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

July 31, 2006

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-078-060712** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify an existing telecommunications facility located at North Eagleville Road, Mansfield, Connecticut.

Dear Attorney Baldwin:

At a public meeting held on July 27, 2006, the Connecticut Siting Council (Council) acknowledged your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated July 12, 2006, including the placement of all necessary equipment and shelters within the tower compound. 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Colin C. Tait
Chairman

CCT/laf

c: The Honorable Elizabeth Patterson, Mayor, Town of Mansfield
Martin H. Berliner, Town Manager, Town of Mansfield
Gregory Padick, Town Planner, Town of Mansfield
Thomas F. Flynn III, Nextel Communications, Inc.
Christopher B. Fisher, Esq., Cuddy & Feder LLP
Michele G. Briggs, New Cingular Wireless PCS, LLC
John Murphy, General Manager, WHUS Radio
George L. Davis, Tower Manager

ROBINSON & COLE LLP

ORIGINAL

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EM-VER-078-060712

July 12, 2006

Via Hand Delivery

S. Derek Phelps
Executive Director
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Antenna Swap/Microwave Installation**
University of Connecticut WHUS tower
North Eagleville Road
Mansfield, Connecticut

Dear Mr. Phelps:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") intends to modify its existing telecommunications facility at the WHUS tower on North Eagleville Road in Mansfield, Connecticut. 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 the Mansfield Town Manager, Martin Berliner.

The Council originally approved Cellco's installation of twelve (12) panel antennas at the 84-foot level on the tower on November 11, 1997. On January 1, 2001, the Council approved Cellco's request to replace the panel antennas with three (3) Metawave antennas at the same level on the tower. On July 13, 2004, the Council approved Cellco's request to add three (3) PCS antennas at the same level on the tower. Cellco now intends to modify this facility further by replacing the three (3) Metawave antennas and three (3) PCS antennas with twelve (12) new antennas, six (6) cellular (Model APL1965-42T2) and six (6) PCS (Model APL866513-42T0) at the same location on the tower. Cellco also intends to install a 4-foot microwave dish antenna (Model P4F-57W) at the 138-foot level on the tower. Attached behind Tab 1 are specifications for the proposed antennas.

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

1. The proposed modification will not increase the overall height of the existing tower. Cellco's cellular and PCS antennas will be mounted at the 84-foot level and Cellco's microwave dish antenna will be installed at the 138-foot level on the 327-foot tower.

2. The proposed modification will not affect any ground-mounted equipment and, therefore, will not require an extension of the site boundaries.

3. The proposed antenna modification will not increase the noise levels at the facility by six decibels or more.

4. The operation of the antennas will not increase radio frequency (RF) power density levels at the facility. A copy of an Antenna Site FCC RF Compliance Assessment and Report is attached behind Tab 2.

Attached behind Tab 3 is a copy of the Detailed Structural Analysis confirming that the tower can accommodate the new Cellco antennas.

For the foregoing reasons, Cellco respectfully submits that the proposed antenna installation at the Mansfield facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

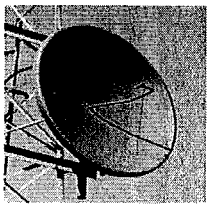
Sincerely,

Kenneth C. Baldwin

Attachment
cc: Martin Berliner, Mansfield Town Manager
Sandy M. Carter

ANDREW®

Antenna Product Information



P4F-57W --
4 ft. standard antenna for 5.725 - 6.425 GHz single pol unpressurized feed

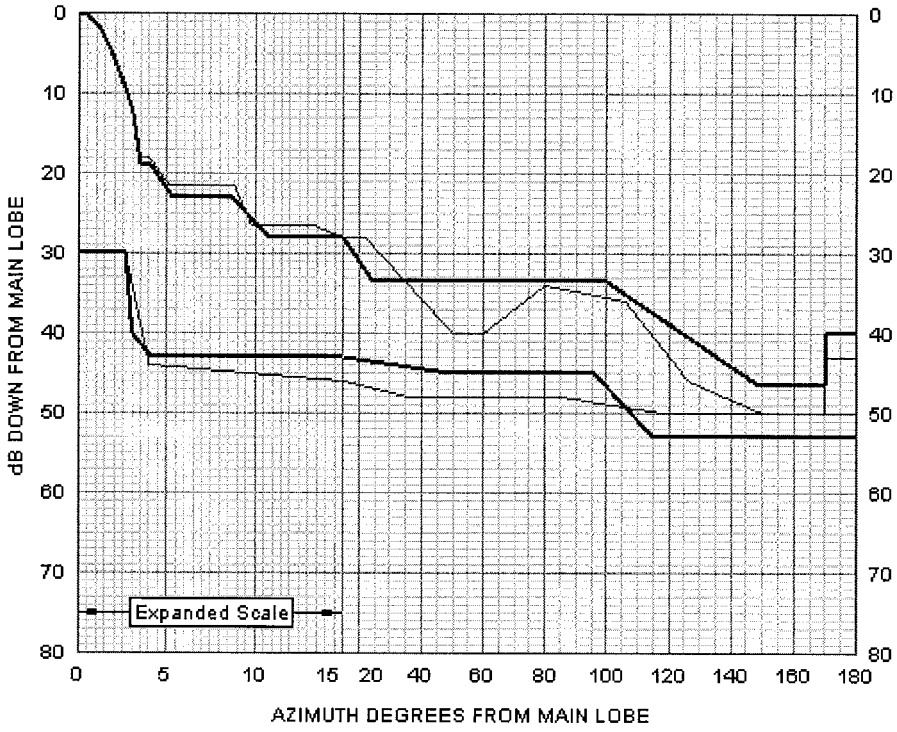
Antenna Specifications

Frequency, GHz	5.725 - 6.425 GHz
Part Number	P4F-57W
Description	4 ft. standard antenna for 5.725 - 6.425 GHz single pol unpressurized feed
Feed Input Options	N Female
Radome Options	None,Molded
Polarization	Single
Regulatory Compliance	
Gain, Low, dBi	34.60
Gain, Mid, dBi	35.00
Gain, Top, dBi	35.40
Beamwidth, deg.	2.90
Cross. Pol. Disc, dB	30.00
F/B Ratio, dB	40.00
VSWR max.	1.10
Return Loss, dB	26.40

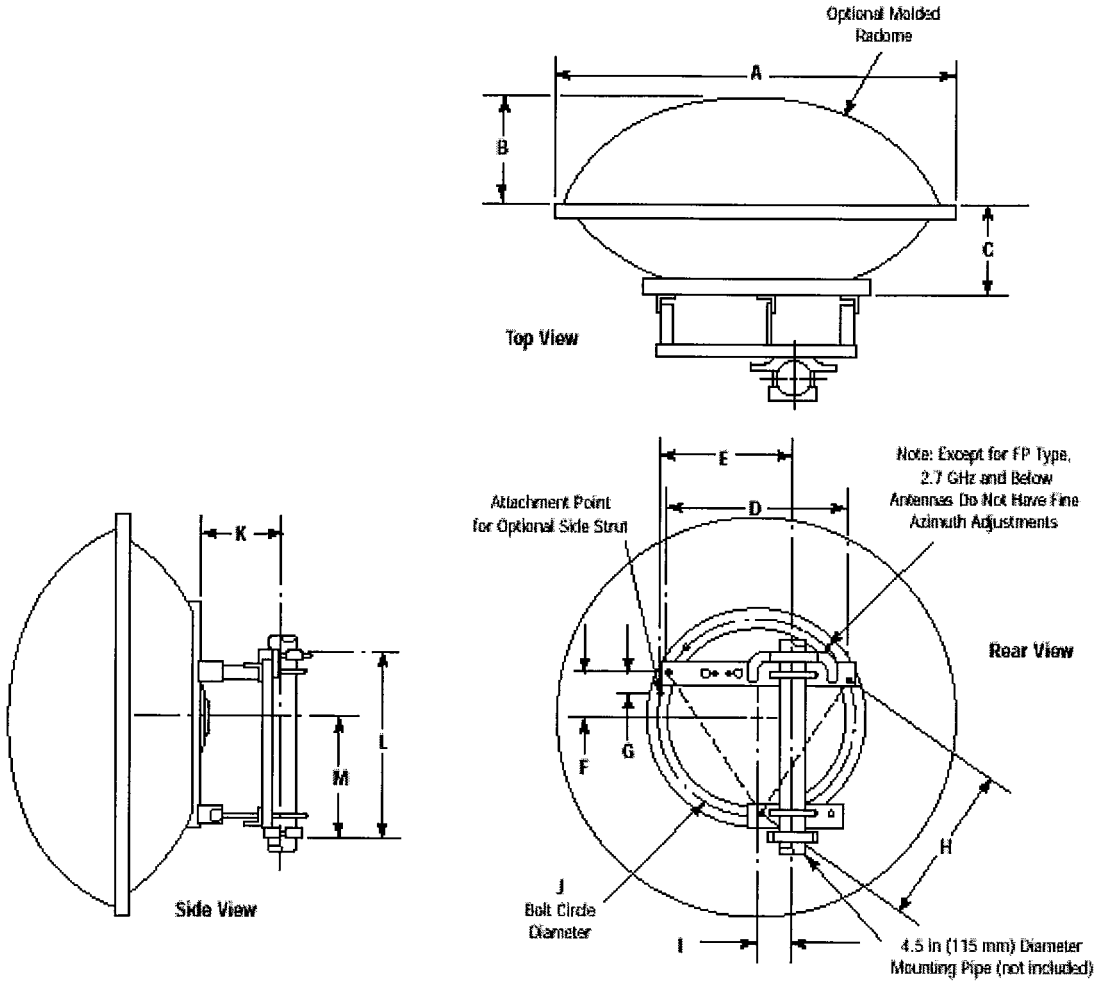
P4F-57W Antenna - Radiation Pattern Envelope

View RPE 4268 (full screen view)

RPE - 4268
Envelope for a Horizontally Polarized Antenna (HH, HV)
Envelope for a Vertically Polarized Antenna (VV, VH)



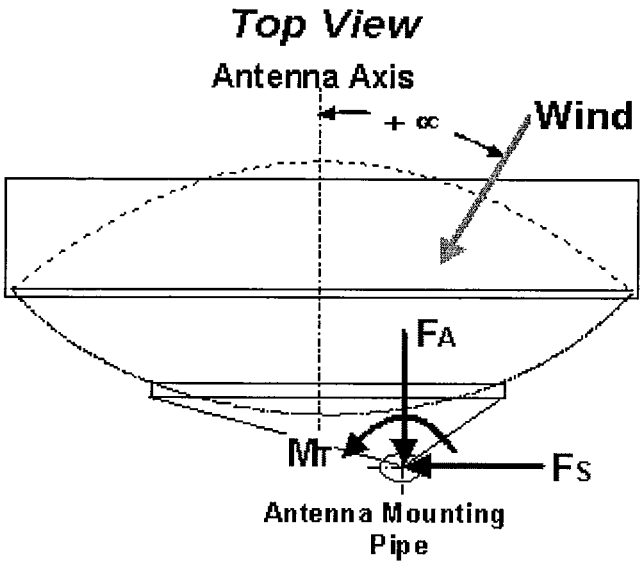
P4F-57W Antenna - Outline Dimensions



Antenna Dimensions in inches (mm)

Dimension Name	Dimension Value, in	Dimension Value, mm
A	52.40	1330.00
B	18.50	470.00
C	7.75	195.00
D	26.50	675.00
E	21.50	545.00
F	7.75	195.00
G	2.25	60.00
H	26.50	675.00
I	5.00	137.00
J	30.60	780.00
K	11.60	295.00
L	30.75	780.00
M	19.00	480.00

P4F-57W Antenna - Wind Forces



Wind Forces at 125 mph (200 km/h)

Axial Force, F_A lb (N)	864 (3843)
Side Force, F_S lb (N)	236 (1049)
Moment, M_T lb-ft (Nm)	-647 (-858)
Angle α For M_T Max	-130

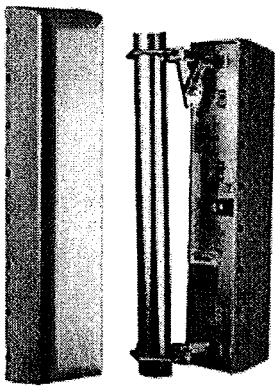
Antenna Packed Weights (Gross) and Dimensions (Single Unit Pack)

Gross Weight, lb (kg)	335.00 (152.00)
Length, in (mm)	58.00 (1480.00)
Width, in (mm)	56.00 (1430.00)
Height, in (mm)	33.00 (840.00)

Product Data Sheet for APL196516-42T2

Maximizer® Directional Panel Antenna

The Celwave® Maximizer series is a log periodic dipole array which uses a patented design to achieve a front-to-back ratio of 45 dB, the highest front-to-back ratio in the industry. Maximizers are available to cover ESMR, AMPS, PCS and DCS frequency ranges. They use Celwave's patented monolithic CELlite® technology, which eliminates cable and soldered joints to reduce the possibility of intermodulation products. The CELlite technology assures high reliability and excellent repeatability of electrical characteristics. The cellular Maximizers are available in 65°, 80° and 90° horizontal beamwidths and the PCS/DCS Maximizers are available in 65° and 90° horizontal beamwidths.



FRONT BACK

Product Specifications

Frequency Band	PCS 1900 (1850-1990 MHz)
Horizontal Pattern	Directional
Antenna Type	Panel Log Periodic
Electrical Down Tilt Option	Fixed
Gain, dBi (dBd)	18.14 (16)
Frequency Range, MHz	1850-1990
Connector Type	7-16 DIN Female
Connector Location	Back
Mount Type	Downtilt
Electrical Downtilt, deg	2
Horizontal Beamwidth, deg	65
Mounting Hardware	APM21-5
Rated Wind Speed, km/h (mph)	200 (125)
VSWR	< 1.3:1
Vertical Beamwidth, deg	6
1st Null Fill, dB	> -15
Null Fill, dB	> -15
1st Upper Sidelobe Suppression, dB	> 18
Upper Sidelobe Suppression, dB	> 18
Polarization	Vertical
Front-To-Back Ratio, dB	45
Maximum Power Input, W	500

Maximizer® Directional Panel Antenna

Lightning protection	Direct Ground
3rd Order IMP @ 2 x 43 dBm, dBc	<-143
Dimensions - HxWxD, mm (in)	1600 x 127 x 102 (63 x 5 x 4)
Weight w/o Mtg. Hardware, kg (lb)	4 (8)
Weight w/ Mtg. Hardware, kg (lb)	4.5 (10)
Radiating Element Material	Aluminum Alloy
Radome Material	UV-Stabilized High Impact ABS
Reflector Material	5032-H32 Aluminum
Max Wind Loading Area, m^2 (ft^2)	0.204 (2.2)
Maximum Thrust @ Rated Wind, N (lbf)	391 (88)
Side Wind Loading Area, m^2 (ft^2)	0.163 (1.75)
Side Thrust @ Rated Wind, N (lbf)	311 (70)
Shipping Weight, kg (lb)	8.2 (18)
Shipping Mode	UPS
Packing Dimensions, HxWxD, mm (in)	2083 x 356 x 254 (82 x 14 x 10)
Shipping Dimensions of Accessory, HxWxD, mm (in)	76 x 229 x 305 (3 x 9 x 12)
Survival Wind Speed, km/h (mph)	200 (125)

Features/Benefits

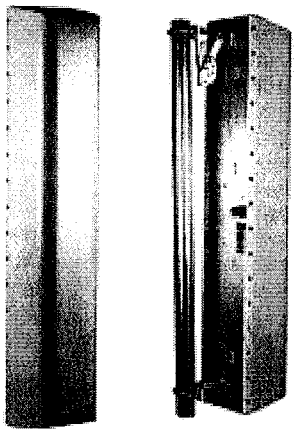
- **45 dB front-to-back ratio reduces co-channel interference.**
- **Monolithic construction reduces IM.**
- **No solder joints, high reliability.**
- **Surface treated components prevent galvanic corrosion.**
- **UV stabilized radome assures long life without radome deterioration due to UV exposure.**

Technical Data Sheet	APL866513-42T0

Maximizer® Directional Panel Antenna

Product Description

The Celwave® Maximizer series is a log periodic dipole array which uses a patented design to achieve a front-to-back ratio of 45 dB, the highest front-to-back ratio in the industry. Maximizers are available to cover ESMR, AMPS, PCS and DCS frequency ranges. They use RFS's patented monolithic CELlite® technology, which eliminates cable and soldered joints to reduce the possibility of inter-modulation products. The CELlite technology assures high reliability and excellent repeatability of electrical characteristics. The cellular Maximizers are available in 65°, 80° and 90° horizontal beamwidths and the PCS/DCS Maximizers are available in 65° and 90° horizontal beamwidths. Patent number 6,133,889.



FRONT BACK

Features/Benefits

- **45 dB front-to-back ratio reduces co-channel interference.**
- **Monolithic construction reduces IM.**
- **No solder joints, high reliability.**
- **Surface treated components prevent galvanic corrosion.**
- **UV stabilized radome assures long life without radome deterioration due to UV exposure.**

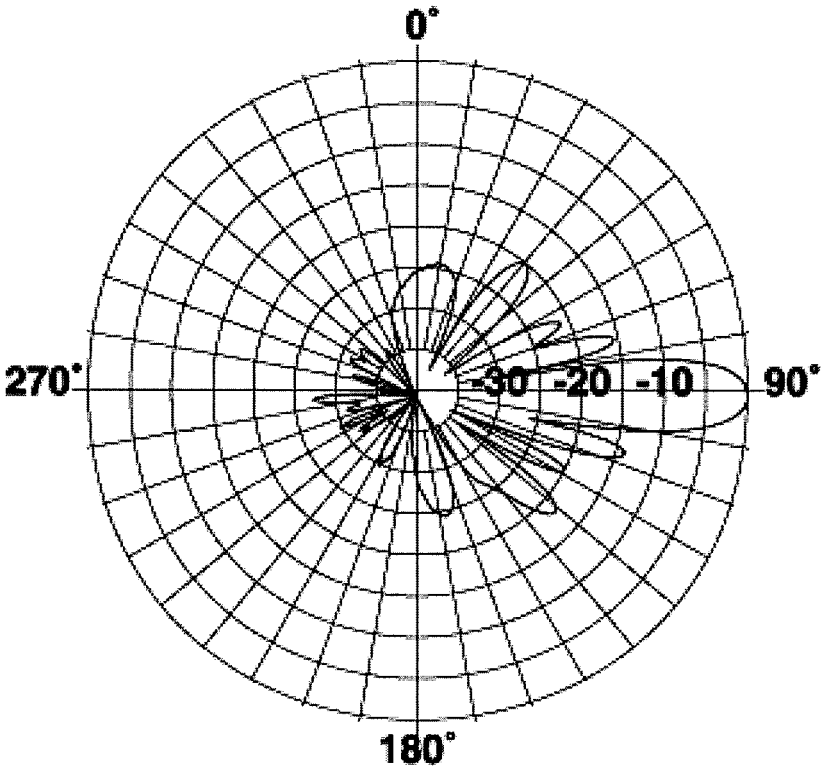
Technical Features

Frequency Band	Trunking/SMR (806-824, 851-869 MHz), Cellular (824-849, 869-894 MHz)
Horizontal Pattern	Directional
Antenna Type	Panel Log Periodic
Electrical Down Tilt Option	Fixed
Gain, dBi (dBd)	15.1 (13)
Frequency Range, MHz	806-894
Connector Type	7-16 DIN Female
Connector Location	Back
Mount Type	Downtilt
Electrical Downtilt, deg	0
Horizontal Beamwidth, deg	65
Mounting Hardware	APM21-3

Rated Wind Speed, km/h (mph)	180 (112)
VSWR	< 1.5:1
Vertical Beamwidth, deg	15
1st Null Fill, dB	> -17
Null Fill, dB	> -17
1st Upper Sidelobe Suppression, dB	> 20
Upper Sidelobe Suppression, dB	> 20
Polarization	Vertical
Front-To-Back Ratio, dB	45
Maximum Power Input, W	500
Lightning protection	Direct Ground
3rd Order IMP @ 16 x 41 dBm, dBm	< -100
Overall Length, m (ft)	1.2 (4.0)
Dimensions - HxWxD, mm (in)	1219 x 234 x 203 (48 x 9.2 x 8)
Radiating Element Material	Aluminum Alloy
Radome Material	UV Stabilized High Impact ABS
Reflector Material	5052-H32 Aluminum
Max Wind Loading Area, m^2 (ft^2)	0.376 (4.05)
Survival Wind Speed, km/h (mph)	200 (125)
Maximum Thrust @ Rated Wind, N (lbf)	903 (203)
Side Wind Loading Area, m^2 (ft^2)	0.248 (2.67)
Side Thrust @ Rated Wind, N (lbf)	594 (133.5)
Shipping Weight, kg (lb)	9.1 (20)
Packing Dimensions, HxWxD, mm (in)	1594 x 343 x 349 (62.75 x 13.5 x 13.75)
Shipping Dimensions of Accessory, HxWxD, mm (in)	305 x 229 x 102 (12 x 9 x 4)
Shipping Mode	UPS
Weight w/o Mtg Hardware, kg (lb)	7 (15.7)
Weight w/ Mtg Hardware, kg (lb)	8.2 (18)

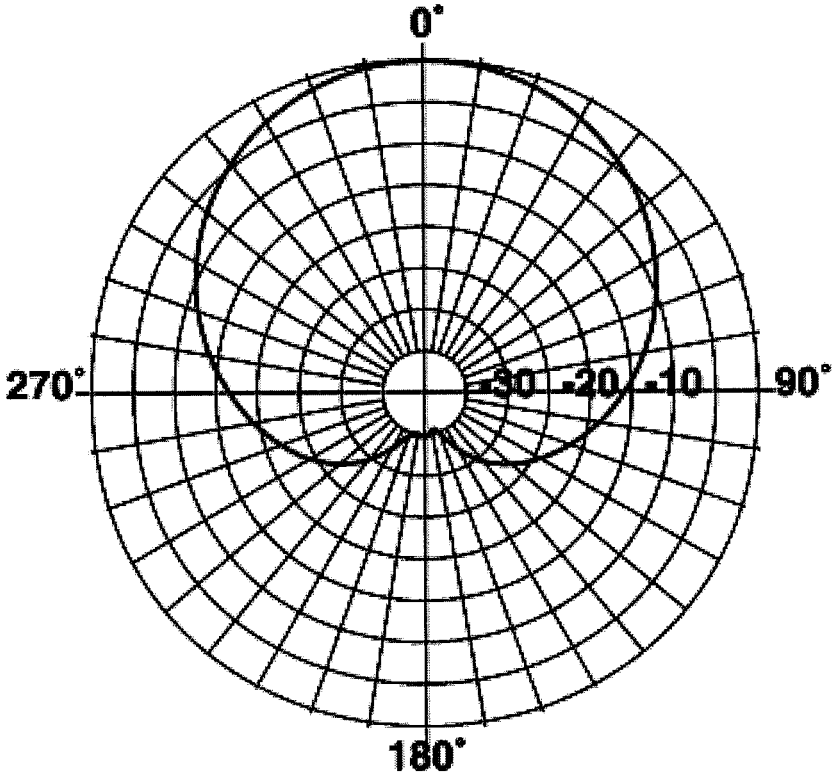
Vertical Pattern

(This is a general representation of the antenna family pattern. For the latest detailed pattern contact Applications Engineering. You may also download the CELplot(TM) pattern reader and antenna pattern data fields from our website.)



Horizontal Pattern

(This is a general representation of the antenna family pattern. For the latest detailed pattern contact Applications Engineering. You may also download the CELplot(TM) pattern reader and antenna pattern data fields from our website.)



Pinnacle Telecom Group

Consulting and Engineering Services

Antenna Site FCC RF Compliance Assessment and Report

prepared for

Verizon Wireless

UConn WHUS Tower
North Eagleville Road
Mansfield, CT

July 11, 2006

14 Ridgedale Avenue, Suite 209 • Cedar Knolls, NJ 07927 • 973-451-1630

Contents

Introduction and Summary

At the request of Verizon Wireless, Pinnacle Telecom Group has performed an independent assessment of FCC radiofrequency (RF) compliance related to the proposed modification of wireless antenna operations on the University of Connecticut (UConn) WHUS tower.

Verizon proposes to replace existing cellular antennas it has on the tower with directional panel antennas at the same height as those existing antennas (84 feet), and also proposes to operate a four-foot point-to-point 5.7 GHz dish antenna at 138 feet.

The FCC requires all wireless system operators to ensure compliance with the Maximum Permissible Exposure (MPE) limit in the FCC's regulations. According to those regulations, there are two ways compliance can be demonstrated: by certifying the antenna operation qualifies for the FCC "categorical exclusion", or by performing a mathematical analysis to show the RF levels satisfy the MPE limit.

The FCC criteria for categorical exclusion are based on an understanding and recognition that the technical characteristics of certain antenna operations and installations obviate the possibility of exceeding the MPE limit. Generally speaking, the use of low power or antennas mounted moderately high above ground can qualify particular antenna operations for the categorical exclusion. The FCC deems antenna operations that satisfy the criteria for categorical exclusion to be automatically in compliance, that is, such operations are categorically excluded from the requirement to specifically assess (i.e., as with a mathematical analysis) and demonstrate compliance with the MPE limit. The criteria for categorical exclusion are provided in the FCC regulations (specifically 47 CFR 1.1306 and 1.1307 – see Appendix B to this report).

The Verizon Wireless directional panel antennas are licensed as part of the Cellular Radiotelephone Service and the Personal Communications Services. According to the FCC criteria for categorical exclusion, such antenna operations involving a tower qualify for the categorical exclusion simply by being mounted

more than 10 meters (approximately 32.8 feet) off the ground. The Verizon antennas satisfy that criterion by a comfortable margin, and thus qualify for the exclusion.

The proposed Verizon Wireless four-foot microwave dish is part of the Point-to-Point Microwave Radio Service – and all antenna operations are categorically excluded.

Therefore, since the subject Verizon Wireless antenna operations qualify as categorically excluded, the FCC requires no further demonstration of compliance. However, in this case, Verizon Wireless has asked for calculations to demonstrate the relative insignificance of the RF levels that will result from its antennas, and we will provide those calculations here.

This report describes a mathematical analysis of RF levels at ground level around the site that will result from the combination of Verizon's proposed modification to its antenna operations. The analysis employs a standard FCC formula for calculating the effects of the antennas in a very conservative manner, in order to ensure "safe-side" results and great confidence in conclusions regarding compliance with established limits for safe continuous exposure of the general public.

The results of a compliance assessment such as this can most clearly be explained by describing the calculated RF levels as a simple percentage of the FCC MPE limit. If the reference for that limit is 100 percent, then calculated results lower than 100 percent indicate compliance.

The RF calculations show a maximum RF level from the combination of proposed directional panel and dish antenna operations of only 0.4865 percent (less than one-half of one percent) of the FCC MPE limit. Obviously, this is an insignificant RF contribution – and because of the conservatism in the analysis, RF levels actually caused by the Verizon antennas will be even less significant.

The remainder of this report provides the following:

- relevant technical data on the proposed Verizon antenna operations as they will be modified;
- a description of the applicable FCC mathematical model for calculating potential RF exposure levels, and application of the relevant technical data to that model;
- analysis of the results of the calculations against the specified FCC limit for safe continuous exposure of the general public.

In addition, Four Appendices are included. Appendix A provides background on the FCC MPE limit. Appendix B provides information on the FCC categorical exclusion. Appendix C provides a copy of the FCC's position on the potential exposure levels from cellular and PCS transmitters. Finally, Appendix D provides background on the qualifications of the author of this report.

Antenna and Transmission Data

Verizon Wireless proposes to replace its cellular antennas at the same height as the existing antennas (84 feet), and to add a point-to-point 5.7 GHz dish antenna at 138 feet. A minimum of 2 dB of line loss applies to each operation, and other relevant data for each operation is summarized below.

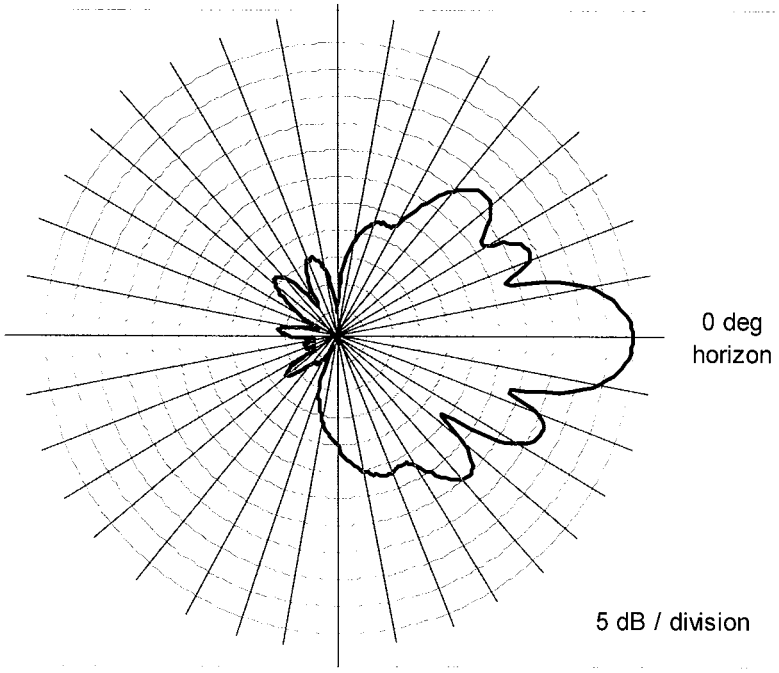
800 MHz Cellular Panels	
Ant. Mfr. & Model (Max. Gain)	RFS APL-866513-42T0 (15.1 dBi)
RF Channels per Sector	9
Trans. Power / RF Channel	20 watts (max.)
1900 MHz PCS Panels	
Ant. Mfr. & Model (Max. Gain)	RFS APL-196516- 42T2 (18.14 dBi)
RF Channels per Sector	6
Trans. Power / RF Channel	16 watts (max.)
5.7 GHz Point-to-Point Dish	
Ant. Mfr. & Model (Max. Gain)	Andrew P4F-57W (35.4 dBi)
RF Channels	1
Trans. Power / RF Channel	1 watt (max.)

Antenna vertical-plane radiation pattern discrimination (relative to the antenna's main beam gain) represents a key factor in calculating RF levels at ground level around a site. Diagrams illustrating the vertical-plane radiation patterns of the Verizon's antenna models are shown below and on the next page. Note that we are applying to the point-to-point dish the minimum pattern standard ("Standard B") imposed by FCC regulations and technical standards; the actual pattern of the antenna is even more directional that this standard.

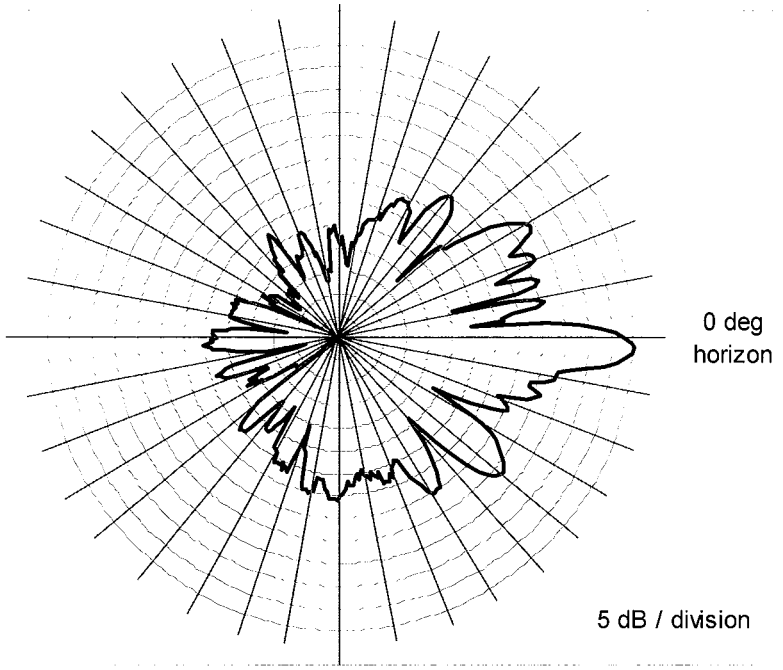
In these antenna vertical-plane pattern diagrams, the antenna is effectively pointed at the three o'clock position, and a decibel scale is used to describe the relative strength of the emissions at different angles. Where the antenna pattern reads 20 dB the relative RF energy emitted at the corresponding downward angle is 1/100th of the maximum that occurs at 0 degrees; at 30 dB, the energy is only 1/1000th of the maximum.

Note that automatic-scaling differences in the pattern drawing software may make some patterns appear visually more or less directional than others, but the actual directionality is reflected in the 5 dB per division scaling.

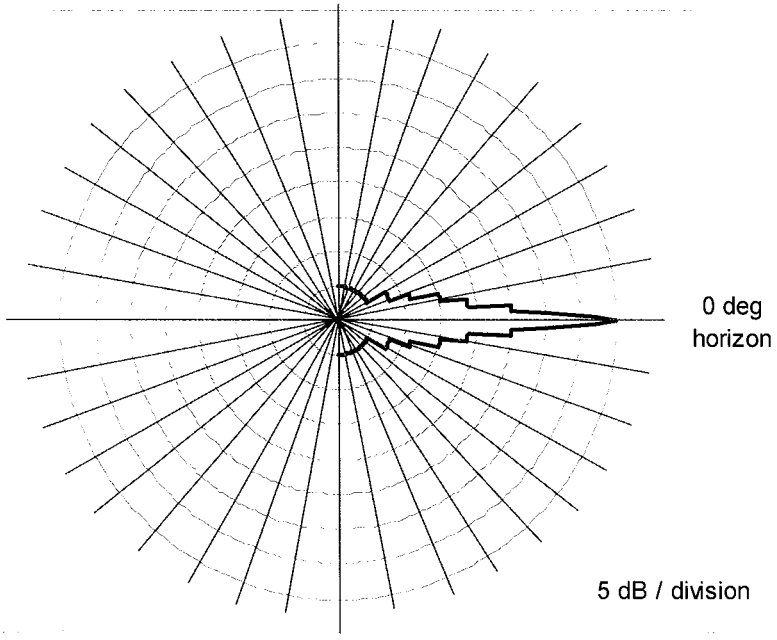
RFS APL-866513-42T0 (800 MHz) - Vertical-Plane Radiation Pattern



RFS APL-196516-42T2 (1900 MHz) - Vertical-Plane Radiation Pattern



Andrew P4F-57W (5.7 GHz) - Vertical-Plane Radiation Pattern



Technical Analysis

FCC Office of Engineering and Technology Bulletin 65 ("OET Bulletin 65") provides guidelines for mathematical models to calculate potential RF exposure levels at various points around transmitting antennas.

At ground-level around an antenna site (in what is called the "far field" of the antennas), the RF levels are directly proportional to the total antenna input power and the relative antenna gain in the downward direction of interest – and the levels are otherwise inversely proportional to the square of the straight-line distance to the antenna.

Conservative calculations also assume the potential RF exposure is enhanced by reflection of the RF energy from the ground. Our calculations will assume a 100% "perfect" reflection, the worst-case approach.

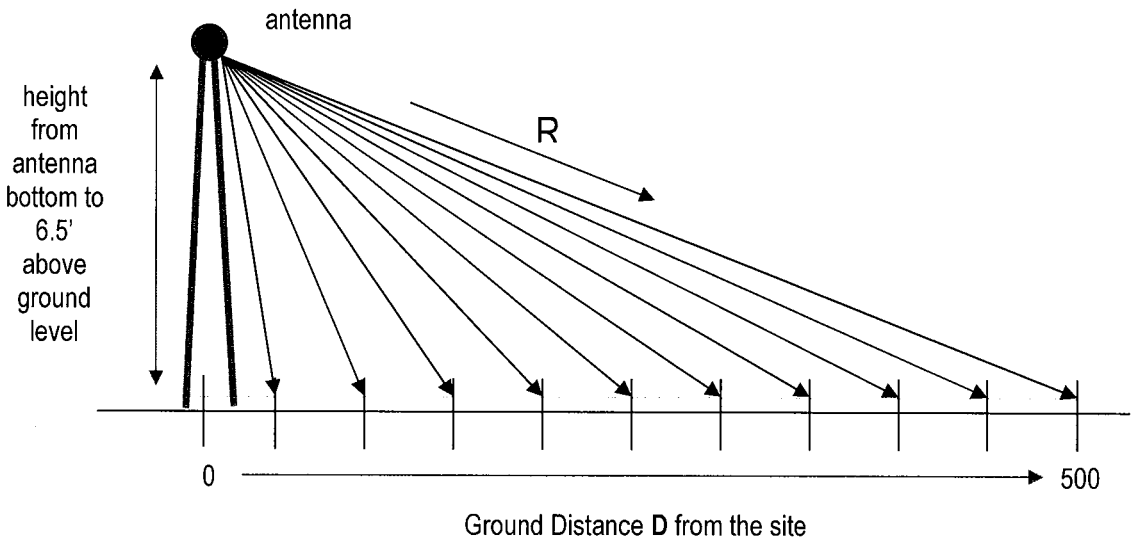
The FCC's formula for ground-level RF exposure calculations is as follows:

$$MPE\% = (100 * TxPower * 10^{(Gmax-Vdisc)/10} * 4) / (MPE * 4\pi * R^2)$$

where

MPE%	=	RF level, expressed as a percentage of the MPE limit applicable to continuous exposure of the general public
100	=	factor to convert the raw result to a percentage
TxPower	=	maximum net power into antenna sector, in milliwatts, a function of the number of channels per sector, the transmitter power per channel, and line loss
$10^{(Gmax-Vdisc)/10}$	=	numeric equivalent of the relative antenna gain in the downward direction of interest; pattern data is taken from the antenna manufacturer specifications
4	=	factor to account for a 100-percent-efficient energy reflection from the ground, and the squared relationship between RF field strength and power density ($2^2 = 4$)
MPE	=	FCC general population MPE limit
R	=	straight-line distance from the RF source to the point of interest, centimeters

The MPE% calculations are performed out to a distance of 500 feet from the facility to points 6.5 feet (approximately two meters, the FCC-recommended standing height) off the ground, as illustrated in the diagram below.



It is commonly understood that the farther away one is from an antenna, the lower the RF level – which is generally but not universally correct. The results of MPE% calculations fairly close to the site will reflect the variations in the vertical-plane antenna pattern as well as the variation in straight-line distance to the antennas. Therefore, RF levels may actually increase slightly with increasing distance within the range of zero to 500 feet from the site. As the distance approaches 500 feet and beyond, though, the antenna pattern factor becomes less significant, the RF levels become primarily distance-controlled, and as a result the RF levels generally decrease with increasing distance.

According to the FCC, when directional antennas are used, compliance assessments are based on the RF effect of a single antenna sector (or, in cases of non-identical parameters, the worst-case effect of any individual sector).

FCC compliance for a collocated antenna site is assessed in the following manner. At each distance point along the ground, an MPE% calculation is made

for each operation (i.e., each frequency band). The sum of the individual MPE% results at each distance point is then compared to 100 percent, which serves as the normalized reference for the FCC MPE limit.

We refer to the sum of the individual MPE% results as "total MPE%", and any calculated total MPE% result exceeding 100 percent is, by definition, higher than the FCC limit and represents non-compliance and a need to mitigate the RF levels. If, on the other hand, all results are below 100 percent, that indicates compliance with the federal regulations on controlling exposure.

Note that the following conservative methodology and assumptions are incorporated into the MPE% calculations:

1. The antennas are assumed to be operating continuously at maximum power.
2. The directional antennas are hypothetically assumed to be pointed directly overhead any and all points of interest at ground level, ignoring the effects of antenna discrimination in the horizontal plane.
3. The power-attenuation effects of any shadowing or visual obstruction to a line-of-sight path from the antennas to the points of interest at ground level are ignored.
4. The calculations intentionally minimize the distance factor (R) by assuming a 6'6" human and performing the calculations from the bottom (rather than the centerline) of the antenna.
5. The potential RF exposure at ground level is assumed to be 100-percent enhanced (increased) via a "perfect" field reflection from the ground itself.

The net result of these assumptions is to intentionally and significantly overstate the calculated RF exposure levels relative to the levels that will actually occur.

The table on the next page provides the results of the MPE% calculations at distance points out to 500 feet from the site, with the overall worst-case result highlighted in bold in the last column.

Ground Distance (ft)	Verizon 800 MHz MPE%	Verizon 1900 MHz MPE%	Verizon 5.7 GHz MPE%	Total Verizon MPE%
0	0.0145	0.0225	0.0014	0.0383
20	0.0561	0.0095	0.0014	0.0670
40	0.0463	0.0336	0.0013	0.0811
60	0.2159	0.0022	0.0012	0.2193
80	0.1135	0.1304	0.0010	0.2449
100	0.0435	0.0643	0.0009	0.1087
120	0.2281	0.0114	0.0008	0.2403
140	0.3856	0.0009	0.0007	0.3872
160	0.3328	0.0116	0.0006	0.3449
180	0.1682	0.0084	0.0005	0.1771
200	0.0611	0.0097	0.0004	0.0712
220	0.0296	0.0175	0.0007	0.0478
240	0.0430	0.0265	0.0006	0.0701
260	0.0793	0.0190	0.0006	0.0989
280	0.1409	0.0107	0.0005	0.1521
300	0.2151	0.0098	0.0004	0.2254
320	0.2881	0.0158	0.0004	0.3043
340	0.2566	0.0141	0.0007	0.2714
360	0.3324	0.0205	0.0006	0.3536
380	0.4041	0.0212	0.0006	0.4259
400	0.3659	0.0192	0.0005	0.3857
420	0.4388	0.0163	0.0005	0.4556
440	0.4009	0.0149	0.0004	0.4162
460	0.4628	0.0227	0.0010	**0.4865**
480	0.4259	0.0209	0.0010	0.4477
500	0.3932	0.0193	0.0009	0.4133

As indicated in bold in the last column, the worst-case overall result is only 0.4865 percent of the FCC limit. In other words, the maximum RF effect of the Verizon antenna operations is less than one-half of one percent of the FCC limit for safe continuous exposure of the general public.

This mathematical analysis serves to confirm the logic of the FCC's categorical exclusion principle – that there are some types of wireless antenna operations that have no significant effect in terms of potential RF exposure.

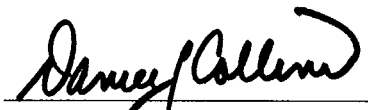
Compliance Conclusion

The analysis provided here demonstrates that the proposed Verizon Wireless antenna modifications satisfy the FCC requirements in terms of compliance with the MPE limit. The operations in each of the three frequency bands – 800 MHz, 1900 MHz, and 5.7 GHz – all qualify for the FCC's categorical exclusion, and thus are automatically deemed by the FCC to be in compliance. In addition, a mathematical analysis of the RF levels caused by the proposed antenna operations shows the worst-case contribution – even conservatively overstated – to be less than one-half of one percent of the FCC MPE limit.

Certification

It is the policy of Pinnacle Telecom Group that all FCC RF compliance assessments are reviewed, approved, and signed by the firm's Chief Technical Officer, who certifies as follows:

1. I have read and fully understand the FCC regulations concerning RF safety and the control of human exposure to RF fields (47 CFR 1.1301 *et seq*).
2. To the best of my knowledge, the statements and information disclosed in this report are true, complete and accurate.
3. The analysis of site RF compliance provided herein is consistent with the applicable FCC regulations, additional guidelines issued by the FCC, and industry practice.



Daniel J. Collins
Chief Technical Officer

7/11/06
Date

Appendix A: Background on the FCC MPE Limit

As directed by the Telecommunications Act of 1996, the FCC has established limits for maximum continuous human exposure to RF fields.

The FCC maximum permissible exposure (MPE) limits represent the consensus of federal agencies and independent experts responsible for RF safety matters. Those agencies include the National Council on Radiation Protection and Measurements (NCRP), the Occupational Safety and Health Administration (OSHA), the National Institute for Occupational Safety and Health (NIOSH), the American National Standards Institute (ANSI), the Environmental Protection Agency (EPA), and the Food and Drug Administration (FDA). In formulating its guidelines, the FCC also considered input from the public and technical community – notably the Institute of Electrical and Electronics Engineers (IEEE).

The FCC's RF exposure guidelines are incorporated in Section 1.301 *et seq* of its Rules and Regulations (47 CFR 1.1301-1.1310). Those guidelines specify MPE limits for both occupational and general population exposure.

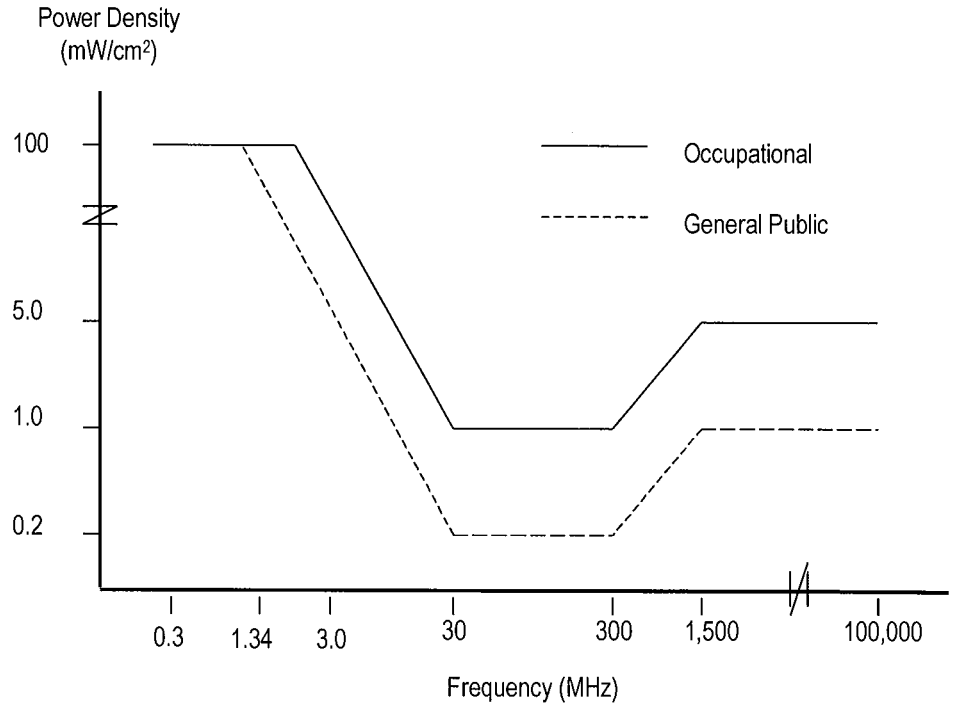
The specified continuous exposure MPE limits are based on known variation of human body susceptibility in different frequency ranges, and a Specific Absorption Rate (SAR) of 4 watts per kilogram, which is universally considered to accurately represent human capacity to dissipate incident RF energy (in the form of heat). The occupational MPE guidelines incorporate a safety factor of 10 or greater with respect to RF levels known to represent a health hazard, and an additional safety factor of five is applied to the MPE limits for general population exposure. Thus, the general population MPE limit has a built-in safety factor of more than 50. The limits were constructed to appropriately protect humans of both sexes and all ages and sizes and under all conditions – and continuous exposure at levels equal to or below the applicable MPE limits is considered to result in no adverse health effects or even health risk.

The reason for *two* tiers of MPE limits is based on an understanding and assumption that members of the general public are unlikely to have had appropriate RF safety training and may not be aware of the exposures they receive; occupational exposure in controlled environments, on the other hand, is assumed to involve individuals who have had such training, are aware of the exposures, and know how to maintain a safe personal work environment.

The FCC's RF exposure limits are expressed in two equivalent forms, using alternative units of field strength (expressed in volts per meter, or V/m), and power density (expressed in milliwatts per square centimeter, or mW/cm^2). The table on the next page lists the FCC limits for both occupational and general population exposures, using the mW/cm^2 reference, for the different radio frequency ranges.

Frequency Range (F) (MHz)	Occupational Exposure (mW/cm^2)	General Public Exposure (mW/cm^2)
0.3 - 1.34	100	100
1.34 - 3.0	100	$180 / F^2$
3.0 - 30	$900 / F^2$	$180 / F^2$
30 - 300	1.0	0.2
300 - 1,500	F / 300	F / 1500
1,500 - 100,000	5.0	1.0

The diagram below provides a graphical illustration of both the FCC's occupational and general population MPE limits.



Because the FCC's RF exposure limits are frequency-shaped, the exact MPE limits applicable to the instant situation depend on the frequency range used by the systems of interest.

The most appropriate method of determining RF compliance is to calculate the RF power density attributable to a particular system and compare that to the MPE limit applicable to the operating frequency in question. The result is usually expressed as a percentage of the MPE limit.

For potential exposure from multiple systems, the respective percentages of the MPE limits are added, and the total percentage compared to 100 (percent of the limit). If the result is less than 100, the total exposure is in compliance; if it is more than 100, exposure mitigation measures are necessary to achieve compliance.

FCC References:

47 CFR, FCC Rules and Regulations, Part 1 (Practice and Procedure), Section 1.1310 (Radiofrequency radiation exposure limits).

47 CFR, FCC Rules and Regulations, Part 22 (Public Mobile Services).

47 CFR, FCC Rules and Regulations, Part 24 (Personal Communications Services).

FCC Second Memorandum Opinion and Order and Notice of Proposed Rulemaking (FCC 97-303), *In the Matter of Procedures for Reviewing Requests for Relief From State and Local Regulations Pursuant to Section 332(c)(7)(B)(v) of the Communications Act of 1934 (WT Docket 97-192), Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation (ET Docket 93-62), and Petition for Rulemaking of the Cellular Telecommunications Industry Association Concerning Amendment of the Commission's Rules to Preempt State and Local Regulation of Commercial Mobile Radio Service Transmitting Facilities*, released August 25, 1997.

FCC First Memorandum Opinion and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released December 24, 1996.

FCC Report and Order, ET Docket 93-62, *In the Matter of Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*, released August 1, 1996.

FCC Office of Engineering and Technology (OET) Bulletin 65, "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields", Edition 97-01, August 1997.

FCC Office of Engineering and Technology (OET) Bulletin 56, "Questions and Answers About Biological Effects and Potential Hazards of RF Radiation", edition 4, August 1999.

Appendix B: The FCC Categorical Exclusion

According to Section 1.1306 of the FCC regulations, antenna facilities not covered by the table in Section 1.1307 (see below) "are deemed individually and cumulatively to have no significant effect on the quality of the human environment and are categorically excluded from environmental processing."

The table in Section 1.1307 of the FCC regulations is shown below, and provides the criteria for facilities requiring a "routine evaluation" of compliance. Facilities not included in the table are "categorically excluded" from the requirement for a routine evaluation.

Of particular interest here are the rows dealing with "Cellular Radiotelephone Service" and "Personal Communications Services" (specifically "Broadband PCS"), and the omission of any reference to the "Point-to-Point Microwave Radio Service".

SERVICE (TITLE 47 CFR RULE PART)	EVALUATION REQUIRED IF:
Experimental Radio Services (part 5)	power > 100 W ERP (164 W EIRP)
Multipoint Distribution Service (subpart K of part 21)	non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1640 W EIRP building-mounted antennas: power > 1640 W EIRP
Paging and Radiotelephone Service (subpart E of part 22)	non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1000 W ERP (1640 W EIRP) building-mounted antennas: power > 1000 W ERP (1640 W EIRP)
Cellular Radiotelephone Service (subpart H of part 22)	non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and total power of all channels > 1000 W ERP (1640 W EIRP) building-mounted antennas: total power of all channels > 1000 W ERP (1640 W EIRP)
Personal Communications Services (part 24)	(1) Narrowband PCS (subpart D): non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and total power of all channels > 1000 W ERP (1640 W EIRP) building-mounted antennas: total power of all channels > 1000 W ERP (1640 W EIRP)

	(2) Broadband PCS (subpart E): non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and total power of all channels > 2000 W ERP (3280 W EIRP) building-mounted antennas: total power of all channels > 2000 W ERP (3280 W EIRP)
Satellite Communications (part 25)	all included
General Wireless Communications Service (part 26)	total power of all channels > 1640 W EIRP
Wireless Communications Service (part 27)	total power of all channels > 1640 W EIRP
Radio Broadcast Services (part 73)	all included
Experimental, auxiliary, and special broadcast and other program distributional services (part 74)	subparts A, G, L: power > 100 W ERP subpart I: non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1640 W EIRP building-mounted antennas: power > 1640 W EIRP
Stations in the Maritime Services (part 80)	ship earth stations only
Private Land Mobile Radio Services Paging Operations (part 90)	non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1000 W ERP (1640 W EIRP) building-mounted antennas: power > 1000 W ERP (1640 W EIRP)
Private Land Mobile Radio Services Specialized Mobile Radio (part 90)	non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and total power of all channels > 1000 W ERP (1640 W EIRP) building-mounted antennas: total power of all channels > 1000 W ERP (1640 W EIRP)

Amateur Radio Service (part 97)	transmitter output power > levels specified in § 97.13(c)(1) of this chapter
Local Multipoint Distribution Service (subpart L of part 101)	non-building-mounted antennas: height above ground level to lowest point of antenna < 10 m and power > 1640 W EIRP building-mounted antennas: power > 1640 W EIRP LMDS licensees are required to attach a label to subscriber transceiver antennas that: (1) provides adequate notice regarding potential radiofrequency safety hazards, *e.g.,* information regarding the safe minimum separation distance required between users and transceiver antennas; and (2) references the applicable FCC-adopted limits for radiofrequency exposure specified in § 1.1310 of this chapter.

Appendix C: FCC Position on Cellular and PCS Transmitters

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF ENGINEERING & TECHNOLOGY
WASHINGTON, D.C. 20554

January 1998

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INFORMATION ON HUMAN EXPOSURE TO RADIOFREQUENCY FIELDS FROM CELLULAR AND PCS RADIO TRANSMITTERS

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(1) Cellular and PCS base stations

Radio frequencies constitute part of the overall electromagnetic spectrum. Cellular communications systems use frequencies in the 800-900 megahertz (MHz) portion of the radiofrequency (RF) spectrum (frequencies formerly used for UHF-TV broadcasting), and transmitters in the Personal Communications Service (PCS) use frequencies in the range of 1850-1990 MHz. Primary antennas for cellular and PCS transmissions are usually located on towers, water tanks and other elevated structures including rooftops and the sides of buildings. The combination of antennas and associated electronic equipment is referred to as a cellular or PCS base station" or "cell site." Typical heights for base station towers or structures are 50-200 feet. A typical cellular base station may utilize several "omni-directional" antennas that look like poles or whips, 10 to 15 feet in length. PCS (and also many cellular) base stations use a number of "sector" antennas that look like rectangular panels. The dimensions of a sector antenna are typically 1 foot by 4 feet. Antennas are usually arranged in three groups of three with one antenna in each group used to transmit signals to mobile units (car phones or hand-held phones). The other two antennas in each group are used to receive signals from mobile units.

The Federal Communications Commission (FCC) authorizes cellular and PCS carriers in various service areas around the country. At a cell site, the total RF power that could be transmitted from each transmitting antenna at a cell site depends on the number of radio channels (transmitters) that have been authorized and the power of each transmitter. Typically, for a cellular base station, a maximum of 21 channels per sector (depending on the system) could be used. Thus, for a typical cell site utilizing sector antennas, each of the three transmitting antennas could be connected to up to 21 transmitters for a total of 63 transmitters per site. When omni-directional antennas are used, up to 96 transmitters could be implemented at a cell site, but this would be very unusual. While a typical base station could have as many as 63 transmitters, not all of the transmitters would be expected to operate simultaneously thus reducing overall emission levels. For the case of PCS base stations, fewer transmitters are normally required due to the relatively greater number of base stations.

Although the FCC permits an **effective radiated power** (ERP) of up to 500 watts per channel (depending on the tower height), the majority of cellular base stations in urban and suburban areas operate at an ERP of 100 watts per channel or less. An ERP of 100 watts corresponds to an **actual** radiated power of 5-10 watts, depending on the type of antenna used (ERP is not equivalent to the power that is radiated but is a measure of the directional

characteristics of the antenna). As the capacity of a system is expanded by dividing cells, i.e., adding additional base stations, lower ERPs are normally used. In urban areas, an ERP of 10 watts per channel (corresponding to a radiated power of 0.5 - 1 watt) or less is commonly used. For PCS base stations, even lower radiated power levels are normally used. The signal from a cellular or PCS base station antenna is essentially directed toward the horizon in a relatively narrow beam in the vertical plane. For example, the radiation pattern for an omni-directional antenna might be compared to a thin doughnut or pancake centered around the antenna while the pattern for a sector antenna is fan-shaped, like a wedge cut from a pie. As with all forms of electromagnetic energy, the power density from a cellular or PCS transmitter decreases rapidly (according to an inverse square law) as one moves away from the antenna. Consequently, normal ground-level exposure is much less than exposures that might be encountered if one were very close to the antenna and in its main transmitted beam. Measurements made near typical cellular and PCS installations have shown that ground-level power densities are well below limits recommended by RF/microwave safety standards.

In 1996, the FCC adopted updated guidelines for evaluating human exposure to radiofrequency (RF) fields from fixed transmitting antennas such as those used for cellular radio and PCS base stations.1 The new guidelines for cellular and PCS base stations are identical to those recommended by the National Council on Radiation Protection and Measurements (NCRP).2 These guidelines are also similar to the 1992 guidelines recommended by the American National Standards Institute and the Institute of Electrical and Electronics Engineers (ANSI/IEEE C95.1-1992).3 The FCC adopted guidelines for hand-held RF devices, such as cellular and PCS phones, that are the same as those recommended by the ANSI/IEEE and NCRP guidelines (see later discussion).

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1 FCC *Report and Order* in ET Docket 93-62, 61 Federal Register 41006 (August 7, 1996); 11 FCC Record 15123 (1997). See also, FCC *Second Memorandum Opinion and Order*, ET Docket 93-62, 62 Federal Register 47960 (September 12, 1997), 12 FCC Record 13494 (1997). For more information on these documents contact the FCC's toll-free number: 1-888-CALL FCC (1-888-225-5322). They may also be viewed and downloaded at the FCC's Office of Engineering and Technology World Wide Web Site under the "RF Safety" heading at the following address: www.fcc.gov/oet/rfsafety. The FCC's RF exposure guidelines are based on recommendations made to the FCC by U.S. federal safety and health agencies such as the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), the National Institute for Occupational Safety and Health (NIOSH) and the Occupational Safety and Health Administration (OSHA).

2 The NCRP is a non-profit corporation chartered by congress to develop information and recommendations concerning radiation protection.

3 The American National Standards Institute is a non-profit, privately-funded, membership organization that coordinates development of voluntary national standards in the United States. The IEEE is a non-profit technical and professional engineering society.

In the case of cellular base station transmitters, at a frequency of 869 MHz (the lowest frequency used), the FCC's RF exposure guidelines recommend a maximum permissible exposure level of the general public (or exposure in "uncontrolled" environments) of about 580 microwatts per square centimeter (μW/cm 2), as averaged over any thirty-minute period. This limit is many times greater than RF levels typical found near the base of typical cellular towers or in the vicinity of other, lower-powered cellular base station transmitters. For example, measurement data obtained from various sources have consistently indicated that "worst-case" ground-level power densities near typical cellular towers are on the order of 1 μW/cm 2 or less (usually significantly less). Calculations corresponding to a "worst-case" situation (all transmitters operating simultaneously and continuously at the maximum licensed power) show that in order to be exposed to levels near the FCC's limits for cellular frequencies, an individual would essentially have to remain in the main transmitting beam (at the height of the antenna) and within a few feet from the antenna. This makes it extremely unlikely that a member of the general public could be exposed to RF levels in excess of these guidelines from cellular base station transmitters.

For PCS base station transmitters, the same type of analysis holds, except that at the PCS transmitting frequencies (1850-1990 MHz) the FCC's exposure limits for the public are 1000 μW/cm 2 . Therefore, there would typically be an even greater margin of safety between actual public exposure levels and the recognized safety limit.

When cellular and PCS antennas are mounted at rooftop locations it is possible that RF levels greater than 1 μW/cm 2 could be present on the rooftop itself. This might become an issue if the rooftop were accessible to maintenance personnel or others. However, exposures approaching or exceeding the safety guidelines are only likely to be encountered very close to and directly in front of the antennas. Even if RF levels were to be higher than desirable on a rooftop, appropriate restrictions could be placed on access. Factoring in the time-averaging aspects of safety standards could also be used to reduce potential exposure. The fact that rooftop cellular and PCS antennas usually operate at lower power levels than antennas on freestanding towers makes excessive exposure conditions on rooftops even less likely. This reason and the significant signal attenuation of a building's roof also minimizes any chance for harmful exposure of persons living or working within the building itself.

(2) <u>Mobile (vehicle-mounted) antennas</u>

Vehicle-mounted antennas used for cellular communications normally operate at a power level of 3 watts or less. These cellular antennas are typically mounted on the roof, on the trunk, or on the rear window of a car or truck. Studies have shown that in order to be exposed to RF levels that approach the safety guidelines it would be necessary to remain very close to a vehicle-mounted cellular antenna. For example, a study done for AT&T Bell Laboratories by the University of Washington documented typical and "worst-case" exposure levels and specific absorption rates (SAR) for vehicle occupants and persons standing close to vehicle-mounted cellular antennas. Worst-case exposure conditions were considered when an individual was at the closest possible distance from the antenna. Several configurations were tested using adult and child "phantom" models.

The results of this study showed that the highest exposure (1900 μW/cm 2) occurred with a female model at a distance of 9.7 cm (3.8 inches) from one of the antennas operating at a power level of 3 watts. Although this level is nominally in excess of the FCC's exposure limits for power density at this frequency, analysis of the data indicated that the antenna

would have to be driven to 7 W of power before the limit for *specific absorption rate* (SAR) allowed by the FCC guidelines would be exceeded. The intermittent nature of transmission and the improbability that a person would remain so close to the antenna for any length of time further reduces the potential for excessive exposure.

The University of Washington study also indicated that vehicle occupants are effectively shielded by the metal body. Motorola, Inc., in comments filed with the FCC, has expressed the opinion that proper installation of a vehicle-mounted antenna to maximize the shielding effect is an effective way of limiting exposure. Motorola and other companies have recommended antenna installation either in the center of the roof or the center of the trunk. In response to concerns expressed over the commonly-used rear-window mounted cellular antennas, Motorola has recommended a minimum separation distance of 30-60 cm (1 -2 feet) to minimize exposure to vehicle occupants resulting from antenna mismatch for this type of antenna installation.

In summary, from data gathered to date, it appears that properly installed, vehicle-mounted, personal wireless transceivers using up to 3 watts of power would result in maximum exposure levels in or near the vehicle that are well below the FCC's safety limits. This assumes that the transmitting antenna is at least 15 cm (about 6 inches) or more from vehicle occupants. Time-averaging of exposure (either a 6 or 30minute period is specified) will usually result in still lower values when compared with safety guidelines.

(3) <u>Hand-held cellular telephones and PCS devices</u>

A question that often arises is whether there may be potential health risks due to the RF emissions from hand-held cellular telephones and PCS devices. The FCC's exposure guidelines, and the ANSI/IEEE and NCRP guidelines upon which they are based, specify limits for human exposure to RF emissions from hand-held RF devices in terms of *specific absorption rate (SAR).* For exposure of the general public, e.g., exposure of the user of a cellular or PCS phone, the SAR limit is an absorption threshold of 1.6 watts/kg (W/kg), as measured over any one gram of tissue.

Measurements and computational analysis of SAR in models of the human head and other studies of SAR distribution using hand-held cellular and PCS phones have shown that, in general, the 1.6 W/kg limit is unlikely to be exceeded under normal conditions of use. Before FCC approval can be granted for marketing of a cellular or PCS phone, compliance 4.with the 1.6 W/kg limit must be demonstrated. Also, testing of hand-held phones is normally done under conditions of maximum power usage. In reality, normal power usage is less and is dependent on distance of the user from the base station transmitter.

In recent years publicity, speculation and concern over claims of possible health effects due to RF fields from hand-held wireless telephones prompted industry-sponsored groups, such as Wireless Technology Research, L.L.C. (WTR) and Motorola, Inc., to initiate research programs aimed at investigating whether there is any risk to users of these devices. Past studies carried out at frequencies both higher and lower than those used for cellular and PCS phones have led expert organizations to conclude that typical RF exposures from these devices are safe. However, the Federal Government is monitoring the results of the ongoing industry-sponsored research through an inter-agency working group led by the EPA and the FDA's Center for Devices and Radiological Health.

In a 1993 "Talk Paper," the FDA stated that it did not have enough information at that time to rule out the possibility of risk, but if such a risk exists "it is probably small." The FDA concluded that there is no proof that cellular telephones can be harmful, but if individuals remain concerned several precautionary actions could be taken. These included limiting conversations on hand-held cellular telephones to those that are essential and making greater use of telephones with vehicle-mounted antennas where there is a greater separation distance between the user and the radiating structure.

***NOTE*:** For more information on these and other RF-related topics, you may call the FCC's toll-free number: 1-888-CALL FCC (1-888-225-5322) or contact the FCC's RF Safety Program, in the Office of Engineering and Technology, at (202) 418-2464. Information is also available at the FCC's Office of Engineering and Technology World Wide Web Site under the "RF Safety" heading at the following address: www.fcc.gov/oet/rfsafety.

Appendix D: Expert Qualifications

Daniel J. Collins, Chief Technical Officer, Pinnacle Telecom Group, LLC

Synopsis:	• 34 years of experience in all aspects of wireless system engineering, related regulation, and RF exposure • Has performed or led RF exposure compliance assessments on more than 10,000 antenna sites since the new FCC regulations went into effect in 1997 • Has provided testimony as an RF compliance expert more than 1,000 times since 1997 • Accepted as an expert in New Jersey, New York, Connecticut, Pennsylvania and more than 40 other states, as well as by the FCC
Education:	• B.E.E., City College of New York (Sch. Of Eng.), 1971 • M.B.A., 1982, Fairleigh Dickinson University, 1982 • Bronx High School of Science, 1966
Current Responsibilities:	• lead all PTG staff work involving RF safety and FCC compliance, microwave and satellite system engineering, and consulting on wireless technology and regulation
Prior Experience:	• Edwards & Kelcey, VP – RF Engineering and Chief Information Technology Officer, 1996-99 • Bellcore, Executive Director – Regulation and Public Policy, 1983-96 • AT&T (Corp. HQ), Director – Spectrum Management Policy and Practice, 1977-83 • AT&T Long Lines, Group Supervisor – Microwave Radio System Design, 1972-77
Specific RF Safety / Compliance Experience:	• Involved in RF exposure matters since 1972 • Have had lead corporate responsibility for RF safety and compliance at AT&T, Bellcore, Edwards & Kelcey, and PTG • While at AT&T, helped develop the mathematical models later adopted by the FCC for predicting RF exposure • Have been relied on for compliance by all major wireless carriers, the federal government, several state and local governments, equipment manufacturers, system integrators, and other consulting and engineering firms
Other Background:	• Author, *Microwave System Engineering* (AT&T, 1974) • Co-author and executive editor, *A Guide to New Technologies and Services* (Bellcore, 1993) • National Spectrum Managers Association (NSMA) – former three-term elected President and Chairman of the Board of Directors; was founding member, twice-elected Vice President, a long-time member of the Board, and was named an NSMA Fellow (one of 12 in all) in 1991 • Listed in *Who's Who in the Media and Communication* and *International Who's Who in Information Technology* • Published more than 35 articles in industry magazines

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF EXISTING 327' GUYED LATTICE TOWER FOR NEW ANTENNA ARRANGEMENT

WHUS Tower
North Eagleville Road
Storrs, Connecticut

prepared for

Verizon Wireless
99 East River Drive
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prepared by

URS CORPORATION
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36921548.00000
VZ1-064

June 30, 2006

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 327' guyed lattice tower located on North Eagleville Road in Storrs, Connecticut. The analysis was conducted in accordance with the 2005 Connecticut State Building Code, the TIA/EIA-222-F standard, and the University of Connecticut (UCONN) requirements for a wind velocity of 90 mph (fastest mile) and 90 mph (fastest mile) concurrent with ½" ice. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction Section of this report. The proposed Verizon Wireless modification is as follows:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
Install: **(1) Andrew P4F-57W Dish on (1) new Dish Mount with (1) EW63 coax cable.**	**Verizon Wireless (Proposed)**	**@ 138'**
Remove: **(3) existing Metawave panel antennas and (3) existing DB932DG90T2E-M antennas and (6) existing 1 1/4" coax cables.** **Install:** **(6) RFS APL196516-42T2 antennas and (6) RFS APL866513-42T0 antennas on the existing platform with (12) existing 1 5/8" coax cables.**	**Verizon Wireless (Proposed)**	**@ 84'**

The results of the analysis indicate that the tower structure is in compliance with the proposed loading conditions. **The tower and its foundation are considered structurally adequate with the wind load classification specified above and all the existing and proposed antenna loading.**

This analysis is based on:

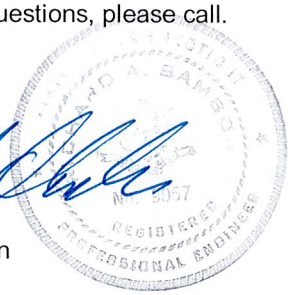
1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Tower geometry and structural member sizes taken from original construction drawings (Sabre Job #: 98-0659) prepared by Sabre Communications Corporation, signed and sealed November 6, 1998.
3) Existing antennas, transmission lines, and ancillary item details taken from an inventory approved by the tower owner.
4) Antenna and mount configuration as specified on the following page of this report.

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the assumption of the antenna and mount configuration as well as the physical condition of the tower and connections. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please call.

Sincerely,

URS Corporation



Richard A. Sambor, P.E.
Manager Facilities Design

RAS/jek

cc: AA, DR, IA, CF/Book – URS

2. INTRODUCTION

The subject tower is located on North Eagleville Road in Storrs, Connecticut. The structure is a 327' guyed lattice tower designed and manufactured by Sabre Communications Corporation.

The tower geometry and structural member sizes taken from original construction drawings (Sabre Job #: 98-0659) prepared by Sabre Communications Corporation, signed and sealed November 6, 1998.

The inventory is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
Lightning Rod	(existing)	Direct Mount	325'	---
Flash Beacon	(existing)	Direct Mount	323'	Rigid Conduit
(1) 2-Bay 6813 w/Radome	(existing)	Flush Mount	305'	(1) 7/8" coax cable
(1) PD1150 and (1) DB809M-XC	(existing)	(1) Sidearm	280'	(2) 1 5/8" coax cables
(2) OGC9-825, (1) AP-16-850/065, (2) DB810K, and (2) TMA's	(existing)	(3) Sidearms	260'	(4) 1 5/8" coax cables and (1) 7/8" coax cable
(12) DB844H90 antennas	Nextel (existing)	(3) T-Frames	240'	(12) 1 5/8" coax cables
(1) 1-Bay 6813 w/o Radome or equal	(existing)	(1) Sidearm	209'	(1) 7/8" coax cable
(1) 1-Bay 6813 w/Radome	(existing)	(1) Sidearm	198'	(1) 7/8" coax cable
(1) MB100RR650200DPAL (9) CSS DUO1417-8670 and (9) TMA's	Cingular (existing)	(3) T-Frames	186'	(12) 1 5/8" coax cables
(1) DB872	(existing)	Direct Mount	172'	(1) 7/8" coax cable
(1) DB806	(existing)	(1) Sidearm	170'	(1) 1 1/4" coax cable
(1) TMA	(existing)	Direct Mount	166'	---
(1) DB872	(existing)	Direct Mount	158'	(1) 7/8" coax cable
(1) DB589	(existing)	(1) Sidearm	154'	(1) 7/8" coax cable
(1) 7' Omni	(existing)	Direct Mount	142'	(1) 1/2" coax cable
(1) Andrew P4F-57W Dish	**Verizon (proposed)**	**(1) Dish Mount**	**138'**	**(1) EW63 coax cable**
(1) PD1108	(existing)	(1) Sidearm	124'	(1) 1/2" coax cable
(1) 6FT Dish	(existing)	(1) Dish Mount	115'	(1) EW63 coax cable
(1) 6FT Dish	(existing)	(1) Dish Mount	112'	(1) EW63 coax cable
(1) PD1108	(existing)	(1) Sidearm	110'	(1) 1/2" coax cable
(1) 8FT Dish	(existing)	(1) Dish Mount	104'	(1) EW63 coax cable
(1) ASP-962 and (1) PR-850	(existing)	Direct Mount	94'	(2) 1/2" coax cables
(6) RFS APL196516-42T2 and (6) RFS APL866513-42T0	**Verizon (proposed)**	(1) Platform	**84'**	(12) 1 5/8" coax cables

Antenna Type	Carrier	Mount	Antenna Centerline Elevation	Cable
(1) DB212-C	(existing)	Direct Mount	74'	(1) 1/2" coax cable
(1) CL-24	(existing)	(1) Sidearm	18'	(1) 1/4" coax cable
(1) 1.2M Dish	(existing)	(1) Sidearm	13'	(1) 1/4" coax cable

This structural analysis of the communications tower was performed by URS Corporation (URS) for Verizon Wireless. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing and proposed antenna loads. This analysis was conducted to evaluate stress on the tower and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with the 2005 Connecticut State Building Code, TIA/EIA-222-F—Structural Standard for Steel Antenna Towers and Antenna Supporting Structures, University of Connecticut (UCONN) requirements, and the American Institute of Steel Construction (AISC) Manual of Steel Construction—Allowable Stress Design (ASD).

The analysis was conducted using RISA Tower 4.5. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 90 mph (fastest mile) Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 90 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

The TIA/EIA standard permits a one-third increase in allowable stresses for towers and monopoles less than 700 feet tall. For the purposes of this analysis, in computing the load capacity the allowable stresses of the tower members were increased by one-third.

4. FINDINGS AND EVALUATION

Stresses on the tower structure were evaluated to compare with allowable stresses in accordance with AISC. The calculated stresses under the proposed loading were below the allowable stresses. Detailed analysis and calculations for the proposed load condition are provided in section 6 of this report. Additionally, the foundation and guy anchors were found to be structurally adequate. At the microwave dish levels, the maximum twist is less than 0.5 degrees and the maximum sway is less than 0.3 degrees.

5. CONCLUSIONS

The results of the analysis indicate that the tower structure is in compliance with the proposed loading conditions. **The tower and its foundation are structurally adequate under the wind load classification specified above and the proposed antenna loadings.**

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations were properly constructed to support original design loads as specified in the original design documents.
10. All coaxial cable is installed as specified in Section 6 of this report.

URS is not responsible for any modifications completed prior to or hereafter in which URS is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

URS hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact URS. URS disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

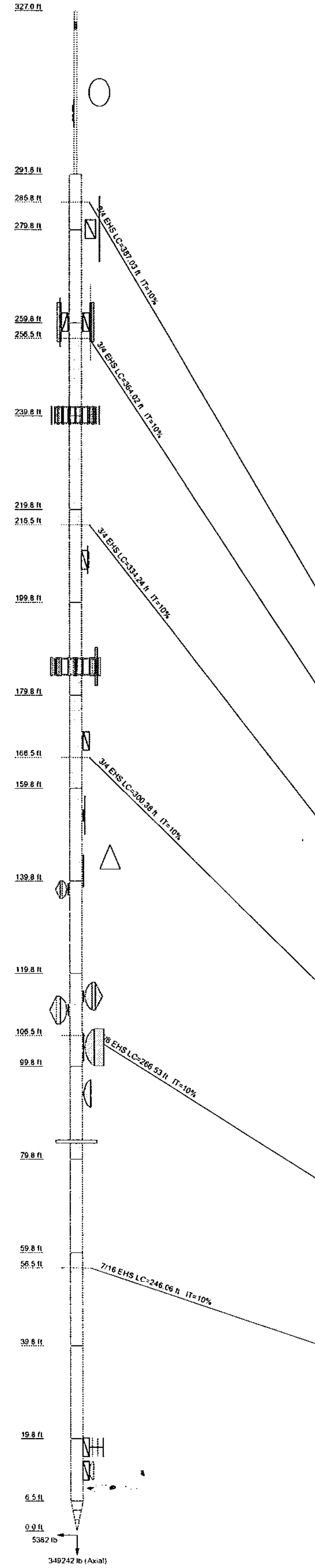
After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

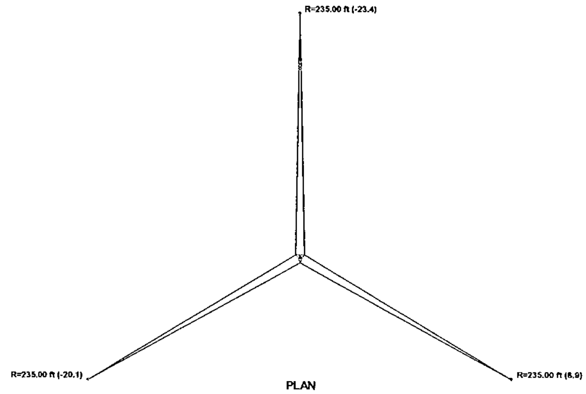
The owner shall refer to TIA/EIA-222-F for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. According to TIA/EIA-222-F section 14.1, Note 1: It is recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

6. DRAWINGS AND DATA

RISA TOWER INPUT/OUTPUT SUMMARY

Section	T16	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1	L1
Legs	SR 3						SR 2 3/4		SR 2 1/2	SR 2 3/4	SR 2 1/2		SR 2 1/4		SR 2		P10.75x0.843
Leg Grade	A572-50																
Diagonals	N.A.	SR 1 1/4				SR 1 3/8	SR 1 1/2	SR 1 1/4	SR 1 3/8	SR 1 1/2	SR 1 1/4	SR 1 1/2	SR 1 3/8				N.A.
Diagonal Grade	N.A.	A36															N.A.
Top Girts	12x3/8	SR 1															N.A.
Mid Girts	9x3/8	N.A.															
Bottom Girts	12x3/8	N.A.															
Horizontals	N.A.	SR 1															N.A.
Sec. Horizontals	N.A.	SR 1															N.A.
Top Guy Pull-Offs	N.A.			MC12x35	N.A.		MC12x35	N.A.		MC12x35	N.A.	MC12x35	N.A.	MC12x35	N.A.	MC12x35	N.A.
Face Width (ft)	3.667																0.895833
# Panels @ (ft)	7 @ 1	4 @ 3.335	78 @ 3.33333													4 @ 3	N.A.
Weight (lb) 36380.0	810.8	1348.2	2021.5	3218.8	2021.5	2066.7	3153.2	1791.0	1658.7	3153.2	1580.5	2942.7	1468.3	2606.6	1287.8	2007.6	3139.1





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Lightning Rod 5/8x4'	325	DB806	170
Flash Beacon Lighting	323	Generic TMA	166
6813 w/Radome	305	DB872	158
PD1150	280	DB589	154
6' Side-Arm	280	2'6"x4" Pipe Mount	154
DB809M-XC	280	7' Whip	142
(2) OGC9-825	260	2'6"x4" Pipe Mount	138
AP16-850/065	260	P4F-57W (Verizon)	138
(2) DB810K	260	2' Sidearm	124
AP16-850/065	260	PD1108	124
3' Sidearm	260	2'6"x4" Pipe Mount	115
3' Sidearm	260	6 FT DISH	115
3' Sidearm	260	2'6"x4" Pipe Mount	112
(2) AP16-850/065	260	6 FT DISH	112
Generic TMA	259	2' Sidearm	110
Generic TMA	259	PD1110	110
12' T-Frame (Nextel)	240	6'x4" Pipe Mount	104
12' T-Frame (Nextel)	240	8 FT DISH	104
12' T-Frame (Nextel)	240	ASP-962	94
(4) DB844H90 (Nextel)	240	PR-850	94
(4) DB844H90 (Nextel)	240	APL196516-42T2 (Verizon)	84
(4) DB844H90 (Nextel)	240	APL866513-42T0 (Verizon)	84
6813 1-Bay w/radome	209	APL866513-42T0 (Verizon)	84
2' Sidearm	209	APL196516-42T2 (Verizon)	84
6813 1-Bay w/radome	198	APL196516-42T2 (Verizon)	84
3' Sidearm	198	APL866513-42T0 (Verizon)	84
(3) DUO1417-8670 (Cingular)	186	APL866513-42T0 (Verizon)	84
(3) DUO1417-8670 (Cingular)	186	APL196516-42T2 (Verizon)	84
PiROD 12' Lightweight T-Frame (Cingular)	186	APL196516-42T2 (Verizon)	84
PiROD 12' Lightweight T-Frame (Cingular)	186	12' Platform (Verizon)	84
PiROD 12' Lightweight T-Frame (Cingular)	186	APL866513-42T0 (Verizon)	84
(3) Generic TMA (Cingular)	186	APL196516-42T2 (Verizon)	84
(3) Generic TMA (Cingular)	186	APL866513-42T0 (Verizon)	84
(3) Generic TMA (Cingular)	186	DB212-2-C	74
MB100RR650200DPAL	186	CL-24/HRM	18
(3) DUO1417-8670 (Cingular)	186	2' Sidearm	18
DB872	172	2' Sidearm	13
3' Sidearm	170	1.2M	13

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

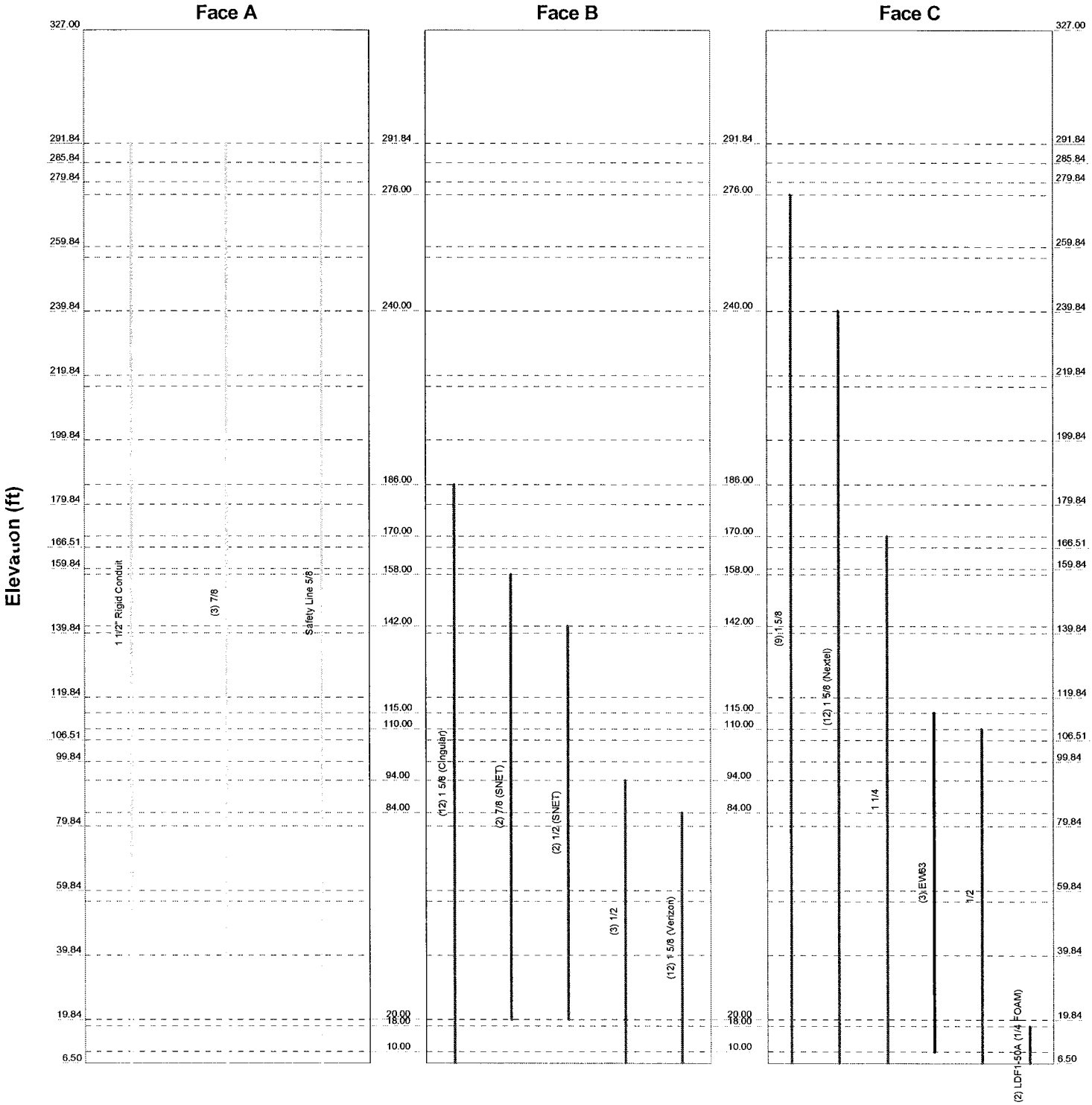
1. Tower designed for a 90 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 90 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 90 mph wind.
4. Weld together tower sections have flange connections.
5. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
6. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
7. Welds are fabricated with ER-70S-6 electrodes.
8. TOWER RATING: 97.8%

URS Corporation	Job: ***327' Guyed Lattice Tower***	
500 Enterprise Drive, Suite 3B	Project: ***North Eagleville Road Storrs, CT***	
Rocky Hill, CT 06067	Client: Verizon Wireless	Drawn by: Staff; App'd:
Phone: (860) 529-8882	Code: TIA/EIA-222-F	Date: 06/30/06; Scale: NTS
FAX: (860) 529-3991	Path: P:\Structural\5.28.2006\ERI\Files\327 Guyed Tower.eri	Dwg No: E-1

RISA TOWER FEEDLINE DISTRIBUTION

Feedline Distribution Chart
6'6" - 327'

Round Flat App In Face App Out Face Truss Leg



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500 Enterprise Drive, Suite 3B
Rocky Hill, CT 06067
Phone: (860) 529-8882
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Job: *327' Guyed Lattice Tower*			
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Code: TIA/EIA-222-F	Date: 06/30/06	Scale: NTS	
Path: P:\Structural 6.28.2006\ERIFiles\327' Guyed Tower.er		Dwg No. E-7	

RISA TOWER DETAILED OUTPUT

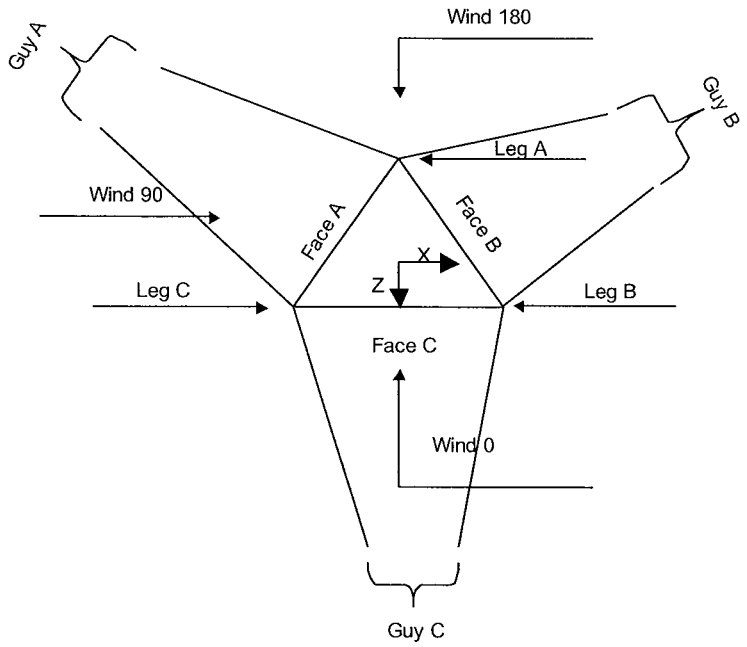
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 327.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 3.67 ft at the top and tapered at the base.
An index plate is provided at the 3x guyed -tower connection.
There is a pole section.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Basic wind speed of 90 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 90 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 90 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
Pressures are calculated at each section.
Stress ratio used in pole design is 1.0664.
Safety factor used in guy design is 2.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Treat Feedline Bundles As Cylinder
Consider Moments - Horizontals	Assume Legs Pinned	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Diagonals	√ Assume Rigid Index Plate	√ Calculate Redundant Bracing Forces
Use Moment Magnification	√ Use Clear Spans For Wind Area	Ignore Redundant Members in FEA
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	SR Leg Bolts Resist Compression
√ Use Code Safety Factors - Guys	√ Retension Guys To Initial Tension	All Leg Panels Have Same Allowable
Escalate Ice	Bypass Mast Stability Checks	Offset Girt At Foundation
Always Use Max Kz	√ Use Azimuth Dish Coefficients	√ Consider Feedline Torque
Use Special Wind Profile	√ Project Wind Area of Appurt.	Include Angle Block Shear Check
√ Include Bolts In Member Capacity	√ Autocalc Torque Arm Areas	Poles
√ Leg Bolts Are At Top Of Section	√ SR Members Have Cut Ends	Include Shear-Torsion Interaction
Secondary Horizontal Braces Leg	√ Sort Capacity Reports By Component	Always Use Sub-Critical Flow
Use Diamond Inner Bracing (4 Sided)	Triangulate Diamond Inner Bracing	Use Top Mounted Sockets
Add IBC .6D+W Combination		



Face Guyed

Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	327.00-291.84	35.16	P10.75x0.843	A572-50 (50 ksi)	

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 327.00-291.84				1	1	1		

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	291.84-279.84			3.67	1	12.00
T2	279.84-259.84			3.67	1	20.00
T3	259.84-239.84			3.67	1	20.00
T4	239.84-219.84			3.67	1	20.00
T5	219.84-199.84			3.67	1	20.00
T6	199.84-179.84			3.67	1	20.00
T7	179.84-159.84			3.67	1	20.00
T8	159.84-139.84			3.67	1	20.00
T9	139.84-119.84			3.67	1	20.00
T10	119.84-99.84			3.67	1	20.00
T11	99.84-79.84			3.67	1	20.00
T12	79.84-59.84			3.67	1	20.00
T13	59.84-39.84			3.67	1	20.00
T14	39.84-19.84			3.67	1	20.00
T15	19.84-6.50			3.67	1	13.34
T16	6.50-0.00			3.67	1	6.50

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	291.84-279.84	3.00	K Brace Left	No	Yes+Steps	0.0000	0.0000
T2	279.84-259.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T3	259.84-239.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T4	239.84-219.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T5	219.84-199.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T6	199.84-179.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T7	179.84-159.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T8	159.84-139.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T9	139.84-119.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T10	119.84-99.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T11	99.84-79.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T12	79.84-59.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T13	59.84-39.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T14	39.84-19.84	3.33	K Brace Left	No	Yes+Steps	0.0000	0.0000
T15	19.84-6.50	3.34	K Brace Left	No	Yes+Steps	0.0000	0.0000
T16	6.50-0.00	1.00	K Brace Left	No	Yes	0.0000	6.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 291.84-279.84	Solid Round	2	A572-50 (50 ksi)	Solid Round	1 3/8	A36 (36 ksi)
T2 279.84-259.84	Solid Round	2	A572-50 (50 ksi)	Solid Round	1 3/8	A36 (36 ksi)

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T3 259.84-239.84	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1 3/8	A36 (36 ksi)
T4 239.84-219.84	Solid Round	2 1/4	A572-50 (50 ksi)	Solid Round	1 3/8	A36 (36 ksi)
T5 219.84-199.84	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	1 1/2	A36 (36 ksi)
T6 199.84-179.84	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T7 179.84-159.84	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	1 1/2	A36 (36 ksi)
T8 159.84-139.84	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	1 3/8	A36 (36 ksi)
T9 139.84-119.84	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T10 119.84-99.84	Solid Round	2 3/4	A572-50 (50 ksi)	Solid Round	1 1/2	A36 (36 ksi)
T11 99.84-79.84	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 3/8	A36 (36 ksi)
T12 79.84-59.84	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T13 59.84-39.84	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T14 39.84-19.84	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T15 19.84-6.50	Solid Round	3	A572-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T16 6.50-0.00	Solid Round	3	A572-50 (50 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 291.84-279.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T2 279.84-259.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T3 259.84-239.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T4 239.84-219.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T5 219.84-199.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T6 199.84-179.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T7 179.84-159.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T8 159.84-139.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T9 139.84-119.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T10 119.84-99.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T11 99.84-79.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T12 79.84-59.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T13 59.84-39.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T14 39.84-19.84	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T15 19.84-6.50	Solid Round	1	A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T16 6.50-0.00	Flat Bar	12x3/8	A36 (36 ksi)	Flat Bar	12x3/8	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 291.84-279.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T2 279.84-259.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T3 259.84-239.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T4 239.84-219.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T5 219.84-199.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T6 199.84-179.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T7 179.84-159.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T8 159.84-139.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T9 139.84-119.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T10 119.84-99.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T11 99.84-79.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T12 79.84-59.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T13 59.84-39.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T14 39.84-19.84	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T15 19.84-6.50	None	Flat Bar		A36 (36 ksi)	Solid Round	1	A36 (36 ksi)
T16 6.50-0.00	2	Flat Bar	9x3/8	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 291.84-279.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T2 279.84-259.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T3 259.84-239.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T4 239.84-219.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T5 219.84-199.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T6 199.84-179.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T7 179.84-159.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T8 159.84-139.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T9 139.84-119.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T10 119.84-99.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T11 99.84-79.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T12 79.84-59.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T13 59.84-39.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T14 39.84-19.84	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T15 19.84-6.50	Solid Round	1	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T1 291.84-279.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T2 279.84-259.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 259.84-239.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 239.84-219.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 219.84-199.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 199.84-179.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 179.84-159.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 159.84-139.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 139.84-	0.00	0.0000	A36	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
119.84			(36 ksi)					
T10 119.84-99.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T11 99.84-79.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T12 79.84-59.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T13 59.84-39.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T14 39.84-19.84	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T15 19.84-6.50	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T16 6.50-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 291.84-279.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 279.84-259.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 259.84-239.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 239.84-219.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 219.84-199.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6 199.84-179.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T7 179.84-159.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 159.84-139.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 139.84-119.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 119.84-99.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 99.84-79.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T12 79.84-59.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T13 59.84-39.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T14 39.84-19.84	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T15 19.84-6.50	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T16 6.50-0.00	No	Yes	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	U	Diagonal Net Width Deduct in	U	Top Girt Net Width Deduct in	U	Bottom Girt Net Width Deduct in	U	Mid Girt Net Width Deduct in	U	Long Horizontal Net Width Deduct in	U	Short Horizontal Net Width Deduct in	U
T1 291.84-279.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 279.84-259.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 259.84-239.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 239.84-219.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 219.84-199.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 199.84-179.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 179.84-159.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 159.84-139.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 139.84-119.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 119.84-99.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 99.84-79.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 79.84-59.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 59.84-39.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 39.84-19.84	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 19.84-6.50	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T16 6.50-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T1 291.84-279.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 279.84-259.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 259.84-239.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 239.84-219.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 219.84-199.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 199.84-179.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 179.84-159.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 159.84-139.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 139.84-119.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 119.84-99.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 99.84-79.84	Flange	1.0000 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 79.84-59.84	Flange	1.3750 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 59.84-39.84	Flange	1.3750 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 39.84-19.84	Flange	1.3750 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T15 19.84-6.50	Flange	1.3750 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T16 6.50-0.00	Flange	1.3750 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension lb	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
285.84	EHS	A	3/4	5830.00	10%	19000	1.155	386.70	235.00	0.0000	-23.40	100%
		B	3/4	5830.00	10%	19000	1.155	361.43	235.00	0.0000	8.90	100%
		C	3/4	5830.00	10%	19000	1.155	384.07	235.00	0.0000	-20.10	100%
256.507	EHS	A	3/4	5830.00	10%	19000	1.155	363.71	235.00	0.0000	-23.40	100%
		B	3/4	5830.00	10%	19000	1.155	339.52	235.00	0.0000	8.90	100%
		C	3/4	5830.00	10%	19000	1.155	361.18	235.00	0.0000	-20.10	100%
216.507	EHS	A	3/4	5830.00	10%	19000	1.155	333.96	235.00	0.0000	-23.40	100%
		B	3/4	5830.00	10%	19000	1.155	311.60	235.00	0.0000	8.90	100%
		C	3/4	5830.00	10%	19000	1.155	331.60	235.00	0.0000	-20.10	100%
166.507	EHS	A	3/4	5830.00	10%	19000	1.155	300.12	235.00	0.0000	-23.40	100%
		B	3/4	5830.00	10%	19000	1.155	280.83	235.00	0.0000	8.90	100%
		C	3/4	5830.00	10%	19000	1.155	298.05	235.00	0.0000	-20.10	100%
106.507	EHS	A	5/8	4240.00	10%	21000	0.813	266.32	235.00	0.0000	-23.40	100%
		B	5/8	4240.00	10%	21000	0.813	252.17	235.00	0.0000	8.90	100%
		C	5/8	4240.00	10%	21000	0.813	264.73	235.00	0.0000	-20.10	100%

56.5067	EHS	A	7/16	2080.00	10%	21000	0.399	245.87	235.00	0.0000	-23.40	100%
		B	7/16	2080.00	10%	21000	0.399	237.36	235.00	0.0000	8.90	100%
		C	7/16	2080.00	10%	21000	0.399	244.82	235.00	0.0000	-20.10	100%

Guy Data(cont'd)

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
285.84	Torque Arm	8.00	0.0000	Channel	A36 (36 ksi)	Channel	MC12x35
256.507	Torque Arm	8.00	0.0000	Channel	A36 (36 ksi)	Channel	MC12x35
216.507	Torque Arm	8.00	0.0000	Channel	A36 (36 ksi)	Channel	MC12x35
166.507	Torque Arm	8.00	0.0000	Channel	A36 (36 ksi)	Channel	MC12x35
106.507	Torque Arm	8.00	0.0000	Channel	A36 (36 ksi)	Channel	MC12x35
56.5067	Torque Arm	8.00	0.0000	Channel	A36 (36 ksi)	Channel	MC12x35

Guy Data (cont'd)

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
285.84	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Channel	MC12x35
256.51	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Channel	MC12x35
216.51	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Channel	MC12x35
166.51	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Channel	MC12x35
106.51	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Channel	MC12x35
56.51	A572-50 (50 ksi)	Solid Round			No	A36 (36 ksi)	Channel	MC12x35

Guy Data (cont'd)

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
285.84	446.63	417.45	443.60		14.39 6.5 sec/pulse	12.61 6.1 sec/pulse	14.20 6.5 sec/pulse	
256.507	420.08	392.15	417.16		12.76	11.16	12.59	

Guy Elevation ft	Cable Weight A lb	Cable Weight B lb	Cable Weight C lb	Cable Weight D lb	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
					6.2 sec/pulse	5.8 sec/pulse	6.1 sec/pulse	
216.507	385.72	359.90	382.99		10.80	9.43	10.65	
					5.7 sec/pulse	5.3 sec/pulse	5.6 sec/pulse	
166.507	346.64	324.36	344.25		8.77	7.70	8.65	
					5.1 sec/pulse	4.8 sec/pulse	5.1 sec/pulse	
106.507	216.52	205.01	215.22		6.72	6.05	6.65	
					4.5 sec/pulse	4.2 sec/pulse	4.5 sec/pulse	
56.5067	98.10	94.71	97.68		5.76	5.38	5.71	
					4.1 sec/pulse	4.0 sec/pulse	4.1 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
285.84	No	No	1	1	1	1	1	1
256.507	No	No	1	1	1	1	1	1
216.507	No	No	1	1	1	1	1	1
166.507	No	No	1	1	1	1	1	1
106.507	No	No	1	1	1	1	1	1
56.5067	No	No	1	1	1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
285.84	0.6250 A325N	5	0.0000	1	0.6250 A325N	5	0.0000	0.75	0.6250 A325N	2	0.0000	0.75
256.507	0.6250 A325N	5	0.0000	1	0.6250 A325N	5	0.0000	0.75	0.6250 A325N	2	0.0000	0.75
216.507	0.6250 A325N	5	0.0000	1	0.6250 A325N	5	0.0000	0.75	0.6250 A325N	2	0.0000	0.75
166.507	0.6250 A325N	5	0.0000	1	0.6250 A325N	5	0.0000	0.75	0.6250 A325N	2	0.0000	0.75
106.507	0.6250 A325N	5	0.0000	1	0.6250 A325N	5	0.0000	0.75	0.6250 A325N	2	0.0000	0.75
56.5067	0.6250 A325N	5	0.0000	1	0.6250 A325N	5	0.0000	0.75	0.6250 A325N	2	0.0000	0.75

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
285.84	A	131.22	31	31	0.5000

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
	B	147.37	32	32	0.5000
	C	132.87	31	31	0.5000
256.507	A	116.55	30	30	0.5000
	B	132.70	31	31	0.5000
	C	118.20	30	30	0.5000
216.507	A	96.55	28	28	0.5000
	B	112.70	29	29	0.5000
	C	98.20	28	28	0.5000
166.507	A	71.55	26	26	0.5000
	B	87.70	27	27	0.5000
	C	73.20	26	26	0.5000
106.507	A	41.55	22	22	0.5000
	B	57.70	24	24	0.5000
	C	43.20	22	22	0.5000
56.5067	A	16.55	21	21	0.5000
	B	32.70	21	21	0.5000
	C	18.20	21	21	0.5000

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8	C	Yes	Ar (CfAe)	276.00 - 6.00	0.0000	0	9	9	1.0000	1.9800		1.04
1 5/8 (Nextel)	C	Yes	Ar (CfAe)	240.00 - 6.00	-2.5000	0	12	12	0.5000	1.9800		1.04
1 5/8 (Cingular)	B	Yes	Ar (CfAe)	186.00 - 6.00	-2.0000	0	12	12	1.0000 1.9800	1.9800		1.04
1 1/4	C	Yes	Ar (CfAe)	170.00 - 6.00	0.0000	-0.4	1	1	1.5500	1.5500		0.66
7/8 (SNET)	B	Yes	Ar (CfAe)	158.00 - 20.00	-2.0000	0.4	2	2	1.1100	1.1100		0.54
1/2 (SNET)	B	Yes	Ar (CfAe)	142.00 - 20.00	-1.0000	0.4	2	2	0.5800	0.5800		0.25
EW63	C	Yes	Af (CfAe)	115.00 - 10.00	0.0000	0.4	3	2	0.5000	1.5742	5.0668	0.51
1/2	C	Yes	Ar (CfAe)	110.00 - 6.00	1.0000	0.45	1	1	0.5800	0.5800		0.25
1/2	B	Yes	Ar (CfAe)	94.00 - 6.00	2.0000	0.4	3	3	0.5800	0.5800		0.25
1 5/8 (Verizon)	B	Yes	Ar (CfAe)	84.00 - 6.00	0.0000	0	12	12	1.0000	1.9800		1.04
LDF1-50A (1/4 FOAM)	C	Yes	Ar (CfAe)	18.00 - 6.00	0.0000	0	2	2	0.3500	0.3500		0.06
EW63	C	Yes	Af (CfAe)	138.00 - 10.00	0.0000	0.35	1	1	0.5000	1.5742	5.0668	0.51

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#		C_AA_A ft^2/ft	Weight plf
1 1/2" Rigid Conduit	A	No	CaAa (Out Of Face)	291.84 - 6.00	0.0000	0.3	1	No Ice	0.15	1.00
								1/2" Ice	0.25	2.22
7/8	A	No	CaAa (Out Of Face)	291.84 - 6.00	0.0000	0	3	No Ice	0.11	0.54
								1/2" Ice	0.21	1.52
Safety Line 5/8	A	No	CaAa (Out Of Face)	291.84 - 6.00	0.0000	0.2	1	No Ice	0.09	0.40
								1/2" Ice	0.19	1.24

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
L1	327.00-291.84	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T1	291.84-279.84	A	0.000	0.000	0.000	6.852	36.24
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	279.84-259.84	A	0.000	0.000	0.000	11.420	60.40
		B	0.000	0.000	0.000	0.000	0.00
		C	23.998	0.000	0.000	0.000	151.26
T3	259.84-239.84	A	0.000	0.000	0.000	11.420	60.40
		B	0.000	0.000	0.000	0.000	0.00
		C	30.017	0.000	0.000	0.000	189.20
T4	239.84-219.84	A	0.000	0.000	0.000	11.420	60.40
		B	0.000	0.000	0.000	0.000	0.00
		C	69.300	0.000	0.000	0.000	436.80
T5	219.84-199.84	A	0.000	0.000	0.000	11.420	60.40
		B	0.000	0.000	0.000	0.000	0.00
		C	69.300	0.000	0.000	0.000	436.80
T6	199.84-179.84	A	0.000	0.000	0.000	11.420	60.40
		B	12.197	0.000	0.000	0.000	76.88
		C	69.300	0.000	0.000	0.000	436.80
T7	179.84-159.84	A	0.000	0.000	0.000	11.420	60.40
		B	39.600	0.000	0.000	0.000	249.60
		C	70.612	0.000	0.000	0.000	443.51
T8	159.84-139.84	A	0.000	0.000	0.000	11.420	60.40
		B	43.168	0.000	0.000	0.000	270.29
		C	71.883	0.000	0.000	0.000	450.00
T9	139.84-119.84	A	0.000	0.000	0.000	11.420	60.40
		B	45.233	0.000	0.000	0.000	281.20
		C	71.883	2.382	0.000	0.000	459.26
T10	119.84-99.84	A	0.000	0.000	0.000	11.420	60.40
		B	45.233	0.000	0.000	0.000	281.20
		C	72.374	6.601	0.000	0.000	485.93
T11	99.84-79.84	A	0.000	0.000	0.000	11.420	60.40
		B	55.523	0.000	0.000	0.000	343.74
		C	72.850	7.871	0.000	0.000	495.80
T12	79.84-59.84	A	0.000	0.000	0.000	11.420	60.40
		B	87.733	0.000	0.000	0.000	545.80
		C	72.850	7.871	0.000	0.000	495.80
T13	59.84-39.84	A	0.000	0.000	0.000	11.420	60.40
		B	87.733	0.000	0.000	0.000	545.80
		C	72.850	7.871	0.000	0.000	495.80
T14	39.84-19.84	A	0.000	0.000	0.000	11.420	60.40
		B	87.688	0.000	0.000	0.000	545.55
		C	72.850	7.871	0.000	0.000	495.80
T15	19.84-6.50	A	0.000	0.000	0.000	7.617	40.29
		B	54.761	0.000	0.000	0.000	342.97
		C	49.262	3.873	0.000	0.000	324.94
T16	6.50-0.00	A	0.000	0.000	0.000	0.285	1.51
		B	2.053	0.000	0.000	0.000	12.86
		C	1.850	0.000	0.000	0.000	11.44

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft²	A_F ft²	C_AA_A In Face ft²	C_AA_A Out Face ft²	Weight lb
L1	327.00-291.84	A	0.500	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T1	291.84-279.84	A	0.500	0.000	0.000	0.000	12.852	96.30
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	279.84-259.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		0.000	0.000	0.000	0.000	0.00
		C		4.013	32.105	0.000	0.000	467.40
T3	259.84-239.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		0.000	0.000	0.000	0.000	0.00
		C		5.006	40.097	0.000	0.000	583.66
T4	239.84-219.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	85.200	0.000	0.000	1227.23
T5	219.84-199.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		0.000	0.000	0.000	0.000	0.00
		C		9.933	85.200	0.000	0.000	1227.23
T6	199.84-179.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		1.530	16.827	0.000	0.000	239.08
		C		9.933	85.200	0.000	0.000	1227.23
T7	179.84-159.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		4.967	54.633	0.000	0.000	776.23
		C		12.092	85.200	0.000	0.000	1246.66
T8	159.84-139.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		11.637	54.842	0.000	0.000	835.39
		C		14.183	85.200	0.000	0.000	1265.47
T9	139.84-119.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		14.633	56.567	0.000	0.000	872.57
		C		14.183	88.591	0.000	0.000	1299.31
T10	119.84-99.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		14.633	56.567	0.000	0.000	872.57
		C		15.521	94.386	0.000	0.000	1383.91
T11	99.84-79.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		17.531	70.668	0.000	0.000	1071.26
		C		16.817	96.127	0.000	0.000	1415.83
T12	79.84-59.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		22.233	115.067	0.000	0.000	1701.40
		C		16.817	96.127	0.000	0.000	1415.83
T13	59.84-39.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		22.233	115.067	0.000	0.000	1701.40
		C		16.817	96.127	0.000	0.000	1415.83
T14	39.84-19.84	A	0.500	0.000	0.000	0.000	21.420	160.49
		B		22.156	115.051	0.000	0.000	1700.63
		C		16.817	96.127	0.000	0.000	1415.83
T15	19.84-6.50	A	0.500	0.000	0.000	0.000	14.287	107.05
		B		8.382	75.460	0.000	0.000	1070.58
		C		12.510	62.875	0.000	0.000	932.38
T16	6.50-0.00	A	0.500	0.000	0.000	0.000	0.535	4.01
		B		0.314	2.828	0.000	0.000	40.13
		C		0.477	2.159	0.000	0.000	32.58

Feed Line Shielding

Section	Elevation	Face	A_R	A_R Ice	A_F	A_F Ice
	ft		ft^2	ft^2	ft^2	ft^2
L1	327.00-291.84		0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
			0.000	0.000	0.000	0.000
T1	291.84-279.84	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	0.000	0.000	0.000	0.000
T2	279.84-259.84	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.015	5.607	0.000	0.000
T3	259.84-239.84	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	2.395	6.626	1.501	2.380
T4	239.84-219.84	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	5.818	14.768	0.000	0.000
T5	219.84-199.84	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000
		C	5.822	14.377	3.465	5.021
T6	199.84-179.84	A	0.000	0.000	0.000	0.000
		B	0.820	2.313	0.000	0.000
		C	5.525	14.367	0.000	0.000
T7	179.84-159.84	A	0.000	0.000	0.000	0.000
		B	2.832	7.517	1.980	3.146
		C	5.932	14.704	3.531	5.135
T8	159.84-139.84	A	0.000	0.000	0.000	0.000
		B	3.085	8.658	0.000	0.000
		C	6.035	15.428	0.000	0.000
T9	139.84-119.84	A	0.000	0.000	0.000	0.000
		B	3.041	8.972	0.000	0.000
		C	5.921	15.597	0.000	0.000
T10	119.84-99.84	A	0.000	0.000	0.000	0.000
		B	3.235	8.980	2.262	3.758
		C	6.635	16.758	3.949	5.852
T11	99.84-79.84	A	0.000	0.000	0.000	0.000
		B	3.967	11.487	0.000	0.000
		C	6.777	17.706	0.000	0.000
T12	79.84-59.84	A	0.000	0.000	0.000	0.000
		B	5.898	17.302	0.000	0.000
		C	6.436	17.224	0.000	0.000
T13	59.84-39.84	A	0.000	0.000	0.000	0.000
		B	5.533	16.158	4.387	7.246
		C	6.100	16.274	4.036	6.020
T14	39.84-19.84	A	0.000	0.000	0.000	0.000
		B	5.895	17.290	0.000	0.000
		C	6.436	17.224	0.000	0.000
T15	19.84-6.50	A	0.000	0.000	0.000	0.000
		B	3.680	10.562	0.000	0.000
		C	4.235	11.463	0.000	0.000
T16	6.50-0.00	A	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.800	1.305
		C	0.000	0.000	0.721	1.094

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	327.00-291.84	0.0000	0.0000	0.0000	0.0000
T1	291.84-279.84	0.0000	-3.4909	0.0000	-3.9526
T2	279.84-259.84	0.0000	-0.4270	0.0000	-1.5999
T3	259.84-239.84	0.0000	0.0937	0.0000	-1.1368
T4	239.84-219.84	0.0000	2.4518	0.0000	0.6705
T5	219.84-199.84	0.0000	2.0594	0.0000	0.4255
T6	199.84-179.84	0.5957	1.9267	0.4976	0.3528
T7	179.84-159.84	1.6020	0.8674	1.3883	-0.3132
T8	159.84-139.84	2.1292	1.2918	1.9158	0.1069
T9	139.84-119.84	2.0820	1.5047	1.8321	0.2972
T10	119.84-99.84	1.5290	1.5305	1.3390	0.3685
T11	99.84-79.84	2.0212	1.5702	1.7038	0.4692
T12	79.84-59.84	3.2629	0.6056	2.7667	-0.2465
T13	59.84-39.84	3.0699	0.4993	2.6152	-0.3452
T14	39.84-19.84	3.2604	0.6040	2.7644	-0.2482
T15	19.84-6.50	3.0881	0.3451	2.5845	-0.5344
T16	6.50-0.00	0.4094	-0.0803	0.4017	-0.2611

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Lightning Rod 5/8x4'	A	From Face	0.00 0.00 0.00	0.0000	325.00	No Ice 1/2" Ice	0.25 0.66	0.25 0.66	31.00 33.82
Flash Beacon Lighting	B	None		0.0000	323.00	No Ice 1/2" Ice	2.70 3.10	2.70 3.10	50.00 70.00
6813 w/Radome	A	From Face	0.00 0.00 0.00	0.0000	305.00	No Ice 1/2" Ice	10.10 12.50	10.10 12.50	175.00 380.00
PD1150	B	From Leg	6.00 0.00 0.00	0.0000	280.00	No Ice 1/2" Ice	1.22 2.43	1.22 2.43	8.00 16.00
6' Side-Arm	B	From Leg	3.00 0.00 0.00	0.0000	280.00	No Ice 1/2" Ice	10.60 15.40	10.60 15.40	140.00 212.00
(2) AP16-850/065	A	From Leg	3.00 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	10.61 11.25	5.64 6.28	26.80 77.92
(2) OGC9-825	C	From Leg	3.00 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	2.10 3.18	2.10 3.18	16.00 32.29
AP16-850/065	C	From Leg	3.00 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	10.61 11.25	5.64 6.28	26.80 77.92
(2) DB810K	B	From Leg	3.00 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	4.08 5.73	4.08 5.73	35.00 65.18
AP16-850/065	B	From Leg	3.00 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	10.61 11.25	5.64 6.28	26.80 77.92

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	lb
3' Sidearm	A	From Leg	1.50 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	5.90 6.60	5.90 6.60	130.00 145.60
3' Sidearm	B	From Leg	1.50 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	5.90 6.60	5.90 6.60	130.00 145.60
3' Sidearm	C	From Leg	1.50 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	5.90 6.60	5.90 6.60	130.00 145.60
(4) DB844H90 (Nextel)	A	From Leg	3.00 0.00 0.00	0.0000	240.00	No Ice 1/2" Ice	2.87 3.18	3.97 4.34	10.00 36.27
(4) DB844H90 (Nextel)	B	From Leg	3.00 0.00 0.00	0.0000	240.00	No Ice 1/2" Ice	2.87 3.18	3.97 4.34	10.00 36.27
(4) DB844H90 (Nextel)	C	From Leg	3.00 0.00 0.00	0.0000	240.00	No Ice 1/2" Ice	2.87 3.18	3.97 4.34	10.00 36.27
12' T-Frame (Nextel)	A	From Leg	1.50 0.00 0.00	0.0000	240.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	465.00 600.00
12' T-Frame (Nextel)	B	From Leg	1.50 0.00 0.00	0.0000	240.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	465.00 600.00
12' T-Frame (Nextel)	C	From Leg	1.50 0.00 0.00	0.0000	240.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	465.00 600.00
6813 1-Bay w/radome	B	From Leg	2.00 0.00 0.00	0.0000	209.00	No Ice 1/2" Ice	4.90 6.00	4.90 6.00	97.00 195.00
6813 1-Bay w/radome	A	From Leg	3.00 0.00 0.00	0.0000	198.00	No Ice 1/2" Ice	4.90 6.00	4.90 6.00	97.00 195.00
2' Sidearm	B	From Leg	1.00 0.00 0.00	0.0000	209.00	No Ice 1/2" Ice	3.90 4.40	3.90 4.40	87.00 97.00
3' Sidearm	A	From Leg	1.50 0.00 0.00	0.0000	198.00	No Ice 1/2" Ice	5.90 6.60	5.90 6.60	130.00 145.60
Generic TMA	A	From Leg	3.00 0.00 0.00	0.0000	259.00	No Ice 1/2" Ice	1.05 1.19	0.35 0.45	15.00 21.35
Generic TMA	B	From Leg	3.00 0.00 0.00	0.0000	259.00	No Ice 1/2" Ice	1.05 1.19	0.35 0.45	15.00 21.35
(3) DUO1417-8670 (Cingular)	A	From Leg	3.00 0.00 0.00	0.0000	186.00	No Ice 1/2" Ice	6.53 6.94	4.20 4.57	20.30 62.49
(3) DUO1417-8670 (Cingular)	B	From Leg	3.00 0.00 0.00	0.0000	186.00	No Ice 1/2" Ice	6.53 6.94	4.20 4.57	20.30 62.49
(3) DUO1417-8670 (Cingular)	C	From Leg	3.00 0.00 0.00	0.0000	186.00	No Ice 1/2" Ice	6.53 6.94	4.20 4.57	20.30 62.49
PiROD 12' Lightweight T-Frame (Cingular)	A	From Leg	1.50 0.00 0.00	0.0000	186.00	No Ice 1/2" Ice	10.20 16.20	10.20 16.20	253.00 355.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
PiROD 12' Lightweight T-Frame (Cingular)	B	From Leg	1.50 0.00 0.00	0.0000	186.00	No Ice 1/2" Ice	10.20 16.20	10.20 16.20	253.00 355.00
PiROD 12' Lightweight T-Frame (Cingular)	C	From Leg	1.50 0.00 0.00	0.0000	186.00	No Ice 1/2" Ice	10.20 16.20	10.20 16.20	253.00 355.00
(3) Generic TMA (Cingular)	A	From Leg	3.00 0.00 0.00	0.0000	186.00	No Ice 1/2" Ice	1.05 1.19	0.35 0.45	15.00 21.35
(3) Generic TMA (Cingular)	B	From Leg	3.00 0.00 0.00	0.0000	186.00	No Ice 1/2" Ice	1.05 1.19	0.35 0.45	15.00 21.35
(3) Generic TMA (Cingular)	C	From Leg	3.00 0.00 0.00	0.0000	186.00	No Ice 1/2" Ice	1.05 1.19	0.35 0.45	15.00 21.35
MB100RR650200DPAL	A	From Leg	3.00 6.00 0.00	0.0000	186.00	No Ice 1/2" Ice	8.80 9.41	3.82 4.78	31.00 70.17
DB872	A	From Leg	0.50 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice	2.80 3.04	1.17 1.36	7.00 23.53
DB806	B	From Leg	3.00 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	1.14 1.68	1.14 1.68	21.00 29.93
3' Sidearm	B	From Leg	1.50 0.00 0.00	0.0000	170.00	No Ice 1/2" Ice	5.90 6.60	5.90 6.60	130.00 145.60
Generic TMA	A	From Leg	0.50 0.00 0.00	0.0000	166.00	No Ice 1/2" Ice	1.05 1.19	0.35 0.45	15.00 21.35
DB872	B	From Leg	0.50 0.00 0.00	0.0000	158.00	No Ice 1/2" Ice	2.80 3.04	1.17 1.36	7.00 23.53
DB589	B	From Leg	1.00 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	2.13 3.00	2.13 3.00	11.50 27.39
DB809M-XC	B	From Leg	6.00 0.00 0.00	0.0000	280.00	No Ice 1/2" Ice	2.84 4.29	2.84 4.29	25.00 46.91
7' Whip	B	From Leg	0.50 0.00 0.00	0.0000	142.00	No Ice 1/2" Ice	1.74 2.60	1.74 2.60	37.30 52.85
PD1108	A	From Leg	2.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice	1.53 2.81	1.53 2.81	10.00 18.00
2' Sidearm	A	From Leg	1.00 0.00 0.00	0.0000	124.00	No Ice 1/2" Ice	3.50 4.20	3.50 4.20	91.00 120.00
2'6"x4" Pipe Mount	B	From Leg	0.50 0.00 0.00	0.0000	154.00	No Ice 1/2" Ice	0.75 0.95	0.75 0.95	27.00 35.41
2'6"x4" Pipe Mount	B	From Leg	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice	0.75 0.95	0.75 0.95	27.00 35.41
2'6"x4" Pipe Mount	C	From Leg	0.50 0.00 0.00	0.0000	112.00	No Ice 1/2" Ice	0.75 0.95	0.75 0.95	27.00 35.41

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
2'6"x4" Pipe Mount	C	From Leg	0.50 0.00 0.00	0.0000	138.00	No Ice 1/2" Ice	0.75 0.95	0.75 0.95	27.00 35.41
6'x4" Pipe Mount	B	From Leg	0.50 0.00 0.00	0.0000	104.00	No Ice 1/2" Ice	2.09 2.46	2.09 2.46	54.72 71.85
2' Sidearm	B	From Leg	1.00 0.00 0.00	0.0000	13.00	No Ice 1/2" Ice	3.90 4.40	3.90 4.40	87.00 97.00
PD1110	A	From Leg	2.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice	3.06 5.10	3.06 5.10	25.00 60.00
2' Sidearm	A	From Leg	1.00 0.00 0.00	0.0000	110.00	No Ice 1/2" Ice	3.90 4.40	3.90 4.40	87.00 97.00
PR-850	B	From Leg	0.50 0.00 0.00	0.0000	94.00	No Ice 1/2" Ice	6.35 11.43	6.35 11.43	38.00 49.40
ASP-962	A	From Leg	0.50 0.00 0.00	0.0000	94.00	No Ice 1/2" Ice	0.16 0.29	0.16 0.29	1.13 1.47
APL866513-42T0 (Verizon)	A	From Leg	3.00 6.00 0.00	0.0000	84.00	No Ice 1/2" Ice	4.29 4.67	3.73 4.10	15.70 46.99
APL866513-42T0 (Verizon)	A	From Leg	3.00 -6.00 0.00	0.0000	84.00	No Ice 1/2" Ice	4.29 4.67	3.73 4.10	15.70 46.99
APL196516-42T2 (Verizon)	A	From Leg	3.00 4.00 0.00	0.0000	84.00	No Ice 1/2" Ice	3.47 3.86	2.96 3.35	8.00 29.39
APL196516-42T2 (Verizon)	A	From Leg	3.00 -4.00 0.00	0.0000	84.00	No Ice 1/2" Ice	3.47 3.86	2.96 3.35	8.00 29.39
APL866513-42T0 (Verizon)	B	From Leg	3.00 6.00 0.00	0.0000	84.00	No Ice 1/2" Ice	4.29 4.67	3.73 4.10	15.70 46.99
APL866513-42T0 (Verizon)	B	From Leg	3.00 -6.00 0.00	0.0000	84.00	No Ice 1/2" Ice	4.29 4.67	3.73 4.10	15.70 46.99
APL196516-42T2 (Verizon)	B	From Leg	3.00 4.00 0.00	0.0000	84.00	No Ice 1/2" Ice	3.47 3.86	2.96 3.35	8.00 29.39
APL196516-42T2 (Verizon)	B	From Leg	3.00 -4.00 0.00	0.0000	84.00	No Ice 1/2" Ice	3.47 3.86	2.96 3.35	8.00 29.39
APL866513-42T0 (Verizon)	C	From Leg	3.00 6.00 0.00	0.0000	84.00	No Ice 1/2" Ice	4.29 4.67	3.73 4.10	15.70 46.99
APL866513-42T0 (Verizon)	C	From Leg	3.00 -6.00 0.00	0.0000	84.00	No Ice 1/2" Ice	4.29 4.67	3.73 4.10	15.70 46.99
APL196516-42T2 (Verizon)	C	From Leg	3.00 4.00 0.00	0.0000	84.00	No Ice 1/2" Ice	3.47 3.86	2.96 3.35	8.00 29.39
APL196516-42T2 (Verizon)	C	From Leg	3.00 -4.00 0.00	0.0000	84.00	No Ice 1/2" Ice	3.47 3.86	2.96 3.35	8.00 29.39

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
12' Platform (Verizon)	C	None		0.0000	84.00	No Ice	40.00	40.00	2000.00
						1/2" Ice	50.00	50.00	2800.00
DB212-2-C	C	From Leg	0.50 0.00 0.00	0.0000	74.00	No Ice 1/2" Ice	3.10 6.22	3.10 6.22	27.00 55.51
CL-24/HRM	B	From Leg	2.00 0.00 0.00	0.0000	18.00	No Ice 1/2" Ice	12.46 13.95	12.46 13.95	50.00 80.00
2' Sidearm	B	From Leg	1.00 0.00 0.00	0.0000	18.00	No Ice 1/2" Ice	3.90 4.40	3.90 4.40	87.00 97.00

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
P4F-57W (Verizon)	C	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		138.00	4.00	No Ice 1/2" Ice	12.57 13.10	335.00 402.25
6 FT DISH	B	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		115.00	6.00	No Ice 1/2" Ice	28.27 29.05	143.00 292.13
6 FT DISH	C	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	60.0000		112.00	6.00	No Ice 1/2" Ice	28.27 29.05	143.00 292.13
8 FT DISH	B	Paraboloid w/Shroud (HP)	From Leg	1.00 0.00 0.00	-30.0000		104.00	8.00	No Ice 1/2" Ice	50.30 51.29	251.00 514.30
1.2M	B	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	0.0000		13.00	4.00	No Ice 1/2" Ice	12.17 13.09	165.00 232.19

Tower Pressures - No Ice

G_H = 1.089 (base tower), 1.089 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 327.00-291.84	309.49	1.896	39	31.497	A	0.000	31.497	31.497	100.00	0.000	0.000
					B	0.000	31.497		100.00		
					C	0.000	31.497		100.00		
T1 291.84-	285.84	1.853	38	46.004	A	3.500	6.948	4.000	38.28	0.000	6.852

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
279.84					B	3.500	6.948		38.28		
					C	3.500	7.531		36.26		
T2 279.84-259.84	269.84	1.823	38	76.673	A	0.000	11.669	6.667	57.13	0.000	11.420
					B	0.000	11.669		57.13		
					C	0.000	34.527		19.31		
T3 259.84-239.84	249.84	1.783	37	77.090	A	3.479	12.186	7.500	47.88	0.000	11.420
					B	3.479	12.186		47.88		
					C	1.979	40.678		17.58		
T4 239.84-219.84	229.84	1.741	36	77.090	A	0.000	12.473	7.500	60.13	0.000	11.420
					B	0.000	12.473		60.13		
					C	0.000	76.824		9.76		
T5 219.84-199.84	209.84	1.696	35	77.507	A	3.459	13.283	8.333	49.77	0.000	11.420
					B	3.459	13.283		49.77		
					C	0.000	77.626		10.74		
T6 199.84-179.84	189.84	1.649	34	77.507	A	0.000	12.984	8.333	64.18	0.000	11.420
					B	0.000	24.361		34.21		
					C	0.000	77.623		10.74		
T7 179.84-159.84	169.84	1.597	33	77.923	A	3.438	14.087	9.167	52.31	0.000	11.420
					B	1.458	50.855		17.52		
					C	0.000	79.627		11.51		
T8 159.84-139.84	149.84	1.541	32	77.507	A	0.000	13.273	8.333	62.79	0.000	11.420
					B	0.000	53.357		15.62		
					C	0.000	79.986		10.42		
T9 139.84-119.84	129.84	1.479	31	77.923	A	0.000	13.792	9.167	66.46	0.000	11.420
					B	0.000	55.985		16.37		
					C	2.382	80.614		11.04		
T10 119.84-99.84	109.84	1.41	29	77.923	A	3.438	14.084	9.167	52.32	0.000	11.420
					B	1.176	56.082		16.01		
					C	6.090	80.683		10.56		
T11 99.84-79.84	89.84	1.331	28	78.340	A	0.000	14.887	10.000	67.17	0.000	11.420
					B	0.000	66.442		15.05		
					C	7.871	81.814		11.15		
T12 79.84-59.84	69.84	1.239	26	78.340	A	0.000	14.595	10.000	68.52	0.000	11.420
					B	0.000	96.429		10.37		
					C	7.871	81.863		11.14		
T13 59.84-39.84	49.84	1.125	23	78.340	A	3.417	14.310	10.000	56.41	0.000	11.420
					B	0.000	96.510		10.36		
					C	7.252	81.915		11.21		
T14 39.84-19.84	29.84	1	21	78.340	A	0.000	14.595	10.000	68.52	0.000	11.420
					B	0.000	96.387		10.37		
					C	7.871	81.863		11.14		
T15 19.84-6.50	13.17	1	21	52.253	A	0.000	9.733	6.670	68.53	0.000	7.617
					B	0.000	60.814		10.97		
					C	3.873	55.330		11.27		
T16 6.50-0.00	3.25	1	21	13.606	A	6.036	3.418	3.418	36.15	0.000	0.285
					B	5.236	5.471		31.92		
					C	5.315	5.268		32.30		

Tower Pressure - With Ice

G_H = 1.089 (base tower), 1.089 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 327.00-291.84	309.49	1.896	39	0.5000	34.428	A	0.000	34.428	34.428	100.00	0.000	0.000
						B	0.000	34.428		100.00		
						C	0.000	34.428		100.00		
T1 291.84-279.84	285.84	1.853	38	0.5000	47.004	A	3.695	11.330	6.000	39.93	0.000	12.852
						B	3.695	11.330		39.93		
						C	3.695	12.497		37.05		
T2 279.84-259.84	269.84	1.823	38	0.5000	78.340	A	0.000	19.118	10.000	52.31	0.000	21.420
						B	0.000	19.118		52.31		
						C	32.105	19.274		19.46		
T3 259.84-239.84	249.84	1.783	37	0.5000	78.757	A	3.673	19.323	10.833	47.11	0.000	21.420
						B	3.673	19.323		47.11		
						C	41.389	19.443		17.81		
T4 239.84-219.84	229.84	1.741	36	0.5000	78.757	A	0.000	19.897	10.833	54.45	0.000	21.420
						B	0.000	19.897		54.45		
						C	85.200	16.801		10.62		
T5 219.84-199.84	209.84	1.696	35	0.5000	79.173	A	3.651	20.398	11.667	48.51	0.000	21.420
						B	3.651	20.398		48.51		
						C	83.830	17.683		11.49		
T6 199.84-179.84	189.84	1.649	34	0.5000	79.173	A	0.000	20.384	11.667	57.24	0.000	21.420
						B	16.827	19.600		32.03		
						C	85.200	17.680		11.34		
T7 179.84-159.84	169.84	1.597	33	0.5000	79.590	A	3.629	21.179	12.500	50.39	0.000	21.420
						B	55.117	18.628		16.95		
						C	83.694	20.286		12.02		
T8 159.84-139.84	149.84	1.541	32	0.5000	79.173	A	0.000	20.670	11.667	56.44	0.000	21.420
						B	54.842	23.649		14.86		
						C	85.200	21.154		10.97		
T9 139.84-119.84	129.84	1.479	31	0.5000	79.590	A	0.000	21.171	12.500	59.04	0.000	21.420
						B	56.567	26.832		14.99		
						C	88.591	21.476		11.36		
T10 119.84-99.84	109.84	1.41	29	0.5000	79.590	A	3.629	21.172	12.500	50.40	0.000	21.420
						B	56.438	26.825		15.01		
						C	92.163	21.655		10.98		
T11 99.84-79.84	89.84	1.331	28	0.5000	80.007	A	0.000	22.240	13.333	59.95	0.000	21.420
						B	70.668	28.284		13.47		
						C	96.127	23.060		11.19		
T12 79.84-59.84	69.84	1.239	26	0.5000	80.007	A	0.000	21.945	13.333	60.76	0.000	21.420
						B	115.067	26.877		9.39		
						C	96.127	23.247		11.17		
T13 59.84-39.84	49.84	1.125	23	0.5000	80.007	A	3.607	21.376	13.333	53.37	0.000	21.420
						B	111.427	27.451		9.60		
						C	93.714	23.627		11.36		
T14 39.84-19.84	29.84	1	21	0.5000	80.007	A	0.000	21.945	13.333	60.76	0.000	21.420
						B	115.051	26.811		9.40		
						C	96.127	23.247		11.17		
T15 19.84-6.50	13.17	1	21	0.5000	53.364	A	0.000	14.635	8.893	60.77	0.000	14.287
						B	75.460	12.456		10.12		
						C	62.875	16.822		11.16		
T16 6.50-0.00	3.25	1	21	0.5000	14.169	A	6.419	4.557	4.557	41.52	0.000	0.535
						B	7.943	4.872		35.57		
						C	7.484	5.034		36.41		

Tower Pressure - Service

G_H = 1.089 (base tower), 1.089 (upper structure)

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 327.00-291.84	309.49	1.896	39	31.497	A	0.000	31.497	31.497	100.00	0.000	0.000
					B	0.000	31.497		100.00		
					C	0.000	31.497		100.00		
T1 291.84-279.84	285.84	1.853	38	46.004	A	3.500	6.948	4.000	38.28	0.000	6.852
					B	3.500	6.948		38.28		
					C	3.500	7.531		36.26		
T2 279.84-259.84	269.84	1.823	38	76.673	A	0.000	11.669	6.667	57.13	0.000	11.420
					B	0.000	11.669		57.13		
					C	0.000	34.527		19.31		
T3 259.84-239.84	249.84	1.783	37	77.090	A	3.479	12.186	7.500	47.88	0.000	11.420
					B	3.479	12.186		47.88		
					C	1.979	40.678		17.58		
T4 239.84-219.84	229.84	1.741	36	77.090	A	0.000	12.473	7.500	60.13	0.000	11.420
					B	0.000	12.473		60.13		
					C	0.000	76.824		9.76		
T5 219.84-199.84	209.84	1.696	35	77.507	A	3.459	13.283	8.333	49.77	0.000	11.420
					B	3.459	13.283		49.77		
					C	0.000	77.626		10.74		
T6 199.84-179.84	189.84	1.649	34	77.507	A	0.000	12.984	8.333	64.18	0.000	11.420
					B	0.000	24.361		34.21		
					C	0.000	77.623		10.74		
T7 179.84-159.84	169.84	1.597	33	77.923	A	3.438	14.087	9.167	52.31	0.000	11.420
					B	1.458	50.855		17.52		
					C	0.000	79.627		11.51		
T8 159.84-139.84	149.84	1.541	32	77.507	A	0.000	13.273	8.333	62.79	0.000	11.420
					B	0.000	53.357		15.62		
					C	0.000	79.986		10.42		
T9 139.84-119.84	129.84	1.479	31	77.923	A	0.000	13.792	9.167	66.46	0.000	11.420
					B	0.000	55.985		16.37		
					C	2.382	80.614		11.04		
T10 119.84-99.84	109.84	1.41	29	77.923	A	3.438	14.084	9.167	52.32	0.000	11.420
					B	1.176	56.082		16.01		
					C	6.090	80.683		10.56		
T11 99.84-79.84	89.84	1.331	28	78.340	A	0.000	14.887	10.000	67.17	0.000	11.420
					B	0.000	66.442		15.05		
					C	7.871	81.814		11.15		
T12 79.84-59.84	69.84	1.239	26	78.340	A	0.000	14.595	10.000	68.52	0.000	11.420
					B	0.000	96.429		10.37		
					C	7.871	81.863		11.14		
T13 59.84-39.84	49.84	1.125	23	78.340	A	3.417	14.310	10.000	56.41	0.000	11.420
					B	0.000	96.510		10.36		
					C	7.252	81.915		11.21		
T14 39.84-19.84	29.84	1	21	78.340	A	0.000	14.595	10.000	68.52	0.000	11.420
					B	0.000	96.387		10.37		
					C	7.871	81.863		11.14		
T15 19.84-6.50	13.17	1	21	52.253	A	0.000	9.733	6.670	68.53	0.000	7.617
					B	0.000	60.814		10.97		
					C	3.873	55.330		11.27		
T16 6.50-0.00	3.25	1	21	13.606	A	6.036	3.418	3.418	36.15	0.000	0.285
					B	5.236	5.471		31.92		
					C	5.315	5.268		32.30		

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3139.08	A	1	0.59	1	1	1	31.497	795.71	22.63	C
			B	1	0.59	1	1	1	31.497			
			C	1	0.59	1	1	1	31.497			
T1 291.84-279.84	36.24	1165.49 TA 842.14	A	0.227	2.508	0.596	1	1	7.643	1114.98	92.91	C
			B	0.227	2.508	0.596	1	1	7.643			
			C	0.24	2.468	0.599	1	1	8.014			
T2 279.84-259.84	211.66	1297.93	A	0.152	2.763	0.582	1	1	6.789	2359.32	117.97	C
			B	0.152	2.763	0.582	1	1	6.789			
			C	0.45	1.973	0.673	1	1	23.251			
T3 259.84-239.84	249.60	1824.47 TA 842.14	A	0.203	2.585	0.591	1	1	10.682	2796.50	139.83	C
			B	0.203	2.585	0.591	1	1	10.682			
			C	0.553	1.84	0.726	1	1	31.517			
T4 239.84-219.84	497.20	1468.30	A	0.162	2.729	0.583	1	1	7.276	6513.70*	325.69	C
			B	0.162	2.729	0.583	1	1	7.276			
			C	0.997	2.093	1	1	1	76.824			
T5 219.84-199.84	497.20	2100.56 TA 842.14	A	0.216	2.543	0.594	1	1	11.346	6378.40*	318.92	C
			B	0.216	2.543	0.594	1	1	11.346			
			C	1	2.1	1	1	1	77.626			
T6 199.84-179.84	574.08	1580.50	A	0.168	2.708	0.584	1	1	7.587	6198.45*	309.92	C
			B	0.314	2.259	0.62	1	1	15.113			
			C	1	2.1	1	1	1	77.623			
T7 179.84-159.84	753.51	2311.02 TA 842.14	A	0.225	2.515	0.596	1	1	11.831	6034.46*	301.72	C
			B	0.671	1.777	0.8	1	1	42.135			
			C	1	2.1	1	1	1	79.627			
T8 159.84-139.84	780.69	1658.72	A	0.171	2.695	0.585	1	1	7.764	5793.26*	289.66	C
			B	0.688	1.776	0.812	1	1	43.309			
			C	1	2.1	1	1	1	79.986			
T9 139.84-119.84	800.86	1790.96	A	0.177	2.675	0.586	1	1	8.082	5588.76*	279.44	C
			B	0.718	1.778	0.833	1	1	46.649			
			C	1	2.1	1	1	1	82.996			
T10 119.84-99.84	827.53	2311.02 TA 842.14	A	0.225	2.515	0.596	1	1	11.829	5327.93*	266.40	C
			B	0.735	1.782	0.845	1	1	48.586			
			C	1	2.1	1	1	1	86.773			
T11 99.84-79.84	899.94	2099.69	A	0.19	2.63	0.588	1	1	8.759	5055.65*	252.78	C
			B	0.848	1.859	0.937	1	1	62.247			
			C	1	2.1	1	1	1	89.685			
T12 79.84-59.84	1102.00	2021.46	A	0.186	2.642	0.588	1	1	8.577	4704.67*	235.23	C
			B	1	2.1	1	1	1	96.429			
			C	1	2.1	1	1	1	89.734			
T13 59.84-39.84	1102.00	2377.63 TA 842.14	A	0.226	2.511	0.596	1	1	11.947	4272.33*	213.62	C
			B	1	2.1	1	1	1	96.510			
			C	1	2.1	1	1	1	89.167			
T14 39.84-19.84	1101.75	2021.46	A	0.186	2.642	0.588	1	1	8.577	3797.55*	189.88	C
			B	1	2.1	1	1	1	96.387			
			C	1	2.1	1	1	1	89.734			
T15 19.84-6.50	708.20	1348.18	A	0.186	2.642	0.588	1	1	5.720	2532.97*	189.88	C
			B	1	2.1	1	1	1	60.814			
			C	1	2.1	1	1	1	59.203			
T16 6.50-0.00	25.80	810.75	A	0.695	1.776	0.816	1	1	8.826	418.00	64.31	B
			B	0.787	1.807	0.886	1	1	10.082			
			C	0.778	1.801	0.879	1	1	9.944			
Sum Weight:	10168.25	36380.04			*$2A_g$ limit					69682.63		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3139.08	A	1	0.59	1	1	1	31.497	795.71	22.63	C
			B	1	0.59	1	1	1	31.497			
			C	1	0.59	1	1	1	31.497			
T1 291.84-279.84	36.24	1165.49 TA 842.14	A	0.227	2.508	0.596	0.825	1	7.031	1051.68	87.64	C
			B	0.227	2.508	0.596	0.825	1	7.031			
			C	0.24	2.468	0.599	0.825	1	7.402			
T2 279.84-259.84	211.66	1297.93	A	0.152	2.763	0.582	0.825	1	6.789	2359.32	117.97	C
			B	0.152	2.763	0.582	0.825	1	6.789			
			C	0.45	1.973	0.673	0.825	1	23.251			
T3 259.84-239.84	249.60	1824.47 TA 842.14	A	0.203	2.585	0.591	0.825	1	10.073	2770.83	138.54	C
			B	0.203	2.585	0.591	0.825	1	10.073			
			C	0.553	1.84	0.726	0.825	1	31.170			
T4 239.84-219.84	497.20	1468.30	A	0.162	2.729	0.583	0.825	1	7.276	6513.70*	325.69	C
			B	0.162	2.729	0.583	0.825	1	7.276			
			C	0.997	2.093	1	0.825	1	76.824			
T5 219.84-199.84	497.20	2100.56 TA 842.14	A	0.216	2.543	0.594	0.825	1	10.741	6378.40*	318.92	C
			B	0.216	2.543	0.594	0.825	1	10.741			
			C	1	2.1	1	0.825	1	77.626			
T6 199.84-179.84	574.08	1580.50	A	0.168	2.708	0.584	0.825	1	7.587	6198.45*	309.92	C
			B	0.314	2.259	0.62	0.825	1	15.113			
			C	1	2.1	1	0.825	1	77.623			
T7 179.84-159.84	753.51	2311.02 TA 842.14	A	0.225	2.515	0.596	0.825	1	11.229	6034.46*	301.72	C
			B	0.671	1.777	0.8	0.825	1	41.880			
			C	1	2.1	1	0.825	1	79.627			
T8 159.84-139.84	780.69	1658.72	A	0.171	2.695	0.585	0.825	1	7.764	5793.26*	289.66	C
			B	0.688	1.776	0.812	0.825	1	43.309			
			C	1	2.1	1	0.825	1	79.986			
T9 139.84-119.84	800.86	1790.96	A	0.177	2.675	0.586	0.825	1	8.082	5588.76*	279.44	C
			B	0.718	1.778	0.833	0.825	1	46.649			
			C	1	2.1	1	0.825	1	82.579			
T10 119.84-99.84	827.53	2311.02 TA 842.14	A	0.225	2.515	0.596	0.825	1	11.227	5327.93*	266.40	C
			B	0.735	1.782	0.845	0.825	1	48.380			
			C	1	2.1	1	0.825	1	85.707			
T11 99.84-79.84	899.94	2099.69	A	0.19	2.63	0.588	0.825	1	8.759	5055.65*	252.78	C
			B	0.848	1.859	0.937	0.825	1	62.247			
			C	1	2.1	1	0.825	1	88.308			
T12 79.84-59.84	1102.00	2021.46	A	0.186	2.642	0.588	0.825	1	8.577	4704.67*	235.23	C
			B	1	2.1	1	0.825	1	96.429			
			C	1	2.1	1	0.825	1	88.357			
T13 59.84-39.84	1102.00	2377.63 TA 842.14	A	0.226	2.511	0.596	0.825	1	11.349	4272.33*	213.62	C
			B	1	2.1	1	0.825	1	96.510			
			C	1	2.1	1	0.825	1	87.897			
T14 39.84-19.84	1101.75	2021.46	A	0.186	2.642	0.588	0.825	1	8.577	3797.55*	189.88	C
			B	1	2.1	1	0.825	1	96.387			
			C	1	2.1	1	0.825	1	88.357			
T15 19.84-6.50	708.20	1348.18	A	0.186	2.642	0.588	0.825	1	5.720	2532.97*	189.88	C
			B	1	2.1	1	0.825	1	60.814			
			C	1	2.1	1	0.825	1	58.525			
T16 6.50-0.00	25.80	810.75	A	0.695	1.776	0.816	0.825	1	7.769	380.60	58.55	B
			B	0.787	1.807	0.886	0.825	1	9.166			
			C	0.778	1.801	0.879	0.825	1	9.014			
Sum Weight:	10168.25	36380.04			*2A_g limit					69556.26		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	R_R	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb							ft^2	lb	plf	
L1 327.00-291.84	0.00	3139.08	A	1	0.59	1	1	1	31.497	795.71	22.63	C
			B	1	0.59	1	1	1	31.497			
			C	1	0.59	1	1	1	31.497			
T1 291.84-279.84	36.24	1165.49 TA 842.14	A	0.227	2.508	0.596	0.8	1	6.943	1042.64	86.89	C
			B	0.227	2.508	0.596	0.8	1	6.943			
			C	0.24	2.468	0.599	0.8	1	7.314			
T2 279.84-259.84	211.66	1297.93	A	0.152	2.763	0.582	0.8	1	6.789	2359.32	117.97	C
			B	0.152	2.763	0.582	0.8	1	6.789			
			C	0.45	1.973	0.673	0.8	1	23.251			
T3 259.84-239.84	249.60	1824.47 TA 842.14	A	0.203	2.585	0.591	0.8	1	9.986	2767.17	138.36	C
			B	0.203	2.585	0.591	0.8	1	9.986			
			C	0.553	1.84	0.726	0.8	1	31.121			
T4 239.84-219.84	497.20	1468.30	A	0.162	2.729	0.583	0.8	1	7.276	6513.70*	325.69	C
			B	0.162	2.729	0.583	0.8	1	7.276			
			C	0.997	2.093	1	0.8	1	76.824			
T5 219.84-199.84	497.20	2100.56 TA 842.14	A	0.216	2.543	0.594	0.8	1	10.655	6378.40*	318.92	C
			B	0.216	2.543	0.594	0.8	1	10.655			
			C	1	2.1	1	0.8	1	77.626			
T6 199.84-179.84	574.08	1580.50	A	0.168	2.708	0.584	0.8	1	7.587	6198.45*	309.92	C
			B	0.314	2.259	0.62	0.8	1	15.113			
			C	1	2.1	1	0.8	1	77.623			
T7 179.84-159.84	753.51	2311.02 TA 842.14	A	0.225	2.515	0.596	0.8	1	11.143	6034.46*	301.72	C
			B	0.671	1.777	0.8	0.8	1	41.843			
			C	1	2.1	1	0.8	1	79.627			
T8 159.84-139.84	780.69	1658.72	A	0.171	2.695	0.585	0.8	1	7.764	5793.26*	289.66	C
			B	0.688	1.776	0.812	0.8	1	43.309			
			C	1	2.1	1	0.8	1	79.986			
T9 139.84-119.84	800.86	1790.96	A	0.177	2.675	0.586	0.8	1	8.082	5588.76*	279.44	C
			B	0.718	1.778	0.833	0.8	1	46.649			
			C	1	2.1	1	0.8	1	82.520			
T10 119.84-99.84	827.53	2311.02 TA 842.14	A	0.225	2.515	0.596	0.8	1	11.141	5327.93*	266.40	C
			B	0.735	1.782	0.845	0.8	1	48.351			
			C	1	2.1	1	0.8	1	85.555			
T11 99.84-79.84	899.94	2099.69	A	0.19	2.63	0.588	0.8	1	8.759	5055.65*	252.78	C
			B	0.848	1.859	0.937	0.8	1	62.247			
			C	1	2.1	1	0.8	1	88.111			
T12 79.84-59.84	1102.00	2021.46	A	0.186	2.642	0.588	0.8	1	8.577	4704.67*	235.23	C
			B	1	2.1	1	0.8	1	96.429			
			C	1	2.1	1	0.8	1	88.160			
T13 59.84-39.84	1102.00	2377.63 TA 842.14	A	0.226	2.511	0.596	0.8	1	11.264	4272.33*	213.62	C
			B	1	2.1	1	0.8	1	96.510			
			C	1	2.1	1	0.8	1	87.716			
T14 39.84-19.84	1101.75	2021.46	A	0.186	2.642	0.588	0.8	1	8.577	3797.55*	189.88	C
			B	1	2.1	1	0.8	1	96.387			
			C	1	2.1	1	0.8	1	88.160			
T15 19.84-6.50	708.20	1348.18	A	0.186	2.642	0.588	0.8	1	5.720	2532.97*	189.88	C
			B	1	2.1	1	0.8	1	60.814			
			C	1	2.1	1	0.8	1	58.428			
T16 6.50-0.00	25.80	810.75	A	0.695	1.776	0.816	0.8	1	7.619	375.25	57.73	B
			B	0.787	1.807	0.886	0.8	1	9.035			
			C	0.778	1.801	0.879	0.8	1	8.881			
Sum Weight:	10168.25	36380.04			*$2A_g$ limit					69538.20		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3139.08	A	1	0.59	1	1	1	31.497	795.71	22.63	C
			B	1	0.59	1	1	1	31.497			
			C	1	0.59	1	1	1	31.497			
T1 291.84-279.84	36.24	1165.49 TA 842.14	A	0.227	2.508	0.596	0.85	1	7.118	1060.72	88.39	C
			B	0.227	2.508	0.596	0.85	1	7.118			
			C	0.24	2.468	0.599	0.85	1	7.489			
T2 279.84-259.84	211.66	1297.93	A	0.152	2.763	0.582	0.85	1	6.789	2359.32	117.97	C
			B	0.152	2.763	0.582	0.85	1	6.789			
			C	0.45	1.973	0.673	0.85	1	23.251			
T3 259.84-239.84	249.60	1824.47 TA 842.14	A	0.203	2.585	0.591	0.85	1	10.160	2774.50	138.72	C
			B	0.203	2.585	0.591	0.85	1	10.160			
			C	0.553	1.84	0.726	0.85	1	31.220			
T4 239.84-219.84	497.20	1468.30	A	0.162	2.729	0.583	0.85	1	7.276	6513.70*	325.69	C
			B	0.162	2.729	0.583	0.85	1	7.276			
			C	0.997	2.093	1	0.85	1	76.824			
T5 219.84-199.84	497.20	2100.56 TA 842.14	A	0.216	2.543	0.594	0.85	1	10.828	6378.40*	318.92	C
			B	0.216	2.543	0.594	0.85	1	10.828			
			C	1	2.1	1	0.85	1	77.626			
T6 199.84-179.84	574.08	1580.50	A	0.168	2.708	0.584	0.85	1	7.587	6198.45*	309.92	C
			B	0.314	2.259	0.62	0.85	1	15.113			
			C	1	2.1	1	0.85	1	77.623			
T7 179.84-159.84	753.51	2311.02 TA 842.14	A	0.225	2.515	0.596	0.85	1	11.315	6034.46*	301.72	C
			B	0.671	1.777	0.8	0.85	1	41.916			
			C	1	2.1	1	0.85	1	79.627			
T8 159.84-139.84	780.69	1658.72	A	0.171	2.695	0.585	0.85	1	7.764	5793.26*	289.66	C
			B	0.688	1.776	0.812	0.85	1	43.309			
			C	1	2.1	1	0.85	1	79.986			
T9 139.84-119.84	800.86	1790.96	A	0.177	2.675	0.586	0.85	1	8.082	5588.76*	279.44	C
			B	0.718	1.778	0.833	0.85	1	46.649			
			C	1	2.1	1	0.85	1	82.639			
T10 119.84-99.84	827.53	2311.02 TA 842.14	A	0.225	2.515	0.596	0.85	1	11.313	5327.93*	266.40	C
			B	0.735	1.782	0.845	0.85	1	48.410			
			C	1	2.1	1	0.85	1	85.859			
T11 99.84-79.84	899.94	2099.69	A	0.19	2.63	0.588	0.85	1	8.759	5055.65*	252.78	C
			B	0.848	1.859	0.937	0.85	1	62.247			
			C	1	2.1	1	0.85	1	88.504			
T12 79.84-59.84	1102.00	2021.46	A	0.186	2.642	0.588	0.85	1	8.577	4704.67*	235.23	C
			B	1	2.1	1	0.85	1	96.429			
			C	1	2.1	1	0.85	1	88.553			
T13 59.84-39.84	1102.00	2377.63 TA 842.14	A	0.226	2.511	0.596	0.85	1	11.435	4272.33*	213.62	C
			B	1	2.1	1	0.85	1	96.510			
			C	1	2.1	1	0.85	1	88.079			
T14 39.84-19.84	1101.75	2021.46	A	0.186	2.642	0.588	0.85	1	8.577	3797.55*	189.88	C
			B	1	2.1	1	0.85	1	96.387			
			C	1	2.1	1	0.85	1	88.553			
T15 19.84-6.50	708.20	1348.18	A	0.186	2.642	0.588	0.85	1	5.720	2532.97*	189.88	C
			B	1	2.1	1	0.85	1	60.814			
			C	1	2.1	1	0.85	1	58.622			
T16 6.50-0.00	25.80	810.75	A	0.695	1.776	0.816	0.85	1	7.920	385.94	59.38	B
			B	0.787	1.807	0.886	0.85	1	9.297			
			C	0.778	1.801	0.879	0.85	1	9.147			
Sum Weight:	10168.25	36380.04			*$2A_g$ limit					69574.31		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3380.71	A	1	0.59	1	1	1	34.428	869.72	24.74	C
			B	1	0.59	1	1	1	34.428			
			C	1	0.59	1	1	1	34.428			
T1 291.84-279.84	96.30	1411.16	A	0.32	2.245	0.622	1	1	10.744	1596.44	133.04	C
		TA	B	0.32	2.245	0.622	1	1	10.744			
		1035.67	C	0.344	2.184	0.631	1	1	11.575			
T2 279.84-259.84	627.90	1562.29	A	0.244	2.456	0.6	1	1	11.478	4350.42	217.52	C
			B	0.244	2.456	0.6	1	1	11.478			
			C	0.656	1.78	0.789	1	1	47.319			
T3 259.84-239.84	744.15	2176.52	A	0.292	2.318	0.613	1	1	15.527	5092.25	254.61	C
		TA	B	0.292	2.318	0.613	1	1	15.527			
		1035.67	C	0.772	1.798	0.874	1	1	58.388			
T4 239.84-219.84	1387.72	1741.82	A	0.253	2.43	0.603	1	1	11.989	7038.15*	351.91	C
			B	0.253	2.43	0.603	1	1	11.989			
			C	1	2.1	1	1	1	102.001			
T5 219.84-199.84	1387.72	2468.59	A	0.304	2.286	0.617	1	1	16.237	6889.38*	344.47	C
		TA	B	0.304	2.286	0.617	1	1	16.237			
		1035.67	C	1	2.1	1	1	1	101.513			
T6 199.84-179.84	1626.80	1856.37	A	0.257	2.415	0.604	1	1	12.308	6695.01*	334.75	C
			B	0.46	1.957	0.678	1	1	30.115			
			C	1	2.1	1	1	1	102.880			
T7 179.84-159.84	2183.38	2688.21	A	0.312	2.265	0.62	1	1	16.750	6515.48*	325.77	C
		TA	B	0.927	1.964	1	1	1	73.745			
		1035.67	C	1	2.1	1	1	1	103.980			
T8 159.84-139.84	2261.36	1941.40	A	0.261	2.405	0.605	1	1	12.500	6257.36*	312.87	C
			B	0.991	2.082	1	1	1	78.491			
			C	1	2.1	1	1	1	106.354			
T9 139.84-119.84	2332.37	2076.00	A	0.266	2.39	0.606	1	1	12.831	6034.24*	301.71	C
			B	1	2.1	1	1	1	83.398			
			C	1	2.1	1	1	1	110.067			
T10 119.84-99.84	2416.97	2688.21	A	0.312	2.266	0.62	1	1	16.745	5752.63*	287.63	C
		TA	B	1	2.1	1	1	1	83.263			
		1035.67	C	1	2.1	1	1	1	113.817			
T11 99.84-79.84	2647.58	2400.70	A	0.278	2.356	0.609	1	1	13.553	5456.64*	272.83	C
			B	1	2.1	1	1	1	98.952			
			C	1	2.1	1	1	1	119.186			
T12 79.84-59.84	3277.72	2315.66	A	0.274	2.367	0.608	1	1	13.351	5077.83*	253.89	C
			B	1	2.1	1	1	1	141.943			
			C	1	2.1	1	1	1	119.373			
T13 59.84-39.84	3277.72	2750.36	A	0.312	2.264	0.62	1	1	16.854	4611.20*	230.56	C
		TA	B	1	2.1	1	1	1	138.878			
		1035.67	C	1	2.1	1	1	1	117.341			
T14 39.84-19.84	3276.95	2315.66	A	0.274	2.367	0.608	1	1	13.351	4098.76*	204.94	C
			B	1	2.1	1	1	1	141.862			
			C	1	2.1	1	1	1	119.373			
T15 19.84-6.50	2110.00	1544.37	A	0.274	2.367	0.608	1	1	8.904	2733.87*	204.94	C
			B	1	2.1	1	1	1	87.916			
			C	1	2.1	1	1	1	79.698			
T16 6.50-0.00	76.72	962.04	A	0.775	1.799	0.876	1	1	10.412	568.16	87.41	B
			B	0.904	1.93	0.987	1	1	12.752			
			C	0.883	1.901	0.968	1	1	12.357			
Sum Weight:	29731.37	42494.12			*2A_g limit					79637.55		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3380.71	A	1	0.59	1	1	1	34.428	869.72	24.74	C
			B	1	0.59	1	1	1	34.428			
			C	1	0.59	1	1	1	34.428			
T1 291.84-279.84	96.30	1411.16	A	0.32	2.245	0.622	0.825	1	10.097	1537.32	128.11	C
		TA	B	0.32	2.245	0.622	0.825	1	10.097			
		1035.67	C	0.344	2.184	0.631	0.825	1	10.928			
T2 279.84-259.84	627.90	1562.29	A	0.244	2.456	0.6	0.825	1	11.478	3938.61	196.93	C
			B	0.244	2.456	0.6	0.825	1	11.478			
			C	0.656	1.78	0.789	0.825	1	41.701			
T3 259.84-239.84	744.15	2176.52	A	0.292	2.318	0.613	0.825	1	14.884	4567.59	228.38	C
		TA	B	0.292	2.318	0.613	0.825	1	14.884			
		1035.67	C	0.772	1.798	0.874	0.825	1	51.145			
T4 239.84-219.84	1387.72	1741.82	A	0.253	2.43	0.603	0.825	1	11.989	7038.15*	351.91	C
			B	0.253	2.43	0.603	0.825	1	11.989			
			C	1	2.1	1	0.825	1	87.091			
T5 219.84-199.84	1387.72	2468.59	A	0.304	2.286	0.617	0.825	1	15.599	6889.38*	344.47	C
		TA	B	0.304	2.286	0.617	0.825	1	15.599			
		1035.67	C	1	2.1	1	0.825	1	86.843			
T6 199.84-179.84	1626.80	1856.37	A	0.257	2.415	0.604	0.825	1	12.308	6695.01*	334.75	C
			B	0.46	1.957	0.678	0.825	1	27.170			
			C	1	2.1	1	0.825	1	87.970			
T7 179.84-159.84	2183.38	2688.21	A	0.312	2.265	0.62	0.825	1	16.115	6515.48*	325.77	C
		TA	B	0.927	1.964	1	0.825	1	64.099			
		1035.67	C	1	2.1	1	0.825	1	89.334			
T8 159.84-139.84	2261.36	1941.40	A	0.261	2.405	0.605	0.825	1	12.500	6257.36*	312.87	C
			B	0.991	2.082	1	0.825	1	68.893			
			C	1	2.1	1	0.825	1	91.444			
T9 139.84-119.84	2332.37	2076.00	A	0.266	2.39	0.606	0.825	1	12.831	6034.24*	301.71	C
			B	1	2.1	1	0.825	1	73.499			
			C	1	2.1	1	0.825	1	94.564			
T10 119.84-99.84	2416.97	2688.21	A	0.312	2.266	0.62	0.825	1	16.110	5752.63*	287.63	C
		TA	B	1	2.1	1	0.825	1	73.386			
		1035.67	C	1	2.1	1	0.825	1	97.689			
T11 99.84-79.84	2647.58	2400.70	A	0.278	2.356	0.609	0.825	1	13.553	5456.64*	272.83	C
			B	1	2.1	1	0.825	1	86.585			
			C	1	2.1	1	0.825	1	102.364			
T12 79.84-59.84	3277.72	2315.66	A	0.274	2.367	0.608	0.825	1	13.351	5077.83*	253.89	C
			B	1	2.1	1	0.825	1	121.807			
			C	1	2.1	1	0.825	1	102.551			
T13 59.84-39.84	3277.72	2750.36	A	0.312	2.264	0.62	0.825	1	16.223	4611.20*	230.56	C
		TA	B	1	2.1	1	0.825	1	119.379			
		1035.67	C	1	2.1	1	0.825	1	100.941			
T14 39.84-19.84	3276.95	2315.66	A	0.274	2.367	0.608	0.825	1	13.351	4098.76*	204.94	C
			B	1	2.1	1	0.825	1	121.728			
			C	1	2.1	1	0.825	1	102.551			
T15 19.84-6.50	2110.00	1544.37	A	0.274	2.367	0.608	0.825	1	8.904	2733.87*	204.94	C
			B	1	2.1	1	0.825	1	74.710			
			C	1	2.1	1	0.825	1	68.694			
T16 6.50-0.00	76.72	962.04	A	0.775	1.799	0.876	0.825	1	9.288	507.55	78.08	B
			B	0.904	1.93	0.987	0.825	1	11.362			
			C	0.883	1.901	0.968	0.825	1	11.048			
Sum Weight:	29731.37	42494.12			*$2A_g$ limit					78581.34		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3380.71	A	1	0.59	1	1	1	34.428	869.72	24.74	C
			B	1	0.59	1	1	1	34.428			
			C	1	0.59	1	1	1	34.428			
T1 291.84-279.84	96.30	1411.16	A	0.32	2.245	0.622	0.8	1	10.005	1528.87	127.41	C
		TA	B	0.32	2.245	0.622	0.8	1	10.005			
		1035.67	C	0.344	2.184	0.631	0.8	1	10.836			
T2 279.84-259.84	627.90	1562.29	A	0.244	2.456	0.6	0.8	1	11.478	3879.78	193.99	C
			B	0.244	2.456	0.6	0.8	1	11.478			
			C	0.656	1.78	0.789	0.8	1	40.898			
T3 259.84-239.84	744.15	2176.52	A	0.292	2.318	0.613	0.8	1	14.793	4492.64	224.63	C
		TA	B	0.292	2.318	0.613	0.8	1	14.793			
		1035.67	C	0.772	1.798	0.874	0.8	1	50.110			
T4 239.84-219.84	1387.72	1741.82	A	0.253	2.43	0.603	0.8	1	11.989	7038.15*	351.91	C
			B	0.253	2.43	0.603	0.8	1	11.989			
			C	1	2.1	1	0.8	1	84.961			
T5 219.84-199.84	1387.72	2468.59	A	0.304	2.286	0.617	0.8	1	15.507	6889.38*	344.47	C
		TA	B	0.304	2.286	0.617	0.8	1	15.507			
		1035.67	C	1	2.1	1	0.8	1	84.747			
T6 199.84-179.84	1626.80	1856.37	A	0.257	2.415	0.604	0.8	1	12.308	6695.01*	334.75	C
			B	0.46	1.957	0.678	0.8	1	26.750			
			C	1	2.1	1	0.8	1	85.840			
T7 179.84-159.84	2183.38	2688.21	A	0.312	2.265	0.62	0.8	1	16.024	6515.48*	325.77	C
		TA	B	0.927	1.964	1	0.8	1	62.721			
		1035.67	C	1	2.1	1	0.8	1	87.241			
T8 159.84-139.84	2261.36	1941.40	A	0.261	2.405	0.605	0.8	1	12.500	6257.36*	312.87	C
			B	0.991	2.082	1	0.8	1	67.522			
			C	1	2.1	1	0.8	1	89.314			
T9 139.84-119.84	2332.37	2076.00	A	0.266	2.39	0.606	0.8	1	12.831	6034.24*	301.71	C
			B	1	2.1	1	0.8	1	72.085			
			C	1	2.1	1	0.8	1	92.349			
T10 119.84-99.84	2416.97	2688.21	A	0.312	2.266	0.62	0.8	1	16.020	5752.63*	287.63	C
		TA	B	1	2.1	1	0.8	1	71.975			
		1035.67	C	1	2.1	1	0.8	1	95.385			
T11 99.84-79.84	2647.58	2400.70	A	0.278	2.356	0.609	0.8	1	13.553	5456.64*	272.83	C
			B	1	2.1	1	0.8	1	84.818			
			C	1	2.1	1	0.8	1	99.961			
T12 79.84-59.84	3277.72	2315.66	A	0.274	2.367	0.608	0.8	1	13.351	5077.83*	253.89	C
			B	1	2.1	1	0.8	1	118.930			
			C	1	2.1	1	0.8	1	100.148			
T13 59.84-39.84	3277.72	2750.36	A	0.312	2.264	0.62	0.8	1	16.133	4611.20*	230.56	C
		TA	B	1	2.1	1	0.8	1	116.593			
		1035.67	C	1	2.1	1	0.8	1	98.599			
T14 39.84-19.84	3276.95	2315.66	A	0.274	2.367	0.608	0.8	1	13.351	4098.76*	204.94	C
			B	1	2.1	1	0.8	1	118.852			
			C	1	2.1	1	0.8	1	100.148			
T15 19.84-6.50	2110.00	1544.37	A	0.274	2.367	0.608	0.8	1	8.904	2733.87*	204.94	C
			B	1	2.1	1	0.8	1	72.824			
			C	1	2.1	1	0.8	1	67.123			
T16 6.50-0.00	76.72	962.04	A	0.775	1.799	0.876	0.8	1	9.128	498.89	76.75	B
			B	0.904	1.93	0.987	0.8	1	11.163			
			C	0.883	1.901	0.968	0.8	1	10.860			
Sum Weight:	29731.37	42494.12			*$2A_g$ limit					78430.45		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3380.71	A	1	0.59	1	1	1	34.428	869.72	24.74	C
			B	1	0.59	1	1	1	34.428			
			C	1	0.59	1	1	1	34.428			
T1 291.84-279.84	96.30	1411.16	A	0.32	2.245	0.622	0.85	1	10.189	1545.76	128.81	C
		TA	B	0.32	2.245	0.622	0.85	1	10.189			
		1035.67	C	0.344	2.184	0.631	0.85	1	11.020			
T2 279.84-259.84	627.90	1562.29	A	0.244	2.456	0.6	0.85	1	11.478	3997.44	199.87	C
			B	0.244	2.456	0.6	0.85	1	11.478			
			C	0.656	1.78	0.789	0.85	1	42.503			
T3 259.84-239.84	744.15	2176.52	A	0.292	2.318	0.613	0.85	1	14.976	4642.54	232.13	C
		TA	B	0.292	2.318	0.613	0.85	1	14.976			
		1035.67	C	0.772	1.798	0.874	0.85	1	52.180			
T4 239.84-219.84	1387.72	1741.82	A	0.253	2.43	0.603	0.85	1	11.989	7038.15*	351.91	C
			B	0.253	2.43	0.603	0.85	1	11.989			
			C	1	2.1	1	0.85	1	89.221			
T5 219.84-199.84	1387.72	2468.59	A	0.304	2.286	0.617	0.85	1	15.690	6889.38*	344.47	C
		TA	B	0.304	2.286	0.617	0.85	1	15.690			
		1035.67	C	1	2.1	1	0.85	1	88.939			
T6 199.84-179.84	1626.80	1856.37	A	0.257	2.415	0.604	0.85	1	12.308	6695.01*	334.75	C
			B	0.46	1.957	0.678	0.85	1	27.591			
			C	1	2.1	1	0.85	1	90.100			
T7 179.84-159.84	2183.38	2688.21	A	0.312	2.265	0.62	0.85	1	16.206	6515.48*	325.77	C
		TA	B	0.927	1.964	1	0.85	1	65.477			
		1035.67	C	1	2.1	1	0.85	1	91.426			
T8 159.84-139.84	2261.36	1941.40	A	0.261	2.405	0.605	0.85	1	12.500	6257.36*	312.87	C
			B	0.991	2.082	1	0.85	1	70.264			
			C	1	2.1	1	0.85	1	93.574			
T9 139.84-119.84	2332.37	2076.00	A	0.266	2.39	0.606	0.85	1	12.831	6034.24*	301.71	C
			B	1	2.1	1	0.85	1	74.913			
			C	1	2.1	1	0.85	1	96.779			
T10 119.84-99.84	2416.97	2688.21	A	0.312	2.266	0.62	0.85	1	16.201	5752.63*	287.63	C
		TA	B	1	2.1	1	0.85	1	74.797			
		1035.67	C	1	2.1	1	0.85	1	99.993			
T11 99.84-79.84	2647.58	2400.70	A	0.278	2.356	0.609	0.85	1	13.553	5456.64*	272.83	C
			B	1	2.1	1	0.85	1	88.352			
			C	1	2.1	1	0.85	1	104.767			
T12 79.84-59.84	3277.72	2315.66	A	0.274	2.367	0.608	0.85	1	13.351	5077.83*	253.89	C
			B	1	2.1	1	0.85	1	124.683			
			C	1	2.1	1	0.85	1	104.954			
T13 59.84-39.84	3277.72	2750.36	A	0.312	2.264	0.62	0.85	1	16.313	4611.20*	230.56	C
		TA	B	1	2.1	1	0.85	1	122.164			
		1035.67	C	1	2.1	1	0.85	1	103.284			
T14 39.84-19.84	3276.95	2315.66	A	0.274	2.367	0.608	0.85	1	13.351	4098.76*	204.94	C
			B	1	2.1	1	0.85	1	124.604			
			C	1	2.1	1	0.85	1	104.954			
T15 19.84-6.50	2110.00	1544.37	A	0.274	2.367	0.608	0.85	1	8.904	2733.87*	204.94	C
			B	1	2.1	1	0.85	1	76.597			
			C	1	2.1	1	0.85	1	70.266			
T16 6.50-0.00	76.72	962.04	A	0.775	1.799	0.876	0.85	1	9.449	516.21	79.42	B
			B	0.904	1.93	0.987	0.85	1	11.560			
			C	0.883	1.901	0.968	0.85	1	11.235			
Sum Weight:	29731.37	42494.12			*2A_g limit					78732.22		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3139.08	A	1	0.59	1	1	1	31.497	795.71	22.63	C
			B	1	0.59	1	1	1	31.497			
			C	1	0.59	1	1	1	31.497			
T1 291.84-279.84	36.24	1165.49 TA 842.14	A	0.227	2.508	0.596	1	1	7.643	1114.98	92.91	C
			B	0.227	2.508	0.596	1	1	7.643			
			C	0.24	2.468	0.599	1	1	8.014			
T2 279.84-259.84	211.66	1297.93	A	0.152	2.763	0.582	1	1	6.789	2359.32	117.97	C
			B	0.152	2.763	0.582	1	1	6.789			
			C	0.45	1.973	0.673	1	1	23.251			
T3 259.84-239.84	249.60	1824.47 TA 842.14	A	0.203	2.585	0.591	1	1	10.682	2796.50	139.83	C
			B	0.203	2.585	0.591	1	1	10.682			
			C	0.553	1.84	0.726	1	1	31.517			
T4 239.84-219.84	497.20	1468.30	A	0.162	2.729	0.583	1	1	7.276	6513.70*	325.69	C
			B	0.162	2.729	0.583	1	1	7.276			
			C	0.997	2.093	1	1	1	76.824			
T5 219.84-199.84	497.20	2100.56 TA 842.14	A	0.216	2.543	0.594	1	1	11.346	6378.40*	318.92	C
			B	0.216	2.543	0.594	1	1	11.346			
			C	1	2.1	1	1	1	77.626			
T6 199.84-179.84	574.08	1580.50	A	0.168	2.708	0.584	1	1	7.587	6198.45*	309.92	C
			B	0.314	2.259	0.62	1	1	15.113			
			C	1	2.1	1	1	1	77.623			
T7 179.84-159.84	753.51	2311.02 TA 842.14	A	0.225	2.515	0.596	1	1	11.831	6034.46*	301.72	C
			B	0.671	1.777	0.8	1	1	42.135			
			C	1	2.1	1	1	1	79.627			
T8 159.84-139.84	780.69	1658.72	A	0.171	2.695	0.585	1	1	7.764	5793.26*	289.66	C
			B	0.688	1.776	0.812	1	1	43.309			
			C	1	2.1	1	1	1	79.986			
T9 139.84-119.84	800.86	1790.96	A	0.177	2.675	0.586	1	1	8.082	5588.76*	279.44	C
			B	0.718	1.778	0.833	1	1	46.649			
			C	1	2.1	1	1	1	82.996			
T10 119.84-99.84	827.53	2311.02 TA 842.14	A	0.225	2.515	0.596	1	1	11.829	5327.93*	266.40	C
			B	0.735	1.782	0.845	1	1	48.586			
			C	1	2.1	1	1	1	86.773			
T11 99.84-79.84	899.94	2099.69	A	0.19	2.63	0.588	1	1	8.759	5055.65*	252.78	C
			B	0.848	1.859	0.937	1	1	62.247			
			C	1	2.1	1	1	1	89.685			
T12 79.84-59.84	1102.00	2021.46	A	0.186	2.642	0.588	1	1	8.577	4704.67*	235.23	C
			B	1	2.1	1	1	1	96.429			
			C	1	2.1	1	1	1	89.734			
T13 59.84-39.84	1102.00	2377.63 TA 842.14	A	0.226	2.511	0.596	1	1	11.947	4272.33*	213.62	C
			B	1	2.1	1	1	1	96.510			
			C	1	2.1	1	1	1	89.167			
T14 39.84-19.84	1101.75	2021.46	A	0.186	2.642	0.588	1	1	8.577	3797.55*	189.88	C
			B	1	2.1	1	1	1	96.387			
			C	1	2.1	1	1	1	89.734			
T15 19.84-6.50	708.20	1348.18	A	0.186	2.642	0.588	1	1	5.720	2532.97*	189.88	C
			B	1	2.1	1	1	1	60.814			
			C	1	2.1	1	1	1	59.203			
T16 6.50-0.00	25.80	810.75	A	0.695	1.776	0.816	1	1	8.826	418.00	64.31	B
			B	0.787	1.807	0.886	1	1	10.082			
			C	0.778	1.801	0.879	1	1	9.944			
Sum Weight:	10168.25	36380.04			*2A_g limit					69682.63		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3139.08	A	1	0.59	1	1	1	31.497	795.71	22.63	C
			B	1	0.59	1	1	1	31.497			
			C	1	0.59	1	1	1	31.497			
T1 291.84-279.84	36.24	1165.49 TA 842.14	A	0.227	2.508	0.596	0.825	1	7.031	1051.68	87.64	C
			B	0.227	2.508	0.596	0.825	1	7.031			
			C	0.24	2.468	0.599	0.825	1	7.402			
T2 279.84-259.84	211.66	1297.93	A	0.152	2.763	0.582	0.825	1	6.789	2359.32	117.97	C
			B	0.152	2.763	0.582	0.825	1	6.789			
			C	0.45	1.973	0.673	0.825	1	23.251			
T3 259.84-239.84	249.60	1824.47 TA 842.14	A	0.203	2.585	0.591	0.825	1	10.073	2770.83	138.54	C
			B	0.203	2.585	0.591	0.825	1	10.073			
			C	0.553	1.84	0.726	0.825	1	31.170			
T4 239.84-219.84	497.20	1468.30	A	0.162	2.729	0.583	0.825	1	7.276	6513.70*	325.69	C
			B	0.162	2.729	0.583	0.825	1	7.276			
			C	0.997	2.093	1	0.825	1	76.824			
T5 219.84-199.84	497.20	2100.56 TA 842.14	A	0.216	2.543	0.594	0.825	1	10.741	6378.40*	318.92	C
			B	0.216	2.543	0.594	0.825	1	10.741			
			C	1	2.1	1	0.825	1	77.626			
T6 199.84-179.84	574.08	1580.50	A	0.168	2.708	0.584	0.825	1	7.587	6198.45*	309.92	C
			B	0.314	2.259	0.62	0.825	1	15.113			
			C	1	2.1	1	0.825	1	77.623			
T7 179.84-159.84	753.51	2311.02 TA 842.14	A	0.225	2.515	0.596	0.825	1	11.229	6034.46*	301.72	C
			B	0.671	1.777	0.8	0.825	1	41.880			
			C	1	2.1	1	0.825	1	79.627			
T8 159.84-139.84	780.69	1658.72	A	0.171	2.695	0.585	0.825	1	7.764	5793.26*	289.66	C
			B	0.688	1.776	0.812	0.825	1	43.309			
			C	1	2.1	1	0.825	1	79.986			
T9 139.84-119.84	800.86	1790.96	A	0.177	2.675	0.586	0.825	1	8.082	5588.76*	279.44	C
			B	0.718	1.778	0.833	0.825	1	46.649			
			C	1	2.1	1	0.825	1	82.579			
T10 119.84-99.84	827.53	2311.02 TA 842.14	A	0.225	2.515	0.596	0.825	1	11.227	5327.93*	266.40	C
			B	0.735	1.782	0.845	0.825	1	48.380			
			C	1	2.1	1	0.825	1	85.707			
T11 99.84-79.84	899.94	2099.69	A	0.19	2.63	0.588	0.825	1	8.759	5055.65*	252.78	C
			B	0.848	1.859	0.937	0.825	1	62.247			
			C	1	2.1	1	0.825	1	88.308			
T12 79.84-59.84	1102.00	2021.46	A	0.186	2.642	0.588	0.825	1	8.577	4704.67*	235.23	C
			B	1	2.1	1	0.825	1	96.429			
			C	1	2.1	1	0.825	1	88.357			
T13 59.84-39.84	1102.00	2377.63 TA 842.14	A	0.226	2.511	0.596	0.825	1	11.349	4272.33*	213.62	C
			B	1	2.1	1	0.825	1	96.510			
			C	1	2.1	1	0.825	1	87.897			
T14 39.84-19.84	1101.75	2021.46	A	0.186	2.642	0.588	0.825	1	8.577	3797.55*	189.88	C
			B	1	2.1	1	0.825	1	96.387			
			C	1	2.1	1	0.825	1	88.357			
T15 19.84-6.50	708.20	1348.18	A	0.186	2.642	0.588	0.825	1	5.720	2532.97*	189.88	C
			B	1	2.1	1	0.825	1	60.814			
			C	1	2.1	1	0.825	1	58.525			
T16 6.50-0.00	25.80	810.75	A	0.695	1.776	0.816	0.825	1	7.769	380.60	58.55	B
			B	0.787	1.807	0.886	0.825	1	9.166			
			C	0.778	1.801	0.879	0.825	1	9.014			
Sum Weight:	10168.25	36380.04			*2A_g limit					69556.26		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3139.08	A	1	0.59	1	1	1	31.497	795.71	22.63	C
			B	1	0.59	1	1	1	31.497			
			C	1	0.59	1	1	1	31.497			
T1 291.84-279.84	36.24	1165.49 TA 842.14	A	0.227	2.508	0.596	0.8	1	6.943	1042.64	86.89	C
			B	0.227	2.508	0.596	0.8	1	6.943			
			C	0.24	2.468	0.599	0.8	1	7.314			
T2 279.84-259.84	211.66	1297.93	A	0.152	2.763	0.582	0.8	1	6.789	2359.32	117.97	C
			B	0.152	2.763	0.582	0.8	1	6.789			
			C	0.45	1.973	0.673	0.8	1	23.251			
T3 259.84-239.84	249.60	1824.47 TA 842.14	A	0.203	2.585	0.591	0.8	1	9.986	2767.17	138.36	C
			B	0.203	2.585	0.591	0.8	1	9.986			
			C	0.553	1.84	0.726	0.8	1	31.121			
T4 239.84-219.84	497.20	1468.30	A	0.162	2.729	0.583	0.8	1	7.276	6513.70*	325.69	C
			B	0.162	2.729	0.583	0.8	1	7.276			
			C	0.997	2.093	1	0.8	1	76.824			
T5 219.84-199.84	497.20	2100.56 TA 842.14	A	0.216	2.543	0.594	0.8	1	10.655	6378.40*	318.92	C
			B	0.216	2.543	0.594	0.8	1	10.655			
			C	1	2.1	1	0.8	1	77.626			
T6 199.84-179.84	574.08	1580.50	A	0.168	2.708	0.584	0.8	1	7.587	6198.45*	309.92	C
			B	0.314	2.259	0.62	0.8	1	15.113			
			C	1	2.1	1	0.8	1	77.623			
T7 179.84-159.84	753.51	2311.02 TA 842.14	A	0.225	2.515	0.596	0.8	1	11.143	6034.46*	301.72	C
			B	0.671	1.777	0.8	0.8	1	41.843			
			C	1	2.1	1	0.8	1	79.627			
T8 159.84-139.84	780.69	1658.72	A	0.171	2.695	0.585	0.8	1	7.764	5793.26*	289.66	C
			B	0.688	1.776	0.812	0.8	1	43.309			
			C	1	2.1	1	0.8	1	79.986			
T9 139.84-119.84	800.86	1790.96	A	0.177	2.675	0.586	0.8	1	8.082	5588.76*	279.44	C
			B	0.718	1.778	0.833	0.8	1	46.649			
			C	1	2.1	1	0.8	1	82.520			
T10 119.84-99.84	827.53	2311.02 TA 842.14	A	0.225	2.515	0.596	0.8	1	11.141	5327.93*	266.40	C
			B	0.735	1.782	0.845	0.8	1	48.351			
			C	1	2.1	1	0.8	1	85.555			
T11 99.84-79.84	899.94	2099.69	A	0.19	2.63	0.588	0.8	1	8.759	5055.65*	252.78	C
			B	0.848	1.859	0.937	0.8	1	62.247			
			C	1	2.1	1	0.8	1	88.111			
T12 79.84-59.84	1102.00	2021.46	A	0.186	2.642	0.588	0.8	1	8.577	4704.67*	235.23	C
			B	1	2.1	1	0.8	1	96.429			
			C	1	2.1	1	0.8	1	88.160			
T13 59.84-39.84	1102.00	2377.63 TA 842.14	A	0.226	2.511	0.596	0.8	1	11.264	4272.33*	213.62	C
			B	1	2.1	1	0.8	1	96.510			
			C	1	2.1	1	0.8	1	87.716			
T14 39.84-19.84	1101.75	2021.46	A	0.186	2.642	0.588	0.8	1	8.577	3797.55*	189.88	C
			B	1	2.1	1	0.8	1	96.387			
			C	1	2.1	1	0.8	1	88.160			
T15 19.84-6.50	708.20	1348.18	A	0.186	2.642	0.588	0.8	1	5.720	2532.97*	189.88	C
			B	1	2.1	1	0.8	1	60.814			
			C	1	2.1	1	0.8	1	58.428			
T16 6.50-0.00	25.80	810.75	A	0.695	1.776	0.816	0.8	1	7.619	375.25	57.73	B
			B	0.787	1.807	0.886	0.8	1	9.035			
			C	0.778	1.801	0.879	0.8	1	8.881			
Sum Weight:	10168.25	36380.04			*2A_g limit					69538.20		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
L1 327.00-291.84	0.00	3139.08	A	1	0.59	1	1	1	31.497	795.71	22.63	C
			B	1	0.59	1	1	1	31.497			
			C	1	0.59	1	1	1	31.497			
T1 291.84-279.84	36.24	1165.49 TA 842.14	A	0.227	2.508	0.596	0.85	1	7.118	1060.72	88.39	C
			B	0.227	2.508	0.596	0.85	1	7.118			
			C	0.24	2.468	0.599	0.85	1	7.489			
T2 279.84-259.84	211.66	1297.93	A	0.152	2.763	0.582	0.85	1	6.789	2359.32	117.97	C
			B	0.152	2.763	0.582	0.85	1	6.789			
			C	0.45	1.973	0.673	0.85	1	23.251			
T3 259.84-239.84	249.60	1824.47 TA 842.14	A	0.203	2.585	0.591	0.85	1	10.160	2774.50	138.72	C
			B	0.203	2.585	0.591	0.85	1	10.160			
			C	0.553	1.84	0.726	0.85	1	31.220			
T4 239.84-219.84	497.20	1468.30	A	0.162	2.729	0.583	0.85	1	7.276	6513.70*	325.69	C
			B	0.162	2.729	0.583	0.85	1	7.276			
			C	0.997	2.093	1	0.85	1	76.824			
T5 219.84-199.84	497.20	2100.56 TA 842.14	A	0.216	2.543	0.594	0.85	1	10.828	6378.40*	318.92	C
			B	0.216	2.543	0.594	0.85	1	10.828			
			C	1	2.1	1	0.85	1	77.626			
T6 199.84-179.84	574.08	1580.50	A	0.168	2.708	0.584	0.85	1	7.587	6198.45*	309.92	C
			B	0.314	2.259	0.62	0.85	1	15.113			
			C	1	2.1	1	0.85	1	77.623			
T7 179.84-159.84	753.51	2311.02 TA 842.14	A	0.225	2.515	0.596	0.85	1	11.315	6034.46*	301.72	C
			B	0.671	1.777	0.8	0.85	1	41.916			
			C	1	2.1	1	0.85	1	79.627			
T8 159.84-139.84	780.69	1658.72	A	0.171	2.695	0.585	0.85	1	7.764	5793.26*	289.66	C
			B	0.688	1.776	0.812	0.85	1	43.309			
			C	1	2.1	1	0.85	1	79.986			
T9 139.84-119.84	800.86	1790.96	A	0.177	2.675	0.586	0.85	1	8.082	5588.76*	279.44	C
			B	0.718	1.778	0.833	0.85	1	46.649			
			C	1	2.1	1	0.85	1	82.639			
T10 119.84-99.84	827.53	2311.02 TA 842.14	A	0.225	2.515	0.596	0.85	1	11.313	5327.93*	266.40	C
			B	0.735	1.782	0.845	0.85	1	48.410			
			C	1	2.1	1	0.85	1	85.859			
T11 99.84-79.84	899.94	2099.69	A	0.19	2.63	0.588	0.85	1	8.759	5055.65*	252.78	C
			B	0.848	1.859	0.937	0.85	1	62.247			
			C	1	2.1	1	0.85	1	88.504			
T12 79.84-59.84	1102.00	2021.46	A	0.186	2.642	0.588	0.85	1	8.577	4704.67*	235.23	C
			B	1	2.1	1	0.85	1	96.429			
			C	1	2.1	1	0.85	1	88.553			
T13 59.84-39.84	1102.00	2377.63 TA 842.14	A	0.226	2.511	0.596	0.85	1	11.435	4272.33*	213.62	C
			B	1	2.1	1	0.85	1	96.510			
			C	1	2.1	1	0.85	1	88.079			
T14 39.84-19.84	1101.75	2021.46	A	0.186	2.642	0.588	0.85	1	8.577	3797.55*	189.88	C
			B	1	2.1	1	0.85	1	96.387			
			C	1	2.1	1	0.85	1	88.553			
T15 19.84-6.50	708.20	1348.18	A	0.186	2.642	0.588	0.85	1	5.720	2532.97*	189.88	C
			B	1	2.1	1	0.85	1	60.814			
			C	1	2.1	1	0.85	1	58.622			
T16 6.50-0.00	25.80	810.75	A	0.695	1.776	0.816	0.85	1	7.920	385.94	59.38	B
			B	0.787	1.807	0.886	0.85	1	9.297			
			C	0.778	1.801	0.879	0.85	1	9.147			
Sum Weight:	10168.25	36380.04			*$2A_g$ limit					69574.31		

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	19662.04			
Bracing Weight	16718.00			
Total Member Self-Weight	36380.04			
Guy Weight	11216.35			
Total Weight	65930.39			
Wind 0 deg - No Ice		-249.56	-92732.96	21724.00
Wind 30 deg - No Ice		46547.45	-79776.28	24347.55
Wind 45 deg - No Ice		65819.33	-64953.52	23208.91
Wind 60 deg - No Ice		80468.00	-45933.81	20828.82
Wind 90 deg - No Ice		93218.85	83.86	13044.00
Wind 120 deg - No Ice		81032.82	46384.50	1421.15
Wind 135 deg - No Ice		66199.57	65460.99	-4820.43
Wind 150 deg - No Ice		46963.13	80219.66	-10942.39
Wind 180 deg - No Ice		341.84	92363.49	-20504.61
Wind 210 deg - No Ice		-46852.72	79565.33	-24016.12
Wind 225 deg - No Ice		-66258.15	64846.53	-23359.02
Wind 240 deg - No Ice		-81186.14	45846.82	-21184.64
Wind 270 deg - No Ice		-93618.11	-292.87	-12842.83
Wind 300 deg - No Ice		-81300.86	-46471.36	-1333.92
Wind 315 deg - No Ice		-66635.52	-65548.17	4557.16
Wind 330 deg - No Ice		-47479.50	-80174.10	10485.70
Member Ice	6114.08			
Guy Ice	8099.59			
Total Weight Ice	104248.17			
Wind 0 deg - Ice		-274.71	-106674.61	24043.29
Wind 30 deg - Ice		53128.52	-91142.04	23177.58
Wind 45 deg - Ice		75038.10	-74134.59	20370.67
Wind 60 deg - Ice		91640.88	-52360.83	16530.96
Wind 90 deg - Ice		106396.43	87.00	6751.78
Wind 120 deg - Ice		93141.46	53357.36	-5260.81
Wind 135 deg - Ice		75429.69	74661.09	-10894.61
Wind 150 deg - Ice		53559.29	91600.91	-16093.99
Wind 180 deg - Ice		352.67	105229.24	-22809.00
Wind 210 deg - Ice		-53438.15	90924.81	-22838.07
Wind 225 deg - Ice		-75492.56	74019.57	-20522.01
Wind 240 deg - Ice		-93303.79	52789.20	-16773.03
Wind 270 deg - Ice		-106808.06	-311.78	-6514.37
Wind 300 deg - Ice		-92500.70	-52919.79	5251.25
Wind 315 deg - Ice		-75882.34	-74751.96	10614.93
Wind 330 deg - Ice		-54097.27	-91556.13	15608.97
Total Weight	65930.39			
Wind 0 deg - Service		-249.56	-92732.96	21724.00
Wind 30 deg - Service		46547.45	-79776.28	24347.55
Wind 45 deg - Service		65819.33	-64953.52	23208.91
Wind 60 deg - Service		80468.00	-45933.81	20828.82
Wind 90 deg - Service		93218.85	83.86	13044.00
Wind 120 deg - Service		81032.82	46384.50	1421.15
Wind 135 deg - Service		66199.57	65460.99	-4820.43
Wind 150 deg - Service		46963.13	80219.66	-10942.39
Wind 180 deg - Service		341.84	92363.49	-20504.61
Wind 210 deg - Service		-46852.72	79565.33	-24016.12
Wind 225 deg - Service		-66258.15	64846.53	-23359.02
Wind 240 deg - Service		-81186.14	45846.82	-21184.64
Wind 270 deg - Service		-93618.11	-292.87	-12842.83
Wind 300 deg - Service		-81300.86	-46471.36	-1333.92
Wind 315 deg - Service		-66635.52	-65548.17	4557.16
Wind 330 deg - Service		-47479.50	-80174.10	10485.70

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 45 deg - No Ice+Guy
5	Dead+Wind 60 deg - No Ice+Guy
6	Dead+Wind 90 deg - No Ice+Guy
7	Dead+Wind 120 deg - No Ice+Guy
8	Dead+Wind 135 deg - No Ice+Guy
9	Dead+Wind 150 deg - No Ice+Guy
10	Dead+Wind 180 deg - No Ice+Guy
11	Dead+Wind 210 deg - No Ice+Guy
12	Dead+Wind 225 deg - No Ice+Guy
13	Dead+Wind 240 deg - No Ice+Guy
14	Dead+Wind 270 deg - No Ice+Guy
15	Dead+Wind 300 deg - No Ice+Guy
16	Dead+Wind 315 deg - No Ice+Guy
17	Dead+Wind 330 deg - No Ice+Guy
18	Dead+Ice+Temp+Guy
19	Dead+Wind 0 deg+Ice+Temp+Guy
20	Dead+Wind 30 deg+Ice+Temp+Guy
21	Dead+Wind 45 deg+Ice+Temp+Guy
22	Dead+Wind 60 deg+Ice+Temp+Guy
23	Dead+Wind 90 deg+Ice+Temp+Guy
24	Dead+Wind 120 deg+Ice+Temp+Guy
25	Dead+Wind 135 deg+Ice+Temp+Guy
26	Dead+Wind 150 deg+Ice+Temp+Guy
27	Dead+Wind 180 deg+Ice+Temp+Guy
28	Dead+Wind 210 deg+Ice+Temp+Guy
29	Dead+Wind 225 deg+Ice+Temp+Guy
30	Dead+Wind 240 deg+Ice+Temp+Guy
31	Dead+Wind 270 deg+Ice+Temp+Guy
32	Dead+Wind 300 deg+Ice+Temp+Guy
33	Dead+Wind 315 deg+Ice+Temp+Guy
34	Dead+Wind 330 deg+Ice+Temp+Guy
35	Dead+Wind 0 deg - Service+Guy
36	Dead+Wind 30 deg - Service+Guy
37	Dead+Wind 45 deg - Service+Guy
38	Dead+Wind 60 deg - Service+Guy
39	Dead+Wind 90 deg - Service+Guy
40	Dead+Wind 120 deg - Service+Guy
41	Dead+Wind 135 deg - Service+Guy
42	Dead+Wind 150 deg - Service+Guy
43	Dead+Wind 180 deg - Service+Guy
44	Dead+Wind 210 deg - Service+Guy
45	Dead+Wind 225 deg - Service+Guy
46	Dead+Wind 240 deg - Service+Guy
47	Dead+Wind 270 deg - Service+Guy
48	Dead+Wind 300 deg - Service+Guy
49	Dead+Wind 315 deg - Service+Guy
50	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
L1	327 - 291.84	Pole	Max Tension	28	0.03	-2.87	-9.14
			Max. Compression	24	-3879.36	-23285.10	-13352.77
			Max. Mx	31	-3872.56	27490.35	373.14
			Max. My	27	-3868.55	-16.60	-27408.57
			Max. Vy	31	-1545.15	27490.35	373.14
			Max. Vx	27	1557.54	-16.60	-27408.57
			Max. Torque	28			-252.84
T1	291.84 - 279.84	Leg	Max Tension	32	9792.59	-683.43	-457.29
			Max. Compression	27	-28817.56	-167.05	-815.45
			Max. Mx	22	9761.99	-2704.07	1544.56
			Max. My	27	9538.58	1.55	-3142.28
			Max. Vy	22	1175.21	-2704.07	1544.56
			Max. Vx	27	1358.45	1.55	-3142.28
		Diagonal	Max Tension	19	4978.91	0.00	0.00
			Max. Compression	26	-5322.94	0.00	0.00
			Max. Mx	24	2914.96	13.56	0.00
			Max. My	28	2099.07	0.00	0.13
			Max. Vy	24	-11.45	0.00	0.00
			Max. Vx	28	-0.11	0.00	0.00
		Horizontal	Max Tension	22	1050.14	0.00	0.00
			Max. Compression	23	-914.72	0.00	0.00
			Max. Mx	18	498.85	6.03	0.00
			Max. My	20	-53.12	0.00	0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	29	0.04	-1.99	-0.01
			Max. Compression	24	-0.04	-1.76	-0.01
			Max. Mx	20	0.00	-2.52	0.01
			Max. My	2	-0.00	-1.30	0.01
			Max. Vy	20	4.66	-2.52	0.01
			Max. Vx	2	-0.01	-1.30	0.01
		Top Girt	Max Tension	24	0.06	0.00	0.00
			Max. Compression	24	-0.06	0.00	0.00
			Max. Mx	29	-0.00	6.03	0.00
			Max. My	28	0.04	0.00	0.00
			Max. Vy	29	-6.58	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	19570.23		
			Top Tension	27	20157.16		
			Top Cable Vert	27	16627.17		
			Top Cable Norm	27	11395.09		
			Top Cable Tan	27	14.72		
			Bot Cable Vert	27	-15014.93		
			Bot Cable Norm	27	12551.72		
			Bot Cable Tan	27	16.42		
		Guy B	Bottom Tension	32	18503.04		
			Top Tension	32	19029.25		
			Top Cable Vert	32	15083.19		
			Top Cable Norm	32	11602.12		
			Top Cable Tan	32	14.28		
			Bot Cable Vert	32	-13563.79		
			Bot Cable Norm	32	12585.14		
			Bot Cable Tan	32	14.55		
		Guy C	Bottom Tension	22	19376.86		
			Top Tension	22	19957.63		
			Top Cable Vert	22	16405.67		
			Top Cable Norm	22	11364.89		
			Top Cable Tan	22	13.89		
			Bot Cable Vert	22	-14802.16		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Norm	22	12504.33		
			Bot Cable Tan	22	17.03		
		Top Guy Pull-Off	Max Tension	28	5681.44	0.00	0.00
			Max. Compression	20	-5000.58	0.00	0.00
			Max. Mx	18	183.35	72.45	0.00
			Max. My	28	-1242.63	0.00	0.00
			Max. Vy	18	-79.03	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
		Torque Arm Top	Max Tension	34	9859.95	-25393.85	0.00
			Max. Compression	26	-1438.53	-59359.10	0.00
			Max. Mx	27	35.80	-64330.58	-0.00
			Max. My	28	7074.13	-38807.67	-0.01
			Max. Vy	27	16150.42	-64330.58	-0.00
			Max. Vx	28	-0.00	-38807.67	-0.00
T2	279.84 - 259.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-34395.92	-152.86	-196.36
			Max. Mx	32	-30760.80	-662.75	-146.12
			Max. My	27	-32450.19	152.77	703.12
			Max. Vy	23	1053.29	-243.81	-34.42
			Max. Vx	19	-1095.80	-470.48	-125.87
		Diagonal	Max Tension	28	3168.74	0.00	0.00
			Max. Compression	20	-3564.69	0.00	0.00
			Max. Mx	24	1901.67	14.19	0.00
			Max. My	20	-681.82	0.00	-0.15
			Max. Vy	24	-11.46	0.00	0.00
			Max. Vx	20	-0.12	0.00	0.00
		Horizontal	Max Tension	27	413.56	0.00	0.00
			Max. Compression	19	-410.23	0.00	0.00
			Max. Mx	18	90.66	6.03	0.00
			Max. My	20	340.03	0.00	0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Secondary Horizontal	Max Tension	29	0.03	-1.92	-0.00
			Max. Compression	25	-0.04	-1.65	-0.01
			Max. Mx	20	-0.00	-2.32	0.01
			Max. My	2	-0.00	-1.23	0.01
			Max. Vy	20	4.56	-2.32	0.01
			Max. Vx	2	-0.01	-1.23	0.01
		Top Girt	Max Tension	21	1586.96	0.00	0.00
			Max. Compression	29	-993.46	0.00	0.00
			Max. Mx	18	184.24	6.03	0.00
			Max. My	28	-146.13	0.00	0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
T3	259.84 - 239.84	Leg	Max Tension	7	3986.63	52.75	-109.25
			Max. Compression	27	-81922.59	378.98	-45.11
			Max. Mx	22	-63667.80	2949.71	-1263.20
			Max. My	27	-64670.28	-330.43	3228.50
			Max. Vy	31	-1470.32	325.45	40.63
			Max. Vx	19	-1472.15	-191.94	298.04
		Diagonal	Max Tension	20	6210.61	0.00	0.00
			Max. Compression	28	-7151.78	0.00	0.00
			Max. Mx	25	-2043.56	14.18	0.00
			Max. My	28	1639.84	0.00	0.13
			Max. Vy	25	-11.45	0.00	0.00
			Max. Vx	28	0.10	0.00	0.00
		Horizontal	Max Tension	23	713.76	0.00	0.00
			Max. Compression	24	-897.02	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	18	-116.58	6.03	0.00
			Max. My	28	-669.62	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	29	0.03	-1.67	-0.00
			Max. Compression	25	-0.03	-1.68	-0.01
			Max. Mx	20	-0.00	-2.24	0.00
			Max. My	2	-0.00	-0.83	0.01
			Max. Vy	20	4.51	-2.24	0.00
			Max. Vx	2	-0.01	0.00	0.00
		Top Girt	Max Tension	21	1843.42	0.00	0.00
			Max. Compression	29	-659.79	0.00	0.00
			Max. Mx	18	393.08	6.03	0.00
			Max. My	28	-593.59	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Guy A	Bottom Tension	27	21360.88		
			Top Tension	27	21891.96		
			Top Cable Vert	27	17313.86		
			Top Cable Norm	27	13397.31		
			Top Cable Tan	27	12.53		
			Bot Cable Vert	27	-15836.83		
			Bot Cable Norm	27	14334.64		
			Bot Cable Tan	27	14.72		
		Guy B	Bottom Tension	32	20219.60		
			Top Tension	32	20689.96		
			Top Cable Vert	32	15547.04		
			Top Cable Norm	32	13651.51		
			Top Cable Tan	32	12.23		
			Bot Cable Vert	32	-14169.46		
			Bot Cable Norm	32	14424.24		
			Bot Cable Tan	32	12.79		
		Guy C	Bottom Tension	22	21159.78		
			Top Tension	22	21684.69		
			Top Cable Vert	22	17073.19		
			Top Cable Norm	22	13369.07		
			Top Cable Tan	22	11.94		
			Bot Cable Vert	22	-15605.48		
			Bot Cable Norm	22	14290.04		
			Bot Cable Tan	22	15.10		
		Top Guy Pull-Off	Max Tension	20	9216.21	0.00	0.00
			Max. Compression	28	-8077.12	0.00	0.00
			Max. Mx	18	340.26	72.45	0.00
			Max. My	20	9216.21	0.00	-0.00
			Max. Vy	18	-79.03	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Torque Arm Top	Max Tension	34	12773.52	-20314.60	0.00
			Max. Compression	26	-3880.43	-61522.94	-0.00
			Max. Mx	27	-2218.65	-66983.65	-0.00
			Max. My	20	808.60	-62143.57	0.01
			Max. Vy	27	16812.93	-66983.65	-0.00
			Max. Vx	20	0.00	-62143.57	0.00
T4	239.84 - 219.84	Leg	Max Tension	7	4594.41	-80.52	90.29
			Max. Compression	27	-81785.24	-375.24	48.89
			Max. Mx	32	-46926.05	-718.39	-40.16
			Max. My	27	-50542.02	338.07	683.82
			Max. Vy	32	373.30	331.64	-187.40
			Max. Vx	20	317.76	35.32	356.05
		Diagonal	Max Tension	23	7562.79	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. Compression	31	-8521.01	0.00	0.00
			Max. Mx	25	-1614.25	14.16	0.00
			Max. My	20	-2470.15	0.00	-0.10
			Max. Vy	25	-11.43	0.00	0.00
			Max. Vx	20	0.08	0.00	0.00
		Horizontal	Max Tension	21	792.46	0.00	0.00
			Max. Compression	7	-411.02	0.00	0.00
			Max. Mx	33	-44.63	6.03	0.00
			Max. My	28	-152.83	0.00	-0.00
			Max. Vy	33	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	13	0.02	-1.02	-0.00
			Max. Compression	25	-0.03	-1.61	-0.00
			Max. Mx	20	0.00	-2.04	0.00
			Max. My	2	-0.00	-0.93	0.01
			Max. Vy	20	4.40	-2.04	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	22	2189.03	0.00	0.00
			Max. Compression	30	-1676.53	0.00	0.00
			Max. Mx	18	196.16	6.03	0.00
			Max. My	28	-1387.90	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T5	219.84 - 199.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-94824.03	583.48	-20.68
			Max. Mx	22	-73943.68	3035.79	-1075.33
			Max. My	27	-41430.73	-395.42	-3375.98
			Max. Vy	22	1226.50	-991.73	-94.41
			Max. Vx	27	1237.33	-395.42	-3375.98
		Diagonal	Max Tension	26	8195.42	0.00	0.00
			Max. Compression	34	-9618.50	0.00	0.00
			Max. Mx	25	-5701.56	16.50	0.00
			Max. My	28	4188.24	0.00	0.10
			Max. Vy	25	-13.32	0.00	0.00
			Max. Vx	28	-0.08	0.00	0.00
		Horizontal	Max Tension	28	1361.58	0.00	0.00
			Max. Compression	19	-837.57	0.00	0.00
			Max. Mx	18	352.99	6.03	0.00
			Max. My	12	-578.57	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	12	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	13	0.02	-1.08	-0.00
			Max. Compression	7	-0.02	-1.20	-0.00
			Max. Mx	20	0.00	-1.89	0.00
			Max. My	2	-0.00	-1.06	0.00
			Max. Vy	20	4.32	-1.89	0.00
			Max. Vx	2	-0.00	0.00	0.00
		Top Girt	Max Tension	28	1008.48	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	481.70	6.03	0.00
			Max. My	28	708.95	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Guy A	Bottom Tension	27	23666.40		
			Top Tension	27	24121.79		
			Top Cable Vert	27	17733.79		
			Top Cable Norm	27	16351.56		
			Top Cable Tan	27	10.22		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Bot Cable Vert	27	-16449.62		
			Bot Cable Norm	27	17014.95		
			Bot Cable Tan	27	11.92		
		Guy B	Bottom Tension	32	22357.83		
			Top Tension	32	22752.40		
			Top Cable Vert	32	15553.19		
			Top Cable Norm	32	16606.32		
			Top Cable Tan	32	9.23		
			Bot Cable Vert	32	-14376.86		
			Bot Cable Norm	32	17122.45		
			Bot Cable Tan	32	10.79		
		Guy C	Bottom Tension	22	23426.27		
			Top Tension	22	23875.48		
			Top Cable Vert	22	17441.25		
			Top Cable Norm	22	16304.63		
			Top Cable Tan	22	9.76		
			Bot Cable Vert	22	-16167.17		
			Bot Cable Norm	22	16953.24		
			Bot Cable Tan	22	12.18		
		Top Guy Pull-Off	Max Tension	20	14142.58	0.00	0.00
			Max. Compression	28	-12529.27	0.00	0.00
			Max. Mx	18	484.80	72.45	0.00
			Max. My	3	-3882.54	0.00	0.00
			Max. Vy	18	-79.03	0.00	0.00
			Max. Vx	3	-0.00	0.00	0.00
		Torque Arm Top	Max Tension	34	16880.32	0.00	0.00
			Max. Compression	26	-7071.42	-63316.34	0.00
			Max. Mx	27	-4811.82	-68631.10	-0.00
			Max. My	20	-186.88	-63661.49	0.00
			Max. Vy	27	17224.32	-68631.10	-0.00
			Max. Vx	20	0.00	-63661.49	0.00
T6	199.84 - 179.84	Leg	Max Tension	7	3395.62	156.69	-218.51
			Max. Compression	27	-96360.40	583.23	22.38
			Max. Mx	24	-85005.26	869.90	-24.14
			Max. My	27	-62395.64	267.91	841.65
			Max. Vy	31	1656.66	710.59	24.30
			Max. Vx	19	1842.94	-304.36	683.20
		Diagonal	Max Tension	34	8508.52	0.00	0.00
			Max. Compression	26	-10228.52	0.00	0.00
			Max. Mx	27	6810.27	11.96	0.00
			Max. My	28	-5568.78	0.00	0.08
			Max. Vy	27	-9.65	0.00	0.00
			Max. Vx	28	-0.07	0.00	0.00
		Horizontal	Max Tension	32	2715.74	0.00	0.00
			Max. Compression	24	-1749.85	0.00	0.00
			Max. Mx	18	361.37	6.03	0.00
			Max. My	27	2201.93	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	27	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	22	0.02	-1.16	-0.00
			Max. Compression	32	-0.01	-1.48	-0.00
			Max. Mx	20	0.01	-1.63	-0.00
			Max. My	27	-0.00	-0.35	0.00
			Max. Vy	20	4.18	-1.63	-0.00
			Max. Vx	27	-0.00	0.00	0.00
		Top Girt	Max Tension	32	1217.94	0.00	0.00
			Max. Compression	7	-290.47	0.00	0.00
			Max. Mx	18	344.26	6.03	0.00
			Max. My	28	632.97	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	18	-6.58	0.00	0.00
			Max. Vx	28	-0.00	0.00	0.00
T7	179.84 - 159.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-105912.79	571.07	-411.39
			Max. Mx	23	-34174.18	-3256.18	565.67
			Max. My	27	-24726.68	410.64	-3374.17
			Max. Vy	23	1285.58	-3256.18	565.67
			Max. Vx	27	1261.87	410.64	-3374.17
		Diagonal	Max Tension	26	12171.98	0.00	0.00
			Max. Compression	34	-13400.13	0.00	0.00
			Max. Mx	27	8171.88	16.50	0.00
			Max. My	28	-6670.41	0.00	0.11
			Max. Vy	27	-13.31	0.00	0.00
			Max. Vx	28	-0.09	0.00	0.00
		Horizontal	Max Tension	28	1417.11	0.00	0.00
			Max. Compression	7	-472.21	0.00	0.00
			Max. Mx	18	429.96	6.03	0.00
			Max. My	20	899.80	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	22	0.02	-1.17	-0.00
			Max. Compression	32	-0.01	-1.48	-0.00
			Max. Mx	34	-0.01	-1.60	0.00
			Max. My	27	-0.00	-0.40	0.00
			Max. Vy	34	4.17	-1.60	0.00
			Max. Vx	27	-0.00	0.00	0.00
		Top Girt	Max Tension	21	929.84	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	381.47	6.03	0.00
			Max. My	27	928.40	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	27	0.00	0.00	0.00
		Guy A	Bottom Tension	27	25253.00		
			Top Tension	27	25614.09		
			Top Cable Vert	27	16539.53		
			Top Cable Norm	27	19558.26		
			Top Cable Tan	27	8.76		
			Bot Cable Vert	27	-15505.40		
			Bot Cable Norm	27	19932.30		
			Bot Cable Tan	27	7.32		
		Guy B	Bottom Tension	32	23703.76		
			Top Tension	32	24003.78		
			Top Cable Vert	32	13789.60		
			Top Cable Norm	32	19647.60		
			Top Cable Tan	32	4.75		
			Bot Cable Vert	32	-12868.65		
			Bot Cable Norm	32	19906.44		
			Bot Cable Tan	32	9.40		
		Guy C	Bottom Tension	22	24958.14		
			Top Tension	22	25313.01		
			Top Cable Vert	22	16180.16		
			Top Cable Norm	22	19466.66		
			Top Cable Tan	22	8.55		
			Bot Cable Vert	22	-15156.69		
			Bot Cable Norm	22	19828.85		
			Bot Cable Tan	22	7.36		
		Top Guy Pull-Off	Max Tension	28	19866.22	0.00	0.00
			Max. Compression	20	-17600.56	0.00	0.00
			Max. Mx	18	677.93	72.45	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. My	27	-13493.51	0.00	-0.00
			Max. Vy	18	-79.03	0.00	0.00
			Max. Vx	27	0.00	0.00	0.00
		Torque Arm Top	Max Tension	26	21332.23	0.00	0.00
			Max. Compression	26	-10382.00	0.00	0.00
			Max. Mx	27	-6565.61	-63406.49	-0.00
			Max. My	28	-1034.49	-60138.79	-0.00
			Max. Vy	27	15919.67	-63406.49	-0.00
			Max. Vx	28	-0.00	-60138.79	-0.00
T8	159.84 - 139.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-106244.62	792.83	-50.81
			Max. Mx	25	-106244.62	792.83	-50.81
			Max. My	34	-95165.68	-233.78	-693.84
			Max. Vy	26	-491.97	-711.13	61.76
			Max. Vx	28	-463.18	302.10	-642.58
		Diagonal	Max Tension	23	7809.70	0.00	0.00
			Max. Compression	31	-9385.06	0.00	0.00
			Max. Mx	28	-2498.46	14.12	0.00
			Max. My	20	-2522.42	0.00	-0.10
			Max. Vy	28	-11.40	0.00	0.00
			Max. Vx	20	0.08	0.00	0.00
		Horizontal	Max Tension	21	1160.12	0.00	0.00
			Max. Compression	13	-25.96	0.00	0.00
			Max. Mx	23	642.02	6.03	0.00
			Max. My	20	946.48	0.00	-0.00
			Max. Vy	23	-6.58	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	23	0.01	-1.52	-0.00
			Max. Compression	31	-0.01	-1.55	-0.00
			Max. Mx	24	0.00	-1.58	0.00
			Max. My	27	-0.00	-0.66	0.00
			Max. Vy	24	4.15	-1.58	0.00
			Max. Vx	27	-0.00	0.00	0.00
		Top Girt	Max Tension	21	1156.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	552.33	6.03	0.00
			Max. My	27	1072.36	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	27	0.00	0.00	0.00
T9	139.84 - 119.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-108277.86	371.80	726.34
			Max. Mx	25	-107711.95	852.99	-36.58
			Max. My	23	-100779.71	405.23	756.11
			Max. Vy	23	644.97	-780.84	60.39
			Max. Vx	22	-526.14	401.91	716.77
		Diagonal	Max Tension	29	3704.63	0.00	0.00
			Max. Compression	20	-6129.58	0.00	0.00
			Max. Mx	28	3670.54	11.97	0.00
			Max. My	20	478.25	0.00	-0.10
			Max. Vy	28	-9.66	0.00	0.00
			Max. Vx	20	0.08	0.00	0.00
		Horizontal	Max Tension	23	1329.45	0.00	0.00
			Max. Compression	7	-23.00	0.00	0.00
			Max. Mx	18	539.46	6.03	0.00
			Max. My	20	1169.80	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Secondary	Max Tension	23	0.02	-1.51	-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. Compression	31	-0.02	-1.52	-0.00
			Max. Mx	31	-0.01	-1.54	-0.00
			Max. My	19	0.00	-0.96	0.00
			Max. Vy	31	4.13	-1.54	-0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	22	1242.66	0.00	0.00
			Max. Compression	13	-37.94	0.00	0.00
			Max. Mx	18	485.02	6.03	0.00
			Max. My	28	1075.88	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T10	119.84 - 99.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-117587.83	496.39	-1122.29
			Max. Mx	23	-77640.00	-2405.98	10.34
			Max. My	27	-66713.49	712.93	-2249.51
			Max. Vy	31	-1503.57	953.52	-685.52
			Max. Vx	27	956.50	631.03	-846.27
		Diagonal	Max Tension	23	12317.82	0.00	0.00
			Max. Compression	26	-15057.50	0.00	0.00
			Max. Mx	28	5082.00	16.51	0.00
			Max. My	20	1785.37	0.00	-0.14
			Max. Vy	28	-13.33	0.00	0.00
			Max. Vx	20	0.11	0.00	0.00
		Horizontal	Max Tension	31	1985.40	0.00	0.00
			Max. Compression	6	-784.59	0.00	0.00
			Max. Mx	22	12.10	6.03	0.00
			Max. My	20	964.86	0.00	-0.00
			Max. Vy	22	-6.58	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	23	0.02	-1.51	-0.00
			Max. Compression	31	-0.02	-1.49	-0.00
			Max. Mx	18	0.00	-1.53	0.00
			Max. My	19	0.00	-0.83	0.00
			Max. Vy	18	4.12	-1.53	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	21	1164.27	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	544.24	6.03	0.00
			Max. My	28	1076.26	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Guy A	Bottom Tension	27	20533.85		
			Top Tension	27	20727.34		
			Top Cable Vert	27	10325.84		
			Top Cable Norm	27	17972.19		
			Top Cable Tan	27	6.29		
			Bot Cable Vert	27	-9709.66		
			Bot Cable Norm	27	18093.13		
			Bot Cable Tan	27	2.46		
		Guy B	Bottom Tension	32	19593.04		
			Top Tension	32	19738.54		
			Top Cable Vert	32	7841.39		
			Top Cable Norm	32	18114.15		
			Top Cable Tan	32	4.77		
			Bot Cable Vert	32	-7313.20		
			Bot Cable Norm	32	18177.02		
			Bot Cable Tan	32	2.45		
		Guy C	Bottom Tension	22	20520.49		
			Top Tension	22	20709.08		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Cable Vert	22	10118.18		
			Top Cable Norm	22	18069.00		
			Top Cable Tan	22	7.11		
			Bot Cable Vert	22	-9510.44		
			Bot Cable Norm	22	18183.57		
			Bot Cable Tan	22	1.52		
		Top Guy Pull-Off	Max Tension	28	19137.88	0.00	0.00
			Max. Compression	20	-16799.90	0.00	0.00
			Max. Mx	32	17152.88	72.45	0.00
			Max. My	28	-5751.27	0.00	-0.00
			Max. Vy	32	-79.03	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Torque Arm Top	Max Tension	31	20230.26	-4502.71	-0.00
			Max. Compression	31	-10118.13	0.00	0.00
			Max. Mx	27	-7704.17	-39705.49	-0.00
			Max. My	28	-4474.60	-17180.19	-0.00
			Max. Vy	27	10001.24	-39705.49	-0.00
			Max. Vx	28	-0.00	-17180.19	-0.00
T11	99.84 - 79.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-162576.40	-446.00	-1101.07
			Max. Mx	25	-149760.41	1237.59	-9.41
			Max. My	21	-160161.29	-486.05	-1110.62
			Max. Vy	23	1344.83	-1045.51	130.78
			Max. Vx	27	1270.11	351.19	-897.06
		Diagonal	Max Tension	34	8993.57	0.00	0.00
			Max. Compression	26	-11940.05	0.00	0.00
			Max. Mx	24	-1519.45	14.17	0.00
			Max. My	20	-3227.60	0.00	-0.14
			Max. Vy	24	-11.44	0.00	0.00
			Max. Vx	20	0.11	0.00	0.00
		Horizontal	Max Tension	27	2375.66	0.00	0.00
			Max. Compression	2	-480.70	0.00	0.00
			Max. Mx	24	1334.78	6.03	0.00
			Max. My	20	2075.73	0.00	-0.00
			Max. Vy	24	-6.58	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	24	0.03	-1.28	-0.00
			Max. Compression	30	-0.02	-0.89	-0.00
			Max. Mx	18	0.00	-1.52	0.00
			Max. My	19	0.01	-0.70	0.01
			Max. Vy	18	4.12	-1.52	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	26	1364.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	710.16	6.03	0.00
			Max. My	28	1238.39	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T12	79.84 - 59.84	Leg	Max Tension	7	540.15	-77.27	480.38
			Max. Compression	22	-167120.81	679.65	964.11
			Max. Mx	24	-134446.94	1296.82	42.27
			Max. My	21	-158734.53	-369.77	-1159.92
			Max. Vy	26	-736.21	-1108.68	132.74
			Max. Vx	24	667.78	-303.93	-947.76
		Diagonal	Max Tension	6	3560.40	0.00	0.00
			Max. Compression	31	-5750.97	0.00	0.00
			Max. Mx	24	3351.03	12.02	0.00
			Max. My	20	-41.77	0.00	-0.13
			Max. Vy	24	-9.70	0.00	0.00
			Max. Vx	20	0.11	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	26	1539.87	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	713.18	6.03	0.00
			Max. My	20	1325.57	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	23	0.04	-1.50	-0.01
			Max. Compression	31	-0.03	-1.42	-0.01
			Max. Mx	28	-0.02	1.71	0.00
			Max. My	19	0.01	-0.32	0.01
			Max. Vy	18	4.12	-1.52	0.00
			Max. Vx	19	-0.01	0.00	0.00
		Top Girt	Max Tension	20	1390.33	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	24	1340.08	6.03	0.00
			Max. My	28	1153.07	0.00	-0.00
			Max. Vy	24	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T13	59.84 - 39.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-178024.09	1244.27	103.46
			Max. Mx	25	-144201.67	-1473.43	-483.28
			Max. My	20	-149141.27	144.86	1399.46
			Max. Vy	25	-914.63	-1201.81	647.30
			Max. Vx	27	-913.34	192.64	-1162.65
		Diagonal	Max Tension	26	4095.01	0.00	0.00
			Max. Compression	34	-6793.75	0.00	0.00
			Max. Mx	23	-2706.93	12.05	0.00
			Max. My	20	-3375.12	0.00	-0.16
			Max. Vy	23	-9.72	0.00	0.00
			Max. Vx	20	0.13	0.00	0.00
		Horizontal	Max Tension	28	1549.70	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	761.38	6.03	0.00
			Max. My	20	1305.21	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	23	0.05	-1.50	-0.02
			Max. Compression	31	-0.04	-1.41	-0.01
			Max. Mx	27	0.00	1.98	0.01
			Max. My	23	0.05	-1.50	-0.02
			Max. Vy	18	4.12	-1.52	0.00
			Max. Vx	23	0.01	0.00	0.00
		Top Girt	Max Tension	31	1354.99	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	769.22	6.03	0.00
			Max. My	28	1101.54	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Guy A	Bottom Tension	27	9358.87		
			Top Tension	27	9436.11		
			Top Cable Vert	27	3201.21		
			Top Cable Norm	27	8876.51		
			Top Cable Tan	27	3.05		
			Bot Cable Vert	27	-2882.58		
			Bot Cable Norm	27	8903.88		
			Bot Cable Tan	27	1.41		
		Guy B	Bottom Tension	32	8944.91		
			Top Tension	32	8990.96		
			Top Cable Vert	32	1921.81		

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Top Cable Vert	22	10118.18		
			Top Cable Norm	22	18069.00		
			Top Cable Tan	22	7.11		
			Bot Cable Vert	22	-9510.44		
			Bot Cable Norm	22	18183.57		
			Bot Cable Tan	22	1.52		
		Top Guy Pull-Off	Max Tension	28	19137.88	0.00	0.00
			Max. Compression	20	-16799.90	0.00	0.00
			Max. Mx	32	17152.88	72.45	0.00
			Max. My	28	-5751.27	0.00	-0.00
			Max. Vy	32	-79.03	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Torque Arm Top	Max Tension	31	20230.26	-4502.71	-0.00
			Max. Compression	31	-10118.13	0.00	0.00
			Max. Mx	27	-7704.17	-39705.49	-0.00
			Max. My	28	-4474.60	-17180.19	-0.00
			Max. Vy	27	10001.24	-39705.49	-0.00
			Max. Vx	28	-0.00	-17180.19	-0.00
T11	99.84 - 79.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-162576.40	-446.00	-1101.07
			Max. Mx	25	-149760.41	1237.59	-9.41
			Max. My	21	-160161.29	-486.05	-1110.62
			Max. Vy	23	1344.83	-1045.51	130.78
			Max. Vx	27	1270.11	351.19	-897.06
		Diagonal	Max Tension	34	8993.57	0.00	0.00
			Max. Compression	26	-11940.05	0.00	0.00
			Max. Mx	24	-1519.45	14.17	0.00
			Max. My	20	-3227.60	0.00	-0.14
			Max. Vy	24	-11.44	0.00	0.00
			Max. Vx	20	0.11	0.00	0.00
		Horizontal	Max Tension	27	2375.66	0.00	0.00
			Max. Compression	2	-480.70	0.00	0.00
			Max. Mx	24	1334.78	6.03	0.00
			Max. My	20	2075.73	0.00	-0.00
			Max. Vy	24	-6.58	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	24	0.03	-1.28	-0.00
			Max. Compression	30	-0.02	-0.89	-0.00
			Max. Mx	18	0.00	-1.52	0.00
			Max. My	19	0.01	-0.70	0.01
			Max. Vy	18	4.12	-1.52	0.00
			Max. Vx	19	-0.00	0.00	0.00
		Top Girt	Max Tension	26	1364.46	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	710.16	6.03	0.00
			Max. My	28	1238.39	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T12	79.84 - 59.84	Leg	Max Tension	7	540.15	-77.27	480.38
			Max. Compression	22	-167120.81	679.65	964.11
			Max. Mx	24	-134446.94	1296.82	42.27
			Max. My	21	-158734.53	-369.77	-1159.92
			Max. Vy	26	-736.21	-1108.68	132.74
			Max. Vx	24	667.78	-303.93	-947.76
		Diagonal	Max Tension	6	3560.40	0.00	0.00
			Max. Compression	31	-5750.97	0.00	0.00
			Max. Mx	24	3351.03	12.02	0.00
			Max. My	20	-41.77	0.00	-0.13
			Max. Vy	24	-9.70	0.00	0.00
			Max. Vx	20	0.11	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
			Top Cable Norm	32	8783.16		
			Top Cable Tan	32	0.28		
			Bot Cable Vert	32	-1660.74		
			Bot Cable Norm	32	8789.39		
			Bot Cable Tan	32	2.39		
		Guy C	Bottom Tension	22	9362.09		
			Top Tension	22	9436.14		
			Top Cable Vert	22	3085.12		
			Top Cable Norm	22	8917.55		
			Top Cable Tan	22	3.37		
			Bot Cable Vert	22	-2773.32		
			Bot Cable Norm	22	8941.89		
			Bot Cable Tan	22	0.91		
		Top Guy Pull-Off	Max Tension	20	9130.73	0.00	0.00
			Max. Compression	29	-6699.14	0.00	0.00
			Max. Mx	18	883.40	72.45	0.00
			Max. My	20	-739.97	0.00	-0.00
			Max. Vy	18	-79.03	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Torque Arm Top	Max Tension	23	9446.43	0.00	0.00
			Max. Compression	26	-4343.11	0.00	0.00
			Max. Mx	27	-2628.63	-12623.35	-0.00
			Max. My	20	-1929.66	-5432.15	0.01
			Max. Vy	27	3238.51	-12623.35	-0.00
			Max. Vx	20	0.00	-5432.15	0.00
T14	39.84 - 19.84	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-177782.08	722.81	1020.41
			Max. Mx	26	-166408.11	1272.53	26.01
			Max. My	22	-177749.69	-502.01	-1140.22
			Max. Vy	27	759.42	-1245.16	147.11
			Max. Vx	32	-656.99	-690.35	1006.34
		Diagonal	Max Tension	12	3836.99	0.00	0.00
			Max. Compression	20	-6642.20	0.00	0.00
			Max. Mx	25	1237.25	12.08	0.00
			Max. My	27	10.87	0.00	0.19
			Max. Vy	25	-9.75	0.00	0.00
			Max. Vx	27	-0.15	0.00	0.00
		Horizontal	Max Tension	28	1482.35	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	772.55	6.03	0.00
			Max. My	20	1298.69	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	23	0.06	-1.50	-0.03
			Max. Compression	31	-0.06	-1.40	-0.02
			Max. Mx	27	0.00	2.43	0.02
			Max. My	23	0.06	-1.50	-0.03
			Max. Vy	27	-4.17	0.00	0.00
			Max. Vx	23	0.01	0.00	0.00
		Top Girt	Max Tension	20	1479.77	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	761.10	6.03	0.00
			Max. My	28	1287.71	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T15	19.84 - 6.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	22	-160383.46	-570.37	-1116.25
			Max. Mx	27	-159561.38	-1246.68	71.40
			Max. My	22	-160383.46	-570.37	-1116.25
			Max. Vy	27	860.08	-1246.68	71.40

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	28	809.44	449.12	-964.83
		Diagonal	Max Tension	23	6568.09	0.00	0.00
			Max. Compression	31	-8352.02	0.00	0.00
			Max. Mx	25	5551.88	12.10	0.00
			Max. My	27	-806.47	0.00	0.20
			Max. Vy	25	-9.76	0.00	0.00
			Max. Vx	27	-0.16	0.00	0.00
		Horizontal	Max Tension	28	1697.64	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	778.17	6.03	0.00
			Max. My	28	1219.21	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
		Secondary Horizontal	Max Tension	23	0.07	-1.50	-0.03
			Max. Compression	31	-0.06	-1.40	-0.02
			Max. Mx	27	-0.00	2.70	0.03
			Max. My	23	0.07	-1.50	-0.03
			Max. Vy	27	-4.40	0.00	0.00
			Max. Vx	23	0.02	0.00	0.00
		Top Girt	Max Tension	21	1665.25	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	18	776.27	6.03	0.00
			Max. My	28	1235.89	0.00	-0.00
			Max. Vy	18	-6.58	0.00	0.00
			Max. Vx	28	0.00	0.00	0.00
T16	6.5 - 0	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	27	-141966.77	22.79	202.18
			Max. Mx	25	-109801.58	2410.62	-43.45
			Max. My	27	-109271.63	1506.45	-1033.68
			Max. Vy	29	7675.17	-1716.98	224.80
			Max. Vx	28	-2514.73	-1768.08	288.88
		Top Girt	Max Tension	27	25199.95	-624.19	-32.58
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	20	21783.54	-1008.13	-46.63
			Max. My	21	21031.68	-1006.75	-46.69
			Max. Vy	21	-468.91	-1006.75	-46.69
			Max. Vx	23	-29.00	-927.88	-44.99
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	28	-5175.44	-2570.91	-24.83
			Max. Mx	28	-5175.44	-2570.91	-24.83
			Max. My	20	-3658.06	-2071.54	-39.47
			Max. Vy	29	-7451.56	-2436.77	-17.72
			Max. Vx	21	-263.37	-2125.14	-39.06
		Mid Girt	Max Tension	21	401.00	0.00	0.00
			Max. Compression	21	-270.49	0.00	0.00
			Max. Mx	27	281.44	12.27	0.00
			Max. My	27	399.46	0.00	2.00
			Max. Vy	27	-19.34	0.00	0.00
			Max. Vx	27	3.15	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Mast	Max. Vert	26	349241.52	-1136.29	-3596.12

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Max. H_x	47	232430.60	5096.56	396.35
	Max. H_z	2	234915.87	419.65	4980.08
	Max. M_x	1	0.00	42.35	20.84
	Max. M_z	1	0.00	42.35	20.84
	Max. Torsion	1	0.00	42.35	20.84
	Min. Vert	1	177359.45	42.35	20.84
	Min. H_x	6	241099.63	-4645.26	200.41
	Min. H_z	10	231375.14	5.54	-4912.44
	Min. M_x	1	0.00	42.35	20.84
	Min. M_z	1	0.00	42.35	20.84
	Min. Torsion	1	0.00	42.35	20.84
Guy C @ 235 ft Elev -20.1 ft Azimuth 240 deg	Max. Vert	13	-10201.27	-7097.29	4097.31
	Max. H_x	46	-10201.27	-7097.29	4097.31
	Max. H_z	21	-144988.63	-152715.81	90341.80
	Min. Vert	22	-146558.28	-155323.55	89617.97
	Min. H_x	22	-146558.28	-155323.55	89617.97
	Min. H_z	13	-10201.27	-7097.29	4097.31
Guy B @ 235 ft Elev 8.9 ft Azimuth 120 deg	Max. Vert	7	-7705.83	6444.41	3720.20
	Max. H_x	32	-127406.71	157011.97	90659.80
	Max. H_z	33	-125388.58	153749.17	90865.59
	Min. Vert	32	-127406.71	157011.97	90659.80
	Min. H_x	7	-7705.83	6444.41	3720.20
	Min. H_z	7	-7705.83	6444.41	3720.20
Guy A @ 235 ft Elev -23.4 ft Azimuth 0 deg	Max. Vert	2	-10416.88	0.32	-8232.54
	Max. H_x	31	-86245.61	9845.88	-99231.13
	Max. H_z	2	-10416.88	0.32	-8232.54
	Min. Vert	27	-148688.12	-64.51	-178813.63
	Min. H_x	23	-83330.36	-9891.65	-96522.80
	Min. H_z	27	-148688.12	-64.51	-178813.63

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	177359.45	-42.35	-20.84	0.00	0.00	0.00
Dead+Wind 0 deg - No Ice+Guy	234915.87	-419.65	-4980.08	0.00	0.00	0.00
Dead+Wind 30 deg - No Ice+Guy	236231.43	2395.59	-3986.05	0.00	0.00	0.00
Dead+Wind 45 deg - No Ice+Guy	232986.40	3522.36	-3266.28	0.00	0.00	0.00
Dead+Wind 60 deg - No Ice+Guy	230761.56	4253.69	-2447.93	0.00	0.00	0.00
Dead+Wind 90 deg - No Ice+Guy	241099.63	4645.26	-200.41	0.00	0.00	0.00
Dead+Wind 120 deg - No Ice+Guy	244170.73	4010.95	2327.02	0.00	0.00	0.00
Dead+Wind 135 deg - No Ice+Guy	244286.88	3135.57	3314.15	0.00	0.00	0.00
Dead+Wind 150 deg - No	241709.02	2128.95	4129.11	0.00	0.00	0.00

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
Ice+Guy						
Dead+Wind 180 deg - No Ice+Guy	231375.14	-5.54	4912.44	0.00	0.00	0.00
Dead+Wind 210 deg - No Ice+Guy	237581.52	-2216.37	4090.65	0.00	0.00	0.00
Dead+Wind 225 deg - No Ice+Guy	237970.97	-3481.06	3198.20	0.00	0.00	0.00
Dead+Wind 240 deg - No Ice+Guy	236087.71	-4482.70	2139.17	0.00	0.00	0.00
Dead+Wind 270 deg - No Ice+Guy	232430.60	-5096.56	-396.35	0.00	0.00	0.00
Dead+Wind 300 deg - No Ice+Guy	224403.11	-4661.78	-2690.16	0.00	0.00	0.00
Dead+Wind 315 deg - No Ice+Guy	227053.70	-3920.56	-3555.76	0.00	0.00	0.00
Dead+Wind 330 deg - No Ice+Guy	231397.61	-2885.84	-4233.69	0.00	0.00	0.00
Dead+Ice+Temp+Guy	239466.98	-88.57	-35.42	0.00	0.00	0.00
Dead+Wind 0 deg+Ice+Temp+Guy	337913.52	-562.75	-3978.42	0.00	0.00	0.00
Dead+Wind 30 deg+Ice+Temp+Guy	344543.82	2342.53	-3020.82	0.00	0.00	0.00
Dead+Wind 45 deg+Ice+Temp+Guy	346556.84	3299.14	-2627.38	0.00	0.00	0.00
Dead+Wind 60 deg+Ice+Temp+Guy	347364.52	3751.65	-2264.52	0.00	0.00	0.00
Dead+Wind 90 deg+Ice+Temp+Guy	348497.63	3688.35	-790.63	0.00	0.00	0.00
Dead+Wind 120 deg+Ice+Temp+Guy	346243.15	3048.39	1771.62	0.00	0.00	0.00
Dead+Wind 135 deg+Ice+Temp+Guy	347318.24	2071.82	2762.89	0.00	0.00	0.00
Dead+Wind 150 deg+Ice+Temp+Guy	349241.52	1136.29	3596.12	0.00	0.00	0.00
Dead+Wind 180 deg+Ice+Temp+Guy	348206.53	-73.73	4386.59	0.00	0.00	0.00
Dead+Wind 210 deg+Ice+Temp+Guy	345851.86	-1358.17	3560.47	0.00	0.00	0.00
Dead+Wind 225 deg+Ice+Temp+Guy	341667.35	-2562.35	2623.00	0.00	0.00	0.00
Dead+Wind 240 deg+Ice+Temp+Guy	338963.41	-3665.12	1514.85	0.00	0.00	0.00
Dead+Wind 270 deg+Ice+Temp+Guy	339256.23	-4424.75	-1044.23	0.00	0.00	0.00
Dead+Wind 300 deg+Ice+Temp+Guy	339178.06	-4466.29	-2616.28	0.00	0.00	0.00
Dead+Wind 315 deg+Ice+Temp+Guy	339045.07	-3988.35	-3033.05	0.00	0.00	0.00
Dead+Wind 330 deg+Ice+Temp+Guy	338432.47	-3106.71	-3376.78	0.00	0.00	0.00
Dead+Wind 0 deg - Service+Guy	234915.87	-419.65	-4980.08	0.00	0.00	0.00
Dead+Wind 30 deg - Service+Guy	236231.43	2395.59	-3986.05	0.00	0.00	0.00
Dead+Wind 45 deg - Service+Guy	232986.40	3522.36	-3266.28	0.00	0.00	0.00
Dead+Wind 60 deg - Service+Guy	230761.56	4253.69	-2447.93	0.00	0.00	0.00
Dead+Wind 90 deg - Service+Guy	241099.63	4645.26	-200.41	0.00	0.00	0.00
Dead+Wind 120 deg -	244170.73	4010.95	2327.02	0.00	0.00	0.00

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
Service+Guy						
Dead+Wind 135 deg - Service+Guy	244286.88	3135.57	3314.15	0.00	0.00	0.00
Dead+Wind 150 deg - Service+Guy	241709.02	2128.95	4129.11	0.00	0.00	0.00
Dead+Wind 180 deg - Service+Guy	231375.14	-5.54	4912.44	0.00	0.00	0.00
Dead+Wind 210 deg - Service+Guy	237581.52	-2216.37	4090.65	0.00	0.00	0.00
Dead+Wind 225 deg - Service+Guy	237970.97	-3481.06	3198.20	0.00	0.00	0.00
Dead+Wind 240 deg - Service+Guy	236087.71	-4482.70	2139.17	0.00	0.00	0.00
Dead+Wind 270 deg - Service+Guy	232430.60	-5096.56	-396.35	0.00	0.00	0.00
Dead+Wind 300 deg - Service+Guy	224403.11	-4661.78	-2690.16	0.00	0.00	0.00
Dead+Wind 315 deg - Service+Guy	227053.70	-3920.56	-3555.76	0.00	0.00	0.00
Dead+Wind 330 deg - Service+Guy	231397.61	-2885.84	-4233.69	0.00	0.00	0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-65929.21	0.00	1.00	65929.22	0.74	0.002%
2	-100.78	-66692.69	-107919.59	99.48	66692.50	107917.33	0.002%
3	54183.48	-65911.10	-93020.47	-54185.09	65910.99	93018.74	0.002%
4	76550.41	-65341.33	-75796.13	-76552.31	65341.28	75794.83	0.002%
5	93512.28	-65132.43	-53656.58	-93508.01	65132.25	53658.42	0.004%
6	108129.69	-66122.56	12.68	-108126.16	66122.21	-11.67	0.003%
7	93951.15	-67078.60	53862.76	-93947.59	67078.11	-53859.88	0.004%
8	76756.58	-66801.10	76012.30	-76753.66	66800.64	-76008.83	0.004%
9	54368.80	-66140.74	93207.20	-54366.66	66140.37	-93203.60	0.003%
10	193.07	-65165.85	107550.12	-190.14	65165.70	-107547.39	0.003%
11	-54488.75	-65947.45	92809.51	54485.99	65947.34	-92810.37	0.002%
12	-76989.24	-66517.22	75689.14	76986.08	66517.05	-75689.74	0.003%
13	-94230.42	-66726.12	53569.59	94227.33	66725.91	-53569.79	0.002%
14	-108528.96	-65735.99	-221.69	108527.09	65735.84	222.12	0.002%
15	-94219.19	-64779.94	-53949.62	94217.83	64779.93	53951.81	0.002%
16	-77192.53	-65057.45	-76099.48	77193.07	65057.27	76095.91	0.003%
17	-54885.17	-65717.81	-93161.64	54884.47	65717.44	93156.69	0.004%
18	0.00	-104246.13	0.00	1.37	104246.12	1.03	0.002%
19	84.04	-106111.11	-143072.61	-87.34	106110.64	143066.80	0.004%
20	71426.27	-104199.76	-122877.02	-71431.34	104199.54	122873.04	0.004%
21	100762.37	-102805.89	-100111.94	-100766.06	102805.89	100109.70	0.002%
22	122903.99	-102295.97	-70872.89	-122899.04	102295.78	70876.37	0.003%
23	142123.90	-104733.82	-77.67	-142121.10	104733.47	79.94	0.002%
24	124114.19	-107083.97	71287.53	-124111.38	107083.48	-71284.05	0.003%
25	100748.36	-106400.68	99937.27	-100745.80	106400.18	-99933.38	0.003%
26	71309.66	-104780.31	122717.14	-71307.29	104779.86	-122713.05	0.003%
27	-6.08	-102381.38	141627.24	16.92	102380.85	-141619.64	0.008%
28	-71735.90	-104292.74	122659.78	71728.53	104292.55	-122663.83	0.005%
29	-101216.83	-105686.61	99996.93	101208.55	105686.19	-99999.54	0.005%
30	-124566.90	-106196.53	71301.26	124559.14	106196.00	-71301.56	0.004%
31	-142535.52	-103758.68	-147.10	142531.21	103758.29	149.53	0.003%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
32	-123473.44	-101408.53	-70849.96	123472.05	101408.51	70852.71	0.002%
33	-101201.02	-102091.82	-100028.14	101202.95	102091.55	100021.45	0.004%
34	-71847.63	-103712.18	-122672.37	71847.65	103711.87	122667.91	0.003%
35	-100.78	-66692.69	-107919.59	99.48	66692.50	107917.33	0.002%
36	54183.48	-65911.10	-93020.47	-54185.09	65910.99	93018.74	0.002%
37	76550.41	-65341.33	-75796.13	-76552.31	65341.28	75794.83	0.002%
38	93512.28	-65132.43	-53656.58	-93508.01	65132.25	53658.42	0.004%
39	108129.69	-66122.56	12.68	-108126.16	66122.21	-11.67	0.003%
40	93951.15	-67078.60	53862.76	-93947.59	67078.11	-53859.88	0.004%
41	76756.58	-66801.10	76012.30	-76753.66	66800.64	-76008.83	0.004%
42	54368.80	-66140.74	93207.20	-54366.66	66140.37	-93203.60	0.003%
43	193.07	-65165.85	107550.12	-190.14	65165.70	-107547.39	0.003%
44	-54488.75	-65947.45	92809.51	54485.99	65947.34	-92810.37	0.002%
45	-76989.24	-66517.22	75689.14	76986.08	66517.05	-75689.74	0.003%
46	-94230.42	-66726.12	53569.59	94227.33	66725.91	-53569.79	0.002%
47	-108528.96	-65735.99	-221.69	108527.09	65735.84	222.12	0.002%
48	-94219.19	-64779.94	-53949.62	94217.83	64779.93	53951.81	0.002%
49	-77192.53	-65057.45	-76099.48	77193.07	65057.27	76095.91	0.003%
50	-54885.17	-65717.81	-93161.64	54884.47	65717.44	93156.69	0.004%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	9	0.00000001	0.00005858
2	Yes	15	0.00000001	0.00006194
3	Yes	15	0.00000001	0.00005835
4	Yes	15	0.00000001	0.00006022
5	Yes	13	0.00008472	0.00010797
6	Yes	15	0.00006189	0.00011026
7	Yes	15	0.00006757	0.00012557
8	Yes	15	0.00006545	0.00012230
9	Yes	15	0.00006112	0.00010961
10	Yes	13	0.00006237	0.00007634
11	Yes	15	0.00000001	0.00006374
12	Yes	15	0.00000001	0.00006944
13	Yes	15	0.00000001	0.00006980
14	Yes	15	0.00000001	0.00005507
15	Yes	12	0.00007352	0.00006888
16	Yes	14	0.00008691	0.00010461
17	Yes	14	0.00009369	0.00013516
18	Yes	9	0.00000001	0.00004917
19	Yes	15	0.00006670	0.00009850
20	Yes	15	0.00006692	0.00010109
21	Yes	15	0.00005752	0.00007717
22	Yes	13	0.00007886	0.00009173
23	Yes	16	0.00006059	0.00009444
24	Yes	16	0.00005783	0.00009130
25	Yes	16	0.00005912	0.00009647
26	Yes	16	0.00005838	0.00009140
27	Yes	12	0.00013003	0.00012161
28	Yes	15	0.00007254	0.00011000
29	Yes	15	0.00007588	0.00011578
30	Yes	15	0.00007554	0.00011219
31	Yes	15	0.00007634	0.00009718
32	Yes	12	0.00008027	0.00006497

33	Yes	14	0.00011130	0.00011046
34	Yes	15	0.00006586	0.00008318
35	Yes	15	0.00000001	0.00006194
36	Yes	15	0.00000001	0.00005835
37	Yes	15	0.00000001	0.00006022
38	Yes	13	0.00008472	0.00010797
39	Yes	15	0.00006189	0.00011026
40	Yes	15	0.00006757	0.00012557
41	Yes	15	0.00006545	0.00012230
42	Yes	15	0.00006112	0.00010961
43	Yes	13	0.00006237	0.00007634
44	Yes	15	0.00000001	0.00006374
45	Yes	15	0.00000001	0.00006944
46	Yes	15	0.00000001	0.00006980
47	Yes	15	0.00000001	0.00005507
48	Yes	12	0.00007352	0.00006888
49	Yes	14	0.00008691	0.00010461
50	Yes	14	0.00009369	0.00013516

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	327 - 291.84	6.604	43	0.4164	0.3532
T1	291.84 - 279.84	7.289	43	0.6427	0.3691
T2	279.84 - 259.84	7.997	43	0.6606	0.3865
T3	259.84 - 239.84	9.150	43	0.6403	0.3480
T4	239.84 - 219.84	10.626	44	0.5517	0.3531
T5	219.84 - 199.84	12.343	41	0.4266	0.3377
T6	199.84 - 179.84	13.919	40	0.3140	0.3639
T7	179.84 - 159.84	14.845	40	0.1515	0.3672
T8	159.84 - 139.84	15.369	40	0.1220	0.3617
T9	139.84 - 119.84	15.666	40	0.1119	0.4035
T10	119.84 - 99.84	15.204	40	0.1891	0.4309
T11	99.84 - 79.84	14.234	40	0.2721	0.4510
T12	79.84 - 59.84	12.840	40	0.4344	0.4956
T13	59.84 - 39.84	10.596	40	0.6155	0.5298
T14	39.84 - 19.84	7.706	40	0.7737	0.6301
T15	19.84 - 6.5	4.100	40	0.9259	0.7206
T16	6.5 - 0	1.364	40	0.9850	0.7319

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
325.00	Lightning Rod 5/8x4'	43	6.612	0.4328	0.3643	19234
323.00	Flash Beacon Lighting	43	6.622	0.4491	0.3628	19234
305.00	6813 w/Radome	43	6.829	0.5815	0.3567	4372
285.84	Guy	43	7.625	0.6554	0.3805	5993
280.00	PD1150	43	7.987	0.6606	0.3865	31471
260.00	(2) AP16-850/065	43	9.142	0.6407	0.3482	42848
259.00	Generic TMA	43	9.198	0.6379	0.3471	53979
256.51	Guy	43	9.337	0.6302	0.3456	39143
240.00	(4) DB844H90	44	10.614	0.5526	0.3531	5747

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
216.51	Guy	41	12.615	0.4093	0.3394	22875
209.00	6813 1-Bay w/radome	40	13.236	0.3721	0.3495	8845
198.00	6813 1-Bay w/radome	40	14.035	0.2988	0.3660	5439
186.00	(3) DUO1417-8670	40	14.626	0.1904	0.3699	8792
172.00	DB872	40	15.073	0.1366	0.3618	21858
170.00	DB806	40	15.125	0.1361	0.3606	25702
166.51	Guy	40	15.212	0.1351	0.3594	17947
166.00	Generic TMA	40	15.224	0.1348	0.3594	17194
158.00	DB872	40	15.412	0.1136	0.3637	15140
154.00	DB589	40	15.501	0.0892	0.3700	16209
142.00	7' Whip	40	15.665	0.1033	0.3985	5305
138.00	P4F-57W	40	15.658	0.1192	0.4074	5011
124.00	PD1108	40	15.356	0.1730	0.4272	8517
115.00	6 FT DISH	40	15.003	0.2134	0.4349	12115
112.00	6 FT DISH	40	14.866	0.2246	0.4373	13035
110.00	PD1110	40	14.770	0.2321	0.4391	13730
106.51	Guy	40	14.595	0.2444	0.4425	15139
104.00	8 FT DISH	40	14.463	0.2535	0.4453	16331
94.00	PR-850	40	13.890	0.3094	0.4610	9658
84.00	APL866513-42T0	40	13.191	0.3951	0.4861	5268
74.00	DB212-2-C	40	12.271	0.4893	0.5045	5249
56.51	Guy	40	10.157	0.6429	0.5417	8699
18.00	CL-24/HRM	40	3.734	0.9377	0.7243	8616
13.00	1.2M	40	2.717	0.9650	0.7301	13754

Maximum Tower Deflections - Design Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
L1	327 - 291.84	14.516	27	0.4164	0.4575
T1	291.84 - 279.84	14.260	27	0.6427	0.5589
T2	279.84 - 259.84	14.730	27	0.6606	0.5424
T3	259.84 - 239.84	15.395	27	0.6403	0.4724
T4	239.84 - 219.84	15.806	28	0.5517	0.4570
T5	219.84 - 199.84	16.128	28	0.4266	0.4200
T6	199.84 - 179.84	16.746	24	0.3140	0.4377
T7	179.84 - 159.84	16.856	24	0.2376	0.4309
T8	159.84 - 139.84	16.734	24	0.1627	0.4218
T9	139.84 - 119.84	16.620	24	0.1882	0.4527
T10	119.84 - 99.84	15.903	24	0.2598	0.4656
T11	99.84 - 79.84	14.804	24	0.2967	0.4915
T12	79.84 - 59.84	13.363	24	0.4488	0.5355
T13	59.84 - 39.84	11.049	24	0.6358	0.5589
T14	39.84 - 19.84	8.065	24	0.8033	0.6566
T15	19.84 - 6.5	4.307	24	0.9699	0.7504
T16	6.5 - 0	1.434	24	1.0352	0.7588

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
325.00	Lightning Rod 5/8x4'	27	14.465	0.4328	0.5560	19234
323.00	Flash Beacon Lighting	27	14.415	0.4491	0.5568	19234
305.00	6813 w/Radome	27	14.113	0.5815	0.5619	4372
285.84	Guy	27	14.477	0.6554	0.5538	5993
280.00	PD1150	27	14.723	0.6606	0.5428	14614
260.00	(2) AP16-850/065	27	15.390	0.6407	0.4728	20027
259.00	Generic TMA	27	15.418	0.6379	0.4707	18299
256.51	Guy	27	15.488	0.6302	0.4667	13346
240.00	(4) DB844H90	28	15.800	0.5526	0.4572	4299
216.51	Guy	28	16.159	0.4093	0.4195	22875
209.00	6813 1-Bay w/radome	24	16.451	0.3721	0.4264	8845
198.00	6813 1-Bay w/radome	24	16.784	0.2988	0.4389	5439
186.00	(3) DUO1417-8670	24	16.877	0.2241	0.4364	8792
172.00	DB872	24	16.804	0.2180	0.4236	15984
170.00	DB806	24	16.790	0.2087	0.4222	13532
166.51	Guy	24	16.766	0.1913	0.4205	10672
166.00	Generic TMA	24	16.763	0.1888	0.4204	10355
158.00	DB872	24	16.729	0.1579	0.4235	9383
154.00	DB589	24	16.724	0.1529	0.4288	15641
142.00	7' Whip	24	16.655	0.1782	0.4496	5305
138.00	P4F-57W	24	16.583	0.1968	0.4549	5011
124.00	PD1108	24	16.097	0.2526	0.4635	8517
115.00	6 FT DISH	24	15.659	0.2609	0.4691	12115
112.00	6 FT DISH	24	15.500	0.2666	0.4721	13035
110.00	PD1110	24	15.391	0.2702	0.4745	13730
106.51	Guy	24	15.195	0.2767	0.4793	15139
104.00	8 FT DISH	24	15.050	0.2826	0.4834	16331
94.00	PR-850	24	14.444	0.3285	0.5053	9658
84.00	APL866513-42T0	24	13.724	0.4094	0.5287	5110
74.00	DB212-2-C	24	12.777	0.5045	0.5407	5008
56.51	Guy	24	10.596	0.6650	0.5700	8527
18.00	CL-24/HRM	24	3.923	0.9861	0.7556	7770
13.00	1.2M	24	2.856	1.0242	0.7644	12374

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	291.84	Leg	A325N	1.0000	4	2095.01	34556.80	0.061 ✓	1.333	Bolt Tension
		Top Guy Pull-Off@285.84	A325N	0.6250	5	1136.29	6442.72	0.176 ✓	1.333	Bolt Shear
		Torque Arm Top@285.84	A325N	0.6250	5	1971.99	6442.72	0.306 ✓	1.333	Bolt Shear
T2	279.84	Leg	A325N	1.0000	4	0.00	34557.40	0.000 ✓	1.333	Bolt Tension
T3	259.84	Leg	A325N	1.0000	4	0.00	34552.10	0.000 ✓	1.333	Bolt Tension
		Top Guy Pull-Off@256.507	A325N	0.6250	5	1843.24	6442.72	0.286 ✓	1.333	Bolt Shear
		Torque Arm Top@256.507	A325N	0.6250	5	2554.70	6442.72	0.397 ✓	1.333	Bolt Shear
T4	239.84	Leg	A325N	1.0000	4	1148.60	34557.50	0.033 ✓	1.333	Bolt Tension
T5	219.84	Leg	A325N	1.0000	4	0.00	34551.30	0.000 ✓	1.333	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Top Guy Pull-Off@216.507	A325N	0.6250	5	2828.52	6442.72	0.439 ✓	1.333	Bolt Shear
		Torque Arm Top@216.507	A325N	0.6250	5	3376.06	6442.72	0.524 ✓	1.333	Bolt Shear
T6	199.84	Leg	A325N	1.0000	4	660.59	34557.20	0.019 ✓	1.333	Bolt Tension
T7	179.84	Leg	A325N	1.0000	4	0.00	34556.90	0.000 ✓	1.333	Bolt Tension
		Top Guy Pull-Off@166.507	A325N	0.6250	5	3973.24	6442.72	0.617 ✓	1.333	Bolt Shear
		Torque Arm Top@166.507	A325N	0.6250	5	4266.45	6442.72	0.662 ✓	1.333	Bolt Shear
T8	159.84	Leg	A325N	1.0000	4	0.00	34556.50	0.000 ✓	1.333	Bolt Tension
T9	139.84	Leg	A325N	1.0000	4	0.00	34556.20	0.000 ✓	1.333	Bolt Tension
T10	119.84	Leg	A325N	1.0000	4	0.00	34556.40	0.000 ✓	1.333	Bolt Tension
		Top Guy Pull-Off@106.507	A325N	0.6250	5	3827.58	6442.72	0.594 ✓	1.333	Bolt Shear
		Torque Arm Top@106.507	A325N	0.6250	5	4046.05	6442.72	0.628 ✓	1.333	Bolt Shear
T11	99.84	Leg	A325N	1.0000	4	0.00	34555.90	0.000 ✓	1.333	Bolt Tension
T12	79.84	Leg	A325N	1.3750	4	135.04	65335.10	0.002 ✓	1.333	Bolt Tension
T13	59.84	Leg	A325N	1.3750	4	0.00	65333.70	0.000 ✓	1.333	Bolt Tension
		Top Guy Pull-Off@56.5067	A325N	0.6250	5	1826.15	6442.72	0.283 ✓	1.333	Bolt Shear
		Torque Arm Top@56.5067	A325N	0.6250	5	1889.29	6442.72	0.293 ✓	1.333	Bolt Shear
T14	39.84	Leg	A325N	1.3750	4	0.00	65334.10	0.000 ✓	1.333	Bolt Tension
T15	19.84	Leg	A325N	1.3750	4	0.00	65333.60	0.000 ✓	1.333	Bolt Tension
T16	6.5	Leg	A325N	1.3750	4	0.00	65334.80	0.000 ✓	1.333	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
T1	285.84 (A) (672)	3/4 EHS	5830.00	58299.92	20157.20	29150.00	2.000	2.892 ✓
	285.84 (A) (673)	3/4 EHS	5830.00	58299.92	19761.80	29150.00	2.000	2.950 ✓
	285.84 (B) (668)	3/4 EHS	5830.00	58299.92	18920.80	29150.00	2.000	3.081 ✓
	285.84 (B) (669)	3/4 EHS	5830.00	58299.92	19029.20	29150.00	2.000	3.064 ✓
	285.84 (C) (664)	3/4 EHS	5830.00	58299.92	19687.90	29150.00	2.000	2.961 ✓
	285.84 (C) (665)	3/4 EHS	5830.00	58299.92	19957.60	29150.00	2.000	2.921 ✓
T3	256.51 (A) (684)	3/4 EHS	5830.00	58299.92	21892.00	29150.00	2.000	2.663 ✓
	256.51 (A) (685)	3/4 EHS	5830.00	58299.92	21501.60	29150.00	2.000	2.711 ✓

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
	256.51 (B) (680)	3/4 EHS	5830.00	58299.92	20510.20	29150.00	2.000	2.842 ✓
	256.51 (B) (681)	3/4 EHS	5830.00	58299.92	20690.00	29150.00	2.000	2.818 ✓
	256.51 (C) (676)	3/4 EHS	5830.00	58299.92	21367.30	29150.00	2.000	2.728 ✓
	256.51 (C) (677)	3/4 EHS	5830.00	58299.92	21684.70	29150.00	2.000	2.689 ✓
T5	216.51 (A) (696)	3/4 EHS	5830.00	58299.92	24121.80	29150.00	2.000	2.417 ✓
	216.51 (A) (697)	3/4 EHS	5830.00	58299.92	23634.90	29150.00	2.000	2.467 ✓
	216.51 (B) (692)	3/4 EHS	5830.00	58299.92	22513.40	29150.00	2.000	2.590 ✓
	216.51 (B) (693)	3/4 EHS	5830.00	58299.92	22752.40	29150.00	2.000	2.562 ✓
	216.51 (C) (688)	3/4 EHS	5830.00	58299.92	23518.80	29150.00	2.000	2.479 ✓
	216.51 (C) (689)	3/4 EHS	5830.00	58299.92	23875.50	29150.00	2.000	2.442 ✓
T7	166.51 (A) (708)	3/4 EHS	5830.00	58299.92	25614.10	29150.00	2.000	2.276 ✓
	166.51 (A) (709)	3/4 EHS	5830.00	58299.92	24782.10	29150.00	2.000	2.353 ✓
	166.51 (B) (704)	3/4 EHS	5830.00	58299.92	23842.30	29150.00	2.000	2.445 ✓
	166.51 (B) (705)	3/4 EHS	5830.00	58299.92	24003.80	29150.00	2.000	2.429 ✓
	166.51 (C) (700)	3/4 EHS	5830.00	58299.92	24854.60	29150.00	2.000	2.346 ✓
	166.51 (C) (701)	3/4 EHS	5830.00	58299.92	25313.00	29150.00	2.000	2.303 ✓
T10	106.51 (A) (720)	5/8 EHS	4240.00	42399.99	20727.30	21200.00	2.000	2.046 ✓
	106.51 (A) (721)	5/8 EHS	4240.00	42399.99	19808.80	21200.00	2.000	2.140 ✓
	106.51 (B) (716)	5/8 EHS	4240.00	42399.99	19738.50	21200.00	2.000	2.148 ✓
	106.51 (B) (717)	5/8 EHS	4240.00	42399.99	19719.70	21200.00	2.000	2.150 ✓
	106.51 (C) (712)	5/8 EHS	4240.00	42399.99	20022.10	21200.00	2.000	2.118 ✓
	106.51 (C) (713)	5/8 EHS	4240.00	42399.99	20709.10	21200.00	2.000	2.047 ✓
T13	56.51 (A) (732)	7/16 EHS	2080.00	20800.02	9436.11	10400.00	2.000	2.204 ✓
	56.51 (A) (733)	7/16 EHS	2080.00	20800.02	8868.69	10400.00	2.000	2.345 ✓
	56.51 (B) (728)	7/16 EHS	2080.00	20800.02	8835.49	10400.00	2.000	2.354 ✓
	56.51 (B) (729)	7/16 EHS	2080.00	20800.02	8990.96	10400.00	2.000	2.313 ✓
	56.51 (C) (724)	7/16 EHS	2080.00	20800.02	8942.74	10400.00	2.000	2.326 ✓
	56.51 (C) (725)	7/16 EHS	2080.00	20800.02	9436.14	10400.00	2.000	2.204 ✓

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
L1	327 - 291.84 (1)	P10.75x0.843	35.16	35.16	120.0	10.366	26.2373	-3867.63	271981.00	0.014

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L1	327 - 291.84 (1)	P10.75x0.843	27731.08	-5.517	33.000	0.167	0.00	0.000	33.000	0.000

Pole Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	327 - 291.84 (1)	P10.75x0.843	0.014	0.167	0.000	0.181 ✓	1.066	H1-3 ✓

Leg Design Data (Compression)

Section No.	Elevation ft	Size	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	291.84 - 279.84	2	12.00	3.00	72.0 K=1.00	1.00	20.564	3.1416	-28817.60	64605.00	0.446
T2	279.84 - 259.84	2	20.00	3.33	80.0 K=1.00	1.00	19.012	3.1416	-34395.90	59729.20	0.576
T3	259.84 - 239.84	2 1/4	20.00	3.33	71.1 K=1.00	1.00	20.731	3.9761	-81922.60	82428.30	0.994
T4	239.84 - 219.84	2 1/4	20.00	3.33	71.1 K=1.00	1.00	20.731	3.9761	-81785.20	82428.30	0.992
T5	219.84 - 199.84	2 1/2	20.00	3.33	64.0 K=1.00	1.00	22.023	4.9087	-94824.00	108105.00	0.877
T6	199.84 - 179.84	2 1/2	20.00	3.33	64.0 K=1.00	1.00	22.023	4.9087	-96360.40	108105.00	0.891
T7	179.84 - 159.84	2 3/4	20.00	3.33	58.2 K=1.00	1.00	23.025	5.9396	-105913.00	136761.00	0.774
T8	159.84 - 139.84	2 1/2	20.00	3.33	64.0 K=1.00	1.00	22.023	4.9087	-106245.00	108105.00	0.983
T9	139.84 - 119.84	2 3/4	20.00	3.33	58.2 K=1.00	1.00	23.025	5.9396	-108278.00	136761.00	0.792
T10	119.84 - 99.84	2 3/4	20.00	3.33	58.2 K=1.00	1.00	23.025	5.9396	-117587.00	136761.00	0.860

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	Mast Stability Index	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T11	99.84 - 79.84	3	20.00	3.33	53.3 K=1.00	1.00	23.823	7.0686	-162576.00	168393.00	0.965
T12	79.84 - 59.84	3	20.00	3.33	53.3 K=1.00	1.00	23.823	7.0686	-167121.00	168393.00	0.992
T13	59.84 - 39.84	3	20.00	3.33	53.3 K=1.00	1.00	23.823	7.0686	-178024.00	168393.00	1.057
T14	39.84 - 19.84	3	20.00	3.33	53.3 K=1.00	1.00	23.823	7.0686	-177782.00	168393.00	1.056
T15	19.84 - 6.5	3	13.34	3.34	53.4 K=1.00	1.00	23.819	7.0686	-160383.00	168363.00	0.953
T16	6.5 - 0	3	6.84	2.10	67.3 K=2.00	1.00	21.431	7.0686	-141967.00	151486.00	0.937

Leg Bending Design Data (Compression)

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	291.84 - 279.84	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T2	279.84 - 259.84	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T3	259.84 - 239.84	2 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T4	239.84 - 219.84	2 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T5	219.84 - 199.84	2 1/2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T6	199.84 - 179.84	2 1/2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T7	179.84 - 159.84	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T8	159.84 - 139.84	2 1/2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T9	139.84 - 119.84	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T10	119.84 - 99.84	2 3/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T11	99.84 - 79.84	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T12	79.84 - 59.84	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T13	59.84 - 39.84	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T14	39.84 - 19.84	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T15	19.84 - 6.5	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T16	6.5 - 0	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Leg Interaction Design Data (Compression)

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	291.84 - 279.84	2	0.446	0.000	0.000	0.446 ✓	1.333	H1-3 ✓
T2	279.84 - 259.84	2	0.576	0.000	0.000	0.576 ✓	1.333	H1-3 ✓
T3	259.84 - 239.84	2 1/4	0.994	0.000	0.000	0.994 ✓	1.333	H1-3 ✓
T4	239.84 - 219.84	2 1/4	0.992	0.000	0.000	0.992 ✓	1.333	H1-3 ✓
T5	219.84 - 199.84	2 1/2	0.877	0.000	0.000	0.877 ✓	1.333	H1-3 ✓
T6	199.84 - 179.84	2 1/2	0.891	0.000	0.000	0.891 ✓	1.333	H1-3 ✓
T7	179.84 - 159.84	2 3/4	0.774	0.000	0.000	0.774 ✓	1.333	H1-3 ✓
T8	159.84 - 139.84	2 1/2	0.983	0.000	0.000	0.983 ✓	1.333	H1-3 ✓
T9	139.84 - 119.84	2 3/4	0.792	0.000	0.000	0.792 ✓	1.333	H1-3 ✓
T10	119.84 - 99.84	2 3/4	0.860	0.000	0.000	0.860 ✓	1.333	H1-3 ✓
T11	99.84 - 79.84	3	0.965	0.000	0.000	0.965 ✓	1.333	H1-3 ✓
T12	79.84 - 59.84	3	0.992	0.000	0.000	0.992 ✓	1.333	H1-3 ✓
T13	59.84 - 39.84	3	1.057	0.000	0.000	1.057 ✓	1.333	H1-3 ✓
T14	39.84 - 19.84	3	1.056	0.000	0.000	1.056 ✓	1.333	H1-3 ✓
T15	19.84 - 6.5	3	0.953	0.000	0.000	0.953 ✓	1.333	H1-3 ✓
T16	6.5 - 0	3	0.937	0.000	0.000	0.937 ✓	1.333	H1-3 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	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	291.84 - 279.84	1 3/8	4.74	4.52	110.5 K=0.70	11.603	1.4849	-5322.94	17228.70	0.309 ✓
T2	279.84 - 259.84	1 3/8	4.96	4.73	115.6 K=0.70	10.905	1.4849	-3564.69	16193.40	0.220 ✓
T3	259.84 - 239.84	1 3/8	4.96	4.70	114.9 K=0.70	11.001	1.4849	-7151.78	16335.50	0.438 ✓
T4	239.84 - 219.84	1 3/8	4.96	4.70	114.9 K=0.70	11.001	1.4849	-8521.01	16335.50	0.522 ✓
T5	219.84 - 199.84	1 1/2	4.96	4.67	104.7 K=0.70	12.374	1.7672	-9618.50	21867.00	0.440 ✓
T6	199.84 - 179.84	1 1/4	4.96	4.67	125.6 K=0.70	9.460	1.2272	-10228.50	11608.90	0.881 ✓
T7	179.84 - 159.84	1 1/2	4.96	4.65	104.1 K=0.70	12.456	1.7672	-13400.10	22012.00	0.609 ✓
T8	159.84 - 139.84	1 3/8	4.96	4.67	114.2 K=0.70	11.097	1.4849	-9385.06	16477.10	0.570 ✓
T9	139.84 - 119.84	1 1/4	4.96	4.65	124.9 K=0.70	9.572	1.2272	-6129.58	11746.50	0.522 ✓
T10	119.84 - 99.84	1 1/2	4.96	4.65	104.1	12.456	1.7672	-15057.50	22012.00	0.684

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
					K=0.70					✓
T11	99.84 - 79.84	1 3/8	4.96	4.62	112.8 K=0.70	11.286	1.4849	-11940.00	16758.30	0.712 ✓
T12	79.84 - 59.84	1 1/4	4.96	4.62	124.1 K=0.70	9.684	1.2272	-5750.97	11883.50	0.484 ✓
T13	59.84 - 39.84	1 1/4	4.96	4.62	124.1 K=0.70	9.684	1.2272	-6793.75	11883.50	0.572 ✓
T14	39.84 - 19.84	1 1/4	4.96	4.62	124.1 K=0.70	9.684	1.2272	-6642.20	11883.50	0.559 ✓
T15	19.84 - 6.5	1 1/4	4.96	4.62	124.2 K=0.70	9.679	1.2272	-8352.02	11878.40	0.703 ✓

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	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	291.84 - 279.84	1	3.67	3.50	117.6 K=0.70	10.622	0.7854	-914.72	8342.71	0.110 ✓
T2	279.84 - 259.84	1	3.67	3.50	117.6 K=0.70	10.622	0.7854	-410.23	8342.71	0.049 ✓
T3	259.84 - 239.84	1	3.67	3.48	116.9 K=0.70	10.721	0.7854	-897.02	8420.16	0.107 ✓
T4	239.84 - 219.84	1	3.67	3.48	116.9 K=0.70	10.721	0.7854	-411.02	8420.16	0.049 ✓
T5	219.84 - 199.84	1	3.67	3.46	116.2 K=0.70	10.819	0.7854	-837.57	8497.28	0.099 ✓
T6	199.84 - 179.84	1	3.67	3.46	116.2 K=0.70	10.819	0.7854	-1749.85	8497.28	0.206 ✓
T7	179.84 - 159.84	1	3.67	3.44	115.5 K=0.70	10.917	0.7854	-472.21	8574.06	0.055 ✓
T8	159.84 - 139.84	1	3.67	3.46	116.2 K=0.70	10.819	0.7854	-25.96	8497.28	0.003 ✓
T9	139.84 - 119.84	1	3.67	3.44	115.5 K=0.70	10.917	0.7854	-23.00	8574.06	0.003 ✓
T10	119.84 - 99.84	1	3.67	3.44	115.5 K=0.70	10.917	0.7854	-784.59	8574.06	0.092 ✓
T11	99.84 - 79.84	1	3.67	3.42	114.8 K=0.70	11.014	0.7854	-480.70	8650.51	0.056 ✓

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	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	291.84 - 279.84	1	1.83	1.75	81.5 K=0.97	15.189	0.7854	-0.04	11929.50	0.000 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T2	279.84 - 259.84	1	1.83	1.75	81.5 K=0.97	15.189	0.7854	-0.04	11929.50	0.000
T3	259.84 - 239.84	1	1.83	1.74	81.3 K=0.97	15.208	0.7854	-0.03	11944.70	0.000
T4	239.84 - 219.84	1	1.83	1.74	81.3 K=0.97	15.208	0.7854	-0.03	11944.70	0.000
T5	219.84 - 199.84	1	1.83	1.73	81.1 K=0.98	15.228	0.7854	-0.02	11960.10	0.000
T6	199.84 - 179.84	1	1.83	1.73	81.1 K=0.98	15.228	0.7854	-0.01	11960.10	0.000
T7	179.84 - 159.84	1	1.83	1.72	81.0 K=0.98	15.248	0.7854	-0.01	11975.90	0.000
T8	159.84 - 139.84	1	1.83	1.73	81.1 K=0.98	15.228	0.7854	-0.01	11960.10	0.000
T9	139.84 - 119.84	1	1.83	1.72	81.0 K=0.98	15.248	0.7854	-0.02	11975.90	0.000
T10	119.84 - 99.84	1	1.83	1.72	81.0 K=0.98	15.248	0.7854	-0.02	11975.90	0.000
T11	99.84 - 79.84	1	1.83	1.71	80.8 K=0.98	15.269	0.7854	-0.02	11992.00	0.000
T12	79.84 - 59.84	1	1.83	1.71	80.8 K=0.98	15.269	0.7854	-0.03	11992.00	0.000
T13	59.84 - 39.84	1	1.83	1.71	80.8 K=0.98	15.269	0.7854	-0.04	11992.00	0.000
T14	39.84 - 19.84	1	1.83	1.71	80.8 K=0.98	15.269	0.7854	-0.06	11992.00	0.000
T15	19.84 - 6.5	1	1.83	1.71	80.8 K=0.98	15.269	0.7854	-0.06	11992.00	0.000

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	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	291.84 - 279.84	1	3.67	3.50	117.6 K=0.70	10.622	0.7854	-0.06	8342.71	0.000
T2	279.84 - 259.84	1	3.67	3.50	117.6 K=0.70	10.622	0.7854	-993.46	8342.71	0.119
T3	259.84 - 239.84	1	3.67	3.50	117.6 K=0.70	10.622	0.7854	-659.79	8342.71	0.079
T4	239.84 - 219.84	1	3.67	3.48	116.9 K=0.70	10.721	0.7854	-1676.53	8420.16	0.199
T6	199.84 - 179.84	1	3.67	3.46	116.2 K=0.70	10.819	0.7854	-290.47	8497.28	0.034
T9	139.84 - 119.84	1	3.67	3.46	116.2 K=0.70	10.819	0.7854	-37.94	8497.28	0.004

Bottom Girt Design Data (Compression)

Section No.	Elevation	Size	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	
T16	6.5 - 0	12x3/8	0.28	0.03	3.6 K=1.00	21.455	4.5000	-5175.44	96549.00	0.054 ✓

Mid Girt Design Data (Compression)

Section No.	Elevation	Size	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	
T16	6.5 - 0	9x3/8	1.41	1.16	128.6 K=1.00	9.025	3.3750	-270.49	30460.70	0.009 ✓

Top Guy Pull-Off Design Data (Compression)

Section No.	Elevation	Size	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	291.84 - 279.84	MC12x35	3.67	3.50	115.1 K=1.00	10.968	10.3000	-5000.55	112971.00	0.044
T3	259.84 - 239.84	MC12x35	3.67	3.48	114.6 K=1.00	11.042	10.3000	-8077.10	113735.00	0.071
T5	219.84 - 199.84	MC12x35	3.67	3.46	114.1 K=1.00	11.116	10.3000	-12529.10	114498.00	0.109
T7	179.84 - 159.84	MC12x35	3.67	3.44	113.5 K=1.00	11.191	10.3000	-17600.40	115263.00	0.153
T10	119.84 - 99.84	MC12x35	3.67	3.44	113.5 K=1.00	11.191	10.3000	-16799.80	115263.00	0.146
T13	59.84 - 39.84	MC12x35	3.67	3.42	113.0 K=1.00	11.265	10.3000	-6698.97	116028.00	0.058

Top Guy Pull-Off Bending Design Data

Section No.	Elevation	Size	Actual M_x	Actual f_{bx}	Allow. F_{bx}	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y	Actual f_{by}	Allow. F_{by}	Ratio $\frac{f_{by}}{F_{by}}$
	ft		lb-ft	ksi	ksi		lb-ft	ksi	ksi	
T1	291.84 - 279.84	MC12x35	72.45	-0.024	21.600	0.001	-0.00	-0.000	21.600	0.000
T3	259.84 - 239.84	MC12x35	72.45	-0.024	21.600	0.001	0.00	-0.000	21.600	0.000
T5	219.84 - 199.84	MC12x35	72.45	-0.024	21.600	0.001	0.00	-0.000	21.600	0.000
T7	179.84 - 159.84	MC12x35	72.45	-0.024	21.600	0.001	0.00	-0.000	21.600	0.000
T10	119.84 - 99.84	MC12x35	72.45	-0.024	21.600	0.001	0.00	-0.000	21.600	0.000
T13	59.84 - 39.84	MC12x35	72.45	-0.024	21.600	0.001	0.00	-0.000	21.600	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	291.84 - 279.84	MC12x35	0.044	0.001	0.000	0.045 ✓	1.333	H1-3 ✓
T3	259.84 - 239.84	MC12x35	0.071	0.001	0.000	0.072 ✓	1.333	H1-3 ✓
T5	219.84 - 199.84	MC12x35	0.109	0.001	0.000	0.111 ✓	1.333	H1-3 ✓
T7	179.84 - 159.84	MC12x35	0.153	0.001	0.000	0.154 ✓	1.333	H1-3 ✓
T10	119.84 - 99.84	MC12x35	0.146	0.001	0.000	0.147 ✓	1.333	H1-3 ✓
T13	59.84 - 39.84	MC12x35	0.058	0.001	0.000	0.059 ✓	1.333	H1-3 ✓

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	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	291.84 - 279.84 (666)	MC12x35	4.00	3.92	125.5 K=1.00	9.483	10.3000	-20.91	97670.50	0.000
T1	291.84 - 279.84 (667)	MC12x35	4.00	3.92	42.4 K=1.00	21.600	10.3000	0.00	97670.50	0.000
T1	291.84 - 279.84 (670)	MC12x35	4.00	3.92	125.5 K=1.00	9.483	10.3000	-250.80	97670.50	0.003
T1	291.84 - 279.84 (671)	MC12x35	4.00	3.92	42.4 K=1.00	21.600	10.3000	0.00	97670.50	0.000
T1	291.84 - 279.84 (674)	MC12x35	4.00	3.92	125.5 K=1.00	9.483	10.3000	-147.02	97670.50	0.002
T1	291.84 - 279.84 (675)	MC12x35	4.00	3.92	125.5 K=1.00	9.483	10.3000	-379.59	97670.50	0.004
T3	259.84 - 239.84 (678)	MC12x35	4.00	3.91	125.2 K=1.00	9.519	10.3000	-1776.78	98045.70	0.018
T3	259.84 - 239.84 (679)	MC12x35	4.00	3.91	125.2 K=1.00	9.519	10.3000	-1780.85	98045.70	0.018
T3	259.84 - 239.84 (682)	MC12x35	4.00	3.91	125.2 K=1.00	9.519	10.3000	-1722.51	98045.70	0.018
T3	259.84 - 239.84 (683)	MC12x35	4.00	3.91	125.2 K=1.00	9.519	10.3000	-2110.16	98045.70	0.022
T3	259.84 - 239.84 (686)	MC12x35	4.00	3.91	125.2 K=1.00	9.519	10.3000	-1954.53	98045.70	0.020
T3	259.84 - 239.84 (687)	MC12x35	4.00	3.91	125.2 K=1.00	9.519	10.3000	-2218.87	98045.70	0.023
T5	219.84 - 199.84 (690)	MC12x35	4.00	3.90	125.0 K=1.00	9.555	10.3000	-4222.95	98421.10	0.043
T5	219.84 - 199.84 (691)	MC12x35	4.00	3.90	125.0 K=1.00	9.555	10.3000	-4246.75	98421.10	0.043
T5	219.84 - 199.84 (694)	MC12x35	4.00	3.90	125.0 K=1.00	9.555	10.3000	-4162.02	98421.10	0.042
T5	219.84 - 199.84 (695)	MC12x35	4.00	3.90	125.0 K=1.00	9.555	10.3000	-4679.80	98421.10	0.048
T5	219.84 - 199.84 (698)	MC12x35	4.00	3.90	125.0 K=1.00	9.555	10.3000	-5964.77	98421.10	0.061

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T5	219.84 - 199.84 (699)	MC12x35	4.00	3.90	125.0 K=1.00	9.555	10.3000	-4812.00	98421.10	0.049
T7	179.84 - 159.84 (702)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-8605.13	98796.70	0.087
T7	179.84 - 159.84 (703)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-6565.81	98796.70	0.066
T7	179.84 - 159.84 (706)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-7392.75	98796.70	0.075
T7	179.84 - 159.84 (707)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-6806.56	98796.70	0.069
T7	179.84 - 159.84 (710)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-8933.91	98796.70	0.090
T7	179.84 - 159.84 (711)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-7590.54	98796.70	0.077
T10	119.84 - 99.84 (714)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-8506.09	98796.70	0.086
T10	119.84 - 99.84 (715)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-6604.73	98796.70	0.067
T10	119.84 - 99.84 (718)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-7749.14	98796.70	0.078
T10	119.84 - 99.84 (719)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-10117.80	98796.70	0.102
T10	119.84 - 99.84 (722)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-9042.47	98796.70	0.092
T10	119.84 - 99.84 (723)	MC12x35	4.00	3.89	124.7 K=1.00	9.592	10.3000	-7704.28	98796.70	0.078
T13	59.84 - 39.84 (726)	MC12x35	4.00	3.88	124.5 K=1.00	9.628	10.3000	-3828.12	99172.50	0.039
T13	59.84 - 39.84 (727)	MC12x35	4.00	3.88	124.5 K=1.00	9.628	10.3000	-2998.75	99172.50	0.030
T13	59.84 - 39.84 (730)	MC12x35	4.00	3.88	124.5 K=1.00	9.628	10.3000	-4184.00	99172.50	0.042
T13	59.84 - 39.84 (731)	MC12x35	4.00	3.88	124.5 K=1.00	9.628	10.3000	-4331.64	99172.50	0.044
T13	59.84 - 39.84 (734)	MC12x35	4.00	3.88	124.5 K=1.00	9.628	10.3000	-4213.05	99172.50	0.042
T13	59.84 - 39.84 (735)	MC12x35	4.00	3.88	124.5 K=1.00	9.628	10.3000	-4342.55	99172.50	0.044

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_v lb-ft	Actual f_{by} ksi	Allow. F_{bv} ksi	Ratio $\frac{f_{by}}{F_{bv}}$
T1	291.84 - 279.84 (666)	MC12x35	-63553.58	-21.126	21.600	0.978	0.00	-0.000	21.600	0.000
T1	291.84 - 279.84 (667)	MC12x35	-64330.58	-21.384	21.600	0.990	-0.00	-0.000	21.600	0.000
T1	291.84 - 279.84 (670)	MC12x35	-63662.50	-21.162	21.600	0.980	0.00	-0.000	21.600	0.000
T1	291.84 - 279.84 (671)	MC12x35	-58754.00	-19.530	21.600	0.904	0.00	-0.000	21.600	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	291.84 - 279.84 (674)	MC12x35	-58882.42	-19.573	21.600	0.906	0.00	-0.000	21.600	0.000
T1	291.84 - 279.84 (675)	MC12x35	-64191.58	-21.338	21.600	0.988	-0.00	-0.000	21.600	0.000
T3	259.84 - 239.84 (678)	MC12x35	-66858.92	-22.225	21.600	1.029	-0.00	-0.000	21.600	0.000
T3	259.84 - 239.84 (679)	MC12x35	-66234.75	-22.017	21.600	1.019	0.00	-0.000	21.600	0.000
T3	259.84 - 239.84 (682)	MC12x35	-60510.67	-20.114	21.600	0.931	0.00	-0.000	21.600	0.000
T3	259.84 - 239.84 (683)	MC12x35	-65973.08	-21.930	21.600	1.015	0.00	-0.000	21.600	0.000
T3	259.84 - 239.84 (686)	MC12x35	-60333.50	-20.055	21.600	0.928	0.00	-0.000	21.600	0.000
T3	259.84 - 239.84 (687)	MC12x35	-66983.67	-22.266	21.600	1.031	-0.00	-0.000	21.600	0.000
T5	219.84 - 199.84 (690)	MC12x35	-68405.33	-22.739	21.600	1.053	-0.00	-0.000	21.600	0.000
T5	219.84 - 199.84 (691)	MC12x35	-67698.67	-22.504	21.600	1.042	0.00	-0.000	21.600	0.000
T5	219.84 - 199.84 (694)	MC12x35	-60516.00	-20.116	21.600	0.931	0.00	-0.000	21.600	0.000
T5	219.84 - 199.84 (695)	MC12x35	-67417.17	-22.410	21.600	1.038	0.00	-0.000	21.600	0.000
T5	219.84 - 199.84 (698)	MC12x35	-59349.25	-19.728	21.600	0.913	0.00	-0.000	21.600	0.000
T5	219.84 - 199.84 (699)	MC12x35	-68631.08	-22.814	21.600	1.056	-0.00	-0.000	21.600	0.000
T7	179.84 - 159.84 (702)	MC12x35	-61248.33	-20.360	21.600	0.943	0.00	-0.000	21.600	0.000
T7	179.84 - 159.84 (703)	MC12x35	-63406.50	-21.077	21.600	0.976	-0.00	-0.000	21.600	0.000
T7	179.84 - 159.84 (706)	MC12x35	-62388.42	-20.738	21.600	0.960	0.00	-0.000	21.600	0.000
T7	179.84 - 159.84 (707)	MC12x35	-53304.67	-17.719	21.600	0.820	0.00	-0.000	21.600	0.000
T7	179.84 - 159.84 (710)	MC12x35	-52648.08	-17.501	21.600	0.810	0.00	-0.000	21.600	0.000
T7	179.84 - 159.84 (711)	MC12x35	-63098.83	-20.975	21.600	0.971	-0.00	-0.000	21.600	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T10	119.84 - 99.84 (714)	MC12x35	-38131.25	-12.675	21.600	0.587	0.00	-0.000	21.600	0.000
T10	119.84 - 99.84 (715)	MC12x35	-39691.50	-13.194	21.600	0.611	-0.00	-0.000	21.600	0.000
T10	119.84 - 99.84 (718)	MC12x35	-39384.17	-13.092	21.600	0.606	0.00	-0.000	21.600	0.000
T10	119.84 - 99.84 (719)	MC12x35	-29484.75	-9.801	21.600	0.454	-0.00	-0.000	21.600	0.000
T10	119.84 - 99.84 (722)	MC12x35	-30316.00	-10.077	21.600	0.467	0.00	-0.000	21.600	0.000
T10	119.84 - 99.84 (723)	MC12x35	-39705.50	-13.198	21.600	0.611	-0.00	-0.000	21.600	0.000
T13	59.84 - 39.84 (726)	MC12x35	-11662.33	-3.877	21.600	0.179	-0.00	-0.000	21.600	0.000
T13	59.84 - 39.84 (727)	MC12x35	-11936.58	-3.968	21.600	0.184	0.00	-0.000	21.600	0.000
T13	59.84 - 39.84 (730)	MC12x35	-7540.84	-2.507	21.600	0.116	0.00	-0.000	21.600	0.000
T13	59.84 - 39.84 (731)	MC12x35	-11692.50	-3.887	21.600	0.180	0.00	-0.000	21.600	0.000
T13	59.84 - 39.84 (734)	MC12x35	-7563.57	-2.514	21.600	0.116	0.00	-0.000	21.600	0.000
T13	59.84 - 39.84 (735)	MC12x35	-12251.17	-4.072	21.600	0.189	-0.00	-0.000	21.600	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	291.84 - 279.84 (666)	MC12x35	0.000	0.978	0.000	0.978 ✔	1.333	H1-3 ✔
T1	291.84 - 279.84 (667)	MC12x35	0.000	0.990	0.000	0.990 ✔	1.333	H1-3 ✔
T1	291.84 - 279.84 (670)	MC12x35	0.003	0.980	0.000	0.982 ✔	1.333	H1-3 ✔
T1	291.84 - 279.84 (671)	MC12x35	0.000	0.904	0.000	0.904 ✔	1.333	H1-3 ✔
T1	291.84 - 279.84 (674)	MC12x35	0.002	0.906	0.000	0.908 ✔	1.333	H1-3 ✔
T1	291.84 - 279.84 (675)	MC12x35	0.004	0.988	0.000	0.992 ✔	1.333	H1-3 ✔
T3	259.84 - 239.84 (678)	MC12x35	0.018	1.029	0.000	1.047 ✔	1.333	H1-3 ✔
T3	259.84 - 239.84 (679)	MC12x35	0.018	1.019	0.000	1.037 ✔	1.333	H1-3 ✔

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T3	259.84 - 239.84 (682)	MC12x35	0.018	0.931	0.000	0.949 ✓	1.333	H1-3 ✓
T3	259.84 - 239.84 (683)	MC12x35	0.022	1.015	0.000	1.037 ✓	1.333	H1-3 ✓
T3	259.84 - 239.84 (686)	MC12x35	0.020	0.928	0.000	0.948 ✓	1.333	H1-3 ✓
T3	259.84 - 239.84 (687)	MC12x35	0.023	1.031	0.000	1.053 ✓	1.333	H1-3 ✓
T5	219.84 - 199.84 (690)	MC12x35	0.043	1.053	0.000	1.096 ✓	1.333	H1-3 ✓
T5	219.84 - 199.84 (691)	MC12x35	0.043	1.042	0.000	1.085 ✓	1.333	H1-3 ✓
T5	219.84 - 199.84 (694)	MC12x35	0.042	0.931	0.000	0.974 ✓	1.333	H1-3 ✓
T5	219.84 - 199.84 (695)	MC12x35	0.048	1.038	0.000	1.085 ✓	1.333	H1-3 ✓
T5	219.84 - 199.84 (698)	MC12x35	0.061	0.913	0.000	0.974 ✓	1.333	H1-3 ✓
T5	219.84 - 199.84 (699)	MC12x35	0.049	1.056	0.000	1.105 ✓	1.333	H1-3 ✓
T7	179.84 - 159.84 (702)	MC12x35	0.087	0.943	0.000	1.030 ✓	1.333	H1-3 ✓
T7	179.84 - 159.84 (703)	MC12x35	0.066	0.976	0.000	1.042 ✓	1.333	H1-3 ✓
T7	179.84 - 159.84 (706)	MC12x35	0.075	0.960	0.000	1.035 ✓	1.333	H1-3 ✓
T7	179.84 - 159.84 (707)	MC12x35	0.069	0.820	0.000	0.889 ✓	1.333	H1-3 ✓
T7	179.84 - 159.84 (710)	MC12x35	0.090	0.810	0.000	0.901 ✓	1.333	H1-3 ✓
T7	179.84 - 159.84 (711)	MC12x35	0.077	0.971	0.000	1.048 ✓	1.333	H1-3 ✓
T10	119.84 - 99.84 (714)	MC12x35	0.086	0.587	0.000	0.673 ✓	1.333	H1-3 ✓
T10	119.84 - 99.84 (715)	MC12x35	0.067	0.611	0.000	0.678 ✓	1.333	H1-3 ✓
T10	119.84 - 99.84 (718)	MC12x35	0.078	0.606	0.000	0.685 ✓	1.333	H1-3 ✓
T10	119.84 - 99.84 (719)	MC12x35	0.102	0.454	0.000	0.556 ✓	1.333	H1-3 ✓
T10	119.84 - 99.84 (722)	MC12x35	0.092	0.467	0.000	0.558 ✓	1.333	H1-3 ✓
T10	119.84 - 99.84 (723)	MC12x35	0.078	0.611	0.000	0.689 ✓	1.333	H1-3 ✓
T13	59.84 - 39.84 (726)	MC12x35	0.039	0.179	0.000	0.218 ✓	1.333	H1-3 ✓
T13	59.84 - 39.84 (727)	MC12x35	0.030	0.184	0.000	0.214 ✓	1.333	H1-3 ✓
T13	59.84 - 39.84 (730)	MC12x35	0.042	0.116	0.000	0.158 ✓	1.333	H1-3 ✓
T13	59.84 - 39.84 (731)	MC12x35	0.044	0.180	0.000	0.224 ✓	1.333	H1-3 ✓
T13	59.84 - 39.84 (734)	MC12x35	0.042	0.116	0.000	0.159 ✓	1.333	H1-3 ✓
T13	59.84 - 39.84 (735)	MC12x35	0.044	0.189	0.000	0.232 ✓	1.333	H1-3 ✓

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	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	291.84 - 279.84	2	12.00	3.00	72.0	30.000	3.1416	9792.59	94247.80	0.104
T3	259.84 - 239.84	2 1/4	20.00	3.33	71.1	30.000	3.9761	3986.63	119282.00	0.033
T4	239.84 - 219.84	2 1/4	20.00	3.33	71.1	30.000	3.9761	4594.41	119282.00	0.039
T6	199.84 - 179.84	2 1/2	20.00	3.33	64.0	30.000	4.9087	3395.62	147262.00	0.023
T12	79.84 - 59.84	3	20.00	3.33	53.3	30.000	7.0686	540.15	212058.00	0.003

Leg Bending Design Data (Tension)

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	291.84 - 279.84	2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T3	259.84 - 239.84	2 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T4	239.84 - 219.84	2 1/4	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T6	199.84 - 179.84	2 1/2	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000
T12	79.84 - 59.84	3	0.00	0.000	37.500	0.000	0.00	0.000	37.500	0.000

Leg Interaction Design Data (Tension)

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	291.84 - 279.84	2	0.104	0.000	0.000	0.104 ✓	1.333	H2-1 ✓
T3	259.84 - 239.84	2 1/4	0.033	0.000	0.000	0.033 ✓	1.333	H2-1 ✓
T4	239.84 - 219.84	2 1/4	0.039	0.000	0.000	0.039 ✓	1.333	H2-1 ✓
T6	199.84 - 179.84	2 1/2	0.023	0.000	0.000	0.023 ✓	1.333	H2-1 ✓
T12	79.84 - 59.84	3	0.003	0.000	0.000	0.003 ✓	1.333	H2-1 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$

Section No.	Elevation ft	Size	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	291.84 - 279.84	1 3/8	4.74	4.52	157.9	21.600	1.4849	4978.91	32073.70	0.155
T2	279.84 - 259.84	1 3/8	4.96	4.73	165.1	21.600	1.4849	3168.74	32073.70	0.099
T3	259.84 - 239.84	1 3/8	4.96	4.70	164.1	21.600	1.4849	6210.61	32073.70	0.194
T4	239.84 - 219.84	1 3/8	4.96	4.70	164.1	21.600	1.4849	7562.79	32073.70	0.236
T5	219.84 - 199.84	1 1/2	4.96	4.67	149.6	21.600	1.7672	8195.42	38170.40	0.215
T6	199.84 - 179.84	1 1/4	4.96	4.67	179.5	21.600	1.2272	8508.52	26507.20	0.321
T7	179.84 - 159.84	1 1/2	4.96	4.65	148.7	21.600	1.7672	12172.00	38170.40	0.319
T8	159.84 - 139.84	1 3/8	4.96	4.67	163.2	21.600	1.4849	7809.70	32073.70	0.243
T9	139.84 - 119.84	1 1/4	4.96	4.65	178.4	21.600	1.2272	3704.63	26507.20	0.140
T10	119.84 - 99.84	1 1/2	4.96	4.65	148.7	21.600	1.7672	12317.80	38170.40	0.323
T11	99.84 - 79.84	1 3/8	4.96	4.62	161.2	21.600	1.4849	8993.57	32073.70	0.280
T12	79.84 - 59.84	1 1/4	4.96	4.62	177.3	21.600	1.2272	3560.40	26507.20	0.134
T13	59.84 - 39.84	1 1/4	4.96	4.62	177.3	21.600	1.2272	4095.01	26507.20	0.154
T14	39.84 - 19.84	1 1/4	4.96	4.62	177.3	21.600	1.2272	3836.99	26507.20	0.145
T15	19.84 - 6.5	1 1/4	4.96	4.62	177.4	21.600	1.2272	6568.09	26507.20	0.248

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	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	291.84 - 279.84	1	3.67	3.50	168.0	21.600	0.7854	1050.14	16964.60	0.062
T2	279.84 - 259.84	1	3.67	3.50	168.0	21.600	0.7854	413.56	16964.60	0.024
T3	259.84 - 239.84	1	3.67	3.48	167.0	21.600	0.7854	713.76	16964.60	0.042
T4	239.84 - 219.84	1	3.67	3.48	167.0	21.600	0.7854	792.46	16964.60	0.047
T5	219.84 - 199.84	1	3.67	3.46	166.0	21.600	0.7854	1361.58	16964.60	0.080
T6	199.84 - 179.84	1	3.67	3.46	166.0	21.600	0.7854	2715.74	16964.60	0.160
T7	179.84 - 159.84	1	3.67	3.44	165.0	21.600	0.7854	1417.11	16964.60	0.084

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T8	159.84 - 139.84	1	3.67	3.46	166.0	21.600	0.7854	1160.12	16964.60	0.068 ✓
T9	139.84 - 119.84	1	3.67	3.44	165.0	21.600	0.7854	1329.45	16964.60	0.078 ✓
T10	119.84 - 99.84	1	3.67	3.44	165.0	21.600	0.7854	1985.40	16964.60	0.117 ✓
T11	99.84 - 79.84	1	3.67	3.42	164.0	21.600	0.7854	2375.66	16964.60	0.140 ✓
T12	79.84 - 59.84	1	3.67	3.42	164.0	21.600	0.7854	1539.87	16964.60	0.091 ✓
T13	59.84 - 39.84	1	3.67	3.42	164.0	21.600	0.7854	1549.70	16964.60	0.091 ✓
T14	39.84 - 19.84	1	3.67	3.42	164.0	21.600	0.7854	1482.35	16964.60	0.087 ✓
T15	19.84 - 6.5	1	3.67	3.42	164.0	21.600	0.7854	1697.64	16964.60	0.100 ✓

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	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	291.84 - 279.84	1	1.83	1.75	84.0	21.600	0.7854	0.04	16964.60	0.000 ✓
T2	279.84 - 259.84	1	1.83	1.75	84.0	21.600	0.7854	0.03	16964.60	0.000 ✓
T3	259.84 - 239.84	1	1.83	1.74	83.5	21.600	0.7854	0.03	16964.60	0.000 ✓
T4	239.84 - 219.84	1	1.83	1.74	83.5	21.600	0.7854	0.02	16964.60	0.000 ✓
T5	219.84 - 199.84	1	1.83	1.73	83.0	21.600	0.7854	0.02	16964.60	0.000 ✓
T6	199.84 - 179.84	1	1.83	1.73	83.0	21.600	0.7854	0.02	16964.60	0.000 ✓
T7	179.84 - 159.84	1	1.83	1.72	82.5	21.600	0.7854	0.02	16964.60	0.000 ✓
T8	159.84 - 139.84	1	1.83	1.73	83.0	21.600	0.7854	0.01	16964.60	0.000 ✓
T9	139.84 - 119.84	1	1.83	1.72	82.5	21.600	0.7854	0.02	16964.60	0.000 ✓
T10	119.84 - 99.84	1	1.83	1.72	82.5	21.600	0.7854	0.02	16964.60	0.000 ✓
T11	99.84 - 79.84	1	1.83	1.71	82.0	21.600	0.7854	0.03	16964.60	0.000 ✓
T12	79.84 - 59.84	1	1.83	1.71	82.0	21.600	0.7854	0.04	16964.60	0.000 ✓
T13	59.84 - 39.84	1	1.83	1.71	82.0	21.600	0.7854	0.05	16964.60	0.000 ✓
T14	39.84 - 19.84	1	1.83	1.71	82.0	21.600	0.7854	0.06	16964.60	0.000 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T15	19.84 - 6.5	1	1.83	1.71	82.0	21.600	0.7854	0.07	16964.60	0.000 ✓

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	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	291.84 - 279.84	1	3.67	3.50	168.0	21.600	0.7854	0.06	16964.60	0.000 ✓
T2	279.84 - 259.84	1	3.67	3.50	168.0	21.600	0.7854	1586.96	16964.60	0.094 ✓
T3	259.84 - 239.84	1	3.67	3.50	168.0	21.600	0.7854	1843.42	16964.60	0.109 ✓
T4	239.84 - 219.84	1	3.67	3.48	167.0	21.600	0.7854	2189.03	16964.60	0.129 ✓
T5	219.84 - 199.84	1	3.67	3.48	167.0	21.600	0.7854	1008.48	16964.60	0.059 ✓
T6	199.84 - 179.84	1	3.67	3.46	166.0	21.600	0.7854	1217.94	16964.60	0.072 ✓
T7	179.84 - 159.84	1	3.67	3.46	166.0	21.600	0.7854	929.84	16964.60	0.055 ✓
T8	159.84 - 139.84	1	3.67	3.44	165.0	21.600	0.7854	1156.46	16964.60	0.068 ✓
T9	139.84 - 119.84	1	3.67	3.46	166.0	21.600	0.7854	1242.66	16964.60	0.073 ✓
T10	119.84 - 99.84	1	3.67	3.44	165.0	21.600	0.7854	1164.27	16964.60	0.069 ✓
T11	99.84 - 79.84	1	3.67	3.44	165.0	21.600	0.7854	1364.46	16964.60	0.080 ✓
T12	79.84 - 59.84	1	3.67	3.42	164.0	21.600	0.7854	1390.33	16964.60	0.082 ✓
T13	59.84 - 39.84	1	3.67	3.42	164.0	21.600	0.7854	1354.99	16964.60	0.080 ✓
T14	39.84 - 19.84	1	3.67	3.42	164.0	21.600	0.7854	1479.77	16964.60	0.087 ✓
T15	19.84 - 6.5	1	3.67	3.42	164.0	21.600	0.7854	1665.25	16964.60	0.098 ✓
T16	6.5 - 0	12x3/8	3.67	3.42	378.8	21.600	4.5000	25199.90	97200.00	0.259 ✓

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T16	6.5 - 0	9x3/8	2.54	2.29	253.7	21.600	3.3750	400.99	72900.00	0.006

Section No.	Elevation	Size	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	✓

Top Guy Pull-Off Design Data (Tension)

Section No.	Elevation	Size	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	291.84 - 279.84	MC12x35	3.67	3.50	37.8	21.600	10.3000	5680.95	222480.00	0.026
T3	259.84 - 239.84	MC12x35	3.67	3.48	37.6	21.600	10.3000	9215.80	222480.00	0.041
T5	219.84 - 199.84	MC12x35	3.67	3.46	37.4	21.600	10.3000	14142.40	222480.00	0.064
T7	179.84 - 159.84	MC12x35	3.67	3.44	37.2	21.600	10.3000	19866.20	222480.00	0.089
T10	119.84 - 99.84	MC12x35	3.67	3.44	37.2	21.600	10.3000	19137.70	222480.00	0.086
T13	59.84 - 39.84	MC12x35	3.67	3.42	36.9	21.600	10.3000	9130.33	222480.00	0.041

Top Guy Pull-Off Bending Design Data

Section No.	Elevation	Size	Actual M_x	Actual f_{bx}	Allow. F_{bx}	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y	Actual f_{by}	Allow. F_{by}	Ratio $\frac{f_{by}}{F_{by}}$
	ft		lb-ft	ksi	ksi		lb-ft	ksi	ksi	
T1	291.84 - 279.84	MC12x35	72.45	0.024	21.600	0.001	-0.00	0.000	27.000	0.000
T3	259.84 - 239.84	MC12x35	72.45	0.024	21.600	0.001	-0.00	0.000	27.000	0.000
T5	219.84 - 199.84	MC12x35	72.45	0.024	21.600	0.001	-0.00	0.000	27.000	0.000
T7	179.84 - 159.84	MC12x35	72.45	0.024	21.600	0.001	0.00	0.000	27.000	0.000
T10	119.84 - 99.84	MC12x35	72.45	0.024	21.600	0.001	0.00	0.000	27.000	0.000
T13	59.84 - 39.84	MC12x35	72.45	0.024	21.600	0.001	0.00	0.000	27.000	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
	ft							
T1	291.84 - 279.84	MC12x35	0.026	0.001	0.000	0.027 ✓	1.333	H2-1 ✓
T3	259.84 - 239.84	MC12x35	0.041	0.001	0.000	0.043 ✓	1.333	H2-1 ✓
T5	219.84 - 199.84	MC12x35	0.064	0.001	0.000	0.065 ✓	1.333	H2-1 ✓
T7	179.84 - 159.84	MC12x35	0.089	0.001	0.000	0.090 ✓	1.333	H2-1 ✓
T10	119.84 - 99.84	MC12x35	0.086	0.001	0.000	0.087 ✓	1.333	H2-1 ✓
T13	59.84 - 39.84	MC12x35	0.041	0.001	0.000	0.042 ✓	1.333	H2-1 ✓

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	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	291.84 - 279.84 (666)	MC12x35	4.00	3.92	42.4	21.600	10.3000	1653.32	222480.00	0.007
T1	291.84 - 279.84 (667)	MC12x35	4.00	3.92	42.4	21.600	10.3000	35.80	222480.00	0.000
T1	291.84 - 279.84 (670)	MC12x35	4.00	3.92	42.4	21.600	10.3000	572.52	222480.00	0.003
T1	291.84 - 279.84 (671)	MC12x35	4.00	3.92	42.4	21.600	10.3000	16.15	222480.00	0.000
T1	291.84 - 279.84 (674)	MC12x35	4.00	3.92	42.4	21.600	10.3000	1793.63	222480.00	0.008
T1	291.84 - 279.84 (675)	MC12x35	4.00	3.92	42.4	21.600	10.3000	1487.18	222480.00	0.007
T3	259.84 - 239.84 (678)	MC12x35	4.00	3.91	42.3	21.600	10.3000	1027.46	222480.00	0.005
T3	259.84 - 239.84 (679)	MC12x35	4.00	3.91	42.3	21.600	10.3000	987.34	222480.00	0.004
T3	259.84 - 239.84 (682)	MC12x35	4.00	3.91	42.3	21.600	10.3000	1308.62	222480.00	0.006
T3	259.84 - 239.84 (683)	MC12x35	4.00	3.91	42.3	21.600	10.3000	808.59	222480.00	0.004
T3	259.84 - 239.84 (686)	MC12x35	4.00	3.91	42.3	21.600	10.3000	1084.53	222480.00	0.005
T3	259.84 - 239.84 (687)	MC12x35	4.00	3.91	42.3	21.600	10.3000	762.12	222480.00	0.003
T5	219.84 - 199.84 (690)	MC12x35	4.00	3.90	42.2	21.600	10.3000	176.73	222480.00	0.001
T5	219.84 - 199.84 (691)	MC12x35	4.00	3.90	42.2	21.600	10.3000	83.33	222480.00	0.000
T5	219.84 - 199.84 (694)	MC12x35	4.00	3.90	42.2	21.600	10.3000	501.13	222480.00	0.002
T5	219.84 - 199.84 (695)	MC12x35	4.00	3.90	42.2	21.600	10.3000	5717.28	222480.00	0.026
T5	219.84 - 199.84 (698)	MC12x35	4.00	3.90	42.2	21.600	10.3000	200.62	222480.00	0.001
T5	219.84 - 199.84 (699)	MC12x35	4.00	3.90	42.2	21.600	10.3000	2669.89	222480.00	0.012
T7	179.84 - 159.84 (702)	MC12x35	4.00	3.89	42.1	21.600	10.3000	7213.82	222480.00	0.032
T7	179.84 - 159.84 (703)	MC12x35	4.00	3.89	42.1	21.600	10.3000	3719.04	222480.00	0.017
T7	179.84 - 159.84 (706)	MC12x35	4.00	3.89	42.1	21.600	10.3000	6967.68	222480.00	0.031
T7	179.84 - 159.84 (707)	MC12x35	4.00	3.89	42.1	21.600	10.3000	8104.17	222480.00	0.036
T7	179.84 - 159.84 (710)	MC12x35	4.00	3.89	42.1	21.600	10.3000	7947.12	222480.00	0.036
T7	179.84 - 159.84 (711)	MC12x35	4.00	3.89	42.1	21.600	10.3000	2979.23	222480.00	0.013
T10	119.84 - 99.84 (714)	MC12x35	4.00	3.89	42.1	21.600	10.3000	6915.52	222480.00	0.031
T10	119.84 - 99.84 (715)	MC12x35	4.00	3.89	42.1	21.600	10.3000	3576.90	222480.00	0.016
T10	119.84 - 99.84 (718)	MC12x35	4.00	3.89	42.1	21.600	10.3000	6184.98	222480.00	0.028
T10	119.84 - 99.84 (719)	MC12x35	4.00	3.89	42.1	21.600	10.3000	7676.12	222480.00	0.035

Section No.	Elevation ft	Size	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	119.84 - 99.84 (722)	MC12x35	4.00	3.89	42.1	21.600	10.3000	7426.88	222480.00	0.033
T10	119.84 - 99.84 (723)	MC12x35	4.00	3.89	42.1	21.600	10.3000	2601.59	222480.00	0.012
T13	59.84 - 39.84 (726)	MC12x35	4.00	3.88	41.9	21.600	10.3000	1010.95	222480.00	0.005
T13	59.84 - 39.84 (727)	MC12x35	4.00	3.88	41.9	21.600	10.3000	826.38	222480.00	0.004
T13	59.84 - 39.84 (730)	MC12x35	4.00	3.88	41.9	21.600	10.3000	4073.42	222480.00	0.018
T13	59.84 - 39.84 (731)	MC12x35	4.00	3.88	41.9	21.600	10.3000	2832.75	222480.00	0.013
T13	59.84 - 39.84 (734)	MC12x35	4.00	3.88	41.9	21.600	10.3000	3821.64	222480.00	0.017
T13	59.84 - 39.84 (735)	MC12x35	4.00	3.88	41.9	21.600	10.3000	275.91	222480.00	0.001

Torque-Arm Top Bending Design Data

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
T1	291.84 - 279.84 (666)	MC12x35	-58918.17	19.585	21.600	0.907	-0.00	0.000	27.000	0.000
T1	291.84 - 279.84 (667)	MC12x35	-64330.58	21.384	21.600	0.990	-0.00	0.000	27.000	0.000
T1	291.84 - 279.84 (670)	MC12x35	-63013.67	20.946	21.600	0.970	0.00	0.000	27.000	0.000
T1	291.84 - 279.84 (671)	MC12x35	-58754.00	19.530	21.600	0.904	0.00	0.000	27.000	0.000
T1	291.84 - 279.84 (674)	MC12x35	-55270.75	18.372	21.600	0.851	0.00	0.000	27.000	0.000
T1	291.84 - 279.84 (675)	MC12x35	-60617.67	20.150	21.600	0.933	-0.00	0.000	27.000	0.000
T3	259.84 - 239.84 (678)	MC12x35	-61776.92	20.535	21.600	0.951	-0.00	0.000	27.000	0.000
T3	259.84 - 239.84 (679)	MC12x35	-61066.75	20.299	21.600	0.940	-0.00	0.000	27.000	0.000
T3	259.84 - 239.84 (682)	MC12x35	-56819.58	18.887	21.600	0.874	0.00	0.000	27.000	0.000
T3	259.84 - 239.84 (683)	MC12x35	-62143.58	20.657	21.600	0.956	0.00	0.000	27.000	0.000
T3	259.84 - 239.84 (686)	MC12x35	-56225.17	18.690	21.600	0.865	0.00	0.000	27.000	0.000
T3	259.84 -	MC12x35	-	20.927	21.600	0.969	-0.00	0.000	27.000	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	239.84 (687)		62956.25							
T5	219.84 - 199.84 (690)	MC12x35	-63706.00	21.177	21.600	0.980	-0.00	0.000	27.000	0.000
T5	219.84 - 199.84 (691)	MC12x35	-62832.50	20.886	21.600	0.967	-0.00	0.000	27.000	0.000
T5	219.84 - 199.84 (694)	MC12x35	-57098.17	18.980	21.600	0.879	0.00	0.000	27.000	0.000
T5	219.84 - 199.84 (695)	MC12x35	-52254.50	17.370	21.600	0.804	0.00	0.000	27.000	0.000
T5	219.84 - 199.84 (698)	MC12x35	-56418.17	18.754	21.600	0.868	0.00	0.000	27.000	0.000
T5	219.84 - 199.84 (699)	MC12x35	-59279.50	19.705	21.600	0.912	-0.00	0.000	27.000	0.000
T7	179.84 - 159.84 (702)	MC12x35	-48511.17	16.126	21.600	0.747	-0.00	0.000	27.000	0.000
T7	179.84 - 159.84 (703)	MC12x35	-56367.75	18.737	21.600	0.867	-0.00	0.000	27.000	0.000
T7	179.84 - 159.84 (706)	MC12x35	-49138.67	16.334	21.600	0.756	0.00	0.000	27.000	0.000
T7	179.84 - 159.84 (707)	MC12x35	-42742.58	14.208	21.600	0.658	0.00	0.000	27.000	0.000
T7	179.84 - 159.84 (710)	MC12x35	-42909.58	14.264	21.600	0.660	-0.00	0.000	27.000	0.000
T7	179.84 - 159.84 (711)	MC12x35	-55726.25	18.524	21.600	0.858	-0.00	0.000	27.000	0.000
T10	119.84 - 99.84 (714)	MC12x35	-31818.08	10.577	21.600	0.490	0.00	0.000	27.000	0.000
T10	119.84 - 99.84 (715)	MC12x35	-36392.17	12.097	21.600	0.560	0.00	0.000	27.000	0.000
T10	119.84 - 99.84 (718)	MC12x35	-30431.08	10.116	21.600	0.468	-0.00	0.000	27.000	0.000
T10	119.84 - 99.84 (719)	MC12x35	-24525.25	8.152	21.600	0.377	-0.00	0.000	27.000	0.000
T10	119.84 - 99.84 (722)	MC12x35	-25385.00	8.438	21.600	0.391	0.00	0.000	27.000	0.000
T10	119.84 - 99.84 (723)	MC12x35	-34943.67	11.616	21.600	0.538	0.00	0.000	27.000	0.000
T13	59.84 - 39.84 (726)	MC12x35	-12413.75	4.126	21.600	0.191	0.00	0.000	27.000	0.000
T13	59.84 - 39.84	MC12x35	-	4.011	21.600	0.186	-0.00	0.000	27.000	0.000

Section No.	Elevation ft	Size	Actual M_x lb-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y lb-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
	(727)		12067.75							
T13	59.84 - 39.84 (730)	MC12x35	-7130.32	2.370	21.600	0.110	-0.00	0.000	27.000	0.000
T13	59.84 - 39.84 (731)	MC12x35	-9902.92	3.292	21.600	0.152	-0.00	0.000	27.000	0.000
T13	59.84 - 39.84 (734)	MC12x35	-7178.38	2.386	21.600	0.110	0.00	0.000	27.000	0.000
T13	59.84 - 39.84 (735)	MC12x35	-11962.25	3.976	21.600	0.184	0.00	0.000	27.000	0.000

Torque-Arm Top Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T1	291.84 - 279.84 (666)	MC12x35	0.007	0.907	0.000	0.914 ✓	1.333	H2-1 ✓
T1	291.84 - 279.84 (667)	MC12x35	0.000	0.990	0.000	0.990 ✓	1.333	H2-1 ✓
T1	291.84 - 279.84 (670)	MC12x35	0.003	0.970	0.000	0.972 ✓	1.333	H2-1 ✓
T1	291.84 - 279.84 (671)	MC12x35	0.000	0.904	0.000	0.904 ✓	1.333	H2-1 ✓
T1	291.84 - 279.84 (674)	MC12x35	0.008	0.851	0.000	0.859 ✓	1.333	H2-1 ✓
T1	291.84 - 279.84 (675)	MC12x35	0.007	0.933	0.000	0.940 ✓	1.333	H2-1 ✓
T3	259.84 - 239.84 (678)	MC12x35	0.005	0.951	0.000	0.955 ✓	1.333	H2-1 ✓
T3	259.84 - 239.84 (679)	MC12x35	0.004	0.940	0.000	0.944 ✓	1.333	H2-1 ✓
T3	259.84 - 239.84 (682)	MC12x35	0.006	0.874	0.000	0.880 ✓	1.333	H2-1 ✓
T3	259.84 - 239.84 (683)	MC12x35	0.004	0.956	0.000	0.960 ✓	1.333	H2-1 ✓
T3	259.84 - 239.84 (686)	MC12x35	0.005	0.865	0.000	0.870 ✓	1.333	H2-1 ✓
T3	259.84 - 239.84 (687)	MC12x35	0.003	0.969	0.000	0.972 ✓	1.333	H2-1 ✓
T5	219.84 - 199.84 (690)	MC12x35	0.001	0.980	0.000	0.981 ✓	1.333	H2-1 ✓
T5	219.84 - 199.84 (691)	MC12x35	0.000	0.967	0.000	0.967 ✓	1.333	H2-1 ✓
T5	219.84 - 199.84 (694)	MC12x35	0.002	0.879	0.000	0.881 ✓	1.333	H2-1 ✓
T5	219.84 - 199.84 (695)	MC12x35	0.026	0.804	0.000	0.830 ✓	1.333	H2-1 ✓
T5	219.84 - 199.84 (698)	MC12x35	0.001	0.868	0.000	0.869 ✓	1.333	H2-1 ✓
T5	219.84 - 199.84 (699)	MC12x35	0.012	0.912	0.000	0.924 ✓	1.333	H2-1 ✓
T7	179.84 - 159.84 (702)	MC12x35	0.032	0.747	0.000	0.779 ✓	1.333	H2-1 ✓
T7	179.84 - 159.84 (703)	MC12x35	0.017	0.867	0.000	0.884 ✓	1.333	H2-1 ✓

Section No.	Elevation ft	Size	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T7	159.84 (703) 179.84 - 159.84 (706)	MC12x35	0.031	0.756	0.000	0.788 ✓	1.333	H2-1 ✓
T7	179.84 - 159.84 (707)	MC12x35	0.036	0.658	0.000	0.694 ✓	1.333	H2-1 ✓
T7	179.84 - 159.84 (710)	MC12x35	0.036	0.660	0.000	0.696 ✓	1.333	H2-1 ✓
T7	179.84 - 159.84 (711)	MC12x35	0.013	0.858	0.000	0.871 ✓	1.333	H2-1 ✓
T10	119.84 - 99.84 (714)	MC12x35	0.031	0.490	0.000	0.521 ✓	1.333	H2-1 ✓
T10	119.84 - 99.84 (715)	MC12x35	0.016	0.560	0.000	0.576 ✓	1.333	H2-1 ✓
T10	119.84 - 99.84 (718)	MC12x35	0.028	0.468	0.000	0.496 ✓	1.333	H2-1 ✓
T10	119.84 - 99.84 (719)	MC12x35	0.035	0.377	0.000	0.412 ✓	1.333	H2-1 ✓
T10	119.84 - 99.84 (722)	MC12x35	0.033	0.391	0.000	0.424 ✓	1.333	H2-1 ✓
T10	119.84 - 99.84 (723)	MC12x35	0.012	0.538	0.000	0.549 ✓	1.333	H2-1 ✓
T13	59.84 - 39.84 (726)	MC12x35	0.005	0.191	0.000	0.196 ✓	1.333	H2-1 ✓
T13	59.84 - 39.84 (727)	MC12x35	0.004	0.186	0.000	0.189 ✓	1.333	H2-1 ✓
T13	59.84 - 39.84 (730)	MC12x35	0.018	0.110	0.000	0.128 ✓	1.333	H2-1 ✓
T13	59.84 - 39.84 (731)	MC12x35	0.013	0.152	0.000	0.165 ✓	1.333	H2-1 ✓
T13	59.84 - 39.84 (734)	MC12x35	0.017	0.110	0.000	0.128 ✓	1.333	H2-1 ✓
T13	59.84 - 39.84 (735)	MC12x35	0.001	0.184	0.000	0.185 ✓	1.333	H2-1 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
L1	327 - 291.84	Pole	P10.75x0.843	1	-3867.63	290040.55	17.0	Pass
T1	291.84 - 279.84	Leg	2	4	-28817.60	86118.46	33.5	Pass
T2	279.84 - 259.84	Leg	2	38	-34395.90	79619.02	43.2	Pass
T3	259.84 - 239.84	Leg	2 1/4	83	-81922.60	109876.92	74.6	Pass
T4	239.84 - 219.84	Leg	2 1/4	128	-81785.20	109876.92	74.4	Pass
T5	219.84 - 199.84	Leg	2 1/2	173	-94824.00	144103.96	65.8	Pass
T6	199.84 - 179.84	Leg	2 1/2	218	-96360.40	144103.96	66.9	Pass
T7	179.84 - 159.84	Leg	2 3/4	262	-105913.00	182302.41	58.1	Pass
T8	159.84 - 139.84	Leg	2 1/2	308	-106245.00	144103.96	73.7	Pass
T9	139.84 - 119.84	Leg	2 3/4	351	-108278.00	182302.41	59.4	Pass
T10	119.84 - 99.84	Leg	2 3/4	396	-117587.00	182302.41	64.5	Pass
T11	99.84 - 79.84	Leg	3	441	-162576.00	224467.86	72.4	Pass
T12	79.84 - 59.84	Leg	3	486	-167121.00	224467.86	74.5	Pass
T13	59.84 - 39.84	Leg	3	533	-178024.00	224467.86	79.3	Pass
T14	39.84 - 19.84	Leg	3	576	-177782.00	224467.86	79.2	Pass
T15	19.84 - 6.5	Leg	3	621	-160383.00	224427.87	71.5	Pass
T16	6.5 - 0	Leg	3	654	-141967.00	201930.83	70.3	Pass
T1	291.84 - 279.84	Diagonal	1 3/8	19	-5322.94	22965.86	23.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T2	279.84 - 259.84	Diagonal	1 3/8	79	-3564.69	21585.80	16.5	Pass
T3	259.84 - 239.84	Diagonal	1 3/8	117	-7151.78	21775.22	32.8	Pass
T4	239.84 - 219.84	Diagonal	1 3/8	132	-8521.01	21775.22	39.1	Pass
T5	219.84 - 199.84	Diagonal	1 1/2	206	-9618.50	29148.71	33.0	Pass
T6	199.84 - 179.84	Diagonal	1 1/4	223	-10228.50	15474.66	66.1	Pass
T7	179.84 - 159.84	Diagonal	1 1/2	289	-13400.10	29341.99	45.7	Pass
T8	159.84 - 139.84	Diagonal	1 3/8	347	-9385.06	21963.97	42.7	Pass
T9	139.84 - 119.84	Diagonal	1 1/4	359	-6129.58	15658.08	39.1	Pass
T10	119.84 - 99.84	Diagonal	1 1/2	410	-15057.50	29341.99	51.3	Pass
T11	99.84 - 79.84	Diagonal	1 3/8	483	-11940.00	22338.81	53.4	Pass
T12	79.84 - 59.84	Diagonal	1 1/4	492	-5750.97	15840.70	36.3	Pass
T13	59.84 - 39.84	Diagonal	1 1/4	566	-6793.75	15840.70	42.9	Pass
T14	39.84 - 19.84	Diagonal	1 1/4	584	-6642.20	15840.70	41.9	Pass
T15	19.84 - 6.5	Diagonal	1 1/4	627	-8352.02	15833.91	52.7	Pass
T1	291.84 - 279.84	Horizontal	1	15	-914.72	11120.83	8.2	Pass
T2	279.84 - 259.84	Horizontal	1	47	-410.23	11120.83	3.7	Pass
T3	259.84 - 239.84	Horizontal	1	113	-897.02	11224.07	8.0	Pass
T4	239.84 - 219.84	Horizontal	1	136	-411.02	11224.07	3.7	Pass
T5	219.84 - 199.84	Horizontal	1	204	-837.57	11326.87	7.4	Pass
T6	199.84 - 179.84	Horizontal	1	234	-1749.85	11326.87	15.4	Pass
T7	179.84 - 159.84	Horizontal	1	287	1417.11	22613.81	6.3	Pass
T8	159.84 - 139.84	Horizontal	1	337	1160.12	22613.81	5.1	Pass
T9	139.84 - 119.84	Horizontal	1	363	1329.45	22613.81	5.9	Pass
T10	119.84 - 99.84	Horizontal	1	406	1985.40	22613.81	8.8	Pass
T11	99.84 - 79.84	Horizontal	1	452	2375.66	22613.81	10.5	Pass
T12	79.84 - 59.84	Horizontal	1	519	1539.87	22613.81	6.8	Pass
T13	59.84 - 39.84	Horizontal	1	556	1549.70	22613.81	6.9	Pass
T14	39.84 - 19.84	Horizontal	1	615	1482.35	22613.81	6.6	Pass
T15	19.84 - 6.5	Horizontal	1	646	1697.64	22613.81	7.5	Pass
T1	291.84 - 279.84	Secondary Horizontal	1	35	-0.03	15902.02	0.0	Pass
T2	279.84 - 259.84	Secondary Horizontal	1	52	-0.03	15902.02	0.0	Pass
T3	259.84 - 239.84	Secondary Horizontal	1	111	-0.03	15922.28	0.0	Pass
T4	239.84 - 219.84	Secondary Horizontal	1	170	-0.03	15922.28	0.0	Pass
T5	219.84 - 199.84	Secondary Horizontal	1	201	-0.02	15942.81	0.0	Pass
T6	199.84 - 179.84	Secondary Horizontal	1	225	0.02	22613.81	0.0	Pass
T7	179.84 - 159.84	Secondary Horizontal	1	284	-0.01	15963.87	0.0	Pass
T8	159.84 - 139.84	Secondary Horizontal	1	315	0.01	22613.81	0.0	Pass
T9	139.84 - 119.84	Secondary Horizontal	1	360	0.02	22613.81	0.0	Pass
T10	119.84 - 99.84	Secondary Horizontal	1	405	0.02	22613.81	0.0	Pass
T11	99.84 - 79.84	Secondary Horizontal	1	450	-0.02	15985.34	0.0	Pass
T12	79.84 - 59.84	Secondary Horizontal	1	495	-0.03	15985.34	0.0	Pass
T13	59.84 - 39.84	Secondary Horizontal	1	568	-0.03	15985.34	0.0	Pass
T14	39.84 - 19.84	Secondary Horizontal	1	585	-0.05	15985.34	0.0	Pass
T15	19.84 - 6.5	Secondary Horizontal	1	637	-0.06	15985.34	0.0	Pass
T1	291.84 - 279.84	Top Girt	1	6	-0.06	11120.83	0.0	Pass
T2	279.84 - 259.84	Top Girt	1	8	-993.46	11120.83	8.9	Pass
T3	259.84 - 239.84	Top Girt	1	39	1843.42	22613.81	8.2	Pass
T4	239.84 - 219.84	Top Girt	1	84	-1676.53	11224.07	14.9	Pass
T5	219.84 - 199.84	Top Girt	1	130	1008.48	22613.81	4.5	Pass
T6	199.84 - 179.84	Top Girt	1	175	1217.94	22613.81	5.4	Pass
T7	179.84 - 159.84	Top Girt	1	219	929.84	22613.81	4.1	Pass
T8	159.84 - 139.84	Top Girt	1	264	1156.46	22613.81	5.1	Pass
T9	139.84 - 119.84	Top Girt	1	309	1242.66	22613.81	5.5	Pass
T10	119.84 - 99.84	Top Girt	1	354	1164.27	22613.81	5.1	Pass
T11	99.84 - 79.84	Top Girt	1	401	1364.46	22613.81	6.0	Pass
T12	79.84 - 59.84	Top Girt	1	444	1390.33	22613.81	6.1	Pass
T13	59.84 - 39.84	Top Girt	1	490	1354.99	22613.81	6.0	Pass
T14	39.84 - 19.84	Top Girt	1	534	1479.77	22613.81	6.5	Pass
T15	19.84 - 6.5	Top Girt	1	579	1665.25	22613.81	7.4	Pass
T16	6.5 - 0	Top Girt	12x3/8	625	25199.90	129567.59	19.4	Pass
T16	6.5 - 0	Bottom Girt	12x3/8	657	-5175.44	128699.81	8.6	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T16	6.5 - 0	Mid Girt	9x3/8	660	-270.49	40604.11	0.7	Pass
T1	291.84 - 279.84	Guy A@285.84	3/4	672	20157.20	29150.00	69.1	Pass
T3	259.84 - 239.84	Guy A@256.507	3/4	684	21892.00	29150.00	75.1	Pass
T5	219.84 - 199.84	Guy A@216.507	3/4	696	24121.80	29150.00	82.8	Pass
T7	179.84 - 159.84	Guy A@166.507	3/4	708	25614.10	29150.00	87.9	Pass
T10	119.84 - 99.84	Guy A@106.507	5/8	720	20727.30	21200.00	97.8	Pass
T13	59.84 - 39.84	Guy A@56.5067	7/16	732	9436.11	10400.00	90.7	Pass
T1	291.84 - 279.84	Guy B@285.84	3/4	669	19029.20	29150.00	65.3	Pass
T3	259.84 - 239.84	Guy B@256.507	3/4	681	20690.00	29150.00	71.0	Pass
T5	219.84 - 199.84	Guy B@216.507	3/4	693	22752.40	29150.00	78.1	Pass
T7	179.84 - 159.84	Guy B@166.507	3/4	705	24003.80	29150.00	82.3	Pass
T10	119.84 - 99.84	Guy B@106.507	5/8	716	19738.50	21200.00	93.1	Pass
T13	59.84 - 39.84	Guy B@56.5067	7/16	729	8990.96	10400.00	86.5	Pass
T1	291.84 - 279.84	Guy C@285.84	3/4	665	19957.60	29150.00	68.5	Pass
T3	259.84 - 239.84	Guy C@256.507	3/4	677	21684.70	29150.00	74.4	Pass
T5	219.84 - 199.84	Guy C@216.507	3/4	689	23875.50	29150.00	81.9	Pass
T7	179.84 - 159.84	Guy C@166.507	3/4	701	25313.00	29150.00	86.8	Pass
T10	119.84 - 99.84	Guy C@106.507	5/8	713	20709.10	21200.00	97.7	Pass
T13	59.84 - 39.84	Guy C@56.5067	7/16	725	9436.14	10400.00	90.7	Pass
T1	291.84 - 279.84	Top Guy Pull-Off@285.84	MC12x35	22	-5000.55	150590.34	3.4 13.2 (b)	Pass
T3	259.84 - 239.84	Top Guy Pull-Off@256.507	MC12x35	120	-8077.10	151608.75	5.4 21.5 (b)	Pass
T5	219.84 - 199.84	Top Guy Pull-Off@216.507	MC12x35	210	-12529.10	152625.83	8.3 32.9 (b)	Pass
T7	179.84 - 159.84	Top Guy Pull-Off@166.507	MC12x35	278	-17600.40	153645.57	11.5 46.3 (b)	Pass
T10	119.84 - 99.84	Top Guy Pull-Off@106.507	MC12x35	413	-16799.80	153645.57	11.0 44.6 (b)	Pass
T13	59.84 - 39.84	Top Guy Pull-Off@56.5067	MC12x35	570	-6698.97	154665.32	4.4 21.3 (b)	Pass
T1	291.84 - 279.84	Torque Arm Top@285.84	MC12x35	675	1487.18	296565.83	74.4	Pass
T3	259.84 - 239.84	Torque Arm Top@256.507	MC12x35	687	-2218.87	130694.92	79.0	Pass
T5	219.84 - 199.84	Torque Arm Top@216.507	MC12x35	699	-4812.00	131195.32	82.9	Pass
T7	179.84 - 159.84	Torque Arm Top@166.507	MC12x35	711	-7590.54	131696.00	78.6	Pass
T10	119.84 - 99.84	Torque Arm Top@106.507	MC12x35	723	-7704.28	131696.00	51.7	Pass
T13	59.84 - 39.84	Torque Arm Top@56.5067	MC12x35	735	-4342.55	132196.94	17.4 22.0 (b)	Pass
						Summary		
						Pole (L1)	17.0	Pass
						Leg (T13)	79.3	Pass
						Diagonal (T6)	66.1	Pass
						Horizontal (T6)	15.4	Pass
						Secondary Horizontal (T3)	0.0	Pass
						Top Girt (T16)	19.4	Pass
						Bottom Girt (T16)	8.6	Pass
						Mid Girt (T16)	0.7	Pass
						Guy A (T10)	97.8	Pass
						Guy B (T10)	93.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
						Guy C (T10)	97.7	Pass
						Top Guy Pull-Off (T7)	46.3	Pass
						Torque Arm Top (T5)	82.9	Pass
						Bolt Checks	49.7	Pass
						RATING =	**97.8**	**Pass**

FOUNDATION ANALYSIS

URS

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FOUNDATION ANALYSIS

TOWER FORCES:

Moment Caused by Tower	$M_t := 0.010 \cdot ft \cdot kips$
Shear at Base of Tower	$S_t := 5.4kip$
Max Compressive Force	$C_t := 350 \cdot kip$
Height of Tower	$H_t := 327 \cdot ft$
Base Plate Bolt Circle	$MP := 1.0ft$

FOOTING DIMENSIONS:

Overall Depth of Footing	$D_f := 4ft$
Length of Pier	$L_p := 2.5 \cdot ft$
Extension of Pier Above Grade	$L_{pag} := 0.5 \cdot ft$
Diameter of Pier	$d_p := 3.0 \cdot ft$
Thickness of Footing	$T_f := 2.0 \cdot ft$
Width of Footing:	$W_f := 10.0ft$
Length of Anchor Bolts:	$L_{st} := 24in$
Projection of anchor bolts above pier	$A_{BP} := 12 \cdot in$
Anchor bolts area	$A_{anchor} := 3.97 \cdot in^2$

PROPERTIES:

Compressive Strength of Concrete	$fc := 3000psi$
Yield Strength of Steel Reinforcement	$fy := 60000 \cdot psi$
Internal Friction Angle of Soil	$\phi_s := 30 \cdot deg$
Allowable Bearing Capacity	$q_s := 5000 \cdot psf$
Unit Weight of Soil	$\gamma_s := 110 \cdot pcf$
Unit Weight of Concrete	$\gamma_c := 150 \cdot pcf$
Depth to Neglect	$n := 1ft$
Cohesion of Clay Type Soil Note: Use 0 for Sandy Soil	$c := 0 \cdot ksf$
Seismic Zone Factor: UBC Fig 23-2	$Z := 2$
Coefficient of Friction between soil and Concrete:	$\mu := 0.5$
Clear Cover of Reinforcement Pier:	$Cvr_{pier} := 3 \cdot in$
Clear Cover of Reinforcement Pier:	$Cvr_{pad} := 3 \cdot in$

PIER REINFORCEMENT:

Bar Size	$BSpier := 7$	Bar Diameter	$d_{bpier} := 0.875 \cdot in$
Number of Bars	$NBpier := 10$	Bar Area	$A_{bpier} := 0.60 \cdot in^2$

PAD REINFORCEMENT:

TOP:	Bar Size	$BS_{top} := 7$	Bar Diameter	$d_{btop} := 0.875 \cdot in$
	Number of Bars	$NB_{top} := 18$	Bar Area	$A_{btop} := 0.60 \cdot in^2$
BOTTOM:	Bar Size	$BS_{bot} := 7$	Bar Diameter	$d_{bbot} := 0.875 \cdot in$
	Number of Bars	$NB_{bot} := 18$	Bar Area	$A_{bot} := 0.60 \cdot in^2$

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

Load Factor (EIA 3.1.1): $LF := if\left[H_t \le 700 \cdot ft, 1.3, if\left[H_t \ge 1200, 1.7, 1.3 + \left(\frac{H_t - 700}{1200 - 700}\right) \cdot 0.4\right]\right]$ $LF = 1.3$

CHECK ANCHOR STEEL EMBEDMENT

$$L_{anchor} := \frac{(0.11 \cdot fy) \cdot in}{\sqrt{fc \cdot psi}}$$

Depth:

$D_{ab} := L_{st} - A_{BP}$ $\quad D_{ab} = 1\,ft$

$DepthCheck := if(D_{ab} \geq L_{anchor}, "Okay", "No Good")$ $\quad L_{anchor} = 10.0416\,ft$

$DepthCheck = "No Good"$ anchor plate is provided

STABILITY OF FOOTING

Passive Pressure:

$P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p}$ $\quad P_{pn} = 0.33\,ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p}$ $\quad P_{pt} = 0.66\,ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}]$ $\quad P_{top} = 0.66\,ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p}$ $\quad P_{bot} = 1.32\,ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2}$ $\quad P_{ave} = 0.99\,ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)]$ $\quad T_p = 2\,ft$

$A_p := W_f \cdot T_p$ $\quad A_p = 20\,ft^2$

Ultimate Shear:

$S_u := P_{ave} \cdot A_p$ $\quad S_u = 19.8\,kip$

Weight of Concrete Pad:

$WT_c := \left[\left(W_f^2 \cdot T_f \right) + \frac{d_p^2 \cdot \pi}{4} L_p \right] \cdot \gamma_c$ $\quad WT_c = 32.6507\,kip$

Weight of Soil: above Footing:

$WT_{s1} := \left[W_f^2 \cdot \left(|L_p - L_{pag}| \right) - \frac{d_p^2 \cdot \pi}{4} \cdot \left(|L_p - L_{pag}| \right) \right] \cdot \gamma_s$ $\quad WT_{s1} = 20.4449\,kip$

Weight of Soil Wedge at back face:

$WT_{s2} := \left(\frac{D_f^2 \cdot \tan(\phi_s)}{2} \cdot W_f \right) \cdot \gamma_s$ $\quad WT_{s2} = 5.0807\,kip$

Total Weight:

$WT_{tot} := WT_c + WT_{s1} + C_t$ $\quad WT_{tot} = 403.0956\,kip$

Resisting Moment:

$M_r := (WT_{tot}) \cdot \frac{W_f}{2} + S_u \cdot \frac{T_f}{3} + WT_{s2} \cdot \left(W_f + \frac{D_f \tan(\phi_s)}{3} \right)$ $\quad M_r = 2083.3961\,kip \cdot ft$

Overturning Moment:

$M_{ot} := M_t + S_t \cdot (L_p + T_f)$ $\quad M_{ot} = 24.31\,kip \cdot ft$

Factor of Safety:

$FS := \frac{M_r}{M_{ot}}$ $\quad FS_{req} := 2$ $\quad FS = 85.7$

$SafetyCheck := if(FS > FS_{req}, "Okay", "No Good")$ $\quad SafetyCheck = "Okay"$

URS

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SHEAR CAPACITY IN PIER

$FS := 2$

$$S_p := \frac{P_{ave} \cdot A_p + \mu \cdot WT_{tot}}{FS}$$

$S_p = 110.6739\,kips$

$ShearCheck := if(S_p > S_t, "Okay", "No Good")$

ShearCheck = "Okay"

BEARING PRESSURE CAUSED BY FOOTING

$A_{mat} := W_f^2$ $\quad A_{mat} = 100\,ft^2$

$S := \frac{W_f^3}{6}$ $\quad S = 166.6667\,ft^3$

$P_{max} := \frac{WT_{tot}}{A_{mat}} + \frac{M_{ot}}{S}$ $\quad P_{max} = 4.1768\,ksf$

$P_{min} := \frac{WT_{tot}}{A_{mat}} - \frac{M_{ot}}{S}$ $\quad P_{min} = 3.8851\,ksf$

$MaxPressure := if(P_{max} < q_s, "Okay", "No Good")$ $\quad MaxPressure = "Okay"$

$MinPressure := if[(P_{min} \geq 0) \cdot (P_{min} < q_s), "Okay", "No Good"]$ $\quad MinPressure = "Okay"$

Distance to Resultant of Pressure Distribution:

$$X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3}$$

$X_p = 47.7263\,ft$

Distance to Kern: $X_k := \frac{W_f}{3}$ $\quad X_k = 3.3333\,ft$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity: $e := \frac{M_{ot}}{WT_{tot}}$ $\quad e = 0.0603$

Adjusted Soil Pressure:

$$P_a := \frac{2 \cdot WT_{tot}}{3 \cdot W_f \left(\frac{W_f}{2} - e \right)}$$

$P_a = 5.4402\,ksf$

$$q_{adj} := if\left(P_{min} < 0, P_a, \frac{P_{max}}{ft^2} \right)$$

$q_{adj} = 4.1768\,ksf$

$PressureCheck := if(q_{adj} < q_s, "Okay", "No Good")$ $\quad PressureCheck = "Okay"$

CONCRETE BEARING CAPACITY (ACI 10.17)

$\phi_c := 0.75$ (ACI 9.3.2.2)

$P_b := \phi_c \cdot 0.85 \cdot f'c \cdot \frac{d_p^2 \cdot \pi}{4}$ $P_b = 1946.6879\,kip$

$BearingCheck := if(P_b > LF \cdot C_t, "Okay", "No Good")$ $BearingCheck = "Okay"$

SHEAR STRENGTH OF CONCRETE

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_{vv} := .85$ (ACI 9.3.2.3)

$d := T_f - Cvr_{pier} - .5 \cdot in$ $d = 20.5\,in$

$d_1 := \frac{W_f}{2} - \frac{d_p}{2}$ $d_1 = 3.5\,ft$

$d_2 := d_1 - d$ $d_2 = 1.7917\,ft$

$L := \left(\frac{W_f}{2} - e\right) \cdot 3$ $L = 14.8191\,ft$

:

$Slope := if\left(L > W_f, \frac{P_{max} - P_{min}}{W_f}, \frac{q_{adj}}{L}\right)$ $Slope = 0.0292\,kcf$

$V_{req} := LF \cdot \left[\left(q_{adj} - Slope \cdot d_1\right) + \left(\frac{Slope \cdot d_1}{2}\right)\right] \cdot W_f \cdot d_1$ $V_{req} = 187.7223\,kip$

ACI 11.3.1.1

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f'c \cdot psi} \cdot W_f \cdot d$ $V_{Avail} = 229.0576\,kip$

$BeamShearCheck := if(V_{req} < V_{Avail}, "Okay", "No Good")$ $BeamShearCheck = "Okay"$

:

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.12.2.1)

$b_o := \left(d_p + d\right) \cdot \pi$ $b_o = 14.7917\,ft$

Area included inside bo: $A_{bo} := \frac{\pi \cdot \left(d_p + d\right)^2}{4}$ $A_{bo} = 17.411\,ft^2$

Area outside of bo: $A_{out} := A_{mat} - A_{bo}$ $A_{out} = 82.589\,ft^2$

Guess Value: $v_u := 1\,ksf$ (From "Foundation Analysis and design", By Joseph Bowles, Eq. 8-9)

Given $d^2 + d_p \cdot d = \frac{WT_{tot}}{\pi \cdot v_u}$

$v_u := \text{Find}(v_u)$ $v_u = 15.9523\,ksf$

$V_u := v_u \cdot d \cdot W_f$ $V_u = 272.5192\,kips$

$V_{req} := LF \cdot V_u$ $V_{req} = 354.275\,kips$

$V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f'c \cdot psi} \cdot b_o \cdot d$ $V_{Avail} = 677.6286\,kips$

$PunchingShearCheck := \text{if}(V_{req} < V_{Avail}, \text{"Okay"}, \text{"No Good"})$

STEEL REINFORCEMENT IN THE PAD $\phi_m := .90$ ACI 9.3.2.2

Take Maximum Bending at face of Pier:

$q_b := q_{adj} - d_1 \cdot Slope$ $q_b = 4.0747\,ksf$

$M_n := \frac{LF}{\phi_m} \cdot \left[(q_{adj} - q_b) \cdot \frac{d_1^2}{3} + q_b \cdot \frac{d_1^2}{2} \right] \cdot W_f$ $M_n = 366.5212\,kip \cdot ft$

ACI 10.2.7.3 $\beta := \text{if}\left[f'c \le 4000 \cdot psi, .85, \text{if}\left[f'c \ge 8000 \cdot psi, .65, .85 - \left(\frac{\frac{f'c}{psi} - 4000}{1000} \right) \cdot .05 \right] \right]$ $\beta = 0.85$

$A_s := \frac{M_n}{\phi_m \cdot fy \cdot d}$ $A_s = 3.9731\,in^2$

$a := \frac{A_s \cdot fy}{\beta \cdot f'c \cdot W_f}$ $a = 0.779\,in$

$A_s := \frac{M_n}{fy \cdot \left(d - \frac{a}{2} \right)}$ $A_s = 3.6451\,in^2$

$\rho := \frac{A_s}{W_f \cdot d}$ $\rho = 0.0015$

$\rho_{min} := \frac{3 \cdot \sqrt{f'c \cdot psi}}{fy}$ $\rho_{min} = 0.0027$

Temperature and Shrinkage: $\rho_{sh} := if(fy \geq 60000 \cdot psi, 0.0018, 0.0020)$ $\rho_{sh} = 0.0018$

(ACI 7.12.2.1b)

FOR BOTTOM BARS: $As := \max(\rho, \rho_{min}, \rho_{sh}) \cdot W_f \cdot d$ $As = 6.737\,in^2$

$As_{prov} := A_{bot} \cdot NB_{bot}$ $As_{prov} = 10.8\,in^2$

$PadReinforcement := if(As_{prov} > As, "Okay", "No Good")$ $PadReinforcement = "Okay"$

FOR TOP BARS: $As := \rho_{sh} \cdot (W_f \cdot d)$ $As = 4.428\,in^2$

$As_{prov} := A_{btop} \cdot NB_{top}$ $As_{prov} = 10.8\,in^2$

$PadReinforcement := if(As_{prov} > As, "Okay", "No Good")$ $PadReinforcement = "Okay"$

TENSION (ACI 12.2.3) **DEVELOPMENT LENGTH OF PAD REINFORCEMENT**

Bar Spacing: $B_{sPad} := \dfrac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1}$ $B_{sPad} = 5.7794\,in$

Development Length Factors:

Reinforcement Location Factor	$\alpha := 1.0$	
Coating Factor	$\beta := 1.0$	
Concrete strength Factor	$\lambda := 1.0$	
Reinforcement Size Factor	$\gamma := 1.0$	

Spacing or Cover Dimension: $c := if\left(Cvr_{pad} < \dfrac{B_{sPad}}{2}, Cvr_{pad}, \dfrac{B_{sPad}}{2}\right)$ $c = 2.8897\,in$

Transverse Reinforcement Index: As allowed by ACI 12.2.4 $k_{tr} := 0$

$$L_{dbt} := \frac{3}{40} \cdot \frac{fy}{\sqrt{f'c \cdot psi}} \cdot \frac{\alpha \cdot \beta \cdot \gamma \cdot \lambda}{\frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot}$$

$L_{dbt} = 21.7678\,in$

$L_{dbmin} := 12 \cdot in$

Minimum Development Length: (ACI 12.2.1) $L_{dbtCheck} := if(L_{dbt} \geq L_{dbmin}, "Use\ L.dbt", "Use\ L.dbmin")$ $L_{dbtCheck} = "Use\ L.dbt"$

Available Length in Pad: $L_{Pad} := \dfrac{W_f}{2} - \dfrac{d_p}{2} - Cvr_{pad}$ $L_{Pad} = 39\,in$

$LpadTension := if(L_{Pad} > L_{dbt}, "Okay", "No Good")$ $LpadTension = "Okay"$

REINFORCEMENT IN PIER

Pier Area: $A_p := \frac{\pi \cdot d_p^2}{4}$ $A_p = 1017.876\,in^2$

(ACI 10.8.4 and 10.9.1) $A_{smin} := 0.01 \cdot 0.05 \cdot A_p$ $A_{smin} = 0.5089\,in^2$

$A_{sprov} := NBpier \cdot A_{bpier}$ $A_{sprov} = 6\,in^2$

$SteelAreaCheck := if(A_{sprov} > A_{smin}, "Okay", "No Good")$ $SteelAreaCheck = "Okay"$

NOTE: Anchor Bolts are not accounted for in reinforcement calculation and will provide additional reinforcement to satisfy minimum requirement of steel.

Bar Spacing In Pier: $B_{sPier} := \frac{d_p \cdot \pi}{NBpier} - d_{bpier}$ $B_{sPier} = 10.4347\,in$

Diamter of Reinforcement Cage: $Diam_{cage} := d_p - 2 \cdot Cvr_{pier}$ $Diam_{cage} = 30\,in$

Maximum Moment in Pier: $M_p := \left[M_t + S_t \cdot \left(L_p + \frac{A_{BP}}{2}\right)\right] \cdot LF$ $M_p = 252.876\,in \cdot kips$

Pier Check evaluated from outside program and results are listed below;

(defined variables) $(f'_c \;\; f_y \;\; cl \;\; Spiral) = (4 \;\; 60 \;\; 3 \;\; 0)$

The required input is column diameter in inches, number of reinforcing bars, bar size number, factored axial load in kips and moment in kip inches: $(D \;\; N \;\; n \;\; P_u \;\; M_{xu}) := (36 \;\; 10 \;\; 7 \;\; 350 \;\; 253)$

Clears any previous output: $(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) := (0 \;\; 0 \;\; 0 \;\; 0)$

$(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) := \phi P'_n(D, N, n, P_u, M_{xu})^T$

The Output is given as useable axial load in kips, moment capacity in kip inches, splicing stress in ksi, and reinforcement ratio: $(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) = (2511.5552 \;\; 1815.4956 \;\; 5.3708 \;\; 0.0059)$

Column size and reinforcement may be changed to match capacity to the applied load.

$AxialLoadCheck := if(\phi P_n \geq P_u, "Okay", "No Good")$ $AxialLoadCheck = "Okay"$

$BendingCheck := if(\phi M_{xn} \geq M_{xu}, "Okay", "No Good")$ $BendingCheck = "Okay"$

DEVELOPMENT LENGTH OF PIER REINFORCEMENT

TENSION (ACI 12.2.3)

Factors for development:

Reinforcement Location Factor $\alpha := 1.0$

Coating Factor $\beta := 1.0$

Concrete strength Factor $\lambda := 1.0$

Reinforcement Size Factor $\gamma := 1.0$

Spacing or Cover Dimension: $c := if\left(Cvr_{pier} < \frac{B_{sPier}}{2}, Cvr_{pier}, \frac{B_{sPier}}{2}\right)$ $c = 3\ in$

Transverse Reinforcement: As allowed by ACI 12.2.4 $k_{tr} := 0$

$$L_{dbt} := \frac{3}{40}\cdot\frac{fy}{\sqrt{f'c\cdot psi}}\cdot\frac{\alpha\cdot\beta\cdot\gamma\cdot\lambda}{\frac{c+k_{tr}}{d_{bpier}}}\cdot d_{bpier} \qquad L_{dbt} = 20.9675\ in$$

Minimum Development Length: (ACI 12.2.1) $L_{dbmin} := 12\cdot in$

Pier reinforcement bars are standard 90 degree hooks and therefore developement in the pad is computed as follows:

$$L_{dh} := \frac{1200\cdot d_{bpier}}{\sqrt{\frac{f'c}{psi}}}\cdot .7 \qquad L_{dh} = 13.4192\ in$$

$$L_{db} := \max\left(L_{dbt}, L_{dbmin}\right) \qquad L_{db} = 20.9675\ in$$

COMPRESSION: (ACI 12.3.2)

$$L_{dbc1} := \frac{.02\cdot d_{bpier}\cdot fy}{\sqrt{f'c\cdot psi}} \qquad L_{dbc1} = 19.1703\ in$$

$$L_{dbmin} := 0.0003\cdot\frac{in^2}{lb}\cdot\left(d_{bpier}\cdot fy\right) \qquad L_{dbmin} = 15.75\ in$$

$$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right) \qquad L_{dbc} = 19.1703\ in$$

Available Length in Pier: $L_{pier} := L_p - 3\cdot in$ $L_{pier} = 27\ in$

$L_{piertension} := if\left(L_{pier} > L_{dbt}, "Okay", "No\ Good"\right)$ $L_{piertension} = "Okay"$

$L_{piercompression} := if\left(L_{pier} > L_{dbc}, "Okay", "No\ Good"\right)$

Available Length in Pad: $L_{pad} := T_f - 3\cdot in$ $L_{pad} = 21\ in$

$L_{padtension} := if\left(L_{pad} > L_{dh}, "Okay", "No\ Good"\right)$ $L_{padtension} = "Okay"$

$L_{padcompression} := if\left(L_{pad} > L_{dbc}, "Okay", "No\ Good"\right)$

TIE SIZE AND SPACING IN COLUMN

Minimum Tie Size:

$Tie_{min} := if(BSpier \le 10, 3, 4)$ $\quad Tie_{min} = 3$

Used #4 Ties

$d_{Tie} := 4$

Seismic factor:
(ACI 21.10.5)

$z := if(Z \le 2, 1, 0.5)$ $\quad z = 1$

$s_{lim1} := 16 \cdot d_{bpier} \cdot z$ $\quad s_{lim1} = 14\,in$

$s_{lim2} := \frac{48 \cdot d_{Tie} \cdot in}{8} \cdot z$ $\quad s_{lim2} = 24\,in$

$s_{lim3} := D_f z$ $\quad s_{lim3} = 48\,in$

$s_{lim4} := 18in$ $\quad s_{lim4} = 18\,in$

Maximum Spacing:

$$s_{tie} := \min\left(\begin{pmatrix} s_{lim1} \\ s_{lim2} \\ s_{lim3} \\ s_{lim4} \end{pmatrix}\right) \qquad s_{tie} = 14\,in$$

Number of Ties Required:

$$n_{tie} := \frac{L_{pier} - 3 \cdot in}{s_{tie}} + 1 \qquad n_{tie} = 2.7143$$

GUY ANCHOR ANALYSIS

URS

Job :	WHUS Guyed Tower - Storrs, CT	**Project No.:**	VZ1 064	**Page**	___ of ___
Description:	Anchor Block Evaluation - UCONN Req's	**Computed by:**	JEK	**Sheet**	1 of 2
	Typical Anchor Block	**Checked by:**		**Date**	6/30/06
				Date	

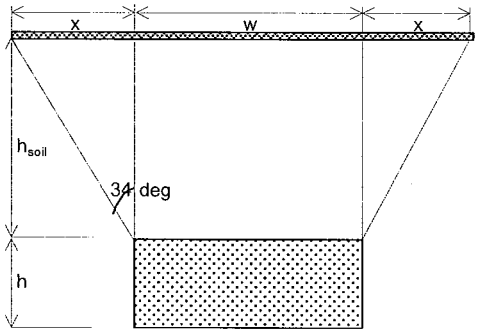
CHECK UPLIFT RESISTANCE

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	149	kips
Sliding =	179	kips

CONCRETE PARAMETERS:

γ conc =	150	pcf
w =	4.5	ft
h =	4	ft
d =	24	ft
Vol. =	*432*	ft^3
Wc =	*64.80*	kips



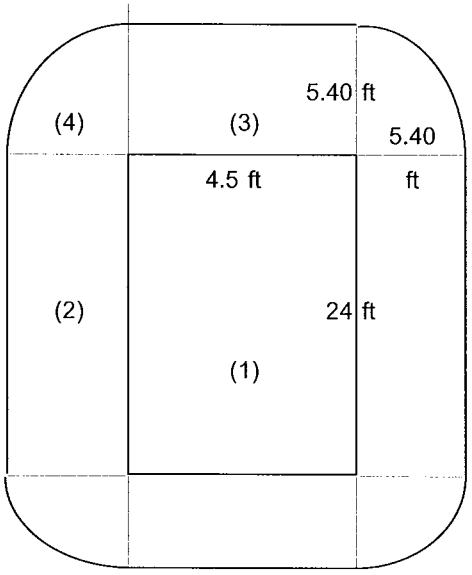
Foundation Section

SOIL PARAMETERS:

γ_{soil} =	120	pcf
h_{soil} =	8	ft
x =	*5.40*	ft

Soil Weight (Wr):

(1) =	103.68	kips
(2) =	124.33	kips
(3) =	23.31	kips
(4) =	29.27	kips
*(5) Anchor Reinf. =	0	kips
Total =	280.59	kips



Foundation Plan View

CHECK UPLIFT (PER EIA/TIA-222-F STANDARD):

Wr / 2.0 + Wc / 1.25 > UPLIFT

192.13 > *149* ***OK***

(Wr + Wc) / 1.5 > UPLIFT

230.26 > *149* ***OK***

CHECK UPLIFT (PER 2005 CT BLDG CODE 3108.4):

(Wr + Wc) / 2.0 > UPLIFT *172.69* > *149* ***OK***

→ ***GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE***

URS

Job :	WHUS Guyed Tower - Storrs, CT	**Project No.:**	VZ1 064	**Page**	___ of ___
Description:	Anchor Block Evaluation - UCONN Req's	**Computed by:**	JEK	**Sheet**	2 of 2
	Typical Anchor Block	**Checked by:**		**Date**	6/30/06
				Date	

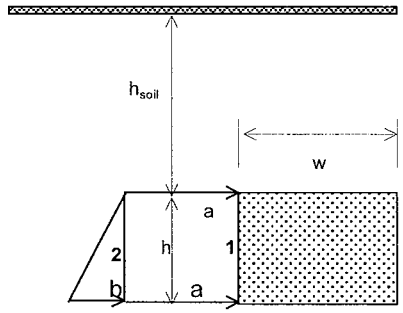
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

γ soil =	120	pcf
h_{soil} =	8	ft
h =	4	ft
ϕ =	34	degrees

ANCHOR PARAMETERS

w = 4.5 ft
h = 4.0 ft
d = 24.0 ft



Foundation Elevation View

K_a = 0.28

K_p = 3.54

Δ = 3.25

HORIZONTAL FORCES

1 =	299.93	k
2 =	18.75	k
RESIST TO SLIDING =	318.67	k

SOIL & CONCRETE WEIGHT =	Wr + Wc =	345.39	k
UPLIFT REACTIONS =		-149	k
SUM =		196.39	k

COEF. OF FRICTION, (0.5) =	98.19	k
RESIST TO SLIDING =	318.67	k
SUM =	416.87	k

SF AGAINST SLIDING

SF = ***2.33*** ***>*** ***2.0*** ***OK***

→ ***GUY ANCHORS AGAINST SLIDING ARE ADEQUATE***