Robinson+Cole

KENNETH C. BALDWIN

280 Trumbull Street
Hartford, CT 06103-3597
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts



ORIGINAL

December 22, 2014

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

Re: **EM-VER-115-130401 – Cellco Partnership d/b/a Verizon Wireless**
**54 Waterbury Road, Prospect, Connecticut**

Dear Ms. Bachman:

On May 1, 2013, the Siting Council acknowledged receipt of Cellco's notice of intent to modify its telecommunications facility at 54 Waterbury Road in Prospect, Connecticut. The modifications involved the replacement of certain antennas. Since receiving the Council's acknowledgement, Cellco has decided to move forward with additional facility modifications including the installation of new antennas, remote radio heads and fiber optic antenna cables. Cellco intends to file a new notice of exempt modification for these improvements shortly.

As a condition of the Council's EM-VER-115-130401 acknowledgement, Cellco was required to provide the Council with an engineer's letter regarding recommendations specified in the structural report. Since the modifications described in EM-VER-115-130401 will not be completed, that engineer's letter will not be submitted.

If you have any questions please do not hesitate to contact me.

Sincerely,

Kenneth C. Baldwin

Copy to:
Sandy M. Carter
Brian Ragozzine
Mark Gauger

STATE OF CONNECTICUT
*CONNECTICUT SITING COUNCIL*
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

May 1, 2013

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103

RE: **EM-VER-115-130401** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at 54 Waterbury Road, Prospect, Connecticut.

Dear Attorney Baldwin:

The Connecticut Siting Council (Council) hereby acknowledges your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies with the following conditions:

- Prior to antenna installation, Verizon makes reinforcements to the tower so that its antenna installation shall not cause the tower to exceed 100 percent of its capacity;
- Within 45 days following completion of the antenna installation, a signed letter from a Professional Engineer duly licensed in the State of Connecticut shall be submitted to the Council to certify that the recommended modifications have been completed and the structure and foundation do not exceed 100 percent of the post-construction structural rating;
- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated March 29, 2013. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Thank you for your attention and cooperation.

Very truly yours,

Melanie A. Bachman
Acting Executive Director

MAB/CDM/jb

c: The Honorable Robert J. Chatfield, Mayor, Town of Prospect
William J. Donovan, Zoning Enforcement Officer, Town of Prospect
Charles Bradshaw

ROBINSON & COL

EM-VER-115-130401

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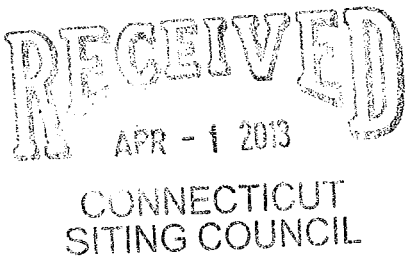
Also admitted in Massachusetts

March 29, 2013




Linda Roberts
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap**
**54 Waterbury Road, Prospect, Connecticut**

Dear Ms. Roberts:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains twelve (12) wireless telecommunications antennas at the 135-foot level of the existing 160-foot tower at the above-referenced address. The tower is owned by Charles E. Bradshaw. The Council approved Cellco's use of this facility in 2006. Cellco now intends to replace three (3) of its existing antennas with three (3) model APX75-866514T0 LTE antennas at the same 135-foot level. Attached behind Tab 1 are the specifications for the replacement antennas.

Please accept this letter as notification pursuant to R.C.S.A. § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Robert Chatfield, Mayor for the Town of Prospect. A copy of this letter is being sent to Charles E. and Averyll B. Bradshaw, the owners of the property on which the facility is located.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas will be located at the 135-foot level on the 160-foot tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

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

4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table for Cellco's modified facility is included behind Tab 2.

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

6. The tower and its foundation can support Cellco's proposed modifications. (*See* Structural Analysis attached behind Tab 3).

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

Sincerely,

Kenneth C. Baldwin

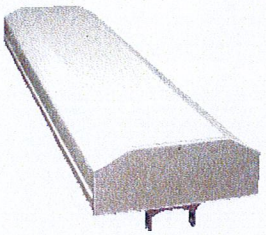
Enclosures
Copy to:
Robert Chatfield, Prospect Mayor
Charles E. and Averyll B. Bradshaw
Sandy M. Carter

**Product Data Sheet** APX75-866514-CT0

Optimizer® Dual Polarized Antenna, 698-896, 65deg, 16.1dBi, 2m, FET, 0deg

## Product Description

Wideband antenna for dense networks where site aspect is essential.



## Features/Benefits

- **Wideband performance 698-896 MHz**
- **High sidelobe suppression**
- **Null fill**
- **Dual polarization**
- **High front-to-back ratio**

## Technical Specifications

### Electrical Specifications

| | |
|---|---|
| Frequency Range, MHz | 698-896 |
| Horizontal Beamwidth, deg | 66 +/-5 |
| Vertical Beamwidth, deg | 9-12 |
| Electrical Downtilt Range, deg | 0 |
| Gain, dBi (dBd) | 16.1 (14) |
| 1st Upper Sidelobe Suppression, dB | >18 |
| Upper Sidelobe Suppression, dB | >18 |
| Front-To-Back Ratio, dB | >30 |
| Polarization | Slant +/-45 degrees |
| VSWR | 1.40:1 |
| Isolation between Ports, dB | >30 |
| 3rd Order IMP @ 2 x 43 dBm, dBc | >150 |
| Impedance, Ohms | 50 |
| Maximum Power Input, W | 500 |
| Lightning Protection | Chassis Ground |
| Connector Type/Location | (2) 7-16 Long Neck DIN Female/Bottom |

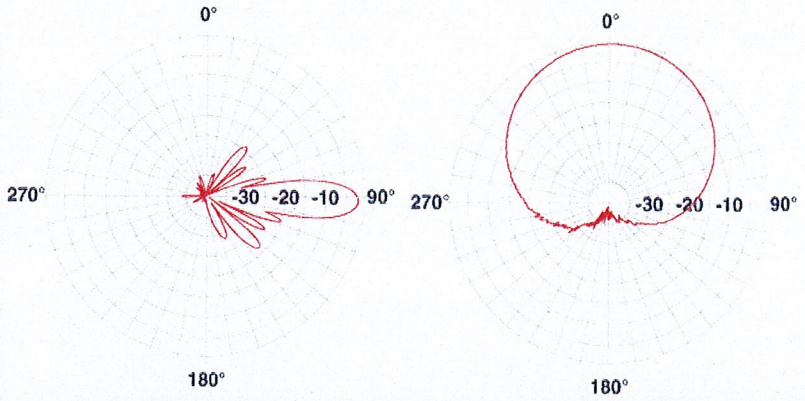
### Mechanical Specifications

| | |
|---|---|
| Dimensions - HxWxD, mm (in) | 2082.8 x 311.2 x 120.7 (82 x 12.25 x 4.75) |
| Weight w/o Mtg Hardware, kg (lb) | 14.0 (30.8) |
| Survival/Rated Wind Speed, km/h (mph) | 200 (125) / 160 (100) |
| Operation temperature, °C (°F) | -40 to +60 (-40 to +140) |
| Radome Material/Color | ASA Plastic/Light Grey RAL7035 |
| Mounting Hardware Material | Diecasted Aluminum |
| Radiating Element Material | Brass |
| Reflector Material | Aluminum |

### Ordering Information

| | |
|---|---|
| Mounting Hardware | APM40-3 |
| Mounting Pipe Diameter, mm (in) | 60-120 (2.36-4.72) |
| Mounting Hardware Weight, kg (lb) | 5.4 (11.9) |

# Optimizer® Dual Polarized Antenna, 698-896, 65deg, 16.1dBi, 2m, FET, 0deg




Vertical Pattern Horizontal Pattern

## Notes

For additional mounting information please click "External Document Link" below.

## External Document Links

APM40 Series Datasheet
APM40 Series Installation Instructions

| | General | Power | Density | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Site Name: Prospect N** | | | | | | | | |
| **Tower Height:** Verizon @ 135ft | | | | | | | | |
| CARRIER | # OF CHAN. | WATTS ERP | HEIGHT | CALC. POWER DENS | FREQ. | MAX. PERMISS. EXP. | FRACTION MPE | Total |
| *F&S Oil | | | | 0.0031 | 451 | 0.3007 | 1.03% | |
| *New Haven Transit | | | | 0.0031 | 451 | 0.3007 | 1.03% | |
| *US Post Office | | | | 0.0031 | 415 | 0.2767 | 1.12% | |
| *Central Comm. | | | | 0.0031 | 452 | 0.3013 | 1.03% | |
| *CT Motor Club | | | | 0.0381 | 150.92 | 0.2000 | 19.05% | |
| *Sprint-Nextel iDEN | 9 | 100 | 146 | 0.0152 | 851 | 0.5673 | 2.68% | |
| *Sprint-Nextel CDMA | 11 | 421 | 146 | 0.0781 | 1962.5 | 1.0000 | 7.81% | |
| *Clearwire | 2 | 153 | 146 | 0.0052 | 2496 | 1.0000 | 0.52% | |
| *Clearwire | 1 | 211 | 151 | 0.0033 | 23 GHz | 1.0000 | 0.33% | |
| *AT&T UMTS | 2 | 1077 | 126 | 0.0488 | 880 | 0.5867 | 8.32% | |
| *AT&T UMTS | 2 | 1556 | 126 | 0.0705 | 1900 | 1.0000 | 7.05% | |
| *AT&T GSM | 1 | 538 | 126 | 0.0122 | 880 | 0.5867 | 2.08% | |
| *AT&T GSM | 4 | 934 | 126 | 0.0846 | 1900 | 1.0000 | 8.46% | |
| *AT&T LTE | 1 | 1375 | 126 | 0.0311 | 734 | 0.4893 | 6.36% | |
| **Verizon PCS** | **14** | **247** | **135** | **0.0682** | **1970** | **1.0000** | **6.82%** | |
| **Verizon Cellular** | **9** | **255** | **135** | **0.0453** | **869** | **0.5793** | **7.82%** | |
| **Verizon AWS** | **1** | **1750** | **135** | **0.0345** | **2145** | **1.0000** | **3.45%** | |
| **Verizon 700** | **1** | **836** | **135** | **0.0165** | **698** | **0.4653** | **3.54%** | |
| | | | | | | | | **88.50%** |
| * Source: Siting Council | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

ARMOR TOWER ENGINEERING

# Structural Analysis of 160 ft Guyed Tower

**Site Name: Prospect North**
**County: New Haven**
**Location: Prospect, CT**

Checked By:

Archan Shah
Structural Engineer

STATE OF CONNECTICUT
DMITRIY V. ALBUL
No. 26725
LICENSED PROFESSIONAL ENGINEER
3/18/2013

## McPhee Electric Ltd.

505 Main Street

Farmington, CT 06032

March 2013

9 North Main Street, 2nd Floor, Cortland, NY 13045
(607)591-5381 Fax: (866)870-0840 www.ArmorTower.com

March 18, 2013

Douglas Barker
McPhee Electric Ltd.
505 Main Street
Farmington, CT 06032

ARMOR TOWER ENGINEERING

RE: Verizon Wireless – Prospect North
54 Waterbury Road, Prospect, CT 06712

Douglas:

We have completed the structural analysis of the subject tower and **have found it to be acceptably loaded within the scope of this analysis to support the proposed antenna loading**. The tower was analyzed according to the requirements of TIA/EIA 222-F standard for New Haven County for 85 mph (fastest mile) wind speed with no ice and 74 mph wind with ½" ice.

The tower we analyzed is a 160' guyed tower consisting of welded sections with pipe legs and pipe bracing. Tower face dimension is 30" the full height above an 80" tapered base. The tower mast is laterally supported by three levels of guying attached to one set of three guy anchors. Foundation details have not been provided for our review and are therefore considered unknown.

The loading used in the analysis consisted of the existing antennas/lines as well as the following:

- Remove (2) existing SLCP 2X6014 Verizon antennas.
- Remove (1) existing BXA70063-4CF-2-750Mhz Verizon antennas.
- Add (3) APX75-866514T0 (1 per sector) @ 135' for Verizon Wireless on existing antenna frames.

Feed lines were assumed to be located as shown on drawing E-7.

The results of the analysis showed all other tower elements were acceptably loaded. For a detailed listing of the tower's performance, please see page 20 of 21 of the calculations.

We appreciate the opportunity to provide our services to McPhee Electric Ltd. and Verizon Wireless and if you have any questions concerning this analysis, please contact us.

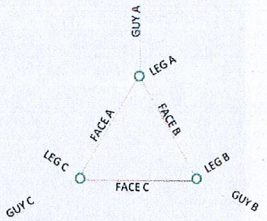
Sincerely,

Alexander Smirnov
ARMOR TOWER, INC.

STATE OF CONNECTICUT
DMITRIY V. ALBUL
No. 28725
LICENSED
PROFESSIONAL ENGINEER
3/18/2013

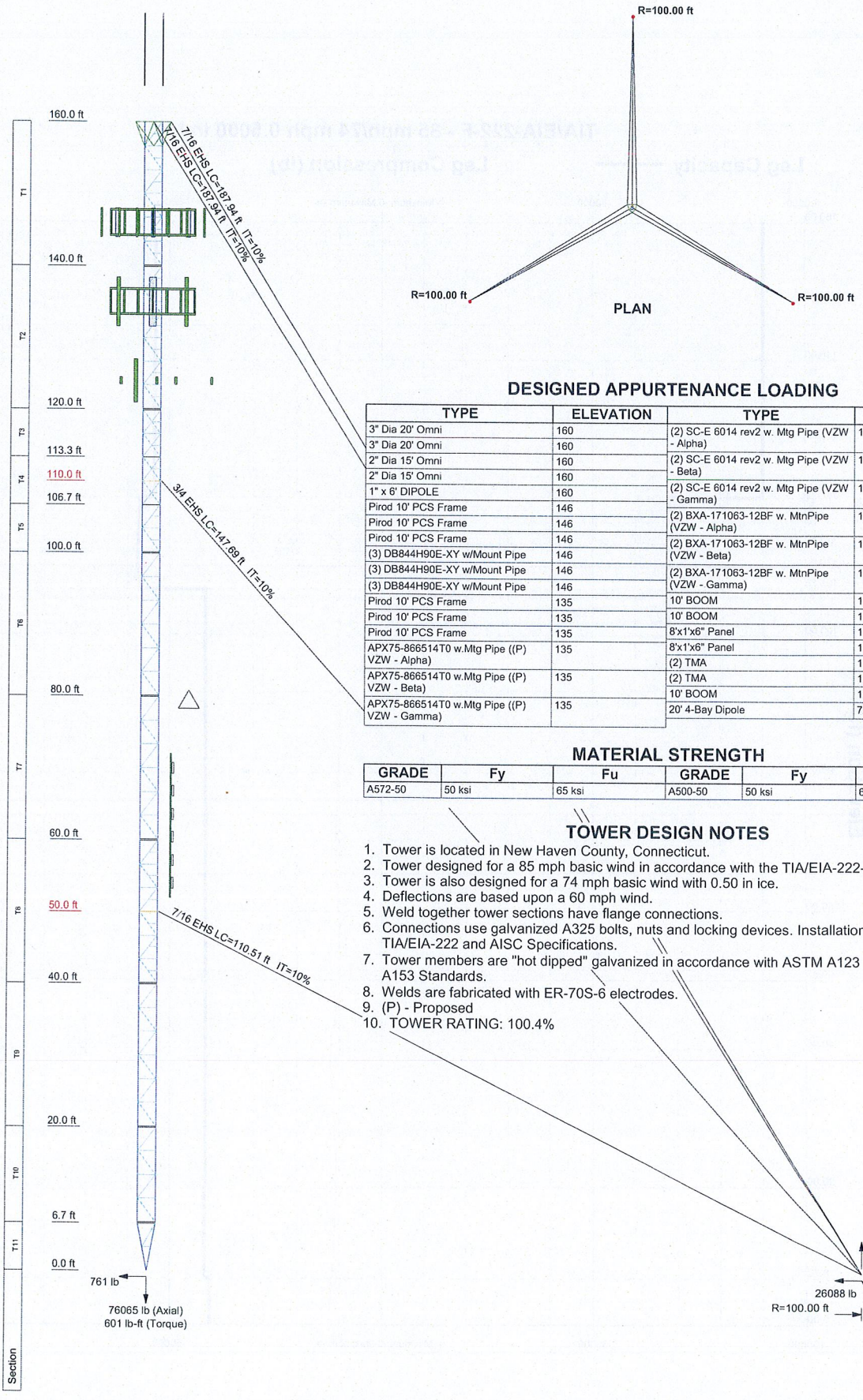
9 North Main Street, 2nd Floor, Cortland, NY 13045
(607)591-5381 Fax: (866)870-0840 www.ArmorTower.com

## PRIMARY ASSUMPTIONS USED IN THE ANALYSIS




1. Leg A is assumed to be oriented North.
2. Allowable steel stresses are defined by AISC-ASD 9th Edition and all welds conform to AWS D1-1 specifications.
3. Armor Tower has been commissioned to analyze the tower according to the requirements of TIA/EIA 222-F for New Haven County, CT. Per this code, a basic wind speed of 85 mph (fastest mile) without ice and 74 mph with ½" ice is recommended. This site is not within a special wind region. It is the client's responsibility to check with local authorities or the tower owner if a greater wind or ice loading is required to be considered in the analysis. Note that Section 3108.4 of the International Building Code states that "Towers shall be designed to resist wind loads according to TIA/EIA-222".
4. The acceptability of the analyzed antenna loading is the responsibility of Verizon Wireless and its affiliates to confirm with the respective carriers or the tower owner.
5. Any deviation from the analyzed antenna loading will require a re-analysis of the tower for verification of structural integrity. Proposed feed lines were assumed to be located as shown on drawing E-7.
6. This analysis assumes all tower members are galvanized adequately to prevent corrosion of the steel and that all tower members are in "like new" condition with no physical deterioration. This analysis also assumes the tower has been maintained properly per TIA/EIA 222-F Annex E recommended inspection and maintenance procedures for tower owners and is in a plumb condition. Armor Tower has not completed a condition assessment of the tower.
7. No accounting for residual stresses due to incorrect tower erection can be made. This analysis assumes all bolts are appropriately tightened providing necessary connection continuity and that the installation of the tower was performed by a qualified tower erector.
8. This certification does not include foundations. Geotechnical or foundation information was not provided to Armor Tower to complete a foundation review. Armor Tower therefore does not accept responsibility for foundation adequacy.
9. No conclusions, expressed or implied, shall indicate that Armor Tower has made an evaluation of the original design, materials, fabrication, or potential erection deficiencies. Any information contrary to that assumed for the purpose of preparing this analysis could alter the findings and conclusions stated.
10. Tower member sizes and geometry are based on a tower structural analysis completed by Bay State Design in 11/05/11. Note that this is not a condition assessment of the tower. Existing and proposed antenna loading is based on customer-supplied data.
11. The investigation of the load carrying capacities of the antenna supporting frames/mounts is outside the scope of this analysis. Antenna mount certification can be completed under separate contract.

9 North Main Street, 2nd Floor, Cortland, NY 13045
(607)591-5381 Fax: (866)870-0840 www.ArmorTower.com




## DESIGNED APPURTENANCE LOADING

| TYPE | ELEVATION | TYPE | ELEVATION |
|---|---|---|---|
| 3" Dia 20' Omni | 160 | (2) SC-E 6014 rev2 w. Mtg Pipe (VZW - Alpha) | 135 |
| 3" Dia 20' Omni | 160 | (2) SC-E 6014 rev2 w. Mtg Pipe (VZW - Beta) | 135 |
| 2" Dia 15' Omni | 160 | (2) SC-E 6014 rev2 w. Mtg Pipe (VZW - Gamma) | 135 |
| 2" Dia 15' Omni | 160 | (2) BXA-171063-12BF w. MtnPipe (VZW - Alpha) | 135 |
| 1" x 6' DIPOLE | 160 | (2) BXA-171063-12BF w. MtnPipe (VZW - Beta) | 135 |
| Pirod 10' PCS Frame | 146 | (2) BXA-171063-12BF w. MtnPipe (VZW - Gamma) | 135 |
| Pirod 10' PCS Frame | 146 | 10' BOOM | 124 |
| Pirod 10' PCS Frame | 146 | 10' BOOM | 124 |
| (3) DB844H90E-XY w/Mount Pipe | 146 | 8'x1'x6" Panel | 124 |
| (3) DB844H90E-XY w/Mount Pipe | 146 | 8'x1'x6" Panel | 124 |
| (3) DB844H90E-XY w/Mount Pipe | 146 | (2) TMA | 124 |
| Pirod 10' PCS Frame | 135 | (2) TMA | 124 |
| Pirod 10' PCS Frame | 135 | 10' BOOM | 124 |
| Pirod 10' PCS Frame | 135 | 20' 4-Bay Dipole | 72 - 52 |
| APX75-866514T0 w.Mtg Pipe ((P) VZW - Alpha) | 135 | | |
| APX75-866514T0 w.Mtg Pipe ((P) VZW - Beta) | 135 | | |
| APX75-866514T0 w.Mtg Pipe ((P) VZW - Gamma) | 135 | | |

## MATERIAL STRENGTH

| GRADE | Fy | Fu | GRADE | Fy | Fu |
|---|---|---|---|---|---|
| A572-50 | 50 ksi | 65 ksi | A500-50 | 50 ksi | 62 ksi |

## TOWER DESIGN NOTES

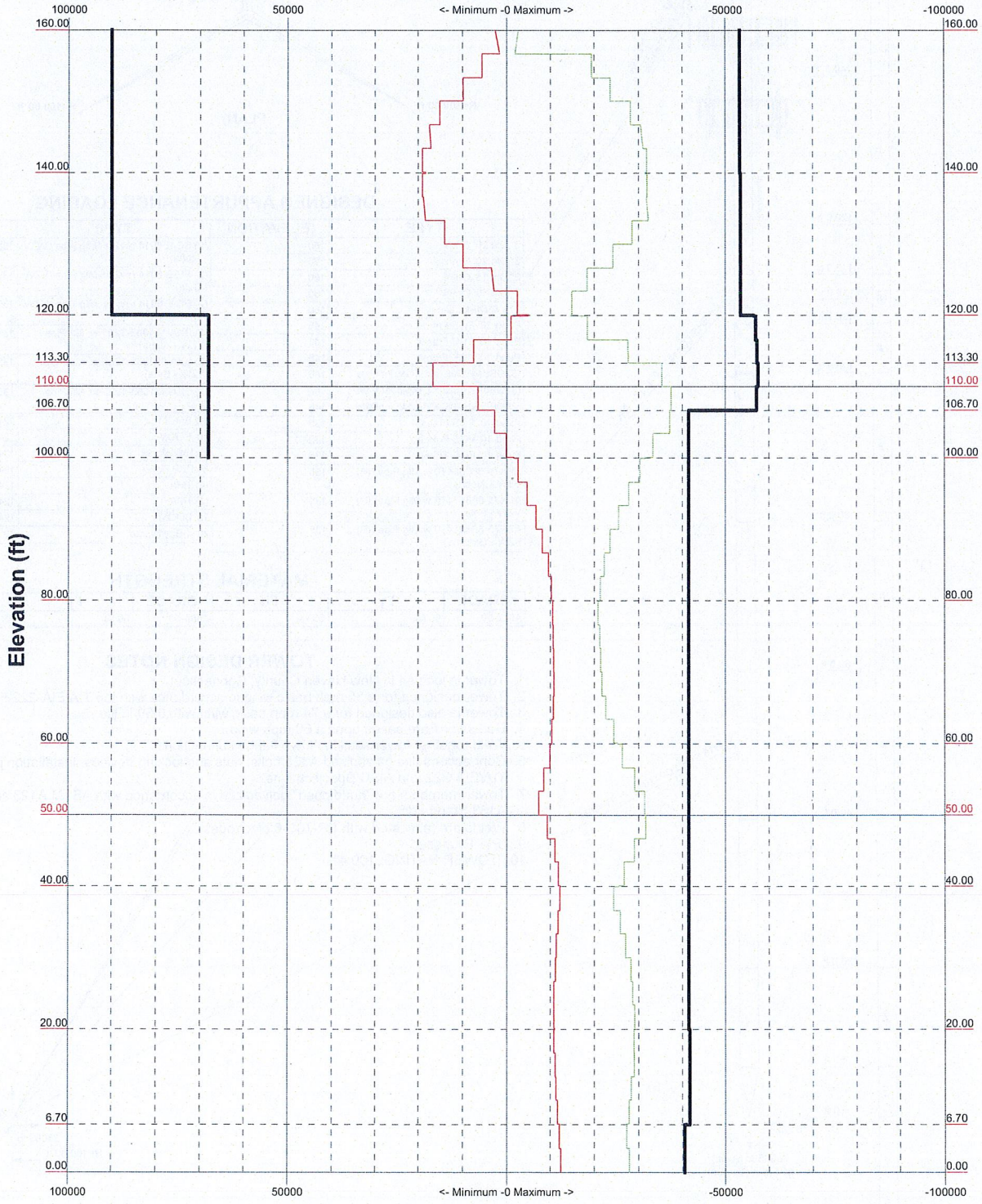
1. Tower is located in New Haven County, Connecticut.
2. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
4. Deflections are based upon a 60 mph wind.
5. Weld together tower sections have flange connections.
6. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
7. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
8. Welds are fabricated with ER-70S-6 electrodes.
9. (P) - Proposed
10. TOWER RATING: 100.4%


ARMOR TOWER
Armor Tower, Inc.
*Armor Tower*
9 N.Main St.
Cortland, NY
Phone: (607) 591-5381
FAX: (866) 870-0840


| | | | |
|---|---|---|---|
| Job: ***STRUCTURAL ANALYSIS OF 160' GUYED TOWE*** | | | |
| Project: ***Prospect North, CT*** | | | |
| Client: Verizon Wireless | Drawn by: AAS | App'd: | |
| Code: TIA/EIA-222-F | Date: 03/18/13 | Scale: NTS | |
| Path: Z:\McPhee Electric\ProspectCT\ReAnalysis Feb 2013\RISA\CT81XC010.er | | Dwg No. E-1 | |

## TIA/EIA-222-F - 85 mph/74 mph 0.5000 in Ice

**Leg Capacity** ——— **Leg Compression (lb)**





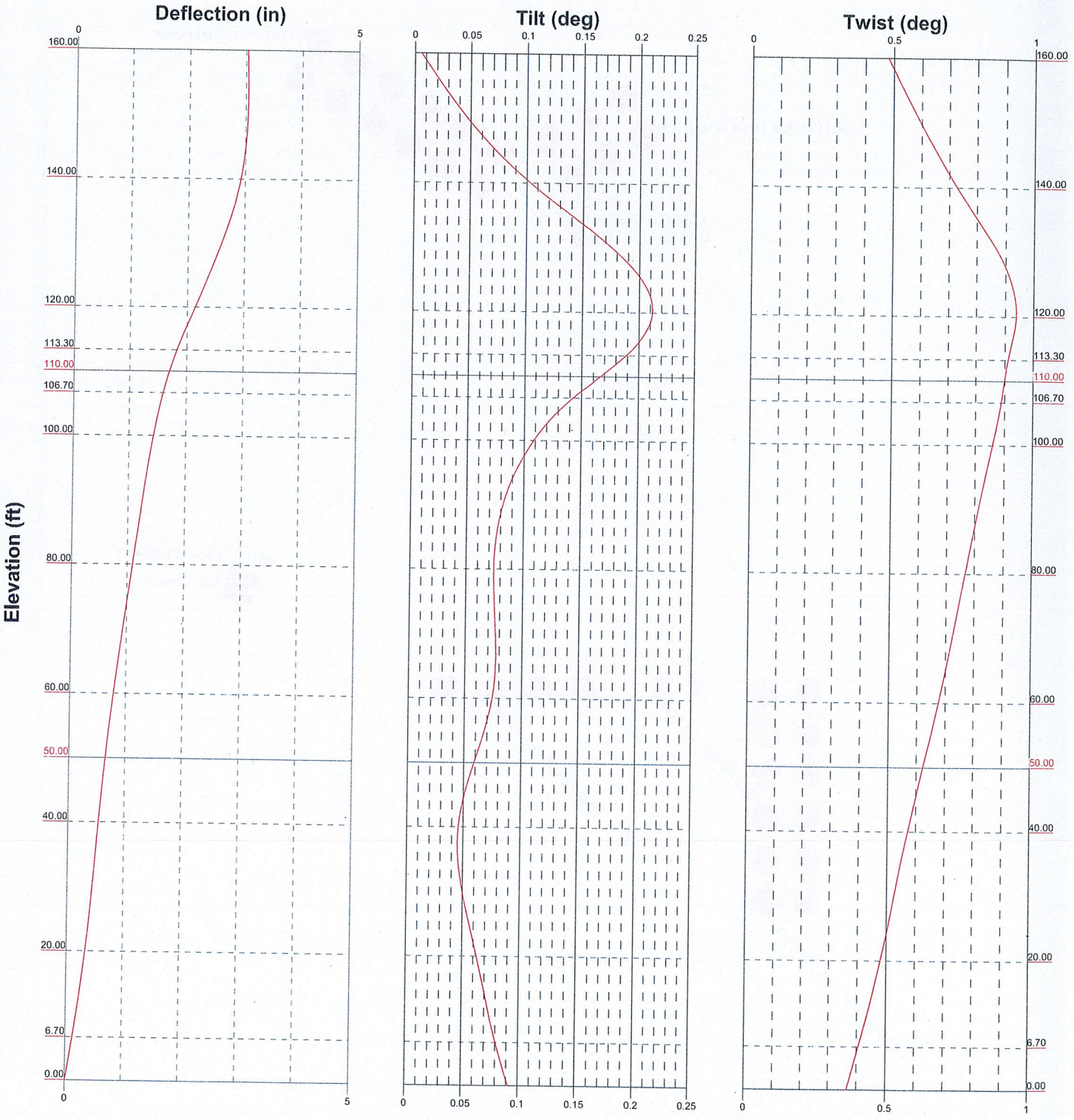
ARMOR TOWER
Armor Tower, Inc.

*Armor Tower*
9 N.Main St.
Cortland, NY
Phone: (607) 591-5381
FAX: (866) 870-0840


| | | | |
|---|---|---|---|
| Job: ***STRUCTURAL ANALYSIS OF 160' GUYED TOWE*** | | | |
| Project: ***Prospect North, CT*** | | | |
| Client: Verizon Wireless | Drawn by: AAS | App'd: | |
| Code: TIA/EIA-222-F | Date: 03/18/13 | Scale: NTS | |
| Path: Z:\McPhee Electric\Prospect CT\ReAnalysis Feb 2013\RISA\CT81XC010.er | | Dwg No. E-3 | |

TIA/EIA-222-F - Service - 60 mph

Maximum Values





ARMOR TOWER

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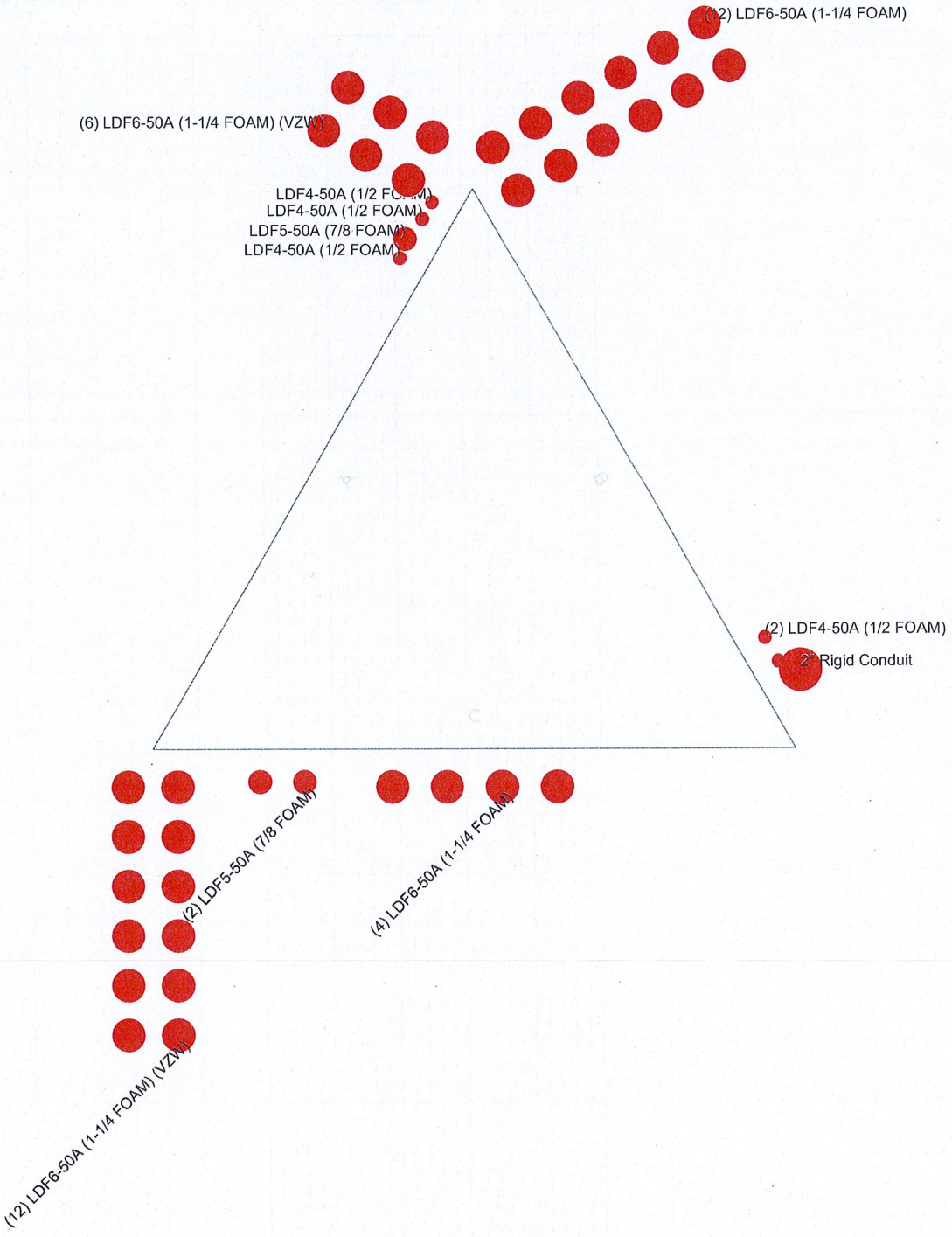
| | | | |
|---|---|---|---|
| Job: ***STRUCTURAL ANALYSIS OF 160' GUYED TOWE*** | | | |
| Project: ***Prospect North, CT*** | | | |
| Client: Verizon Wireless | Drawn by: AAS | App'd: | |
| Code: TIA/EIA-222-F | Date: 03/18/13 | Scale: NTS | |
| Path: Z:\McPhee Electric\ProspectCT\ReAnalysis Feb 2013\RISA\CT81XC010.ed | | Dwg No. E-5 | |

# Feedline Plan

Round  Flat  App In Face  App Out Face




| | | | |
|---|---|---|---|
| ARMOR TOWER<br>Armor Tower, Inc. | *Armor Tower*<br>9 N.Main St.<br>Cortland, NY<br>Phone: (607) 591-5381<br>FAX: (866) 870-0840 | Job: ***STRUCTURAL ANALYSIS OF 160' GUYED TOWE*** | |
| | | Project: ***Prospect North, CT*** | |
| | | Client: Verizon Wireless | Drawn by: AAS / App'd: |
| | | Code: TIA/EIA-222-F | Date: 03/18/13 / Scale: NTS |
| | | Path: Z:\McPhee Electric\ProspectCT\ReAnalysis Feb 2013\RISA\CT61XC010.er | Dwg No. E-7 |

| ARMOR TOWER | Job | Page |
|---|---|---|
| | STRUCTURAL ANALYSIS OF 160' GUYED TOWER | 1 of 21 |
| *Armor Tower*<br>*9 N.Main St.*<br>*Cortland, NY*<br>*Phone: (607) 591-5381*<br>*FAX: (866) 870-0840* | **Project**<br>Prospect North, CT | **Date**<br>12:06:06 03/18/13 |
| | **Client**<br>Verizon Wireless | **Designed by**<br>AAS |

# Force Totals (Does not include forces on guys)

| *Load Case* | *Vertical Forces* *lb* | *Sum of Forces X* *lb* | *Sum of Forces Z* *lb* | *Sum of Torques* *lb-ft* |
|---|---|---|---|---|
| Leg Weight | 3160.86 | | | |
| Bracing Weight | 1459.36 | | | |
| Total Member Self-Weight | 4620.22 | | | |
| Guy Weight | 1093.00 | | | |
| Total Weight | 12703.45 | | | |
| Wind 0 deg - No Ice | | 9.57 | -15370.62 | 1615.76 |
| Wind 30 deg - No Ice | | 7759.07 | -13316.13 | 2808.62 |
| Wind 60 deg - No Ice | | 13429.52 | -7693.60 | 3248.92 |
| Wind 90 deg - No Ice | | 15501.55 | -9.57 | 2818.67 |
| Wind 120 deg - No Ice | | 13419.95 | 7677.02 | 1633.16 |
| Wind 150 deg - No Ice | | 7742.49 | 13306.56 | 10.04 |
| Wind 180 deg - No Ice | | -9.57 | 15370.62 | -1615.76 |
| Wind 210 deg - No Ice | | -7759.07 | 13316.13 | -2808.62 |
| Wind 240 deg - No Ice | | -13429.52 | 7693.60 | -3248.92 |
| Wind 270 deg - No Ice | | -15501.55 | 9.57 | -2818.67 |
| Wind 300 deg - No Ice | | -13419.95 | -7677.02 | -1633.16 |
| Wind 330 deg - No Ice | | -7742.49 | -13306.56 | -10.04 |
| Member Ice | 1956.12 | | | |
| Guy Ice | 1172.95 | | | |
| Total Weight Ice | 25764.35 | | | |
| Wind 0 deg - Ice | | 6.82 | -18461.85 | 1600.43 |
| Wind 30 deg - Ice | | 8941.00 | -15409.21 | 2453.54 |
| Wind 60 deg - Ice | | 15285.22 | -8788.33 | 2664.47 |
| Wind 90 deg - Ice | | 17870.17 | -6.82 | 2146.90 |
| Wind 120 deg - Ice | | 16055.24 | 9225.02 | 1030.41 |
| Wind 150 deg - Ice | | 8929.17 | 15402.39 | -306.63 |
| Wind 180 deg - Ice | | -6.82 | 17564.83 | -1591.30 |
| Wind 210 deg - Ice | | -8941.00 | 15409.21 | -2453.54 |
| Wind 240 deg - Ice | | -16062.06 | 9236.84 | -2630.85 |
| Wind 270 deg - Ice | | -17870.17 | 6.82 | -2146.90 |
| Wind 300 deg - Ice | | -15278.40 | -8776.51 | -1073.17 |
| Wind 330 deg - Ice | | -8929.17 | -15402.39 | 306.63 |
| Total Weight | 12703.45 | | | |
| Wind 0 deg - Service | | 4.77 | -7658.72 | 805.09 |
| Wind 30 deg - Service | | 3866.11 | -6635.03 | 1399.45 |
| Wind 60 deg - Service | | 6691.53 | -3833.49 | 1618.84 |
| Wind 90 deg - Service | | 7723.96 | -4.77 | 1404.46 |
| Wind 120 deg - Service | | 6686.76 | 3825.23 | 813.75 |
| Wind 150 deg - Service | | 3857.85 | 6630.26 | 5.00 |
| Wind 180 deg - Service | | -4.77 | 7658.72 | -805.09 |
| Wind 210 deg - Service | | -3866.11 | 6635.03 | -1399.45 |
| Wind 240 deg - Service | | -6691.53 | 3833.49 | -1618.84 |
| Wind 270 deg - Service | | -7723.96 | 4.77 | -1404.46 |
| Wind 300 deg - Service | | -6686.76 | -3825.23 | -813.75 |
| Wind 330 deg - Service | | -3857.85 | -6630.26 | -5.00 |

## Load Combinations

| *Comb. No.* | *Description* |
|---|---|
| 1 | Dead Only |
| 2 | Dead+Wind 0 deg - No Ice+Guy |
| 3 | Dead+Wind 30 deg - No Ice+Guy |
| 4 | Dead+Wind 60 deg - No Ice+Guy |
| 5 | Dead+Wind 90 deg - No Ice+Guy |
| 6 | Dead+Wind 120 deg - No Ice+Guy |
| 7 | Dead+Wind 150 deg - No Ice+Guy |
| 8 | Dead+Wind 180 deg - No Ice+Guy |
| 9 | Dead+Wind 210 deg - No Ice+Guy |
| 10 | Dead+Wind 240 deg - No Ice+Guy |
| 11 | Dead+Wind 270 deg - No Ice+Guy |
| 12 | Dead+Wind 300 deg - No Ice+Guy |
| 13 | Dead+Wind 330 deg - No Ice+Guy |
| 14 | Dead+Ice+Temp+Guy |
| 15 | Dead+Wind 0 deg+Ice+Temp+Guy |
| 16 | Dead+Wind 30 deg+Ice+Temp+Guy |
| 17 | Dead+Wind 60 deg+Ice+Temp+Guy |
| 18 | Dead+Wind 90 deg+Ice+Temp+Guy |
| 19 | Dead+Wind 120 deg+Ice+Temp+Guy |
| 20 | Dead+Wind 150 deg+Ice+Temp+Guy |
| 21 | Dead+Wind 180 deg+Ice+Temp+Guy |
| 22 | Dead+Wind 210 deg+Ice+Temp+Guy |
| 23 | Dead+Wind 240 deg+Ice+Temp+Guy |
| 24 | Dead+Wind 270 deg+Ice+Temp+Guy |
| 25 | Dead+Wind 300 deg+Ice+Temp+Guy |
| 26 | Dead+Wind 330 deg+Ice+Temp+Guy |
| 27 | Dead+Wind 0 deg - Service+Guy |
| 28 | Dead+Wind 30 deg - Service+Guy |
| 29 | Dead+Wind 60 deg - Service+Guy |
| 30 | Dead+Wind 90 deg - Service+Guy |
| 31 | Dead+Wind 120 deg - Service+Guy |
| 32 | Dead+Wind 150 deg - Service+Guy |
| 33 | Dead+Wind 180 deg - Service+Guy |
| 34 | Dead+Wind 210 deg - Service+Guy |
| 35 | Dead+Wind 240 deg - Service+Guy |
| 36 | Dead+Wind 270 deg - Service+Guy |
| 37 | Dead+Wind 300 deg - Service+Guy |
| 38 | Dead+Wind 330 deg - Service+Guy |

## Maximum Member Forces

| *Section No.* | *Elevation ft* | *Component Type* | *Condition* | *Gov. Load Comb.* | *Force lb* | *Major Axis Moment lb-ft* | *Minor Axis Moment lb-ft* |
|---|---|---|---|---|---|---|---|
| T1 | 160 - 140 | Leg | Max Tension | 10 | 19095.29 | -22.14 | 96.72 |
| | | | Max. Compression | 17 | -31995.61 | 271.19 | 113.61 |
| | | | Max. Mx | 5 | -6026.40 | 745.49 | -581.51 |
| | | | Max. My | 2 | -16592.38 | 117.90 | -897.24 |
| | | | Max. Vy | 4 | -1071.96 | 118.30 | -78.93 |
| | | | Max. Vx | 10 | -866.74 | 32.08 | 464.39 |
| | | Diagonal | Max Tension | 11 | 4469.23 | 0.00 | 0.00 |
| | | | Max. Compression | 5 | -4709.84 | 0.00 | 0.00 |
| | | | Max. Mx | 16 | 745.90 | 2.80 | 0.00 |
| | | | Max. My | 17 | 581.16 | 0.00 | -0.06 |
| | | | Max. Vy | 16 | -2.70 | 0.00 | 0.00 |
| | | | Max. Vx | 17 | -0.06 | 0.00 | 0.00 |

| *Section No.* | *Elevation ft* | *Component Type* | *Condition* | *Gov. Load Comb.* | *Force lb* | *Major Axis Moment lb-ft* | *Minor Axis Moment lb-ft* |
|---|---|---|---|---|---|---|---|
| | | Horizontal | Max Tension | 9 | 1302.36 | 0.00 | 0.00 |
| | | | Max. Compression | 3 | -1211.64 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 92.33 | 1.67 | 0.00 |
| | | | Max. My | 23 | 378.35 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | -2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.00 | 0.00 | 0.00 |
| | | Secondary Horizontal | Max Tension | 18 | 0.01 | -0.49 | -0.00 |
| | | | Max. Compression | 24 | -0.01 | -0.48 | -0.00 |
| | | | Max. Mx | 20 | 0.01 | -0.57 | 0.00 |
| | | | Max. My | 15 | 0.00 | -0.24 | 0.01 |
| | | | Max. Vy | 20 | 1.92 | -0.57 | 0.00 |
| | | | Max. Vx | 15 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 15 | 190.65 | 0.00 | 0.00 |
| | | | Max. Compression | 6 | -169.22 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 18.00 | 1.67 | 0.00 |
| | | | Max. My | 16 | 45.74 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| | | Guy A | Bottom Tension | 21 | 7789.92 | | |
| | | | Top Tension | 21 | 7943.31 | | |
| | | | Top Cable Vert | 21 | 6873.10 | | |
| | | | Top Cable Norm | 21 | 3982.05 | | |
| | | | Top Cable Tan | 21 | 5.58 | | |
| | | | Bot Cable Vert | 21 | -6483.74 | | |
| | | | Bot Cable Norm | 21 | 4317.86 | | |
| | | | Bot Cable Tan | 21 | 6.17 | | |
| | | Guy B | Bottom Tension | 25 | 7775.64 | | |
| | | | Top Tension | 25 | 7929.04 | | |
| | | | Top Cable Vert | 25 | 6861.02 | | |
| | | | Top Cable Norm | 25 | 3974.42 | | |
| | | | Top Cable Tan | 25 | 5.70 | | |
| | | | Bot Cable Vert | 25 | -6471.67 | | |
| | | | Bot Cable Norm | 25 | 4310.23 | | |
| | | | Bot Cable Tan | 25 | 6.05 | | |
| | | Guy C | Bottom Tension | 17 | 7893.80 | | |
| | | | Top Tension | 17 | 8047.15 | | |
| | | | Top Cable Vert | 17 | 6961.02 | | |
| | | | Top Cable Norm | 17 | 4037.43 | | |
| | | | Top Cable Tan | 17 | 6.10 | | |
| | | | Bot Cable Vert | 17 | -6571.67 | | |
| | | | Bot Cable Norm | 17 | 4373.24 | | |
| | | | Bot Cable Tan | 17 | 5.65 | | |
| | | Top Guy Pull-Off | Max Tension | 7 | 2236.15 | 0.00 | 0.00 |
| | | | Max. Compression | 13 | -2260.58 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 7.06 | 4.26 | 0.00 |
| | | | Max. My | 22 | 796.47 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 6.82 | 0.00 | 0.00 |
| | | | Max. Vx | 22 | -0.00 | 0.00 | 0.00 |
| | | Torque Arm Top | Max Tension | 23 | 6033.87 | 0.00 | 0.00 |
| | | | Max. Compression | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Mx | 19 | 3878.79 | -8.01 | 0.00 |
| | | | Max. My | 22 | 3455.20 | 0.00 | 0.00 |
| | | | Max. Vy | 19 | 12.82 | 0.00 | 0.00 |
| | | | Max. Vx | 22 | -0.00 | 0.00 | 0.00 |
| | | Torque Arm Bottom | Max Tension | 2 | 578.87 | 0.00 | 0.00 |
| | | | Max. Compression | 21 | -9620.69 | 0.00 | 0.00 |
| | | | Max. Mx | 20 | -5026.21 | -13.40 | 0.00 |
| | | | Max. My | 23 | -346.41 | 0.00 | -0.20 |
| | | | Max. Vy | 20 | 12.90 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | 0.19 | 0.00 | 0.00 |
| T2 | 140 - 120 | Leg | Max Tension | 6 | 19081.85 | 225.77 | 216.53 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | | Max. Compression | 4 | -32337.44 | 20.38 | 272.37 |
| | | | Max. Mx | 5 | -8486.09 | 1082.50 | 730.86 |
| | | | Max. My | 2 | -20125.76 | -120.73 | -1039.44 |
| | | | Max. Vy | 24 | -3411.46 | 152.57 | -102.69 |
| | | | Max. Vx | 15 | -2751.40 | 240.60 | 402.49 |
| | | Diagonal | Max Tension | 24 | 6798.42 | 0.00 | 0.00 |
| | | | Max. Compression | 18 | -7117.22 | 0.00 | 0.00 |
| | | | Max. Mx | 24 | 6798.42 | 2.81 | 0.00 |
| | | | Max. My | 23 | 889.11 | 0.00 | 0.09 |
| | | | Max. Vy | 24 | -2.71 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.08 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 4 | 1384.87 | 0.00 | 0.00 |
| | | | Max. Compression | 10 | -1202.79 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 132.29 | 1.67 | 0.00 |
| | | | Max. My | 23 | 383.99 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | -2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.00 | 0.00 | 0.00 |
| | | Secondary Horizontal | Max Tension | 18 | 0.02 | -0.49 | -0.01 |
| | | | Max. Compression | 24 | -0.02 | -0.48 | -0.01 |
| | | | Max. Mx | 20 | 0.01 | -0.63 | 0.00 |
| | | | Max. My | 15 | 0.00 | -0.15 | 0.01 |
| | | | Max. Vy | 20 | 1.97 | -0.63 | 0.00 |
| | | | Max. Vx | 15 | -0.01 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 13 | 578.01 | 0.00 | 0.00 |
| | | | Max. Compression | 7 | -575.15 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 23.61 | 1.67 | 0.00 |
| | | | Max. My | 16 | -360.41 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 15 | 1350.63 | 0.00 | 0.00 |
| | | | Max. Compression | 8 | -1371.13 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 7.36 | 1.67 | 0.00 |
| | | | Max. My | 16 | -972.69 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| T3 | 120 - 113.3 | Leg | Max Tension | 21 | 7579.98 | 62.85 | -26.32 |
| | | | Max. Compression | 15 | -27560.52 | -2.95 | 193.09 |
| | | | Max. Mx | 24 | -8145.56 | 436.63 | -76.40 |
| | | | Max. My | 15 | -13926.60 | 290.06 | 631.65 |
| | | | Max. Vy | 24 | -3411.29 | 436.63 | -76.40 |
| | | | Max. Vx | 15 | -2750.70 | 290.06 | 631.65 |
| | | Diagonal | Max Tension | 20 | 3210.71 | 0.00 | 0.00 |
| | | | Max. Compression | 24 | -4921.87 | 0.05 | 26.28 |
| | | | Max. Mx | 15 | 2601.02 | -12.21 | 0.85 |
| | | | Max. My | 17 | -3979.65 | -1.47 | 45.59 |
| | | | Max. Vy | 15 | 7.24 | -12.21 | 0.85 |
| | | | Max. Vx | 17 | -22.01 | -1.47 | 45.59 |
| | | Horizontal | Max Tension | 21 | 1836.56 | 0.00 | 0.00 |
| | | | Max. Compression | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 820.22 | 1.67 | 0.00 |
| | | | Max. My | 23 | 1555.47 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | -2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.00 | 0.00 | 0.00 |
| | | Secondary Horizontal | Max Tension | 17 | 0.74 | 0.00 | 0.00 |
| | | | Max. Compression | 11 | -0.01 | 0.00 | 0.00 |
| | | | Max. Mx | 15 | 0.17 | 1.02 | 0.00 |
| | | | Max. My | 10 | 0.01 | 0.00 | 0.00 |
| | | | Max. Vy | 24 | -47.20 | 0.00 | 0.00 |
| | | | Max. Vx | 17 | -69.15 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 18 | 1153.90 | 0.00 | 0.00 |
| | | | Max. Compression | 3 | -601.31 | 0.00 | 0.00 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | | Max. Mx | 14 | 96.04 | 1.67 | 0.00 |
| | | | Max. My | 16 | -551.09 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| T4 | 113.3 - 106.7 | Leg | Max Tension | 21 | 16688.44 | -4.18 | -33.03 |
| | | | Max. Compression | 19 | -37393.91 | -252.59 | -36.31 |
| | | | Max. Mx | 18 | 1435.75 | -287.62 | 36.10 |
| | | | Max. My | 21 | 6589.65 | -12.70 | -307.16 |
| | | | Max. Vy | 18 | -99.89 | -287.62 | 36.10 |
| | | | Max. Vx | 16 | 137.31 | 1.01 | -126.79 |
| | | Diagonal | Max Tension | 17 | 3267.17 | 0.00 | 0.00 |
| | | | Max. Compression | 23 | -4850.77 | 1.05 | 38.21 |
| | | | Max. Mx | 23 | 1879.75 | -9.56 | -40.39 |
| | | | Max. My | 22 | -3196.83 | -7.31 | -49.84 |
| | | | Max. Vy | 23 | 5.97 | -9.56 | -40.39 |
| | | | Max. Vx | 22 | 24.10 | -7.31 | -49.84 |
| | | Secondary Horizontal | Max Tension | 17 | 0.69 | 0.00 | 0.00 |
| | | | Max. Compression | 11 | -0.01 | 0.00 | 0.00 |
| | | | Max. Mx | 15 | 0.16 | 0.96 | 0.00 |
| | | | Max. My | 10 | 0.01 | 0.00 | 0.00 |
| | | | Max. Vy | 24 | -40.63 | 0.00 | 0.00 |
| | | | Max. Vx | 17 | -69.35 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 21 | 2200.31 | 0.00 | 0.00 |
| | | | Max. Compression | 10 | -403.32 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 425.46 | 1.67 | 0.00 |
| | | | Max. My | 16 | 507.25 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | 0.00 | 0.00 | 0.00 |
| | | Guy A | Bottom Tension | 21 | 17855.88 | | |
| | | | Top Tension | 21 | 18065.67 | | |
| | | | Top Cable Vert | 21 | 13576.65 | | |
| | | | Top Cable Norm | 21 | 11918.18 | | |
| | | | Top Cable Tan | 21 | 1.85 | | |
| | | | Bot Cable Vert | 21 | -13120.40 | | |
| | | | Bot Cable Norm | 21 | 12111.46 | | |
| | | | Bot Cable Tan | 21 | 1.85 | | |
| | | Guy B | Bottom Tension | 25 | 17958.59 | | |
| | | | Top Tension | 25 | 18168.37 | | |
| | | | Top Cable Vert | 25 | 13652.77 | | |
| | | | Top Cable Norm | 25 | 11987.14 | | |
| | | | Top Cable Tan | 25 | 1.64 | | |
| | | | Bot Cable Vert | 25 | -13196.52 | | |
| | | | Bot Cable Norm | 25 | 12180.43 | | |
| | | | Bot Cable Tan | 25 | 1.64 | | |
| | | Guy C | Bottom Tension | 17 | 17944.30 | | |
| | | | Top Tension | 17 | 18154.08 | | |
| | | | Top Cable Vert | 17 | 13642.18 | | |
| | | | Top Cable Norm | 17 | 11977.54 | | |
| | | | Top Cable Tan | 17 | 3.93 | | |
| | | | Bot Cable Vert | 17 | -13185.93 | | |
| | | | Bot Cable Norm | 17 | 12170.83 | | |
| | | | Bot Cable Tan | 17 | 3.93 | | |
| | | Top Guy Pull-Off | Max Tension | 15 | 6097.13 | 0.00 | 0.00 |
| | | | Max. Compression | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 3507.93 | 4.26 | 0.00 |
| | | | Max. My | 10 | 3799.40 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 6.82 | 0.00 | 0.00 |
| | | | Max. Vx | 10 | 0.00 | 0.00 | 0.00 |
| T5 | 106.7 - 100 | Leg | Max Tension | 8 | 2770.34 | -8.54 | -27.09 |
| | | | Max. Compression | 19 | -37078.13 | 64.54 | -297.70 |
| | | | Max. Mx | 23 | -12530.52 | 366.20 | -266.71 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | | Max. My | 16 | -18559.02 | -119.77 | 391.28 |
| | | | Max. Vy | 18 | -1138.77 | 34.18 | -352.96 |
| | | | Max. Vx | 26 | 1178.00 | 3.95 | 384.29 |
| | | Diagonal | Max Tension | 16 | 2672.41 | 0.00 | 0.00 |
| | | | Max. Compression | 26 | -3039.54 | 0.00 | 0.00 |
| | | | Max. Mx | 18 | -2611.89 | 2.79 | 0.00 |
| | | | Max. My | 16 | -1557.57 | 0.00 | -0.06 |
| | | | Max. Vy | 18 | -2.70 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | 0.06 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 19 | 642.21 | 0.00 | 0.00 |
| | | | Max. Compression | 19 | -642.21 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 248.40 | 1.67 | 0.00 |
| | | | Max. My | 23 | 631.50 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | -2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.00 | 0.00 | 0.00 |
| | | Secondary Horizontal | Max Tension | 18 | 0.01 | -0.47 | -0.00 |
| | | | Max. Compression | 24 | -0.01 | -0.49 | -0.00 |
| | | | Max. Mx | 20 | 0.01 | -0.55 | 0.00 |
| | | | Max. My | 2 | 0.00 | -0.14 | 0.01 |
| | | | Max. Vy | 20 | 1.90 | -0.55 | 0.00 |
| | | | Max. Vx | 2 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 23 | 2169.02 | 0.00 | 0.00 |
| | | | Max. Compression | 4 | -226.02 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 794.21 | 1.67 | 0.00 |
| | | | Max. My | 16 | 229.74 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 19 | 421.06 | 0.00 | 0.00 |
| | | | Max. Compression | 23 | -122.61 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 156.29 | 1.67 | 0.00 |
| | | | Max. My | 16 | 284.77 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| T6 | 100 - 80 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 19 | -31937.00 | 185.23 | -364.93 |
| | | | Max. Mx | 19 | -27191.10 | -301.32 | 103.50 |
| | | | Max. My | 19 | -31937.00 | 185.23 | -364.93 |
| | | | Max. Vy | 18 | -1137.11 | 128.96 | -346.25 |
| | | | Max. Vx | 26 | 1179.73 | -52.77 | 286.08 |
| | | Diagonal | Max Tension | 16 | 2200.61 | 0.00 | 0.00 |
| | | | Max. Compression | 26 | -2503.06 | 0.00 | 0.00 |
| | | | Max. Mx | 18 | -2277.46 | 2.79 | 0.00 |
| | | | Max. My | 23 | 362.29 | 0.00 | 0.06 |
| | | | Max. Vy | 18 | -2.69 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.06 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 19 | 553.17 | 0.00 | 0.00 |
| | | | Max. Compression | 19 | -553.17 | 0.00 | 0.00 |
| | | | Max. Mx | 21 | 431.22 | 1.67 | 0.00 |
| | | | Max. My | 23 | 547.15 | 0.00 | 0.00 |
| | | | Max. Vy | 21 | -2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 23 | 246.54 | 0.00 | 0.00 |
| | | | Max. Compression | 4 | -83.48 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 71.17 | 1.67 | 0.00 |
| | | | Max. My | 16 | -58.22 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 26 | 191.09 | 0.00 | 0.00 |
| | | | Max. Compression | 11 | -28.08 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 50.52 | 1.67 | 0.00 |
| | | | Max. My | 16 | 139.97 | 0.00 | -0.00 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| T7 | 80 - 60 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 19 | -25298.45 | 221.90 | -286.99 |
| | | | Max. Mx | 19 | -23752.34 | 291.23 | -281.93 |
| | | | Max. My | 15 | -20513.16 | 198.30 | -298.02 |
| | | | Max. Vy | 18 | 913.54 | 203.40 | -287.54 |
| | | | Max. Vx | 15 | -752.92 | -45.81 | 205.07 |
| | | Diagonal | Max Tension | 23 | 1018.86 | 0.00 | 0.00 |
| | | | Max. Compression | 18 | -2032.07 | 0.00 | 0.00 |
| | | | Max. Mx | 15 | 821.15 | 2.79 | 0.00 |
| | | | Max. My | 22 | 73.95 | 0.00 | 0.06 |
| | | | Max. Vy | 15 | 2.69 | 0.00 | 0.00 |
| | | | Max. Vx | 22 | 0.05 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 18 | 473.91 | 0.00 | 0.00 |
| | | | Max. Compression | 19 | -438.18 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 259.51 | 1.67 | 0.00 |
| | | | Max. My | 23 | 433.99 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | -2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 24 | 169.43 | 0.00 | 0.00 |
| | | | Max. Compression | 4 | -5.99 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 53.18 | 1.67 | 0.00 |
| | | | Max. My | 16 | 41.49 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 15 | 166.86 | 0.00 | 0.00 |
| | | | Max. Compression | 26 | -29.95 | 0.00 | 0.00 |
| | | | Max. Mx | 23 | 65.94 | 1.67 | 0.00 |
| | | | Max. My | 16 | -7.24 | 0.00 | -0.00 |
| | | | Max. Vy | 23 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| T8 | 60 - 40 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 23 | -31765.65 | 282.18 | 151.52 |
| | | | Max. Mx | 19 | -17429.27 | -443.91 | -350.46 |
| | | | Max. My | 22 | -29082.17 | -171.07 | -452.32 |
| | | | Max. Vy | 18 | 915.64 | 127.06 | -288.19 |
| | | | Max. Vx | 22 | -926.34 | 304.88 | -187.41 |
| | | Diagonal | Max Tension | 16 | 2154.95 | 0.00 | 0.00 |
| | | | Max. Compression | 23 | -2731.08 | 0.00 | 0.00 |
| | | | Max. Mx | 15 | 1392.88 | 2.79 | 0.00 |
| | | | Max. My | 16 | 550.62 | 0.00 | -0.05 |
| | | | Max. Vy | 15 | -2.69 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | 0.05 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 23 | 550.20 | 0.00 | 0.00 |
| | | | Max. Compression | 23 | -550.20 | 0.00 | 0.00 |
| | | | Max. Mx | 21 | 421.21 | 1.67 | 0.00 |
| | | | Max. My | 23 | 550.20 | 0.00 | 0.00 |
| | | | Max. Vy | 21 | -2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.00 | 0.00 | 0.00 |
| | | Secondary Horizontal | Max Tension | 19 | 0.01 | -0.50 | -0.01 |
| | | | Max. Compression | 23 | -0.01 | -0.49 | -0.00 |
| | | | Max. Mx | 20 | 0.01 | -0.56 | 0.00 |
| | | | Max. My | 15 | 0.00 | -0.01 | 0.01 |
| | | | Max. Vy | 20 | 1.78 | -0.56 | 0.00 |
| | | | Max. Vx | 15 | -0.01 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 21 | 251.38 | 0.00 | 0.00 |
| | | | Max. Compression | 19 | -3.07 | 0.00 | 0.00 |
| | | | Max. Mx | 23 | 224.92 | 1.67 | 0.00 |
| | | | Max. My | 16 | 172.86 | 0.00 | -0.00 |
| | | | Max. Vy | 23 | 2.67 | 0.00 | 0.00 |

| *Section No.* | *Elevation ft* | *Component Type* | *Condition* | *Gov. Load Comb.* | *Force lb* | *Major Axis Moment lb-ft* | *Minor Axis Moment lb-ft* |
|---|---|---|---|---|---|---|---|
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 17 | 266.13 | 0.00 | 0.00 |
| | | | Max. Compression | 10 | -21.52 | 0.00 | 0.00 |
| | | | Max. Mx | 25 | 44.96 | 1.67 | 0.00 |
| | | | Max. My | 16 | 259.78 | 0.00 | -0.00 |
| | | | Max. Vy | 25 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| | | Guy A | Bottom Tension | 21 | 6004.79 | | |
| | | | Top Tension | 21 | 6053.19 | | |
| | | | Top Cable Vert | 21 | 2798.63 | | |
| | | | Top Cable Norm | 21 | 5367.38 | | |
| | | | Top Cable Tan | 21 | 0.90 | | |
| | | | Bot Cable Vert | 21 | -2645.96 | | |
| | | | Bot Cable Norm | 21 | 5390.40 | | |
| | | | Bot Cable Tan | 21 | 0.90 | | |
| | | Guy B | Bottom Tension | 25 | 6015.98 | | |
| | | | Top Tension | 25 | 6064.38 | | |
| | | | Top Cable Vert | 25 | 2803.67 | | |
| | | | Top Cable Norm | 25 | 5377.37 | | |
| | | | Top Cable Tan | 25 | 0.39 | | |
| | | | Bot Cable Vert | 25 | -2651.01 | | |
| | | | Bot Cable Norm | 25 | 5400.39 | | |
| | | | Bot Cable Tan | 25 | 0.39 | | |
| | | Guy C | Bottom Tension | 17 | 6010.96 | | |
| | | | Top Tension | 17 | 6059.35 | | |
| | | | Top Cable Vert | 17 | 2801.41 | | |
| | | | Top Cable Norm | 17 | 5372.88 | | |
| | | | Top Cable Tan | 17 | 0.97 | | |
| | | | Bot Cable Vert | 17 | -2648.75 | | |
| | | | Bot Cable Norm | 17 | 5395.90 | | |
| | | | Bot Cable Tan | 17 | 0.97 | | |
| | | Top Guy Pull-Off | Max Tension | 25 | 3243.65 | 0.00 | 0.00 |
| | | | Max. Compression | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Mx | 17 | 945.80 | 4.26 | 0.00 |
| | | | Max. My | 22 | 807.57 | 0.00 | -0.00 |
| | | | Max. Vy | 17 | 6.82 | 0.00 | 0.00 |
| | | | Max. Vx | 22 | -0.00 | 0.00 | 0.00 |
| T9 | 40 - 20 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 22 | -29062.61 | -126.71 | 216.49 |
| | | | Max. Mx | 19 | -25524.30 | 311.87 | -301.22 |
| | | | Max. My | 15 | -27567.52 | 284.56 | -358.15 |
| | | | Max. Vy | 19 | -738.92 | 250.31 | -308.13 |
| | | | Max. Vx | 22 | -926.60 | 260.64 | -110.18 |
| | | Diagonal | Max Tension | 16 | 1625.00 | 0.00 | 0.00 |
| | | | Max. Compression | 22 | -1834.43 | 0.00 | 0.00 |
| | | | Max. Mx | 23 | -438.71 | 2.78 | 0.00 |
| | | | Max. My | 22 | -134.93 | 0.00 | 0.04 |
| | | | Max. Vy | 23 | -2.69 | 0.00 | 0.00 |
| | | | Max. Vx | 22 | 0.04 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 25 | 503.27 | 0.00 | 0.00 |
| | | | Max. Compression | 25 | -503.27 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 309.20 | 1.67 | 0.00 |
| | | | Max. My | 23 | 477.58 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | -2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 26 | 173.86 | 0.00 | 0.00 |
| | | | Max. Compression | 16 | -73.94 | 0.00 | 0.00 |
| | | | Max. Mx | 25 | 27.27 | 1.67 | 0.00 |
| | | | Max. My | 16 | -73.93 | 0.00 | -0.00 |
| | | | Max. Vy | 25 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | Bottom Girt | Max Tension | 15 | 224.54 | 0.00 | 0.00 |
| | | | Max. Compression | 10 | -45.41 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 61.54 | 1.67 | 0.00 |
| | | | Max. My | 16 | 163.21 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | 0.00 | 0.00 | 0.00 |
| T10 | 20 - 6.7 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 25 | -29055.87 | 226.99 | -334.34 |
| | | | Max. Mx | 15 | -26803.24 | 535.01 | -280.45 |
| | | | Max. My | 16 | -23940.63 | 359.30 | -450.86 |
| | | | Max. Vy | 24 | -2751.12 | 412.14 | -80.60 |
| | | | Max. Vx | 20 | 2975.30 | -121.74 | -116.99 |
| | | Diagonal | Max Tension | 21 | 1001.57 | 0.00 | 0.00 |
| | | | Max. Compression | 17 | -1850.53 | 0.00 | 0.00 |
| | | | Max. Mx | 23 | 640.89 | 2.77 | 0.00 |
| | | | Max. My | 22 | -899.02 | 0.00 | 0.04 |
| | | | Max. Vy | 23 | -2.69 | 0.00 | 0.00 |
| | | | Max. Vx | 22 | 0.04 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 16 | 536.77 | 0.00 | 0.00 |
| | | | Max. Compression | 25 | -503.26 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 317.62 | 1.67 | 0.00 |
| | | | Max. My | 23 | 479.48 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | -2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 26 | 207.82 | 0.00 | 0.00 |
| | | | Max. Compression | 4 | -35.33 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 58.35 | 1.67 | 0.00 |
| | | | Max. My | 16 | 42.79 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 16 | 1872.98 | 0.00 | 0.00 |
| | | | Max. Compression | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 1145.20 | 1.67 | 0.00 |
| | | | Max. My | 16 | 1647.96 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 2.67 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | -0.00 | 0.00 | 0.00 |
| T11 | 6.7 - 0 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 18 | -27812.12 | -93.41 | 161.06 |
| | | | Max. Mx | 22 | -27568.19 | -504.96 | -618.60 |
| | | | Max. My | 10 | -18555.59 | -130.91 | -907.38 |
| | | | Max. Vy | 23 | 2949.01 | 57.80 | 57.39 |
| | | | Max. Vx | 22 | 423.33 | -171.42 | -859.63 |
| | | Diagonal | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 23 | -1195.09 | 0.00 | 0.00 |
| | | | Max. Mx | 15 | -510.31 | 1.94 | 0.00 |
| | | | Max. My | 16 | -625.69 | 0.00 | -0.03 |
| | | | Max. Vy | 15 | 2.04 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | 0.03 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 23 | 523.91 | 0.00 | 0.00 |
| | | | Max. Compression | 18 | -489.94 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 334.76 | 0.41 | 0.00 |
| | | | Max. My | 23 | 523.91 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 1.32 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | 0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 23 | 2098.38 | 0.00 | 0.00 |
| | | | Max. Compression | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 1383.24 | 1.63 | 0.00 |
| | | | Max. My | 16 | 1500.50 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | -2.64 | 0.00 | 0.00 |
| | | | Max. Vx | 16 | 0.00 | 0.00 | 0.00 |

## Maximum Reactions

| *Location* | *Condition* | *Gov. Load Comb.* | *Vertical lb* | *Horizontal, X lb* | *Horizontal, Z lb* |
|---|---|---|---|---|---|
| Mast | Max. Vert | 23 | 76065.30 | 493.43 | -307.94 |
| | Max. $H_x$ | 25 | 69754.62 | 626.31 | 359.48 |
| | Max. $H_z$ | 15 | 75934.62 | -17.87 | 579.40 |
| | Max. $M_x$ | 1 | 0.00 | -2.42 | -2.73 |
| | Max. $M_z$ | 1 | 0.00 | -2.42 | -2.73 |
| | Max. Torsion | 10 | 537.60 | 345.75 | -205.06 |
| | Min. Vert | 1 | 38936.01 | -2.42 | -2.73 |
| | Min. $H_x$ | 17 | 69770.32 | -658.13 | 355.77 |
| | Min. $H_z$ | 21 | 69704.09 | -15.38 | -760.50 |
| | Min. $M_x$ | 1 | 0.00 | -2.42 | -2.73 |
| | Min. $M_z$ | 1 | 0.00 | -2.42 | -2.73 |
| | Min. Torsion | 4 | -601.09 | -499.02 | 284.65 |
| Guy C @ 100 ft Elev 0 ft Azimuth 240 deg | Max. Vert | 10 | -1172.14 | -633.26 | 366.45 |
| | Max. $H_x$ | 10 | -1172.14 | -633.26 | 366.45 |
| | Max. $H_z$ | 16 | -27886.24 | -21742.32 | 13079.64 |
| | Min. Vert | 17 | -28615.02 | -22594.23 | 13030.08 |
| | Min. $H_x$ | 17 | -28615.02 | -22594.23 | 13030.08 |
| | Min. $H_z$ | 10 | -1172.14 | -633.26 | 366.45 |
| Guy B @ 100 ft Elev 0 ft Azimuth 120 deg | Max. Vert | 6 | -1170.92 | 632.63 | 365.69 |
| | Max. $H_x$ | 25 | -28614.76 | 22595.91 | 13038.72 |
| | Max. $H_z$ | 26 | -27883.58 | 21742.03 | 13092.22 |
| | Min. Vert | 25 | -28614.76 | 22595.91 | 13038.72 |
| | Min. $H_x$ | 6 | -1170.92 | 632.63 | 365.69 |
| | Min. $H_z$ | 6 | -1170.92 | 632.63 | 365.69 |
| Guy A @ 100 ft Elev 0 ft Azimuth 0 deg | Max. Vert | 2 | -1179.96 | 0.35 | -737.30 |
| | Max. $H_x$ | 24 | -15805.24 | 976.11 | -13991.77 |
| | Max. $H_z$ | 2 | -1179.96 | 0.35 | -737.30 |
| | Min. Vert | 21 | -28535.06 | -6.95 | -26009.99 |
| | Min. $H_x$ | 18 | -15779.21 | -975.86 | -13964.85 |
| | Min. $H_z$ | 21 | -28535.06 | -6.95 | -26009.99 |

## Tower Mast Reaction Summary

| *Load Combination* | *Vertical lb* | *Shear$_x$ lb* | *Shear$_z$ lb* | *Overturning Moment, $M_x$ lb-ft* | *Overturning Moment, $M_z$ lb-ft* | *Torque lb-ft* |
|---|---|---|---|---|---|---|
| Dead Only | 38936.01 | 2.42 | 2.73 | 0.00 | 0.00 | 1.60 |
| Dead+Wind 0 deg - No Ice+Guy | 52314.76 | 4.49 | -409.93 | 0.00 | 0.00 | 295.80 |
| Dead+Wind 30 deg - No Ice+Guy | 49913.48 | 298.68 | -377.68 | 0.00 | 0.00 | 510.96 |
| Dead+Wind 60 deg - No Ice+Guy | 46225.97 | 499.02 | -284.65 | 0.00 | 0.00 | 601.09 |
| Dead+Wind 90 deg - No Ice+Guy | 50126.54 | 470.95 | -63.92 | 0.00 | 0.00 | 462.82 |
| Dead+Wind 120 deg - No Ice+Guy | 52521.11 | 350.26 | 206.97 | 0.00 | 0.00 | 250.61 |
| Dead+Wind 150 deg - No Ice+Guy | 49983.29 | 179.03 | 447.88 | 0.00 | 0.00 | -13.76 |
| Dead+Wind 180 deg - No Ice+Guy | 46106.64 | 3.23 | 579.73 | 0.00 | 0.00 | -320.03 |
| Dead+Wind 210 deg - No Ice+Guy | 50036.53 | -173.99 | 446.92 | 0.00 | 0.00 | -505.56 |
| Dead+Wind 240 deg - No Ice+Guy | 52563.20 | -345.75 | 205.06 | 0.00 | 0.00 | -537.60 |
| Dead+Wind 270 deg - No Ice+Guy | 50141.02 | -466.01 | -66.73 | 0.00 | 0.00 | -454.83 |

| Load Combination | Vertical | $Shear_x$ | $Shear_z$ | Overturning Moment, $M_x$ | Overturning Moment, $M_z$ | Torque |
|---|---|---|---|---|---|---|
| | lb | lb | lb | lb-ft | lb-ft | lb-ft |
| Dead+Wind 300 deg - No Ice+Guy | 46160.01 | -492.68 | -287.57 | 0.00 | 0.00 | -273.36 |
| Dead+Wind 330 deg - No Ice+Guy | 49882.56 | -290.49 | -378.84 | 0.00 | 0.00 | 17.16 |
| Dead+Icc+Temp+Guy | 55250.12 | 14.54 | 15.58 | 0.00 | 0.00 | 2.44 |
| Dead+Wind 0 deg+Ice+Temp+Guy | 75934.62 | 17.87 | -579.40 | 0.00 | 0.00 | 282.84 |
| Dead+Wind 30 deg+Ice+Temp+Guy | 73052.04 | 415.07 | -481.71 | 0.00 | 0.00 | 416.36 |
| Dead+Wind 60 deg+Ice+Temp+Guy | 69770.32 | 658.13 | -355.77 | 0.00 | 0.00 | 390.86 |
| Dead+Wind 90 deg+Ice+Temp+Guy | 73116.11 | 639.37 | -81.15 | 0.00 | 0.00 | 226.81 |
| Dead+Wind 120 deg+Ice+Temp+Guy | 75993.87 | 522.26 | 312.25 | 0.00 | 0.00 | 68.89 |
| Dead+Wind 150 deg+Ice+Temp+Guy | 73034.04 | 242.29 | 609.92 | 0.00 | 0.00 | -83.67 |
| Dead+Wind 180 deg+Ice+Temp+Guy | 69704.09 | 15.38 | 760.50 | 0.00 | 0.00 | -297.97 |
| Dead+Wind 210 deg+Ice+Temp+Guy | 73107.65 | -213.16 | 607.21 | 0.00 | 0.00 | -413.67 |
| Dead+Wind 240 deg+Ice+Temp+Guy | 76065.30 | -493.43 | 307.94 | 0.00 | 0.00 | -341.81 |
| Dead+Wind 270 deg+Ice+Temp+Guy | 73159.27 | -609.31 | -85.53 | 0.00 | 0.00 | -216.73 |
| Dead+Wind 300 deg+Ice+Temp+Guy | 69754.62 | -626.31 | -359.48 | 0.00 | 0.00 | -84.28 |
| Dead+Wind 330 deg+Ice+Temp+Guy | 73032.00 | -380.98 | -483.50 | 0.00 | 0.00 | 88.45 |
| Dead+Wind 0 deg - Service+Guy | 39887.75 | 3.18 | -301.36 | 0.00 | 0.00 | 155.33 |
| Dead+Wind 30 deg - Service+Guy | 40119.61 | 153.61 | -257.83 | 0.00 | 0.00 | 265.75 |
| Dead+Wind 60 deg - Service+Guy | 40279.97 | 262.13 | -147.24 | 0.00 | 0.00 | 285.56 |
| Dead+Wind 90 deg - Service+Guy | 40128.55 | 301.94 | 2.95 | 0.00 | 0.00 | 229.91 |
| Dead+Wind 120 deg - Service+Guy | 39897.02 | 263.45 | 155.49 | 0.00 | 0.00 | 131.95 |
| Dead+Wind 150 deg - Service+Guy | 40102.16 | 151.07 | 264.70 | 0.00 | 0.00 | -0.67 |
| Dead+Wind 180 deg - Service+Guy | 40253.88 | 2.05 | 304.21 | 0.00 | 0.00 | -151.96 |
| Dead+Wind 210 deg - Service+Guy | 40120.58 | -146.94 | 264.16 | 0.00 | 0.00 | -262.15 |
| Dead+Wind 240 deg - Service+Guy | 39915.49 | -259.13 | 154.42 | 0.00 | 0.00 | -281.56 |
| Dead+Wind 270 deg - Service+Guy | 40127.01 | -297.09 | 1.53 | 0.00 | 0.00 | -225.44 |
| Dead+Wind 300 deg - Service+Guy | 40260.80 | -256.62 | -148.57 | 0.00 | 0.00 | -127.74 |
| Dead+Wind 330 deg - Service+Guy | 40099.14 | -147.50 | -258.62 | 0.00 | 0.00 | 4.21 |

## Maximum Tower Deflections - Service Wind

| Section No. | Elevation | Horz. Deflection | Gov. Load Comb. | Tilt | Twist |
|---|---|---|---|---|---|
| | ft | in | | ° | ° |
| T1 | 160 - 140 | 3.025 | 29 | 0.0077 | 0.4824 |
| T2 | 140 - 120 | 2.923 | 29 | 0.1043 | 0.7294 |
| T3 | 120 - 113.3 | 2.140 | 29 | 0.2104 | 0.9376 |
| T4 | 113.3 - 106.7 | 1.829 | 29 | 0.1909 | 0.9090 |
| T5 | 106.7 - 100 | 1.592 | 37 | 0.1446 | 0.8872 |
| T6 | 100 - 80 | 1.432 | 37 | 0.1114 | 0.8572 |
| T7 | 80 - 60 | 1.094 | 37 | 0.0761 | 0.7668 |
| T8 | 60 - 40 | 0.777 | 37 | 0.0722 | 0.6755 |
| T9 | 40 - 20 | 0.540 | 37 | 0.0453 | 0.5752 |
| T10 | 20 - 6.7 | 0.337 | 33 | 0.0648 | 0.4817 |
| T11 | 6.7 - 0 | 0.124 | 33 | 0.0826 | 0.4043 |

## Critical Deflections and Radius of Curvature - Service Wind

| Elevation | Appurtenance | Gov. Load Comb. | Deflection | Tilt | Twist | Radius of Curvature |
|---|---|---|---|---|---|---|
| ft | | | in | ° | ° | ft |
| 160.00 | Guy | 29 | 3.025 | 0.0077 | 0.4824 | 18619 |
| 146.00 | Pirod 10' PCS Frame | 29 | 3.014 | 0.0692 | 0.6474 | 6650 |
| 135.00 | Pirod 10' PCS Frame | 29 | 2.784 | 0.1391 | 0.8037 | 6125 |
| 124.00 | 10' BOOM | 29 | 2.331 | 0.2031 | 0.9278 | 19929 |

| *Elevation* | *Appurtenance* | *Gov. Load Comb.* | *Deflection* | *Tilt* | *Twist* | *Radius of Curvature* |
|---|---|---|---|---|---|---|
| *ft* | | | *in* | ° | ° | *ft* |
| 110.00 | Guy | 29 | 1.700 | 0.1684 | 0.8972 | 6022 |
| 72.00 | 20' 4-Bay Dipole | 37 | 0.964 | 0.0758 | 0.7315 | 277325 |
| 67.00 | 20' 4-Bay Dipole | 37 | 0.884 | 0.0758 | 0.7088 | 81170 |
| 62.00 | 20' 4-Bay Dipole | 37 | 0.807 | 0.0739 | 0.6852 | 48199 |
| 57.00 | 20' 4-Bay Dipole | 37 | 0.736 | 0.0686 | 0.6606 | 43079 |
| 52.00 | 20' 4-Bay Dipole | 37 | 0.671 | 0.0606 | 0.6351 | 47568 |
| 50.00 | Guy | 37 | 0.647 | 0.0572 | 0.6248 | 49754 |

## Maximum Tower Deflections - Design Wind

| *Section No.* | *Elevation* | *Horz. Deflection* | *Gov. Load Comb.* | *Tilt* | *Twist* |
|---|---|---|---|---|---|
| | *ft* | *in* | | ° | ° |
| T1 | 160 - 140 | 12.823 | 23 | 0.3080 | 1.1762 |
| T2 | 140 - 120 | 11.378 | 23 | 0.4988 | 1.6218 |
| T3 | 120 - 113.3 | 8.634 | 23 | 0.6797 | 1.9898 |
| T4 | 113.3 - 106.7 | 7.662 | 23 | 0.6143 | 1.9239 |
| T5 | 106.7 - 100 | 6.886 | 23 | 0.5008 | 1.8764 |
| T6 | 100 - 80 | 6.305 | 23 | 0.4225 | 1.8078 |
| T7 | 80 - 60 | 4.883 | 23 | 0.3362 | 1.6077 |
| T8 | 60 - 40 | 3.452 | 23 | 0.3268 | 1.4054 |
| T9 | 40 - 20 | 2.316 | 23 | 0.2274 | 1.1837 |
| T10 | 20 - 6.7 | 1.348 | 23 | 0.2768 | 0.9867 |
| T11 | 6.7 - 0 | 0.485 | 19 | 0.3284 | 0.8301 |

## Critical Deflections and Radius of Curvature - Design Wind

| *Elevation* | *Appurtenance* | *Gov. Load Comb.* | *Deflection* | *Tilt* | *Twist* | *Radius of Curvature* |
|---|---|---|---|---|---|---|
| *ft* | | | *in* | ° | ° | *ft* |
| 160.00 | Guy | 23 | 12.823 | 0.3080 | 1.1762 | 9340 |
| 146.00 | Pirod 10' PCS Frame | 23 | 11.930 | 0.4302 | 1.4734 | 3336 |
| 135.00 | Pirod 10' PCS Frame | 23 | 10.795 | 0.5658 | 1.7570 | 3116 |
| 124.00 | 10' BOOM | 23 | 9.240 | 0.6771 | 1.9780 | 11392 |
| 110.00 | Guy | 23 | 7.246 | 0.5544 | 1.8985 | 2263 |
| 72.00 | 20' 4-Bay Dipole | 23 | 4.302 | 0.3399 | 1.5300 | 18603 |
| 67.00 | 20' 4-Bay Dipole | 23 | 3.939 | 0.3402 | 1.4795 | 13614 |
| 62.00 | 20' 4-Bay Dipole | 23 | 3.587 | 0.3329 | 1.4271 | 10846 |
| 57.00 | 20' 4-Bay Dipole | 23 | 3.257 | 0.3137 | 1.3721 | 10344 |
| 52.00 | 20' 4-Bay Dipole | 23 | 2.953 | 0.2854 | 1.3155 | 11098 |
| 50.00 | Guy | 23 | 2.838 | 0.2732 | 1.2928 | 11447 |

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| **Project** | **Date** |
| Prospect North, CT | 12:06:06 03/18/13 |
| **Client** | **Designed by** |
| Verizon Wireless | AAS |

## Bolt Design Data

| Section No. | Elevation ft | Component Type | Bolt Grade | Maximum Load per Bolt lb | Allowable Load lb | Ratio Load / Allowable | Allowable Ratio | Criteria |
|---|---|---|---|---|---|---|---|---|
| T1 | 160 | Leg | A325N | 4576.17 | 19434.50 | 0.235 ✓ | 1.333 | Bolt Tension |
| T2 | 140 | Leg | A325N | 0.00 | 19355.60 | 0.000 ✓ | 1.333 | Bolt Tension |
| T5 | 106.7 | Leg | A325N | 0.00 | 19425.50 | 0.000 ✓ | 1.333 | Bolt Tension |
| T6 | 100 | Leg | A325N | 0.00 | 19436.90 | 0.000 ✓ | 1.333 | Bolt Tension |
| T7 | 80 | Leg | A325N | 0.00 | 19432.70 | 0.000 ✓ | 1.333 | Bolt Tension |
| T8 | 60 | Leg | A325N | 0.00 | 19430.60 | 0.000 ✓ | 1.333 | Bolt Tension |
| T9 | 40 | Leg | A325N | 0.00 | 19438.10 | 0.000 ✓ | 1.333 | Bolt Tension |
| T10 | 20 | Leg | A325N | 0.00 | 19372.00 | 0.000 ✓ | 1.333 | Bolt Tension |
| T11 | 6.7 | Leg | A325N | 0.00 | 19437.30 | 0.000 ✓ | 1.333 | Bolt Tension |

## Guy Design Data

| Section No. | Elevation ft | Initial Tension lb | Breaking Load lb | Actual T lb | Allowable $T_a$ lb | Required S.F. | Actual S.F. |
|---|---|---|---|---|---|---|---|
| T1 | 160.00 (A) (317) | 2080.00 | 20800.02 | 7943.31 | 10400.00 | 2.000 | 2.619 ✓ |
| | 160.00 (A) (318) | 2080.00 | 20800.02 | 7708.54 | 10400.00 | 2.000 | 2.698 ✓ |
| | 160.00 (B) (311) | 2080.00 | 20800.02 | 7929.04 | 10400.00 | 2.000 | 2.623 ✓ |
| | 160.00 (B) (312) | 2080.00 | 20800.02 | 7721.07 | 10400.00 | 2.000 | 2.694 ✓ |
| | 160.00 (C) (305) | 2080.00 | 20800.02 | 7618.48 | 10400.00 | 2.000 | 2.730 ✓ |
| | 160.00 (C) (306) | 2080.00 | 20800.02 | 8047.15 | 10400.00 | 2.000 | 2.585 ✓ |
| T4 | 110.00 (A) (327) | 5830.00 | 58299.91 | 18065.70 | 29150.00 | 2.000 | 3.227 ✓ |
| | 110.00 (B) (326) | 5830.00 | 58299.91 | 18168.40 | 29150.00 | 2.000 | 3.209 ✓ |
| | 110.00 (C) (323) | 5830.00 | 58299.91 | 18154.10 | 29150.00 | 2.000 | 3.211 ✓ |
| T8 | 50.00 (A) (332) | 2080.00 | 20800.02 | 6053.19 | 10400.00 | 2.000 | 3.436 ✓ |
| | 50.00 (B) (331) | 2080.00 | 20800.02 | 6064.38 | 10400.00 | 2.000 | 3.430 ✓ |
| | 50.00 (C) (328) | 2080.00 | 20800.02 | 6059.35 | 10400.00 | 2.000 | 3.433 ✓ |

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| Verizon Wireless | AAS |

# Compression Checks

## Leg Design Data (Compression)

| Section No. | Elevation ft | L ft | $L_u$ ft | Kl/r | Mast Stability Index | $F_a$ ksi | A $in^2$ | Actual P lb | Allow. $P_a$ lb | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 160 - 140 | 20.00 | 3.32 | 86.2 K=2.00 | 1.00 | 17.741 | 2.2535 | -31995.60 | 39980.40 | 0.800 ✓ |
| T2 | 140 - 120 | 20.00 | 3.31 | 85.9 K=2.00 | 1.00 | 17.817 | 2.2535 | -32337.40 | 40150.30 | 0.805 ✓ |
| T3 | 120 - 113.3 | 6.70 | 3.31 | 41.9 K=1.00 | 0.99 | 25.231 | 1.7040 | -27560.50 | 42995.60 | 0.641 ✓ |
| T4 | 113.3 - 106.7 | 6.60 | 3.30 | 41.8 K=1.00 | 0.98 | 25.185 | 1.7040 | -37393.90 | 42916.10 | 0.871 ✓ |
| T5 | 106.7 - 100 | 6.70 | 3.31 | 83.8 K=2.00 | 1.00 | 18.241 | 1.7040 | -37078.10 | 31082.90 | 1.193 ✓ |
| T6 | 100 - 80 | 20.00 | 3.31 | 83.7 K=2.00 | 1.00 | 18.255 | 1.7040 | -31937.00 | 31107.50 | 1.027 ✓ |
| T7 | 80 - 60 | 20.00 | 3.31 | 83.7 K=2.00 | 1.00 | 18.255 | 1.7040 | -25298.40 | 31107.50 | 0.813 ✓ |
| T8 | 60 - 40 | 20.00 | 3.31 | 83.7 K=2.00 | 1.00 | 18.255 | 1.7040 | -31765.60 | 31107.50 | 1.021 ✓ |
| T9 | 40 - 20 | 20.00 | 3.31 | 83.7 K=2.00 | 1.00 | 18.255 | 1.7040 | -29062.60 | 31107.50 | 0.934 ✓ |
| T10 | 20 - 6.7 | 13.30 | 3.28 | 83.2 K=2.00 | 1.00 | 18.371 | 1.7040 | -29055.90 | 31304.20 | 0.928 ✓ |
| T11 | 6.7 - 0 | 6.85 | 3.38 | 85.7 K=2.00 | 1.00 | 17.843 | 1.7040 | -27812.10 | 30404.50 | 0.915 ✓ |

## Diagonal Design Data (Compression)

| Section No. | Elevation ft | L ft | $L_u$ ft | Kl/r | $F_a$ ksi | A $in^2$ | Actual P lb | Allow. $P_a$ lb | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 160 - 140 | 4.16 | 3.76 | 94.6 K=0.70 | 15.935 | 0.3326 | -4709.84 | 5300.39 | 0.889 ✓ |
| T2 | 140 - 120 | 4.14 | 3.75 | 94.3 K=0.70 | 15.991 | 0.3326 | -7117.22 | 5319.04 | 1.338 ✗ |
| T3 | 120 - 113.3 | 4.15 | 1.87 | 67.4 K=1.00 | 21.411 | 0.3326 | -4921.87 | 7122.16 | 0.691 ✓ |
| T4 | 113.3 - 106.7 | 4.14 | 1.87 | 67.3 K=1.00 | 21.431 | 0.3326 | -4850.77 | 7128.68 | 0.680 ✓ |
| T5 | 106.7 - 100 | 4.15 | 3.75 | 94.4 K=0.70 | 15.979 | 0.3326 | -3039.54 | 5315.31 | 0.572 ✓ |
| T6 | 100 - 80 | 4.14 | 3.75 | 94.3 K=0.70 | 15.991 | 0.3326 | -2503.06 | 5319.04 | 0.471 ✓ |
| T7 | 80 - 60 | 4.14 | 3.75 | 94.3 K=0.70 | 15.991 | 0.3326 | -2032.07 | 5319.04 | 0.382 ✓ |
| T8 | 60 - 40 | 4.14 | 3.75 | 94.3 K=0.70 | 15.991 | 0.3326 | -2731.08 | 5319.04 | 0.513 ✓ |
| T9 | 40 - 20 | 4.14 | 3.75 | 94.3 K=0.70 | 15.991 | 0.3326 | -1834.43 | 5319.04 | 0.345 ✓ |

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T10 | 20 - 6.7 | 4.13 | 3.73 | 93.9<br>K=0.70 | 16.080 | 0.3326 | -1850.53 | 5348.76 | 0.346 ✓ |
| T11 | 6.7 - 0 | 3.81 | 3.32 | 83.7<br>K=0.70 | 18.266 | 0.3326 | -1195.09 | 6076.00 | 0.197 ✓ |

## Horizontal Design Data (Compression)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T1 | 160 - 140 | 2.50 | 2.26 | 81.3<br>K=1.00 | 18.753 | 0.3326 | -1211.64 | 6237.97 | 0.194 ✓ |
| T2 | 140 - 120 | 2.50 | 2.26 | 81.3<br>K=1.00 | 18.753 | 0.3326 | -1202.79 | 6237.97 | 0.193 ✓ |
| T5 | 106.7 - 100 | 2.50 | 2.26 | 81.3<br>K=1.00 | 18.753 | 0.3326 | -642.21 | 6237.97 | 0.103 ✓ |
| T6 | 100 - 80 | 2.50 | 2.26 | 81.3<br>K=1.00 | 18.753 | 0.3326 | -553.16 | 6237.97 | 0.089 ✓ |
| T7 | 80 - 60 | 2.50 | 2.26 | 81.3<br>K=1.00 | 18.753 | 0.3326 | -438.18 | 6237.97 | 0.070 ✓ |
| T8 | 60 - 40 | 2.50 | 2.26 | 81.3<br>K=1.00 | 18.753 | 0.3326 | -550.20 | 6237.97 | 0.088 ✓ |
| T9 | 40 - 20 | 2.50 | 2.26 | 81.3<br>K=1.00 | 18.753 | 0.3326 | -503.27 | 6237.97 | 0.081 ✓ |
| T10 | 20 - 6.7 | 2.50 | 2.26 | 81.3<br>K=1.00 | 18.753 | 0.3326 | -503.26 | 6237.97 | 0.081 ✓ |
| T11 | 6.7 - 0 | 1.23 | 0.99 | 35.8<br>K=1.00 | 26.410 | 0.3326 | -489.94 | 8784.88 | 0.056 ✓ |

## Secondary Horizontal Design Data (Compression)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T1 | 160 - 140 | 1.25 | 1.13 | 72.3<br>K=1.00 | 20.499 | 0.4418 | -0.01 | 9056.00 | 0.000 ✓ |
| T2 | 140 - 120 | 1.25 | 1.13 | 72.3<br>K=1.00 | 20.499 | 0.4418 | -0.02 | 9056.00 | 0.000 ✓ |
| T3 | 120 - 113.3 | 1.25 | 1.13 | 72.3<br>K=1.00 | 20.502 | 0.4418 | -0.01 | 9057.33 | 0.000 ✓ |
| T4 | 113.3 - 106.7 | 1.25 | 1.13 | 72.3<br>K=1.00 | 20.502 | 0.4418 | -0.01 | 9057.33 | 0.000 ✓ |
| T5 | 106.7 - 100 | 1.25 | 1.13 | 72.3<br>K=1.00 | 20.499 | 0.4418 | -0.01 | 9056.00 | 0.000 ✓ |
| T8 | 60 - 40 | 1.25 | 1.13 | 40.7<br>K=1.00 | 25.740 | 0.3326 | -0.01 | 8562.02 | 0.000 ✓ |

## Top Girt Design Data (Compression)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T2 | 140 - 120 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -575.15 | 5059.73 | 0.114 ✓ |
| T3 | 120 - 113.3 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -601.31 | 5059.73 | 0.119 ✓ |
| T4 | 113.3 - 106.7 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -403.32 | 5059.73 | 0.080 ✓ |
| T5 | 106.7 - 100 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -226.02 | 5059.73 | 0.045 ✓ |
| T6 | 100 - 80 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -83.48 | 5059.73 | 0.016 ✓ |
| T7 | 80 - 60 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -5.99 | 5059.73 | 0.001 ✓ |
| T8 | 60 - 40 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -3.07 | 5059.73 | 0.001 ✓ |
| T9 | 40 - 20 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -73.94 | 5059.73 | 0.015 ✓ |
| T10 | 20 - 6.7 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -35.33 | 5059.73 | 0.007 ✓ |

## Bottom Girt Design Data (Compression)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T1 | 160 - 140 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -169.22 | 5059.73 | 0.033 ✓ |
| T2 | 140 - 120 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -1371.13 | 5059.73 | 0.271 ✓ |
| T5 | 106.7 - 100 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -122.61 | 5059.73 | 0.024 ✓ |
| T6 | 100 - 80 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -28.08 | 5059.73 | 0.006 ✓ |
| T7 | 80 - 60 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -29.95 | 5059.73 | 0.006 ✓ |
| T8 | 60 - 40 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -21.52 | 5059.73 | 0.004 ✓ |
| T9 | 40 - 20 | 2.50 | 2.26 | 81.3<br>K=1.00 | 15.211 | 0.3326 | -45.41 | 5059.73 | 0.009 ✓ |

## Top Guy Pull-Off Design Data (Compression)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T1 | 160 - 140 | 2.50 | 2.26 | 86.8<br>K=1.00 | 17.618 | 1.2272 | -2260.58 | 21621.00 | 0.105 ✓ |

| | | |
|---|---|---|
| ARMOR TOWER<br>*Armor Tower*<br>*9 N.Main St.*<br>*Cortland, NY*<br>*Phone: (607) 591-5381*<br>*FAX: (866) 870-0840* | **Job**<br>STRUCTURAL ANALYSIS OF 160' GUYED TOWER | **Page**<br>17 of 21 |
| | **Project**<br>Prospect North, CT | **Date**<br>12:06:06 03/18/13 |
| | **Client**<br>Verizon Wireless | **Designed by**<br>AAS |

## Torque-Arm Bottom Design Data

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T1 | 160 - 140 (309) | 4.16 | 3.96 | 80.9<br>K=1.00 | 15.257 | 2.1100 | -9382.98 | 32192.10 | 0.291 ✓ |
| T1 | 160 - 140 (310) | 4.16 | 3.96 | 80.9<br>K=1.00 | 15.257 | 2.1100 | -9441.55 | 32192.10 | 0.293 ✓ |
| T1 | 160 - 140 (315) | 4.16 | 3.96 | 80.9<br>K=1.00 | 15.257 | 2.1100 | -9468.11 | 32192.10 | 0.294 ✓ |
| T1 | 160 - 140 (316) | 4.16 | 3.96 | 80.9<br>K=1.00 | 15.257 | 2.1100 | -9189.39 | 32192.10 | 0.285 ✓ |
| T1 | 160 - 140 (321) | 4.16 | 3.96 | 80.9<br>K=1.00 | 15.257 | 2.1100 | -8992.17 | 32192.10 | 0.279 ✓ |
| T1 | 160 - 140 (322) | 4.16 | 3.96 | 80.9<br>K=1.00 | 15.257 | 2.1100 | -9620.69 | 32192.10 | 0.299 ✓ |

## *Tension Checks*

## Leg Design Data (Tension)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T1 | 160 - 140 | 20.00 | 3.32 | 43.1 | 30.000 | 2.2535 | 19095.30 | 67606.20 | 0.282 ✓ |
| T2 | 140 - 120 | 20.00 | 3.31 | 42.9 | 30.000 | 2.2535 | 19081.80 | 67606.20 | 0.282 ✓ |
| T3 | 120 - 113.3 | 6.70 | 3.31 | 41.9 | 30.000 | 1.7040 | 7579.98 | 51121.50 | 0.148 ✓ |
| T4 | 113.3 - 106.7 | 6.60 | 3.30 | 41.8 | 30.000 | 1.7040 | 16688.40 | 51121.50 | 0.326 ✓ |
| T5 | 106.7 - 100 | 6.70 | 3.31 | 41.9 | 30.000 | 1.7040 | 2770.34 | 51121.50 | 0.054 ✓ |

## Diagonal Design Data (Tension)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T1 | 160 - 140 | 4.16 | 3.76 | 135.1 | 30.000 | 0.3326 | 4469.23 | 9979.05 | 0.448 ✓ |
| T2 | 140 - 120 | 4.14 | 3.75 | 134.8 | 30.000 | 0.3326 | 6798.42 | 9979.05 | 0.681 ✓ |
| T3 | 120 - 113.3 | 4.15 | 1.87 | 67.4 | 30.000 | 0.3326 | 3210.71 | 9979.05 | 0.322 ✓ |
| T4 | 113.3 - 106.7 | 4.14 | 1.87 | 67.3 | 30.000 | 0.3326 | 3267.17 | 9979.05 | 0.327 ✓ |
| T5 | 106.7 - 100 | 4.15 | 3.75 | 134.8 | 30.000 | 0.3326 | 2672.41 | 9979.05 | 0.268 ✓ |
| T6 | 100 - 80 | 4.14 | 3.75 | 134.8 | 30.000 | 0.3326 | 2200.61 | 9979.05 | 0.221 ✓ |
| T7 | 80 - 60 | 4.14 | 3.75 | 134.8 | 30.000 | 0.3326 | 1018.86 | 9979.05 | 0.102 ✓ |
| T8 | 60 - 40 | 4.14 | 3.75 | 134.8 | 30.000 | 0.3326 | 2154.95 | 9979.05 | 0.216 ✓ |
| T9 | 40 - 20 | 4.14 | 3.75 | 134.8 | 30.000 | 0.3326 | 1625.00 | 9979.05 | 0.163 ✓ |
| T10 | 20 - 6.7 | 4.13 | 3.73 | 134.2 | 30.000 | 0.3326 | 1001.57 | 9979.05 | 0.100 ✓ |

## Horizontal Design Data (Tension)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T1 | 160 - 140 | 2.50 | 2.26 | 81.3 | 30.000 | 0.3326 | 1302.36 | 9979.05 | 0.131 ✓ |
| T2 | 140 - 120 | 2.50 | 2.26 | 81.3 | 30.000 | 0.3326 | 1384.87 | 9979.05 | 0.139 ✓ |
| T3 | 120 - 113.3 | 2.50 | 2.26 | 81.3 | 30.000 | 0.3326 | 1836.56 | 9979.05 | 0.184 ✓ |
| T5 | 106.7 - 100 | 2.50 | 2.26 | 81.3 | 30.000 | 0.3326 | 642.21 | 9979.05 | 0.064 ✓ |
| T6 | 100 - 80 | 2.50 | 2.26 | 81.3 | 30.000 | 0.3326 | 553.16 | 9979.05 | 0.055 ✓ |
| T7 | 80 - 60 | 2.50 | 2.26 | 81.3 | 30.000 | 0.3326 | 473.90 | 9979.05 | 0.047 ✓ |
| T8 | 60 - 40 | 2.50 | 2.26 | 81.3 | 30.000 | 0.3326 | 550.20 | 9979.05 | 0.055 ✓ |
| T9 | 40 - 20 | 2.50 | 2.26 | 81.3 | 30.000 | 0.3326 | 503.27 | 9979.05 | 0.050 ✓ |
| T10 | 20 - 6.7 | 2.50 | 2.26 | 81.3 | 30.000 | 0.3326 | 536.77 | 9979.05 | 0.054 ✓ |
| T11 | 6.7 - 0 | 1.23 | 0.99 | 35.8 | 30.000 | 0.3326 | 523.91 | 9979.05 | 0.053 ✓ |

## Secondary Horizontal Design Data (Tension)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T1 | 160 - 140 | 1.25 | 1.13 | 72.3 | 30.000 | 0.4418 | 0.01 | 13253.60 | 0.000 ✓ |
| T2 | 140 - 120 | 1.25 | 1.13 | 72.3 | 30.000 | 0.4418 | 0.02 | 13253.60 | 0.000 ✓ |
| T3 | 120 - 113.3 | 1.25 | 1.13 | 72.3 | 30.000 | 0.4418 | 0.74 | 13253.60 | 0.000 ✓ |
| T4 | 113.3 - 106.7 | 1.25 | 1.13 | 72.3 | 30.000 | 0.4418 | 0.69 | 13253.60 | 0.000 ✓ |
| T5 | 106.7 - 100 | 1.25 | 1.13 | 72.3 | 30.000 | 0.4418 | 0.01 | 13253.60 | 0.000 ✓ |
| T8 | 60 - 40 | 1.25 | 1.13 | 40.7 | 30.000 | 0.3326 | 0.01 | 9979.05 | 0.000 ✓ |

## Top Girt Design Data (Tension)

| Section No. | Elevation | L | $L_u$ | Kl/r | $F_a$ | A | Actual P | Allow. $P_a$ | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| | ft | ft | ft | | ksi | $in^2$ | lb | lb | |
| T2 | 140 - 120 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 578.01 | 7184.92 | 0.080 ✓ |
| T3 | 120 - 113.3 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 1153.90 | 7184.92 | 0.161 ✓ |
| T4 | 113.3 - 106.7 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 2200.31 | 7184.92 | 0.306 ✓ |
| T5 | 106.7 - 100 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 2169.02 | 7184.92 | 0.302 ✓ |
| T6 | 100 - 80 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 246.54 | 7184.92 | 0.034 ✓ |
| T7 | 80 - 60 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 169.43 | 7184.92 | 0.024 ✓ |
| T8 | 60 - 40 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 251.38 | 7184.92 | 0.035 ✓ |
| T9 | 40 - 20 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 173.86 | 7184.92 | 0.024 ✓ |

| Section No. | Elevation ft | L ft | $L_u$ ft | Kl/r | $F_a$ ksi | A $in^2$ | Actual P lb | Allow. $P_a$ lb | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| T10 | 20 - 6.7 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 207.82 | 7184.92 | 0.029 ✓ |
| T11 | 6.7 - 0 | 2.47 | 2.23 | 80.2 | 21.600 | 0.3326 | 2098.38 | 7184.92 | 0.292 ✓ |

## Bottom Girt Design Data (Tension)

| Section No. | Elevation ft | L ft | $L_u$ ft | Kl/r | $F_a$ ksi | A $in^2$ | Actual P lb | Allow. $P_a$ lb | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 160 - 140 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 190.65 | 7184.92 | 0.027 ✓ |
| T2 | 140 - 120 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 1350.63 | 7184.92 | 0.188 ✓ |
| T5 | 106.7 - 100 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 421.06 | 7184.92 | 0.059 ✓ |
| T6 | 100 - 80 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 191.09 | 7184.92 | 0.027 ✓ |
| T7 | 80 - 60 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 166.87 | 7184.92 | 0.023 ✓ |
| T8 | 60 - 40 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 266.13 | 7184.92 | 0.037 ✓ |
| T9 | 40 - 20 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 224.54 | 7184.92 | 0.031 ✓ |
| T10 | 20 - 6.7 | 2.50 | 2.26 | 81.3 | 21.600 | 0.3326 | 1872.98 | 7184.92 | 0.261 ✓ |

## Top Guy Pull-Off Design Data (Tension)

| Section No. | Elevation ft | L ft | $L_u$ ft | Kl/r | $F_a$ ksi | A $in^2$ | Actual P lb | Allow. $P_a$ lb | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 160 - 140 | 2.50 | 2.26 | 86.8 | 30.000 | 1.2272 | 2236.15 | 36815.50 | 0.061 ✓ |
| T4 | 113.3 - 106.7 | 2.50 | 2.26 | 86.8 | 30.000 | 1.2272 | 6097.13 | 36815.50 | 0.166 ✓ |
| T8 | 60 - 40 | 2.50 | 2.26 | 86.8 | 30.000 | 1.2272 | 3243.65 | 36815.50 | 0.088 ✓ |

## Torque-Arm Top Design Data

| Section No. | Elevation ft | L ft | $L_u$ ft | Kl/r | $F_a$ ksi | A $in^2$ | Actual P lb | Allow. $P_a$ lb | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 160 - 140 (307) | 2.50 | 2.38 | 31.3 | 21.600 | 2.1100 | 5903.81 | 45576.00 | 0.130 ✓ |
| T1 | 160 - 140 (308) | 2.50 | 2.38 | 31.3 | 21.600 | 2.1100 | 5680.38 | 45576.00 | 0.125 ✓ |
| T1 | 160 - 140 (313) | 2.50 | 2.38 | 31.3 | 21.600 | 2.1100 | 5922.24 | 45576.00 | 0.130 ✓ |
| T1 | 160 - 140 (314) | 2.50 | 2.38 | 31.3 | 21.600 | 2.1100 | 5630.91 | 45576.00 | 0.124 ✓ |
| T1 | 160 - 140 (319) | 2.50 | 2.38 | 31.3 | 21.600 | 2.1100 | 5547.71 | 45576.00 | 0.122 ✓ |
| T1 | 160 - 140 (320) | 2.50 | 2.38 | 31.3 | 21.600 | 2.1100 | 6033.87 | 45576.00 | 0.132 ✓ |

## Torque-Arm Bottom Design Data

| Section No. | Elevation ft | L ft | $L_u$ ft | Kl/r | $F_a$ ksi | A $in^2$ | Actual P lb | Allow. $P_a$ lb | Ratio $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|
| T1 | 160 - 140 (309) | 4.16 | 3.96 | 52.0 | 21.600 | 2.1100 | 564.67 | 45576.00 | 0.012 ✓ |
| T1 | 160 - 140 (310) | 4.16 | 3.96 | 52.0 | 21.600 | 2.1100 | 433.72 | 45576.00 | 0.010 ✓ |
| T1 | 160 - 140 (315) | 4.16 | 3.96 | 52.0 | 21.600 | 2.1100 | 559.22 | 45576.00 | 0.012 ✓ |
| T1 | 160 - 140 (316) | 4.16 | 3.96 | 52.0 | 21.600 | 2.1100 | 160.43 | 45576.00 | 0.004 ✓ |
| T1 | 160 - 140 (321) | 4.16 | 3.96 | 52.0 | 21.600 | 2.1100 | 13.04 | 45576.00 | 0.000 ✓ |
| T1 | 160 - 140 (322) | 4.16 | 3.96 | 52.0 | 21.600 | 2.1100 | 578.87 | 45576.00 | 0.013 ✓ |

## Section Capacity Table

| Section No. | Elevation ft | Component Type | Critical Element | P lb | $SF*P_{allow}$ lb | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|
| T1 | 160 - 140 | Leg | 1 | -31995.60 | 53293.87 | 60.0 | Pass |
| | | Diagonal | 25 | -4709.84 | 7065.42 | 66.7 | Pass |
| | | Horizontal | 34 | -1211.64 | 8315.21 | 14.6 | Pass |
| | | Secondary Horizontal | 13 | -0.01 | 12071.65 | 0.0 | Pass |
| | | Bottom Girt | 9 | -169.22 | 6744.62 | 2.5 | Pass |
| | | Guy A@160 | 317 | 7943.31 | 10400.00 | 76.4 | Pass |
| | | Guy B@160 | 311 | 7929.04 | 10400.00 | 76.2 | Pass |
| | | Guy C@160 | 306 | 8047.15 | 10400.00 | 77.4 | Pass |
| | | Top Guy Pull-Off@160 | 4 | -2260.58 | 28820.79 | 7.8 | Pass |
| | | Torque Arm Top@160 | 320 | 6033.87 | 60752.81 | 9.9 | Pass |
| | | Torque Arm Bottom@160 | 322 | -9620.69 | 42912.07 | 22.4 | Pass |
| T2 | 140 - 120 | Leg | 39 | -32337.40 | 53520.35 | 60.4 | Pass |
| | | Diagonal | 48 | -7117.22 | 7090.28 | 100.4 | Acceptable |
| | | Horizontal | 52 | -1202.79 | 8315.21 | 14.5 | Pass |
| | | Secondary Horizontal | 51 | -0.02 | 12071.65 | 0.0 | Pass |
| | | Top Girt | 43 | -575.15 | 6744.62 | 8.5 | Pass |
| | | Bottom Girt | 46 | -1371.13 | 6744.62 | 20.3 | Pass |
| T3 | 120 - 113.3 | Leg | 79 | -27560.50 | 57313.13 | 48.1 | Pass |
| | | Diagonal | 91 | -4921.87 | 9493.84 | 51.8 | Pass |
| | | Horizontal | 90 | 1836.56 | 13302.07 | 13.8 | Pass |
| | | Secondary Horizontal | 97 | 0.74 | 17667.05 | 0.7 | Pass |
| | | Top Girt | 80 | 1153.90 | 9577.50 | 12.0 | Pass |
| T4 | 113.3 - 106.7 | Leg | 99 | -37393.90 | 57207.16 | 65.4 | Pass |
| | | Diagonal | 112 | -4850.77 | 9502.53 | 51.0 | Pass |
| | | Secondary Horizontal | 118 | 0.69 | 17667.05 | 0.6 | Pass |
| | | Top Girt | 101 | 2200.31 | 9577.50 | 23.0 | Pass |
| | | Guy A@110 | 327 | 18065.70 | 29150.00 | 62.0 | Pass |
| | | Guy B@110 | 326 | 18168.40 | 29150.00 | 62.3 | Pass |
| | | Guy C@110 | 323 | 18154.10 | 29150.00 | 62.3 | Pass |
| | | Top Guy Pull-Off@110 | 111 | 6097.13 | 49075.06 | 12.4 | Pass |
| T5 | 106.7 - 100 | Leg | 120 | -37078.10 | 41433.50 | 89.5 | Pass |
| | | Diagonal | 134 | -3039.54 | 7085.31 | 42.9 | Pass |
| | | Horizontal | 132 | -642.21 | 8315.21 | 7.7 | Pass |
| | | Secondary Horizontal | 131 | -0.01 | 12071.65 | 0.0 | Pass |
| | | Top Girt | 124 | 2169.02 | 9577.50 | 22.6 | Pass |
| | | Bottom Girt | 126 | 421.06 | 9577.50 | 4.4 | Pass |
| T6 | 100 - 80 | Leg | 138 | -31937.00 | 41466.30 | 77.0 | Pass |
| | | Diagonal | 167 | -2503.06 | 7090.28 | 35.3 | Pass |
| | | Horizontal | 149 | -553.16 | 8315.21 | 6.7 | Pass |

| ARMOR TOWER | Job: STRUCTURAL ANALYSIS OF 160' GUYED TOWER | Page: 21 of 21 |
|---|---|---|
| *Armor Tower*<br>*9 N.Main St.*<br>*Cortland, NY*<br>*Phone: (607) 591-5381*<br>*FAX: (866) 870-0840* | Project: Prospect North, CT | Date: 12:06:06 03/18/13 |
| | Client: Verizon Wireless | Designed by: AAS |

| Section No. | Elevation ft | Component Type | Critical Element | P lb | $SF*P_{allow}$ lb | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|
| | | Top Girt | 142 | 246.54 | 9577.50 | 2.6 | Pass |
| | | Bottom Girt | 143 | 191.09 | 9577.50 | 2.0 | Pass |
| T7 | 80 - 60 | Leg | 170 | -25298.40 | 41466.30 | 61.0 | Pass |
| | | Diagonal | 178 | -2032.07 | 7090.28 | 28.7 | Pass |
| | | Horizontal | 181 | -438.18 | 8315.21 | 5.3 | Pass |
| | | Top Girt | 173 | 169.43 | 9577.50 | 1.8 | Pass |
| | | Bottom Girt | 176 | 166.87 | 9577.50 | 1.7 | Pass |
| T8 | 60 - 40 | Leg | 201 | -31765.60 | 41466.30 | 76.6 | Pass |
| | | Diagonal | 225 | -2731.08 | 7090.28 | 38.5 | Pass |
| | | Horizontal | 214 | -550.20 | 8315.21 | 6.6 | Pass |
| | | Secondary Horizontal | 213 | -0.01 | 11413.17 | 0.0 | Pass |
| | | Top Girt | 205 | 251.38 | 9577.50 | 2.6 | Pass |
| | | Bottom Girt | 209 | 266.13 | 9577.50 | 2.8 | Pass |
| | | Guy A@50 | 332 | 6053.19 | 10400.00 | 58.2 | Pass |
| | | Guy B@50 | 331 | 6064.38 | 10400.00 | 58.3 | Pass |
| | | Guy C@50 | 328 | 6059.35 | 10400.00 | 58.3 | Pass |
| | | Top Guy Pull-Off@50 | 224 | 3243.65 | 49075.06 | 6.6 | Pass |
| T9 | 40 - 20 | Leg | 241 | -29062.60 | 41466.30 | 70.1 | Pass |
| | | Diagonal | 270 | -1834.43 | 7090.28 | 25.9 | Pass |
| | | Horizontal | 259 | -503.27 | 8315.21 | 6.1 | Pass |
| | | Top Girt | 243 | 173.86 | 9577.50 | 1.8 | Pass |
| | | Bottom Girt | 245 | 224.54 | 9577.50 | 2.3 | Pass |
| T10 | 20 - 6.7 | Leg | 272 | -29055.90 | 41728.50 | 69.6 | Pass |
| | | Diagonal | 280 | -1850.53 | 7129.90 | 26.0 | Pass |
| | | Horizontal | 287 | -503.26 | 8315.21 | 6.1 | Pass |
| | | Top Girt | 274 | 207.82 | 9577.50 | 2.2 | Pass |
| | | Bottom Girt | 277 | 1872.98 | 9577.50 | 19.6 | Pass |
| T11 | 6.7 - 0 | Leg | 295 | -27812.10 | 40529.20 | 68.6 | Pass |
| | | Diagonal | 302 | -1195.09 | 8099.31 | 14.8 | Pass |
| | | Horizontal | 301 | -489.94 | 11710.24 | 4.2 | Pass |
| | | Top Girt | 299 | 2098.38 | 9577.50 | 21.9 | Pass |
| | | | | | | Summary | |
| | | | | | Leg (T5) | 89.5 | Pass |
| | | | | | Diagonal (T2) | 100.4 | Acceptable |
| | | | | | Horizontal (T1) | 14.6 | Pass |
| | | | | | Secondary Horizontal (T3) | 0.7 | Pass |
| | | | | | Top Girt (T4) | 23.0 | Pass |
| | | | | | Bottom Girt (T2) | 20.3 | Pass |
| | | | | | Guy A (T1) | 76.4 | Pass |
| | | | | | Guy B (T1) | 76.2 | Pass |
| | | | | | Guy C (T1) | 77.4 | Pass |
| | | | | | Top Guy Pull-Off (T4) | 12.4 | Pass |
| | | | | | Torque Arm Top (T1) | 9.9 | Pass |
| | | | | | Torque Arm Bottom (T1) | 22.4 | Pass |
| | | | | | Bolt Checks | 17.7 | Pass |
| | | | | | **RATING =** | **100.4** | **Acceptable** |