CONNECTICUT SITING COUNCIL

In re:

T-Mobile USA, Inc. Notice to Make an Exempt Modification to an Existing Facility, Christian Hill Road, a/k/a 100 Berlin Road, Cromwell, Connecticut.	:	**EXEMPT MODIFICATION NO.** ________
	:	May 15, 2009

NOTICE OF EXEMPT MODIFICATION

Pursuant to Conn. Agencies Regs. §§ 16-50j-73 and 16-50j-72(b), T-Mobile USA, Inc. ("T-Mobile") hereby gives notice to the Connecticut Siting Council ("Council") and the Town of Cromwell of T-Mobile's intent to make an exempt modification to an existing sign structure (the "Tower") located at Christian Hill Road, a/k/a 100 Berlin Road in Cromwell, Connecticut.[1] Specifically, T-Mobile plans to upgrade its wireless system in Connecticut by implementing its Universal Mobile Telecommunications System ("UMTS"). UMTS is a third-generation ("3G") technology that utilizes a code division multiple access ("CDMA") base to allow for fast and large data transfers. To accomplish this upgrade, T-Mobile must modify its antenna and equipment configurations at many of its existing sites.

Once the UMTS upgrade is complete, T-Mobile will operate on a more unified communication system, allowing international wireless telephones to function world-wide. Furthermore, UMTS will enhance GPS navigation capabilities and provide emergency responders with more advanced tracking capabilities. The proposed UMTS

[1] The Council approved T-Mobile's petition for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need was required to construct a pole within an existing wireless communication tower and array at this facility on January 25, 2006 (Petition No. 750).

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

technology is compatible with the existing second-generation ("2G") Global System for Mobile Communication ("GSM") currently on the Tower and the proposed upgrade is expected to enhance the existing 2G system. In order to accomplish the upgrade at this site, T-Mobile plans to add UMTS technology and install associated equipment at the base of the Tower.

Under the Council's regulations (Conn. Agencies Regs. § 16-50j-72(b)), T-Mobile's plans do not constitute a modification subject to the Council's review because T-Mobile will not change the height of the Tower, will not extend the boundaries of the compound, will not increase the noise levels at the site, and will not increase the total radio frequency electromagnetic radiation power density at the site to levels above applicable standards.

The Tower is a 108-foot sign structure tower located at Christian Hill Road in Cromwell, Connecticut (41.6057, -72.7014). The Tower is owned by Shaner Hotel Group Properties. There are multiple carriers located on the Tower. Currently, T-Mobile has 3 antennas and 6 Tower Mounted Amplifiers ("TMA") located on the Tower with a centerline of 108 feet. A site plan with Tower specifications is attached.

T-Mobile plans to add 3 UMTS antennas and 3 UMTS Twin TMA to the Tower. The proposed antennas and TMA will have the same centerline as the existing antennas and TMA – 108 feet. To confirm the Tower can support these changes, T-Mobile commissioned Natcomm, Inc. to perform a structural analysis of the Tower (attached). According to the structural assessment, dated April 30, 2009, "...the subject structure **is**

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

adequate to support the proposed modified antenna configuration" (Section 1-5, Structural Analysis, emphasis in original).

In addition, T-Mobile plans to locate 6, 1-5/8 inch coax cables under the proposed ice bridge. The proposed ice bridge would run from the Tower to T-Mobile's existing equipment cabinet. T-Mobile proposes to install the UMTS equipment cabinet on its existing 9-foot by 9-foot (approximately) concrete pad. Hence, no increase in the size of the concrete pad is necessary. T-Mobile also proposes to install power wiring and telephone wiring to run from the existing power protection cabinet to the proposed UMTS equipment cabinet.

Therefore, excluding brief, minor, construction-related noise during the addition of the antennas and the installation of the equipment cabinet, T-Mobile's changes to the Tower will not increase noise levels at the site.

The proposed antennas and TMA will not adversely impact the health and safety of the surrounding community or the people working on the Tower. The total radio frequency exposure measured around the Tower will be well below the National Council on Radiation Protection and Measurements' ("NCRP") standard adopted by the Federal Communications Commission ("FCC"). The worst-case power density analysis measured at the base of the Tower indicates that T-Mobile's antennas will emit 10.58% of the NCRP's standard for maximum permissible exposure. A cumulative power density analysis indicates that together, all of the antennas on the Tower will emit only 30.95% of the NCRP's standard for maximum permissible exposure. Therefore, the power density levels will be well below the FCC mandated radio frequency exposure

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

limits in all locations around the Tower, even with extremely conservative assumptions. The power density analysis is attached.

In conclusion, T-Mobile's proposed plan to add antennas and TMA at this site does not constitute a modification subject to the Council's jurisdiction because T-Mobile will not increase the height of the Tower, will not extend the boundaries of the site, will not increase the noise levels at the site, and the total radio frequency electromagnetic radiation power density will stay within all applicable standards. *See* Conn. Agencies Regs. § 16-50j-72.

T-Mobile USA, Inc.

By: ______________________

Thomas J. Regan
Brown Rudnick LLP
185 Asylum Street, CityPlace I
Hartford, CT 06103-3402
Email - tregan@brownrudnick.com
Phone - 860.509.6522
Fax - 860.509.6622

Certificate of Service

This is to certify that on this 15th day of May, 2009, the foregoing Notice of Exempt Modification was sent, via first class mail, to the following:

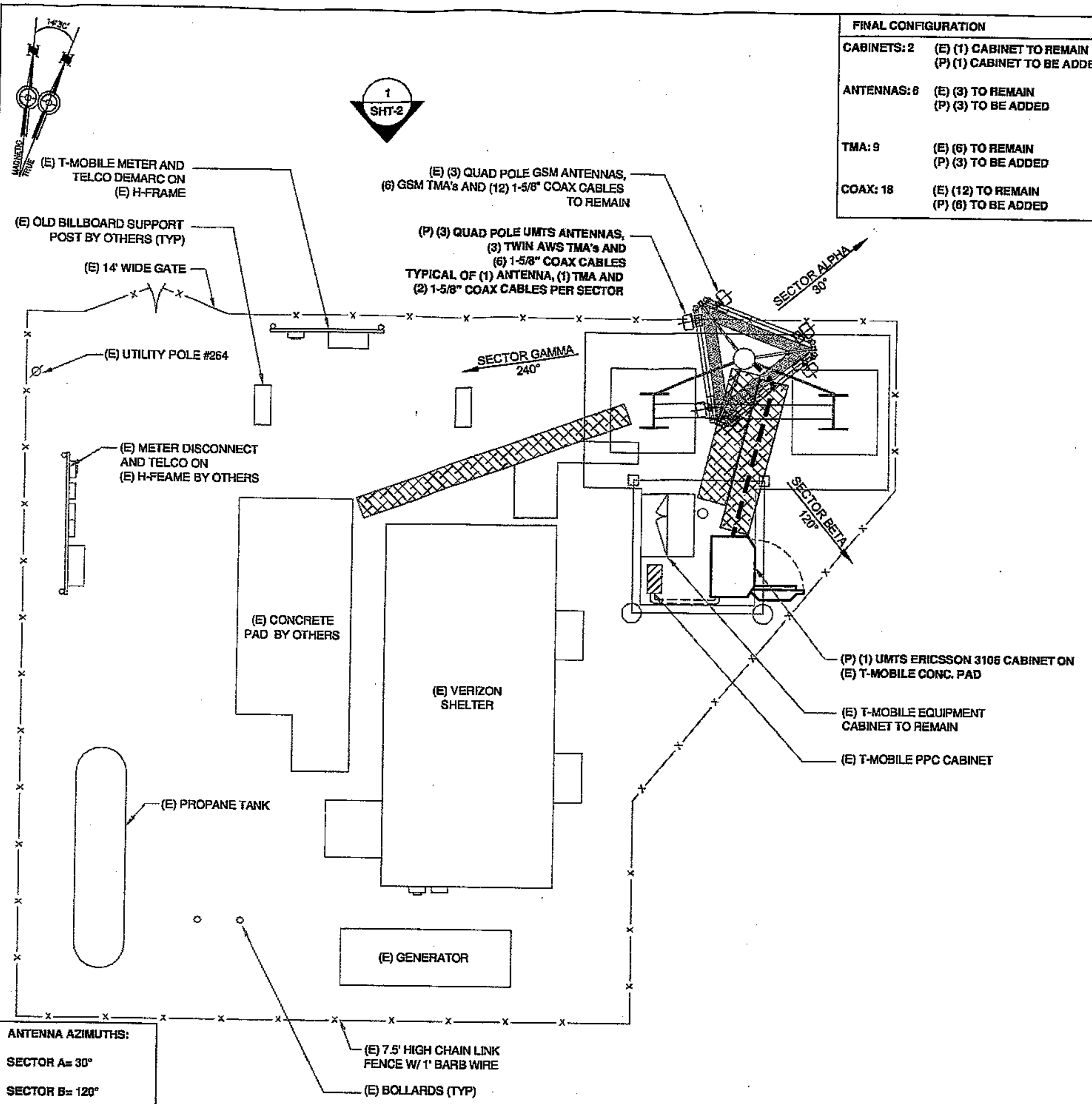
Town of Cromwell
First Selectman's Office
First Selectman Jeremy Shingleton
41 West Street
Cromwell, CT 06416

By: ______________________
Thomas J. Regan

40259781 v1 - 025064/0016

BROWN RUDNICK LLP
CITYPLACE I
185 ASYLUM STREET
HARTFORD, CT 06103
(860) 509-6500

FINAL CONFIGURATION	
CABINETS: 2	(E) (1) CABINET TO REMAIN (P) (1) CABINET TO BE ADDED
ANTENNAS: 6	(E) (3) TO REMAIN (P) (3) TO BE ADDED
TMA: 9	(E) (6) TO REMAIN (P) (3) TO BE ADDED
COAX: 18	(E) (12) TO REMAIN (P) (6) TO BE ADDED



ANTENNA AZIMUTHS:

SECTOR A= 30°

SECTOR B= 120°

SECTOR C= 240°

ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

PLAN

SCALE: 1" = 10'-0"

5 0 5 10 15

TRANSCEND WIRELESS, LLC
10 INDUSTRIAL AVE.
MAHWAH, NJ 07430
OFFICE: (201) 684-0055
FAX:(201) 684-0066

FOR

OMNIPOINT COMMUNICATIONS, INC. DBA T-MOBILE USA, INC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX:(860) 692-7159

ATLANTIS GROUP
15 Cypress St., Suite 300
Newton Centre, MA 02459
Office: 617-965-0789
Fax 617-663-6032

SITE NUMBER: CTHA240A

SITE NAME: VERIZON-BB

ADDRESS: CHRISTIAN HILL ROAD/100 BERLIN RD CROMWELL, CT 06416

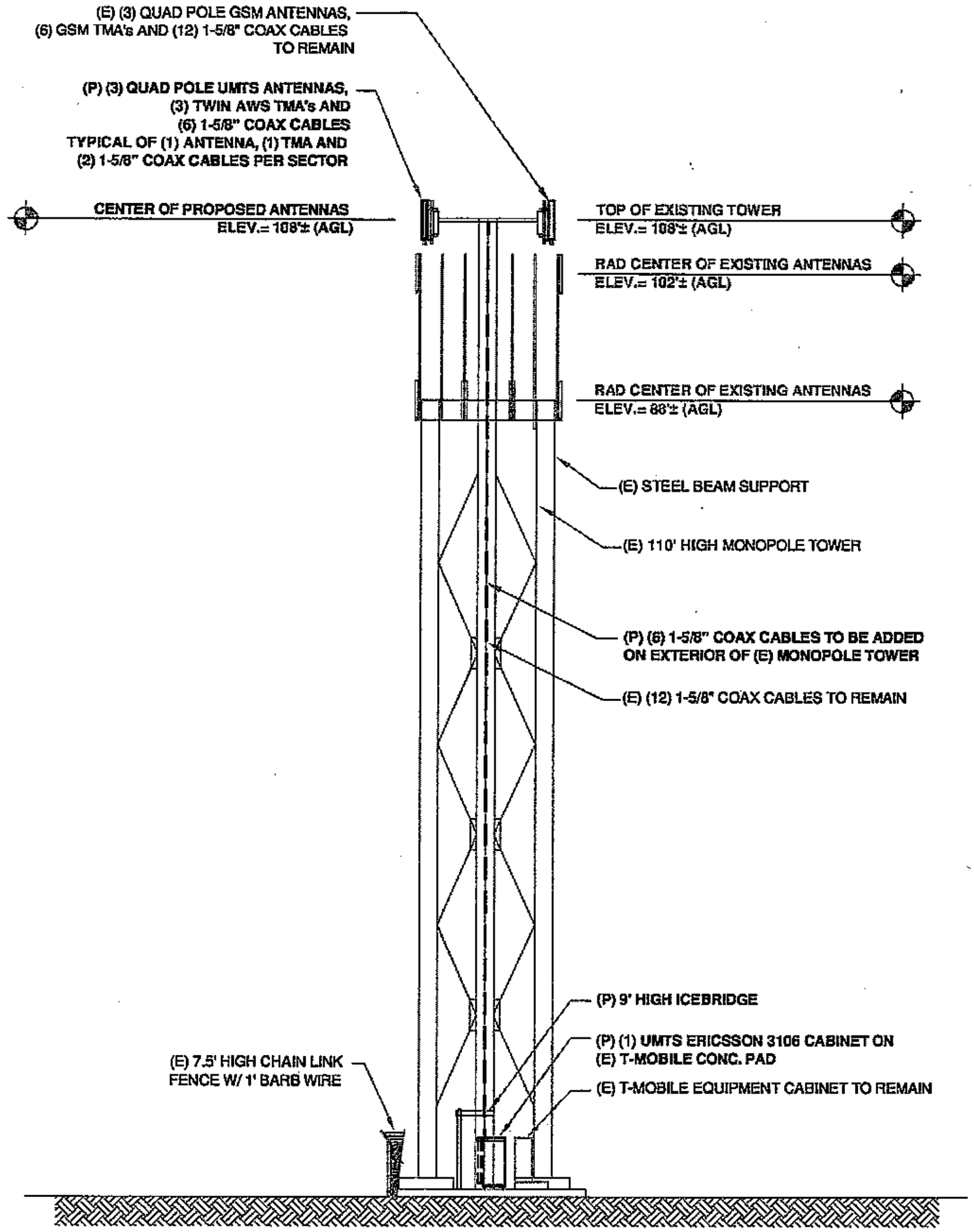
DRAWN BY G.C.

REVISION	DATE
0: FINAL LE	03-11-09
A: REVIEW	02-09-09

APPROVALS

Site Owner	Date
Construction Manager	Date
RF Engineer	Date
Site Acquisition	Date

The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.



ALL EQUIPMENT LOCATIONS ARE APPROXIMATE AND ARE SUBJECT TO APPROVAL BY LESSEE/LICENSEE'S STRUCTURAL & RF ENGINEERS. LOCATIONS OF POWER & TELEPHONE FACILITIES ARE SUBJECT TO APPROVAL BY UTILITY COMPANIES.

ELEVATION

SCALE: 1" = 20'–0"

10 0 10 20 30

TRANSCEND WIRELESS, LLC
10 INDUSTRIAL AVE.
MAHWAH, NJ 07430
OFFICE: (201) 684-0055
FAX:(201) 684-0066

FOR

OMNIPOINT COMMUNICATIONS, INC. DBA T-MOBILE USA, INC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
OFFICE: (860) 692-7100
FAX:(860) 692-7159

ATLANTIS GROUP
15 Cypress St., Suite 300
Newton Centre, MA 02459
Office: 617-965-0789
Fax: 617-663-6032

SITE NUMBER: CTHA240A
SITE NAME: VERIZON-BB
ADDRESS: CHRISTIAN HILL ROAD/100 BERLIN RD CROMWELL, CT 06416
DRAWN BY: G.C.

REVISION	DATE
0: FINAL LE	03-11-09
A: REVIEW	02-09-09

APPROVALS

Site Owner — Date

Construction Manager — Date

RF Engineer — Date

Site Acquisition — Date

The above parties hereby approve and accept these documents and authorize the contractor to proceed with the construction described herein, all construction documents are subject to review by the local building department and any changes or modifications they may impose.

NATCOMM INC.
CONSULTING ENGINEERS

Structural Analysis Report

82' Sign Structure w/ 111' Pipe Mast

T-Mobile Site Ref: CTHA240A

Verizon Site Ref: Cromwell SW

100 Berlin Road
Cromwell, CT

Natcomm Project No. 09009-CO-7

~~Date: April 02, 2009~~
Rev 1: April 30, 2009

STATE OF CONNECTICUT
No. 16604
LICENSED
PROFESSIONAL ENGINEER

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

p: 203.488.0580
f: 203.488.8587
w: nat-eng.com
63-2 N. Branford Rd.
Branford, CT 06405

Table of Contents

SECTION 1 - REPORT

- INTRODUCTION.
- ANTENNA AND APPURTENANCE SUMMARY.
- PRIMARY ASSUMPTIONS USED IN THE ANALYSIS.
- ANALYSIS.
- TOWER LOADING.
- TOWER CAPACITY.
- FOUNDATION AND ANCHORS.
- CONCLUSION.

SECTION 2 – CONDITIONS & SOFTWARE

- STANDARD ENGINEERING CONDITIONS.
- GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM.

SECTION 3 – WIND LOAD CALCULATIONS

- EIA/TIA WIND LOADS ON STRUCTURAL MEMBERS.
- EIA/TIA WIND LOADS ON ANTENNAS AND MOUNTS.

SECTION 4 – RISA-3D

- RISA-3D REPORT

SECTION 5 – CALCULATIONS

- ANCHOR BOLTS AND BASE PLATE (MAST)
- FLANGE BOLTS AND FLANGE PLATE (MAST)
- ANCHOR BOLTS AND BASE PLATE (LEG)
- FOUNDATION

SECTION 5 – REFERENCE MATERIALS

- RF DATA SHEET
- ANTENNA CUT SHEETS

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna installation proposed by T-Mobile on the existing 82-ft sign structure located in Cromwell, Connecticut.

The host structure is a 82-ft sign structure with a 111-ft pipe mast. The existing structure geometry, member sizes, foundation system and antenna and appurtenance information were obtained from a previous structural design report prepared by URS Corporation dated December 1, 2005 and visual verification of the existing structure conducted from existing grade by Natcomm personnel during February 2009.

The structure is made up of two (2) W24x68 vertical steel legs, one (1) HSS18x0.5 steel pipe mast, L5x5x5/16 horizontal and diagonal steel bracing and WT6x15 steel bracing.

T-Mobile is proposing the installation of three (3) panel antennas, three (3) TMA' and six (6) coax cables. Refer to the Antenna and Appurtenance Summary below for a detailed description of the proposed antenna and appurtenance configuration.

Antenna and Appurtenance Summary

The existing structure was designed to support several communication antennas. The existing, proposed and future loads considered in this analysis consist of the following:

- T-MOBILE: (Existing)

  Antennas: Three (3) RFS APX16DWV-16DWVS-E-A20 panel antennas on a low profile platform mounted on a 111-ft pipe mast with a RAD center elevation of 108-ft AGL.
  Coax Cables: Twelve (12) 1-5/8" Ø coax cables, nine (9) within existing 111-ft pipe mast and three (3) on the exterior of the pipe mast.

- CINGULAR/AT&T: (Existing)

  Antennas: Six (6) Powerwave 7770.00 panel antennas, six (6) Powerwave LPG21401 TMA's and six (6) Powerwave LPG13519 diplexers on pipe mounts with a RAD center elevation of 98-ft AGL.
  Coax Cables: Twelve (12) 1-5/8" Ø coax cables run on the exterior of existing sign structure.

- VERIZON: (Existing)

  Antennas: Nine (9) Swedcom ALP-9212 and six (6) Decibel 948F85T2E-M_2 panel antennas with a RAD center elevation of 88-ft AGL.
  Coax Cables: Fifteen (15) 1-5/8" Ø coax cables run on the exterior of the existing sign structure.

- T-MOBILE (Existing/Reserved)

  Antennas: One (1) VIC-100 GPS antenna on a side arm mounted to the leg of the sign structure with a RAD center elevation of 50-ft AGL.
  Coax Cables: One (1) 1/2" Ø coax cable run on the exterior of the existing sign structure.

- POCKET WIRELESS (Existing/Reserved)

  Antennas: Three (3) RFS APXV18-206517S-C panel antennas mounted to the steel flanges (legs) of the existing sign structure with a RAD center elevation of 77-ft AGL.
  Coax Cable: Six (6) 1-5/8" Ø coaxial cables vertically supported on the existing legs of the sign structure per detail 2/02 on URS drawing 02, dated 11/24/08.

- **T-MOBILE: (Proposed)**

  Antennas: Three (3) RFS APX16DWV-16DWVS-E-A20 panel antennas and nine (9) Andrew OneBase Twin Dual Duplex TMA's on an existing low profile platform mounted on a 111-ft pipe mast with a RAD center elevation of 108-ft AGL.

  Coax Cables: Six (6) 1-5/8" Ø coax cables on the exterior of the pipe mast.

Primary Assumptions Used in the Analysis

- The structure's theoretical capacity not including any assessment of the condition of the tower.
- The structure carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Structure is properly installed and maintained.
- Structure is in plumb condition.
- Structure loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original structure design documents or reinforcement drawings.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All structure members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled RISA-3D. The program analyzes the structure, considering the worst case loading condition.

The existing structure was analyzed for 85 mph basic wind speed (fastest mile) with no ice and 75% reduction of wind force with ½ inch accumulative ice to determine stresses in members as per guidelines of TIA/EIA-222-F-96 entitled "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Allowable Stress Design (ASD).

Structure Loading

Structure loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA/EIA-222-F, gravity loads of the structure and its components, and the application of ½" radial ice to the structure and its components.

Basic Wind Speed:	Middlesex; v = 85 mph (fastest mile)	*[Section 16 of TIA/EIA-222-F-96]*
	Cromwell; v = 100 mph (3 second gust) equivalent to v = 80 mph (fastest mile)	*[Appendix K of the 2005 CT Building Code Supplement]*
	TIA/EIA wind speed criteria controls..	
Load Cases:	<u>Load Case 1</u>; 85 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation. This load case typically controls the design.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	<u>Load Case 2</u>; 74 mph wind speed w/ ½" radial ice plus gravity load – used in calculation of tower stresses. The 74 mph wind speed velocity represents 75% of the wind pressure generated by the 85 mph wind speed.	*[Section 2.3.16 of TIA/EIA-222-F-96]*
	<u>Load Case 3</u>; Seismic – not checked	*[Section 1614.5 of CT State Bldg. Code 2005] does not control in the design of this structure type*

Structure Capacity

Member stresses were calculated utilizing the structural analysis software RISA-3D. Allowable stresses were determined based on Table 5 of the TIA/EIA code with a 1/3 increase per Section 3.1.1.1 of the same code.

Calculated stresses were found to be within allowable limits. In Load Case 6, per RISA-3D "Steel Code Checks", this structure was found to be at **99.0%** of its total capacity.

Tower Section	Location	Stress Ratio (percentage of capacity)	Result
Leg 2	1.25'	99.0%	**PASS**

Foundation and Anchors

The existing foundation consists of an 55-ft long (approx) x 8.5-ft wide x 3-ft deep reinforced concrete strip footing with concrete column pedestals. The sub-grade conditions used in the analysis of the existing foundation were based on normal soil values as permitted by EIA/TIA-222-F Section 7.1.3. The base of the sign structure is connected to the foundation by means of (20) 1"∅, (assumed ASTM A-615-75) anchor bolts embedded into the existing concrete foundation. The base of the communications pipe structure is connected to the foundation by means of (10) 1.75"∅, ASTM A615-75 anchor bolts embedded into the existing concrete foundation.

Review of the foundation and anchor design consisted of verification of applied loads obtained from the tower design calculations and code checks of allowable stresses:

- The foundation was found to be within allowable limits.

Foundation	Design Limit	IBC 2003/2005 CT State Building Code Section 3108.4.2	Proposed Loading	Result
Reinf. Conc. Pad w/ Pedestals	OTM	2.0	3.6	**PASS**

Note: OTM denotes Overturning Moment

- The structure anchor bolts, base plate and flange plates were found to be within allowable limits.

Structure Component	Design Limit	Stress Ratio (percentage of capacity)	Result
Anchor Bolts (Mast)	Tension	60.7%	**PASS**
Base Plate (Mast)	Bending	43.0%	**PASS**
Flange Bolts	Tension	25.6%	**PASS**
Flange Plate	Bending	22.7%	**PASS**
Anchor Bolts (Leg)	Tension	29.2%	**PASS**
Base Plate (Leg)	Bending	98.0%	**PASS**

Conclusion

This analysis shows that the subject structure **is adequate** to support the proposed modified antenna configuration.

The analysis is based, in part, on the information provided to this office by Verizon Wireless. If the existing conditions are different than the information in this report, Natcomm, 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

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 Natcomm, 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 Natcomm, 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. Natcomm, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM ~ RISA-3D

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

Modeling Features:

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

Analysis Features:

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

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

Graphics Features:

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

Design Features:

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

Results Features:

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

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

Wind Speeds

Basic Wind Speed, V	$V := 85$	mph	
Basic Wind Speed with Ice, V_i	$V_i := 74$	mph	(per TIA/EIA-222-F Section 2.3.16)

Heights above ground level, z

Leg Member Section 1 =	$z_1 := 10$	ft
Leg Member Section 2 =	$z_2 := 30$	ft
Leg Member Section 3 =	$z_3 := 50$	ft
Leg Member Section 4 =	$z_4 := 70$	ft
Bracing Members =	$z_{Br} := 40$	ft

Exposure Coefficients, kz

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

Leg Member Section 1 = $Kz_1 := \left(\frac{z_1}{33}\right)^{\frac{2}{7}} = 0.711$

Leg Member Section 2 = $Kz_2 := \left(\frac{z_2}{33}\right)^{\frac{2}{7}} = 0.973$

Leg Member Section 3 = $Kz_3 := \left(\frac{z_3}{33}\right)^{\frac{2}{7}} = 1.126$

Leg Member Section 4 = $Kz_4 := \left(\frac{z_4}{33}\right)^{\frac{2}{7}} = 1.24$

Bracing Members = $Kz_{Br} := \left(\frac{z_{Br}}{33}\right)^{\frac{2}{7}} = 1.057$

Velocity Pressure without ice, qz

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

Leg Member Section 1 = $qz_1 := 0.00256 \cdot Kz_1 \cdot V^2 = 13.15$

Leg Member Section 2 = $qz_2 := 0.00256 \cdot Kz_2 \cdot V^2 = 17.999$

Leg Member Section 3 = $qz_3 := 0.00256 \cdot Kz_3 \cdot V^2 = 20.827$

Leg Member Section 4 = $qz_4 := 0.00256 \cdot Kz_4 \cdot V^2 = 22.929$

Bracing Members = $qz_{Br} := 0.00256 \cdot Kz_{Br} \cdot V^2 = 19.541$

Velocity Pressure with ice, qzICE

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

Leg Member Section 1 = $qzICE_1 := 0.00256 \cdot Kz_1 \cdot V_i^2 = 9.967$

Leg Member Section 2 = $qzICE_2 := 0.00256 \cdot Kz_2 \cdot V_i^2 = 13.642$

Leg Member Section 3 = $qzICE_3 := 0.00256 \cdot Kz_3 \cdot V_i^2 = 15.786$

Leg Member Section 4 = $qzICE_4 := 0.00256 \cdot Kz_4 \cdot V_i^2 = 17.379$

Bracing Members = $qzICE_{Br} := 0.00256 \cdot Kz_{Br} \cdot V_i^2 = 14.811$

TIA/EIA Common Factors:

Gust Response Factor =	$G_H := 1.69$		(per TIA/EIA-222-F Section 2.3.4)
Gust Response Factor Multiplier =	$m := 1.25$		(per TIA/EIA-222-F Section 2.3.4.4)
Radial Ice Thickness =	$Ir := 0.50$	in	(per TIA/EIA-222-F Section 2.3.1)
Radial Ice Density =	$Id := 56.00$	pcf	

Development of Wind & Ice Load on W24x68 w/ Plate (per TIA/EIA-222-F-1996 Criteria)

W24x68 w/ Plate Data:

Shape = Flat

Depth = $d := 25.75$ in

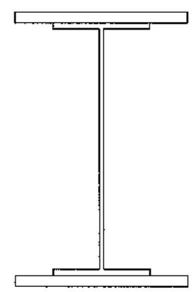
Length = $L := 20$ ft

Flange Width = $b_f := 16$ in

Flange Thickness = $t_f := 2.585$ in

Web Thickness = $t_w := .415$ in

Member Cross Sectional Area = $A_{member} := 52.1$ in^2



Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{member} := 2\left(t_f + 2\cdot Ir\right)\cdot\left(b_f + 2\cdot Ir\right) + \left(d - 2t_f - 2Ir\right)\left(t_w + 2\cdot Ir\right) - A_{member} = 97.5$

Weight of Ice on Member = $W_{ICE\_member} := Id\cdot\frac{Ai_{member}}{144} = 38$ plf **BLC 3**

Wind Perpendicular to Flange:

Member Aspect Ratio = $Ar_{member} := \frac{12L}{b_f} = 15.0$

Member Force Coefficient = $Ca_{member} = 1.67$ (per TIA/EIA-222-F Table 3)

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

Flange Projected Surface Area = $A_{member} := \frac{b_f}{12} = 1.333$ ft

Section 1 Flange Wind Force = $qz_1\cdot G_H\cdot Ca_{member}\cdot A_{member} = 49$ plf **BLC 7**

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

Flange Projected Surface Area w/ Ice = $AICE_{member} := \frac{\left(b_f + 2\cdot Ir\right)}{12} = 1.417$ ft

Section 1 Flange Wind Force w/ Ice = $qzICE_1\cdot G_H\cdot Ca_{member}\cdot AICE_{member} = 40$ plf **BLC 6**

Wind Perpendicular to Web

Member Aspect Ratio = $Ar_{member} := \frac{12L}{d} = 9.3$

Member Force Coefficient = $Ca_{member} = 1.48$ (per TIA/EIA-222-F Table 3)

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

Web Projected Surface Area = $A_{member} := \frac{d}{12} = 2.146$ ft

Section 1 Web Wind Force = $qz_1 \cdot G_H \cdot Ca_{member} \cdot A_{member} = 70$ plf **BLC 5**

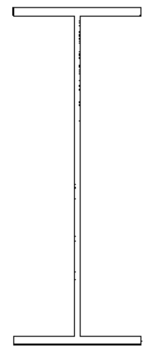
Wind Load (with ice) (per TIA/EIA-222-F-1996 Section 2.3.2)

Web Projected Surface Area w/ Ice = $AICE_{member} := \frac{(d + 2 \cdot Ir)}{12} = 2.229$ ft

Section 1 Web Wind Force w/ Ice = $qzICE_1 \cdot G_H \cdot Ca_{member} \cdot AICE_{member} = 55$ plf **BLC 4**

Development of Wind & Ice Load on W24x68 (per TIA/EIA-222-F-1996 Criteria)

W24x68 Data:



Shape = Flat

Depth = $d := 23.75$ in

Length = $L := 20$ ft

Flange Width = $b_f := 9$ in

Flange Thickness = $t_f := .585$ in

Web Thickness = $t_w := .415$ in

Member Cross Sectional Area = $A_{member} := 20.1$ in^2

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{member} := 2\left(t_f + 2\cdot Ir\right)\cdot\left(b_f + 2\cdot Ir\right) + \left(d - 2t_f - 2Ir\right)\left(t_w + 2\cdot Ir\right) - A_{member} = 42.1$

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

Wind Perpendicular to Flange:

Member Aspect Ratio = $Ar_{member} := \frac{12L}{b_f} = 26.7$

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

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

Flange Projected Surface Area = $A_{member} := \frac{b_f}{12} = 0.75$ ft

Section 2 Flange Wind Force = $qz_2\cdot G_H\cdot Ca_{member}\cdot A_{member} = 46$ plf **BLC 7**

Section 3 Flange Wind Force = $qz_3\cdot G_H\cdot Ca_{member}\cdot A_{member} = 53$ plf **BLC 7**

Section 4 Flange Wind Force = $qz_4\cdot G_H\cdot Ca_{member}\cdot A_{member} = 58$ plf **BLC 7**

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

Flange Projected Surface Area w/ Ice = $AICE_{member} := \frac{\left(b_f + 2\cdot Ir\right)}{12} = 0.833$ ft

Section 2 Flange Wind Force w/ Ice = $qzICE_2\cdot G_H\cdot Ca_{member}\cdot AICE_{member} = 38$ plf **BLC 6**

Section 3 Flange Wind Force w/ Ice = $qzICE_3\cdot G_H\cdot Ca_{member}\cdot AICE_{member} = 44$ plf **BLC 6**

Section 4 Flange Wind Force w/ Ice = $qzICE_4\cdot G_H\cdot Ca_{member}\cdot AICE_{member} = 49$ plf **BLC 6**

Wind Perpendicular to Web

Member Aspect Ratio = $Ar_{member} := \frac{12L}{d} = 10.1$

Member Force Coefficient = $Ca_{member} = 1.5$ (per TIA/EIA-222-F Table 3)

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

Web Projected Surface Area =	$A_{member} := \frac{d}{12} = 1.979$	ft	
Section 2 Web Wind Force =	$qz_2 \cdot G_H \cdot Ca_{member} \cdot A_{member} = 91$	plf	**BLC 5**
Section 3 Web Wind Force =	$qz_3 \cdot G_H \cdot Ca_{member} \cdot A_{member} = 105$	plf	**BLC 5**
Section 4 Web Wind Force =	$qz_4 \cdot G_H \cdot Ca_{member} \cdot A_{member} = 115$	plf	**BLC 5**

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

Web Projected Surface Area w/ Ice =	$AICE_{member} := \frac{(d + 2 \cdot Ir)}{12} = 2.063$	ft	
Section 2 Web Wind Force w/ Ice =	$qzICE_2 \cdot G_H \cdot Ca_{member} \cdot AICE_{member} = 71$	plf	**BLC 4**
Section 3 Web Wind Force w/ Ice =	$qzICE_3 \cdot G_H \cdot Ca_{member} \cdot AICE_{member} = 83$	plf	**BLC 4**
Section 4 Web Wind Force w/ Ice =	$qzICE_4 \cdot G_H \cdot Ca_{member} \cdot AICE_{member} = 91$	plf	**BLC 4**

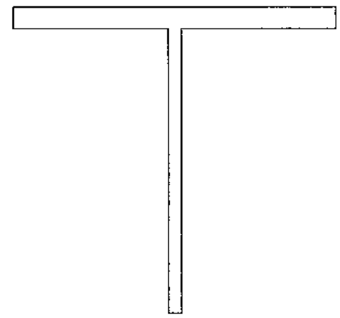
NATCOMM INC.
CONSULTING ENGINEERS

p: 203.488.0580 f: 203.488.8587 w: ncat-eng.com
63-2 N. Branford Rd., Branford, CT 06405

Subject:	Wind Loading on Structural Members
Location:	Cromwell, CT
Rev. 1: 4/30/09	Prepared by: T.J.L. Checked by: C.F.C. Job No. 09009-CO.7

Development of Wind & Ice Load on WT 6x15 (per TIA/EIA-222-F-1996 Criteria)

WT 6x15 Data:



Shape = Flat

Depth = $d := 6.17$ in

Length = $L := 10$ ft

Flange Width = $b_f := 6.52$ in

Flange Thickness = $t_f := 0.44$ in

Web Thickness = $t_w := 0.26$ in

Member Cross Sectional Area = $A_{member} := 4.4$ in^2

Member Aspect Ratio = $Ar_{member} := \frac{12L}{b_f} = 18.4$

Member Force Coefficient = $Ca_{member} = 1.78$ (per TIA/EIA-222-F Table 3)

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{member} := \left[\left(t_f + 2\cdot Ir\right)\cdot\left(b_f + 2\cdot Ir\right) + \left(d - t_f\right)\left(t_w + 2\cdot Ir\right) - A_{member}\right] = 13.6$

Weight of Ice on Member = $W_{ICE\_member} := Id\cdot\frac{Ai_{member}}{144} = 5$ plf **BLC 3**

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

Member Projected Surface Area = $A_{member} := \frac{b_f}{12} = 0.543$ ft

Total Member Wind Force = $qz_{Br}\cdot G_H\cdot Ca_{member}\cdot A_{member} = 32$ plf **BLC 5,7**

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

Member Projected Surface Area w/ Ice = $AICE_{member} := \frac{\left(b_f + 2\cdot Ir\right)}{12} = 0.627$ ft

Total Member Wind Force w/ Ice = $qzICE_{Br}\cdot G_H\cdot Ca_{member}\cdot AICE_{member} = 28$ plf **BLC 4,6**

Development of Wind & Ice Load on L5x5x5/16 (per TIA/EIA-222-F-1996 Criteria)

L5x5x5/16 Data:

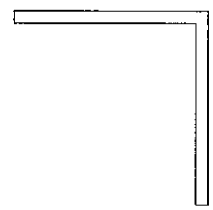
Shape = Flat

Length = $L := 32$ ft

Width = $b := 5$ in

Thickness = $t := 0.3125$ in

Member Cross Sectional Area = $A_{member} := 3.03$ in^2



Member Aspect Ratio = $Ar_{member} := \frac{12L}{b} = 76.8$

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

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{member} := (b - t)(t + 2 \cdot Ir) + (b + 2 \cdot Ir)(t + 2 \cdot Ir) - A_{member} = 11$

Weight of Ice on Member = $W_{ICE\_member} := Id \cdot \frac{Ai_{member}}{144} = 4$ plf **BLC 3**

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

Member Projected Surface Area = $A_{member} := \frac{b}{12} = 0.417$ ft

Total Member Wind Force = $qz_{Br} \cdot G_H \cdot Ca_{member} \cdot A_{member} = 28$ plf **BLC 7**

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

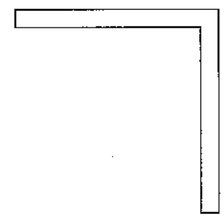
Member Projected Surface Area w/ Ice = $AICE_{member} := \frac{(b + 2 \cdot Ir)}{12} = 0.5$ ft

Total Member Wind Force w/ Ice = $qzICE_{Br} \cdot G_H \cdot Ca_{member} \cdot AICE_{member} = 25$ plf **BLC 6**

Development of Wind & Ice Load on L3.5x3.5x5/16 (per TIA/EIA-222-F-1996 Criteria)

L3.5x3.5x5/16 Data:

Shape = Flat



Length = $L := 20$ ft

Width = $b := 3.5$ in

Thickness = $t := 0.3125$ in

Member Cross Sectional Area = $A_{member} := 2.09$ in^2

Member Aspect Ratio = $Ar_{member} := \frac{12L}{b} = 68.6$

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

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{member} := [(b - t)(t + 2 \cdot Ir) + (b + 2 \cdot Ir)(t + 2 \cdot Ir)] - A_{member} = 8$

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

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

Member Projected Surface Area = $A_{member} := \frac{b}{12} = 0.292$ ft

Total Member Wind Force = $qz_{Br} \cdot G_H \cdot Ca_{member} \cdot A_{member} = 19$ plf **BLC 7**

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

Member Projected Surface Area w/ Ice = $AICE_{member} := \frac{(b + 2 \cdot Ir)}{12} = 0.375$ ft

Total Member Wind Force w/ Ice = $qzICE_{Br} \cdot G_H \cdot Ca_{member} \cdot AICE_{member} = 19$ plf **BLC 6**

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

Wind Speeds

Basic Wind Speed, V — $V := 85$ mph

Basic Wind Speed with Ice, V_i — $V_i := 74$ mph (per TIA/EIA-222-F Section 2.3.16)

Heights above ground level, z

Mast = $z_{mast} := 96.5$ ft

Verizon = $z_{vz} := 88$ ft

AT&T = $z_{att} := 98$ ft

T-Mobile = $z_{t\_mb} := 108$ ft

Pocket = $z_{pocket} := 77$ ft

Exposure Coefficients, kz

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

Mast = $Kz_{mast} := \left(\frac{z_{mast}}{33}\right)^{\frac{2}{7}} = 1.359$

Verizon = $Kz_{vz} := \left(\frac{z_{vz}}{33}\right)^{\frac{2}{7}} = 1.323$

AT&T = $Kz_{att} := \left(\frac{z_{att}}{33}\right)^{\frac{2}{7}} = 1.365$

T-Mobile = $Kz_{t\_mb} := \left(\frac{z_{t\_mb}}{33}\right)^{\frac{2}{7}} = 1.403$

Pocket = $Kz_{pocket} := \left(\frac{z_{pocket}}{33}\right)^{\frac{2}{7}} = 1.274$

Velocity Pressure without ice, qz

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

Mast = $qz_{mast} := 0.00256 \cdot Kz_{mast} \cdot V^2 = 25.132$

Verizon = $qz_{vz} := 0.00256 \cdot Kz_{vz} \cdot V^2 = 24.478$

AT&T = $qz_{att} := 0.00256 \cdot Kz_{att} \cdot V^2 = 25.243$

T-Mobile = $qz_{t\_mb} := 0.00256 \cdot Kz_{t\_mb} \cdot V^2 = 25.953$

Pocket = $qz_{pocket} := 0.00256 \cdot Kz_{pocket} \cdot V^2 = 23.562$

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

Mast = $qzICE_{mast} := 0.00256 \cdot Kz_{mast} \cdot V_i^2 = 19.048$

Verizon = $qzICE_{vz} := 0.00256 \cdot Kz_{vz} \cdot V_i^2 = 18.553$

AT&T = $qzICE_{att} := 0.00256 \cdot Kz_{att} \cdot V_i^2 = 19.132$

T-Mobile = $qzICE_{t\_mb} := 0.00256 \cdot Kz_{t\_mb} \cdot V_i^2 = 19.671$

Pocket = $qzICE_{pocket} := 0.00256 \cdot Kz_{pocket} \cdot V_i^2 = 17.858$

TIA/EIA Common Factors:

Gust Response Factor =	$G_H := 1.69$		(per TIA/EIA-222-F Section 2.3.4)
Gust Response Factor Multiplier =	$m := 1.25$		(per TIA/EIA-222-F Section 2.3.4.4)
Radial Ice Thickness =	$Ir := 0.50$	in	(per TIA/EIA-222-F Section 2.3.1)
Radial Ice Density =	$Id := 56.00$	pcf	

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

PCS Mast Data:

Mast Shape = Round

Mast Diameter = $D_{mast} := 18$ in (HSS18x0.5)

Mast Length = $L_{mast} := 111$ ft

Mast Thickness = $t_{mast} := .465$ in

Mast Aspect Ratio = $Ar_{mast} := \frac{12L_{mast}}{D_{mast}} = 74.0$

Mast Force Coefficient = $Ca_{mast} = 1.2$ (per TIA/EIA-222-F Table 3)

Velocity Coefficient = $C := \left(\sqrt{Kz_{mast}}\right)\cdot V\cdot\frac{D_{mast}}{12} = 148.622$

Structure Force Coefficient = $C_{Fmast} = 0.59$ (per TIA/EIA-222-F Table 1 for round pole)

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

Mast Projected Surface Area = $A_{mast} := \frac{D_{mast}}{12} = 1.5$ ft

Total Mast Wind Force = $qz_{mast}\cdot G_H\cdot C_{Fmast}\cdot Ca_{mast}\cdot A_{mast} = 45$ plf **BLC 5,7**

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

Mast Projected Surface Area w/ Ice = $AICE_{mast} := \frac{\left(D_{mast} + 2\cdot Ir\right)}{12} = 1.583$ ft

Total Mast Wind Force w/ Ice = $qzICE_{mast}\cdot G_H\cdot C_{Fmast}\cdot Ca_{mast}\cdot AICE_{mast} = 36$ plf **BLC 4,6**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

Ice Area per Linear Foot = $Ai_{mast} := \frac{\pi}{4}\left[\left(D_{mast} + Ir\cdot 2\right)^2 - D_{mast}^{\,2}\right] = 29.1$ sq in

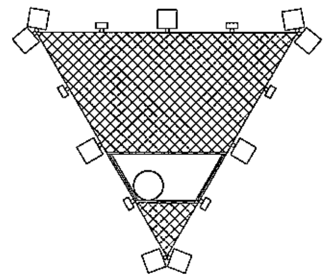
Weight of Ice on Mast = $W_{ICEmast} := Id\cdot\frac{Ai_{mast}}{144} = 11$ plf **BLC 3**

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

Antenna Data:

Antenna Model = Swedcom ALP 9212 (Verizon)

Antenna Shape = Flat



Antenna Height = $L_{ant} := 52.0$ in

Antenna Width = $W_{ant} := 11.4$ in

Antenna Thickness = $T_{ant} := 11.4$ in

Antenna Weight = $WT_{ant} := 26.7$ lbs

Number of Antennas = $N_{ant} := 9$

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.6$

Antenna Force Coefficient = $Ca_{ant} = 1.4$ (per TIA/EIA-222-F-1996 Table 3)

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

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.1$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 37.1$ sf

Total Antenna Wind Force = $F_{ant} := qz_{vz} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 2146$ lbs **BLC 5,7**

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

Assumes Maximum Possible Wind Pressure on Antennas

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

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 41.1$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qzICE_{vz} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 1803$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 240$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6758$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1391$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 45$ lbs

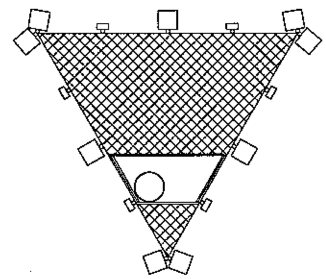
Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 406$ lbs **BLC 3**

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

Antenna Data:

Antenna Model = Decibel DB948F85T2E-M (Verizon)

Antenna Shape = Flat



Antenna Height = $L_{ant} := 48$ in

Antenna Width = $W_{ant} := 7$ in

Antenna Thickness = $T_{ant} := 3.5$ in

Antenna Weight = $WT_{ant} := 8.5$ lbs

Number of Antennas = $N_{ant} := 6$

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 6.9$

Antenna Force Coefficient = $Ca_{ant} = 1.4$ (per TIA/EIA-222-F-1996 Table 3)

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

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 2.3$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 14$ sf

Total Antenna Wind Force = $F_{ant} := qz_{vz} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 811$ lbs **BLC 5,7**

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

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 2.7$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 16.3$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qzICE_{vz} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 717$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 51$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1176$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 588$ cu in

Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 19$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 114$ lbs **BLC 3**

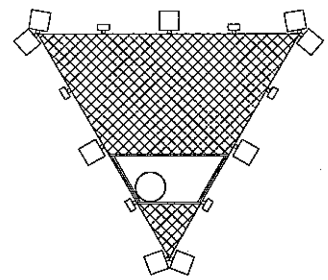
Development of Wind & Ice Load on Platform

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

Platform Data:

Platform Model = Valmount 13' Platform w/ Handrails (Verizon)

Platform Shape = Flat



(Force Coefficient Value Included in Area) Platform Area = $A_{plt} := 31.3$ sq ft

(Force Coefficient Value Included in Area) Platform Area w/ Ice = $A_{ICEplt} := 40.2$ sq ft

Platform Weight = $WT_{plt} := 1822$ lbs

Platform Weight w/ Ice = $WT_{ICEplt} := 2452$ lbs

Wind Load (without ice)

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

Total Platform Wind Force = $F_{plt} := qz_{vz} \cdot G_H \cdot A_{plt} = 1295$ lbs **BLC 5,7**

Wind Load (with ice)

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

Total Platform Wind Force w/ Ice = $Fi_{plt} := qzICE_{vz} \cdot G_H \cdot A_{ICEplt} = 1260$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of Platform = $WT_{plt} = 1822$ lbs **BLC 2**

Gravity Load (ice only)

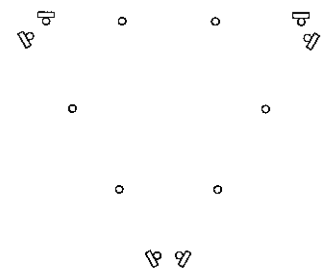
Weight of Ice on Platform = $WT_{ICEplt} - WT_{plt} = 630$ lbs **BLC 3**

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

Antenna Data:

Antenna Model = Powerwave 7770 (AT&T)

Antenna Shape = Flat



Antenna Height = $L_{ant} := 55$ in

Antenna Width = $W_{ant} := 11$ in

Antenna Thickness = $T_{ant} := 5$ in

Antenna Weight = $WT_{ant} := 35$ lbs

Number of Antennas = $N_{ant} := 6$

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 5.0$

Antenna Force Coefficient = $Ca_{ant} = 1.4$ (per TIA/EIA-222-F-1996 Table 3)

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

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.2$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 25.2$ sf

Total Antenna Wind Force = $F_{ant} := qz_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1506$ lbs **BLC 5,7**

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

Assumes Maximum Possible Wind Pressure on Antennas

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

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 28$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qzICE_{att} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 1267$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 210$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 3025$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 1007$ cu in

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

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 196$ lbs **BLC 3**

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

TMA Data:

TMA Model = Powerwave LGP214 (AT&T)

TMA Shape = Flat

TMA Height = $L_{TMA} := 14.4$ in

TMA Width = $W_{TMA} := 9.2$ in

TMA Thickness = $T_{TMA} := 2.6$ in

TMA Weight = $WT_{TMA} := 14.1$ lbs

Number of TMA's = $N_{TMA} := 6$

TMA Aspect Ratio = $Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1.6$

TMA Force Coefficient = $Ca_{TMA} = 1.4$ (per TIA/EIA-222-F Table 3)

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

Assumes Maximum Possible Wind Pressure on TMA's

Surface Area for One TMA = $SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.9$ sf

TMA Projected Surface Area = $A_{TMA} := SA_{TMA} \cdot N_{TMA} = 5.5$ sf

Total TMA Wind Force = $F_{TMA} := qz_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{TMA} = 330$ lbs **BLC 5,7**

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

Assumes Maximum Possible Wind Pressure on TMA's

Surface Area for One TMA w/ Ice = $SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 1.1$ sf

TMA Projected Surface Area w/ Ice = $A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 6.5$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA} := qzICE_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{ICETMA} = 296$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of All TMA's = $WT_{TMA} \cdot N_{TMA} = 85$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each TMA = $V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 344$ cu in

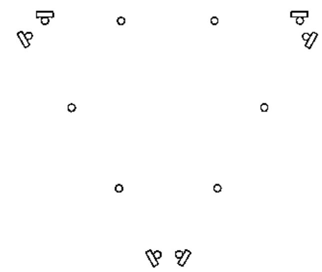
Volume of Ice on Each TMA = $V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 221$ cu in

Weight of Ice on Each TMA = $W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 7$ lbs

Weight of Ice on All TMA's $W_{ICETMA} \cdot N_{TMA} = 43$ lbs **BLC 3**

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

Mount Data:



Mount Type: 4" Φ Pipes (AT&T)

Mount Shape = Round

Pipe Mount Length = $L_{mnt} := 120$ in

4 inch Pipe Mount Linear Weight = $W_{mnt} := 10.8$ plf

Pipe Mount Outside Diameter = $D_{mnt} := 4.5$ in

Number of Mounting Pipes = $N_{mnt} := 12$

Mount Aspect Ratio = $Ar_{mnt} := \frac{L_{mnt}}{D_{mnt}} = 27$

Mount Force Factor = $Ca_{mnt} = 1.2$ (per TIA/EIA-222-F Table 3)

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

Surface Area for One Mount = $SA_{mnt} := \frac{D_{mnt} \cdot L_{mnt}}{144} = 3.75$ sf

Mount Projected Surface Area = $A_{mnt} := SA_{mnt} \cdot N_{mnt} = 45$ sf

Total Mount Wind Force = $F_{mnt} := qz_{att} \cdot G_H \cdot Ca_{mnt} \cdot A_{mnt} = 2304$ lbs **BLC 5,7**

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

Surface Area for One Mount w/ Ice = $SA_{ICEmnt} := \frac{(D_{mnt} + 2 \cdot Ir) \cdot L_{mnt}}{144} = 4.583$ sf

Mount Projected Surface Area w/ Ice = $A_{ICEmnt} := SA_{ICEmnt} \cdot N_{mnt} = 55$ sf

Total Mount Wind Force = $Fi_{mnt} := qzICE_{att} \cdot G_H \cdot Ca_{mnt} \cdot A_{ICEmnt} = 2134$ lbs **BLC 4,6**

Gravity Loads (without ice) (per TIA/EIA-222-F-1996)

Weight Each Pipe Mount = $WT_{mnt} := W_{mnt} \cdot \frac{L_{mnt}}{12} = 108$ lbs

Weight of All Mounts = $WT_{mnt} \cdot N_{mnt} = 1296$ lbs **BLC 2**

Gravity Loads (ice only) (per TIA/EIA-222-F-1996)

Volume of Each Pipe = $V_{mnt} := \frac{\pi}{4} \cdot D_{mnt}^{2} \cdot L_{mnt} = 1909$ cu in

Volume of Ice on Each Pipe = $V_{ice} := \left[\frac{\pi}{4} \cdot \left[(D_{mnt} + 1)^2\right] \cdot (L_{mnt} + 1)\right] - V_{mnt} = 966$ cu in

Weight of Ice each mount (incl, hardware) = $W_{ICEmnt} := \frac{V_{ice}}{1728} \cdot Id = 31$ lbs

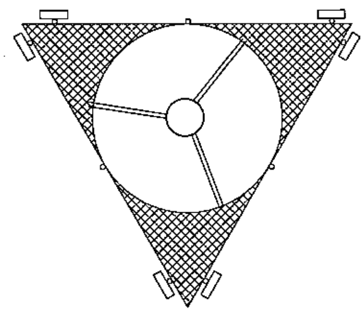
Weight of Ice on All Mounts = $W_{ICEmnt} \cdot N_{mnt} + 5 = 381$ lbs **BLC 3**

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

Antenna Data:

Antenna Model = RFS APX16DWV-16DWVS-E-A20 (T-Mobile)

Antenna Shape = Flat



Antenna Height = $L_{ant} := 55.9$ in

Antenna Width = $W_{ant} := 13$ in

Antenna Thickness = $T_{ant} := 3.15$ in

Antenna Weight = $WT_{ant} := 40.7$ lbs

Number of Antennas = $N_{ant} := 6$

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$

Antenna Force Coefficient = $Ca_{ant} = 1.4$ (per TIA/EIA-222-F-1996 Table 3)

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

Assumes Maximum Possible Wind Pressure on Antennas

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

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 30.3$ sf

Total Antenna Wind Force = $F_{ant} := qz_{t\_mb} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 1859$ lbs **BLC 5,7**

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

Assumes Maximum Possible Wind Pressure on Antennas

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

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 33.2$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qzICE_{t\_mb} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 1545$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 244$ lbs **BLC 2**

Gravity Load (ice only)

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

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

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

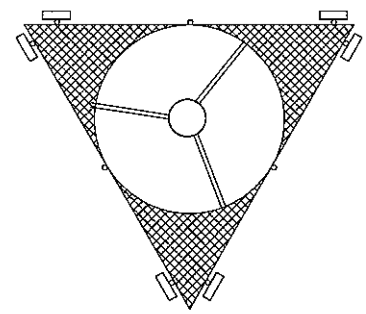
Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 198$ lbs **BLC 3**

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

TMA Data:

TMA Model = Andrew OneBase PCS Twin Dual Duplex TMA (T-Mobile)

TMA Shape = Flat



TMA Height = $L_{TMA} := 10.2$ in

TMA Width = $W_{TMA} := 6.7$ in

TMA Thickness = $T_{TMA} := 3.7$ in

TMA Weight = $WT_{TMA} := 14.6$ lbs

Number of TMA's = $N_{TMA} := 9$

TMA Aspect Ratio = $Ar_{TMA} := \frac{L_{TMA}}{W_{TMA}} = 1.5$

TMA Force Coefficient = $Ca_{TMA} = 1.4$ (per TIA/EIA-222-F Table 3)

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

Assumes Maximum Possible Wind Pressure on TMA's

Surface Area for One TMA = $SA_{TMA} := \frac{L_{TMA} \cdot W_{TMA}}{144} = 0.5$ sf

TMA Projected Surface Area = $A_{TMA} := SA_{TMA} \cdot N_{TMA} = 4.3$ sf

Total TMA Wind Force = $F_{TMA} := qz_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{TMA} = 255$ lbs **BLC 5,7**

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

Assumes Maximum Possible Wind Pressure on TMA's

Surface Area for One TMA w/ Ice = $SA_{ICETMA} := \frac{(L_{TMA} + 1) \cdot (W_{TMA} + 1)}{144} = 0.6$ sf

TMA Projected Surface Area w/ Ice = $A_{ICETMA} := SA_{ICETMA} \cdot N_{TMA} = 5.4$ sf

Total TMA Wind Force w/ Ice = $Fi_{TMA} := qzICE_{att} \cdot G_H \cdot Ca_{TMA} \cdot A_{ICETMA} = 244$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of All TMA's = $WT_{TMA} \cdot N_{TMA} = 131$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each TMA = $V_{TMA} := L_{TMA} \cdot W_{TMA} \cdot T_{TMA} = 253$ cu in

Volume of Ice on Each TMA = $V_{ice} := (L_{TMA} + 1)(W_{TMA} + 1)(T_{TMA} + 1) - V_{TMA} = 152$ cu in

Weight of Ice on Each TMA = $W_{ICETMA} := \frac{V_{ice}}{1728} \cdot Id = 5$ lbs

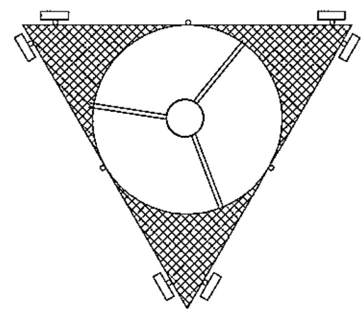
Weight of Ice on All TMA's $W_{ICETMA} \cdot N_{TMA} = 44$ lbs **BLC 3**

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

Platform Data:

Platform Model = Valmount 13' Low Profile Platform (T-Mobile)

Platform Shape = Flat



(Force Coefficient Value Included in Area) Platform Area = $A_{plt} := 15.7$ sq ft

(Force Coefficient Value Included in Area) Platform Area w/ Ice = $A_{ICEplt} := 20.1$ sq ft

Platform Weight = $WT_{plt} := 1300$ lbs

Platform Weight w/ Ice = $WT_{ICEplt} := 1765$ lbs

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

Total Platform Wind Force = $F_{plt} := qz_{t\_mb} \cdot G_H \cdot A_{plt} = 689$ lbs **BLC 5,7**

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

Total Platform Wind Force w/ Ice = $Fi_{plt} := qzICE_{t\_mb} \cdot G_H \cdot A_{ICEplt} = 668$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of Platform = $WT_{plt} = 1300$ lbs **BLC 2**

Gravity Load (ice only)

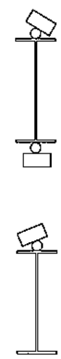
Weight of Ice on Platform = $WT_{ICEplt} - WT_{plt} = 465$ lbs **BLC 3**

Development of Wind & Ice Load on Antennas

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

Antenna Data:

Antenna Model = RFS APXV18-206517-S-C (Pocket)



Antenna Shape = **Flat**

Antenna Height = $L_{ant} := 72.0$ in

Antenna Width = $W_{ant} := 6.8$ in

Antenna Thickness = $T_{ant} := 3.15$ in

Antenna Weight = $WT_{ant} := 32.5$ lbs

Number of Antennas = $N_{ant} := 3$

Antenna Aspect Ratio = $Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 10.6$

Antenna Force Coefficient = $Ca_{ant} = 1.52$ (per TIA/EIA-222-F-1996 Table 3)

Wind Load (without ice)

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

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna = $SA_{ant} := \frac{L_{ant} \cdot W_{ant}}{144} = 3.4$ sf

Antenna Projected Surface Area = $A_{ant} := SA_{ant} \cdot N_{ant} = 10.2$ sf

Total Antenna Wind Force = $F_{ant} := qz_{pocket} \cdot G_H \cdot Ca_{ant} \cdot A_{ant} = 617$ lbs **BLC 5,7**

Wind Load (with ice)

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

Assumes Maximum Possible Wind Pressure on Antennas

Surface Area for One Antenna w/ Ice = $SA_{ICEant} := \frac{(L_{ant} + 1) \cdot (W_{ant} + 1)}{144} = 4$ sf

Antenna Projected Surface Area w/ Ice = $A_{ICEant} := SA_{ICEant} \cdot N_{ant} = 11.9$ sf

Total Antenna Wind Force w/ Ice = $Fi_{ant} := qzICE_{pocket} \cdot G_H \cdot Ca_{ant} \cdot A_{ICEant} = 544$ lbs **BLC 4,6**

Gravity Load (without ice)

Weight of All Antennas = $WT_{ant} \cdot N_{ant} = 98$ lbs **BLC 2**

Gravity Load (ice only)

Volume of Each Antenna = $V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 1542$ cu in

Volume of Ice on Each Antenna = $V_{ice} := (L_{ant} + 1)(W_{ant} + 1) \cdot (T_{ant} + 1) - V_{ant} = 821$ cu in

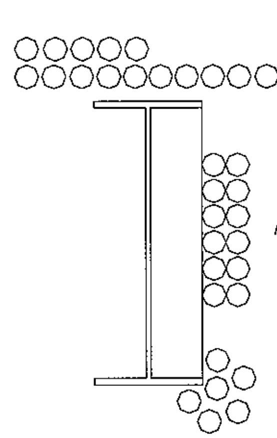
Weight of Ice on Each Antenna = $W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 27$ lbs

Weight of Ice on All Antennas = $W_{ICEant} \cdot N_{ant} = 80$ lbs **BLC 3**

NATCOMM INC.
CONSULTING ENGINEERS
p:203.488.0580 f:203.488.2587 w:eat-eng.com
63-2 N. Branford Rd., Branford, CT 06405

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

Coax Cable Data:



Coax Type: Use HELIAX 1-5/8"

Shape: Round

Coax Outside Diameter = $D_{coax} := 1.98$ in

Coax Cable Length = $L_{coax} := 110$ ft

Weight of Coax per foot = $WT_{coax} := 1.04$ plf

Total Number of Coax = $N_{coax} := 33$

Number of Projected Coax = $NP_{coax} := 4$

Coax aspect ratio = $Ar_{coax} := L_{coax} \cdot \frac{12}{D_{coax}} = 667$

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

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

Surface Area for One Coax = $SA_{coax} := \frac{(2D_{coax})}{12} = 0.33$ ft

Coax Projected Surface Area = $A_{coax} := SA_{coax} \cdot NP_{coax} = 1.32$ ft

Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{mast} \cdot G_H \cdot A_{coax} = 67$ plf **BLC 5,7**

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

Surface Area for One Coax w/ Ice = $SA_{ICEcoax} := \frac{(2D_{coax} + 2 \cdot Ir)}{12} = 0.41$ ft

Coax Projected Surface Area w/ Ice = $A_{ICEcoax} := SA_{ICEcoax} \cdot NP_{coax} = 1.653$ ft

Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qzICE_{mast} \cdot G_H \cdot A_{ICEcoax} = 64$ plf **BLC 4,6**

Gravity Loads (without ice)

Weight of all cables w/o ice = $WT_{coax} \cdot N_{coax} = 34$ plf **BLC 2**

Gravity Loads (ice only)

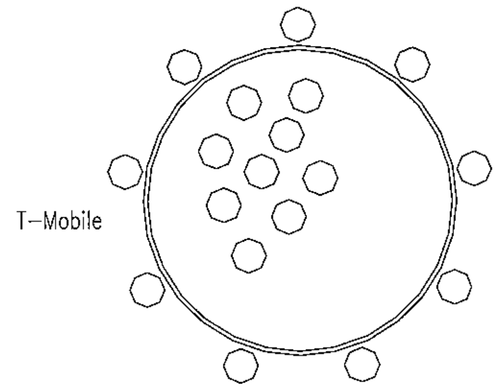
Ice Area per Linear Foot = $Ai_{coax} := \frac{\pi}{4}\left[(D_{coax} + 2 \cdot Ir)^2 - D_{coax}^{\ 2}\right] = 3.9$ si

Ice Weight per Linear Foot = $WTi_{coax} := Id \cdot \frac{Ai_{coax}}{144} = 2$ plf

Ice Weight All Coax per foot = $WTi_{coax} \cdot N_{coax} = 50$ plf **BLC 3**

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

Coax Cable Data:



Coax Type: Use HELIAX 1-5/8"

Shape: Round

Coax Outside Diameter = $D_{coax} := 1.98$ in

Coax Cable Length = $L_{coax} := 110$ ft

Weight of Coax per foot = $WT_{coax} := 1.04$ plf

Total Number of Coax = $N_{coax} := 18$

Number of Projected Coax = $NP_{coax} := 2$

Coax aspect ratio = $Ar_{coax} := L_{coax} \cdot \frac{12}{D_{coax}} = 667$

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

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

Surface Area for One Coax = $SA_{coax} := \frac{(2D_{coax})}{12} = 0.33$ ft

Coax Projected Surface Area = $A_{coax} := SA_{coax} \cdot NP_{coax} = 0.66$ ft

Coax Wind Force = $F_{coax} := Ca_{coax} \cdot qz_{mast} \cdot G_H \cdot A_{coax} = 34$ plf **BLC 5,7**

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

Surface Area for One Coax w/ Ice = $SA_{ICEcoax} := \frac{(2D_{coax} + 2 \cdot Ir)}{12} = 0.41$ ft

Coax Projected Surface Area w/ Ice = $A_{ICEcoax} := SA_{ICEcoax} \cdot NP_{coax} = 0.827$ ft

Coax Wind Force w/ Ice = $Fi_{coax} := Ca_{coax} \cdot qzICE_{mast} \cdot G_H \cdot A_{ICEcoax} = 32$ plf **BLC 4,6**

Gravity Loads (without ice)

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

Gravity Loads (ice only)

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

Ice Weight per Linear Foot = $WTi_{coax} := Id \cdot \frac{Ai_{coax}}{144} = 2$ plf

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

Global

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation	Yes
Include Warping	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Vertical Axis	Y

Hot Rolled Steel Code	AISC: ASD 9th
Cold Formed Steel Code	AISI 99: ASD
Wood Code	NDS 91/97: ASD
Wood Temperature	< 100F
Concrete Code	ACI 2002

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

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/ft^3]	Yield[ksi]
1	A36 Gr.36	29000	11154	.3	.65	.49	36
2	A572 Gr.50	29000	11154	.3	.65	.49	50
3	A992	29000	11154	.3	.65	.49	50
4	A500 Gr.42	29000	11154	.3	.65	.49	42
5	A500 Gr.46	29000	11154	.3	.65	.49	46

Hot Rolled Steel Design Parameters

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	Kyy	Kzz	Cm-yy	Cm-...	Cb	y sw...	z sw...	Function
1	CROSS...	L5x5x5/...	15.207	Segment	Segment										Lateral
2	CROSS...	L5x5x5/...	15.207	Segment	Segment										Lateral
3	CROSS...	L5x5x5/...	15.207	Segment	Segment										Lateral
4	CROSS...	L5x5x5/...	15.207	Segment	Segment										Lateral
5	CROSS...	L3.5x3.5...	18.916	Segment	Segment										Lateral
6	CROSS...	L3.5x3.5...	18.916	Segment	Segment										Lateral
7	CROSS...	L5x5x5/...	33.126												Lateral
8	CROSS...	L5x5x5/...	33.126												Lateral
9	HORZ1	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
10	HORZ2	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
11	HORZ3	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
12	HORZ4	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
13	HORZ5	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
14	HORZ6	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
15	HORZ7	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
16	HORZ8	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
17	HORZ9	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
18	HORZ10	L5x5x5/...	13.509	Segment	Segment	12	20								Lateral
19	HORZ11	Tube8x...	13.5	1	1	1	1								Lateral
20	LEG1	W24x68	60	Segment	Segment	20	12								Lateral
21	LEG2	W24x68	60	Segment	Segment	20	12								Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Lengt...	Lbyy[ft]	Lbzz[ft]	Lcomp top[ft]	Lcomp bot[ft]	Kyy	Kzz	Cm-yy	Cm-...	Cb	y sw...	z sw...	Function
22	LEG_W...	W24x68...	20.5	Segment	Segment	20.5	10.5								Lateral
23	LEG_W...	W24x68...	20.5	Segment	Segment	20.5	10.5								Lateral
24	WT1	WT6x15	10.091												Lateral
25	WT2	WT6x15	10.091												Lateral
26	WT3	WT6x15	10.091												Lateral
27	WT4	WT6x15	10.091												Lateral
28	WT5	WT6x15	10.091												Lateral
29	WT6	WT6x15	10.091												Lateral
30	WT7	WT6x15	10.091												Lateral
31	WT8	WT6x15	10.091												Lateral
32	WT9	WT6x15	10.091												Lateral
33	WT10	WT6x15	10.091												Lateral
34	WT11	WT6x15	10.091												Lateral
35	WT12	WT6x15	10.091												Lateral
36	WT13	WT6x15	10.091												Lateral
37	WT14	WT6x15	10.091												Lateral
38	WT15	WT6x15	10.091												Lateral
39	WT16	WT6x15	10.091												Lateral
40	WT17	WT6x15	10.091												Lateral
41	WT18	WT6x15	10.091												Lateral
42	WT19	WT6x15	10.091												Lateral
43	WT20	WT6x15	10.091												Lateral
44	Mast1	HSS18x...	29	Segment	Segment										Lateral
45	Mast2	HSS18x...	27.5	Segment	Segment										Lateral
46	Mast3	HSS18x...	27.5	Segment	Segment										Lateral
47	Mast4	HSS18x...	27	Segment	Segment										Lateral
48	Horz 12	Tube8x...	13.5	1	1	1	1								Lateral

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	W24x68	W24X68	Column	Wide Flange	A992	Typical	20.1	70.4	1830	1.87
2	L5x5x5/16	L5X5X5	Beam	Wide Flange	A36 Gr.36	Typical	3.03	7.42	7.42	.108
3	L3.5x3.5x5/16	L3.5X3.5X5	Beam	Wide Flange	A36 Gr.36	Typical	2.09	2.45	2.45	.073
4	Tube8x4x5/16	TU8X4X5	Beam	Wide Flange	A500 Gr.46	Typical	6.86	18.1	53.9	45.2
5	HSS18x0.5	HSS18X0.5	Column	Pipe	A500 Gr.42	Typical	25.6	985	985	1970
6	WT6x15	WT6X15	Beam	W_Tee	A572 Gr.50	Typical	4.4	10.2	13.5	.228
7	W24x68 w/ pl	new	Column	Wide Flange	A992	Typical	52.1	753.067	6733.167	10

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotat...	Section/Shape	Type	Design List	Material	Design Rules
1	CROSSDI...	5	10			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
2	CROSSDI...	9	6			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
3	CROSSDI...	9	12			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
4	CROSSDI...	11	10			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
5	CROSSDI...	13	18			L3.5x3.5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
6	CROSSDI...	17	14			L3.5x3.5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
7	CROSSDI...	19	TOPLEG2			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
8	CROSSDI...	TOPLEG1	20			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
9	HORZ1	3	6			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
10	HORZ2	5	4			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
11	HORZ3	11	14			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
12	HORZ4	13	12			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
13	HORZ5	17	20			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
14	HORZ6	19	18			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
15	HORZ7	23	26			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotat...	Section/Shape	Type	Design List	Material	Design Rules
16	HORZ8	25	24			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
17	HORZ9	29	32			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
18	HORZ10	31	30			L5x5x5/16	Beam	Wide Fla...	A36 Gr.36	Typical
19	HORZ11	TOPLEG1	TOPLEG2			Tube8x4x5/16	Beam	Wide Fla...	A500 Gr...	Typical
20	LEG1	TOPPLT1	TOPLEG1		90	W24x68	Column	Wide Fla...	A992	Typical
21	LEG2	TOPPLT2	TOPLEG2		90	W24x68	Column	Wide Fla...	A992	Typical
22	LEG_W_P...	BOTLEG1	TOPPLT1		90	W24x68 w/ pl	Column	Wide Fla...	A992	Typical
23	LEG_W_P...	BOTLEG2	TOPPLT2		90	W24x68 w/ pl	Column	Wide Fla...	A992	Typical
24	WT1	1	MC1		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
25	WT2	MC1	2		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
26	WT3	MC1	7		90	WT6x15	Beam	W_Tee	A572 Gr...	Typical
27	WT4	MC1	8		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
28	WT5	MC2	7		90	WT6x15	Beam	W_Tee	A572 Gr...	Typical
29	WT6	MC2	8		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
30	WT7	MC2	15		90	WT6x15	Beam	W_Tee	A572 Gr...	Typical
31	WT8	MC2	16		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
32	WT9	16	MC3		90	WT6x15	Beam	W_Tee	A572 Gr...	Typical
33	WT10	15	MC3		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
34	WT11	21	MC3		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
35	WT12	MC3	22		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
36	WT13	21	MC4		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
37	WT14	22	MC4		90	WT6x15	Beam	W_Tee	A572 Gr...	Typical
38	WT15	MC4	27		90	WT6x15	Beam	W_Tee	A572 Gr...	Typical
39	WT16	MC4	28		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
40	WT17	MC5	27		90	WT6x15	Beam	W_Tee	A572 Gr...	Typical
41	WT18	MC5	28		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
42	WT19	MC5	33		90	WT6x15	Beam	W_Tee	A572 Gr...	Typical
43	WT20	MC5	34		270	WT6x15	Beam	W_Tee	A572 Gr...	Typical
44	Mast1	BOTMAST	FC1			HSS18x0.5	Column	Pipe	A500 Gr...	Typical
45	Mast2	FC1	FC2			HSS18x0.5	Column	Pipe	A500 Gr...	Typical
46	Mast3	FC2	FC3			HSS18x0.5	Column	Pipe	A500 Gr...	Typical
47	Mast4	FC3	TOPMAST			HSS18x0.5	Column	Pipe	A500 Gr...	Typical
48	Horz 12	TOPLEG1	TOPLEG2			Tube8x4x5/16	Beam	Wide Fla...	A500 Gr...	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
1	1	0	12	0	0	
2	2	13.5	12	0	0	
3	3	0	23	0	0	
4	4	13.5	23	0	0	
5	5	0	23.5	0	0	
6	6	13.5	23.5	0	0	
7	7	0	25.75	0	0	
8	8	13.5	25.75	0	0	
9	9	0	30.5	0	0	
10	10	13.5	30.5	0	0	
11	11	0	37.5	0	0	
12	12	13.5	37.5	0	0	
13	13	0	38	0	0	
14	14	13.5	38	0	0	
15	15	0	39.5	0	0	
16	16	13.5	39.5	0	0	
17	17	0	51.25	0	0	
18	18	13.5	51.25	0	0	
19	19	0	51.75	0	0	
20	20	13.5	51.75	0	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Dia...
21	21	0	53.25	0	0	
22	22	13.5	53.25	0	0	
23	23	0	55.25	0	0	
24	24	13.5	55.25	0	0	
25	25	0	55.75	0	0	
26	26	13.5	55.75	0	0	
27	27	0	67	0	0	
28	28	13.5	67	0	0	
29	29	0	75.5	0	0	
30	30	13.5	75.5	0	0	
31	31	0	76	0	0	
32	32	13.5	76	0	0	
33	33	0	80.75	0	0	
34	34	13.5	80.75	0	0	
35	35	6.75	23.25	0	0	
36	36	6.75	27	0	0	
37	37	6.75	34	0	0	
38	38	6.75	37.75	0	0	
39	39	6.75	44.625	0	0	
40	40	6.75	51.5	0	0	
41	41	6.75	55.5	0	0	
42	43	6.75	75.75	0	0	
43	BOTLEG1	0	1.5	0	0	
44	BOTLEG2	13.5	1.5	0	0	
45	BOTMAST	6.75	0	3	0	
46	MC1	6.75	18.875	3	0	
47	MC2	6.75	32.625	3	0	
48	MC3	6.75	46.375	3	0	
49	MC4	6.75	60.125	3	0	
50	MC5	6.75	73.875	3	0	
51	TOPLEG1	0	82	0	0	
52	TOPLEG2	13.5	82	0	0	
53	TOPMAST	6.75	111	3	0	
54	TOPPLT1	0	22	0	0	
55	TOPPLT2	13.5	22	0	0	
56	T_MOBILE	6.75	108	3	0	
57	POCKET	0	77	0	0	
58	POCKET2	13.5	77	0	0	
59	FC1	6.75	29	3	0	
60	FC2	6.75	56.5	3	0	
61	FC3	6.75	84	3	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]	Footing
1	BOTLEG1	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
2	BOTMAST	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
3	BOTLEG2	Reaction	Reaction	Reaction	Reaction	Reaction	Reaction	
4	TOPLEG1							
5	TOPLEG2							
6	FC3							
7	FC2							
8	FC1							

Joint Loads and Enforced Displacements (BLC 2 : Weight of Equipment)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*ft...
1	TOPLEG1	L	Y	-.12
2	TOPLEG2	L	Y	-.12
3	TOPLEG1	L	Y	-.026
4	TOPLEG2	L	Y	-.026
5	TOPLEG1	L	Y	-.911
6	TOPLEG2	L	Y	-.911
7	TOPLEG1	L	Y	-.105
8	TOPLEG2	L	Y	-.105
9	TOPLEG1	L	Y	-.043
10	TOPLEG2	L	Y	-.043
11	TOPLEG1	L	Y	-.648
12	TOPLEG2	L	Y	-.648
13	T_MOBILE	L	Y	-.244
14	T_MOBILE	L	Y	-.131
15	T_MOBILE	L	Y	-1.3
16	POCKET	L	Y	-.033
17	POCKET2	L	Y	-.066

Joint Loads and Enforced Displacements (BLC 3 : Weight of Ice)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*ft...
1	TOPLEG1	L	Y	-.203
2	TOPLEG2	L	Y	-.203
3	TOPLEG1	L	Y	-.057
4	TOPLEG2	L	Y	-.057
5	TOPLEG1	L	Y	-.315
6	TOPLEG2	L	Y	-.315
7	TOPLEG1	L	Y	-.098
8	TOPLEG2	L	Y	-.098
9	TOPLEG1	L	Y	-.022
10	TOPLEG2	L	Y	-.022
11	TOPLEG1	L	Y	-.192
12	TOPLEG2	L	Y	-.192
13	T_MOBILE	L	Y	-.198
14	T_MOBILE	L	Y	-.044
15	T_MOBILE	L	Y	-.465
16	POCKET	L	Y	-.027
17	POCKET2	L	Y	-.054

Joint Loads and Enforced Displacements (BLC 4 : TIA/EIA Wind with Ice (+X))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*ft...
1	TOPLEG1	L	X	.902
2	TOPLEG2	L	X	.902
3	TOPLEG1	L	X	.359
4	TOPLEG2	L	X	.359
5	TOPLEG1	L	X	.63
6	TOPLEG2	L	X	.63
7	TOPLEG1	L	X	.634
8	TOPLEG2	L	X	.634
9	TOPLEG1	L	X	.148
10	TOPLEG2	L	X	.148
11	TOPLEG1	L	X	1.067
12	TOPLEG2	L	X	1.067
13	T_MOBILE	L	X	1.545
14	T_MOBILE	L	X	.244
15	T_MOBILE	L	X	.668
16	POCKET	L	X	.182

Joint Loads and Enforced Displacements (BLC 4 : TIA/EIA Wind with Ice (+X)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*ft...
17	POCKET2	L	X	.363
18	TOPLEG1	L	Y	6.062
19	TOPLEG2	L	Y	-6.062

Joint Loads and Enforced Displacements (BLC 5 : TIA/EIA Wind (+X))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*ft...
1	TOPLEG1	L	X	1.073
2	TOPLEG2	L	X	1.073
3	TOPLEG1	L	X	.406
4	TOPLEG2	L	X	.406
5	TOPLEG1	L	X	.648
6	TOPLEG2	L	X	.648
7	TOPLEG1	L	X	.753
8	TOPLEG2	L	X	.753
9	TOPLEG1	L	X	.165
10	TOPLEG2	L	X	.165
11	TOPLEG1	L	X	1.152
12	TOPLEG2	L	X	1.152
13	T_MOBILE	L	X	1.859
14	T_MOBILE	L	X	.255
15	T_MOBILE	L	X	.689
16	POCKET	L	X	.206
17	POCKET2	L	X	.412
18	TOPLEG2	L	Y	-6.797
19	TOPLEG1	L	Y	6.797

Joint Loads and Enforced Displacements (BLC 6 : TIA/EIA Wind with Ice(+Z))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*ft...
1	TOPLEG1	L	Mx	40.916
2	TOPLEG2	L	Mx	40.916
3	TOPLEG1	L	Z	.902
4	TOPLEG2	L	Z	.902
5	TOPLEG1	L	Z	.359
6	TOPLEG2	L	Z	.359
7	TOPLEG1	L	Z	.63
8	TOPLEG2	L	Z	.63
9	TOPLEG1	L	Z	.634
10	TOPLEG2	L	Z	.634
11	TOPLEG1	L	Z	.148
12	TOPLEG2	L	Z	.148
13	TOPLEG1	L	Z	1.067
14	TOPLEG2	L	Z	1.067
15	T_MOBILE	L	Z	1.545
16	T_MOBILE	L	Z	.244
17	T_MOBILE	L	Z	.668
18	POCKET	L	Z	.182
19	POCKET2	L	Z	.363

Joint Loads and Enforced Displacements (BLC 7 : TIA/EIA Wind (+Z))

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*ft...
1	TOPLEG1	L	Mx	45.876
2	TOPLEG2	L	Mx	45.876
3	TOPLEG1	L	Z	1.073
4	TOPLEG2	L	Z	1.073
5	TOPLEG1	L	Z	.406
6	TOPLEG2	L	Z	.406

Joint Loads and Enforced Displacements (BLC 7 : TIA/EIA Wind (+Z)) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*ft...
7	TOPLEG1	L	Z	.648
8	TOPLEG2	L	Z	.648
9	TOPLEG1	L	Z	.753
10	TOPLEG2	L	Z	.753
11	TOPLEG1	L	Z	.165
12	TOPLEG2	L	Z	.165
13	TOPLEG1	L	Z	1.152
14	TOPLEG2	L	Z	1.152
15	T_MOBILE	L	Z	1.859
16	T_MOBILE	L	Z	.255
17	T_MOBILE	L	Z	.689
18	POCKET	L	Z	.206
19	POCKET2	L	Z	.412

Member Distributed Loads (BLC 2 : Weight of Equipment)

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitude[k/ft,...	Start Location[ft,%]	End Location[ft,%]
1	LEG2	Y	-.034	-.034	0	0
2	Mast1	Y	-.019	-.019	0	0
3	Mast2	Y	-.019	-.019	0	0
4	Mast3	Y	-.019	-.019	0	0
5	Mast4	Y	-.019	-.019	0	0

Member Distributed Loads (BLC 3 : Weight of Ice)

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitude[k/ft,...	Start Location[ft,%]	End Location[ft,%]
1	CROSSDIAG1	Y	-.004	-.004	0	0
2	CROSSDIAG2	Y	-.004	-.004	0	0
3	CROSSDIAG3	Y	-.004	-.004	0	0
4	CROSSDIAG4	Y	-.004	-.004	0	0
5	CROSSDIAG5	Y	-.003	-.003	0	0
6	CROSSDIAG6	Y	-.003	-.003	0	0
7	CROSSDIAG7	Y	-.004	-.004	0	0
8	CROSSDIAG8	Y	-.004	-.004	0	0
9	HORZ1	Y	-.004	-.004	0	0
10	HORZ2	Y	-.004	-.004	0	0
11	HORZ3	Y	-.004	-.004	0	0
12	HORZ4	Y	-.004	-.004	0	0
13	HORZ5	Y	-.004	-.004	0	0
14	HORZ6	Y	-.004	-.004	0	0
15	HORZ7	Y	-.004	-.004	0	0
16	HORZ8	Y	-.004	-.004	0	0
17	HORZ9	Y	-.004	-.004	0	0
18	HORZ10	Y	-.004	-.004	0	0
19	HORZ11	Y	-.004	-.004	0	0
20	LEG1	Y	-.016	-.016	0	0
21	LEG2	Y	-.016	-.016	0	0
22	LEG2	Y	-.05	-.05	0	0
23	LEG_W_PLT1	Y	-.038	-.038	0	0
24	LEG_W_PLT2	Y	-.038	-.038	0	0
25	Mast4	Y	-.011	-.011	0	0
26	Mast1	Y	-.011	-.011	0	0
27	Mast2	Y	-.011	-.011	0	0
28	Mast3	Y	-.011	-.011	0	0
29	WT1	Y	-.005	-.005	0	0
30	WT2	Y	-.005	-.005	0	0
31	WT3	Y	-.005	-.005	0	0
32	WT4	Y	-.005	-.005	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitude[k/ft,...	Start Location[ft,%]	End Location[ft,%]
33	WT5	Y	-.005	-.005	0	0
34	WT6	Y	-.005	-.005	0	0
35	WT7	Y	-.005	-.005	0	0
36	WT8	Y	-.005	-.005	0	0
37	WT9	Y	-.005	-.005	0	0
38	WT10	Y	-.005	-.005	0	0
39	WT11	Y	-.005	-.005	0	0
40	WT12	Y	-.005	-.005	0	0
41	WT13	Y	-.005	-.005	0	0
42	WT14	Y	-.005	-.005	0	0
43	WT15	Y	-.005	-.005	0	0
44	WT16	Y	-.005	-.005	0	0
45	WT17	Y	-.005	-.005	0	0
46	WT18	Y	-.005	-.005	0	0
47	WT19	Y	-.005	-.005	0	0
48	WT20	Y	-.005	-.005	0	0
49	Mast1	Y	-.027	-.027	0	0
50	Mast2	Y	-.027	-.027	0	0
51	Mast3	Y	-.027	-.027	0	0
52	Mast4	Y	-.027	-.027	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitude[k/ft,...	Start Location[ft,%]	End Location[ft,%]
1	LEG1	X	.071	.071	0	20
2	LEG1	X	.083	.083	20	40
3	LEG1	X	.091	.091	40	60
4	LEG2	X	.064	.064	0	0
5	LEG_W_PLT1	X	.055	.055	0	0
6	Mast1	X	0	.009	0	0
7	Mast1	X	.032	.032	0	0
8	Mast2	X	.009	.018	0	0
9	Mast2	X	.032	.032	0	0
10	Mast3	X	.018	.027	0	0
11	Mast3	X	.032	.032	0	0
12	Mast4	X	.027	.036	0	0
13	Mast4	X	.032	.032	0	0
14	WT1	X	.028	.028	0	0
15	WT2	X	.028	.028	0	0
16	WT3	X	.028	.028	0	0
17	WT4	X	.028	.028	0	0
18	WT5	X	.028	.028	0	0
19	WT6	X	.028	.028	0	0
20	WT7	X	.028	.028	0	0
21	WT8	X	.028	.028	0	0
22	WT9	X	.028	.028	0	0
23	WT10	X	.028	.028	0	0
24	WT11	X	.028	.028	0	0
25	WT12	X	.028	.028	0	0
26	WT13	X	.028	.028	0	0
27	WT14	X	.028	.028	0	0
28	WT15	X	.028	.028	0	0
29	WT16	X	.028	.028	0	0
30	WT17	X	.028	.028	0	0
31	WT18	X	.028	.028	0	0
32	WT19	X	.028	.028	0	0
33	WT20	X	.028	.028	0	0

Member Distributed Loads (BLC 5 : TIA/EIA Wind (+X))

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitude[k/ft,...	Start Location[ft,%]	End Location[ft,%]
1	LEG1	X	.115	.115	40	60
2	LEG1	X	.105	.105	20	40
3	LEG1	X	.091	.091	0	20
4	LEG2	X	.067	.067	0	0
5	LEG W PLT1	X	.07	.07	0	0
6	Mast1	X	0	.012	0	0
7	Mast1	X	.034	.034	0	0
8	Mast2	X	.012	.023	0	0
9	Mast2	X	.034	.034	0	0
10	Mast3	X	.023	.034	0	0
11	Mast3	X	.034	.034	0	0
12	Mast4	X	.034	.045	0	0
13	Mast4	X	.034	.034	0	0
14	WT1	X	.032	.032	0	0
15	WT2	X	.032	.032	0	0
16	WT3	X	.032	.032	0	0
17	WT4	X	.032	.032	0	0
18	WT5	X	.032	.032	0	0
19	WT6	X	.032	.032	0	0
20	WT7	X	.032	.032	0	0
21	WT8	X	.032	.032	0	0
22	WT9	X	.032	.032	0	0
23	WT10	X	.032	.032	0	0
24	WT11	X	.032	.032	0	0
25	WT12	X	.032	.032	0	0
26	WT13	X	.032	.032	0	0
27	WT14	X	.032	.032	0	0
28	WT15	X	.032	.032	0	0
29	WT16	X	.032	.032	0	0
30	WT17	X	.032	.032	0	0
31	WT18	X	.032	.032	0	0
32	WT19	X	.032	.032	0	0
33	WT20	X	.032	.032	0	0

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

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitude[k/ft,...	Start Location[ft,%]	End Location[ft,%]
1	CROSSDIAG1	Z	.025	.025	0	0
2	CROSSDIAG2	Z	.025	.025	0	0
3	CROSSDIAG3	Z	.025	.025	0	0
4	CROSSDIAG4	Z	.025	.025	0	0
5	CROSSDIAG5	Z	.019	.019	0	0
6	CROSSDIAG6	Z	.019	.019	0	0
7	CROSSDIAG7	Z	.025	.025	0	0
8	CROSSDIAG8	Z	.025	.025	0	0
9	HORZ1	Z	.025	.025	0	0
10	HORZ2	Z	.025	.025	0	0
11	HORZ3	Z	.025	.025	0	0
12	HORZ4	Z	.025	.025	0	0
13	HORZ5	Z	.025	.025	0	0
14	HORZ6	Z	.025	.025	0	0
15	HORZ7	Z	.025	.025	0	0
16	HORZ8	Z	.025	.025	0	0
17	HORZ9	Z	.025	.025	0	0
18	HORZ10	Z	.025	.025	0	0
19	HORZ11	Z	.025	.025	0	0
20	LEG1	Z	.038	.038	0	20
21	LEG1	Z	.044	.044	20	40

Member Distributed Loads (BLC 6 : TIA/EIA Wind with Ice(+Z)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitude[k/ft,...	Start Location[ft,%]	End Location[ft,%]
22	LEG1	Z	.049	.049	40	60
23	LEG2	Z	.038	.038	0	20
24	LEG2	Z	.044	.044	20	40
25	LEG2	Z	.049	.049	40	60
26	LEG2	Z	.064	.064	0	0
27	LEG_W_PLT1	Z	.04	.04	0	0
28	LEG_W_PLT2	Z	.04	.04	0	0
29	Mast1	Z	0	.009	0	0
30	Mast1	Z	.032	.032	0	0
31	Mast2	Z	.009	.018	0	0
32	Mast2	Z	.032	.032	0	0
33	Mast3	Z	.018	.027	0	0
34	Mast3	Z	.032	.032	0	0
35	Mast4	Z	.027	.036	0	0
36	Mast4	Z	.032	.032	0	0
37	WT1	Z	.028	.028	0	0
38	WT2	Z	.028	.028	0	0
39	WT3	Z	.028	.028	0	0
40	WT4	Z	.028	.028	0	0
41	WT5	Z	.028	.028	0	0
42	WT6	Z	.028	.028	0	0
43	WT7	Z	.028	.028	0	0
44	WT8	Z	.028	.028	0	0
45	WT9	Z	.028	.028	0	0
46	WT10	Z	.028	.028	0	0
47	WT11	Z	.028	.028	0	0
48	WT12	Z	.028	.028	0	0
49	WT13	Z	.028	.028	0	0
50	WT14	Z	.028	.028	0	0
51	WT15	Z	.028	.028	0	0
52	WT16	Z	.028	.028	0	0
53	WT17	Z	.028	.028	0	0
54	WT18	Z	.028	.028	0	0
55	WT19	Z	.028	.028	0	0
56	WT20	Z	.028	.028	0	0

Member Distributed Loads (BLC 7 : TIA/EIA Wind (+Z))

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitude[k/ft,...	Start Location[ft,%]	End Location[ft,%]
1	CROSSDIAG1	Z	.028	.028	0	0
2	CROSSDIAG2	Z	.028	.028	0	0
3	CROSSDIAG3	Z	.028	.028	0	0
4	CROSSDIAG4	Z	.028	.028	0	0
5	CROSSDIAG5	Z	.019	.019	0	0
6	CROSSDIAG6	Z	.019	.019	0	0
7	CROSSDIAG7	Z	.028	.028	0	0
8	CROSSDIAG8	Z	.028	.028	0	0
9	HORZ1	Z	.028	.028	0	0
10	HORZ2	Z	.028	.028	0	0
11	HORZ3	Z	.028	.028	0	0
12	HORZ4	Z	.028	.028	0	0
13	HORZ5	Z	.028	.028	0	0
14	HORZ6	Z	.028	.028	0	0
15	HORZ7	Z	.028	.028	0	0
16	HORZ8	Z	.028	.028	0	0
17	HORZ9	Z	.028	.028	0	0
18	HORZ10	Z	.028	.028	0	0
19	HORZ11	Z	.028	.028	0	0

Member Distributed Loads (BLC 7 : TIA/EIA Wind (+Z)) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,deg]	End Magnitude[k/ft,...	Start Location[ft,%]	End Location[ft,%]
20	LEG1	Z	.046	.046	0	20
21	LEG1	Z	.053	.053	20	40
22	LEG1	Z	.058	.058	40	60
23	LEG2	Z	.046	.046	0	20
24	LEG2	Z	.053	.053	20	40
25	LEG2	Z	.058	.058	40	60
26	LEG2	Z	.067	.067	0	0
27	LEG W PLT1	Z	.049	.049	0	0
28	LEG W PLT2	Z	.049	.049	0	0
29	Mast1	Z	0	.012	0	0
30	Mast1	Z	.034	.034	0	0
31	Mast2	Z	.012	.023	0	0
32	Mast2	Z	.034	.034	0	0
33	Mast3	Z	.023	.034	0	0
34	Mast3	Z	.034	.034	0	0
35	Mast4	Z	.034	.045	0	0
36	Mast4	Z	.034	.034	0	0
37	WT1	Z	.032	.032	0	0
38	WT2	Z	.032	.032	0	0
39	WT3	Z	.032	.032	0	0
40	WT4	Z	.032	.032	0	0
41	WT5	Z	.032	.032	0	0
42	WT6	Z	.032	.032	0	0
43	WT7	Z	.032	.032	0	0
44	WT8	Z	.032	.032	0	0
45	WT9	Z	.032	.032	0	0
46	WT10	Z	.032	.032	0	0
47	WT11	Z	.032	.032	0	0
48	WT12	Z	.032	.032	0	0
49	WT13	Z	.032	.032	0	0
50	WT14	Z	.032	.032	0	0
51	WT15	Z	.032	.032	0	0
52	WT16	Z	.032	.032	0	0
53	WT17	Z	.032	.032	0	0
54	WT18	Z	.032	.032	0	0
55	WT19	Z	.032	.032	0	0
56	WT20	Z	.032	.032	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Grav...	Z Gra...	Joint	Point	Distributed	Area (Mem...	Surfa...
1	Self Weight	None		-1						
2	Weight of Equipment	None				17		5		
3	Weight of Ice	None				17		52		
4	TIA/EIA Wind with Ice (+X)	None				19		33		
5	TIA/EIA Wind (+X)	None				19		33		
6	TIA/EIA Wind with Ice(+Z)	None				19		56		
7	TIA/EIA Wind (+Z)	None				19		56		

Load Combinations

	Description	Solve	PD...	SR..	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...
1	TIA/EIA Wind + Ice in +X Direction	Yes			1	1	2	1	3	1	4	1								
2	TIA/EIA Wind in +X Direction	Yes			1	1	2	1	5	1										
3	TIA/EIA Wind + Ice in +Z Direction	Yes			1	1	2	1	3	1	6	1								
4	TIA/EIA Wind in +Z Direction	Yes			1	1	2	1	7	1										
5	TIA/EIA Wind + Ice in -Z' Direction	Yes			1	1	2	1	3	1	6	-1								

Load Combinations (Continued)

	Description	Solve	PD...	SR..	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...	BLC	Fa...
6	TIA/EIA Wind in -Z' Direction	Yes			1	1	2	1	7	-1										
7	Self Weight				1	1														

Envelope Member Section Forces

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque[k-ft]	lc	y-y Mome...	lc	z-z Momen...	lc
1	CROSSDIAG1	1	max	.634	5	.089	1	.214	6	.004	6	.458	4	.38	2
2			min	-8.327	2	-.014	4	-.215	4	-.004	4	-.498	6	-.253	4
3		2	max	.609	5	.048	2	.108	6	.004	6	.097	6	.56	6
4			min	-8.345	2	-.049	4	-.108	4	-.004	4	-.061	4	-.602	4
5		3	max	.584	5	.25	6	.017	2	.004	6	.145	4	1.176	6
6			min	-8.559	2	-.174	4	-.013	4	-.004	4	-.223	6	-1.105	4
7		4	max	.485	4	.215	6	.093	4	.004	6	.294	6	.441	6
8			min	-8.577	2	-.209	4	-.094	6	-.004	4	-.263	4	-.482	4
9		5	max	.467	4	.181	6	.2	4	.004	6	.431	6	.52	4
10			min	-8.595	2	-.244	4	-.2	6	-.004	4	-.478	4	-.486	6
11	CROSSDIAG2	1	max	8.685	2	.223	4	.204	6	.003	4	.363	6	.215	4
12			min	-6.972	6	-.152	6	-.205	4	-.003	6	-.43	4	-.43	2
13		2	max	8.703	2	.188	4	.098	6	.003	4	.313	6	.724	6
14			min	-6.954	6	-.187	6	-.098	4	-.003	6	-.286	4	-.744	4
15		3	max	8.801	2	.153	4	.02	4	.003	4	.052	4	1.393	6
16			min	-6.936	6	-.222	6	-.02	6	-.003	6	-.2	2	-1.324	4
17		4	max	8.819	2	.051	2	.126	4	.003	4	.141	6	.74	6
18			min	-6.474	6	-.048	6	-.126	6	-.003	6	-.106	4	-.772	4
19		5	max	8.837	2	.016	2	.233	4	.003	4	.461	4	.432	6
20			min	-6.456	6	-.089	5	-.233	6	-.003	6	-.517	6	-.374	4
21	CROSSDIAG3	1	max	4.005	6	.143	3	.243	6	.004	6	.241	2	.324	3
22			min	-13.733	2	-.056	6	-.244	4	-.004	4	-.088	5	-.227	6
23		2	max	3.987	6	.102	4	.136	6	.004	6	.246	6	.481	6
24			min	-13.751	2	-.091	6	-.138	4	-.004	4	-.223	4	-.515	4
25		3	max	3.969	6	.067	4	.048	6	.004	6	.178	6	.997	6
26			min	-13.867	2	-.129	5	-.047	3	-.004	4	-.223	4	-.971	4
27		4	max	3.635	6	.018	3	.059	4	.004	6	.248	6	.896	6
28			min	-13.885	2	-.01	6	-.059	6	-.004	4	-.215	4	-.945	4
29		5	max	3.617	6	-.019	4	.166	4	.004	6	.084	4	.67	6
30			min	-13.903	2	-.057	5	-.165	6	-.004	4	-.127	6	-.638	4
31	CROSSDIAG4	1	max	13.632	2	.06	5	.191	6	.002	4	.178	4	.845	6
32			min	-5.681	6	.011	4	-.189	4	-.002	6	-.207	6	-.811	4
33		2	max	13.65	2	.013	6	.085	6	.002	4	.246	6	1.133	6
34			min	-5.663	6	-.025	3	-.083	4	-.002	6	-.205	4	-1.16	4
35		3	max	13.842	2	.152	5	.04	3	.003	4	.254	6	1.295	6
36			min	-5.644	6	-.085	4	-.04	5	-.003	6	-.298	4	-1.229	4
37		4	max	13.86	2	.115	6	.146	4	.003	4	.361	6	.688	6
38			min	-5.321	6	-.119	4	-.146	6	-.003	6	-.325	4	-.707	4
39		5	max	13.879	2	.081	6	.252	4	.003	4	.089	6	.206	3
40			min	-5.303	6	-.16	3	-.253	6	-.003	6	-.326	2	-.111	6
41	CROSSDIAG5	1	max	10.832	6	.075	3	.195	5	.003	6	.287	4	.477	3
42			min	-13.16	2	-.016	6	-.195	3	-.003	4	-.334	5	-.422	5
43		2	max	10.808	6	.041	3	.105	5	.003	6	.077	5	.184	6
44			min	-13.184	2	-.044	5	-.105	3	-.003	4	-.046	4	-.224	4
45		3	max	10.785	6	.096	5	.021	5	.005	6	.009	2	.657	5
46			min	-13.258	2	-.04	1	-.022	3	-.004	4	-.082	3	-.603	4
47		4	max	10.616	6	.064	6	.069	4	.005	6	.173	5	.317	6
48			min	-13.282	2	-.057	4	-.069	6	-.004	4	-.138	4	-.378	3
49		5	max	10.593	6	.04	6	.159	4	.005	6	.01	4	.241	4
50			min	-13.305	2	-.089	3	-.159	6	-.004	4	-.096	1	-.238	6
51	CROSSDIAG6	1	max	14.501	2	.088	3	.169	6	.004	4	.058	4	.209	3

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque[k-ft]	lc	y-y Mome...	lc	z-z Momen...	lc
52			min	-1.132	4	-.029	6	-.17	4	-.004	6	-.135	5	-.116	6
53		2	max	14.524	2	.057	4	.079	6	.004	4	.161	5	.438	6
54			min	-1.108	4	-.053	6	-.08	4	-.004	6	-.131	4	-.444	3
55		3	max	14.597	2	.033	4	.017	3	.004	4	.054	6	.772	6
56			min	-1.133	4	-.086	5	-.017	5	-.004	6	-.113	3	-.707	4
57		4	max	14.621	2	.044	5	.107	3	.003	4	.122	5	.293	6
58			min	-1.109	4	-.044	3	-.107	5	-.003	6	-.086	4	-.31	4
59		5	max	14.644	2	.017	6	.197	3	.003	4	.241	4	.412	3
60			min	-1.086	4	-.078	3	-.197	5	-.003	6	-.297	5	-.328	5
61	CROSSDIAG7	1	max	0	5	.097	3	0	1	.002	2	0	1	0	1
62			min	-24.949	2	0	5	-.464	4	-.002	4	0	1	0	1
63		2	max	0	5	.048	3	0	1	.002	2	.424	1	0	5
64			min	-25.027	2	0	5	-.232	4	-.002	4	-1.731	4	-2.342	4
65		3	max	0	5	0	1	0	1	.002	2	.566	1	0	5
66			min	-25.105	2	0	1	0	1	-.002	4	-2.308	4	-3.123	4
67		4	max	0	5	0	5	.232	4	.002	2	.424	1	0	5
68			min	-25.183	2	-.048	1	0	1	-.002	4	-1.731	4	-2.342	4
69		5	max	0	5	0	5	.464	4	.002	2	0	1	0	1
70			min	-25.261	2	-.097	1	0	1	-.002	4	0	1	0	1
71	CROSSDIAG8	1	max	0	1	.097	3	.464	6	.003	4	0	1	0	1
72			min	-4.024	6	0	1	-.464	4	-.003	6	0	1	0	1
73		2	max	0	1	.048	3	.232	6	.003	4	2.342	6	1.731	6
74			min	-3.946	6	0	1	-.232	4	-.003	6	-1.731	4	-2.342	4
75		3	max	0	1	0	1	0	1	.003	4	3.123	6	2.308	6
76			min	-3.868	6	0	1	0	1	-.003	6	-2.308	4	-3.123	4
77		4	max	0	1	0	1	.232	4	.003	4	2.342	6	1.731	6
78			min	-3.79	6	-.048	5	-.232	6	-.003	6	-1.731	4	-2.342	4
79		5	max	0	1	0	1	.464	4	.003	4	0	1	0	1
80			min	-3.712	6	-.097	5	-.464	6	-.003	6	0	1	0	1
81	HORZ1	1	max	5.215	4	.123	3	.187	6	0	6	0	1	0	1
82			min	-3.983	6	-.03	6	-.187	4	-.001	2	0	1	0	1
83		2	max	5.213	4	.08	4	.092	6	0	6	.227	5	.447	6
84			min	-3.985	6	-.065	6	-.093	4	-.001	2	-.101	4	-.566	4
85		3	max	7.774	4	.104	5	.002	4	0	6	.128	5	.766	6
86			min	-9.489	6	-.048	4	-.004	2	-.001	2	-.051	4	-.838	4
87		4	max	7.773	4	.067	6	.093	4	0	6	.223	5	.454	6
88			min	-9.49	6	-.082	4	-.093	6	-.001	2	-.097	4	-.573	4
89		5	max	7.771	4	.033	6	.188	4	0	6	0	1	0	1
90			min	-9.492	6	-.125	3	-.188	6	-.001	2	0	1	0	1
91	HORZ2	1	max	8.05	4	.127	3	.191	6	0	5	0	1	0	1
92			min	-9.686	6	-.035	6	-.191	4	-.001	2	0	1	0	1
93		2	max	8.051	4	.085	4	.097	6	0	5	.226	5	.468	6
94			min	-9.685	6	-.07	6	-.097	4	-.001	2	-.1	4	-.587	4
95		3	max	8.052	4	.05	4	.004	2	0	6	.135	5	.794	6
96			min	-9.683	6	-.106	5	-.002	4	-.001	2	-.058	4	-.865	4
97		4	max	5.492	4	.067	6	.096	4	0	6	.231	5	.461	6
98			min	-4.179	6	-.082	4	-.096	6	-.001	2	-.105	4	-.58	4
99		5	max	5.493	4	.032	6	.191	4	0	6	0	1	0	1
100			min	-4.178	6	-.125	3	-.191	6	-.001	2	0	1	0	1
101	HORZ3	1	max	1.463	3	.124	3	.186	6	0	6	0	1	0	1
102			min	-1.613	2	-.029	6	-.187	4	-.001	2	0	1	0	1
103		2	max	1.461	3	.08	4	.092	6	0	6	.228	5	.444	6
104			min	-1.614	2	-.064	6	-.092	4	-.001	2	-.1	4	-.567	4
105		3	max	3.933	4	.103	5	.002	4	.001	6	.132	5	.76	6
106			min	-5.554	6	-.048	4	-.004	2	-.001	2	-.051	4	-.837	4
107		4	max	3.932	4	.066	6	.093	4	.001	6	.225	5	.451	6
108			min	-5.555	6	-.082	4	-.093	6	-.001	2	-.097	4	-.573	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque[k-ft]	lc	y-y Mome...	lc	z-z Momen...	lc
109		5	max	3.93	4	.032	6	.188	4	.001	6	0	1	0	1
110			min	-5.556	6	-.125	3	-.187	6	-.001	2	0	1	0	1
111	HORZ4	1	max	5.598	4	.127	3	.192	6	0	6	0	1	0	1
112			min	-7.165	6	-.034	6	-.191	4	-.001	2	0	1	0	1
113		2	max	5.599	4	.085	4	.097	6	0	6	.229	5	.469	6
114			min	-7.164	6	-.069	6	-.097	4	-.001	2	-.1	4	-.588	4
115		3	max	5.601	4	.05	4	.004	2	0	6	.141	5	.794	6
116			min	-7.163	6	-.106	5	-.002	4	-.001	2	-.058	4	-.867	4
117		4	max	3.048	3	.067	6	.096	4	0	6	.232	5	.461	6
118			min	-1.686	6	-.083	4	-.096	6	-.001	2	-.104	4	-.581	4
119		5	max	3.049	3	.032	6	.191	4	0	6	0	1	0	1
120			min	-1.685	6	-.126	3	-.191	6	-.001	2	0	1	0	1
121	HORZ5	1	max	2.416	5	.084	3	.186	6	.001	6	0	1	0	1
122			min	-1.601	2	.015	6	-.187	4	-.002	2	0	1	0	1
123		2	max	2.415	5	.036	4	.091	6	.001	6	.326	6	.336	6
124			min	-1.602	2	-.02	6	-.093	4	-.002	2	-.206	4	-.462	4
125		3	max	2.413	5	.064	5	.005	2	.002	6	.339	6	.54	6
126			min	-3.122	1	-.039	1	-.003	6	-.002	2	-.264	4	-.625	4
127		4	max	1.45	4	.021	6	.093	4	.002	6	.324	6	.342	6
128			min	-3.124	1	-.038	4	-.092	6	-.002	2	-.203	4	-.467	4
129		5	max	1.449	4	-.014	6	.188	4	.002	6	0	1	0	1
130			min	-3.126	1	-.086	3	-.187	6	-.002	2	0	1	0	1
131	HORZ6	1	max	6.087	2	.088	3	.192	6	0	6	0	1	0	1
132			min	-5.27	6	.01	6	-.191	4	-.002	2	0	1	0	1
133		2	max	6.088	2	.04	4	.098	6	0	6	.329	6	.363	6
134			min	-5.269	6	-.024	6	-.097	4	-.002	2	-.207	4	-.48	4
135		3	max	7.463	2	.033	1	.003	6	0	6	.35	6	.583	6
136			min	-5.268	6	-.067	5	-.005	2	-.002	2	-.271	4	-.652	4
137		4	max	7.464	2	.023	6	.096	4	0	6	.332	6	.358	6
138			min	-2.201	6	-.038	4	-.097	6	-.002	2	-.209	4	-.475	4
139		5	max	7.466	2	-.012	6	.191	4	0	6	0	1	0	1
140			min	-2.2	6	-.086	3	-.192	6	-.002	2	0	1	0	1
141	HORZ7	1	max	4.639	6	.101	3	.186	6	.001	6	0	1	0	1
142			min	-2.253	2	-.007	6	-.187	4	-.002	2	0	1	0	1
143		2	max	4.638	6	.056	4	.091	6	.001	6	.272	6	.39	6
144			min	-2.255	2	-.042	6	-.093	4	-.002	2	-.16	4	-.509	4
145		3	max	4.637	6	.083	5	.002	4	.002	6	.233	6	.643	6
146			min	-3.842	2	-.022	4	-.005	2	-.002	2	-.175	4	-.714	4
147		4	max	.363	6	.043	6	.093	4	.002	6	.271	6	.393	6
148			min	-3.843	2	-.056	4	-.092	6	-.002	2	-.159	4	-.511	4
149		5	max	.362	6	.008	6	.188	4	.002	6	0	1	0	1
150			min	-3.845	2	-.102	3	-.186	6	-.002	2	0	1	0	1
151	HORZ8	1	max	3.113	2	.104	3	.192	6	0	6	0	1	0	1
152			min	-2.667	5	-.012	6	-.191	4	-.002	2	0	1	0	1
153		2	max	3.114	2	.058	4	.098	6	0	6	.277	6	.416	6
154			min	-2.665	5	-.047	6	-.096	4	-.002	2	-.162	4	-.524	4
155		3	max	4.702	2	.024	4	.005	2	0	6	.245	6	.689	6
156			min	-2.663	5	-.086	5	-.002	4	-.002	2	-.181	4	-.739	4
157		4	max	4.703	2	.046	6	.096	4	0	6	.278	6	.413	6
158			min	-.643	4	-.058	4	-.097	6	-.002	2	-.163	4	-.522	4
159		5	max	4.704	2	.011	6	.191	4	0	6	0	1	0	1
160			min	-.642	4	-.103	3	-.192	6	-.002	2	0	1	0	1
161	HORZ9	1	max	3.798	6	.072	3	.186	6	.001	6	0	1	0	1
162			min	-1.604	4	.028	6	-.188	4	-.002	2	0	1	0	1
163		2	max	3.797	6	.023	3	.092	6	.001	6	.356	6	.307	6
164			min	-1.605	4	-.007	6	-.094	4	-.002	2	-.243	4	-.431	4
165		3	max	3.796	6	.051	5	0	4	.001	6	.403	6	.473	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque[k-ft]	lc	y-y Mome...	lc	z-z Momen...	lc
166			min	-2.749	1	.013	4	-.005	2	-.002	2	-.343	4	-.553	4
167		4	max	1.431	6	.007	6	.094	4	.001	6	.356	6	.308	6
168			min	-2.751	1	-.023	3	-.092	6	-.002	2	-.243	4	-.431	4
169		5	max	1.43	6	-.027	6	.188	4	.001	6	0	1	0	1
170			min	-2.753	1	-.072	3	-.186	6	-.002	2	0	1	0	1
171	HORZ10	1	max	1.102	2	.073	3	.192	6	0	6	0	1	0	1
172			min	-2.059	3	.024	6	-.19	4	-.002	2	0	1	0	1
173		2	max	1.104	2	.024	3	.098	6	0	6	.362	6	.33	6
174			min	-2.057	3	-.011	6	-.095	4	-.002	2	-.244	4	-.437	4
175		3	max	2.702	1	-.012	4	.005	2	0	6	.414	6	.517	6
176			min	-2.056	3	-.054	5	0	4	-.002	2	-.346	4	-.565	4
177		4	max	2.704	1	.011	6	.095	4	0	6	.362	6	.329	6
178			min	-1.218	4	-.024	3	-.097	6	-.002	2	-.244	4	-.437	4
179		5	max	2.706	1	-.024	6	.19	4	0	6	0	1	0	1
180			min	-1.217	4	-.073	3	-.192	6	-.002	2	0	1	0	1
181	HORZ11	1	max	7.001	6	.262	3	.192	6	.405	6	.199	4	2.386	6
182			min	-5.327	4	.165	6	-.19	4	-.733	2	-.208	6	-1.279	4
183		2	max	7.001	6	.17	3	.097	6	.405	6	.28	6	1.963	6
184			min	-5.327	4	.086	6	-.096	4	-.733	2	-.284	4	-1.953	4
185		3	max	7.001	6	.082	4	.003	6	.405	6	.449	6	1.806	6
186			min	-5.327	4	.005	5	-.005	2	-.733	2	-.448	4	-2.361	4
187		4	max	7.001	6	.003	4	.093	4	.405	6	.299	6	1.915	6
188			min	-5.327	4	-.087	5	-.092	6	-.733	2	-.294	4	-2.504	4
189		5	max	7.001	6	-.076	4	.188	4	.405	6	.18	4	2.29	6
190			min	-5.327	4	-.179	5	-.186	6	-.733	2	-.169	6	-2.38	4
191	LEG1	1	max	239.203	6	14.138	6	3.135	4	.173	4	8.654	4	218.251	6
192			min	-221.045	4	-14.245	4	-3.148	6	-.175	6	-13.407	2	-221.805	4
193		2	max	194.907	6	6.229	6	1.472	2	.027	2	4.289	4	91.633	6
194			min	-180.681	4	-6.126	4	-.283	6	-.02	5	-3.818	6	-95.936	4
195		3	max	139.065	6	1.234	6	1.862	6	.054	6	2.055	4	45.32	6
196			min	-120.884	4	-1.035	4	-3.302	2	-.067	4	-3.91	6	-52.386	4
197		4	max	92.57	6	.975	2	.544	6	.056	2	2.741	2	41.101	6
198			min	-77.533	4	-.259	6	-1.09	2	-.048	4	-.86	6	-43.934	4
199		5	max	6.717	5	4.856	6	12.426	6	.066	2	4.771	6	46.684	6
200			min	-4.407	2	-4.853	4	-11.52	4	-.029	4	-2.557	4	-46.09	4
201	LEG2	1	max	240.961	6	17.869	6	4.215	6	.101	2	12.315	6	239.633	6
202			min	-218.721	4	-18.013	4	-4.125	4	-.083	4	-13.755	2	-241.221	4
203		2	max	197.953	6	5.987	6	1.321	2	.029	2	3.086	2	98.21	6
204			min	-180.471	4	-6.321	4	-.285	5	-.01	6	-2.397	4	-95.502	4
205		3	max	149.369	6	.619	6	2.906	6	.079	4	3.545	2	55.37	6
206			min	-130.885	4	-.914	4	-4.032	2	-.093	6	-1.265	4	-48.122	4
207		4	max	94.669	6	.353	6	.276	4	.068	4	2.87	2	37.373	6
208			min	-79.876	4	-.849	2	-.979	2	-.083	6	-.278	6	-34.092	4
209		5	max	32.01	2	4.844	6	14.459	4	.068	4	4.76	4	45.066	6
210			min	2.325	6	-4.847	4	-14.002	6	-.087	6	-4.58	6	-45.66	4
211	LEG_W_PLT1	1	max	251.522	6	19.061	6	5.305	6	.169	4	120.432	2	559.525	6
212			min	-225.744	4	-19.081	4	-15.637	2	-.171	6	-32.298	6	-564.357	4
213		2	max	250.614	6	18.81	6	5.305	6	.169	4	41.212	2	462.481	6
214			min	-226.652	4	-18.829	4	-15.278	2	-.171	6	-5.11	6	-467.212	4
215		3	max	249.705	6	18.559	6	5.305	6	.169	4	22.077	6	366.724	6
216			min	-227.561	4	-18.578	4	-14.919	2	-.171	6	-36.169	2	-371.355	4
217		4	max	240.112	6	14.389	6	3.135	4	.173	4	8.056	6	291.353	6
218			min	-220.136	4	-14.496	4	-3.148	6	-.175	6	-27.857	2	-295.456	4
219		5	max	239.203	6	14.138	6	3.135	4	.173	4	8.654	4	218.251	6
220			min	-221.045	4	-14.245	4	-3.148	6	-.175	6	-13.407	2	-221.805	4
221	LEG_W_PLT2	1	max	254.472	6	23.312	6	5.208	4	.099	2	119.416	2	662.857	6
222			min	-224.517	4	-23.327	4	-15.204	2	-.081	4	-25.859	4	-666.032	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque[k-ft]	lc	y-y Mome...	lc	z-z Momen...	lc
223		2	max	253.563	6	23.061	6	5.208	4	.099	2	41.495	2	544.025	6
224			min	-225.425	4	-23.076	4	-15.204	2	-.081	4	-.791	5	-547.125	4
225		3	max	252.655	6	22.81	6	5.208	4	.099	2	27.526	4	426.481	6
226			min	-226.334	4	-22.825	4	-15.204	2	-.081	4	-36.426	2	-429.506	4
227		4	max	241.87	6	18.121	6	4.215	6	.101	2	8.719	4	331.858	6
228			min	-217.812	4	-18.264	4	-4.125	4	-.083	4	-27.322	2	-334.18	4
229		5	max	240.961	6	17.869	6	4.215	6	.101	2	12.315	6	239.633	6
230			min	-218.721	4	-18.013	4	-4.125	4	-.083	4	-13.755	2	-241.221	4
231	WT1	1	max	12.736	6	.148	4	.162	1	.005	6	0	1	0	1
232			min	-25.53	2	-.148	6	.011	6	-.005	4	0	1	0	1
233		2	max	12.686	6	.074	4	.081	1	.005	6	.306	1	.279	6
234			min	-25.502	2	-.074	6	.005	6	-.005	4	.02	6	-.279	4
235		3	max	12.637	6	0	1	0	1	.005	6	.408	1	.372	6
236			min	-25.473	2	0	1	0	1	-.005	4	.027	6	-.372	4
237		4	max	12.587	6	.074	6	-.005	6	.005	6	.306	1	.279	6
238			min	-25.445	2	-.074	4	-.081	1	-.005	4	.02	6	-.279	4
239		5	max	12.537	6	.148	6	-.011	6	.005	6	0	1	0	1
240			min	-25.417	2	-.148	4	-.162	1	-.005	4	0	1	0	1
241	WT2	1	max	26.286	2	.148	4	.113	3	.003	4	0	1	0	1
242			min	-13.956	4	-.148	6	-.045	2	-.003	6	0	1	0	1
243		2	max	26.366	2	.074	4	.056	3	.003	4	.214	3	.279	6
244			min	-13.954	4	-.074	6	-.023	2	-.003	6	-.086	2	-.279	4
245		3	max	26.446	2	0	1	0	1	.003	4	.285	3	.372	6
246			min	-13.953	4	0	1	0	1	-.003	6	-.114	2	-.372	4
247		4	max	26.525	2	.074	6	.023	2	.003	4	.214	3	.279	6
248			min	-13.951	4	-.074	4	-.056	3	-.003	6	-.086	2	-.279	4
249		5	max	26.605	2	.148	6	.045	2	.003	4	0	1	0	1
250			min	-13.949	4	-.148	4	-.113	3	-.003	6	0	1	0	1
251	WT3	1	max	30.607	2	.148	4	.045	2	.007	4	0	1	0	1
252			min	-17.934	6	-.148	6	-.113	5	-.007	6	0	1	0	1
253		2	max	30.527	2	.074	4	.023	2	.007	4	.086	2	.279	6
254			min	-17.936	6	-.074	6	-.056	5	-.007	6	-.214	5	-.279	4
255		3	max	30.448	2	0	1	0	1	.007	4	.114	2	.372	6
256			min	-17.938	6	0	1	0	1	-.007	6	-.285	5	-.372	4
257		4	max	30.368	2	.074	6	.056	5	.007	4	.086	2	.279	6
258			min	-17.939	6	-.074	4	-.023	2	-.007	6	-.214	5	-.279	4
259		5	max	30.288	2	.148	6	.113	5	.007	4	0	1	0	1
260			min	-17.941	6	-.148	4	-.045	2	-.007	6	0	1	0	1
261	WT4	1	max	18.937	4	.148	4	.162	1	.005	6	0	1	0	1
262			min	-31.374	2	-.148	6	.011	4	-.005	4	0	1	0	1
263		2	max	18.887	4	.074	4	.081	1	.005	6	.306	1	.279	6
264			min	-31.346	2	-.074	6	.005	4	-.005	4	.02	4	-.279	4
265		3	max	18.838	4	0	1	0	1	.005	6	.408	1	.372	6
266			min	-31.317	2	0	1	0	1	-.005	4	.027	4	-.372	4
267		4	max	18.788	4	.074	6	-.005	4	.005	6	.306	1	.279	6
268			min	-31.289	2	-.074	4	-.081	1	-.005	4	.02	4	-.279	4
269		5	max	18.738	4	.148	6	-.011	4	.005	6	0	1	0	1
270			min	-31.261	2	-.148	4	-.162	1	-.005	4	0	1	0	1
271	WT5	1	max	37.539	6	.148	4	-.011	6	.009	6	0	1	0	1
272			min	-37.825	4	-.148	6	-.162	1	-.009	4	0	1	0	1
273		2	max	37.589	6	.074	4	-.005	6	.009	6	-.02	6	.279	6
274			min	-37.823	4	-.074	6	-.081	1	-.009	4	-.306	1	-.279	4
275		3	max	37.639	6	0	1	0	1	.009	6	-.027	6	.372	6
276			min	-37.822	4	0	1	0	1	-.009	4	-.408	1	-.372	4
277		4	max	37.688	6	.074	6	.081	1	.009	6	-.02	6	.279	6
278			min	-37.82	4	-.074	4	.005	6	-.009	4	-.306	1	-.279	4
279		5	max	37.738	6	.148	6	.162	1	.009	6	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 Mome...	lc	z-z Momen...	lc
280			min	-37.818	4	-.148	4	.011	6	-.009	4	0	1	0	1
281	WT6	1	max	48.976	6	.148	4	.113	3	.005	4	0	1	0	1
282			min	-47.806	4	-.148	6	-.045	2	-.005	6	0	1	0	1
283		2	max	49.025	6	.074	4	.056	3	.005	4	.214	3	.279	6
284			min	-47.805	4	-.074	6	-.023	2	-.005	6	-.086	2	-.279	4
285		3	max	49.075	6	0	1	0	1	.005	4	.285	3	.372	6
286			min	-47.803	4	0	1	0	1	-.005	6	-.114	2	-.372	4
287		4	max	49.125	6	.074	6	.023	2	.005	4	.214	3	.279	6
288			min	-47.801	4	-.074	4	-.056	3	-.005	6	-.086	2	-.279	4
289		5	max	49.175	6	.148	6	.045	2	.005	4	0	1	0	1
290			min	-47.799	4	-.148	4	-.113	3	-.005	6	0	1	0	1
291	WT7	1	max	29.463	4	.148	4	.045	2	.011	4	0	1	0	1
292			min	-28.999	6	-.148	6	-.113	5	-.012	6	0	1	0	1
293		2	max	29.413	4	.074	4	.023	2	.011	4	.086	2	.279	6
294			min	-29	6	-.074	6	-.056	5	-.012	6	-.214	5	-.279	4
295		3	max	29.363	4	0	1	0	1	.011	4	.114	2	.372	6
296			min	-29.002	6	0	1	0	1	-.012	6	-.285	5	-.372	4
297		4	max	29.314	4	.074	6	.056	5	.011	4	.086	2	.279	6
298			min	-29.004	6	-.074	4	-.023	2	-.012	6	-.214	5	-.279	4
299		5	max	29.264	4	.148	6	.113	5	.011	4	0	1	0	1
300			min	-29.005	6	-.148	4	-.045	2	-.012	6	0	1	0	1
301	WT8	1	max	39.396	4	.148	4	.162	1	.008	6	0	1	0	1
302			min	-40.324	6	-.148	6	.011	4	-.008	4	0	1	0	1
303		2	max	39.346	4	.074	4	.081	1	.008	6	.306	1	.279	6
304			min	-40.326	6	-.074	6	.005	4	-.008	4	.02	4	-.279	4
305		3	max	39.296	4	0	1	0	1	.008	6	.408	1	.372	6
306			min	-40.328	6	0	1	0	1	-.008	4	.027	4	-.372	4
307		4	max	39.247	4	.074	6	-.005	4	.008	6	.306	1	.279	6
308			min	-40.329	6	-.074	4	-.081	1	-.008	4	.02	4	-.279	4
309		5	max	39.197	4	.148	6	-.011	4	.008	6	0	1	0	1
310			min	-40.331	6	-.148	4	-.162	1	-.008	4	0	1	0	1
311	WT9	1	max	45.605	6	.148	4	.045	2	.006	4	0	1	0	1
312			min	-44.602	4	-.148	6	-.113	3	-.006	2	0	1	0	1
313		2	max	45.555	6	.074	4	.023	2	.006	4	.086	2	.279	6
314			min	-44.604	4	-.074	6	-.056	3	-.006	2	-.214	3	-.279	4
315		3	max	45.505	6	0	1	0	1	.006	4	.114	2	.372	6
316			min	-44.606	4	0	1	0	1	-.006	2	-.285	3	-.372	4
317		4	max	45.456	6	.074	6	.056	3	.006	4	.086	2	.279	6
318			min	-44.607	4	-.074	4	-.023	2	-.006	2	-.214	3	-.279	4
319		5	max	45.406	6	.148	6	.113	3	.006	4	0	1	0	1
320			min	-44.609	4	-.148	4	-.045	2	-.006	2	0	1	0	1
321	WT10	1	max	36.29	6	.148	4	.162	1	.012	6	0	1	0	1
322			min	-36.875	4	-.148	6	.011	6	-.012	4	0	1	0	1
323		2	max	36.24	6	.074	4	.081	1	.012	6	.306	1	.279	6
324			min	-36.877	4	-.074	6	.005	6	-.012	4	.02	6	-.279	4
325		3	max	36.19	6	0	1	0	1	.012	6	.408	1	.372	6
326			min	-36.879	4	0	1	0	1	-.012	4	.027	6	-.372	4
327		4	max	36.14	6	.074	6	-.005	6	.012	6	.306	1	.279	6
328			min	-36.881	4	-.074	4	-.081	1	-.012	4	.02	6	-.279	4
329		5	max	36.091	6	.148	6	-.011	6	.012	6	0	1	0	1
330			min	-36.882	4	-.148	4	-.162	1	-.012	4	0	1	0	1
331	WT11	1	max	33.59	4	.148	4	.113	5	.014	4	0	1	0	1
332			min	-33.144	6	-.148	6	-.045	2	-.014	6	0	1	0	1
333		2	max	33.639	4	.074	4	.056	5	.014	4	.214	5	.279	6
334			min	-33.142	6	-.074	6	-.023	2	-.014	6	-.086	2	-.279	4
335		3	max	33.689	4	0	1	0	1	.014	4	.285	5	.372	6
336			min	-33.14	6	0	1	0	1	-.014	6	-.114	2	-.372	4

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque[k-ft]	lc	y-y Mome...	lc	z-z Momen...	lc
337		4	max	33.739	4	.074	6	.023	2	.014	4	.214	5	.279	6
338			min	-33.138	6	-.074	4	-.056	5	-.014	6	-.086	2	-.279	4
339		5	max	33.789	4	.148	6	.045	2	.014	4	0	1	0	1
340			min	-33.137	6	-.148	4	-.113	5	-.014	6	0	1	0	1
341	WT12	1	max	41.687	4	.148	4	.162	1	.009	6	0	1	0	1
342			min	-42.679	6	-.148	6	.011	4	-.009	4	0	1	0	1
343		2	max	41.637	4	.074	4	.081	1	.009	6	.306	1	.279	6
344			min	-42.681	6	-.074	6	.005	4	-.009	4	.02	4	-.279	4
345		3	max	41.587	4	0	1	0	1	.009	6	.408	1	.372	6
346			min	-42.683	6	0	1	0	1	-.009	4	.027	4	-.372	4
347		4	max	41.538	4	.074	6	-.005	4	.009	6	.306	1	.279	6
348			min	-42.684	6	-.074	4	-.081	1	-.009	4	.02	4	-.279	4
349		5	max	41.488	4	.148	6	-.011	4	.009	6	0	1	0	1
350			min	-42.686	6	-.148	4	-.162	1	-.009	4	0	1	0	1
351	WT13	1	max	33.114	6	.148	4	.162	1	.015	6	0	1	0	1
352			min	-31.792	4	-.148	6	.011	6	-.014	4	0	1	0	1
353		2	max	33.064	6	.074	4	.081	1	.015	6	.306	1	.279	6
354			min	-31.793	4	-.074	6	.005	6	-.014	4	.02	6	-.279	4
355		3	max	33.014	6	0	1	0	1	.015	6	.408	1	.372	6
356			min	-31.795	4	0	1	0	1	-.014	4	.027	6	-.372	4
357		4	max	32.965	6	.074	6	-.005	6	.015	6	.306	1	.279	6
358			min	-31.797	4	-.074	4	-.081	1	-.014	4	.02	6	-.279	4
359		5	max	32.915	6	.148	6	-.011	6	.015	6	0	1	0	1
360			min	-31.799	4	-.148	4	-.162	1	-.014	4	0	1	0	1
361	WT14	1	max	35.182	6	.148	4	.045	2	.006	4	0	1	0	1
362			min	-36.038	4	-.148	6	-.113	3	-.009	2	0	1	0	1
363		2	max	35.132	6	.074	4	.023	2	.006	4	.086	2	.279	6
364			min	-36.04	4	-.074	6	-.056	3	-.009	2	-.214	3	-.279	4
365		3	max	35.082	6	0	1	0	1	.006	4	.114	2	.372	6
366			min	-36.041	4	0	1	0	1	-.009	2	-.285	3	-.372	4
367		4	max	35.033	6	.074	6	.056	3	.006	4	.086	2	.279	6
368			min	-36.043	4	-.074	4	-.023	2	-.009	2	-.214	3	-.279	4
369		5	max	34.983	6	.148	6	.113	3	.006	4	0	1	0	1
370			min	-36.045	4	-.148	4	-.045	2	-.009	2	0	1	0	1
371	WT15	1	max	50.8	4	.148	4	.045	2	.01	4	0	1	0	1
372			min	-51.724	6	-.148	6	-.113	5	-.011	6	0	1	0	1
373		2	max	50.751	4	.074	4	.023	2	.01	4	.086	2	.279	6
374			min	-51.726	6	-.074	6	-.056	5	-.011	6	-.214	5	-.279	4
375		3	max	50.701	4	0	1	0	1	.01	4	.114	2	.372	6
376			min	-51.727	6	0	1	0	1	-.011	6	-.285	5	-.372	4
377		4	max	50.651	4	.074	6	.056	5	.01	4	.086	2	.279	6
378			min	-51.729	6	-.074	4	-.023	2	-.011	6	-.214	5	-.279	4
379		5	max	50.601	4	.148	6	.113	5	.01	4	0	1	0	1
380			min	-51.731	6	-.148	4	-.045	2	-.011	6	0	1	0	1
381	WT16	1	max	54.997	4	.148	4	.162	1	.007	2	0	1	0	1
382			min	-53.769	6	-.148	6	.011	4	-.003	4	0	1	0	1
383		2	max	54.947	4	.074	4	.081	1	.007	2	.306	1	.279	6
384			min	-53.77	6	-.074	6	.005	4	-.003	4	.02	4	-.279	4
385		3	max	54.897	4	0	1	0	1	.007	2	.408	1	.372	6
386			min	-53.772	6	0	1	0	1	-.003	4	.027	4	-.372	4
387		4	max	54.847	4	.074	6	-.005	4	.007	2	.306	1	.279	6
388			min	-53.774	6	-.074	4	-.081	1	-.003	4	.02	4	-.279	4
389		5	max	54.798	4	.148	6	-.011	4	.007	2	0	1	0	1
390			min	-53.776	6	-.148	4	-.162	1	-.003	4	0	1	0	1
391	WT17	1	max	50.573	6	.148	4	-.011	6	.017	6	0	1	0	1
392			min	-49.906	4	-.148	6	-.162	1	-.014	4	0	1	0	1
393		2	max	50.622	6	.074	4	-.005	6	.017	6	-.02	6	.279	6

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque[k-ft]	lc	y-y Mome...	lc	z-z Momen...	lc
394			min	-49.904	4	-.074	6	-.081	1	-.014	4	-.306	1	-.279	4
395		3	max	50.672	6	0	1	0	1	.017	6	-.027	6	.372	6
396			min	-49.903	4	0	1	0	1	-.014	4	-.408	1	-.372	4
397		4	max	50.722	6	.074	6	.081	1	.017	6	-.02	6	.279	6
398			min	-49.901	4	-.074	4	.005	6	-.014	4	-.306	1	-.279	4
399		5	max	50.771	6	.148	6	.162	1	.017	6	0	1	0	1
400			min	-49.899	4	-.148	4	.011	6	-.014	4	0	1	0	1
401	WT18	1	max	53.429	6	.148	4	.113	3	.005	4	0	1	0	1
402			min	-54.545	4	-.148	6	-.045	2	-.01	2	0	1	0	1
403		2	max	53.479	6	.074	4	.056	3	.005	4	.214	3	.279	6
404			min	-54.543	4	-.074	6	-.023	2	-.01	2	-.086	2	-.279	4
405		3	max	53.529	6	0	1	0	1	.005	4	.285	3	.372	6
406			min	-54.541	4	0	1	0	1	-.01	2	-.114	2	-.372	4
407		4	max	53.579	6	.074	6	.023	2	.005	4	.214	3	.279	6
408			min	-54.539	4	-.074	4	-.056	3	-.01	2	-.086	2	-.279	4
409		5	max	53.628	6	.148	6	.045	2	.005	4	0	1	0	1
410			min	-54.538	4	-.148	4	-.113	3	-.01	2	0	1	0	1
411	WT19	1	max	21.887	4	.148	4	.045	2	.015	2	0	1	0	1
412			min	-22.633	6	-.148	6	-.113	5	-.005	6	0	1	0	1
413		2	max	21.837	4	.074	4	.023	2	.015	2	.086	2	.279	6
414			min	-22.635	6	-.074	6	-.056	5	-.005	6	-.214	5	-.279	4
415		3	max	21.787	4	0	1	0	1	.015	2	.114	2	.372	6
416			min	-22.637	6	0	1	0	1	-.005	6	-.285	5	-.372	4
417		4	max	21.738	4	.074	6	.056	5	.015	2	.086	2	.279	6
418			min	-22.639	6	-.074	4	-.023	2	-.005	6	-.214	5	-.279	4
419		5	max	21.688	4	.148	6	.113	5	.015	2	0	1	0	1
420			min	-22.64	6	-.148	4	-.045	2	-.005	6	0	1	0	1
421	WT20	1	max	26.517	4	.148	4	.162	1	.015	2	0	1	0	1
422			min	-25.455	6	-.148	6	.011	4	-.01	6	0	1	0	1
423		2	max	26.467	4	.074	4	.081	1	.015	2	.306	1	.279	6
424			min	-25.457	6	-.074	6	.005	4	-.01	6	.02	4	-.279	4
425		3	max	26.417	4	0	1	0	1	.015	2	.408	1	.372	6
426			min	-25.458	6	0	1	0	1	-.01	6	.027	4	-.372	4
427		4	max	26.367	4	.074	6	-.005	4	.015	2	.306	1	.279	6
428			min	-25.46	6	-.074	4	-.081	1	-.01	6	.02	4	-.279	4
429		5	max	26.318	4	.148	6	-.011	4	.015	2	0	1	0	1
430			min	-25.462	6	-.148	4	-.162	1	-.01	6	0	1	0	1
431	Mast1	1	max	491.659	4	5.387	2	2.926	6	.085	2	92.56	4	63.707	2
432			min	-464.595	6	-.103	6	-2.892	4	-.048	6	-92.024	6	-.727	6
433		2	max	490.89	4	5.129	2	2.669	6	.085	2	72.513	4	25.573	2
434			min	-465.365	6	-.103	6	-2.635	4	-.048	6	-71.729	6	0	4
435		3	max	490.121	4	4.85	2	2.39	6	.085	2	54.411	4	.769	6
436			min	-466.134	6	-.103	6	-2.355	4	-.048	6	-53.378	6	-10.616	2
437		4	max	446.43	4	.039	6	1.554	4	.078	2	48.784	4	1.109	6
438			min	-423.306	6	-2.683	2	-1.646	6	-.045	6	-47.865	6	-23.91	2
439		5	max	445.661	4	.039	6	1.877	4	.078	2	61.207	4	.849	5
440			min	-424.076	6	-3.005	2	-1.969	6	-.045	6	-60.954	6	-3.304	2
441	Mast2	1	max	445.661	4	.039	6	1.877	4	.078	2	61.207	4	.849	5
442			min	-424.076	6	-3.005	2	-1.969	6	-.045	6	-60.954	6	-3.304	2
443		2	max	339.515	4	.113	6	2.228	6	.07	2	60.922	4	7.703	2
444			min	-318.795	6	-.076	4	-2.195	4	-.04	6	-60.895	6	-.177	4
445		3	max	338.785	4	.113	6	1.884	6	.07	2	47.002	4	9.011	2
446			min	-319.525	6	-.364	2	-1.851	4	-.04	6	-46.75	6	-.453	6
447		4	max	230.952	4	3.055	2	2.62	6	.056	2	31.614	4	.508	3
448			min	-213.239	6	-.039	6	-2.687	4	-.033	6	-31.46	6	-.735	6
449		5	max	230.223	4	2.672	2	2.238	6	.056	2	14.445	4	.246	3
450			min	-213.968	6	-.039	6	-2.305	4	-.033	6	-14.75	6	-19.24	2

Envelope Member Section Forces (Continued)

	Member	Sec		Axial[k]	lc	y Shear[k]	lc	z Shear[k]	lc	Torque[k-ft]	lc	y-y Mome...	lc	z-z Momen...	lc
451	Mast3	1	max	230.223	4	2.672	2	2.238	6	.056	2	14.445	4	.246	3
452			min	-213.968	6	-.039	6	-2.305	4	-.033	6	-14.75	6	-19.24	2
453		2	max	111.03	4	.008	3	9.969	4	.034	2	38.56	4	11.817	2
454			min	-96.729	6	-12.517	2	-9.929	6	-.02	6	-38.978	6	-.247	6
455		3	max	110.301	4	.008	3	10.389	4	.034	2	108.53	4	99.306	2
456			min	-97.458	6	-12.937	2	-10.349	6	-.02	6	-108.674	6	-.085	6
457		4	max	7.264	3	5.246	2	5.246	6	0	1	129.23	4	129.23	2
458			min	5.27	2	0	3	-5.246	4	0	1	-129.23	6	0	3
459		5	max	6.273	3	4.788	2	4.788	6	0	1	94.731	4	94.731	2
460			min	4.54	2	0	3	-4.788	4	0	1	-94.731	6	0	3
461	Mast4	1	max	6.273	3	4.788	2	4.788	6	0	1	94.731	4	94.731	2
462			min	4.54	6	0	3	-4.788	4	0	1	-94.731	6	0	3
463		2	max	5.3	3	4.319	2	4.319	6	0	1	63.985	4	63.985	2
464			min	3.824	6	0	3	-4.319	4	0	1	-63.985	6	0	3
465		3	max	4.328	3	3.832	2	3.832	6	0	1	36.463	4	36.463	2
466			min	3.107	6	0	3	-3.832	4	0	1	-36.463	6	0	3
467		4	max	3.355	3	3.327	2	3.327	6	0	1	12.29	4	12.29	2
468			min	2.391	6	0	3	-3.327	4	0	1	-12.29	6	0	3
469		5	max	0	1	0	1	0	1	0	1	0	1	0	1
470			min	0	1	0	1	0	1	0	1	0	1	0	1
471	Horz 12	1	max	7.001	6	.239	4	.003	6	.405	6	.217	6	2.386	6
472			min	-5.327	4	.163	5	-.005	2	-.733	2	-.226	4	-1.279	4
473		2	max	7.001	6	.16	4	.003	6	.405	6	.227	6	1.963	6
474			min	-5.327	4	.084	5	-.005	2	-.733	2	-.231	4	-1.953	4
475		3	max	7.001	6	.082	4	.003	6	.405	6	.236	6	1.806	6
476			min	-5.327	4	.005	5	-.005	2	-.733	2	-.236	4	-2.361	4
477		4	max	7.001	6	.003	4	.003	6	.405	6	.246	6	1.915	6
478			min	-5.327	4	-.073	5	-.005	2	-.733	2	-.241	4	-2.504	4
479		5	max	7.001	6	-.076	4	.003	6	.405	6	.256	6	2.29	6
480			min	-5.327	4	-.152	5	-.005	2	-.733	2	-.246	4	-2.38	4

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	CROSSDIAG1	1	max	.209	5	.068	1	.165	6	.879	4	1.319	2	3.144	4	3.859	6
2			min	-2.748	2	-.011	4	-.165	4	-1.319	2	-.879	4	-3.425	6	-3.543	4
3		2	max	.201	5	.037	2	.083	6	2.089	4	1.944	6	.666	6	.472	4
4			min	-2.754	2	-.038	4	-.083	4	-1.944	6	-2.089	4	-.419	4	-.75	6
5		3	max	.193	5	.192	6	.013	2	3.833	4	4.079	6	.996	4	1.729	6
6			min	-2.825	2	-.134	4	-.01	4	-4.079	6	-3.833	4	-1.535	6	-1.122	4
7		4	max	.16	4	.165	6	.072	4	1.674	4	1.53	6	2.017	6	2.036	4
8			min	-2.831	2	-.161	4	-.072	6	-1.53	6	-1.674	4	-1.807	4	-2.273	6
9		5	max	.154	4	.139	6	.153	4	1.687	6	1.803	4	2.96	6	3.703	4
10			min	-2.837	2	-.187	4	-.154	6	-1.803	4	-1.687	6	-3.286	4	-3.335	6
11	CROSSDIAG2	1	max	2.866	2	.171	4	.157	6	1.492	2	.747	4	2.492	6	3.33	4
12			min	-2.301	6	-.117	6	-.157	4	-.747	4	-1.492	2	-2.955	4	-2.808	6
13		2	max	2.872	2	.144	4	.075	6	2.581	4	2.512	6	2.15	6	2.211	4
14			min	-2.295	6	-.143	6	-.076	4	-2.512	6	-2.581	4	-1.962	4	-2.423	6
15		3	max	2.905	2	.118	4	.015	4	4.592	4	4.832	6	.354	4	1.549	2
16			min	-2.289	6	-.17	6	-.015	6	-4.832	6	-4.592	4	-1.375	2	-.399	4
17		4	max	2.911	2	.039	2	.097	4	2.677	4	2.567	6	.967	6	.821	4
18			min	-2.137	6	-.037	6	-.097	6	-2.567	6	-2.677	4	-.728	4	-1.09	6
19		5	max	2.917	2	.012	2	.179	4	1.296	4	1.498	6	3.168	4	4.007	6
20			min	-2.131	6	-.068	5	-.179	6	-1.498	6	-1.296	4	-3.556	6	-3.569	4
21	CROSSDIAG3	1	max	1.322	6	.11	3	.187	6	.786	6	1.123	3	1.659	2	.684	5
22			min	-4.532	2	-.043	6	-.188	4	-1.123	3	-.786	6	-.607	5	-1.869	2
23		2	max	1.316	6	.078	4	.105	6	1.788	4	1.67	6	1.692	6	1.725	4

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	lc	y Shear...	lc	z Shear...	lc	y-Top[ksi]	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
24			min	-4.538	2	-.07	6	-.106	4	-1.67	6	-1.788	4	-1.531	4	-1.906	6
25		3	max	1.31	6	.052	4	.037	6	3.369	4	3.459	6	1.224	6	1.726	4
26			min	-4.577	2	-.099	5	-.036	3	-3.459	6	-3.369	4	-1.532	4	-1.38	6
27		4	max	1.2	6	.014	3	.046	4	3.278	4	3.109	6	1.706	6	1.662	4
28			min	-4.583	2	-.008	6	-.045	6	-3.109	6	-3.278	4	-1.475	4	-1.922	6
29		5	max	1.194	6	-.015	4	.127	4	2.215	4	2.324	6	.575	4	.982	6
30			min	-4.588	2	-.044	5	-.127	6	-2.324	6	-2.215	4	-.871	6	-.648	4
31	CROSSDIAG4	1	max	4.499	2	.046	5	.147	6	2.814	4	2.932	6	1.221	4	1.602	6
32			min	-1.875	6	.009	4	-.146	4	-2.932	6	-2.814	4	-1.422	6	-1.376	4
33		2	max	4.505	2	.01	6	.065	6	4.026	4	3.93	6	1.693	6	1.591	4
34			min	-1.869	6	-.019	3	-.064	4	-3.93	6	-4.026	4	-1.412	4	-1.908	6
35		3	max	4.568	2	.117	5	.03	3	4.265	4	4.492	6	1.748	6	2.311	4
36			min	-1.863	6	-.065	4	-.031	5	-4.492	6	-4.265	4	-2.051	4	-1.97	6
37		4	max	4.574	2	.089	6	.112	4	2.452	4	2.387	6	2.483	6	2.513	4
38			min	-1.756	6	-.092	4	-.112	6	-2.387	6	-2.452	4	-2.23	4	-2.798	6
39		5	max	4.58	2	.062	6	.194	4	.387	6	.715	3	.609	6	2.521	2
40			min	-1.75	6	-.123	3	-.194	6	-.715	3	-.387	6	-2.238	2	-.686	6
41	CROSSDIAG5	1	max	5.183	6	.082	3	.214	5	3.064	5	3.465	3	4.102	4	5.648	5
42			min	-6.297	2	-.018	6	-.214	3	-3.465	3	-3.064	5	-4.778	5	-4.849	4
43		2	max	5.171	6	.045	3	.115	5	1.626	4	1.337	6	1.107	5	.778	4
44			min	-6.308	2	-.048	5	-.116	3	-1.337	6	-1.626	4	-.658	4	-1.308	5
45		3	max	5.16	6	.105	5	.023	5	4.38	4	4.774	5	.133	2	1.378	3
46			min	-6.344	2	-.044	1	-.024	3	-4.774	5	-4.38	4	-1.166	3	-.157	2
47		4	max	5.08	6	.07	6	.075	4	2.747	3	2.305	6	2.471	5	2.331	4
48			min	-6.355	2	-.063	4	-.076	6	-2.305	6	-2.747	3	-1.972	4	-2.921	5
49		5	max	5.068	6	.043	6	.174	4	1.726	6	1.753	4	.143	4	1.62	1
50			min	-6.366	2	-.098	3	-.175	6	-1.753	4	-1.726	6	-1.37	1	-.169	4
51	CROSSDIAG6	1	max	6.938	2	.097	3	.186	6	.843	6	1.515	3	.829	4	2.283	5
52			min	-.542	4	-.032	6	-.186	4	-1.515	3	-.843	6	-1.931	5	-.98	4
53		2	max	6.949	2	.062	4	.087	6	3.226	3	3.184	6	2.302	5	2.21	4
54			min	-.53	4	-.058	6	-.088	4	-3.184	6	-3.226	3	-1.87	4	-2.721	5
55		3	max	6.984	2	.036	4	.019	3	5.136	4	5.61	6	.766	6	1.914	3
56			min	-.542	4	-.094	5	-.019	5	-5.61	6	-5.136	4	-1.619	3	-.906	6
57		4	max	6.996	2	.048	5	.117	3	2.252	4	2.13	6	1.742	5	1.445	4
58			min	-.531	4	-.049	3	-.118	5	-2.13	6	-2.252	4	-1.223	4	-2.059	5
59		5	max	7.007	2	.018	6	.216	3	2.382	5	2.994	3	3.445	4	5.02	5
60			min	-.52	4	-.086	3	-.216	5	-2.994	3	-2.382	5	-4.246	5	-4.072	4
61	CROSSDIAG7	1	max	0	5	.074	3	0	1	0	1	0	1	0	1	0	1
62			min	-8.234	2	0	5	-.356	4	0	1	0	1	0	1	0	1
63		2	max	0	5	.037	3	0	1	8.127	4	0	5	2.915	1	13.404	4
64			min	-8.26	2	0	5	-.178	4	0	5	-8.127	4	-11.895	4	-3.285	1
65		3	max	0	5	0	1	0	1	10.836	4	0	5	3.887	1	17.872	4
66			min	-8.285	2	0	1	0	1	0	5	-10.836	4	-15.861	4	-4.38	1
67		4	max	0	5	0	5	.178	4	8.127	4	0	5	2.915	1	13.404	4
68			min	-8.311	2	-.037	1	0	1	0	5	-8.127	4	-11.895	4	-3.285	1
69		5	max	0	5	0	5	.356	4	0	1	0	1	0	1	0	1
70			min	-8.337	2	-.074	1	0	1	0	1	0	1	0	1	0	1
71	CROSSDIAG8	1	max	0	1	.074	3	.356	6	0	1	0	1	0	1	0	1
72			min	-1.328	6	0	1	-.356	4	0	1	0	1	0	1	0	1
73		2	max	0	1	.037	3	.178	6	8.127	4	6.006	6	16.096	6	13.404	4
74			min	-1.302	6	0	1	-.178	4	-6.006	6	-8.127	4	-11.895	4	-18.137	6
75		3	max	0	1	0	1	0	1	10.836	4	8.008	6	21.461	6	17.872	4
76			min	-1.276	6	0	1	0	1	-8.008	6	-10.836	4	-15.861	4	-24.183	6
77		4	max	0	1	0	1	.178	4	8.127	4	6.006	6	16.096	6	13.404	4
78			min	-1.251	6	-.037	5	-.178	6	-6.006	6	-8.127	4	-11.895	4	-18.137	6
79		5	max	0	1	0	1	.356	4	0	1	0	1	0	1	0	1
80			min	-1.225	6	-.074	5	-.356	6	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
81	HORZ1	1	max	1.721	4	.095	3	.144	6	0	1	0	1	0	1	0	1
82			min	-1.315	6	-.023	6	-.144	4	0	1	0	1	0	1	0	1
83		2	max	1.721	4	.061	4	.071	6	1.965	4	1.549	6	1.561	5	.785	4
84			min	-1.315	6	-.05	6	-.071	4	-1.549	6	-1.965	4	-.696	4	-1.758	5
85		3	max	2.566	4	.08	5	.002	4	2.907	4	2.658	6	.883	5	.394	4
86			min	-3.132	6	-.037	4	-.003	2	-2.658	6	-2.907	4	-.35	4	-.995	5
87		4	max	2.565	4	.052	6	.071	4	1.989	4	1.576	6	1.53	5	.75	4
88			min	-3.132	6	-.063	4	-.071	6	-1.576	6	-1.989	4	-.665	4	-1.724	5
89		5	max	2.565	4	.025	6	.144	4	0	1	0	1	0	1	0	1
90			min	-3.133	6	-.096	3	-.144	6	0	1	0	1	0	1	0	1
91	HORZ2	1	max	2.657	4	.098	3	.147	6	0	1	0	1	0	1	0	1
92			min	-3.197	6	-.027	6	-.147	4	0	1	0	1	0	1	0	1
93		2	max	2.657	4	.065	4	.074	6	2.037	4	1.625	6	1.554	5	.776	4
94			min	-3.196	6	-.053	6	-.074	4	-1.625	6	-2.037	4	-.689	4	-1.751	5
95		3	max	2.658	4	.038	4	.003	2	3.001	4	2.755	6	.93	5	.447	4
96			min	-3.196	6	-.082	5	-.002	4	-2.755	6	-3.001	4	-.397	4	-1.048	5
97		4	max	1.813	4	.051	6	.074	4	2.012	4	1.598	6	1.584	5	.811	4
98			min	-1.379	6	-.063	4	-.074	6	-1.598	6	-2.012	4	-.72	4	-1.785	5
99		5	max	1.813	4	.025	6	.146	4	0	1	0	1	0	1	0	1
100			min	-1.379	6	-.096	3	-.146	6	0	1	0	1	0	1	0	1
101	HORZ3	1	max	.483	3	.095	3	.143	6	0	1	0	1	0	1	0	1
102			min	-.532	2	-.023	6	-.143	4	0	1	0	1	0	1	0	1
103		2	max	.482	3	.062	4	.071	6	1.966	4	1.54	6	1.566	5	.773	4
104			min	-.533	2	-.049	6	-.071	4	-1.54	6	-1.966	4	-.686	4	-1.764	5
105		3	max	1.298	4	.079	5	.002	4	2.906	4	2.635	6	.91	5	.392	4
106			min	-1.833	6	-.037	4	-.003	2	-2.635	6	-2.906	4	-.348	4	-1.026	5
107		4	max	1.298	4	.051	6	.071	4	1.989	4	1.565	6	1.544	5	.748	4
108			min	-1.833	6	-.063	4	-.071	6	-1.565	6	-1.989	4	-.664	4	-1.74	5
109		5	max	1.297	4	.024	6	.144	4	0	1	0	1	0	1	0	1
110			min	-1.834	6	-.096	3	-.144	6	0	1	0	1	0	1	0	1
111	HORZ4	1	max	1.848	4	.098	3	.147	6	0	1	0	1	0	1	0	1
112			min	-2.365	6	-.026	6	-.147	4	0	1	0	1	0	1	0	1
113		2	max	1.848	4	.065	4	.075	6	2.04	4	1.626	6	1.574	5	.778	4
114			min	-2.364	6	-.053	6	-.074	4	-1.626	6	-2.04	4	-.69	4	-1.773	5
115		3	max	1.848	4	.038	4	.003	2	3.008	4	2.756	6	.969	5	.451	4
116			min	-2.364	6	-.081	5	-.002	4	-2.756	6	-3.008	4	-.4	4	-1.092	5
117		4	max	1.006	3	.051	6	.074	4	2.017	4	1.601	6	1.595	5	.803	4
118			min	-.557	6	-.063	4	-.074	6	-1.601	6	-2.017	4	-.712	4	-1.797	5
119		5	max	1.006	3	.025	6	.146	4	0	1	0	1	0	1	0	1
120			min	-.556	6	-.097	3	-.147	6	0	1	0	1	0	1	0	1
121	HORZ5	1	max	.797	5	.065	3	.143	6	0	1	0	1	0	1	0	1
122			min	-.528	2	.012	6	-.144	4	0	1	0	1	0	1	0	1
123		2	max	.797	5	.028	4	.07	6	1.603	4	1.167	6	2.242	6	1.593	4
124			min	-.529	2	-.015	6	-.071	4	-1.167	6	-1.603	4	-1.414	4	-2.526	6
125		3	max	.796	5	.049	5	.004	2	2.169	4	1.875	6	2.328	6	2.045	4
126			min	-1.03	1	-.03	1	-.002	6	-1.875	6	-2.169	4	-1.815	4	-2.624	6
127		4	max	.479	4	.016	6	.071	4	1.62	4	1.185	6	2.226	6	1.575	4
128			min	-1.031	1	-.029	4	-.071	6	-1.185	6	-1.62	4	-1.398	4	-2.508	6
129		5	max	.478	4	-.011	6	.144	4	0	1	0	1	0	1	0	1
130			min	-1.032	1	-.066	3	-.143	6	0	1	0	1	0	1	0	1
131	HORZ6	1	max	2.009	2	.067	3	.148	6	0	1	0	1	0	1	0	1
132			min	-1.739	6	.008	6	-.147	4	0	1	0	1	0	1	0	1
133		2	max	2.009	2	.031	4	.075	6	1.666	4	1.259	6	2.263	6	1.602	4
134			min	-1.739	6	-.019	6	-.074	4	-1.259	6	-1.666	4	-1.421	4	-2.551	6
135		3	max	2.463	2	.026	1	.002	6	2.261	4	2.023	6	2.404	6	2.098	4
136			min	-1.738	6	-.051	5	-.004	2	-2.023	6	-2.261	4	-1.862	4	-2.709	6
137		4	max	2.463	2	.018	6	.074	4	1.649	4	1.241	6	2.28	6	1.619	4

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	lc	y Shear...	lc	z Shear...	lc	y-Top[ksi]	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
138			min	-.726	6	-.029	4	-.075	6	-1.241	6	-1.649	4	-1.437	4	-2.569	6
139		5	max	2.464	2	-.009	6	.146	4	0	1	0	1	0	1	0	1
140			min	-.726	6	-.066	3	-.147	6	0	1	0	1	0	1	0	1
141	HORZ7	1	max	1.531	6	.078	3	.143	6	0	1	0	1	0	1	0	1
142			min	-.744	2	-.006	6	-.144	4	0	1	0	1	0	1	0	1
143		2	max	1.531	6	.043	4	.07	6	1.766	4	1.353	6	1.87	6	1.238	4
144			min	-.744	2	-.032	6	-.071	4	-1.353	6	-1.766	4	-1.099	4	-2.108	6
145		3	max	1.53	6	.064	5	.001	4	2.476	4	2.231	6	1.599	6	1.353	4
146			min	-1.268	2	-.017	4	-.004	2	-2.231	6	-2.476	4	-1.201	4	-1.802	6
147		4	max	.12	6	.033	6	.071	4	1.774	4	1.363	6	1.861	6	1.229	4
148			min	-1.268	2	-.043	4	-.07	6	-1.363	6	-1.774	4	-1.091	4	-2.097	6
149		5	max	.12	6	.006	6	.144	4	0	1	0	1	0	1	0	1
150			min	-1.269	2	-.078	3	-.143	6	0	1	0	1	0	1	0	1
151	HORZ8	1	max	1.027	2	.08	3	.148	6	0	1	0	1	0	1	0	1
152			min	-.88	5	-.009	6	-.147	4	0	1	0	1	0	1	0	1
153		2	max	1.028	2	.045	4	.075	6	1.818	4	1.443	6	1.902	6	1.254	4
154			min	-.88	5	-.036	6	-.074	4	-1.443	6	-1.818	4	-1.113	4	-2.143	6
155		3	max	1.552	2	.018	4	.004	2	2.565	4	2.392	6	1.681	6	1.404	4
156			min	-.879	5	-.066	5	-.001	4	-2.392	6	-2.565	4	-1.246	4	-1.894	6
157		4	max	1.552	2	.035	6	.074	4	1.81	4	1.433	6	1.911	6	1.263	4
158			min	-.212	4	-.044	4	-.075	6	-1.433	6	-1.81	4	-1.121	4	-2.153	6
159		5	max	1.553	2	.008	6	.146	4	0	1	0	1	0	1	0	1
160			min	-.212	4	-.079	3	-.147	6	0	1	0	1	0	1	0	1
161	HORZ9	1	max	1.254	6	.055	3	.143	6	0	1	0	1	0	1	0	1
162			min	-.529	4	.021	6	-.145	4	0	1	0	1	0	1	0	1
163		2	max	1.253	6	.018	3	.07	6	1.495	4	1.066	6	2.447	6	1.879	4
164			min	-.53	4	-.006	6	-.072	4	-1.066	6	-1.495	4	-1.668	4	-2.758	6
165		3	max	1.253	6	.039	5	0	4	1.918	4	1.641	6	2.77	6	2.654	4
166			min	-.907	1	.01	4	-.004	2	-1.641	6	-1.918	4	-2.355	4	-3.121	6
167		4	max	.472	6	.006	6	.072	4	1.495	4	1.068	6	2.446	6	1.88	4
168			min	-.908	1	-.018	3	-.07	6	-1.068	6	-1.495	4	-1.668	4	-2.757	6
169		5	max	.472	6	-.021	6	.145	4	0	1	0	1	0	1	0	1
170			min	-.909	1	-.055	3	-.143	6	0	1	0	1	0	1	0	1
171	HORZ10	1	max	.364	2	.056	3	.148	6	0	1	0	1	0	1	0	1
172			min	-.68	3	.018	6	-.146	4	0	1	0	1	0	1	0	1
173		2	max	.364	2	.019	3	.075	6	1.517	4	1.145	6	2.485	6	1.892	4
174			min	-.679	3	-.008	6	-.073	4	-1.145	6	-1.517	4	-1.679	4	-2.8	6
175		3	max	.892	1	-.009	4	.004	2	1.962	4	1.794	6	2.847	6	2.678	4
176			min	-.678	3	-.042	5	0	4	-1.794	6	-1.962	4	-2.376	4	-3.208	6
177		4	max	.892	1	.008	6	.073	4	1.517	4	1.143	6	2.486	6	1.891	4
178			min	-.402	4	-.019	3	-.075	6	-1.143	6	-1.517	4	-1.678	4	-2.801	6
179		5	max	.893	1	-.019	6	.146	4	0	1	0	1	0	1	0	1
180			min	-.402	4	-.056	3	-.147	6	0	1	0	1	0	1	0	1
181	HORZ11	1	max	1.021	6	.052	3	.077	6	1.139	4	2.125	6	.264	4	.276	6
182			min	-.777	4	.033	6	-.076	4	-2.125	6	-1.139	4	-.276	6	-.264	4
183		2	max	1.021	6	.034	3	.039	6	1.739	4	1.748	6	.371	6	.377	4
184			min	-.777	4	.017	6	-.038	4	-1.748	6	-1.739	4	-.377	4	-.371	6
185		3	max	1.021	6	.016	4	.001	6	2.103	4	1.608	6	.595	6	.595	4
186			min	-.777	4	.001	5	-.002	2	-1.608	6	-2.103	4	-.595	4	-.595	6
187		4	max	1.021	6	0	4	.037	4	2.229	4	1.705	6	.397	6	.39	4
188			min	-.777	4	-.017	5	-.037	6	-1.705	6	-2.229	4	-.39	4	-.397	6
189		5	max	1.021	6	-.015	4	.075	4	2.12	4	2.039	6	.238	4	.224	6
190			min	-.777	4	-.036	5	-.074	6	-2.039	6	-2.12	4	-.224	6	-.238	4
191	LEG1	1	max	11.901	6	1.436	6	.299	4	17.257	4	16.981	6	6.613	4	10.243	2
192			min	-10.997	4	-1.447	4	-.3	6	-16.981	6	-17.257	4	-10.243	2	-6.613	4
193		2	max	9.697	6	.632	6	.14	2	7.464	4	7.129	6	3.277	4	2.917	6
194			min	-8.989	4	-.622	4	-.027	6	-7.129	6	-7.464	4	-2.917	6	-3.277	4

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	lc	y Shear...	lc	z Shear...	lc	y-Top[ksi]	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
195		3	max	6.919	6	.125	6	.177	6	4.076	4	3.526	6	1.57	4	2.988	6
196			min	-6.014	4	-.105	4	-.315	2	-3.526	6	-4.076	4	-2.988	6	-1.57	4
197		4	max	4.605	6	.099	2	.052	6	3.418	4	3.198	6	2.094	2	.657	6
198			min	-3.857	4	-.026	6	-.104	2	-3.198	6	-3.418	4	-.657	6	-2.094	2
199		5	max	.334	5	.493	6	1.185	6	3.586	4	3.632	6	3.646	6	1.954	4
200			min	-.219	2	-.493	4	-1.098	4	-3.632	6	-3.586	4	-1.954	4	-3.646	6
201	LEG2	1	max	11.988	6	1.815	6	.402	6	18.768	4	18.644	6	9.409	6	10.51	2
202			min	-10.882	4	-1.829	4	-.393	4	-18.644	6	-18.768	4	-10.51	2	-9.409	6
203		2	max	9.848	6	.608	6	.126	2	7.43	4	7.641	6	2.358	2	1.832	4
204			min	-8.979	4	-.642	4	-.027	5	-7.641	6	-7.43	4	-1.832	4	-2.358	2
205		3	max	7.431	6	.063	6	.277	6	3.744	4	4.308	6	2.708	2	.967	4
206			min	-6.512	4	-.093	4	-.384	2	-4.308	6	-3.744	4	-.967	4	-2.708	2
207		4	max	4.71	6	.036	6	.026	4	2.653	4	2.908	6	2.193	2	.213	6
208			min	-3.974	4	-.086	2	-.093	2	-2.908	6	-2.653	4	-.213	6	-2.193	2
209		5	max	1.593	2	.492	6	1.378	4	3.553	4	3.506	6	3.637	4	3.499	6
210			min	.116	6	-.492	4	-1.335	6	-3.506	6	-3.553	4	-3.499	6	-3.637	4
211	LEG_W_PLT1	1	max	4.828	6	1.938	6	.504	6	11.919	4	11.817	6	8.636	2	2.316	6
212			min	-4.333	4	-1.94	4	-1.485	2	-11.817	6	-11.919	4	-2.316	6	-8.636	2
213		2	max	4.81	6	1.912	6	.504	6	9.867	4	9.767	6	2.955	2	.366	6
214			min	-4.35	4	-1.914	4	-1.451	2	-9.767	6	-9.867	4	-.366	6	-2.955	2
215		3	max	4.793	6	1.887	6	.504	6	7.843	4	7.745	6	1.583	6	2.594	2
216			min	-4.368	4	-1.889	4	-1.417	2	-7.745	6	-7.843	4	-2.594	2	-1.583	6
217		4	max	4.609	6	1.463	6	.298	4	6.24	4	6.153	6	.578	6	1.998	2
218			min	-4.225	4	-1.474	4	-.299	6	-6.153	6	-6.24	4	-1.998	2	-.578	6
219		5	max	4.591	6	1.437	6	.298	4	4.684	4	4.609	6	.621	4	.961	2
220			min	-4.243	4	-1.448	4	-.299	6	-4.609	6	-4.684	4	-.961	2	-.621	4
221	LEG_W_PLT2	1	max	4.884	6	2.37	6	.495	4	14.066	4	13.999	6	8.563	2	1.854	4
222			min	-4.309	4	-2.372	4	-1.444	2	-13.999	6	-14.066	4	-1.854	4	-8.563	2
223		2	max	4.867	6	2.345	6	.495	4	11.555	4	11.489	6	2.975	2	.057	5
224			min	-4.327	4	-2.346	4	-1.444	2	-11.489	6	-11.555	4	-.057	5	-2.975	2
225		3	max	4.849	6	2.319	6	.495	4	9.071	4	9.007	6	1.974	4	2.612	2
226			min	-4.344	4	-2.321	4	-1.444	2	-9.007	6	-9.071	4	-2.612	2	-1.974	4
227		4	max	4.642	6	1.842	6	.4	6	7.058	4	7.009	6	.625	4	1.959	2
228			min	-4.181	4	-1.857	4	-.392	4	-7.009	6	-7.058	4	-1.959	2	-.625	4
229		5	max	4.625	6	1.817	6	.4	6	5.094	4	5.061	6	.883	6	.986	2
230			min	-4.198	4	-1.831	4	-.392	4	-5.061	6	-5.094	4	-.986	2	-.883	6
231	WT1	1	max	2.895	6	.11	4	.068	1	0	1	0	1	0	1	0	1
232			min	-5.802	2	-.11	6	.004	6	0	1	0	1	0	1	0	1
233		2	max	2.883	6	.055	4	.034	1	.315	4	1.216	6	1.174	1	-.077	6
234			min	-5.796	2	-.055	6	.002	6	-.315	6	-1.216	4	.077	6	-1.174	1
235		3	max	2.872	6	0	1	0	1	.42	4	1.621	6	1.565	1	-.103	6
236			min	-5.789	2	0	1	0	1	-.42	6	-1.621	4	.103	6	-1.565	1
237		4	max	2.861	6	.055	6	-.002	6	.315	4	1.216	6	1.174	1	-.077	6
238			min	-5.783	2	-.055	4	-.034	1	-.315	6	-1.216	4	.077	6	-1.174	1
239		5	max	2.849	6	.11	6	-.004	6	0	1	0	1	0	1	0	1
240			min	-5.777	2	-.11	4	-.068	1	0	1	0	1	0	1	0	1
241	WT2	1	max	5.974	2	.11	4	.047	3	0	1	0	1	0	1	0	1
242			min	-3.172	4	-.11	6	-.019	2	0	1	0	1	0	1	0	1
243		2	max	5.992	2	.055	4	.024	3	.315	4	1.216	6	.819	3	.328	2
244			min	-3.171	4	-.055	6	-.009	2	-.315	6	-1.216	4	-.328	2	-.819	3
245		3	max	6.01	2	0	1	0	1	.42	4	1.621	6	1.092	3	.438	2
246			min	-3.171	4	0	1	0	1	-.42	6	-1.621	4	-.438	2	-1.092	3
247		4	max	6.028	2	.055	6	.009	2	.315	4	1.216	6	.819	3	.328	2
248			min	-3.171	4	-.055	4	-.024	3	-.315	6	-1.216	4	-.328	2	-.819	3
249		5	max	6.047	2	.11	6	.019	2	0	1	0	1	0	1	0	1
250			min	-3.17	4	-.11	4	-.047	3	0	1	0	1	0	1	0	1
251	WT3	1	max	6.956	2	.11	4	.019	2	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
252			min	-4.076	6	-.11	6	-.047	5	0	1	0	1	0	1	0	1
253		2	max	6.938	2	.055	4	.009	2	.315	4	1.216	6	.328	2	.819	5
254			min	-4.076	6	-.055	6	-.024	5	-.315	6	-1.216	4	-.819	5	-.328	2
255		3	max	6.92	2	0	1	0	1	.42	4	1.621	6	.438	2	1.092	5
256			min	-4.077	6	0	1	0	1	-.42	6	-1.621	4	-1.092	5	-.438	2
257		4	max	6.902	2	.055	6	.024	5	.315	4	1.216	6	.328	2	.819	5
258			min	-4.077	6	-.055	4	-.009	2	-.315	6	-1.216	4	-.819	5	-.328	2
259		5	max	6.884	2	.11	6	.047	5	0	1	0	1	0	1	0	1
260			min	-4.078	6	-.11	4	-.019	2	0	1	0	1	0	1	0	1
261	WT4	1	max	4.304	4	.11	4	.068	1	0	1	0	1	0	1	0	1
262			min	-7.13	2	-.11	6	.004	4	0	1	0	1	0	1	0	1
263		2	max	4.293	4	.055	4	.034	1	.315	4	1.216	6	1.174	1	-.077	4
264			min	-7.124	2	-.055	6	.002	4	-.315	6	-1.216	4	.077	4	-1.174	1
265		3	max	4.281	4	0	1	0	1	.42	4	1.621	6	1.565	1	-.103	4
266			min	-7.118	2	0	1	0	1	-.42	6	-1.621	4	.103	4	-1.565	1
267		4	max	4.27	4	.055	6	-.002	4	.315	4	1.216	6	1.174	1	-.077	4
268			min	-7.111	2	-.055	4	-.034	1	-.315	6	-1.216	4	.077	4	-1.174	1
269		5	max	4.259	4	.11	6	-.004	4	0	1	0	1	0	1	0	1
270			min	-7.105	2	-.11	4	-.068	1	0	1	0	1	0	1	0	1
271	WT5	1	max	8.532	6	.11	4	-.004	6	0	1	0	1	0	1	0	1
272			min	-8.597	4	-.11	6	-.068	1	0	1	0	1	0	1	0	1
273		2	max	8.543	6	.055	4	-.002	6	.315	4	1.216	6	-.077	6	1.174	1
274			min	-8.596	4	-.055	6	-.034	1	-.315	6	-1.216	4	-1.174	1	.077	6
275		3	max	8.554	6	0	1	0	1	.42	4	1.621	6	-.103	6	1.565	1
276			min	-8.596	4	0	1	0	1	-.42	6	-1.621	4	-1.565	1	.103	6
277		4	max	8.566	6	.055	6	.034	1	.315	4	1.216	6	-.077	6	1.174	1
278			min	-8.595	4	-.055	4	.002	6	-.315	6	-1.216	4	-1.174	1	.077	6
279		5	max	8.577	6	.11	6	.068	1	0	1	0	1	0	1	0	1
280			min	-8.595	4	-.11	4	.004	6	0	1	0	1	0	1	0	1
281	WT6	1	max	11.131	6	.11	4	.047	3	0	1	0	1	0	1	0	1
282			min	-10.865	4	-.11	6	-.019	2	0	1	0	1	0	1	0	1
283		2	max	11.142	6	.055	4	.024	3	.315	4	1.216	6	.819	3	.328	2
284			min	-10.865	4	-.055	6	-.009	2	-.315	6	-1.216	4	-.328	2	-.819	3
285		3	max	11.153	6	0	1	0	1	.42	4	1.621	6	1.092	3	.438	2
286			min	-10.864	4	0	1	0	1	-.42	6	-1.621	4	-.438	2	-1.092	3
287		4	max	11.165	6	.055	6	.009	2	.315	4	1.216	6	.819	3	.328	2
288			min	-10.864	4	-.055	4	-.024	3	-.315	6	-1.216	4	-.328	2	-.819	3
289		5	max	11.176	6	.11	6	.019	2	0	1	0	1	0	1	0	1
290			min	-10.863	4	-.11	4	-.047	3	0	1	0	1	0	1	0	1
291	WT7	1	max	6.696	4	.11	4	.019	2	0	1	0	1	0	1	0	1
292			min	-6.591	6	-.11	6	-.047	5	0	1	0	1	0	1	0	1
293		2	max	6.685	4	.055	4	.009	2	.315	4	1.216	6	.328	2	.819	5
294			min	-6.591	6	-.055	6	-.024	5	-.315	6	-1.216	4	-.819	5	-.328	2
295		3	max	6.674	4	0	1	0	1	.42	4	1.621	6	.438	2	1.092	5
296			min	-6.591	6	0	1	0	1	-.42	6	-1.621	4	-1.092	5	-.438	2
297		4	max	6.662	4	.055	6	.024	5	.315	4	1.216	6	.328	2	.819	5
298			min	-6.592	6	-.055	4	-.009	2	-.315	6	-1.216	4	-.819	5	-.328	2
299		5	max	6.651	4	.11	6	.047	5	0	1	0	1	0	1	0	1
300			min	-6.592	6	-.11	4	-.019	2	0	1	0	1	0	1	0	1
301	WT8	1	max	8.954	4	.11	4	.068	1	0	1	0	1	0	1	0	1
302			min	-9.165	6	-.11	6	.004	4	0	1	0	1	0	1	0	1
303		2	max	8.942	4	.055	4	.034	1	.315	4	1.216	6	1.174	1	-.077	4
304			min	-9.165	6	-.055	6	.002	4	-.315	6	-1.216	4	.077	4	-1.174	1
305		3	max	8.931	4	0	1	0	1	.42	4	1.621	6	1.565	1	-.103	4
306			min	-9.165	6	0	1	0	1	-.42	6	-1.621	4	.103	4	-1.565	1
307		4	max	8.92	4	.055	6	-.002	4	.315	4	1.216	6	1.174	1	-.077	4
308			min	-9.166	6	-.055	4	-.034	1	-.315	6	-1.216	4	.077	4	-1.174	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
309		5	max	8.908	4	.11	6	-.004	4	0	1	0	1	0	1	0	1
310			min	-9.166	6	-.11	4	-.068	1	0	1	0	1	0	1	0	1
311	WT9	1	max	10.365	6	.11	4	.019	2	0	1	0	1	0	1	0	1
312			min	-10.137	4	-.11	6	-.047	3	0	1	0	1	0	1	0	1
313		2	max	10.353	6	.055	4	.009	2	.315	4	1.216	6	.328	2	.819	3
314			min	-10.137	4	-.055	6	-.024	3	-.315	6	-1.216	4	-.819	3	-.328	2
315		3	max	10.342	6	0	1	0	1	.42	4	1.621	6	.438	2	1.092	3
316			min	-10.138	4	0	1	0	1	-.42	6	-1.621	4	-1.092	3	-.438	2
317		4	max	10.331	6	.055	6	.024	3	.315	4	1.216	6	.328	2	.819	3
318			min	-10.138	4	-.055	4	-.009	2	-.315	6	-1.216	4	-.819	3	-.328	2
319		5	max	10.32	6	.11	6	.047	3	0	1	0	1	0	1	0	1
320			min	-10.138	4	-.11	4	-.019	2	0	1	0	1	0	1	0	1
321	WT10	1	max	8.248	6	.11	4	.068	1	0	1	0	1	0	1	0	1
322			min	-8.381	4	-.11	6	.004	6	0	1	0	1	0	1	0	1
323		2	max	8.236	6	.055	4	.034	1	.315	4	1.216	6	1.174	1	-.077	6
324			min	-8.381	4	-.055	6	.002	6	-.315	6	-1.216	4	.077	6	-1.174	1
325		3	max	8.225	6	0	1	0	1	.42	4	1.621	6	1.565	1	-.103	6
326			min	-8.382	4	0	1	0	1	-.42	6	-1.621	4	.103	6	-1.565	1
327		4	max	8.214	6	.055	6	-.002	6	.315	4	1.216	6	1.174	1	-.077	6
328			min	-8.382	4	-.055	4	-.034	1	-.315	6	-1.216	4	.077	6	-1.174	1
329		5	max	8.202	6	.11	6	-.004	6	0	1	0	1	0	1	0	1
330			min	-8.382	4	-.11	4	-.068	1	0	1	0	1	0	1	0	1
331	WT11	1	max	7.634	4	.11	4	.047	5	0	1	0	1	0	1	0	1
332			min	-7.533	6	-.11	6	-.019	2	0	1	0	1	0	1	0	1
333		2	max	7.645	4	.055	4	.024	5	.315	4	1.216	6	.819	5	.328	2
334			min	-7.532	6	-.055	6	-.009	2	-.315	6	-1.216	4	-.328	2	-.819	5
335		3	max	7.657	4	0	1	0	1	.42	4	1.621	6	1.092	5	.438	2
336			min	-7.532	6	0	1	0	1	-.42	6	-1.621	4	-.438	2	-1.092	5
337		4	max	7.668	4	.055	6	.009	2	.315	4	1.216	6	.819	5	.328	2
338			min	-7.531	6	-.055	4	-.024	5	-.315	6	-1.216	4	-.328	2	-.819	5
339		5	max	7.679	4	.11	6	.019	2	0	1	0	1	0	1	0	1
340			min	-7.531	6	-.11	4	-.047	5	0	1	0	1	0	1	0	1
341	WT12	1	max	9.474	4	.11	4	.068	1	0	1	0	1	0	1	0	1
342			min	-9.7	6	-.11	6	.004	4	0	1	0	1	0	1	0	1
343		2	max	9.463	4	.055	4	.034	1	.315	4	1.216	6	1.174	1	-.077	4
344			min	-9.7	6	-.055	6	.002	4	-.315	6	-1.216	4	.077	4	-1.174	1
345		3	max	9.452	4	0	1	0	1	.42	4	1.621	6	1.565	1	-.103	4
346			min	-9.701	6	0	1	0	1	-.42	6	-1.621	4	.103	4	-1.565	1
347		4	max	9.44	4	.055	6	-.002	4	.315	4	1.216	6	1.174	1	-.077	4
348			min	-9.701	6	-.055	4	-.034	1	-.315	6	-1.216	4	.077	4	-1.174	1
349		5	max	9.429	4	.11	6	-.004	4	0	1	0	1	0	1	0	1
350			min	-9.701	6	-.11	4	-.068	1	0	1	0	1	0	1	0	1
351	WT13	1	max	7.526	6	.11	4	.068	1	0	1	0	1	0	1	0	1
352			min	-7.225	4	-.11	6	.004	6	0	1	0	1	0	1	0	1
353		2	max	7.515	6	.055	4	.034	1	.315	4	1.216	6	1.174	1	-.077	6
354			min	-7.226	4	-.055	6	.002	6	-.315	6	-1.216	4	.077	6	-1.174	1
355		3	max	7.503	6	0	1	0	1	.42	4	1.621	6	1.565	1	-.103	6
356			min	-7.226	4	0	1	0	1	-.42	6	-1.621	4	.103	6	-1.565	1
357		4	max	7.492	6	.055	6	-.002	6	.315	4	1.216	6	1.174	1	-.077	6
358			min	-7.227	4	-.055	4	-.034	1	-.315	6	-1.216	4	.077	6	-1.174	1
359		5	max	7.481	6	.11	6	-.004	6	0	1	0	1	0	1	0	1
360			min	-7.227	4	-.11	4	-.068	1	0	1	0	1	0	1	0	1
361	WT14	1	max	7.996	6	.11	4	.019	2	0	1	0	1	0	1	0	1
362			min	-8.19	4	-.11	6	-.047	3	0	1	0	1	0	1	0	1
363		2	max	7.985	6	.055	4	.009	2	.315	4	1.216	6	.328	2	.819	3
364			min	-8.191	4	-.055	6	-.024	3	-.315	6	-1.216	4	-.819	3	-.328	2
365		3	max	7.973	6	0	1	0	1	.42	4	1.621	6	.438	2	1.092	3

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	lc	y Shear...	lc	z Shear...	lc	y-Top[ksi]	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
366			min	-8.191	4	0	1	0	1	-.42	6	-1.621	4	-1.092	3	-.438	2
367		4	max	7.962	6	.055	6	.024	3	.315	4	1.216	6	.328	2	.819	3
368			min	-8.192	4	-.055	4	-.009	2	-.315	6	-1.216	4	-.819	3	-.328	2
369		5	max	7.951	6	.11	6	.047	3	0	1	0	1	0	1	0	1
370			min	-8.192	4	-.11	4	-.019	2	0	1	0	1	0	1	0	1
371	WT15	1	max	11.546	4	.11	4	.019	2	0	1	0	1	0	1	0	1
372			min	-11.755	6	-.11	6	-.047	5	0	1	0	1	0	1	0	1
373		2	max	11.534	4	.055	4	.009	2	.315	4	1.216	6	.328	2	.819	5
374			min	-11.756	6	-.055	6	-.024	5	-.315	6	-1.216	4	-.819	5	-.328	2
375		3	max	11.523	4	0	1	0	1	.42	4	1.621	6	.438	2	1.092	5
376			min	-11.756	6	0	1	0	1	-.42	6	-1.621	4	-1.092	5	-.438	2
377		4	max	11.512	4	.055	6	.024	5	.315	4	1.216	6	.328	2	.819	5
378			min	-11.757	6	-.055	4	-.009	2	-.315	6	-1.216	4	-.819	5	-.328	2
379		5	max	11.5	4	.11	6	.047	5	0	1	0	1	0	1	0	1
380			min	-11.757	6	-.11	4	-.019	2	0	1	0	1	0	1	0	1
381	WT16	1	max	12.499	4	.11	4	.068	1	0	1	0	1	0	1	0	1
382			min	-12.22	6	-.11	6	.004	4	0	1	0	1	0	1	0	1
383		2	max	12.488	4	.055	4	.034	1	.315	4	1.216	6	1.174	1	-.077	4
384			min	-12.221	6	-.055	6	.002	4	-.315	6	-1.216	4	.077	4	-1.174	1
385		3	max	12.477	4	0	1	0	1	.42	4	1.621	6	1.565	1	-.103	4
386			min	-12.221	6	0	1	0	1	-.42	6	-1.621	4	.103	4	-1.565	1
387		4	max	12.465	4	.055	6	-.002	4	.315	4	1.216	6	1.174	1	-.077	4
388			min	-12.221	6	-.055	4	-.034	1	-.315	6	-1.216	4	.077	4	-1.174	1
389		5	max	12.454	4	.11	6	-.004	4	0	1	0	1	0	1	0	1
390			min	-12.222	6	-.11	4	-.068	1	0	1	0	1	0	1	0	1
391	WT17	1	max	11.494	6	.11	4	-.004	6	0	1	0	1	0	1	0	1
392			min	-11.342	4	-.11	6	-.068	1	0	1	0	1	0	1	0	1
393		2	max	11.505	6	.055	4	-.002	6	.315	4	1.216	6	-.077	6	1.174	1
394			min	-11.342	4	-.055	6	-.034	1	-.315	6	-1.216	4	-1.174	1	.077	6
395		3	max	11.516	6	0	1	0	1	.42	4	1.621	6	-.103	6	1.565	1
396			min	-11.342	4	0	1	0	1	-.42	6	-1.621	4	-1.565	1	.103	6
397		4	max	11.528	6	.055	6	.034	1	.315	4	1.216	6	-.077	6	1.174	1
398			min	-11.341	4	-.055	4	.002	6	-.315	6	-1.216	4	-1.174	1	.077	6
399		5	max	11.539	6	.11	6	.068	1	0	1	0	1	0	1	0	1
400			min	-11.341	4	-.11	4	.004	6	0	1	0	1	0	1	0	1
401	WT18	1	max	12.143	6	.11	4	.047	3	0	1	0	1	0	1	0	1
402			min	-12.397	4	-.11	6	-.019	2	0	1	0	1	0	1	0	1
403		2	max	12.154	6	.055	4	.024	3	.315	4	1.216	6	.819	3	.328	2
404			min	-12.396	4	-.055	6	-.009	2	-.315	6	-1.216	4	-.328	2	-.819	3
405		3	max	12.166	6	0	1	0	1	.42	4	1.621	6	1.092	3	.438	2
406			min	-12.396	4	0	1	0	1	-.42	6	-1.621	4	-.438	2	-1.092	3
407		4	max	12.177	6	.055	6	.009	2	.315	4	1.216	6	.819	3	.328	2
408			min	-12.395	4	-.055	4	-.024	3	-.315	6	-1.216	4	-.328	2	-.819	3
409		5	max	12.188	6	.11	6	.019	2	0	1	0	1	0	1	0	1
410			min	-12.395	4	-.11	4	-.047	3	0	1	0	1	0	1	0	1
411	WT19	1	max	4.974	4	.11	4	.019	2	0	1	0	1	0	1	0	1
412			min	-5.144	6	-.11	6	-.047	5	0	1	0	1	0	1	0	1
413		2	max	4.963	4	.055	4	.009	2	.315	4	1.216	6	.328	2	.819	5
414			min	-5.144	6	-.055	6	-.024	5	-.315	6	-1.216	4	-.819	5	-.328	2
415		3	max	4.952	4	0	1	0	1	.42	4	1.621	6	.438	2	1.092	5
416			min	-5.145	6	0	1	0	1	-.42	6	-1.621	4	-1.092	5	-.438	2
417		4	max	4.94	4	.055	6	.024	5	.315	4	1.216	6	.328	2	.819	5
418			min	-5.145	6	-.055	4	-.009	2	-.315	6	-1.216	4	-.819	5	-.328	2
419		5	max	4.929	4	.11	6	.047	5	0	1	0	1	0	1	0	1
420			min	-5.146	6	-.11	4	-.019	2	0	1	0	1	0	1	0	1
421	WT20	1	max	6.027	4	.11	4	.068	1	0	1	0	1	0	1	0	1
422			min	-5.785	6	-.11	6	.004	4	0	1	0	1	0	1	0	1

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	lc	y Shear...	lc	z Shear...	lc	y-Top[ksi]	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
423		2	max	6.015	4	.055	4	.034	1	.315	4	1.216	6	1.174	1	-.077	4
424			min	-5.786	6	-.055	6	.002	4	-.315	6	-1.216	4	.077	4	-1.174	1
425		3	max	6.004	4	0	1	0	1	.42	4	1.621	6	1.565	1	-.103	4
426			min	-5.786	6	0	1	0	1	-.42	6	-1.621	4	.103	4	-1.565	1
427		4	max	5.993	4	.055	6	-.002	4	.315	4	1.216	6	1.174	1	-.077	4
428			min	-5.786	6	-.055	4	-.034	1	-.315	6	-1.216	4	.077	4	-1.174	1
429		5	max	5.981	4	.11	6	-.004	4	0	1	0	1	0	1	0	1
430			min	-5.787	6	-.11	4	-.068	1	0	1	0	1	0	1	0	1
431	Mast1	1	max	19.205	4	.421	2	.229	6	.08	6	6.985	2	10.149	4	10.09	6
432			min	-18.148	6	-.008	6	-.226	4	-6.985	2	-.08	6	-10.09	6	-10.149	4
433		2	max	19.175	4	.401	2	.209	6	0	4	2.804	2	7.951	4	7.865	6
434			min	-18.178	6	-.008	6	-.206	4	-2.804	2	0	4	-7.865	6	-7.951	4
435		3	max	19.145	4	.379	2	.187	6	1.164	2	.084	6	5.966	4	5.853	6
436			min	-18.208	6	-.008	6	-.184	4	-.084	6	-1.164	2	-5.853	6	-5.966	4
437		4	max	17.439	4	.003	6	.121	4	2.622	2	.122	6	5.349	4	5.248	6
438			min	-16.535	6	-.21	2	-.129	6	-.122	6	-2.622	2	-5.248	6	-5.349	4
439		5	max	17.409	4	.003	6	.147	4	.362	2	.093	5	6.711	4	6.683	6
440			min	-16.565	6	-.235	2	-.154	6	-.093	5	-.362	2	-6.683	6	-6.711	4
441	Mast2	1	max	17.409	4	.003	6	.147	4	.362	2	.093	5	6.711	4	6.683	6
442			min	-16.565	6	-.235	2	-.154	6	-.093	5	-.362	2	-6.683	6	-6.711	4
443		2	max	13.262	4	.009	6	.174	6	.019	4	.845	2	6.68	4	6.677	6
444			min	-12.453	6	-.006	4	-.172	4	-.845	2	-.019	4	-6.677	6	-6.68	4
445		3	max	13.234	4	.009	6	.147	6	.05	6	.988	2	5.154	4	5.126	6
446			min	-12.481	6	-.028	2	-.145	4	-.988	2	-.05	6	-5.126	6	-5.154	4
447		4	max	9.022	4	.239	2	.205	6	.081	6	.056	3	3.466	4	3.449	6
448			min	-8.33	6	-.003	6	-.21	4	-.056	3	-.081	6	-3.449	6	-3.466	4
449		5	max	8.993	4	.209	2	.175	6	2.11	2	.027	3	1.584	4	1.617	6
450			min	-8.358	6	-.003	6	-.18	4	-.027	3	-2.11	2	-1.617	6	-1.584	4
451	Mast3	1	max	8.993	4	.209	2	.175	6	2.11	2	.027	3	1.584	4	1.617	6
452			min	-8.358	6	-.003	6	-.18	4	-.027	3	-2.11	2	-1.617	6	-1.584	4
453		2	max	4.337	4	0	3	.779	4	.027	6	1.296	2	4.228	4	4.274	6
454			min	-3.778	6	-.978	2	-.776	6	-1.296	2	-.027	6	-4.274	6	-4.228	4
455		3	max	4.309	4	0	3	.812	4	.009	6	10.888	2	11.9	4	11.916	6
456			min	-3.807	6	-1.011	2	-.809	6	-10.888	2	-.009	6	-11.916	6	-11.9	4
457		4	max	.284	3	.41	2	.41	6	0	3	14.169	2	14.169	4	14.169	6
458			min	.206	2	0	3	-.41	4	-14.169	2	0	3	-14.169	6	-14.169	4
459		5	max	.245	3	.374	2	.374	6	0	3	10.387	2	10.387	4	10.387	6
460			min	.177	2	0	3	-.374	4	-10.387	2	0	3	-10.387	6	-10.387	4
461	Mast4	1	max	.245	3	.374	2	.374	6	0	3	10.387	2	10.387	4	10.387	6
462			min	.177	6	0	3	-.374	4	-10.387	2	0	3	-10.387	6	-10.387	4
463		2	max	.207	3	.337	2	.337	6	0	3	7.016	2	7.016	4	7.016	6
464			min	.149	6	0	3	-.337	4	-7.016	2	0	3	-7.016	6	-7.016	4
465		3	max	.169	3	.299	2	.299	6	0	3	3.998	2	3.998	4	3.998	6
466			min	.121	6	0	3	-.299	4	-3.998	2	0	3	-3.998	6	-3.998	4
467		4	max	.131	3	.26	2	.26	6	0	3	1.348	2	1.348	4	1.348	6
468			min	.093	6	0	3	-.26	4	-1.348	2	0	3	-1.348	6	-1.348	4
469		5	max	0	1	0	1	0	1	0	1	0	1	0	1	0	1
470			min	0	1	0	1	0	1	0	1	0	1	0	1	0	1
471	Horz 12	1	max	1.021	6	.048	4	.001	6	1.139	4	2.125	6	.287	6	.3	4
472			min	-.777	4	.033	5	-.002	2	-2.125	6	-1.139	4	-.3	4	-.287	6
473		2	max	1.021	6	.032	4	.001	6	1.739	4	1.748	6	.3	6	.306	4
474			min	-.777	4	.017	5	-.002	2	-1.748	6	-1.739	4	-.306	4	-.3	6
475		3	max	1.021	6	.016	4	.001	6	2.103	4	1.608	6	.313	6	.313	4
476			min	-.777	4	.001	5	-.002	2	-1.608	6	-2.103	4	-.313	4	-.313	6
477		4	max	1.021	6	0	4	.001	6	2.229	4	1.705	6	.326	6	.319	4
478			min	-.777	4	-.015	5	-.002	2	-1.705	6	-2.229	4	-.319	4	-.326	6
479		5	max	1.021	6	-.015	4	.001	6	2.12	4	2.039	6	.339	6	.326	4

Envelope Member Section Stresses (Continued)

	Member	Sec		Axial[ksi]	lc	y Shear...	lc	z Shear...	lc	y-Top[ksi]	lc	y-Bot[ksi]	lc	z-Top[ksi]	lc	z-Bot[ksi]	lc
480			min	-.777	4	-.03	5	-.002	2	-2.039	6	-2.12	4	-.326	4	-.339	6

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	BOTLEG1	max	5.305	6	251.522	6	19.061	6	559.525	6	.169	4	120.432	2
2		min	-15.637	2	-225.744	4	-19.081	4	-564.357	4	-.171	6	-32.298	6
3	BOTMAST	max	.103	6	491.659	4	2.926	6	92.024	6	.085	2	63.707	2
4		min	-5.387	2	-464.595	6	-2.892	4	-92.56	4	-.048	6	-.727	6
5	BOTLEG2	max	5.208	4	254.472	6	23.312	6	662.857	6	.099	2	119.416	2
6		min	-15.204	2	-224.517	4	-23.327	4	-666.032	4	-.081	4	-25.859	4
7	Totals:	max	0	4	56.882	5	45.299	6						
8		min	-36.228	2	41.399	4	-45.299	4						

Envelope Joint Displacements

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation...	lc	Y Rotation...	lc	Z Rotation ...	lc
1	1	max	.306	2	.019	4	.252	4	3.601e-3	4	1.364e-3	6	3.079e-4	6
2		min	-.066	6	-.021	6	-.249	6	-3.565e-3	6	-1.349e-3	4	-2.743e-3	2
3	2	max	.305	2	.019	4	.296	4	4.216e-3	4	6.429e-4	4	9.966e-5	6
4		min	-.039	4	-.021	6	-.295	6	-4.192e-3	6	-7.909e-4	2	-2.741e-3	2
5	3	max	.513	2	.041	4	.905	4	6.351e-3	4	3.609e-3	6	4.833e-4	6
6		min	-.049	6	-.045	6	-.896	6	-6.275e-3	6	-3.571e-3	4	-5.477e-4	4
7	4	max	.513	2	.041	4	1.056	4	7.295e-3	4	1.709e-3	4	3.778e-4	4
8		min	-.041	6	-.045	6	-1.05	6	-7.25e-3	6	-2.087e-3	2	-3.401e-4	6
9	5	max	.512	2	.043	4	.945	4	6.628e-3	4	4.07e-3	6	8.718e-4	6
10		min	-.054	6	-.047	6	-.935	6	-6.547e-3	6	-4.027e-3	4	-9.452e-4	4
11	6	max	.512	2	.043	4	1.102	4	7.592e-3	4	1.928e-3	4	9.493e-4	4
12		min	-.037	6	-.048	6	-1.096	6	-7.545e-3	6	-2.353e-3	2	-9.233e-4	6
13	7	max	.498	2	.053	4	1.143	4	7.759e-3	4	4.607e-3	6	8.514e-4	6
14		min	-.087	6	-.058	6	-1.131	6	-7.658e-3	6	-4.576e-3	4	-8.618e-4	4
15	8	max	.497	2	.053	4	1.328	4	8.783e-3	4	2.277e-3	4	9.165e-4	4
16		min	-.005	4	-.059	6	-1.32	6	-8.729e-3	6	-2.326e-3	2	-9.397e-4	6
17	9	max	.569	2	.071	4	1.648	4	9.736e-3	4	6.004e-3	6	7.377e-4	4
18		min	-.068	6	-.078	6	-1.628	6	-9.591e-3	6	-5.998e-3	4	-1.411e-3	2
19	10	max	.57	2	.07	4	1.893	4	1.081e-2	4	3.183e-3	4	1.112e-3	6
20		min	-.038	6	-.078	6	-1.882	6	-1.075e-2	6	-3.14e-3	6	-1.443e-3	2
21	11	max	.653	2	.098	4	2.568	4	1.191e-2	4	6.64e-3	6	7.792e-4	6
22		min	-.065	6	-.106	6	-2.533	6	-1.169e-2	6	-6.486e-3	4	-1.313e-3	2
23	12	max	.654	2	.096	4	2.904	4	1.3e-2	4	2.828e-3	4	4.146e-4	4
24		min	-.062	6	-.107	6	-2.889	6	-1.297e-2	6	-3.441e-3	2	-1.226e-3	2
25	13	max	.662	2	.099	4	2.64	4	1.204e-2	4	7.744e-3	6	9.027e-4	6
26		min	-.07	6	-.108	6	-2.604	6	-1.181e-2	6	-7.571e-3	4	-1.393e-3	2
27	14	max	.662	2	.098	4	2.983	4	1.312e-2	4	3.724e-3	4	5.108e-4	4
28		min	-.06	6	-.109	6	-2.968	6	-1.31e-2	6	-3.656e-3	6	-1.294e-3	2
29	15	max	.687	2	.105	4	2.861	4	1.238e-2	4	8.118e-3	6	8.042e-4	6
30		min	-.087	6	-.114	6	-2.821	6	-1.214e-2	6	-7.935e-3	4	-1.322e-3	2
31	16	max	.685	2	.104	4	3.223	4	1.347e-2	4	3.98e-3	4	5.144e-4	4
32		min	-.049	6	-.115	6	-3.208	6	-1.346e-2	6	-3.902e-3	6	-1.228e-3	2
33	17	max	.869	2	.136	4	4.771	4	1.452e-2	4	1.205e-2	6	2.097e-4	6
34		min	-.092	6	-.147	6	-4.685	6	-1.409e-2	6	-1.176e-2	4	-2.274e-3	2
35	18	max	.865	2	.134	4	5.281	4	1.549e-2	4	6.574e-3	4	1.038e-3	6
36		min	-.087	6	-.149	6	-5.274	6	-1.565e-2	6	-6.413e-3	6	-2.176e-3	2
37	19	max	.883	2	.137	4	4.858	4	1.459e-2	4	1.19e-2	6	3.34e-4	6
38		min	-.094	6	-.149	6	-4.77	6	-1.415e-2	6	-1.158e-2	4	-2.422e-3	2
39	20	max	.879	2	.136	4	5.374	4	1.556e-2	4	6.358e-3	4	1.059e-3	6
40		min	-.093	6	-.15	6	-5.368	6	-1.573e-2	6	-6.159e-3	6	-2.346e-3	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation...	lc	Y Rotation...	lc	Z Rotation ...	lc
41	21	max	.928	2	.141	4	5.123	4	1.48e-2	4	1.148e-2	6	6.492e-4	6
42		min	-.103	6	-.153	6	-5.026	6	-1.433e-2	6	-1.105e-2	4	-2.407e-3	2
43	22	max	.924	2	.14	4	5.656	4	1.575e-2	4	5.733e-3	4	7.519e-4	6
44		min	-.111	6	-.155	6	-5.653	6	-1.595e-2	6	-5.42e-3	6	-2.51e-3	2
45	23	max	.982	2	.144	4	5.482	4	1.507e-2	4	1.112e-2	6	5.981e-4	6
46		min	-.12	6	-.157	6	-5.373	6	-1.457e-2	6	-1.055e-2	4	-2.095e-3	2
47	24	max	.981	2	.143	4	6.037	4	1.6e-2	4	5.012e-3	4	3.421e-4	6
48		min	-.122	6	-.159	6	-6.04	6	-1.624e-2	6	-5.7e-3	2	-2.168e-3	2
49	25	max	.994	2	.145	4	5.573	4	1.514e-2	4	1.103e-2	6	5.404e-4	6
50		min	-.123	6	-.158	6	-5.461	6	-1.462e-2	6	-1.042e-2	4	-2.056e-3	2
51	26	max	.994	2	.144	4	6.134	4	1.606e-2	4	4.831e-3	4	3.202e-4	6
52		min	-.124	6	-.16	6	-6.138	6	-1.631e-2	6	-5.814e-3	2	-2.084e-3	2
53	27	max	1.244	2	.162	4	7.712	4	1.653e-2	4	9.027e-3	6	4.991e-4	6
54		min	-.177	6	-.18	6	-7.519	6	-1.587e-2	6	-8.361e-3	2	-2.066e-3	2
55	28	max	1.237	2	.162	4	8.381	4	1.718e-2	4	8.314e-4	3	2.275e-4	6
56		min	-.154	6	-.182	6	-8.431	6	-1.759e-2	6	-8.38e-3	2	-2.093e-3	2
57	29	max	1.466	2	.164	4	9.449	4	1.756e-2	4	8.353e-3	6	5.919e-4	4
58		min	-.207	6	-.183	6	-9.187	6	-1.686e-2	6	-1.086e-2	2	-1.763e-3	2
59	30	max	1.466	2	.163	4	10.175	4	1.802e-2	4	4.2e-3	6	9.879e-4	6
60		min	-.206	6	-.185	6	-10.269	6	-1.847e-2	6	-1.086e-2	2	-1.803e-3	2
61	31	max	1.476	2	.164	4	9.555	4	1.762e-2	4	8.314e-3	6	6.96e-4	4
62		min	-.205	6	-.184	6	-9.289	6	-1.692e-2	6	-1.1e-2	2	-1.688e-3	2
63	32	max	1.476	2	.163	4	10.283	4	1.808e-2	4	4.411e-3	6	1.053e-3	6
64		min	-.212	6	-.186	6	-10.38	6	-1.853e-2	6	-1.101e-2	2	-1.717e-3	2
65	33	max	1.556	2	.165	4	10.576	4	1.825e-2	4	7.938e-3	6	9.686e-4	6
66		min	-.197	6	-.186	6	-10.27	6	-1.756e-2	6	-1.24e-2	2	-1.206e-3	2
67	34	max	1.556	2	.164	4	11.328	4	1.867e-2	4	6.415e-3	6	1.087e-3	4
68		min	-.242	6	-.188	6	-11.451	6	-1.912e-2	6	-1.24e-2	2	-1.126e-3	2
69	35	max	.513	2	.015	4	1.085	4	6.921e-3	4	9.718e-4	6	-2.195e-6	4
70		min	-.045	6	-.066	5	-1.102	6	-6.849e-3	6	-1.809e-3	2	-3.295e-4	2
71	36	max	.537	2	.052	4	1.546	4	8.803e-3	4	1.276e-3	6	1.152e-5	4
72		min	-.049	6	-.057	6	-1.533	6	-8.698e-3	6	-2.385e-3	2	-4.443e-4	2
73	37	max	.608	2	.097	4	2.455	4	1.176e-2	4	1.971e-3	6	5.58e-5	4
74		min	-.058	6	-.106	6	-2.435	6	-1.162e-2	6	-3.691e-3	2	-3.818e-4	2
75	38	max	.658	2	.071	4	2.856	4	1.246e-2	4	2.22e-3	6	-4.289e-6	6
76		min	-.064	6	-.123	6	-2.856	6	-1.233e-2	6	-3.987e-3	2	-7.096e-4	2
77	39	max	.755	2	.118	4	4.334	4	1.448e-2	4	3.158e-3	6	4.602e-5	4
78		min	-.077	6	-.13	6	-4.298	6	-1.434e-2	6	-5.546e-3	2	-6.964e-4	2
79	40	max	.874	2	.166	4	5.187	4	1.498e-2	4	3.666e-3	6	-6.664e-6	6
80		min	-.092	6	-.222	6	-5.166	6	-1.484e-2	6	-6.317e-3	2	-9.545e-4	2
81	41	max	.988	2	.15	4	5.908	4	1.554e-2	4	4.15e-3	6	-6.037e-6	4
82		min	-.122	6	-.203	6	-5.878	6	-1.54e-2	6	-7.117e-3	2	-9.989e-4	2
83	43	max	1.471	2	.214	4	9.994	4	1.781e-2	4	6.707e-3	6	-6.599e-6	4
84		min	-.207	6	-.275	6	-9.933	6	-1.769e-2	6	-1.153e-2	2	-1.157e-3	2
85	BOTLEG1	max	0	2	0	4	0	4	0	4	0	6	0	6
86		min	0	6	0	6	0	6	0	6	0	4	0	2
87	BOTLEG2	max	0	2	0	4	0	4	0	4	0	4	0	4
88		min	0	4	0	6	0	6	0	6	0	2	0	2
89	BOTMAST	max	0	2	0	6	0	4	0	4	0	6	0	6
90		min	0	6	0	4	0	6	0	6	0	2	0	2
91	MC1	max	.34	2	.142	6	.817	4	6.413e-3	4	5.888e-6	6	1.823e-5	4
92		min	0	6	-.15	4	-.808	6	-6.332e-3	6	-1.045e-5	2	-1.428e-3	2
93	MC2	max	.464	2	.236	6	2.169	4	1.027e-2	4	9.969e-6	6	6.819e-5	4
94		min	-.007	4	-.249	4	-2.143	6	-1.015e-2	6	-1.75e-5	2	-5.627e-4	2
95	MC3	max	.602	2	.307	6	4.2	4	1.4e-2	4	1.36e-5	6	6.141e-5	4
96		min	-.018	4	-.324	4	-4.153	6	-1.387e-2	6	-2.377e-5	2	-1.151e-3	2
97	MC4	max	.777	2	.355	6	6.674	4	1.557e-2	4	1.654e-5	6	3.725e-5	4

Envelope Joint Displacements (Continued)

	Joint		X [in]	lc	Y [in]	lc	Z [in]	lc	X Rotation...	lc	Y Rotation...	lc	Z Rotation ...	lc
98		min	-.026	4	-.375	4	-6.606	6	-1.544e-2	6	-2.885e-5	2	-4.71e-4	2
99	MC5	max	1.006	2	.376	6	9.53	4	2.081e-2	4	1.832e-5	6	3.452e-5	4
100		min	-.032	4	-.4	4	-9.443	6	-2.07e-2	6	-3.195e-5	2	-4.496e-3	2
101	TOPLEG1	max	1.574	2	.165	4	10.852	4	1.842e-2	4	7.862e-3	6	1.233e-3	6
102		min	-.217	6	-.186	6	-10.536	6	-1.772e-2	6	-1.283e-2	2	-1.252e-3	4
103	TOPLEG2	max	1.572	2	.164	4	11.61	4	1.883e-2	4	6.987e-3	6	1.464e-3	4
104		min	-.222	6	-.188	6	-11.74	6	-1.929e-2	6	-1.283e-2	2	-1.234e-3	6
105	TOPMAST	max	6.639	2	.374	6	22.429	4	3.227e-2	4	1.832e-5	6	3.452e-5	4
106		min	-.047	4	-.402	4	-22.296	6	-3.216e-2	6	-3.195e-5	2	-1.596e-2	2
107	TOPPLT1	max	.507	2	.036	4	.831	4	5.768e-3	4	2.689e-3	6	1.733e-4	4
108		min	-.048	6	-.04	6	-.822	6	-5.702e-3	6	-2.661e-3	4	-9.476e-4	2
109	TOPPLT2	max	.507	2	.036	4	.971	4	6.665e-3	4	1.272e-3	4	6.771e-4	6
110		min	-.038	6	-.04	6	-.965	6	-6.624e-3	6	-1.556e-3	2	-9.616e-4	2
111	T MOBILE	max	6.065	2	.374	6	21.268	4	3.226e-2	4	1.832e-5	6	3.452e-5	4
112		min	-.046	4	-.402	4	-21.138	6	-3.216e-2	6	-3.195e-5	2	-1.596e-2	2
113	POCKET	max	1.496	2	.164	4	9.767	4	1.775e-2	4	8.234e-3	6	7.76e-4	4
114		min	-.198	6	-.184	6	-9.492	6	-1.705e-2	6	-1.13e-2	2	-1.552e-3	2
115	POCKET2	max	1.496	2	.163	4	10.5	4	1.819e-2	4	4.833e-3	6	1.05e-3	6
116		min	-.225	6	-.186	6	-10.603	6	-1.864e-2	6	-1.13e-2	2	-1.573e-3	2
117	FC1	max	.442	2	.211	6	1.749	4	9.092e-3	4	8.893e-6	6	5.903e-5	4
118		min	-.004	4	-.223	4	-1.728	6	-8.973e-3	6	-1.565e-5	2	-5.217e-4	2
119	FC2	max	.745	2	.342	6	5.999	4	1.538e-2	4	1.577e-5	6	3.999e-5	4
120		min	-.024	4	-.362	4	-5.937	6	-1.525e-2	6	-2.751e-5	2	-9.088e-4	2
121	FC3	max	1.955	2	.375	6	12.461	4	2.694e-2	4	1.832e-5	6	3.452e-5	4
122		min	-.036	4	-.401	4	-12.362	6	-2.683e-2	6	-3.195e-5	2	-1.063e-2	2

Envelope AISC ASD Steel Code Checks

	Member	Shape	Code Check	Loc[ft]	lc	Shear Check	Loc[ft]	...	lc	Fa ...	Ft [...	...	Fb ...	C..	C..		AS...
1	CROSS..	L5X5X5	.099	15.207	2	.018	7.603	y	6	17...	28...	...					H2-1
2	CROSS..	L5X5X5	.166	15.207	2	.015	0	y	4	17...	28...	...					H1-1
3	CROSS..	L5X5X5	.159	15.207	2	.017	0	z	4	17...	28...	...					H2-1
4	CROSS..	L5X5X5	.260	15.207	2	.016	15.207	z	4	17...	28...	...					H1-1
5	CROSS..	L3.5X3.5X5	.704	0	6	.021	18.916	z	6	7.3...	28...	...					H1-1
6	CROSS..	L3.5X3.5X5	.952	18.916	2	.020	18.916	z	6	7.3...	28...	...					H1-1
7	CROSS..	L5X5X5	.290	33.126	2	.022	0	z	4	1.2...	28...	...					H2-1
8	CROSS..	L5X5X5	.046	0	6	.025	0	z	6	1.2...	28...	...					H2-1
9	HORZ1	L5X5X5	.135	6.755	4	.009	13.509	z	6	18...	28...	...					H1-1
10	HORZ2	L5X5X5	.140	6.755	4	.008	13.509	z	6	18...	28...	...					H1-1
11	HORZ3	L5X5X5	.069	6.755	4	.010	13.509	z	6	18...	28...	...					H1-1
12	HORZ4	L5X5X5	.098	6.755	4	.009	13.509	z	6	18...	28...	...					H1-1
13	HORZ5	L5X5X5	.042	0	5	.010	13.509	z	6	18...	28...	...					H1-1
14	HORZ6	L5X5X5	.130	13.509	2	.009	13.509	z	6	18...	28...	...					H1-1
15	HORZ7	L5X5X5	.081	0	6	.010	13.509	z	6	18...	28...	...					H1-1
16	HORZ8	L5X5X5	.082	13.509	2	.009	0	z	6	18...	28...	...					H1-1
17	HORZ9	L5X5X5	.066	0	6	.010	13.509	z	6	18...	28...	...					H1-1
18	HORZ10	L5X5X5	.047	13.509	1	.009	0	z	6	18...	28...	...					H1-1
19	HORZ11	TU8X4X5	.089	8.016	4	.022	0	y	2	36...	36...	...	40...	1	.85	.85	H2-1
20	LEG1	W24X68	.875	.625	6	.083	15.625	y	6	39...	39...	...	38...	...	...	.85	H1-2
21	LEG2	W24X68	.990	1.25	6	.083	0	y	4	39...	39...	...	38...	...	...	.85	H1-2
22	LEG_W..	new	.468	0	6	.077	5.339	y	4	35...	39...	...	39...	...	...	.85	H1-2
23	LEG_W..	new	.513	0	6	.094	0	y	4	35...	39...	...	39...	...	...	.85	H1-2
24	WT1	WT6X15	.204	5.045	6	.009	0	y	4	19...	39...	...	28...	1	1	1	H1-3
25	WT2	WT6X15	.335	5.256	2	.007	0	y	4	19...	39...	...	28...	1	1	1	H1-1
26	WT3	WT6X15	.385	4.94	2	.010	0	y	6	19...	39...	...	28...	1	1	1	H1-1
27	WT4	WT6X15	.240	4.94	4	.009	0	y	4	19...	39...	...	28...	1	1	1	H1-1
28	WT5	WT6X15	.510	5.045	6	.012	0	y	6	19...	39...	...	28...	1	1	1	H1-1

Envelope AISC ASD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[ft]	lc	Shear Check	Loc[ft]	...	lc	Fa ...	Ft [...	...	Fb ...	...	C...	C...	AS...
29	WT6	WT6X15	.649	5.045	6	.008	10.091	y	4	19...	39...	...	28...	1	1	1	H1-1
30	WT7	WT6X15	.364	4.94	4	.014	10.091	y	6	19...	39...	...	28...	1	1	1	H1-1
31	WT8	WT6X15	.482	4.94	4	.011	10.091	y	6	19...	39...	...	28...	1	1	1	H1-1
32	WT9	WT6X15	.606	5.045	6	.009	0	y	4	19...	39...	...	28...	1	1	1	H1-1
33	WT10	WT6X15	.493	5.045	6	.015	10.091	y	6	19...	39...	...	28...	1	1	1	H1-1
34	WT11	WT6X15	.415	5.151	4	.016	0	y	4	19...	39...	...	28...	1	1	1	H1-1
35	WT12	WT6X15	.509	4.94	4	.012	0	y	6	19...	39...	...	28...	1	1	1	H1-1
36	WT13	WT6X15	.454	5.045	6	.017	0	y	6	19...	39...	...	28...	1	1	1	H1-1
37	WT14	WT6X15	.479	5.045	6	.010	10.091	y	4	19...	39...	...	28...	1	1	1	H1-1
38	WT15	WT6X15	.617	4.94	4	.014	10.091	y	6	19...	39...	...	28...	1	1	1	H1-1
39	WT16	WT6X15	.667	4.94	4	.009	0	z	2	19...	39...	...	28...	1	1	1	H1-1
40	WT17	WT6X15	.669	5.045	6	.019	0	y	6	19...	39...	...	28...	1	1	1	H1-1
41	WT18	WT6X15	.704	5.045	6	.011	0	y	2	19...	39...	...	28...	1	1	1	H1-1
42	WT19	WT6X15	.275	4.94	4	.015	0	y	2	19...	39...	...	28...	1	1	1	H1-1
43	WT20	WT6X15	.329	4.94	4	.015	10.091	z	2	19...	39...	...	28...	1	1	1	H1-1
44	Mast1	HSS18X0.5	.846	0	4	.019	0		2	29...	33...	...	36...	1	.85	...	H1-2
45	Mast2	HSS18X0.5	.719	3.438	4	.011	17.474		2	33...	33...	...	36...	...	.85	....	H1-2
46	Mast3	HSS18X0.5	.557	17.188	4	.046	17.188		2	31...	33...	...	36...	...	.85	...	H1-2
47	Mast4	HSS18X0.5	.286	0	4	.017	0		4	28...	33...	...	36...	...	.85	.6	H1-2
48	Horz 12	TU8X4X5	.087	0	6	.022	0	y	2	36...	36...	...	40...	...	...	.85	H1-2

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	BOTLEG1	-13.52	-115.021	-1.363	53.491	.086	104.462
2	1	BOTMAST	-4.709	18.222	-.019	-.787	.074	55.562
3	1	BOTLEG2	-13.294	153.681	1.383	-59.249	.086	104.356
4	1	Totals:	-31.523	56.882	0			
5	1	COG (ft):	X: 8.794	Y: 51.774	Z: 1.076			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	2	BOTLEG1	-15.637	-137.552	-1.542	62.572	.099	120.432
2	2	BOTMAST	-5.387	13.17	-.035	-.807	.085	63.707
3	2	BOTLEG2	-15.204	165.78	1.577	-67.199	.099	119.416
4	2	Totals:	-36.228	41.399	0			
5	2	COG (ft):	X: 9.304	Y: 50.749	Z: 1.084			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	3	BOTLEG1	-4.489	-194.311	-16.688	-496.285	.155	27.453
2	3	BOTMAST	-.082	441.222	-2.571	-82.069	.036	.62
3	3	BOTLEG2	4.571	-190.028	-20.728	-592.986	-.071	-22.435
4	3	Totals:	0	56.882	-39.987			
5	3	COG (ft):	X: 7.355	Y: 51.774	Z: 1.076			

Joint Reactions

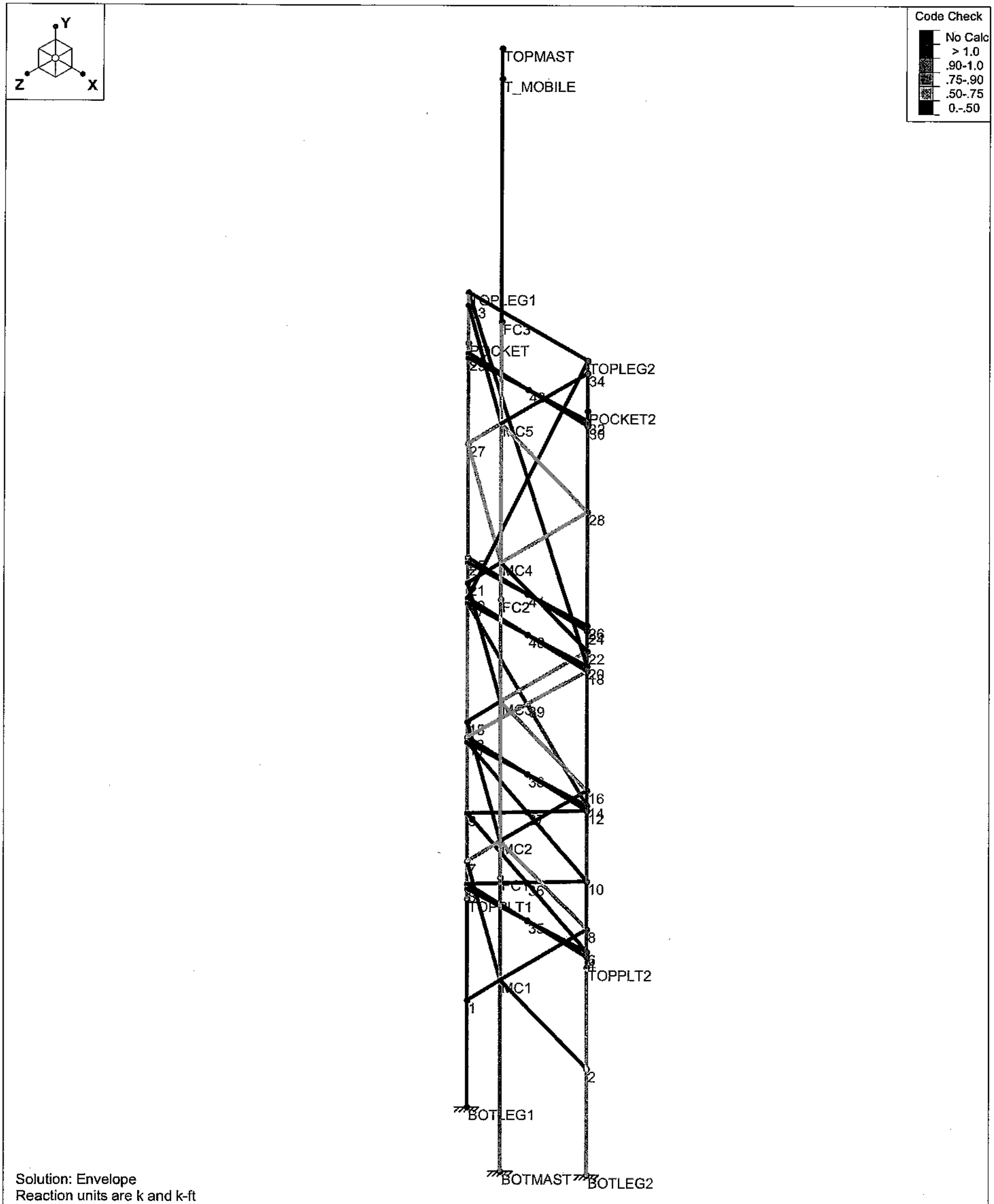
	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	4	BOTLEG1	-5.121	-225.744	-19.081	-564.357	.169	31.067
2	4	BOTMAST	-.088	491.659	-2.892	-92.56	.038	.636
3	4	BOTLEG2	5.208	-224.517	-23.327	-666.032	-.081	-25.859
4	4	Totals:	0	41.399	-45.299			
5	4	COG (ft):	X: 7.088	Y: 50.749	Z: 1.084			

Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	5	BOTLEG1	4.74	227.569	16.664	490.285	-.157	-29.024
2	5	BOTMAST	.099	-404.177	2.614	81.324	-.045	-.672
3	5	BOTLEG2	-4.839	233.49	20.709	588.569	.069	24.01
4	5	Totals:	0	56.882	39.987			
5	5	COG (ft):	X: 7.355	Y: 51.774	Z: 1.076			

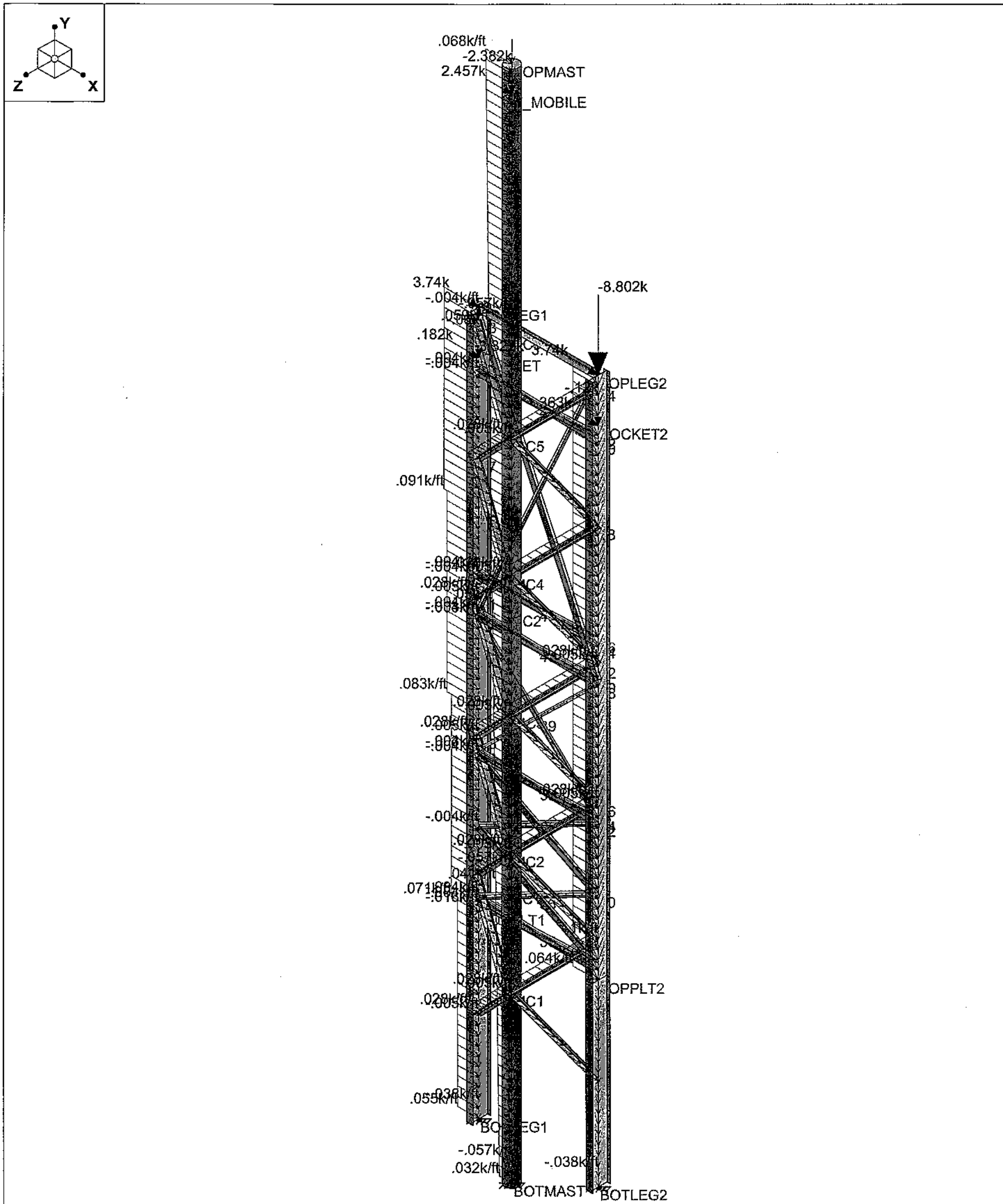
Joint Reactions

	LC	Joint Label	X [k]	Y [k]	Z [k]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	6	BOTLEG1	5.305	251.522	19.061	559.525	-.171	-32.298
2	6	BOTMAST	.103	-464.595	2.926	92.024	-.048	-.727
3	6	BOTLEG2	-5.408	254.472	23.312	662.857	.079	26.953
4	6	Totals:	0	41.399	45.299			
5	6	COG (ft):	X: 7.088	Y: 50.749	Z: 1.084			



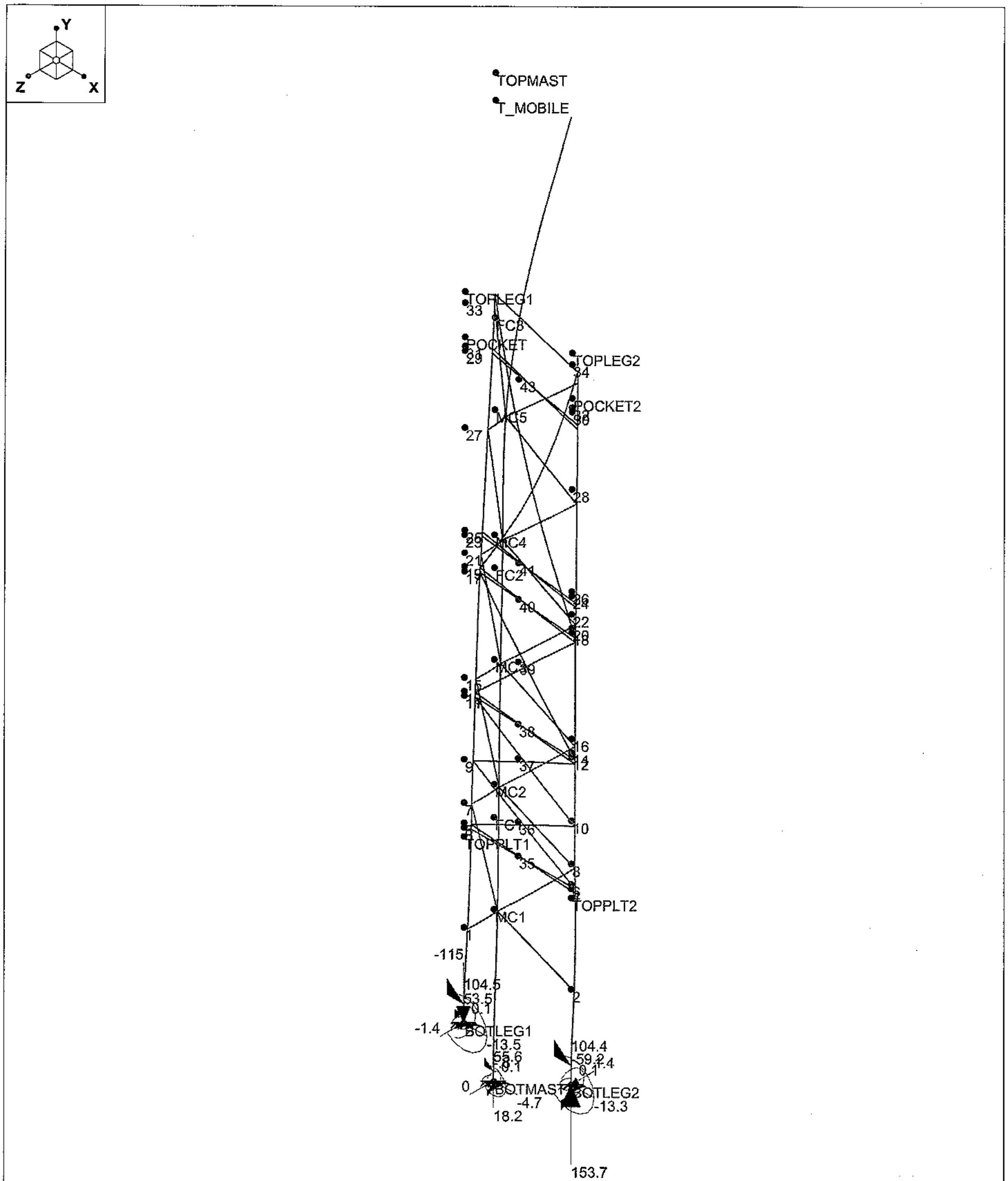
Solution: Envelope
Reaction units are k and k-ft

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:09 PM
09009-CO.7	Unity Check	82' Sign Structure.r3d



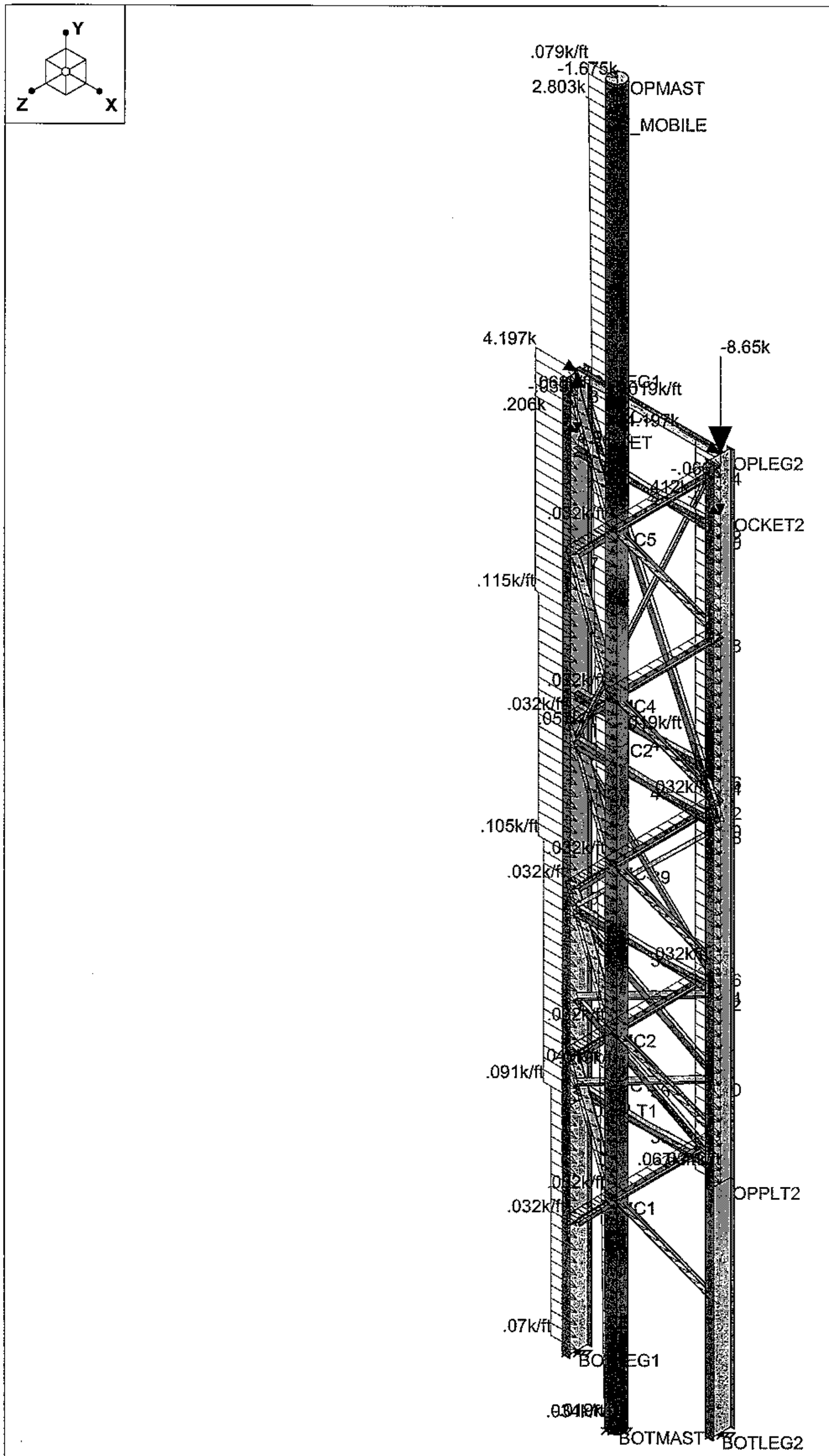
Loads: LC 1, TIA/EIA Wind + Ice in +X Direction

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:02 PM
09009-CO.7	LC #1 Loads	82' Sign Structure.r3d



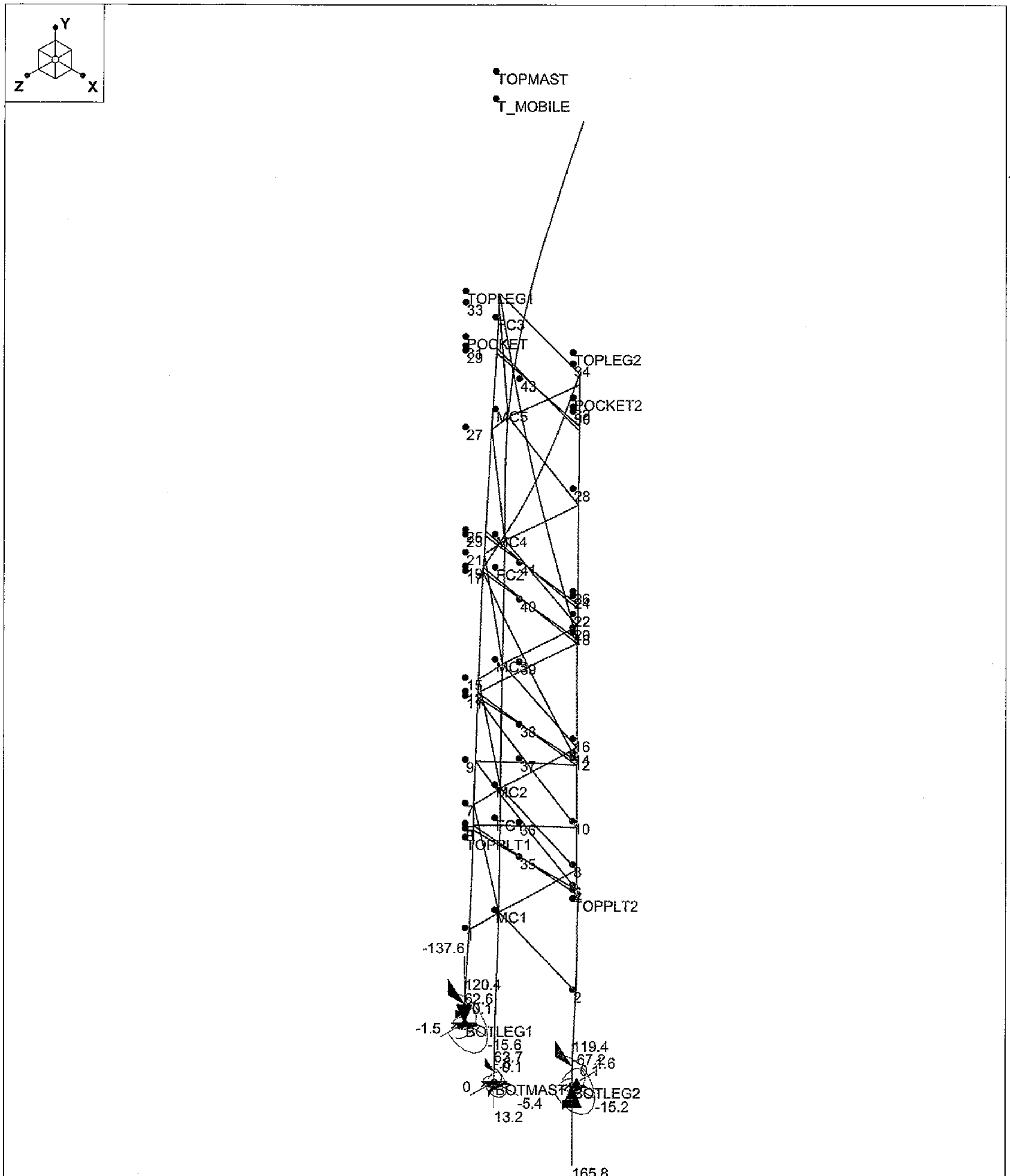
Results for LC 1, TIA/EIA Wind + Ice in +X Direction
Reaction units are k and k-ft

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:05 PM
09009-CO.7	LC #1 Reactions and Deflected Shape	82' Sign Structure.r3d



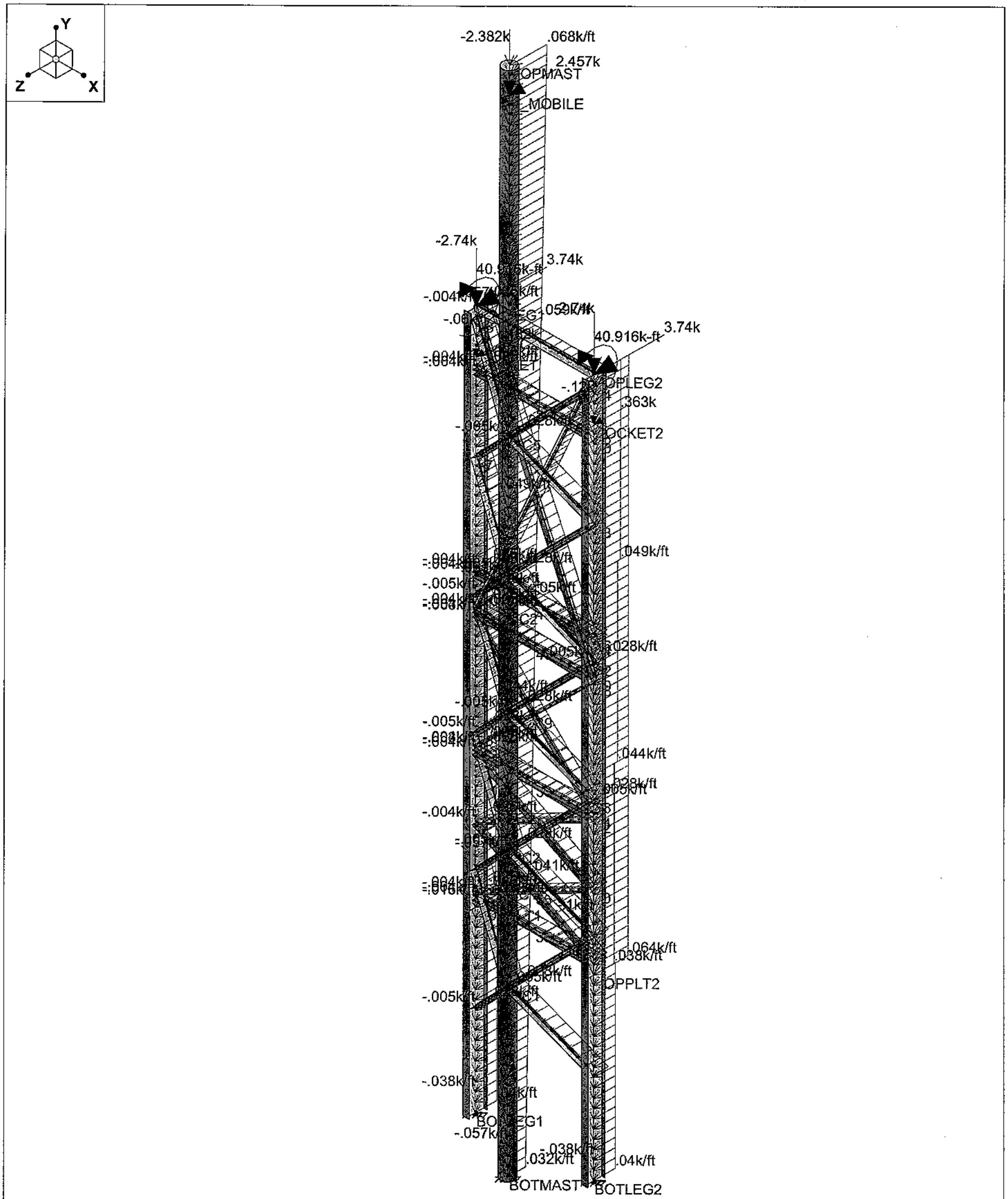
Loads: LC 2, TIA/EIA Wind in +X Direction

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:02 PM
09009-CO.7	LC #2 Loads	82' Sign Structure.r3d



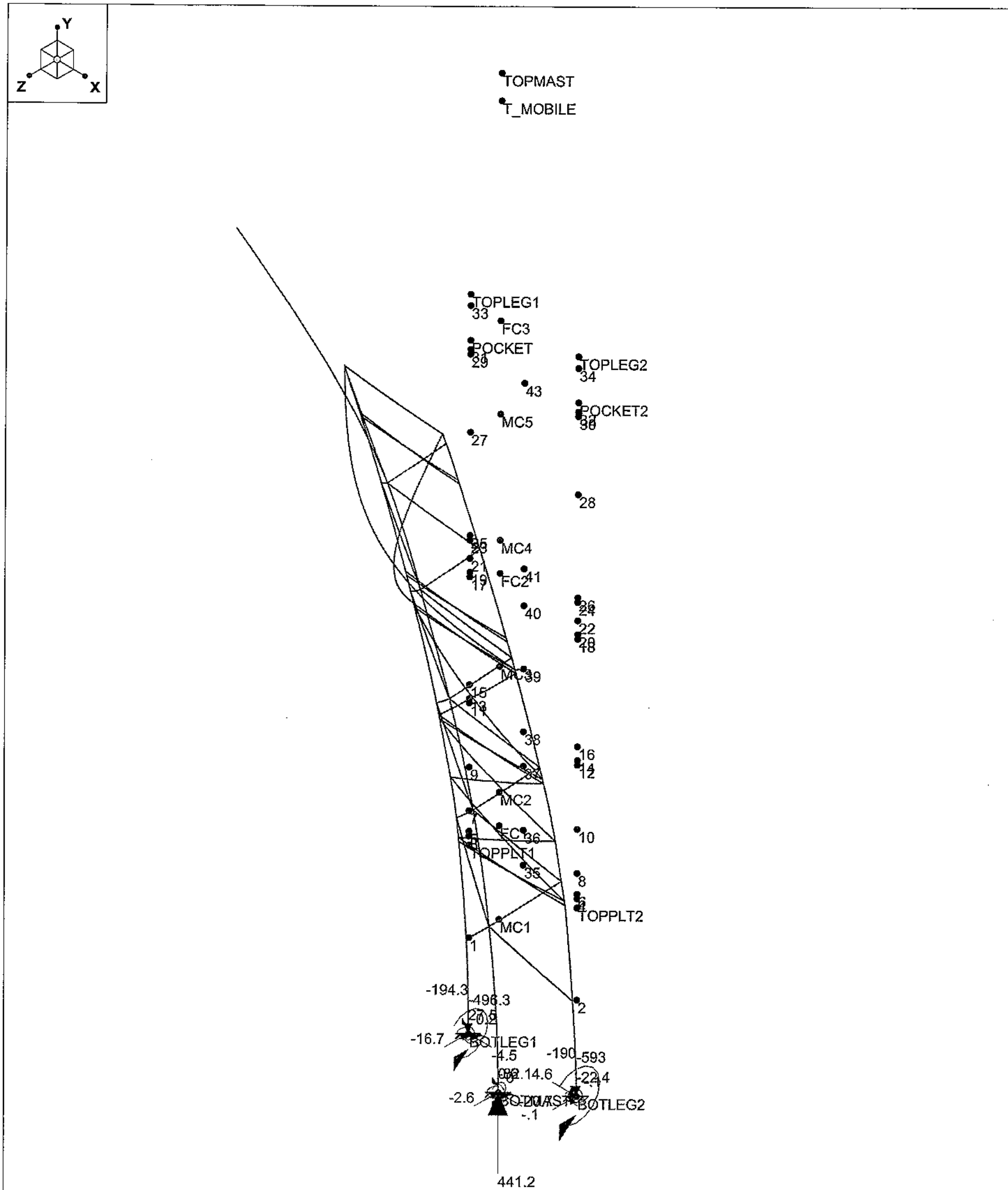
Results for LC 2, TIA/EIA Wind in +X Direction
Reaction units are k and k-ft

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:05 PM
09009-CO.7	LC #2 Reactions and Deflected Shape	82' Sign Structure.r3d



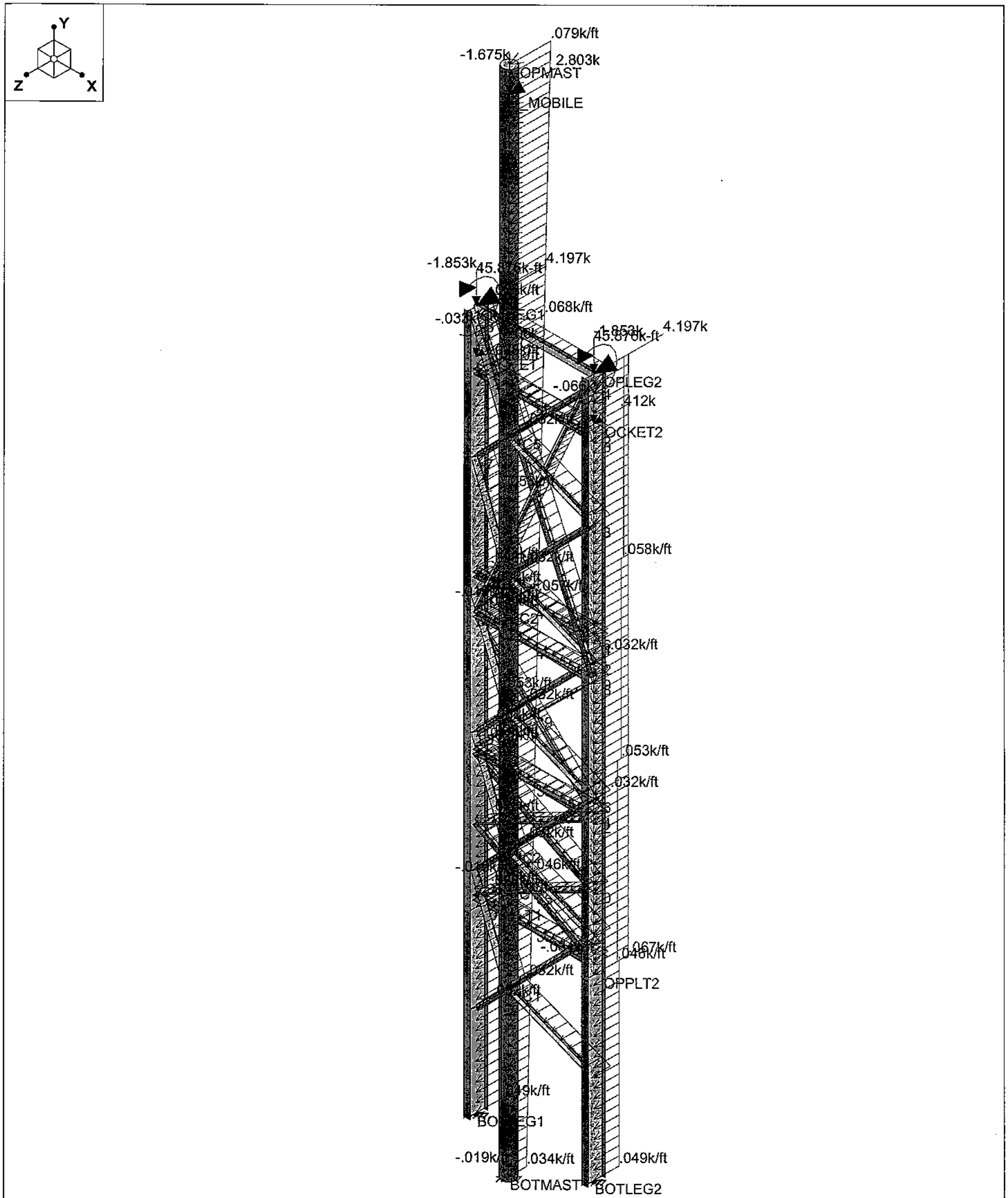
Loads: LC 3, TIA/EIA Wind + Ice in +Z Direction

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:03 PM
09009-CO.7	LC #3 Loads	82' Sign Structure.r3d



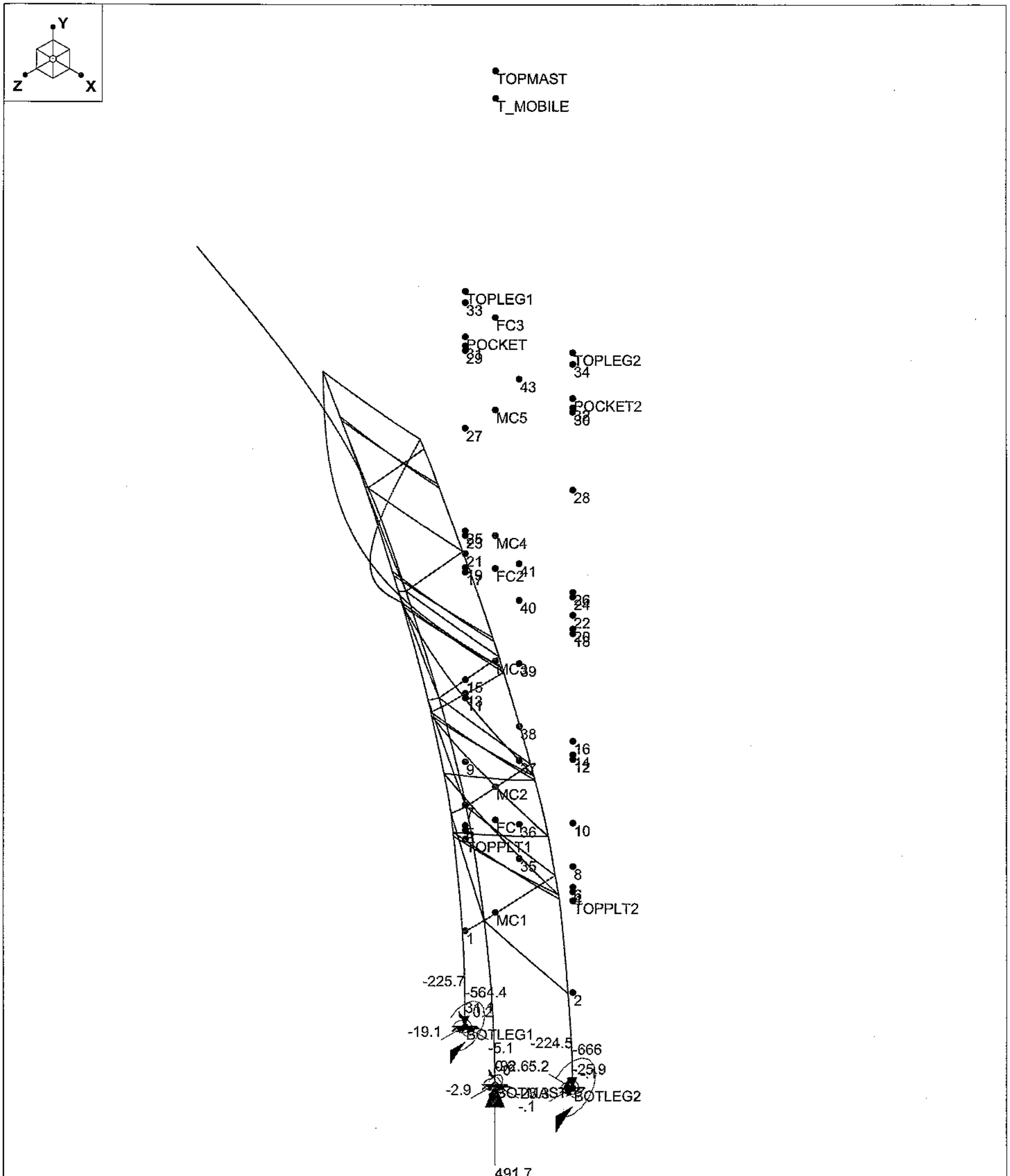
Results for LC 3, TIA/EIA Wind + Ice in +Z Direction
Reaction units are k and k-ft

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:06 PM
09009-CO.7	LC #3 Reactions and Deflected Shape	82' Sign Structure.r3d



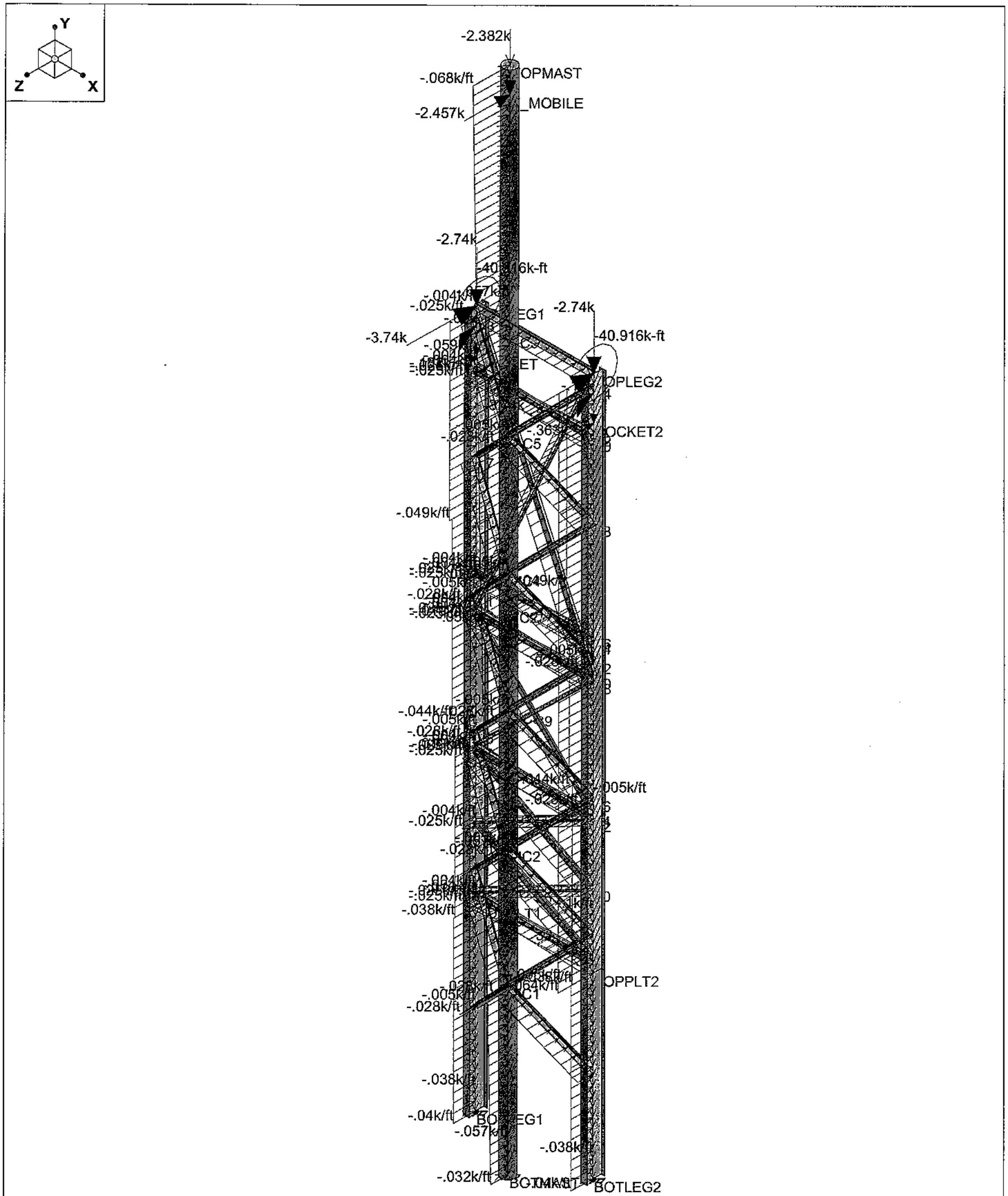
Loads: LC 4, TIA/EIA Wind in +Z Direction

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:03 PM
09009-CO.7	LC #4 Loads	82' Sign Structure.r3d



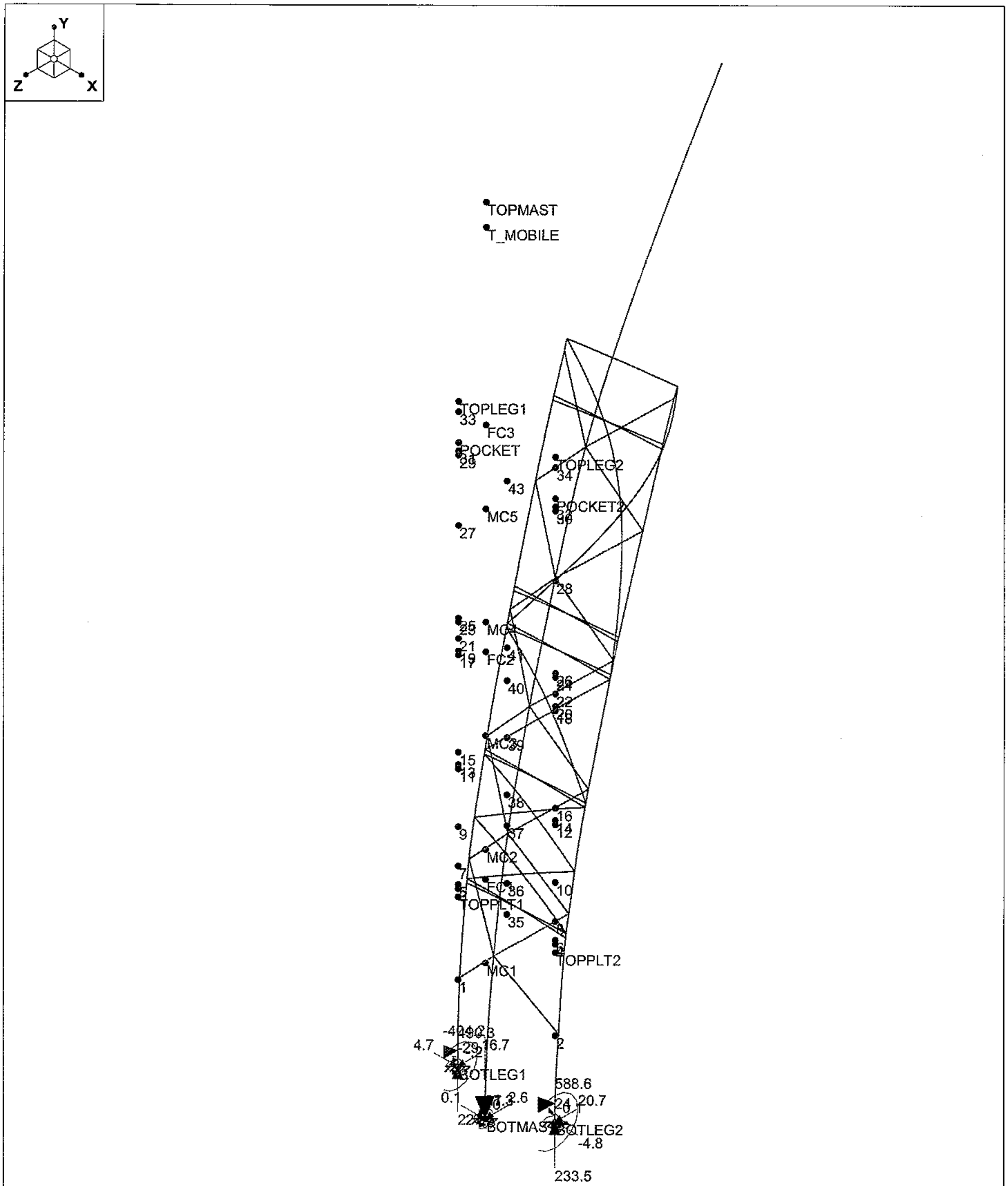
Results for LC 4, TIA/EIA Wind in +Z Direction
Reaction units are k and k-ft

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:06 PM
09009-CO.7	LC #4 Reactions and Deflected Shape	82' Sign Structure.r3d



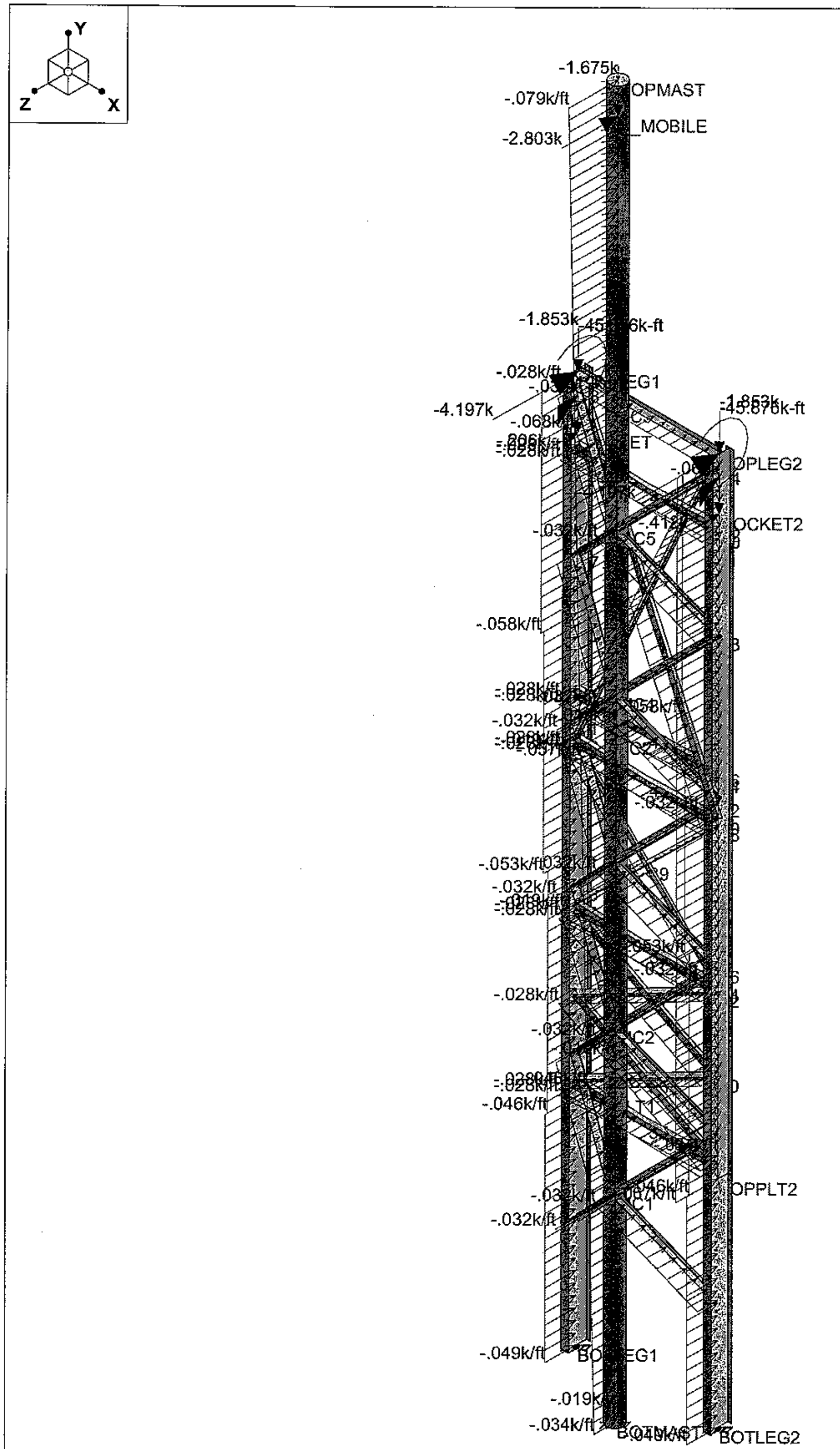
Loads: LC 5, TIA/EIA Wind + Ice in -Z' Direction

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:03 PM
09009-CO.7	LC #5 Loads	82' Sign Structure.r3d



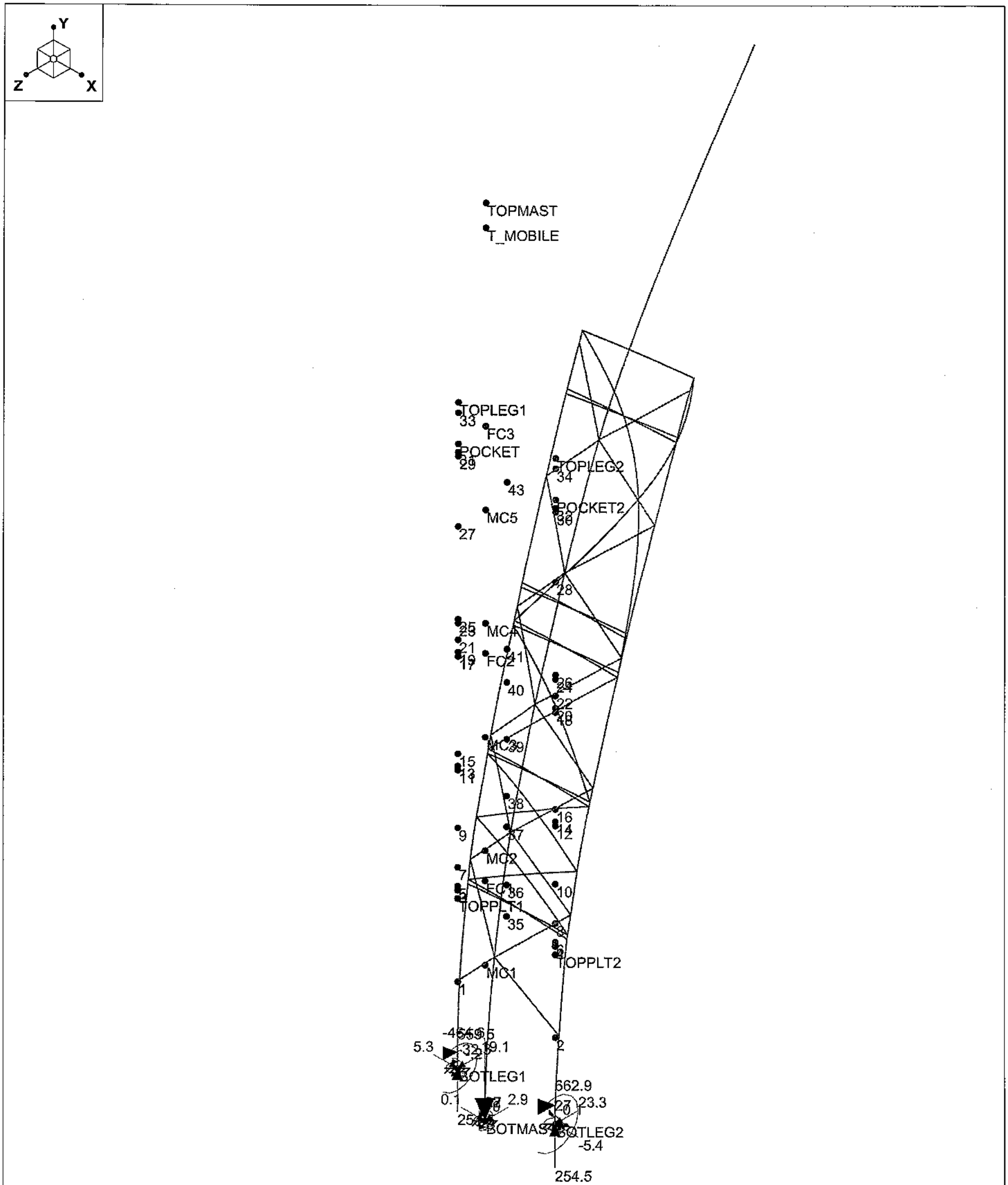
Results for LC 5, TIA/EIA Wind + Ice in -Z' Direction
Reaction units are k and k-ft

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:08 PM
09009-CO.7	LC #5 Reactions and Deflected Shape	82' Sign Structure.r3d



Loads: LC 6, TIA/EIA Wind in -Z' Direction

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:04 PM
09009-CO.7	LC #6 Loads	82' Sign Structure.r3d

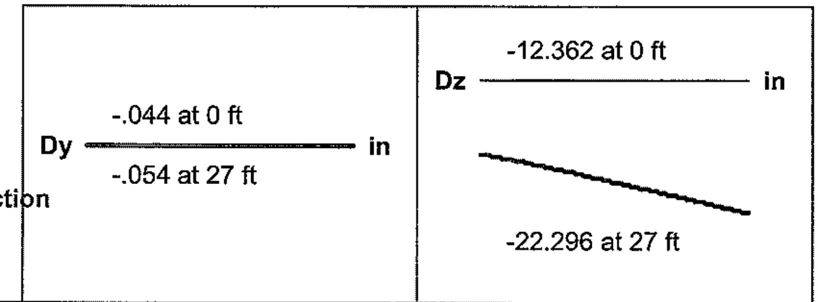


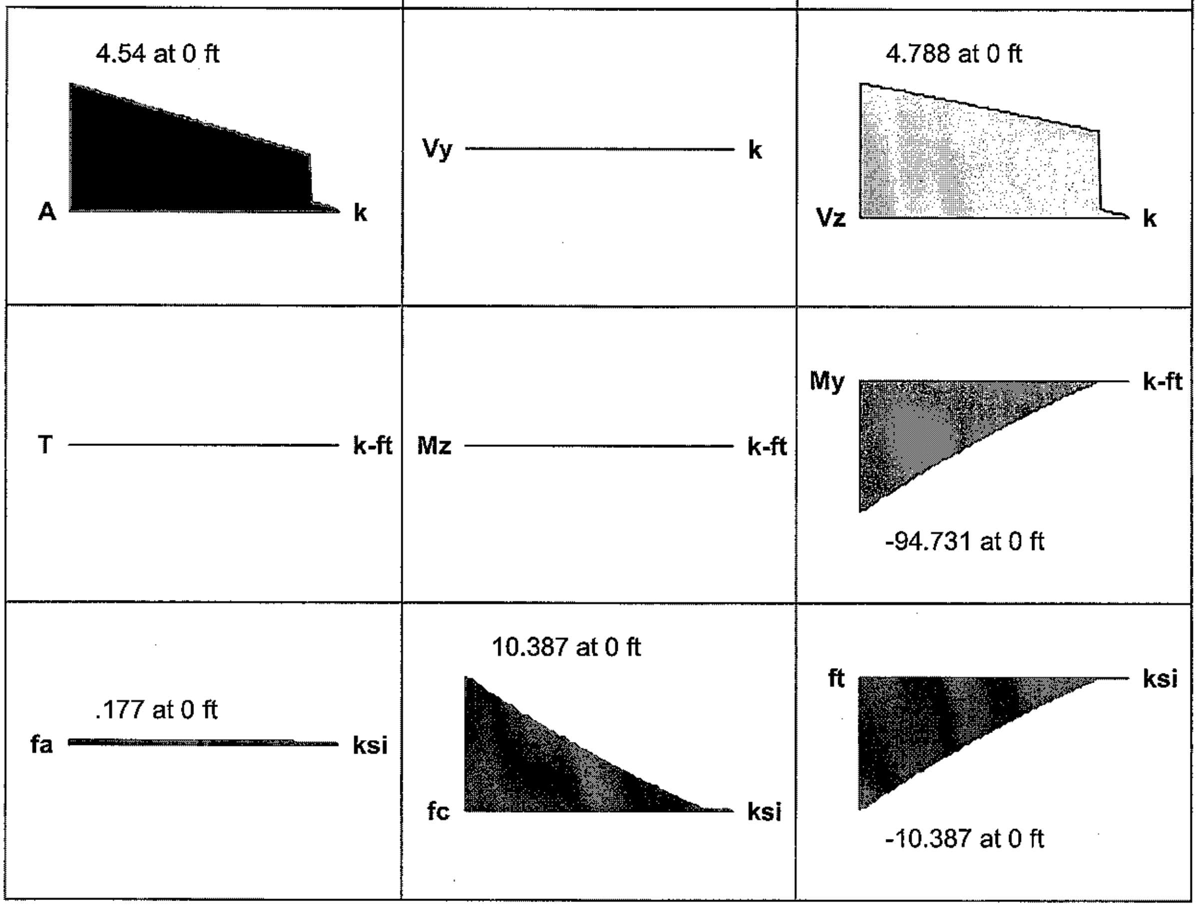
Results for LC 6, TIA/EIA Wind in -Z' Direction
Reaction units are k and k-ft

Natcomm	82' Sign Structure with 111' Pipe Mast	
TJL		Apr 30, 2009 at 2:08 PM
09009-CO.7	LC #6 Reactions and Deflected Shape	82' Sign Structure.r3d

Column: ***Mast4***

Shape: **HSS18X0.5**
Material: **A500 Gr.42**
Length: **27 ft**
I Joint: **FC3**
J Joint: **TOPMAST**
LC 6: TIA/EIA Wind in -Z' Direction
Code Check: **0.286 (bending)**
Report Based On 97 Sections





AISC ASD 9th Ed. Code Check

Max Bending Check	**0.286**	Max Shear Check	**0.017 (s)**
Location	**0 ft**	Location	**0 ft**
Equation	**H1-2**	Max Defl Ratio	**L/33**

Compact
Allowables Increase: **1.333**

Fy	**42 ksi**		Y-Y	Z-Z
Fa	**28.518 ksi**	Cm	**.85**	**.6**
Ft	**33.592 ksi**	Lb	**24 ft**	**24 ft**
Fby	**36.951 ksi**	KL/r	**46.43**	**46.43**
Fbz	**36.951 ksi**	Sway	**No**	**No**
Fvy	**22.394 ksi**			
Fvz	**22.394 ksi**	L Comp Flange	**24 ft**	
Cb	**1.75**	Torque Length	**NC**	

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	$OM := 92 \cdot ft \cdot kips$	(Input From Risa-3D LC #6)
Shear Force =	$Shear := 3 \cdot kips$	(Input From Risa-3D LC #6)
Axial Force =	$Axial := -465 \cdot kips$	(Input From Risa-3D LC #6)

Anchor Bolt Data:

Use ASTM A615 Grade 75

Number of Anchor Bolts =	$N := 10$
Diameter of Bolt Circle =	$D_{bc} := 24 \cdot in$
Bolt "Column" Distance =	$l := 3 \cdot in$
Bolt Ultimate Strenght =	$F_u := 100 \cdot ksi$
Bolt Yeild Strenght =	$F_y := 75 \cdot ksi$
Bolt Modulus =	$E := 29000 \cdot ksi$
Diameter of Anchor Bolts =	$D := 1.75 \cdot in$
Threads per Inch =	$n := 4$

Base Plate Data:

Use ASTM A572 Mod 50

Plate Yield Strength =	$Fy_{bp} := 50 \cdot ksi$
Base Plate Thickness =	$t_{bp} := 2.0 \cdot in$
Base Plate Diameter =	$D_{bp} := 30 \cdot in$
Outer Pole Diameter =	$D_{pole} := 18 \cdot in$

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 12 \cdot in$

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

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

$d_1 = 7.05 \cdot in$ $d_6 = -7.05 \cdot in$

$d_2 = 11.41 \cdot in$ $d_7 = -11.41 \cdot in$

$d_3 = 11.41 \cdot in$ $d_8 = -11.41 \cdot in$

$d_4 = 7.05 \cdot in$ $d_9 = -7.05 \cdot in$

$d_5 = 0.00 \cdot in$ $d_{10} = -0.00 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 9 \cdot in$

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

$MA_1 = 0.00 \cdot in$ $MA_6 = 0.00 \cdot in$

$MA_2 = 2.41 \cdot in$ $MA_7 = 0.00 \cdot in$

$MA_3 = 2.41 \cdot in$ $MA_8 = 0.00 \cdot in$

$MA_4 = 0.00 \cdot in$ $MA_9 = 0.00 \cdot in$

$MA_5 = 0.00 \cdot in$ $MA_{10} = 0.00 \cdot in$

Effective Width of Baseplate for Bending = $W_{eff} := .9 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 21.6 \cdot in$

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i (d_i)^2 = 720 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D^2 = 2.405 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D - \frac{0.9743 \cdot in}{n}\right)^2 = 1.782 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 1.506 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.377 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^{\ 3}}{32} = 0.336 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N} = 64.9 \cdot kips$

Allowable Tensile Force = $T_{ALL.Gross} := 1.333 \cdot \left(0.33 \cdot A_g \cdot F_u\right) = 105.8 \cdot kips$ (1.333 increase allowed per TIA/EIA)

$T_{ALL.Net} := 1.333 \cdot \left(0.60 \cdot A_n \cdot F_y\right) = 106.912 \cdot kips$ (1.333 increase allowed per TIA/EIA)

Bolt Tension % of Capacity = $\frac{T_{Max}}{T_{ALL.Net}} = 0.607$ Bolts are "upset bolts". Use net area per AISC

Condition1 = $Condition1 := if\left(\frac{T_{Max}}{T_{ALL.Net}} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

$Condition1 = \text{"OK"}$

Check Anchor Bolt Bending Stress:

Maximum Bending Moment = $M_x := \left(\frac{Shear}{N}\right) \cdot l = 0.075 \cdot ft \cdot kips$

Maximum Bending Stress = $f_{bx} := \frac{M_x}{S_x} = 2.7 \cdot ksi$

Allowable Bending Stress = $F_{bx} := 1.333 \cdot 0.6 \cdot F_y = 60 \cdot ksi$ (1.333 increase allowed per TIA/EIA)

Check Combined Stress Requirement:

Per ASCE Manual 72: "If the clearance between the base plate and concrete does not exceed two times the bolt diameter a bending stress analysis of the bolts is NOT normally required.

$$l := \begin{cases} l & \text{if } l > 2 \cdot D_n \\ 0 & \text{otherwise} \end{cases} = 0 \cdot in$$

$$f_{bx} := \begin{cases} f_{bx} & \text{if } l > 2 \cdot D_n \\ 0 & \text{otherwise} \end{cases} = 0 \cdot ksi$$

Check Anchor Bolt Compression/Combined Stress:

Maximum Compressive Force = $C_{Max} := OM \cdot \frac{R_{bc}}{I_p} + \frac{Axial}{N} = -28.1 \cdot kips$

Maximum Compressive Stress = $f_a := \frac{C_{Max}}{A_n} = -15.8 \cdot ksi$

$K := 0.65$

$$C_c := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{F_y}} = 87.364$$

$$F_a := \begin{cases} \dfrac{\left[1 - \dfrac{\left(\frac{K \cdot l}{r}\right)^2}{2 \cdot C_c^2}\right] \cdot F_y}{\dfrac{5}{3} + \dfrac{3 \cdot \left(\frac{K \cdot l}{r}\right)}{8 \cdot C_c} - \dfrac{\left(\frac{K \cdot l}{r}\right)^3}{8 \cdot C_c^3}} & \text{if } \frac{K \cdot l}{r} \le C_c \\ \dfrac{12 \cdot \pi^2 \cdot E}{23 \cdot \left(\frac{K \cdot l}{r}\right)^2} & \text{if } \frac{K \cdot l}{r} > C_c \end{cases} = 45 \cdot ksi$$

Allowable Compressive Stress = $F_a := 1.333 \cdot F_a = 60 \cdot ksi$ (1.333 increase allowed per TIA/EIA)

Combined Stress % of Capacity = $\left(\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}}\right) = -0.263$

Condition 2 = $Condition2 := if\left(\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

Condition2 = "OK"

Base Plate Analysis:

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

$C_1 = 57.3 \cdot kips$	$C_6 = 35.7 \cdot kips$
$C_2 = 64.0 \cdot kips$	$C_7 = 29.0 \cdot kips$
$C_3 = 64.0 \cdot kips$	$C_8 = 29.0 \cdot kips$
$C_4 = 57.3 \cdot kips$	$C_9 = 35.7 \cdot kips$
$C_5 = 46.5 \cdot kips$	$C_{10} = 46.5 \cdot kips$

Maximum Bending Stress in Plate = $f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(W_{eff} t_{bp}^{2}\right)} = 21.4 \cdot ksi$

Allowable Bending Stress in Plate = $F_{bp} := 1.33 \cdot 0.75 \cdot Fy_{bp} = 49.9 \cdot ksi$

Plate Bending Stresse % of Capacity = $\frac{f_{bp}}{F_{bp}} = 0.43$

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

Condition3 = "Ok"

Flange Bolt and Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	$OM := 95.0 \cdot ft \cdot kips$	(Input From Risa-3D LC #6)
Shear Force =	$Shear := 5.0 \cdot kips$	(Input From Risa-3D LC #6)
Axial Force =	$Axial := 4.5 \cdot kips$	(Input From Risa-3D LC #6)

Flange Bolt Data:

Use ASTM A325

Number of Flange Bolts =	$N := 20$
Diameter of Bolt Circle =	$D_{bc} := 21.0 \cdot in$
Bolt "Column" Distance =	$l := .125 \cdot in$
Bolt Ultimate Strenght =	$F_u := 120 \cdot ksi$
Bolt Yield Strenght =	$F_y := 92 \cdot ksi$
Bolt Modulus =	$E := 29000 \cdot ksi$
Diameter of Flange Bolts =	$D := 1.00 \cdot in$
Threads per Inch =	$n := 8$

Plate Data:

Use ASTM A572 Mod 50

Plate Yield Strength =	$Fy_{bp} := 50 \cdot ksi$
Plate Thickness =	$t_{bp} := 1.25 \cdot in$
Plate Diameter =	$D_{bp} := 24.00 \cdot in$
Outer Pole Diameter =	$D_{pole} := 18.00 \cdot in$

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

Radius of Bolt Circle =: $R_{bc} := \frac{D_{bc}}{2} = 10.5 \cdot in$

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

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

$d_1 = 3.24 \cdot in$ $d_6 = 9.99 \cdot in$

$d_2 = 6.17 \cdot in$ $d_7 = 8.49 \cdot in$

$d_3 = 8.49 \cdot in$ $d_8 = 6.17 \cdot in$

$d_4 = 9.99 \cdot in$ $d_9 = 3.24 \cdot in$

$d_5 = 10.50 \cdot in$ $d_{10} = 0.00 \cdot in$

Critical Distances For Bending in Plate:

Outer Pole Radius = $R_{pole} := \frac{D_{pole}}{2} = 9 \cdot in$

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

$MA_1 = 0.00 \cdot in$ $MA_6 = 0.99 \cdot in$

$MA_2 = 0.00 \cdot in$ $MA_7 = 0.00 \cdot in$

$MA_3 = 0.00 \cdot in$ $MA_8 = 0.00 \cdot in$

$MA_4 = 0.99 \cdot in$ $MA_9 = 0.00 \cdot in$

$MA_5 = 1.50 \cdot in$ $MA_{10} = 0.00 \cdot in$

Effective Width of plate for Bending = $W_{eff} := .8 \cdot 2 \cdot \sqrt{\left(\frac{D_{bp}}{2}\right)^2 - \left(\frac{D_{pole}}{2}\right)^2} = 12.7 \cdot in$

Flange Bolt Analysis:

Calculated Flange Bolt Properties:

Polar Moment of Inertia = $I_p := \sum_i (d_i)^2 = 1102.5 \cdot in^2$

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

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

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

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

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

Check Flange Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := OM \cdot \frac{R_{bc}}{I_p} - \frac{Axial}{N} = 10.6 \cdot kips$

Allowable Tensile Force = $T_{ALL.Gross} := 1.333 \cdot (0.33 \cdot A_g \cdot F_u) = 41.5 \cdot kips$ (1.333 increase allowed per TIA/EIA)

Bolt Tension % of Capacity = $\frac{T_{Max}}{T_{ALL.Gross}} = 0.256$ Bolts are "upset bolts". Use net area per AISC

Condition1 = Condition1 := if$\left(\frac{T_{Max}}{T_{ALL.Gross}} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

Condition1 = "OK"

Check Flange Bolt Bending Stress:

Maximum Bending Moment = $M_x := \left(\frac{Shear}{N}\right) \cdot l = 2.604 \times 10^{-3} \cdot ft \cdot kips$

Maximum Bending Stress = $f_{bx} := \frac{M_x}{S_x} = 0.5 \cdot ksi$

Allowable Bending Stress = $F_{bx} := 1.333 \cdot 0.6 \cdot F_y = 73.6 \cdot ksi$ (1.333 increase allowed per TIA/EIA)

Check Combined Stress Requirement:

Per ASCE Manual 72: "If the clearance between the base plate and concrete does not exceed two times the bolt diameter a bending stress analysis of the bolts is NOT normally required.

$$I := \begin{cases} I & \text{if } I > 2 \cdot D_n \\ 0 & \text{otherwise} \end{cases} = 0 \cdot in$$

$$f_{bx} := \begin{cases} f_{bx} & \text{if } I > 2 \cdot D_n \\ 0 & \text{otherwise} \end{cases} = 0 \cdot ksi$$

Check Flange Bolt Compression/Combined Stress:

Maximum Compressive Force = $C_{Max} := OM \cdot \frac{R_{bc}}{I_p} + \frac{Axial}{N} = 11.1 \cdot kips$

Maximum Compressive Stress = $f_a := \frac{C_{Max}}{A_n} = 18.3 \cdot ksi$

$K := 0.65$

$$C_c := \sqrt{\frac{2 \cdot \pi^2 \cdot E}{F_y}} = 78.881$$

$$F_a := \begin{cases} \dfrac{\left[1 - \dfrac{\left(\frac{K \cdot l}{r}\right)^2}{2 \cdot C_c^2}\right] \cdot F_y}{\dfrac{5}{3} + \dfrac{3 \cdot \left(\frac{K \cdot l}{r}\right)}{8 \cdot C_c} - \dfrac{\left(\frac{K \cdot l}{r}\right)^3}{8 \cdot C_c^3}} & \text{if } \dfrac{K \cdot l}{r} \le C_c \\ \dfrac{12 \cdot \pi^2 \cdot E}{23 \cdot \left(\frac{K \cdot l}{r}\right)^2} & \text{if } \dfrac{K \cdot l}{r} > C_c \end{cases} = 55.2 \cdot ksi$$

Allowable Compressive Stress = $F_a := 1.333 \cdot F_a = 73.6 \cdot ksi$ (1.333 increase allowed per TIA/EIA)

Combined Stress % of Capacity = $\left(\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}}\right) = 0.249$

Condition 2 = $Condition2 := if\left(\frac{f_a}{F_a} + \frac{f_{bx}}{F_{bx}} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

Condition2 = "OK"

Plate Analysis:

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

$C_1 = 3.6 \cdot kips$	$C_6 = 10.6 \cdot kips$
$C_2 = 6.6 \cdot kips$	$C_7 = 9.0 \cdot kips$
$C_3 = 9.0 \cdot kips$	$C_8 = 6.6 \cdot kips$
$C_4 = 10.6 \cdot kips$	$C_9 = 3.6 \cdot kips$
$C_5 = 11.1 \cdot kips$	$C_{10} = 0.2 \cdot kips$

Maximum Bending Stress in Plate = $f_{bp} := \sum_i \frac{6 \cdot C_i \cdot MA_i}{\left(W_{eff} \cdot t_{bp}^{\ 2}\right)} = 11.3 \cdot ksi$

Allowable Bending Stress in Plate = $F_{bp} := 1.33 \cdot 0.75 \cdot Fy_{bp} = 49.9 \cdot ksi$

Plate Bending Stresse % of Capacity = $\frac{f_{bp}}{F_{bp}} = 0.227$

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

Condition3 = "Ok"

Anchor Bolt and Base Plate Analysis:

Input Data:

Tower Reactions:

Overturning Moment =	$OM := 666 \cdot ft \cdot kips$	(Input From Risa-3D LC # 4)
Shear Force =	$Shear := 24 \cdot kips$	(Input From Risa-3D LC # 4)
Axial Force =	$Axial := -224 \cdot kips$	(Input From Risa-3D LC # 4)

Anchor Bolt Data:

Use ASTM A36

Number of Anchor Bolts =	$N := 20$	(User Input)
Bolt Ultimate Strenght =	$F_u := 100 \cdot ksi$	(User Input)
Bolt Yeild Strenght =	$F_y := 75 \cdot ksi$	(User Input)
Bolt Modulus =	$E := 29000 \cdot ksi$	(User Input)
Diameter of Anchor Bolts =	$D_b := 1.5 \cdot in$	(User Input)
Threads per Inch =	$n_b := 4$	(User Input)

Base Plate Data:

Use ASTM 36

Plate Yield Strength =	$Fy_{bp} := 36 \cdot ksi$	(User Input)
Base Plate Thickness =	$t_{bp} := 1.5 \cdot in$	(User Input)

Geometric Layout Data:

Distance from Bolts to Centroid of Pole:

$d_1 := 17.125in$ (User Input)

$d_2 := 11.25in$ (User Input)

$d_3 := 4.9375in$ (User Input)

Number of Bolts at Distance:

$N_1 := 12$

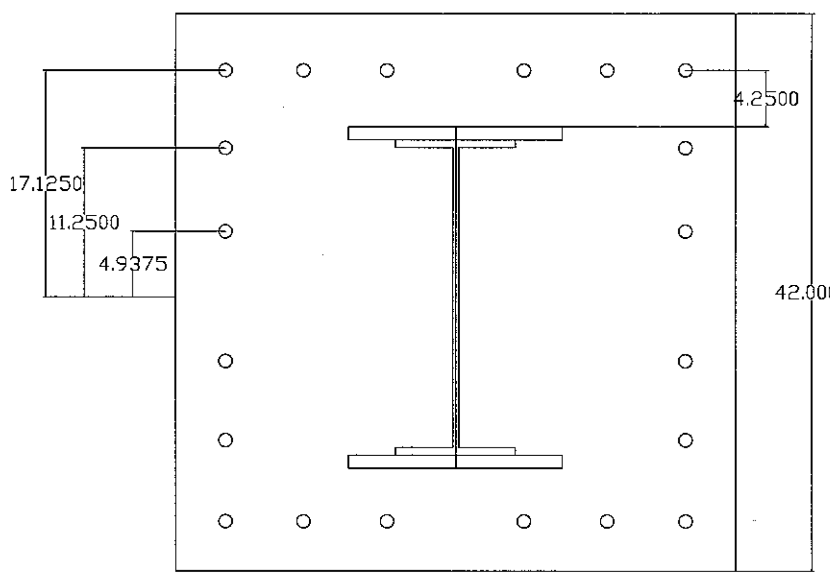
$N_2 := 4$

$N_3 := 4$

Critical Distances For Bending in Plate:

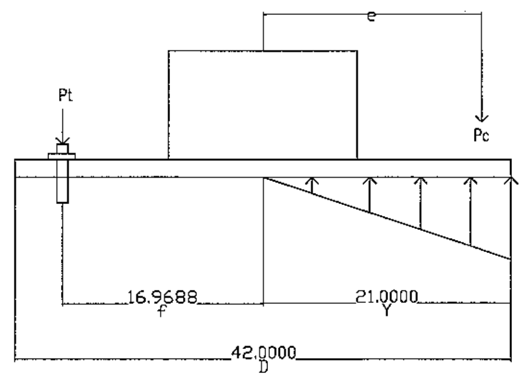
$ma_1 := 4.25in$ (User Input)

Effective Width of Baseplate for Bending = $B_{eff} := 42in$ (User Input)



ANCHOR BOLT AND PLATE GEOMETRY

Base Plate Analysis:



Length of Base Plate = $D := 42in$

Width of Base Plate = $B := 42in$

Length of Stress Distribution = $Y := 21in$

Distance from NA to Bolts in Tension = $f := 17in$

Modular Ratio = $n := \frac{E_s}{57 \cdot \sqrt{E_c}} = 9.29$

Area of Steel in Tension Zone = $A_s := 7.5 \cdot in^2$

$$K_1 := \frac{6n \cdot A_s}{B} = 0.829ft$$

Eccentricity = $$e := \frac{\left(K_1 \cdot f^2 + K_1 \cdot \frac{D}{2} \cdot f - K_1 \cdot f \cdot Y + \frac{3}{2} \cdot D \cdot Y^2 - Y^3\right)}{\left(3 \cdot Y^2 + K_1 \cdot Y - K_1 \cdot \frac{D}{2} - K_1 \cdot f\right)} = 18.546 \cdot in$$

Compression Force = $P_c := \frac{OM}{e} = 431 \cdot kips$

Uplift Force = $$P_t := -P_c \cdot \left[\frac{\left(\frac{D}{2} - \frac{Y}{3} - e\right)}{\left(\frac{D}{2} - \frac{Y}{3} + f\right)}\right] = 63 \cdot kips$$

Bearing Force on Grout = $\theta_c := 2 \cdot \frac{\left(P_c + P_t\right)}{Y \cdot B} = 1120psi$

Total Uplift Force = $F := P_t - 6 \cdot \frac{Axial}{N} = 130 \cdot kips$

Applied Bending Stress in Plate = $$f_{bp} := \frac{6 \cdot \left(F \cdot ma_1\right)}{B_{eff} t_{bp}^{\ 2}} = 35.18 \cdot ksi$$

Allowable Bending Stress in Plate = $F_{bp} := 1.33 \cdot 0.75 \cdot Fy_{bp} = 35.9 \cdot ksi$

Plate Bending Stress % of Capacity = $\frac{f_{bp}}{F_{bp}} = 0.98$

Check Plate Bending Stress $Plate\_Bending\_Stress := if\left(\frac{f_{bp}}{F_{bp}} < 1.00, "Ok", "Overstressed"\right)$

$Plate\_Bending\_Stress = "Ok"$

Allowable Bearing Capacity of Grout = $\sigma_{all} := 3000 \cdot psi$

Bearing Percent of Capacity = $\frac{\sigma_c}{\sigma_{all}} = 0.37$

$Grout\_Bearing\_Capicity := if\left(\sigma_{all} > \sigma_c, "OK", "NG"\right)$

$Grout\_Bearing\_Capicity = "OK"$

Anchor Bolt Analysis:

Calculated Anchor Bolt Properties:

Polar Moment of Inertia = $I_p := \left[(d_1)^2 \cdot N_1 + (d_2)^2 \cdot N_2 + (d_3)^2 \cdot N_3\right] = 4123 \cdot in^2$

Gross Area of Bolt = $A_g := \frac{\pi}{4} \cdot D_b^{\,2} = 1.767 \cdot in^2$

Net Area of Bolt = $A_n := \frac{\pi}{4} \cdot \left(D_b - \frac{0.9743 \cdot in}{n_b}\right)^2 = 1.24 \cdot in^2$

Net Diameter = $D_n := \frac{2 \cdot \sqrt{A_n}}{\sqrt{\pi}} = 1.256 \cdot in$

Radius of Gyration of Bolt = $r := \frac{D_n}{4} = 0.314 \cdot in$

Section Modulus of Bolt = $S_x := \frac{\pi \cdot D_n^{\,3}}{32} = 0.195 \cdot in^3$

Check Anchor Bolt Tension Force:

Maximum Tensile Force = $T_{Max} := \frac{P_t}{6} - \frac{Axial}{N} = 21.7 \cdot kips$

Allowable Tensile Force (Gross Area) = $T_{ALL.Gross} := 1.333 \cdot (0.33 \cdot A_g \cdot F_u) = 77.7 \cdot kips$ (1.333 increase allowed per TIA/EIA)

Allowable Tensile Force (Net Area) = $T_{ALL.Net} := 1.333 \cdot (0.60 \cdot A_n \cdot F_y) = 74.4 \cdot kips$ (1.333 increase allowed per TIA/EIA)

Bolt Tension % of Capacity = $\frac{T_{Max}}{T_{ALL.Net}} \cdot 100 = 29.2$ Bolts are "upset bolts". Use net area per AISC

Condition1 = $Bolt\_Tension := if\left(\frac{T_{Max}}{T_{ALL.Net}} \le 1.00, \text{"OK"}, \text{"Overstressed"}\right)$

$Bolt\_Tension = \text{"OK"}$ Note Shear stress is negligible

Foundation Check

Base Reactions:

$OM_1 := 564 \cdot kip \cdot ft$

$Axial_1 := -225 \cdot kips$

$Shear_1 := 19 \cdot kips$

$OM_2 := 666 \cdot kip \cdot ft$

$Axial_2 := -224 \cdot kips$

$Shear_2 := 23 \cdot kips$

$OM_m := 92 \cdot kip \cdot ft$

$Axial_m := 492 \cdot kips$

$Shear_m := 3 \cdot kips$

Foundation Data:

$D1 := 1.29 \cdot ft$

$D2 := 2 \cdot ft$

$D3 := 3 \cdot ft$

$D4 := 3 \cdot ft$

$D_{tot} := 7.17 \cdot ft$

$W1 := 6 \cdot ft$

$W2 := 21.5 \cdot ft$

$W3 := 26.5 \cdot ft$

$W4 := 55 \cdot ft$

$L1 := 6 \cdot ft$

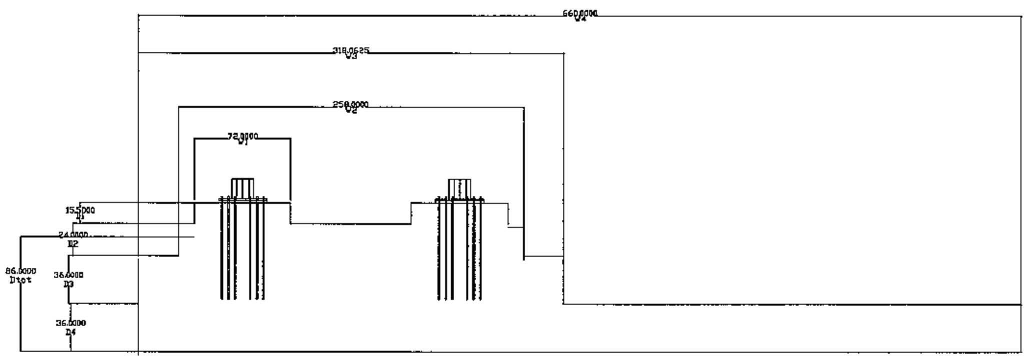
$L2 := 11 \cdot ft$

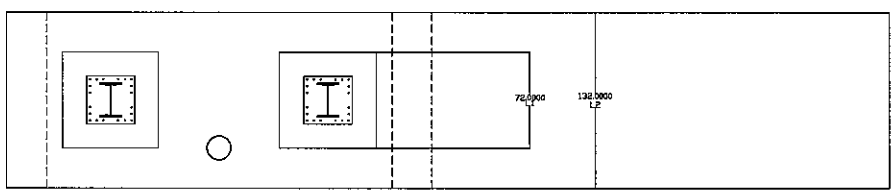
Material Data;

$\theta_{conc} := 150 \cdot pcf$

$\theta_{soil} := 100 \cdot pcf$

$\pi_s := 30 \cdot deg$





Volume of Concrete = $V_c := (D1 \cdot W1 \cdot L1) + (D2 \cdot W2 + D3 \cdot W3 + D4 \cdot W4) \cdot L2 = 3209 \cdot ft^3$

Volume of Soil Above Footing = $V_{s1} := [(D2 - 10 \cdot in) \cdot (W3 - W2) + [(D2 - 10 \cdot in) + D3] \cdot (W4 - W3)] \cdot L2 = 1370 \cdot f$

Volume of Soil Wedge at Back Face = $V_{s2} := D_{tot}^{\,2} \cdot W4 \cdot \tan(\Phi_s) = 1632 \cdot ft^3$

Volume of Soil Wedge at Back Face Corners = $V_{s3} := 2 \cdot \left[\left(D_{tot}\right)^3 \cdot \frac{\tan(\Phi_s)}{3} \right] = 142 \cdot ft^3$

Weight of Concrete = $W_c := V_c \cdot \gamma_{conc} = 481 \cdot kips$

Weight of Soil Above Footing = $W_{s1} := V_{s1} \cdot \gamma_{soil} = 137 \cdot kips$

Weight of Soil Wedge at Back Face = $W_{s2} := V_{s2} \cdot \gamma_{soil} = 163 \cdot kips$

Weight of Soil Wedge at Back Face Corners = $W_{s3} := V_{s3} \cdot \gamma_{soil} = 14 \cdot kips$

$$M_r := \left(W_c + W_{s1} + Axial_1 + Axial_2 + Axial_m\right)\cdot\frac{L2}{2} + \left(W_{s2} + W_{s3}\right)\left(L2 + \frac{D_{tot}\cdot\tan\left(\Phi_s\right)}{2}\right) = 5957\cdot kip\cdot ft$$

$$M_{ot} := OM_1 + OM_2 + OM_m + \left(Shear_1 + Shear_2 + Shear_m\right)\cdot D_{tot} = 1645\cdot kip\cdot ft$$

$$FS := \frac{M_r}{M_{ot}} = 3.6$$

$$Condition1 := if\left(\frac{M_r}{M_{ot}} > 2, \text{"OK"}, \text{"Overstressed"}\right)$$

Condition1 = "OK"

UMTS RFDS v2.0

Site ID	CTHA240A	Site Type	Co-Location.
Address	Christian Hill Road/100 Berlin Road, Cromwell, CT 06416	Latitude	0
		Longitude	0

TMO UMTS Engineer	M Lucey

GSM Impacted?	
Alpha	
Beta	
Gamma	
Delta	

History (approvals)	Date
RFDS	02/18/09
GSM RF Acceptance	

RFDS Revision	1

Site Leasing/Zoning	Preliminary Leasing	Preliminary Zoning
* # of Sectors	Information not available	—
* # of Antennas	Information not available	Information not available
Antenna Model	Information not available	—
Antenna Size	—	Information not available
* # of TMA	Information not available	—
* # of Feeders	Information not available	Information not available
Feeder Diameter	Information not available	Information not available
Leased area (sq ft)	Information not available	Information not available
* # of Cabinets	Information not available	Information not available
Cabinet Model	Information not available	—
Site Comments	UMTS overlay, Tie in and upgrade RET.	

* Legend: Config under threshold; Config meets threshold; Config above threshold; Text / Not checked

GSM Information

Existing Alpha	Existing Beta	Existing Gamma	Existing Delta		Proposed Alpha	Proposed Beta	Proposed Gamma	Proposed Delta
108	108	108		Ant. Height (ft)	108	108	108	
YES	YES	YES		RET deployed	YES	YES	YES	
1 5/8"	1 5/8"	1 5/8"		Feeder Type	1 5/8"	1 5/8"	1 5/8"	
130	130	130		Feeder Length (ft)	130	130	130	
2	2	2		# Current TRX	2	2	2	
2	3	3		# Forec. TRX	2	3	3	
				# of Nortel HePA				

Existing		Proposed
S12000 outdoor	Cabinet Type	S12000 outdoor
1	Cabinet #	1

UMTS Information

Existing Alpha	Existing Beta	Existing Gamma	Existing Delta		Proposed Alpha	Proposed Beta	Proposed Gamma	Proposed Delta
—	—	—	—	Ant. Height (ft)	108	108	108	
—	—	—	—	RET deployed	YES	YES	YES	
—	—	—	—	Feeder Type	1 5/8"	1 5/8"	1 5/8"	
—	—	—	—	Feeder Length (ft)	130	130	130	

Existing		Proposed
—	Cabinet Type	RBS 3106
—	Cabinet #	1

UMTS RFDS v2.0 — T-Mobile

Site ID	CTHA240A	Site Type	Co-Location.
Address	Christian Hill Road/100 Berlin Road, Cromwell, CT 06416	Latitude	0
		Longitude	0

TMO UMTS Engineer	M Lucey

GSM Impacted?

Alpha	
Beta	
Gamma	
Delta	

History (approvals)	Date
RFDS	02/18/09
GSM RF Acceptance	

RFDS Revision	1

ALPHA

	Existing 1	Existing 2	Existing 3	Existing 4	Proposed 1	Proposed 2	Proposed 3	Proposed 4
Mount	X	X		X	X	X		X
Antenna Deployed	GSM				GSM			UMTS
Ant. Type	Quad pole				Quad pole			Quad pole
Ant. Model	X16DWV-16DWVS-A				X16DWV-16DWVS-A			X16DWV-16DWVS-A
Ant. Vendor	RFS				RFS			RFS
Azimuth	30				30			
E-Tilt (sw)	-/-/-				-/-/-			
M-Tilt	0				0			
TMA #	2				2			1
TMA Type	dTMA 1.9 GHz				dTMA 1.9 GHz			RFS - Twin AWS
Used Feeders	4				4			2

☐ GSM Lost Spatial Diversity

Req	OK	
		Add new Mount
		Relocate GSM antenna
		Swap GSM antenna
		Consolidate GSM feeders
X		Add Twin TMA
		Swap single TMA with twin TMA
		Add Booster
X		Add two new feeders for UMTS
		Reuse GSM feeders for UMTS

Comments

BETA

	Existing 1	Existing 2	Existing 3	Existing 4	Proposed 1	Proposed 2	Proposed 3	Proposed 4
Mount	X				X			X
Antenna Deployed	GSM				GSM			UMTS
Ant. Type	Quad pole				Quad pole			Quad pole
Ant. Model	X16DWV-16DWVS-A				X16DWV-16DWVS-A			X16DWV-16DWVS-A
Ant. Vendor	RFS				RFS			RFS
Azimuth	120				120			
E-Tilt (sw)	-/-/-				-/-/-			
M-Tilt	0				0			
TMA #	2				2			1
TMA Type	dTMA 1.9 GHz				dTMA 1.9 GHz			RFS - Twin AWS
Used Feeders	4				4			2

☐ GSM Lost Spatial Diversity

Req	OK	
		Add new Mount
		Relocate GSM antenna
		Swap GSM antenna
		Consolidate GSM feeders
X		Add Twin TMA
		Swap single TMA with twin TMA
		Add Booster
X		Add two new feeders for UMTS
		Reuse GSM feeders for UMTS

Comments

UMTS RFDS v2.0

T-Mobile

Site ID	CTHA240A	Site Type	Co-Location.
Address	Christian Hill Road/100 Berlin Road, Cromwell, CT 06416	Latitude	0
		Longitude	0

TMO UMTS Engineer	M Lucey

GSM Impacted?

Alpha	
Beta	
Gamma	
Delta	

History (approvals)	Date
RFDS	02/18/09
GSM RF Acceptance	

RFDS Revision	1

GAMMA

	Existing Configuration					Proposed Configuration			
Mount	X					X			X
Antenna Deployed	GSM					GSM			UMTS
Ant. Type	Quad pole					Quad pole			Quad pole
Ant. Model	X16DWV-16DWVS-A					X16DWV-16DWVS-A			X16DWV-16DWVS-A
Ant. Vendor	RFS					RFS			RFS
Azimuth	240					240			
E-Tilt (sw)	- / - / -					- / - / -			
M-Tilt	0					0			
TMA #	2					2			1
TMA Type	dTMA 1.9 GHz					dTMA 1.9 GHz			RFS - Twin AWS
Used Feeders	4					4			2

☐ GSM Lost Spatial Diversity

Req	OK	
		Add new Mount
		Relocate GSM antenna
		Swap GSM antenna
		Consolidate GSM feeders
X		Add Twin TMA
		Swap single TMA with twin TMA
		Add Booster
X		Add two new feeders for UMTS
		Reuse GSM feeders for UMTS

Comments

DELTA

	Existing Configuration					Proposed Configuration			
Mount									
Antenna Deployed									
Ant. Type									
Ant. Model									
Ant. Vendor									
Azimuth									
E-Tilt (sw)									
M-Tilt									
TMA #									
TMA Type									
Used Feeders									

☐ GSM Lost Spatial Diversity

Req	OK	
		Add new Mount
		Relocate GSM antenna
		Swap GSM antenna
		Consolidate GSM feeders
		Add Twin TMA
		Swap single TMA with twin TMA
		Add Booster
		Add two new feeders for UMTS
		Reuse GSM feeders for UMTS

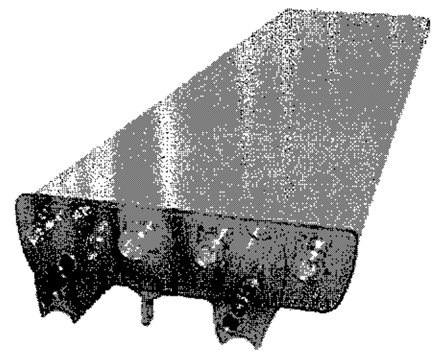
Comments

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

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

Product Description

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



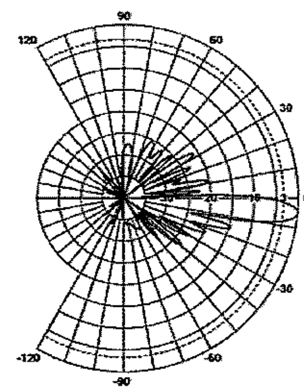
Features/Benefits

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

Technical Specifications

Electrical Specifications

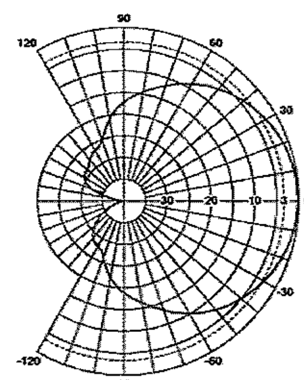
Frequency Range, MHz	1710-2200
Horizontal Beamwidth, deg	65
Vertical Beamwidth, deg	5.9 to 7.7
Electrical Downtilt, deg	0-10
Gain, dBi (dBd)	18.4 (16.3)
1st Upper Sidelobe Suppression, dB	> 18 (typically > 20)
Upper Sidelobe Suppression, dB	> 18 all (typically > 20)
Front-To-Back Ratio, dB	>26 (typically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



Vertical Pattern

Mechanical Specifications

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



Horizontal Pattern

Ordering Information

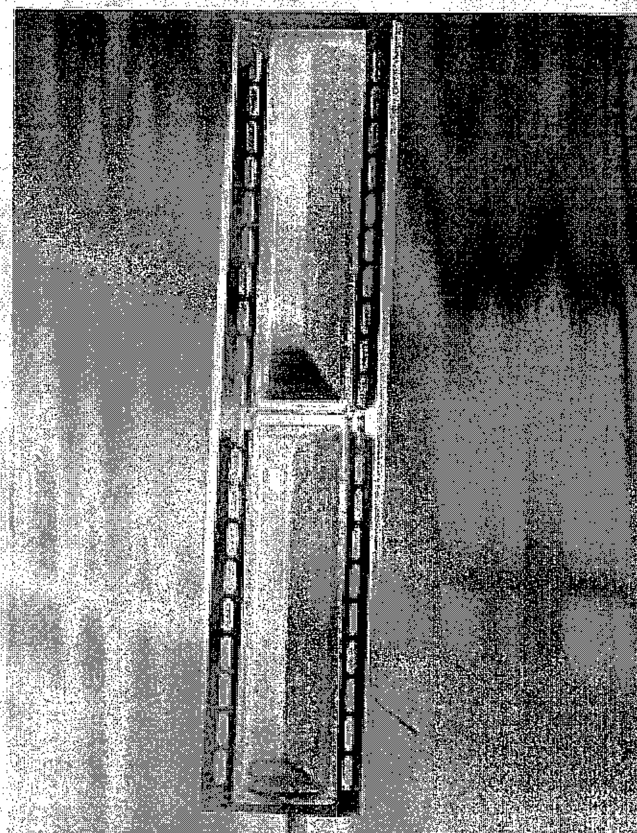
Mounting Hardware	APM40-2 + APM40-E2

Swedcom Corporation

ALP 9212-N

Log-Periodic Reflector Antenna

92 Degrees 12 dBd



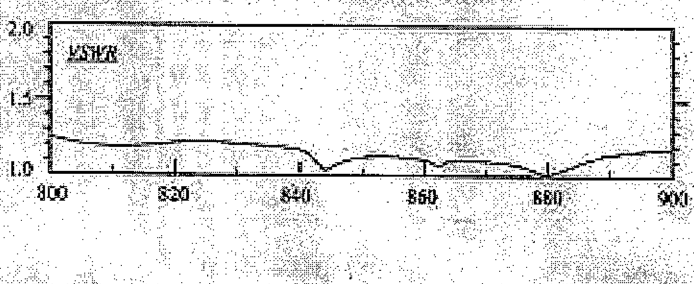
Features:

- **Broadbanded. (800-900 MHz)**
- **Low backlobe radiation. Front-to-back ratio better than 28 dB**
- **Low Intermodulation Products.**
- **Low Wind-load.**
- **Low weight.**
- **Small size.**
- **Rugged design.**

Please see the following pages including radiation patterns/tables for *ALP 9212-N.*

Electrical Specifications:

Frequency range:	806-896 MHz
Impedance:	50 ohm
Connector:	N-female or 7/8" EIA
VSWR:	Typ. 1.3:1 max 1.5:1
Polarization:	Vertical
Gain:	12 dBd
Front to back ratio:	>28 dB
Side-lobe supression:	>18 dB
Intermodulation: (2x25W):	IM3 >146 dB IM5 >153 dB IM7 & IM9 >163 dB
Power Rating:	500 W
H-Plane: -3 dB	95 °
E-Plane: -3 dB	15 °
Lightning Protection:	DC Grounded



Mechanical Specifications:

Overall Height:	52 in	(1320 mm)
Width:	11.4 in	(290 mm)
Depth:	11.4 in	(290 mm)
Weight including brackets:	26.7 lbs	(12 Kg)
Rated wind velocity:	113 mph	(180 Km/h)
Wind Area (CxA/Front):	3.9 sq.ft	(0.36 sq.m)
Lateral thrust at rated wind		
Worst case:	570 N	

Materials:

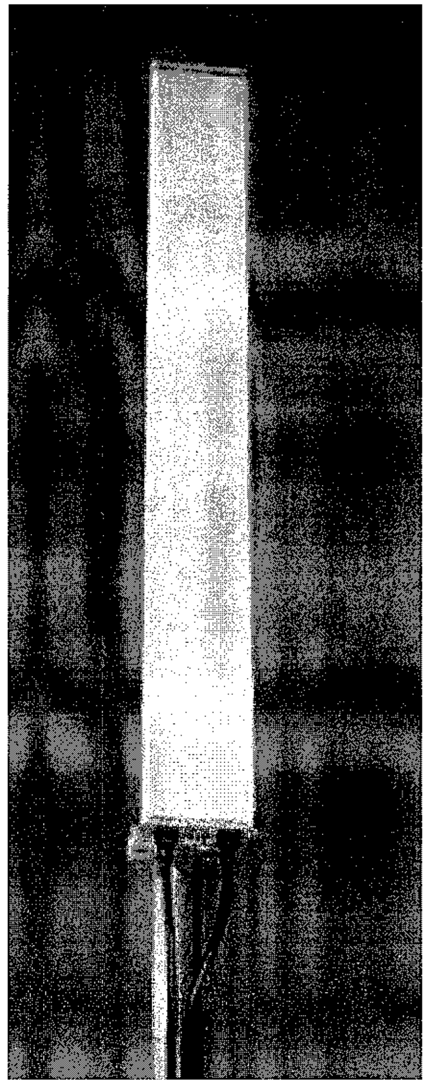
Radiating elements:	Aluminum
Element housing:	Grey PVC
Back-plate:	Aluminum
Mounting hardware	
clamps:	Hot dip galvanized steel
bolts:	Stainless steel

Manufactured by: Allgon System AB

Technical Data Sheet	APXV18-206517-C
Optimizer® Panel Dual Polarized Antenna	

Product Description

This variable tilt antenna provides exceptional suppression of all upper sidelobes at all downtilt angles. It also features null fill and a wide downtilt range with optional remote tilt.



Features/Benefits

• Variable electrical downtilt - provides enhanced precision in controlling intercell interference. The tilt is infield adjustable 0-10 deg.
• High Suppression of all Upper Sidelobes (Typically <-20dB).
• Optional remote tilt - can be retrofitted.
• Broadband design.
• Dual polarization.
• Low profile for low visual impact.

Technical Features

Frequency Band	3G/UMTS (Single, Broad, Dual and Triple-Band)
Horizontal Pattern	Directional
Antenna Type	Panel Dual Polarized
Electrical Down Tilt Option	Variable

Technical Data Sheet	APXV18-206517-C

Optimizer® Panel Dual Polarized Antenna

Gain, dBi (dBd)	18.8 (16.7) , 19.0 (16.9)
Frequency Range, MHz	1710-1900 , 1900-2170
Connector Type	(2) 7-16 DIN Female
Connector Location	Bottom
Mount Type	Downtilt
Electrical Downtilt, deg	0-10
Horizontal Beamwidth, deg	67 , 63
Mounting Hardware	APM40-2
Rated Wind Speed, km/h (mph)	160 (100)
VSWR	< 1.5:1
Vertical Beamwidth, deg	5.0 , 4.6
Upper Sidelobe Suppression, dB	>17 , >18 all (Typically >20)
Polarization	Dual pol +/-45°
Front-To-Back Ratio, dB	> 30
Maximum Power Input, W	300
Isolation between Ports, dB	> 30
Lightning Protection	Direct Ground
3rd Order IMP @ 2 x 43 dBm, dBc	> 150
7th Order IMP @ 2x46 dBm, dBc	> 170
Overall Length, m (ft)	1.85 (6.06)
Dimensions - HxWxD, mm (in)	1850 x 175 x 80 (72.0 x 6.8 x 3.15)
Weight w/o Mtg Hardware, kg (lb)	12 (26.4)
Weight w/ Mtg Hardware, kg (lb)	14.8 (32.5)
Radiating Element Material	Brass
Radome Material	Fiberglass
Reflector Material	Aluminum
Max Wind Loading Area, m^2 (ft^2)	0.31 (3.3)
Survival Wind Speed, km/h (mph)	200 (125)
Maximum Thrust @ Rated Wind, N (lbf)	558 (125)
Front Thrust @ Rated Wind, N (lbf)	558 (125)
Shipping Weight, kg (lb)	18.3 (39.8)
Packing Dimensions, HxWxD, mm (in)	2021 x 260 x 200 (79.5 x 10.2 x 7.8)
Packing Dimensions - HxWxD, m (ft)	2.0 x 0.26 x 0.2 (6.6 x 0.85 x 0.65)

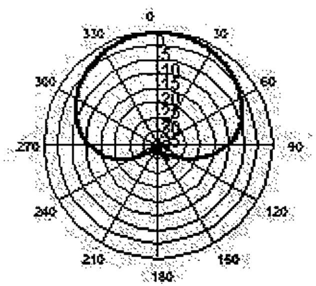
Notes

For additional mounting information please click "Additional Product Information" below.

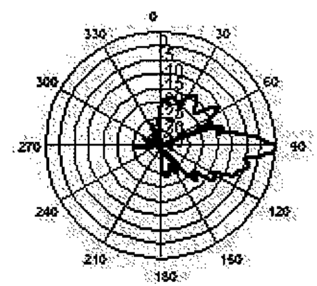
DECIBEL® *Base Station Antennas*	**948F85T2E-M** 16.1 dBi, Directed Dipole Antenna 1850-1990 MHz	**1850-1990 MHz** **MaxFill™** **dB Director®**

- Exceptional azimuth roll-off reducing soft hand-offs and improving capacity
- Excellent upper side lobe suppression
- Deep null filling below the horizon assures improved signal intensity
- Low profile appearance and low wind loading profile for easier zoning approvals

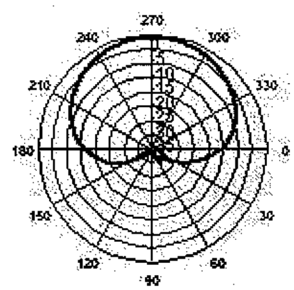
85°



Azimuth 1850 MHz (Tilt=2)



Vertical 1850 MHz (Tilt=2)



Horizontal 1850 MHz (Tilt=2)

ELECTRICAL

Frequency (MHz):	1850-1990
Polarization:	Vertical
Gain (dBd/dBi):	14/16.1
Azimuth BW:	85°
Elevation BW:	8°
Beam Tilt:	2°
USLS* (dB):	>18
Null Fill* (dB):	15
Front-to-Back Ratio* (dB):	40
VSWR:	<1.33:1
IM Suppression - Two 20 Watt Carriers:	-150 dBc
Impedance:	50 Ohms
Max Input Power:	250 Watts
Lightning Protection:	DC Ground
Opt Electrical Tilt:	0°,4°,6°

MECHANICAL

Weight:	8.5 lbs (3.9 kg)
Dimensions (LxWxD):	48 X 3.5 X 7 in (1219 X 89 X 178 mm)
Max. Wind Area:	1.18 ft² (0.11 m²)
Max. Wind Load (@ 100mph):	65 lbf (289 N)
Max. Wind Speed:	125 mph (201 km/h)
Radiator Material:	Low Loss Circuit Board
Reflector Material:	Aluminum
Radome Material:	ABS, UV Resistant
Mounting Hardware Material:	Galvanized Steel
Connector Type:	7-16 DIN - Female (Bottom)
Color:	Light Gray
Standard Mounting Hardware:	DB390 Pipe Mount Kit, included
Downtilt Mounting Hardware:	DB5098, optional
Opt. Mounting Hardware:	DB5094-AZ Azimuth Wall Mount

ANDREW®

Andrew Corporation
8635 Stemmons Freeway
Dallas, Texas U.S.A 75247-3701
Tel: 214.631.0310

Fax: 214.631.4706
Toll Free Tel: 1.800.676.5342
Fax: 1.800.229.4706
www.andrew.com

Date: 4/29/2004
* - Indicates Typical Values

dbtech@andrew.com

Dual Broadband Antenna

90° 1.4 m MET Antenna

806-960/1710-2170 MHz

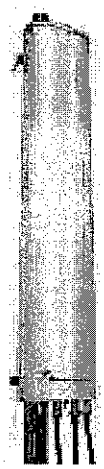
Part Number:	Horizontal Beamwidth: 90°	Electrical Downtilt: Adjustable
7770.00	Gain: 13.5/16 dBi	Connector Type: 7/16 female

The Powerwave dual band dual polarized broadband antenna has individual adjustable electrical downtilt per band (upgradeable to Remote Electrical Tilt (RET). Four connector ports allow separate tilts on each frequency band and ensure the use of diversity concepts. The phase shifter technology, based on a patented sliding dielectric, minimizes intermodulation distortion and maximizes efficiency. The slant +/- 45° dual polarization system provides the independent fading signals needed for achieving top-quality coverage via diversity concepts. The Powerwave Broadband antenna design is based on a patented stacked aperture-coupled patch technology, which provides high isolation performance and a wide VSWR bandwidth. The antennas have superior radiation patterns due to a unique reflector design which provides a very small variation of the –3dB horizontal beam width over the frequency band as well as a high front-to-back ratio.

ANTENNA SYSTEMS

BASE STATION SYSTEMS

COVERAGE SYSTEMS



Key Benefits

- Excellent broad- and multi-band capabilities
- Polarization purity makes good diversity gain
- Excellent pattern performance and high gain over frequency
- High passive intermodulation performance
- Light, slim and robust design

Preliminary

806-960/1710-2170 MHz

Dual Broadband Antenna

Electrical Specifications (Preliminary)

Frequency band (MHz)	806-960		1710-2170
Gain, ± 0.5dB (dBi)	13.5		16.0
Polarization		Dual linear ±45°	
Nominal Impedance (Ohm)		50	
VSWR	1.5:1		
VSWR			1.5:1
Isolation between inputs (dB)	30		
Isolation between inputs (dB)			30
Inter band isolation (dB)		40	
Horizontal -3 dB beamwidth	85 ± 5°		85 ± 5°
Tracking, Horizontal plane, ±60° (dB)	<2.0		
Tracking, Horizontal plane, ±60° (dB)			<2.0
Electrical downtilt range (adjustable)	0° to 10°		0° to 8°
Vertical -3 dB beamwidth	14.3 ± 2.0°		6.6 ± 1°
Sidelobe suppression, Vertical 1 st upper (dB)	>17,16,15 x=0, 5, 10° MET		> 17, 16,15 x=0, 4, 8° MET
Vertical beam squint	<0.8°		<0.5°
First null-fill (dB)	<-25		<-25
Front-to-back ratio (dB)	>25		>27
Front-to-back ratio, total power (dB)	>20		>23
IM3, 2Tx@43dBm (dBc)	<-153		
IM3, 2Tx@43dBm (dBc)			<-153
IM7, 2Tx@43dBm (dBc)			<-160
Power Handling, Average per input (W)	400		250
Power Handling, Average total (W)	800		500

All specifications are subject to change without notice.
Contact your Powerwave representative for complete performance data.

Mechanical Specifications

Connector Type	4 x 7/16 DIN female
Connector Position	Bottom
Dimensions, HxWxD	1408mm x 280mm x 125mm (55"x11"x5")
Weight Including Brackets	15.8 kg (35 lbs)
Wind Load, Frontal, 42m/s Cd=1	435N (98 lbf)
Survival Wind Speed (m/s)	70 (156mph)
Lightning Protection	DC grounded
Radome Material	GRP
Radome Color	Light Gray
Mounting	Pre-mounted Standard Brackets
Packing Size	1550mm x 355mm x 255mm (61"x14"x10")

Corporate Headquarters
Powerwave Technologies, Inc.
1801 East St. Andrew Place
Santa Ana, CA 92705 USA
Tel: 714-466-1000
Fax: 714-466-5800
www.powerwave.com

Main European Office
Antennvägen 6
SE-187 80 Täby
Sweden
Tel: +46 8 540 822 00
Fax: +46 8 540 823 40

Main Asia Pacific Office
23 F Tai Yau Building
181 Johnston Road
Wanchai, Hong Kong
Tel: +852 2512 6123
Fax: +852 2575 4860

Powerwave technologies

Tower Mounted Amplifier

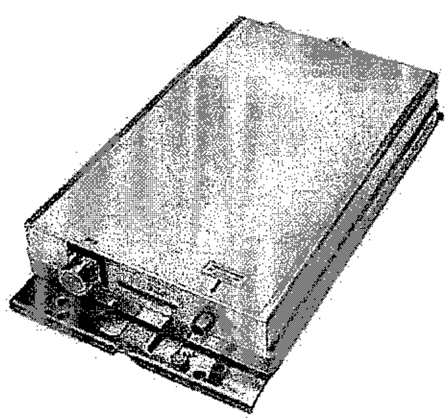
Dual Band 1900 MHz with 850 MHz Bypass

1900/850 MHz

Part Number: LGP 214nn	Up-link: 1850-1910 MHz Down-link: 1930-1990 MHz Bypass: 824-894 MHz	Gain: 12 dB Noise Figure: < 1.7 dB

The Powerwave® TMA-DD 1900/850 is a dual band Tower Mounted Amplifier (TMA) to be installed near the antenna. Deployed in an AMPS, GSM, GPRS, EDGE and CDMA network it will increase capacity and coverage as well as extend the battery life time for the handsets. The TMA System will provide enhanced coverage and improved up-link signal quality. Appropriate for new rollouts by optimizing coverage with a reduced number of BTSs or as an upgrade to existing BTSs for enhancing the existing coverage.

Extended band TMA facilitates simplified logistics, especially when the frequency bands are scattered. The unit comprises of high Q band-pass filters, dual balanced low noise amplifiers with circuits for active bias, supervision, alarms and lightning protection circuit. The Powerwave patented design with all active components integrated within the filter body provides an extremely reliable, compact and lightweight TMA solution. The vented enclosure design is employed to prevent the effect of condensation, thereby guaranteeing long, reliable, maintenance-free service in all environmental conditions. These TMAs offer an easy to install, maintenance free, cost effective solution for coverage enhancement and increased quality in mobile communication networks.



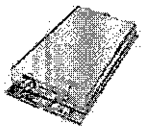
Key Benefits:

- 850 MHz Bypass
- Improved Network Quality
- Increased Coverage
- State of the Art Performance
- Excellent Power Handling
- Low Tx Loss
- Exceptional Reliability

ANTENNA SYSTEMS

BASE STATION SYSTEMS

COVERAGE SYSTEMS



1900/850 MHz

Tower Mounted Amplifier

Technical Specifications

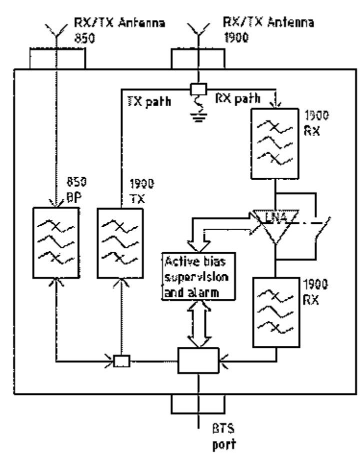
Product Number	LGP214nn	
850 MHz	Bypass (MHz)	824-894
	Return loss* (dB)	> 20
	Insertion loss* (dB)	< 0.3
1900 MHz		
Up-link	Frequency range, full band (60 MHz)	1850-1910
	Nominal gain (dB)	12
	Return loss* (dB)	> 20
	Noise figure* (dB)	< 1.7
	Output 3rd order Intercept Point* (dBm)	> +23
Down-link	Frequency range, full band (60 MHz)	1930-1990
	Insertion loss* (dB)	< 0.6
	Return loss* (dB)	> 20
Intermodulation	2 Tx@x43 dBm (dBc)	<-158
Alarm Functionality	Two levels,individually supervised LNAs	
Power Consumption	@12 VDC	1.2 W

* Typical

All specifications subject to change without notice. Please contact your Powerwave representative for complete performance data.

Mechanical Specifications

Size,W x H x D (without mounting plate)	235 x 366 x 66 mm (9.2 x 14.4 x 2.6 in)
Weight	6.4 kg (14.1 lbs)
Color	Off white (NCS 1502-R)
Housing	Aluminum
RF-connectors	DIN 7/16 female.
Mounting kit	Mounting kit for pole and wall is included
Temperature range	-40 °C to +65 °C (-40 °F to +149 °F)
MTBF	>1 million hours
Safety	UL 60 950
Ingress protection, IP 65	EN 60 529
Environmental	ETS 300 019
EMC	FCC Part 15



Corporate Headquarters
Powerwave Technologies, Inc.
1801 East St. Andrew Place
Santa Ana, CA 92705 USA
Tel: 714-466-1000
Fax: 714-466-5800
www.powerwave.com

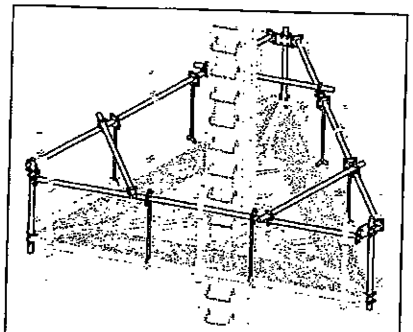
Main European Office
Antennvägen 6
SE-187 80 Täby
Sweden
Tel: +46 8 540 822 00
Fax: +46 8 540 823 40

Main Asia-Pacific Office
23 F Tai Yau Building
181 Johnston Road
Wanchai, Hong Kong
Tel: +852 2512 6123
Fax: +852 2575 4860

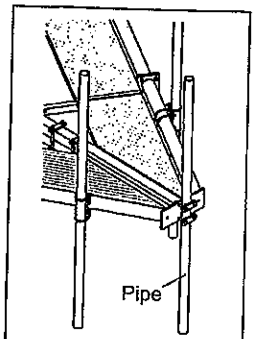
Powerwave technologies

13′ and 15′ Low Profile Platform

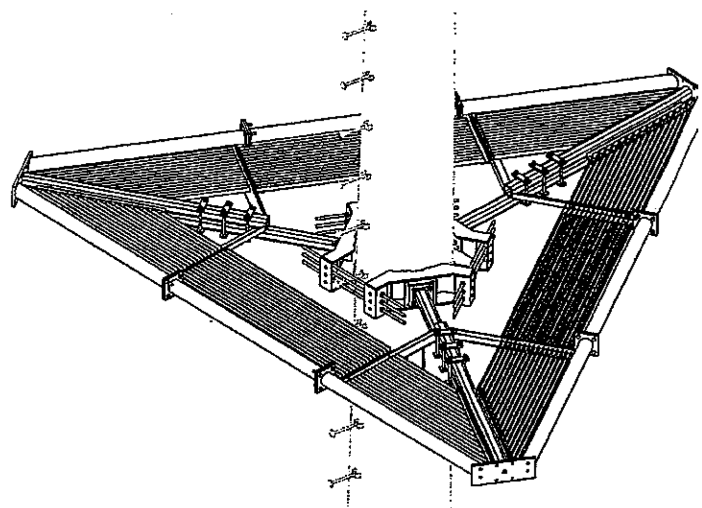
13' Low Profile Platform mounts are ideal for co-locate applications fitting a wide variety of straight and tapered monopoles. Mount capacity is approximately 240 sq. ft. distributed around the mount, considering 90 mph basic windspeed with ½" radial ice at 150' elevation[1].



Handrail option makes antenna installation and maintenance safer.



Corner Mount Option



[1] Capacity of mount is provided for comparison purposes only and is valid for conditions specified. **Call Valmont Structures for capacity on your specific installation.** Actual load capacity is dependent on basic windspeed, ice load, height of mount and other factors specific to individual installations. All Valmont Structures antenna mounts are designed and manufactured in accordance with ANSI/TIA/EIA-222-F standards.

Description - all platforms fit 12" to 54" monopoles	**13' Platform P/N**	**15' Platform P/N**
Platform (no antenna mounting pipes)	852206	852301
Platform with 12 Interface Kits for Antenna Pipes. **Antenna Mounting Pipes ordered separately. See chart next page.**	803441	207175
Platform (includes 9-84" antenna mounting pipes)	852207	852302
Platform (includes 12-84" antenna mounting pipes)	852208	852303
Platform **with Handrail** (no antenna mounting pipes)	852365	800074
Platform **with Handrail** (includes 9-84" antenna mounting pipes)	852366	800075
Platform **with Handrail** (includes 12-84" antenna mounting pipes)	852367	800076
Handrail only, (no antenna mounting pipes)	800083	800086
Handrail only, (includes 9-84" antenna mounting pipes)	800084	800087
Handrail only, (includes 12-84" antenna mounting pipes)	800085	800088
Corner Mount Option - Lightweight	852215	852215
Corner Mount Option - Heavy Duty	852216	852216

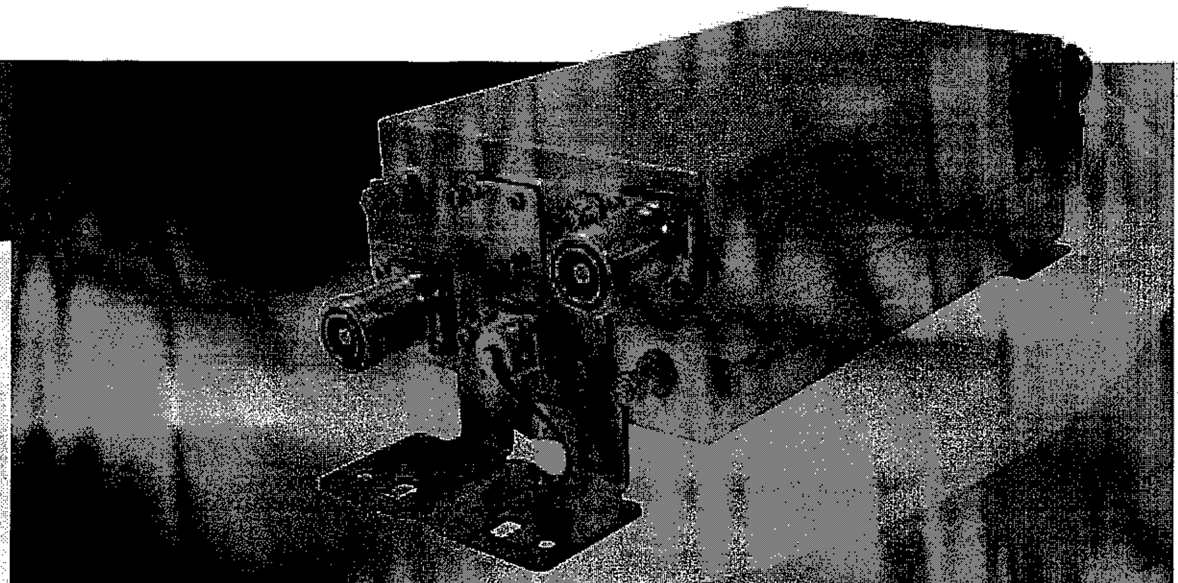
Weight and Areas[2]	**Weight, No Ice (lbs.)**	**Weight, ½" Ice (lbs.)**	**Area, No Ice (C_AA_C)**	**Area, ½" Ice (C_AA_C)**
13' Low Profile Platform	1,300	1,765	15.7 sq. ft.	20.1 sq. ft.
13' Platform with Handrail	1,822	2,452	31.3 sq. ft.	40.2 sq. ft.
15' Low Profile Platform	1,500	2,030	17.3 sq. ft.	22.1 sq. ft.
15' Platform with Handrail	2,043	2,748	33.8 sq. ft.	43.6 sq. ft.

[2] All areas presented are computed in accordance with ANSI/TIA/EIA-222-F 1996. All areas do not include cross arms, pipe mounts or antenna mounting pipes.

All of the above information, including but not limited to: prices, areas, dimensions, is subject to change without notice.

ANDREW®
A CommScope Company

PRODUCT SPECIFICATION



OneBase™ PCS Twin Dual Duplex TMA

Full Band Tower Mounted Amplifier with AISG and VSWR Alarm

Designed for the highest reliability even in the most demanding installation environments

The tower mounted amplifiers from Andrew Wireless Solutions optimize network performance and represent the ideal solution for coverage and capacity enhancement.

By improving uplink performance, the tower mounted amplifier (TMA) ensures optimum coverage of fringe areas, weak spots, and indoor locations. The unit is easy to install in any wireless system and guarantees:

Improved sensitivity, reducing dropped calls and failed connection attempts.

Enhanced signal quality, improving voice clarity and data speed.

Lower handset output, extending talk time, reducing interference in GSM/EDGE, UMTS, and CDMA systems.

The PCS twin dual duplex TMA is part of the OneBase™ product family, which combines Andrew products and technology into complete solutions for use in integrated base station systems.

The self-contained body is engineered to ensure the highest reliability in severe environments while featuring a very compact size and attractive appearance.

The PCS twin dual duplex TMA includes pole mounting hardware.

- 12 dB gain
- Full band operation
- AISG compatible interface
- RET antenna port
- Multi-stage lightning protection
- Sealed to protection class IP67
- In-line connectors
- Failsafe LNA bypass
- VSWR monitoring alarm
- Automatic dc switching
- Conventional PDU compatible
- Field upgradeable firmware

CommScope

SPECIFICATIONS

OneBase™ PCS Twin Dual Duplex TMA

Electrical

UPLINK

Frequency range, MHz	1850–1910
Gain, dB	12 ± 1
Total group delay, ns	150 max.
Delay variation—any 5 MHz BW, ns	50 max.
Delay variation – any 240 kHz BW, ns	9 max.
Noise figure – mid band, dB	1.2 typ.
Noise figure – full band, dB	2 max.
Return loss, dB	18 min.
Output IP3, dBm	26 min.

DOWNLINK

Frequency range, MHz	1930–1990
Insertion loss, dB	0.4 typ, 0.7 max.
Group delay, ns	50 max.
Delay variation – any 5 MHz BW, ns	15 max.
Return loss, dB	18 min.
IMD at antenna port, (2 x +43 dBm), dBm	-107
Maximum input power – RMS, W	500
Maximum input power – PEP, W	5000

AISG

Protocol	AISG 2.0 standard AISG 1.1 optional
RET Antenna support	24 VDC & RS-485

VSWR ALARM

Alarm threshold – return loss, dB	<9.54 ± 2

POWER

Power supply voltage, Vdc	7–30
Operating current, mA	135 ± 15 mA at 12V 110 ± 15 mA at 15V 75 ± 10 mA at 24V
Failure current consumption, mA	190 ± 10 mA at 10-18V

Mechanical

Height, depth, width, mm (in)	260 × 94 x 170 (10.2 × 3.7 × 6.7)
Weight w/o mounting hardware, kg (lb)	6.6 (14.6)
Finish	Gray paint
Connectors	
RF	7-16 DIN female (long-neck)
AISG	8 pin circ., IEC 60130
Ground screw diameter, in	1/4 in

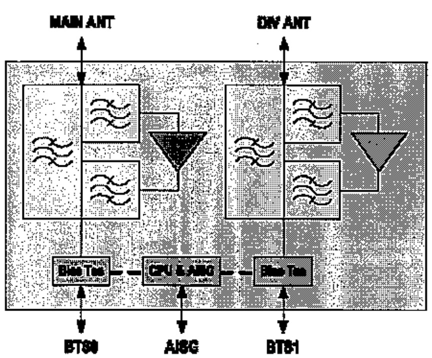
Environmental

Operating temperature range, °C	-40 to +65
Ingress protection	IP67
Lightning protection	
Antenna port	dc ground
BTS port	20 kA, 8/20 µs

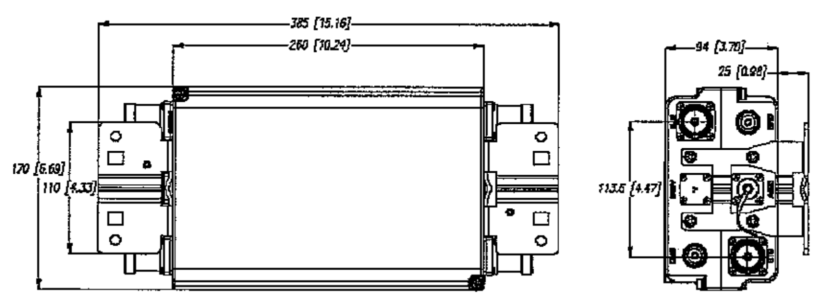
Part Number

PCS twin dual duplex TMA	E15S09P94

Block Diagram



Dimensions-mm [in]



Ordering Information: SPECIFY MODEL NUMBER TO ORDER TMA WITH ACCESSORIES AS SHOWN

Model: ETW190VS12UB　　Description: **PCS Twin Dual Duplex TMA - AISG 2.0 standard**　　Included Accessories: **Mounting hardware**

ANDREW. A CommScope Company

www.andrew.com

Visit our Web site or contact your local Andrew representative for more information.

PA102517.1-EN (5/08)

T · Mobile ·

T-Mobile USA Inc.
35 Griffin Rd South, Bloomfield, CT 06002-1853
Phone: (860) 692-7100
Fax: (860) 692-7159

Technical Memo

To: Transcend
From: Farid Marbouh - Radio Frequency Engineer
cc: Jason Overbey
Subject: Power Density Report for CTHA240A
Date: May 8, 2009

1. Introduction:

This report is the result of an Electromagnetic Field Intensities (EMF - Power Densities) study for the T-Mobile antenna installation on a Billboard at Christian Hill Road/ 100 Berlin Rd, Cromwell, CT. This study incorporates the most conservative consideration for determining the practical combined worst case power density levels that would be theoretically encountered from locations surrounding the transmitting location.

2. Discussion:

The following assumptions were used in the calculations:

1) The emissions from T-Mobile transmitters are in the (1935-1944.8), (2140-2145), (2110-2120)MHz frequency Band.
2) The antenna array consists of three sectors, with 2 antennas per sector.
3) The model number for GSM antenna is APX16DWV-16DWV.
3) The model number for UMTS antenna is APX16DWV-16DWV.
4) GSM antenna center line height is 108 ft.
4) UMTS antenna center line height is 108 ft.
5) The maximum transmit power from any GSM sector is 2510.96 Watts Effective Radiated Power (EiRP) assuming 8 channels per sector.
5) The maximum transmit power from any UMTS sector is 2505.01 Watts Effective Radiated Power (EiRP) assuming 2 channels per sector.
6) All the antennas are simultaneously transmitting and receiving, 24 hours a day.
7) Power levels emitting from the antennas are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
8) The average ground level of the studied area does not change significantly with respect to the transmitting location.

Equations given in "FCC OET Bulletin 65, Edition 97-01" were then used with the above information to perform the calculations.

3. Conclusion:

Based on the above worst case assumptions, the power density calculation from the T-Mobile antenna installation on a Billboard at Christian Hill Road/ 100 Berlin Rd, Cromwell, CT, is 0.10577 mW/cm^2. This value represents 10.577% of the Maximum Permissible Exposure (MPE) standard of 1 milliwatt per square centimeter (mW/cm^2) set forth in the FCC/ANSI/IEEE C95.1-1991. Furthermore, the proposed antenna location for T-Mobile will not interfere with existing public safety communications, AM or FM radio broadcasts, TV, Police Communications, HAM Radio communications or any other signals in the area.

The combined Power Density from other carriers is 20.37%. The combined Power Density for the site is 30.947% of the M.P.E. standard.

Connecticut Market

T-Mobile

Worst Case Power Density

Site:	CTHA240A
Site Address:	Christian Hill Road/ 100 Berlin Rd
Town:	Cromwell
Tower Height:	60 ft.
Tower Style:	Billboard

GSM Data		UMTS Data	
Base Station TX output	20 W	Base Station TX output	40 W
Number of channels	8	Number of channels	2
Antenna Model	APX16DWV-16DWV	Antenna Model	APX16DWV-16DWV
Cable Size	1 5/8 in.	Cable Size	1 5/8 in.
Cable Length	133 ft.	Cable Length	133 ft.
Antenna Height	108.0 ft.	Antenna Height	108.0 ft.
Ground Reflection	1.6	Ground Reflection	1.6
Frequency	1945.0 MHz	Frequency	2.1 GHz
Jumper & Connector loss	4.50 dB	Jumper & Connector loss	1.50 dB
Antenna Gain	18.0 dBi	Antenna Gain	18.0 dBi
Cable Loss per foot	0.0116 dB	Cable Loss per foot	0.0116 dB
Total Cable Loss	1.5428 dB	Total Cable Loss	1.5428 dB
Total Attenuation	6.0428 dB	Total Attenuation	3.0428 dB
Total EIRP per Channel	54.97 dBm	Total EIRP per Channel	60.98 dBm
(In Watts)	313.87 W	(In Watts)	1252.51 W
Total EIRP per Sector	64.00 dBm	Total EIRP per Sector	63.99 dBm
(In Watts)	2510.96 W	(In Watts)	2505.01 W
nsg	11.9572	nsg	14.9572
Power Density (S) =	0.052949 mW/cm^2	Power Density (S) =	0.052824 mW/cm^2
T-Mobile Worst Case % MPE =	10.5773%		

Equation Used :

$$S = \frac{(1000)(grf)^2(Power)*10^{(nsg/10)}}{4\pi(R)^2}$$

Office of Engineering and Technology (OET) Bulletin 65, Edition 97-01, August 1997

Co-Location Total

Carrier	% of Standard
Verizon	13.2900 %
Cingular	
Sprint	
AT&T Wireless	7.0800 %
Nextel	
MetroPCS	
Other Antenna Systems	
Total Excluding T-Mobile	**20.3700 %**
T-Mobile	10.5773
Total % MPE for Site	**30.9473%**