1	-.009	5	-.021	3
145		3	max	4.92	4	0	1	0	1	0	1	.016	3	-.02	2
146			min	-4.92	1	0	1	0	1	0	1	-.012	5	-.028	3
147		4	max	4.907	4	-.003	2	.013	2	0	1	.012	3	-.015	2
148			min	-4.907	1	-.018	6	.005	6	0	1	-.009	5	-.021	3
149		5	max	4.894	4	-.006	2	.026	2	0	1	0	1	0	1
150			min	-4.894	1	-.035	6	.01	6	0	1	0	1	0	1
151	M16	1	max	4.946	1	.035	6	.026	4	0	1	0	1	0	1
152			min	-4.946	4	.006	2	.01	3	0	1	0	1	0	1
153		2	max	4.933	1	.018	6	.013	4	0	1	.021	6	.009	2
154			min	-4.933	4	.003	2	.005	3	0	1	.015	2	-.012	3
155		3	max	4.92	1	0	1	0	1	0	1	.028	6	.012	2
156			min	-4.92	4	0	1	0	1	0	1	.02	2	-.016	3
157		4	max	4.907	1	-.003	5	-.005	6	0	1	.021	6	.009	2
158			min	-4.907	4	-.018	3	-.013	2	0	1	.015	2	-.012	3
159		5	max	4.894	1	-.006	5	-.01	6	0	1	0	1	0	1
160			min	-4.894	4	-.035	3	-.026	2	0	1	0	1	0	1
161	M17	1	max	4.946	4	.035	3	.026	4	0	1	0	1	0	1
162			min	1.046	3	.006	5	-.026	1	0	1	0	1	0	1
163		2	max	4.933	4	.018	3	.013	4	0	1	.021	6	.009	5
164			min	1.041	3	.003	5	-.013	1	0	1	-.009	2	-.021	3
165		3	max	4.92	4	0	1	0	1	0	1	.028	6	.012	5
166			min	1.036	3	0	1	0	1	0	1	-.012	2	-.028	3
167		4	max	4.907	4	-.003	2	.013	2	0	1	.021	6	.009	5
168			min	1.031	3	-.018	6	-.013	5	0	1	-.009	2	-.021	3
169		5	max	4.894	4	-.006	2	.026	2	0	1	0	1	0	1
170			min	1.026	3	-.035	6	-.026	5	0	1	0	1	0	1
171	M18	1	max	7.25	1	.035	6	.026	1	0	1	0	1	0	1
172			min	1.548	3	.006	2	-.026	4	0	1	0	1	0	1
173		2	max	7.263	1	.018	6	.013	1	0	1	.021	3	.009	2
174			min	1.553	3	.003	2	-.013	4	0	1	-.009	5	-.021	6
175		3	max	7.276	1	0	1	0	1	0	1	.028	3	.012	2
176			min	1.558	3	0	1	0	1	0	1	-.012	5	-.028	6
177		4	max	7.289	1	-.003	5	.013	5	0	1	.021	3	.009	2
178			min	1.563	3	-.018	3	-.013	2	0	1	-.009	5	-.021	6
179		5	max	7.302	1	-.006	5	.026	5	0	1	0	1	0	1
180			min	1.568	3	-.035	3	-.026	2	0	1	0	1	0	1
181	M19	1	max	7.25	1	.035	6	-.01	3	0	1	0	1	0	1
182			min	-7.25	4	.006	2	-.026	1	0	1	0	1	0	1
183		2	max	7.263	1	.018	6	-.005	3	0	1	.012	3	-.015	2
184			min	-7.263	4	.003	2	-.013	1	0	1	-.009	2	-.021	6
185		3	max	7.276	1	0	1	0	1	0	1	.016	3	-.02	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torqu...	LC	y-y Mo...	LC	z-z Mo...	LC
186			min	-7.276	4	0	1	0	1	0	1	-.012	2	-.028	6
187		4	max	7.289	1	-.003	5	.013	5	0	1	.012	3	-.015	2
188			min	-7.289	4	-.018	3	.005	6	0	1	-.009	2	-.021	6
189		5	max	7.302	1	-.006	5	.026	5	0	1	0	1	0	1
190			min	-7.302	4	-.035	3	.01	6	0	1	0	1	0	1
191	M20	1	max	7.25	4	.035	3	.026	1	0	1	0	1	0	1
192			min	-7.25	1	.006	5	.01	3	0	1	0	1	0	1
193		2	max	7.263	4	.018	3	.013	1	0	1	.021	3	.009	2
194			min	-7.263	1	.003	5	.005	3	0	1	.015	5	-.012	3
195		3	max	7.276	4	0	1	0	1	0	1	.028	3	.012	2
196			min	-7.276	1	0	1	0	1	0	1	.02	5	-.016	3
197		4	max	7.289	4	-.003	2	-.005	6	0	1	.021	3	.009	2
198			min	-7.289	1	-.018	6	-.013	5	0	1	.015	5	-.012	3
199		5	max	7.302	4	-.006	2	-.01	6	0	1	0	1	0	1
200			min	-7.302	1	-.035	6	-.026	5	0	1	0	1	0	1
201	M21	1	max	-1.548	3	.035	3	.026	4	0	1	0	1	0	1
202			min	-7.25	1	.006	5	-.026	1	0	1	0	1	0	1
203		2	max	-1.553	3	.018	3	.013	4	0	1	.021	6	.009	5
204			min	-7.263	1	.003	5	-.013	1	0	1	-.009	2	-.021	3
205		3	max	-1.558	3	0	1	0	1	0	1	.028	6	.012	5
206			min	-7.276	1	0	1	0	1	0	1	-.012	2	-.028	3
207		4	max	-1.563	3	-.003	2	.013	2	0	1	.021	6	.009	5
208			min	-7.289	1	-.018	6	-.013	5	0	1	-.009	2	-.021	3
209		5	max	-1.568	3	-.006	2	.026	2	0	1	0	1	0	1
210			min	-7.302	1	-.035	6	-.026	5	0	1	0	1	0	1

Envelope Member Section Stresses

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
1	M1	1	max	1.719	3	.041	1	0	1	0	4	.183	1	.183	4	0	1
2			min	.436	2	0	4	-.041	4	-.183	1	0	4	0	1	-.183	4
3		2	max	1.323	3	.073	2	0	1	0	4	.245	2	.245	5	0	1
4			min	.336	2	0	4	-.073	5	-.245	2	0	4	0	1	-.245	5
5		3	max	.944	3	0	4	.072	4	0	4	.161	1	.161	4	0	1
6			min	.241	2	-.072	1	0	1	-.161	1	0	4	0	1	-.161	4
7		4	max	.55	3	0	4	.042	5	0	4	0	2	0	5	0	1
8			min	.143	2	-.042	2	0	1	0	2	0	4	0	1	0	5
9		5	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
10			min	0	1	0	4	0	4	0	1	0	1	0	1	0	1
11	M2	1	max	.431	1	.168	3	.13	1	0	1	0	1	0	1	0	1
12			min	.102	3	.035	5	-.13	5	0	1	0	1	0	1	0	1
13		2	max	.459	1	.084	3	.065	1	1.794	6	.804	2	3.624	3	1.804	5
14			min	.111	3	.018	5	-.065	5	-.804	2	-1.794	6	-1.624	5	-4.027	3
15		3	max	.486	1	0	1	0	1	2.392	6	1.072	2	4.831	3	2.406	5
16			min	.12	3	0	1	0	1	-1.072	2	-2.392	6	-2.165	5	-5.369	3
17		4	max	.514	1	-.018	2	.065	4	1.794	6	.804	2	3.624	3	1.804	5
18			min	.129	3	-.084	3	-.065	2	-.804	2	-1.794	6	-1.624	5	-4.027	3
19		5	max	.542	1	-.035	2	.13	4	0	1	0	1	0	1	0	1
20			min	.138	3	-.168	3	-.13	2	0	1	0	1	0	1	0	1
21	M3	1	max	.431	1	.168	3	-.043	3	0	1	0	1	0	1	0	1
22			min	-.431	4	.035	5	-.13	5	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
23		2	max	.459	1	.084	3	-.021	3	1.794	3	-1.4	2	2.15	3	1.804	5
24			min	-.459	4	.018	5	-.065	5	1.4	2	-1.794	3	-1.624	5	-2.39	3
25		3	max	.486	1	0	1	0	1	2.392	3	-1.867	2	2.867	3	2.406	5
26			min	-.486	4	0	1	0	1	1.867	2	-2.392	3	-2.165	5	-3.186	3
27		4	max	.514	1	-.018	5	.065	4	1.794	3	-1.4	2	2.15	3	1.804	2
28			min	-.514	4	-.084	3	.021	3	1.4	2	-1.794	3	-1.624	2	-2.39	3
29		5	max	.542	1	-.035	5	.13	4	0	1	0	1	0	1	0	1
30			min	-.542	4	-.168	3	.043	3	0	1	0	1	0	1	0	1
31	M4	1	max	.431	4	.168	3	.13	1	0	1	0	1	0	1	0	1
32			min	-.431	1	.035	2	.043	3	0	1	0	1	0	1	0	1
33		2	max	.459	4	.084	3	.065	1	1.064	3	.804	2	3.624	3	-3.144	2
34			min	-.459	1	.018	2	.021	6	-.804	2	-1.064	3	2.829	2	-4.027	3
35		3	max	.486	4	0	1	0	1	1.419	3	1.072	2	4.831	3	-4.191	2
36			min	-.486	1	0	1	0	1	-1.072	2	-1.419	3	3.772	2	-5.369	3
37		4	max	.514	4	-.018	5	-.021	3	1.064	3	.804	2	3.624	3	-3.144	2
38			min	-.514	1	-.084	3	-.065	4	-.804	2	-1.064	3	2.829	2	-4.027	3
39		5	max	.542	4	-.035	2	-.043	3	0	1	0	1	0	1	0	1
40			min	-.542	1	-.168	6	-.13	4	0	1	0	1	0	1	0	1
41	M5	1	max	-.102	6	.168	6	.13	5	0	1	0	1	0	1	0	1
42			min	-.431	1	.035	2	-.13	1	0	1	0	1	0	1	0	1
43		2	max	-.111	6	.084	6	.065	5	1.794	3	.804	5	3.624	6	1.804	2
44			min	-.459	1	.018	2	-.065	1	-.804	5	-1.794	3	-1.624	2	-4.027	6
45		3	max	-.12	6	0	1	0	1	2.392	3	1.072	5	4.831	6	2.406	2
46			min	-.486	1	0	1	0	1	-1.072	5	-2.392	3	-2.165	2	-5.369	6
47		4	max	-.129	6	-.018	5	.065	2	1.794	3	.804	5	3.624	6	1.804	2
48			min	-.514	1	-.084	3	-.065	4	-.804	5	-1.794	3	-1.624	2	-4.027	6
49		5	max	-.138	3	-.035	2	.13	2	0	1	0	1	0	1	0	1
50			min	-.542	1	-.168	3	-.13	4	0	1	0	1	0	1	0	1
51	M6	1	max	.621	4	.067	3	.05	1	0	1	0	1	0	1	0	1
52			min	.139	3	.012	2	-.05	5	0	1	0	1	0	1	0	1
53		2	max	.632	4	.034	6	.025	1	.385	6	.167	2	.781	3	.4	5
54			min	.143	3	.006	2	-.025	5	-.167	2	-.385	6	-.338	5	-.923	3
55		3	max	.643	4	0	1	0	1	.513	6	.222	2	1.041	3	.533	5
56			min	.147	3	0	1	0	1	-.222	2	-.513	6	-.451	5	-1.23	3
57		4	max	.654	4	-.006	5	.025	4	.385	6	.167	2	.781	3	.4	5
58			min	.151	3	-.034	3	-.025	2	-.167	2	-.385	6	-.338	5	-.923	3
59		5	max	.665	1	-.012	5	.05	4	0	1	0	1	0	1	0	1
60			min	.156	3	-.067	3	-.05	2	0	1	0	1	0	1	0	1
61	M7	1	max	.621	1	.067	6	-.019	6	0	1	0	1	0	1	0	1
62			min	-.621	4	.012	2	-.05	1	0	1	0	1	0	1	0	1
63		2	max	.632	1	.034	6	-.01	6	.385	3	-.277	2	.435	6	.4	2
64			min	-.632	4	.006	2	-.025	1	.277	2	-.385	3	-.338	2	-.514	6
65		3	max	.643	1	0	1	0	1	.513	3	-.369	2	.579	6	.533	2
66			min	-.643	4	0	1	0	1	.369	2	-.513	3	-.451	2	-.685	6
67		4	max	.654	1	-.006	5	.025	5	.385	3	-.277	2	.435	6	.4	2
68			min	-.654	4	-.034	3	.01	3	.277	2	-.385	3	-.338	2	-.514	6
69		5	max	.665	1	-.012	5	.05	5	0	1	0	1	0	1	0	1
70			min	-.665	4	-.067	3	.019	3	0	1	0	1	0	1	0	1
71	M8	1	max	.621	4	.067	3	.05	1	0	1	0	1	0	1	0	1
72			min	-.621	1	.012	5	.019	6	0	1	0	1	0	1	0	1
73		2	max	.632	4	.034	3	.025	1	.214	3	.167	2	.781	3	-.664	5
74			min	-.632	1	.006	5	.01	6	-.167	2	-.214	3	.561	5	-.923	3

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
75		3	max	.643	4	0	1	0	1	.286	3	.222	2	1.041	3	-.885	5
76			min	-.643	1	0	1	0	1	-.222	2	-.286	3	.749	5	-1.23	3
77		4	max	.654	4	-.006	2	-.01	3	.214	3	.167	2	.781	3	-.664	5
78			min	-.654	1	-.034	6	-.025	5	-.167	2	-.214	3	.561	5	-.923	3
79		5	max	.665	4	-.012	2	-.019	3	0	1	0	1	0	1	0	1
80			min	-.665	1	-.067	6	-.05	5	0	1	0	1	0	1	0	1
81	M9	1	max	-.139	3	.067	6	.05	4	0	1	0	1	0	1	0	1
82			min	-.621	1	.012	5	-.05	2	0	1	0	1	0	1	0	1
83		2	max	-.143	3	.034	6	.025	4	.385	3	.167	5	.781	6	.4	2
84			min	-.632	1	.006	5	-.025	2	-.167	5	-.385	3	-.338	2	-.923	6
85		3	max	-.147	3	0	1	0	1	.513	3	.222	5	1.041	6	.533	2
86			min	-.643	1	0	1	0	1	-.222	5	-.513	3	-.451	2	-1.23	6
87		4	max	-.151	3	-.006	2	.025	1	.385	3	.167	5	.781	6	.4	2
88			min	-.654	1	-.034	3	-.025	5	-.167	5	-.385	3	-.338	2	-.923	6
89		5	max	-.156	3	-.012	2	.05	1	0	1	0	1	0	1	0	1
90			min	-.665	1	-.067	3	-.05	5	0	1	0	1	0	1	0	1
91	M10	1	max	.049	1	.067	3	.05	1	0	1	0	1	0	1	0	1
92			min	.016	3	.012	2	-.05	5	0	1	0	1	0	1	0	1
93		2	max	.06	1	.034	3	.025	1	.385	6	.167	2	.781	3	.4	5
94			min	.02	3	.006	2	-.025	5	-.167	2	-.385	6	-.338	5	-.923	3
95		3	max	.071	1	0	1	0	1	.513	6	.222	2	1.041	3	.533	5
96			min	.024	3	0	1	0	1	-.222	2	-.513	6	-.451	5	-1.23	3
97		4	max	.082	1	-.006	5	.025	4	.385	6	.167	2	.781	3	.4	5
98			min	.028	3	-.034	3	-.025	2	-.167	2	-.385	6	-.338	5	-.923	3
99		5	max	.093	1	-.012	5	.05	4	0	1	0	1	0	1	0	1
100			min	.032	3	-.067	3	-.05	2	0	1	0	1	0	1	0	1
101	M11	1	max	.049	1	.067	6	-.019	3	0	1	0	1	0	1	0	1
102			min	-.049	4	.012	2	-.05	5	0	1	0	1	0	1	0	1
103		2	max	.06	1	.034	6	-.01	3	.385	6	-.277	2	.435	3	.4	2
104			min	-.06	4	.006	2	-.025	5	.277	2	-.385	6	-.338	2	-.514	3
105		3	max	.071	1	0	1	0	1	.513	6	-.369	2	.579	3	.533	2
106			min	-.071	4	0	1	0	1	.369	2	-.513	6	-.451	2	-.685	3
107		4	max	.082	1	-.006	5	.025	1	.385	6	-.277	2	.435	3	.4	2
108			min	-.082	4	-.034	3	.01	6	.277	2	-.385	6	-.338	2	-.514	3
109		5	max	.093	1	-.012	5	.05	1	0	1	0	1	0	1	0	1
110			min	-.093	4	-.067	3	.019	6	0	1	0	1	0	1	0	1
111	M12	1	max	.049	4	.067	3	.05	1	0	1	0	1	0	1	0	1
112			min	-.049	1	.012	2	.019	6	0	1	0	1	0	1	0	1
113		2	max	.06	4	.034	6	.025	1	.214	6	.167	2	.781	3	-.664	5
114			min	-.06	1	.006	5	.01	6	-.167	2	-.214	6	.561	5	-.923	3
115		3	max	.071	4	0	1	0	1	.286	6	.222	2	1.041	3	-.885	5
116			min	-.071	1	0	1	0	1	-.222	2	-.286	6	.749	5	-1.23	3
117		4	max	.082	4	-.006	2	-.01	3	.214	6	.167	2	.781	3	-.664	5
118			min	-.082	1	-.034	3	-.025	5	-.167	2	-.214	6	.561	5	-.923	3
119		5	max	.093	4	-.012	2	-.019	3	0	1	0	1	0	1	0	1
120			min	-.093	1	-.067	3	-.05	5	0	1	0	1	0	1	0	1
121	M13	1	max	-.016	3	.067	6	.05	4	0	1	0	1	0	1	0	1
122			min	-.049	4	.012	5	-.05	2	0	1	0	1	0	1	0	1
123		2	max	-.02	3	.034	6	.025	4	.385	3	.167	5	.781	6	.4	2
124			min	-.06	4	.006	5	-.025	2	-.167	5	-.385	3	-.338	2	-.923	6
125		3	max	-.024	3	0	1	0	1	.513	3	.222	5	1.041	6	.533	2
126			min	-.071	4	0	1	0	1	-.222	5	-.513	3	-.451	2	-1.23	6

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
127		4	max	-.028	3	-.006	2	.025	1	.385	3	.167	5	.781	6	.4	2
128			min	-.082	4	-.034	6	-.025	5	-.167	5	-.385	3	-.338	2	-.923	6
129		5	max	-.032	3	-.012	2	.05	1	0	1	0	1	0	1	0	1
130			min	-.093	4	-.067	3	-.05	5	0	1	0	1	0	1	0	1
131	M14	1	max	-.879	3	.067	6	.05	1	0	1	0	1	0	1	0	1
132			min	-4.156	4	.012	2	-.05	4	0	1	0	1	0	1	0	1
133		2	max	-.875	3	.034	6	.025	1	.385	6	.167	2	.781	3	.4	5
134			min	-4.145	4	.006	2	-.025	4	-.167	2	-.385	6	-.338	5	-.923	3
135		3	max	-.871	3	0	1	0	1	.513	6	.222	2	1.041	3	.533	5
136			min	-4.134	4	0	1	0	1	-.222	2	-.513	6	-.451	5	-1.23	3
137		4	max	-.867	3	-.006	5	.025	5	.385	6	.167	2	.781	3	.4	5
138			min	-4.123	4	-.034	3	-.025	2	-.167	2	-.385	6	-.338	5	-.923	3
139		5	max	-.862	3	-.012	5	.05	5	0	1	0	1	0	1	0	1
140			min	-4.112	4	-.067	3	-.05	2	0	1	0	1	0	1	0	1
141	M15	1	max	4.156	4	.067	3	-.019	3	0	1	0	1	0	1	0	1
142			min	-4.156	1	.012	5	-.05	4	0	1	0	1	0	1	0	1
143		2	max	4.145	4	.034	3	-.01	3	.385	3	-.277	2	.435	3	.4	5
144			min	-4.145	1	.006	5	-.025	4	.277	2	-.385	3	-.338	5	-.514	3
145		3	max	4.134	4	0	1	0	1	.513	3	-.369	2	.579	3	.533	5
146			min	-4.134	1	0	1	0	1	.369	2	-.513	3	-.451	5	-.685	3
147		4	max	4.123	4	-.006	2	.025	2	.385	3	-.277	2	.435	3	.4	5
148			min	-4.123	1	-.034	6	.01	6	.277	2	-.385	3	-.338	5	-.514	3
149		5	max	4.112	4	-.012	2	.05	2	0	1	0	1	0	1	0	1
150			min	-4.112	1	-.067	6	.019	6	0	1	0	1	0	1	0	1
151	M16	1	max	4.156	1	.067	6	.05	4	0	1	0	1	0	1	0	1
152			min	-4.156	4	.012	2	.019	3	0	1	0	1	0	1	0	1
153		2	max	4.145	1	.034	6	.025	4	.214	3	.167	2	.781	6	-.664	2
154			min	-4.145	4	.006	2	.01	3	-.167	2	-.214	3	.561	2	-.923	6
155		3	max	4.134	1	0	1	0	1	.286	3	.222	2	1.041	6	-.885	2
156			min	-4.134	4	0	1	0	1	-.222	2	-.286	3	.749	2	-1.23	6
157		4	max	4.123	1	-.006	5	-.01	6	.214	3	.167	2	.781	6	-.664	2
158			min	-4.123	4	-.034	3	-.025	2	-.167	2	-.214	3	.561	2	-.923	6
159		5	max	4.112	1	-.012	5	-.019	6	0	1	0	1	0	1	0	1
160			min	-4.112	4	-.067	3	-.05	2	0	1	0	1	0	1	0	1
161	M17	1	max	4.156	4	.067	3	.05	4	0	1	0	1	0	1	0	1
162			min	.879	3	.012	5	-.05	1	0	1	0	1	0	1	0	1
163		2	max	4.145	4	.034	3	.025	4	.385	3	.167	5	.781	6	.4	2
164			min	.875	3	.006	5	-.025	1	-.167	5	-.385	3	-.338	2	-.923	6
165		3	max	4.134	4	0	1	0	1	.513	3	.222	5	1.041	6	.533	2
166			min	.871	3	0	1	0	1	-.222	5	-.513	3	-.451	2	-1.23	6
167		4	max	4.123	4	-.006	2	.025	2	.385	3	.167	5	.781	6	.4	2
168			min	.867	3	-.034	6	-.025	5	-.167	5	-.385	3	-.338	2	-.923	6
169		5	max	4.112	4	-.012	2	.05	2	0	1	0	1	0	1	0	1
170			min	.862	3	-.067	6	-.05	5	0	1	0	1	0	1	0	1
171	M18	1	max	6.093	1	.067	6	.05	1	0	1	0	1	0	1	0	1
172			min	1.3	3	.012	2	-.05	4	0	1	0	1	0	1	0	1
173		2	max	6.104	1	.034	6	.025	1	.385	6	.167	2	.781	3	.4	5
174			min	1.305	3	.006	2	-.025	4	-.167	2	-.385	6	-.338	5	-.923	3
175		3	max	6.114	1	0	1	0	1	.513	6	.222	2	1.041	3	.533	5
176			min	1.309	3	0	1	0	1	-.222	2	-.513	6	-.451	5	-1.23	3
177		4	max	6.125	1	-.006	5	.025	5	.385	6	.167	2	.781	3	.4	5
178			min	1.313	3	-.034	3	-.025	2	-.167	2	-.385	6	-.338	5	-.923	3

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
179		5	max	6.136	1	-.012	5	.05	5	0	1	0	1	0	1	0	1
180			min	1.317	3	-.067	3	-.05	2	0	1	0	1	0	1	0	1
181	M19	1	max	6.093	1	.067	6	-.019	3	0	1	0	1	0	1	0	1
182			min	-6.093	4	.012	2	-.05	1	0	1	0	1	0	1	0	1
183		2	max	6.104	1	.034	6	-.01	3	.385	6	-.277	2	.435	3	.4	2
184			min	-6.104	4	.006	2	-.025	1	.277	2	-.385	6	-.338	2	-.514	3
185		3	max	6.114	1	0	1	0	1	.513	6	-.369	2	.579	3	.533	2
186			min	-6.114	4	0	1	0	1	.369	2	-.513	6	-.451	2	-.685	3
187		4	max	6.125	1	-.006	5	.025	5	.385	6	-.277	2	.435	3	.4	2
188			min	-6.125	4	-.034	3	.01	6	.277	2	-.385	6	-.338	2	-.514	3
189		5	max	6.136	1	-.012	5	.05	5	0	1	0	1	0	1	0	1
190			min	-6.136	4	-.067	3	.019	6	0	1	0	1	0	1	0	1
191	M20	1	max	6.093	4	.067	3	.05	1	0	1	0	1	0	1	0	1
192			min	-6.093	1	.012	5	.019	3	0	1	0	1	0	1	0	1
193		2	max	6.104	4	.034	3	.025	1	.214	3	.167	2	.781	3	-.664	5
194			min	-6.104	1	.006	5	.01	3	-.167	2	-.214	3	.561	5	-.923	3
195		3	max	6.114	4	0	1	0	1	.286	3	.222	2	1.041	3	-.885	5
196			min	-6.114	1	0	1	0	1	-.222	2	-.286	3	.749	5	-1.23	3
197		4	max	6.125	4	-.006	2	-.01	6	.214	3	.167	2	.781	3	-.664	5
198			min	-6.125	1	-.034	6	-.025	5	-.167	2	-.214	3	.561	5	-.923	3
199		5	max	6.136	4	-.012	2	-.019	6	0	1	0	1	0	1	0	1
200			min	-6.136	1	-.067	6	-.05	5	0	1	0	1	0	1	0	1
201	M21	1	max	-1.3	3	.067	3	.05	4	0	1	0	1	0	1	0	1
202			min	-6.093	1	.012	5	-.05	1	0	1	0	1	0	1	0	1
203		2	max	-1.305	3	.034	3	.025	4	.385	3	.167	5	.781	6	.4	2
204			min	-6.104	1	.006	5	-.025	1	-.167	5	-.385	3	-.338	2	-.923	6
205		3	max	-1.309	3	0	1	0	1	.513	3	.222	5	1.041	6	.533	2
206			min	-6.114	1	0	1	0	1	-.222	5	-.513	3	-.451	2	-1.23	6
207		4	max	-1.313	3	-.006	2	.025	2	.385	3	.167	5	.781	6	.4	2
208			min	-6.125	1	-.034	6	-.025	5	-.167	5	-.385	3	-.338	2	-.923	6
209		5	max	-1.317	3	-.012	2	.05	2	0	1	0	1	0	1	0	1
210			min	-6.136	1	-.067	6	-.05	5	0	1	0	1	0	1	0	1

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N12	max	-.144	6	.122	3	-.144	3	0	1	0	1	0	1
2		min	-.718	1	.026	5	-.718	4	0	1	0	1	0	1
3	N11	max	.585	4	.122	3	.585	1	0	1	0	1	0	1
4		min	-.718	1	.026	5	-.718	4	0	1	0	1	0	1
5	N9	max	-.144	6	.122	6	-.144	3	0	1	0	1	0	1
6		min	-.718	1	.026	2	-.718	4	0	1	0	1	0	1
7	N10	max	.585	4	.122	6	.585	1	0	1	0	1	0	1
8		min	-.718	1	.026	2	-.718	4	0	1	0	1	0	1
9	N18	max	.541	4	.035	6	.541	1	0	1	0	1	0	1
10		min	-.578	1	.006	2	-.578	4	0	1	0	1	0	1
11	N22	max	.06	4	.035	6	.06	1	0	1	0	1	0	1
12		min	-.097	1	.006	2	-.097	4	0	1	0	1	0	1
13	N19	max	.541	4	.035	3	.541	1	0	1	0	1	0	1
14		min	-.578	1	.006	5	-.578	4	0	1	0	1	0	1
15	N23	max	.06	4	.035	3	.06	1	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
16		min	-.097	1	.006	5	-.097	4	0	1	0	1	0	1
17	N17	max	-.124	6	.035	6	-.124	3	0	1	0	1	0	1
18		min	-.578	1	.006	5	-.578	4	0	1	0	1	0	1
19	N20	max	-.124	6	.035	3	-.124	3	0	1	0	1	0	1
20		min	-.578	1	.007	2	-.578	4	0	1	0	1	0	1
21	N21	max	-.02	6	.035	3	-.02	3	0	1	0	1	0	1
22		min	-.097	1	.006	5	-.097	4	0	1	0	1	0	1
23	N25	max	3.478	4	.036	3	3.478	1	0	1	0	1	0	1
24		min	.719	3	.007	2	.719	6	0	1	0	1	0	1
25	N1	max	0	4	39.012	3	0	1	0	1	0	3	1.303	1
26		min	-.47	2	9.898	2	-.47	5	-1.303	4	0	2	0	4
27	N31	max	5.146	4	.036	3	5.144	1	0	1	0	1	0	1
28		min	-5.183	1	.005	5	-5.181	4	0	1	0	1	0	1
29	N32	max	-1.101	6	.036	3	-1.101	3	0	1	0	1	0	1
30		min	-5.183	1	.008	2	-5.183	4	0	1	0	1	0	1
31	N29	max	-1.101	6	.034	3	-1.101	3	0	1	0	1	0	1
32		min	-5.181	1	.005	5	-5.181	4	0	1	0	1	0	1
33	N30	max	5.144	4	.036	6	5.146	1	0	1	0	1	0	1
34		min	-5.181	1	.005	2	-5.183	4	0	1	0	1	0	1
35	N27	max	3.442	1	.036	6	3.443	4	0	1	0	1	0	1
36		min	-3.478	4	.005	2	-3.479	1	0	1	0	1	0	1
37	N28	max	3.479	4	.034	3	3.479	1	0	1	0	1	0	1
38		min	.719	3	.005	5	.719	6	0	1	0	1	0	1
39	N26	max	3.443	1	.036	3	3.442	4	0	1	0	1	0	1
40		min	-3.479	4	.005	5	-3.478	1	0	1	0	1	0	1
41	N24	max	-.02	6	.035	3	-.02	3	0	1	0	1	0	1
42		min	-.097	1	.006	2	-.097	4	0	1	0	1	0	1
43	Totals:	max	0	6	40.063	3	0	2						
44		min	-12.999	1	10.103	2	-12.999	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotatio...	LC	Y Rotatio...	LC	Z Rotation...	LC
1	N1	max	0	2	0	2	0	5	0	4	0	2	0	4
2		min	0	4	0	3	0	1	0	1	0	3	0	1
3	N2	max	.003	1	-.004	2	.003	4	1.304e-4	5	0	2	0	6
4		min	0	6	-.014	3	0	3	0	3	0	3	-1.304e-4	2
5	N4	max	.001	1	-.007	2	.001	4	0	3	0	2	1.248e-4	2
6		min	0	6	-.029	3	0	3	-1.248e-4	5	0	3	0	6
7	N5	max	0	1	-.008	2	0	4	8.708e-6	5	0	2	0	6
8		min	0	4	-.032	3	0	1	0	3	0	3	-8.708e-6	2
9	N6	max	0	6	-.009	2	0	3	0	2	0	2	1.032e-4	1
10		min	-.009	1	-.035	3	-.009	4	-1.032e-4	4	0	3	0	5
11	N7	max	.013	1	-.009	2	.013	4	1.588e-3	4	0	2	0	6
12		min	0	6	-.036	3	0	3	0	3	0	3	-1.588e-3	1
13	N8	max	1.211	1	-.01	2	1.211	4	6.51e-3	4	0	2	0	6
14		min	0	6	-.039	3	0	3	0	3	0	3	-6.51e-3	1
15	N9	max	0	1	0	2	0	4	8.903e-4	5	3.091e-3	5	3.946e-3	3
16		min	0	6	0	6	0	3	-3.974e-3	3	-4.474e-3	1	-7.599e-4	5
17	N10	max	0	1	0	2	0	4	2.949e-3	3	3.091e-3	2	2.921e-3	3
18		min	0	4	0	6	0	1	-7.599e-4	2	-1.622e-3	3	-8.903e-4	5

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotatio...	LC	Y Rotatio...	LC	Z Rotation...	LC
19	N11	max	0	1	0	5	0	4	-2.207e-3	2	-4.057e-3	3	-2.337e-3	2
20		min	0	4	0	3	0	1	-3.946e-3	3	-4.474e-3	1	-3.974e-3	3
21	N12	max	0	1	0	5	0	4	3.974e-3	6	3.091e-3	2	7.599e-4	2
22		min	0	6	0	3	0	3	-8.903e-4	2	-4.474e-3	4	-3.946e-3	6
23	N17	max	0	1	0	5	0	4	-9.088e-5	5	3.467e-4	5	9.239e-4	3
24		min	0	6	0	6	0	3	-8.966e-4	3	-4.786e-4	1	-3.394e-5	5
25	N18	max	0	1	0	2	0	4	7.725e-4	3	3.467e-4	2	7.998e-4	3
26		min	0	4	0	6	0	1	-3.394e-5	2	-1.564e-4	3	9.088e-5	5
27	N19	max	0	1	0	5	0	4	-4.135e-4	2	-4.597e-4	6	-2.887e-4	2
28		min	0	4	0	3	0	1	-9.239e-4	3	-4.786e-4	1	-8.966e-4	6
29	N20	max	0	1	0	2	0	4	8.966e-4	6	3.467e-4	2	3.394e-5	2
30		min	0	6	0	3	0	3	9.088e-5	2	-4.786e-4	4	-9.239e-4	6
31	N21	max	0	1	0	5	0	4	-3.827e-5	5	3.27e-4	5	9.644e-4	3
32		min	0	6	0	3	0	3	-9.665e-4	3	-4.589e-4	1	4.697e-5	5
33	N22	max	0	1	0	2	0	4	8.424e-4	3	3.27e-4	2	8.403e-4	3
34		min	0	4	0	6	0	1	4.697e-5	5	-1.607e-4	3	3.827e-5	2
35	N23	max	0	1	0	5	0	4	-3.609e-4	2	-4.4e-4	2	-3.696e-4	2
36		min	0	4	0	3	0	1	-9.644e-4	6	-4.589e-4	1	-9.665e-4	3
37	N24	max	0	1	0	2	0	4	9.665e-4	6	3.27e-4	2	-4.697e-5	2
38		min	0	6	0	3	0	3	3.827e-5	2	-4.589e-4	4	-9.644e-4	6
39	N25	max	0	3	0	2	0	6	-1.076e-4	5	1.82e-4	5	1.028e-3	3
40		min	0	4	0	3	0	1	-1.006e-3	3	-4.246e-4	3	4.469e-6	5
41	N26	max	0	4	0	5	0	1	8.821e-4	6	1.82e-4	5	9.043e-4	3
42		min	0	1	0	3	0	4	4.469e-6	5	-1.915e-4	6	1.076e-4	2
43	N27	max	0	4	0	2	0	1	-4.302e-4	2	-2.951e-4	2	-3.271e-4	2
44		min	0	1	0	6	0	4	-1.028e-3	3	-4.246e-4	3	-1.006e-3	3
45	N28	max	0	3	0	5	0	6	1.006e-3	6	1.82e-4	2	-4.469e-6	2
46		min	0	4	0	3	0	1	1.076e-4	2	-4.246e-4	6	-1.028e-3	6
47	N29	max	0	1	0	5	0	4	7.331e-4	5	5.353e-4	5	1.079e-3	6
48		min	0	6	0	3	0	3	-1.251e-3	1	-6.672e-4	1	-4.105e-4	2
49	N30	max	0	1	0	2	0	4	1.079e-3	3	5.353e-4	2	7.411e-4	3
50		min	0	4	0	6	0	1	8.54e-4	2	-1.164e-4	3	-7.331e-4	2
51	N31	max	0	1	0	5	0	4	4.105e-4	2	-4.997e-4	3	-1.177e-3	2
52		min	0	4	0	3	0	1	-8.652e-4	3	-6.672e-4	1	-1.251e-3	1
53	N32	max	0	1	0	2	0	4	1.251e-3	4	5.353e-4	2	4.105e-4	5
54		min	0	6	0	6	0	3	-7.331e-4	2	-6.672e-4	4	-1.079e-3	3

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

	Member	Shape	Code Check	Loc...	LC	Sh...	Loc[ft]	Dir	LC	phi*Pn...	phi*...	phi*...	phi*...	...	Eqn
1	M1	HSS16x0....	.209	81.25	1	.058	80.208		1	771.911	858...	352.8	352.8	...	H1...
2	M2	L3.5x3.5x4	.183	5.012	1	.007	9.82	y	3	13.09	55.08	2.416	3.891	...	H2-1
3	M3	L3.5x3.5x4	.166	5.115	2	.007	9.82	y	3	13.09	55.08	2.416	3.891	...	H2-1
4	M4	L3.5x3.5x4	.183	5.012	4	.007	9.82	y	6	13.09	55.08	2.416	3.891	...	H2-1
5	M5	L3.5x3.5x4	.155	4.91	6	.007	9.82	y	3	13.09	55.08	2.416	3.891	...	H2-1
6	M6	L2.5x2.5x4	.054	1.805	1	.003	3.536	y	3	25.642	38.5..	1.114	2.452	...	H2-1
7	M7	L2.5x2.5x4	.049	1.805	2	.003	3.536	y	3	25.642	38.5..	1.114	2.452	...	H2-1
8	M8	L2.5x2.5x4	.054	1.805	4	.003	3.536	y	6	25.642	38.5..	1.114	2.452	...	H2-1
9	M9	L2.5x2.5x4	.044	1.805	4	.003	3.536	y	3	25.642	38.5..	1.114	2.452	...	H2-1
10	M10	L2.5x2.5x4	.033	1.768	3	.003	3.536	y	3	25.642	38.5..	1.114	2.452	...	H2-1
11	M11	L2.5x2.5x4	.027	1.768	3	.003	3.536	y	3	25.642	38.5..	1.114	2.452	...	H2-1

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

	Member	Shape	Code Check	Loc...	LC	Sh...	Loc[ft]	Dir	LC	phi*Pn..	phi*...	phi*...	phi*...	...	Eqn
12	M12	L2.5x2.5x4	.033	1.768	6	.003	3.536	y	3	25.642	38.5..	1.114	2.452	...	H2-1
13	M13	L2.5x2.5x4	.032	1.768	6	.003	3.536	y	3	25.642	38.5..	1.114	2.452	...	H2-1
14	M14	L2.5x2.5x4	.151	1.731	1	.003	3.536	y	3	25.642	38.5..	1.114	2.452	...	H2-1
15	M15	L2.5x2.5x4	.211	1.731	5	.003	3.536	y	6	25.642	38.5..	1.114	2.452	...	H2-1
16	M16	L2.5x2.5x4	.216	1.731	1	.003	3.536	y	3	25.642	38.5..	1.114	2.452	...	H2-1
17	M17	L2.5x2.5x4	.216	1.731	4	.003	3.536	y	6	25.642	38.5..	1.114	2.452	...	H2-1
18	M18	L2.5x2.5x4	.308	1.805	1	.003	0	y	6	25.642	38.5..	1.114	2.452	...	H2-1
19	M19	L2.5x2.5x4	.303	1.805	2	.003	0	y	6	25.642	38.5..	1.114	2.452	...	H2-1
20	M20	L2.5x2.5x4	.308	1.805	4	.003	3.536	y	6	25.642	38.5..	1.114	2.452	...	H2-1
21	M21	L2.5x2.5x4	.213	1.805	4	.003	3.536	y	6	25.642	38.5..	1.114	2.452	...	H2-1

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N12	-.718	.034	-.585	0	0	0
2	1	N11	-.718	.034	.585	0	0	0
3	1	N9	-.718	.034	-.585	0	0	0
4	1	N10	-.718	.034	.585	0	0	0
5	1	N18	-.578	.008	.541	0	0	0
6	1	N22	-.097	.009	.06	0	0	0
7	1	N19	-.578	.009	.541	0	0	0
8	1	N23	-.097	.009	.06	0	0	0
9	1	N17	-.578	.008	-.541	0	0	0
10	1	N20	-.578	.009	-.541	0	0	0
11	1	N21	-.097	.009	-.06	0	0	0
12	1	N25	3.443	.01	3.478	0	0	0
13	1	N1	-.47	13.197	0	0	0	1.303
14	1	N31	-5.183	.011	5.144	0	0	0
15	1	N32	-5.183	.011	-5.144	0	0	0
16	1	N29	-5.181	.006	-5.146	0	0	0
17	1	N30	-5.181	.006	5.146	0	0	0
18	1	N27	3.442	.007	-3.479	0	0	0
19	1	N28	3.442	.007	3.479	0	0	0
20	1	N26	3.443	.01	-3.478	0	0	0
21	1	N24	-.097	.009	-.06	0	0	0
22	1	Totals:	-12.999	13.471	0			
23	1	COG (ft):	X: 0	Y: 54.508	Z: 0			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N12	-.718	.026	-.585	0	0	0
2	2	N11	-.718	.026	.585	0	0	0
3	2	N9	-.718	.026	-.585	0	0	0
4	2	N10	-.718	.026	.585	0	0	0
5	2	N18	-.578	.006	.541	0	0	0
6	2	N22	-.097	.006	.06	0	0	0
7	2	N19	-.578	.007	.541	0	0	0
8	2	N23	-.097	.006	.06	0	0	0
9	2	N17	-.578	.006	-.541	0	0	0
10	2	N20	-.578	.007	-.541	0	0	0
11	2	N21	-.097	.006	-.06	0	0	0
12	2	N25	3.44	.007	3.476	0	0	0
13	2	N1	-.47	9.898	0	0	0	1.303
14	2	N31	-5.181	.008	5.142	0	0	0
15	2	N32	-5.181	.008	-5.142	0	0	0
16	2	N29	-5.178	.005	-5.144	0	0	0
17	2	N30	-5.178	.005	5.144	0	0	0
18	2	N27	3.439	.005	-3.477	0	0	0
19	2	N28	3.439	.005	3.477	0	0	0
20	2	N26	3.44	.007	-3.476	0	0	0
21	2	N24	-.097	.006	-.06	0	0	0
22	2	Totals:	-12.999	10.103	0			
23	2	COG (ft):	X: 0	Y: 54.508	Z: 0			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N12	-.188	.122	-.144	0	0	0
2	3	N11	-.188	.122	.144	0	0	0
3	3	N9	-.188	.122	-.144	0	0	0
4	3	N10	-.188	.122	.144	0	0	0
5	3	N18	-.138	.035	.124	0	0	0
6	3	N22	-.034	.035	.02	0	0	0
7	3	N19	-.138	.035	.124	0	0	0
8	3	N23	-.034	.035	.02	0	0	0
9	3	N17	-.138	.035	-.124	0	0	0
10	3	N20	-.138	.035	-.124	0	0	0
11	3	N21	-.034	.035	-.02	0	0	0
12	3	N25	.719	.036	.733	0	0	0
13	3	N1	-.113	39.012	0	0	0	.331
14	3	N31	-1.116	.036	1.101	0	0	0
15	3	N32	-1.116	.036	-1.101	0	0	0
16	3	N29	-1.115	.034	-1.101	0	0	0
17	3	N30	-1.115	.034	1.101	0	0	0
18	3	N27	.719	.034	-.733	0	0	0
19	3	N28	.719	.034	.733	0	0	0
20	3	N26	.719	.036	-.733	0	0	0
21	3	N24	-.034	.035	-.02	0	0	0
22	3	Totals:	-3.143	40.063	0			
23	3	COG (ft):	X: 0	Y: 54.089	Z: 0			

Joint Reactions

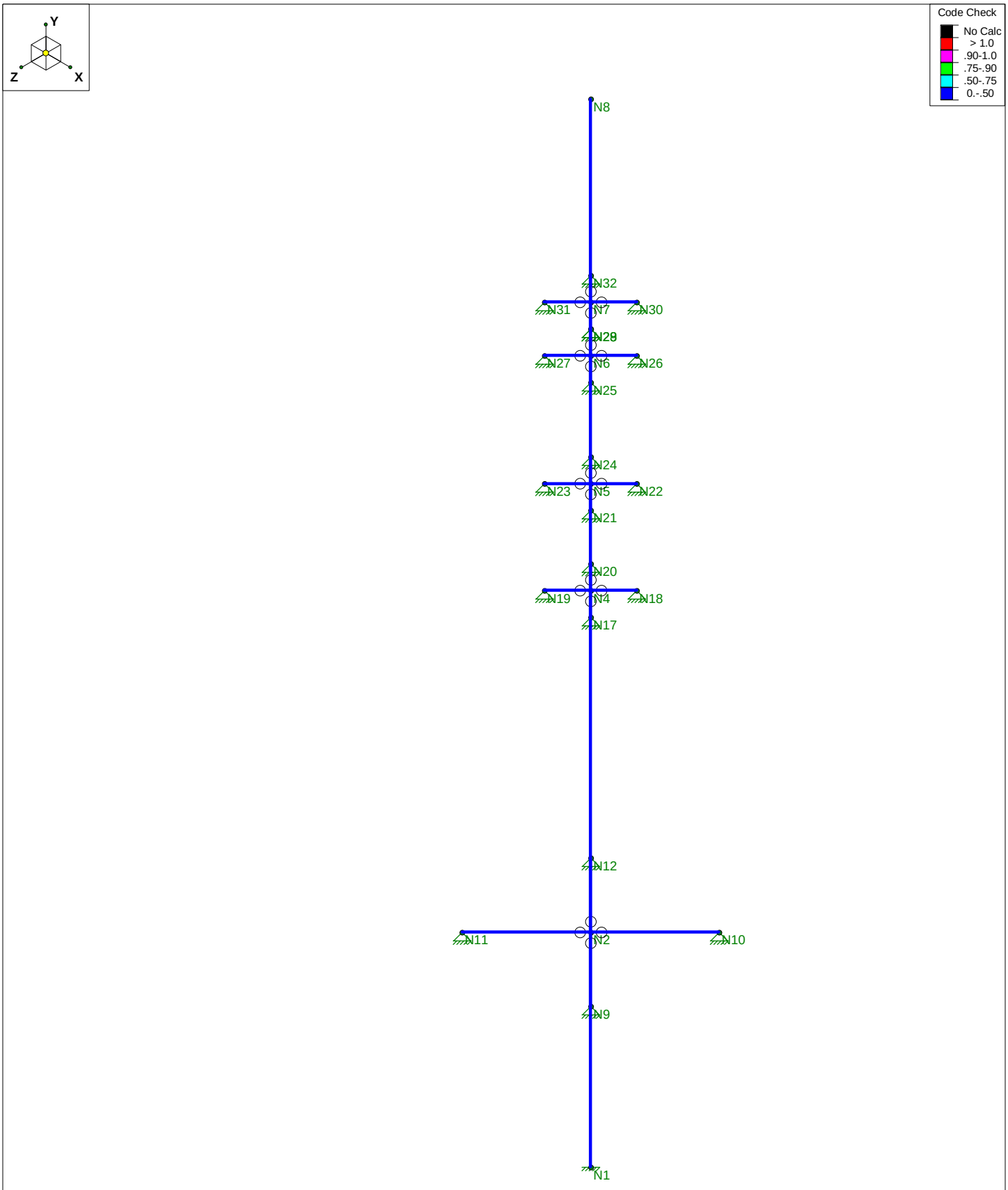
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N12	-.585	.034	-.718	0	0	0
2	4	N11	.585	.034	-.718	0	0	0
3	4	N9	-.585	.034	-.718	0	0	0
4	4	N10	.585	.034	-.718	0	0	0
5	4	N18	.541	.009	-.578	0	0	0
6	4	N22	.06	.009	-.097	0	0	0
7	4	N19	.541	.008	-.578	0	0	0
8	4	N23	.06	.009	-.097	0	0	0
9	4	N17	-.541	.008	-.578	0	0	0
10	4	N20	-.541	.009	-.578	0	0	0
11	4	N21	-.06	.009	-.097	0	0	0
12	4	N25	3.478	.01	3.443	0	0	0
13	4	N1	0	13.197	-.47	-1.303	0	0
14	4	N31	5.146	.006	-5.181	0	0	0
15	4	N32	-5.144	.011	-5.183	0	0	0
16	4	N29	-5.146	.006	-5.181	0	0	0
17	4	N30	5.144	.011	-5.183	0	0	0
18	4	N27	-3.478	.01	3.443	0	0	0
19	4	N28	3.479	.007	3.442	0	0	0
20	4	N26	-3.479	.007	3.442	0	0	0
21	4	N24	-.06	.009	-.097	0	0	0
22	4	Totals:	0	13.471	-12.999			
23	4	COG (ft):	X: 0	Y: 54.508	Z: 0			

Joint Reactions

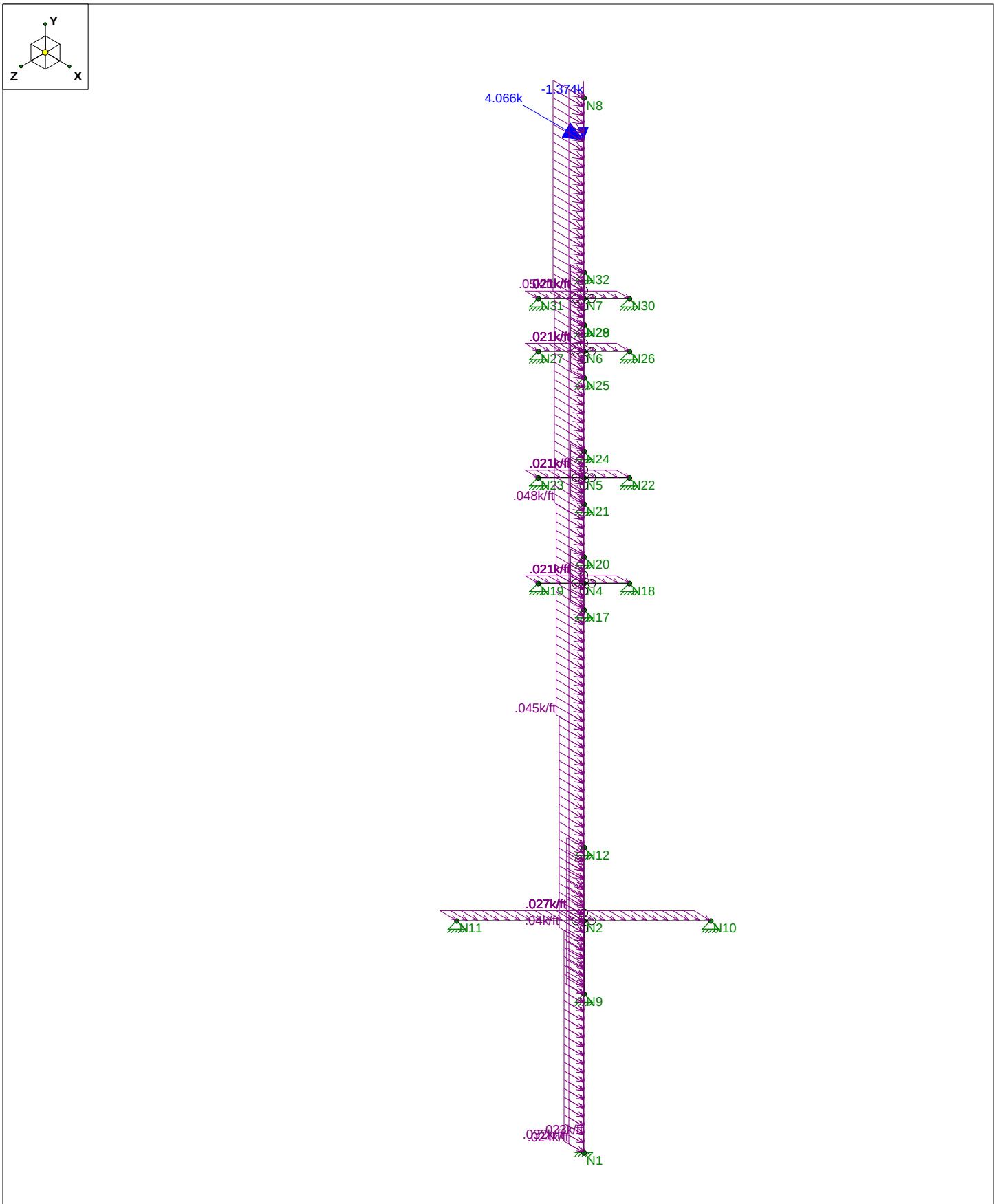
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	5	N12	-.585	.026	-.718	0	0	0
2	5	N11	.585	.026	-.718	0	0	0
3	5	N9	-.585	.026	-.718	0	0	0
4	5	N10	.585	.026	-.718	0	0	0
5	5	N18	.541	.007	-.578	0	0	0
6	5	N22	.06	.006	-.097	0	0	0
7	5	N19	.541	.006	-.578	0	0	0
8	5	N23	.06	.006	-.097	0	0	0
9	5	N17	-.541	.006	-.578	0	0	0
10	5	N20	-.541	.007	-.578	0	0	0
11	5	N21	-.06	.006	-.097	0	0	0
12	5	N25	3.476	.007	3.44	0	0	0
13	5	N1	0	9.898	-.47	-1.303	0	0
14	5	N31	5.144	.005	-5.178	0	0	0
15	5	N32	-5.142	.008	-5.181	0	0	0
16	5	N29	-5.144	.005	-5.178	0	0	0
17	5	N30	5.142	.008	-5.181	0	0	0
18	5	N27	-3.476	.007	3.44	0	0	0
19	5	N28	3.477	.005	3.439	0	0	0
20	5	N26	-3.477	.005	3.439	0	0	0
21	5	N24	-.06	.006	-.097	0	0	0
22	5	Totals:	0	10.103	-12.999			
23	5	COG (ft):	X: 0	Y: 54.508	Z: 0			

Joint Reactions

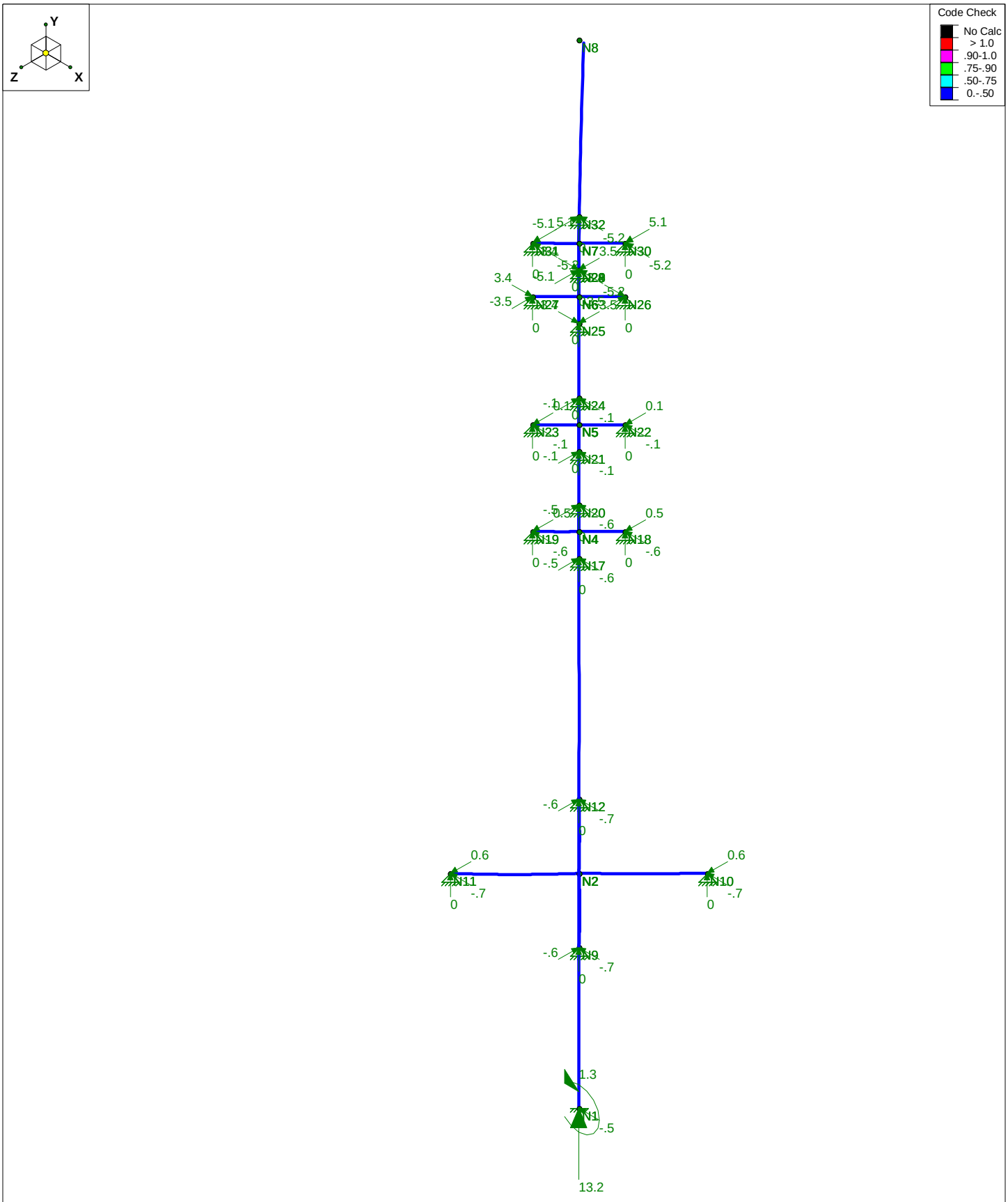
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	6	N12	-.144	.122	-.188	0	0	0
2	6	N11	.144	.122	-.188	0	0	0
3	6	N9	-.144	.122	-.188	0	0	0
4	6	N10	.144	.122	-.188	0	0	0
5	6	N18	.124	.035	-.138	0	0	0
6	6	N22	.02	.035	-.034	0	0	0
7	6	N19	.124	.035	-.138	0	0	0
8	6	N23	.02	.035	-.034	0	0	0
9	6	N17	-.124	.035	-.138	0	0	0
10	6	N20	-.124	.035	-.138	0	0	0
11	6	N21	-.02	.035	-.034	0	0	0
12	6	N25	.733	.036	.719	0	0	0
13	6	N1	0	39.012	-.113	-.331	0	0
14	6	N31	1.101	.034	-1.115	0	0	0
15	6	N32	-1.101	.036	-1.116	0	0	0
16	6	N29	-1.101	.034	-1.115	0	0	0
17	6	N30	1.101	.036	-1.116	0	0	0
18	6	N27	-.733	.036	.719	0	0	0
19	6	N28	.733	.034	.719	0	0	0
20	6	N26	-.733	.034	.719	0	0	0
21	6	N24	-.02	.035	-.034	0	0	0
22	6	Totals:	0	40.063	-3.143			
23	6	COG (ft):	X: 0	Y: 54.089	Z: 0			



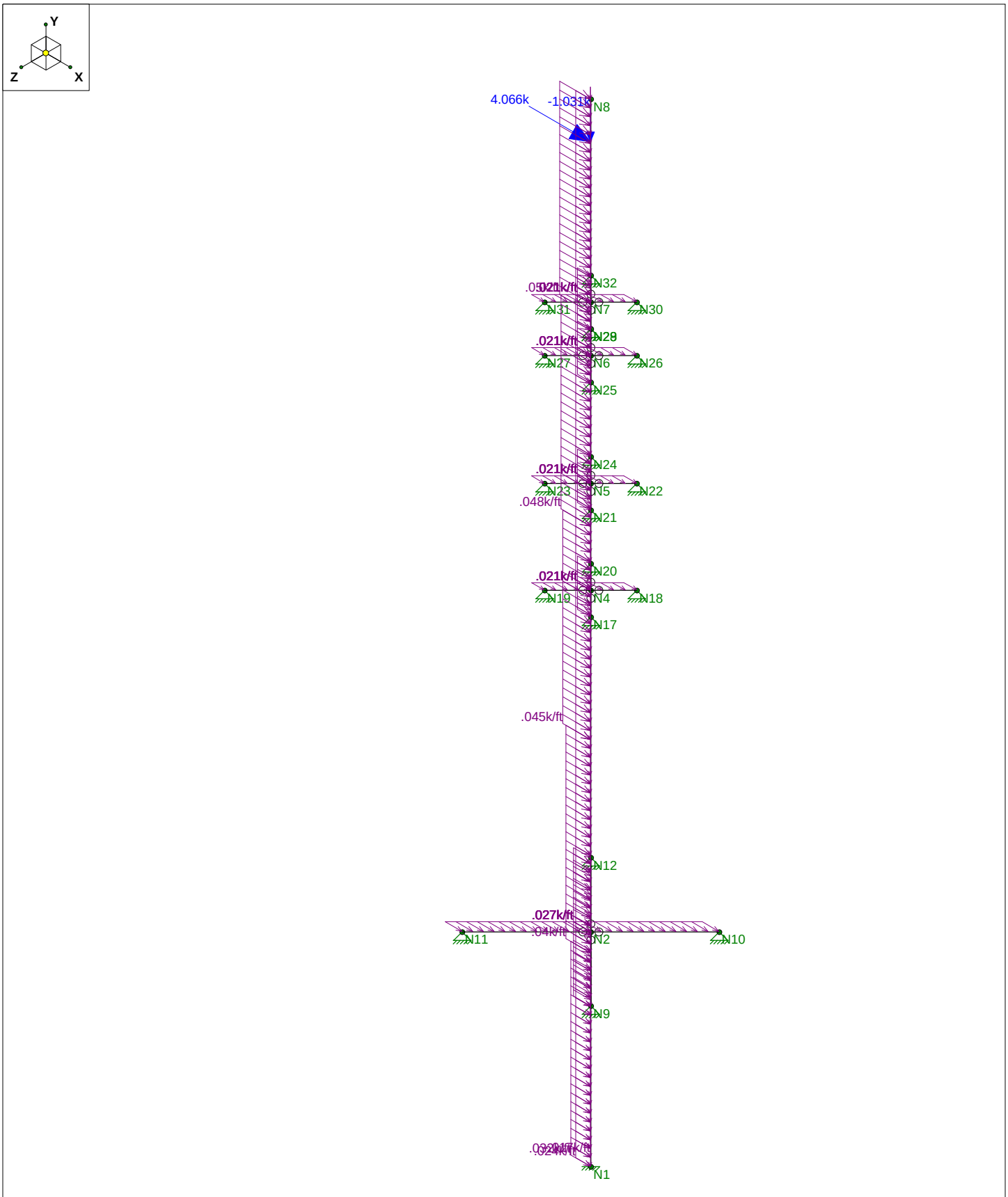
CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:49 PM
16159.11 - CT11360A	Unity Check	TIA - Antenna Mast.r3d



CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:47 PM
16159.11 - CT11360A	LC #1 Loads	TIA - Antenna Mast.r3d

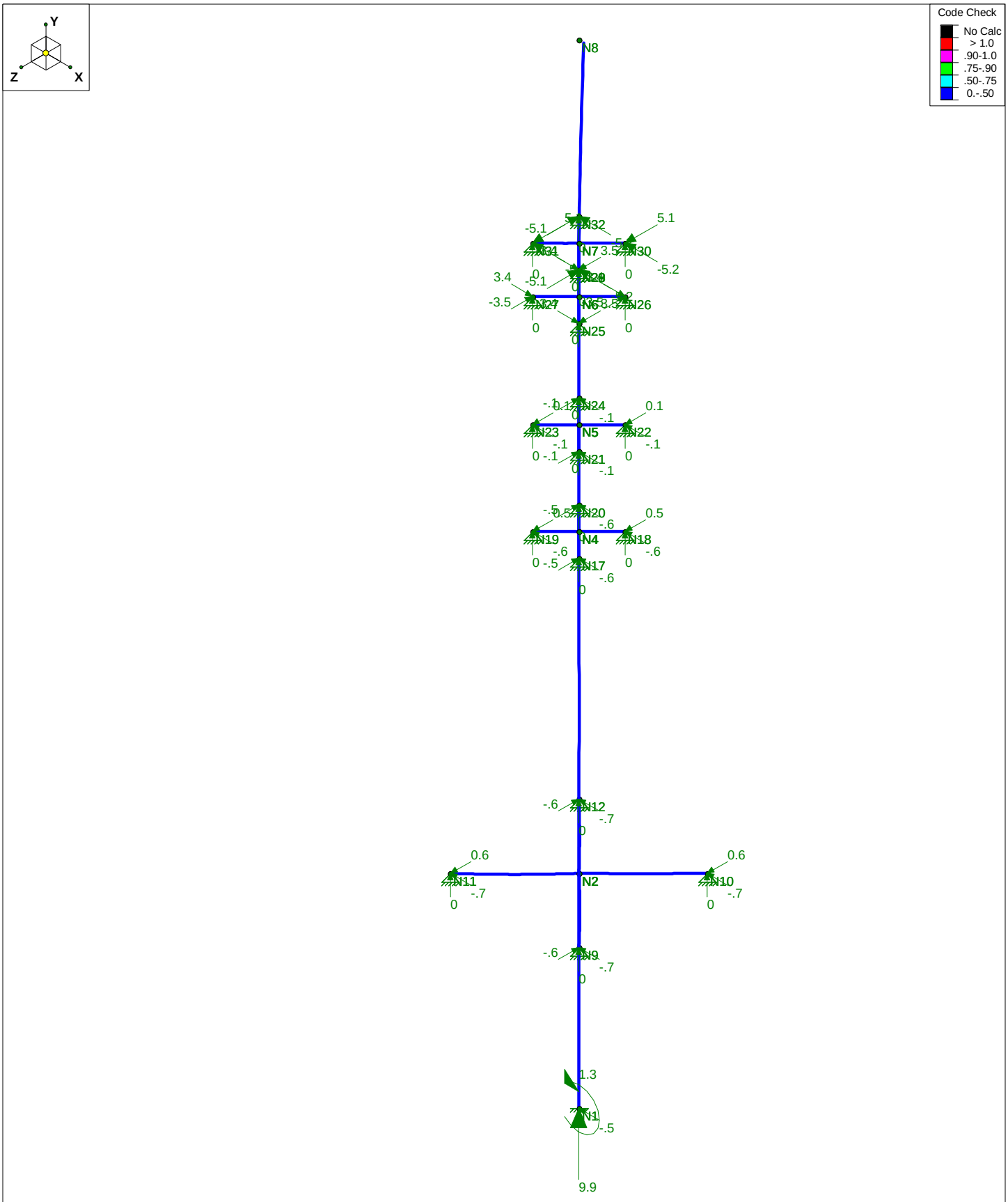


CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:50 PM
16159.11 - CT11360A	LC #1 Reactions and Deflected Shape	TIA - Antenna Mast.r3d

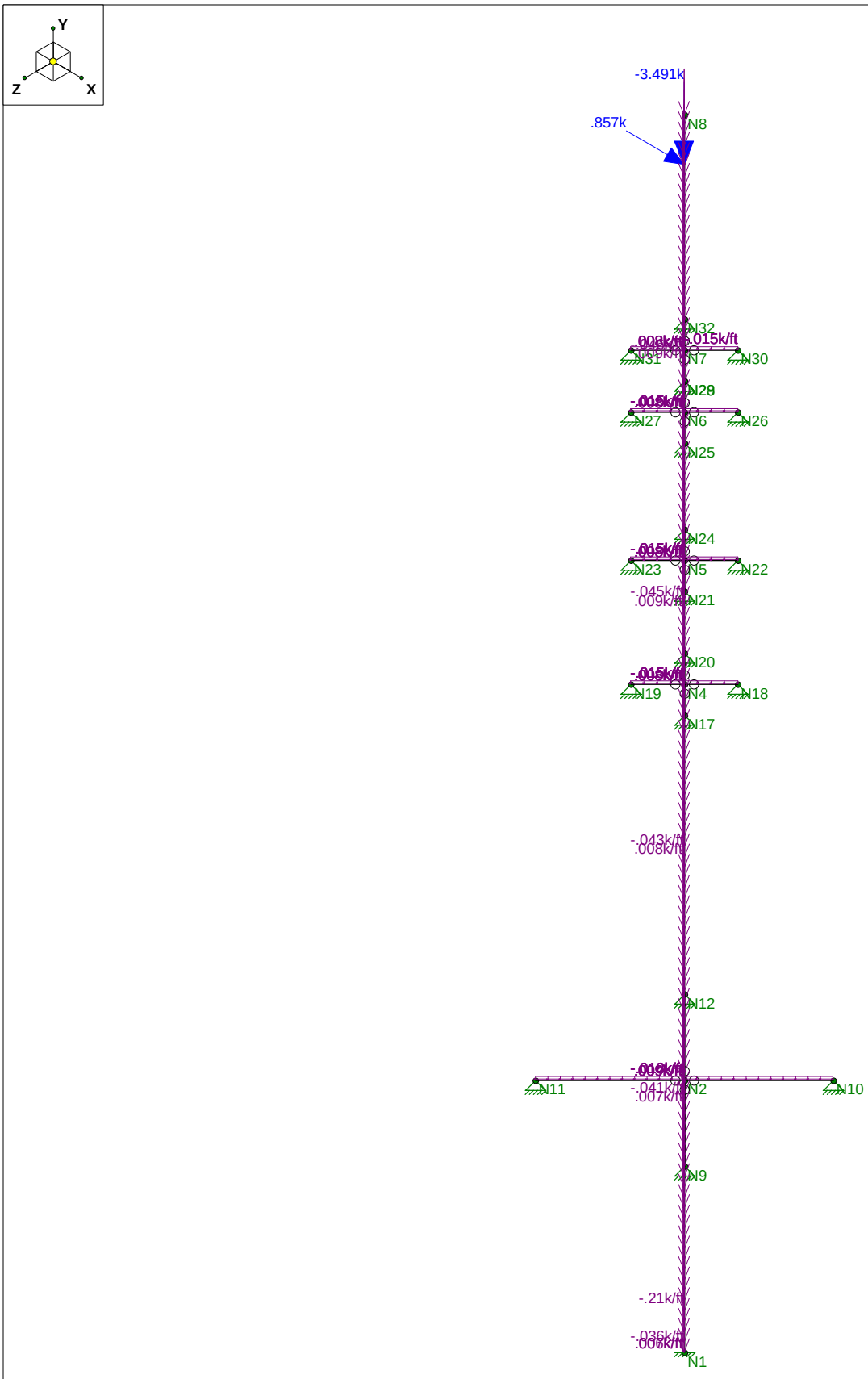


Loads: LC 2, 0.9D + 1.6W (X-direction)

CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:48 PM
16159.11 - CT11360A	LC #2 Loads	TIA - Antenna Mast.r3d

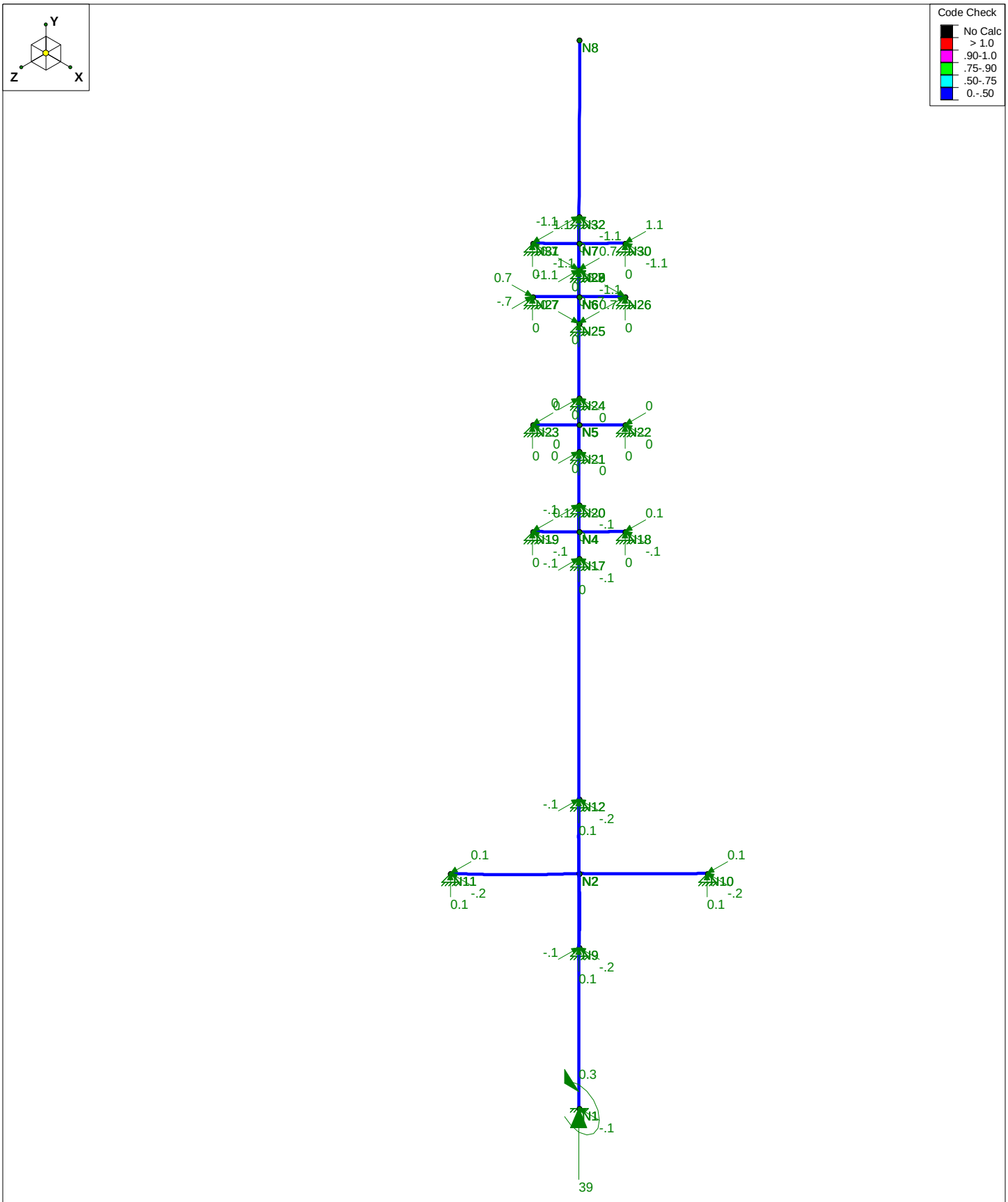


CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:51 PM
16159.11 - CT11360A	LC #2 Reactions and Deflected Shape	TIA - Antenna Mast.r3d

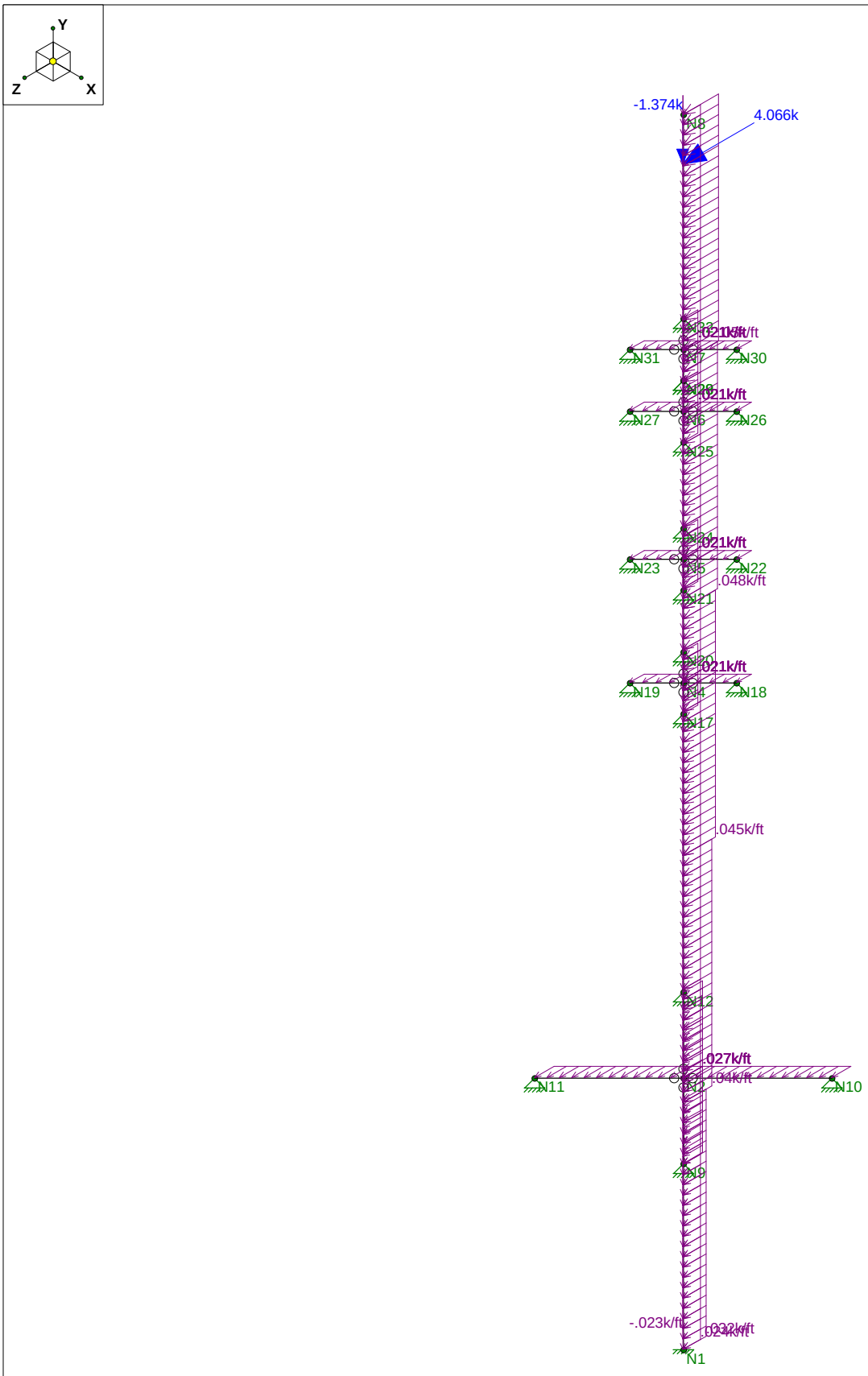


Loads: LC 3, 1.2D + 1.0Di + 1.0Wi (X-direction)

CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:48 PM
16159.11 - CT11360A	LC #3 Loads	TIA - Antenna Mast.r3d

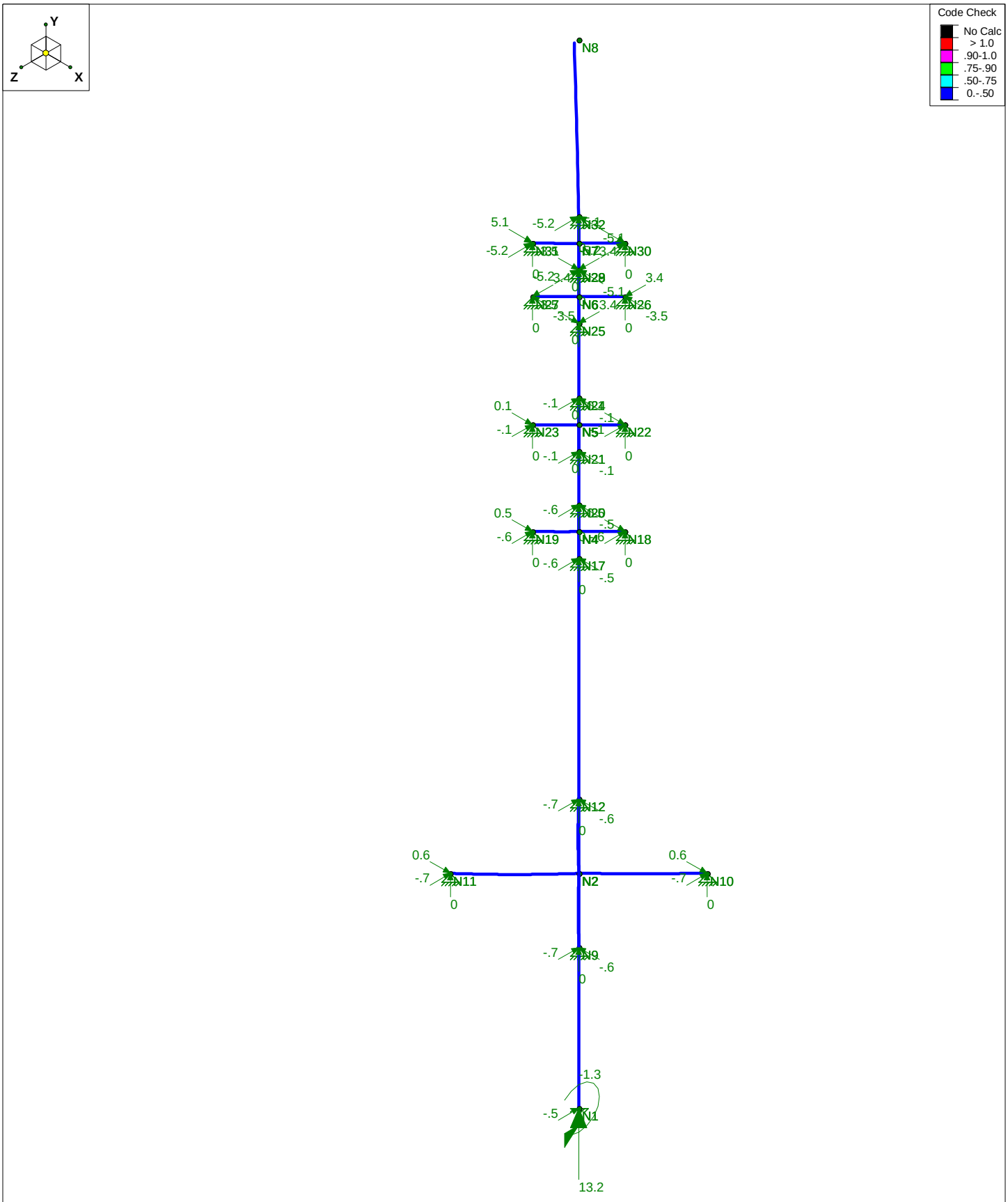


CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:51 PM
16159.11 - CT11360A	LC #3 Reactions and Deflected Shape	TIA - Antenna Mast.r3d

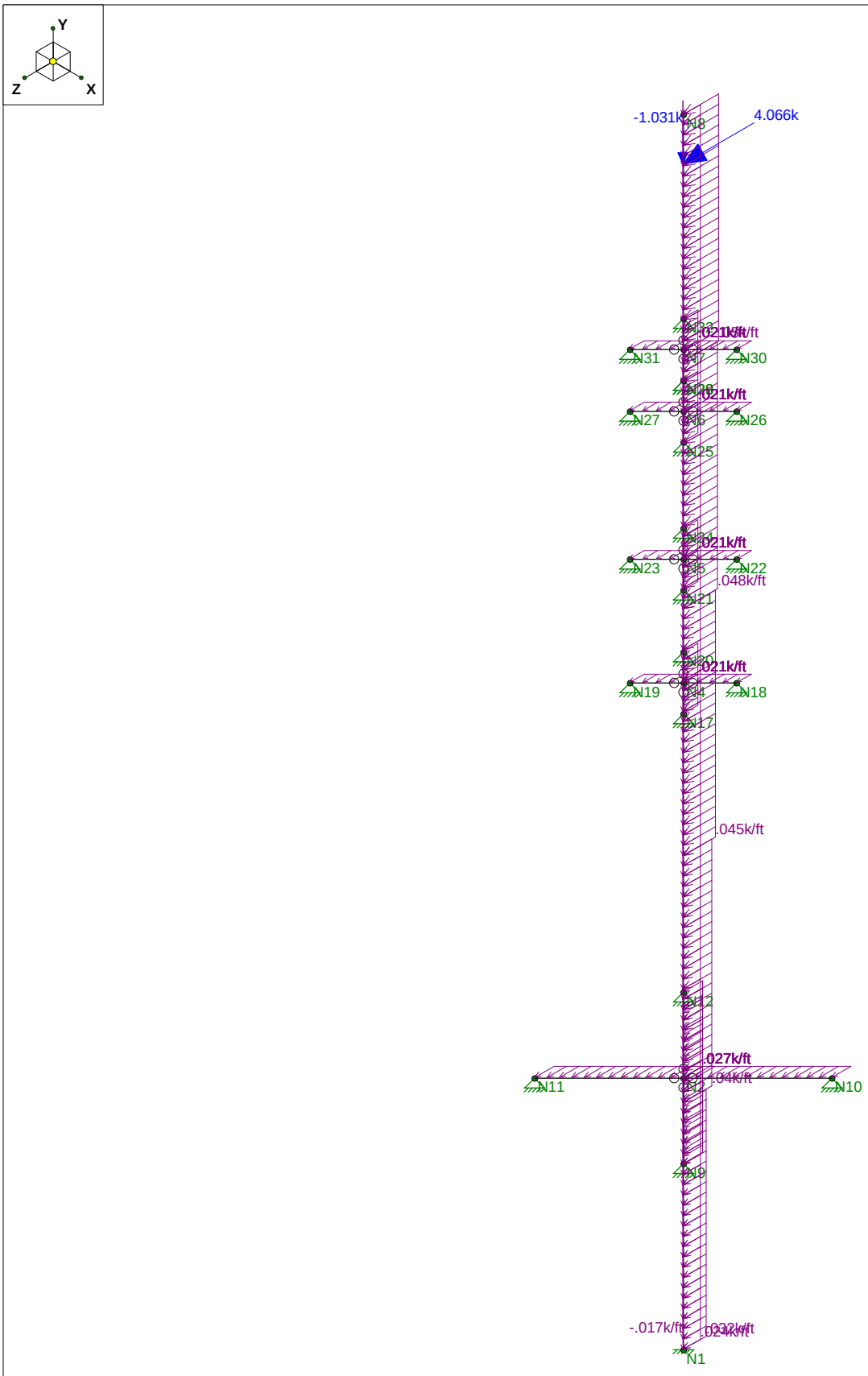


Loads: LC 4, 1.2D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:48 PM
16159.11 - CT11360A	LC #4 Loads	TIA - Antenna Mast.r3d

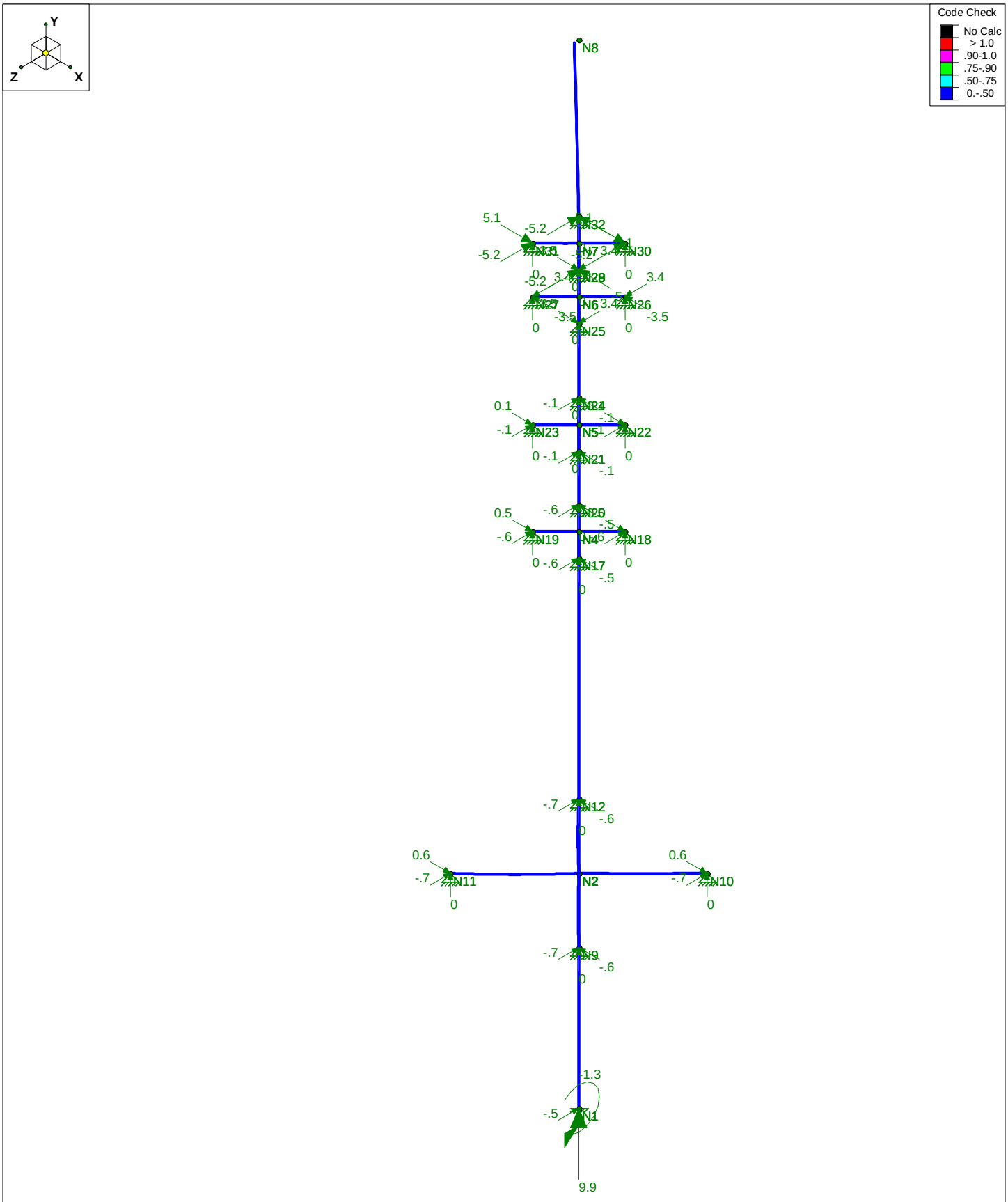


CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:52 PM
16159.11 - CT11360A	LC #4 Reactions and Deflected Shape	TIA - Antenna Mast.r3d

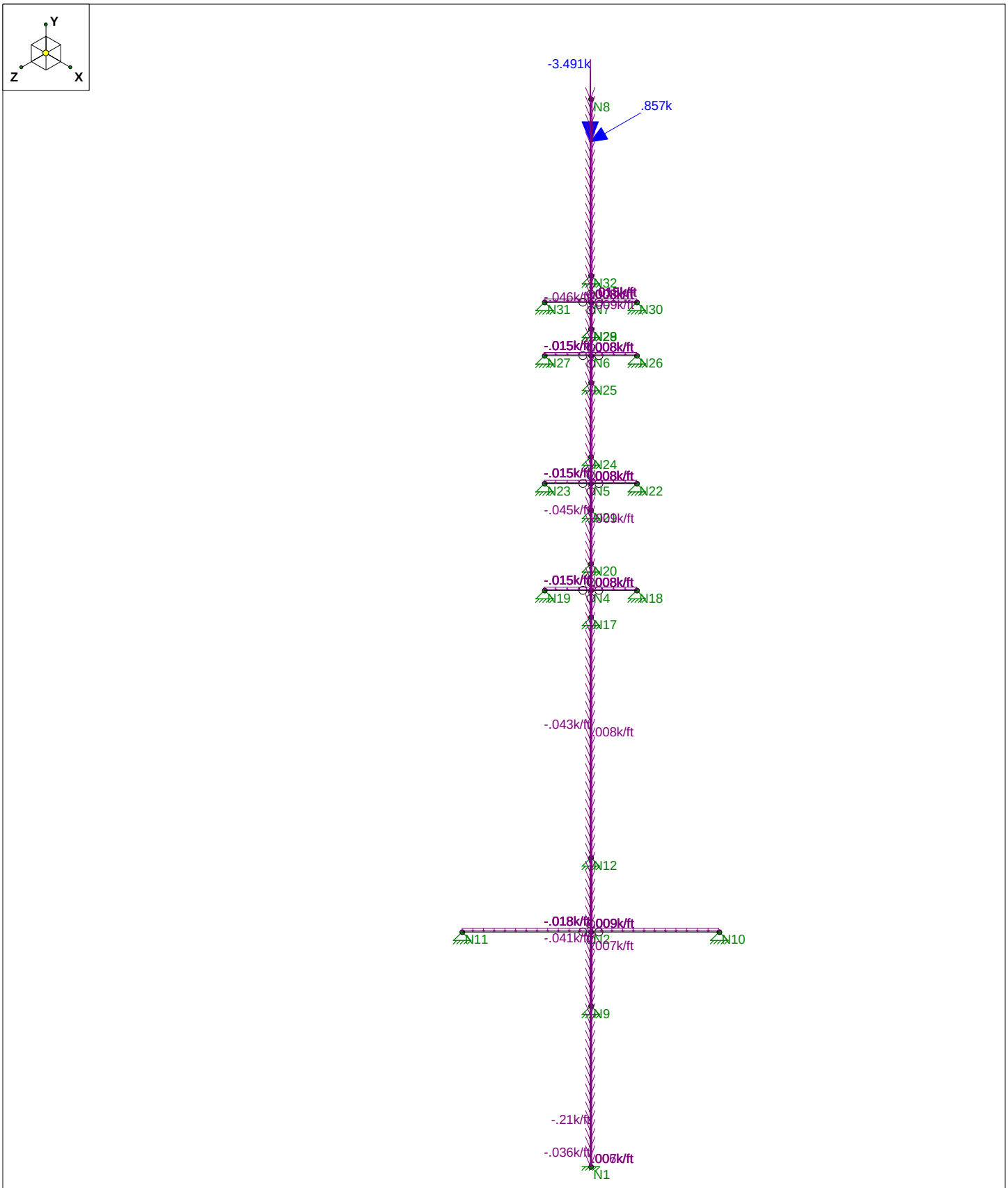


Loads: LC 5, 0.9D + 1.6W (Z-direction)

CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:48 PM
16159.11 - CT11360A	LC #5 Loads	TIA - Antenna Mast.r3d

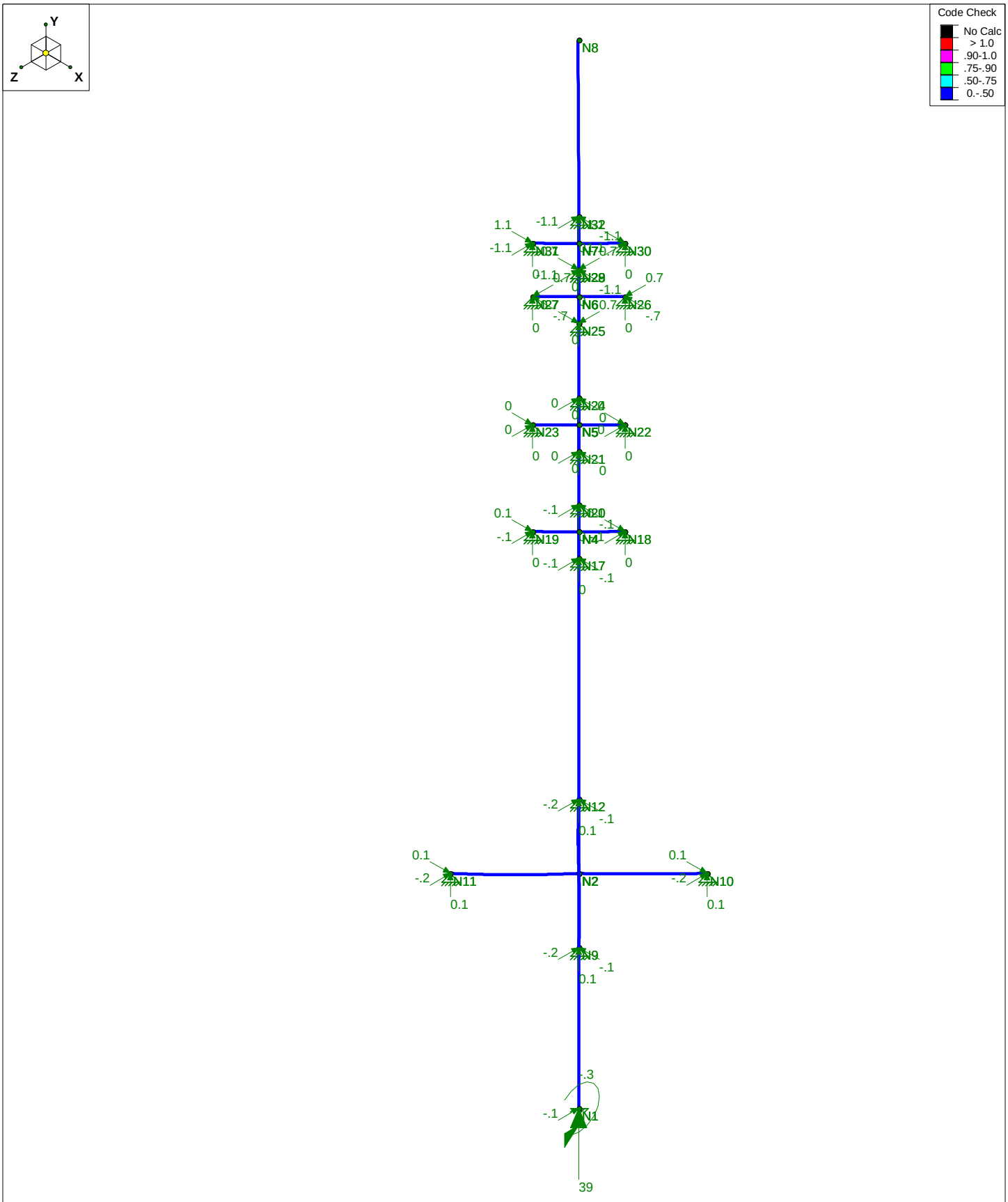


CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:52 PM
16159.11 - CT11360A	LC #5 Reactions and Deflected Shape	TIA - Antenna Mast.r3d



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

CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:48 PM
16159.11 - CT11360A	LC #6 Loads	TIA - Antenna Mast.r3d



CENTEK Engineering, INC.		
tjl, cfc	Struct # 910 - Antenna Mast	Feb 13, 2017 at 3:52 PM
16159.11 - CT11360A	LC #6 Reactions and Deflected Shape	TIA - Antenna Mast.r3d

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Subject: Connection of Powermount to Tower # 910

Location: Fairfield, CT

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 16159.11

Rev. 0: 2/13/17

Antenna Mast Connection to Tower:

Reactions:

Horz = $Horz := 20.9 \cdot kips$ (User Input)

Pipe Collar:

Bolt Data:

Bolt Type = ASTM A325 (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)

Plate Data:

Plate Width = $W_{plt} := 5 \cdot in$ (User Input)

Plate Thickness = $t_{plt} := 1.25 \cdot in$ (User Input)

Distance from Bolt to Collar = $d_{st} := 1.75 \cdot in$ (User Input)

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

Weld Data:

Weld Size = $sw := \frac{5}{16} \cdot in$ (User Input)

Weld Length = $l_w := 5 \cdot in$ (User Input)

Number of Welds = $n_w := 2$ (User Input)

Weld Strength = $F_w := 70 \cdot ksi$ (User Input)

Check Pipe Collar Bolts:

Tension Force = $f_t := \frac{Horz}{N_b} = 5.2 \cdot kips$

Bolt Tenison % of Capacity = $\frac{f_t}{F_t} = 25.24 \cdot \%$

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

Bolt_Tension = "OK"

Check Pipe Collar Plate:

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

Plate Section Modulus = $Z_{plt} := \frac{1}{4} \cdot W_{plt} \cdot t_{plt}^2 = 1.953 \cdot in^3$

Plate Bending Moment = $M := \frac{Horz}{2} \cdot d_{st} = 18.287 \cdot in \cdot kips$

Plate Bending Stress = $f_b := \frac{M}{Z_{plt}} = 9.363 \cdot ksi$

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

Plate_Bending = "OK"

Check Pipe Collar Weld:

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

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

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

Plate Stress = $f_w := \frac{Horz}{A_w \cdot n_w} = 9.46 \cdot ksi$

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

Weld = "OK"

Reactions:

Force =	Fab := 7.2·kips	(User Input)

Angle Plate:

Bolt Data:

Bolt Type =	ASTM A325	(User Input)
Bolt Diameter =	D := 0.625·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)

Plate Data:

Plate Width =	$W_{plt} := 3 \cdot in$	(User Input)
Plate Thickness =	$t_{plt} := 0.75 \cdot in$	(User Input)
Distance from Bolt to Collar =	$d_{st} := 1.5 \cdot in$	(User Input)
Yield Strength =	$F_y := 36 \cdot ksi$	(User Input)
Tensile Strength =	$F_u := 58 \cdot ksi$	(User Input)
Hole Diamter =	$Hole_d := .8125 \cdot in$	(User Input)

Weld Data:

Weld Size =	$sw := \frac{5}{16} \cdot in$	(User Input)
Weld Length =	$l_w := 3 \cdot in$	(User Input)
Number of Welds =	$n_w := 2$	(User Input)
Weld Strength =	$F_w := 70 \cdot ksi$	(User Input)

Check Angle Brace Bolts:

Shear Force = $f_v := \frac{Fab}{N_b} = 7.2 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 58.06 \cdot \%$

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

Bolt_Shear = "OK"

Check Angle Connection Plate:

Plate Gross Area = $A_g := W_{plt} \cdot t_{plt} = 2.25 \cdot in^2$

Plate Net Area = $A_n := \left[W_{plt} - \left(Hole_d + .0625 \cdot in\right)\right] \cdot t_{plt} = 1.594 \cdot in^2$

Shear Lag Factor = $U := 1.0$

Plate Effective Net Area = $A_e := A_n \cdot U = 1.594 \cdot in^2$

Yielding Factor = $\phi_t := 0.9$

Rupture Factor = $\phi_r := 0.75$

Bearing Strength Factor = $\phi_b := 0.75$

Clear Distance = $l_c := d_{st} - \frac{Hole_d}{2} = 1.094 \cdot in$

Tensile Yielding = $P_{at} := \phi_t \cdot F_y \cdot A_g = 72.9 \cdot kips$

Tensile Rupture = $P_{ar} := \phi_r \cdot F_u \cdot A_e = 69.328 \cdot kips$

Bearing Strength = $R_a := \phi_b \cdot 1.2 \cdot l_c \cdot t_{plt} \cdot F_u = 42.82 \cdot kips$

$Pa := \min\left(P_{at}, P_{ar}, R_a\right) = 42.82 \cdot kips$

$Plate := if\left(Fab < Pa, "OK", "Overstressed"\right)$

Plate = "OK"

Check Angle Connection Plate Weld:

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

Weld Area = $A_w := .707 \cdot sw \cdot l_w = 0.663 \cdot in^2$

Plate Stress = $f_w := \frac{Fab}{A_w \cdot n_w} = 5.431 \cdot ksi$

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

Weld = "OK"

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Subject:	Flange Bolts and Flangeplate Analysis
Location:	Fairfield, CT
Rev. 0: 2/13/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16159.11

Flange Bolt and Flange Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	OM := 73.1·ft·kips	(Input From Risa3D)
Shear Force =	Shear := 14.9·kips	(Input From Risa3D)
Axial Force =	Axial := 13.2·kips	(Input From Risa3D)

Flange Bolt Data:

Use ASTM A325

Number of Flange Bolts =	N := 12	(User Input)
Diameter of Bolt Circle =	D_{bc} := 19·in	(User Input)
Bolt Minimum Tensile Strength =	F_{ub} := 120·ksi	(User Input)
Bolt Modulus =	E := 29000·ksi	(User Input)
Diameter of Flange Bolts =	D := 1.00·in	(User Input)
Threads per Inch =	n := 8	(User Input)

Flange Plate Data:

Use ASTM A36

Plate Yield Strength =	Fy_{bp} := 36·ksi	(User Input)
Flange Plate Thickness =	t_{bp} := 1·in	(User Input)
Flange Plate Diameter =	D_{bp} := 22·in	(User Input)
Outer Pole Diameter =	D_{pole} := 16·in	(User Input)

Weld Data:

Weld Size =	$sw := \frac{1}{4}\cdot in$	(User Input)
Weld Strength =	F_w := 70·ksi	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 9.5 \cdot in$

Distance to Bolts = $i := 1 .. N$

$$d_i := \left| \begin{array}{l} \theta \leftarrow 2 \cdot \pi \cdot \left(\frac{i}{N} \right) \\ d \leftarrow R_{bc} \cdot \sin(\theta) \end{array} \right.$$

$d_1 = 4.75 \cdot in$ $d_7 = -4.75 \cdot in$

$d_2 = 8.23 \cdot in$ $d_8 = -8.23 \cdot in$

$d_3 = 9.50 \cdot in$ $d_9 = -9.50 \cdot in$

$d_4 = 8.23 \cdot in$ $d_{10} = -8.23 \cdot in$

$d_5 = 4.75 \cdot in$ $d_{11} = -4.75 \cdot in$

$d_6 = 0.00 \cdot in$ $d_{12} = -0.00 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 8 \cdot in$

Moment Arms of Bolts about Neutral Axis = $MA_i := if\left(d_i \geq R_{pole}, d_i - R_{pole}, 0in\right)$

$MA_1 = 0.00 \cdot in$ $MA_7 = 0.00 \cdot in$

$MA_2 = 0.23 \cdot in$ $MA_8 = 0.00 \cdot in$

$MA_3 = 1.50 \cdot in$ $MA_9 = 0.00 \cdot in$

$MA_4 = 0.23 \cdot in$ $MA_{10} = 0.00 \cdot in$

$MA_5 = 0.00 \cdot in$ $MA_{11} = 0.00 \cdot in$

$MA_6 = 0.00 \cdot in$ $MA_{12} = 0.00 \cdot in$

Effective Width of Flangeplate for Bending = $B_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 12.1 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i \left(d_i\right)^2 = 541.5 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 0.785 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 0.606 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 0.878 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.22 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^3}{32} = 0.066 \cdot in^3$

Check Flange Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N} = 14.3 \cdot kips$

Maximum Shear Force = $V_{Max} := \frac{Shear}{N} = 1.2 \cdot kips$

Design Tensile Strength = $\Phi R_{nt} := \left(0.75 \cdot F_{ub} \cdot 0.75 \cdot A_g\right) = 53 \cdot kips$

Bolt Tension % of Capacity = $\frac{T_{Max}}{\Phi R_{nt}} = 26.95 \cdot \%$

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{\Phi R_{nt}} \le 1.00, "OK", "Overstressed"\right)$

Condition1 = "OK"

Design Shear Strength = $\Phi R_{nv} := \left(0.75 \cdot 0.45 \cdot F_{ub} \cdot A_g\right) = 31.8 \cdot kips$

Condition2 = $Condition2 := if\left[\left(\frac{V_{Max}}{\Phi R_{nv}}\right)^2 + \left(\frac{T_{Max}}{\Phi R_{nt}}\right)^2 \le 1.00, "OK", "Overstressed"\right]$

Condition2 = "OK"

Flange Plate Analysis:

Force from Bolts = $C_i := \frac{OM \cdot d_i}{I_p} + \frac{Axial}{N}$

$C_1 = 8.8 \cdot kips$ $C_7 = -6.6 \cdot kips$

$C_2 = 14.4 \cdot kips$ $C_8 = -12.2 \cdot kips$

$C_3 = 16.5 \cdot kips$ $C_9 = -14.3 \cdot kips$

$C_4 = 14.4 \cdot kips$ $C_{10} = -12.2 \cdot kips$

$C_5 = 8.8 \cdot kips$ $C_{11} = -6.6 \cdot kips$

$C_6 = 1.1 \cdot kips$ $C_{12} = 1.1 \cdot kips$

Maximum Bending Stress in Plate = $f_{bp} := \sum_i \frac{4 \cdot C_i \cdot MA_i}{\left(B_{eff} \cdot t_{bp}^2\right)} = 10.4 \cdot ksi$

Allowable Bending Stress in Plate = $F_{bp} := 0.9 \cdot Fy_{bp} = 32.4 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 32.0 \cdot \%$

Condition3 = $Condition3 := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$

Condition3 = "Ok"

Check Weld:

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

Weld Area = $A_w := \frac{\pi}{4} \cdot \left[\left(D_{pole} + 2sw \cdot 0.707\right)^2 - D_{pole}^2\right] = 8.98 \cdot in^2$

Section Modulus of Weld = $S_w := \frac{\pi \cdot \left[\left(D_{pole} + 2sw \cdot 0.707\right)^4 - D_{pole}^4\right]}{32 \cdot \left(D_{pole} + 2sw \cdot 0.707\right)} = 35.94 \cdot in^3$

Weld Stress = $f_w := \frac{OM}{S_w} + \frac{Shear}{A_w} = 26.07 \cdot ksi$

$Condition3 := if\left(f_w < F_w, "OK", "Overstressed"\right)$

Condition3 = "OK"

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Subject:	Load Analysis of Antenna Mast on Structure #910
Location:	Fairfield, CT
Rev. 0: 2/13/17	Prepared by: T.J.L Checked by: C.F.C. Job No. 16159.11

Basic Components

Heavy Wind Pressure =	p := 4.00	psf	(User Input NESC 2007 Figure 250-1 & Table 250-1)
Basic Windspeed =	V := 110	mph	(User Input NESC 2007 Figure 250-2(e))
Radial Ice Thickness =	Ir := 0.50	in	(User Input)
Radial Ice Density =	Id := 56.0	pcf	(User Input)

Factors for Extreme Wind Calculation

Elevation of Top of Mast Above Grade =	TME := 100	ft	(User Input)
Multiplier Gust Response Factor =	m := 1.25		(User Input - Only for NESC Extreme wind case)
NESC Factor =	kv := 1.43		(User Input from NESC 2007 Table 250-3 equation)
Importance Factor =	I := 1.0		(User Input from NESC 2007 Section 250.C.2)
Velocity Pressure Coefficient =	$Kz := 2.01\cdot\left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.266$		(NESC 2007 Table 250-2)
Exposure Factor =	$Es := 0.346\left[\frac{33}{(0.67\cdot TME)}\right]^{\frac{1}{7}} = 0.313$		(NESC 2007 Table 250-3)
Response Term =	$Bs := \frac{1}{\left(1 + 0.375\cdot\frac{TME}{220}\right)} = 0.854$		(NESC 2007 Table 250-3)
Gust Response Factor =	$Grf := \frac{\left[1 + \left(2.7\cdot Es\cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.871$		(NESC 2007 Table 250-3)
Wind Pressure =	$qz := 0.00256\cdot Kz\cdot V^2\cdot Grf\cdot I = 34.1$	psf	(NESC 2007 Section 250.C.2)

Shape Factors

NUS Design Criteria Issued April 12, 2007

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

Overload Factors

NU Design Criteria Table

Overload Factors for Wind Loads:

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

Overload Factors for Vertical Loads:

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

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APX16DWV-16DWVS		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)
Antenna Width =	$W_{ant} := 13$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 45$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant1} := WT_{ant} \cdot N_{ant} = 135$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1017$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 33$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 99$ lbs

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 15.1$ sf

Total Antenna Wind Force = $F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1034$ lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 5.5$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 16.6$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 106$ lbs

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Andrew LNX-6515DS		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 96.4$	in	(User Input)
Antenna Width =	$W_{ant} := 11.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7.1$	in	(User Input)
Antenna Weight =	$WT_{ant} := 45$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 3$		(User Input)

Gravity Load (without ice)

Weight of All Antennas = $Wt_{ant2} := WT_{ant} \cdot N_{ant} = 135$ lbs

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 8145$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 2032$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 66$ lbs

Weight of Ice on All Antennas = $Wt_{ice.ant2} := W_{ICEant} \cdot N_{ant} = 198$ lbs

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 8$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 23.9$ sf

Total Antenna Wind Force = $F_{ant2} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 1632$ lbs

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 8.7$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 26.2$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant2} := p \cdot Cd_F \cdot A_{ICEant} = 168$ lbs

Development of Wind & Ice Load on Platform

Platform Data:

Platform Model =	SitePro Monopole Triple T-Arm RMV 5-272		
Mount Shape =	Flat		
Mount Projected Surface Area =	$CdAa := 10$	sf	(User Input)
Mount Projected Surface Area w/ Ice =	$CdAa_{ice} := 15$	sf	(User Input)
Mount Weight =	$WT_{mnt} := 875$	lbs	(User Input)
Mount Weight w/ Ice =	$WT_{mnt.ice} := 1250$	lbs	(User Input)

Gravity Loads (without ice)

Weight of All Mounts = $Wt_{mnt1} := WT_{mnt} = 875$ lbs

Gravity Load (ice only)

Weight of Ice on All Mounts = $Wt_{ice.mnt1} := \left(WT_{mnt.ice} - WT_{mnt}\right) = 375$ lbs

Wind Load (NESC Heavy)

Total Mount Wind Force w/ Ice = $Fi_{mnt1} := p \cdot CdAa_{ice} = 60$ lbs

Wind Load (NESC Extreme)

Total Mount Wind Force = $F_{mnt1} := qz \cdot CdAa \cdot m = 427$ lbs

Total Equipment Loads:

NESC Heavy Wind Vertical =

$$\left(Wt_{ant1} + Wt_{ice.ant1} + Wt_{ant2} + Wt_{ice.ant2} + Wt_{mnt1} + Wt_{ice.mnt1}\right)\cdot 1.5 = 2725$$

NESC Heavy Wind Trasnsverse =

$$\left(Fi_{ant1} + Fi_{ant2} + Fi_{mnt1}\right)\cdot 2.5 = 834$$

NESC Extreme Wind Vertical =

$$\left(Wt_{ant1} + Wt_{ant2} + Wt_{mnt1}\right) = 1145$$

NESC Extreme Wind Trasnsverse =

$$\left(F_{ant1} + F_{ant2} + F_{mnt1}\right) = 3092$$

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Subject:	Coax Cable on Antenna Mast Tower # 910
Location:	Fairfield, CT
Rev. 0: 2/13/17	Prepared by: T.J.L Checked by: C.F.C. Job No. 16159.11

Coax Cable on Antenna Mast

Distance Between Coax Cable Attach Points = $Coax_{Span} := \begin{pmatrix} 7.5 \\ 10 \\ 8.5 \\ 11 \\ 21 \\ 38 \end{pmatrix} \cdot ft$ *(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 = $N_{coax} := 18$ *(User Input)*

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

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

Extreme Wind Pressure = $qz := 34.1 \cdot psf$ *(User Input)*

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

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

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

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

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

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

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

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

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

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

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 = $W_{ice} := Ai_{coax} \cdot Id \cdot NX_{coax} = 18.179 \cdot plf$

Heavy Vertical Load =

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

Heavy Wind Transverse Load =

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

$$Heavy\_WInd_{Vert} = \begin{pmatrix} 415 \\ 553 \\ 470 \\ 609 \\ 1162 \\ 2103 \end{pmatrix} lb \qquad Heavy\_Wind_{Trans} = \begin{pmatrix} 50 \\ 66 \\ 56 \\ 73 \\ 139 \\ 251 \end{pmatrix} lb$$

Extreme Wind Vertical Load =

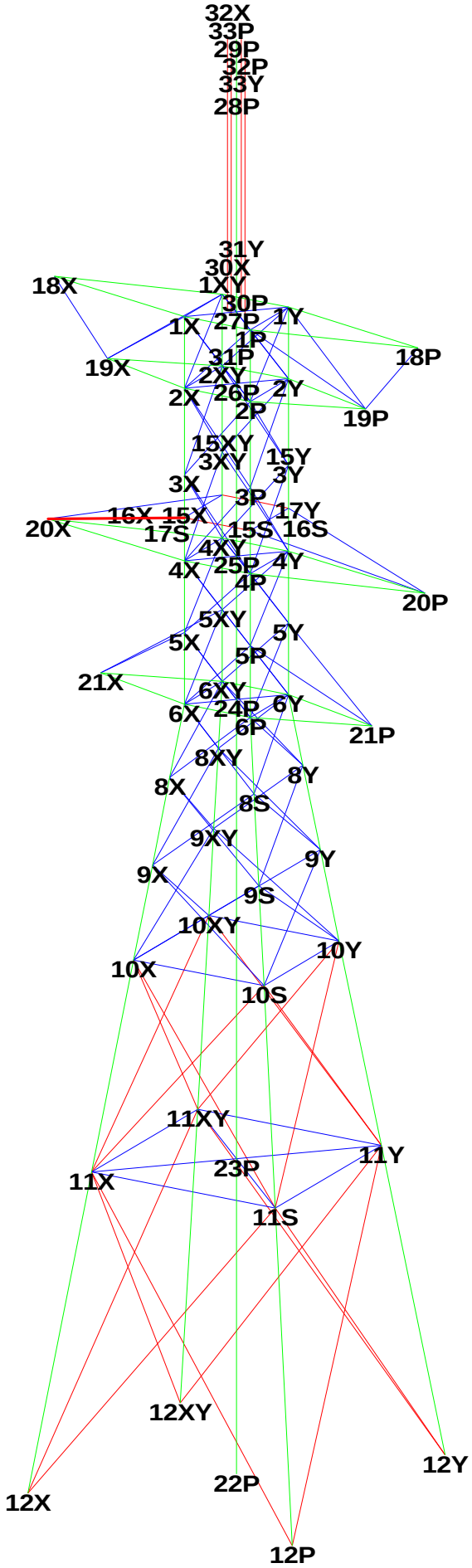
$$\overrightarrow{Extreme\_Wind_{Vert} := \left(N_{coax} \cdot W_{coax} \cdot Coax_{Span} \cdot OF_{EV}\right)}$$

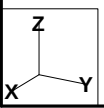
Extreme Wind Transverse Load =

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

$$Extreme\_Wind_{Vert} = \begin{pmatrix} 140 \\ 187 \\ 159 \\ 206 \\ 393 \\ 711 \end{pmatrix} lb \qquad Extreme\_Wind_{Trans} = \begin{pmatrix} 135 \\ 180 \\ 153 \\ 198 \\ 378 \\ 684 \end{pmatrix} lb$$

Centek Engineering Inc, Project: "pls tower 910 w_Antenna Mast"
Tower Version 12.50, 3:31:30 PM Monday, February 13, 2017
Undeformed geometry displayed





Project Name : 15019.001 - Fairfield, CT
Project Notes: Eversource Structure # 910/ T-Mobile CT11360A
Project File : J:\Jobs\1615900.WI\11_CT11360A\05_Structural\Backup Documentation\Calcs\PLS Tower\pls tower 910 w_Antenna Mast.tow
Date run   : 3:30:44 PM Monday, February 13, 2017
by   : Tower Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

Member "g9P" will not be checked for block 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 "g9X" will not be checked for block 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 "g9XY" will not be checked for block 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 "g9Y" will not be checked for block 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 "g10P" will not be checked for block 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 "g10X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "g11P" will not be checked for block 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 "g11X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "g11Y" will not be checked for block 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 "g14P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "g15P" will not be checked for block 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 "g15X" will not be checked for block 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 "g15XY" will not be checked for block 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 "g15Y" will not be checked for block 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 "g16P" will not be checked for block 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 "g16X" will not be checked for block 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 "g16XY" will not be checked for block 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 "g16Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
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Member "g17XY" will not be checked for block 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 "g17Y" will not be checked for block 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 "g18P" will not be checked for block 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 "g18X" will not be checked for block 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 "g18XY" will not be checked for block 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 "g18Y" will not be checked for block 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 "g19P" will not be checked for block 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 "g19X" will not be checked for block 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 "g19XY" will not be checked for block 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 "g19Y" will not be checked for block 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 "g20P" will not be checked for block 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 "g20X" will not be checked for block 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 "g20XY" will not be checked for block 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 "g20Y" will not be checked for block 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 "g21P" will not be checked for block 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 "g21X" will not be checked for block 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 "g21XY" will not be checked for block 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 "g21Y" will not be checked for block 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 "g22P" will not be checked for block 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 "g22X" will not be checked for block 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 "g22XY" will not be checked for block 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 "g22Y" will not be checked for block 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 "g23P" will not be checked for block 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 "g23X" will not be checked for block 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 "g23XY" will not be checked for block 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 "g23Y" will not be checked for block 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 "g26P" will not be checked for block 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 "g26X" will not be checked for block 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 "g26XY" will not be checked for block 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 "g26Y" will not be checked for block 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 "g27P" will not be checked for block 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 "g27X" will not be checked for block 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 "g27XY" will not be checked for block 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 "g27Y" will not be checked for block 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 "g28P" will not be checked for block 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 "g28X" will not be checked for block 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 "g28XY" will not be checked for block 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 "g28Y" will not be checked for block 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 "g29P" will not be checked for block 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 "g29X" will not be checked for block 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 "g29XY" will not be checked for block 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 "g29Y" will not be checked for block 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 1800.97 exceeds maximum of 200.00 for member "g53P" ??
KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53X" ??
KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53XY" ??
KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53Y" ??
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54P" ??
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54X" ??
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54XY" ??
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54Y" ??
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55P" ??
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55X" ??
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55XY" ??
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55Y" ??
Unusual number of fixed joints found: 5. Towers normally have from between 1 and 4 fixed joints. ??
The model has 81 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\1615900.wi\11_ct11360a\05_structural\backup documentation\calcs\pls tower\structure 910.lca

*** Analysis Results:

Maximum element usage is 81.07% for Angle "g11Y" in load case "NESC Extreme"
Maximum insulator usage is 12.29% for Clamp "9" 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	12P	-4.18	-4.17	-30.39	5.91	0.07	0.00	0.07	0.00	0.00
NESC Heavy	22P	-0.00	-1.03	-21.48	1.03	12.03	-0.00	12.03	-0.00	0.00
NESC Heavy	12X	3.83	-3.93	19.59	5.49	0.07	0.00	0.07	0.01	0.00
NESC Heavy	12XY	-3.83	-3.93	19.59	5.49	0.07	-0.00	0.07	-0.01	0.00
NESC Heavy	12Y	4.18	-4.17	-30.39	5.91	0.07	-0.00	0.07	-0.00	0.00
NESC Extreme	12P	-6.55	-7.08	-47.64	9.64	0.10	0.00	0.10	0.01	0.00
NESC Extreme	22P	0.00	-1.50	-6.19	1.50	20.12	0.00	20.12	-0.00	0.00
NESC Extreme	12X	7.72	-8.07	39.31	11.17	0.10	-0.00	0.10	0.01	0.00
NESC Extreme	12XY	-7.72	-8.07	39.31	11.17	0.10	0.00	0.10	-0.01	0.00
NESC Extreme	12Y	6.55	-7.08	-47.64	9.64	0.10	-0.00	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	Member Leg	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	12P	11S	g11P	30.963	0.064	0.065	-0.038	-0.053	-4.18	-4.17	-30.39
NESC Heavy	12X	11X	g11X	-20.281	1.612	1.643	-1.114	1.208	3.83	-3.93	19.59
NESC Heavy	12XY	11XY	g11XY	-20.281	1.612	1.643	1.114	1.208	-3.83	-3.93	19.59
NESC Heavy	12Y	11Y	g11Y	30.963	0.064	0.065	0.038	-0.053	4.18	-4.17	-30.39
NESC Extreme	12P	11S	g11P	48.608	0.464	0.468	-0.072	0.462	-6.55	-7.08	-47.64
NESC Extreme	12X	11X	g11X	-40.730	3.391	3.455	-2.263	2.611	7.72	-8.07	39.31
NESC Extreme	12XY	11XY	g11XY	-40.730	3.391	3.455	2.263	2.611	-7.72	-8.07	39.31
NESC Extreme	12Y	11Y	g11Y	48.608	0.464	0.468	0.072	0.462	6.55	-7.08	-47.64

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	100.000	81.000	17	26	1.34	5.00	52.910	1.34	27.50	221.660
2	81.000	36.500	56	173	5.00	9.86	265.035	27.50	9.86	431.535
3	36.500	0.000	15	34	9.86	20.00	544.965	9.86	20.00	544.965

*** 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 Type	Angle No.	Steel Strength	Max Usage Cont-rol	Max Use In Comp.	Comp. Member	Comp. Control Case	Comp. Force	Comp. Control	L/R Capacity	Comp. Connect.	Comp. Connect.	RLX	RLY	RLZ	L/R Comp.	KL/R Member	Length Comp.	No. Of Bolts

					(ksi)	%		%		(kips)		(kips)	(kips)	(kips)			
(ft)																	
Leg1		Leg1	SAE	4X4X0.25	33.0	59.64	Comp	59.64	g6Y	-31.913	NESC Ext	53.509	0.000	0.000	1.000	1.000	1.000
75.47	75.47	5.000	1	0													
Leg2		Leg2	SAE	4X4X0.3125	33.0	70.39	Comp	70.39	g9Y	-39.521	NESC Ext	56.145	91.000	175.781	1.000	1.000	1.000
100.49	100.49	6.624	1	10													
Leg3		Leg3	SAE	4X4X0.375	33.0	81.07	Comp	81.07	g11Y	-48.004	NESC Ext	59.214	91.000	210.937	0.333	0.333	0.333
113.70	113.70	22.420	1	10													
XBrace1		XBrace1	SAE	1.75X1.75X0.1875	33.0	42.55	Comp	42.55	g12X	-4.918	NESC Ext	11.559	18.200	21.094	0.750	0.500	0.500
123.69	122.85	7.071	5	2													
XBrace2		XBrace2	SAU	3X2X0.1875	33.0	26.23	Comp	26.23	g22X	-4.981	NESC Ext	18.986	27.300	31.641	0.500	0.750	0.500
109.16	111.87	7.071	2	3													
XBrace3		XBrace3	SAE	2X2X0.1875	33.0	18.30	Cross	18.30	g25P	-1.975	NESC Ext	10.792	18.200	21.094	1.000	0.561	0.561
148.00	137.22	7.610	6	2													
XBrace4		XBrace4	SAU	2.5X2X0.1875	33.0	15.15	Cross	15.15	g29P	-1.052	NESC Ext	6.939	18.200	21.094	0.549	1.000	0.549
222.10	182.79	11.105	6	2													
XBrace5		XBrace5	SAE	1.75X1.75X0.25	33.0	73.68	Comp	73.68	g30XY	-1.665	NESC Hea	2.260	18.200	28.125	0.789	0.577	0.577
382.75	320.25	18.850	5	2													
XBrace6		XBrace6	SAE	1.75X1.75X0.1875	33.0	33.36	Tens	0.00	g33XY	0.000		1.070	18.200	21.094	0.796	0.409	0.409
496.93	407.26	27.937	5	2													
XBrace8		XBrace8	SAU	3X2X0.1875	33.0	29.11	Comp	29.11	g17P	-5.029	NESC Ext	17.275	27.300	31.641	1.000	1.500	1.000
120.57	120.47	3.905	5	3													
Horz1		Horizontal 1	SAE	1.75X1.75X0.1875	33.0	54.70	Comp	54.70	g34X	-3.172	NESC Ext	5.799	9.100	10.547	1.000	1.000	1.000
174.93	174.93	5.000	4	1													
Horz2		Horizontal 2	SAU	2.5X2X0.1875	33.0	41.52	Comp	41.52	g38X	-3.778	NESC Ext	10.412	9.100	10.547	1.000	0.500	0.500
149.22	149.22	9.861	4	1													
Horz3		Horizontal 3	SAU	3X2.5X0.25	33.0	44.72	Comp	44.72	g40X	-4.070	NESC Ext	12.054	9.100	14.062	1.000	0.500	0.500
176.37	176.37	13.889	4	1													
Horz4		Horizontal 4	SAU	4X3X0.25	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000
0.00	0.00	0.000	0	0													
Horz5		Horizontal 5	Bar	1.75x1/4	33.0	38.18	Tens	0.00	g43Y	0.000		0.129	9.100	14.062	1.000	2.000	1.000
983.61	983.61	2.500	4	1													
Inner1		Inner1	SAE	1.75X1.75X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000
0.00	0.00	0.000	0	0													
Inner2		Inner2	SAU	2.5X2X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000
0.00	0.00	0.000	0	0													
Arm1		Ground Wire Arm	SAU	3X2.5X0.25	33.0	12.60	Tens	0.94	g44P	-0.171	NESC Ext	19.099	18.200	28.125	1.000	0.500	0.500
146.34	140.11	11.524	5	2													
Arm2		Top Cross Arm	SAU	3X2.5X0.25	33.0	15.40	Comp	15.40	g46P	-2.803	NESC Hea	28.509	18.200	28.125	1.000	0.500	0.500
97.38	108.69	7.669	3	2													
Arm3		Middle Cross Arm	SAU	3.5X2.5X0.25	33.0	20.67	Comp	20.67	g48P	-3.761	NESC Hea	24.527	18.200	28.125	1.000	0.500	0.500
132.50	129.56	12.013	5	2													
Arm4		Bottom Cross Arm	SAU	3X2.5X0.25	33.0	20.92	Comp	20.92	g50P	-1.904	NESC Hea	27.682	9.100	14.062	1.000	0.500	0.500
103.41	111.70	8.143	3	1													
ArmBr1	Ground Wire Arm Brace		DAE	2.5X2.5X0.1875	33.0	17.56	Comp	17.56	g52X	-1.598	NESC Hea	40.856	9.100	21.094	1.000	1.000	1.000
98.76	104.07	6.403	2	1													
ArmBr2	Top Cross Arm Brace		Bar	1.75x1/4	33.0	32.56	Tens	0.00	g53Y	0.000		0.039	9.100	14.062	1.000	1.000	1.000
1800.97	1800.97	9.155	4	1													
ArmBr3	Middle Cross Arm Brace		Bar	1.75x1/4	33.0	41.03	Tens	0.00	g54Y	0.000		0.021	9.100	14.062	1.000	1.000	1.000
2435.79	2435.79	12.382	4	1													
ArmBr4	Bottom Cross Arm Brace		Bar	1.75x1/4	33.0	18.79	Tens	0.00	g55Y	0.000		0.035	9.100	14.062	1.000	1.000	1.000
1879.82	1879.82	9.556	4	1													
Mast		Mast Pwmnt Pipe HSS16"x0.5"			42.0	2.29	Comp	2.29	g61P	-19.981	NESC Hea	872.521	0.000	0.000	1.000	1.000	1.000
48.09	48.09	22.000	1	0													
MB1		Mast Brace 1	SAE	2.5X2.5X0.25	36.0	32.40	Tens	27.28	g56X	-3.708	NESC Ext	28.492	16.800	13.594	1.000	1.000	1.000
86.41	103.20	3.536	3	1													
MB2		Mast Brace 2	SAE	3.5X3.5X0.25	36.0	14.74	Comp	14.74	g60P	-2.003	NESC Ext	16.774	16.800	13.594	1.000	1.000	1.000

169.81 169.81 9.821 4 1
fic1 Fictitious1 Bar fic 36.0 0.00 0.00 g72P 0.000 0.000 0.000 0.000 1.000 1.000 1.000
2280000.00 2280000.00 19.000 4 0
fic Fictitious2 Bar fic 36.0 0.00 0.00 g70P 0.000 0.000 0.000 0.000 1.000 1.000 1.000
80400.00 80400.00 0.670 4 0

Group Summary (Tension Portion):

Group No.	Group Label	Angle No.	Angle Desc.	Angle Type	Angle Size	Steel Strength	Max Usage	Usage Control	Max Use In Tens.	Tension Member	Tension Force	Tension Control Load Case	Net Section Capacity	Tension Connect. Shear Capacity	Tension Connect. Bearing Capacity	Tension Connect. Rupture Capacity	Length Tens. Member	Of Bolts	Hole Diameter
						(ksi)	%		%		(kips)		(kips)	(kips)	(kips)	(kips)	(ft)		(in)
	Leg1		Leg1	SAE	4X4X0.25	33.0	59.64	Comp	52.06	g6X	27.423	NESC Ext	52.676	0.000	0.000	0.000	5.000	0	2.000 0.6875
	Leg2		Leg2	SAE	4X4X0.3125	33.0	70.39	Comp	55.73	g7X	32.323	NESC Ext	58.001	0.000	0.000	0.000	5.096	0	2.990 0.6875
	Leg3		Leg3	SAE	4X4X0.375	33.0	81.07	Comp	51.67	g11X	33.995	NESC Ext	65.794	91.000	210.937	193.014	22.420	10	3.360 0.6875
	XBrace1		XBrace1	SAE	1.75X1.75X0.1875	33.0	42.55	Comp	31.64	g12Y	4.615	NESC Ext	14.585	18.200	21.094	16.189	7.071	2	1.000 0.6875
	XBrace2		XBrace2	SAU	3X2X0.1875	33.0	26.23	Comp	23.84	g22P	5.459	NESC Ext	22.901	27.300	31.641	28.125	7.071	3	1.000 0.6875
	XBrace3		XBrace3	SAE	2X2X0.1875	33.0	18.30	Cross	11.80	g25X	1.549	NESC Ext	17.258	18.200	21.094	13.131	7.610	2	1.000 0.6875
	XBrace4		XBrace4	SAU	2.5X2X0.1875	33.0	15.15	Cross	7.62	g27Y	1.387	NESC Ext	20.228	18.200	21.094	18.750	9.426	2	1.000 0.6875
	XBrace5		XBrace5	SAE	1.75X1.75X0.25	33.0	73.68	Comp	26.15	g31X	4.320	NESC Ext	18.952	18.200	28.125	16.523	18.850	2	1.000 0.6875
	XBrace6		XBrace6	SAE	1.75X1.75X0.1875	33.0	33.36	Tens	33.36	g33X	4.404	NESC Ext	14.585	18.200	21.094	13.201	27.937	2	1.000 0.6875
	XBrace8		XBrace8	SAU	3X2X0.1875	33.0	29.11	Comp	18.44	g17X	4.222	NESC Ext	22.901	27.300	31.641	28.125	3.905	3	1.000 0.6875
	Horz1		Horizontal 1	SAE	1.75X1.75X0.1875	33.0	54.70	Comp	37.22	g35X	2.872	NESC Ext	14.585	9.100	10.547	7.717	5.000	1	1.000 0.6875
	Horz2		Horizontal 2	SAU	2.5X2X0.1875	33.0	41.52	Comp	8.72	g38P	0.673	NESC Ext	17.444	9.100	10.547	7.717	9.861	1	1.000 0.6875
	Horz3		Horizontal 3	SAU	3X2.5X0.25	33.0	44.72	Comp	11.07	g40P	1.007	NESC Ext	30.090	9.100	14.062	12.500	13.889	1	1.000 0.6875
	Horz4		Horizontal 4	SAU	4X3X0.25	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0	0.000 0
	Horz5		Horizontal 5	Bar	1.75x1/4	33.0	38.18	Tens	38.18	g43X	3.012	NESC Hea	7.889	9.100	14.062	10.289	2.500	1	1.000 0.6875
	Inner1		Inner1	SAE	1.75X1.75X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0	0.000 0
	Inner2		Inner2	SAU	2.5X2X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0	0.000 0
	Arm1		Ground Wire Arm	SAU	3X2.5X0.25	33.0	12.60	Tens	12.60	g45P	2.293	NESC Hea	33.802	18.200	28.125	28.125	5.000	2	1.000 0.6875
	Arm2		Top Cross Arm	SAU	3X2.5X0.25	33.0	15.40	Comp	0.00	g47Y	0.000		33.802	18.200	28.125	28.125	5.000	2	1.000 0.6875

```
    Arm3       Middle Cross Arm   SAU     3.5X2.5X0.25     33.0 20.67  Comp  0.00    g49Y   0.000           37.663   18.200   28.125   28.125  5.000
2 1.000   0.6875
    Arm4       Bottom Cross Arm   SAU       3X2.5X0.25     33.0 20.92  Comp  2.98    g50X   0.271NESC Ext   33.802    9.100   14.062   22.059  8.143
1 1.000   0.6875
  ArmBr1  Ground Wire Arm Brace   DAE   2.5X2.5X0.1875     33.0 17.56  Comp  0.00    g52X   0.000           45.803    9.100   21.094   18.750  6.403
1 2.000   0.6875
  ArmBr2    Top Cross Arm Brace   Bar         1.75x1/4     33.0 32.56  Tens 32.56    g53X   2.568NESC Hea    7.889    9.100   14.062   10.289  9.155
1 1.000   0.6875
  ArmBr3 Middle Cross Arm Brace   Bar         1.75x1/4     33.0 41.03  Tens 41.03    g54P   3.237NESC Hea    7.889    9.100   14.062   10.289 12.382
1 1.000   0.6875
  ArmBr4 Bottom Cross Arm Brace   Bar         1.75x1/4     33.0 18.79  Tens 18.79    g55Y   1.482NESC Hea    7.889    9.100   14.062   10.289  9.556
1 1.000   0.6875
   Mast                    Mast Pwmnt Pipe HSS16"x0.5"     42.0  2.29  Comp  0.00    g67P   0.000           953.399    0.000    0.000    0.000  4.000
0 0.000        0
     MB1           Mast Brace 1   SAE     2.5X2.5X0.25     36.0 32.40  Tens 32.40    g56P   3.915NESC Ext    32.987   16.800   13.594   12.083  3.536
1 1.000   0.6875
     MB2           Mast Brace 2   SAE     3.5X3.5X0.25     36.0 14.74  Comp  0.00    g60Y   0.000           49.187   16.800   13.594   12.083  9.821
1 1.000   0.6875
    fic1            Fictitious1   Bar              fic     36.0  0.00        0.00    g72P   0.000NESC Hea    3.600    0.000    0.000    0.000 19.000
0 0.000        0
     fic            Fictitious2   Bar              fic     36.0  0.00        0.00    g70P   0.113NESC Ext    3.600    0.000    0.000    0.000  0.670
0 0.000        0
```

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	73.68	g30XY	Angle
NESC Extreme	81.07	g11Y	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	3.28	NESC Heavy	0.0
2	Clamp	2.34	NESC Heavy	0.0
3	Clamp	3.93	NESC Heavy	0.0
4	Clamp	4.00	NESC Heavy	0.0
5	Clamp	3.95	NESC Heavy	0.0
6	Clamp	4.00	NESC Heavy	0.0
7	Clamp	3.89	NESC Heavy	0.0
8	Clamp	3.94	NESC Heavy	0.0
9	Clamp	12.29	NESC Heavy	0.0
10	Clamp	8.29	NESC Heavy	0.0
11	Clamp	4.18	NESC Heavy	0.0
12	Clamp	3.20	NESC Heavy	0.0
13	Clamp	3.68	NESC Heavy	0.0
14	Clamp	8.82	NESC Heavy	0.0

*** Weight of structure (lbs):

Weight of Angles*Section DLF:	16230.0
Total:	16230.0

*** End of Report

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

Project Name : 15019.001 - Fairfield, CT
Project Notes: Eversource Structure # 910/ T-Mobile CT11360A
Project File : J:\Jobs\1615900.WI\11_CT11360A\05_Structural\Backup Documentation\Calcs\PLS Tower\pls tower 910 w_Antenna Mast.tow
Date run     : 3:30:43 PM Monday, February 13, 2017
by           : Tower Version 12.50
Licensed to  : Centek Engineering Inc

Successfully performed nonlinear analysis

Member "g9P" will not be checked for block 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 "g9X" will not be checked for block 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 "g9XY" will not be checked for block 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 "g9Y" will not be checked for block 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 "g10P" will not be checked for block 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 "g10X" will not be checked for block 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 "g10XY" will not be checked for block 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 "g10Y" will not be checked for block 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 "g11P" will not be checked for block 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 "g11X" will not be checked for block 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 "g11XY" will not be checked for block 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 "g11Y" will not be checked for block 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 "g14P" will not be checked for block 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 "g14X" will not be checked for block 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 "g14XY" will not be checked for block 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 "g14Y" will not be checked for block 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 "g15P" will not be checked for block 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 "g15X" will not be checked for block 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 "g15XY" will not be checked for block 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 "g15Y" will not be checked for block 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 "g16P" will not be checked for block 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 "g16X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
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and spacing distances will be checked. ??
Member "g16XY" will not be checked for block 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 "g16Y" will not be checked for block 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 "g17P" will not be checked for block 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 "g17X" will not be checked for block 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 "g17XY" will not be checked for block 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 "g17Y" will not be checked for block 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 "g18P" will not be checked for block 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 "g18X" will not be checked for block 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 "g18XY" will not be checked for block 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 "g18Y" will not be checked for block 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 "g19P" will not be checked for block 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 "g19X" will not be checked for block 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 "g19XY" will not be checked for block 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 "g19Y" will not be checked for block 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 "g20P" will not be checked for block 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 "g20X" will not be checked for block 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 "g20XY" will not be checked for block 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 "g20Y" will not be checked for block 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 "g21P" will not be checked for block 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 "g21X" will not be checked for block 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 "g21XY" will not be checked for block 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 "g21Y" will not be checked for block 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 "g22P" will not be checked for block 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 "g22X" will not be checked for block 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 "g22XY" will not be checked for block 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 "g22Y" will not be checked for block 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 "g23P" will not be checked for block 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 "g23X" will not be checked for block 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 "g23XY" will not be checked for block 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 "g23Y" will not be checked for block 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 "g26P" will not be checked for block 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 "g26X" will not be checked for block 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 "g26XY" will not be checked for block 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 "g26Y" will not be checked for block 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 "g27P" will not be checked for block 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 "g27X" will not be checked for block 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 "g27XY" will not be checked for block 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 "g27Y" will not be checked for block 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 "g28P" will not be checked for block 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 "g28X" will not be checked for block 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 "g28XY" will not be checked for block 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 "g28Y" will not be checked for block 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 "g29P" will not be checked for block 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 "g29X" will not be checked for block 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 "g29XY" will not be checked for block 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 "g29Y" will not be checked for block 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 1800.97 exceeds maximum of 200.00 for member "g53P" ??
KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53X" ??
KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53XY" ??
KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53Y" ??
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54P" ??
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54X" ??
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54XY" ??
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54Y" ??
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55P" ??
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55X" ??
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55XY" ??
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55Y" ??
Unusual number of fixed joints found: 5. Towers normally have from between 1 and 4 fixed joints. ??
The model has 81 warnings. ??

Nonlinear convergence parameters: Use Standard Parameters
Tension only member maximum compression load as a percent of compression capacity: 100%
Member check option: ASCE 10
Connection rupture check: ASCE 10
Crossing diagonal check: ASCE 10 [Alternate Unsupported RLOUT = 1]
Included angle check: None
Climbing load check: None
Redundant members checked with: Actual Force

Joints Geometry:

Joint Label	Symmetry Code	X Coord. (ft)	Y Coord. (ft)	Z Coord. (ft)	X Disp. Rest.	Y Disp. Rest.	Z Disp. Rest.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
1P	XY-Symmetry	2.5	2.5	81	Free	Free	Free	Free	Free	Free
2P	XY-Symmetry	2.5	2.5	76	Free	Free	Free	Free	Free	Free
3P	XY-Symmetry	2.5	2.5	70	Free	Free	Free	Free	Free	Free
4P	XY-Symmetry	2.5	2.5	64	Free	Free	Free	Free	Free	Free
5P	XY-Symmetry	2.5	2.5	59	Free	Free	Free	Free	Free	Free
6P	XY-Symmetry	2.5	2.5	54	Free	Free	Free	Free	Free	Free
18P	X-Symmetry	0	13.75	81	Free	Free	Free	Free	Free	Free
19P	X-Symmetry	0	9.75	76	Free	Free	Free	Free	Free	Free
20P	X-Symmetry	0	14.25	64	Free	Free	Free	Free	Free	Free
21P	X-Symmetry	0	10.25	54	Free	Free	Free	Free	Free	Free
12P	XY-Symmetry	10	10	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
22P	None	0	0	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
23P	None	0	0	22	Free	Free	Free	Free	Free	Free
24P	None	0	0	54	Free	Free	Free	Free	Free	Free
25P	None	0	0	64	Free	Free	Free	Free	Free	Free
26P	None	0	0	76	Free	Free	Free	Free	Free	Free
27P	None	0	0	81	Free	Free	Free	Free	Free	Free
28P	None	0	0	96	Free	Free	Free	Free	Free	Free
29P	None	0	0	100	Free	Free	Free	Free	Free	Free
30P	X-Symmetry	0	0.67	81	Free	Free	Free	Free	Free	Free
31P	Y-Symmetry	0.67	0	81	Free	Free	Free	Free	Free	Free
32P	X-Symmetry	0	0.67	100	Free	Free	Free	Free	Free	Free

33P	Y-Symmetry	0.67	0	100	Free	Free	Free	Free	Free	Free
1X	X-GenXY	2.5	-2.5	81	Free	Free	Free	Free	Free	Free
1XY	XY-GenXY	-2.5	-2.5	81	Free	Free	Free	Free	Free	Free
1Y	Y-GenXY	-2.5	2.5	81	Free	Free	Free	Free	Free	Free
2X	X-GenXY	2.5	-2.5	76	Free	Free	Free	Free	Free	Free
2XY	XY-GenXY	-2.5	-2.5	76	Free	Free	Free	Free	Free	Free
2Y	Y-GenXY	-2.5	2.5	76	Free	Free	Free	Free	Free	Free
3X	X-GenXY	2.5	-2.5	70	Free	Free	Free	Free	Free	Free
3XY	XY-GenXY	-2.5	-2.5	70	Free	Free	Free	Free	Free	Free
3Y	Y-GenXY	-2.5	2.5	70	Free	Free	Free	Free	Free	Free
4X	X-GenXY	2.5	-2.5	64	Free	Free	Free	Free	Free	Free
4XY	XY-GenXY	-2.5	-2.5	64	Free	Free	Free	Free	Free	Free
4Y	Y-GenXY	-2.5	2.5	64	Free	Free	Free	Free	Free	Free
5X	X-GenXY	2.5	-2.5	59	Free	Free	Free	Free	Free	Free
5XY	XY-GenXY	-2.5	-2.5	59	Free	Free	Free	Free	Free	Free
5Y	Y-GenXY	-2.5	2.5	59	Free	Free	Free	Free	Free	Free
6X	X-GenXY	2.5	-2.5	54	Free	Free	Free	Free	Free	Free
6XY	XY-GenXY	-2.5	-2.5	54	Free	Free	Free	Free	Free	Free
6Y	Y-GenXY	-2.5	2.5	54	Free	Free	Free	Free	Free	Free
18X	X-Gen	0	-13.75	81	Free	Free	Free	Free	Free	Free
19X	X-Gen	0	-9.75	76	Free	Free	Free	Free	Free	Free
20X	X-Gen	0	-14.25	64	Free	Free	Free	Free	Free	Free
21X	X-Gen	0	-10.25	54	Free	Free	Free	Free	Free	Free
12X	X-GenXY	10	-10	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
12XY	XY-GenXY	-10	-10	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
12Y	Y-GenXY	-10	10	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
30X	X-Gen	0	-0.67	81	Free	Free	Free	Free	Free	Free
31Y	Y-Gen	-0.67	0	81	Free	Free	Free	Free	Free	Free
32X	X-Gen	0	-0.67	100	Free	Free	Free	Free	Free	Free
33Y	Y-Gen	-0.67	0	100	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.	X Rot. Rest.	Y Rot. Rest.	Z Rot. Rest.
8S	XY-Symmetry	6P	12P	0	49	Free	Free	Free	Free	Free	Free
9S	XY-Symmetry	6P	12P	0	43	Free	Free	Free	Free	Free	Free
10S	XY-Symmetry	6P	12P	0	36.5	Free	Free	Free	Free	Free	Free
11S	XY-Symmetry	6P	12P	0	22	Free	Free	Free	Free	Free	Free
15S	XY-Symmetry	3P	4P	0.5	0	Free	Free	Free	Free	Free	Free
16S	X-Symmetry	3P	4Y	0.5	0	Free	Free	Free	Free	Free	Free
17S	Y-Symmetry	3P	4X	0.5	0	Free	Free	Free	Free	Free	Free
8X	X-GenXY	6P	12P	0	49	Free	Free	Free	Free	Free	Free
8XY	XY-GenXY	6P	12P	0	49	Free	Free	Free	Free	Free	Free
8Y	Y-GenXY	6P	12P	0	49	Free	Free	Free	Free	Free	Free
9X	X-GenXY	6P	12P	0	43	Free	Free	Free	Free	Free	Free
9XY	XY-GenXY	6P	12P	0	43	Free	Free	Free	Free	Free	Free
9Y	Y-GenXY	6P	12P	0	43	Free	Free	Free	Free	Free	Free
10X	X-GenXY	6P	12P	0	36.5	Free	Free	Free	Free	Free	Free
10XY	XY-GenXY	6P	12P	0	36.5	Free	Free	Free	Free	Free	Free
10Y	Y-GenXY	6P	12P	0	36.5	Free	Free	Free	Free	Free	Free
11X	X-GenXY	6P	12P	0	22	Free	Free	Free	Free	Free	Free
11XY	XY-GenXY	6P	12P	0	22	Free	Free	Free	Free	Free	Free
11Y	Y-GenXY	6P	12P	0	22	Free	Free	Free	Free	Free	Free
15X	X-GenXY	3P	4P	0.5	0	Free	Free	Free	Free	Free	Free
15XY	XY-GenXY	3P	4P	0.5	0	Free	Free	Free	Free	Free	Free
15Y	Y-GenXY	3P	4P	0.5	0	Free	Free	Free	Free	Free	Free

16X	X-Gen	3P	4Y	0.5	0	Free	Free	Free	Free	Free	Free
17Y	Y-Gen	3P	4X	0.5	0	Free	Free	Free	Free	Free	Free

The model contains 52 primary and 24 secondary joints for a total of 76 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
A500-42	2.9e+004	42	58	0	0	0	0	0	0

Bolt Properties:

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

Number Bolts Used By Type:

Bolt Type	Number Bolts
5/8 A394	416
5/8 A325	20

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	4X4X0.375	4	4	0.375	9.8	2.86	8.67	1.23	1.23	0.788	1	4	2	0	1.0000	0
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	3.5X3.5X0.25	3.5	3.5	0.25	5.8	1.69	11.5	1.09	1.09	0.694	1	3.5	1.75	0	1.0000	0
SAE	2.5X2.5X0.25	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	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	4X3X0.25	4	3	0.25	5.8	1.69	13.25	1.28	0.896	0.651	1	4	1.5	0	1.0000	0
SAU	3.5X2.5X0.25	3.5	2.5	0.25	4.9	1.44	11.25	1.12	0.735	0.544	1	3.5	1.25	0	1.0000	0
SAU	3X2.5X0.25	3	2.5	0.25	4.5	1.31	9.5	0.945	0.753	0.528	1	3	1.25	0	1.0000	0
SAU	3X2X0.1875	3	2	0.1875	3.07	0.9	13.33	0.966	0.583	0.439	1	3	1	0	1.0000	0
SAU	2.5X2X0.1875	2.5	2	0.1875	2.75	0.81	10.67	0.793	0.6	0.427	1	2.5	1	0	1.0000	0
DAE	2.5X2.5X0.1875	2.5	2.5	0.1875	6.14	1.8	10.67	0.778	1.18	0.778	2	2.5	1.25	0	1.0000	0
Bar	1.75x1/4	1.75	0	0.25	1.5	0.4375	7	0.305	0.061	0.305	1	1.75	0	0	0.0000	0
Pwmnt	Pipe HSS16"x0.5"	16	15.07	0	82.85	22.7	1	5.49	5.49	5.49	1	16	0	0	0.0000	0
Bar	fic	1	0	0.1	0.005	0.1	1	0.0001	0.0001	0.0001	1	0.1	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	Leg1	SAE	4X4X0.25	A7	Beam	Leg	None	0.000
Leg2	Leg2	SAE	4X4X0.3125	A7	Beam	Leg	None	0.000
Leg3	Leg3	SAE	4X4X0.375	A7	Beam	Leg	None	0.000
XBrace1	XBrace1	SAE	1.75X1.75X0.1875	A7	Truss	Crossing Diagonal	None	0.000
XBrace2	XBrace2	SAU	3X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000
XBrace3	XBrace3	SAE	2X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000
XBrace4	XBrace4	SAU	2.5X2X0.1875	A7	Truss	Crossing Diagonal	None	0.000
XBrace5	XBrace5	SAE	1.75X1.75X0.25	A7	T-Only	Other	None	0.000
XBrace6	XBrace6	SAE	1.75X1.75X0.1875	A7	T-Only	Other	None	0.000
XBrace8	XBrace8	SAU	3X2X0.1875	A7	Truss	Other	None	0.000
Horz1	Horizontal 1	SAE	1.75X1.75X0.1875	A7	Truss	Other	None	0.000
Horz2	Horizontal 2	SAU	2.5X2X0.1875	A7	Truss	Other	None	0.000
Horz3	Horizontal 3	SAU	3X2.5X0.25	A7	Truss	Other	None	0.000
Horz4	Horizontal 4	SAU	4X3X0.25	A7	Beam	Other	None	0.000
Horz5	Horizontal 5	Bar	1.75x1/4	A7	T-Only	Other	None	0.000
Inner1	Inner1	SAE	1.75X1.75X0.1875	A7	Truss	Other	None	0.000
Inner2	Inner2	SAU	2.5X2X0.1875	A7	Truss	Other	None	0.000
Arm1	Ground Wire Arm	SAU	3X2.5X0.25	A7	Beam	Other	None	0.000
Arm2	Top Cross Arm	SAU	3X2.5X0.25	A7	Beam	Other	None	0.000
Arm3	Middle Cross Arm	SAU	3.5X2.5X0.25	A7	Beam	Other	None	0.000
Arm4	Bottom Cross Arm	SAU	3X2.5X0.25	A7	Beam	Other	None	0.000
ArmBr1	Ground Wire Arm Brace	DAE	2.5X2.5X0.1875	A7	Truss	Other	None	0.000
ArmBr2	Top Cross Arm Brace	Bar	1.75x1/4	A7	Truss	Other	None	0.000
ArmBr3	Middle Cross Arm Brace	Bar	1.75x1/4	A7	Truss	Other	None	0.000
ArmBr4	Bottom Cross Arm Brace	Bar	1.75x1/4	A7	Truss	Other	None	0.000
Mast	Mast	Pwmnt Pipe	HSS16"x0.5"	A500-42	Beam	Other	None	0.000
MB1	Mast Brace 1	SAE	2.5X2.5X0.25	A 36	Truss	Other	None	0.000
MB2	Mast Brace 2	SAE	3.5X3.5X0.25	A 36	Truss	Other	None	0.000
fic1	Fictitious1	Bar	fic	A 36	T-Only	Other	None	0.000
fic	Fictitious2	Bar	fic	A 36	T-Only	Fictitious	None	0.000

Aggregate Angle Information:

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

Angle Type	Angle Size	Material Type	Total Length (ft)	Total Surface Area (ft^2)	Total Weight (lbs)
SAE	4X4X0.25	A7	108.00	144.00	712.80
SAE	4X4X0.3125	A7	71.34	95.12	584.97
SAE	4X4X0.375	A7	148.79	198.39	1458.14
SAE	1.75X1.75X0.1875	A7	330.06	192.54	699.73
SAU	3X2X0.1875	A7	238.10	198.42	730.97
SAE	2X2X0.1875	A7	60.88	40.59	148.54
SAU	2.5X2X0.1875	A7	203.69	152.77	560.16
SAE	1.75X1.75X0.25	A7	150.80	87.97	417.72
SAU	3X2.5X0.25	A7	194.90	178.66	877.06
Bar	1.75x1/4	A7	134.37	39.19	201.56
SAU	3.5X2.5X0.25	A7	58.05	58.05	284.46
DAE	2.5X2.5X0.1875	A7	12.81	10.67	78.63

SAE	2.5X2.5X0.25	A 36	56.57	47.14	231.93	
SAE	3.5X3.5X0.25	A 36	39.28	45.83	227.85	
Pwmnt Pipe	HSS16"x0.5"	A500-42	100.00	517.83	8285.00	
Bar	fic	A 36	81.36	13.56	0.41	

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

Section Label	Joint Defining Section Bottom	Dead Load Adjust. Factor	Transverse Drag x Area Factor For Face	Longitudinal Drag x Area Factor For Face	Transverse Area Factor (CD From Code)	Longitudinal Area Factor (CD From Code)	Af Flat Factor For Face EIA Only	Ar Round Factor For Face EIA Only	Transverse Drag x Area Factor For All	Longitudinal Drag x Area Factor For All	SAPS Angle Drag x Area Factor	SAPS Round Drag x Area Factor	Force Solid Face
1	27P	1.000	3.200	3.200	1.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	None
2	10S	1.000	3.200	3.200	1.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	None
3	12P	1.100	3.200	3.200	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	# Bolt Holes	# Shear Planes	Connect Leg	Short Edge Dist. (in)	Long Edge Dist. (in)	End Dist. (in)	Bolt Spacing (in)	Shear Path Length (in)	Tension Path Length (in)	Rest. Coef.
g1P	Leg1		XY-Symmetry	1P	2P	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g1X	Leg1		X-GenXY	1X	2X	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g1XY	Leg1		XY-GenXY	1XY	2XY	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g1Y	Leg1		Y-GenXY	1Y	2Y	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g2P	Leg1		XY-Symmetry	2P	3P	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g2X	Leg1		X-GenXY	2X	3X	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g2XY	Leg1		XY-GenXY	2XY	3XY	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g2Y	Leg1		Y-GenXY	2Y	3Y	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g3P	Leg1		XY-Symmetry	3P	15S	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g3X	Leg1		X-GenXY	3X	15X	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g3XY	Leg1		XY-GenXY	3XY	15XY	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g3Y	Leg1		Y-GenXY	3Y	15Y	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g4P	Leg1		XY-Symmetry	15S	4P	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g4X	Leg1		X-GenXY	15X	4X	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0
g4XY	Leg1		XY-GenXY	15XY	4XY	1	4	1	1	1	5/8 A394	0	4	1		0	0	0	0	0	0	0

0	0	0																						
	g4Y	Leg1		Y-GenXY	15Y	4Y	1	4	1	1	1	5/8	A394	0	4	1			0	0	0	0		
0	0	0																						
	g5P	Leg1		XY-Symmetry	4P	5P	1	4	1	1	1	5/8	A394	0	2	1			0	0	0	0		
0	0	0																						
	g5X	Leg1		X-GenXY	4X	5X	1	4	1	1	1	5/8	A394	0	2	1			0	0	0	0		
0	0	0																						
	g5XY	Leg1		XY-GenXY	4XY	5XY	1	4	1	1	1	5/8	A394	0	2	1			0	0	0	0		
0	0	0																						
	g5Y	Leg1		Y-GenXY	4Y	5Y	1	4	1	1	1	5/8	A394	0	2	1			0	0	0	0		
0	0	0																						
	g6P	Leg1		XY-Symmetry	5P	6P	1	4	1	1	1	5/8	A394	0	2	1			0	0	0	0		
0	0	0																						
	g6X	Leg1		X-GenXY	5X	6X	1	4	1	1	1	5/8	A394	0	2	1			0	0	0	0		
0	0	0																						
	g6XY	Leg1		XY-GenXY	5XY	6XY	1	4	1	1	1	5/8	A394	0	2	1			0	0	0	0		
0	0	0																						
	g6Y	Leg1		Y-GenXY	5Y	6Y	1	4	1	1	1	5/8	A394	0	2	1			0	0	0	0		
0	0	0																						
	g7P	Leg2		XY-Symmetry	6P	8S	1	4	1	1	1	5/8	A394	0	2.99	1			0	0	0	0		
0	0	0																						
	g7X	Leg2		X-GenXY	6X	8X	1	4	1	1	1	5/8	A394	0	2.99	1			0	0	0	0		
0	0	0																						
	g7XY	Leg2		XY-GenXY	6XY	8XY	1	4	1	1	1	5/8	A394	0	2.99	1			0	0	0	0		
0	0	0																						
	g7Y	Leg2		Y-GenXY	6Y	8Y	1	4	1	1	1	5/8	A394	0	2.99	1			0	0	0	0		
0	0	0																						
	g8P	Leg2		XY-Symmetry	8S	9S	1	4	1	1	1	5/8	A394	0	2.3	1			0	0	0	0		
0	0	0																						
	g8X	Leg2		X-GenXY	8X	9X	1	4	1	1	1	5/8	A394	0	2.3	1			0	0	0	0		
0	0	0																						
	g8XY	Leg2		XY-GenXY	8XY	9XY	1	4	1	1	1	5/8	A394	0	2.3	1			0	0	0	0		
0	0	0																						
	g8Y	Leg2		Y-GenXY	8Y	9Y	1	4	1	1	1	5/8	A394	0	2.3	1			0	0	0	0		
0	0	0																						
	g9P	Leg2		XY-Symmetry	9S	10S	1	4	1	1	1	5/8	A394	10	2.03	1		Both	0.875	2	1.5	3.5		
0	0	0																						
	g9X	Leg2		X-GenXY	9X	10X	1	4	1	1	1	5/8	A394	10	2.03	1		Both	0.875	2	1.5	3.5		
0	0	0																						
	g9XY	Leg2		XY-GenXY	9XY	10XY	1	4	1	1	1	5/8	A394	10	2.03	1		Both	0.875	2	1.5	3.5		
0	0	0																						
	g9Y	Leg2		Y-GenXY	9Y	10Y	1	4	1	1	1	5/8	A394	10	2.03	1		Both	0.875	2	1.5	3.5		
0	0	0																						
	g10P	Leg3		XY-Symmetry	10S	11S	1	4	0.5	0.5	0.5	5/8	A394	10	3.35	1		Both	1.3125	2.375	1.5	3.5		
0	0	0																						
	g10X	Leg3		X-GenXY	10X	11X	1	4	0.5	0.5	0.5	5/8	A394	10	3.35	1		Both	1.3125	2.375	1.5	3.5		
0	0	0																						
	g10XY	Leg3		XY-GenXY	10XY	11XY	1	4	0.5	0.5	0.5	5/8	A394	10	3.35	1		Both	1.3125	2.375	1.5	3.5		
0	0	0																						
	g10Y	Leg3		Y-GenXY	10Y	11Y	1	4	0.5	0.5	0.5	5/8	A394	10	3.35	1		Both	1.3125	2.375	1.5	3.5		
0	0	0																						
	g11P	Leg3		XY-Symmetry	11S	12P	1	4	0.333	0.333	0.333	5/8	A394	10	3.36	1		Both	0.875	1.9375	1.5	3.75		
0	0	0																						
	g11X	Leg3		X-GenXY	11X	12X	1	4	0.333	0.333	0.333	5/8	A394	10	3.36	1		Both	0.875	1.9375	1.5	3.75		
0	0	0																						
	g11XY	Leg3		XY-GenXY	11XY	12XY	1	4	0.333	0.333	0.333	5/8	A394	10	3.36	1		Both	0.875	1.9375	1.5	3.75		
0	0	0																						
	g11Y	Leg3		Y-GenXY	11Y	12Y	1	4	0.333	0.333	0.333	5/8	A394	10	3.36	1		Both	0.875	1.9375	1.5	3.75		
0	0	0																						
	g12P	XBrace1		XY-Symmetry	1P	2X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short	only	0.8125	0	1	2		

0		0	0																		
	g12X	XBrace1		X-GenXY	1X	2P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.8125	0	1	2
0		0	0																		
	g12XY	XBrace1		XY-GenXY	1XY	2Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.8125	0	1	2
0		0	0																		
	g12Y	XBrace1		Y-GenXY	1Y	2XY	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.8125	0	1	2
0		0	0																		
	g13P	XBrace1		XY-Symmetry	1P	2Y	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.8125	0	1	2
0		0	0																		
	g13X	XBrace1		X-GenXY	1X	2XY	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.8125	0	1	2
0		0	0																		
	g13XY	XBrace1		XY-GenXY	1XY	2X	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.8125	0	1	2
0		0	0																		
	g13Y	XBrace1		Y-GenXY	1Y	2P	2	5	0.75	0.5	0.5	5/8	A394	2	1	1	Short only	0.8125	0	1	2
0		0	0																		
	g14P	XBrace2		XY-Symmetry	2P	3X	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g14X	XBrace2		X-GenXY	2X	3P	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g14XY	XBrace2		XY-GenXY	2XY	3Y	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g14Y	XBrace2		Y-GenXY	2Y	3XY	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g15P	XBrace2		XY-Symmetry	2P	3Y	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g15X	XBrace2		X-GenXY	2X	3XY	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g15XY	XBrace2		XY-GenXY	2XY	3X	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g15Y	XBrace2		Y-GenXY	2Y	3P	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g16P	XBrace8		XY-Symmetry	3P	17S	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g16X	XBrace8		X-GenXY	3X	17S	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g16XY	XBrace8		XY-GenXY	3XY	17Y	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g16Y	XBrace8		Y-GenXY	3Y	17Y	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g17P	XBrace8		XY-Symmetry	17S	4P	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g17X	XBrace8		X-GenXY	17S	4X	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g17XY	XBrace8		XY-GenXY	17Y	4XY	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g17Y	XBrace8		Y-GenXY	17Y	4Y	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g18P	XBrace8		XY-Symmetry	3P	16S	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g18X	XBrace8		X-GenXY	3X	16X	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g18XY	XBrace8		XY-GenXY	3XY	16X	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g18Y	XBrace8		Y-GenXY	3Y	16S	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g19P	XBrace8		XY-Symmetry	16S	4P	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g19X	XBrace8		X-GenXY	16X	4X	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g19XY	XBrace8		XY-GenXY	16X	4XY	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125

0		0	0																		
	g19Y	XBrace8		Y-GenXY	16S	4Y	2	5	1	1.5	1	5/8	A394	3	1	1	Long only	0.875	1.4375	1	3.125
0		0	0																		
	g20P	XBrace2		XY-Symmetry	4P	5X	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g20X	XBrace2		X-GenXY	4X	5P	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g20XY	XBrace2		XY-GenXY	4XY	5Y	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g20Y	XBrace2		Y-GenXY	4Y	5XY	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g21P	XBrace2		XY-Symmetry	4P	5Y	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g21X	XBrace2		X-GenXY	4X	5XY	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g21XY	XBrace2		XY-GenXY	4XY	5X	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g21Y	XBrace2		Y-GenXY	4Y	5P	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g22P	XBrace2		XY-Symmetry	5P	6X	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g22X	XBrace2		X-GenXY	5X	6P	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g22XY	XBrace2		XY-GenXY	5XY	6Y	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g22Y	XBrace2		Y-GenXY	5Y	6XY	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g23P	XBrace2		XY-Symmetry	5P	6Y	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g23X	XBrace2		X-GenXY	5X	6XY	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g23XY	XBrace2		XY-GenXY	5XY	6X	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g23Y	XBrace2		Y-GenXY	5Y	6P	2	5	0.5	0.75	0.5	5/8	A394	3	1	1	Long only	0.875	1.4375	1	2.75
0		0	0																		
	g24P	XBrace3		XY-Symmetry	6P	8X	2	5	0.781	0.561	0.561	5/8	A394	2	1	1	Short only	1	0	1	1.375
0		0	0																		
	g24X	XBrace3		X-GenXY	6X	8S	2	5	0.781	0.561	0.561	5/8	A394	2	1	1	Short only	1	0	1	1.375
0		0	0																		
	g24XY	XBrace3		XY-GenXY	6XY	8Y	2	5	0.781	0.561	0.561	5/8	A394	2	1	1	Short only	1	0	1	1.375
0		0	0																		
	g24Y	XBrace3		Y-GenXY	6Y	8XY	2	5	0.781	0.561	0.561	5/8	A394	2	1	1	Short only	1	0	1	1.375
0		0	0																		
	g25P	XBrace3		XY-Symmetry	6P	8Y	2	5	0.781	0.561	0.561	5/8	A394	2	1	1	Short only	1	0	1	1.375
0		0	0																		
	g25X	XBrace3		X-GenXY	6X	8XY	2	5	0.781	0.561	0.561	5/8	A394	2	1	1	Short only	1	0	1	1.375
0		0	0																		
	g25XY	XBrace3		XY-GenXY	6XY	8X	2	5	0.781	0.561	0.561	5/8	A394	2	1	1	Short only	1	0	1	1.375
0		0	0																		
	g25Y	XBrace3		Y-GenXY	6Y	8S	2	5	0.781	0.561	0.561	5/8	A394	2	1	1	Short only	1	0	1	1.375
0		0	0																		
	g26P	XBrace4		XY-Symmetry	8S	9X	2	5	0.569	0.785	0.569	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.625
0		0	0																		
	g26X	XBrace4		X-GenXY	8X	9S	2	5	0.569	0.785	0.569	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.625
0		0	0																		
	g26XY	XBrace4		XY-GenXY	8XY	9Y	2	5	0.569	0.785	0.569	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.625
0		0	0																		
	g26Y	XBrace4		Y-GenXY	8Y	9XY	2	5	0.569	0.785	0.569	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.625
0		0	0																		
	g27P	XBrace4		XY-Symmetry	8S	9Y	2	5	0.569	0.785	0.569	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.625

0	0	0																			
g27X	XBrace4		X-GenXY	8X	9XY	2	5	0.569	0.785	0.569	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.625	
0	0	0																			
g27XY	XBrace4		XY-GenXY	8XY	9X	2	5	0.569	0.785	0.569	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.625	
0	0	0																			
g27Y	XBrace4		Y-GenXY	8Y	9S	2	5	0.569	0.785	0.569	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.625	
0	0	0																			
g28P	XBrace4		XY-Symmetry	9S	10X	2	5	0.549	0.774	0.549	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.25	
0	0	0																			
g28X	XBrace4		X-GenXY	9X	10S	2	5	0.549	0.774	0.549	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.25	
0	0	0																			
g28XY	XBrace4		XY-GenXY	9XY	10Y	2	5	0.549	0.774	0.549	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.25	
0	0	0																			
g28Y	XBrace4		Y-GenXY	9Y	10XY	2	5	0.549	0.774	0.549	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.25	
0	0	0																			
g29P	XBrace4		XY-Symmetry	9S	10Y	2	5	0.549	0.774	0.549	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.25	
0	0	0																			
g29X	XBrace4		X-GenXY	9X	10XY	2	5	0.549	0.774	0.549	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.25	
0	0	0																			
g29XY	XBrace4		XY-GenXY	9XY	10X	2	5	0.549	0.774	0.549	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.25	
0	0	0																			
g29Y	XBrace4		Y-GenXY	9Y	10S	2	5	0.549	0.774	0.549	5/8	A394	2	1	1	Long only	0.875	1.5625	1	3.25	
0	0	0																			
g30P	XBrace5		XY-Symmetry	10S	11X	2	5	0.789	0.577	0.577	5/8	A394	2	1	1	Short only	0.8125	0	1	1.4375	
0	0	0																			
g30X	XBrace5		X-GenXY	10X	11S	2	5	0.789	0.577	0.577	5/8	A394	2	1	1	Short only	0.8125	0	1	1.4375	
0	0	0																			
g30XY	XBrace5		XY-GenXY	10XY	11Y	2	5	0.789	0.577	0.577	5/8	A394	2	1	1	Short only	0.8125	0	1	1.4375	
0	0	0																			
g30Y	XBrace5		Y-GenXY	10Y	11XY	2	5	0.789	0.577	0.577	5/8	A394	2	1	1	Short only	0.8125	0	1	1.4375	
0	0	0																			
g31P	XBrace5		XY-Symmetry	10S	11Y	2	5	0.789	0.577	0.577	5/8	A394	2	1	1	Short only	0.8125	0	1	1.4375	
0	0	0																			
g31X	XBrace5		X-GenXY	10X	11XY	2	5	0.789	0.577	0.577	5/8	A394	2	1	1	Short only	0.8125	0	1	1.4375	
0	0	0																			
g31XY	XBrace5		XY-GenXY	10XY	11X	2	5	0.789	0.577	0.577	5/8	A394	2	1	1	Short only	0.8125	0	1	1.4375	
0	0	0																			
g31Y	XBrace5		Y-GenXY	10Y	11S	2	5	0.789	0.577	0.577	5/8	A394	2	1	1	Short only	0.8125	0	1	1.4375	
0	0	0																			
g32P	XBrace6		XY-Symmetry	11S	12X	2	5	0.796	0.409	0.409	5/8	A394	2	1	1	Short only	0.875	0	1	1.5	
0	0	0																			
g32X	XBrace6		X-GenXY	11X	12P	2	5	0.796	0.409	0.409	5/8	A394	2	1	1	Short only	0.875	0	1	1.5	
0	0	0																			
g32XY	XBrace6		XY-GenXY	11XY	12Y	2	5	0.796	0.409	0.409	5/8	A394	2	1	1	Short only	0.875	0	1	1.5	
0	0	0																			
g32Y	XBrace6		Y-GenXY	11Y	12XY	2	5	0.796	0.409	0.409	5/8	A394	2	1	1	Short only	0.875	0	1	1.5	
0	0	0																			
g33P	XBrace6		XY-Symmetry	11S	12Y	2	5	0.796	0.409	0.409	5/8	A394	2	1	1	Short only	0.875	0	1	1.5	
0	0	0																			
g33X	XBrace6		X-GenXY	11X	12XY	2	5	0.796	0.409	0.409	5/8	A394	2	1	1	Short only	0.875	0	1	1.5	
0	0	0																			
g33XY	XBrace6		XY-GenXY	11XY	12X	2	5	0.796	0.409	0.409	5/8	A394	2	1	1	Short only	0.875	0	1	1.5	
0	0	0																			
g33Y	XBrace6		Y-GenXY	11Y	12P	2	5	0.796	0.409	0.409	5/8	A394	2	1	1	Short only	0.875	0	1	1.5	
0	0	0																			
g34P	Horz1		X-Symmetry	1P	1Y	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	1	0	
0	0	0																			
g34X	Horz1		X-Gen	1X	1XY	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	1	0	
0	0	0																			
g35P	Horz1		X-Symmetry	2P	2Y	3	4	1	1	1	5/8	A394	1	1	1	Short only	0.875	0	1	0	

0	0	0																				
	g35X	Horz1	X-Gen	2X	2XY	3	4	1	1	1	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g36P	Horz1	X-Symmetry	4P	4Y	3	4	1	1	1	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g36X	Horz1	X-Gen	4X	4XY	3	4	1	1	1	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g37P	Horz1	X-Symmetry	6P	6Y	3	4	1	1	1	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g37X	Horz1	X-Gen	6X	6XY	3	4	1	1	1	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g38P	Horz2	X-Symmetry	10S	10Y	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g38X	Horz2	X-Gen	10X	10XY	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g39P	Horz2	Y-Symmetry	10X	10S	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g39Y	Horz2	Y-Gen	10XY	10Y	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g40P	Horz3	X-Symmetry	11S	11Y	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short	only	1.25	0	1	0	
0	0	0																				
	g40X	Horz3	X-Gen	11X	11XY	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short	only	1.25	0	1	0	
0	0	0																				
	g41P	Horz3	Y-Symmetry	11X	11S	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short	only	1.25	0	1	0	
0	0	0																				
	g41Y	Horz3	Y-Gen	11XY	11Y	3	4	1	0.5	0.5	5/8	A394	1	1	1	Short	only	1.25	0	1	0	
0	0	0																				
	g42P	Horz1	XY-Symmetry	15S	16S	3	4	1	1	1	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g42X	Horz1	X-GenXY	15X	16X	3	4	1	1	1	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g42XY	Horz1	XY-GenXY	15XY	16X	3	4	1	1	1	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g42Y	Horz1	Y-GenXY	15Y	16S	3	4	1	1	1	5/8	A394	1	1	1	Short	only	0.875	0	1	0	
0	0	0																				
	g43P	Horz5	XY-Symmetry	15X	17S	3	4	1	2	1	5/8	A394	1	1	1	Long	only	0.875	0	1	0	
0	0	0																				
	g43X	Horz5	X-GenXY	15S	17S	3	4	1	2	1	5/8	A394	1	1	1	Long	only	0.875	0	1	0	
0	0	0																				
	g43XY	Horz5	XY-GenXY	15Y	17Y	3	4	1	2	1	5/8	A394	1	1	1	Long	only	0.875	0	1	0	
0	0	0																				
	g43Y	Horz5	Y-GenXY	15XY	17Y	3	4	1	2	1	5/8	A394	1	1	1	Long	only	0.875	0	1	0	
0	0	0																				
	g44P	Arm1	XY-Symmetry	18X	1X	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long	only	1.25	0	2.375	1.5	
0	0	0																				
	g44X	Arm1	X-GenXY	18P	1P	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long	only	1.25	0	2.375	1.5	
0	0	0																				
	g44XY	Arm1	XY-GenXY	18P	1Y	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long	only	1.25	0	2.375	1.5	
0	0	0																				
	g44Y	Arm1	Y-GenXY	18X	1XY	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long	only	1.25	0	2.375	1.5	
0	0	0																				
	g45P	Arm1	Y-Symmetry	1X	1P	3	5	1	1	1	5/8	A394	2	1	1	Long	only	1.25	0	2.375	1.5	
0	0	0																				
	g45Y	Arm1	Y-Gen	1XY	1Y	3	5	1	1	1	5/8	A394	2	1	1	Long	only	1.25	0	2.375	1.5	
0	0	0																				
	g46P	Arm2	XY-Symmetry	19X	2X	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long	only	1.25	0	2.375	1.5	
0	0	0																				
	g46X	Arm2	X-GenXY	19P	2P	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long	only	1.25	0	2.375	1.5	
0	0	0																				
	g46XY	Arm2	XY-GenXY	19P	2Y	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long	only	1.25	0	2.375	1.5	

0	0	0																		
	g46Y	Arm2		Y-GenXY	19X	2XY	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.25	0	2.375	1.5
0	0	0																		
	g47P	Arm2		Y-Symmetry	2X	2P	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	2.375	1.5
0	0	0																		
	g47Y	Arm2		Y-Gen	2XY	2Y	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.25	0	2.375	1.5
0	0	0																		
	g48P	Arm3		XY-Symmetry	20X	4X	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.75	0	2.375	1.5
0	0	0																		
	g48X	Arm3		X-GenXY	20P	4P	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.75	0	2.375	1.5
0	0	0																		
	g48XY	Arm3		XY-GenXY	20P	4Y	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.75	0	2.375	1.5
0	0	0																		
	g48Y	Arm3		Y-GenXY	20X	4XY	3	5	1	0.5	0.5	5/8	A394	2	1	1	Long only	1.75	0	2.375	1.5
0	0	0																		
	g49P	Arm3		Y-Symmetry	4X	4P	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.75	0	2.375	1.5
0	0	0																		
	g49Y	Arm3		Y-Gen	4XY	4Y	3	5	1	1	1	5/8	A394	2	1	1	Long only	1.75	0	2.375	1.5
0	0	0																		
	g50P	Arm4		XY-Symmetry	21X	6X	3	4	1	0.5	0.5	5/8	A394	1	1	1	Long only	1.5	0	2.75	0
0	0	0																		
	g50X	Arm4		X-GenXY	21P	6P	3	4	1	0.5	0.5	5/8	A394	1	1	1	Long only	1.5	0	2.75	0
0	0	0																		
	g50XY	Arm4		XY-GenXY	21P	6Y	3	4	1	0.5	0.5	5/8	A394	1	1	1	Long only	1.5	0	2.75	0
0	0	0																		
	g50Y	Arm4		Y-GenXY	21X	6XY	3	4	1	0.5	0.5	5/8	A394	1	1	1	Long only	1.5	0	2.75	0
0	0	0																		
	g51P	Arm4		Y-Symmetry	6X	6P	3	4	1	1	1	5/8	A394	1	1	1	Long only	1.5	0	2.75	0
0	0	0																		
	g51Y	Arm4		Y-Gen	6XY	6Y	3	4	1	1	1	5/8	A394	1	1	1	Long only	1.5	0	2.75	0
0	0	0																		
	g52P	ArmBr1		X-Symmetry	18X	19X	2	4	1	1	1	5/8	A394	1	2	1	Short only	1.25	0	1	0
0	0	0																		
	g52X	ArmBr1		X-Gen	18P	19P	2	4	1	1	1	5/8	A394	1	2	1	Short only	1.25	0	1	0
0	0	0																		
	g53P	ArmBr2		XY-Symmetry	19X	1X	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g53X	ArmBr2		X-GenXY	19P	1P	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g53XY	ArmBr2		XY-GenXY	19P	1Y	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g53Y	ArmBr2		Y-GenXY	19X	1XY	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g54P	ArmBr3		XY-Symmetry	20X	15X	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g54X	ArmBr3		X-GenXY	20P	15S	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g54XY	ArmBr3		XY-GenXY	20P	15Y	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g54Y	ArmBr3		Y-GenXY	20X	15XY	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g55P	ArmBr4		XY-Symmetry	21X	5X	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g55X	ArmBr4		X-GenXY	21P	5P	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g55XY	ArmBr4		XY-GenXY	21P	5Y	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g55Y	ArmBr4		Y-GenXY	21X	5XY	2	4	1	1	1	5/8	A394	1	1	1	Long only	0.875	0	1	0
0	0	0																		
	g56P	MB1		XY-Symmetry	1X	27P	3	4	1	1	1	5/8	A325	1	1	1	Short only	1.25	0	1	0

0	0	0																			
g56X	MB1		X-GenXY	1P	27P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g56XY	MB1		XY-GenXY	1Y	27P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g56Y	MB1		Y-GenXY	1XY	27P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g57P	MB1		XY-Symmetry	2X	26P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g57X	MB1		X-GenXY	2P	26P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g57XY	MB1		XY-GenXY	2Y	26P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g57Y	MB1		Y-GenXY	2XY	26P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g58P	MB1		XY-Symmetry	4X	25P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g58X	MB1		X-GenXY	4P	25P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g58XY	MB1		XY-GenXY	4Y	25P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g58Y	MB1		Y-GenXY	4XY	25P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g59P	MB1		XY-Symmetry	6X	24P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g59X	MB1		X-GenXY	6P	24P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g59XY	MB1		XY-GenXY	6Y	24P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g59Y	MB1		Y-GenXY	6XY	24P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g60P	MB2		XY-Symmetry	11X	23P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g60X	MB2		X-GenXY	11S	23P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g60XY	MB2		XY-GenXY	11Y	23P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g60Y	MB2		Y-GenXY	11XY	23P	3	4	1	1	1	5/8 A325	1	1	1	Short only	1.25	0	1	0	
0	0	0																			
g61P	Mast		None	22P	23P	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g62P	Mast		None	23P	24P	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g63P	Mast		None	24P	25P	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g64P	Mast		None	25P	26P	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g65P	Mast		None	26P	27P	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g66P	Mast		None	27P	28P	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g67P	Mast		None	28P	29P	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g72P	fic1		X-Symmetry	30X	32X	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g72X	fic1		X-Gen	30P	32P	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g73P	fic1		Y-Symmetry	33P	31P	1	4	1	1	1		0	0	0		0	0	0	0		
0	0	0																			
g73Y	fic1		Y-Gen	33Y	31Y	1	4	1	1	1		0	0	0		0	0	0	0		

0	0	0																	
	g70P	fic	X-Symmetry	32X	29P	1	4	1	1	1	0	0	0	0	0	0	0		
0	0	0																	
	g70X	fic	X-Gen	32P	29P	1	4	1	1	1	0	0	0	0	0	0	0		
0	0	0																	
	g71P	fic	X-Symmetry	30X	27P	1	4	1	1	1	0	0	0	0	0	0	0		
0	0	0																	
	g71X	fic	X-Gen	30P	27P	1	4	1	1	1	0	0	0	0	0	0	0		
0	0	0																	
	g74P	fic	Y-Symmetry	31P	27P	1	4	1	1	1	0	0	0	0	0	0	0		
0	0	0																	
	g74Y	fic	Y-Gen	31Y	27P	1	4	1	1	1	0	0	0	0	0	0	0		
0	0	0																	
	g75P	fic	Y-Symmetry	33P	29P	1	4	1	1	1	0	0	0	0	0	0	0		
0	0	0																	
	g75Y	fic	Y-Gen	33Y	29P	1	4	1	1	1	0	0	0	0	0	0	0		
0	0	0																	

Member Capacities and Overrides:

Member Label	Group Label	Design Comp. Tension Capacity	Design Control Capacity	Tension Criterion	Tension Control Face	L/r Length (ft)	L/r Comp. Capacity (kips)	Connection Shear Capacity (kips)	Connection Bearing Capacity (kips)	Net Section Tension Capacity (kips)	Rupture Capacity (kips)	RTE End Tension Capacity (kips)	RTE Edge Dist. Capacity (kips)	Override Comp. Capacity (kips)	Override Warnings or Errors
				Unsup. Criterion											
g1P	Leg1	53.509	L/r	41.332	Net Sect	75	5.00	53.509	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g1X	Leg1	53.509	L/r	41.332	Net Sect	75	5.00	53.509	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g1XY	Leg1	53.509	L/r	41.332	Net Sect	75	5.00	53.509	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g1Y	Leg1	53.509	L/r	41.332	Net Sect	75	5.00	53.509	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g2P	Leg1	48.884	L/r	41.332	Net Sect	91	6.00	48.884	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g2X	Leg1	48.884	L/r	41.332	Net Sect	91	6.00	48.884	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g2XY	Leg1	48.884	L/r	41.332	Net Sect	91	6.00	48.884	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g2Y	Leg1	48.884	L/r	41.332	Net Sect	91	6.00	48.884	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3P	Leg1	60.236	L/r	41.332	Net Sect	45	3.00	60.236	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3X	Leg1	60.236	L/r	41.332	Net Sect	45	3.00	60.236	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3XY	Leg1	60.236	L/r	41.332	Net Sect	45	3.00	60.236	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g3Y	Leg1	60.236	L/r	41.332	Net Sect	45	3.00	60.236	0.000	0.000	41.332	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											

g4P	Leg1	60.236	L/r	41.332	Net Sect	45	3.00	60.236	0.000	0.000	41.332	0.000	0.000	0.000	0.000	0.000
				Automatic												
g4X	Leg1	60.236	L/r	41.332	Net Sect	45	3.00	60.236	0.000	0.000	41.332	0.000	0.000	0.000	0.000	0.000
				Automatic												
g4XY	Leg1	60.236	L/r	41.332	Net Sect	45	3.00	60.236	0.000	0.000	41.332	0.000	0.000	0.000	0.000	0.000
				Automatic												
g4Y	Leg1	60.236	L/r	41.332	Net Sect	45	3.00	60.236	0.000	0.000	41.332	0.000	0.000	0.000	0.000	0.000
				Automatic												
g5P	Leg1	53.509	L/r	52.676	Net Sect	75	5.00	53.509	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000
				Automatic												
g5X	Leg1	53.509	L/r	52.676	Net Sect	75	5.00	53.509	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000
				Automatic												
g5XY	Leg1	53.509	L/r	52.676	Net Sect	75	5.00	53.509	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000
				Automatic												
g5Y	Leg1	53.509	L/r	52.676	Net Sect	75	5.00	53.509	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000
				Automatic												
g6P	Leg1	53.509	L/r	52.676	Net Sect	75	5.00	53.509	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000
				Automatic												
g6X	Leg1	53.509	L/r	52.676	Net Sect	75	5.00	53.509	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000
				Automatic												
g6XY	Leg1	53.509	L/r	52.676	Net Sect	75	5.00	53.509	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000
				Automatic												
g6Y	Leg1	53.509	L/r	52.676	Net Sect	75	5.00	53.509	0.000	0.000	52.676	0.000	0.000	0.000	0.000	0.000
				Automatic												
g7P	Leg2	65.558	L/r	58.001	Net Sect	77	5.10	65.558	0.000	0.000	58.001	0.000	0.000	0.000	0.000	0.000
				Automatic												
g7X	Leg2	65.558	L/r	58.001	Net Sect	77	5.10	65.558	0.000	0.000	58.001	0.000	0.000	0.000	0.000	0.000
				Automatic												
g7XY	Leg2	65.558	L/r	58.001	Net Sect	77	5.10	65.558	0.000	0.000	58.001	0.000	0.000	0.000	0.000	0.000
				Automatic												
g7Y	Leg2	65.558	L/r	58.001	Net Sect	77	5.10	65.558	0.000	0.000	58.001	0.000	0.000	0.000	0.000	0.000
				Automatic												
g8P	Leg2	59.556	L/r	62.893	Net Sect	93	6.11	59.556	0.000	0.000	62.893	0.000	0.000	0.000	0.000	0.000
				Automatic												
g8X	Leg2	59.556	L/r	62.893	Net Sect	93	6.11	59.556	0.000	0.000	62.893	0.000	0.000	0.000	0.000	0.000
				Automatic												
g8XY	Leg2	59.556	L/r	62.893	Net Sect	93	6.11	59.556	0.000	0.000	62.893	0.000	0.000	0.000	0.000	0.000
				Automatic												
g8Y	Leg2	59.556	L/r	62.893	Net Sect	93	6.11	59.556	0.000	0.000	62.893	0.000	0.000	0.000	0.000	0.000
				Automatic												
g9P	**Leg2**	**56.145**	**L/r**	**64.808**	**Net Sect**	**100**	**6.62**	**56.145**	**91.000**	**175.781**	**64.808**	**160.845**	**0.000**	**0.000**	**0.000**	
0.000		**0.000**		**Automatic**	**Member "g9P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**											
g9X	**Leg2**	**56.145**	**L/r**	**64.808**	**Net Sect**	**100**	**6.62**	**56.145**	**91.000**	**175.781**	**64.808**	**160.845**	**0.000**	**0.000**	**0.000**	
0.000		**0.000**		**Automatic**	**Member "g9X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**											
g9XY	**Leg2**	**56.145**	**L/r**	**64.808**	**Net Sect**	**100**	**6.62**	**56.145**	**91.000**	**175.781**	**64.808**	**160.845**	**0.000**	**0.000**	**0.000**	
0.000		**0.000**		**Automatic**	**Member "g9XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**											
g9Y	**Leg2**	**56.145**	**L/r**	**64.808**	**Net Sect**	**100**	**6.62**	**56.145**	**91.000**	**175.781**	**64.808**	**160.845**	**0.000**	**0.000**	**0.000**	
0.000		**0.000**		**Automatic**	**Member "g9Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**											
g10P	**Leg3**	**59.940**	**L/r**	**65.879**	**Net Sect**	**113**	**14.78**	**59.940**	**91.000**	**210.937**	**65.879**	**281.250**	**0.000**	**0.000**	**0.000**	
0.000		**0.000**		**Automatic**	**Member "g10P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**											
g10X	**Leg3**	**59.940**	**L/r**	**65.879**	**Net Sect**	**113**	**14.78**	**59.940**	**91.000**	**210.937**	**65.879**	**281.250**	**0.000**	**0.000**	**0.000**	
0.000		**0.000**		**Automatic**	**Member "g10X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??**											
g10XY	**Leg3**	**59.940**	**L/r**	**65.879**	**Net Sect**	**113**	**14.78**	**59.940**	**91.000**	**210.937**	**65.879**	**281.250**	**0.000**	**0.000**	**0.000**	

0.000 0.000 Automatic Member "g10XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g10Y Leg3 59.940 L/r 65.879 Net Sect 113 14.78 59.940 91.000 210.937 65.879 281.250 0.000 0.000 0.000
0.000 0.000 Automatic Member "g10Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g11P Leg3 59.214 L/r 65.794 Net Sect 114 22.42 59.214 91.000 210.937 65.794 193.014 0.000 0.000 0.000
0.000 0.000 Automatic Member "g11P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g11X Leg3 59.214 L/r 65.794 Net Sect 114 22.42 59.214 91.000 210.937 65.794 193.014 0.000 0.000 0.000
0.000 0.000 Automatic Member "g11X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g11XY Leg3 59.214 L/r 65.794 Net Sect 114 22.42 59.214 91.000 210.937 65.794 193.014 0.000 0.000 0.000
0.000 0.000 Automatic Member "g11XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g11Y Leg3 59.214 L/r 65.794 Net Sect 114 22.42 59.214 91.000 210.937 65.794 193.014 0.000 0.000 0.000
0.000 0.000 Automatic Member "g11Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g12P XBrace1 11.559 L/r 14.585 Net Sect 124 7.07 11.559 18.200 21.094 14.585 16.189 0.000 0.000 0.000
0.000 0.000 Automatic
g12X XBrace1 11.559 L/r 14.585 Net Sect 124 7.07 11.559 18.200 21.094 14.585 16.189 0.000 0.000 0.000
0.000 0.000 Automatic
g12XY XBrace1 11.559 L/r 14.585 Net Sect 124 7.07 11.559 18.200 21.094 14.585 16.189 0.000 0.000 0.000
0.000 0.000 Automatic
g12Y XBrace1 11.559 L/r 14.585 Net Sect 124 7.07 11.559 18.200 21.094 14.585 16.189 0.000 0.000 0.000
0.000 0.000 Automatic
g13P XBrace1 11.559 L/r 14.585 Net Sect 124 7.07 11.559 18.200 21.094 14.585 16.189 0.000 0.000 0.000
0.000 0.000 Automatic
g13X XBrace1 11.559 L/r 14.585 Net Sect 124 7.07 11.559 18.200 21.094 14.585 16.189 0.000 0.000 0.000
0.000 0.000 Automatic
g13XY XBrace1 11.559 L/r 14.585 Net Sect 124 7.07 11.559 18.200 21.094 14.585 16.189 0.000 0.000 0.000
0.000 0.000 Automatic
g13Y XBrace1 11.559 L/r 14.585 Net Sect 124 7.07 11.559 18.200 21.094 14.585 16.189 0.000 0.000 0.000
0.000 0.000 Automatic
g14P XBrace2 17.275 L/r 22.901 Net Sect 121 7.81 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g14P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g14X XBrace2 17.275 L/r 22.901 Net Sect 121 7.81 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g14X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g14XY XBrace2 17.275 L/r 22.901 Net Sect 121 7.81 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g14XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g14Y XBrace2 17.275 L/r 22.901 Net Sect 121 7.81 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g14Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g15P XBrace2 17.275 L/r 22.901 Net Sect 121 7.81 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g15P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g15X XBrace2 17.275 L/r 22.901 Net Sect 121 7.81 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g15X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g15XY XBrace2 17.275 L/r 22.901 Net Sect 121 7.81 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g15XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g15Y XBrace2 17.275 L/r 22.901 Net Sect 121 7.81 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g15Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g16P XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000

0.000 0.000 Automatic Member "g16P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g16X XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g16X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g16XY XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g16XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g16Y XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g16Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g17P XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g17P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g17X XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g17X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g17XY XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g17XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g17Y XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g17Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g18P XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g18P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g18X XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g18X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g18XY XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g18XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g18Y XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g18Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g19P XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g19P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g19X XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g19X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g19XY XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g19XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g19Y XBrace8 17.275 L/r 22.901 Net Sect 121 3.91 17.275 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g19Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g20P XBrace2 18.986 L/r 22.901 Net Sect 109 7.07 18.986 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g20P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g20X XBrace2 18.986 L/r 22.901 Net Sect 109 7.07 18.986 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g20X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g20XY XBrace2 18.986 L/r 22.901 Net Sect 109 7.07 18.986 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g20XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge and spacing distances will be checked. ??
g20Y XBrace2 18.986 L/r 22.901 Net Sect 109 7.07 18.986 27.300 31.641 22.901 28.125 0.000 0.000 0.000
0.000 0.000 Automatic Member "g20Y" will not be checked for block shear since more than one gage line exists (long edge

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distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g21P XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g21P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g21X XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g21X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
  g21XY XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic Member "g21XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g21Y XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g21Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g22P XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g22P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g22X XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g22X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
  g22XY XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic Member "g22XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g22Y XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g22Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g23P XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g23P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g23X XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g23X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
  g23XY XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic Member "g23XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g23Y XBrace2   18.986       L/r   22.901  Net Sect     109   7.07   18.986     27.300     31.641   22.901   28.125    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g23Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g24P XBrace3   12.421       L/r   13.131   Rupture     130   7.61   12.421     18.200     21.094   17.258   13.131    0.000    0.000    0.000
0.000              0.000           Automatic
   g24X XBrace3   12.421       L/r   13.131   Rupture     130   7.61   12.421     18.200     21.094   17.258   13.131    0.000    0.000    0.000
0.000              0.000           Automatic
  g24XY XBrace3   12.421       L/r   13.131   Rupture     130   7.61   12.421     18.200     21.094   17.258   13.131    0.000    0.000    0.000
0.000              0.000           Automatic
   g24Y XBrace3   12.421       L/r   13.131   Rupture     130   7.61   12.421     18.200     21.094   17.258   13.131    0.000    0.000    0.000
0.000              0.000           Automatic
   g25P XBrace3   12.421       L/r   13.131   Rupture     130   7.61   12.421     18.200     21.094   17.258   13.131    0.000    0.000    0.000
0.000              0.000           Automatic
   g25X XBrace3   12.421       L/r   13.131   Rupture     130   7.61   12.421     18.200     21.094   17.258   13.131    0.000    0.000    0.000
0.000              0.000           Automatic
  g25XY XBrace3   12.421       L/r   13.131   Rupture     130   7.61   12.421     18.200     21.094   17.258   13.131    0.000    0.000    0.000
0.000              0.000           Automatic
   g25Y XBrace3   12.421       L/r   13.131   Rupture     130   7.61   12.421     18.200     21.094   17.258   13.131    0.000    0.000    0.000
0.000              0.000           Automatic
   g26P XBrace4   11.265       L/r   18.200     Shear     151   9.43   11.265     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g26P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g26X XBrace4   11.265       L/r   18.200     Shear     151   9.43   11.265     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000              0.000           Automatic  Member "g26X" will not be checked for block shear since more than one gage line exists (long edge
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distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
  g26XY XBrace4   11.265       L/r   18.200     Shear     151   9.43   11.265     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic Member "g26XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g26Y XBrace4   11.265       L/r   18.200     Shear     151   9.43   11.265     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g26Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g27P XBrace4   11.265       L/r   18.200     Shear     151   9.43   11.265     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g27P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g27X XBrace4   11.265       L/r   18.200     Shear     151   9.43   11.265     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g27X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
  g27XY XBrace4   11.265       L/r   18.200     Shear     151   9.43   11.265     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic Member "g27XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g27Y XBrace4   11.265       L/r   18.200     Shear     151   9.43   11.265     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g27Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g28P XBrace4    9.103       L/r   18.200     Shear     172  11.10    9.103     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g28P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g28X XBrace4    9.103       L/r   18.200     Shear     172  11.10    9.103     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g28X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
  g28XY XBrace4    9.103       L/r   18.200     Shear     172  11.10    9.103     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic Member "g28XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g28Y XBrace4    9.103       L/r   18.200     Shear     172  11.10    9.103     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g28Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g29P XBrace4    9.103       L/r   18.200     Shear     172  11.10    9.103     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g29P" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g29X XBrace4    9.103       L/r   18.200     Shear     172  11.10    9.103     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g29X" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
  g29XY XBrace4    9.103       L/r   18.200     Shear     172  11.10    9.103     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic Member "g29XY" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g29Y XBrace4    9.103       L/r   18.200     Shear     172  11.10    9.103     18.200     21.094   20.228   18.750    0.000    0.000    0.000
0.000             0.000           Automatic  Member "g29Y" will not be checked for block shear since more than one gage line exists (long edge
distance (g) greater than zero); however, end, edge and spacing distances will be checked.  ??
   g30P XBrace5    2.260       L/r   16.523   Rupture     383  18.85    2.260     18.200     28.125   18.952   16.523    0.000    0.000    0.000
0.000             0.000           Automatic
   g30X XBrace5    2.260       L/r   16.523   Rupture     383  18.85    2.260     18.200     28.125   18.952   16.523    0.000    0.000    0.000
0.000             0.000           Automatic
  g30XY XBrace5    2.260       L/r   16.523   Rupture     383  18.85    2.260     18.200     28.125   18.952   16.523    0.000    0.000    0.000
0.000             0.000           Automatic
   g30Y XBrace5    2.260       L/r   16.523   Rupture     383  18.85    2.260     18.200     28.125   18.952   16.523    0.000    0.000    0.000
0.000             0.000           Automatic
   g31P XBrace5    2.260       L/r   16.523   Rupture     383  18.85    2.260     18.200     28.125   18.952   16.523    0.000    0.000    0.000
0.000             0.000           Automatic
   g31X XBrace5    2.260       L/r   16.523   Rupture     383  18.85    2.260     18.200     28.125   18.952   16.523    0.000    0.000    0.000
0.000             0.000           Automatic
  g31XY XBrace5    2.260       L/r   16.523   Rupture     383  18.85    2.260     18.200     28.125   18.952   16.523    0.000    0.000    0.000
0.000             0.000           Automatic
   g31Y XBrace5    2.260       L/r   16.523   Rupture     383  18.85    2.260     18.200     28.125   18.952   16.523    0.000    0.000    0.000
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0.000		0.000		Automatic											
g32P	XBrace6	1.070	L/r	13.201	Rupture	497	27.94	1.070	18.200	21.094	14.585	13.201	0.000	0.000	0.000
0.000		0.000		Automatic											
g32X	XBrace6	1.070	L/r	13.201	Rupture	497	27.94	1.070	18.200	21.094	14.585	13.201	0.000	0.000	0.000
0.000		0.000		Automatic											
g32XY	XBrace6	1.070	L/r	13.201	Rupture	497	27.94	1.070	18.200	21.094	14.585	13.201	0.000	0.000	0.000
0.000		0.000		Automatic											
g32Y	XBrace6	1.070	L/r	13.201	Rupture	497	27.94	1.070	18.200	21.094	14.585	13.201	0.000	0.000	0.000
0.000		0.000		Automatic											
g33P	XBrace6	1.070	L/r	13.201	Rupture	497	27.94	1.070	18.200	21.094	14.585	13.201	0.000	0.000	0.000
0.000		0.000		Automatic											
g33X	XBrace6	1.070	L/r	13.201	Rupture	497	27.94	1.070	18.200	21.094	14.585	13.201	0.000	0.000	0.000
0.000		0.000		Automatic											
g33XY	XBrace6	1.070	L/r	13.201	Rupture	497	27.94	1.070	18.200	21.094	14.585	13.201	0.000	0.000	0.000
0.000		0.000		Automatic											
g33Y	XBrace6	1.070	L/r	13.201	Rupture	497	27.94	1.070	18.200	21.094	14.585	13.201	0.000	0.000	0.000
0.000		0.000		Automatic											
g34P	Horz1	5.799	L/r	7.717	Rupture	175	5.00	5.799	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g34X	Horz1	5.799	L/r	7.717	Rupture	175	5.00	5.799	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g35P	Horz1	5.799	L/r	7.717	Rupture	175	5.00	5.799	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g35X	Horz1	5.799	L/r	7.717	Rupture	175	5.00	5.799	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g36P	Horz1	5.799	L/r	7.717	Rupture	175	5.00	5.799	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g36X	Horz1	5.799	L/r	7.717	Rupture	175	5.00	5.799	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g37P	Horz1	5.799	L/r	7.717	Rupture	175	5.00	5.799	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g37X	Horz1	5.799	L/r	7.717	Rupture	175	5.00	5.799	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g38P	Horz2	9.100	Shear	7.717	Rupture	149	9.86	10.412	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g38X	Horz2	9.100	Shear	7.717	Rupture	149	9.86	10.412	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g39P	Horz2	9.100	Shear	7.717	Rupture	149	9.86	10.412	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g39Y	Horz2	9.100	Shear	7.717	Rupture	149	9.86	10.412	9.100	10.547	17.444	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g40P	Horz3	9.100	Shear	9.100	Shear	176	13.89	12.054	9.100	14.062	30.090	12.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g40X	Horz3	9.100	Shear	9.100	Shear	176	13.89	12.054	9.100	14.062	30.090	12.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g41P	Horz3	9.100	Shear	9.100	Shear	176	13.89	12.054	9.100	14.062	30.090	12.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g41Y	Horz3	9.100	Shear	9.100	Shear	176	13.89	12.054	9.100	14.062	30.090	12.500	0.000	0.000	0.000
0.000		0.000		Automatic											
g42P	Horz1	9.100	Shear	7.717	Rupture	87	2.50	14.114	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g42X	Horz1	9.100	Shear	7.717	Rupture	87	2.50	14.114	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g42XY	Horz1	9.100	Shear	7.717	Rupture	87	2.50	14.114	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g42Y	Horz1	9.100	Shear	7.717	Rupture	87	2.50	14.114	9.100	10.547	14.585	7.717	0.000	0.000	0.000
0.000		0.000		Automatic											
g43P	Horz5	0.129	L/r	7.889	Net Sect	984	2.50	0.129	9.100	14.062	7.889	10.289	0.000	0.000	0.000
0.000		0.000		Automatic											
g43X	Horz5	0.129	L/r	7.889	Net Sect	984	2.50	0.129	9.100	14.062	7.889	10.289	0.000	0.000	0.000

0.000		0.000		Automatic											
g43XY	Horz5	0.129	L/r	7.889	Net Sect	984	2.50	0.129	9.100	14.062	7.889	10.289	0.000	0.000	0.000
0.000		0.000		Automatic											
g43Y	Horz5	0.129	L/r	7.889	Net Sect	984	2.50	0.129	9.100	14.062	7.889	10.289	0.000	0.000	0.000
0.000		0.000		Automatic											
g44P	Arm1	18.200	Shear	18.200	Shear	146	11.52	19.099	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g44X	Arm1	18.200	Shear	18.200	Shear	146	11.52	19.099	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g44XY	Arm1	18.200	Shear	18.200	Shear	146	11.52	19.099	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g44Y	Arm1	18.200	Shear	18.200	Shear	146	11.52	19.099	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g45P	Arm1	18.200	Shear	18.200	Shear	114	5.00	26.226	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g45Y	Arm1	18.200	Shear	18.200	Shear	114	5.00	26.226	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g46P	Arm2	18.200	Shear	18.200	Shear	97	7.67	28.509	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g46X	Arm2	18.200	Shear	18.200	Shear	97	7.67	28.509	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g46XY	Arm2	18.200	Shear	18.200	Shear	97	7.67	28.509	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g46Y	Arm2	18.200	Shear	18.200	Shear	97	7.67	28.509	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g47P	Arm2	18.200	Shear	18.200	Shear	114	5.00	26.226	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g47Y	Arm2	18.200	Shear	18.200	Shear	114	5.00	26.226	18.200	28.125	33.802	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g48P	Arm3	18.200	Shear	18.200	Shear	132	12.01	24.527	18.200	28.125	37.663	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g48X	Arm3	18.200	Shear	18.200	Shear	132	12.01	24.527	18.200	28.125	37.663	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g48XY	Arm3	18.200	Shear	18.200	Shear	132	12.01	24.527	18.200	28.125	37.663	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g48Y	Arm3	18.200	Shear	18.200	Shear	132	12.01	24.527	18.200	28.125	37.663	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g49P	Arm3	18.200	Shear	18.200	Shear	110	5.00	29.359	18.200	28.125	37.663	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g49Y	Arm3	18.200	Shear	18.200	Shear	110	5.00	29.359	18.200	28.125	37.663	28.125	0.000	0.000	0.000
0.000		0.000		Automatic											
g50P	Arm4	9.100	Shear	9.100	Shear	103	8.14	27.682	9.100	14.062	33.802	22.059	0.000	0.000	0.000
0.000		0.000		Automatic											
g50X	Arm4	9.100	Shear	9.100	Shear	103	8.14	27.682	9.100	14.062	33.802	22.059	0.000	0.000	0.000
0.000		0.000		Automatic											
g50XY	Arm4	9.100	Shear	9.100	Shear	103	8.14	27.682	9.100	14.062	33.802	22.059	0.000	0.000	0.000
0.000		0.000		Automatic											
g50Y	Arm4	9.100	Shear	9.100	Shear	103	8.14	27.682	9.100	14.062	33.802	22.059	0.000	0.000	0.000
0.000		0.000		Automatic											
g51P	Arm4	9.100	Shear	9.100	Shear	114	5.00	26.226	9.100	14.062	33.802	22.059	0.000	0.000	0.000
0.000		0.000		Automatic											
g51Y	Arm4	9.100	Shear	9.100	Shear	114	5.00	26.226	9.100	14.062	33.802	22.059	0.000	0.000	0.000
0.000		0.000		Automatic											
g52P	ArmBr1	9.100	Shear	9.100	Shear	99	6.40	40.856	9.100	21.094	45.803	18.750	0.000	0.000	0.000
0.000		0.000		Automatic											
g52X	ArmBr1	9.100	Shear	9.100	Shear	99	6.40	40.856	9.100	21.094	45.803	18.750	0.000	0.000	0.000
0.000		0.000		Automatic											
g53P	**ArmBr2**	**0.039**	**L/r**	**7.889**	**Net Sect**	**1801**	**9.15**	**0.039**	**9.100**	**14.062**	**7.889**	**10.289**	**0.000**	**0.000**	**0.000**
0.000		**0.000**		**Automatic**											

KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53P" ??
g53X ArmBr2 0.039 L/r 7.889 Net Sect 1801 9.15 0.039 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53X" ??
g53XY ArmBr2 0.039 L/r 7.889 Net Sect 1801 9.15 0.039 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53XY" ??
g53Y ArmBr2 0.039 L/r 7.889 Net Sect 1801 9.15 0.039 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 1800.97 exceeds maximum of 200.00 for member "g53Y" ??
g54P ArmBr3 0.021 L/r 7.889 Net Sect 2436 12.38 0.021 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54P" ??
g54X ArmBr3 0.021 L/r 7.889 Net Sect 2436 12.38 0.021 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54X" ??
g54XY ArmBr3 0.021 L/r 7.889 Net Sect 2436 12.38 0.021 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54XY" ??
g54Y ArmBr3 0.021 L/r 7.889 Net Sect 2436 12.38 0.021 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 2435.79 exceeds maximum of 200.00 for member "g54Y" ??
g55P ArmBr4 0.035 L/r 7.889 Net Sect 1880 9.56 0.035 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55P" ??
g55X ArmBr4 0.035 L/r 7.889 Net Sect 1880 9.56 0.035 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55X" ??
g55XY ArmBr4 0.035 L/r 7.889 Net Sect 1880 9.56 0.035 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55XY" ??
g55Y ArmBr4 0.035 L/r 7.889 Net Sect 1880 9.56 0.035 9.100 14.062 7.889 10.289 0.000 0.000 0.000
0.000 0.000 Automatic
KL/R value of 1879.82 exceeds maximum of 200.00 for member "g55Y" ??
g56P MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g56X MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g56XY MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g56Y MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g57P MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g57X MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g57XY MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g57Y MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g58P MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g58X MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g58XY MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g58Y MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000
0.000 0.000 Automatic
g59P MB1 13.594 Bearing 12.083 Rupture 86 3.54 28.492 16.800 13.594 32.987 12.083 0.000 0.000 0.000

0.000		0.000		Automatic											
g59X	MB1	13.594	Bearing	12.083	Rupture	86	3.54	28.492	16.800	13.594	32.987	12.083	0.000	0.000	0.000
0.000		0.000		Automatic											
g59XY	MB1	13.594	Bearing	12.083	Rupture	86	3.54	28.492	16.800	13.594	32.987	12.083	0.000	0.000	0.000
0.000		0.000		Automatic											
g59Y	MB1	13.594	Bearing	12.083	Rupture	86	3.54	28.492	16.800	13.594	32.987	12.083	0.000	0.000	0.000
0.000		0.000		Automatic											
g60P	MB2	13.594	Bearing	12.083	Rupture	170	9.82	16.774	16.800	13.594	49.187	12.083	0.000	0.000	0.000
0.000		0.000		Automatic											
g60X	MB2	13.594	Bearing	12.083	Rupture	170	9.82	16.774	16.800	13.594	49.187	12.083	0.000	0.000	0.000
0.000		0.000		Automatic											
g60XY	MB2	13.594	Bearing	12.083	Rupture	170	9.82	16.774	16.800	13.594	49.187	12.083	0.000	0.000	0.000
0.000		0.000		Automatic											
g60Y	MB2	13.594	Bearing	12.083	Rupture	170	9.82	16.774	16.800	13.594	49.187	12.083	0.000	0.000	0.000
0.000		0.000		Automatic											
g61P	Mast	872.521	L/r	953.399	Net Sect	48	22.00	872.521	0.000	0.000	953.399	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g62P	Mast	782.285	L/r	953.399	Net Sect	70	32.00	782.285	0.000	0.000	953.399	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g63P	Mast	936.688	L/r	953.399	Net Sect	22	10.00	936.688	0.000	0.000	953.399	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g64P	Mast	929.336	L/r	953.399	Net Sect	26	12.00	929.336	0.000	0.000	953.399	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g65P	Mast	949.221	L/r	953.399	Net Sect	11	5.00	949.221	0.000	0.000	953.399	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g66P	Mast	915.800	L/r	953.399	Net Sect	33	15.00	915.800	0.000	0.000	953.399	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g67P	Mast	950.725	L/r	953.399	Net Sect	9	4.00	950.725	0.000	0.000	953.399	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g72P	fic1	0.000	L/r	3.600	Net Sect	2280000	19.00	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g72X	fic1	0.000	L/r	3.600	Net Sect	2280000	19.00	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g73P	fic1	0.000	L/r	3.600	Net Sect	2280000	19.00	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g73Y	fic1	0.000	L/r	3.600	Net Sect	2280000	19.00	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g70P	fic	0.000	L/r	3.600	Net Sect	80400	0.67	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g70X	fic	0.000	L/r	3.600	Net Sect	80400	0.67	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g71P	fic	0.000	L/r	3.600	Net Sect	80400	0.67	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g71X	fic	0.000	L/r	3.600	Net Sect	80400	0.67	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g74P	fic	0.000	L/r	3.600	Net Sect	80400	0.67	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g74Y	fic	0.000	L/r	3.600	Net Sect	80400	0.67	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g75P	fic	0.000	L/r	3.600	Net Sect	80400	0.67	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											
g75Y	fic	0.000	L/r	3.600	Net Sect	80400	0.67	0.000	0.000	0.000	3.600	0.000	0.000	0.000	0.000
0.000		0.000		Automatic											

The model contains 233 angle members.

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

Joint	Dead	X-Drag	Y-Drag

Label	Load (kips)	Area (ft^2)	Area (ft^2)
1P	0.0881	4.647	3.059
2P	0.116	6.231	5.377
3P	0.0657	4.089	4.089
4P	0.114	6.408	4.695
5P	0.0836	5.357	5.092
6P	0.12	6.090	5.173
18P	0.0715	3.479	1.146
19P	0.0679	3.764	1.961
20P	0.0774	5.196	1.299
21P	0.051	3.283	1.440
12P	0.169	7.346	7.346
22P	0.911	14.667	14.667
23P	2.35	40.051	40.051
24P	1.77	29.042	29.042
25P	0.94	15.708	15.708
26P	0.733	12.375	12.375
27P	0.857	14.381	14.381
28P	0.787	12.667	12.667
29P	0.166	2.672	2.672
30P	4.92e-005	0.082	0.079
31P	4.92e-005	0.079	0.082
32P	4.92e-005	0.082	0.079
33P	4.92e-005	0.079	0.082
1X	0.0881	4.647	3.059
1XY	0.0881	4.647	3.059
1Y	0.0881	4.647	3.059
2X	0.116	6.231	5.377
2XY	0.116	6.231	5.377
2Y	0.116	6.231	5.377
3X	0.0657	4.089	4.089
3XY	0.0657	4.089	4.089
3Y	0.0657	4.089	4.089
4X	0.114	6.408	4.695
4XY	0.114	6.408	4.695
4Y	0.114	6.408	4.695
5X	0.0836	5.357	5.092
5XY	0.0836	5.357	5.092
5Y	0.0836	5.357	5.092
6X	0.12	6.090	5.173
6XY	0.12	6.090	5.173
6Y	0.12	6.090	5.173
18X	0.0715	3.479	1.146
19X	0.0679	3.764	1.961
20X	0.0774	5.196	1.299
21X	0.051	3.283	1.440
12X	0.169	7.346	7.346
12XY	0.169	7.346	7.346
12Y	0.169	7.346	7.346
30X	4.92e-005	0.082	0.079
31Y	4.92e-005	0.079	0.082
32X	4.92e-005	0.082	0.079
33Y	4.92e-005	0.079	0.082
8S	0.0905	4.512	4.512
9S	0.109	5.549	5.549
10S	0.209	8.831	8.831
11S	0.385	14.969	14.969

15S	0.0336	2.067	1.467
16S	0.0293	1.500	2.317
17S	0.0277	2.317	1.500
8X	0.0905	4.512	4.512
8XY	0.0905	4.512	4.512
8Y	0.0905	4.512	4.512
9X	0.109	5.549	5.549
9XY	0.109	5.549	5.549
9Y	0.109	5.549	5.549
10X	0.209	8.831	8.831
10XY	0.209	8.831	8.831
10Y	0.209	8.831	8.831
11X	0.385	14.969	14.969
11XY	0.385	14.969	14.969
11Y	0.385	14.969	14.969
15X	0.0336	2.067	1.467
15XY	0.0336	2.067	1.467
15Y	0.0336	2.067	1.467
16X	0.0293	1.500	2.317
17Y	0.0277	2.317	1.500
Total	15.5	485.675	442.174

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	1.906	41.822	32.031	7.350	1.725
2	6.292	259.045	225.335	126.332	99.289
3	7.301	184.808	184.808	113.605	113.605
Total	15.500	485.675	442.174	247.287	214.619

Angle Member Weights and Surface Areas by Section:

Section Label	Unfactored Weight (kips)	Factored Weight (kips)	Unfactored Surface Area (ft^2)	Factored Surface Area (ft^2)
1	1.906	1.906	169.928	169.928
2	6.292	6.292	1019.901	1019.901
3	7.301	8.032	739.675	813.642
Total	15.500	16.230	1929.504	2003.472

Section Joint Information:

Section Label	Joint Label	Joint Elevation (ft)
1	1P	81.000
1	1Y	81.000
1	1X	81.000
1	1XY	81.000
1	18X	81.000
1	18P	81.000
1	27P	81.000
1	28P	96.000
1	29P	100.000

1	30X	81.000
1	32X	100.000
1	30P	81.000
1	32P	100.000
1	33P	100.000
1	31P	81.000
1	33Y	100.000
1	31Y	81.000
2	1P	81.000
2	2P	76.000
2	1X	81.000
2	2X	76.000
2	1XY	81.000
2	2XY	76.000
2	1Y	81.000
2	2Y	76.000
2	3P	70.000
2	3X	70.000
2	3XY	70.000
2	3Y	70.000
2	15S	67.000
2	15X	67.000
2	15XY	67.000
2	15Y	67.000
2	4P	64.000
2	4X	64.000
2	4XY	64.000
2	4Y	64.000
2	5P	59.000
2	5X	59.000
2	5XY	59.000
2	5Y	59.000
2	6P	54.000
2	6X	54.000
2	6XY	54.000
2	6Y	54.000
2	8S	49.000
2	8X	49.000
2	8XY	49.000
2	8Y	49.000
2	9S	43.000
2	9X	43.000
2	9XY	43.000
2	9Y	43.000
2	10S	36.500
2	10X	36.500
2	10XY	36.500
2	10Y	36.500
2	17S	67.000
2	17Y	67.000
2	16S	67.000
2	16X	67.000
2	19X	76.000
2	19P	76.000
2	20X	64.000
2	20P	64.000
2	21X	54.000
2	21P	54.000
2	18X	81.000
2	18P	81.000

2	26P	76.000
2	25P	64.000
2	24P	54.000
2	27P	81.000
3	10S	36.500
3	11S	22.000
3	10X	36.500
3	11X	22.000
3	10XY	36.500
3	11XY	22.000
3	10Y	36.500
3	11Y	22.000
3	12P	0.000
3	12X	0.000
3	12XY	0.000
3	12Y	0.000
3	23P	22.000
3	22P	0.000
3	24P	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	100.000	81.000	17	26	1.34	5.00	52.910	1.34	27.50	221.660
2	81.000	36.500	56	173	5.00	9.86	265.035	27.50	9.86	431.535
3	36.500	0.000	15	34	9.86	20.00	544.965	9.86	20.00	544.965

*** 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	18P	C-EX1	No Limit
2	18X	C-EX1	No Limit
3	19P	C-EX1	No Limit
4	19X	C-EX1	No Limit
5	20P	C-EX1	No Limit
6	20X	C-EX1	No Limit
7	21P	C-EX1	No Limit
8	21X	C-EX1	No Limit
9	23P	C-EX1	No Limit
10	24P	C-EX1	No Limit
11	25P	C-EX1	No Limit
12	26P	C-EX1	No Limit

13	27P	C-EX1	No Limit
14	28P	C-EX1	No Limit

*** Loads Data

Loads from file: j:\jobs\1615900.wi\11_ct11360a\05_structural\backup documentation\calcs\pls tower\structure 910.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)	100.00 (ft)	
Structure height	100.00 (ft)	
Structure height above ground	100.00 (ft)	
Tower Shape	Rectangular	

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

Vector Load Cases:

Load Case Description	Dead Load Factor	Wind Area Factor	SF for Steel Poles and Tubular Arms and Towers	SF for Guys and Cables	SF for Insuls.	SF For Found.	Point Loads	Wind/Ice Model	Trans. Wind Pressure (psf)	Longit. Wind Pressure (psf)	Ice Thick. (in)	Ice Density (lbs/ft^3)	Temperature (deg F)	Joint Displ.
NESC Heavy	1.5000	2.5000	1.00000	1.0000	1.0000	1.0000	15 loads	Wind on Face	4	0	0.000	56.000	60.0	
NESC Extreme	1.0000	1.0000	1.00000	1.0000	1.0000	1.0000	15 loads	NESC 2012	31	0	0.000	56.000	60.0	

Point Loads for Load Case "NESC Heavy":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
18P	1151	1054	0	Shield Wire
18X	698	815	0	Fiber Optic Wire
19P	1477	1169	0	Conductor
19X	1477	1169	0	Conductor
20P	1477	1169	0	Conductor
20X	1477	1169	0	Conductor
21P	1477	1169	0	Conductor
21X	1477	1169	0	Conductor
28P	2725	834	0	Antennas
28P	415	50	0	Coax Cables
27P	553	66	0	Coax Cables
26P	470	56	0	Coax Cables
25P	609	73	0	Coax Cables
24P	1162	139	0	Coax Cables
23P	2103	251	0	Coax Cables

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

Section Label	Z of	Z of	Ave. Elev.	Res. Adj.	Tran Adj.	Tran Drag	Tran Wind	Long Adj.	Long Drag	Long Wind	Ice Weight	Total Weight

	Top (ft)	Bottom (ft)	Above Ground (ft)	Wind Pres. (psf)	Wind Pres. (psf)	Coef	Load (lbs)	Wind Pres. (psf)	Coef	Load (lbs)	(lbs)	(lbs)
1	100.00	81.00	90.50	10.00	10.00	3.200	55.2	0.00	3.200	0.0	0	2859
2	81.00	36.50	58.75	10.00	10.00	3.200	3177.2	0.00	3.200	0.0	0	9438
3	36.50	0.00	18.25	10.00	10.00	3.200	3635.3	0.00	3.200	0.0	0	12047

Point Loads for Load Case "NESC Extreme":

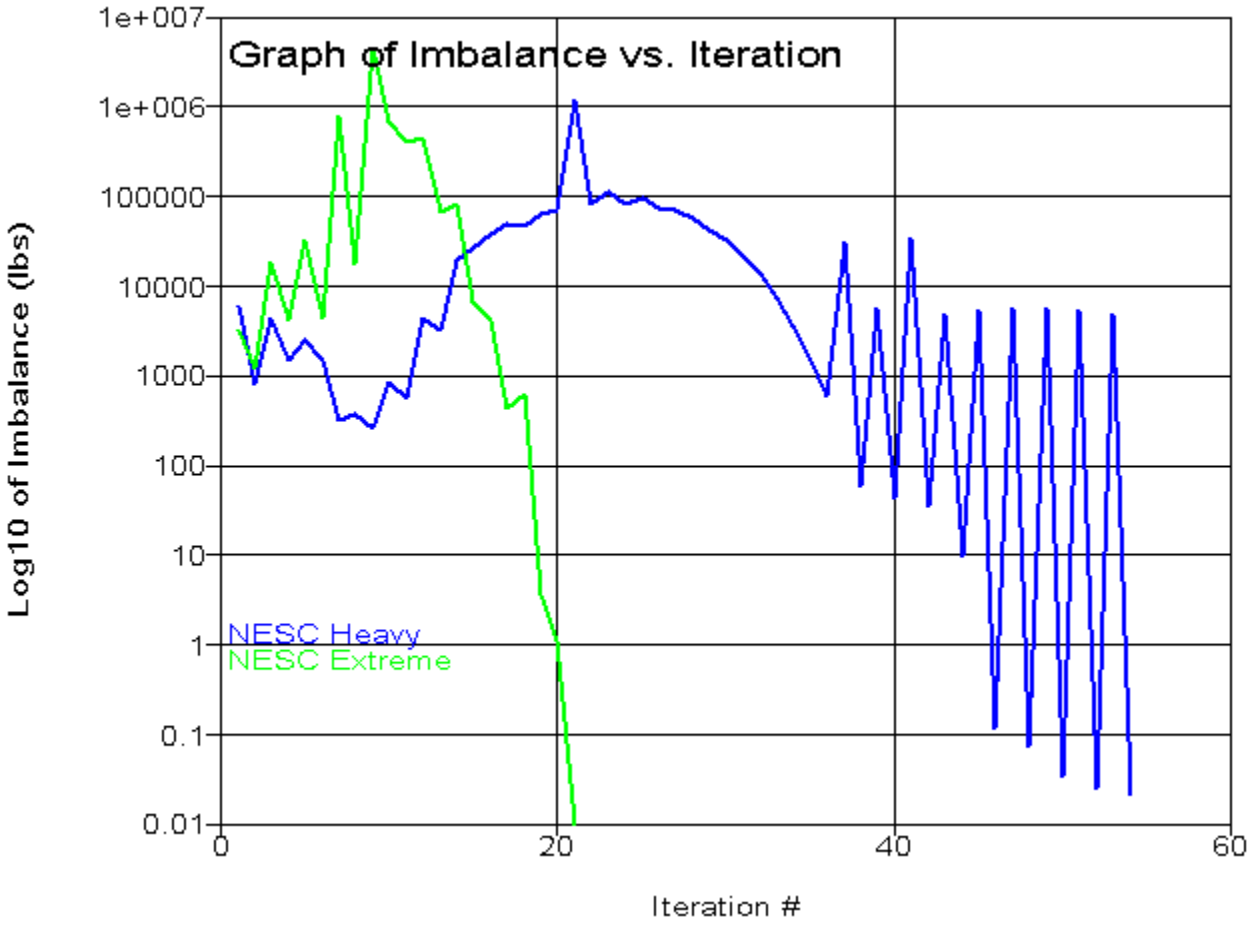
Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
18P	355	1030	0	Shield Wire
18X	176	479	0	Fiber Optic Wire
19P	524	1293	0	Conductor
19X	524	1293	0	Conductor
20P	524	1293	0	Conductor
20X	524	1293	0	Conductor
21P	524	1293	0	Conductor
21X	524	1293	0	Conductor
28P	1145	3092	0	Antennas
28P	140	135	0	Coax Cables
27P	187	180	0	Coax Cables
26P	159	153	0	Coax Cables
25P	206	198	0	Coax Cables
24P	393	378	0	Coax Cables
23P	711	684	0	Coax Cables

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

Section Label	Top (ft)	Bottom (ft)	Above Ground (ft)	Wind Pres. (psf)	Wind Pres. (psf)	Tran Face Area (ft^2)	Tran Face Area (ft^2)	Tran Area (ft^2)	Tran Soli- dity Ratio	Tran Drag Coef	Tran Drag Coef	Tran Load (lbs)	Long Wind Pres. (psf)	Long Face Area (ft^2)	Long Face Area (ft^2)	Long Area (ft^2)	Long Soli- dity Ratio	Long Drag Coef	Long Drag Coef	Long Load (lbs)	Ice Weight (lbs)	Total Weight
Z of Elev.	Z of Ave.	Res. Adj.	Tran Adj.	Tran Angle	Tran Round	Tran Gross	Tran Soli-	Tran Angle	Tran Round	Tran Wind	Long Adj.	Long Angle	Long Round	Long Gross	Long Soli-	Long Angle	Long Round	Long Wind	Ice Weight	Total Weight		
1	100.00	81.00	90.50	31.37	31.37	1.25	0.48	52.91	0.033	3.200	2.000	155.3	0.00	6.88	0.48	221.66	0.033	3.200	2.000	0.0	0	1906
2	81.00	36.50	58.75	31.37	31.37	69.96	29.33	265.03	0.375	3.200	2.000	8862.5	0.00	90.33	36.00	431.53	0.293	3.200	2.000	0.0	0	6292
3	36.50	0.00	18.25	31.37	31.37	41.60	72.00	544.97	0.208	3.200	2.000	8693.5	0.00	41.60	72.00	544.97	0.208	3.200	2.000	0.0	0	8032

*** Analysis Results:

Maximum element usage is 81.07% for Angle "g11Y" in load case "NESC Extreme"
Maximum insulator usage is 12.29% for Clamp "9" in load case "NESC Heavy"



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

Group Label	Angle Label	Max. Usage For All LC %	Max. Tens. For All LC (kips)	Max. Comp. For All LC (kips)	LC 1 (kips)	LC 2 (kips)
Leg1	g1P	7.47	0.000	-3.998	-2.621	-3.998
Leg1	g1X	6.19	2.558	0.000	0.172	2.558
Leg1	g1XY	6.19	2.558	0.000	0.172	2.558
Leg1	g1Y	7.47	0.000	-3.998	-2.621	-3.998

Leg1	g2P	19.17	0.000	-9.369	-6.044	-9.369
Leg1	g2X	25.04	10.349	0.000	4.140	10.349
Leg1	g2XY	25.04	10.349	0.000	4.140	10.349
Leg1	g2Y	19.17	0.000	-9.369	-6.044	-9.369
Leg1	g3P	30.14	0.000	-18.155	-10.045	-18.155
Leg1	g3X	32.52	13.441	0.000	5.466	13.441
Leg1	g3XY	32.52	13.441	0.000	5.466	13.441
Leg1	g3Y	30.14	0.000	-18.155	-10.045	-18.155
Leg1	g4P	30.83	0.000	-18.574	-10.882	-18.574
Leg1	g4X	31.50	13.019	0.000	4.627	13.019
Leg1	g4XY	31.50	13.019	0.000	4.627	13.019
Leg1	g4Y	30.83	0.000	-18.574	-10.882	-18.574
Leg1	g5P	47.60	0.000	-25.473	-15.682	-25.473
Leg1	g5X	41.51	21.866	0.000	9.338	21.866
Leg1	g5XY	41.51	21.866	0.000	9.338	21.866
Leg1	g5Y	47.60	0.000	-25.473	-15.682	-25.473
Leg1	g6P	59.64	0.000	-31.913	-19.918	-31.913
Leg1	g6X	52.06	27.423	0.000	12.083	27.423
Leg1	g6XY	52.06	27.423	0.000	12.083	27.423
Leg1	g6Y	59.64	0.000	-31.913	-19.918	-31.913
Leg2	g7P	55.12	0.000	-36.136	-22.647	-36.136
Leg2	g7X	55.73	32.323	0.000	15.446	32.323
Leg2	g7XY	55.73	32.323	0.000	15.446	32.323
Leg2	g7Y	55.12	0.000	-36.136	-22.647	-36.136
Leg2	g8P	67.23	0.000	-40.038	-25.643	-40.038
Leg2	g8X	55.46	34.879	0.000	17.244	34.879
Leg2	g8XY	55.46	34.879	0.000	17.244	34.879
Leg2	g8Y	67.23	0.000	-40.038	-25.643	-40.038
Leg2	g9P	70.39	0.000	-39.521	-25.801	-39.521
Leg2	g9X	54.00	34.996	0.000	17.698	34.996
Leg2	g9XY	54.00	34.996	0.000	17.698	34.996
Leg2	g9Y	70.39	0.000	-39.521	-25.801	-39.521
Leg3	g10P	74.01	0.000	-44.361	-27.168	-44.361
Leg3	g10X	48.25	31.788	0.000	17.387	31.788
Leg3	g10XY	48.25	31.788	0.000	17.387	31.788
Leg3	g10Y	74.01	0.000	-44.361	-27.168	-44.361
Leg3	g11P	81.07	0.000	-48.004	-30.690	-48.004
Leg3	g11X	51.67	33.995	0.000	16.950	33.995
Leg3	g11XY	51.67	33.995	0.000	16.950	33.995
Leg3	g11Y	81.07	0.000	-48.004	-30.690	-48.004
XBrace1	g12P	31.64	4.615	0.000	1.792	4.615
XBrace1	g12X	42.55	0.000	-4.918	-2.227	-4.918
XBrace1	g12XY	42.55	0.000	-4.918	-2.227	-4.918
XBrace1	g12Y	31.64	4.615	0.000	1.792	4.615
XBrace1	g13P	3.34	0.000	-0.289	-0.289	-0.179
XBrace1	g13X	2.29	0.334	0.000	0.152	0.334
XBrace1	g13XY	2.29	0.334	0.000	0.152	0.334
XBrace1	g13Y	3.34	0.000	-0.289	-0.289	-0.179
XBrace2	g14P	18.53	4.243	0.000	2.481	4.243
XBrace2	g14X	20.79	0.000	-3.591	-2.047	-3.591
XBrace2	g14XY	20.79	0.000	-3.591	-2.047	-3.591
XBrace2	g14Y	18.53	4.243	0.000	2.481	4.243
XBrace2	g15P	17.49	0.000	-2.141	-0.597	-2.141
XBrace2	g15X	17.15	0.000	-2.099	-1.540	-2.099
XBrace2	g15XY	17.15	0.000	-2.099	-1.540	-2.099
XBrace2	g15Y	17.49	0.000	-2.141	-0.597	-2.141
XBrace8	g16P	16.54	3.787	0.000	2.035	3.787
XBrace8	g16X	25.73	0.000	-4.444	-2.570	-4.444
XBrace8	g16XY	25.73	0.000	-4.444	-2.570	-4.444
XBrace8	g16Y	16.54	3.787	0.000	2.035	3.787

XBrace8	g17P	29.11	0.000	-5.029	-2.705	-5.029
XBrace8	g17X	18.44	4.222	0.000	2.115	4.222
XBrace8	g17XY	18.44	4.222	0.000	2.115	4.222
XBrace8	g17Y	29.11	0.000	-5.029	-2.705	-5.029
XBrace8	g18P	7.75	1.775	0.000	0.400	1.775
XBrace8	g18X	10.55	2.416	0.000	1.655	2.416
XBrace8	g18XY	10.55	2.416	0.000	1.655	2.416
XBrace8	g18Y	7.75	1.775	0.000	0.400	1.775
XBrace8	g19P	7.43	1.702	0.000	0.371	1.702
XBrace8	g19X	10.24	2.345	0.000	1.628	2.345
XBrace8	g19XY	10.24	2.345	0.000	1.628	2.345
XBrace8	g19Y	7.43	1.702	0.000	0.371	1.702
XBrace2	g20P	23.43	5.365	0.000	3.691	5.365
XBrace2	g20X	24.54	0.000	-4.660	-2.227	-4.660
XBrace2	g20XY	24.54	0.000	-4.660	-2.227	-4.660
XBrace2	g20Y	23.43	5.365	0.000	3.691	5.365
XBrace2	g21P	2.51	0.574	0.000	0.289	0.574
XBrace2	g21X	6.05	0.000	-0.847	-0.601	-0.847
XBrace2	g21XY	6.05	0.000	-0.847	-0.601	-0.847
XBrace2	g21Y	2.51	0.574	0.000	0.289	0.574
XBrace2	g22P	23.84	5.459	0.000	3.752	5.459
XBrace2	g22X	26.23	0.000	-4.981	-2.342	-4.981
XBrace2	g22XY	26.23	0.000	-4.981	-2.342	-4.981
XBrace2	g22Y	23.84	5.459	0.000	3.752	5.459
XBrace2	g23P	7.35	0.000	-1.028	-0.962	-1.028
XBrace2	g23X	4.46	1.022	0.000	0.273	1.022
XBrace2	g23XY	4.46	1.022	0.000	0.273	1.022
XBrace2	g23Y	7.35	0.000	-1.028	-0.962	-1.028
XBrace3	g24P	6.06	0.795	0.000	0.795	0.697
XBrace3	g24X	11.19	0.000	-1.390	-1.390	-1.274
XBrace3	g24XY	11.19	0.000	-1.390	-1.390	-1.274
XBrace3	g24Y	6.06	0.795	0.000	0.795	0.697
XBrace3	g25P	18.30	0.000	-1.975	-1.139	-1.975
XBrace3	g25X	11.80	1.549	0.000	0.784	1.549
XBrace3	g25XY	11.80	1.549	0.000	0.784	1.549
XBrace3	g25Y	18.30	0.000	-1.975	-1.139	-1.975
XBrace4	g26P	5.86	1.066	0.000	0.976	1.066
XBrace4	g26X	7.22	0.000	-0.814	-0.814	-0.738
XBrace4	g26XY	7.22	0.000	-0.814	-0.814	-0.738
XBrace4	g26Y	5.86	1.066	0.000	0.976	1.066
XBrace4	g27P	7.62	1.387	0.000	0.796	1.387
XBrace4	g27X	11.64	0.000	-1.026	-0.534	-1.026
XBrace4	g27XY	11.64	0.000	-1.026	-0.534	-1.026
XBrace4	g27Y	7.62	1.387	0.000	0.796	1.387
XBrace4	g28P	3.82	0.695	0.000	0.594	0.695
XBrace4	g28X	11.85	0.000	-1.079	-0.914	-1.079
XBrace4	g28XY	11.85	0.000	-1.079	-0.914	-1.079
XBrace4	g28Y	3.82	0.695	0.000	0.594	0.695
XBrace4	g29P	15.15	0.000	-1.052	-0.628	-1.052
XBrace4	g29X	3.89	0.708	0.000	0.352	0.708
XBrace4	g29XY	3.89	0.708	0.000	0.352	0.708
XBrace4	g29Y	15.15	0.000	-1.052	-0.628	-1.052
XBrace5	g30P	22.44	3.707	0.000	0.135	3.707
XBrace5	g30X	73.68	0.000	-1.665	-1.665	0.000
XBrace5	g30XY	73.68	0.000	-1.665	-1.665	0.000
XBrace5	g30Y	22.44	3.707	0.000	0.135	3.707
XBrace5	g31P	0.00	0.000	0.000	0.000	0.000
XBrace5	g31X	26.15	4.320	0.000	2.346	4.320
XBrace5	g31XY	26.15	4.320	0.000	2.346	4.320
XBrace5	g31Y	0.00	0.000	0.000	0.000	0.000

XBrace6	g32P	29.16	3.849	0.000	1.951	3.849
XBrace6	g32X	0.00	0.000	0.000	0.000	0.000
XBrace6	g32XY	0.00	0.000	0.000	0.000	0.000
XBrace6	g32Y	29.16	3.849	0.000	1.951	3.849
XBrace6	g33P	0.00	0.000	0.000	0.000	0.000
XBrace6	g33X	33.36	4.404	0.000	2.162	4.404
XBrace6	g33XY	33.36	4.404	0.000	2.162	4.404
XBrace6	g33Y	0.00	0.000	0.000	0.000	0.000
Horz1	g34P	29.09	2.245	-0.224	-0.224	2.245
Horz1	g34X	54.70	0.000	-3.172	-1.493	-3.172
Horz1	g35P	9.65	0.745	-0.406	0.745	-0.406
Horz1	g35X	37.22	2.872	0.000	1.991	2.872
Horz1	g36P	20.72	0.466	-1.201	0.466	-1.201
Horz1	g36X	7.27	0.561	0.000	0.561	0.125
Horz1	g37P	25.91	0.000	-1.502	-0.273	-1.502
Horz1	g37X	22.33	1.723	0.000	1.214	1.723
Horz2	g38P	8.72	0.673	0.000	0.415	0.673
Horz2	g38X	41.52	0.000	-3.778	-2.026	-3.778
Horz2	g39P	14.63	0.503	-1.331	0.503	-1.331
Horz2	g39Y	14.63	0.503	-1.331	0.503	-1.331
Horz3	g40P	11.07	1.007	0.000	0.455	1.007
Horz3	g40X	44.72	0.000	-4.070	-2.430	-4.070
Horz3	g41P	13.33	0.000	-1.213	-0.087	-1.213
Horz3	g41Y	13.33	0.000	-1.213	-0.087	-1.213
Horz1	g42P	5.48	0.041	-0.498	-0.498	0.041
Horz1	g42X	6.70	0.000	-0.609	-0.609	-0.302
Horz1	g42XY	6.70	0.000	-0.609	-0.609	-0.302
Horz1	g42Y	5.48	0.041	-0.498	-0.498	0.041
Horz5	g43P	36.44	2.875	0.000	2.875	0.926
Horz5	g43X	38.18	3.012	0.000	3.012	1.419
Horz5	g43XY	38.18	3.012	0.000	3.012	1.419
Horz5	g43Y	36.44	2.875	0.000	2.875	0.926
Arm1	g44P	0.94	0.000	-0.171	-0.111	-0.171
Arm1	g44X	5.79	1.054	0.000	1.054	0.848
Arm1	g44XY	5.79	1.054	0.000	1.054	0.848
Arm1	g44Y	0.94	0.000	-0.171	-0.111	-0.171
Arm1	g45P	12.60	2.293	0.000	2.293	1.161
Arm1	g45Y	12.60	2.293	0.000	2.293	1.161
Arm2	g46P	15.40	0.000	-2.803	-2.803	-1.716
Arm2	g46X	11.30	0.000	-2.057	-2.057	-0.374
Arm2	g46XY	11.30	0.000	-2.057	-2.057	-0.374
Arm2	g46Y	15.40	0.000	-2.803	-2.803	-1.716
Arm2	g47P	13.62	0.000	-2.479	-2.479	-1.466
Arm2	g47Y	13.62	0.000	-2.479	-2.479	-1.466
Arm3	g48P	20.67	0.000	-3.761	-3.761	-1.986
Arm3	g48X	13.89	0.000	-2.529	-2.529	-0.484
Arm3	g48XY	13.89	0.000	-2.529	-2.529	-0.484
Arm3	g48Y	20.67	0.000	-3.761	-3.761	-1.986
Arm3	g49P	15.70	0.000	-2.857	-2.857	-0.625
Arm3	g49Y	15.70	0.000	-2.857	-2.857	-0.625
Arm4	g50P	20.92	0.000	-1.904	-1.904	-1.288
Arm4	g50X	6.92	0.271	-0.630	-0.630	0.271
Arm4	g50XY	6.92	0.271	-0.630	-0.630	0.271
Arm4	g50Y	20.92	0.000	-1.904	-1.904	-1.288
Arm4	g51P	19.22	0.000	-1.749	-1.749	-0.626
Arm4	g51Y	19.22	0.000	-1.749	-1.749	-0.626
ArmBr1	g52P	11.23	0.000	-1.022	-1.022	-0.505
ArmBr1	g52X	17.56	0.000	-1.598	-1.598	-0.726
ArmBr2	g53P	27.40	2.161	0.000	2.161	0.931
ArmBr2	g53X	32.56	2.568	0.000	2.568	1.079

ArmBr2	g53XY	32.56	2.568	0.000	2.568	1.079	
ArmBr2	g53Y	27.40	2.161	0.000	2.161	0.931	
ArmBr3	g54P	41.03	3.237	0.000	3.237	1.280	
ArmBr3	g54X	40.90	3.227	0.000	3.227	1.266	
ArmBr3	g54XY	40.90	3.227	0.000	3.227	1.266	
ArmBr3	g54Y	41.03	3.237	0.000	3.237	1.280	
ArmBr4	g55P	18.79	1.482	0.000	1.482	0.615	
ArmBr4	g55X	18.54	1.463	0.000	1.463	0.579	
ArmBr4	g55XY	18.54	1.463	0.000	1.463	0.579	
ArmBr4	g55Y	18.79	1.482	0.000	1.482	0.615	
MB1	g56P	32.40	3.915	0.000	1.190	3.915	
MB1	g56X	27.28	0.000	-3.708	-0.725	-3.708	
MB1	g56XY	27.28	0.000	-3.708	-0.725	-3.708	
MB1	g56Y	32.40	3.915	0.000	1.190	3.915	
MB1	g57P	13.95	0.000	-1.896	-0.373	-1.896	
MB1	g57X	24.59	2.971	0.000	0.776	2.971	
MB1	g57XY	24.59	2.971	0.000	0.776	2.971	
MB1	g57Y	13.95	0.000	-1.896	-0.373	-1.896	
MB1	g58P	8.58	0.000	-1.166	-0.780	-1.166	
MB1	g58X	4.19	0.000	-0.570	-0.570	-0.348	
MB1	g58XY	4.19	0.000	-0.570	-0.570	-0.348	
MB1	g58Y	8.58	0.000	-1.166	-0.780	-1.166	
MB1	g59P	9.52	1.150	0.000	0.616	1.150	
MB1	g59X	10.87	0.000	-1.478	-1.285	-1.478	
MB1	g59XY	10.87	0.000	-1.478	-1.285	-1.478	
MB1	g59Y	9.52	1.150	0.000	0.616	1.150	
MB2	g60P	14.74	0.000	-2.003	-0.612	-2.003	
MB2	g60X	11.29	0.000	-1.535	-0.772	-1.535	
MB2	g60XY	11.29	0.000	-1.535	-0.772	-1.535	
MB2	g60Y	14.74	0.000	-2.003	-0.612	-2.003	
Mast	g61P	2.29	0.000	-19.981	-19.981	-5.650	
Mast	g62P	1.79	0.000	-14.001	-14.001	-4.408	
Mast	g63P	1.07	0.000	-9.990	-9.990	-3.373	
Mast	g64P	0.86	0.000	-7.975	-7.975	-3.059	
Mast	g65P	0.67	0.000	-6.406	-6.406	-2.795	
Mast	g66P	0.50	0.000	-4.565	-4.565	-1.921	
Mast	g67P	0.06	0.000	-0.560	-0.249	-0.560	
fic1	g72P	0.00	0.000	0.000	0.000	0.000	
fic1	g72X	0.00	0.000	0.000	0.000	0.000	
fic1	g73P	0.00	0.000	0.000	0.000	0.000	
fic1	g73Y	0.00	0.000	0.000	0.000	0.000	
fic	**g70P**	**0.00**	**0.113**	**0.000**	**0.003**	**0.113**	**Axial force too large for fictitious member ??**
fic	**g70X**	**0.00**	**0.112**	**0.000**	**0.000**	**0.112**	**Axial force too large for fictitious member ??**
fic	**g71P**	**0.00**	**0.112**	**0.000**	**0.003**	**0.112**	**Axial force too large for fictitious member ??**
fic	**g71X**	**0.00**	**0.112**	**0.000**	**0.000**	**0.112**	**Axial force too large for fictitious member ??**
fic	**g74P**	**0.00**	**0.112**	**0.000**	**0.003**	**0.112**	**Axial force too large for fictitious member ??**
fic	**g74Y**	**0.00**	**0.112**	**0.000**	**0.003**	**0.112**	**Axial force too large for fictitious member ??**
fic	**g75P**	**0.00**	**0.112**	**0.000**	**0.003**	**0.112**	**Axial force too large for fictitious member ??**
fic	**g75Y**	**0.00**	**0.112**	**0.000**	**0.003**	**0.112**	**Axial force too large for fictitious member ??**

*** Analysis Results for Load Case No. 1 "NESC Heavy" - Number of iterations in SAPS 54

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	-3.116e-005	0.1759	-0.0163	-0.2685	-0.0001	-0.0006	2.5	2.676	80.98
2P	0.0001036	0.1524	-0.01602	-0.2621	-0.0071	0.0019	2.5	2.652	75.98
3P	0.0003909	0.1263	-0.01531	-0.2432	0.0164	0.0018	2.5	2.626	69.98
4P	6.486e-005	0.1007	-0.01414	-0.2347	-0.0239	0.0019	2.5	2.601	63.99
5P	0.001439	0.08241	-0.01272	-0.2049	0.0066	0.0030	2.501	2.582	58.99
6P	-3.802e-005	0.0649	-0.01092	-0.1756	0.0007	0.0042	2.5	2.565	53.99
18P	-2.957e-015	0.176	-0.07405	-0.3065	-0.0000	-0.0000	-2.957e-015	13.93	80.93
19P	-1.382e-015	0.1518	-0.05434	-0.3202	-0.0000	-0.0000	-1.382e-015	9.902	75.95
20P	-1.194e-015	0.09972	-0.08139	-0.3702	-0.0000	0.0000	-1.194e-015	14.35	63.92
21P	1.264e-015	0.06471	-0.04143	-0.2494	0.0000	-0.0000	1.264e-015	10.31	53.96
12P	0	0	0	0.0000	0.0000	0.0000	10	10	0
22P	0	0	0	0.0000	0.0000	0.0000	0	0	0
23P	1.615e-015	0.01384	-0.0006721	-0.0527	0.0000	0.0000	1.615e-015	0.01384	22
24P	-1.342e-015	0.06507	-0.001394	-0.1734	-0.0000	0.0000	-1.342e-015	0.06507	54
25P	-3.158e-015	0.1009	-0.001609	-0.2287	-0.0000	0.0000	-3.158e-015	0.1009	64
26P	-5.081e-015	0.1524	-0.001866	-0.2616	-0.0000	0.0000	-5.081e-015	0.1524	76
27P	-5.93e-015	0.176	-0.00197	-0.2813	-0.0000	0.0000	-5.93e-015	0.176	81
28P	-8.52e-015	0.2572	-0.002294	-0.3244	-0.0000	0.0000	-8.52e-015	0.2572	96
29P	-9.211e-015	0.2798	-0.002359	-0.3244	-0.0000	0.0000	-9.211e-015	0.2798	100
30P	1.782e-014	-0.2934	-0.6412	0.0000	0.0000	0.0000	1.782e-014	0.3766	80.36
31P	-0.67	0.8457	-0.02147	0.0000	0.0000	0.0000	2.298e-010	0.8457	80.98
32P	2.263e-014	-0.2119	-0.6482	0.0000	0.0000	0.0000	2.263e-014	0.4581	99.35
33P	-0.67	0.9495	-0.02186	0.0000	0.0000	0.0000	2.022e-010	0.9495	99.98
1X	-0.0002076	0.1756	0.005831	-0.2574	-0.0118	-0.0013	2.5	-2.324	81.01
1XY	0.0002076	0.1756	0.005831	-0.2574	0.0118	0.0013	-2.5	-2.324	81.01
1Y	3.116e-005	0.1759	-0.0163	-0.2685	0.0001	0.0006	-2.5	2.676	80.98
2X	0.0002768	0.1528	0.005868	-0.2563	0.0084	-0.0012	2.5	-2.347	76.01
2XY	-0.0002768	0.1528	0.005868	-0.2563	-0.0084	0.0012	-2.5	-2.347	76.01
2Y	-0.0001036	0.1524	-0.01602	-0.2621	0.0071	-0.0019	-2.5	2.652	75.98
3X	-0.001527	0.1256	0.005489	-0.2616	0.0026	-0.0017	2.498	-2.374	70.01
3XY	0.001527	0.1256	0.005489	-0.2616	-0.0026	0.0017	-2.498	-2.374	70.01
3Y	-0.0003909	0.1263	-0.01531	-0.2432	-0.0164	-0.0018	-2.5	2.626	69.98
4X	7.805e-005	0.1011	0.005001	-0.2132	-0.0041	-0.0021	2.5	-2.399	64.01
4XY	-7.805e-005	0.1011	0.005001	-0.2132	0.0041	0.0021	-2.5	-2.399	64.01
4Y	-6.486e-005	0.1007	-0.01414	-0.2347	0.0239	-0.0019	-2.5	2.601	63.99
5X	-0.001138	0.08098	0.004212	-0.2147	0.0009	-0.0044	2.499	-2.419	59
5XY	0.001138	0.08098	0.004212	-0.2147	-0.0009	0.0044	-2.499	-2.419	59
5Y	-0.001439	0.08241	-0.01272	-0.2049	-0.0066	-0.0030	-2.501	2.582	58.99
6X	0.0001688	0.06515	0.003163	-0.1614	-0.0025	-0.0067	2.5	-2.435	54
6XY	-0.0001688	0.06515	0.003163	-0.1614	0.0025	0.0067	-2.5	-2.435	54
6Y	3.802e-005	0.0649	-0.01092	-0.1756	-0.0007	-0.0042	-2.5	2.565	53.99
18X	-1.003e-014	0.1757	0.05247	-0.2295	0.0000	-0.0000	-1.003e-014	-13.57	81.05
19X	-5.712e-015	0.1535	0.03499	-0.2160	-0.0000	0.0000	-5.712e-015	-9.596	76.03
20X	-6.495e-015	0.1022	0.03137	-0.0877	0.0000	-0.0000	-6.495e-015	-14.15	64.03
21X	-1.87e-015	0.06567	0.02531	-0.1653	0.0000	-0.0000	-1.87e-015	-10.18	54.03
12X	0	0	0	0.0000	0.0000	0.0000	10	-10	0
12XY	0	0	0	0.0000	0.0000	0.0000	-10	-10	0
12Y	0	0	0	0.0000	0.0000	0.0000	-10	10	0
30X	-5.439e-015	1.516	-0.02147	0.0000	0.0000	0.0000	-5.439e-015	0.8457	80.98
31Y	0.67	0.8457	-0.02147	0.0000	0.0000	0.0000	-2.298e-010	0.8457	80.98

32X	-8.442e-015	1.62	-0.02186	0.0000	0.0000	0.0000	-8.442e-015	0.9495	99.98
33Y	0.67	0.9495	-0.02186	0.0000	0.0000	0.0000	-2.022e-010	0.9495	99.98
8S	0.001097	0.05202	-0.01084	-0.1292	-0.0178	0.0052	3.196	3.246	48.99
9S	0.001244	0.03916	-0.0103	-0.1081	0.0040	0.0076	4.029	4.067	42.99
10S	8.703e-005	0.02863	-0.00941	-0.0756	0.0039	0.0083	4.931	4.959	36.49
11S	8.321e-005	0.01353	-0.006567	-0.0489	-0.0060	0.0034	6.945	6.958	21.99
15S	-0.0006013	0.1135	-0.01475	-0.2475	0.0065	0.0018	2.499	2.613	66.99
16S	-3.426e-015	0.06192	-0.01438	0.0000	0.0000	0.0000	-3.426e-015	2.562	66.99
17S	-0.0002644	0.1129	-0.004511	0.0000	0.0000	0.0000	2.5	0.1129	67
8X	-0.0009274	0.05154	0.003767	-0.1378	0.0113	-0.0070	3.194	-3.143	49
8XY	0.0009274	0.05154	0.003767	-0.1378	-0.0113	0.0070	-3.194	-3.143	49
8Y	-0.001097	0.05202	-0.01084	-0.1292	0.0178	-0.0052	-3.196	3.246	48.99
9X	-0.0005969	0.039	0.004025	-0.1028	-0.0046	-0.0017	4.027	-3.989	43
9XY	0.0005969	0.039	0.004025	-0.1028	0.0046	0.0017	-4.027	-3.989	43
9Y	-0.001244	0.03916	-0.0103	-0.1081	-0.0040	-0.0076	-4.029	4.067	42.99
10X	-0.0004253	0.02842	0.003808	-0.0768	0.0025	-0.0012	4.93	-4.902	36.5
10XY	0.0004253	0.02842	0.003808	-0.0768	-0.0025	0.0012	-4.93	-4.902	36.5
10Y	-8.703e-005	0.02863	-0.00941	-0.0756	-0.0039	-0.0083	-4.931	4.959	36.49
11X	-0.0004442	0.01357	0.00272	-0.0483	0.0009	-0.0009	6.944	-6.931	22
11XY	0.0004442	0.01357	0.00272	-0.0483	-0.0009	0.0009	-6.944	-6.931	22
11Y	-8.321e-005	0.01353	-0.006567	-0.0489	0.0060	-0.0034	-6.945	6.958	21.99
15X	-0.0008938	0.1124	0.005226	-0.2325	-0.0224	-0.0018	2.499	-2.388	67.01
15XY	0.0008938	0.1124	0.005226	-0.2325	0.0224	0.0018	-2.499	-2.388	67.01
15Y	0.0006013	0.1135	-0.01475	-0.2475	-0.0065	-0.0018	-2.499	2.613	66.99
16X	-4.783e-015	0.176	0.004318	0.0000	0.0000	0.0000	-4.783e-015	-2.324	67
17Y	0.0002644	0.1129	-0.004511	0.0000	0.0000	0.0000	-2.5	0.1129	67

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
12P	-4.18	0.0	-4.17	0.0	0.0	-30.39	0.0	0.0	30.96	0.0	0.07	0.0	0.0	0.0	0.0	0.00	0.0	0.0
22P	-0.00	0.0	-1.03	0.0	0.0	-21.48	0.0	0.0	21.51	0.0	12.03	0.0	-0.0	0.0	0.0	-0.00	0.0	0.0
12X	3.83	0.0	-3.93	0.0	0.0	19.59	0.0	0.0	20.35	0.0	0.07	0.0	0.0	0.0	0.0	0.01	0.0	0.0
12XY	-3.83	0.0	-3.93	0.0	0.0	19.59	0.0	0.0	20.35	0.0	0.07	0.0	-0.0	0.0	0.0	-0.01	0.0	0.0
12Y	4.18	0.0	-4.17	0.0	0.0	-30.39	0.0	0.0	30.96	0.0	0.07	0.0	-0.0	0.0	0.0	-0.00	0.0	0.0

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

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0000	0.0000	-0.1321	-0.0000	0.0000	0.1321	-0.0000	0.1759	-0.0163
2P	0.0000	0.0000	-0.1745	0.0000	-0.0000	0.1745	0.0001	0.1524	-0.0160
3P	0.0000	0.0000	-0.0985	0.0000	0.0000	0.0985	0.0004	0.1263	-0.0153
4P	0.0000	0.0000	-0.1715	-0.0000	-0.0000	0.1715	0.0001	0.1007	-0.0141
5P	0.0000	0.0000	-0.1254	0.0000	0.0000	0.1254	0.0014	0.0824	-0.0127
6P	0.0000	0.0000	-0.1797	0.0000	-0.0000	0.1797	-0.0000	0.0649	-0.0109
18P	0.0000	1.0540	-1.2583	-0.0000	-1.0540	1.2583	-0.0000	0.1760	-0.0740
19P	0.0000	1.1690	-1.5789	-0.0000	-1.1690	1.5789	-0.0000	0.1518	-0.0543
20P	0.0000	1.1690	-1.5932	0.0000	-1.1690	1.5932	-0.0000	0.0997	-0.0814
21P	0.0000	1.1690	-1.5535	-0.0000	-1.1690	1.5535	0.0000	0.0647	-0.0414
12P	0.0000	0.0000	-0.2790	4.1840	4.1684	-30.1159	0.0000	0.0000	0.0000
22P	0.0000	0.4693	-1.5037	0.0000	0.5567	-19.9810	0.0000	0.0000	0.0000
23P	0.0000	1.4030	-5.9819	0.0000	-1.4030	5.9819	0.0000	0.0138	-0.0007

24P	0.0000	1.0350	-4.0141	0.0000	-1.0350	4.0141	-0.0000	0.0651	-0.0014
25P	0.0000	0.5423	-2.0195	0.0000	-0.5423	2.0195	-0.0000	0.1009	-0.0016
26P	0.0000	0.3120	-1.5698	-0.0000	-0.3120	1.5698	-0.0000	0.1524	-0.0019
27P	0.0000	0.0660	-1.8392	0.0000	-0.0660	1.8393	-0.0000	0.1760	-0.0020
28P	0.0000	0.8840	-4.3206	0.0000	-0.8840	4.3206	-0.0000	0.2572	-0.0023
29P	0.0000	0.0000	-0.2486	-0.0000	0.0000	0.2486	-0.0000	0.2798	-0.0024
30P	0.0000	0.0000	-0.0001	-0.0000	-0.0000	0.0001	0.0000	-0.2934	-0.6412
31P	0.0000	0.0025	-0.0001	-0.0000	-0.0025	0.0001	-0.6700	0.8457	-0.0215
32P	0.0000	0.0000	-0.0001	-0.0000	-0.0000	0.0001	0.0000	-0.2119	-0.6482
33P	0.0000	0.0025	-0.0001	-0.0000	-0.0025	0.0001	-0.6700	0.9495	-0.0219
1X	0.0000	0.0662	-0.1321	-0.0000	-0.0662	0.1321	-0.0002	0.1756	0.0058
1XY	0.0000	0.0662	-0.1321	0.0000	-0.0662	0.1321	0.0002	0.1756	0.0058
1Y	0.0000	0.0000	-0.1321	0.0000	0.0000	0.1321	0.0000	0.1759	-0.0163
2X	0.0000	0.1164	-0.1745	0.0000	-0.1164	0.1745	0.0003	0.1528	0.0059
2XY	0.0000	0.1164	-0.1745	-0.0000	-0.1164	0.1745	-0.0003	0.1528	0.0059
2Y	0.0000	0.0000	-0.1745	-0.0000	-0.0000	0.1745	-0.0001	0.1524	-0.0160
3X	0.0000	0.0949	-0.0985	0.0000	-0.0949	0.0985	-0.0015	0.1256	0.0055
3XY	0.0000	0.0949	-0.0985	-0.0000	-0.0949	0.0985	0.0015	0.1256	0.0055
3Y	0.0000	0.0000	-0.0985	-0.0000	0.0000	0.0985	-0.0004	0.1263	-0.0153
4X	0.0000	0.0982	-0.1715	0.0000	-0.0982	0.1715	0.0001	0.1011	0.0050
4XY	0.0000	0.0982	-0.1715	-0.0000	-0.0982	0.1715	-0.0001	0.1011	0.0050
4Y	0.0000	0.0000	-0.1715	0.0000	-0.0000	0.1715	-0.0001	0.1007	-0.0141
5X	0.0000	0.1229	-0.1254	0.0000	-0.1229	0.1254	-0.0011	0.0810	0.0042
5XY	0.0000	0.1229	-0.1254	-0.0000	-0.1229	0.1254	0.0011	0.0810	0.0042
5Y	0.0000	0.0000	-0.1254	-0.0000	0.0000	0.1254	-0.0014	0.0824	-0.0127
6X	0.0000	0.1121	-0.1797	0.0000	-0.1121	0.1797	0.0002	0.0652	0.0032
6XY	0.0000	0.1121	-0.1797	-0.0000	-0.1121	0.1797	-0.0002	0.0652	0.0032
6Y	0.0000	0.0000	-0.1797	-0.0000	-0.0000	0.1797	0.0000	0.0649	-0.0109
18X	0.0000	0.8517	-0.8053	0.0000	-0.8517	0.8053	-0.0000	0.1757	0.0525
19X	0.0000	1.2318	-1.5789	-0.0000	-1.2318	1.5789	-0.0000	0.1535	0.0350
20X	0.0000	1.2106	-1.5932	-0.0000	-1.2106	1.5932	-0.0000	0.1022	0.0314
21X	0.0000	1.2151	-1.5535	-0.0000	-1.2151	1.5535	-0.0000	0.0657	0.0253
12X	0.0000	0.1833	-0.2790	-3.8346	3.7452	19.8697	0.0000	0.0000	0.0000
12XY	0.0000	0.1833	-0.2790	3.8346	3.7452	19.8697	0.0000	0.0000	0.0000
12Y	0.0000	0.0000	-0.2790	-4.1840	4.1684	-30.1159	0.0000	0.0000	0.0000
30X	0.0000	0.0025	-0.0001	-0.0000	-0.0025	0.0001	-0.0000	1.5157	-0.0215
31Y	0.0000	0.0025	-0.0001	0.0000	-0.0025	0.0001	0.6700	0.8457	-0.0215
32X	0.0000	0.0025	-0.0001	-0.0000	-0.0025	0.0001	-0.0000	1.6195	-0.0219
33Y	0.0000	0.0025	-0.0001	0.0000	-0.0025	0.0001	0.6700	0.9495	-0.0219
8S	0.0000	0.0000	-0.1357	-0.0000	-0.0000	0.1357	0.0011	0.0520	-0.0108
9S	0.0000	0.0000	-0.1630	-0.0000	-0.0000	0.1630	0.0012	0.0392	-0.0103
10S	0.0000	0.0000	-0.3328	-0.0000	-0.0000	0.3328	0.0001	0.0286	-0.0094
11S	0.0000	0.0000	-0.6347	-0.0000	-0.0000	0.6347	0.0001	0.0135	-0.0066
15S	0.0000	0.0000	-0.0504	-0.0000	-0.0000	0.0504	-0.0006	0.1135	-0.0148
16S	0.0000	0.0000	-0.0439	0.0000	-0.0000	0.0439	-0.0000	0.0619	-0.0144
17S	0.0000	0.0000	-0.0416	-0.0000	-0.0000	0.0416	-0.0003	0.1129	-0.0045
8X	0.0000	0.1107	-0.1357	-0.0000	-0.1107	0.1357	-0.0009	0.0515	0.0038
8XY	0.0000	0.1107	-0.1357	0.0000	-0.1107	0.1357	0.0009	0.0515	0.0038
8Y	0.0000	0.0000	-0.1357	0.0000	-0.0000	0.1357	-0.0011	0.0520	-0.0108
9X	0.0000	0.1355	-0.1630	-0.0000	-0.1355	0.1630	-0.0006	0.0390	0.0040
9XY	0.0000	0.1355	-0.1630	0.0000	-0.1355	0.1630	0.0006	0.0390	0.0040
9Y	0.0000	0.0000	-0.1630	0.0000	-0.0000	0.1630	-0.0012	0.0392	-0.0103
10X	0.0000	0.2266	-0.3328	-0.0000	-0.2266	0.3328	-0.0004	0.0284	0.0038
10XY	0.0000	0.2266	-0.3328	0.0000	-0.2266	0.3328	0.0004	0.0284	0.0038
10Y	0.0000	0.0000	-0.3328	0.0000	-0.0000	0.3328	-0.0001	0.0286	-0.0094
11X	0.0000	0.3606	-0.6347	-0.0000	-0.3606	0.6347	-0.0004	0.0136	0.0027
11XY	0.0000	0.3606	-0.6347	0.0000	-0.3606	0.6347	0.0004	0.0136	0.0027
11Y	0.0000	0.0000	-0.6347	0.0000	-0.0000	0.6347	-0.0001	0.0135	-0.0066
15X	0.0000	0.0469	-0.0504	-0.0000	-0.0469	0.0504	-0.0009	0.1124	0.0052
15XY	0.0000	0.0469	-0.0504	0.0000	-0.0469	0.0504	0.0009	0.1124	0.0052

15Y	0.0000	0.0000	-0.0504	0.0000	-0.0000	0.0504	0.0006	0.1135	-0.0148
16X	0.0000	0.0741	-0.0439	0.0000	-0.0741	0.0439	-0.0000	0.1760	0.0043
17Y	0.0000	0.0000	-0.0416	0.0000	-0.0000	0.0416	0.0003	0.1129	-0.0045

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

Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	Original Supported L/R Cap. (kips)	RLX	RLY	RLZ	L/R	KL/R	Curve No.	Alternate Unsupported L/R Cap. (kips)	RLOUT	L/R	KL/R	Curve No.
g13P	g13Y	Short only	-0.29	-0.29	11.56	0.750	0.500	0.500	123.69	122.85	5	8.63	1.000	158.01	143.38	6
g13Y	g13P	Short only	-0.29	-0.29	11.56	0.750	0.500	0.500	123.69	122.85	5	8.63	1.000	158.01	143.38	6
g15P	g15Y	Long only	-0.60	-0.60	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g15X	g15XY	Long only	-1.54	-1.54	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g15XY	g15X	Long only	-1.54	-1.54	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g15Y	g15P	Long only	-0.60	-0.60	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g21X	g21XY	Long only	-0.60	-0.60	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g21XY	g21X	Long only	-0.60	-0.60	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g23P	g23Y	Long only	-0.96	-0.96	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g23Y	g23P	Long only	-0.96	-0.96	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g25P	g25Y	Short only	-1.14	-1.14	12.42	0.781	0.561	0.561	130.02	127.68	5	10.79	1.000	148.00	137.22	6
g25Y	g25P	Short only	-1.14	-1.14	12.42	0.781	0.561	0.561	130.02	127.68	5	10.79	1.000	148.00	137.22	6
g27X	g27XY	Long only	-0.53	-0.53	11.27	0.569	0.785	0.569	150.73	143.46	5	8.82	1.000	188.53	162.14	6
g27XY	g27X	Long only	-0.53	-0.53	11.27	0.569	0.785	0.569	150.73	143.46	5	8.82	1.000	188.53	162.14	6
g29P	g29Y	Long only	-0.63	-0.63	9.10	0.549	0.774	0.549	171.90	159.59	5	6.94	1.000	222.10	182.79	6
g29Y	g29P	Long only	-0.63	-0.63	9.10	0.549	0.774	0.549	171.90	159.59	5	6.94	1.000	222.10	182.79	6

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	1.641	50.00	50.00	3.28
2	1.172	50.00	50.00	2.34
3	1.965	50.00	50.00	3.93
4	2.002	50.00	50.00	4.00
5	1.976	50.00	50.00	3.95
6	2.001	50.00	50.00	4.00
7	1.944	50.00	50.00	3.89
8	1.972	50.00	50.00	3.94
9	6.144	50.00	50.00	12.29
10	4.145	50.00	50.00	8.29
11	2.091	50.00	50.00	4.18
12	1.601	50.00	50.00	3.20
13	1.840	50.00	50.00	3.68
14	4.410	50.00	50.00	8.82

*** Analysis Results for Load Case No. 2 "NESC Extreme" - Number of iterations in SAPS 21

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

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1P	0.0003121	0.3091	-0.02502	-0.4795	0.0073	-0.0042	2.5	2.809	80.97
2P	-5.642e-005	0.2669	-0.02448	-0.4674	-0.0074	0.0014	2.5	2.767	75.98
3P	0.0002547	0.2197	-0.0233	-0.4448	0.0307	0.0010	2.5	2.72	69.98
4P	-0.0001671	0.1751	-0.02117	-0.3970	-0.0461	0.0015	2.5	2.675	63.98
5P	0.002651	0.1421	-0.0188	-0.3624	0.0108	0.0009	2.503	2.642	58.98
6P	-0.0002089	0.113	-0.01588	-0.2906	0.0040	0.0005	2.5	2.613	53.98
18P	-1.214e-014	0.3088	-0.1216	-0.4991	0.0000	0.0000	-1.214e-014	14.06	80.88
19P	-1.017e-014	0.2665	-0.08736	-0.5089	0.0000	0.0000	-1.017e-014	10.02	75.91
20P	-1.543e-014	0.1747	-0.1134	-0.4690	-0.0000	0.0000	-1.543e-014	14.42	63.89
21P	-1.173e-014	0.113	-0.06318	-0.3784	-0.0000	0.0000	-1.173e-014	10.36	53.94
12P	0	0	0	0.0000	0.0000	0.0000	10	10	0
22P	0	0	0	0.0000	0.0000	0.0000	0	0	0
23P	-2.34e-015	0.02352	-0.0002014	-0.0911	-0.0000	0.0000	-2.34e-015	0.02352	22
24P	-4.715e-015	0.113	-0.0005409	-0.3005	0.0000	0.0000	-4.715e-015	0.113	54
25P	-4.539e-015	0.1751	-0.0007847	-0.3987	0.0000	0.0000	-4.539e-015	0.1751	64
26P	-4.432e-015	0.2665	-0.001189	-0.4732	0.0000	0.0000	-4.432e-015	0.2665	76
27P	-4.437e-015	0.31	-0.001399	-0.5398	-0.0000	0.0000	-4.437e-015	0.31	81
28P	-4.453e-015	0.4787	-0.002391	-0.6956	-0.0000	0.0000	-4.453e-015	0.4787	96
29P	-4.455e-015	0.5272	-0.00269	-0.6958	-0.0000	0.0000	-4.455e-015	0.5272	100
30P	-3.806e-015	-0.3056	-0.6692	0.0000	0.0000	0.0000	-3.806e-015	0.3644	80.33
31P	-0.67	0.3644	-0.6692	0.0000	0.0000	0.0000	1.894e-007	0.3644	80.33
32P	-3.683e-015	-0.08835	-0.6705	0.0000	0.0000	0.0000	-3.683e-015	0.5816	99.33
33P	-0.67	0.5816	-0.6705	0.0000	0.0000	0.0000	-1.697e-007	0.5816	99.33
1X	-0.0004411	0.3091	0.01464	-0.4737	-0.0213	-0.0039	2.5	-2.191	81.01
1XY	0.0004411	0.3091	0.01464	-0.4737	0.0213	0.0039	-2.5	-2.191	81.01
1Y	-0.0003121	0.3091	-0.02502	-0.4795	-0.0073	0.0042	-2.5	2.809	80.97
2X	0.0003994	0.2672	0.01459	-0.4651	0.0177	0.0002	2.5	-2.233	76.01
2XY	-0.0003994	0.2672	0.01459	-0.4651	-0.0177	-0.0002	-2.5	-2.233	76.01
2Y	5.642e-005	0.2669	-0.02448	-0.4674	0.0074	-0.0014	-2.5	2.767	75.98
3X	-0.002705	0.2195	0.01367	-0.4513	-0.0052	0.0005	2.497	-2.281	70.01
3XY	0.002705	0.2195	0.01367	-0.4513	0.0052	-0.0005	-2.497	-2.281	70.01
3Y	-0.0002547	0.2197	-0.0233	-0.4448	-0.0307	-0.0010	-2.5	2.72	69.98
4X	1.738e-005	0.1753	0.01243	-0.3896	0.0050	0.0007	2.5	-2.325	64.01
4XY	-1.738e-005	0.1753	0.01243	-0.3896	-0.0050	-0.0007	-2.5	-2.325	64.01
4Y	0.0001671	0.1751	-0.02117	-0.3970	0.0461	-0.0015	-2.5	2.675	63.98
5X	-0.002286	0.1415	0.0106	-0.3662	-0.0025	-0.0009	2.498	-2.358	59.01
5XY	0.002286	0.1415	0.0106	-0.3662	0.0025	0.0009	-2.498	-2.358	59.01
5Y	-0.002651	0.1421	-0.0188	-0.3624	-0.0108	-0.0009	-2.503	2.642	58.98
6X	0.0002396	0.1131	0.008241	-0.2825	-0.0024	-0.0025	2.5	-2.387	54.01
6XY	-0.0002396	0.1131	0.008241	-0.2825	0.0024	0.0025	-2.5	-2.387	54.01
6Y	0.0002089	0.113	-0.01588	-0.2906	-0.0040	-0.0005	-2.5	2.613	53.98
18X	3.325e-015	0.3094	0.1061	-0.4647	0.0000	0.0000	3.325e-015	-13.44	81.11
19X	1.786e-015	0.268	0.07329	-0.4598	0.0000	0.0000	1.786e-015	-9.482	76.07
20X	6.618e-015	0.1761	0.08707	-0.3508	-0.0000	0.0000	6.618e-015	-14.07	64.09
21X	-1.872e-015	0.1136	0.05207	-0.3444	0.0000	0.0000	-1.872e-015	-10.14	54.05
12X	0	0	0	0.0000	0.0000	0.0000	10	-10	0
12XY	0	0	0	0.0000	0.0000	0.0000	-10	-10	0
12Y	0	0	0	0.0000	0.0000	0.0000	-10	10	0
30X	-3.807e-015	1.034	-0.6692	0.0000	0.0000	0.0000	-3.807e-015	0.3644	80.33
31Y	0.67	0.3644	-0.6692	0.0000	0.0000	0.0000	-1.894e-007	0.3644	80.33

32X	-3.689e-015	1.252	-0.6705	0.0000	0.0000	0.0000	-3.689e-015	0.5816	99.33
33Y	0.67	0.5816	-0.6705	0.0000	0.0000	0.0000	1.697e-007	0.5816	99.33
8S	0.001852	0.091	-0.0159	-0.2166	-0.0292	0.0023	3.196	3.285	48.98
9S	0.001851	0.07031	-0.01515	-0.1723	0.0090	0.0086	4.03	4.098	42.98
10S	0.0001413	0.05259	-0.01399	-0.1364	0.0052	0.0076	4.931	4.983	36.49
11S	0.0001842	0.0229	-0.01003	-0.0945	-0.0085	0.0013	6.945	6.967	21.99
15S	-0.001559	0.1967	-0.02224	-0.4285	0.0097	0.0011	2.498	2.697	66.98
16S	-5.741e-015	0.2851	-0.02272	0.0000	0.0000	0.0000	-5.741e-015	2.785	66.98
17S	0.004015	0.1965	-0.004498	0.0000	0.0000	0.0000	2.504	0.1965	67
8X	-0.001847	0.09098	0.008663	-0.2239	0.0234	-0.0019	3.193	-3.103	49.01
8XY	0.001847	0.09098	0.008663	-0.2239	-0.0234	0.0019	-3.193	-3.103	49.01
8Y	-0.001852	0.091	-0.0159	-0.2166	0.0292	-0.0023	-3.196	3.285	48.98
9X	-0.001213	0.0698	0.008606	-0.1692	-0.0076	0.0057	4.027	-3.958	43.01
9XY	0.001213	0.0698	0.008606	-0.1692	0.0076	-0.0057	-4.027	-3.958	43.01
9Y	-0.001851	0.07031	-0.01515	-0.1723	-0.0090	-0.0086	-4.03	4.098	42.98
10X	-0.0007931	0.05318	0.0076	-0.1278	0.0049	0.0048	4.93	-4.877	36.51
10XY	0.0007931	0.05318	0.0076	-0.1278	-0.0049	-0.0048	-4.93	-4.877	36.51
10Y	-0.0001413	0.05259	-0.01399	-0.1364	-0.0052	-0.0076	-4.931	4.983	36.49
11X	-0.0007439	0.02335	0.006008	-0.0997	0.0021	-0.0001	6.944	-6.921	22.01
11XY	0.0007439	0.02335	0.006008	-0.0997	-0.0021	0.0001	-6.944	-6.921	22.01
11Y	-0.0001842	0.0229	-0.01003	-0.0945	0.0085	-0.0013	-6.945	6.967	21.99
15X	-0.001126	0.1963	0.01305	-0.4223	-0.0386	0.0009	2.499	-2.304	67.01
15XY	0.001126	0.1963	0.01305	-0.4223	0.0386	-0.0009	-2.499	-2.304	67.01
15Y	0.001559	0.1967	-0.02224	-0.4285	-0.0097	-0.0011	-2.498	2.697	66.98
16X	-3.705e-015	0.2699	0.01138	0.0000	0.0000	0.0000	-3.705e-015	-2.23	67.01
17Y	-0.004015	0.1965	-0.004498	0.0000	0.0000	0.0000	-2.504	0.1965	67

Joint Support Reactions for Load Case "NESC Extreme":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
12P	-6.55	0.0	-7.08	0.0	0.0	-47.64	0.0	0.0	48.61	0.0	0.10	0.0	0.0	0.0	0.0	0.01	0.0	0.0
22P	0.00	0.0	-1.50	0.0	0.0	-6.19	0.0	0.0	6.37	0.0	20.12	0.0	0.0	0.0	0.0	-0.00	0.0	0.0
12X	7.72	0.0	-8.07	0.0	0.0	39.31	0.0	0.0	40.87	0.0	0.10	0.0	-0.0	0.0	0.0	0.01	0.0	0.0
12XY	-7.72	0.0	-8.07	0.0	0.0	39.31	0.0	0.0	40.87	0.0	0.10	0.0	0.0	0.0	0.0	-0.01	0.0	0.0
12Y	6.55	0.0	-7.08	0.0	0.0	-47.64	0.0	0.0	48.61	0.0	0.10	0.0	-0.0	0.0	0.0	-0.01	0.0	0.0

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

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0000	0.1674	-0.2245	0.0000	-0.1674	0.2245	0.0003	0.3091	-0.0250
2P	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	-0.0001	0.2669	-0.0245
3P	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0003	0.2197	-0.0233
4P	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0002	0.1751	-0.0212
5P	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0027	0.1421	-0.0188
6P	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	-0.0002	0.1130	-0.0159
18P	0.0000	1.1974	-0.5795	-0.0000	-1.1974	0.5795	-0.0000	0.3088	-0.1216
19P	0.0000	1.4513	-0.6364	-0.0000	-1.4513	0.6364	-0.0000	0.2665	-0.0874
20P	0.0000	1.4513	-0.6364	0.0000	-1.4513	0.6364	-0.0000	0.1747	-0.1134
21P	0.0000	1.4513	-0.6364	0.0000	-1.4513	0.6364	-0.0000	0.1130	-0.0632
12P	0.0000	0.5796	-0.5354	6.5456	6.4997	-47.1090	0.0000	0.0000	0.0000
22P	0.0000	0.5796	-0.5354	-0.0000	0.9177	-5.6514	0.0000	0.0000	0.0000
23P	0.0000	1.2636	-1.2464	-0.0000	-1.2636	1.2464	-0.0000	0.0235	-0.0002

24P	0.0000	1.1158	-1.0408	0.0000	-1.1158	1.0408	-0.0000	0.1130	-0.0005
25P	0.0000	0.3563	-0.3184	-0.0000	-0.3563	0.3184	-0.0000	0.1751	-0.0008
26P	0.0000	0.3113	-0.2714	-0.0000	-0.3113	0.2714	-0.0000	0.2665	-0.0012
27P	0.0000	0.3474	-0.4115	0.0000	-0.3474	0.4115	-0.0000	0.3100	-0.0014
28P	0.0000	3.2361	-1.3971	0.0000	-3.2361	1.3971	-0.0000	0.4787	-0.0024
29P	0.0000	0.0091	-0.1121	-0.0000	-0.0091	0.1121	-0.0000	0.5272	-0.0027
30P	0.0000	0.0091	-0.1121	-0.0000	-0.0091	0.1121	-0.0000	-0.3056	-0.6692
31P	0.0000	0.0091	-0.1121	-0.0000	-0.0091	0.1121	-0.6700	0.3644	-0.6692
32P	0.0000	0.0091	-0.1121	-0.0000	-0.0091	0.1121	-0.0000	-0.0884	-0.6705
33P	0.0000	0.0091	-0.1121	0.0000	-0.0091	0.1121	-0.6700	0.5816	-0.6705
1X	0.0000	0.1674	-0.2245	0.0000	-0.1674	0.2245	-0.0004	0.3091	0.0146
1XY	0.0000	0.1674	-0.2245	-0.0000	-0.1674	0.2245	0.0004	0.3091	0.0146
1Y	0.0000	0.1674	-0.2245	-0.0000	-0.1674	0.2245	-0.0003	0.3091	-0.0250
2X	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0004	0.2672	0.0146
2XY	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0004	0.2672	0.0146
2Y	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	0.0001	0.2669	-0.0245
3X	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	-0.0027	0.2195	0.0137
3XY	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	0.0027	0.2195	0.0137
3Y	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0003	0.2197	-0.0233
4X	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0000	0.1753	0.0124
4XY	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0000	0.1753	0.0124
4Y	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0002	0.1751	-0.0212
5X	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	-0.0023	0.1415	0.0106
5XY	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	0.0023	0.1415	0.0106
5Y	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0027	0.1421	-0.0188
6X	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0002	0.1131	0.0082
6XY	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0002	0.1131	0.0082
6Y	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	0.0002	0.1130	-0.0159
18X	0.0000	0.6464	-0.4005	0.0000	-0.6464	0.4005	0.0000	0.3094	0.1061
19X	0.0000	1.4513	-0.6364	-0.0000	-1.4513	0.6364	0.0000	0.2680	0.0733
20X	0.0000	1.4513	-0.6364	-0.0000	-1.4513	0.6364	0.0000	0.1761	0.0871
21X	0.0000	1.4513	-0.6364	0.0000	-1.4513	0.6364	-0.0000	0.1136	0.0521
12X	0.0000	0.5796	-0.5354	-7.7236	7.4917	39.8503	0.0000	0.0000	0.0000
12XY	0.0000	0.5796	-0.5354	7.7236	7.4917	39.8503	0.0000	0.0000	0.0000
12Y	0.0000	0.5796	-0.5354	-6.5456	6.4997	-47.1090	0.0000	0.0000	0.0000
30X	0.0000	0.0091	-0.1121	-0.0000	-0.0091	0.1121	-0.0000	1.0344	-0.6692
31Y	0.0000	0.0091	-0.1121	0.0000	-0.0091	0.1121	0.6700	0.3644	-0.6692
32X	0.0000	0.0091	-0.1121	-0.0000	-0.0091	0.1121	-0.0000	1.2516	-0.6705
33Y	0.0000	0.0091	-0.1121	-0.0000	-0.0091	0.1121	0.6700	0.5816	-0.6705
8S	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	0.0019	0.0910	-0.0159
9S	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	0.0019	0.0703	-0.0152
10S	0.0000	0.7378	-0.6478	0.0000	-0.7378	0.6478	0.0001	0.0526	-0.0140
11S	0.0000	0.5796	-0.5354	0.0000	-0.5796	0.5354	0.0002	0.0229	-0.0100
15S	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0016	0.1967	-0.0222
16S	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0000	0.2851	-0.0227
17S	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	0.0040	0.1965	-0.0045
8X	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0018	0.0910	0.0087
8XY	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0018	0.0910	0.0087
8Y	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	-0.0019	0.0910	-0.0159
9X	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0012	0.0698	0.0086
9XY	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0012	0.0698	0.0086
9Y	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	-0.0019	0.0703	-0.0152
10X	0.0000	0.7378	-0.6478	0.0000	-0.7378	0.6478	-0.0008	0.0532	0.0076
10XY	0.0000	0.7378	-0.6478	-0.0000	-0.7378	0.6478	0.0008	0.0532	0.0076
10Y	0.0000	0.7378	-0.6478	-0.0000	-0.7378	0.6478	-0.0001	0.0526	-0.0140
11X	0.0000	0.5796	-0.5354	0.0000	-0.5796	0.5354	-0.0007	0.0233	0.0060
11XY	0.0000	0.5796	-0.5354	-0.0000	-0.5796	0.5354	0.0007	0.0233	0.0060
11Y	0.0000	0.5796	-0.5354	-0.0000	-0.5796	0.5354	-0.0002	0.0229	-0.0100
15X	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0011	0.1963	0.0130
15XY	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0011	0.1963	0.0130

15Y	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	0.0016	0.1967	-0.0222	
16X	0.0000	0.1583	-0.1124	0.0000	-0.1583	0.1124	-0.0000	0.2699	0.0114	
17Y	0.0000	0.1583	-0.1124	-0.0000	-0.1583	0.1124	-0.0040	0.1965	-0.0045	

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

Comp. Member Label	Tens. Member Label	Connect Leg for Comp. Member	Force In Comp. Member (kips)	Force In Tens. Member (kips)	Original Supported L/R Cap. (kips)	RLX	RLY	RLZ	L/R	KL/R	Curve No.	Alternate Unsupported L/R Cap. (kips)	RLOUT	L/R	KL/R	Curve No.
g13P	g13Y	Short only	-0.18	-0.18	11.56	0.750	0.500	0.500	123.69	122.85	5	8.63	1.000	158.01	143.38	6
g13Y	g13P	Short only	-0.18	-0.18	11.56	0.750	0.500	0.500	123.69	122.85	5	8.63	1.000	158.01	143.38	6
g15P	g15Y	Long only	-2.14	-2.14	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g15X	g15XY	Long only	-2.10	-2.10	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g15XY	g15X	Long only	-2.10	-2.10	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g15Y	g15P	Long only	-2.14	-2.14	17.27	0.500	0.750	0.500	120.57	120.47	5	12.24	1.000	160.76	145.07	6
g21X	g21XY	Long only	-0.85	-0.85	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g21XY	g21X	Long only	-0.85	-0.85	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g23P	g23Y	Long only	-1.03	-1.03	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g23Y	g23P	Long only	-1.03	-1.03	18.99	0.500	0.750	0.500	109.16	111.87	2	13.99	1.000	145.55	135.71	6
g25P	g25Y	Short only	-1.97	-1.97	12.42	0.781	0.561	0.561	130.02	127.68	5	10.79	1.000	148.00	137.22	6
g25Y	g25P	Short only	-1.97	-1.97	12.42	0.781	0.561	0.561	130.02	127.68	5	10.79	1.000	148.00	137.22	6
g27X	g27XY	Long only	-1.03	-1.03	11.27	0.569	0.785	0.569	150.73	143.46	5	8.82	1.000	188.53	162.14	6
g27XY	g27X	Long only	-1.03	-1.03	11.27	0.569	0.785	0.569	150.73	143.46	5	8.82	1.000	188.53	162.14	6
g29P	g29Y	Long only	-1.05	-1.05	9.10	0.549	0.774	0.549	171.90	159.59	5	6.94	1.000	222.10	182.79	6
g29Y	g29P	Long only	-1.05	-1.05	9.10	0.549	0.774	0.549	171.90	159.59	5	6.94	1.000	222.10	182.79	6

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	1.330	50.00	50.00	2.66
2	0.760	50.00	50.00	1.52
3	1.585	50.00	50.00	3.17
4	1.585	50.00	50.00	3.17
5	1.585	50.00	50.00	3.17
6	1.585	50.00	50.00	3.17
7	1.585	50.00	50.00	3.17
8	1.585	50.00	50.00	3.17
9	1.775	50.00	50.00	3.55
10	1.526	50.00	50.00	3.05
11	0.478	50.00	50.00	0.96
12	0.413	50.00	50.00	0.83
13	0.539	50.00	50.00	1.08
14	3.525	50.00	50.00	7.05

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

Group Summary (Compression Portion):

Group Label	Group Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Cont-rol %	Comp. 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 (ft)	KL/R	Length	Curve No.	Comp. No.	No. Of Member Bolts
Leg1	Leg1	SAE	4X4X0.25	33.0	59.64	Comp	59.64	g6Y	-31.913	NESC Ext	53.509	0.000	0.000	1.000	1.000	1.000	75.47	75.47	5.000	1	0		
Leg2	Leg2	SAE	4X4X0.3125	33.0	70.39	Comp	70.39	g9Y	-39.521	NESC Ext	56.145	91.000	175.781	1.000	1.000	1.000	100.49	100.49	6.624	1	10		
Leg3	Leg3	SAE	4X4X0.375	33.0	81.07	Comp	81.07	g11Y	-48.004	NESC Ext	59.214	91.000	210.937	0.333	0.333	0.333	113.70	113.70	22.420	1	10		
XBrace1	XBrace1	SAE	1.75X1.75X0.1875	33.0	42.55	Comp	42.55	g12X	-4.918	NESC Ext	11.559	18.200	21.094	0.750	0.500	0.500	123.69	122.85	7.071	5	2		
XBrace2	XBrace2	SAU	3X2X0.1875	33.0	26.23	Comp	26.23	g22X	-4.981	NESC Ext	18.986	27.300	31.641	0.500	0.750	0.500	109.16	111.87	7.071	2	3		
XBrace3	XBrace3	SAE	2X2X0.1875	33.0	18.30	Cross	18.30	g25P	-1.975	NESC Ext	10.792	18.200	21.094	1.000	0.561	0.561	148.00	137.22	7.610	6	2		
XBrace4	XBrace4	SAU	2.5X2X0.1875	33.0	15.15	Cross	15.15	g29P	-1.052	NESC Ext	6.939	18.200	21.094	0.549	1.000	0.549	222.10	182.79	11.105	6	2		
XBrace5	XBrace5	SAE	1.75X1.75X0.25	33.0	73.68	Comp	73.68	g30XY	-1.665	NESC Hea	2.260	18.200	28.125	0.789	0.577	0.577	382.75	320.25	18.850	5	2		
XBrace6	XBrace6	SAE	1.75X1.75X0.1875	33.0	33.36	Tens	0.00	g33XY	0.000		1.070	18.200	21.094	0.796	0.409	0.409	496.93	407.26	27.937	5	2		
XBrace8	XBrace8	SAU	3X2X0.1875	33.0	29.11	Comp	29.11	g17P	-5.029	NESC Ext	17.275	27.300	31.641	1.000	1.500	1.000	120.57	120.47	3.905	5	3		
Horz1	Horizontal 1	SAE	1.75X1.75X0.1875	33.0	54.70	Comp	54.70	g34X	-3.172	NESC Ext	5.799	9.100	10.547	1.000	1.000	1.000	174.93	174.93	5.000	4	1		
Horz2	Horizontal 2	SAU	2.5X2X0.1875	33.0	41.52	Comp	41.52	g38X	-3.778	NESC Ext	10.412	9.100	10.547	1.000	0.500	0.500	149.22	149.22	9.861	4	1		
Horz3	Horizontal 3	SAU	3X2.5X0.25	33.0	44.72	Comp	44.72	g40X	-4.070	NESC Ext	12.054	9.100	14.062	1.000	0.500	0.500	176.37	176.37	13.889	4	1		
Horz4	Horizontal 4	SAU	4X3X0.25	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.000	0	0		
Horz5	Horizontal 5	Bar	1.75x1/4	33.0	38.18	Tens	0.00	g43Y	0.000		0.129	9.100	14.062	1.000	2.000	1.000	983.61	983.61	2.500	4	1		
Inner1	Inner1	SAE	1.75X1.75X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.000	0	0		
Inner2	Inner2	SAU	2.5X2X0.1875	33.0	0.00		0.00		0.000		0.000	0.000	0.000	0.000	0.000	0.000	0.00	0.00	0.000	0	0		
Arm1	Ground Wire Arm	SAU	3X2.5X0.25	33.0	12.60	Tens	0.94	g44P	-0.171	NESC Ext	19.099	18.200	28.125	1.000	0.500	0.500	146.34	140.11	11.524	5	2		
Arm2	Top Cross Arm	SAU	3X2.5X0.25	33.0	15.40	Comp	15.40	g46P	-2.803	NESC Hea	28.509	18.200	28.125	1.000	0.500	0.500							

97.38 108.69 7.669 3 2
Arm3 Middle Cross Arm SAU 3.5X2.5X0.25 33.0 20.67 Comp 20.67 g48P -3.761NESC Hea 24.527 18.200 28.125 1.000 0.500 0.500
132.50 129.56 12.013 5 2
Arm4 Bottom Cross Arm SAU 3X2.5X0.25 33.0 20.92 Comp 20.92 g50P -1.904NESC Hea 27.682 9.100 14.062 1.000 0.500 0.500
103.41 111.70 8.143 3 1
ArmBr1 Ground Wire Arm Brace DAE 2.5X2.5X0.1875 33.0 17.56 Comp 17.56 g52X -1.598NESC Hea 40.856 9.100 21.094 1.000 1.000 1.000
98.76 104.07 6.403 2 1
ArmBr2 Top Cross Arm Brace Bar 1.75x1/4 33.0 32.56 Tens 0.00 g53Y 0.000 0.039 9.100 14.062 1.000 1.000 1.000
1800.97 1800.97 9.155 4 1
ArmBr3 Middle Cross Arm Brace Bar 1.75x1/4 33.0 41.03 Tens 0.00 g54Y 0.000 0.021 9.100 14.062 1.000 1.000 1.000
2435.79 2435.79 12.382 4 1
ArmBr4 Bottom Cross Arm Brace Bar 1.75x1/4 33.0 18.79 Tens 0.00 g55Y 0.000 0.035 9.100 14.062 1.000 1.000 1.000
1879.82 1879.82 9.556 4 1
Mast Mast Pwmnt Pipe HSS16"x0.5" 42.0 2.29 Comp 2.29 g61P -19.981NESC Hea 872.521 0.000 0.000 1.000 1.000 1.000
48.09 48.09 22.000 1 0
MB1 Mast Brace 1 SAE 2.5X2.5X0.25 36.0 32.40 Tens 27.28 g56X -3.708NESC Ext 28.492 16.800 13.594 1.000 1.000 1.000
86.41 103.20 3.536 3 1
MB2 Mast Brace 2 SAE 3.5X3.5X0.25 36.0 14.74 Comp 14.74 g60P -2.003NESC Ext 16.774 16.800 13.594 1.000 1.000 1.000
169.81 169.81 9.821 4 1
fic1 Fictitious1 Bar fic 36.0 0.00 0.00 g72P 0.000 0.000 0.000 0.000 1.000 1.000 1.000
2280000.00 2280000.00 19.000 4 0
fic Fictitious2 Bar fic 36.0 0.00 0.00 g70P 0.000 0.000 0.000 0.000 1.000 1.000 1.000
80400.00 80400.00 0.670 4 0

Group Summary (Tension Portion):

Group No.	Group Label	Angle No.	Angle Desc.	Angle Type	Steel Size	Steel Strength	Max Usage %	Max Usage Control	Tension Cont-rol	Tension Use In Tens. %	Tension Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Member Tens. (ft)	Hole Of Bolts	Hole Diameter (in)
Leg1	Leg1	SAE	4X4X0.25	33.0	59.64	Comp	52.06	g6X	27.423	NESC Ext	52.676	0.000	0.000	0.000	5.000	0	2.000	0.6875
Leg2	Leg2	SAE	4X4X0.3125	33.0	70.39	Comp	55.73	g7X	32.323	NESC Ext	58.001	0.000	0.000	0.000	5.096	0	2.990	0.6875
Leg3	Leg3	SAE	4X4X0.375	33.0	81.07	Comp	51.67	g11X	33.995	NESC Ext	65.794	91.000	210.937	193.014	22.420	10	3.360	0.6875
XBrace1	XBrace1	SAE	1.75X1.75X0.1875	33.0	42.55	Comp	31.64	g12Y	4.615	NESC Ext	14.585	18.200	21.094	16.189	7.071	2	1.000	0.6875
XBrace2	XBrace2	SAU	3X2X0.1875	33.0	26.23	Comp	23.84	g22P	5.459	NESC Ext	22.901	27.300	31.641	28.125	7.071	3	1.000	0.6875
XBrace3	XBrace3	SAE	2X2X0.1875	33.0	18.30	Cross	11.80	g25X	1.549	NESC Ext	17.258	18.200	21.094	13.131	7.610	2	1.000	0.6875
XBrace4	XBrace4	SAU	2.5X2X0.1875	33.0	15.15	Cross	7.62	g27Y	1.387	NESC Ext	20.228	18.200	21.094	18.750	9.426	2	1.000	0.6875
XBrace5	XBrace5	SAE	1.75X1.75X0.25	33.0	73.68	Comp	26.15	g31X	4.320	NESC Ext	18.952	18.200	28.125	16.523	18.850	2	1.000	0.6875
XBrace6	XBrace6	SAE	1.75X1.75X0.1875	33.0	33.36	Tens	33.36	g33X	4.404	NESC Ext	14.585	18.200	21.094	13.201	27.937	2	1.000	0.6875
XBrace8	XBrace8	SAU	3X2X0.1875	33.0	29.11	Comp	18.44	g17X	4.222	NESC Ext	22.901	27.300	31.641	28.125	3.905	3	1.000	0.6875

Horz1	Horizontal 1	SAE	1.75X1.75X0.1875	33.0	54.70	Comp	37.22	g35X	2.872NESC Ext	14.585	9.100	10.547	7.717	5.000	1	1.000	0.6875
Horz2	Horizontal 2	SAU	2.5X2X0.1875	33.0	41.52	Comp	8.72	g38P	0.673NESC Ext	17.444	9.100	10.547	7.717	9.861	1	1.000	0.6875
Horz3	Horizontal 3	SAU	3X2.5X0.25	33.0	44.72	Comp	11.07	g40P	1.007NESC Ext	30.090	9.100	14.062	12.500	13.889	1	1.000	0.6875
Horz4	Horizontal 4	SAU	4X3X0.25	33.0	0.00		0.00		0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0
Horz5	Horizontal 5	Bar	1.75x1/4	33.0	38.18	Tens	38.18	g43X	3.012NESC Hea	7.889	9.100	14.062	10.289	2.500	1	1.000	0.6875
Inner1	Inner1	SAE	1.75X1.75X0.1875	33.0	0.00		0.00		0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0
Inner2	Inner2	SAU	2.5X2X0.1875	33.0	0.00		0.00		0.000	0.000	0.000	0.000	0.000	0.000	0	0.000	0
Arm1	Ground Wire Arm	SAU	3X2.5X0.25	33.0	12.60	Tens	12.60	g45P	2.293NESC Hea	33.802	18.200	28.125	28.125	5.000	2	1.000	0.6875
Arm2	Top Cross Arm	SAU	3X2.5X0.25	33.0	15.40	Comp	0.00	g47Y	0.000	33.802	18.200	28.125	28.125	5.000	2	1.000	0.6875
Arm3	Middle Cross Arm	SAU	3.5X2.5X0.25	33.0	20.67	Comp	0.00	g49Y	0.000	37.663	18.200	28.125	28.125	5.000	2	1.000	0.6875
Arm4	Bottom Cross Arm	SAU	3X2.5X0.25	33.0	20.92	Comp	2.98	g50X	0.271NESC Ext	33.802	9.100	14.062	22.059	8.143	1	1.000	0.6875
ArmBr1	Ground Wire Arm Brace	DAE	2.5X2.5X0.1875	33.0	17.56	Comp	0.00	g52X	0.000	45.803	9.100	21.094	18.750	6.403	1	2.000	0.6875
ArmBr2	Top Cross Arm Brace	Bar	1.75x1/4	33.0	32.56	Tens	32.56	g53X	2.568NESC Hea	7.889	9.100	14.062	10.289	9.155	1	1.000	0.6875
ArmBr3	Middle Cross Arm Brace	Bar	1.75x1/4	33.0	41.03	Tens	41.03	g54P	3.237NESC Hea	7.889	9.100	14.062	10.289	12.382	1	1.000	0.6875
ArmBr4	Bottom Cross Arm Brace	Bar	1.75x1/4	33.0	18.79	Tens	18.79	g55Y	1.482NESC Hea	7.889	9.100	14.062	10.289	9.556	1	1.000	0.6875
Mast	Mast Pwmnt Pipe	HSS16"x0.5"		42.0	2.29	Comp	0.00	g67P	0.000	953.399	0.000	0.000	0.000	4.000	0	0.000	0
MB1	Mast Brace 1	SAE	2.5X2.5X0.25	36.0	32.40	Tens	32.40	g56P	3.915NESC Ext	32.987	16.800	13.594	12.083	3.536	1	1.000	0.6875
MB2	Mast Brace 2	SAE	3.5X3.5X0.25	36.0	14.74	Comp	0.00	g60Y	0.000	49.187	16.800	13.594	12.083	9.821	1	1.000	0.6875
fic1	Fictitious1	Bar	fic	36.0	0.00		0.00	g72P	0.000NESC Hea	3.600	0.000	0.000	0.000	19.000	0	0.000	0
fic	Fictitious2	Bar	fic	36.0	0.00		0.00	g70P	0.113NESC Ext	3.600	0.000	0.000	0.000	0.670	0	0.000	0

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	73.68	g30XY	Angle
NESC Extreme	81.07	g11Y	Angle

Summary of Insulator Usages:

Insulator	Insulator	Maximum	Load Case	Weight

Label	Type	Usage %		(lbs)
1	Clamp	3.28	NESC Heavy	0.0
2	Clamp	2.34	NESC Heavy	0.0
3	Clamp	3.93	NESC Heavy	0.0
4	Clamp	4.00	NESC Heavy	0.0
5	Clamp	3.95	NESC Heavy	0.0
6	Clamp	4.00	NESC Heavy	0.0
7	Clamp	3.89	NESC Heavy	0.0
8	Clamp	3.94	NESC Heavy	0.0
9	Clamp	12.29	NESC Heavy	0.0
10	Clamp	8.29	NESC Heavy	0.0
11	Clamp	4.18	NESC Heavy	0.0
12	Clamp	3.20	NESC Heavy	0.0
13	Clamp	3.68	NESC Heavy	0.0
14	Clamp	8.82	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	18P	0.000	1.054	1.258	1.641
NESC Heavy	2	Clamp	18X	0.000	0.852	0.805	1.172
NESC Heavy	3	Clamp	19P	0.000	1.169	1.579	1.965
NESC Heavy	4	Clamp	19X	0.000	1.232	1.579	2.002
NESC Heavy	5	Clamp	20P	0.000	1.169	1.593	1.976
NESC Heavy	6	Clamp	20X	0.000	1.211	1.593	2.001
NESC Heavy	7	Clamp	21P	0.000	1.169	1.553	1.944
NESC Heavy	8	Clamp	21X	0.000	1.215	1.553	1.972
NESC Heavy	9	Clamp	23P	0.000	1.403	5.982	6.144
NESC Heavy	10	Clamp	24P	0.000	1.035	4.014	4.145
NESC Heavy	11	Clamp	25P	0.000	0.542	2.020	2.091
NESC Heavy	12	Clamp	26P	0.000	0.312	1.570	1.601
NESC Heavy	13	Clamp	27P	0.000	0.066	1.839	1.840
NESC Heavy	14	Clamp	28P	0.000	0.884	4.321	4.410
NESC Extreme	1	Clamp	18P	0.000	1.197	0.579	1.330
NESC Extreme	2	Clamp	18X	0.000	0.646	0.400	0.760
NESC Extreme	3	Clamp	19P	0.000	1.451	0.636	1.585
NESC Extreme	4	Clamp	19X	0.000	1.451	0.636	1.585
NESC Extreme	5	Clamp	20P	0.000	1.451	0.636	1.585
NESC Extreme	6	Clamp	20X	0.000	1.451	0.636	1.585
NESC Extreme	7	Clamp	21P	0.000	1.451	0.636	1.585
NESC Extreme	8	Clamp	21X	0.000	1.451	0.636	1.585
NESC Extreme	9	Clamp	23P	0.000	1.264	1.246	1.775
NESC Extreme	10	Clamp	24P	0.000	1.116	1.041	1.526
NESC Extreme	11	Clamp	25P	0.000	0.356	0.318	0.478
NESC Extreme	12	Clamp	26P	0.000	0.311	0.271	0.413
NESC Extreme	13	Clamp	27P	0.000	0.347	0.411	0.539
NESC Extreme	14	Clamp	28P	0.000	3.236	1.397	3.525

Overturning Moments For User Input Concentrated Loads:

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

Load Case	Total Tran.	Total Long.	Total Vert.	Transverse Overturning	Longitudinal Overturning	Torsional Moment

	Load (kips)	Load (kips)	Load (kips)	Moment (ft-k)	Moment (ft-k)	(ft-k)
NESC Heavy	10.352	0.000	18.748	723.356	0.000	0.000
NESC Extreme	14.087	0.000	6.616	1010.506	0.000	0.000

*** Weight of structure (lbs):

Weight of Angles*Section DLF:	16230.0
Total:	16230.0

*** End of Report

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Subject:	Foundation Analysis CL&P Tower # 910
Location:	Fairfield, CT
Rev. 1: 5/5/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16159.11

Foundation Analysis

NE, NW and SW Tower Legs - With Existing 8'x8' additional concrete block

Input Data:

Max. Reactions at Tower Leg:

Shear (Compression Leg) =	$Shear_{comp} := 9.64 \cdot 1.1 \cdot kips = 10.6 \cdot kips$	(User Input from PLS Tower)
Shear (Uplift Leg) =	$Shear_{up} := 11.17 \cdot 1.1 \cdot kips = 12.3 \cdot kips$	(User Input from PLS Tower)
Compression =	$Comp := 47.64 \cdot 1.1 \cdot kips = 52.4 \cdot kips$	(User Input from PLS Tower)
Uplift =	$Uplift := 39.31 \cdot 1.1 \cdot kips = 43.2 \cdot kips$	(User Input from PLS Tower)

Tower Properties:

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

Foundation Properties:

Pier Height =	$P_H := 1.5 \cdot ft$	(User Input)
Pier Width Top =	$P_{w1} := 1.67 \cdot ft$	(User Input)
Pier Width Botttom =	$P_{w2} := 1.89 \cdot ft$	(User Input)
Pier Projection Above Grade =	$P_P := 6 \cdot ft$	(User Input)
Pad Width =	$Pd_w := 5 \cdot ft$	(User Input)
Pad Thickness =	$Pd_t := 2 \cdot ft$	(User Input)
Block Width =	$B_w := 8 \cdot ft$	(User Input)
Block Thickness =	$B_t := 3.75 \cdot ft$	(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)
Soil Bearing Capacity =	$BC_{soil} := 7000 \cdot psf$	(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 = $V_{pad} := Pd_w^2 \cdot Pd_t = 50 \cdot ft^3$

Volume of the Concrete Pier = $V_{pier} := \frac{(P_H)}{3} \cdot \left(P_{w1}^2 + P_{w2}^2 + \sqrt{P_{w1}^2 \cdot P_{w2}^2}\right) = 4.76 \cdot ft^3$

Volume of the Concrete Block = $V_{block} := B_w^2 \cdot B_t = 240 \cdot ft^3$

Volume of Soil = $V_{soil} := 0$

Total Volume of Concrete = $V_{Conc} := V_{pad} + V_{pier} + V_{block} = 295 \cdot ft^3$

Mass of Concrete = $Mass_{Conc} := V_{Conc} \cdot \gamma c = 44.2 \cdot kips$

Mass of Soil = $Mass_{Soil} := V_{soil} \cdot \gamma s = 0 \cdot kips$

Total Mass = $Mass_{tot} := Mass_{Conc} + Mass_{Soil} = 44 \cdot kips$

Check Uplift:

Required Factor of Safety = $F_S := 1.0$

$ActualFS := \frac{Mass_{tot}}{Uplift} = 1.02$

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

Uplift_Check = "OK"

Check Bearing:

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

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

$Bearing := \frac{Comp + Mass_{Conc}}{A_{pad}} = 3.86 \cdot ksf$

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

Bearing_Check = "OK"

Check Sliding:

Sliding Resistance = $S_R := \mu \cdot (Mass_{Conc} + Comp) = 43.478 \cdot kips$

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

Sliding_Check = "OK"

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Subject:	Foundation Analysis CL&P Tower # 910
Location:	Fairfield, CT
Rev. 0: 2/13/17	Prepared by: T.J.L. Checked by: C.F.C. Job No. 16159.11

Foundation Analysis

SE Tower Leg - With Proposed Reinforcement

Input Data:

Max. Reactions at Tower Leg:

Shear (Compression Leg) = $Shear_{comp} := 9.64 \cdot 1.1 \cdot kips = 10.6 \cdot kips$ (User Input from PLS Tower)

Shear (Uplift Leg) = $Shear_{up} := 11.17 \cdot 1.1 \cdot kips = 12.3 \cdot kips$ (User Input from PLS Tower)

Compression = $Comp := 47.64 \cdot 1.1 \cdot kips = 52.4 \cdot kips$ (User Input from PLS Tower)

Uplift = $Uplift := 39.31 \cdot 1.1 \cdot kips = 43.2 \cdot kips$ (User Input from PLS Tower)

Tower Properties:

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

Foundation Properties:

Pier Height = $P_H := 3.25 \cdot ft$ (User Input)

Pier Width Top = $P_{w1} := 1.67 \cdot ft$ (User Input)

Pier Width Botttom = $P_{w2} := 2.08 \cdot ft$ (User Input)

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

Pad Width = $Pd_w := 9 \cdot ft$ (User Input)

Pad Thickness = $Pd_t := 4 \cdot ft$ (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)

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 = $V_{pad} := Pd_w^2 \cdot Pd_t = 324 \cdot ft^3$

Volume of the Concrete Pier = $V_{pier} := \frac{(P_H)}{3} \cdot \left(P_{w1}^2 + P_{w2}^2 + \sqrt{P_{w1}^2 \cdot P_{w2}^2}\right) = 11.47 \cdot ft^3$

Resisting Pyramid Base 1 = $B_1 := Pd_w^2 = 81\,ft^2$

Resisting Pyramid Base 2 = $B_2 := \left[2 \cdot \tan(\phi) \cdot (P_H - P_P) + Pd_w\right]^2 = 148\,ft^2$

Volume of Soil = $V_{soil} := \left[\frac{(P_H - P_P)}{3} \cdot \left(B_1 + B_2 + \sqrt{B_1 \cdot B_2}\right)\right] - V_{pier} = 299 \cdot ft^3$

Total Volume of Concrete = $V_{Conc} := V_{pad} + V_{pier} = 335 \cdot ft^3$

Mass of Concrete = $Mass_{Conc} := V_{Conc} \cdot \gamma c = 50.3 \cdot kips$

Mass of Soil = $Mass_{Soil} := V_{soil} \cdot \gamma s = 30 \cdot kips$

Total Mass = $Mass_{tot} := Mass_{Conc} + Mass_{Soil} = 80 \cdot kips$

Check Uplift:

Required Factor of Safety = $F_S := 1.0$

$ActualFS := \frac{Mass_{tot}}{Uplift} = 1.86$

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

Uplift_Check = "OK"

Check Bearing:

Cross Sectional Area of Pad = $A_{pad} := Pd_w^2 = 81\,ft^2$

Section Modulus of Pad = $S_{pad} := \frac{(Pd_w)^3}{6} = 122 \cdot ft^3$

Residual Mass of Concrete = $Mass_{Concr} := V_{Conc} \cdot (\gamma c - \gamma s) = 16.8 \cdot kips$

$Bearing := \frac{Comp + Mass_{Concr}}{A_{pad}} + \frac{\left[Shear_{comp} \cdot (P_H + Pd_t)\right]}{S_{pad}} = 1.49 \cdot ksf$

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

Bearing_Check = "OK"

Check Sliding:

Sliding Resistance = $S_R := \mu \cdot (Mass_{Conc} + Comp) = 46.226 \cdot kips$

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

Sliding_Check = "OK"

RAN Template: 704Bu Outdoor	A&L Template: 704B_3DP

CT11360A_1.3_L700

Section 1 - Site Information

Site ID: CT11360A
Status: Draft
Version: 1.3
Project Type: L700
Approved: Not Approved
Approved By: Not Approved
Last Modified: 12/8/2016 2:17:30 PM
Last Modified By: GSM1900\AMurill9

Site Name: Westport/Rt 136
Site Class: Utility Lattice Tower
Site Type: Structure Non Building
Solution Type:
Plan Year: 2015
Market: CONNECTICUT
Vendor: Ericsson
Landlord: <undefined>

Latitude: 41.20161600
Longitude: -73.33205500
Address: 640 Westport Turnpike #ST910 Line #1720
City, State: Fairfield, CT
Region: NORTHEAST

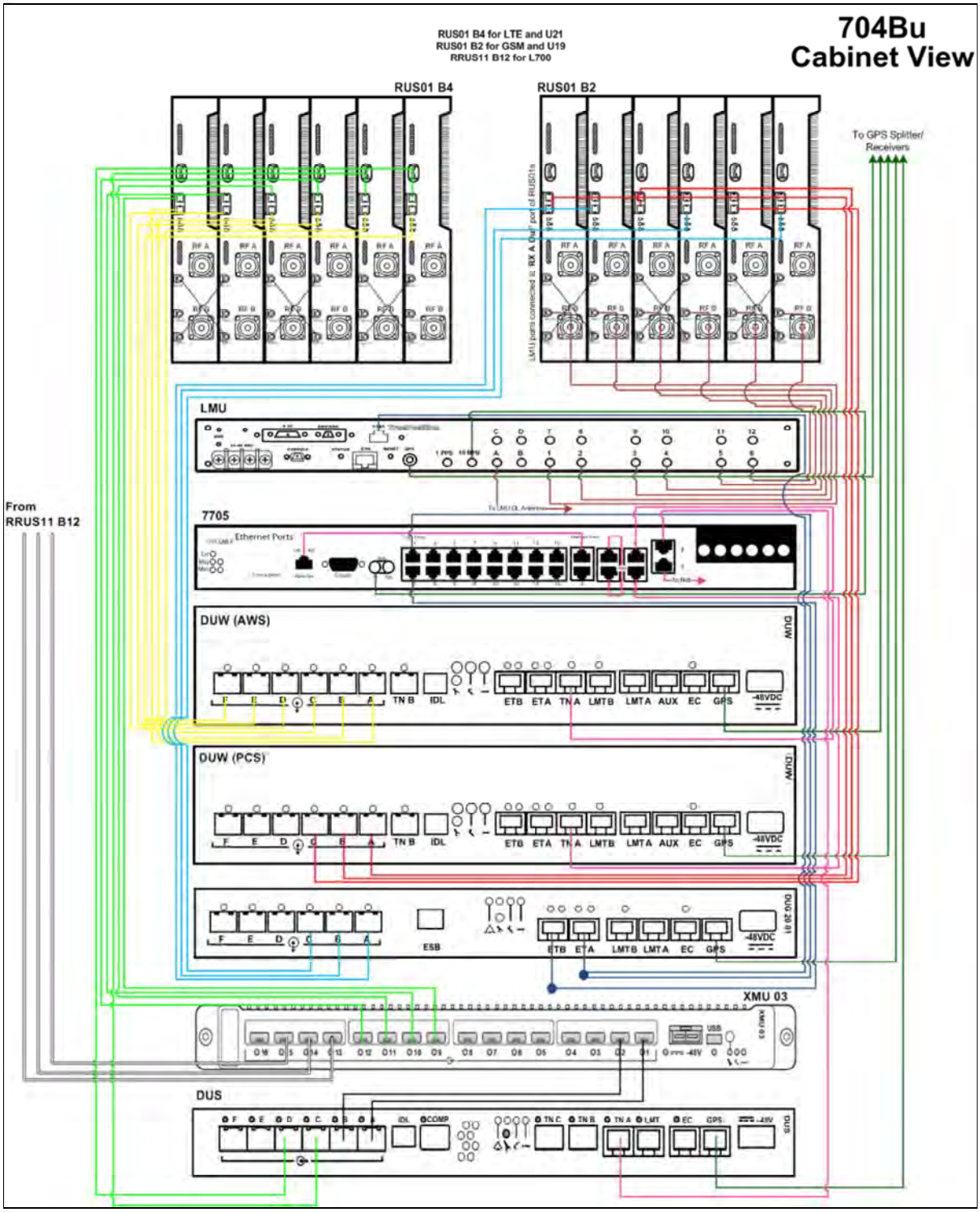
RAN Template: 704Bu Outdoor		AL Template: 704B_3DP		
Sector Count: 3	Antenna Count: 6	Coax Line Count: 18	TMA Count: 6	RRU Count: 0

Section 2 - Existing Template Images

— This section is intentionally blank. —

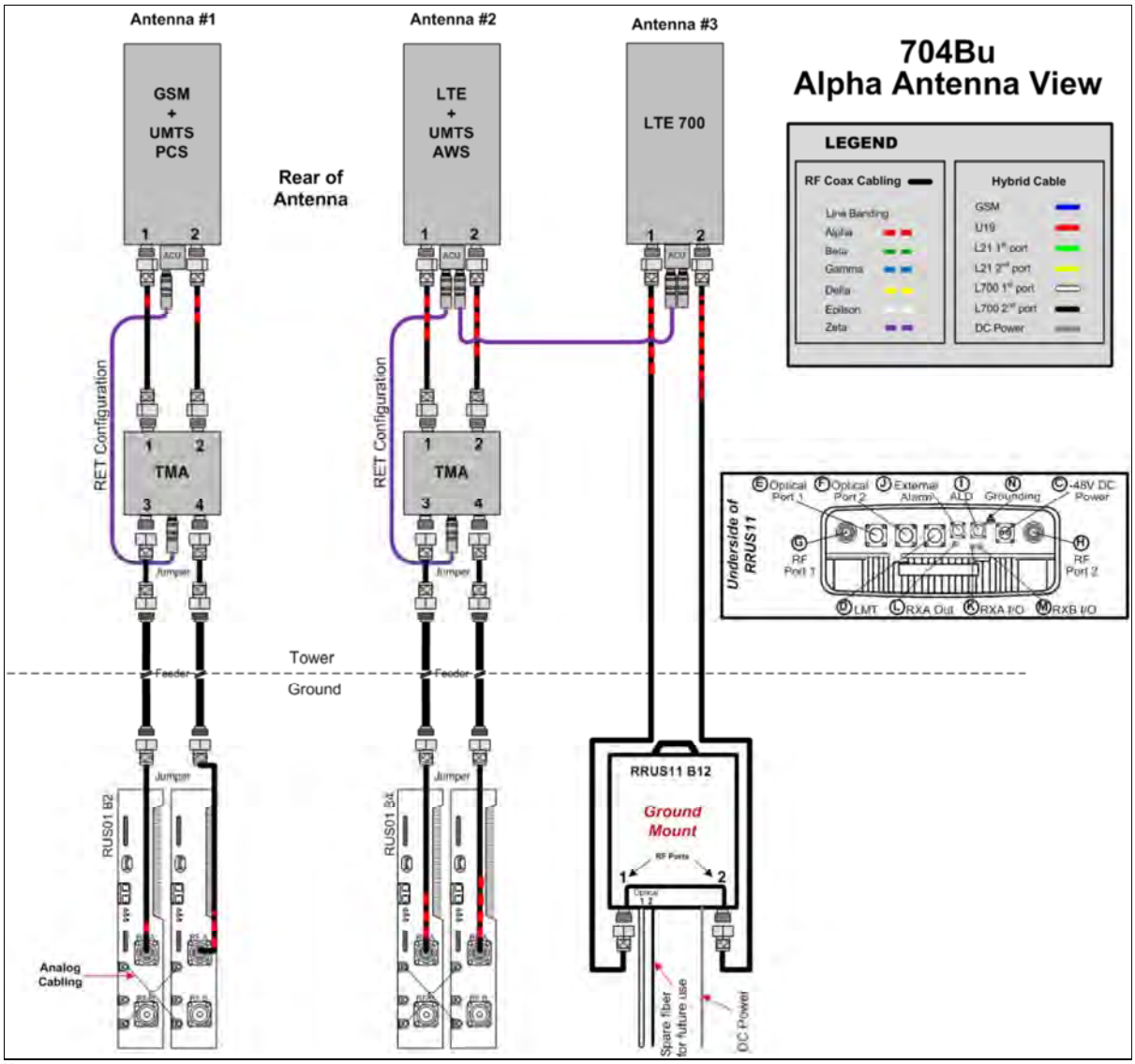
Section 3 - Proposed Template Images

704Bu.png



Notes:

AL_704Bu.png


Antenna #1
Antenna #2
Antenna #3
704Bu
Alpha Antenna View
GSM
+
UMTS
PCS
LTE
+
UMTS
AWS
LTE 700
Rear of
Antenna
LEGEND
RF Coax Cabling
Hybrid Cable
Line Banding
Alpha
Beta
Gamma
Delta
Epsilon
Zeta
GSM
U19
L21 1st port
L21 2nd port
L700 1st port
L700 2nd port
DC Power
RET Configuration
TMA
Jumper
Feeder
Tower
Ground
RUS01 B2
RUS01 B4
Analog
Cabling
RRUS11 B12
Ground
Mount
RF Ports
Optical 1,2
Spare fiber
for future use
DC Power
Underside of
RRUS11
Optical
Port 1
Optical
Port 2
External
Alarm
ALD
Grounding
-48V DC
Power
RF
Port 1
RF
Port 2
LMT
RXA Out
RXA I/O
RXB I/O

Notes:

Section 4 - Siteplan Images

---- This section is intentionally blank. ----

RAN Template:	A&L Template:
704Bu Outdoor	704B_3DP

CT11360A_1.3_L700

Section 5 - RAN Equipment

Existing RAN Equipment	
Template: 4B Outdoor	
Enclosure	1
Enclosure Type	RBS 6102
Baseband	DUL20 (L2100), DUW30 (U1900), DUW30 (U2100), DUG20 (G1900)
Radio	RUS01 B4 (x4) (U2100, L2100), RUS01 B2 (x4) (U1900, G1900)

Proposed RAN Equipment		
Template: 704Bu Outdoor		
Enclosure	1	2
Enclosure Type	RBS 6102	Ground Mount
Baseband	DUG20 (G1900), DUW30 (U1900), DUW30 (U2100), DUS41 (L2100, L700)	
Multiplexer	XMU	
Radio	RUS01 B2 (x2) (G1900), RUS01 B2 (x2) (U1900), RUS01 B4 (x2) (U2100), RUS01 B4 (x2) (L2100)	RRUS11 B12 (x3) (L700)

RAN Scope of Work:

Swap DUL with DUS41.Add XMU. Romove microwave. Remove 1 7/8" coax. Need to evaluate for fortworth design and platform to accommodate design.

RAN Template: 704Bu Outdoor	A&L Template: 704B_3DP

CT11360A_1.3_L700

Section 6 - A&L Equipment

Existing Template: Custom
Proposed Template: 704B_3DP

Sector 1 (Existing) view from behind	
Coverage Type	A - Outdoor Macro
Antenna	1
Antenna Model	APXV18-206516S-A20 (Dual)
Azimuth	25
M. Tilt	0
Height	96
Ports	P1
Active Tech.	U2100 U1900 L2100 G1900
Dark Tech.	
Restricted Tech.	
Decomm. Tech.	
E. Tilt	2
Cables	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.
TMAs	Generic Style 4 - Dual Diplexed PCS/AWS
Diplexers / Combiners	Generic AWS/PCS Diplexer
Radio	
Sector Equipment	

Unconnected Equipment:

Scope of Work:

RAN Template: 704Bu Outdoor	A&L Template: 704B_3DP

CT11360A_1.3_L700

Sector 1 (Proposed) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	APX16DWV-16DWV-S-E-A20 (Quad)		LNX-6515DS-A1M (Dual)
Azimuth	10		10
M. Tilt	0		0
Height	96		96
Ports	P1	P2	P3
Active Tech.	U1900 G1900	U2100 L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt	2	2	2
Cables	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.
TMAs	Generic Style 1A - Twin PCS	Generic Style 1B - Twin AWS	
Diplexers / Combiners			
Radio			
Sector Equipment			Andrew Smart Bias T

Unconnected Equipment:

Scope of Work:

Ground Mounted TMA's.

RAN Template: 704Bu Outdoor	A&L Template: 704B_3DP

CT11360A_1.3_L700

Sector 2 (Existing) view from behind	
Coverage Type	A - Outdoor Macro
Antenna	1
Antenna Model	APXV18-206516S-A20 (Dual)
Azimuth	200
M. Tilt	0
Height	96
Ports	P1
Active Tech.	U2100 U1900 L2100 G1900
Dark Tech.	
Restricted Tech.	
Decomm. Tech.	
E. Tilt	2
Cables	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.
TMAs	Generic Style 4 - Dual Diplexed PCS/AWS
Diplexers / Combiners	Generic AWS/PCS Diplexer
Radio	
Sector Equipment	

Unconnected Equipment:

Scope of Work:

RAN Template: 704Bu Outdoor	A&L Template: 704B_3DP

CT11360A_1.3_L700

Sector 2 (Proposed) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	APX16DWV-16DWV-S-E-A20 (Quad)		LNX-6515DS-A1M (Dual)
Azimuth	120		120
M. Tilt	0		0
Height	96		96
Ports	P1	P2	P3
Active Tech.	U1900 G1900	U2100 L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt	2	2	2
Cables	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.
TMAs	Generic Style 1A - Twin PCS	Generic Style 1B - Twin AWS	
Diplexers / Combiners			
Radio			
Sector Equipment			Andrew Smart Bias T

Unconnected Equipment:

Scope of Work:

Ground Mounted TMA's

RAN Template: 704Bu Outdoor	A&L Template: 704B_3DP

CT11360A_1.3_L700

Sector 3 (Proposed) view from behind			
Coverage Type	A - Outdoor Macro		
Antenna	1		2
Antenna Model	APX16DWV-16DWV-S-E-A20 (Quad)		LNX-6515DS-A1M (Dual)
Azimuth	240		240
M. Tilt	0		0
Height	96		96
Ports	P1	P2	P3
Active Tech.	U1900 G1900	U2100 L2100	L700
Dark Tech.			
Restricted Tech.			
Decomm. Tech.			
E. Tilt	2	2	2
Cables	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.	1-5/8" Coax - 115 ft. 1-5/8" Coax - 115 ft.
TMAs	Generic Style 1A - Twin PCS	Generic Style 1B - Twin AWS	
Diplexers / Combiners			
Radio			
Sector Equipment			Andrew Smart Bias T

Unconnected Equipment:

Scope of Work:

Ground Mounted TMA's

Product Data Sheet **APX16DWV-16DWVS-E-A20**

Optimizer® Side-by-Side Dual Polarized Antenna, 1710-2200, 65deg, 18.4dBi, 1.4m, VET, 0-10deg RET

Product Description

A combination of two X-Polarized antennas in a single radome, this pair of variable tilt antennas provides exceptional suppression of all upper sidelobes at all downtilt angles. It also features a wide downtilt range. This antenna is optimized for performance across the entire frequency band (1710-2200 MHz). The antenna comes pre-connected with two antenna control units (ACU).

Features/Benefits

- **Variable electrical downtilt - provides enhanced precision in controlling intercell interference. The tilt is infield adjustable 0-10 deg.**
- **High Suppression of all Upper Sidelobes (Typically <-20dB).**
- **Gain tracking – difference between AWS UL (1710-1755 MHz) and DL (2110-2155 MHz) <1dB.**
- **Two X-Polarised panels in a single radome.**
- **Azimuth horizontal beamwidth difference <4deg between AWS UL (1710-1755 MHz) and DL (2110-2155 MHz).**
- **Low profile for low visual impact.**
- **Dual polarization; Broadband design.**
- **Includes (2) AISG 2.0 Compatible ACU-A20-N antenna control units.**

Technical Specifications

Electrical Specifications

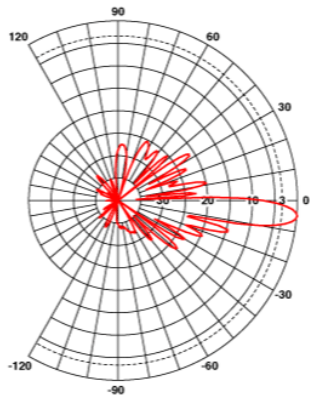
Frequency Range, MHz	1710-2200
Horizontal Beamwidth, deg	65
Vertical Beamwidth, deg	5.9 to 7.7
Electrical Downtilt, deg	0-10
Gain, dBi (dBd)	18.4 (16.3)
1st Upper Sidelobe Suppression, dB	> 18 (typically > 20)
Upper Sidelobe Suppression, dB	> 18 all (typically > 20)
Front-To-Back Ratio, dB	>26 (typically 28)
Polarization	Dual pol +/-45°
VSWR	< 1.5:1
Isolation between Ports, dB	> 30
3rd Order IMP @ 2 x 43 dBm, dBc	> 150 (155 Typical)
Impedance, Ohms	50
Maximum Power Input, W	300
Lightning Protection	Direct Ground
Connector Type	(4) 7-16 Long Neck Female

Mechanical Specifications

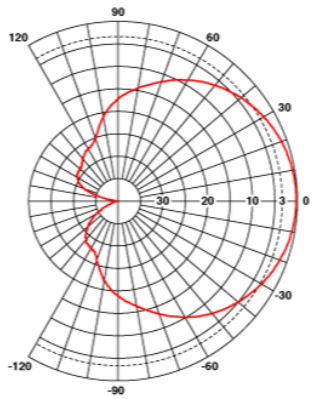
Dimensions - HxWxD, mm (in)	1420 x 331 x 80 (55.9 x 13 x 3.15)
Weight w/o Mtg Hardware, kg (lb)	18.5 (40.7)
Survival Wind Speed, km/h (mph)	200 (125)
Rated Wind Speed, km/h (mph)	160 (100)
Max Wind Loading Area, m² (ft²)	0.47 (5.03)
Front Thrust @ Rated Wind, N (lbf)	756 (170)
Maximum Thrust @ Rated Wind, N (lbf)	756 (170)
Wind Load - Side @ Rated Wind, N (lbf)	231 (52)
Wind Load - Rear @ Rated Wind, N (lbf)	408 (92)
Radome Material	Fiberglass
Radome Color	Light Grey RAL7035
Mounting Hardware Material	Diecasted Aluminum
Shipping Weight, kg (lb)	24.5 (53.9)
Packing Dimensions, HxWxD, mm (in)	1520 x 408 x 198 (59.8 x 16 x 7.8)

Ordering Information

Mounting Hardware	APM40-2 + APM40-E2

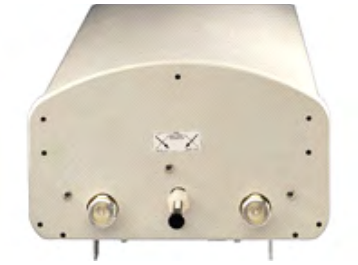


Vertical Pattern



Horizontal Pattern

Product Specifications



LNX-6515DS-VTM

Andrew® Antenna, 698–896 MHz, 65° horizontal beamwidth, RET compatible

- Excellent choice to maximize both coverage and capacity in suburban and rural applications
- Fully compatible with Andrew remote electrical tilt system for greater OpEx savings
- Exceptional horizontal pattern roll-off and strong front-to-back ratio
- Extended bandwidth allows one antenna to serve multiple frequency allocations
- Great solution to maximize network coverage and capacity
- The RF connectors are designed for IP67 rating and the radome for IP56 rating
- The values presented on this datasheet have been calculated based on N-P-BASTA White Paper version 9.6 by the NGMN Alliance

Electrical Specifications

Frequency Band, MHz	**698–806**	**806–896**
Gain by all Beam Tilts, average, dBi	16.6	16.9
Gain by all Beam Tilts Tolerance, dB	±0.4	±0.3
Gain by Beam Tilt, average, dBi	0 ° | 16.6 4 ° | 16.6 8 ° | 16.4	0 ° | 17.0 4 ° | 17.0 8 ° | 16.8
Beamwidth, Horizontal, degrees	65	64
Beamwidth, Horizontal Tolerance, degrees	±1	±0.9
Beamwidth, Vertical, degrees	9.7	8.6
Beamwidth, Vertical Tolerance, degrees	±0.6	±0.4
Beam Tilt, degrees	0–8	0–8
USLS, dB	18	18
Front-to-Back Total Power at 180° ± 30°, dB	25	23
CPR at Boresight, dB	24	27
CPR at Sector, dB	15	13
Isolation, dB	30	30
VSWR | Return Loss, dB	1.4 | 15.6	1.4 | 15.6
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153
Input Power per Port, maximum, watts	400	400
Polarization	±45°	±45°
Impedance	50 ohm	50 ohm

General Specifications

Antenna Brand	Andrew®
Antenna Type	DualPol®
Band	Single band
Brand	DualPol® | Teletilt®
Operating Frequency Band	698 – 896 MHz

Mechanical Specifications

Color	Light gray
Lightning Protection	dc Ground
Radiator Material	Aluminum
Radome Material	Fiberglass, UV resistant

Product Specifications

LNX-6515DS-VTM

RF Connector Interface	7-16 DIN Female
RF Connector Location	Bottom
RF Connector Quantity, total	2
Wind Loading, maximum	878.0 N @ 150 km/h 197.4 lbf @ 150 km/h
Wind Speed, maximum	241.0 km/h | 149.8 mph

Dimensions

Depth	181.0 mm | 7.1 in
Length	2449.0 mm | 96.4 in
Width	301.0 mm | 11.9 in
Net Weight	19.8 kg | 43.7 lb

Remote Electrical Tilt (RET) Information

Model with Factory Installed AISG 1.1 Actuator	LNX-6515DS-R2M
Model with Factory Installed AISG 2.0 Actuator	LNX-6515DS-A1M
RET System	Teletilt®

Regulatory Compliance/Certifications

Agency	Classification
RoHS 2011/65/EU	Compliant by Exemption
China RoHS SJ/T 11364-2006	Above Maximum Concentration Value (MCV)
ISO 9001:2008	Designed, manufactured and/or distributed under this quality management system

Included Products

DB380-3 — Pipe Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Used for wide panel antennas. Includes three clamp sets.

DB5083D — Downtilt Mounting Kit for 2.4"-4.5" (60-115 mm) OD round members. Consists of two DB5083 heavy-duty, galvanized steel downtilt mounting brackets. This kit is compatible with the DB380-3 pipe mount for panel antennas with three mounting points.

Exhibit E

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11360A

Westport/Rt 136
640 Westport Turnpike
Fairfield, CT 06824

April 27, 2017

EBI Project Number: 6217001848

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	5.01 %

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

EBI Consulting
environmental | engineering | due diligence

April 27, 2017

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11360A – Westport/Rt 136**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **640 Westport Turnpike, Fairfield, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (µW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

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

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

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **640 Westport Turnpike, Fairfield, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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

1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

3) 2 UMTS channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel

5) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

6) Since all radios are ground mounted there are additional cabling losses accounted for. For each ground mounted RF path the following losses were calculated. 0.65 dB of additional cable loss for all ground mounted 700 MHz Channels, 1.18 dB of additional cable loss for all ground mounted 1900 MHz channels and 1.22 dB of additional cable loss for all ground mounted 2100 MHz channels were factored into the calculations used for this analysis. This is based on manufacturers Specifications for 115 feet of 1-5/8" coax cable on each path.

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

8) For the following calculations the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

9) The antennas used in this modeling are the **RFS APX16DWV-16DWVS-E-A20** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **Commscope LNX-6515DS-A1M** for 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APX16DWV-16DWVS-E-A20** has a maximum gain of **16.3 dBd** at its main lobe at 1900 MHz and 2100 MHz. The **Commscope LNX-6515DS-A1M** has a maximum gain of **14.6 dBd** at its main lobe at 700 MHz. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

10) The antenna mounting height centerline of the proposed antennas is **96 feet** above ground level (AGL).

11) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves. Per the Connecticut Siting Council active database there are no additional carriers listed at this facility.

12) All calculations were done with respect to uncontrolled / general public threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20	Make / Model:	RFS APX16DWV-16DWVS-E-A20
Gain:	16.3 dBd	Gain:	16.3 dBd	Gain:	16.3 dBd
Height (AGL):	96	Height (AGL):	96	Height (AGL):	96
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	8	Channel Count	8	Channel Count	8
Total TX Power(W):	300	Total TX Power(W):	300	Total TX Power(W):	300
ERP (W):	9,698.97	ERP (W):	9,698.97	ERP (W):	9,698.97
Antenna A1 MPE%	4.30	Antenna B1 MPE%	4.30	Antenna C1 MPE%	4.30
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M	Make / Model:	Commscope LNX-6515DS-A1M
Gain:	14.6 dBd	Gain:	14.6 dBd	Gain:	14.6 dBd
Height (AGL):	96	Height (AGL):	96	Height (AGL):	96
Frequency Bands	700 MHz	Frequency Bands	700 MHz	Frequency Bands	700 MHz
Channel Count	1	Channel Count	1	Channel Count	1
Total TX Power(W):	30	Total TX Power(W):	30	Total TX Power(W):	30
ERP (W):	744.94	ERP (W):	744.94	ERP (W):	744.94
Antenna A2 MPE%	0.71	Antenna B2 MPE%	0.71	Antenna C2 MPE%	0.71

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**5.01 %**
No Additional Carriers On Site	NA
Site Total MPE %:	**5.01 %**

T-Mobile Sector A Total:	5.01 %
T-Mobile Sector B Total:	5.01 %
T-Mobile Sector C Total:	5.01 %
Site Total:	5.01 %

T-Mobile _Max Values per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1900 MHz UMTS	2	975.26	96	8.66	PCS - 1900 MHz	1000	0.86%
T-Mobile PCS - 1900 MHz GSM	2	975.26	96	8.66	PCS - 1900 MHz	1000	0.86%
T-Mobile AWS - 2100 MHz UMTS	2	966.32	96	8.58	AWS - 2100 MHz	1000	0.86%
T-Mobile AWS - 2100 MHz LTE	2	2,433.05	96	21.60	AWS - 2100 MHz	1000	1.72%
T-Mobile 700 MHz LTE	1	744.94	96	3.31	700 MHz	467	0.71%
						Total:	**5.01%**

Summary

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

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	5.01 %
Sector B:	5.01 %
Sector C:	5.01 %
T-Mobile Per Sector Maximum:	5.01 %
Site Total:	5.01 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.01%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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

Exhibit F

EVERSOURCE ENERGY

56 Prospect Street, Hartford, CT
06103

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

June 12, 2017

Mr. Mark Richard
T-Mobile
35 Griffin Road South
Bloomfield, CT 06002

RE: T-Mobile Antenna Site, CT-11 360A, Westport Turnpike, Fairfield, structure 910

Dear Mr. Richard:

Based on our reviews of the site drawings provided by ForeSite, the structural analysis and foundation review provided by Centek Engineering, along with a third party review performed by Paul J. Ford & Co., we have reviewed for acceptance this modification.

Since there are no outstanding structural or site related issues to resolve at this time, please contact Mr. Henry O'Brien of Eversource Real Estate (860-665-6987) to review and execute the lease amendment.

Sincerely,

Joel Szarkowicz
Transmission Line & Civil Engineering

Ref: CT11360A-L700-CD-V1 (S&S).pdf
Ref: 16159.11 – CT11360A Structural Analysis Rev1 17.05.05.pdf