HPC Wireless Services
22 Shelter Rock Lane.
Building C
Danbury, CT, 06810
P.: 203.797.1112

HPC
WIRELESS SERVICES

July 25, 2014

VIA OVERNIGHT COURIER

Connecticut Siting Council
10 Franklin Square
New Britain, Connecticut 06051
Attn: Ms. Melanie Bachman, Acting Executive Director

Re: Sprint Spectrum, L.P. – Exempt Modification
242 Pent Road (aka 236 Pent Road), Beacon Falls, Connecticut

Dear Ms. Bachman:

This letter and attachments are submitted on behalf of Sprint Spectrum, L.P. ("Sprint"). Sprint is undertaking modifications to certain existing sites in its Connecticut system in order to implement updated technology. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction that constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and attachments is being sent to the First Selectman of the Town of Beacon Falls.

Sprint plans to modify the existing wireless communications facility owned by The Connecticut Light and Power Company and located at 242 Pent Road (aka 236 Pent Road), Beacon Falls, (coordinates 41°-26'-40.24" N, 73°-04'-22.02" W). Attached are plan and elevation drawings depicting the planned changes, and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration. Also included is a power density report reflecting the modification to Sprint's operations at the site.

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes ("C.G.S.") Section 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in R.C.S.A. Section 16-50j-72(b)(2).

1. Sprint will remove the existing four (4) CMDA antennas and add two (2) dual-band panel LTE antennas on existing pipe masts, at a centerline height of approximately 96.25' above grade. Sprint will also remove the existing eight (8) cables and install four (4) new cables along the existing coaxial run. The existing platform will also be removed. The proposed modifications will not extend the height of the approximately

81' structure, which is approximately 96' when the existing extension is included.

2. Sprint will add one (1) new equipment cabinet and replace the two (2) existing cabinets with similar cabinets, for a total of three (3) cabinets on the existing steel platform and Concrete Pad. Sprint will also add two (2) RRHs (Remote Radio Heads) on a new Unistrut Frame and new mounting pipe, also all on the existing steel platform and Concrete Pad. The existing GPS antenna will be replaced by another GPS antenna. The existing Distribution and Fiber Management enclosure will remain. AAV work shall also occur. These changes will have no effect on the site boundaries and the rental area of 40' X 45' shall not be increased.

3. The proposed changes will not increase the noise level at the existing facility by six decibels or more. The incremental effect of the proposed changes will be negligible.

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated on the attached report prepared by EBI Consulting, Sprint's operations at the site will result in a total power density of approximately 12.243%, which is also the total power density as Sprint is the only Carrier at this location.

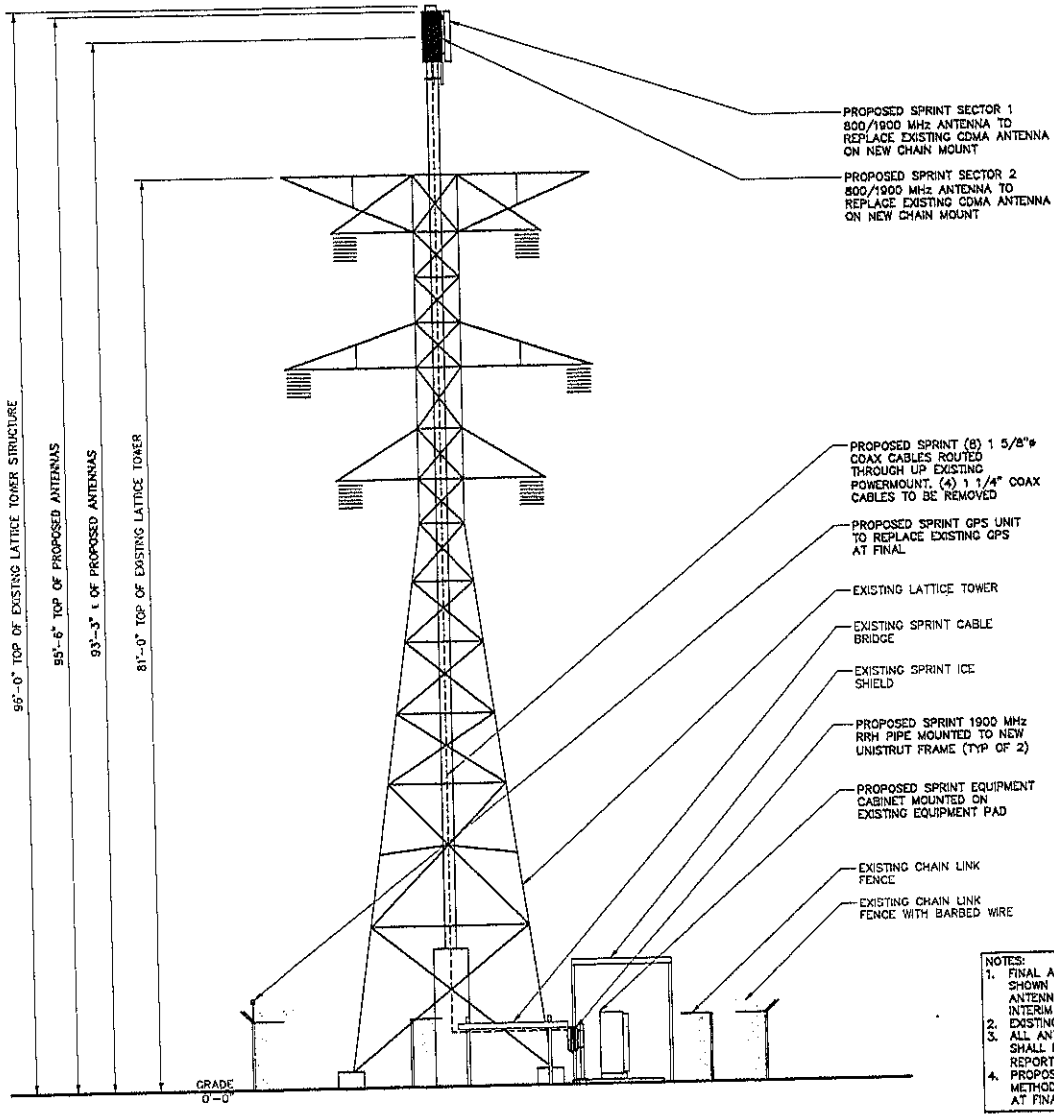
Please contact me by phone at (203) 610-1071 or by e-mail at mjhowlett@optonline.netwith questions concerning this matter. Thank you for your consideration.

Respectfully yours,

Melanie J. Howlett

Attachments

cc: Honorable Christopher J. Bielik, First Selectman, Town of Beacon Falls
Darlene and Carol Griska (underlying property owners)



NOTES:
1. FINAL ANTENNA & EQUIPMENT CONFIGURATION SHOWN ON THIS PLAN. SEE EQUIPMENT & ANTENNA PLAN SHEETS FOR EXISTING AND INTERIM CONFIGURATION.
2. EXISTING TOWER INVENTORY PROVIDED BY OTHERS.
3. ALL ANTENNA AND CABLING WORK ON THE TOWER SHALL BE IN ACCORDANCE WITH STRUCTURAL REPORT FOR THE TOWER (BY OTHERS).
4. PROPOSED CABLING TO FOLLOW EXISTING ROUTE & METHOD OF ATTACHMENT. REMOVE EXISITNG COAX AT FINAL

1 SOUTHEAST ELEVATION

11x17 SCALE: 3/32" = 1'-0" | 24x36 SCALE: 3/16" = 1'-0"

Sprint

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
5	10-01-13	ISSUED FOR CONSTRUCTION	AHS	KMB
4	04-29-14	REVISED PER CLIENT COMMENTS	JRP	KMB
3	05-12-14	REVISED PER CLIENT COMMENTS	JLS	KMB
2	05-17-14	REVISED PER CLIENT COMMENTS	JRP	KMB
1				
0				

KMB DESIGN GROUP
kmbdg.com
100B ROUTE 36, SUITE 209
HAZLET, NJ 07717
(732) 286-5671

Stephen A. Bray
PROFESSIONAL ENGINEER
STATE OF CONNECTICUT
STEPHEN A. BRAY
NO. 26057
LICENCED PROFESSIONAL ENGINEER

CT LICENSE: 26057 6/17/14

PROJECT NUMBER: 332.1463

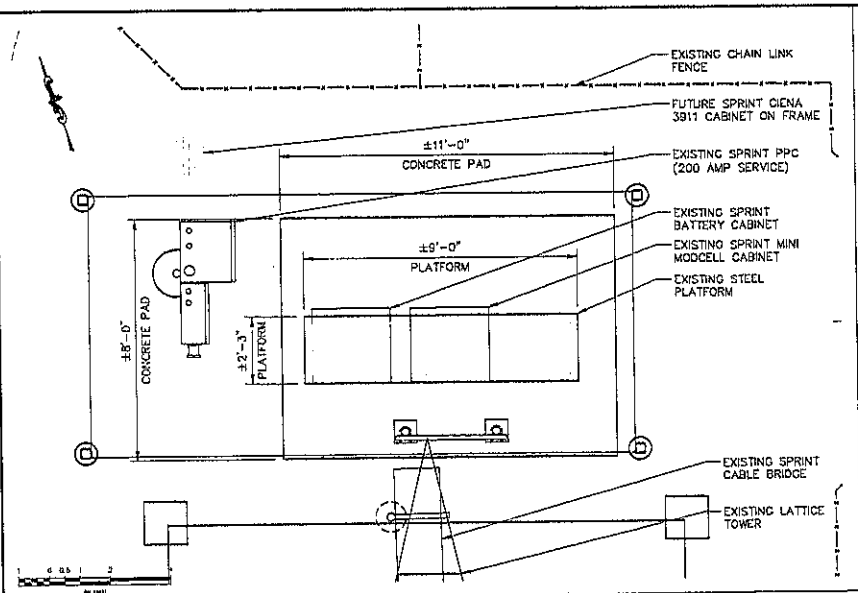
SITE INFORMATION:
236 PENT RD
BEACON FALLS, CT 06403
NEW HAVEN COUNTY
CL&P #326
CT03XC037

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-07-12

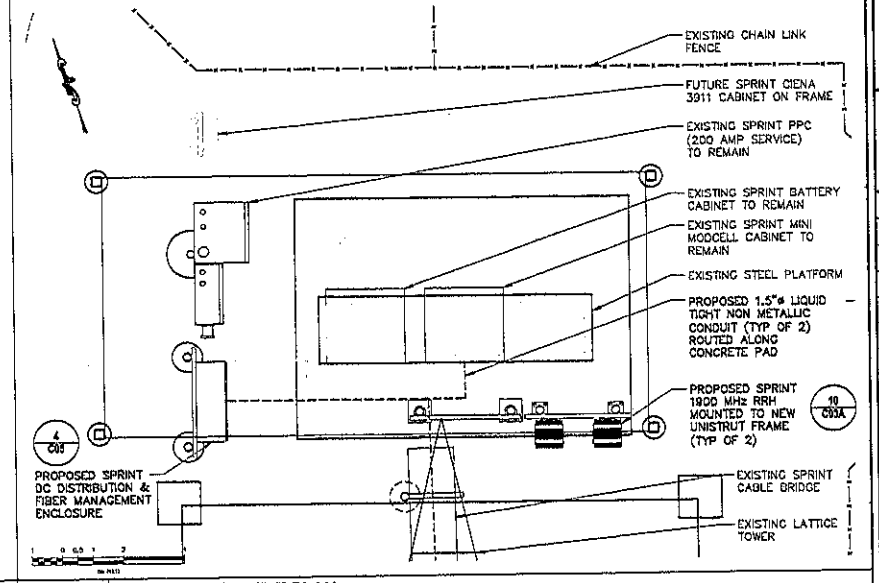
SHEET TITLE: ELEVATION

SHEET NUMBER: C02A REV: 3



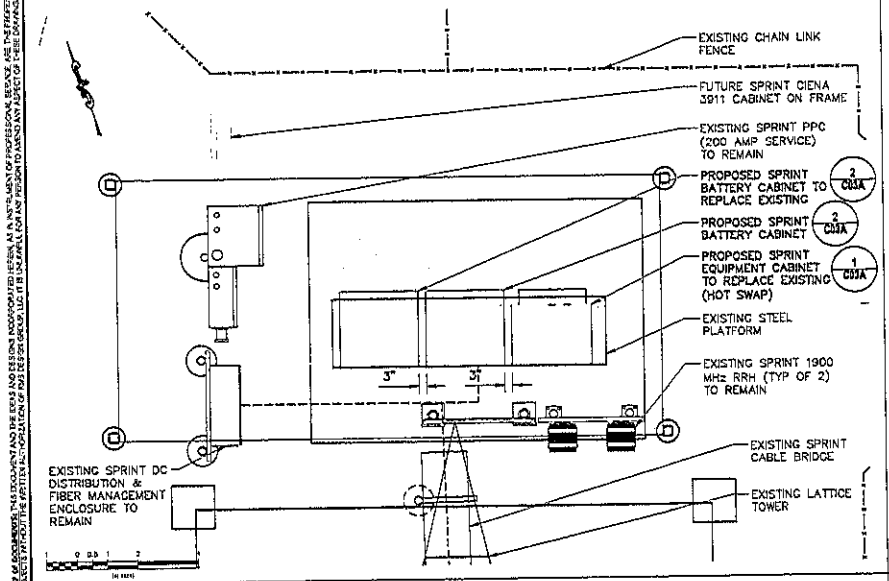
1 EXISTING EQUIPMENT PLAN

11x17 SCALE: 1/4" = 1'-0" | 24x36 SCALE: 1/2" = 1'-0"



2 INTERIM EQUIPMENT PLAN

11x17 SCALE: 1/4" = 1'-0" | 24x36 SCALE: 1/2" = 1'-0"



3 FINAL EQUIPMENT PLAN

11x17 SCALE: 1/4" = 1'-0" | 24x36 SCALE: 1/2" = 1'-0"

NOTE:
1. CONTRACTOR TO REPLACE ALL MISSING GROUND BARS AND GROUNDING CONNECTIONS AS REQUIRED.

Sprint

Alcatel·Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
1	08/17/14	REVISED PER CLIENT COMMENTS	JRP	KMB
2	08/13/14	REVISED PER CLIENT COMMENTS	JLS	KMB
3	06/09/14	REVISED PER CLIENT COMMENTS	JRP	KMB
4	05/09/13	ISSUED FOR CONSTRUCTION	AHS	KMB

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WALL, NJ 07719
(732) 306-9433

Stephen A. Bray
PROFESSIONAL ENGINEER

STATE OF CONNECTICUT · STEPHEN A. BRAY · No. 20657 · LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 20657 8/17/14

PROJECT NUMBER: 332.1463

SITE INFORMATION:
236 PENT RD
BEACON FALLS, CT 06403
NEW HAVEN COUNTY
CL&P #326
CT03XC037

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-07-12

SHEET TITLE: EQUIPMENT PLANS

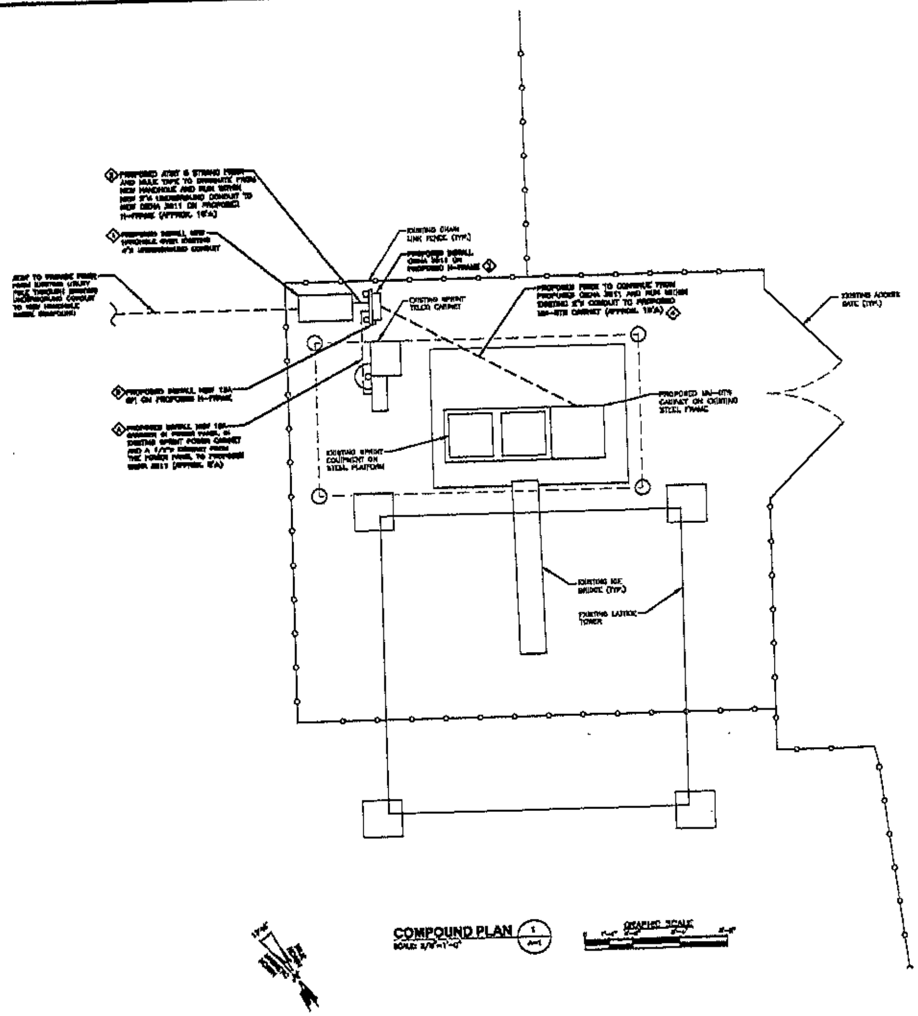
SHEET NUMBER: C03 | REV.: 3

AAV SCOPE OF WORK NOTES:

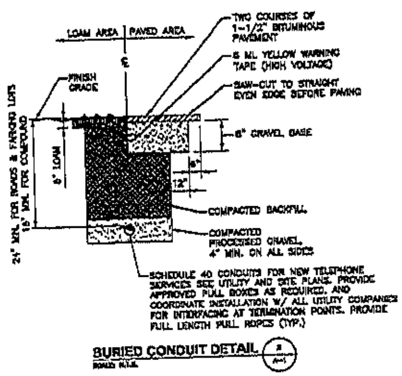
1. FIBER RUN: PROPOSED INSTALL NEW HANDHOLE OVER EXISTING 4"Ø UNDERGROUND CONDUIT
2. PROPOSED AT&T 6 STRAND FIBER AND MULE TAPE TO ORIGINATE FROM NEW HANDHOLE AND RUN WITHIN NEW 2"Ø UNDERGROUND CONDUIT TO NEW CIENA 3911 ON PROPOSED H-FRAME (APPROX. 10'±)
3. PROPOSED INSTALL CIENA 3911 ON PROPOSED H-FRAME
4. PROPOSED FIBER TO CONTINUE FROM PROPOSED CIENA 3911 AND RUN WITHIN EXISTING 2"Ø CONDUIT TO PROPOSED MM-BTS CABINET (APPROX. 15'±)
5. POWER RUN: PROPOSED INSTALL NEW 15A BREAKER IN POWER PANEL IN EXISTING SPRINT POWER CABINET AND A 1/2"Ø CONDUIT FROM THE POWER PANEL TO PROPOSED CIENA 3911 (APPROX. 8'±)
6. PROPOSED INSTALL NEW 15A GFI ON PROPOSED H-FRAME

CALL BEFORE YOU DIG

CALL TOLL FREE 800-922-4455



COMPOUND PLAN (1/A-1)



BURIED CONDUIT DETAIL (2/A-1)

SCALE: N.T.S.

Sprint

Alcatel-Lucent

Hudson Design Group

SUBMITTALS

SITE NUMBER: CT03XC037

SITE NAME: NU – BEACON FALLS (CL&P)

SITE ADDRESS: 236 PENT ROAD BEACON FALLS, CT 06403

COMPOUND PLAN

A-1

KMB DID NOT PERFORM THE AAV DESIGN VISIT. THIS WAS DONE BY OTHERS AND IS INCLUDED FOR REFERENCE ONLY.

Sprint

Alcatel-Lucent

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
	03-17-14	REVISED PER CLIENT COMMENTS	JRP	KMB
	06-13-14	REVISED PER CLIENT COMMENTS	JLB	KMB
	04-29-14	REVISED PER CLIENT COMMENTS	JRP	KMB
	10-06-12	ISSUED FOR CONSTRUCTION	AMR	KOD

KMB DESIGN GROUP
kmbdg.com

Stephen A. Bray
PROFESSIONAL ENGINEER

CT LICENSE: 26657 — 6/17/14

PROJECT NUMBER: 332.1463

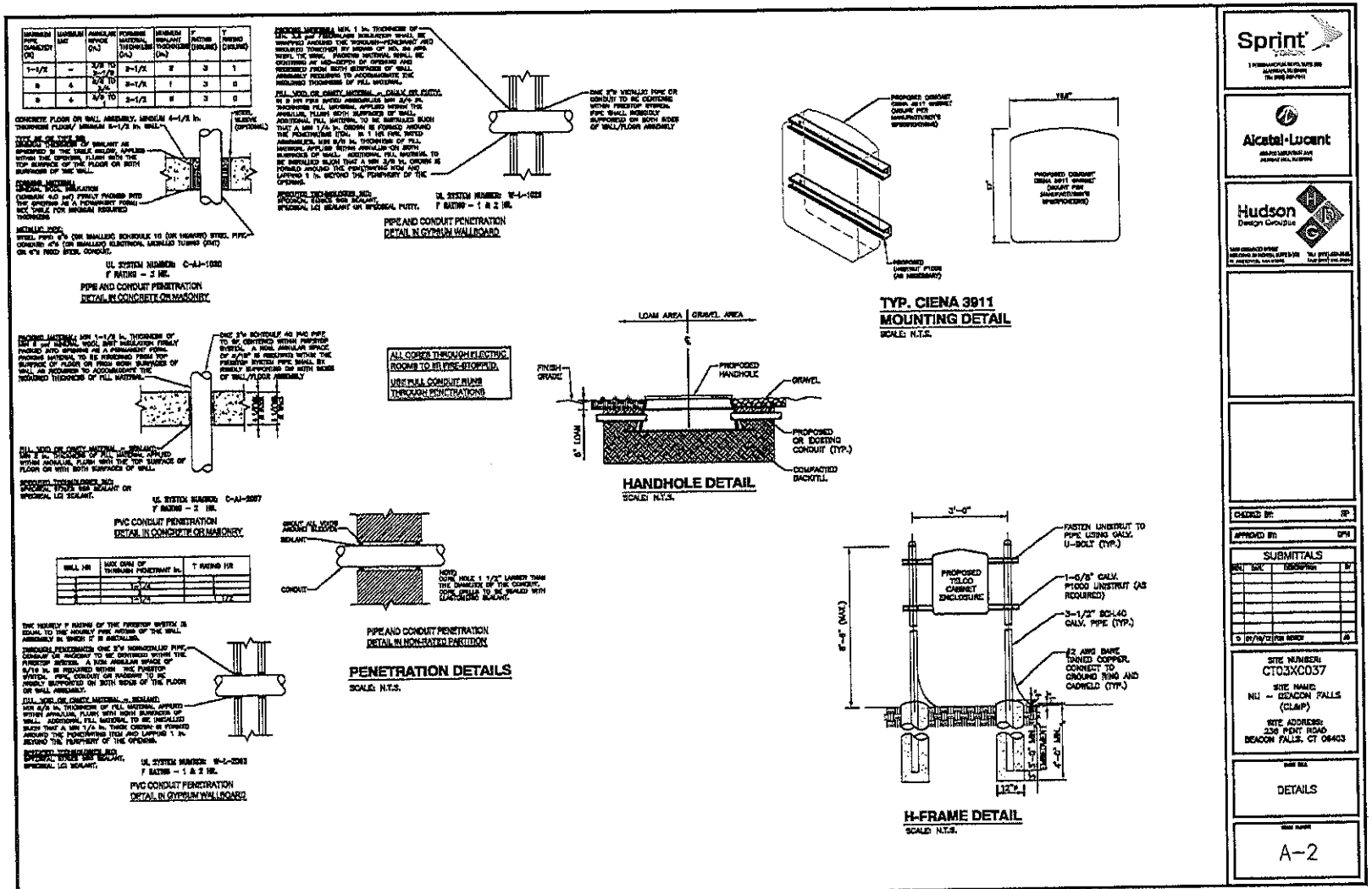
SITE INFORMATION:
236 PENT RD
BEACON FALLS, CT 06403
NEW HAVEN COUNTY
CL&P #326
CT03XC037

PROJECT TYPE: NETWORK VISION

DRAWN BY: JLS | CHECKED BY: | DATE: 03-07-12

SHEET TITLE: AAV DRAWINGS

SHEET NUMBER: C07B | REV: 3



Sprint

Alcatel·Lucent

Hudson Design Group LLC

REV.	DATE	REVISION DESCRIPTION	DRAWN BY	CHKD. BY
1	01-17-14	REVISED PER CLIENT COMMENTS	JRF	KMB
2	01-13-14	REVISED PER CLIENT COMMENTS	JLS	KMB
1	04-09-14	REVISED PER CLIENT COMMENTS	JRF	SMS
0	12-06-12	ISSUED FOR CONSTRUCTION	ANS	RCD

CHECKED BY: SP

APPROVED BY: SPM

SUBMITTALS

NO.	DATE	DESCRIPTION	BY
0	01/10/13	FOR BIDDING	JS

SITE NUMBER: CT03XC037

SITE NAME: NU – BEACON FALLS (CL&P)

SITE ADDRESS: 236 PENT ROAD BEACON FALLS, CT 06403

SHEET TITLE: DETAILS

SHEET NUMBER: A-2

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(732) 359-0022

Stephen A. Bray
PROFESSIONAL ENGINEER

STATE OF CONNECTICUT — STEPHEN A. BRAY — LICENSED PROFESSIONAL ENGINEER

CT LICENSE: 20697 — 9/17/14

PROJECT NUMBER: 332.1463

SITE INFORMATION:
236 PENT RD
BEACON FALLS, CT 06403
NEW HAVEN COUNTY
CL&P #326
CT03XC037

PROJECT TYPE: NETWORK VISION

DRAWN BY:	CHECKED BY:	DATE:
JLS		03-07-12

SHEET TITLE: AAV DRAWINGS

SHEET NUMBER: C07C — REV.: 3

KMB DID NOT PERFORM THE AAV DESIGN VISIT. THIS WAS DONE BY OTHERS AND IS INCLUDED FOR REFERENCE ONLY.

CENTEK engineering

Centered on Solutions℠

Structural Analysis of Powermount and CL&P Tower

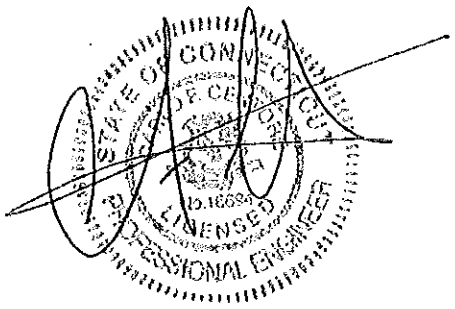
Sprint Site Ref: CT03XC037

CL&P Structure No. 326
81' Electric Transmission Lattice Tower

236 Pent Road
Beacon Falls, CT

CENTEK Project No. 12047.CO15

~~Date: April 1, 2013~~
~~Rev 1: June 4, 2013~~
Rev 2: March 6, 2014



Prepared for:
Sprint Nextel
8 Airline Drive, Suite 105
Albany, NY 12205

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

CENTEK Engineering, Inc.
Structural Analysis – 81-ft CL&P Tower # 326
Sprint Antenna Upgrade - CT03XC037
Beacon Falls, CT
Rev 2 ~ March 6, 2014

Table of Contents

CENTEK Engineering, Inc.
Structural Analysis – 81-ft CL&P Tower # 326
Sprint Antenna Upgrade - CT03XC037
Beacon Falls, CT
Rev 2 ~ March 6, 2014

Introduction

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

The proposed loads consist of the following:

- SPRINT (Existing to Remain)
  Mast: 12" Sch. 40 (O.D. = 12.75") x 96'-3" tall ASTM A500 Gr. 42 FWT powermount.
- **SPRINT (Existing to Remove)**
  Antennas: Four (4) Decibel DB980H90E-M panel antennas mounted on an existing 14-ft low profile platform to the existing powermount with a RAD center elevation of 93.25-ft above grade.
  Coax Cables: Four (4) 1-1/4" ∅ coax cables mounted within the existing powermount.
- **SPRINT (Proposed):**
  Antennas: Two (2) RFS APXVSPP18-C panel antennas flush mounted to the existing powermount with a RAD center elevation of 96.25-ft above grade.
  Coax Cables: Eight (8) 1-5/8" ∅ coax cables mounted within the existing powermount.

Primary assumptions used in the analysis

- Allowable steel stresses are defined by AISC-ASD 9th edition for design of the Powermount and antenna supporting elements.
- ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", defines allowable steel stresses for evaluation of the CL&P utility tower.
- All utility tower members are adequately protected to prevent corrosion of steel members.
- All proposed antenna mounts are modeled as listed above.
- All coaxial cable will be installed within the powermount unless specified otherwise.
- Powermount will be properly installed and maintained.
- No residual stresses exist due to incorrect tower erection.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds conform to the requirements of AWS D1.1.
- Powermount and utility tower will be in plumb condition.
- Utility tower was properly installed and maintained and all members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
- Any deviation from the analyzed loading will require a new analysis for verification of structural adequacy.

CENTEK Engineering, Inc.
Structural Analysis – 81-ft CL&P Tower # 326
Sprint Antenna Upgrade - CT03XC037
Beacon Falls, CT
Rev 2 ~ March 6, 2014

Analysis

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

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

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

The existing 81-ft tall CL&P lattice tower was analyzed for its ability to resist loads prescribed by the NESC standard. Maximum usage for the tower was calculated considering the additional forces from the powermount and associated appurtenances. Section 7 of this report details these gravity and lateral wind loads.

Design Basis

Our analysis was performed in accordance with EIA-222-F-1996, ASCE Manual No. 10-97, "Design of Latticed Steel Transmission Structures", NESC C2-2007 and Northeast Utilities Design Criteria.

The CL&P tower structure, considering existing and future conductor and shield wire loading, with the existing powermount was analyzed under two conditions:

- UTILITY TOWER ANALYSIS

  The purpose of this analysis is to determine the adequacy of the existing utility structure to support the proposed antenna loads. The loading and design requirements were analyzed in accordance with the 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)

CENTEK Engineering, Inc.
Structural Analysis – 81-ft CL&P Tower # 326
Sprint Antenna Upgrade - CT03XC037
Beacon Falls, CT
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- POWERMOUNT ANALYSIS

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

Load cases considered:

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

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

Note 2: Per NU Mast Design Criteria Exception 1.

Results

- POWERMOUNT

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

Component	Design Limit	Stress Ratio (percentage of capacity)	Result
12" Sch. 40 Pipe	Bending	11.3%	**PASS**
L2x2x3/16 Brace	Bending	22.1%	**PASS**
Connection	Shear	35.3%	**PASS**

- UTILITY TOWER

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

A maximum usage of **84.51%** occurs in the utility structure under the **NESC Extreme** loading condition.

TOWER SECTION:

The utility structure was found to be within allowable limits.

Tower Member	Stress Ratio (% of capacity)	Result
Angle g38X	84.51%	**PASS**

- FOUNDATION AND ANCHORS

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

Review of the foundation design consisted of verification of applied loads obtained from the tower design calculations and comparison to original design loads:

BASE REACTIONS:

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

Load Case	Shear	Uplift	Compression
NESC Heavy Wind	8.64 kips	24.54 kips	43.94 kips
NESC Extreme Wind	10.07 kips	38.84 kips	49.00 kips

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

FOUNDATION:

The foundation was found to be within allowable limits.

Foundation	Design Limit	Allowable Limit	Proposed Loading (2)	Result
Reinf. Conc. Pad & Pier	Uplift	1.0 FS (1)	1.06 FS (1)	PASS

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

Conclusions and Recommendations

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

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:

Carlo F. Centore, PE
Principal ~ Structural Engineer

STATE OF CONNECTICUT
CARLO F. CENTORE
No. 16694
LICENSED
PROFESSIONAL ENGINEER

Prepared by:

Timothy J. Lynn, PE
Structural Engineer

CENTEK Engineering, Inc.
Structural Analysis – 81-ft CL&P Tower # 326
Sprint Antenna Upgrade - CT03XC037
Beacon Falls, CT
Rev 2 ~ March 6, 2014

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.

CENTEK Engineering, Inc.
Structural Analysis – 81-ft CL&P Tower # 326
Sprint Antenna Upgrade - CT03XC037
Beacon Falls, CT
Rev 2 ~ March 6, 2014

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.

CONDITIONS & SOFTWARE

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

Graphics Features:

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

Design Features:

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

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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.

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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

CONDITIONS & SOFTWARE

- 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.

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Rev 2 ~ March 6, 2014

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

Introduction

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

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

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

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

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

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

Note 1: *Prepared from documentation provide from Northeast Utilities.*

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PCS Mast

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

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

ELECTRIC TRANSMISSION TOWER

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

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

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

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

Northeast Utilities

Northeast Utilities
Overhead Transmission Standards

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.

Beacon Falls
STR #326
1570/1575 Line tower

1/2/98

	AHEAD COND	BACK COND
	4/0 CU	4/0 CU
DIAM =	0.522	0.522
WEIGHT =	0.653	0.653

LOADING PARAMETERS

bk
ah

	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK
	NESC		1" ICE		High Wind	
WIND (PSF)	4		0		20	
ICE (IN)	0.5		1		0	
OLF ANG	1.65		1.15		1.15	
OLF WIND	2.5		1.15		1.15	
OLF WT	1.5		1.15		1.15	
TENS (#) **	4500	4500	6222	6222	2907	2907

				NESC			1" ICE			High Wind		
STR	ANGLE	WIND SPAN	WGT SPAN	H	L	V	H	L	V	H	L	V
BACK	0	603	1153	765	-7425	2228	0	-7155	3375	603	-3343	866
AHEAD	0	603	1153	765	7425	2228	0	7155	3375	603	3343	866
				1530	**0**	**4457**	**0**	**0**	**6751**	**1207**	**0**	**1732**

10 PSF = 62.5 MPH

1/2/98

326 tower Shield Wire

1570/1575

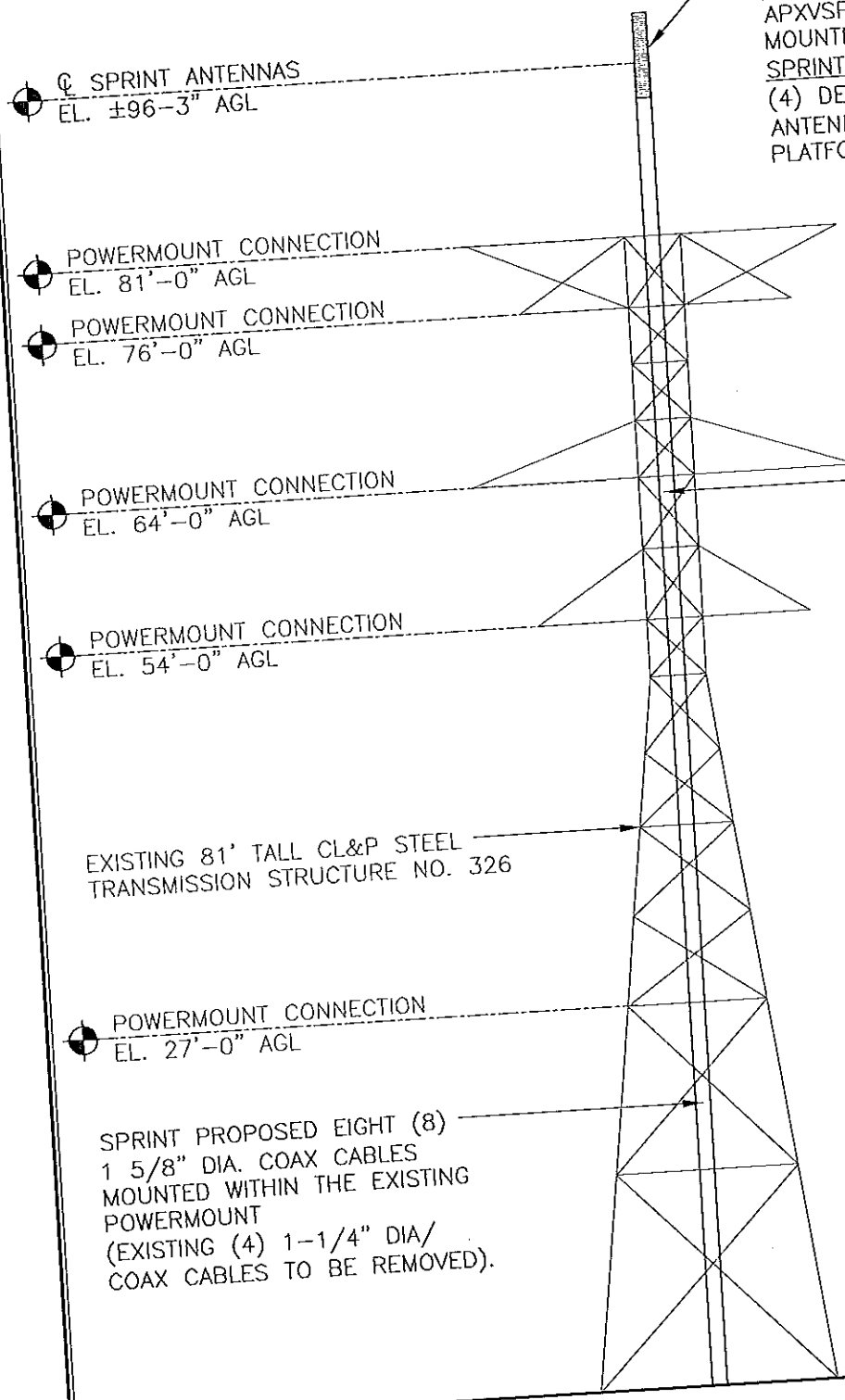
	AHEAD SW	BACK SW
	11/32 cw	11/32 cw
DIAM =	0.344	0.344
WEIGHT =	0.257	0.257

LOADING PARAMETERS

bk
ah

	AHEAD	BACK	AHEAD	BACK	AHEAD	BACK
	NESC		1" ICE		HIGH WIND	
WIND (PSF)	4		0		20	
ICE (IN)	0.5		1		0	
OLF ANG	1.65		1.15		1.15	
OLF WIND	2.5		1.15		1.15	
OLF WT	1.5		1.15		1.15	
TENS (#) **	3200	3200	4624	4624	1762	1762

				NESC			1" ICE			HIGH WIND		
STR	ANGLE	WIND SPAN	WGT SPAN	H	L	V	H	L	V	H	L	V
BACK	0	603	1153	675	-5280	1352	0	-5318	2557	398	-2026	341
AHEAD	0	603	1153	675	5280	1352	0	5318	2557	398	2026	341
				1351	**0**	**2704**	**0**	**0**	**5114**	**795**	**0**	**682**



1 / S-1 TOWER & POWERMOUNT ELEVATION

SCALE: NOT TO SCALE

REVISIONS		
00	4/1/13	ISSUED FOR NJ REVIEW
01	6/4/13	ISSUED FOR NJ REVIEW
02	6/4/13	CONSTRUCTION

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CT03XC037
CL&P 326

236 PENT ROAD
BEACON FALLS, CT 06403

PROJECT NO:	12047.C015
DRAWN BY:	TJL
CHECKED BY:	CFC
SCALE:	AS NOTED
DATE:	4/1/13

TOWER AND MAST ELEVATION

EL-1

DWG. 1 OF 1

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Subject: Load Analysis of Powermount on CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 2: 3/6/14

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

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

Wind Speeds

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

Heights above ground level, z

Powermount Section 1	$z_{pmnt1} := 75$	ft	(User Input)
Powermount Section 2	$z_{pmnt2} := 45$	ft	(User Input)
Powermount Section 3	$z_{pmnt3} := 15$	ft	(User Input)
Sprint	$z_{spt} := 93.25$	ft	(User Input)
Coax	$z_{coax} := 87$	ft	(User Input)

Exposure Coefficients, kz

(per TIA/EIA-222-F Section 2.3.3)

Powermount Section 1: $Kz_{pmnt1} := \left(\frac{z_{pmnt1}}{33}\right)^{\frac{2}{7}} = 1.264$

Powermount Section 2: $Kz_{pmnt2} := \left(\frac{z_{pmnt2}}{33}\right)^{\frac{2}{7}} = 1.093$

Powermount Section 3: $Kz_{pmnt3} := \left(\frac{z_{pmnt3}}{33}\right)^{\frac{2}{7}} = 0.798$

Sprint: $Kz_{spt} := \left(\frac{z_{spt}}{33}\right)^{\frac{2}{7}} = 1.346$

Coax: $Kz_{coax} := \left(\frac{z_{coax}}{33}\right)^{\frac{2}{7}} = 1.319$

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

Powermount Section 1 $qz_{pmnt1} := 0.00256 \cdot Kz_{pmnt1} \cdot V^2 = 23.386$

Powermount Section 2 $qz_{pmnt2} := 0.00256 \cdot Kz_{pmnt2} \cdot V^2 = 20.21$

Powermount Section 3 $qz_{pmnt3} := 0.00256 \cdot Kz_{pmnt3} \cdot V^2 = 14.765$

Sprint $qz_{spt} := 0.00256 \cdot Kz_{spt} \cdot V^2 = 24.887$

Coax $qz_{coax} := 0.00256 \cdot Kz_{coax} \cdot V^2 = 24.399$

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

Powermount Section 1 $qzICE_{pmnt1} := 0.00256 \cdot Kz_{pmnt1} \cdot V_i^2 = 17.725$

Powermount Section 2 $qzICE_{pmnt2} := 0.00256 \cdot Kz_{pmnt2} \cdot V_i^2 = 15.318$

Powermount Section 3 $qzICE_{pmnt3} := 0.00256 \cdot Kz_{pmnt3} \cdot V_i^2 = 11.191$

Sprint $qzICE_{spt} := 0.00256 \cdot Kz_{spt} \cdot V_i^2 = 18.862$

Coax $qzICE_{coax} := 0.00256 \cdot Kz_{coax} \cdot V_i^2 = 18.492$

TIA/EIA Common Factors:

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

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

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

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

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Subject: Load Analysis of Powermount on CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 2: 3/6/14

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

Development of Wind & Ice Load on Powermonut

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

Powermount Data:

(12" Std. Pipe)

Powermount Shape = Round (User Input)

Powermount Diameter = $D_{pmnt} := 12.8$ in (User Input)

Powermount Length = $L_{pmnt} := 96.25$ ft (User Input)

Powermount Thickness = $t_{pmnt} := 0.375$ in (User Input)

Velocity Coefficient = $C := \sqrt{Kz_{pmnt3}} \cdot V \cdot \frac{D_{pmnt}}{12} = 81$

Powermount Force Coefficient = $CF_{pmnt} = 0.59$ (per TIA/EIA-222-F Table 1)

Wind Load (without ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Powermount Projected Surface Area = $A_{pmnt} := \frac{D_{pmnt}}{12} = 1.067$ sf/ft

Total Powermount Section 1 Wind Force = $qz_{pmnt1} \cdot G_H \cdot CF_{pmnt} \cdot A_{pmnt} = 25$ plf **BLC 5,7**

Total Powermount Section 2 Wind Force = $qz_{pmnt2} \cdot G_H \cdot CF_{pmnt} \cdot A_{pmnt} = 21$ plf **BLC 5,7**

Total Powermount Section 3 Wind Force = $qz_{pmnt3} \cdot G_H \cdot CF_{pmnt} \cdot A_{pmnt} = 16$ plf **BLC 5,7**

Wind Load (with Ice)

(per TIA/EIA-222-F-1996 Section 2.3.2)

Powermount Projected Surface Area w/ Ice = $AICE_{pmnt} := \frac{(D_{pmnt} + 2 \cdot Ir)}{12} = 1.15$ sf/ft

Total Powermount Section 1 Wind Force w/ Ice = $qzICE_{pmnt1} \cdot G_H \cdot CF_{pmnt} \cdot AICE_{pmnt} = 20$ plf **BLC 4,6**

Total Powermount Section 2 Wind Force w/ Ice = $qzICE_{pmnt2} \cdot G_H \cdot CF_{pmnt} \cdot AICE_{pmnt} = 18$ plf **BLC 4,6**

Total Powermount Section 3 Wind Force w/ Ice = $qzICE_{pmnt3} \cdot G_H \cdot CF_{pmnt} \cdot AICE_{pmnt} = 13$ plf **BLC 4,6**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $AI_{pmnt} := \frac{\pi}{4}\left[\left(D_{pmnt} + Ir \cdot 2\right)^2 - D_{pmnt}^2\right] = 20.9$ sq in

Weight of Ice on Powermount = $W_{ICEpmnt} := Id \cdot \frac{AI_{pmnt}}{144} = 8$ plf **BLC 3**

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Subject: Load Analysis of Powermount on CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 2: 3/6/14

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

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

Antenna Data:

Antenna Model =	(Sprint) RFS APXVSPP18-C			
Antenna Shape =	Flat		(User Input)	
Antenna Height =	$L_{ant} := 72$	in	(User Input)	
Antenna Width =	$W_{ant} := 11.8$	in	(User Input)	
Antenna Thickness =	$T_{ant} := 7$	in	(User Input)	
Antenna Weight =	$WT_{ant} := 57$	lbs	(User Input)	
Number of Antennas =	$N_{ant} := 2$		(User Input)	
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.1$			
Antenna Force Coefficient =	$Ca_{ant} = 1.4$		(per TIA/EIA-222-F-1996 Table 3)	

(per TIA/EIA-222-F-1996 Section 2.3.2)

Wind Load (without ice)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.9$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 11.8$	sf	
Total Antenna Wind Force =	$F_{ant} := qz_{spt} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 695$	lbs	**BLC 5,7**

(per TIA/EIA-222-F-1996 Section 2.3.2)

Wind Load (with Ice)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.5$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 13$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qzICE_{spt} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 579$	lbs	**BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 114$	lbs	**BLC 2**

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5947$	cu in	
Volume of Ice on Each Antenna =	$V_{Ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1528$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{Ice}}{1728} \cdot Id = 50$	lbs	
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 99$	lbs	**BLC 3**

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Subject: Load Analysis of Powermount on CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 2: 3/6/14

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

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

Mount Data: (Sprint)

Mount Type: Tri-Sector Chain Mount

Mount Shape = Flat

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

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

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

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

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

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

Gravity Load (without ice)

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

Gravity Loads (ice only)

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

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Subject: Load Analysis of Powermount on CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 2: 3/6/14

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

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

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

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

Shape = Round (User Input)

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

Coax Cable Length = $L_{coax} := 93$ ft (User Input)

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

Total Number of Coax = $N_{coax} := 8$ (User Input)

No. of Coax Projecting Outside Face of PCS Mast = $NP_{coax} := 0$ (User Input) (Cables located inside Powermount)

Coax aspect ratio, $Ar_{coax} := \frac{(L_{coax} \cdot 12)}{D_{coax}} = 563.6$

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

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

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

Total Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{coax} \cdot G_H \cdot A_{coax} = 0$ plf **BLC 5,7**

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

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

Total Coax Wind Force w/ Ice = $FI_{coax} := Ca_{coax} \cdot qzICE_{coax} \cdot G_H \cdot AICE_{coax} = 0$ plf **BLC 4,6**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

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

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

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Subject: Load Analysis of Powermount on CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 2: 3/6/14

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

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

Member Data: L2x2x3/16

Antenna Shape = Flat (User Input)

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

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

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

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

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

Member Force Coefficient = $Ca_{mem} = 1.57$ (per TIA/EIA-222-F-1996 Table 3)

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

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

Total Member Wind Force = $F_{mem} := qz_{pmnt1} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 10$ plf **BLC 5,7**

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

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

Total Member Wind Force w/ Ice = $Fl_{mem} := qzICE_{pmnt1} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 12$ plf **BLC 4,6**

Gravity Load (without Ice)

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

Gravity Loads (Ice only)

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

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

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Subject: Load Analysis of Powermount on CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 2: 3/6/14

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

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

Member Data: L3x3x3/16

Antenna Shape = Flat (User Input)

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

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

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

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

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

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

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

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

Total Member Wind Force = $F_{mem} := qz_{pmnt3} \cdot G_H \cdot Ca_{mem} \cdot A_{mem} = 12$ plf **BLC 5,7**

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

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

Total Member Wind Force w/ Ice = $Fi_{mem} := qzICE_{pmnt3} \cdot G_H \cdot Ca_{mem} \cdot A_{ICEmem} = 13$ plf **BLC 4,6**

Gravity Load (without Ice)

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

Gravity Loads (ice only)

Ice Area per Linear foot = $Al_{mem} := \left[\left(H_{mem} + 2 \cdot Ir\right) + \left(W_{mem} - t_{mem}\right)\right] \cdot \left(t_{mem} + 2 \cdot Ir\right) - \left[H_{mem} + \left(W_{mem} + t_{mem}\right)\right] \cdot t_{mem} = 7$ sq in

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

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

Location: **Beacon Falls, CT**

Date: 3/15/13 Prepared by: T.J.L. Checked by: C.F.C. Job No. 12047.CO15

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

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

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

Location: **Beacon Falls, CT**
Date: 3/15/13 Prepared by: T.J.L. Checked by: C.F.C. Job No. 12047.CO15

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

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

Company : CENTEK Engineering, INC.
Designer : tjl, cfc
Job Number : 12047.CO15 - CT03XC037
CL&P Struct. #326 - Powermount

Mar 6, 2014
2:39 PM
Checked By:_____

Global

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

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

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	PCA Load Contour
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
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

Hot Rolled Steel Properties

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

Hot Rolled Steel Design Parameters

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

Hot Rolled Steel Section Sets

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

Member Primary Data

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

Joint Coordinates and Temperatures

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

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
		Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
1	N1							
2	N2							
3	N3							
4	N4							
5	N5							
6	N6							
7	N7							
8	N8	Reaction	Reaction	Reaction				
9	N9	Reaction	Reaction	Reaction				
10	N10	Reaction	Reaction	Reaction				
11	N11	Reaction	Reaction	Reaction				
12	N12	Reaction	Reaction	Reaction				
13	N13	Reaction	Reaction	Reaction				
14	N14	Reaction	Reaction	Reaction				
15	N15	Reaction	Reaction	Reaction				
16	N16	Reaction	Reaction	Reaction				
17	N18	Reaction	Reaction	Reaction				
18	N19	Reaction	Reaction	Reaction				
19	N21	Reaction	Reaction	Reaction				
20	N22	Reaction	Reaction	Reaction				
21	N17	Reaction	Reaction	Reaction				
22	N20	Reaction	Reaction	Reaction				
23	N23	Reaction	Reaction	Reaction				

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.114	96.25
2	M1	Y	-.16	96.25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Y	-.099	96.25
2	M1	Y	-.04	96.25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.579	96.25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	X	.695	96.25

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.579	96.25

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

Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]

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

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M1	Z	.695	96.25

Joint Loads and Enforced Displacements

Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/f...
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	-.008	-.008	0	0

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

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

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.013	.013	0	30
2	M1	X	.018	.018	30	60
3	M1	X	.02	.02	60	96.25
4	M17	X	.012	.012	0	0
5	M14	X	.012	.012	0	0
6	M11	X	.012	.012	0	0
7	M8	X	.012	.012	0	0
8	M15	X	.012	.012	0	0
9	M16	X	.012	.012	0	0
10	M12	X	.012	.012	0	0
11	M13	X	.012	.012	0	0
12	M9	X	.012	.012	0	0
13	M10	X	.012	.012	0	0
14	M6	X	.012	.012	0	0
15	M7	X	.013	.013	0	0
16	M2	X	.013	.013	0	0
17	M4	X				

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
18	M3	X	.013	.013	0	0
19	M5	X	.013	.013	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	X	.016	.016	0	30
2	M1	X	.021	.021	30	60
3	M1	X	.025	.025	60	96.25
4	M17	X	.01	.01	0	0
5	M14	X	.01	.01	0	0
6	M11	X	.01	.01	0	0
7	M8	X	.01	.01	0	0
8	M15	X	.01	.01	0	0
9	M16	X	.01	.01	0	0
10	M12	X	.01	.01	0	0
11	M13	X	.01	.01	0	0
12	M9	X	.01	.01	0	0
13	M10	X	.01	.01	0	0
14	M6	X	.01	.01	0	0
15	M7	X	.012	.012	0	0
16	M2	X	.012	.012	0	0
17	M4	X	.012	.012	0	0
18	M3	X	.012	.012	0	0
19	M5	X	.012	.012	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.013	.013	0	30
2	M1	Z	.018	.018	30	60
3	M1	Z	.02	.02	60	96.25
4	M15	Z	.012	.012	0	0
5	M16	Z	.012	.012	0	0
6	M12	Z	.012	.012	0	0
7	M13	Z	.012	.012	0	0
8	M9	Z	.012	.012	0	0
9	M10	Z	.012	.012	0	0
10	M6	Z	.012	.012	0	0
11	M7	Z	.013	.013	0	0
12	M4	Z	.013	.013	0	0
13	M5	Z	.013	.013	0	0
14	M2	Z	.013	.013	0	0
15	M3	Z				

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
1	M1	Z	.016	.016	0	30
2	M1	Z	.021	.021	30	60
3	M1	Z	.025	.025	60	96.25
4	M15	Z	.01	.01	0	0
5	M16	Z	.01	.01	0	0
6	M12	Z	.01	.01	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,F]	End Magnitude[k/ft,F]	Start Location[ft,%]	End Location[ft,%]
7	M13	Z	.01	.01	0	0
8	M9	Z	.01	.01	0	0
9	M10	Z	.01	.01	0	0
10	M6	Z	.01	.01	0	0
11	M7	Z	.012	.012	0	0
12	M4	Z	.012	.012	0	0
13	M5	Z	.012	.012	0	0
14	M2	Z	.012	.012	0	0
15	M3	Z				

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Grav...	Joint	Point	Distrib...	Area(...	Surfac...
1	Self Weight (Powermount)	None		-1						
2	Weight of Appurtenances	None					2	1		
3	Weight of Ice Only on PCS Struct	None					2	17		
4	(X) TIA/EIA Wind with Ice on PCS	None					1	19		
5	(X) TIA/EIA Wind on PCS Structur	None					1	19		
6	(Z) TIA/EIA Wind with Ice on PCS	None					1	15		
7	(Z) TIA/EIA Wind on PCS Structur	None					1	15		

Load Combinations

	Description	Solve	PDelta	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	(X) TIA/EIA Wind + Ice on PCS..	Yes			1	1	2	1	3	1	4	1										
2	(X) TIA/EIA Wind on PCS Struc..	Yes			1	1	2	1	5	1												
3	(Z) TIA/EIA Wind + Ice on PCS..	Yes			1	1	2	1	3	1	6	1										
4	(Z) TIA/EIA Wind on PCS Struc..	Yes			1	1	2	1	7	1												

Envelope Member Section Forces

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
1	M1	1	max	6.872	3	.204	2	0	1	0	1	.882	4	.879	2
2			min	5.899	2	0	3	-.205	4	0	1	0	1	0	3
3		2	max	5.293	3	0	3	.18	4	0	1	.591	4	.593	2
4			min	4.512	2	-.181	2	0	1	0	1	0	1	0	3
5		3	max	3.619	3	0	3	.152	4	0	1	0	1	0	3
6			min	3.073	4	-.152	2	0	1	0	1	-.258	4	-.255	2
7		4	max	2.016	1	0	3	0	1	0	1	0	1	0	3
8			min	1.674	2	-.003	2	-.019	4	0	1	-.753	4	-.64	2
9		5	max	.413	1	.695	2	0	1	0	1	0	1	0	1
10			min	.274	2	0	3	-.695	4	0	1	0	1	0	1
11	M2	1	max	.208	2	.027	1	.04	1	0	1	0	1	0	1
12			min	-.282	4	.015	4	.03	4	0	1	0	1	0	1
13		2	max	.193	2	.013	1	.02	1	0	1	.07	1	.023	2
14			min	-.263	4	.007	4	.015	4	0	1	.047	4	.006	3
15		3	max	.178	2	0	1	0	1	0	1	.093	1	.031	2
16			min	-.245	4	0	1	0	1	0	1	.062	4	.008	3
17		4	max	.163	2	-.007	2	-.015	4	0	1	.07	1	.023	2
18			min	-.226	4	-.013	3	-.02	1	0	1	.047	4	.006	3
19		5	max	.148	2	-.015	2	-.03	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	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
20			min	-.208	4	-.027	3	-.04	1	0	1	0	1	0	1
21	M3	1	max	.253	2	.021	3	.025	1	0	1	0	1	0	1
22			min	.192	3	.012	4	-.032	3	0	1	0	1	0	1
23		2	max	.268	2	.011	3	.012	1	0	1	.038	1	.009	2
24			min	.204	3	.006	4	-.016	3	0	1	-.015	4	-.045	3
25		3	max	.283	2	0	1	0	1	0	1	.051	1	.012	2
26			min	.217	3	0	1	0	1	0	1	-.02	4	-.059	3
27		4	max	.298	2	-.006	2	.016	3	0	1	.038	1	.009	2
28			min	.229	3	-.011	1	-.012	1	0	1	-.015	4	-.045	3
29		5	max	.313	2	-.012	2	.032	3	0	1	0	1	0	1
30			min	.241	3	-.021	1	-.025	1	0	1	0	1	0	1
31	M4	1	max	-.192	1	.027	1	.04	1	0	1	0	1	0	1
32			min	-.282	4	.015	2	-.032	3	0	1	0	1	0	1
33		2	max	-.176	1	.013	3	.02	1	0	1	.07	1	.023	2
34			min	-.263	4	.007	4	-.016	3	0	1	-.016	4	-.062	3
35		3	max	-.16	1	0	1	0	1	0	1	.093	1	.031	2
36			min	-.245	4	0	1	0	1	0	1	-.021	4	-.083	3
37		4	max	-.144	1	-.007	4	.016	3	0	1	.07	1	.023	2
38			min	-.226	4	-.013	1	-.02	1	0	1	-.016	4	-.062	3
39		5	max	-.127	1	-.015	4	.032	3	0	1	0	1	0	1
40			min	-.208	4	-.027	1	-.04	1	0	1	0	1	0	1
41	M5	1	max	.219	4	.021	3	.032	3	0	1	0	1	0	1
42			min	-.253	2	.012	4	.023	2	0	1	.045	3	.015	4
43		2	max	.23	4	.011	3	.016	3	0	1	.029	2	.003	1
44			min	-.268	2	.006	4	.011	2	0	1	.059	3	.02	4
45		3	max	.242	4	0	1	0	1	0	1	.038	2	.004	1
46			min	-.283	2	0	1	0	1	0	1	.045	3	.015	4
47		4	max	.253	4	-.006	4	-.011	2	0	1	.029	2	.003	1
48			min	-.298	2	-.011	1	-.016	3	0	1	0	1	0	1
49		5	max	.264	4	-.012	2	-.023	2	0	1	0	1	0	1
50			min	-.313	2	-.021	1	-.032	3	0	1	0	1	0	1
51	M6	1	max	.09	4	.005	1	-.004	2	0	1	0	1	0	1
52			min	-.278	2	.003	2	-.012	3	0	1	0	1	-.002	2
53		2	max	.088	4	.002	3	-.002	2	0	1	-.002	4	-.005	3
54			min	-.273	2	.001	2	-.006	3	0	1	0	1	-.003	2
55		3	max	.086	4	0	1	0	1	0	1	-.003	4	-.006	3
56			min	-.268	2	0	1	0	1	0	1	0	1	-.002	2
57		4	max	.084	4	-.001	4	.006	3	0	1	-.002	4	-.005	3
58			min	-.263	2	-.002	1	.002	2	0	1	0	1	0	1
59		5	max	.082	4	-.003	4	.012	3	0	1	0	1	0	1
60			min	-.258	2	-.005	1	.004	2	0	1	0	1	0	1
61	M7	1	max	.258	2	.005	3	.005	1	0	1	0	1	0	1
62			min	.071	3	.003	4	-.012	3	0	1	.003	1	0	2
63		2	max	.263	2	.002	3	.002	1	0	1	-.002	4	-.005	3
64			min	.073	3	.001	4	-.006	3	0	1	.004	1	0	2
65		3	max	.268	2	0	1	0	1	0	1	-.003	4	-.006	3
66			min	.076	3	0	1	0	1	0	1	.003	1	0	2
67		4	max	.273	2	-.001	2	.006	3	0	1	-.002	4	-.005	3
68			min	.078	3	-.002	1	-.002	1	0	1	0	1	0	1
69		5	max	.278	2	-.003	2	.012	3	0	1	0	1	0	1
70			min	.081	3	-.005	1	-.005	1	0	1	0	1	0	1
71	M8	1	max	0	1	.003	1	0	4	0	1	0	1	0	1
72			min	-.415	4	.001	4	-.007	1	0	1	0	1	0	1

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
73		2	max	0	1	.001	1	0	4	0	1	0	3	0	4
74			min	-.415	4	0	4	-.004	1	0	1	0	1	-.001	1
75		3	max	0	1	0	1	0	1	0	1	0	3	0	4
76			min	-.415	4	0	1	0	1	0	1	0	1	-.002	1
77		4	max	0	1	0	2	.004	1	0	1	0	3	0	4
78			min	-.415	4	-.001	3	0	3	0	1	0	1	-.001	1
79		5	max	0	1	-.001	2	.007	1	0	1	0	1	0	1
80			min	-.415	4	-.003	3	0	3	0	1	0	1	0	1
81	M9	1	max	.055	4	.005	1	-.004	2	0	1	0	1	0	1
82			min	-.153	2	.003	2	-.012	3	0	1	0	1	-.002	2
83		2	max	.053	4	.002	1	-.002	2	0	1	-.002	4	-.005	3
84			min	-.148	2	.001	2	-.006	3	0	1	0	1	-.003	2
85		3	max	.051	4	0	1	0	1	0	1	-.003	4	-.006	3
86			min	-.143	2	0	1	0	1	0	1	0	1	-.002	2
87		4	max	.049	4	-.001	4	.006	3	0	1	-.002	4	-.005	3
88			min	-.138	2	-.002	1	.002	2	0	1	0	1	0	1
89		5	max	.047	4	-.003	4	.012	3	0	1	0	1	0	1
90			min	-.133	2	-.005	1	.004	2	0	1	0	1	0	1
91	M10	1	max	.133	2	.005	1	.005	1	0	1	0	1	0	1
92			min	.037	3	.003	4	-.012	3	0	1	.003	1	0	2
93		2	max	.138	2	.002	1	.002	1	0	1	-.002	4	-.005	3
94			min	.039	3	.001	4	-.006	3	0	1	.004	1	0	2
95		3	max	.143	2	0	1	0	1	0	1	-.003	4	-.006	3
96			min	.042	3	0	1	0	1	0	1	.003	1	0	2
97		4	max	.148	2	-.001	2	.006	3	0	1	-.002	4	-.005	3
98			min	.044	3	-.002	3	-.002	1	0	1	0	1	0	1
99		5	max	.153	2	-.003	2	.012	3	0	1	0	1	0	1
100			min	.047	3	-.005	3	-.005	1	0	1	0	1	0	1
101	M11	1	max	0	1	.003	1	0	3	0	1	0	1	0	1
102			min	-.248	4	.001	4	-.007	1	0	1	0	3	0	4
103		2	max	0	1	.001	1	0	3	0	1	0	1	-.001	1
104			min	-.248	4	0	4	-.004	1	0	1	0	3	0	4
105		3	max	0	1	0	1	0	1	0	1	0	1	-.002	1
106			min	-.248	4	0	2	.004	1	0	1	0	3	0	4
107		4	max	0	1	0	3	0	4	0	1	0	1	-.001	1
108			min	-.248	4	-.001	2	.007	1	0	1	0	1	0	1
109		5	max	0	1	-.001	1	0	4	0	1	0	1	0	1
110			min	-.248	4	-.003	1	-.004	2	0	1	0	1	0	1
111	M12	1	max	1.399	2	.005	1	-.012	3	0	1	0	1	-.002	2
112			min	-.473	4	.003	4	-.002	2	0	1	0	1	-.005	3
113		2	max	1.404	2	.002	1	-.006	3	0	1	-.002	4	-.003	2
114			min	-.475	4	.001	4	0	1	0	1	0	1	-.006	3
115		3	max	1.409	2	0	1	0	1	0	1	-.003	4	-.002	2
116			min	-.477	4	0	1	0	1	0	1	0	1	-.002	3
117		4	max	1.414	2	-.001	2	.006	3	0	1	-.002	4	-.005	3
118			min	-.479	4	-.002	3	.002	2	0	1	0	1	0	1
119		5	max	1.419	2	-.003	2	.012	3	0	1	0	1	0	1
120			min	-.481	4	-.005	3	.004	2	0	1	0	1	0	1
121	M13	1	max	-.398	3	.005	3	.005	1	0	1	0	1	0	1
122			min	-1.419	2	.003	2	-.012	3	0	1	.003	1	0	2
123		2	max	-.396	3	.002	3	.002	1	0	1	-.002	4	-.005	3
124			min	-1.414	2	.001	2	-.006	3	0	1	.004	1	0	2
125		3	max	-.393	3	0	1	0	1	0	1				

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	LC	y Shear[k]	LC	z Shear[k]	LC	Torque[k-ft]	LC	y-y Momen...	LC	z-z Momen...	LC
126			min	-1.409	2	0	1	0	1	0	1	-.003	4	-.006	3
127		4	max	-.391	3	-.001	4	.006	3	0	1	.003	1	0	2
128			min	-1.404	2	-.002	1	-.002	1	0	1	-.002	4	-.005	3
129		5	max	-.388	3	-.003	4	.012	3	0	1	0	1	0	1
130			min	-1.399	2	-.005	1	-.005	1	0	1	0	1	0	1
131	M14	1	max	2.302	4	.003	1	0	4	0	1	0	1	0	1
132			min	0	1	.001	2	-.007	1	0	1	0	3	0	4
133		2	max	2.302	4	.001	1	0	4	0	1	0	1	-.001	1
134			min	0	1	0	2	-.004	1	0	1	0	3	0	4
135		3	max	2.302	4	0	1	0	1	0	1	0	1	-.002	1
136			min	0	1	0	1	0	1	0	1	0	3	0	4
137		4	max	2.302	4	0	4	.004	1	0	1	0	1	-.001	1
138			min	0	1	-.001	3	0	3	0	1	0	1	0	1
139		5	max	2.302	4	-.001	4	.007	1	0	1	0	1	0	1
140			min	0	1	-.003	3	0	3	0	1	0	1	0	1
141	M15	1	max	.717	4	.005	3	-.004	2	0	1	0	1	0	1
142			min	-2.153	2	.003	2	-.012	3	0	1	0	1	-.002	2
143		2	max	.715	4	.002	3	-.002	2	0	1	-.002	4	-.005	3
144			min	-2.148	2	.001	2	-.006	3	0	1	0	1	-.003	2
145		3	max	.713	4	0	1	0	1	0	1	-.003	4	-.006	3
146			min	-2.143	2	0	1	0	1	0	1	0	1	-.002	2
147		4	max	.711	4	-.001	4	.006	3	0	1	-.002	4	-.005	3
148			min	-2.138	2	-.002	1	.002	2	0	1	0	1	0	1
149		5	max	.709	4	-.003	4	.012	3	0	1	0	1	0	1
150			min	-2.133	2	-.005	1	.004	2	0	1	0	1	0	1
151	M16	1	max	2.133	2	.005	1	.005	1	0	1	0	1	0	1
152			min	.584	3	.003	2	-.012	3	0	1	.003	1	0	2
153		2	max	2.138	2	.002	1	.002	1	0	1	-.002	4	-.005	3
154			min	.587	3	.001	2	-.006	3	0	1	.004	1	0	2
155		3	max	2.143	2	0	1	0	1	0	1	-.003	4	-.006	3
156			min	.589	3	0	1	0	1	0	1	.003	1	0	2
157		4	max	2.148	2	-.001	4	.006	3	0	1	-.002	4	-.005	3
158			min	.592	3	-.002	3	-.002	1	0	1	0	1	0	1
159		5	max	2.153	2	-.003	4	.012	3	0	1	0	1	0	1
160			min	.594	3	-.005	3	-.005	1	0	1	0	1	0	1
161	M17	1	max	0	1	.003	3	0	3	0	1	0	1	0	1
162			min	-3.442	4	.001	4	-.007	1	0	1	0	3	0	4
163		2	max	0	1	.001	3	0	3	0	1	0	1	-.001	1
164			min	-3.442	4	0	4	-.004	1	0	1	0	3	0	4
165		3	max	0	1	0	1	0	1	0	1	0	1	-.002	1
166			min	-3.442	4	0	1	0	1	0	1	0	3	0	4
167		4	max	0	1	0	2	.004	1	0	1	0	1	-.001	1
168			min	-3.442	4	-.001	1	0	4	0	1	0	1	0	1
169		5	max	0	1	-.001	2	.007	1	0	1	0	1	0	1
170			min	-3.442	4	-.003	1	0	4	0	1	0	1	0	1

Envelope Member Section Stresses

	Member	Sec		Axial[ksi]	LC	y Shear[...	LC	z Shear[...	LC	y-Top[ksi]	LC	y-Bot[ksi]	LC	z-Top[ksi]	LC	z-Bot[ksi]	LC
1	M1	1	max	.471	3	.028	2	0	1	0	3	.241	2	.242	4	0	1
2			min	.405	2	0	3	-.028	4	-.241	2	0	3	0	1	-.242	4
3		2	max	.363	3	0	3	.025	4	0	3	.162	2	.162	4	0	1

Company : CENTEK Engineering, INC.
Designer : tjl, cfc
Job Number : 12047.CO15 - CT03XC037 CL&P Struct. #326 - Powermount

Mar 6, 2014
2:39 PM
Checked By:_____

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
4			min	.31	2	-.025	2	0	1	-.162	2	0	3	0	1	-.162	4
5		3	max	.248	3	0	3	.021	4	.07	2	0	3	0	1	.071	4
6			min	.211	4	-.021	2	0	1	0	3	-.07	2	-.071	4	0	1
7		4	max	.138	1	0	3	0	1	.175	2	0	3	-.206	4	0	1
8			min	.115	2	0	2	-.003	4	0	3	-.175	2	-.206	4	0	1
9		5	max	.028	1	.095	2	0	1	0	1	0	1	0	1	0	1
10			min	.019	2	0	3	-.095	4	0	1	0	1	0	1	0	1
11	M2	1	max	.191	2	.057	1	.085	1	0	1	0	1	0	1	0	1
12			min	-.258	4	.031	4	.064	4	0	1	0	1	0	1	0	1
13		2	max	.177	2	.028	1	.043	1	-.099	3	.378	2	2.33	1	-1.724	4
14			min	-.241	4	.016	4	.032	4	-.378	2	.099	3	1.561	4	-2.572	1
15		3	max	.163	2	0	1	0	1	-.132	3	.504	2	3.106	1	-2.298	4
16			min	-.225	4	0	1	0	1	-.504	2	.132	3	2.082	4	-3.43	1
17		4	max	.15	2	-.016	2	-.032	4	-.099	3	.378	2	2.33	1	-1.724	4
18			min	-.208	4	-.028	3	-.043	1	-.378	2	.099	3	1.561	4	-2.572	1
19		5	max	.136	2	-.031	2	-.064	4	0	1	0	1	0	1	0	1
20			min	-.191	4	-.057	3	-.085	1	0	1	0	1	0	1	0	1
21	M3	1	max	.233	2	.045	3	.053	1	0	1	0	1	0	1	0	1
22			min	.176	3	.025	4	-.069	3	0	1	0	1	0	1	0	1
23		2	max	.246	2	.022	3	.026	1	.721	3	.152	2	1.274	1	.56	4
24			min	.187	3	.012	4	-.035	3	-.152	2	-.721	3	-.507	4	-1.406	1
25		3	max	.26	2	0	1	0	1	.962	3	.202	2	1.698	1	.747	4
26			min	.199	3	0	1	0	1	-.202	2	-.961	3	-.677	4	-1.875	1
27		4	max	.274	2	-.012	2	.035	3	.721	3	.152	2	1.274	1	.56	4
28			min	.21	3	-.022	1	-.026	1	-.152	2	-.721	3	-.507	4	-1.406	1
29		5	max	.287	2	-.025	2	.069	3	0	1	0	1	0	1	0	1
30			min	.222	3	-.045	1	-.053	1	0	1	0	1	0	1	0	1
31	M4	1	max	-.176	1	.057	1	.085	1	0	1	0	1	0	1	0	1
32			min	-.258	4	.031	2	-.069	3	0	1	0	1	0	1	0	1
33		2	max	-.161	1	.028	3	.043	1	1.003	3	.378	2	2.33	1	.589	4
34			min	-.241	4	.016	4	-.035	3	-.378	2	-1.003	3	-.534	4	-2.572	1
35		3	max	-.147	1	0	1	0	1	1.338	3	.504	2	3.106	1	.786	4
36			min	-.225	4	0	1	0	1	-.504	2	-1.337	3	-.711	4	-3.43	1
37		4	max	-.132	1	-.016	4	.035	3	1.003	3	.378	2	2.33	1	.589	4
38			min	-.208	4	-.028	1	-.043	1	-.378	2	-1.003	3	-.534	4	-2.572	1
39		5	max	-.117	1	-.031	4	.069	3	0	1	0	1	0	1	0	1
40			min	-.191	4	-.057	1	-.085	1	0	1	0	1	0	1	0	1
41	M5	1	max	.201	4	.045	3	.069	3	0	1	0	1	0	1	0	1
42			min	-.233	2	.025	4	.049	2	0	1	0	1	0	1	0	1
43		2	max	.211	4	.022	3	.035	3	-.05	1	.246	4	1.484	3	-1.059	2
44			min	-.246	2	.012	4	.024	2	-.246	4	.05	1	.959	2	-1.639	3
45		3	max	.222	4	0	1	0	1	-.067	1	.328	4	1.979	3	-1.412	2
46			min	-.26	2	0	1	0	1	-.328	4	.067	1	1.279	2	-2.185	3
47		4	max	.232	4	-.012	4	-.024	2	-.05	1	.246	4	1.484	3	-1.059	2
48			min	-.274	2	-.022	1	-.035	3	-.246	4	.05	1	.959	2	-1.639	3
49		5	max	.243	4	-.025	2	-.049	2	0	1	0	1	0	1	0	1
50			min	-.287	2	-.045	1	-.069	3	0	1	0	1	0	1	0	1
51	M6	1	max	.125	4	.015	1	-.013	2	0	1	0	1	0	1	0	1
52			min	-.385	2	.009	2	-.038	3	0	1	0	1	0	1	0	1
53		2	max	.122	4	.008	3	-.007	2	.181	3	-.073	2	-.004	1	.184	4
54			min	-.378	2	.004	2	-.019	3	.073	2	-.181	3	-.159	4	.004	1
55		3	max	.119	4	0	1	0	1	.241	3	-.098	2	-.005	1	.245	4
56			min	-.371	2	0	1	0	1	.098	2	-.241	3	-.212	4	.006	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
57		4	max	.116	4	-.004	4	.019	3	.181	3	-.073	2	-.004	1	.184	4
58			min	-.364	2	-.008	1	.007	2	.073	2	-.181	3	-.159	4	.004	1
59		5	max	.113	4	-.009	4	.038	3	0	1	0	1	0	1	0	1
60			min	-.357	2	-.015	1	.013	2	0	1	0	1	0	1	0	1
61	M7	1	max	.357	2	.015	3	.016	1	0	1	0	1	0	1	0	1
62			min	.098	3	.009	4	-.038	3	0	1	0	1	0	1	0	1
63		2	max	.364	2	.008	3	.008	1	.181	3	.016	2	.213	1	.184	4
64			min	.101	3	.004	4	-.019	3	-.016	2	-.181	3	-.159	4	-.246	1
65		3	max	.371	2	0	1	0	1	.241	3	.021	2	.284	1	.245	4
66			min	.105	3	0	1	0	1	-.021	2	-.241	3	-.212	4	-.328	1
67		4	max	.378	2	-.004	2	.019	3	.181	3	.016	2	.213	1	.184	4
68			min	.108	3	-.008	1	-.008	1	-.016	2	-.181	3	-.159	4	-.246	1
69		5	max	.385	2	-.009	2	.038	3	0	1	0	1	0	1	0	1
70			min	.112	3	-.015	1	-.016	1	0	1	0	1	0	1	0	1
71	M8	1	max	0	1	.008	1	0	3	0	1	0	1	0	1	0	1
72			min	-.575	4	.005	4	-.022	1	0	1	0	1	0	1	0	1
73		2	max	0	1	.004	1	0	3	.056	1	-.008	4	.03	3	.059	1
74			min	-.575	4	.002	4	-.011	1	.008	4	-.056	1	-.051	1	-.035	3
75		3	max	0	1	0	1	0	1	.074	1	-.011	4	.041	3	.079	1
76			min	-.575	4	0	1	0	1	.011	4	-.074	1	-.069	1	-.047	3
77		4	max	0	1	-.002	2	.011	1	.056	1	-.008	4	.03	3	.059	1
78			min	-.575	4	-.004	3	0	3	.008	4	-.056	1	-.051	1	-.035	3
79		5	max	0	1	-.005	2	.022	1	0	1	0	1	0	1	0	1
80			min	-.575	4	-.008	3	0	3	0	1	0	1	0	1	0	1
81	M9	1	max	.077	4	.015	1	-.013	2	0	1	0	1	0	1	0	1
82			min	-.211	2	.009	2	-.038	3	0	1	0	1	0	1	0	1
83		2	max	.074	4	.008	1	-.007	2	.181	3	-.073	2	-.004	1	.184	4
84			min	-.205	2	.004	2	-.019	3	.073	2	-.181	3	-.159	4	.004	1
85		3	max	.071	4	0	1	0	1	.241	3	-.098	2	-.005	1	.245	4
86			min	-.198	2	0	1	0	1	.098	2	-.241	3	-.212	4	.006	1
87		4	max	.068	4	-.004	4	.019	3	.181	3	-.073	2	-.004	1	.184	4
88			min	-.191	2	-.008	1	.007	2	.073	2	-.181	3	-.159	4	.004	1
89		5	max	.065	4	-.009	4	.038	3	0	1	0	1	0	1	0	1
90			min	-.184	2	-.015	1	.013	2	0	1	0	1	0	1	0	1
91	M10	1	max	.184	2	.015	1	.016	1	0	1	0	1	0	1	0	1
92			min	.051	3	.009	4	-.038	3	0	1	0	1	0	1	0	1
93		2	max	.191	2	.008	1	.008	1	.181	3	.016	2	.213	1	.184	4
94			min	.055	3	.004	4	-.019	3	-.016	2	-.181	3	-.159	4	-.246	1
95		3	max	.198	2	0	1	0	1	.241	3	.021	2	.284	1	.245	4
96			min	.058	3	0	1	0	1	-.021	2	-.241	3	-.212	4	-.328	1
97		4	max	.205	2	-.004	2	.019	3	.181	3	.016	2	.213	1	.184	4
98			min	.062	3	-.008	3	-.008	1	-.016	2	-.181	3	-.159	4	-.246	1
99		5	max	.211	2	-.009	2	.038	3	0	1	0	1	0	1	0	1
100			min	.065	3	-.015	3	-.016	1	0	1	0	1	0	1	0	1
101	M11	1	max	0	1	.008	1	0	3	0	1	0	1	0	1	0	1
102			min	-.343	4	.005	4	-.022	1	0	1	0	1	0	1	0	1
103		2	max	0	1	.004	1	0	3	.056	1	-.008	4	.03	3	.059	1
104			min	-.343	4	.002	4	-.011	1	.008	4	-.056	1	-.051	1	-.035	3
105		3	max	0	1	0	1	0	1	.074	1	-.011	4	.041	3	.079	1
106			min	-.343	4	0	1	0	1	.011	4	-.074	1	-.069	1	-.047	3
107		4	max	0	1	-.002	2	.011	1	.056	1	-.008	4	.03	3	.059	1
108			min	-.343	4	-.004	3	0	3	.008	4	-.056	1	-.051	1	-.035	3
109		5	max	0	1	-.005	2	.022	1	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
110			min	-.343	4	-.008	1	0	3	0	1	0	1	0	1	0	1
111	M12	1	max	1.938	2	.015	1	-.013	2	0	1	0	1	0	1	0	1
112			min	-.655	4	.009	4	-.038	3	0	1	0	1	0	1	0	1
113		2	max	1.945	2	.008	1	-.007	2	.181	3	-.073	2	-.004	1	.184	4
114			min	-.658	4	.004	4	-.019	3	.073	2	-.181	3	-.159	4	.004	1
115		3	max	1.952	2	0	1	0	1	.241	3	-.098	2	-.005	1	.245	4
116			min	-.66	4	0	1	0	1	.098	2	-.241	3	-.212	4	.006	1
117		4	max	1.958	2	-.004	2	.019	3	.181	3	-.073	2	-.004	1	.184	4
118			min	-.663	4	-.008	3	.007	2	.073	2	-.181	3	-.159	4	.004	1
119		5	max	1.965	2	-.009	2	.038	3	0	1	0	1	0	1	0	1
120			min	-.666	4	-.015	3	.013	2	0	1	0	1	0	1	0	1
121	M13	1	max	-.552	3	.015	3	.016	1	0	1	0	1	0	1	0	1
122			min	-1.965	2	.009	2	-.038	3	0	1	0	1	0	1	0	1
123		2	max	-.548	3	.008	3	.008	1	.181	3	.016	2	.213	1	.184	4
124			min	-1.958	2	.004	2	-.019	3	-.016	2	-.181	3	-.159	4	-.246	1
125		3	max	-.545	3	0	1	0	1	.241	3	.021	2	.284	1	.245	4
126			min	-1.952	2	0	1	0	1	-.021	2	-.241	3	-.212	4	-.328	1
127		4	max	-.542	3	-.004	4	.019	3	.181	3	.016	2	.213	1	.184	4
128			min	-1.945	2	-.008	1	-.008	1	-.016	2	-.181	3	-.159	4	-.246	1
129		5	max	-.538	3	-.009	4	.038	3	0	1	0	1	0	1	0	1
130			min	-1.938	2	-.015	1	-.016	1	0	1	0	1	0	1	0	1
131	M14	1	max	3.189	4	.008	1	0	3	0	1	0	1	0	1	0	1
132			min	0	1	.005	2	-.022	1	0	1	0	1	0	1	0	1
133		2	max	3.189	4	.004	1	0	3	.056	1	-.008	4	.03	3	.059	1
134			min	0	1	.002	2	-.011	1	.008	4	-.056	1	-.051	1	-.035	3
135		3	max	3.189	4	0	1	0	1	.074	1	-.011	4	.041	3	.079	1
136			min	0	1	0	1	0	1	.011	4	-.074	1	-.069	1	-.047	3
137		4	max	3.189	4	-.002	4	.011	1	.056	1	-.008	4	.03	3	.059	1
138			min	0	1	-.004	3	0	3	.008	4	-.056	1	-.051	1	-.035	3
139		5	max	3.189	4	-.005	4	.022	1	0	1	0	1	0	1	0	1
140			min	0	1	-.008	3	0	3	0	1	0	1	0	1	0	1
141	M15	1	max	.993	4	.015	3	-.013	2	0	1	0	1	0	1	0	1
142			min	-2.982	2	.009	2	-.038	3	0	1	0	1	0	1	0	1
143		2	max	.99	4	.008	3	-.007	2	.181	3	-.073	2	-.004	1	.184	4
144			min	-2.975	2	.004	2	-.019	3	.073	2	-.181	3	-.159	4	.004	1
145		3	max	.987	4	0	1	0	1	.241	3	-.098	2	-.005	1	.245	4
146			min	-2.968	2	0	1	0	1	.098	2	-.241	3	-.212	4	.006	1
147		4	max	.984	4	-.004	4	.019	3	.181	3	-.073	2	-.004	1	.184	4
148			min	-2.961	2	-.008	1	.007	2	.073	2	-.181	3	-.159	4	.004	1
149		5	max	.982	4	-.009	4	.038	3	0	1	0	1	0	1	0	1
150			min	-2.954	2	-.015	1	.013	2	0	1	0	1	0	1	0	1
151	M16	1	max	2.954	2	.015	1	.016	1	0	1	0	1	0	1	0	1
152			min	.809	3	.009	2	-.038	3	0	1	0	1	0	1	0	1
153		2	max	2.961	2	.008	1	.008	1	.181	3	.016	2	.213	1	.184	4
154			min	.813	3	.004	2	-.019	3	-.016	2	-.181	3	-.159	4	-.246	1
155		3	max	2.968	2	0	1	0	1	.241	3	.021	2	.284	1	.245	4
156			min	.816	3	0	1	0	1	-.021	2	-.241	3	-.212	4	-.328	1
157		4	max	2.975	2	-.004	4	.019	3	.181	3	.016	2	.213	1	.184	4
158			min	.82	3	-.008	3	-.008	1	-.016	2	-.181	3	-.159	4	-.246	1
159		5	max	2.982	2	-.009	4	.038	3	0	1	0	1	0	1	0	1
160			min	.823	3	-.015	3	-.016	1	0	1	0	1	0	1	0	1
161	M17	1	max	0	1	.008	3	0	3	0	1	0	1	0	1	0	1
162			min	-4.767	4	.005	4	-.022	1	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
163		2	max	0	1	.004	3	0	3	.056	1	-.008	4	.03	3	.059	1
164			min	-4.767	4	.002	4	-.011	1	.008	4	-.056	1	-.051	1	-.035	3
165		3	max	0	1	0	1	0	1	.074	1	-.011	4	.041	3	.079	1
166			min	-4.767	4	0	1	0	1	.011	4	-.074	1	-.069	1	-.047	3
167		4	max	0	1	-.002	2	.011	1	.056	1	-.008	4	.03	3	.059	1
168			min	-4.767	4	-.004	1	0	3	.008	4	-.056	1	-.051	1	-.035	3
169		5	max	0	1	-.005	2	.022	1	0	1	0	1	0	1	0	1
170			min	-4.767	4	-.008	1	0	3	0	1	0	1	0	1	0	1

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N1	max	0	4	6.872	3	0	2	0	2	0	1	.879	2
2		min	-.204	2	5.899	2	-.205	4	-.882	4	0	1	0	4
3	N8	max	.154	4	.027	1	.138	2	0	1	0	1	0	1
4		min	-.16	2	.015	2	-.238	4	0	1	0	1	0	1
5	N9	max	-.172	3	.021	1	-.155	1	0	1	0	1	0	1
6		min	-.263	2	.012	2	-.185	4	0	1	0	1	0	1
7	N10	max	-.138	3	.027	1	-.124	1	0	1	0	1	0	1
8		min	-.16	2	.015	2	-.238	4	0	1	0	1	0	1
9	N11	max	.192	4	.021	1	.172	2	0	1	0	1	0	1
10		min	-.263	2	.012	2	-.185	4	0	1	0	1	0	1
11	N12	max	0	4	.003	1	0	1	0	1	0	1	0	1
12		min	-.007	1	.001	2	-.415	4	0	1	0	1	0	1
13	N13	max	.079	4	.005	1	.103	2	0	1	0	1	0	1
14		min	-.258	2	.003	2	-.044	4	0	1	0	1	0	1
15	N14	max	-.07	3	.005	3	-.042	3	0	1	0	1	0	1
16		min	-.258	2	.003	2	-.103	2	0	1	0	1	0	1
17	N15	max	0	3	.003	1	0	1	0	1	0	1	0	1
18		min	-.007	1	.001	2	-.248	4	0	1	0	1	0	1
19	N16	max	.047	4	.005	1	.055	2	0	1	0	1	0	1
20		min	-.143	2	.003	2	-.031	4	0	1	0	1	0	1
21	N18	max	0	4	.003	3	2.302	4	0	1	0	1	0	1
22		min	-.007	1	.001	2	0	2	0	1	0	1	0	1
23	N19	max	1.29	2	.005	3	.173	4	0	1	0	1	0	1
24		min	-.44	4	.003	4	-.542	2	0	1	0	1	0	1
25	N21	max	0	3	.003	3	0	1	0	1	0	1	0	1
26		min	-.007	1	.001	2	-3.442	4	0	1	0	1	0	1
27	N22	max	.658	4	.005	3	.824	2	0	1	0	1	0	1
28		min	-1.989	2	.003	2	-.285	4	0	1	0	1	0	1
29	N17	max	-.039	3	.005	1	-.029	3	0	1	0	1	0	1
30		min	-.143	2	.003	2	-.055	2	0	1	0	1	0	1
31	N20	max	1.29	2	.005	3	.542	2	0	1	0	1	0	1
32		min	.363	3	.003	4	.138	3	0	1	0	1	0	1
33	N23	max	-.544	3	.005	3	-.24	3	0	1	0	1	0	1
34		min	-1.989	2	.003	2	-.824	2	0	1	0			
35	Totals:	max	0	4	7.016	3	0	1						
36		min	-3.272	2	5.978	2	-3.225	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	2	0	2	0	4	0	4	0	1	0	4
2		min	0	4	0	3	0	2	0	2	0	1	0	2
3	N2	max	0	2	-.004	2	0	4	3.065e-5	4	0	1	0	3
4		min	0	4	-.005	3	0	1	0	1	0	1	-3.052e-5	2
5	N3	max	0	2	-.007	2	0	4	0	1	0	1	5.036e-5	2
6		min	0	3	-.008	3	0	1	-5.165e-5	4	0	1	0	3
7	N4	max	0	2	-.007	2	0	4	2.516e-5	4	0	1	0	3
8		min	0	3	-.009	3	0	1	0	1	0	1	-2.062e-5	2
9	N5	max	0	4	-.008	2	0	2	0	1	0	1	7.266e-5	2
10		min	-.002	2	-.009	3	-.002	4	-8.192e-5	4	0	1	0	3
11	N6	max	.003	2	-.008	2	.002	4	4.851e-4	4	0	1	0	4
12		min	0	3	-.01	3	0	1	0	2	0	1	-5.031e-4	2
13	N7	max	.308	2	-.008	2	.304	4	2.184e-3	4	0	1	0	4
14		min	0	3	-.01	3	0	1	0	2	0	1	-2.202e-3	2
15	N8	max	0	2	0	2	0	4	1.755e-3	1	2.43e-3	1	1.393e-3	1
16		min	0	4	0	1	0	2	1.144e-3	4	1.684e-3	4	9.025e-4	4
17	N9	max	0	2	0	2	0	4	9.4e-5	4	6.326e-4	4	8.161e-4	1
18		min	0	3	0	1	0	1	-6.471e-4	1	-1.028e-3	1	-8.271e-5	4
19	N10	max	0	2	0	2	0	4	1.727e-3	1	2.43e-3	1	8.161e-5	4
20		min	0	3	0	1	0	1	-7.007e-5	4	-9.161e-4	4	-1.428e-3	1
21	N11	max	0	2	0	2	0	4	-4.383e-4	2	-8.217e-4	2	-6.028e-4	2
22		min	0	4	0	1	0	2	-6.908e-4	3	-1.237e-3	3	-9.396e-4	3
23	N12	max	0	1	0	2	0	4	5.616e-4	3	4.224e-5	2	5.036e-5	2
24		min	0	4	0	1	0	1	4.659e-4	2	-5.014e-6	3	0	3
25	N13	max	0	2	0	2	0	4	-1.165e-4	2	-2.864e-5	1	-1.828e-4	4
26		min	0	4	0	1	0	2	-1.427e-4	3	-1.111e-4	3	-2.878e-4	1
27	N14	max	0	2	0	2	0	2	-1.021e-4	2	1.111e-4	3	3.62e-4	1
28		min	0	3	0	3	0	3	-1.427e-4	3	-9.28e-5	1	1.828e-4	4
29	N15	max	0	1	0	2	0	4	6.203e-4	3	3.021e-5	2	0	3
30		min	0	3	0	1	0	1	5.154e-4	2	-5.014e-6	3	-2.062e-5	2
31	N16	max	0	2	0	2	0	4	-7.256e-5	4	-2.629e-5	1	-2.346e-4	4
32		min	0	4	0	1	0	2	-1.286e-4	1	-1.072e-4	3	-3.26e-4	1
33	N17	max	0	2	0	2	0	2	-7.256e-5	4	1.072e-4	3	3.822e-4	1
34		min	0	3	0	1	0	3	-1.663e-4	1	-9.045e-5	1	2.346e-4	4
35	N18	max	0	1	0	2	0	2	6.728e-4	3	-2.764e-6	4	7.266e-5	2
36		min	0	4	0	3	0	4	5.592e-4	2	-1.188e-4	2	0	3
37	N19	max	0	4	0	4	0	2	-1.438e-4	2	-8.439e-7	1	-2.184e-4	4
38		min	0	2	0	3	0	4	-1.853e-4	3	-5.732e-5	3	-3.407e-4	1
39	N20	max	0	3	0	4	0	3	-1.135e-4	2	5.732e-5	3	4.197e-4	1
40		min	0	2	0	3	0	2	-1.853e-4	3	-6.5e-5	1	2.184e-4	4
41	N21	max	0	1	0	2	0	4	6.889e-4	3	2.223e-4	2	0	4
42		min	0	3	0	3	0	1	5.724e-4	2	-5.014e-6	3	-5.031e-4	2
43	N22	max	0	2	0	2	0	4	3.076e-4	4	-5.921e-5	1	-3.642e-4	2
44		min	0	4	0	3	0	2	-1.412e-6	1	-1.762e-4	4	-4.568e-4	3
45	N23	max	0	2	0	2	0	2	3.076e-4	4	1.762e-4	4	4.568e-4	3
46		min	0	3	0	3	0	3	-3.22e-4	1	-1.234e-4	1	2.665e-4	2

Company : CENTEK Engineering, INC.
Designer : tjl, cfc
Job Number : 12047.CO15 - CT03XC037

CL&P Struct. #326 - Powermount

Mar 6, 2014
2:39 PM
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Envelope AISC ASD Steel Code Checks

	Mem...	Shape	Code Check	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	Fa [...	Ft [...	Fb y...	Fb z...	...	C...	C...	AS...
1	M1	12" FWT..	.113	81.211	2	.020	80.208		4	25.5..	30	33	33	1	.6	.85	H1-2
2	M2	L3x3x3	.034	0	2	.006	0	z	1	5.68	21.6	- Co..					H1-1
3	M3	L3x3x3	.032	6.279	2	.005	6.279	z	3	9.008	21.6	- Co..					H1-1
4	M4	L3x3x3	.012	0	4	.006	0	z	1	5.68	21.6	- Co..					H2-1
5	M5	L3x3x3	.027	6.279	4	.005	0	z	3	9.008	21.6	- Co..					H1-1
6	M6	L2x2x3	.018	0	2	.003	0	z	3	16.7..	21.6	- Co..					H2-1
7	M7	L2x2x3	.023	2.167	2	.003	2.167	z	3	16.7..	21.6	- Co..					H1-1
8	M8	L2x2x3	.027	0	4	.002	1.167	z	1	19.5..	21.6	- Co..					H2-1
9	M9	L2x2x3	.010	0	2	.003	0	z	3	16.7..	21.6	- Co..					H2-1
10	M10	L2x2x3	.013	2.167	2	.003	2.167	z	3	16.7..	21.6	- Co..					H1-1
11	M11	L2x2x3	.016	0	4	.002	1.167	z	1	19.5..	21.6	- Co..					H2-1
12	M12	L2x2x3	.117	2.167	2	.003	2.167	z	3	16.7..	21.6	- Co..					H1-1
13	M13	L2x2x3	.091	0	2	.003	2.167	z	3	16.7..	21.6	- Co..					H2-1
14	M14	L2x2x3	.164	0	4	.002	0	z	1	19.5..	21.6	- Co..					H1-1
15	M15	L2x2x3	.138	0	2	.003	0	z	3	16.7..	21.6	- Co..					H2-1
16	M16	L2x2x3	.178	2.167	2	.003	2.167	z	3	16.7..	21.6	- Co..					H1-1
17	M17	L2x2x3	.221	0	4	.002	1.167	z	1	19.5..	21.6	- Co..					H2-1

Company : CENTEK Engineering, INC.
Designer : tjl, cfc
Job Number : 12047.CO15 - CT03XC037

CL&P Struct. #326 - Powermount

Mar 6, 2014
2:41 PM
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Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N1	-.164	6.872	0	0	0	.701
2	1	N8	-.152	.027	.124	0	0	0
3	1	N9	-.243	.021	-.155	0	0	0
4	1	N10	-.152	.027	-.124	0	0	0
5	1	N11	-.243	.021	.155	0	0	0
6	1	N12	-.007	.003	0	0	0	0
7	1	N13	-.231	.005	.091	0	0	0
8	1	N14	-.231	.005	-.091	0	0	0
9	1	N15	-.007	.003	0	0	0	0
10	1	N16	-.122	.005	.045	0	0	0
11	1	N18	-.007	.003	0	0	0	0
12	1	N19	1.059	.005	-.447	0	0	0
13	1	N21	-.007	.003	0	0	0	0
14	1	N22	-1.649	.005	.682	0	0	0
15	1	N17	-.122	.005	-.045	0	0	0
16	1	N20	1.059	.005	.447	0	0	0
17	1	N23	-1.649	.005	-.682	0	0	0
18	1	Totals:	-2.867	7.016	0			
19	1	COG (ft):	X: 0	Y: 50.672	Z: -.021			

Company : CENTEK Engineering, INC.
Designer : tjl, cfc
Job Number : 12047.CO15 - CT03XC037

CL&P Struct. #326 - Powermount

Mar 6, 2014
2:44 PM
Checked By:_____

Joint Reactions

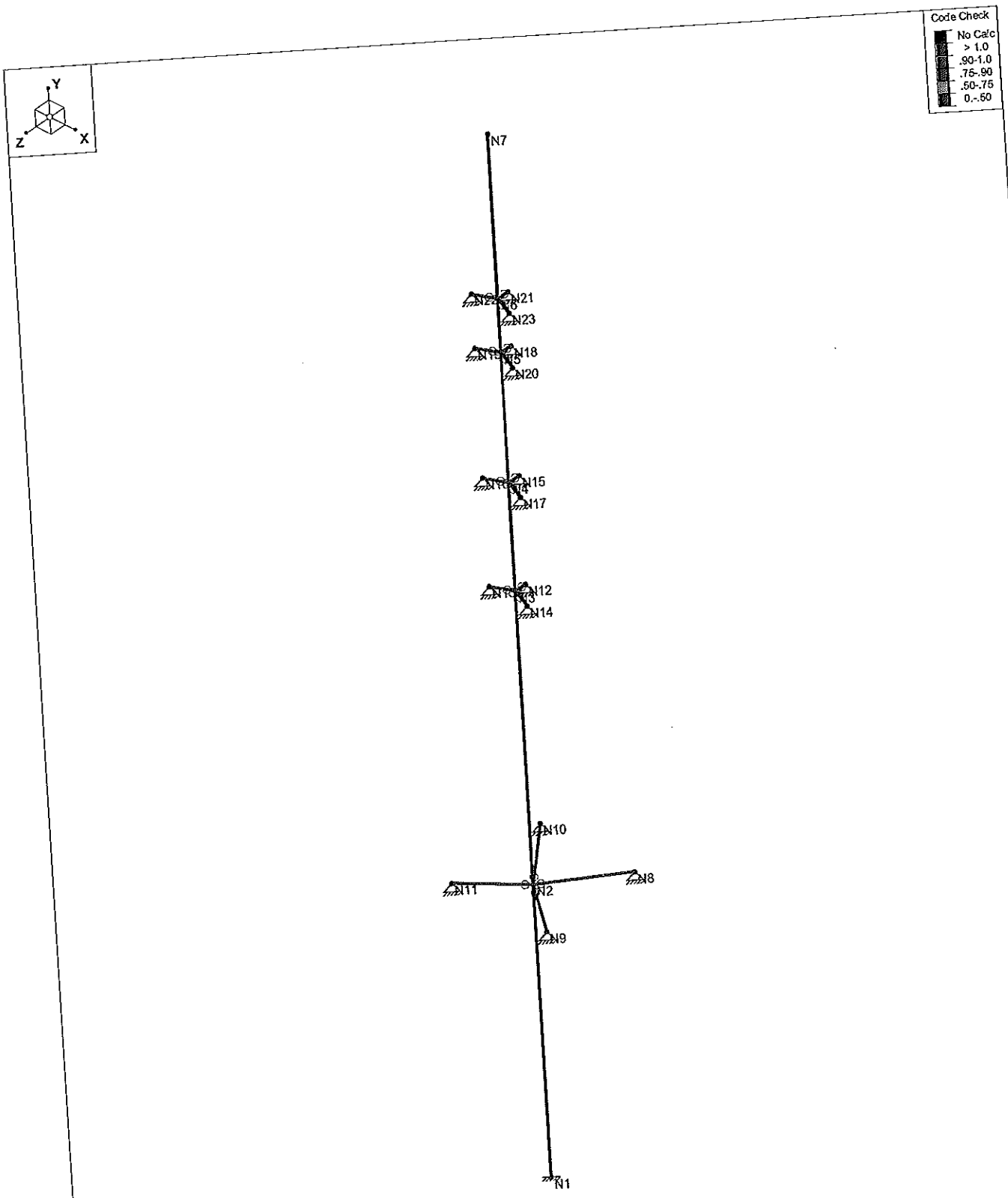
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	N1	-.204	5.899	0	0	0	.879
2	2	N8	-.16	.015	.138	0	0	0
3	2	N9	-.263	.012	-.172	0	0	0
4	2	N10	-.16	.015	-.138	0	0	0
5	2	N11	-.263	.012	.172	0	0	0
6	2	N12	-.006	.001	0	0	0	0
7	2	N13	-.258	.003	.103	0	0	0
8	2	N14	-.258	.003	-.103	0	0	0
9	2	N15	-.006	.001	0	0	0	0
10	2	N16	-.143	.003	.055	0	0	0
11	2	N18	-.006	.001	0	0	0	0
12	2	N19	1.29	.003	-.542	0	0	0
13	2	N21	-.006	.001	0	0	0	0
14	2	N22	-1.989	.003	.824	0	0	0
15	2	N17	-.143	.003	-.055	0	0	0
16	2	N20	1.29	.003	.542	0	0	0
17	2	N23	-1.989	.003	-.824	0	0	0
18	2	Totals:	-3.272	5.978	0			
19	2	COG (ft):	X: 0	Y: 50.145	Z: -.014			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	N1	0	6.872	-.165	-.704	0	0
2	3	N8	.138	.027	-.222	0	0	0
3	3	N9	-.172	.021	-.173	0	0	0
4	3	N10	-.138	.027	-.222	0	0	0
5	3	N11	.172	.021	-.173	0	0	0
6	3	N12	0	.003	-.365	0	0	0
7	3	N13	.07	.005	-.042	0	0	0
8	3	N14	-.07	.005	-.042	0	0	0
9	3	N15	0	.003	-.202	0	0	0
10	3	N16	.039	.005	-.029	0	0	0
11	3	N18	0	.003	1.9	0	0	0
12	3	N19	-.363	.005	.138	0	0	0
13	3	N21	0	.003	-2.845	0	0	0
14	3	N22	.544	.005	-.24	0	0	0
15	3	N17	-.039	.005	-.029	0	0	0
16	3	N20	.363	.005	.138	0	0	0
17	3	N23	-.544	.005	-.24	0	0	0
18	3	Totals:	0	7.016	-2.811			
19	3	COG (ft):	X: 0	Y: 50.672	Z: -.021			

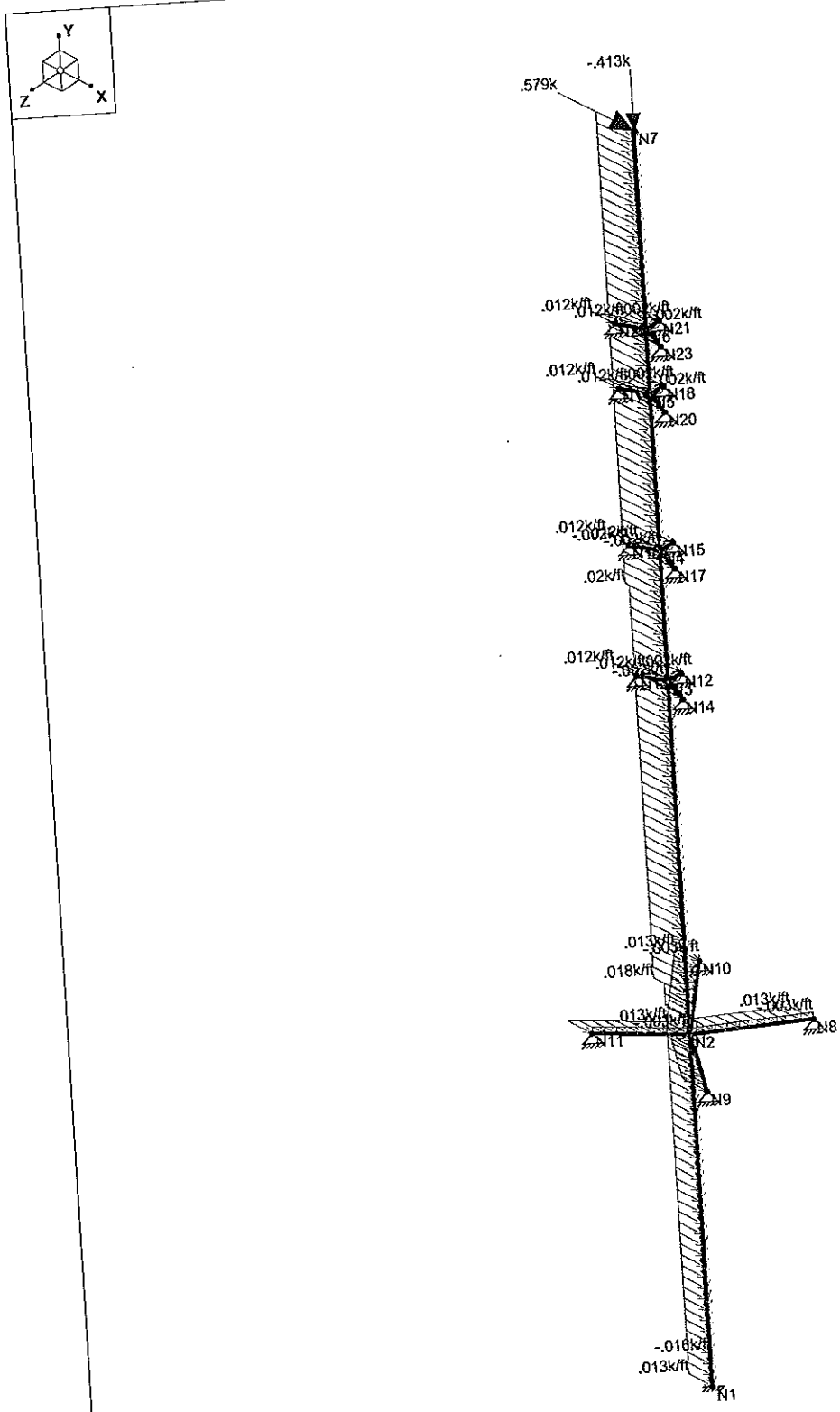
Joint Reactions (By Combination)

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	N1	0	5.899	-.205	-.882	0	0
2	4	N8	.154	.015	-.238	0	0	0
3	4	N9	-.192	.012	-.185	0	0	0
4	4	N10	-.154	.015	-.238	0	0	0
5	4	N11	.192	.012	-.185	0	0	0
6	4	N12	0	.001	-.415	0	0	0
7	4	N13	.079	.003	-.044	0	0	0
8	4	N14	-.079	.003	-.044	0	0	0
9	4	N15	0	.001	-.248	0	0	0
10	4	N16	.047	.003	-.031	0	0	0
11	4	N18	0	.001	2.302	0	0	0
12	4	N19	-.44	.003	.173	0	0	0
13	4	N21	0	.001	-3.442	0	0	0
14	4	N22	.658	.003	-.285	0	0	0
15	4	N17	-.047	.003	-.031	0	0	0
16	4	N20	.44	.003	.173	0	0	0
17	4	N23	-.658	.003	-.285			
18	4	Totals:	0	5.978	-3.225			
19	4	COG (ft):	X: 0	Y: 50.145	Z: -.014			



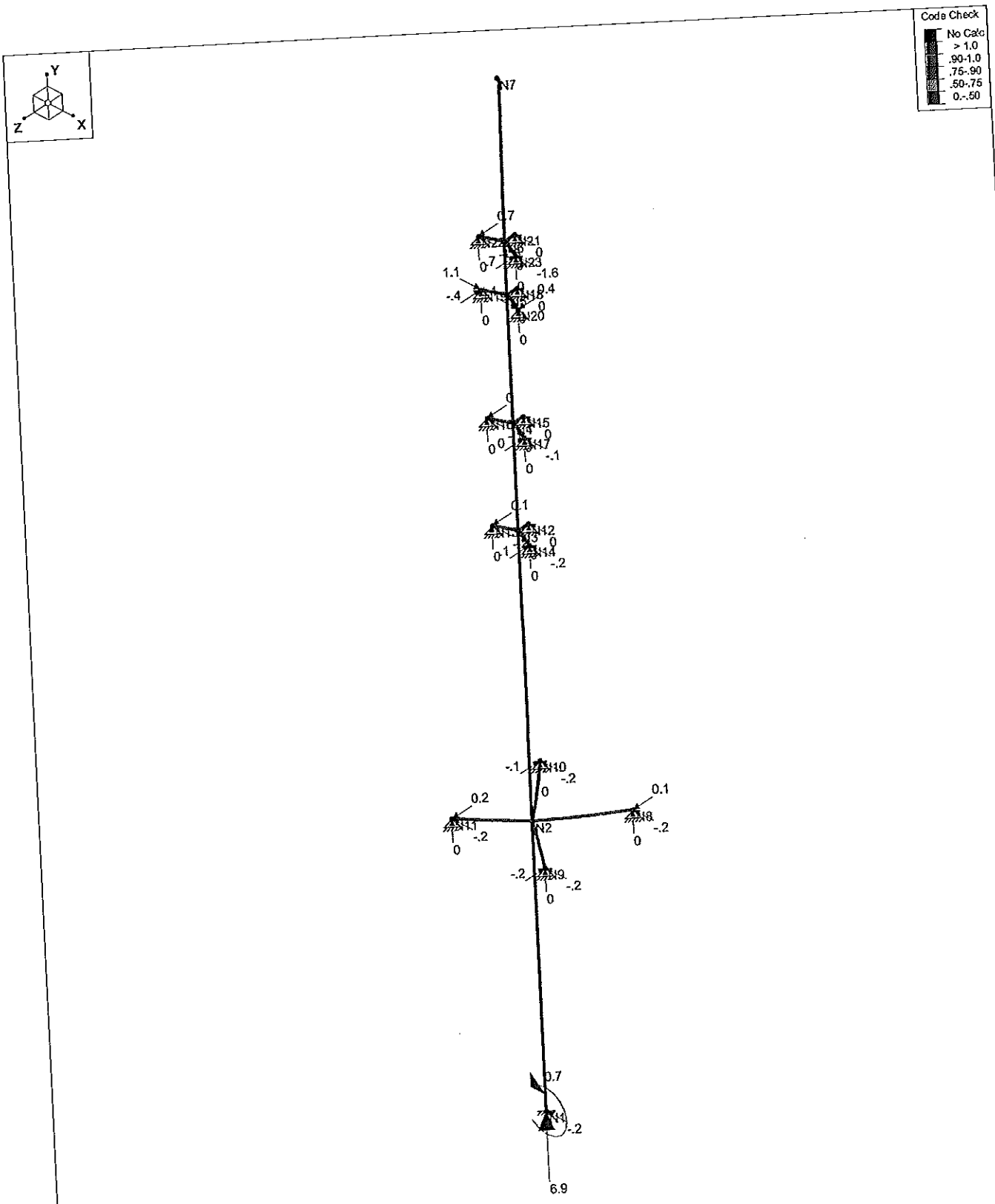
Solution: Envelope

CENTEK Engineering, INC.	CL&P Struct. #326 - Powermount	Mar 6, 2014 at 2:40 PM
tjl, cfc	Unity Check	EIA-TIA.r3d
12047.CO15 - CT03XC037		



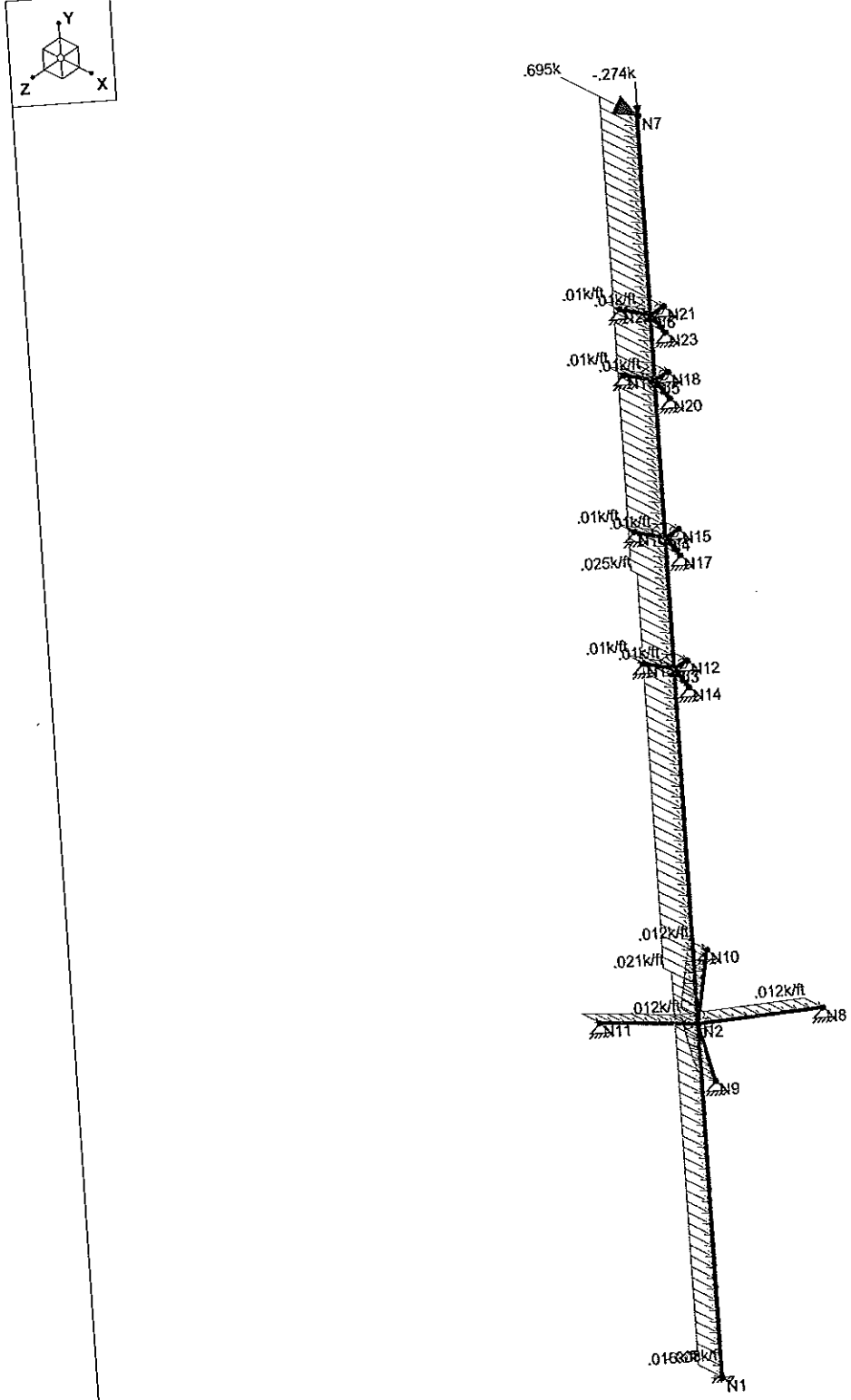
Loads: LC 1, (X) TIA/EIA Wind + Ice on PCS Structure

CENTEK Engineering, INC.	CL&P Struct. #326 - Powermount	Mar 6, 2014 at 2:40 PM
tjl, cfc	LC #1 Loads	EIA-TIA.r3d
12047.CO15 - CT03XC037		



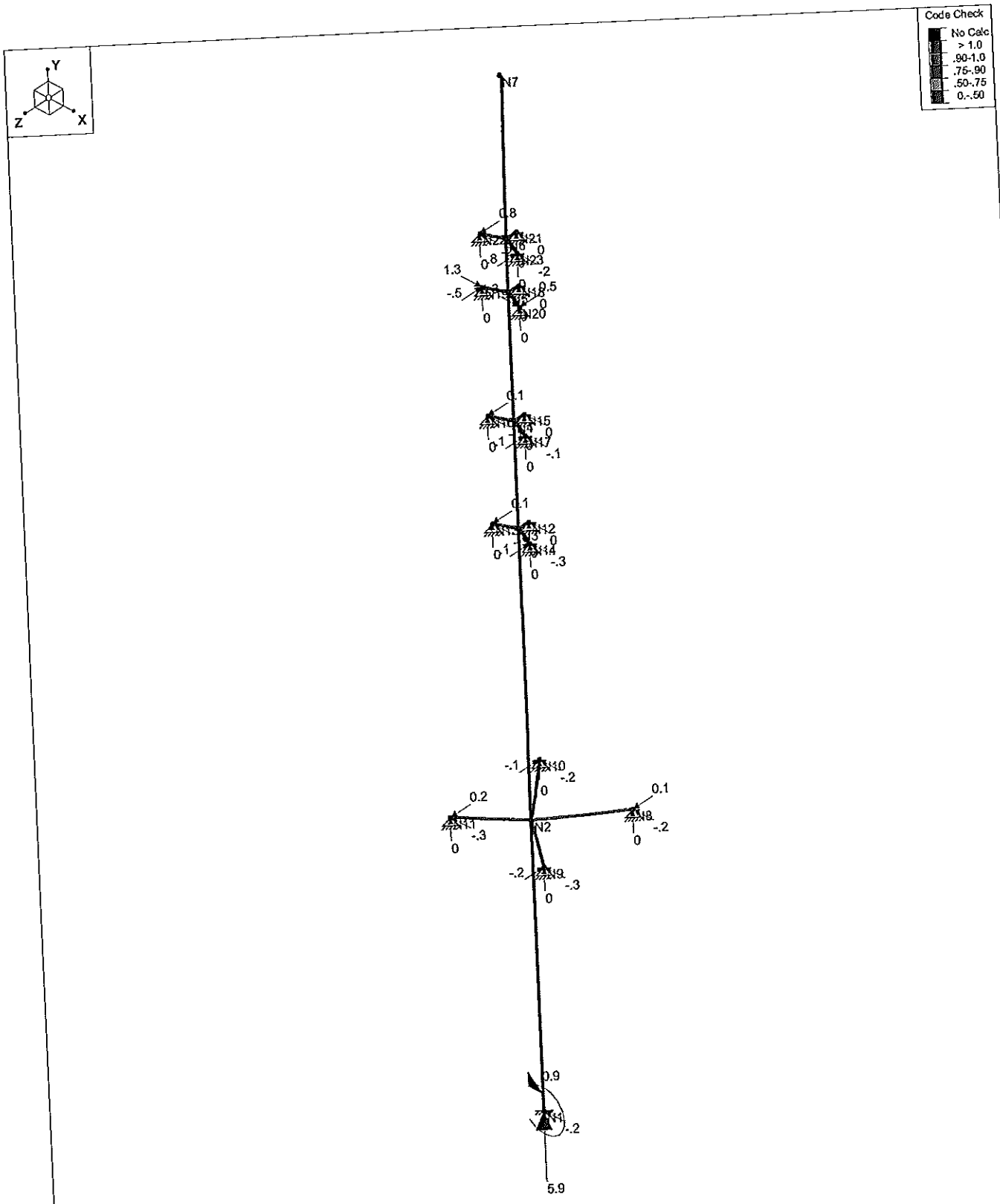
Results for LC 1, (X) TIA/EIA Wind + Ice on PCS Structure
Z-moment Reaction units are k and k-ft

CENTEK Engineering, INC.	CL&P Struct. #326 - Powermount	Mar 6, 2014 at 2:44 PM
tjl, cfc	LC #1 Reactions and Deflected Shape	EIA-TIA.r3d
12047.CO15 - CT03XC037		



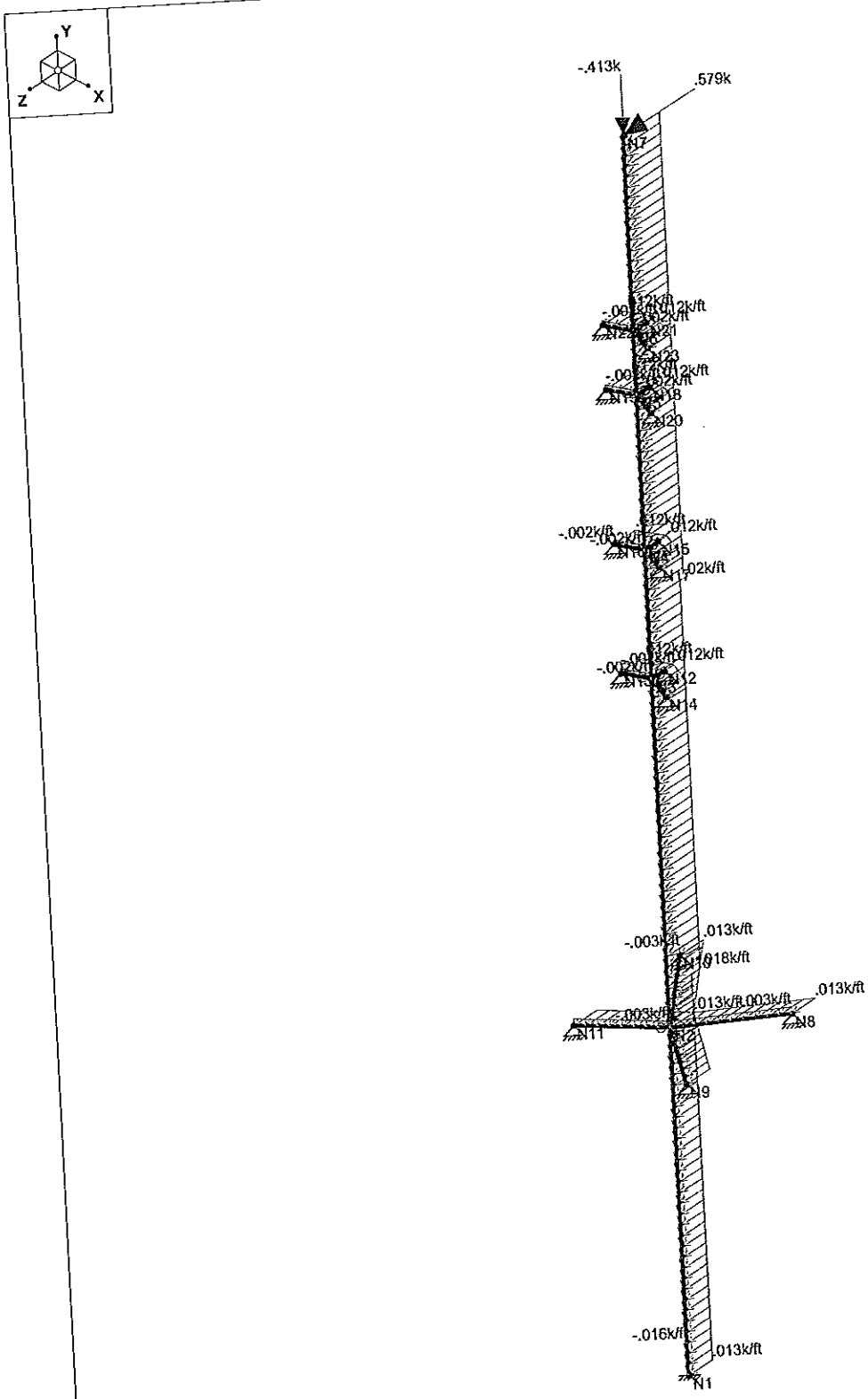
Loads: LC 2, (X) TIA/EIA Wind on PCS Structure

CENTEK Engineering, INC.	CL&P Struct. #326 - Powermount	Mar 6, 2014 at 2:41 PM
tjl, cfc	LC #2 Loads	EIA-TIA.r3d
12047.CO15 - CT03XC037		



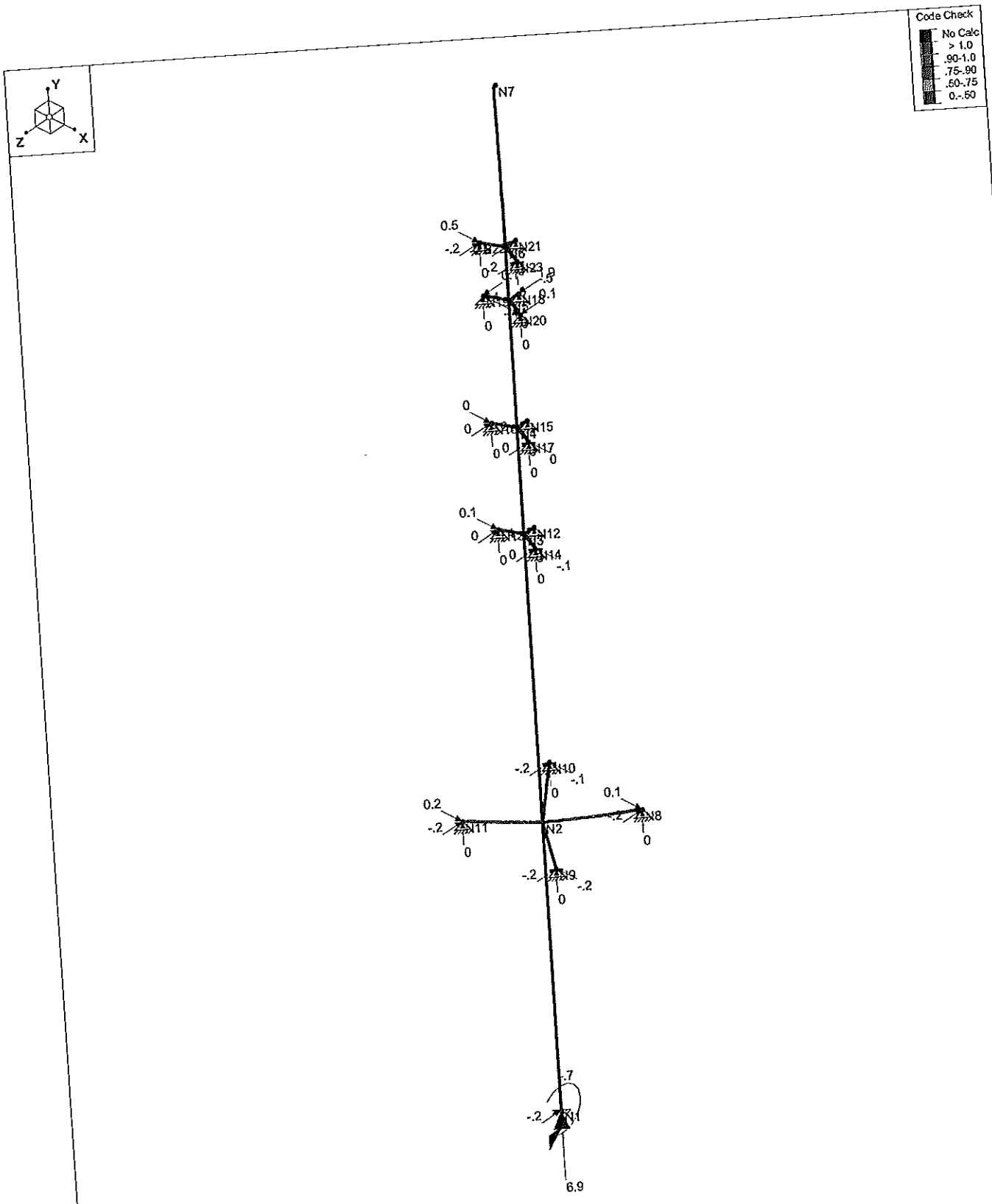
Results for LC 2, (X) TIA/EIA Wind on PCS Structure
Z-moment Reaction units are k and k-ft

CENTEK Engineering, INC.	CL&P Struct. #326 - Powermount	Mar 6, 2014 at 2:44 PM
tjl, cfc	LC #2 Reactions and Deflected Shape	EIA-TIA.r3d
12047.CO15 - CT03XC037		



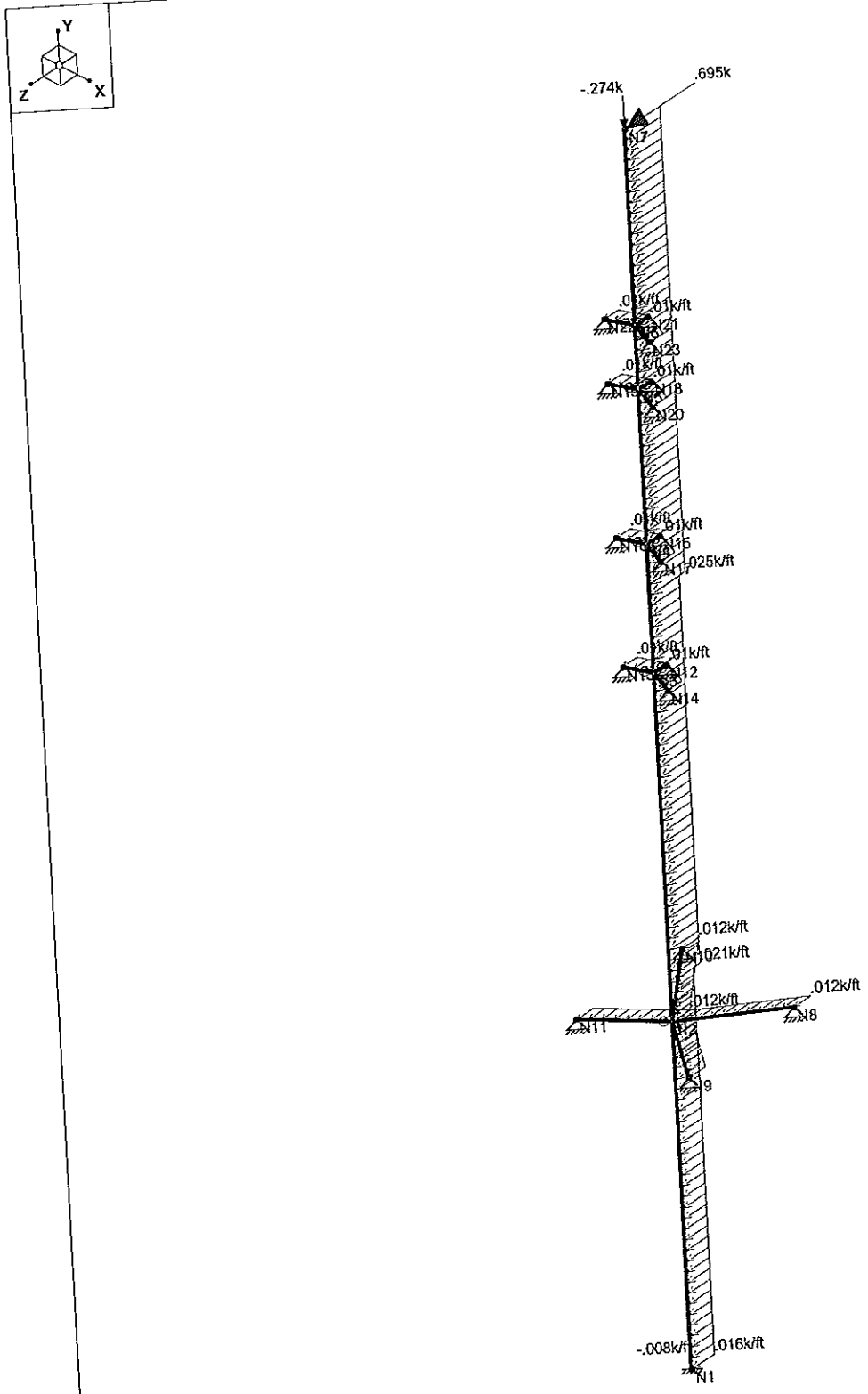
Loads: LC 3, (Z) TIA/EIA Wind + Ice on PCS Structure

CENTEK Engineering, INC.	CL&P Struct. #326 - Powermount	Mar 6, 2014 at 2:41 PM
tjl, cfc	LC #3 Loads	EIA-TIA.r3d
12047.CO15 - CT03XC037		



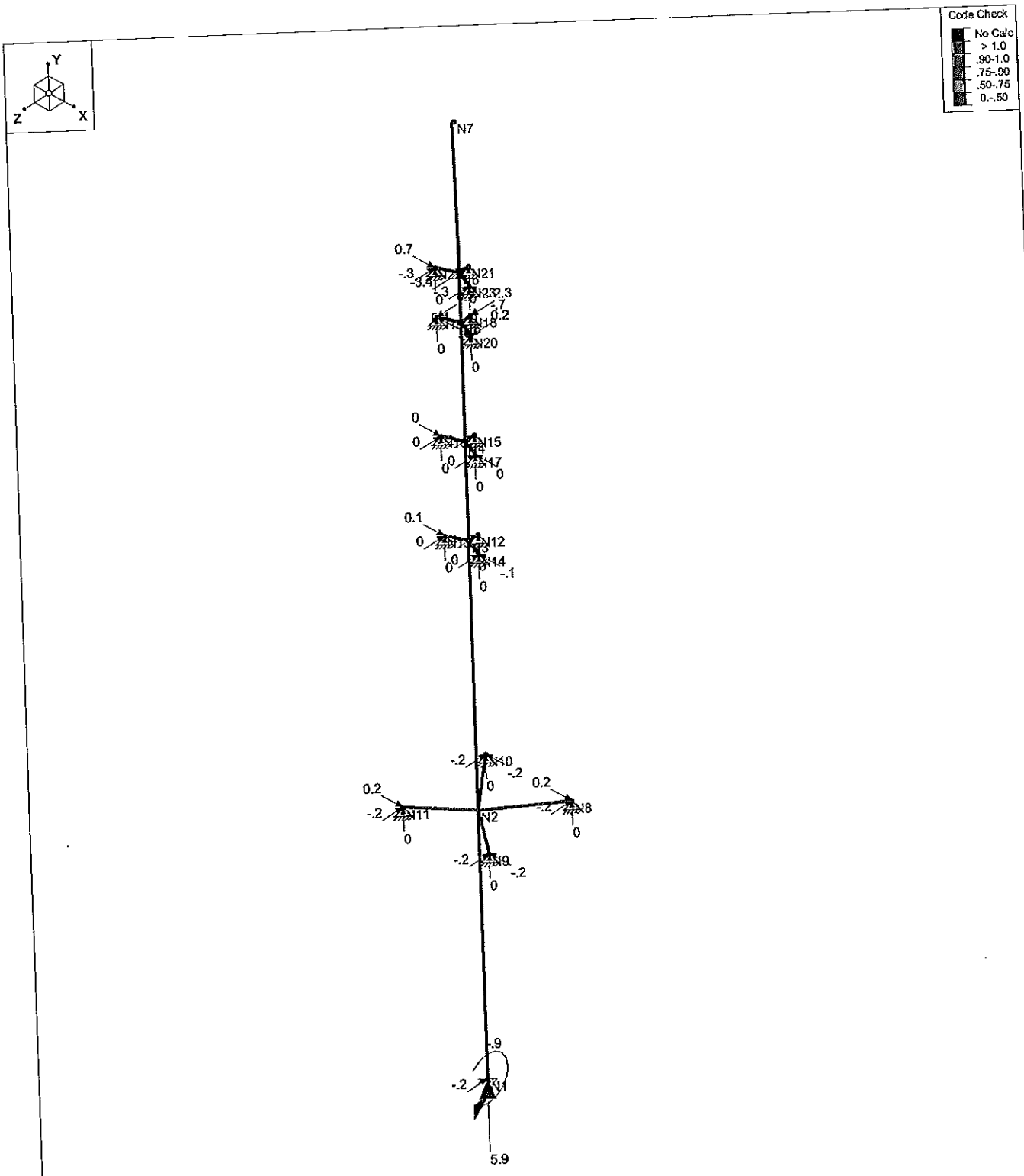
Results for LC 3, (Z) TIA/EIA Wind + Ice on PCS Structure
Z-moment Reaction units are k and k-ft

CENTEK Engineering, INC.	CL&P Struct. #326 - Powermount	Mar 6, 2014 at 2:45 PM
tjl, cfc	LC #3 Reactions and Deflected Shape	EIA-TIA.r3d
12047.CO15 - CT03XC037		



Loads: LC 4, (Z) TIA/EIA Wind on PCS Structure

CENTEK Engineering, INC.	CL&P Struct. #326 - Powermount	Mar 6, 2014 at 2:41 PM
tjl, cfc	LC #4 Loads	EIA-TIA.r3d
12047.CO15 - CT03XC037		



Results for LC 4, (Z) TIA/EIA Wind on PCS Structure
Z-moment Reaction units are k and k-ft

CENTEK Engineering, INC.	CL&P Struct. #326 - Powermount	SK - 1
tjl, cfc	LC #4 Reactions and Deflected Shape	Mar 6, 2014 at 2:48 PM
12047.CO15 - CT03XC037		EIA-TIA.r3d

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Subject: Connection of Powermount to CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 1: 6/4/13

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

Powermount Connection to CL&P Tower:

Check Pipe Collar Bolts:

Reactions:

Tension = Tension := 4.1·kips (Input From Risa-3D LC #4) (Sum of the forces in brace members)

Shear = Shear := 4.1·kips (Input From Risa-3D LC #2) (Sum of the forces in brace members)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

Bolt Diameter = D := 0.625·in (User Input)

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

Allowable Tensile Strength = $F_t := 13.8 \cdot kips$ (User Input)

Allowable Shear Strength = $F_v := 8.3 \cdot kips$ (User Input)

Shear Force = $f_v := \frac{Shear}{N_b} = 1 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_v}{F_v} = 12.35 \cdot \%$

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

$Bolt\_Shear = "OK"$

Tension Force = $f_t := \frac{Tension}{N_b} = 1 \cdot kips$

Bolt Tenison % of Capacity = $\frac{f_t}{F_t} = 7.43 \cdot \%$

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

$Bolt\_Tension = "OK"$

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Subject: Connection of Powermount to CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 1: 6/4/13

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

Check Pipe Collar to Angle Brace Bolts:

Reactions:

Shear = $Shear := 4.1 \cdot kips$ (Input From Risa-3D LC #4)
(Sum of the forces in brace members)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

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

Totoal Number of Bolts = $N_b := 3$ (User Input)

Number of Bolts (Hole Transverse to Line of Force) = $N_{bT} := 1$ (User Input)

Number of Bolts (Hole Parallel to Line of Force) = $N_{bP} := 2$ (User Input)

Allowable Shear Strength (Hole Transverse to Line of Force) = $F_{VT} := 4.3 \cdot kips$ (User Input)

Allowable Shear Strength (Hole Parallel to Line of Force) = $F_{VP} := 3.66 \cdot kips$ (User Input)

Bolt Shear % of Capacity = $f_V := \frac{Shear}{(N_{bT} \cdot F_{VT} + N_{bP} \cdot F_{VP})} = 35.3 \cdot \%$

Check Bolt Shear = $Bolt\_Shear := if(f_V \le 1.00, "OK", "Overstressed")$

$Bolt\_Shear = "OK"$

Check Angle Brace to Tower Bolts:

Reactions:

Vertical = $Vertical := 0 \cdot kips$ (Input From Risa-3D LC #4)

Horizontal x-dir = $Horizontal_x := 0 \cdot kips$ (Input From Risa-3D LC #4)

Horizontal z-dir = $Horizontal_z := 3.5 \cdot kips$ (Input From Risa-3D LC #4)

Bolt Data:

Bolt Type = ASTMA325 (User Input)

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

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

Allowable Tensile Strength = $F_t := 13.8 \cdot kips$ (User Input)

Allowable Shear Strength = $F_V := 16.6 \cdot kips$ (User Input) (Bolt is in Double Shear)

Shear Force = $f_V := \frac{\sqrt{Horizontal_z^2 + Vertical^2}}{N_b} = 3.5 \cdot kips$

Bolt Shear % of Capacity = $\frac{f_V}{F_V} = 21.08 \cdot \%$

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

$Bolt\_Shear = "OK"$

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Subject: Load Analysis of Powermount on CL&P Structure #326

Location: Beacon Falls, CT

Rev. 0: 3/25/13

Prepared by: T.J.L Checked by: C.F.C.
Job No. 12047.CO15

Basic Components

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

Factors for Extreme Wind Calculation

Elevation of Top of PCS Mast Above Grade = TME := 97 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 = $Kz := 2.01 \cdot \left(\frac{TME}{900}\right)^{\frac{2}{9.5}} = 1.258$ (NESC 2007 Table 250-2)

Exposure Factor = $Es := 0.346 \left[\frac{33}{(0.67 \cdot TME)}\right]^{\frac{1}{7}} = 0.314$ (NESC 2007 Table 250-3)

Response Term = $Bs := \frac{1}{\left(1 + 0.375 \cdot \frac{TME}{220}\right)} = 0.858$ (NESC 2007 Table 250-3)

Gust Response Factor = $Grf := \frac{\left[1 + \left(2.7 \cdot Es \cdot Bs^{\frac{1}{2}}\right)\right]}{kv^2} = 0.873$ (NESC 2007 Table 250-3)

Wind Pressure = $qz := 0.00256 \cdot Kz \cdot V^2 \cdot Grf \cdot I = 34$ 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 APXVSPP18-C		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 72$	in	(User Input)
Antenna Width =	$W_{ant} := 11.8$	in	(User Input)
Antenna Thickness =	$T_{ant} := 7$	in	(User Input)
Antenna Weight =	$WT_{ant} := 57$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 2$		(User Input)

Wind Load (NESC Extreme)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna =	$SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.9$	sf	
Antenna Projected Surface Area =	$A_{ant} := SA_{ant} \cdot N_{ant} = 11.8$	sf	
Total Antenna Wind Force =	$F_{ant1} := qz \cdot Cd_F \cdot A_{ant} \cdot m = 803$	lbs	BLC 5

Wind Load (NESC Heavy)

Assumes Maximum Possible Wind Pressure Applied to all Antennas Simultaneously

Surface Area for One Antenna w/ Ice =	$SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 6.5$	sf	
Antenna Projected Surface Area w/ Ice =	$A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 13$	sf	
Total Antenna Wind Force w/ Ice =	$Fi_{ant1} := p \cdot Cd_F \cdot A_{ICEant} = 83$	lbs	BLC 4

Gravity Load (without Ice)

Weight of All Antennas =	$Wt_{ant1} := (WT_{ant} \cdot N_{ant}) = 114$	lbs	BLC 2

Gravity Load (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5947$	cu in	
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1528$	cu in	
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 50$	lbs	
Weight of Ice on All Antennas =	$Wt_{ice.ant1} := W_{ICEant} \cdot N_{ant} = 99$	lbs	BLC 3

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Subject: Load Analysis of Powermount on CL&P Structure #326

Location: Beacon Falls, CT

Rev. 0: 3/25/13

Prepared by: T.J.L Checked by: C.F.C.
Job No. 12047.CO15

Development of Wind & Ice Load on Mounts

Mount Data: (Sprint)

Mount Type = Tri-Sector Chain Mount

Platform Shape = Flat (User Input)

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

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

Wind Load (NESC Extreme)

Total Platform Wind Force = $F_{mnt1} := 0 = 0$ (Mount Shielded by Antennas) lbs **BLC 5**

Wind Load (NESC Heavy)

Total Platform Wind Force w/ Ice = $Fi_{mnt1} := 0$ (Mount Shielded by Antennas) lbs **BLC 4**

Gravity Load (without ice)

Weight of Platform = $Wt_{mnt1} := WT_{mnt} = 160$ lbs **BLC 2**

Gravity Loads (ice only)

Weight of Ice on Platform = $Wt_{ice.mnt1} := (WT_{mnt.ice} - WT_{mnt}) = 40$ lbs **BLC 3**

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Subject: Load Analysis of Powermount on CL&P Structure #326

Location: Beacon Falls, CT

Rev. 0: 3/25/13

Prepared by: T.J.L Checked by: C.F.C.
Job No. 12047.CO15

Total Equipment Loads:

Sprint @ 96.25-ft AGL

NESC Heavy Wind Vertical = $\left(Wt_{ant1} + Wt_{ice.ant1} + Wt_{mnt1} + Wt_{ice.mnt1}\right) \cdot 1.5 = 620$

NESC Heavy Wind Trasnsverse = $\left(Fi_{ant1} + Fi_{mnt1}\right) \cdot 2.5 = 208$

NESC Extreme Wind Vertical = $\left(Wt_{ant1} + Wt_{mnt1}\right) = 274$

NESC Extreme Wind Trasnsverse = $\left(F_{ant1} + F_{mnt1}\right) = 803$

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Subject: Coax Cable on Powermount on CL&P Tower # 1281

Location: Greenwich, CT

Rev. 1: 3/6/14

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO5

Coax Cable within Powermount

(Below Top of Tower)

Distance Between Coax Cable Attach Points = $Coax_{Span} := \begin{pmatrix} 7.5 \\ 10 \\ 8.5 \\ 11 \\ 18.5 \\ 40.5 \end{pmatrix} \cdot ft$ *(User Input)*

Diameter of Coax Cable =	$D_{coax} := 1.98 \cdot in$	*(User Input)*	
Weight of Coax Cable =	$W_{coax} := 1.04 \cdot plf$	*(User Input)*	
Number of Coax Cables =	$N_{coax} := 8$	*(User Input)*	(Cables Inside Powermount)
Number of Projected Coax Cables Transverse =	$NP_{Tcoax} := 0$	*(User Input)*	
Extreme Wind Pressure =	$qz := 34 \cdot psf$	*(User Input)*	
Heavy Wind Pressure =	$p := 4 \cdot psf$	*(User Input)*	
Radial Ice Thickness =	$Ir := 0.5 \cdot in$	*(User Input)*	
Radial Ice Density =	$Id := 56 \cdot pcf$	*(User Input)*	
Shape Factor =	$Cd_{coax} := 1.6$	*(User Input)*	
Overload Factor for NESC Heavy Wind Load =	$OF_{HW} := 2.5$	*(User Input)*	
Overload Factor for NESC Extreme Wind Load =	$OF_{EW} := 1.0$	*(User Input)*	
Overload Factor for NESC Heavy Vertical Load =	$OF_{HV} := 1.5$	*(User Input)*	
Overload Factor for NESC Extreme Vertical Load =	$OF_{EV} := 1.0$	*(User Input)*	
Wind Area with Ice Transverse =	$A_{Tice} := 0$		
Wind Area without Ice Transverse =	$A_T := 0$		
Ice Area per Liner Ft =	$AI_{coax} := 0$		
Weight of Ice on All Coax Cables =	$W_{ice} := 0$		

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Subject:	Coax Cable on Powermount on CL&P Tower # 1281
Location:	Greenwich, CT
Rev. 1: 3/6/14	Prepared by: T.J.L. Checked by: C.F.C. Job No. 12047.CO5

Heavy Vertical Load =

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

Heavy Transverse Load =

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

$$Heavy_{Vert} = \begin{pmatrix} 94 \\ 125 \\ 106 \\ 137 \\ 231 \\ 505 \end{pmatrix} lb \qquad Heavy_{Trans} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$

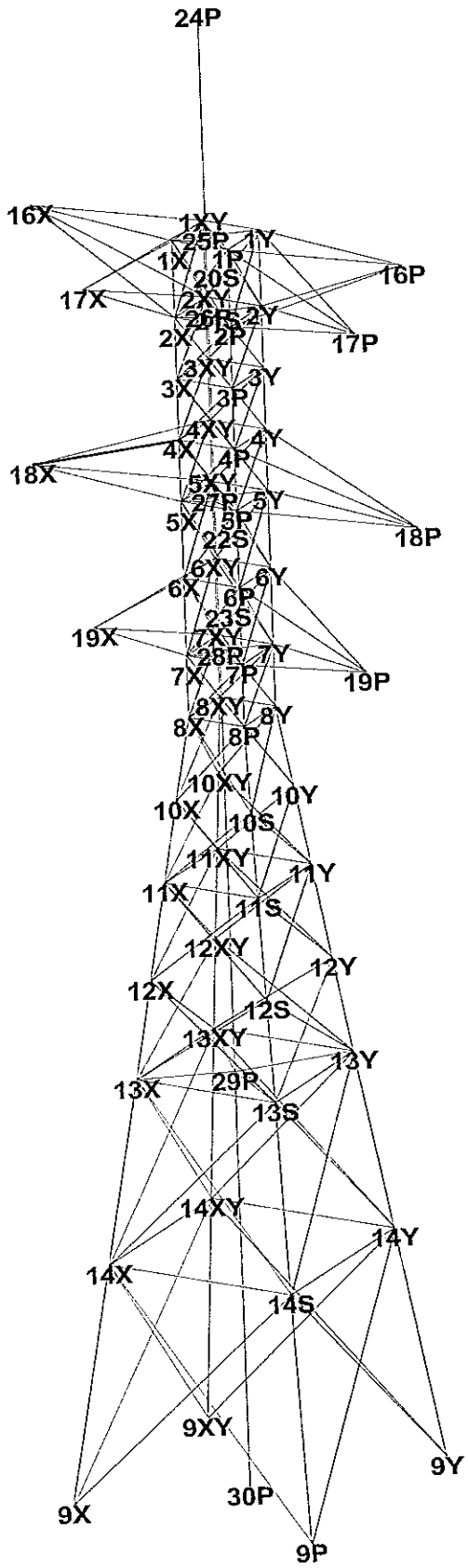
Extreme Vertical Load =

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

Extreme Transverse Load =

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

$$Extreme_{Vert} = \begin{pmatrix} 62 \\ 83 \\ 71 \\ 92 \\ 154 \\ 337 \end{pmatrix} lb \qquad Extreme_{Trans} = \begin{pmatrix} 0 \\ 0 \\ 0 \\ 0 \\ 0 \\ 0 \end{pmatrix}$$


24P
16X
1XY
25P
1Y
1X
1P
16P
20S
17X
2XY
26P
2S
2Y
2X
2P
17P
3XY
3Y
3X
3P
4XY
4Y
4X
4P
18X
5XY
27P
5Y
5X
5P
18P
22S
6XY
6Y
6X
6P
23S
19X
7XY
28P
7Y
19P
7X
7P
8XY
8Y
8X
8P
10XY
10Y
10X
10S
11XY
11Y
11X
11S
12XY
12Y
12X
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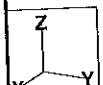
9XY
9Y
30P
9X
9P


Z
Y

Project Name : 12047.C015 - Beacon Falls, CT
Project Notes: CL&P Structure #326 / Sprint - CT03XC037
Project File : J:\Jobs\1204700.WI\C015 - CT03XC037\Rev (2)\Calcs\PLS Tower\CL&P # 326.tow
Date run : 1:24:24 PM Thursday, March 06, 2014
by : Tower Version 12.50
Licensed to : Centek Engineering Inc

Successfully performed nonlinear analysis

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

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

Loads from file: j:\jobs\1204700.wi\co15 - ct03xc037\rev (2)\calcs\pls tower\cl&p # 326.lca

*** Analysis Results:

Maximum element usage is 84.51% for Angle "g38X" in load case "NESC Heavy"
Maximum insulator usage is 9.70% for Clamp "6" in load case "NESC Heavy"

Summary of Joint Support Reactions For All Load Cases:

Load Case	Joint Label	Long. Force (kips)	Tran. Force (kips)	Vert. Force (kips)	Shear Force (kips)	Tran. Moment (ft-k)	Long. Moment (ft-k)	Bending Moment (ft-k)	Vert. Moment (ft-k)	Found. Usage %
NESC Heavy	9P	-5.62	-6.57	-43.78	8.64	0.04	0.18	0.18	0.02	0.00
NESC Heavy	30P	-0.00	-0.40	-13.89	0.40	2.95	0.00	2.95	-0.06	0.00
NESC Heavy	9X	4.68	-2.97	24.54	5.54	0.03	0.01	0.03	-0.00	0.00
NESC Heavy	9XY	-4.75	-2.77	24.11	5.50	0.02	-0.02	0.03	0.00	0.00
NESC Heavy	9Y	5.69	-6.49	-43.94	8.63	0.04	0.18	0.18	0.02	0.00
NESC Extreme	9P	-6.30	-6.58	-48.66	9.11	0.11	-0.20	0.23	-0.02	0.00
NESC Extreme	30P	-0.00	-0.32	-5.36	0.32	5.14	-0.07	5.14	-0.03	0.00
NESC Extreme	9X	7.30	-6.94	38.84	10.07	0.11	0.02	0.11	0.01	0.00
NESC Extreme	9XY	-7.40	-6.81	38.70	10.06	0.11	-0.02	0.11	-0.01	0.00
NESC Extreme	9Y	6.41	-6.63	-49.00	9.22	0.10	-0.20	0.22	-0.03	0.00

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

Load Case	Support Joint	Origin Joint	Leg Member	Force In Leg Dir. (kips)	Residual Shear Perpendicular To Leg (kips)	Residual Shear Horizontal To Leg - Res. (kips)	Residual Shear Horizontal To Leg - Long. (kips)	Residual Shear Horizontal To Leg - Tran. (kips)	Total Long. Force (kips)	Total Tran. Force (kips)	Total Vert. Force (kips)
NESC Heavy	9P	14S	g13P	44.619	0.873	0.879	-0.074	0.876	-5.62	-6.57	-43.78
NESC Heavy	9X	14X	g13X	-25.115	1.494	1.502	-1.487	-0.218	4.68	-2.97	24.54
NESC Heavy	9XY	14XY	g13XY	-24.671	1.651	1.659	1.619	-0.361	-4.75	-2.77	24.11
NESC Heavy	9Y	14Y	g13Y	44.778	0.768	0.774	0.019	0.774	5.69	-6.49	-43.94
NESC Extreme	9P	14S	g13P	49.510	0.255	0.257	-0.027	0.256	-6.30	-6.58	-48.66
NESC Extreme	9X	14X	g13X	-40.016	2.889	2.938	-2.251	1.887	7.30	-6.94	38.84
NESC Extreme	9XY	14XY	g13XY	-39.875	2.915	2.963	2.371	1.776	-7.40	-6.81	38.70
NESC Extreme	9Y	14Y	g13Y	49.857	0.255	0.258	-0.036	0.256	6.41	-6.63	-49.00

Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Tran. Face Top Width (ft)	Tran. Face Bot Width (ft)	Tran. Face Gross Area (ft^2)	Long. Face Top Width (ft)	Long. Face Bot Width (ft)	Long. Face Gross Area (ft^2)
1	96.250	50.000	49	180	0.00	4.00	154.500	0.00	4.00	506.813
2	50.000	0.000	31	90	4.00	17.00	525.000	4.00	17.00	525.000

*** 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	L/R	KL/R	Length	Group Curve Desc.	Angle No. Type	Angle Size	Steel Strength	Max Usage Control	Max Comp. Use In	Comp. Control Member	Comp. Force	Comp. Control Load	L/R Capacity	Comp. Connect. Shear	Comp. Connect. Bearing	RLX	RLY	RLZ
Comp.	No.	Of																

Member	Bolts				Comp.		Case		Capacity	Capacity			
Comp.				(ksi)	%		%	(kips)	(kips)	(kips)			
(ft)													
Leg1	L4x4x1/4	SAE	4X4X0.25	33.0	38.28	Tens	35.95	g5Y -19.238NESC Hea	53.509	54.600	84.375	1.000	1.000 1.000
75.47 75.47 5.000	1	6											
Leg2	L4x4x5/16	SAE	4X4X0.3125	33.0	79.08	Comp	79.08	g11Y -45.856NESC Ext	57.983	72.800	140.625	1.000	1.000 1.000
96.41 96.41 6.355	1	8											
Diag1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	21.38	Cross	21.38	g29P -2.348NESC Hea	10.982	18.200	28.125	0.787	1.000 0.573
161.13 145.30 7.103	6	2											
Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	21.58	Comp	21.58	g16XY -3.927NESC Hea	22.933	18.200	28.125	0.750	0.500 0.500
86.81 95.10 5.657	2	2											
Diag3	L2.5x2x1/4	SAU	2.5X2X0.25	33.0	40.67	Comp	40.67	g26X -7.402NESC Hea	26.806	18.200	28.125	0.750	0.500 0.500
80.05 90.04 5.657	2	2											
Diag4	L2x2x3/16	SAE	2X2X0.1875	33.0	14.29	Cross	14.29	g33P -1.088NESC Hea	7.612	18.200	21.094	0.777	1.000 0.554
190.56 163.39 9.798	6	2											
Diag5	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	84.51	Comp	84.51	g38X -1.513NESC Hea	1.790	18.200	21.094	0.782	0.437 0.437
375.62 314.82 21.495	5	2											
Diag6	L2x2x1/4	SAE	2X2X0.25	33.0	48.80	Comp	48.80	g36X -2.142NESC Ext	4.389	18.200	28.125	0.783	0.566 0.566
287.38 247.58 16.544	5	2											
Horz1	L2x2x1/4	SAE	2X2X0.25	33.0	14.62	Comp	14.62	g40X -2.585NESC Hea	17.680	18.200	28.125	1.000	1.000 1.000
122.76 122.14 4.000	5	2											
Horz2	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	37.35	Tens	27.61	g47X -5.025NESC Ext	25.851	18.200	28.125	1.000	1.000 1.000
97.76 108.88 4.000	3	2											
Horz3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	18.90	Comp	18.90	g53X -0.605NESC Ext	3.201	9.100	10.547	1.000	1.000 1.000
235.45 235.45 6.730	4	1											
Horz4	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	75.87	Comp	75.87	g57X -5.926NESC Ext	7.811	18.200	21.094	1.000	0.500 0.500
201.05 181.80 13.035	5	2											
Inner1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	27.54	Tens	12.68	g59Y -1.154NESC Hea	18.292	9.100	14.062	1.000	1.000 1.000
99.53 104.65 2.828	2	1											
ShieldAr	L2x2x1/4	SAE	2X2X0.25	33.0	29.97	Tens	0.00	g63Y 0.000	17.777	18.200	28.125	1.000	1.000 1.000
122.76 121.70 4.000	6	2											
ShArmBr	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	24.92	Comp	24.92	g70P -3.653NESC Hea	14.662	18.200	28.125	0.500	0.500 0.500
152.41 152.41 12.472	4	2											
TopCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	42.77	Comp	42.77	g64P -4.615NESC Hea	10.791	18.200	28.125	1.000	1.000 1.000
195.61 177.66 8.004	5	2											
TopArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	24.52	Tens	0.00	g71Y 0.000	3.207	18.200	28.125	1.000	1.000 1.000
289.64 289.64 9.437	4	2											
MidCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	65.20	Comp	65.20	g66P -7.655NESC Hea	11.740	18.200	28.125	1.000	0.500 0.500
185.99 170.33 11.919	5	2											
MidArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	39.67	Tens	0.00	g72Y 0.000	1.807	18.200	28.125	1.000	1.000 1.000
385.85 385.85 12.572	4	2											
BotCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	41.59	Comp	41.59	g68P -4.488NESC Hea	10.791	18.200	28.125	1.000	1.000 1.000
195.61 177.66 8.004	5	2											
BotArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	23.71	Tens	0.00	g73Y 0.000	3.207	18.200	28.125	1.000	1.000 1.000
289.64 289.64 9.437	4	2											
Pwmnt	12" Std. Pipe	Pwmnt	Pipe 12" Std.	50.0	2.48	Comp	2.48	g74P -12.830NESC Hea	517.731	0.000	0.000	1.000	1.000 1.000
73.92 73.92 27.042	1	0											
PMBR1	L2x2x3/16	SAE	2X2X0.1875	36.0	29.90	Tens	18.88	g82P -1.925NESC Hea	18.610	16.800	10.195	1.000	1.000 1.000
65.99 92.99 2.167	3	1	A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P g80X g82P g82X g83P g84P g84X g86P g86X ??										
PMBR2	L3x3x3/16	SAE	3X3X0.1875	36.0	4.54	Comp	4.54	g88P -0.463NESC Ext	19.523	16.800	10.195	1.000	1.000 1.000
126.41 126.41 6.278	4	1											

Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Tension Use In Tens. %	Tension Control Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Tension Member Tens. (ft)	No. Of Bolts
Leg1	L4x4x1/4	SAE	4X4X0.25	33.0	38.28	Tens	38.28	g5X	15.033	NESC Ext	39.270	54.600	84.375	84.375	5.000	6
4.000	0.75																
Leg2	L4x4x5/16	SAE	4X4X0.3125	33.0	79.08	Comp	73.11	g13X	35.286	NESC Ext	48.262	91.000	175.781	137.867	15.506	10
4.000	0.75																
Diag1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	21.38	Cross	14.79	g14P	2.693	NESC Ext	18.488	18.200	28.125	21.875	6.403	2
1.000	0.75																
Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	21.58	Comp	18.19	g18P	3.310	NESC Hea	22.349	18.200	28.125	21.875	5.657	2
1.000	0.75																
Diag3	L2.5x2x1/4	SAU	2.5X2X0.25	33.0	40.67	Comp	31.21	g26P	5.681	NESC Ext	22.201	18.200	28.125	19.875	5.657	2
1.000	0.75																
Diag4	L2x2x3/16	SAE	2X2X0.1875	33.0	14.29	Cross	8.66	g33X	1.358	NESC Ext	16.910	18.200	21.094	15.680	9.798	2
1.000	0.75																
Diag5	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	84.51	Comp	27.07	g39X	3.854	NESC Ext	14.237	18.200	21.094	15.504	21.495	2
1.000	0.75																
Diag6	L2x2x1/4	SAE	2X2X0.25	33.0	48.80	Comp	31.48	g37X	5.016	NESC Ext	22.349	18.200	28.125	15.937	16.544	2
1.000	0.75																
Horz1	L2x2x1/4	SAE	2X2X0.25	33.0	14.62	Comp	0.00	g40X	0.000		22.349	18.200	28.125	19.781	4.000	2
1.000	0.75																
Horz2	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	37.35	Tens	37.35	g46Y	6.798	NESC Hea	29.774	18.200	28.125	20.719	4.000	2
1.000	0.75																
Horz3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	18.90	Comp	3.49	g53P	0.255	NESC Ext	14.237	9.100	10.547	7.312	6.730	1
1.000	0.75																
Horz4	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	75.87	Comp	10.73	g56Y	1.487	NESC Hea	22.613	18.200	21.094	13.852	13.035	2
1.000	0.75																
Inner1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	27.54	Tens	27.54	g58Y	2.092	NESC Hea	18.488	9.100	14.062	7.594	2.828	1
1.000	0.75																
ShieldAr	L2x2x1/4	SAE	2X2X0.25	33.0	29.97	Tens	29.97	g63Y	5.454	NESC Hea	22.349	18.200	28.125	18.844	4.000	2
1.000	0.75																
ShArmBr	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	24.92	Comp	0.00	g70Y	0.000		29.774	18.200	28.125	21.875	12.472	2
1.000	0.75																
TopCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	42.77	Comp	0.00	g65Y	0.000		29.774	18.200	28.125	22.969	4.000	2
1.000	0.75																
TopArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	24.52	Tens	24.52	g71P	4.462	NESC Hea	22.349	18.200	28.125	20.906	9.437	2
1.000	0.75																
MidCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	65.20	Comp	0.00	g67Y	0.000		29.774	18.200	28.125	22.969	4.000	2
1.000	0.75																
MidArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	39.67	Tens	39.67	g72P	7.219	NESC Hea	22.349	18.200	28.125	20.906	12.572	2
1.000	0.75																
BotCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	41.59	Comp	0.00	g69Y	0.000		29.774	18.200	28.125	22.969	4.000	2
1.000	0.75																
BotArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	23.71	Tens	23.71	g73P	4.316	NESC Hea	22.349	18.200	28.125	20.906	9.437	2
1.000	0.75																
Pwmnt	12" Std. Pipe	Pwmnt	Pipe 12" Std.	50.0	2.48	Comp	0.00	g79P	0.000		679.999	0.000	0.000	0.000	15.250	0
0.000	0																
PMBR1	**L2x2x3/16**	**SAE**	**2X2X0.1875**	**36.0**	**29.90**	**Tens**	**29.90**	**g80P**	**3.049**	**NESC Hea**	**18.827**	**16.800**	**10.195**	**10.343**	**2.167**	**1**
1.000	**0.6875**	**A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P g80X g82P g82X g83P g84P g84X g86P g86X ??**															

PMBR2		L3x3x3/16	SAE	3X3X0.1875	36.0	4.54	Comp	1.15	g89P	0.118NESC Hea	31.139	16.800	10.195	11.328	7.918	1
1.000	0.6875																

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	84.51	g38X	Angle
NESC Extreme	79.08	g11Y	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	6.28	NESC Heavy	0.0
2	Clamp	6.32	NESC Heavy	0.0
3	Clamp	9.60	NESC Heavy	0.0
4	Clamp	9.63	NESC Heavy	0.0
5	Clamp	9.68	NESC Heavy	0.0
6	Clamp	9.70	NESC Heavy	0.0
7	Clamp	9.60	NESC Heavy	0.0
8	Clamp	9.63	NESC Heavy	0.0
9	Clamp	2.73	NESC Heavy	0.0
10	Clamp	0.40	NESC Extreme	0.0
11	Clamp	0.40	NESC Extreme	0.0
12	Clamp	0.40	NESC Extreme	0.0
13	Clamp	1.17	NESC Extreme	0.0
14	Clamp	0.77	NESC Extreme	0.0
15	Clamp	0.77	NESC Extreme	0.0
16	Clamp	0.79	NESC Heavy	0.0
17	Clamp	1.91	NESC Heavy	0.0
18	Clamp	1.60	NESC Heavy	0.0
19	Clamp	2.07	NESC Heavy	0.0
20	Clamp	3.58	NESC Heavy	0.0
21	Clamp	5.74	NESC Heavy	0.0

*** Weight of structure (lbs):
Weight of Angles*Section DLF: 12664.8
Total: 12664.8

*** End of Report

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*****************************************************************************
*                                                                           *
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*                                                                           *
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Project Name : 12047.CO15 - Beacon Falls, CT
Project Notes: CL&P Structure #326 / Sprint - CT03XC037
Project File : J:\Jobs\1204700.WI\CO15 - CT03XC037\Rev (2)\Calcs\PLS Tower\CL&P # 326.tow
Date run     : 1:24:24 PM Thursday, March 06, 2014
by           : Tower Version 12.50
Licensed to  : Centek Engineering Inc

Successfully performed nonlinear analysis

Member "g7P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g7X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g7XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g7Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g13P" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g13X" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g13XY" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
Member "g13Y" will not be checked for block shear since more than one gage line exists (long edge distance (g) greater than zero); however, end, edge
and spacing distances will be checked. ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g52P" ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g52Y" ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g53P" ??
KL/R value of 235.45 exceeds maximum of 200.00 for member "g53X" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62P" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62X" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62XY" ??
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62Y" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71P" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71X" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71XY" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71Y" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72P" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72X" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72XY" ??
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72Y" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73P" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73X" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73XY" ??
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73Y" ??
Unusual number of fixed joints found: 5.  Towers normally have from between 1 and 4 fixed joints. ??
The model has 29 warnings.  ??
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1Y	Y-GenXY	-2	2	81	Free	Free	Free	Free	Free	Free
2X	X-GenXY	2	-2	76	Free	Free	Free	Free	Free	Free
2XY	XY-GenXY	-2	-2	76	Free	Free	Free	Free	Free	Free
2Y	Y-GenXY	-2	2	76	Free	Free	Free	Free	Free	Free
3X	X-GenXY	2	-2	72	Free	Free	Free	Free	Free	Free
3XY	XY-GenXY	-2	-2	72	Free	Free	Free	Free	Free	Free
3Y	Y-GenXY	-2	2	72	Free	Free	Free	Free	Free	Free
4X	X-GenXY	2	-2	68	Free	Free	Free	Free	Free	Free
4XY	XY-GenXY	-2	-2	68	Free	Free	Free	Free	Free	Free
4Y	Y-GenXY	-2	2	68	Free	Free	Free	Free	Free	Free
5X	X-GenXY	2	-2	64	Free	Free	Free	Free	Free	Free
5XY	XY-GenXY	-2	-2	64	Free	Free	Free	Free	Free	Free
5Y	Y-GenXY	-2	2	64	Free	Free	Free	Free	Free	Free
6X	X-GenXY	2	-2	59	Free	Free	Free	Free	Free	Free
6XY	XY-GenXY	-2	-2	59	Free	Free	Free	Free	Free	Free
6Y	Y-GenXY	-2	2	59	Free	Free	Free	Free	Free	Free
7X	X-GenXY	2	-2	54	Free	Free	Free	Free	Free	Free
7XY	XY-GenXY	-2	-2	54	Free	Free	Free	Free	Free	Free
7Y	Y-GenXY	-2	2	54	Free	Free	Free	Free	Free	Free
8X	X-GenXY	2	-2	50	Free	Free	Free	Free	Free	Free
8XY	XY-GenXY	-2	-2	50	Free	Free	Free	Free	Free	Free
8Y	Y-GenXY	-2	2	50	Free	Free	Free	Free	Free	Free
9X	X-GenXY	8.5	-8.5	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
9XY	XY-GenXY	-8.5	-8.5	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
9Y	Y-GenXY	-8.5	8.5	0	Fixed	Fixed	Fixed	Fixed	Fixed	Fixed
16X	X-Gen	0	-13.25	81	Free	Free	Free	Free	Free	Free
17X	X-Gen	0	-9.75	76	Free	Free	Free	Free	Free	Free
18X	X-Gen	0	-13.75	64	Free	Free	Free	Free	Free	Free
19X	X-Gen	0	-9.75	54	Free	Free	Free	Free	Free	Free

Secondary Joints:

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

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

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

Steel Material Properties:

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

Bolt Properties:

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

Number Bolts Used By Type:

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

Angle Properties:

Angle Type	Angle Size	Long Leg (in)	Short Leg (in)	Thick. (in)	Unit Weight (lbs/ft)	Gross Area (in^2)	w/t Ratio	Radius of Gyration Rx (in)	Radius of Gyration Ry (in)	Radius of Gyration Rz (in)	Number of Angles	Wind Width (in)	Short Edge Dist. (in)	Long Edge Dist. (in)	Optimize Cost Factor	Section Modulus (in^3)
SAE	4X4X0.3125	4	4	0.3125	8.2	2.4	10.6	1.24	1.24	0.791	1	4	2	0	1.0000	0
SAE	4X4X0.25	4	4	0.25	6.6	1.94	13.5	1.25	1.25	0.795	1	4	2	0	1.0000	0
SAE	3X3X0.1875	3	3	0.1875	3.71	1.09	13.33	0.939	0.939	0.596	1	3	1.5	0	1.0000	0
SAE	2.5X2.5X0.25	2.5	2.5	0.25	4.1	1.19	7.75	0.769	0.769	0.491	1	2.5	1.25	0	1.0000	0
SAE	2.5X2.5X0.1875	2.5	2.5	0.1875	3.07	0.902	10.67	0.778	0.778	0.495	1	2.5	1.25	0	1.0000	0
SAE	2X2X0.25	2	2	0.25	3.19	0.94	5	0.609	0.609	0.391	1	2	1	0	1.0000	0
SAE	2X2X0.1875	2	2	0.1875	2.44	0.71	8	0.617	0.617	0.394	1	2	1	0	1.0000	0
SAE	1.75X1.75X0.25	1.75	1.75	0.25	2.77	0.81	4.25	0.529	0.529	0.341	1	1.75	0.875	0	1.0000	0
SAE	1.75X1.75X0.1875	1.75	1.75	0.1875	2.12	0.62	6	0.537	0.537	0.343	1	1.75	0.875	0	1.0000	0
SAU	2.5X2X0.25	2.5	2	0.25	3.62	1.06	7.75	0.784	0.592	0.424	1	2.5	1	0	1.0000	0
Pwmnt	Pipe 12" Std.	12.75	12	0	49.6	13.6	1	4.39	4.39	4.39	1	12.75	0	0	0.0000	0

Angle Groups:

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

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

Aggregate Angle Information:

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

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

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

Section Label	Joint Defining Section Bottom	Dead Load Adjust. Factor	Transverse Drag x Area Factor For Face	Longitudinal Drag x Area Factor For Face	Transverse Area Factor (CD From Code)	Longitudinal Area Factor (CD From Code)	Af Flat Factor For Face EIA Only	Ar Round Factor For Face EIA Only	Transverse Drag x Area Factor For All	Longitudinal Drag x Area Factor For All	SAPS Angle Drag x Area Factor	SAPS Round Drag x Area Factor	Force Solid Face
1	8P	1.000	3.200	3.200	1.000	1.000	0.000	0.000	1.000	1.000	0.000	0.000	None
2	9P	1.050	3.400	3.400	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 Tension Rest. Path Coef.	Path Length	Path Length
g1P	Leg1		XY-Symmetry	1P	2P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g1X	Leg1		X-GenXY	1X	2X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g1XY	Leg1		XY-GenXY	1XY	2XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g1Y	Leg1		Y-GenXY	1Y	2Y	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g2P	Leg1		XY-Symmetry	2P	3P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g2X	Leg1		X-GenXY	2X	3X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g2XY	Leg1		XY-GenXY	2XY	3XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g2Y	Leg1		Y-GenXY	2Y	3Y	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g3P	Leg1		XY-Symmetry	3P	4P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g3X	Leg1		X-GenXY	3X	4X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g3XY	Leg1		XY-GenXY	3XY	4XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g3Y	Leg1		Y-GenXY	3Y	4Y	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g4P	Leg1		XY-Symmetry	4P	5P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g4X	Leg1		X-GenXY	4X	5X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g4XY	Leg1		XY-GenXY	4XY	5XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g4Y	Leg1		Y-GenXY	4Y	5Y	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g5P	Leg1		XY-Symmetry	5P	6P	1	4	1	1	1	5/8 A394	6	4	1	Both	1.75	0	1.25	0	0	0	0
g5X	Leg1		X-GenXY	5X	6X	1	4	1	1	1	5/8 A394	6	4	1	Both	1.75	0	1.25	0	0	0	0
g5XY	Leg1		XY-GenXY	5XY	6XY	1	4	1	1	1	5/8 A394	6	4	1	Both	1.75	0	1.25	0	0	0	0
g5Y	Leg1		Y-GenXY	5Y	6Y	1	4	1	1	1	5/8 A394	6	4	1	Both	1.75	0	1.25	0	0	0	0
g6P	Leg2		XY-Symmetry	6P	7P	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g6X	Leg2		X-GenXY	6X	7X	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0
g6XY	Leg2		XY-GenXY	6XY	7XY	1	4	1	1	1	5/8 A394	0	4	0		0	0	0	0	0	0	0

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

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

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

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

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

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

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

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

g83P	PMBR1	None	26P	21S	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g84P	PMBR1	X-Symmetry	5X	27P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g84X	PMBR1	X-Gen	5P	27P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g85P	PMBR1	None	27P	22S	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g86P	PMBR1	X-Symmetry	7X	28P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g86X	PMBR1	X-Gen	7P	28P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g87P	PMBR1	None	28P	23S	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g88P	PMBR2	X-Symmetry	13X	29P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g88X	PMBR2	X-Gen	13S	29P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g89P	PMBR2	X-Symmetry	13XY	29P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0
g89X	PMBR2	X-Gen	13Y	29P	3	4	1	1	1 5/8 A325	1	1	1	Long only	0	0	0	0	0	0	0

Member Capacities and Overrides:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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0.000              0.000          Automatic
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62X"  ??
  g62XY ShieldAr    6.715       L/r  18.200     Shear  225  11.43    6.715     18.200     28.125     22.349     18.844     0.000     0.000     0.000
0.000              0.000          Automatic
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62XY"  ??
   g62Y ShieldAr    6.715       L/r  18.200     Shear  225  11.43    6.715     18.200     28.125     22.349     18.844     0.000     0.000     0.000
0.000              0.000          Automatic
KL/R value of 200.16 exceeds maximum of 200.00 for member "g62Y"  ??
   g63P ShieldAr   17.777       L/r  18.200     Shear  123   4.00   17.777     18.200     28.125     22.349     18.844     0.000     0.000     0.000
0.000              0.000          Automatic
   g63Y ShieldAr   17.777       L/r  18.200     Shear  123   4.00   17.777     18.200     28.125     22.349     18.844     0.000     0.000     0.000
0.000              0.000          Automatic
   g64P TopCrArm   10.791       L/r  18.200     Shear  196   8.00   10.791     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g64X TopCrArm   10.791       L/r  18.200     Shear  196   8.00   10.791     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
  g64XY TopCrArm   10.791       L/r  18.200     Shear  196   8.00   10.791     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g64Y TopCrArm   10.791       L/r  18.200     Shear  196   8.00   10.791     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g65P TopCrArm   18.200     Shear  18.200     Shear   98   4.00   25.851     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g65Y TopCrArm   18.200     Shear  18.200     Shear   98   4.00   25.851     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g66P MidCrArm   11.740       L/r  18.200     Shear  186  11.92   11.740     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g66X MidCrArm   11.740       L/r  18.200     Shear  186  11.92   11.740     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
  g66XY MidCrArm   11.740       L/r  18.200     Shear  186  11.92   11.740     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g66Y MidCrArm   11.740       L/r  18.200     Shear  186  11.92   11.740     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g67P MidCrArm   18.200     Shear  18.200     Shear   98   4.00   25.851     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g67Y MidCrArm   18.200     Shear  18.200     Shear   98   4.00   25.851     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g68P BotCrArm   10.791       L/r  18.200     Shear  196   8.00   10.791     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g68X BotCrArm   10.791       L/r  18.200     Shear  196   8.00   10.791     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
  g68XY BotCrArm   10.791       L/r  18.200     Shear  196   8.00   10.791     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g68Y BotCrArm   10.791       L/r  18.200     Shear  196   8.00   10.791     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g69P BotCrArm   18.200     Shear  18.200     Shear   98   4.00   25.851     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g69Y BotCrArm   18.200     Shear  18.200     Shear   98   4.00   25.851     18.200     28.125     29.774     22.969     0.000     0.000     0.000
0.000              0.000          Automatic
   g70P  ShArmBr   14.662       L/r  18.200     Shear  152  12.47   14.662     18.200     28.125     29.774     21.875     0.000     0.000     0.000
0.000              0.000          Automatic
   g70X  ShArmBr   14.662       L/r  18.200     Shear  152  12.47   14.662     18.200     28.125     29.774     21.875     0.000     0.000     0.000
0.000              0.000          Automatic
  g70XY  ShArmBr   14.662       L/r  18.200     Shear  152  12.47   14.662     18.200     28.125     29.774     21.875     0.000     0.000     0.000
0.000              0.000          Automatic
   g70Y  ShArmBr   14.662       L/r  18.200     Shear  152  12.47   14.662     18.200     28.125     29.774     21.875     0.000     0.000     0.000
0.000              0.000          Automatic
   g71P TopArmBr    3.207       L/r  18.200     Shear  290   9.44    3.207     18.200     28.125     22.349     20.906     0.000     0.000     0.000
0.000              0.000          Automatic
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71P"  ??
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g71X TopArmBr		3.207	L/r	18.200	Shear	290	9.44	3.207	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71X" ??															
g71XY TopArmBr		3.207	L/r	18.200	Shear	290	9.44	3.207	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71XY" ??															
g71Y TopArmBr		3.207	L/r	18.200	Shear	290	9.44	3.207	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 289.64 exceeds maximum of 200.00 for member "g71Y" ??															
g72P MidArmBr		1.807	L/r	18.200	Shear	386	12.57	1.807	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72P" ??															
g72X MidArmBr		1.807	L/r	18.200	Shear	386	12.57	1.807	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72X" ??															
g72XY MidArmBr		1.807	L/r	18.200	Shear	386	12.57	1.807	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72XY" ??															
g72Y MidArmBr		1.807	L/r	18.200	Shear	386	12.57	1.807	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 385.85 exceeds maximum of 200.00 for member "g72Y" ??															
g73P BotArmBr		3.207	L/r	18.200	Shear	290	9.44	3.207	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73P" ??															
g73X BotArmBr		3.207	L/r	18.200	Shear	290	9.44	3.207	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73X" ??															
g73XY BotArmBr		3.207	L/r	18.200	Shear	290	9.44	3.207	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73XY" ??															
g73Y BotArmBr		3.207	L/r	18.200	Shear	290	9.44	3.207	18.200	28.125	22.349	20.906	0.000	0.000	0.000
0.000		0.000	Automatic												
KL/R value of 289.64 exceeds maximum of 200.00 for member "g73Y" ??															
g74P	Pwmnt	517.731	L/r	679.999	Net Sect	74	27.04	517.731	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g75P	Pwmnt	518.738	L/r	679.999	Net Sect	74	26.96	518.738	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g76P	Pwmnt	657.809	L/r	679.999	Net Sect	27	10.00	657.809	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g77P	Pwmnt	648.046	L/r	679.999	Net Sect	33	12.00	648.046	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g78P	Pwmnt	674.451	L/r	679.999	Net Sect	14	5.00	674.451	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g79P	Pwmnt	628.394	L/r	679.999	Net Sect	42	15.25	628.394	0.000	0.000	679.999	0.000	0.000	0.000	0.000
0.000		0.000	Automatic												
g80P	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000	Automatic												
g80X	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000	Automatic												
g81P	PMBR1	10.195	Bearing	10.195	Bearing	36	1.17	20.699	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000	Automatic												
g82P	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000	Automatic												
g82X	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000	Automatic												
g83P	PMBR1	10.195	Bearing	10.195	Bearing	36	1.17	20.699	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000	Automatic												
g84P	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000

0.000		0.000		Automatic											
g84X	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g85P	PMBR1	10.195	Bearing	10.195	Bearing	36	1.17	20.699	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g86P	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g86X	PMBR1	10.195	Bearing	10.195	Bearing	66	2.17	18.610	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g87P	PMBR1	10.195	Bearing	10.195	Bearing	36	1.17	20.699	16.800	10.195	18.827	10.343	0.000	0.000	0.000
0.000		0.000		Automatic											
g88P	PMBR2	10.195	Bearing	10.195	Bearing	126	6.28	19.523	16.800	10.195	31.139	11.328	0.000	0.000	0.000
0.000		0.000		Automatic											
g88X	PMBR2	10.195	Bearing	10.195	Bearing	126	6.28	19.523	16.800	10.195	31.139	11.328	0.000	0.000	0.000
0.000		0.000		Automatic											
g89P	PMBR2	10.195	Bearing	10.195	Bearing	159	7.92	12.277	16.800	10.195	31.139	11.328	0.000	0.000	0.000
0.000		0.000		Automatic											
g89X	PMBR2	10.195	Bearing	10.195	Bearing	159	7.92	12.277	16.800	10.195	31.139	11.328	0.000	0.000	0.000
0.000		0.000		Automatic											

The model contains 270 angle members.

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

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

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

Unadjusted Dead Load and Drag Areas by Section:

Section Label	Unfactored Dead Load (kips)	X-Drag Area All (ft^2)	Y-Drag Area All (ft^2)	X-Drag Area Face (ft^2)	Y-Drag Area Face (ft^2)
1	5.980	220.615	179.780	72.904	94.599
2	6.366	219.838	219.838	62.795	120.170
Total	12.346	440.453	399.618	135.699	214.770

Angle Member Weights and Surface Areas by Section:

Section	Unfactored	Factored	Unfactored	Factored

Label	Weight (kips)	Weight (kips)	Surface Area (ft^2)	Surface Area (ft^2)
1	5.980	5.980	931.589	931.589
2	6.366	6.685	948.131	995.537
Total	12.346	12.665	1879.720	1927.127

Section Joint Information:

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

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

Sections Information:

Section Label	Top Z (ft)	Bottom Z (ft)	Joint Count	Member Count	Tran. Face Top Width (ft)	Tran. Face Bot Width (ft)	Tran. Face Gross Area (ft^2)	Long. Face Top Width (ft)	Long. Face Bot Width (ft)	Long. Face Gross Area (ft^2)
1	96.250	50.000	49	180	0.00	4.00	154.500	0.00	4.00	506.813
2	50.000	0.000	31	90	4.00	17.00	525.000	4.00	17.00	525.000

*** Insulator Data

Clamp Properties:

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

Clamp Insulator Connectivity:

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

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

*** Loads Data

Loads from file: j:\jobs\1204700.wi\co15 - ct03xc037\rev (2)\calcs\pls tower\cl&p # 326.lca

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

Loading Method Parameters:

Structure Height Summary (used for calculating wind/ice adjust with height):

Z of ground for wind height adjust	0.00 (ft)	and structure Z coordinate that will be put on the centerline ground profile in PLS-CADD.
Ground elevation shift	0.00 (ft)	
Z of ground with shift	0.00 (ft)	
Z of structure top (highest joint)	96.25 (ft)	
Structure height	96.25 (ft)	
Structure height above ground	96.25 (ft)	
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 Tubular and Towers	SF for Poles Arms and 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	0.0	
NESC Extreme	1.0000	1.0000	1.00000	1.0000	1.0000	1.0000	15 loads	NESC 2007	31	0	0.000	0.000	0.0	

Point Loads for Load Case "NESC Heavy":

Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
16P	2704	1351	0	Shield Wire
16X	2704	1351	0	Shield Wire
17P	4457	1530	0	Conductor
17X	4457	1530	0	Conductor
18P	4457	1530	0	Conductor
18X	4457	1530	0	Conductor
19P	4457	1530	0	Conductor
19X	4457	1530	0	Conductor
24P	620	208	0	Sprint Antennas
24P	94	0	0	Coax Cables - Powermount
25P	125	0	0	Coax Cables - Powermount
26P	106	0	0	Coax Cables - Powermount
27P	137	0	0	Coax Cables - Powermount
28P	231	0	0	Coax Cables - Powermount
29P	505	0	0	Coax Cables - Powermount

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)	Load (lbs)	Load (lbs)
1	96.25	50.00	73.13	10.00	10.00	3.200	3027.2	0.00	3.200	0.0	0	8970
2	50.00	0.00	25.00	10.00	10.00	3.400	4085.8	0.00	3.400	0.0	0	10027

Point Loads for Load Case "NESC Extreme":

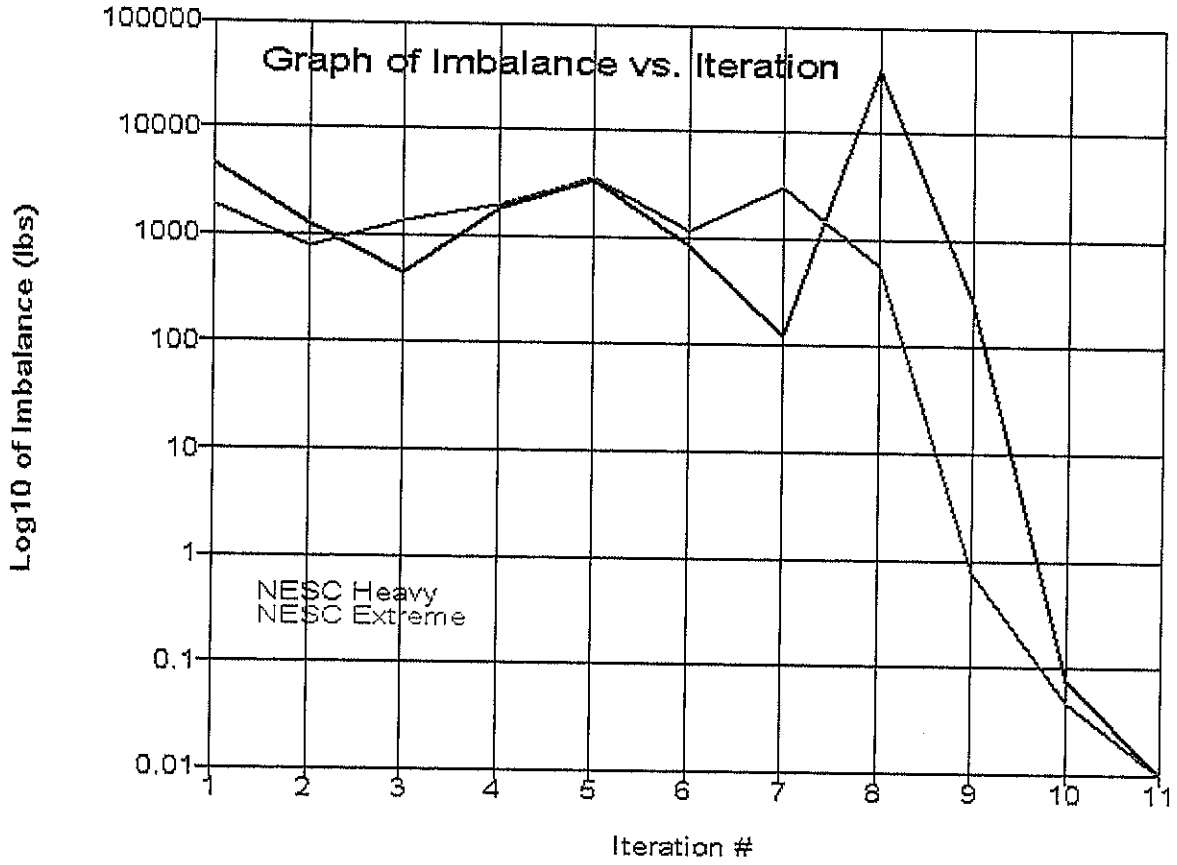
Joint Label	Vertical Load (lbs)	Transverse Load (lbs)	Longitudinal Load (lbs)	Load Comment
16P	682	795	0	Shield Wire
16X	682	795	0	Shield Wire
17P	1732	1207	0	Conductor
17X	1732	1207	0	Conductor
18P	1732	1207	0	Conductor
18X	1732	1207	0	Conductor
19P	1732	1207	0	Conductor
19X	1732	1207	0	Conductor
24P	274	803	0	Sprint Antennas
24P	62	0	0	Coax Cables - Powermount
25P	83	0	0	Coax Cables - Powermount
26P	71	0	0	Coax Cables - Powermount
27P	92	0	0	Coax Cables - Powermount
28P	154	0	0	Coax Cables - Powermount
29P	337	0	0	Coax Cables - Powermount

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

Section Label	Z of Top (ft)	Z of Bottom (ft)	Ave. Elev. Above Ground (ft)	Res. Adj. Wind Pres. (psf)	Tran Adj. Wind Pres. (psf)	Tran Angle Face Area (ft^2)	Tran Round Face Area (ft^2)	Tran Gross Area (ft^2)	Tran Soli-dity Ratio	Tran Angle Drag Coef	Tran Round Drag Coef	Tran Wind Load (lbs)	Long Adj. Wind Pres. (psf)	Long Angle Face Area (ft^2)	Long Round Face Area (ft^2)	Long Gross Area (ft^2)	Long Soli-dity Ratio	Long Angle Drag Coef	Long Round Drag Coef	Long Wind Load (lbs)	Ice Weight (lbs)	Total Weight (lbs)
1	96.25	50.00	73.13	31.23	31.23	49.71	44.89	154.50	0.612	3.200	2.000	7771.5	0.00	72.90	0.00	506.81	0.144	3.200	2.000	0.0	0	5980
2	50.00	0.00	25.00	31.23	31.23	62.80	57.38	525.00	0.229	3.200	2.000	9859.1	0.00	62.80	0.00	525.00	0.120	3.200	2.000	0.0	0	6685

*** Analysis Results:

Maximum element usage is 84.51% for Angle "g38X" in load case "NESC Heavy"
Maximum insulator usage is 9.70% for Clamp "6" 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	5.27	0.000	-2.817	-2.817	-2.429
Leg1	g1X	3.33	1.306	-0.029	-0.029	1.306
Leg1	g1XY	2.41	0.946	-0.455	-0.455	0.946
Leg1	g1Y	5.82	0.000	-3.113	-3.113	-2.489

Leg1	g2P	11.44	0.000	-6.554	-6.554	-6.071
Leg1	g2X	12.03	4.726	0.000	2.363	4.726
Leg1	g2XY	10.22	4.013	0.000	1.575	4.013
Leg1	g2Y	12.29	0.000	-7.042	-7.042	-6.169
Leg1	g3P	18.89	0.000	-10.823	-10.823	-9.921
Leg1	g3X	19.57	7.687	0.000	4.629	7.687
Leg1	g3XY	18.01	7.074	0.000	3.853	7.074
Leg1	g3Y	19.80	0.000	-11.344	-11.344	-10.120
Leg1	g4P	27.53	0.000	-15.772	-15.772	-14.294
Leg1	g4X	27.18	10.675	0.000	6.383	10.675
Leg1	g4XY	26.07	10.238	0.000	5.778	10.238
Leg1	g4Y	28.34	0.000	-16.236	-16.236	-14.579
Leg1	g5P	34.59	0.000	-18.506	-18.506	-17.881
Leg1	g5X	38.28	15.033	0.000	10.916	15.033
Leg1	g5XY	36.95	14.511	0.000	10.088	14.511
Leg1	g5Y	35.95	0.000	-19.238	-19.238	-18.403
Leg2	g6P	41.11	0.000	-27.161	-27.161	-25.925
Leg2	g6X	43.95	21.213	0.000	15.139	21.213
Leg2	g6XY	42.95	20.728	0.000	14.316	20.728
Leg2	g6Y	42.33	0.000	-27.966	-27.966	-26.527
Leg2	g7P	47.98	0.000	-33.963	-33.963	-33.569
Leg2	g7X	60.32	29.114	0.000	22.342	29.114
Leg2	g7XY	58.86	28.409	0.000	21.227	28.409
Leg2	g7Y	49.59	0.000	-35.105	-35.105	-34.373
Leg2	g8P	64.94	0.000	-41.556	-41.556	-41.530
Leg2	g8X	68.00	35.184	0.000	26.748	35.184
Leg2	g8XY	66.64	34.481	0.000	25.729	34.481
Leg2	g8Y	66.67	0.000	-42.660	-42.660	-42.235
Leg2	g9P	68.74	0.000	-44.318	-43.853	-44.318
Leg2	g9X	69.85	36.735	0.000	26.945	36.735
Leg2	g9XY	68.63	36.097	0.000	26.103	36.097
Leg2	g9Y	69.58	0.000	-44.854	-44.791	-44.854
Leg2	g10P	74.48	0.000	-43.398	-41.831	-43.398
Leg2	g10X	70.72	35.552	0.000	25.358	35.552
Leg2	g10XY	69.63	35.006	0.000	24.719	35.006
Leg2	g10Y	75.11	0.000	-43.764	-42.577	-43.764
Leg2	g11P	78.60	0.000	-45.577	-43.122	-45.577
Leg2	g11X	68.44	37.055	0.000	25.497	37.055
Leg2	g11XY	67.52	36.558	0.000	24.956	36.558
Leg2	g11Y	79.08	0.000	-45.856	-43.752	-45.856
Leg2	g12P	76.03	0.000	-45.861	-42.153	-45.861
Leg2	g12X	72.01	34.753	0.000	23.536	34.753
Leg2	g12XY	71.29	34.405	0.000	23.104	34.405
Leg2	g12Y	76.50	0.000	-46.143	-42.530	-46.143
Leg2	g13P	75.27	0.000	-49.257	-43.316	-49.257
Leg2	g13X	73.11	35.286	0.000	23.851	35.286
Leg2	g13XY	72.80	35.135	0.000	23.421	35.135
Leg2	g13Y	75.69	0.000	-49.534	-43.535	-49.534
Diag1	g14P	14.79	2.693	0.000	1.907	2.693
Diag1	g14X	17.04	0.000	-2.833	-2.240	-2.833
Diag1	g14XY	14.58	0.000	-2.425	-2.020	-2.425
Diag1	g14Y	12.35	2.248	0.000	1.676	2.248
Diag1	g15P	5.97	0.000	-0.754	-0.754	-0.500
Diag1	g15X	1.74	0.126	-0.220	-0.220	0.126
Diag1	g15XY	1.71	0.117	-0.216	-0.216	0.117
Diag1	g15Y	5.62	0.000	-0.709	-0.709	-0.503
Diag2	g16P	12.02	2.188	0.000	1.278	2.188
Diag2	g16X	21.44	0.000	-3.902	-3.902	-3.091
Diag2	g16XY	21.58	0.000	-3.927	-3.927	-3.024

Diag2	g16Y	10.72	1.951	0.000	0.956	1.951
Diag2	g17P	5.39	0.000	-0.982	-0.781	-0.982
Diag2	g17X	5.50	1.001	0.000	0.833	1.001
Diag2	g17XY	4.15	0.755	0.000	0.613	0.755
Diag2	g17Y	4.32	0.000	-0.786	-0.673	-0.786
Diag2	g18P	18.19	3.310	0.000	3.310	3.149
Diag2	g18X	14.22	0.000	-2.588	-2.014	-2.588
Diag2	g18XY	13.72	0.000	-2.497	-1.957	-2.497
Diag2	g18Y	16.85	3.067	0.000	3.067	2.936
Diag2	g19P	11.08	0.000	-2.017	-2.017	-1.752
Diag2	g19X	6.44	1.172	0.000	0.534	1.172
Diag2	g19XY	5.22	0.949	0.000	0.359	0.949
Diag2	g19Y	10.22	0.000	-1.860	-1.860	-1.525
Diag2	g20P	15.49	2.819	0.000	2.046	2.819
Diag2	g20X	18.47	0.000	-3.362	-3.362	-3.315
Diag2	g20XY	18.81	0.000	-3.423	-3.423	-3.287
Diag2	g20Y	14.34	2.610	0.000	1.765	2.610
Diag2	g21P	13.05	0.000	-2.376	-2.376	-2.218
Diag2	g21X	9.36	1.703	0.000	1.076	1.703
Diag2	g21XY	7.99	1.454	0.000	0.857	1.454
Diag2	g21Y	12.50	0.000	-2.275	-2.275	-2.029
Diag3	g22P	23.26	4.233	0.000	3.147	4.233
Diag3	g22X	30.25	0.000	-5.505	-5.505	-5.120
Diag3	g22XY	30.97	0.000	-5.637	-5.637	-5.190
Diag3	g22Y	21.90	3.986	0.000	2.747	3.986
Diag3	g23P	24.34	0.000	-4.431	-4.431	-4.344
Diag3	g23X	20.19	3.675	0.000	2.767	3.675
Diag3	g23XY	19.46	3.541	0.000	2.595	3.541
Diag3	g23Y	23.70	0.000	-4.314	-4.314	-4.231
Diag3	g24P	24.87	4.526	0.000	3.355	4.526
Diag3	g24X	30.33	0.000	-5.520	-5.520	-5.371
Diag3	g24XY	30.57	0.000	-5.564	-5.564	-5.388
Diag3	g24Y	23.82	4.336	0.000	3.083	4.336
Diag3	g25P	28.70	0.000	-5.223	-5.223	-4.914
Diag3	g25X	21.32	3.880	0.000	2.701	3.880
Diag3	g25XY	20.64	3.756	0.000	2.551	3.756
Diag3	g25Y	27.96	0.000	-5.089	-5.089	-4.789
Diag3	g26P	31.21	5.681	0.000	4.183	5.681
Diag3	g26X	40.67	0.000	-7.402	-7.402	-6.959
Diag3	g26XY	39.21	0.000	-7.136	-7.136	-6.627
Diag3	g26Y	27.96	5.089	0.000	3.515	5.089
Diag3	g27P	33.13	0.000	-6.030	-6.030	-6.002
Diag3	g27X	28.75	5.233	0.000	4.180	5.233
Diag3	g27XY	26.20	4.769	0.000	3.647	4.769
Diag3	g27Y	30.68	0.000	-5.584	-5.563	-5.584
Diag1	g28P	7.87	0.000	-0.864	-0.864	-0.262
Diag1	g28X	1.05	0.076	-0.115	0.076	-0.115
Diag1	g28XY	2.51	0.457	0.000	0.457	0.285
Diag1	g28Y	11.35	0.000	-1.387	-1.387	-0.756
Diag1	g29P	21.38	0.000	-2.348	-2.348	-2.308
Diag1	g29X	11.95	2.176	0.000	1.809	2.176
Diag1	g29XY	9.00	1.638	0.000	1.153	1.638
Diag1	g29Y	19.00	0.000	-2.087	-2.087	-2.042
Diag4	g30P	1.89	0.297	-0.204	-0.204	0.297
Diag4	g30X	2.79	0.437	-0.225	0.437	-0.225
Diag4	g30XY	4.90	0.768	0.000	0.768	0.092
Diag4	g30Y	4.08	0.013	-0.481	-0.481	0.013
Diag4	g31P	7.08	1.111	0.000	1.111	1.054
Diag4	g31X	8.15	0.000	-0.820	-0.567	-0.820

Diag4	g31XY	11.79	0.000	-1.187	-1.017	-1.187
Diag4	g31Y	8.09	1.269	0.000	1.269	1.235
Diag4	g32P	6.90	0.355	-0.525	-0.525	0.355
Diag4	g32X	9.71	0.000	-0.826	-0.179	-0.826
Diag4	g32XY	7.83	0.038	-0.596	0.038	-0.596
Diag4	g32Y	10.38	0.111	-0.790	-0.790	0.111
Diag4	g33P	14.29	0.000	-1.088	-1.088	-1.048
Diag4	g33X	8.66	1.358	0.000	1.097	1.358
Diag4	g33XY	6.84	1.072	0.000	0.746	1.072
Diag4	g33Y	12.34	0.000	-0.939	-0.939	-0.932
Diag2	g34P	9.96	0.906	0.000	0.057	0.906
Diag2	g34X	8.72	0.200	-0.679	0.200	-0.679
Diag2	g34XY	6.41	0.395	-0.499	0.395	-0.499
Diag2	g34Y	7.91	0.720	-0.114	-0.114	0.720
Diag2	g35P	6.59	0.599	0.000	0.599	0.495
Diag2	g35X	12.41	0.000	-0.696	-0.489	-0.696
Diag2	g35XY	16.35	0.000	-0.917	-0.760	-0.917
Diag2	g35Y	7.40	0.674	0.000	0.629	0.674
Diag6	g36P	22.90	0.113	-1.005	-1.005	0.113
Diag6	g36X	48.80	0.000	-2.142	-1.677	-2.142
Diag6	g36XY	47.32	0.000	-2.077	-1.481	-2.077
Diag6	g36Y	30.48	0.000	-1.338	-1.338	-0.063
Diag6	g37P	2.65	0.000	-0.116	-0.116	0.000
Diag6	g37X	31.48	5.016	0.000	3.396	5.016
Diag6	g37XY	29.87	4.761	0.000	3.107	4.761
Diag6	g37Y	0.93	0.148	0.000	0.000	0.148
Diag5	g38P	35.76	2.476	-0.640	-0.640	2.476
Diag5	g38X	84.51	0.000	-1.513	-1.513	0.000
Diag5	g38XY	75.04	0.000	-1.344	-1.344	0.000
Diag5	g38Y	48.83	2.294	-0.874	-0.874	2.294
Diag5	g39P	4.90	0.000	-0.088	0.000	-0.088
Diag5	g39X	27.07	3.854	0.000	2.627	3.854
Diag5	g39XY	25.71	3.661	0.000	2.412	3.661
Diag5	g39Y	0.67	0.095	0.000	0.095	0.000
Horz1	g40P	11.75	0.000	-2.077	-2.077	-0.263
Horz1	g40X	14.62	0.000	-2.585	-2.585	-1.352
Horz2	g41P	15.41	2.804	0.000	2.804	1.269
Horz2	g41X	11.53	2.098	0.000	2.098	0.468
Horz2	g42P	10.18	1.853	0.000	1.853	1.763
Horz2	g42X	7.60	0.000	-1.383	-0.852	-1.383
Horz2	g43P	12.26	2.232	0.000	1.928	2.232
Horz2	g43X	12.64	0.000	-2.300	-2.089	-2.300
Horz2	g44P	21.71	5.928	0.000	5.928	4.726
Horz2	g44X	9.81	0.000	-2.536	-0.478	-2.536
Horz2	g45P	1.91	0.348	0.000	0.348	0.075
Horz2	g45Y	3.35	0.609	0.000	0.609	0.223
Horz2	g46P	37.01	6.735	0.000	6.735	2.719
Horz2	g46Y	37.35	6.798	0.000	6.798	2.758
Horz2	g47P	29.54	5.377	0.000	5.087	5.377
Horz2	g47X	27.61	0.000	-5.025	-4.227	-5.025
Horz2	g48P	29.12	7.949	0.000	7.949	7.339
Horz2	g48X	21.30	0.000	-5.506	-3.487	-5.506
Horz2	g49P	26.39	4.804	0.000	4.804	1.934
Horz2	g49Y	27.69	5.039	0.000	5.039	2.080
Horz2	g50P	1.21	0.330	0.000	0.263	0.330
Horz2	g50X	2.18	0.000	-0.563	-0.544	-0.563
Horz2	g51P	1.39	0.253	0.000	0.253	0.055
Horz2	g51Y	1.95	0.354	0.000	0.354	0.119
Horz3	g52P	1.84	0.134	0.000	0.134	0.117

Horz3	g52Y	1.98	0.145	0.000	0.145	0.119
Horz3	g53P	3.49	0.255	0.000	0.248	0.255
Horz3	g53X	18.90	0.000	-0.605	-0.426	-0.605
Horz4	g54P	7.03	0.974	0.000	0.910	0.974
Horz4	g54Y	6.55	0.907	0.000	0.907	0.898
Horz4	g55P	1.82	0.000	-0.221	-0.141	-0.221
Horz4	g55X	25.28	0.000	-3.072	-2.256	-3.072
Horz4	g56P	10.25	1.420	-0.435	1.420	-0.435
Horz4	g56Y	10.73	1.487	-0.329	1.487	-0.329
Horz4	g57P	0.88	0.000	-0.068	-0.068	-0.053
Horz4	g57X	75.87	0.000	-5.926	-3.993	-5.926
Inner1	g58P	4.91	0.373	-0.292	0.373	-0.292
Inner1	g58X	13.67	1.038	0.000	1.038	0.802
Inner1	g58XY	17.70	1.344	-0.115	1.344	-0.115
Inner1	g58Y	27.54	2.092	0.000	2.092	1.328
Inner1	g59P	3.79	0.288	-0.246	-0.246	0.288
Inner1	g59X	5.98	0.000	-0.544	-0.531	-0.544
Inner1	g59XY	9.40	0.000	-0.855	-0.855	-0.001
Inner1	g59Y	12.68	0.000	-1.154	-1.154	-0.670
Inner1	g60P	2.27	0.068	-0.206	-0.206	0.068
Inner1	g60X	2.90	0.000	-0.264	-0.264	-0.255
Inner1	g60XY	9.09	0.000	-0.828	-0.828	-0.278
Inner1	g60Y	10.11	0.000	-0.920	-0.920	-0.433
Inner1	g61P	2.71	0.000	-0.247	-0.156	-0.247
Inner1	g61X	9.59	0.728	0.000	0.728	0.486
Inner1	g61XY	4.29	0.000	-0.390	-0.279	-0.390
Inner1	g61Y	7.75	0.588	0.000	0.588	0.534
ShieldAr	g62P	14.43	2.626	0.000	2.626	0.584
ShieldAr	g62X	21.34	3.884	0.000	3.884	1.255
ShieldAr	g62XY	21.78	3.963	0.000	3.963	1.536
ShieldAr	g62Y	13.09	2.382	0.000	2.382	0.255
ShieldAr	g63P	25.58	4.656	0.000	4.656	1.645
ShieldAr	g63Y	29.97	5.454	0.000	5.454	1.919
TopCrArm	g64P	42.77	0.000	-4.615	-4.615	-2.392
TopCrArm	g64X	25.72	0.000	-2.776	-2.776	-0.593
TopCrArm	g64XY	26.43	0.000	-2.852	-2.852	-0.917
TopCrArm	g64Y	39.88	0.000	-4.303	-4.303	-1.982
TopCrArm	g65P	24.28	0.000	-4.419	-4.419	-1.535
TopCrArm	g65Y	26.26	0.000	-4.779	-4.779	-1.616
MidCrArm	g66P	65.20	0.000	-7.655	-7.655	-3.460
MidCrArm	g66X	51.19	0.000	-6.010	-6.010	-2.029
MidCrArm	g66XY	51.14	0.000	-6.004	-6.004	-2.037
MidCrArm	g66Y	64.69	0.000	-7.595	-7.595	-3.425
MidCrArm	g67P	23.65	0.000	-4.305	-4.305	-1.751
MidCrArm	g67Y	25.15	0.000	-4.578	-4.578	-1.806
BotCrArm	g68P	41.59	0.000	-4.488	-4.488	-2.204
BotCrArm	g68X	26.21	0.000	-2.828	-2.828	-0.763
BotCrArm	g68XY	25.98	0.000	-2.804	-2.804	-0.743
BotCrArm	g68Y	41.13	0.000	-4.439	-4.439	-2.182
BotCrArm	g69P	9.40	0.000	-1.711	-1.711	-0.705
BotCrArm	g69Y	8.76	0.000	-1.595	-1.595	-0.606
ShArmBr	g70P	24.92	0.000	-3.653	-3.653	-1.171
ShArmBr	g70X	23.70	0.000	-3.475	-3.475	-0.838
ShArmBr	g70XY	24.30	0.000	-3.563	-3.563	-1.143
ShArmBr	g70Y	23.12	0.000	-3.389	-3.389	-0.812
TopArmBr	g71P	24.52	4.462	0.000	4.462	1.977
TopArmBr	g71X	23.25	4.231	0.000	4.231	1.542
TopArmBr	g71XY	23.74	4.320	0.000	4.320	1.924
TopArmBr	g71Y	22.49	4.094	0.000	4.094	1.495

MidArmBr	g72P	39.67	7.219	0.000	7.219	2.910
MidArmBr	g72X	39.47	7.183	0.000	7.183	2.881
MidArmBr	g72XY	39.42	7.175	0.000	7.175	2.890
MidArmBr	g72Y	39.32	7.157	0.000	7.157	2.874
BotArmBr	g73P	23.71	4.316	0.000	4.316	1.758
BotArmBr	g73X	23.55	4.287	0.000	4.287	1.741
BotArmBr	g73XY	23.41	4.261	0.000	4.261	1.719
BotArmBr	g73Y	23.39	4.257	0.000	4.257	1.731
Pwmnt	g74P	2.48	0.000	-12.830	-12.830	-5.147
Pwmnt	g75P	1.94	0.000	-10.072	-10.072	-4.547
Pwmnt	g76P	1.13	0.000	-7.407	-7.407	-3.359
Pwmnt	g77P	0.83	0.000	-5.347	-5.347	-2.411
Pwmnt	g78P	0.50	0.000	-3.356	-3.356	-1.424
Pwmnt	g79P	0.20	0.000	-1.277	-1.277	-0.446
PMBR1	g80P	29.90	3.049	0.000	3.049	2.678
PMBR1	g80X	12.47	0.904	-1.272	0.904	-1.272
PMBR1	g81P	14.03	1.430	0.000	1.430	0.497
PMBR1	g82P	18.88	0.000	-1.925	-1.925	-1.903
PMBR1	g82X	9.96	1.016	-0.649	-0.649	1.016
PMBR1	g83P	8.54	0.000	-0.871	-0.871	-0.292
PMBR1	g84P	12.19	0.000	-1.243	-1.243	-0.708
PMBR1	g84X	10.67	0.000	-1.088	-1.088	-0.239
PMBR1	g85P	8.84	0.000	-0.901	-0.901	-0.370
PMBR1	g86P	8.19	0.835	0.000	0.706	0.835
PMBR1	g86X	11.50	0.000	-1.172	-1.172	-1.027
PMBR1	g87P	1.81	0.000	-0.184	-0.184	-0.067
PMBR2	g88P	4.54	0.118	-0.463	0.118	-0.463
PMBR2	g88X	4.19	0.000	-0.427	-0.427	-0.380
PMBR2	g89P	3.10	0.118	-0.316	0.118	-0.316
PMBR2	g89X	3.44	0.000	-0.351	-0.351	-0.351

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

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

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1P	-0.004713	0.3548	-0.02745	-0.5605	0.0104	0.0205	1.995	2.355	80.97
2P	-0.003672	0.3094	-0.02699	-0.5293	0.0009	0.0116	1.996	2.309	75.97
3P	-0.003168	0.2743	-0.02637	-0.4910	-0.0077	0.0085	1.997	2.274	71.97
4P	-0.002634	0.2402	-0.02546	-0.4847	-0.0127	0.0053	1.997	2.24	67.97
5P	-0.001916	0.2063	-0.02419	-0.4939	0.0064	0.0019	1.998	2.206	63.98
6P	-0.001418	0.1675	-0.0224	-0.4177	-0.0153	-0.0004	1.999	2.167	58.98
7P	-0.0007793	0.1313	-0.02031	-0.4155	0.0150	-0.0026	1.999	2.131	53.98
8P	-0.0008661	0.1055	-0.01828	-0.3209	-0.0282	-0.0050	1.999	2.106	49.98
9P	0	0	0	0.0000	0.0000	0.0000	8.5	8.5	0
16P	-0.007229	0.3555	-0.1365	-0.5601	0.0065	0.0127	-0.007229	13.61	80.86
17P	-0.005657	0.3079	-0.1017	-0.5653	-0.0004	0.0138	-0.005657	10.06	75.9
18P	-0.004615	0.2032	-0.1417	-0.6164	0.0026	0.0124	-0.004615	13.95	63.86
19P	-0.002729	0.1298	-0.08254	-0.4864	0.0026	0.0127	-0.002729	9.88	53.92
24P	-0.005472	0.5063	-0.003913	-0.5902	-0.0056	0.0074	1.162	0.5063	96.25
25P	-0.003965	0.3545	-0.003109	-0.5296	-0.0056	0.0074	1.163	0.3545	81
26P	-0.003452	0.3096	-0.002864	-0.5068	-0.0063	0.0070	1.164	0.3096	76
27P	-0.001958	0.2066	-0.002259	-0.4691	-0.0068	0.0056	1.165	0.2066	64
28P	-0.0009502	0.1316	-0.00179	-0.3750	-0.0045	0.0045	1.166	0.1316	54
29P	-6.203e-005	0.02503	-0.0008912	-0.1159	-0.0003	0.0021	1.167	0.02503	27.04
30P	0	0	0	0.0000	0.0000	0.0000	1.167	0	0
1X	-0.00383	0.3542	0.007752	-0.4599	0.0109	0.0056	1.996	-1.646	81.01
1XY	-0.00345	0.3531	0.007138	-0.4927	-0.0141	0.0169	-2.003	-1.647	81.01
1Y	-0.004408	0.3538	-0.02803	-0.5276	-0.0125	0.0100	-2.004	2.354	80.97
2X	-0.002761	0.3101	0.00795	-0.4884	0.0013	0.0158	1.997	-1.69	76.01
2XY	-0.003004	0.3092	0.007371	-0.5021	-0.0109	0.0147	-2.003	-1.691	76.01
2Y	-0.003997	0.3085	-0.02754	-0.5135	-0.0097	0.0140	-2.004	2.309	75.97
3X	-0.002405	0.2744	0.007941	-0.5139	-0.0055	0.0146	1.998	-1.726	72.01
3XY	-0.002306	0.2736	0.007418	-0.5111	-0.0094	0.0149	-2.002	-1.726	72.01
3Y	-0.003383	0.2735	-0.02689	-0.4924	-0.0088	0.0151	-2.003	2.273	71.97
4X	-0.002	0.2395	0.007764	-0.4885	-0.0106	0.0133	1.998	-1.76	68.01
4XY	-0.001757	0.2387	0.007296	-0.4829	-0.0041	0.0151	-2.002	-1.761	68.01
4Y	-0.002858	0.2394	-0.02594	-0.4891	-0.0036	0.0162	-2.003	2.239	67.97
5X	-0.001485	0.2069	0.007443	-0.4322	0.0099	0.0119	1.999	-1.793	64.01
5XY	-0.001429	0.2062	0.007018	-0.4541	-0.0112	0.0154	-2.001	-1.794	64.01
5Y	-0.002603	0.2055	-0.02464	-0.4737	-0.0102	0.0174	-2.003	2.205	63.98
6X	-0.001237	0.167	0.006632	-0.4462	-0.0086	0.0078	1.999	-1.833	59.01
6XY	-0.0007471	0.1662	0.00628	-0.4367	-0.0053	0.0157	-2.001	-1.834	59.01
6Y	-0.002007	0.1667	-0.02278	-0.4263	-0.0001	0.0175	-2.002	2.167	58.98
7X	-0.0008094	0.1315	0.00567	-0.3651	0.0028	0.0043	1.999	-1.868	54.01
7XY	-0.0004051	0.1308	0.005378	-0.3826	-0.0018	0.0159	-2	-1.869	54.01
7Y	-0.001701	0.1305	-0.02064	-0.3997	-0.0183	0.0177	-2.002	2.13	53.98
8X	-0.0004422	0.1056	0.004471	-0.3474	0.0081	0.0050	2	-1.894	50
8XY	-0.0003791	0.1049	0.004242	-0.3404	-0.0141	0.0133	-2	-1.895	50
8Y	-0.0008965	0.1048	-0.01854	-0.3232	0.0174	0.0179	-2.001	2.105	49.98
9X	0	0	0	0.0000	0.0000	0.0000	8.5	-8.5	0
9XY	0	0	0	0.0000	0.0000	0.0000	-8.5	-8.5	0
9Y	0	0	0	0.0000	0.0000	0.0000	-8.5	8.5	0
16X	-0.0008376	0.353	0.1009	-0.4740	0.0059	0.0158	-0.0008376	-12.9	81.1
17X	-0.001029	0.311	0.07131	-0.4577	-0.0015	0.0129	-0.001029	-9.439	76.07
18X	0.000878	0.2095	0.08499	-0.3466	0.0041	0.0102	0.000878	-13.54	64.08

19X	0.000943	0.1323	0.0571	-0.3845	0.0047	0.0121	0.000943	-9.618	54.06
10S	0.002529	0.07983	-0.01785	-0.2453	-0.0043	0.0023	2.69	2.768	44.69
11S	-0.0004345	0.05877	-0.01754	-0.2011	0.0069	0.0038	3.365	3.424	39.48
12S	0.002477	0.04001	-0.01571	-0.1464	-0.0217	0.0006	4.175	4.212	33.28
13S	-0.0003303	0.02512	-0.01399	-0.1174	0.0478	0.0065	4.984	5.01	27.03
14S	-0.009021	0.007831	-0.009971	-0.0508	-0.0072	0.0012	6.508	6.525	15.24
20S	-0.004044	0.3541	-0.005073	-0.5057	-0.0905	0.0201	-0.004044	0.3541	80.99
21S	-0.003401	0.3094	-0.004956	-0.4996	-0.0878	0.0113	-0.003401	0.3094	76
22S	-0.001905	0.2064	-0.00412	-0.4543	-0.0794	0.0089	-0.001905	0.2064	64
23S	-0.0009385	0.1314	-0.003472	-0.3656	-0.0702	0.0107	-0.0009385	0.1314	54
10X	-0.002103	0.0788	0.005697	-0.2432	0.0033	0.0101	2.686	-2.609	44.71
10XY	0.00168	0.07809	0.005499	-0.2421	-0.0037	0.0047	-2.686	-2.61	44.71
10Y	-0.003804	0.07925	-0.01807	-0.2421	-0.0009	0.0083	-2.692	2.767	44.69
11X	-0.0001684	0.05877	0.006508	-0.1993	-0.0065	0.0083	3.365	-3.306	39.51
11XY	-8.861e-006	0.05816	0.006328	-0.1967	0.0058	0.0028	-3.365	-3.307	39.51
11Y	-0.0005273	0.05817	-0.01773	-0.2000	-0.0084	0.0054	-3.366	3.423	39.48
12X	-0.001389	0.03919	0.006586	-0.1547	0.0085	0.0015	4.171	-4.133	33.3
12XY	0.001396	0.03861	0.006438	-0.1531	-0.0091	0.0056	-4.171	-4.133	33.3
12Y	-0.003181	0.03952	-0.01586	-0.1449	0.0084	0.0044	-4.175	4.212	33.28
13X	-0.0003503	0.02479	0.006243	-0.1052	-0.0037	-0.0011	4.984	-4.96	27.05
13XY	0.0005096	0.02429	0.006114	-0.1064	0.0035	0.0043	-4.984	-4.96	27.05
13Y	-0.0002767	0.02461	-0.01409	-0.1163	-0.0071	0.0028	-4.985	5.009	27.03
14X	-0.0008756	0.007134	0.00436	-0.0564	0.0047	-0.0011	6.517	-6.51	15.25
14XY	0.001114	0.006791	0.004276	-0.0544	-0.0040	0.0025	-6.516	-6.511	15.25
14Y	-0.008987	0.007522	-0.007719	-0.0487	0.0221	0.0026	-6.526	6.525	15.24

Joint Support Reactions for Load Case "NESC Heavy":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Comp. Force (kips)	Z Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
9P	-5.62	0.0	-6.57	0.0	0.0	-43.78	0.0	0.0	44.63	0.0	0.04	0.0	0.2	0.0	0.0	0.02	0.0	0.0
30P	-0.00	0.0	-0.40	0.0	0.0	-13.89	0.0	0.0	13.89	0.0	2.95	0.0	0.0	0.0	0.0	-0.06	0.0	0.0
9X	4.68	0.0	-2.97	0.0	0.0	24.54	0.0	0.0	25.16	0.0	0.03	0.0	0.0	0.0	0.0	-0.00	0.0	0.0
9XY	-4.75	0.0	-2.77	0.0	0.0	24.11	0.0	0.0	24.73	0.0	0.02	0.0	-0.0	0.0	0.0	0.00	0.0	0.0
9Y	5.69	0.0	-6.49	0.0	0.0	-43.94	0.0	0.0	44.78	0.0	0.04	0.0	0.2	0.0	0.0	0.02	0.0	0.0

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

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0000	0.0000	-0.1303	-0.0000	0.0000	0.1303	-0.0047	0.3548	-0.0274
2P	0.0000	0.0000	-0.1956	-0.0000	0.0000	0.1956	-0.0037	0.3094	-0.0270
3P	0.0000	0.0000	-0.1183	0.0000	0.0000	0.1183	-0.0032	0.2743	-0.0264
4P	0.0000	0.0000	-0.1484	0.0000	0.0000	0.1484	-0.0026	0.2402	-0.0255
5P	0.0000	0.0000	-0.1775	-0.0000	0.0000	0.1775	-0.0019	0.2063	-0.0242
6P	0.0000	0.0000	-0.1722	-0.0000	0.0000	0.1722	-0.0014	0.1675	-0.0224
7P	0.0000	0.0000	-0.1799	0.0000	0.0000	0.1799	-0.0008	0.1313	-0.0203
8P	0.0000	0.0000	-0.1457	-0.0000	0.0000	0.1457	-0.0009	0.1055	-0.0183
9P	0.0000	0.0000	-0.1719	5.6180	6.5675	-43.6106	0.0000	0.0000	0.0000
16P	0.0000	1.3510	-2.8354	-0.0000	-1.3510	2.8354	-0.0072	0.3555	-0.1365
17P	0.0000	1.5300	-4.5514	-0.0000	-1.5300	4.5514	-0.0057	0.3079	-0.1017
18P	0.0000	1.5300	-4.5905	-0.0000	-1.5300	4.5905	-0.0046	0.2032	-0.1417
19P	0.0000	1.5300	-4.5514	-0.0000	-1.5300	4.5514	-0.0027	0.1298	-0.0825
24P	0.0000	0.4672	-1.2813	-0.0000	-0.4672	1.2813	-0.0055	0.5063	-0.0039

25P	0.0000	0.3442	-0.8884	-0.0000	-0.3442	0.8884	-0.0040	0.3545	-0.0031
26P	0.0000	0.2890	-0.7485	-0.0000	-0.2890	0.7485	-0.0035	0.3096	-0.0029
27P	0.0000	0.3740	-0.9655	-0.0000	-0.3740	0.9655	-0.0020	0.2066	-0.0023
28P	0.0000	0.6569	-1.6660	-0.0000	-0.6569	1.6660	-0.0010	0.1316	-0.0018
29P	0.0000	0.9754	-2.6972	-0.0000	-0.9754	2.6972	-0.0001	0.0250	-0.0009
30P	0.0000	0.4884	-1.0563	0.0007	-0.0854	-12.8294	0.0000	0.0000	0.0000
1X	0.0000	0.0613	-0.1303	-0.0000	-0.0613	0.1303	-0.0038	0.3542	0.0078
1XY	0.0000	0.0613	-0.1263	-0.0000	-0.0613	0.1263	-0.0035	0.3531	0.0071
1Y	0.0000	0.0000	-0.1263	-0.0000	0.0000	0.1263	-0.0044	0.3538	-0.0280
2X	0.0000	0.1026	-0.1956	-0.0000	-0.1026	0.1956	-0.0028	0.3101	0.0079
2XY	0.0000	0.1026	-0.1917	-0.0000	-0.1026	0.1917	-0.0030	0.3092	0.0074
2Y	0.0000	0.0000	-0.1917	-0.0000	0.0000	0.1917	-0.0040	0.3085	-0.0275
3X	0.0000	0.0862	-0.1183	0.0000	-0.0862	0.1183	-0.0024	0.2744	0.0079
3XY	0.0000	0.0862	-0.1183	0.0000	-0.0862	0.1183	-0.0023	0.2736	0.0074
3Y	0.0000	0.0000	-0.1183	0.0000	0.0000	0.1183	-0.0034	0.2735	-0.0269
4X	0.0000	0.0981	-0.1484	0.0000	-0.0981	0.1484	-0.0020	0.2395	0.0078
4XY	0.0000	0.0981	-0.1484	0.0000	-0.0981	0.1484	-0.0018	0.2387	0.0073
4Y	0.0000	0.0000	-0.1484	0.0000	0.0000	0.1484	-0.0029	0.2394	-0.0259
5X	0.0000	0.0911	-0.1775	-0.0000	-0.0911	0.1775	-0.0015	0.2069	0.0074
5XY	0.0000	0.0911	-0.1735	-0.0000	-0.0911	0.1735	-0.0014	0.2062	0.0070
5Y	0.0000	0.0000	-0.1735	-0.0000	0.0000	0.1735	-0.0026	0.2055	-0.0246
6X	0.0000	0.1237	-0.1722	0.0000	-0.1237	0.1722	-0.0012	0.1670	0.0066
6XY	0.0000	0.1237	-0.1722	0.0000	-0.1237	0.1722	-0.0007	0.1662	0.0063
6Y	0.0000	0.0000	-0.1722	-0.0000	0.0000	0.1722	-0.0020	0.1667	-0.0228
7X	0.0000	0.0949	-0.1799	-0.0000	-0.0949	0.1799	-0.0008	0.1315	0.0057
7XY	0.0000	0.0949	-0.1759	-0.0000	-0.0949	0.1759	-0.0004	0.1308	0.0054
7Y	0.0000	0.0000	-0.1759	-0.0000	0.0000	0.1759	-0.0017	0.1305	-0.0206
8X	0.0000	0.1013	-0.1457	0.0000	-0.1013	0.1457	-0.0004	0.1056	0.0045
8XY	0.0000	0.1013	-0.1457	0.0000	-0.1013	0.1457	-0.0004	0.1049	0.0042
8Y	0.0000	0.0000	-0.1457	0.0000	0.0000	0.1457	-0.0009	0.1048	-0.0185
9X	0.0000	0.1402	-0.1719	-4.6770	2.8325	24.7138	0.0000	0.0000	0.0000
9XY	0.0000	0.1402	-0.1719	4.7526	2.6330	24.2776	0.0000	0.0000	0.0000
9Y	0.0000	0.0000	-0.1719	-5.6942	6.4864	-43.7728	0.0000	0.0000	0.0000
16X	0.0000	1.3976	-2.8354	-0.0000	-1.3976	2.8354	-0.0008	0.3530	0.1009
17X	0.0000	1.5721	-4.5514	-0.0000	-1.5721	4.5514	-0.0010	0.3110	0.0713
18X	0.0000	1.5672	-4.5905	-0.0000	-1.5672	4.5905	0.0009	0.2095	0.0850
19X	0.0000	1.5721	-4.5514	-0.0000	-1.5721	4.5514	0.0009	0.1323	0.0571
10S	0.0000	0.0000	-0.1307	-0.0000	0.0000	0.1307	0.0025	0.0798	-0.0178
11S	0.0000	0.0000	-0.1659	-0.0000	0.0000	0.1659	-0.0004	0.0588	-0.0175
12S	0.0000	0.0000	-0.1753	-0.0000	0.0000	0.1753	0.0025	0.0400	-0.0157
13S	0.0000	0.0000	-0.3240	0.0000	0.0000	0.3240	-0.0003	0.0251	-0.0140
14S	0.0000	0.0000	-0.3955	-0.0000	0.0000	0.3955	-0.0090	0.0078	-0.0100
20S	0.0000	0.0000	-0.0256	-0.0000	0.0000	0.0256	-0.0040	0.3541	-0.0051
21S	0.0000	0.0000	-0.0256	-0.0000	0.0000	0.0256	-0.0034	0.3094	-0.0050
22S	0.0000	0.0000	-0.0256	-0.0000	0.0000	0.0256	-0.0019	0.2064	-0.0041
23S	0.0000	0.0000	-0.0256	-0.0000	0.0000	0.0256	-0.0009	0.1314	-0.0035
10X	0.0000	0.1002	-0.1307	0.0000	-0.1002	0.1307	-0.0021	0.0788	0.0057
10XY	0.0000	0.1002	-0.1307	0.0000	-0.1002	0.1307	0.0017	0.0781	0.0055
10Y	0.0000	0.0000	-0.1307	-0.0000	0.0000	0.1307	-0.0038	0.0792	-0.0181
11X	0.0000	0.1322	-0.1659	0.0000	-0.1322	0.1659	-0.0002	0.0588	0.0065
11XY	0.0000	0.1322	-0.1659	-0.0000	-0.1322	0.1659	-0.0000	0.0582	0.0063
11Y	0.0000	0.0000	-0.1659	-0.0000	0.0000	0.1659	-0.0005	0.0582	-0.0177
12X	0.0000	0.1303	-0.1753	-0.0000	-0.1303	0.1753	-0.0014	0.0392	0.0066
12XY	0.0000	0.1303	-0.1753	-0.0000	-0.1303	0.1753	0.0014	0.0386	0.0064
12Y	0.0000	0.0000	-0.1753	-0.0000	0.0000	0.1753	-0.0032	0.0395	-0.0159
13X	0.0000	0.2165	-0.3240	-0.0000	-0.2165	0.3240	-0.0004	0.0248	0.0062
13XY	0.0000	0.2165	-0.3288	-0.0000	-0.2165	0.3288	0.0005	0.0243	0.0061
13Y	0.0000	0.0000	-0.3288	-0.0000	0.0000	0.3288	-0.0003	0.0246	-0.0141
14X	0.0000	0.3004	-0.3955	-0.0000	-0.3004	0.3955	-0.0009	0.0071	0.0044

14XY	0.0000	0.3004	-0.3955	-0.0000	-0.3004	0.3955	0.0011	0.0068	0.0043
14Y	0.0000	0.0000	-0.3955	-0.0000	0.0000	0.3955	-0.0090	0.0075	-0.0077

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)	Original Supported RLX	Original Supported RLY	Original Supported RLZ	Original Supported L/R	Original Supported KL/R	Original Supported Curve No.	Alternate Unsupported L/R Cap. (kips)	Alternate Unsupported RLOUT	Alternate Unsupported L/R	Alternate Unsupported KL/R	Alternate Unsupported Curve No.
g15P	g15Y	Long only	-0.75	-0.71	16.63	0.750	0.500	0.500	112.66	114.50	2	12.62	1.000	145.25	135.53	6
g15X	g15XY	Long only	-0.22	-0.22	16.63	0.750	0.500	0.500	112.66	114.50	2	12.62	1.000	145.25	135.53	6
g15XY	g15X	Long only	-0.22	-0.22	16.63	0.750	0.500	0.500	112.66	114.50	2	12.62	1.000	145.25	135.53	6
g15Y	g15P	Long only	-0.71	-0.75	16.63	0.750	0.500	0.500	112.66	114.50	2	12.62	1.000	145.25	135.53	6
g17P	g17Y	Long only	-0.78	-0.67	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g17Y	g17P	Long only	-0.67	-0.78	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g19P	g19Y	Long only	-2.02	-1.86	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g19Y	g19P	Long only	-1.86	-2.02	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g21P	g21Y	Long only	-2.38	-2.27	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g21Y	g21P	Long only	-2.27	-2.38	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g23P	g23Y	Short only	-4.43	-4.31	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g23Y	g23P	Short only	-4.31	-4.43	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g25P	g25Y	Short only	-5.22	-5.09	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g25Y	g25P	Short only	-5.09	-5.22	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g27P	g27Y	Short only	-6.03	-5.56	26.81	0.750	0.500	0.500	80.05	90.04	2	24.22	1.000	86.58	103.29	3
g27Y	g27P	Short only	-5.56	-6.03	26.81	0.750	0.500	0.500	80.05	90.04	2	24.22	1.000	86.58	103.29	3
g28P	g28X	Long only	-0.86	0.08	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g29P	g29Y	Long only	-2.35	-2.09	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g29Y	g29P	Long only	-2.09	-2.35	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g31X	g31XY	Long only	-0.57	-1.02	11.79	0.776	0.552	0.552	134.73	131.26	5	10.07	1.000	155.86	142.05	6
g31XY	g31X	Long only	-1.02	-0.57	11.79	0.776	0.552	0.552	134.73	131.26	5	10.07	1.000	155.86	142.05	6
g32P	g32X	Long only	-0.53	-0.18	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g32X	g32P	Long only	-0.18	-0.53	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g32Y	g32XY	Long only	-0.79	0.04	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g33P	g33Y	Long only	-1.09	-0.94	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g33Y	g33P	Long only	-0.94	-1.09	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g35X	g35XY	Long only	-0.49	-0.76	7.78	0.772	0.545	0.545	185.93	185.93	4	5.61	1.000	219.03	219.03	4
g35XY	g35X	Long only	-0.76	-0.49	7.78	0.772	0.545	0.545	185.93	185.93	4	5.61	1.000	219.03	219.03	4

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	3.141	50.00	50.00	6.28
2	3.161	50.00	50.00	6.32
3	4.802	50.00	50.00	9.60
4	4.815	50.00	50.00	9.63
5	4.839	50.00	50.00	9.68
6	4.851	50.00	50.00	9.70
7	4.802	50.00	50.00	9.60
8	4.815	50.00	50.00	9.63
9	1.364	50.00	50.00	2.73
10	0.192	50.00	50.00	0.38

11	0.148	50.00	50.00	0.30
12	0.172	50.00	50.00	0.34
13	0.146	50.00	50.00	0.29
14	0.166	50.00	50.00	0.33
15	0.329	50.00	50.00	0.66
16	0.395	50.00	50.00	0.79
17	0.953	50.00	50.00	1.91
18	0.802	50.00	50.00	1.60
19	1.035	50.00	50.00	2.07
20	1.791	50.00	50.00	3.58
21	2.868	50.00	50.00	5.74

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

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

Joint Label	X-Displ (ft)	Y-Displ (ft)	Z-Displ (ft)	X-Rot (deg)	Y-Rot (deg)	Z-Rot (deg)	X-Pos (ft)	Y-Pos (ft)	Z-Pos (ft)
1P	-0.003241	0.4172	-0.02641	-0.6137	0.0049	0.0135	1.997	2.417	80.97
2P	-0.002678	0.3655	-0.02593	-0.5947	-0.0005	0.0122	1.997	2.365	75.97
3P	-0.002252	0.3251	-0.02529	-0.5689	-0.0063	0.0091	1.998	2.325	71.97
4P	-0.001832	0.2858	-0.02439	-0.5553	-0.0085	0.0060	1.998	2.286	67.98
5P	-0.001319	0.2475	-0.02319	-0.5476	0.0021	0.0027	1.999	2.247	63.98
6P	-0.0008777	0.2026	-0.0214	-0.4874	-0.0113	-0.0004	1.999	2.203	58.98
7P	-0.0004153	0.1613	-0.01937	-0.4633	0.0118	-0.0033	2	2.161	53.98
8P	-0.0005501	0.1316	-0.01733	-0.3805	-0.0265	-0.0051	1.999	2.132	49.98
9P	0	0	0	0.0000	0.0000	0.0000	8.5	8.5	0
16P	-0.005653	0.4167	-0.1447	-0.6014	0.0033	0.0127	-0.005653	13.67	80.86
17P	-0.004342	0.3645	-0.1077	-0.6105	-0.0004	0.0113	-0.004342	10.11	75.89
18P	-0.003439	0.2458	-0.1433	-0.6064	0.0006	0.0090	-0.003439	14	63.86
19P	-0.002067	0.1604	-0.08694	-0.5205	0.0011	0.0103	-0.002067	9.91	53.91
24P	-0.004091	0.605	-0.003549	-0.7456	-0.0049	0.0055	1.163	0.605	96.25
25P	-0.00278	0.4173	-0.002376	-0.6235	-0.0049	0.0055	1.164	0.4173	81
26P	-0.002352	0.3654	-0.002089	-0.5798	-0.0049	0.0050	1.165	0.3654	76
27P	-0.001304	0.2476	-0.001438	-0.5367	-0.0046	0.0036	1.166	0.2476	64
28P	-0.000601	0.1616	-0.0009824	-0.4320	-0.0034	0.0027	1.166	0.1616	54
29P	0.0001507	0.03534	-0.000376	-0.1492	-0.0000	0.0012	1.167	0.03534	27.04
30P	0	0	0	0.0000	0.0000	0.0000	1.167	0	0
1X	-0.002532	0.4171	0.01398	-0.5592	0.0073	0.0067	1.997	-1.583	81.01
1XY	-0.002333	0.4161	0.01354	-0.5795	-0.0103	0.0139	-2.002	-1.584	81.01
1Y	-0.003202	0.4162	-0.02678	-0.5931	-0.0080	0.0103	-2.003	2.416	80.97
2X	-0.001858	0.3659	0.01413	-0.5726	-0.0003	0.0125	1.998	-1.634	76.01
2XY	-0.001912	0.3651	0.01371	-0.5795	-0.0074	0.0138	-2.002	-1.635	76.01
2Y	-0.002825	0.3647	-0.02629	-0.5841	-0.0059	0.0128	-2.003	2.365	75.97
3X	-0.001604	0.3253	0.014	-0.5787	-0.0036	0.0103	1.998	-1.675	72.01
3XY	-0.001443	0.3246	0.01363	-0.5767	-0.0061	0.0142	-2.001	-1.675	72.01
3Y	-0.002456	0.3245	-0.02565	-0.5697	-0.0055	0.0137	-2.002	2.324	71.97
4X	-0.001339	0.2856	0.01365	-0.5591	-0.0059	0.0081	1.999	-1.714	68.01
4XY	-0.001072	0.285	0.01333	-0.5554	-0.0036	0.0147	-2.001	-1.715	68.01
4Y	-0.002091	0.2852	-0.02474	-0.5577	-0.0033	0.0145	-2.002	2.285	67.98
5X	-0.001076	0.2478	0.01307	-0.5131	0.0061	0.0058	1.999	-1.752	64.01
5XY	-0.000782	0.2472	0.01278	-0.5274	-0.0071	0.0152	-2.001	-1.753	64.01
5Y	-0.001866	0.2469	-0.02352	-0.5356	-0.0062	0.0154	-2.002	2.247	63.98
6X	-0.0008998	0.2026	0.01194	-0.5033	-0.0041	0.0021	1.999	-1.798	59.01
6XY	-0.0003172	0.2019	0.01169	-0.4972	-0.0055	0.0156	-2	-1.798	59.01
6Y	-0.001501	0.202	-0.02168	-0.4929	0.0006	0.0160	-2.002	2.202	58.98
7X	-0.0006571	0.1615	0.01058	-0.4344	-0.0025	-0.0011	1.999	-1.839	54.01
7XY	-1.879e-005	0.1608	0.01037	-0.4461	0.0030	0.0159	-2	-1.839	54.01
7Y	-0.001266	0.1607	-0.0196	-0.4534	-0.0150	0.0166	-2.001	2.161	53.98
8X	-0.0002361	0.1316	0.009022	-0.3937	0.0139	-0.0021	2	-1.868	50.01
8XY	-0.0001708	0.1311	0.008851	-0.3882	-0.0180	0.0151	-2	-1.869	50.01
8Y	-0.0005884	0.131	-0.01752	-0.3809	0.0181	0.0169	-2.001	2.131	49.98
9X	0	0	0	0.0000	0.0000	0.0000	8.5	-8.5	0
9XY	0	0	0	0.0000	0.0000	0.0000	-8.5	-8.5	0
9Y	0	0	0	0.0000	0.0000	0.0000	-8.5	8.5	0
16X	5.464e-005	0.417	0.1274	-0.5821	0.0030	0.0139	5.464e-005	-12.83	81.13
17X	-0.0002726	0.3664	0.09128	-0.5693	-0.0023	0.0112	-0.0002726	-9.384	76.09
18X	0.0009276	0.2492	0.1169	-0.5000	0.0025	0.0083	0.0009276	-13.5	64.12

19X	0.0009303	0.1619	0.07368	-0.4808	0.0030	0.0103	0.0009303	-9.588	54.07
10S	0.002788	0.101	-0.01751	-0.2902	-0.0035	0.0037	2.691	2.789	44.69
11S	-0.0001782	0.0763	-0.01763	-0.2414	0.0030	0.0048	3.365	3.441	39.48
12S	0.002865	0.0532	-0.01619	-0.1812	-0.0106	0.0040	4.175	4.225	33.28
13S	-1.408e-005	0.03536	-0.01463	-0.1394	0.0028	0.0040	4.985	5.02	27.03
14S	0.009873	0.01375	-0.008094	-0.0758	-0.0248	-0.0006	6.527	6.531	15.24
20S	-0.002807	0.4167	-0.003703	-0.5845	-0.0679	0.0227	-0.002807	0.4167	81
21S	-0.002334	0.3654	-0.003623	-0.5726	-0.0645	0.0055	-0.002334	0.3654	76
22S	-0.001282	0.2476	-0.002861	-0.5209	-0.0613	0.0051	-0.001282	0.2476	64
23S	-0.0005964	0.1615	-0.002346	-0.4217	-0.0568	0.0076	-0.0005964	0.1615	54
10X	-0.002615	0.1006	0.01007	-0.2888	0.0034	0.0037	2.685	-2.587	44.72
10XY	0.002496	0.1001	0.00991	-0.2875	-0.0039	0.0060	-2.685	-2.588	44.72
10Y	-0.003533	0.1006	-0.01768	-0.2870	-0.0002	0.0072	-2.691	2.789	44.69
11X	-8.355e-005	0.07632	0.01077	-0.2392	-0.0081	0.0029	3.365	-3.289	39.51
11XY	0.0001429	0.07594	0.01062	-0.2373	0.0075	0.0036	-3.365	-3.289	39.51
11Y	-0.0002737	0.07593	-0.01779	-0.2393	-0.0099	0.0048	-3.365	3.441	39.48
12X	-0.001927	0.05295	0.01034	-0.1866	0.0119	-0.0036	4.17	-4.119	33.3
12XY	0.002112	0.05263	0.01021	-0.1852	-0.0125	0.0063	-4.17	-4.119	33.3
12Y	-0.003057	0.05294	-0.01634	-0.1803	0.0190	0.0065	-4.175	4.225	33.28
13X	-0.0004461	0.03501	0.009447	-0.1293	-0.0071	-0.0043	4.984	-4.95	27.05
13XY	0.0007246	0.03477	0.009347	-0.1311	0.0069	0.0035	-4.984	-4.95	27.05
13Y	7.001e-005	0.03509	-0.01478	-0.1352	-0.0504	-0.0023	-4.984	5.02	27.03
14X	-0.001346	0.01398	0.005995	-0.0779	0.0073	-0.0046	6.516	-6.504	15.26
14XY	0.001607	0.01371	0.005962	-0.0771	-0.0066	0.0038	-6.516	-6.504	15.26
14Y	0.009899	0.01353	-0.01076	-0.0758	0.0055	0.0031	-6.508	6.531	15.24

Joint Support Reactions for Load Case "NESC Extreme":

Joint Label	X Force (kips)	X Usage %	Y Force (kips)	Y Usage %	H-Shear Usage %	Z Force (kips)	Comp. Usage %	Uplift Usage %	Result. Force (kips)	Result. Usage %	X Moment (ft-k)	X-M. Usage %	Y Moment (ft-k)	Y-M. Usage %	H-Bend-M Usage %	Z Moment (ft-k)	Z-M. Usage %	Max. Usage %
9P	-6.30	0.0	-6.58	0.0	0.0	-48.66	0.0	0.0	49.51	0.0	0.11	0.0	-0.2	0.0	0.0	-0.02	0.0	0.0
30P	-0.00	0.0	-0.32	0.0	0.0	-5.36	0.0	0.0	5.37	0.0	5.14	0.0	-0.1	0.0	0.0	-0.03	0.0	0.0
9X	7.30	0.0	-6.94	0.0	0.0	38.84	0.0	0.0	40.12	0.0	0.11	0.0	0.0	0.0	0.0	0.01	0.0	0.0
9XY	-7.40	0.0	-6.81	0.0	0.0	38.70	0.0	0.0	39.98	0.0	0.11	0.0	-0.0	0.0	0.0	-0.01	0.0	0.0
9Y	6.41	0.0	-6.63	0.0	0.0	-49.00	0.0	0.0	49.86	0.0	0.10	0.0	-0.2	0.0	0.0	-0.03	0.0	0.0

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

Joint Label	X External Load (kips)	Y External Load (kips)	Z External Load (kips)	X Member Force (kips)	Y Member Force (kips)	Z Member Force (kips)	X Disp. (ft)	Y Disp. (ft)	Z Disp. (ft)
1P	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0032	0.4172	-0.0264
2P	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0027	0.3655	-0.0259
3P	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0023	0.3251	-0.0253
4P	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0018	0.2858	-0.0244
5P	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0013	0.2475	-0.0232
6P	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0009	0.2026	-0.0214
7P	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0004	0.1613	-0.0194
8P	0.0000	0.4766	-0.3377	0.0000	-0.4766	0.3377	-0.0006	0.1316	-0.0173
9P	0.0000	0.3180	-0.2156	6.2991	6.2640	-48.4492	0.0000	0.0000	0.0000
16P	0.0000	0.9536	-0.8040	-0.0000	-0.9536	0.8040	-0.0057	0.4167	-0.1447
17P	0.0000	1.3656	-1.8540	-0.0000	-1.3656	1.8540	-0.0043	0.3645	-0.1077
18P	0.0000	1.3656	-1.8540	-0.0000	-1.3656	1.8540	-0.0034	0.2458	-0.1433
19P	0.0000	1.3656	-1.8540	-0.0000	-1.3656	1.8540	-0.0021	0.1604	-0.0869
24P	0.0000	0.9616	-0.4580	-0.0000	-0.9616	0.4580	-0.0041	0.6050	-0.0035

25P	0.0000	0.1586	-0.2050	0.0000	-0.1586	0.2050	-0.0028	0.4173	-0.0024
26P	0.0000	0.1586	-0.1930	-0.0000	-0.1586	0.1930	-0.0024	0.3654	-0.0021
27P	0.0000	0.1586	-0.2140	-0.0000	-0.1586	0.2140	-0.0013	0.2476	-0.0014
28P	0.0000	0.4766	-0.4917	-0.0000	-0.4766	0.4917	-0.0006	0.1616	-0.0010
29P	0.0000	0.3180	-0.5526	-0.0000	-0.3180	0.5526	0.0002	0.0353	-0.0004
30P	0.0000	0.3180	-0.2156	0.0049	-0.0027	-5.1470	0.0000	0.0000	0.0000
1X	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0025	0.4171	0.0140
1XY	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0023	0.4161	0.0135
1Y	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0032	0.4162	-0.0268
2X	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0019	0.3659	0.0141
2XY	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0019	0.3651	0.0137
2Y	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0028	0.3647	-0.0263
3X	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0016	0.3253	0.0140
3XY	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0014	0.3246	0.0136
3Y	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0025	0.3245	-0.0257
4X	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0013	0.2856	0.0137
4XY	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0011	0.2850	0.0133
4Y	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0021	0.2852	-0.0247
5X	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0011	0.2478	0.0131
5XY	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0008	0.2472	0.0128
5Y	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0019	0.2469	-0.0235
6X	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0009	0.2026	0.0119
6XY	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0003	0.2019	0.0117
6Y	0.0000	0.1586	-0.1220	0.0000	-0.1586	0.1220	-0.0015	0.2020	-0.0217
7X	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0007	0.1615	0.0106
7XY	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0000	0.1608	0.0104
7Y	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0013	0.1607	-0.0196
8X	0.0000	0.4766	-0.3377	0.0000	-0.4766	0.3377	-0.0002	0.1316	0.0090
8XY	0.0000	0.4766	-0.3377	0.0000	-0.4766	0.3377	-0.0002	0.1311	0.0089
8Y	0.0000	0.4766	-0.3377	0.0000	-0.4766	0.3377	-0.0006	0.1310	-0.0175
9X	0.0000	0.3180	-0.2156	-7.2998	6.6180	39.0521	0.0000	0.0000	0.0000
9XY	0.0000	0.3180	-0.2156	7.4015	6.4888	38.9114	0.0000	0.0000	0.0000
9Y	0.0000	0.3180	-0.2156	-6.4056	6.3073	-48.7829	0.0000	0.0000	0.0000
16X	0.0000	0.9536	-0.8040	-0.0000	-0.9536	0.8040	0.0001	0.4170	0.1274
17X	0.0000	1.3656	-1.8540	-0.0000	-1.3656	1.8540	-0.0003	0.3664	0.0913
18X	0.0000	1.3656	-1.8540	-0.0000	-1.3656	1.8540	0.0009	0.2492	0.1169
19X	0.0000	1.3656	-1.8540	-0.0000	-1.3656	1.8540	0.0009	0.1619	0.0737
10S	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	0.0028	0.1010	-0.0175
11S	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	-0.0002	0.0763	-0.0176
12S	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	0.0029	0.0532	-0.0162
13S	0.0000	0.3180	-0.2156	-0.0000	-0.3180	0.2156	-0.0000	0.0354	-0.0146
14S	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	0.0099	0.0137	-0.0081
20S	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0028	0.4167	-0.0037
21S	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0023	0.3654	-0.0036
22S	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0013	0.2476	-0.0029
23S	0.0000	0.1586	-0.1220	-0.0000	-0.1586	0.1220	-0.0006	0.1615	-0.0023
10X	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	-0.0026	0.1006	0.0101
10XY	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	0.0025	0.1001	0.0099
10Y	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	-0.0035	0.1006	-0.0177
11X	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	-0.0001	0.0763	0.0108
11XY	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	0.0001	0.0759	0.0106
11Y	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	-0.0003	0.0759	-0.0178
12X	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	-0.0019	0.0530	0.0103
12XY	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	0.0021	0.0526	0.0102
12Y	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	-0.0031	0.0529	-0.0163
13X	0.0000	0.3180	-0.2156	-0.0000	-0.3180	0.2156	-0.0004	0.0350	0.0094
13XY	0.0000	0.3180	-0.2156	-0.0000	-0.3180	0.2156	0.0007	0.0348	0.0093
13Y	0.0000	0.3180	-0.2156	-0.0000	-0.3180	0.2156	0.0001	0.0351	-0.0148
14X	0.0000	0.3180	-0.2156	-0.0000	-0.3180	0.2156	-0.0013	0.0140	0.0060

14XY	0.0000	0.3180	-0.2156	-0.0000	-0.3180	0.2156	0.0016	0.0137	0.0060
14Y	0.0000	0.3180	-0.2156	0.0000	-0.3180	0.2156	0.0099	0.0135	-0.0108

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	Original Supported RLX	Original Supported RLY	Original Supported RLZ	Original Supported L/R	Original Supported KL/R	Original Supported Curve No.	Alternate Unsupported Cap. (kips)	Alternate Unsupported RLOUT	Alternate Unsupported L/R	Alternate Unsupported KL/R	Alternate Unsupported Curve No.
g15P	g15Y	Long only	-0.50	-0.50	16.63	0.750	0.500	0.500	112.66	114.50	2	12.62	1.000	145.25	135.53	6
g15Y	g15P	Long only	-0.50	-0.50	16.63	0.750	0.500	0.500	112.66	114.50	2	12.62	1.000	145.25	135.53	6
g17P	g17Y	Long only	-0.98	-0.79	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g17Y	g17P	Long only	-0.79	-0.98	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g19P	g19Y	Long only	-1.75	-1.52	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g19Y	g19P	Long only	-1.52	-1.75	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g21P	g21Y	Long only	-2.22	-2.03	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g21Y	g21P	Long only	-2.03	-2.22	22.93	0.750	0.500	0.500	86.81	95.10	2	19.04	1.000	111.47	115.73	3
g23P	g23Y	Short only	-4.34	-4.23	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g23Y	g23P	Short only	-4.23	-4.34	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g25P	g25Y	Short only	-4.91	-4.79	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g25Y	g25P	Short only	-4.79	-4.91	25.30	0.750	0.500	0.500	90.61	97.96	2	23.00	1.000	98.01	109.00	3
g27P	g27Y	Short only	-6.00	-5.58	26.81	0.750	0.500	0.500	80.05	90.04	2	24.22	1.000	86.58	103.29	3
g27Y	g27P	Short only	-5.58	-6.00	26.81	0.750	0.500	0.500	80.05	90.04	2	24.22	1.000	86.58	103.29	3
g28P	g28X	Long only	-0.26	-0.12	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g28X	g28P	Long only	-0.12	-0.26	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g29P	g29Y	Long only	-2.31	-2.04	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g29Y	g29P	Long only	-2.04	-2.31	12.22	0.787	0.573	0.573	143.23	137.74	5	10.98	1.000	161.13	145.30	6
g31X	g31XY	Long only	-0.82	-1.19	11.79	0.776	0.552	0.552	134.73	131.26	5	10.07	1.000	155.86	142.05	6
g31XY	g31X	Long only	-1.19	-0.82	11.79	0.776	0.552	0.552	134.73	131.26	5	10.07	1.000	155.86	142.05	6
g32XY	g32Y	Long only	-0.60	0.11	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g33P	g33Y	Long only	-1.05	-0.93	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g33Y	g33P	Long only	-0.93	-1.05	8.51	0.777	0.554	0.554	165.32	154.57	5	7.61	1.000	190.56	163.39	6
g35X	g35XY	Long only	-0.70	-0.92	7.78	0.772	0.545	0.545	185.93	185.93	4	5.61	1.000	219.03	219.03	4
g35XY	g35X	Long only	-0.92	-0.70	7.78	0.772	0.545	0.545	185.93	185.93	4	5.61	1.000	219.03	219.03	4

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

Clamp Label	Force (kips)	Input Holding Capacity (kips)	Factored Holding Capacity (kips)	Usage %
1	1.247	50.00	50.00	2.49
2	1.247	50.00	50.00	2.49
3	2.303	50.00	50.00	4.61
4	2.303	50.00	50.00	4.61
5	2.303	50.00	50.00	4.61
6	2.303	50.00	50.00	4.61
7	2.303	50.00	50.00	4.61
8	2.303	50.00	50.00	4.61
9	1.065	50.00	50.00	2.13
10	0.200	50.00	50.00	0.40
11	0.200	50.00	50.00	0.40
12	0.200	50.00	50.00	0.40
13	0.584	50.00	50.00	1.17

14	0.384	50.00	50.00	0.77
15	0.384	50.00	50.00	0.77
16	0.384	50.00	50.00	0.77
17	0.259	50.00	50.00	0.52
18	0.250	50.00	50.00	0.50
19	0.266	50.00	50.00	0.53
20	0.685	50.00	50:00	1.37
21	0.638	50.00	50.00	1.28

*** 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	L/R	KL/R Comp.	Length (ft)	No. of Bolts	Group Curve Desc.	Angle No. Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Use In Comp. %	Comp. Control Member	Comp. Force (kips)	Comp. Load Case	L/R Capacity (kips)	Comp. Connect. Shear Capacity (kips)	Comp. Connect. Bearing Capacity (kips)	RLX	RLY	RLZ
Leg1	75.47	75.47	5.000	1	6	SAE	4X4X0.25	33.0	38.28	Tens	35.95	g5Y	-19.238	NESC Hea	53.509	54.600	84.375	1.000	1.000	1.000
Leg2	96.41	96.41	6.355	1	8	SAE	4X4X0.3125	33.0	79.08	Comp	79.08	g11Y	-45.856	NESC Ext	57.983	72.800	140.625	1.000	1.000	1.000
Diag1	161.13	145.30	7.103	6	2	L1.75x1.75x1/4	1.75X1.75X0.25	33.0	21.38	Cross	21.38	g29P	-2.348	NESC Hea	10.982	18.200	28.125	0.787	1.000	0.573
Diag2	86.81	95.10	5.657	2	2	L2x2x1/4	2X2X0.25	33.0	21.58	Comp	21.58	g16XY	-3.927	NESC Hea	22.933	18.200	28.125	0.750	0.500	0.500
Diag3	80.05	90.04	5.657	2	2	L2.5x2x1/4	2.5X2X0.25	33.0	40.67	Comp	40.67	g26X	-7.402	NESC Hea	26.806	18.200	28.125	0.750	0.500	0.500
Diag4	190.56	163.39	9.798	6	2	L2x2x3/16	2X2X0.1875	33.0	14.29	Cross	14.29	g33P	-1.088	NESC Hea	7.612	18.200	21.094	0.777	1.000	0.554
Diag5	375.62	314.82	21.495	5	2	L1.75x1.75x3/16	1.75X1.75X0.1875	33.0	84.51	Comp	84.51	g38X	-1.513	NESC Hea	1.790	18.200	21.094	0.782	0.437	0.437
Diag6	287.38	247.58	16.544	5	2	L2x2x1/4	2X2X0.25	33.0	48.80	Comp	48.80	g36X	-2.142	NESC Ext	4.389	18.200	28.125	0.783	0.566	0.566
Horz1	122.76	122.14	4.000	5	2	L2x2x1/4	2X2X0.25	33.0	14.62	Comp	14.62	g40X	-2.585	NESC Hea	17.680	18.200	28.125	1.000	1.000	1.000
Horz2	97.76	108.88	4.000	3	2	L2.5x2.5x1/4	2.5X2.5X0.25	33.0	37.35	Tens	27.61	g47X	-5.025	NESC Ext	25.851	18.200	28.125	1.000	1.000	1.000
Horz3	235.45	235.45	6.730	4	1	L1.75x1.75x3/16	1.75X1.75X0.1875	33.0	18.90	Comp	18.90	g53X	-0.605	NESC Ext	3.201	9.100	10.547	1.000	1.000	1.000
Horz4	201.05	181.80	13.035	5	2	L2.5x2.5x3/16	2.5X2.5X0.1875	33.0	75.87	Comp	75.87	g57X	-5.926	NESC Ext	7.811	18.200	21.094	1.000	0.500	0.500
Inner1	99.53	104.65	2.828	2	1	L1.75x1.75x1/4	1.75X1.75X0.25	33.0	27.54	Tens	12.68	g59Y	-1.154	NESC Hea	18.292	9.100	14.062	1.000	1.000	1.000
ShieldAr	122.76	121.70	4.000	6	2	L2x2x1/4	2X2X0.25	33.0	29.97	Tens	0.00	g63Y	0.000		17.777	18.200	28.125	1.000	1.000	1.000
ShArmBr	152.41	152.41	12.472	4	2	L2.5x2.5x1/4	2.5X2.5X0.25	33.0	24.92	Comp	24.92	g70P	-3.653	NESC Hea	14.662	18.200	28.125	0.500	0.500	0.500
TopCrArm	195.61	177.66	8.004	5	2	L2.5x2.5x1/4	2.5X2.5X0.25	33.0	42.77	Comp	42.77	g64P	-4.615	NESC Hea	10.791	18.200	28.125	1.000	1.000	1.000
TopArmBr	289.64	289.64	9.437	4	2	L2x2x1/4	2X2X0.25	33.0	24.52	Tens	0.00	g71Y	0.000		3.207	18.200	28.125	1.000	1.000	1.000
MidCrArm	185.99	170.33	11.919	5	2	L2.5x2.5x1/4	2.5X2.5X0.25	33.0	65.20	Comp	65.20	g66P	-7.655	NESC Hea	11.740	18.200	28.125	1.000	0.500	0.500
MidArmBr						L2x2x1/4	2X2X0.25	33.0	39.67	Tens	0.00	g72Y	0.000		1.807	18.200	28.125	1.000	1.000	1.000

385.85 385.85 12.572 4 2
BotCrArm L2.5x2.5x1/4 SAE 2.5X2.5X0.25 33.0 41.59 Comp 41.59 g68P -4.488NESC Hea 10.791 18.200 28.125 1.000 1.000 1.000
195.61 177.66 8.004 5 2
BotArmBr L2x2x1/4 SAE 2X2X0.25 33.0 23.71 Tens 0.00 g73Y 0.000 3.207 18.200 28.125 1.000 1.000 1.000
289.64 289.64 9.437 4 2
Pwmnt 12" Std. Pipe Pwmnt Pipe 12" Std. 50.0 2.48 Comp 2.48 g74P -12.830NESC Hea 517.731 0.000 0.000 1.000 1.000 1.000
73.92 73.92 27.042 1 0
PMBR1 L2x2x3/16 SAE 2X2X0.1875 36.0 29.90 Tens 18.88 g82P -1.925NESC Hea 18.610 16.800 10.195 1.000 1.000 1.000
65.99 92.99 2.167 3 1 A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P g80X g82P g82X g83P g84P g84X g86P g86X ??
PMBR2 L3x3x3/16 SAE 3X3X0.1875 36.0 4.54 Comp 4.54 g88P -0.463NESC Ext 19.523 16.800 10.195 1.000 1.000 1.000
126.41 126.41 6.278 4 1

Group Summary (Tension Portion):

Group No.	Group Label	Angle Desc.	Angle Type	Angle Size	Steel Strength (ksi)	Max Usage %	Usage Control	Max Tens. %	Tension Control Member	Tension Force (kips)	Tension Control Load Case	Net Section Capacity (kips)	Tension Connect. Shear Capacity (kips)	Tension Connect. Bearing Capacity (kips)	Tension Connect. Rupture Capacity (kips)	Length Tens. Member (ft)	No. Of Bolts Tens. (in)	Hole Diameter	Holes
Leg1	L4x4x1/4	SAE	4X4X0.25	33.0	38.28	Tens	38.28	g5X	15.033NESC Ext	39.270	54.600	84.375	84.375	5.000	6	4.000	0.75
Leg2	L4x4x5/16	SAE	4X4X0.3125	33.0	79.08	Comp	73.11	g13X	35.286NESC Ext	48.262	91.000	175.781	137.867	15.506	10	4.000	0.75
Diag1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	21.38	Cross	14.79	g14P	2.693NESC Ext	18.488	18.200	28.125	21.875	6.403	2	1.000	0.75
Diag2	L2x2x1/4	SAE	2X2X0.25	33.0	21.58	Comp	18.19	g18P	3.310NESC Hea	22.349	18.200	28.125	21.875	5.657	2	1.000	0.75
Diag3	L2.5x2x1/4	SAU	2.5X2X0.25	33.0	40.67	Comp	31.21	g26P	5.681NESC Ext	22.201	18.200	28.125	19.875	5.657	2	1.000	0.75
Diag4	L2x2x3/16	SAE	2X2X0.1875	33.0	14.29	Cross	8.66	g33X	1.358NESC Ext	16.910	18.200	21.094	15.680	9.798	2	1.000	0.75
Diag5	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	84.51	Comp	27.07	g39X	3.854NESC Ext	14.237	18.200	21.094	15.504	21.495	2	1.000	0.75
Diag6	L2x2x1/4	SAE	2X2X0.25	33.0	48.80	Comp	31.48	g37X	5.016NESC Ext	22.349	18.200	28.125	15.937	16.544	2	1.000	0.75
Horz1	L2x2x1/4	SAE	2X2X0.25	33.0	14.62	Comp	0.00	g40X	0.000	22.349	18.200	28.125	19.781	4.000	2	1.000	0.75
Horz2	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	37.35	Tens	37.35	g46Y	6.798NESC Hea	29.774	18.200	28.125	20.719	4.000	2	1.000	0.75
Horz3	L1.75x1.75x3/16	SAE	1.75X1.75X0.1875	33.0	18.90	Comp	3.49	g53P	0.255NESC Ext	14.237	9.100	10.547	7.312	6.730	1	1.000	0.75
Horz4	L2.5x2.5x3/16	SAE	2.5X2.5X0.1875	33.0	75.87	Comp	10.73	g56Y	1.487NESC Hea	22.613	18.200	21.094	13.852	13.035	2	1.000	0.75
Inner1	L1.75x1.75x1/4	SAE	1.75X1.75X0.25	33.0	27.54	Tens	27.54	g58Y	2.092NESC Hea	18.488	9.100	14.062	7.594	2.828	1	1.000	0.75
ShieldAr	L2x2x1/4	SAE	2X2X0.25	33.0	29.97	Tens	29.97	g63Y	5.454NESC Hea	22.349	18.200	28.125	18.844	4.000	2	1.000	0.75
ShArmBr	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	24.92	Comp	0.00	g70Y	0.000	29.774	18.200	28.125	21.875	12.472	2	1.000	0.75
TopCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	42.77	Comp	0.00	g65Y	0.000	29.774	18.200	28.125	22.969	4.000	2	1.000	0.75

TopArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	24.52	Tens	24.52	g71P	4.462NESC Hea	22.349	18.200	28.125	20.906	9.437	2
1.000	0.75														
MidCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	65.20	Comp	0.00	g67Y	0.000	29.774	18.200	28.125	22.969	4.000	2
1.000	0.75														
MidArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	39.67	Tens	39.67	g72P	7.219NESC Hea	22.349	18.200	28.125	20.906	12.572	2
1.000	0.75														
BotCrArm	L2.5x2.5x1/4	SAE	2.5X2.5X0.25	33.0	41.59	Comp	0.00	g69Y	0.000	29.774	18.200	28.125	22.969	4.000	2
1.000	0.75														
BotArmBr	L2x2x1/4	SAE	2X2X0.25	33.0	23.71	Tens	23.71	g73P	4.316NESC Hea	22.349	18.200	28.125	20.906	9.437	2
1.000	0.75														
Pwmnt	12" Std. Pipe Pwmnt		Pipe 12" Std.	50.0	2.48	Comp	0.00	g79P	0.000	679.999	0.000	0.000	0.000	15.250	0
0.000	0														
PMBR1	**L2x2x3/16**	**SAE**	**2X2X0.1875**	**36.0**	**29.90**	**Tens**	**29.90**	**g80P**	**3.049NESC Hea**	**18.827**	**16.800**	**10.195**	**10.343**	**2.167**	**1**
1.000	**0.6875**	**A potentially damaging moment exists in the following members (make sure your system is well triangulated to minimize moments): g80P**													
g80X g82P g82X g83P g84P g84X g86P g86X ??															
PMBR2	L3x3x3/16	SAE	3X3X0.1875	36.0	4.54	Comp	1.15	g89P	0.118NESC Hea	31.139	16.800	10.195	11.328	7.918	1
1.000	0.6875														

*** Maximum Stress Summary for Each Load Case

Summary of Maximum Usages by Load Case:

Load Case	Maximum Usage %	Element Label	Element Type
NESC Heavy	84.51	g38X	Angle
NESC Extreme	79.08	g11Y	Angle

Summary of Insulator Usages:

Insulator Label	Insulator Type	Maximum Usage %	Load Case	Weight (lbs)
1	Clamp	6.28	NESC Heavy	0.0
2	Clamp	6.32	NESC Heavy	0.0
3	Clamp	9.60	NESC Heavy	0.0
4	Clamp	9.63	NESC Heavy	0.0
5	Clamp	9.68	NESC Heavy	0.0
6	Clamp	9.70	NESC Heavy	0.0
7	Clamp	9.60	NESC Heavy	0.0
8	Clamp	9.63	NESC Heavy	0.0
9	Clamp	2.73	NESC Heavy	0.0
10	Clamp	0.40	NESC Extreme	0.0
11	Clamp	0.40	NESC Extreme	0.0
12	Clamp	0.40	NESC Extreme	0.0
13	Clamp	1.17	NESC Extreme	0.0
14	Clamp	0.77	NESC Extreme	0.0
15	Clamp	0.77	NESC Extreme	0.0
16	Clamp	0.79	NESC Heavy	0.0
17	Clamp	1.91	NESC Heavy	0.0
18	Clamp	1.60	NESC Heavy	0.0
19	Clamp	2.07	NESC Heavy	0.0
20	Clamp	3.58	NESC Heavy	0.0
21	Clamp	5.74	NESC Heavy	0.0

Loads At Insulator Attachments For All Load Cases:

Load Case	Insulator Label	Insulator Type	Structure Attach Label	Structure Attach Load X (kips)	Structure Attach Load Y (kips)	Structure Attach Load Z (kips)	Structure Attach Load Res. (kips)
NESC Heavy	1	Clamp	16P	0.000	1.351	2.835	3.141
NESC Heavy	2	Clamp	16X	0.000	1.398	2.835	3.161
NESC Heavy	3	Clamp	17P	0.000	1.530	4.551	4.802
NESC Heavy	4	Clamp	17X	0.000	1.572	4.551	4.815
NESC Heavy	5	Clamp	18P	0.000	1.530	4.590	4.839
NESC Heavy	6	Clamp	18X	0.000	1.567	4.590	4.851
NESC Heavy	7	Clamp	19P	0.000	1.530	4.551	4.802
NESC Heavy	8	Clamp	19X	0.000	1.572	4.551	4.815
NESC Heavy	9	Clamp	24P	0.000	0.467	1.281	1.364
NESC Heavy	10	Clamp	2Y	0.000	0.000	0.192	0.192
NESC Heavy	11	Clamp	4Y	0.000	0.000	0.148	0.148
NESC Heavy	12	Clamp	6Y	0.000	0.000	0.172	0.172
NESC Heavy	13	Clamp	8Y	0.000	0.000	0.146	0.146
NESC Heavy	14	Clamp	11Y	0.000	0.000	0.166	0.166
NESC Heavy	15	Clamp	13Y	0.000	0.000	0.329	0.329
NESC Heavy	16	Clamp	14Y	0.000	0.000	0.395	0.395
NESC Heavy	17	Clamp	25P	0.000	0.344	0.888	0.953
NESC Heavy	18	Clamp	26P	0.000	0.289	0.748	0.802
NESC Heavy	19	Clamp	27P	0.000	0.374	0.965	1.035
NESC Heavy	20	Clamp	28P	0.000	0.657	1.666	1.791
NESC Heavy	21	Clamp	29P	0.000	0.975	2.697	2.868
NESC Extreme	1	Clamp	16P	0.000	0.954	0.804	1.247
NESC Extreme	2	Clamp	16X	0.000	0.954	0.804	1.247
NESC Extreme	3	Clamp	17P	0.000	1.366	1.854	2.303
NESC Extreme	4	Clamp	17X	0.000	1.366	1.854	2.303
NESC Extreme	5	Clamp	18P	0.000	1.366	1.854	2.303
NESC Extreme	6	Clamp	18X	0.000	1.366	1.854	2.303
NESC Extreme	7	Clamp	19P	0.000	1.366	1.854	2.303
NESC Extreme	8	Clamp	19X	0.000	1.366	1.854	2.303
NESC Extreme	9	Clamp	24P	0.000	0.962	0.458	1.065
NESC Extreme	10	Clamp	2Y	0.000	0.159	0.122	0.200
NESC Extreme	11	Clamp	4Y	0.000	0.159	0.122	0.200
NESC Extreme	12	Clamp	6Y	0.000	0.159	0.122	0.200
NESC Extreme	13	Clamp	8Y	0.000	0.477	0.338	0.584
NESC Extreme	14	Clamp	11Y	0.000	0.318	0.216	0.384
NESC Extreme	15	Clamp	13Y	0.000	0.318	0.216	0.384
NESC Extreme	16	Clamp	14Y	0.000	0.318	0.216	0.384
NESC Extreme	17	Clamp	25P	0.000	0.159	0.205	0.259
NESC Extreme	18	Clamp	26P	0.000	0.159	0.193	0.250
NESC Extreme	19	Clamp	27P	0.000	0.159	0.214	0.266
NESC Extreme	20	Clamp	28P	0.000	0.477	0.492	0.685
NESC Extreme	21	Clamp	29P	0.000	0.318	0.553	0.638

Overturning Moments For User Input Concentrated Loads:

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

Load Case	Total Tran. Load (kips)	Total Long. Load (kips)	Total Vert. Load (kips)	Transverse Overturning Moment (ft-k)	Longitudinal Overturning Moment (ft-k)	Torsional Moment (ft-k)

NESC Heavy	12.090	0.000	33.968	832.522	2.122	0.243
NESC Extreme	9.635	0.000	12.829	674.395	1.252	0.937

*** Weight of structure (lbs):
Weight of Angles*Section DLF: 12664.8
Total: 12664.8

*** End of Report

CENTEK engineering
Centered on Solutions
63-2 North Branford Road
Branford, CT 06405
www.centekeng.com
P:(203) 488-0580
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Subject:	Foundation Analysis CL&P Tower # 326
Location:	Beacon Falls, CT
Rev. 2: 3/6/14	Prepared by: T.J.L. Checked by: C.F.C. Job No. 12047.CO15

Foundation Analysis

Input Data:

Max. Reactions at Tower Leg:

Shear (Compression Leg) =	$Shear_{comp} := 9.2 \cdot 1.1 \cdot kips = 10.1 \cdot kips$	(User Input)
Shear (Uplift Leg) =	$Shear_{up} := 10.1 \cdot 1.1 \cdot kips = 11.1 \cdot kips$	(User Input)
Compression =	$Comp := 49.0 \cdot 1.1 \cdot kips = 53.9 \cdot kips$	(User Input)
Uplift =	$Uplift := 38.8 \cdot 1.1 \cdot kips = 42.7 \cdot kips$	(User Input)

Tower Properties:

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

Foundation Properties:

(Refer to NUSCO drawing 01145-60001)

Pier Height =	$P_H := 6 \cdot ft$	(User Input)
Pier Width Top =	$P_{w1} := 1.5 \cdot ft$	(User Input)
Pier Width Botttom =	$P_{w2} := 2.42 \cdot ft$	(User Input)
Pier Projection Above Grade =	$P_P := 0.5 \cdot ft$	(User Input)
Pad Width =	$Pd_w := 5 \cdot ft$	(User Input)
Pad Thickness =	$Pd_t := 1.5 \cdot ft$	(User Input)

Subgrade Properties:

Concrete Unit Weight =	$\gamma c := 150 \cdot pcf$	(User Input)
Water Unit Weight =	$\gamma w := 62.4 \cdot pcf$	(User Input)
Soil Unit Weight =	$\gamma s := 100 \cdot pcf$	(User Input)
Uplift Angle =	$\phi := 30.0 \cdot deg$	(User Input)
Ultimate Soil Bearing Capacity =	$BC_{soil} := 7000 \cdot psf$	(User Input)
Coefficient of Friction =	$\mu := 0.45$	(User Input)
Coefficient of Lateral Soil Pressure =	$K_p := \frac{1 + \sin(\phi)}{1 - \sin(\phi)} = 3$	

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Subject: Foundation Analysis CL&P Tower # 326

Location: Beacon Falls, CT

Rev. 2: 3/6/14

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 12047.CO15

Calculated Data:

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

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

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

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

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

Total Volume of Concrete = $V_{Conc} := V_{pad} + V_{pier} = 61 \cdot ft^3$

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

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

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

Check Uplift:

Required Factor of Safety = $F_S := 1.0$

$ActualFS := \frac{Mass_{tot}}{Uplift} = 1.06$

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

$Uplift\_Check = "OK"$

Check Bearing:

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

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

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

$Bearing := \frac{Comp + Mass_{Concr}}{A_{pad}} + \frac{\left[Shear_{comp} \cdot (P_H + Pd_t)\right]}{S_{pad}} = 5.92 \cdot ksf$

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

$Bearing\_Check = "OK"$

Check Sliding:

Sliding Resistance = $S_R := \mu \cdot \left(Mass_{Conc} + Comp\right) = 28.371 \cdot kips$

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

$Sliding\_Check = "OK"$

	Market	Southern Connecticut	
	Cascade ID	CT03XC037	
		Sector 1	Sector 2
1900	1900MHz_Azimuth	60	130
1900	1900MHz_No_of_Antennas	1	1
1900	1900MHz_RADCenter(ft)	96.3	96.3
1900	1900MHz_Antenna Make	RFS	RFS
1900	1900MHz_Antenna Model	APXVSPP18-C-A20	APXVSPP18-C-A20
1900	1900MHz_Horizontal_Beamwidth	65	65
1900	1900MHz_Vertical_Beamwidth	5.5	5.5
1900	1900MHz_AntennaHeight (ft)	6	6
1900	1900MHz_AntennaGain(dBd)	15.9	15.9
1900	1900MHz_E_Tilt	0	0
1900	1900MHz _M_Tilt	0	0
1900	1900_Effective_Tilt	0	0
1900	1900MHz_Carrier_Forecast_Year_2013	2	2
1900	1900MHz_RRH Manufacturer	ALU	ALU
1900	1900MHz_RRH Model	RRH 1900 4X45 65MHz	RRH 1900 4X45 65MHz
1900	1900MHz_RRH Count	1	1
1900	1900MHz_RRH Location	On the Ground	On the Ground
1900	1900MHz Combiner Model	No Combiner Required	No Combiner Required
1900	1900MHz Power Split Ratio (Main/Split)		
1900	1900MHz Splitter Manufacturer		
1900	1900MHz Splitter Model		
1900	1900MHz Number of Splitters	0	0
1900	1900MHz_Top_Jumper #1_Length (RRH or Combiner-to-Antenna for TT or Main Coax to Antenna for Ground Mount, ft)		
1900	1900MHz_Top_Jumper #1_Cable_Model (RRH or Combiner-to-Antenna for TT or Main Coax to Antenna for Ground Mount)		
1900	1900MHz_Top_Jumper #2_Length (RRH to Combiner for TT if applicable, ft)		
1900	1900MHz_Top_Jumper #2_Cable_Model (RRH to Combiner for TT if applicable)		
1900	1900MHz_Main_Coax_Cable_Length (ft)	N/A	N/A
1900	1900MHz_Main_Coax_Cable_Model	120	120
1900	1900MHz_Bottom_Jumper #1_Length (Ground based RRH to Combiner-OR-Main Coax, ft)	LCF158-50JA-A	LCF158-50JA-A
1900	1900MHz_Bottom_Jumper #1_Cable_Model (Ground based RRH to Combiner-OR-Main Coax)	10	10
1900	1900MHz_Bottom_Jumper #2_Length (Ground based-Combiner to Main Coax, ft)	LCF12-50J	LCF12-50J
1900	1900MHz_Bottom_Jumper #2_Cable_Model (Ground based-Combiner to Main Coax)	N/A	N/A
800	800MHz_Azimuth	N/A	N/A
800	800MHz_No_of_Antennas	N/A	N/A
800	800MHz_RADCenter(ft)	0	0
800	800MHz_AntennaMake	N/A	N/A
800	800MHz_AntennaModel	N/A	N/A
800	800MHz_Horizontal_Beamwidth	N/A	N/A
800	800MHz_Vertical_Beamwidth	N/A	N/A
800	800MHz_AntennaHeight (ft)	N/A	N/A
800	800MHz_AntennaGain (dBd)	N/A	N/A
800	800MHz_E_Tilt	N/A	N/A
800	800MHz_M_Tilt	N/A	N/A
800	800 MHz_Effective Tilt (degrees)	N/A	N/A
800	800MHz_RRH Manufacturer	N/A	N/A
800	800_Combiner_Model	N/A	N/A
800	800MHz_RRH Model	N/A	N/A
800	800MHz_RRH Count	N/A	N/A
800	800MHz_RRH Location	0	0
800	800MHz Power Split Ratio (Main/Split)	N/A	N/A
800	800MHz Splitter Manufacturer		
800	800MHz Splitter Model		
800	800MHz Number of Splitters	0	0
800	800_Top_Jumper #1_Length (RRH to Antenna for TT or Main Coax to Antenna for GM)	N/A	N/A
800	800_Top_Jumper_Cable_Model (RRH to Antenna for TT or Main Coax to Antenna for GM)	N/A	N/A
800	800MHz_Main_Coax_Cable_Length (ft)	N/A	N/A
800	800MHz_Main_Coax_Cable_Model	N/A	N/A
800	800_Bottom_Jumper #1_Length (Ground based RRH to Main Coax)	N/A	N/A
800	800_Bottom_Jumper #1_Cable_Model (Ground based RRH to Main Coax)	N/A	N/A
Comments	Has_Split	No	No
Comments	Plumbing Scenario	177	177
Comments	Date Updated	GM4	GM4
Comments	Update Description	2/24/2014	2/24/2014
Comments	Site Type	GM4 Coax no 800 with LTE (TempGroundMount)	GM4 Coax no 800 with LTE (TempGroundMount)
Comments	Deployment Forecast	11.3	11.3
Comments	Comments		
Comments	This RFDS is Deployment View RFDS Generated on 2/24/2014		

Product Data Sheet APXVSPP18-C

Triple Band Dual Polarized Antenna, 806-1995, 65deg, 16-18dBi, 1.8m, VET, 0-10deg, 0.5m AISG Cable

Product Description

This antenna is an ideal choice for dual band site upgrade for high traffic areas. It features 4 ports in 1900 MHz and 2 ports in 800 MHz.

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 < 18 dB)**
- **Independent control of electrical downtilt for 800 and PCS bands**
- **Remote tilt – AISG compatible**
- **Low profile for low visual impact**
- **Quick and easy to adjust**
- **High front-to-back ratio**

Technical Specifications

Electrical Specifications

Frequency Range, MHz	806-869	1850-1995	1850-1995
Horizontal Beamwidth, deg	65	65	65
Vertical Beamwidth, deg	11.5	5.5	5.5
Electrical Downtilt, deg		0-10	
Gain, dBi (dBd)	15.5 (13.4)	18.0 (15.9)	18.0 (15.9)
1st Upper Sidelobe Suppression, dB, typ. @ T0° & T8°		>18	
Front-To-Back Ratio, dB, @ 180° ± 15°	>30	>27	>27
Polarization		Dual pol +/-45°	
Return Loss, dB		> 14	
Isolation between Ports, dB		>28	
3rd Order IMP @ 2 x 43 dBm, @ 2 min. duration		>110	
Cross Polar Discrimination (XPD) 0°, dB	>15	>20	>20
Cross Polar Discrimination (XPD) ± 60°, dB	>9.5	>11	>11
HBW Squint accross same band ports, °		±5	
Impedance, Ohms		50	
Maximum Power Input, W		250	
Lightning Protection		Direct Ground	
Connector Type		(6) 7-16 DIN Female	

Mechanical Specifications

Dimensions - HxWxD, mm (in)	1829 x 302 x 178 (72.0 x 11.8 x 7)
Weight w/o Mtg Hardware, kg (lb)	25.8 (57)
Radome Material	ASA
Radome Color	Light Grey RAL7035
Mounting Hardware Material	Diecasted Aluminum and Galvanized Steel

Ordering Information

Mounting Hardware	APM40-2 Downtilt Kit
AISG System Cable	0.5 m, included
Mounting Pipe Diameter, mm (in)	60-120 (2.4-4.7)
Mounting Hardware Weight, kg (lb)	3.4 (7.5)

Northeast
Utilities System

56 Prospect Street, Hartford, CT 06103

Northeast Utilities Service Company
P.O. Box 270
Hartford, CT 06141-0270
(203) 665-5000

June 24, 2014

Ms. Jennifer Gaudet
HPC Development

Sprint,
1 International Blvd.
Suite 300
Mahwah NJ
07495

RE: Sprint Antenna Site, CT-03XC037, 236 Pent Rd., Beacon Falls CT, structure 326.

Dear Ms. Gaudet:

Based on our reviews of the site drawings, the structural analysis and foundation review provided by Centek Engineering, along with a third party review performed by Paul J. Ford we have reviewed for acceptance this modification.

Since there are no outstanding structural issues to resolve at this time please contact Mr. O'Brien (860-665-6987) to resolve any lease issues; once the lease amendment is secured you may then contact Mr. John Landry directly (860-665-5425) to begin the construction arrangements.

Sincerely,

Robert Gray
Transmission Line Engineering

REF: 12047.CO15 - CT03XC037.pdf
NV_CT03XC037_06.19.14_Final_Rev 3.pd

EBI Consulting
environmental | engineering | due diligence

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

Sprint Existing Facility

Site ID: CT03XC037

NU-Beacon Falls (CL&P)
236 Pent Street
Beacon Falls, CT 06403

July 21, 2014

EBI Project Number: 62143966

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

EBI Consulting
environmental | engineering | due diligence

July 21, 2014

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

Re: Emissions Values for Site: **CT03XC037 – NU-Beacon Falls (CL&P)**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 236 Pent Street, Beacon Falls, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades 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 μW/cm2 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 cellular band is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the PCS band 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 upgrades to the existing Sprint Wireless antenna facility located at 236 Pent Street, Beacon Falls, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. 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 emissions were calculated using the following assumptions:

1) 2 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
2) 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.
3) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
4) The antenna used in this modeling is the APXVSPP18-C-A20. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 15.9 dBd gain value at its main lobe at 1900 MHz and 13.4 dBd at its main lobe for 850 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.

5) The antenna mounting height centerline of the proposed antennas is **96.25 feet** above ground level (AGL)
6) 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.

All calculation were done with respect to uncontrolled / general public threshold limits

Site ID	CT03XC037 - NU-Beacon Falls (CL&P)
Site Addresss	236 Pent Street, Beacon Falls, CT, 06403
Site Type	Utility Transmission Tower

Sector 1

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
1a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	96.25	90.25	1/2 "	0.5	0	1386.9474	61.21693	6.12169%
1a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	0	0	13.4	96.25	90.25	1/2 "	0.5	0	0	0	0.00000%
														Sector total Power Density Value:			6.122%

Sector 2

Antenna Number	Antenna Make	Antenna Model	Radio Type	Frequency Band	Technology	Power Out Per Channel (Watts)	Number of Channels	Composite Power	Antenna Gain in direction of sample point (dBd)	Antenna Height (ft)	analysis height	Cable Size	Cable Loss (dB)	Additional Loss	ERP	Power Density Value	Power Density Percentage
2a	RFS	APXVSPP18-C-A20	RRH	1900 MHz	CDMA / LTE	20	2	40	15.9	96.25	90.25	1/2 "	0.5	0	1386.9474	61.21693	6.12169%
2a	RFS	APXVSPP18-C-A20	RRH	850 MHz	CDMA / LTE	20	0	0	13.4	96.25	90.25	1/2 "	0.5	0	0	0	0.00000%
														Sector total Power Density Value:			6.122%

Site Composite MPE %

Carrier	MPE %
Sprint	12.243%
Total Site MPE %	**12.243%**

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Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **12.243% (6.122% from each sector)** of the allowable FCC established general public limit considering both sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **12.243%** 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. Per the Connecticut Siting Council database, there are no additional carriers located at this facility.

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.

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