May 9, 2014

VIA OVERNIGHT DELIVERY

Ms. Melanie A. Bachman
Acting Executive Director
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

RE: Sprint Spectrum, L.P. – Notice of Exempt Modification
35 Old Route 44 (aka 34 Old Route 44), Eastford, CT

Dear Ms. Bachman:

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

Sprint plans to modify the existing facility at 35 Old Route 44, Eastford, owned by Cordless Data Transfer, Inc. (coordinates 41°52'16.7"N, -72°03'48"W). Attached are drawings depicting the planned changes, and documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration. Also included is a power density calculation reflecting the modification to Sprint's operations at the site.

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

1. Sprint will remove the six (6) existing antennas; add three (3) dual-band panel antennas to the existing frames on existing mounting pipes; and add six (6) RRHs (remote radio heads) all at a centerline height of approximately 165.5' from the tower base. Sprint will also install three (3) hybriflex cables along the existing coaxial cable run, and remove the existing coaxial cables.

2. Sprint will replace the two (2) existing cabinets with three (3) new cabinets (including two (2) battery cabinets); the existing power plant will be replaced by a battery cabinet; and a fiber/power distribution box will be added to a new H-frame, all on the existing concrete pad. These changes will have no effect on the site boundaries, Sprint's lease area or the landlord's lease area.

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

4. The changes to the facility will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site. As indicated in the attached power density calculations, Sprint's operations at the site will result in a power density of 4.725%; the combined site operations will result in a total power density of 20.925%.

Please feel free to contact me at jgaudet@hpcwireless.com or 860 798-7454 with any questions or concerns regarding this matter. Thank you for your consideration.

Respectfully submitted,

*Jennifer Young Gaudet*

Jennifer Young Gaudet

Attachments

cc: Mr. Arthur Brodeur, First Selectman, Town of Eastford
Priscilla D. Armitage (underlying property owner)

DRAWN BY: KJG CHECKED BY: KAB

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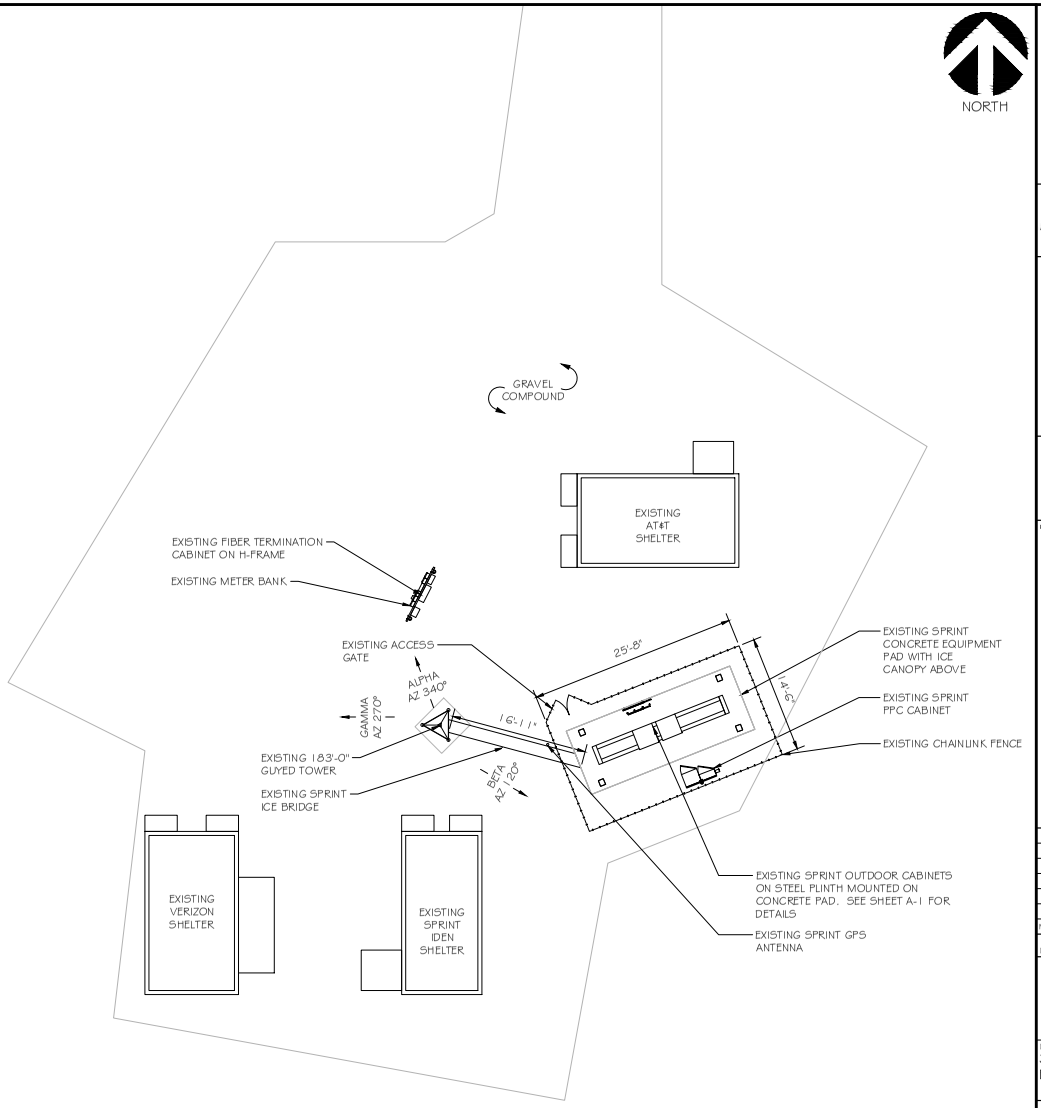
## VICINITY MAP


GENERAL NOTES:

1. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE CODES ORDINANCES, LAWS, AND REGULATIONS OF ALL MUNICIPALITIES, UTILITIES COMPANY, OR OTHER PUBLIC AUTHORITIES.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS THAT MAY BE REQUIRED BY ANY FEDERAL, STATE, COUNTY, OR MUNICIPAL AUTHORITIES.
3. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER, IN WRITING, OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF BIDS OR PERFORMANCE OF WORK. MINOR OMISSIONS OR ERRORS IN THE BID DOCUMENTS SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY FOR THE OVERALL INTENT OF THESE DRAWINGS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING SITE IMPROVEMENTS PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED AS A RESULT OF CONSTRUCTION OF THE FACILITY.
5. THE SCOPE OF WORK FOR THIS PROJECT SHALL INCLUDE PROVIDING ALL MATERIALS, EQUIPMENT, AND LABOR REQUIRED TO COMPLETE THIS PROJECT. ALL EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
6. THE CONTRACTOR SHALL VISIT THE PROJECT SITE PRIOR TO SUBMITTING A BID TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
7. CONTRACTOR SHALL VERIFY ANTENNA ELEVATION AND AZIMUTH WITH RF ENGINEERING PRIOR TO INSTALLATION.
8. TRANSMITTER EQUIPMENT AND ANTENNAS ARE DESIGNED TO MEET ANSI/EIA/TIA 222-G REQUIREMENTS.
9. ALL STRUCTURAL ELEMENTS SHALL BE HOT DIPPED GALVANIZED STEEL
10. CONTRACTOR SHALL MAKE A UTILITY "ONE-CALL" TO LOCATE ALL UTILITIES PRIOR TO EXCAVATING.
11. IF ANY UNDERGROUND UTILITIES OR STRUCTURES EXIST BENEATH THE PROJECT AREA, CONTRACTOR MUST LOCATE IT AND CONTACT THE APPLICANT & THE OWNER'S REPRESENTATIVE.
12. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION BY TECHNICIANS APPROXIMATELY 2 TIMES PER MONTH.
13. RAMAKER & ASSOCIATES HAS NOT PERFORMED A STRUCTURAL ANALYSIS FOR THIS PROJECT. PRIOR TO THE INSTALLATION OF THE PROPOSED EQUIPMENT OR MODIFICATION OF THE EXISTING STRUCTURE, A STRUCTURAL ANALYSIS SHALL BE PERFORMED BY SPRINT'S AGENT TO CERTIFY THAT THE EXISTING/PROPOSED COMMUNICATION STRUCTURE AND COMPONENTS ARE STRUCTURALLY ADEQUATE TO SUPPORT ALL EXISTING AND PROPOSED ANTENNAS, COAXIAL CABLES, AND OTHER APPURTENANCES.
14. PROPERTY LINE INFORMATION WAS PREPARED USING DEEDS, TAX MAPS, AND PLANS OF RECORD AND SHOULD NOT BE CONSTRUED AS AN ACCURATE BOUNDARY SURVEY.
15. THIS PLAN IS SUBJECT TO ALL EASEMENTS AND RESTRICTIONS OF RECORD.
16. THE PROPOSED FACILITY WILL CAUSE ONLY A "DE MINIMIS" INCREASE IN STORMWATER RUNOFF; THEREFORE, NO DRAINAGE STRUCTURES ARE PROPOSED.
17. NO SIGNIFICANT NOISE, SMOKE, DUST, OR ODOR WILL RESULT FROM THIS FACILITY.
18. THE FACILITY IS UNMANNED AND NOT INTENDED FOR HUMAN HABITATION (NO HANDICAP ACCESS REQUIRED).
19. POWER TO THE FACILITY WILL BE MONITORED BY A SEPARATE METER.




SITE PLAN
SCALE: 1" = 1

Sprint
6391 Sprint Parkway
Overland Park, KS 66251

Alcatel·Lucent

RAMAKER & ASSOCIATES, INC.
1120 Dallas Street, Sauk City, WI 53583
Phone: 608-643-4100 Fax: 608-643-7999
www.Ramaker.com

# NETWORK VISION MMBTS LAUNCH NORTHERN CT MARKET

Certification & Seal:

| MARK | DATE | DESCRIPTION |
|---|---|---|
| D | 2/24/14 | RFDS & SCENARIO 124 REVs |
| C | 11/15/13 | GM2 REVISIONS |
| B | 11/08/12 | FINAL PRELIMINARY CD'S |
| A | 9/06/12 | 90% CD REVIEW |

ISSUE PHASE: FINAL PRELIMINARY
DATE ISSUED: 02/24/2014

PROJECT TITLE:
EASTFORD-CDT
SITE #: CT33XC016

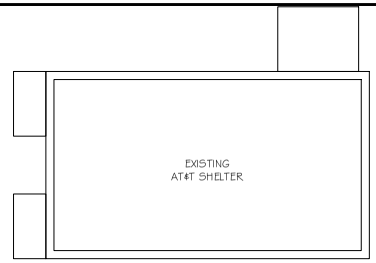
PROJECT INFORMATION:
34 OLD ROUTE 44
EASTFORD, CT 06242

SHEET TITLE:
OVERALL SITE PLAN

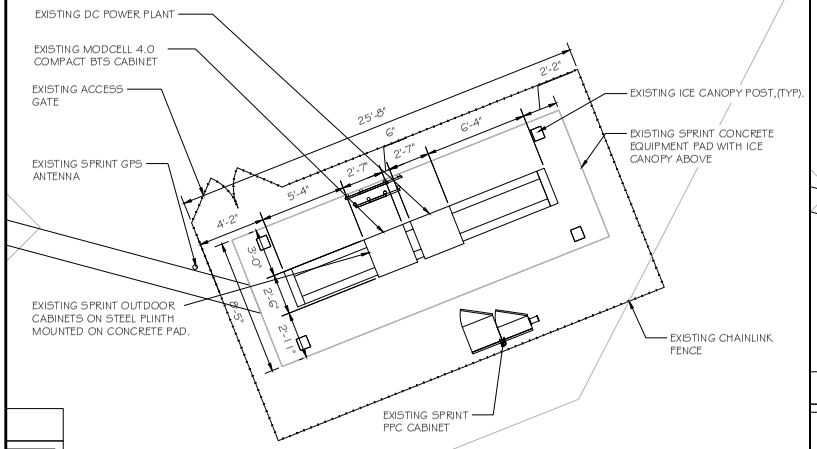
0 7.5' 15' 30'
11" x 17" - 1" = 15'
22" x 34" - 1" = 7.5'

PROJECT NUMBER: 22974
SHEET NUMBER: C-1

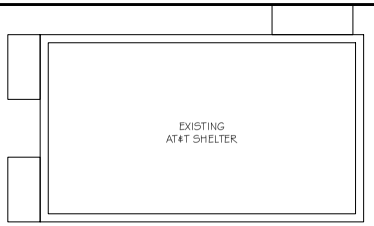
DRAWN BY: KJG CHECKED BY: KAB



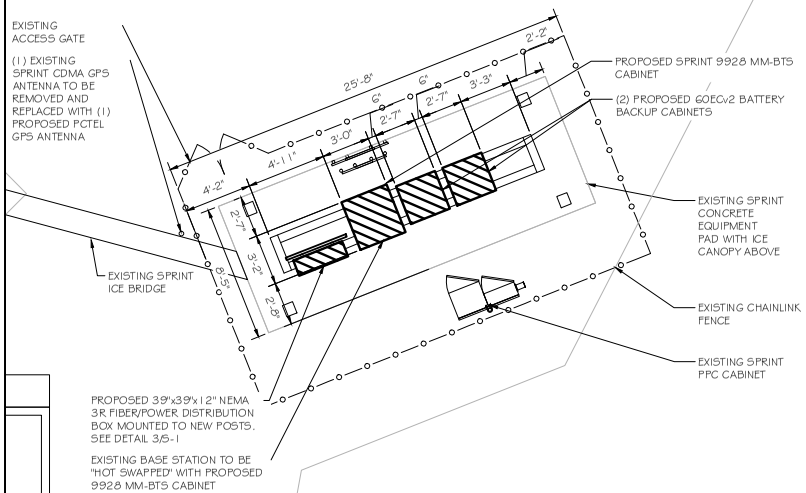





EXISTING EQUIPMENT PLAN (1)
SCALE: 1" = 7.5'








PROPOSED EQUIPMENT PLAN (2)
SCALE: 1" = 7.5'

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# NETWORK VISION MMBTS LAUNCH NORTHERN CT MARKET

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ISSUE PHASE: FINAL PRELIMINARY — DATE ISSUED: 02/24/2014

PROJECT TITLE:
EASTFORD-CDT
SITE #: CT33XC016

PROJECT INFORMATION:
34 OLD ROUTE 44
EASTFORD, CT 06242

SHEET TITLE:
EQUIPMENT PLAN

0 3.75' 7.5' 15'
11" x 17" - 1" = 7.5'
22" x 34" - 1" = 3.75'

PROJECT NUMBER: 22974
SHEET NUMBER: A-1



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## NOTES:

I. SCOPE

A. THIS SECTION COVERS THE SPECIFICATIONS FOR ANTENNA AND COAXIAL CABLE INSTALLATION OF: ANTENNAS, COAXIAL, CONNECTIONS, AND ICE BRIDGE.

B. REFERENCE SPRINT STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES FOR GENERAL REQUIREMENTS.

II. ANTENNAS:

A. ANTENNAS SHALL BE PLUMB AND INSTALLED SO THAT THE ENTIRE WHIP EXTENDS ABOVE VERTICAL PIPE MOUNT. DIRECTIONAL ANTENNAS SHALL BE ORIENTED TO PROPER AZIMUTH, PROVIDED ON THE RF SPECIFICATION SHEET. NOTE: THE ANTENNA MAY BE ORIENTED USING THE REFLECTOR AS THE REFERENCE, ADJUSTING ITS AZIMUTH 180 DEGREES FROM MAXIMUM ANTENNA RADIATION.

B. MICROWAVE ANTENNAS (DISHES) SHALL BE ASSEMBLED PER MANUFACTURER'S DRAWINGS. STIFF ARMS AND RADOMES SHALL BE INSTALLED WITH POLARIZATION PROVIDED BY RF SPECIFICATION SHEET. IF PATH IS NOT READY TO ALIGN, DISH SHOULD BE POINTED TOWARD CALCULATED AZIMUTH, OR DIRECTION OF FIELD STAKE DENOTING OPPOSITE END. 2 STIFF ARMS SHALL BE PROVIDED FOR MICROWAVE DISHES 6'-0" IN DIAMETER OR GREATER.

C. A TRANSIT SHALL BE USED TO PROPERLY ALIGN CELLULAR AND MICROWAVE ANTENNAS.

III. COAXIAL CABLE:

A. COAXIAL CABLE SHALL BE SUPPORTED WITH SNAP-IN HANGERS. SNAP-IN HANGERS SHOULD BE USED EVERY 3 FEET THE ENTIRE HEIGHT OF THE TOWER. ANGLE ADAPTERS OR ROUND MEMBER ADAPTERS WITH BUTTERFLY CLAMPS SHALL BE USED ELSEWHERE, I.E. SIDEARMS, PLATFORMS, AND MICROWAVE MOUNTS.

B. COAXIAL CABLE SHALL ALSO BE SUPPORTED WITH HOISTING GRIPS, INSTALLED AT MAXIMUM INTERVALS OF 200 FEET. HOISTING GRIPS SHALL BE ATTACHED WITH SHACKLES, BOLTED IN THE 9/16" HOLE OF WAVEGUIDE LADDER.

C. ALL JUMPERS USED BETWEEN COAXIAL CABLE AND ANTENNA SHALL BE SUPPORTED WITHIN 18 INCHES OF ANTENNA, USING BUTTERFLY CLAMPS WITH ANGLE ADAPTERS OR ROUND MEMBER ADAPTERS AROUND PIPES. CELLULAR ANTENNAS TYPICALLY USE 6' JUMPERS; MICROWAVE DISHES USE 3' JUMPERS.

D. COAXIAL CABLE SHALL BE NEATLY BENT WHEN REQUIRED, USING A MINIMUM BENDING RADIUS OF 10 TIMES THE DIAMETER OF THE COAXIAL CABLE. DRIP LOOPS SHOULD BEGIN AT THE ICE BRIDGE. THE END IN THE COAXIAL CABLE SHOULD BE AT A LOWER HEIGHT THAN THE ENTRY PORT.

E. COAXIAL CABLE SHALL BE SUPPORTED WITH SNAP-IN HANGERS ON THE WAVEGUIDE LADDER UNDER ICE BRIDGE. COAXIAL CABLE SHOULD BE NEATLY CUT 16" INSIDE BUILDING AND TERMINATED AT THE QUARTER WAVE SHORTS.

F. CONNECTORS WILL NORMALLY BE PROVIDED FIRST OFF REEL FROM FACTORY. CONNECTORS TERMINATED IN BUILDING SHALL BE NEATLY INSTALLED PER MANUFACTURER'S SPECIFICATIONS.

G. COAXIAL CABLES SHOULD BE LABELED WITH TAGS INSIDE THE BUILDING.

H. USE 2" WIDE COLORED TAPE TO INDICATE SECTORS. CONTRACTOR TO USE SECTOR COLOR CODING AS INDICATED IN THESE DRAWINGS OR AS PROVIDED BY SPRINT.

I. ALL EXCEPTIONS NEED TO BE VERIFIED WITH THE PROJECT MANAGER.

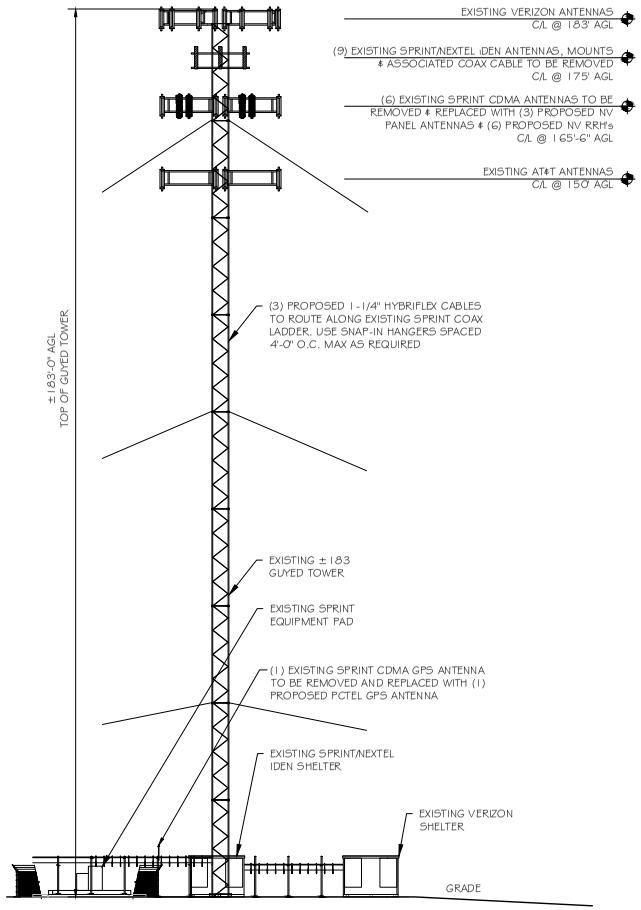
IV. CONNECTORS:

A. ALL CONNECTIONS AND GROUNDING KITS SHALL BE WEATHERPROOFED USING COLD SHRINK OR ANDREW APPROVED WEATHER STRIPPING. NOTE: NO PORTION OF CONNECTOR SHALL BE EXPOSED TO THE ELEMENTS.

B. COAXIAL CABLE SHALL BE GROUNDED USING GROUNDING KITS AT THE TOP (BELOW THE BEND), BOTTOM (ABOVE THE BEND ON TOWER GROUND BAR), AND ON BUILDING GROUND BAR BEFORE ENTRY INTO WAVEGUIDE PORTS. 4" CABLE BOOTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

C. GROUNDING KITS SHALL BE NEATLY INSTALLED SO THAT THE JUMPER RUNS IN THE SAME DIRECTION AS THE COAXIAL AND GROUND BAR. JUMPER WIRE SHOULD RUN IN A DIRECT PATH TO THE GROUND BAR/ TOWER LADDER, BUT HAVE ADEQUATE SLACK FOR EXPANSION, CONTRACTION, AND REPAIR. NON-OXIDE GREASE SHOULD BE APPLIED BETWEEN LUG AND BAR/TOWER.

D. TOWER GROUND BAR SHALL BE INSTALLED ON THE ANGLE BEHIND THE FIRST DIAGONAL WAVEGUIDE LADDER RUNG, ABOVE 8'-6". GROUND BAR SHALL BE ISOLATED FROM ANGLE USING NEWTON BUSHINGS PROVIDED.




ELEVATION 1
SCALE: 1"= 25'-0"

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# NETWORK VISION MMBTS LAUNCH NORTHERN CT MARKET

Certification & Seal:

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| C | 11/15/13 | GM2 REVISIONS |
| B | 11/08/12 | FINAL PRELIMINARY CD'S |
| A | 9/06/12 | 90% CD REVIEW |

ISSUE PHASE: FINAL PRELIMINARY DATE ISSUED: 02/24/2014

PROJECT TITLE:

EASTFORD-CDT
SITE #: CT33XC016

PROJECT INFORMATION:
34 OLD ROUTE 44
EASTFORD, CT 06242

SHEET TITLE:
SITE ELEVATION & NOTES

0 12.5' 25' 50'

11" x 17" - 1" = 25'
22" x 34" - 1" = 12.5'

PROJECT NUMBER: 22974
SHEET NUMBER: A-2

# FRED A. NUDD CORPORATION

1743 ROUTE 104, BOX 577
ONTARIO, NY 14519
(315) 524-2531 FAX (315) 524-4249

*www.nuddtowers.com*


Mark LeGault
Cordless Data Transfer, Inc.
600 Old Hartford Road
Colchester, CT 06415
March 29, 2014

Nudd Job Number: 114-13067

Site Location: 35 Old Route 44, Eastford, CT 06242, Windham County

Subject: Structural Analysis of an existing 190 ft Guyed Tower

Fred A. Nudd Corporation has completed a structural analysis of an existing 190 ft guyed tower. The tower was originally designed by Fred A. Nudd Corporation in March of 1998. The tower analysis was completed considering TIA-222-F design standards, which is the enforced design standard of the 2003 International Building Code and 2005 State Building Code of Connecticut with 2009 Amendments. Additional standards used in this analysis include AISC Allowable Stress Design Manual, 9th Edition, and ACI318-05, Building Code Requirements for Structural Concrete and Commentary. Tower and foundation dimensions have been taken from drawings by Fred A. Nudd, project number 98-5874, dated March 1998. The tower was later extended and re-guyed by Fred A. Nudd Corporation, drawing number 00-5874A-1, dated July 31, 2000. Geotechnical information was taken from a subsurface exploration report by Tower Engineering Professionals, Inc., project number 090004.14, dated September 22, 2009. Design criteria per each analysis are noted on the following page. The tower is assumed to be in good, undamaged and equivalent as new condition and has been maintained / inspected per criteria by TIA-222.

The purpose of this analysis is to determine the structure's ability to support new Sprint equipment installed at a rad center of 165.5 ft above ground level (AGL). The new equipment to be installed, which includes antennas, diplexers, and associated hardware are listed on the following page in the appurtenance loading table.

Results of the analysis indicate the tower will be able to the support the design loads noted in the appurtenance loading table on the following page. Specific section design loads, capacities and stress ratios are provided on the following pages. Maximum member usage was found to be 99%.

The tower base foundation and anchors were analyzed considering onsite soil information from the aforementioned geotechnical report. Based on this analysis, the foundation and anchors will be able support the proposed appurtenance loading, in addition to the existing wireless equipment and tower superstructure. Specific design loads, capacities and stress ratios are provided on the following pages.

In conclusion, the tower superstructure and substructure can support the listed existing and proposed appurtenance loading.

We trust this report satisfies your needs. Please contact us with any questions or concerns regarding this report.

Best Regards,

Fred. A. Nudd Corporation

**Code Design Criteria**

TIA-222-F
Windspeed = 85 mph, fastest mile
Exposure = C
Radial Ice = 0.5 inch
Ice Windspeed = 74 mph, 3-second gust

**Appurtenance Loading – Existing and To Remain on Tower**

| Elevation (ft)[1] | Antenna | Mount | Coax (in)[2] |
|---|---|---|---|
| 193 | (3) Antel BXA-70063-6CF<br>(6) Antel LPA-80080-6CF<br>(3) Antel BXA-171085/8BF<br>(6) RFS FD9R6004/2C-3L | Sector Frame | (12) 1-5/8 |
| 180 | (9) Swedcom ALP-E-9011 | Sector Frame | (9) 1-1/4 |
| 150 | (6) Powerwave P90-14-XLH-RR<br>(3) KMW AM-X-CD-17-65-00T-RET<br>(6) Ericsson RRUS-11<br>(6) Powerwave TT08-DB111-001<br>(1) Raycap DC6-48-60-18-8F | Sector Frame | (12) 1-5/8<br>(2) 19.7 mm DC<br>(1) 10 mm Fiber |

[1]*Note elevation is measured from grade to center of antenna*
[2]*Note no coax is to be removed during the installation of the new wireless equipment. All coax is to remain installed in its original location and orientation.*

**Appurtenance Loading – Final Configuration for Sprint**

| Height (ft) | Carrier | Appurtenance | Mount | Coax (in) |
|---|---|---|---|---|
| 165.5 | Sprint | (3) RFS APXV9ERR18-C-A20<br>(6) Alcatel Lucent 4x40W RRH, 1900 MHz<br>(6) Alcatel Lucent 2x50W RRH, 800 MHz | (3) 12 ft Boom / Frame | (3) 1-1/4 Hybriflex |

- *Height measurement taken as distance from top of base foundation to center of appurtenance.*
- *Sprint's proposed coax may be installed on any tower face.*

**Maximum Member Usage Results**

| Member | Usage (%) |
|---|---|
| Leg | 99 |
| Diagonal | 81 |
| Horizontal | 61 |
| Guy Wires | 74 |
| Bolts | 49 |
| Anchor Rod | 76 |

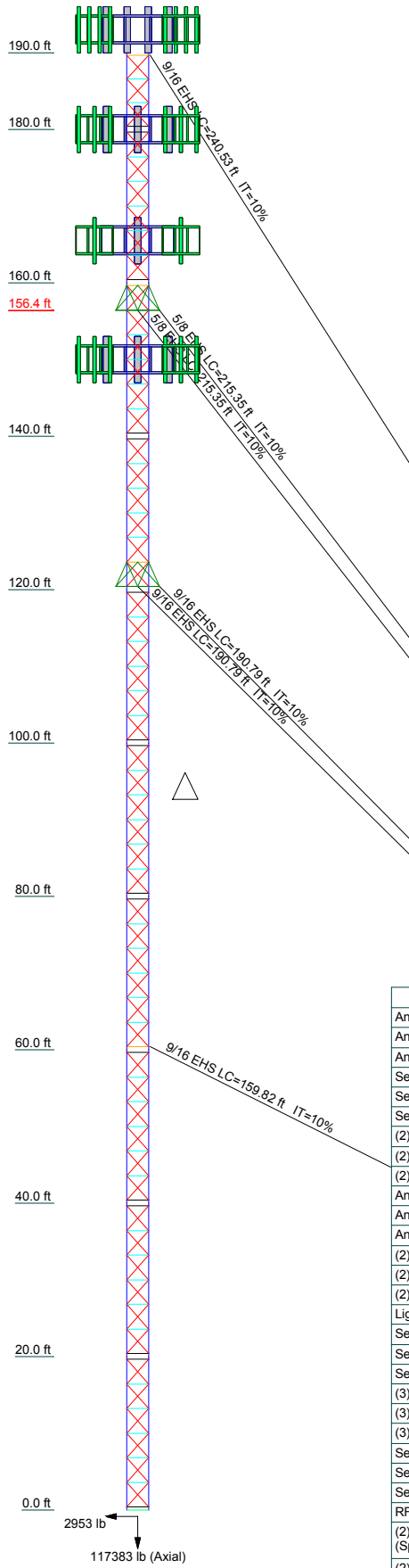
- *Usage above 100% indicates the applied design load exceeds the member strength capacity and requires strengthening.*

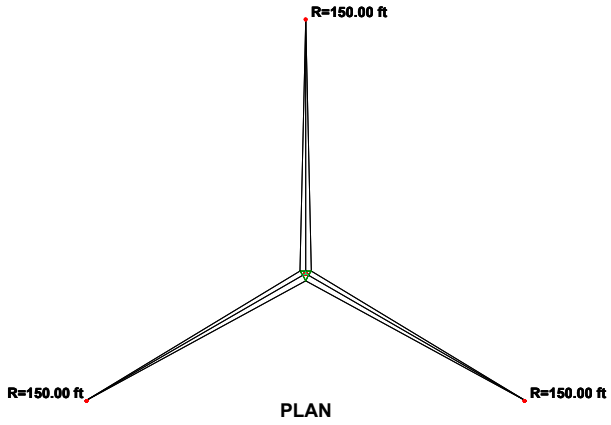
**Maximum Member Usage Results**

| Member | Capacity (kips) | Analysis (kips) | Usage (%) |
|---|---|---|---|
| Base Axial | 121.0 | 119.5 | 99 |
| Anchor Uplift | 64.9 | 45.3 | 70 |
| Anchor Shear | 53.9 | 53.5 | 99 |

- *Usage above 100% indicates the applied design load exceeds the member strength capacity and requires strengthening.*

| Section | T1 | T2 | T3 | T4 | T5 | T6 | T7 | T8 | T9 | T10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Legs | | | | | | P2.5x.203 | | | | |
| Leg Grade | | | | | | A572-55 | | | | |
| Diagonals | | | | | | SR 5/8 | | | | |
| Diagonal Grade | | | | | | A36 | | | | |
| Top Girts | | | N.A. | | | 3.5 | L1 1/2x1 1/2x3/16 | | | |
| Bottom Girts | | L1 1/2x1 1/2x3/16 | | L1 1/2x1 1/2x3/16 | | 54 @ 3.20833 | N.A. | L1 1/2x1 1/2x3/16 | | |
| Horizontals | | | | | L1 1/2x1 1/2x3/16 | | | | | |
| Top Guy Pull-Offs | | | L2x2x5/16 | | N.A. | | L1 3/4x1 3/4x3/16 | | N.A. | |
| Face Width (ft) | A | N.A. | | | | | | | | |
| # Panels @ (ft) | 3 @ 3.08333 | | | | | | | | | |
| Weight (lb) | 6797.3 | 340.3 | 658.2 | 923.0 | 923.0 | 658.2 | 658.2 | 661.6 | 658.2 | 658.2 |




## DESIGNED APPURTENANCE LOADING

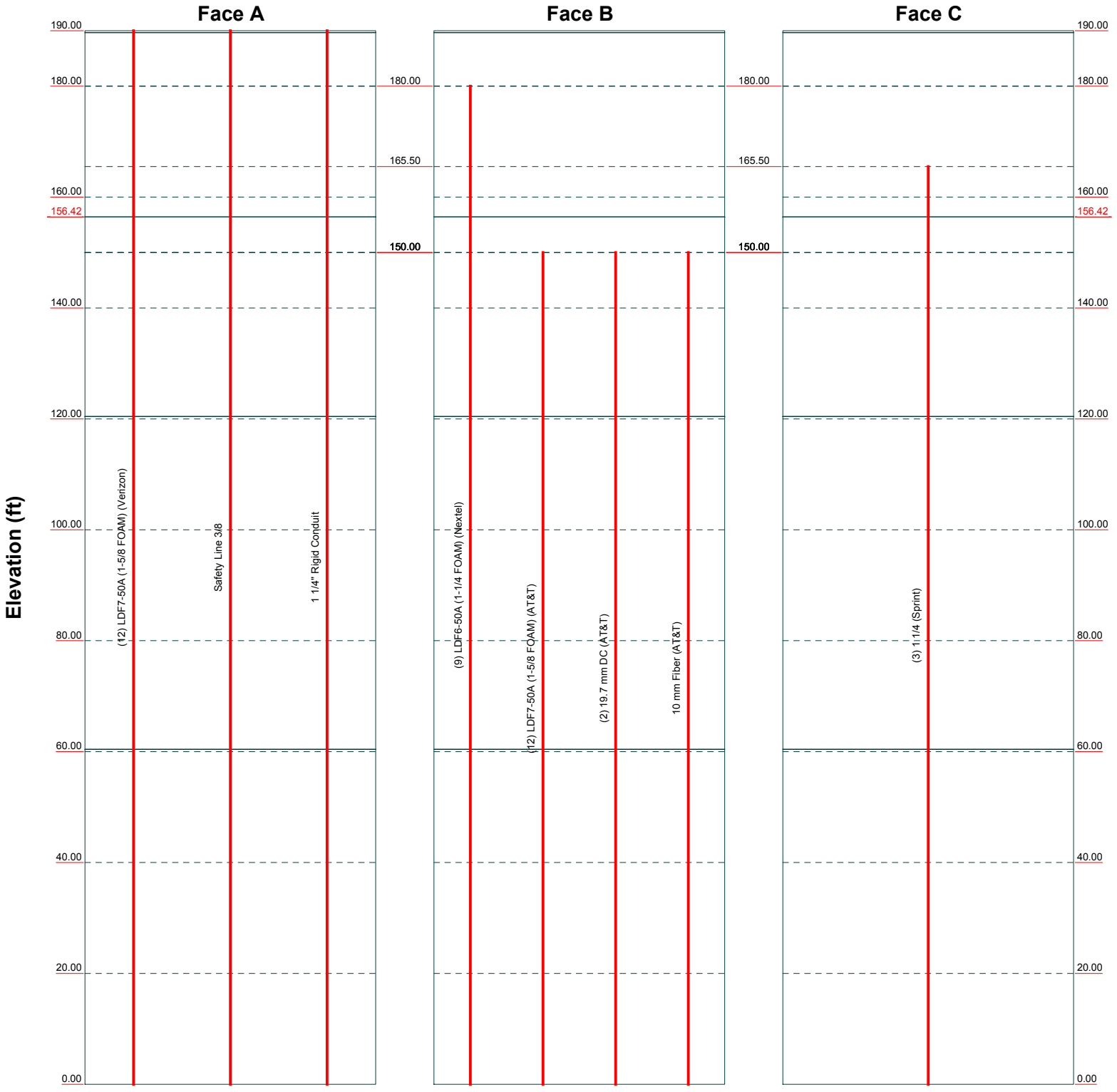
| TYPE | ELEVATION | TYPE | ELEVATION |
|---|---|---|---|
| Antel BXA-70063-6CF (Verizon) | 193 | (2) Alcatel Lucent 2X50W RRH (Sprint) | 165.5 |
| Antel BXA-70063-6CF (Verizon) | 193 | RFS APXV9ERR18-C (Sprint) | 165.5 |
| Antel BXA-70063-6CF (Verizon) | 193 | (2) Alcatel Lucent 4X40W RRH (Sprint) | 165.5 |
| Sector Frame (Verizon) | 193 | (2) Alcatel Lucent 2X50W RRH (Sprint) | 165.5 |
| Sector Frame (Verizon) | 193 | (2) Powerwave TT08-DB111-001 (ATI Mobility) | 150 |
| Sector Frame (Verizon) | 193 | (2) Powerwave TT08-DB111-001 (ATI Mobility) | 150 |
| (2) Antel LPA-80080-6CF (Verizon) | 193 | (2) Powerwave TT08-DB111-001 (ATI Mobility) | 150 |
| (2) Antel LPA-80080-6CF (Verizon) | 193 | Raycap DC6-48-60-18-8F (ATI Mobility) | 150 |
| (2) Antel LPA-80080-6CF (Verizon) | 193 | Sector Frame (ATI Mobility) | 150 |
| Antel BXA-171085/8BF (Verizon) | 193 | Sector Frame (ATI Mobility) | 150 |
| Antel BXA-171085/8BF (Verizon) | 193 | Sector Frame (ATI Mobility) | 150 |
| Antel BXA-171085/8BF (Verizon) | 193 | (2) Powerwave P90-14-XLH-RR (ATI Mobility) | 150 |
| (2) RFS FD9R6004/2C-3L (Verizon) | 193 | (2) Powerwave P90-14-XLH-RR (ATI Mobility) | 150 |
| (2) RFS FD9R6004/2C-3L (Verizon) | 193 | (2) Powerwave P90-14-XLH-RR (ATI Mobility) | 150 |
| (2) RFS FD9R6004/2C-3L (Verizon) | 193 | KMW AM-X-CD-17-65-00T-RET (ATI Mobility) | 150 |
| Lightning Rod 5/8x4' | 190 | KMW AM-X-CD-17-65-00T-RET (ATI Mobility) | 150 |
| Sector Frame (Nextel) | 180 | KMW AM-X-CD-17-65-00T-RET (ATI Mobility) | 150 |
| Sector Frame (Nextel) | 180 | (2) Ericsson RRUS-11 (ATI Mobility) | 150 |
| Sector Frame (Nextel) | 180 | (2) Ericsson RRUS-11 (ATI Mobility) | 150 |
| (3) Swedcom ALP-E-9011 (Nextel) | 180 | (2) Ericsson RRUS-11 (ATI Mobility) | 150 |
| (3) Swedcom ALP-E-9011 (Nextel) | 180 | | |
| (3) Swedcom ALP-E-9011 (Nextel) | 180 | | |
| Sector Frame (Sprint) | 165.5 | | |
| Sector Frame (Sprint) | 165.5 | | |
| Sector Frame (Sprint) | 165.5 | | |
| RFS APXV9ERR18-C (Sprint) | 165.5 | | |
| (2) Alcatel Lucent 4X40W RRH (Sprint) | 165.5 | | |
| (2) Alcatel Lucent 2X50W RRH (Sprint) | 165.5 | | |
| RFS APXV9ERR18-C (Sprint) | 165.5 | | |
| (2) Alcatel Lucent 4X40W RRH (Sprint) | 165.5 | | |

## SYMBOL LIST

| | | | |
|---|---|---|---|
| Phone: FAX: | POD: 114-13067 | | |
| | Project: Eastford, CT | | |
| | Client: CDT | Drawn by: FAN | App'd: |
| | Code: TIA/EIA-222-F | Date: 03/29/14 | Scale: NTS |
| | Path: | | Dwg No. E-1 |

# Feedline Distribution Chart
## 0' - 190'

Round | Flat | App In Face | App Out Face | Truss Leg




| | | | |
|---|---|---|---|
| Job: ***114-13067*** | | | |
| Project: ***Eastford, CT*** | | | |
| Client: CDT | Drawn by: FAN | App'd: | |
| Code: TIA/EIA-222-F | Date: 03/29/14 | Scale: NTS | |
| Path: | | Dwg No. E-7 | |

Phone:
FAX:

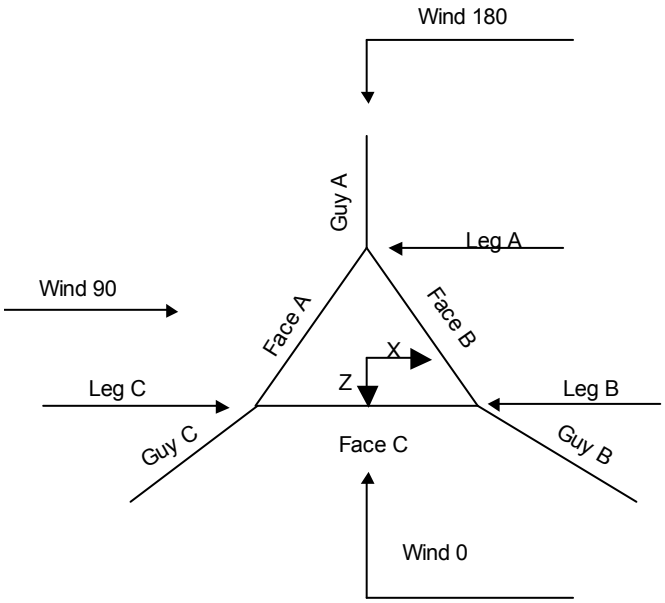
# Tower Input Data

The main tower is a 3x guyed tower with an overall height of 190.00 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 3.50 ft at the top and 3.50 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

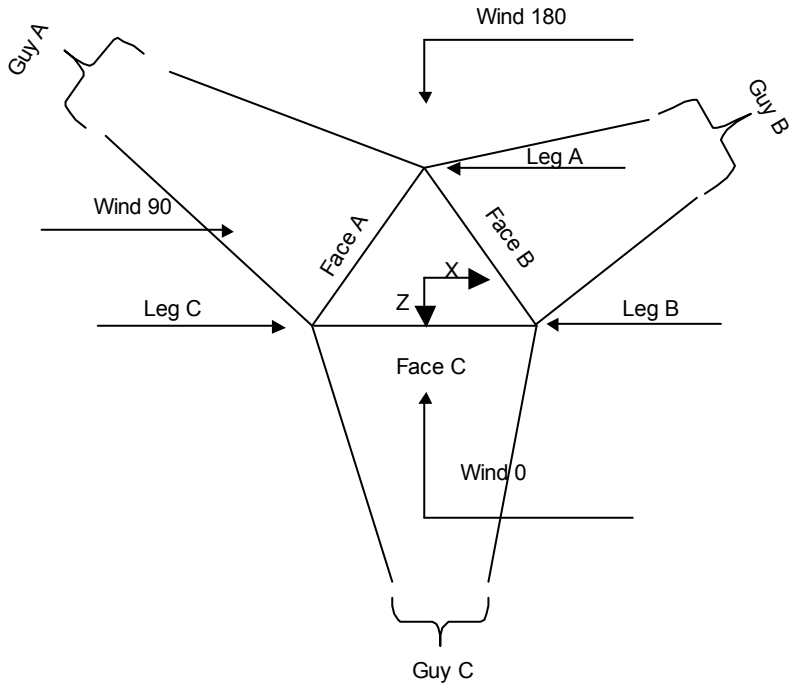
Tower is located in New London County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 50 mph.
Weld together tower sections have flange connections..
Tension only take-up is 0.0313 in.
Pressures are calculated at each section.
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 | | |




***Corner & Starmount Guyed Tower***




***Face Guyed***

## Tower Section Geometry

| Tower Section | Tower Elevation ft | Assembly Database | Description | Section Width ft | Number of Sections | Section Length ft |
|---|---|---|---|---|---|---|
| T1 | 190.00-180.00 | | | 3.50 | 1 | 10.00 |
| T2 | 180.00-160.00 | | | 3.50 | 1 | 20.00 |
| T3 | 160.00-140.00 | | | 3.50 | 1 | 20.00 |
| T4 | 140.00-120.00 | | | 3.50 | 1 | 20.00 |
| T5 | 120.00-100.00 | | | 3.50 | 1 | 20.00 |
| T6 | 100.00-80.00 | | | 3.50 | 1 | 20.00 |
| T7 | 80.00-60.00 | | | 3.50 | 1 | 20.00 |
| T8 | 60.00-40.00 | | | 3.50 | 1 | 20.00 |
| T9 | 40.00-20.00 | | | 3.50 | 1 | 20.00 |
| T10 | 20.00-0.00 | | | 3.50 | 1 | 20.00 |

## 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 | 190.00-180.00 | 3.08 | TX Brace | No | Yes | 4.5000 | 4.5000 |
| T2 | 180.00-160.00 | 3.21 | TX Brace | No | Yes | 4.5000 | 4.5000 |
| T3 | 160.00-140.00 | 3.21 | TX Brace | No | Yes | 4.5000 | 4.5000 |
| T4 | 140.00-120.00 | 3.21 | TX Brace | No | Yes | 4.5000 | 4.5000 |
| T5 | 120.00-100.00 | 3.21 | TX Brace | No | Yes | 4.5000 | 4.5000 |
| T6 | 100.00-80.00 | 3.21 | TX Brace | No | Yes | 4.5000 | 4.5000 |
| T7 | 80.00-60.00 | 3.21 | TX Brace | No | Yes | 4.5000 | 4.5000 |
| T8 | 60.00-40.00 | 3.21 | TX Brace | No | Yes | 4.5000 | 4.5000 |
| T9 | 40.00-20.00 | 3.21 | TX Brace | No | Yes | 4.5000 | 4.5000 |
| T10 | 20.00-0.00 | 3.21 | TX Brace | No | Yes | 4.5000 | 4.5000 |

## Tower Section Geometry *(cont'd)*

| Tower Elevation ft | Leg Type | Leg Size | Leg Grade | Diagonal Type | Diagonal Size | Diagonal Grade |
|---|---|---|---|---|---|---|
| T1 190.00-180.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | A36 (36 ksi) |
| T2 180.00-160.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | A36 (36 ksi) |
| T3 160.00-140.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | A36 (36 ksi) |
| T4 140.00-120.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | A36 (36 ksi) |
| T5 120.00-100.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | A36 (36 ksi) |
| T6 100.00-80.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | A36 (36 ksi) |
| T7 80.00-60.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | A36 (36 ksi) |
| T8 60.00-40.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | A36 (36 ksi) |
| T9 40.00-20.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | A36 (36 ksi) |
| T10 20.00-0.00 | Pipe | P2.5x.203 | A572-55 (55 ksi) | Solid Round | 5/8 | 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 190.00-180.00 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T2 180.00-160.00 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T3 160.00-140.00 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T4 140.00-120.00 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T5 120.00-100.00 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 |

| Tower Elevation ft | Top Girt Type | Top Girt Size | Top Girt Grade | Bottom Girt Type | Bottom Girt Size | Bottom Girt Grade |
|---|---|---|---|---|---|---|
| T6 100.00-80.00 | Equal Angle | L1 1/2x1 1/2x3/16 | (36 ksi) A36 (36 ksi) | Equal Angle | L1 1/2x1 1/2x3/16 | (36 ksi) A36 (36 ksi) |
| T7 80.00-60.00 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T8 60.00-40.00 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T9 40.00-20.00 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T10 20.00-0.00 | Equal Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) | Equal Angle | L1 1/2x1 1/2x3/16 | 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 190.00-180.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T2 180.00-160.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T3 160.00-140.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T4 140.00-120.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T5 120.00-100.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T6 100.00-80.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T7 80.00-60.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T8 60.00-40.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T9 40.00-20.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 ksi) |
| T10 20.00-0.00 | None | Flat Bar | | A36 (36 ksi) | Single Angle | L1 1/2x1 1/2x3/16 | A36 (36 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 190.00-180.00 | 0.00 | 0.0000 | A36 (36 ksi) | 1 | 1 | 1 | 36.0000 | 36.0000 |
| T2 180.00-160.00 | 0.00 | 0.0000 | A36 (36 ksi) | 1 | 1 | 1 | 36.0000 | 36.0000 |
| T3 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 |

| 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 |
|---|---|---|---|---|---|---|---|---|
| 160.00-140.00 | | | (36 ksi) | | | | | |
| T4 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 |
| 140.00-120.00 | | | (36 ksi) | | | | | |
| T5 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 |
| 120.00-100.00 | | | (36 ksi) | | | | | |
| T6 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 |
| 100.00-80.00 | | | (36 ksi) | | | | | |
| T7 80.00-60.00 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 |
| | | | (36 ksi) | | | | | |
| T8 60.00-40.00 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 |
| | | | (36 ksi) | | | | | |
| T9 40.00-20.00 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 |
| | | | (36 ksi) | | | | | |
| T10 20.00-0.00 | 0.00 | 0.0000 | A36 | 1 | 1 | 1 | 36.0000 | 36.0000 |
| | | | (36 ksi) | | | | | |

## Tower Section Geometry *(cont'd)*

| Tower Elevation ft | Calc K Single Angles | Calc K Solid Rounds | K Factors[1] Legs | X Brace Diags X | X Brace Diags Y | K Single Diags X | K Single Diags Y | Girts X | Girts Y | Horiz. X | Horiz. Y | Sec. Horiz. X | Sec. Horiz. Y | Inner Brace X | Inner Brace Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 190.00-180.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| T2 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 180.00-160.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| T3 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 160.00-140.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| T4 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 140.00-120.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| T5 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 120.00-100.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| T6 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 100.00-80.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| T7 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 80.00-60.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| T8 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 60.00-40.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| T9 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 40.00-20.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| T10 | No | No | 1 | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 1 | 1 | 1 | 1 |
| 20.00-0.00 | | | | 1 | 1 | 1 | 1 | 0.65 | 0.65 | 0.65 | 0.65 | 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 | | Diagonal | | Top Girt | | Bottom Girt | | Mid Girt | | Long Horizontal | | Short Horizontal | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U | Net Width Deduct in | U |
| T1 190.00-180.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |
| T2 180.00-160.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |
| T3 160.00-140.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |
| T4 140.00-120.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |
| T5 120.00-100.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |
| T6 100.00-80.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |
| T7 80.00-60.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |
| T8 60.00-40.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |
| T9 40.00-20.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |
| T10 20.00-0.00 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 1 | 0.0000 | 0.75 | 0.0000 | 1 | 0.0000 | 0.75 |

## Tower Section Geometry *(cont'd)*

| Tower Elevation ft | Leg Connection Type | Leg | | Diagonal | | Top Girt | | Bottom Girt | | Mid Girt | | Long Horizontal | | Short Horizontal | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. | Bolt Size in | No. |
| T1 190.00-180.00 | Flange | 0.7500 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 180.00-160.00 | Flange | 0.7500 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 160.00-140.00 | Flange | 0.7500 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 140.00-120.00 | Flange | 0.7500 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 120.00-100.00 | Flange | 0.7500 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 100.00-80.00 | Flange | 0.7500 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 80.00-60.00 | Flange | 0.7500 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 60.00-40.00 | Flange | 0.7500 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 40.00-20.00 | Flange | 0.7500 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 20.00-0.00 | Flange | 0.7500 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 % |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 156.417 | EHS | A | 5/8 | 4240.00 | 10% | 21000 | 0.813 | 215.17 | 150.00 | 0.0000 | 0.00 | 100% |
| | | B | 5/8 | 4240.00 | 10% | 21000 | 0.813 | 215.17 | 150.00 | 0.0000 | 0.00 | 100% |
| | | C | 5/8 | 4240.00 | 10% | 21000 | 0.813 | 215.17 | 150.00 | 0.0000 | 0.00 | 100% |
| 120.375 | EHS | A | 9/16 | 3500.00 | 10% | 21000 | 0.671 | 190.63 | 150.00 | 0.0000 | 0.00 | 100% |
| | | B | 9/16 | 3500.00 | 10% | 21000 | 0.671 | 190.63 | 150.00 | 0.0000 | 0.00 | 100% |
| | | C | 9/16 | 3500.00 | 10% | 21000 | 0.671 | 190.63 | 150.00 | 0.0000 | 0.00 | 100% |
| 60.375 | EHS | A | 9/16 | 3500.00 | 10% | 21000 | 0.671 | 159.69 | 150.00 | 0.0000 | 0.00 | 100% |
| | | B | 9/16 | 3500.00 | 10% | 21000 | 0.671 | 159.69 | 150.00 | 0.0000 | 0.00 | 100% |
| | | C | 9/16 | 3500.00 | 10% | 21000 | 0.671 | 159.69 | 150.00 | 0.0000 | 0.00 | 100% |
| 189.625 | EHS | A | 9/16 | 3500.00 | 10% | 21000 | 0.671 | 240.33 | 150.00 | 0.0000 | 0.00 | 100% |
| | | B | 9/16 | 3500.00 | 10% | 21000 | 0.671 | 240.33 | 150.00 | 0.0000 | 0.00 | 100% |
| | | C | 9/16 | 3500.00 | 10% | 21000 | 0.671 | 240.33 | 150.00 | 0.0000 | 0.00 | 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 |
|---|---|---|---|---|---|---|---|
| 156.417 | Torque Arm | 7.00 | 30.0000 | Dog Ear | A36 (36 ksi) | Single Angle | L3x3x1/4 |
| 120.375 | Torque Arm | 7.00 | 30.0000 | Dog Ear | A36 (36 ksi) | Single Angle | L3x3x1/4 |
| 60.375 | Corner | | | | | | |
| 189.625 | Corner | | | | | | |

## 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 |
|---|---|---|---|---|---|---|---|---|
| 156.42 | A572-50 (50 ksi) | Solid Round | | | No | A36 (36 ksi) | Equal Angle | L2x2x5/16 |
| 120.38 | A572-50 (50 ksi) | Solid Round | | | No | A36 (36 ksi) | Equal Angle | L2x2x5/16 |
| 60.38 | A572-50 (50 ksi) | Solid Round | | | No | A36 (36 ksi) | Equal Angle | L1 3/4x1 3/4x3/16 |
| 189.63 | A572-50 (50 ksi) | Solid Round | | | No | A36 (36 ksi) | Equal Angle | L1 3/4x1 3/4x3/16 |

## 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 |
|---|---|---|---|---|---|---|---|---|

| 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 |
|---|---|---|---|---|---|---|---|---|
| 156.417 | 174.93 | 174.93 | 174.93 | | 4.38<br>3.6 sec/pulse | 4.38<br>3.6 sec/pulse | 4.38<br>3.6 sec/pulse | |
| 120.375 | 127.91 | 127.91 | 127.91 | | 3.45<br>3.2 sec/pulse | 3.45<br>3.2 sec/pulse | 3.45<br>3.2 sec/pulse | |
| 60.375 | 107.15 | 107.15 | 107.15 | | 2.43<br>2.7 sec/pulse | 2.43<br>2.7 sec/pulse | 2.43<br>2.7 sec/pulse | |
| 189.625 | 161.26 | 161.26 | 161.26 | | 5.44<br>4.0 sec/pulse | 5.44<br>4.0 sec/pulse | 5.44<br>4.0 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 $K_y$ |
|---|---|---|---|---|---|---|---|---|
| 156.417 | No | No | 1 | 1 | 1 | 1 | 1 | 1 |
| 120.375 | No | No | 1 | 1 | 1 | 1 | 1 | 1 |
| 60.375 | No | No | | | 1 | 1 | 1 | 1 |
| 189.625 | No | No | | | 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 156.417 | 0.7500<br>A325N | 2 | 0.0000 | 0.75 | 0.7500<br>A325N | 2 | 0.0000 | 0.75 | 0.6250<br>A325N | 0 | 0.0000 | 0.75 |
| 120.375 | 0.7500<br>A325N | 2 | 0.0000 | 0.75 | 0.7500<br>A325N | 2 | 0.0000 | 0.75 | 0.6250<br>A325N | 0 | 0.0000 | 0.75 |
| 60.375 | 0.6250<br>A325N | 0 | 0.0000 | 0.75 | 0.0000<br>A325N | 0 | 0.0000 | 0.75 | 0.6250<br>A325N | 0 | 0.0000 | 0.75 |
| 189.625 | 0.6250<br>A325N | 0 | 0.0000 | 0.75 | 0.0000<br>A325N | 0 | 0.0000 | 0.75 | 0.6250<br>A325N | 0 | 0.0000 | 0.75 |

## Guy Pressures

| Guy Elevation ft | Guy Location | z ft | $q_z$ psf | $q_z$ Ice psf | Ice Thickness in |
|---|---|---|---|---|---|
| 156.417 | A | 78.21 | 24 | 18 | 0.5000 |
| | B | 78.21 | 24 | 18 | 0.5000 |
| | C | 78.21 | 24 | 18 | 0.5000 |
| 120.375 | A | 60.19 | 22 | 16 | 0.5000 |
| | B | 60.19 | 22 | 16 | 0.5000 |
| | C | 60.19 | 22 | 16 | 0.5000 |
| 60.375 | A | 30.19 | 18 | 14 | 0.5000 |
| | B | 30.19 | 18 | 14 | 0.5000 |

| Guy Elevation ft | Guy Location | z ft | $q_z$ psf | $q_z$ Ice psf | Ice Thickness in |
|---|---|---|---|---|---|
| | C | 30.19 | 18 | 14 | 0.5000 |
| 189.625 | A | 94.81 | 25 | 19 | 0.5000 |
| | B | 94.81 | 25 | 19 | 0.5000 |
| | C | 94.81 | 25 | 19 | 0.5000 |

## Guy-Mast Forces (Excluding Wind) - No Ice

| Guy Elevation ft | Guy Location | Chord Angle ° | Guy Tension Top / Bottom lb | $F_x$ lb | $F_y$ lb | $F_z$ lb | $M_x$ lb-ft | $M_y$ lb-ft | $M_z$ lb-ft |
|---|---|---|---|---|---|---|---|---|---|
| 156.417 | A | 46.5797 | 4367.06 / 4240.00 | -69.93 | 3213.15 | -2956.68 | -6492.90 | 10489.68 | -11246.04 |
| | A | 46.5797 | 4367.06 / 4240.00 | 69.93 | 3213.15 | -2956.68 | -6492.90 | -10489.68 | 11246.04 |
| | B | 46.5797 | 4367.06 / 4240.00 | 2595.52 | 3213.15 | 1417.78 | 12985.81 | 10489.68 | 0.00 |
| | B | 46.5797 | 4367.06 / 4240.00 | 2525.59 | 3213.15 | 1538.90 | -6492.90 | -10489.68 | -11246.04 |
| | C | 46.5797 | 4367.06 / 4240.00 | -2525.59 | 3213.15 | 1538.90 | -6492.90 | 10489.68 | 11246.04 |
| | C | 46.5797 | 4367.06 / 4240.00 | -2595.52 | 3213.15 | 1417.78 | 12985.81 | -10489.68 | 0.00 |
| | | | Sum: | 0.00 | 19278.93 | 0.00 | -0.00 | 0.00 | 0.00 |
| 120.375 | A | 39.1191 | 3580.70 / 3500.00 | -64.94 | 2297.61 | -2745.58 | -4642.84 | 9740.74 | -8041.64 |
| | A | 39.1191 | 3580.70 / 3500.00 | 64.94 | 2297.61 | -2745.58 | -4642.84 | -9740.74 | 8041.64 |
| | B | 39.1191 | 3580.70 / 3500.00 | 2410.21 | 2297.61 | 1316.55 | 9285.68 | 9740.74 | 0.00 |
| | B | 39.1191 | 3580.70 / 3500.00 | 2345.27 | 2297.61 | 1429.03 | -4642.84 | -9740.74 | -8041.64 |
| | C | 39.1191 | 3580.70 / 3500.00 | -2345.27 | 2297.61 | 1429.03 | -4642.84 | 9740.74 | 8041.64 |
| | C | 39.1191 | 3580.70 / 3500.00 | -2410.21 | 2297.61 | 1316.55 | 9285.68 | -9740.74 | 0.00 |
| | | | Sum: | 0.00 | 13785.67 | 0.00 | -0.00 | 0.00 | 0.00 |
| 60.375 | A | 22.1953 | 3540.48 / 3500.00 | 0.00 | 1383.35 | -3259.04 | -2795.37 | 0.00 | 0.00 |
| | B | 22.1953 | 3540.48 / 3500.00 | 2822.41 | 1383.35 | 1629.52 | 1397.68 | 0.00 | -2420.86 |
| | C | 22.1953 | 3540.48 / 3500.00 | -2822.41 | 1383.35 | 1629.52 | 1397.68 | -0.00 | 2420.86 |
| | | | Sum: | 0.00 | 4150.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| 189.625 | A | 52.0323 | 3627.13 / 3500.00 | 0.00 | 2889.89 | -2191.94 | -5839.67 | 0.00 | 0.00 |
| | B | 52.0323 | 3627.13 / 3500.00 | 1898.28 | 2889.89 | 1095.97 | 2919.83 | 0.00 | -5057.30 |
| | C | 52.0323 | 3627.13 / 3500.00 | -1898.28 | 2889.89 | 1095.97 | 2919.83 | -0.00 | 5057.30 |
| | | | Sum: | 0.00 | 8669.66 | -0.00 | 0.00 | 0.00 | 0.00 |

## Guy-Mast Forces (Excluding Wind) - Ice

| Guy Elevation | Guy Location | Chord Angle | Guy Tension Top / Bottom | $F_x$ | $F_y$ | $F_z$ | $M_x$ | $M_y$ | $M_z$ |
|---|---|---|---|---|---|---|---|---|---|
| ft | | ° | lb | lb | lb | lb | lb-ft | lb-ft | lb-ft |
| 156.417 | A | 46.5797 | 6148.96 / 5914.51 | -98.00 | 4542.18 | -4143.51 | -9178.51 | 14700.32 | -15897.64 |
| | A | 46.5797 | 6148.96 / 5914.51 | 98.00 | 4542.18 | -4143.51 | -9178.51 | -14700.32 | 15897.64 |
| | B | 46.5797 | 6148.96 / 5914.51 | 3637.39 | 4542.18 | 1986.88 | 18357.02 | 14700.32 | 0.00 |
| | B | 46.5797 | 6148.96 / 5914.51 | 3539.38 | 4542.18 | 2156.63 | -9178.51 | -14700.32 | -15897.64 |
| | C | 46.5797 | 6148.96 / 5914.51 | -3539.38 | 4542.18 | 2156.63 | -9178.51 | 14700.32 | 15897.64 |
| | C | 46.5797 | 6148.96 / 5914.51 | -3637.39 | 4542.18 | 1986.88 | 18357.02 | -14700.32 | 0.00 |
| | | | Sum: | 0.00 | 27253.10 | 0.00 | -0.00 | 0.00 | 0.00 |
| 120.375 | A | 39.1191 | 5072.76 / 4914.01 | -91.58 | 3276.08 | -3871.93 | -6620.07 | 13736.80 | -11466.29 |
| | A | 39.1191 | 5072.76 / 4914.01 | 91.58 | 3276.08 | -3871.93 | -6620.07 | -13736.80 | 11466.29 |
| | B | 39.1191 | 5072.76 / 4914.01 | 3398.98 | 3276.08 | 1856.65 | 13240.14 | 13736.80 | 0.00 |
| | B | 39.1191 | 5072.76 / 4914.01 | 3307.40 | 3276.08 | 2015.27 | -6620.07 | -13736.80 | -11466.29 |
| | C | 39.1191 | 5072.76 / 4914.01 | -3307.40 | 3276.08 | 2015.27 | -6620.07 | 13736.80 | 11466.29 |
| | C | 39.1191 | 5072.76 / 4914.01 | -3398.98 | 3276.08 | 1856.65 | 13240.14 | -13736.80 | 0.00 |
| | | | Sum: | 0.00 | 19656.50 | 0.00 | -0.00 | 0.00 | 0.00 |
| 60.375 | A | 22.1953 | 5015.17 / 4935.55 | 0.00 | 1984.79 | -4605.71 | -4010.72 | 0.00 | 0.00 |
| | B | 22.1953 | 5015.17 / 4935.55 | 3988.66 | 1984.79 | 2302.85 | 2005.36 | 0.00 | -3473.38 |
| | C | 22.1953 | 5015.17 / 4935.55 | -3988.66 | 1984.79 | 2302.85 | 2005.36 | -0.00 | 3473.38 |
| | | | Sum: | 0.00 | 5954.37 | 0.00 | 0.00 | 0.00 | 0.00 |
| 189.625 | A | 52.0323 | 5142.99 / 4892.91 | 0.00 | 4114.31 | -3085.91 | -8313.89 | 0.00 | 0.00 |
| | B | 52.0323 | 5142.99 / 4892.91 | 2672.48 | 4114.31 | 1542.95 | 4156.95 | 0.00 | -7200.04 |
| | C | 52.0323 | 5142.99 / 4892.91 | -2672.48 | 4114.31 | 1542.95 | 4156.95 | -0.00 | 7200.04 |
| | | | Sum: | 0.00 | 12342.93 | -0.00 | 0.00 | 0.00 | 0.00 |

## Guy-Mast Forces (Excluding Wind) - Service

| Guy Elevation | Guy Location | Chord Angle | Guy Tension Top / Bottom | $F_x$ | $F_y$ | $F_z$ | $M_x$ | $M_y$ | $M_z$ |
|---|---|---|---|---|---|---|---|---|---|
| ft | | ° | lb | lb | lb | lb | lb-ft | lb-ft | lb-ft |
| 156.417 | A | 46.5797 | 4367.06 / 4240.00 | -69.93 | 3213.15 | -2956.68 | -6492.90 | 10489.68 | -11246.04 |
| | A | 46.5797 | 4367.06 | 69.93 | 3213.15 | -2956.68 | -6492.90 | -10489.68 | 11246.04 |

| Guy Elevation ft | Guy Location | Chord Angle ° | Guy Tension Top Bottom lb | $F_x$ lb | $F_y$ lb | $F_z$ lb | $M_x$ lb-ft | $M_y$ lb-ft | $M_z$ lb-ft |
|---|---|---|---|---|---|---|---|---|---|
| | | | 4240.00 | | | | | | |
| | B | 46.5797 | 4367.06 | 2595.52 | 3213.15 | 1417.78 | 12985.81 | 10489.68 | 0.00 |
| | | | 4240.00 | | | | | | |
| | B | 46.5797 | 4367.06 | 2525.59 | 3213.15 | 1538.90 | -6492.90 | -10489.68 | -11246.04 |
| | | | 4240.00 | | | | | | |
| | C | 46.5797 | 4367.06 | -2525.59 | 3213.15 | 1538.90 | -6492.90 | 10489.68 | 11246.04 |
| | | | 4240.00 | | | | | | |
| | C | 46.5797 | 4367.06 | -2595.52 | 3213.15 | 1417.78 | 12985.81 | -10489.68 | 0.00 |
| | | | 4240.00 | | | | | | |
| | | | Sum: | 0.00 | 19278.93 | 0.00 | -0.00 | 0.00 | 0.00 |
| 120.375 | A | 39.1191 | 3580.70 | -64.94 | 2297.61 | -2745.58 | -4642.84 | 9740.74 | -8041.64 |
| | | | 3500.00 | | | | | | |
| | A | 39.1191 | 3580.70 | 64.94 | 2297.61 | -2745.58 | -4642.84 | -9740.74 | 8041.64 |
| | | | 3500.00 | | | | | | |
| | B | 39.1191 | 3580.70 | 2410.21 | 2297.61 | 1316.55 | 9285.68 | 9740.74 | 0.00 |
| | | | 3500.00 | | | | | | |
| | B | 39.1191 | 3580.70 | 2345.27 | 2297.61 | 1429.03 | -4642.84 | -9740.74 | -8041.64 |
| | | | 3500.00 | | | | | | |
| | C | 39.1191 | 3580.70 | -2345.27 | 2297.61 | 1429.03 | -4642.84 | 9740.74 | 8041.64 |
| | | | 3500.00 | | | | | | |
| | C | 39.1191 | 3580.70 | -2410.21 | 2297.61 | 1316.55 | 9285.68 | -9740.74 | 0.00 |
| | | | 3500.00 | | | | | | |
| | | | Sum: | 0.00 | 13785.67 | 0.00 | -0.00 | 0.00 | 0.00 |
| 60.375 | A | 22.1953 | 3540.48 | 0.00 | 1383.35 | -3259.04 | -2795.37 | 0.00 | 0.00 |
| | | | 3500.00 | | | | | | |
| | B | 22.1953 | 3540.48 | 2822.41 | 1383.35 | 1629.52 | 1397.68 | 0.00 | -2420.86 |
| | | | 3500.00 | | | | | | |
| | C | 22.1953 | 3540.48 | -2822.41 | 1383.35 | 1629.52 | 1397.68 | -0.00 | 2420.86 |
| | | | 3500.00 | | | | | | |
| | | | Sum: | 0.00 | 4150.04 | 0.00 | 0.00 | 0.00 | 0.00 |
| 189.625 | A | 52.0323 | 3627.13 | 0.00 | 2889.89 | -2191.94 | -5839.67 | 0.00 | 0.00 |
| | | | 3500.00 | | | | | | |
| | B | 52.0323 | 3627.13 | 1898.28 | 2889.89 | 1095.97 | 2919.83 | 0.00 | -5057.30 |
| | | | 3500.00 | | | | | | |
| | C | 52.0323 | 3627.13 | -1898.28 | 2889.89 | 1095.97 | 2919.83 | -0.00 | 5057.30 |
| | | | 3500.00 | | | | | | |
| | | | Sum: | 0.00 | 8669.66 | -0.00 | 0.00 | 0.00 | 0.00 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LDF7-50A (1-5/8 FOAM) (Verizon) | A | Yes | Ar (CfAe) | 190.00 - 0.00 | 1.5000 | -0.15 | 12 | 8 | 1.0000 | 1.9800 | | 0.82 |
| LDF6-50A (1-1/4 FOAM) (Nextel) | B | Yes | Ar (CfAe) | 180.00 - 0.00 | 1.5000 | -0.15 | 9 | 6 | 1.0000 | 1.5500 | | 0.66 |
| 1 1/4 (Sprint) | C | Yes | Ar (CfAe) | 165.50 - 0.00 | 1.5000 | 0 | 3 | 3 | 1.0000 | 1.5500 | | 0.66 |
| LDF7-50A (1-5/8 FOAM) (AT&T) | B | Yes | Ar (CfAe) | 150.00 - 0.00 | 1.5000 | 0.25 | 12 | 6 | 1.0000 | 1.9800 | | 0.82 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Safety Line 3/8 | A | Yes | Ar (CfAe) | 190.00 - 0.00 | 0.0000 | 0.1 | 1 | 1 | 0.3750 | 0.3750 | | 0.22 |
| 1 1/4" Rigid Conduit | A | Yes | Ar (CfAe) | 190.00 - 0.00 | 0.0000 | 0.4 | 1 | 1 | 1.2500 | 1.2500 | | 0.70 |
| 19.7 mm DC (AT&T) | B | Yes | Ar (CfAe) | 150.00 - 0.00 | 0.0000 | 0.25 | 2 | 2 | 0.8800 | 0.8800 | | 0.40 |
| 10 mm Fiber (AT&T) | B | Yes | Ar (CfAe) | 150.00 - 0.00 | 0.0000 | 0.25 | 1 | 1 | 0.4000<br>0.8800 | 0.8800 | | 0.20 |

## 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 |
|---|---|---|---|---|---|---|---|
| T1 | 190.00-180.00 | A | 14.554 | 0.000 | 0.000 | 0.000 | 107.60 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| T2 | 180.00-160.00 | A | 29.108 | 0.000 | 0.000 | 0.000 | 215.20 |
| | | B | 15.500 | 0.000 | 0.000 | 0.000 | 118.80 |
| | | C | 2.131 | 0.000 | 0.000 | 0.000 | 10.89 |
| T3 | 160.00-140.00 | A | 29.108 | 0.000 | 0.000 | 0.000 | 215.20 |
| | | B | 27.600 | 0.000 | 0.000 | 0.000 | 227.20 |
| | | C | 7.750 | 0.000 | 0.000 | 0.000 | 39.60 |
| T4 | 140.00-120.00 | A | 29.108 | 0.000 | 0.000 | 0.000 | 215.20 |
| | | B | 39.700 | 0.000 | 0.000 | 0.000 | 335.60 |
| | | C | 7.750 | 0.000 | 0.000 | 0.000 | 39.60 |
| T5 | 120.00-100.00 | A | 29.108 | 0.000 | 0.000 | 0.000 | 215.20 |
| | | B | 39.700 | 0.000 | 0.000 | 0.000 | 335.60 |
| | | C | 7.750 | 0.000 | 0.000 | 0.000 | 39.60 |
| T6 | 100.00-80.00 | A | 29.108 | 0.000 | 0.000 | 0.000 | 215.20 |
| | | B | 39.700 | 0.000 | 0.000 | 0.000 | 335.60 |
| | | C | 7.750 | 0.000 | 0.000 | 0.000 | 39.60 |
| T7 | 80.00-60.00 | A | 29.108 | 0.000 | 0.000 | 0.000 | 215.20 |
| | | B | 39.700 | 0.000 | 0.000 | 0.000 | 335.60 |
| | | C | 7.750 | 0.000 | 0.000 | 0.000 | 39.60 |
| T8 | 60.00-40.00 | A | 29.108 | 0.000 | 0.000 | 0.000 | 215.20 |
| | | B | 39.700 | 0.000 | 0.000 | 0.000 | 335.60 |
| | | C | 7.750 | 0.000 | 0.000 | 0.000 | 39.60 |
| T9 | 40.00-20.00 | A | 29.108 | 0.000 | 0.000 | 0.000 | 215.20 |
| | | B | 39.700 | 0.000 | 0.000 | 0.000 | 335.60 |
| | | C | 7.750 | 0.000 | 0.000 | 0.000 | 39.60 |
| T10 | 20.00-0.00 | A | 29.108 | 0.000 | 0.000 | 0.000 | 215.20 |
| | | B | 39.700 | 0.000 | 0.000 | 0.000 | 335.60 |
| | | C | 7.750 | 0.000 | 0.000 | 0.000 | 39.60 |

## Feed Line/Linear Appurtenances Section Areas - With Ice

| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight lb |
|---|---|---|---|---|---|---|---|---|
| T1 | 190.00-180.00 | A | 0.500 | 5.504 | 17.383 | 0.000 | 0.000 | 344.77 |
| | | B | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| | | C | | 0.000 | 0.000 | 0.000 | 0.000 | 0.00 |
| T2 | 180.00-160.00 | A | 0.500 | 11.008 | 34.767 | 0.000 | 0.000 | 689.55 |

| Tower Section | Tower Elevation ft | Face or Leg | Ice Thickness in | $A_R$ $ft^2$ | $A_F$ $ft^2$ | $C_AA_A$ In Face $ft^2$ | $C_AA_A$ Out Face $ft^2$ | Weight lb |
|---|---|---|---|---|---|---|---|---|
| | | B | | 4.250 | 21.250 | 0.000 | 0.000 | 380.52 |
| | | C | | 1.169 | 2.337 | 0.000 | 0.000 | 37.52 |
| T3 | 160.00-140.00 | A | 0.500 | 11.008 | 34.767 | 0.000 | 0.000 | 689.55 |
| | | B | | 9.867 | 35.133 | 0.000 | 0.000 | 772.19 |
| | | C | | 4.250 | 8.500 | 0.000 | 0.000 | 136.44 |
| T4 | 140.00-120.00 | A | 0.500 | 11.008 | 34.767 | 0.000 | 0.000 | 689.55 |
| | | B | | 15.483 | 49.017 | 0.000 | 0.000 | 1163.85 |
| | | C | | 4.250 | 8.500 | 0.000 | 0.000 | 136.44 |
| T5 | 120.00-100.00 | A | 0.500 | 11.008 | 34.767 | 0.000 | 0.000 | 689.55 |
| | | B | | 15.483 | 49.017 | 0.000 | 0.000 | 1163.85 |
| | | C | | 4.250 | 8.500 | 0.000 | 0.000 | 136.44 |
| T6 | 100.00-80.00 | A | 0.500 | 11.008 | 34.767 | 0.000 | 0.000 | 689.55 |
| | | B | | 15.483 | 49.017 | 0.000 | 0.000 | 1163.85 |
| | | C | | 4.250 | 8.500 | 0.000 | 0.000 | 136.44 |
| T7 | 80.00-60.00 | A | 0.500 | 11.008 | 34.767 | 0.000 | 0.000 | 689.55 |
| | | B | | 15.483 | 49.017 | 0.000 | 0.000 | 1163.85 |
| | | C | | 4.250 | 8.500 | 0.000 | 0.000 | 136.44 |
| T8 | 60.00-40.00 | A | 0.500 | 11.008 | 34.767 | 0.000 | 0.000 | 689.55 |
| | | B | | 15.483 | 49.017 | 0.000 | 0.000 | 1163.85 |
| | | C | | 4.250 | 8.500 | 0.000 | 0.000 | 136.44 |
| T9 | 40.00-20.00 | A | 0.500 | 11.008 | 34.767 | 0.000 | 0.000 | 689.55 |
| | | B | | 15.483 | 49.017 | 0.000 | 0.000 | 1163.85 |
| | | C | | 4.250 | 8.500 | 0.000 | 0.000 | 136.44 |
| T10 | 20.00-0.00 | A | 0.500 | 11.008 | 34.767 | 0.000 | 0.000 | 689.55 |
| | | B | | 15.483 | 49.017 | 0.000 | 0.000 | 1163.85 |
| | | C | | 4.250 | 8.500 | 0.000 | 0.000 | 136.44 |

## Feed Line Shielding

| Section | Elevation ft | Face | $A_R$ $ft^2$ | $A_R$ Ice $ft^2$ | $A_F$ $ft^2$ | $A_F$ Ice $ft^2$ |
|---|---|---|---|---|---|---|
| T1 | 190.00-180.00 | A | 0.606 | 3.241 | 0.758 | 1.192 |
| | | B | 0.000 | 0.000 | 0.000 | 0.000 |
| | | C | 0.000 | 0.000 | 0.000 | 0.000 |
| T2 | 180.00-160.00 | A | 1.234 | 6.380 | 1.273 | 2.003 |
| | | B | 0.657 | 3.554 | 0.678 | 1.116 |
| | | C | 0.090 | 0.489 | 0.093 | 0.153 |
| T3 | 160.00-140.00 | A | 1.234 | 6.380 | 1.334 | 2.098 |
| | | B | 1.170 | 6.272 | 1.265 | 2.063 |
| | | C | 0.329 | 1.777 | 0.355 | 0.584 |
| T4 | 140.00-120.00 | A | 1.234 | 6.380 | 1.334 | 2.098 |
| | | B | 1.683 | 8.991 | 1.820 | 2.956 |
| | | C | 0.329 | 1.777 | 0.355 | 0.584 |
| T5 | 120.00-100.00 | A | 1.234 | 6.380 | 1.273 | 2.003 |
| | | B | 1.683 | 8.991 | 1.737 | 2.822 |
| | | C | 0.329 | 1.777 | 0.339 | 0.558 |
| T6 | 100.00-80.00 | A | 1.234 | 6.380 | 1.273 | 2.003 |
| | | B | 1.683 | 8.991 | 1.737 | 2.822 |
| | | C | 0.329 | 1.777 | 0.339 | 0.558 |
| T7 | 80.00-60.00 | A | 1.234 | 6.380 | 1.304 | 2.050 |
| | | B | 1.683 | 8.991 | 1.778 | 2.889 |
| | | C | 0.329 | 1.777 | 0.347 | 0.571 |
| T8 | 60.00-40.00 | A | 1.234 | 6.380 | 1.273 | 2.003 |
| | | B | 1.683 | 8.991 | 1.737 | 2.822 |
| | | C | 0.329 | 1.777 | 0.339 | 0.558 |
| T9 | 40.00-20.00 | A | 1.234 | 6.380 | 1.273 | 2.003 |

| Section | Elevation ft | Face | $A_R$ $ft^2$ | $A_R$ Ice $ft^2$ | $A_F$ $ft^2$ | $A_F$ Ice $ft^2$ |
|---|---|---|---|---|---|---|
| | | B | 1.683 | 8.991 | 1.737 | 2.822 |
| | | C | 0.329 | 1.777 | 0.339 | 0.558 |
| T10 | 20.00-0.00 | A | 1.234 | 6.380 | 1.273 | 2.003 |
| | | B | 1.683 | 8.991 | 1.737 | 2.822 |
| | | C | 0.329 | 1.777 | 0.339 | 0.558 |

## Feed Line Center of Pressure

| Section | Elevation ft | $CP_X$ in | $CP_Z$ in | $CP_X$ Ice in | $CP_Z$ Ice in |
|---|---|---|---|---|---|
| T1 | 190.00-180.00 | -5.7018 | -1.4588 | -4.2855 | -1.3355 |
| T2 | 180.00-160.00 | -3.1108 | -3.0382 | -2.3682 | -2.5784 |
| T3 | 160.00-140.00 | -0.6535 | -1.7074 | -0.6262 | -1.6851 |
| T4 | 140.00-120.00 | 1.1844 | -1.4149 | 0.6893 | -1.4399 |
| T5 | 120.00-100.00 | 1.1897 | -1.4212 | 0.6932 | -1.4448 |
| T6 | 100.00-80.00 | 1.1897 | -1.4212 | 0.6932 | -1.4448 |
| T7 | 80.00-60.00 | 1.1870 | -1.4180 | 0.6913 | -1.4423 |
| T8 | 60.00-40.00 | 1.1897 | -1.4212 | 0.6932 | -1.4448 |
| T9 | 40.00-20.00 | 1.1897 | -1.4212 | 0.6932 | -1.4448 |
| T10 | 20.00-0.00 | 1.1897 | -1.4212 | 0.6932 | -1.4448 |

## Discrete Tower Loads

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| Antel BXA-70063-6CF | A | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 7.57 | 2.21 | 17.00 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 8.02 | 2.70 | 57.60 |
| | | | 0.00 | | | | | | |
| Antel BXA-70063-6CF | B | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 7.57 | 2.21 | 17.00 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 8.02 | 2.70 | 57.60 |
| | | | 0.00 | | | | | | |
| Antel BXA-70063-6CF | C | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 7.57 | 2.21 | 17.00 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 8.02 | 2.70 | 57.60 |
| | | | 0.00 | | | | | | |
| Sector Frame | A | From Leg | 0.00 | 0.0000 | 193.00 | No Ice | 13.60 | 13.60 | 465.00 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 18.40 | 18.40 | 600.00 |
| | | | 0.00 | | | | | | |
| Sector Frame | B | From Leg | 0.00 | 0.0000 | 193.00 | No Ice | 13.60 | 13.60 | 465.00 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 18.40 | 18.40 | 600.00 |
| | | | 0.00 | | | | | | |
| Sector Frame | C | From Leg | 0.00 | 0.0000 | 193.00 | No Ice | 13.60 | 13.60 | 465.00 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 18.40 | 18.40 | 600.00 |
| | | | 0.00 | | | | | | |
| (2) Antel LPA-80080-6CF | A | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 4.33 | 8.62 | 21.00 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 4.80 | 9.07 | 69.20 |
| | | | 0.00 | | | | | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| (2) Antel LPA-80080-6CF | B | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 4.33 | 8.62 | 21.00 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 4.80 | 9.07 | 69.20 |
| | | | 0.00 | | | | | | |
| (2) Antel LPA-80080-6CF | C | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 4.33 | 8.62 | 21.00 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 4.80 | 9.07 | 69.20 |
| | | | 0.00 | | | | | | |
| Antel BXA-171085/8BF | A | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 2.94 | 2.16 | 18.50 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 3.25 | 2.48 | 37.30 |
| | | | 0.00 | | | | | | |
| Antel BXA-171085/8BF | B | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 2.94 | 2.16 | 18.50 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 3.25 | 2.48 | 37.30 |
| | | | 0.00 | | | | | | |
| Antel BXA-171085/8BF | C | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 2.94 | 2.16 | 18.50 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 3.25 | 2.48 | 37.30 |
| | | | 0.00 | | | | | | |
| (2) RFS FD9R6004/2C-3L | A | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 0.00 | 0.08 | 2.60 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 0.00 | 0.12 | 4.90 |
| | | | 0.00 | | | | | | |
| (2) RFS FD9R6004/2C-3L | B | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 0.00 | 0.08 | 2.60 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 0.00 | 0.12 | 4.90 |
| | | | 0.00 | | | | | | |
| (2) RFS FD9R6004/2C-3L | C | From Leg | 3.00 | 0.0000 | 193.00 | No Ice | 0.00 | 0.08 | 2.60 |
| (Verizon) | | | 0.00 | | | 1/2" Ice | 0.00 | 0.12 | 4.90 |
| | | | 0.00 | | | | | | |
| Lightning Rod 5/8x4' | C | None | | 0.0000 | 190.00 | No Ice | 0.25 | 0.25 | 31.00 |
| | | | | | | 1/2" Ice | 0.66 | 0.66 | 33.82 |
| Sector Frame | A | From Leg | 0.00 | 0.0000 | 180.00 | No Ice | 13.60 | 13.60 | 465.00 |
| (Nextel) | | | 0.00 | | | 1/2" Ice | 18.40 | 18.40 | 600.00 |
| | | | 0.00 | | | | | | |
| Sector Frame | B | From Leg | 0.00 | 0.0000 | 180.00 | No Ice | 13.60 | 13.60 | 465.00 |
| (Nextel) | | | 0.00 | | | 1/2" Ice | 18.40 | 18.40 | 600.00 |
| | | | 0.00 | | | | | | |
| Sector Frame | C | From Leg | 0.00 | 0.0000 | 180.00 | No Ice | 13.60 | 13.60 | 465.00 |
| (Nextel) | | | 0.00 | | | 1/2" Ice | 18.40 | 18.40 | 600.00 |
| | | | 0.00 | | | | | | |
| (3) Swedcom ALP-E-9011 | A | From Leg | 3.00 | 0.0000 | 180.00 | No Ice | 2.68 | 3.17 | 10.00 |
| (Nextel) | | | 0.00 | | | 1/2" Ice | 2.96 | 3.44 | 33.80 |
| | | | 0.00 | | | | | | |
| (3) Swedcom ALP-E-9011 | B | From Leg | 3.00 | 0.0000 | 180.00 | No Ice | 2.68 | 3.17 | 10.00 |
| (Nextel) | | | 0.00 | | | 1/2" Ice | 2.96 | 3.44 | 33.80 |
| | | | 0.00 | | | | | | |
| (3) Swedcom ALP-E-9011 | C | From Leg | 3.00 | 0.0000 | 180.00 | No Ice | 2.68 | 3.17 | 10.00 |
| (Nextel) | | | 0.00 | | | 1/2" Ice | 2.96 | 3.44 | 33.80 |
| | | | 0.00 | | | | | | |
| Sector Frame | A | From Leg | 0.00 | 0.0000 | 150.00 | No Ice | 13.60 | 13.60 | 465.00 |
| (AT&T Mobility) | | | 0.00 | | | 1/2" Ice | 18.40 | 18.40 | 600.00 |
| | | | 0.00 | | | | | | |
| Sector Frame | B | From Leg | 0.00 | 0.0000 | 150.00 | No Ice | 13.60 | 13.60 | 465.00 |
| (AT&T Mobility) | | | 0.00 | | | 1/2" Ice | 18.40 | 18.40 | 600.00 |
| | | | 0.00 | | | | | | |
| Sector Frame | C | From Leg | 0.00 | 0.0000 | 150.00 | No Ice | 13.60 | 13.60 | 465.00 |
| (AT&T Mobility) | | | 0.00 | | | 1/2" Ice | 18.40 | 18.40 | 600.00 |
| | | | 0.00 | | | | | | |
| (2) Powerwave | A | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 5.56 | 2.05 | 41.00 |
| P90-14-XLH-RR | | | 0.00 | | | 1/2" Ice | 5.89 | 2.38 | 76.10 |
| (AT&T Mobility) | | | 0.00 | | | | | | |
| (2) Powerwave | B | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 5.56 | 2.05 | 41.00 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| P90-14-XLH-RR | | | 0.00 | | | 1/2" Ice | 5.89 | 2.38 | 76.10 |
| (AT&T Mobility) | | | 0.00 | | | | | | |
| (2) Powerwave | C | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 5.56 | 2.05 | 41.00 |
| P90-14-XLH-RR | | | 0.00 | | | 1/2" Ice | 5.89 | 2.38 | 76.10 |
| (AT&T Mobility) | | | 0.00 | | | | | | |
| KMW | A | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 11.31 | 6.80 | 59.50 |
| AM-X-CD-17-65-00T-RET | | | 0.00 | | | 1/2" Ice | 11.93 | 7.48 | 120.90 |
| (AT&T Mobility) | | | 0.00 | | | | | | |
| KMW | B | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 11.31 | 6.80 | 59.50 |
| AM-X-CD-17-65-00T-RET | | | 0.00 | | | 1/2" Ice | 11.93 | 7.48 | 120.90 |
| (AT&T Mobility) | | | 0.00 | | | | | | |
| KMW | C | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 11.31 | 6.80 | 59.50 |
| AM-X-CD-17-65-00T-RET | | | 0.00 | | | 1/2" Ice | 11.93 | 7.48 | 120.90 |
| (AT&T Mobility) | | | 0.00 | | | | | | |
| (2) Ericsson RRUS-11 | A | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 2.94 | 1.25 | 50.00 |
| (AT&T Mobility) | | | 0.00 | | | 1/2" Ice | 3.12 | 1.37 | 69.30 |
| | | | 0.00 | | | | | | |
| (2) Ericsson RRUS-11 | B | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 2.94 | 1.25 | 50.00 |
| (AT&T Mobility) | | | 0.00 | | | 1/2" Ice | 3.12 | 1.37 | 69.30 |
| | | | 0.00 | | | | | | |
| (2) Ericsson RRUS-11 | C | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 2.94 | 1.25 | 50.00 |
| (AT&T Mobility) | | | 0.00 | | | 1/2" Ice | 3.12 | 1.37 | 69.30 |
| | | | 0.00 | | | | | | |
| (2) Powerwave | A | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 0.92 | 0.75 | 22.00 |
| TT08-DB111-001 | | | 0.00 | | | 1/2" Ice | 1.03 | 0.85 | 29.60 |
| (AT&T Mobility) | | | 0.00 | | | | | | |
| (2) Powerwave | B | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 0.92 | 0.75 | 22.00 |
| TT08-DB111-001 | | | 0.00 | | | 1/2" Ice | 1.03 | 0.85 | 29.60 |
| (AT&T Mobility) | | | 0.00 | | | | | | |
| (2) Powerwave | C | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 0.92 | 0.75 | 22.00 |
| TT08-DB111-001 | | | 0.00 | | | 1/2" Ice | 1.03 | 0.85 | 29.60 |
| (AT&T Mobility) | | | 0.00 | | | | | | |
| Raycap DC6-48-60-18-8F | A | From Leg | 3.00 | 0.0000 | 150.00 | No Ice | 2.57 | 2.57 | 31.80 |
| (AT&T Mobility) | | | 0.00 | | | 1/2" Ice | 2.74 | 2.74 | 54.40 |
| | | | 0.00 | | | | | | |
| Sector Frame | A | From Leg | 0.00 | 0.0000 | 165.50 | No Ice | 13.60 | 7.00 | 465.00 |
| (Sprint) | | | 0.00 | | | 1/2" Ice | 18.40 | 9.00 | 600.00 |
| | | | 0.00 | | | | | | |
| Sector Frame | B | From Leg | 0.00 | 0.0000 | 165.50 | No Ice | 13.60 | 7.00 | 465.00 |
| (Sprint) | | | 0.00 | | | 1/2" Ice | 18.40 | 9.00 | 600.00 |
| | | | 0.00 | | | | | | |
| Sector Frame | C | From Leg | 0.00 | 0.0000 | 165.50 | No Ice | 13.60 | 7.00 | 465.00 |
| (Sprint) | | | 0.00 | | | 1/2" Ice | 18.40 | 9.00 | 600.00 |
| | | | 0.00 | | | | | | |
| RFS APXV9ERR18-C | A | From Leg | 3.00 | 0.0000 | 165.50 | No Ice | 8.02 | 3.35 | 62.00 |
| (Sprint) | | | 0.00 | | | 1/2" Ice | 8.48 | 3.81 | 114.00 |
| | | | 0.00 | | | | | | |
| (2) Alcatel Lucent 4X40W | A | From Leg | 3.00 | 0.0000 | 165.50 | No Ice | 1.20 | 2.24 | 60.00 |
| RRH | | | 0.00 | | | 1/2" Ice | 2.50 | 2.42 | 83.10 |
| (Sprint) | | | 0.00 | | | | | | |
| (2) Alcatel Lucent 2X50W | A | From Leg | 3.00 | 0.0000 | 165.50 | No Ice | 1.10 | 1.36 | 60.00 |
| RRH | | | 0.00 | | | 1/2" Ice | 2.22 | 1.50 | 78.30 |
| (Sprint) | | | 0.00 | | | | | | |
| RFS APXV9ERR18-C | B | From Leg | 3.00 | 0.0000 | 165.50 | No Ice | 8.02 | 3.35 | 62.00 |
| (Sprint) | | | 0.00 | | | 1/2" Ice | 8.48 | 3.81 | 114.00 |
| | | | 0.00 | | | | | | |
| (2) Alcatel Lucent 4X40W | B | From Leg | 3.00 | 0.0000 | 165.50 | No Ice | 1.20 | 2.24 | 60.00 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|
| RRH | | | 0.00 | | | 1/2" Ice | 2.50 | 2.42 | 83.10 |
| (Sprint) | | | 0.00 | | | | | | |
| (2) Alcatel Lucent 2X50W | B | From Leg | 3.00 | 0.0000 | 165.50 | No Ice | 1.10 | 1.36 | 60.00 |
| RRH | | | 0.00 | | | 1/2" Ice | 2.22 | 1.50 | 78.30 |
| (Sprint) | | | 0.00 | | | | | | |
| RFS APXV9ERR18-C | C | From Leg | 3.00 | 0.0000 | 165.50 | No Ice | 8.02 | 3.35 | 62.00 |
| (Sprint) | | | 0.00 | | | 1/2" Ice | 8.48 | 3.81 | 114.00 |
| | | | 0.00 | | | | | | |
| (2) Alcatel Lucent 4X40W | C | From Leg | 3.00 | 0.0000 | 165.50 | No Ice | 1.20 | 2.24 | 60.00 |
| RRH | | | 0.00 | | | 1/2" Ice | 2.50 | 2.42 | 83.10 |
| (Sprint) | | | 0.00 | | | | | | |
| (2) Alcatel Lucent 2X50W | C | From Leg | 3.00 | 0.0000 | 165.50 | No Ice | 1.10 | 1.36 | 60.00 |
| RRH | | | 0.00 | | | 1/2" Ice | 2.22 | 1.50 | 78.30 |
| (Sprint) | | | 0.00 | | | | | | |

## Tower Pressures - No Ice

$G_H = 1.117$

| 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 $ft^2$ |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 185.00 | 1.636 | 30 | 37.396 | A | 0.940 | 20.098 | 4.792 | 22.78 | 0.000 | 0.000 |
| 190.00-180.00 | | | | | B | 1.698 | 6.150 | | 61.06 | 0.000 | 0.000 |
| | | | | | C | 1.698 | 6.150 | | 61.06 | 0.000 | 0.000 |
| T2 | 170.00 | 1.597 | 30 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| 180.00-160.00 | | | | | B | 2.175 | 27.191 | | 32.63 | 0.000 | 0.000 |
| | | | | | C | 2.760 | 14.389 | | 55.89 | 0.000 | 0.000 |
| T3 | 150.00 | 1.541 | 29 | 74.792 | A | 1.655 | 40.222 | 9.583 | 22.88 | 0.000 | 0.000 |
| 160.00-140.00 | | | | | B | 1.724 | 38.778 | | 23.66 | 0.000 | 0.000 |
| | | | | | C | 2.634 | 19.769 | | 42.78 | 0.000 | 0.000 |
| T4 | 130.00 | 1.48 | 27 | 74.792 | A | 1.655 | 40.222 | 9.583 | 22.88 | 0.000 | 0.000 |
| 140.00-120.00 | | | | | B | 1.169 | 50.365 | | 18.60 | 0.000 | 0.000 |
| | | | | | C | 2.634 | 19.769 | | 42.78 | 0.000 | 0.000 |
| T5 | 110.00 | 1.411 | 26 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| 120.00-100.00 | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |
| T6 | 90.00 | 1.332 | 25 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| 100.00-80.00 | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |
| T7 80.00-60.00 | 70.00 | 1.24 | 23 | 74.792 | A | 1.617 | 40.222 | 9.583 | 22.91 | 0.000 | 0.000 |
| | | | | | B | 1.143 | 50.365 | | 18.61 | 0.000 | 0.000 |
| | | | | | C | 2.574 | 19.769 | | 42.89 | 0.000 | 0.000 |
| T8 60.00-40.00 | 50.00 | 1.126 | 21 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |
| T9 40.00-20.00 | 30.00 | 1 | 18 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T10 20.00-0.00 | 10.00 | 1 | 18 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |

## Tower Pressure - With Ice

$G_H = 1.117$

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 185.00 | 1.636 | 23 | 0.5000 | 38.229 | A | 17.889 | 13.339 | 6.458 | 20.68 | 0.000 | 0.000 |
| 190.00-180.00 | | | | | | B | 1.698 | 11.076 | | 50.56 | 0.000 | 0.000 |
| | | | | | | C | 1.698 | 11.076 | | 50.56 | 0.000 | 0.000 |
| T2 | 170.00 | 1.597 | 22 | 0.5000 | 76.458 | A | 35.617 | 26.634 | 12.917 | 20.75 | 0.000 | 0.000 |
| 180.00-160.00 | | | | | | B | 22.987 | 22.702 | | 28.27 | 0.000 | 0.000 |
| | | | | | | C | 5.037 | 22.686 | | 46.59 | 0.000 | 0.000 |
| T3 | 150.00 | 1.541 | 21 | 0.5000 | 76.458 | A | 35.657 | 26.634 | 12.917 | 20.74 | 0.000 | 0.000 |
| 160.00-140.00 | | | | | | B | 36.060 | 25.600 | | 20.95 | 0.000 | 0.000 |
| | | | | | | C | 10.904 | 24.479 | | 36.51 | 0.000 | 0.000 |
| T4 | 130.00 | 1.48 | 21 | 0.5000 | 76.458 | A | 35.657 | 26.634 | 12.917 | 20.74 | 0.000 | 0.000 |
| 140.00-120.00 | | | | | | B | 49.049 | 28.499 | | 16.66 | 0.000 | 0.000 |
| | | | | | | C | 10.904 | 24.479 | | 36.51 | 0.000 | 0.000 |
| T5 | 110.00 | 1.411 | 20 | 0.5000 | 76.458 | A | 35.617 | 26.634 | 12.917 | 20.75 | 0.000 | 0.000 |
| 120.00-100.00 | | | | | | B | 49.048 | 28.499 | | 16.66 | 0.000 | 0.000 |
| | | | | | | C | 10.795 | 24.479 | | 36.62 | 0.000 | 0.000 |
| T6 100.00-80.00 | 90.00 | 1.332 | 18 | 0.5000 | 76.458 | A | 35.617 | 26.634 | 12.917 | 20.75 | 0.000 | 0.000 |
| | | | | | | B | 49.048 | 28.499 | | 16.66 | 0.000 | 0.000 |
| | | | | | | C | 10.795 | 24.479 | | 36.62 | 0.000 | 0.000 |
| T7 80.00-60.00 | 70.00 | 1.24 | 17 | 0.5000 | 76.458 | A | 35.637 | 26.634 | 12.917 | 20.74 | 0.000 | 0.000 |
| | | | | | | B | 49.048 | 28.499 | | 16.66 | 0.000 | 0.000 |
| | | | | | | C | 10.850 | 24.479 | | 36.56 | 0.000 | 0.000 |
| T8 60.00-40.00 | 50.00 | 1.126 | 16 | 0.5000 | 76.458 | A | 35.617 | 26.634 | 12.917 | 20.75 | 0.000 | 0.000 |
| | | | | | | B | 49.048 | 28.499 | | 16.66 | 0.000 | 0.000 |
| | | | | | | C | 10.795 | 24.479 | | 36.62 | 0.000 | 0.000 |
| T9 40.00-20.00 | 30.00 | 1 | 14 | 0.5000 | 76.458 | A | 35.617 | 26.634 | 12.917 | 20.75 | 0.000 | 0.000 |
| | | | | | | B | 49.048 | 28.499 | | 16.66 | 0.000 | 0.000 |
| | | | | | | C | 10.795 | 24.479 | | 36.62 | 0.000 | 0.000 |
| T10 20.00-0.00 | 10.00 | 1 | 14 | 0.5000 | 76.458 | A | 35.617 | 26.634 | 12.917 | 20.75 | 0.000 | 0.000 |
| | | | | | | B | 49.048 | 28.499 | | 16.66 | 0.000 | 0.000 |
| | | | | | | C | 10.795 | 24.479 | | 36.62 | 0.000 | 0.000 |

## Tower Pressure - Service

$G_H = 1.117$

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 185.00 | 1.636 | 10 | 37.396 | A | 0.940 | 20.098 | 4.792 | 22.78 | 0.000 | 0.000 |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 190.00-180.00 | | | | | B | 1.698 | 6.150 | | 61.06 | 0.000 | 0.000 |
| | | | | | C | 1.698 | 6.150 | | 61.06 | 0.000 | 0.000 |
| T2 | 170.00 | 1.597 | 10 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| 180.00-160.00 | | | | | B | 2.175 | 27.191 | | 32.63 | 0.000 | 0.000 |
| | | | | | C | 2.760 | 14.389 | | 55.89 | 0.000 | 0.000 |
| T3 | 150.00 | 1.541 | 10 | 74.792 | A | 1.655 | 40.222 | 9.583 | 22.88 | 0.000 | 0.000 |
| 160.00-140.00 | | | | | B | 1.724 | 38.778 | | 23.66 | 0.000 | 0.000 |
| | | | | | C | 2.634 | 19.769 | | 42.78 | 0.000 | 0.000 |
| T4 | 130.00 | 1.48 | 9 | 74.792 | A | 1.655 | 40.222 | 9.583 | 22.88 | 0.000 | 0.000 |
| 140.00-120.00 | | | | | B | 1.169 | 50.365 | | 18.60 | 0.000 | 0.000 |
| | | | | | C | 2.634 | 19.769 | | 42.78 | 0.000 | 0.000 |
| T5 | 110.00 | 1.411 | 9 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| 120.00-100.00 | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |
| T6 | 90.00 | 1.332 | 9 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| 100.00-80.00 | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |
| T7 80.00-60.00 | 70.00 | 1.24 | 8 | 74.792 | A | 1.617 | 40.222 | 9.583 | 22.91 | 0.000 | 0.000 |
| | | | | | B | 1.143 | 50.365 | | 18.61 | 0.000 | 0.000 |
| | | | | | C | 2.574 | 19.769 | | 42.89 | 0.000 | 0.000 |
| T8 60.00-40.00 | 50.00 | 1.126 | 7 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |
| T9 40.00-20.00 | 30.00 | 1 | 6 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |
| T10 20.00-0.00 | 10.00 | 1 | 6 | 74.792 | A | 1.579 | 40.222 | 9.583 | 22.93 | 0.000 | 0.000 |
| | | | | | B | 1.116 | 50.365 | | 18.62 | 0.000 | 0.000 |
| | | | | | C | 2.514 | 19.769 | | 43.01 | 0.000 | 0.000 |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 107.60 | 340.32 | A | 0.563 | 1.832 | 0.731 | 1 | 1 | 15.640 | 968.89 | 96.89 | A |
| 190.00-180.00 | | | B | 0.21 | 2.563 | 0.592 | 1 | 1 | 5.341 | | | |
| | | | C | 0.21 | 2.563 | 0.592 | 1 | 1 | 5.341 | | | |
| T2 | 344.89 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 1872.74 | 93.64 | A |
| 180.00-160.00 | | | B | 0.393 | 2.079 | 0.649 | 1 | 1 | 19.811 | | | |
| | | | C | 0.229 | 2.501 | 0.597 | 1 | 1 | 11.347 | | | |
| T3 | 482.00 | 680.49 | A | 0.56 | 1.834 | 0.73 | 1 | 1 | 31.012 | 1811.80 | 90.59 | A |
| 160.00-140.00 | | TA 242.49 | B | 0.542 | 1.852 | 0.72 | 1 | 1 | 29.626 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 1 | 1 | 14.807 | | | |
| T4 | 590.40 | 680.49 | A | 0.56 | 1.834 | 0.73 | 1 | 1 | 31.012 | 2284.14 | 114.21 | B |
| 140.00-120.00 | | TA 242.49 | B | 0.689 | 1.776 | 0.812 | 1 | 1 | 42.072 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 1 | 1 | 14.807 | | | |
| T5 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 2173.64 | 108.68 | B |
| 120.00-100.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |
| T6 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 2052.52 | 102.63 | B |
| 100.00-80.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |
| T7 | 590.40 | 661.59 | A | 0.559 | 1.835 | 0.73 | 1 | 1 | 30.963 | 1912.08 | 95.60 | B |
| 80.00-60.00 | | | B | 0.689 | 1.776 | 0.812 | 1 | 1 | 42.033 | | | |
| | | | C | 0.299 | 2.299 | 0.616 | 1 | 1 | 14.742 | | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T8 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 1735.21 | 86.76 | B |
| 60.00-40.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |
| T9 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 1540.97 | 77.05 | B |
| 40.00-20.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |
| T10 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 1540.97 | 77.05 | B |
| 20.00-0.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |
| Sum Weight: | 5067.29 | 6797.35 | | | | | | | | 17892.97 | | |

## Tower Forces - No Ice - Wind 60 To Face

| Section Elevation ft | Add Weight lb | Self Weight lb | Face | e | $C_F$ | $R_R$ | $D_F$ | $D_R$ | $A_E$ $ft^2$ | F lb | w plf | Ctrl. Face |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 107.60 | 340.32 | A | 0.563 | 1.832 | 0.731 | 0.8 | 1 | 15.452 | 957.24 | 95.72 | A |
| 190.00-180.00 | | | B | 0.21 | 2.563 | 0.592 | 0.8 | 1 | 5.002 | | | |
| | | | C | 0.21 | 2.563 | 0.592 | 0.8 | 1 | 5.002 | | | |
| T2 | 344.89 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 1853.60 | 92.68 | A |
| 180.00-160.00 | | | B | 0.393 | 2.079 | 0.649 | 0.8 | 1 | 19.376 | | | |
| | | | C | 0.229 | 2.501 | 0.597 | 0.8 | 1 | 10.795 | | | |
| T3 | 482.00 | 680.49 | A | 0.56 | 1.834 | 0.73 | 0.8 | 1 | 30.681 | 1792.47 | 89.62 | A |
| 160.00-140.00 | | TA 242.49 | B | 0.542 | 1.852 | 0.72 | 0.8 | 1 | 29.282 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 0.8 | 1 | 14.280 | | | |
| T4 | 590.40 | 680.49 | A | 0.56 | 1.834 | 0.73 | 0.8 | 1 | 30.681 | 2271.44 | 113.57 | B |
| 140.00-120.00 | | TA 242.49 | B | 0.689 | 1.776 | 0.812 | 0.8 | 1 | 41.838 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 0.8 | 1 | 14.280 | | | |
| T5 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 2162.09 | 108.10 | B |
| 120.00-100.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| T6 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 2041.61 | 102.08 | B |
| 100.00-80.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| T7 | 590.40 | 661.59 | A | 0.559 | 1.835 | 0.73 | 0.8 | 1 | 30.639 | 1901.69 | 95.08 | B |
| 80.00-60.00 | | | B | 0.689 | 1.776 | 0.812 | 0.8 | 1 | 41.804 | | | |
| | | | C | 0.299 | 2.299 | 0.616 | 0.8 | 1 | 14.227 | | | |
| T8 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 1725.99 | 86.30 | B |
| 60.00-40.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| T9 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 1532.78 | 76.64 | B |
| 40.00-20.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| T10 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 1532.78 | 76.64 | B |
| 20.00-0.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| Sum Weight: | 5067.29 | 6797.35 | | | | | | | | 17771.70 | | |

## Tower Forces - No Ice - Wind 90 To Face

| Section Elevation ft | Add Weight lb | Self Weight lb | Face | e | $C_F$ | $R_R$ | $D_F$ | $D_R$ | $A_E$ ft² | F lb | w plf | Ctrl. Face |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 107.60 | 340.32 | A | 0.563 | 1.832 | 0.731 | 0.85 | 1 | 15.499 | 960.15 | 96.01 | A |
| 190.00-180.00 | | | B | 0.21 | 2.563 | 0.592 | 0.85 | 1 | 5.087 | | | |
| | | | C | 0.21 | 2.563 | 0.592 | 0.85 | 1 | 5.087 | | | |
| T2 | 344.89 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 1858.39 | 92.92 | A |
| 180.00-160.00 | | | B | 0.393 | 2.079 | 0.649 | 0.85 | 1 | 19.485 | | | |
| | | | C | 0.229 | 2.501 | 0.597 | 0.85 | 1 | 10.933 | | | |
| T3 | 482.00 | 680.49 | A | 0.56 | 1.834 | 0.73 | 0.85 | 1 | 30.764 | 1797.30 | 89.87 | A |
| 160.00-140.00 | | TA 242.49 | B | 0.542 | 1.852 | 0.72 | 0.85 | 1 | 29.368 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 0.85 | 1 | 14.411 | | | |
| T4 | 590.40 | 680.49 | A | 0.56 | 1.834 | 0.73 | 0.85 | 1 | 30.764 | 2274.62 | 113.73 | B |
| 140.00-120.00 | | TA 242.49 | B | 0.689 | 1.776 | 0.812 | 0.85 | 1 | 41.896 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 0.85 | 1 | 14.411 | | | |
| T5 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 2164.98 | 108.25 | B |
| 120.00-100.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| T6 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 2044.34 | 102.22 | B |
| 100.00-80.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| T7 | 590.40 | 661.59 | A | 0.559 | 1.835 | 0.73 | 0.85 | 1 | 30.720 | 1904.29 | 95.21 | B |
| 80.00-60.00 | | | B | 0.689 | 1.776 | 0.812 | 0.85 | 1 | 41.861 | | | |
| | | | C | 0.299 | 2.299 | 0.616 | 0.85 | 1 | 14.356 | | | |
| T8 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 1728.30 | 86.41 | B |
| 60.00-40.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| T9 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 1534.83 | 76.74 | B |
| 40.00-20.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| T10 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 1534.83 | 76.74 | B |
| 20.00-0.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| Sum Weight: | 5067.29 | 6797.35 | | | | | | | | 17802.01 | | |

## Tower Forces - With Ice - Wind Normal To Face

| Section Elevation ft | Add Weight lb | Self Weight lb | Face | e | $C_F$ | $R_R$ | $D_F$ | $D_R$ | $A_E$ ft² | F lb | w plf | Ctrl. Face |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 344.77 | 526.95 | A | 0.817 | 1.829 | 0.91 | 1 | 1 | 30.032 | 1393.44 | 139.34 | A |
| 190.00-180.00 | | | B | 0.334 | 2.209 | 0.627 | 1 | 1 | 8.642 | | | |
| | | | C | 0.334 | 2.209 | 0.627 | 1 | 1 | 8.642 | | | |
| T2 | 1107.59 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 1 | 1 | 59.802 | 2705.18 | 135.26 | A |
| 180.00-160.00 | | | B | 0.598 | 1.806 | 0.752 | 1 | 1 | 40.061 | | | |
| | | | C | 0.363 | 2.143 | 0.637 | 1 | 1 | 19.489 | | | |
| T3 | 1598.18 | 1039.55 | A | 0.815 | 1.828 | 0.909 | 1 | 1 | 59.854 | 2613.06 | 130.65 | A |
| 160.00-140.00 | | TA 376.86 | B | 0.806 | 1.821 | 0.902 | 1 | 1 | 59.143 | | | |
| | | | C | 0.463 | 1.953 | 0.679 | 1 | 1 | 27.531 | | | |
| T4 | 1989.85 | 1039.55 | A | 0.815 | 1.828 | 0.909 | 1 | 1 | 59.854 | 3506.44* | 175.32 | B |
| 140.00-120.00 | | TA 376.86 | B | 1 | 2.1 | 1 | 1 | 1 | 77.548 | | | |
| | | | C | 0.463 | 1.953 | 0.679 | 1 | 1 | 27.531 | | | |
| T5 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 1 | 1 | 59.802 | 3343.01* | 167.15 | B |
| 120.00-100.00 | | | B | 1 | 2.1 | 1 | 1 | 1 | 77.546 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 1 | 1 | 27.405 | | | |
| T6 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 1 | 1 | 59.802 | 3156.73* | 157.84 | B |
| 100.00-80.00 | | | B | 1 | 2.1 | 1 | 1 | 1 | 77.546 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 1 | 1 | 27.405 | | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T7 | 1989.85 | 1018.61 | A | 0.814 | 1.827 | 0.908 | 1 | 1 | 59.828 | 2938.01* | 146.90 | B |
| 80.00-60.00 | | | B | 1 | 2.1 | 1 | 1 | 1 | 77.547 | | | |
| | | | C | 0.462 | 1.954 | 0.679 | 1 | 1 | 27.468 | | | |
| T8 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 1 | 1 | 59.802 | 2668.71* | 133.44 | B |
| 60.00-40.00 | | | B | 1 | 2.1 | 1 | 1 | 1 | 77.546 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 1 | 1 | 27.405 | | | |
| T9 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 1 | 1 | 59.802 | 2369.97* | 118.50 | B |
| 40.00-20.00 | | | B | 1 | 2.1 | 1 | 1 | 1 | 77.546 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 1 | 1 | 27.405 | | | |
| T10 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 1 | 1 | 59.802 | 2369.97* | 118.50 | B |
| 20.00-0.00 | | | B | 1 | 2.1 | 1 | 1 | 1 | 77.546 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 1 | 1 | 27.405 | | | |
| Sum Weight: | 16979.46 | 10457.71 | | | *2Ag limit | | | | | 27064.51 | | |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 344.77 | 526.95 | A | 0.817 | 1.829 | 0.91 | 0.8 | 1 | 26.454 | 1227.43 | 122.74 | A |
| 190.00-180.00 | | | B | 0.334 | 2.209 | 0.627 | 0.8 | 1 | 8.302 | | | |
| | | | C | 0.334 | 2.209 | 0.627 | 0.8 | 1 | 8.302 | | | |
| T2 | 1107.59 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.8 | 1 | 52.679 | 2382.95 | 119.15 | A |
| 180.00-160.00 | | | B | 0.598 | 1.806 | 0.752 | 0.8 | 1 | 35.464 | | | |
| | | | C | 0.363 | 2.143 | 0.637 | 0.8 | 1 | 18.482 | | | |
| T3 | 1598.18 | 1039.55 | A | 0.815 | 1.828 | 0.909 | 0.8 | 1 | 52.723 | 2301.72 | 115.09 | A |
| 160.00-140.00 | | TA 376.86 | B | 0.806 | 1.821 | 0.902 | 0.8 | 1 | 51.931 | | | |
| | | | C | 0.463 | 1.953 | 0.679 | 0.8 | 1 | 25.350 | | | |
| T4 | 1989.85 | 1039.55 | A | 0.815 | 1.828 | 0.909 | 0.8 | 1 | 52.723 | 3261.84 | 163.09 | B |
| 140.00-120.00 | | TA 376.86 | B | 1 | 2.1 | 1 | 0.8 | 1 | 67.738 | | | |
| | | | C | 0.463 | 1.953 | 0.679 | 0.8 | 1 | 25.350 | | | |
| T5 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.8 | 1 | 52.679 | 3109.76 | 155.49 | B |
| 120.00-100.00 | | | B | 1 | 2.1 | 1 | 0.8 | 1 | 67.737 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.8 | 1 | 25.246 | | | |
| T6 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.8 | 1 | 52.679 | 2936.48 | 146.82 | B |
| 100.00-80.00 | | | B | 1 | 2.1 | 1 | 0.8 | 1 | 67.737 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.8 | 1 | 25.246 | | | |
| T7 | 1989.85 | 1018.61 | A | 0.814 | 1.827 | 0.908 | 0.8 | 1 | 52.701 | 2733.04 | 136.65 | B |
| 80.00-60.00 | | | B | 1 | 2.1 | 1 | 0.8 | 1 | 67.737 | | | |
| | | | C | 0.462 | 1.954 | 0.679 | 0.8 | 1 | 25.298 | | | |
| T8 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.8 | 1 | 52.679 | 2482.51 | 124.13 | B |
| 60.00-40.00 | | | B | 1 | 2.1 | 1 | 0.8 | 1 | 67.737 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.8 | 1 | 25.246 | | | |
| T9 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.8 | 1 | 52.679 | 2204.61 | 110.23 | B |
| 40.00-20.00 | | | B | 1 | 2.1 | 1 | 0.8 | 1 | 67.737 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.8 | 1 | 25.246 | | | |
| T10 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.8 | 1 | 52.679 | 2204.61 | 110.23 | B |
| 20.00-0.00 | | | B | 1 | 2.1 | 1 | 0.8 | 1 | 67.737 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.8 | 1 | 25.246 | | | |
| Sum Weight: | 16979.46 | 10457.71 | | | | | | | | 24844.96 | | |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 344.77 | 526.95 | A | 0.817 | 1.829 | 0.91 | 0.85 | 1 | 27.348 | 1268.93 | 126.89 | A |
| 190.00-180.00 | | | B | 0.334 | 2.209 | 0.627 | 0.85 | 1 | 8.387 | | | |
| | | | C | 0.334 | 2.209 | 0.627 | 0.85 | 1 | 8.387 | | | |
| T2 | 1107.59 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.85 | 1 | 54.460 | 2463.51 | 123.18 | A |
| 180.00-160.00 | | | B | 0.598 | 1.806 | 0.752 | 0.85 | 1 | 36.613 | | | |
| | | | C | 0.363 | 2.143 | 0.637 | 0.85 | 1 | 18.733 | | | |
| T3 | 1598.18 | 1039.55 | A | 0.815 | 1.828 | 0.909 | 0.85 | 1 | 54.506 | 2379.56 | 118.98 | A |
| 160.00-140.00 | | TA 376.86 | B | 0.806 | 1.821 | 0.902 | 0.85 | 1 | 53.734 | | | |
| | | | C | 0.463 | 1.953 | 0.679 | 0.85 | 1 | 25.895 | | | |
| T4 | 1989.85 | 1039.55 | A | 0.815 | 1.828 | 0.909 | 0.85 | 1 | 54.506 | 3379.94 | 169.00 | B |
| 140.00-120.00 | | TA 376.86 | B | 1 | 2.1 | 1 | 0.85 | 1 | 70.190 | | | |
| | | | C | 0.463 | 1.953 | 0.679 | 0.85 | 1 | 25.895 | | | |
| T5 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.85 | 1 | 54.460 | 3222.35 | 161.12 | B |
| 120.00-100.00 | | | B | 1 | 2.1 | 1 | 0.85 | 1 | 70.189 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.85 | 1 | 25.786 | | | |
| T6 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.85 | 1 | 54.460 | 3042.79 | 152.14 | B |
| 100.00-80.00 | | | B | 1 | 2.1 | 1 | 0.85 | 1 | 70.189 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.85 | 1 | 25.786 | | | |
| T7 | 1989.85 | 1018.61 | A | 0.814 | 1.827 | 0.908 | 0.85 | 1 | 54.483 | 2831.99 | 141.60 | B |
| 80.00-60.00 | | | B | 1 | 2.1 | 1 | 0.85 | 1 | 70.190 | | | |
| | | | C | 0.462 | 1.954 | 0.679 | 0.85 | 1 | 25.840 | | | |
| T8 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.85 | 1 | 54.460 | 2572.39 | 128.62 | B |
| 60.00-40.00 | | | B | 1 | 2.1 | 1 | 0.85 | 1 | 70.189 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.85 | 1 | 25.786 | | | |
| T9 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.85 | 1 | 54.460 | 2284.43 | 114.22 | B |
| 40.00-20.00 | | | B | 1 | 2.1 | 1 | 0.85 | 1 | 70.189 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.85 | 1 | 25.786 | | | |
| T10 | 1989.85 | 1013.22 | A | 0.814 | 1.827 | 0.908 | 0.85 | 1 | 54.460 | 2284.43 | 114.22 | B |
| 20.00-0.00 | | | B | 1 | 2.1 | 1 | 0.85 | 1 | 70.189 | | | |
| | | | C | 0.461 | 1.955 | 0.679 | 0.85 | 1 | 25.786 | | | |
| Sum Weight: | 16979.46 | 10457.71 | | | | | | | | 25730.31 | | |

## Tower Forces - Service - Wind Normal To Face

| Section Elevation ft | Add Weight lb | Self Weight lb | Face | e | $C_F$ | $R_R$ | $D_F$ | $D_R$ | $A_E$ $ft^2$ | F lb | w plf | Ctrl. Face |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 107.60 | 340.32 | A | 0.563 | 1.832 | 0.731 | 1 | 1 | 15.640 | 335.25 | 33.53 | A |
| 190.00-180.00 | | | B | 0.21 | 2.563 | 0.592 | 1 | 1 | 5.341 | | | |
| | | | C | 0.21 | 2.563 | 0.592 | 1 | 1 | 5.341 | | | |
| T2 | 344.89 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 648.01 | 32.40 | A |
| 180.00-160.00 | | | B | 0.393 | 2.079 | 0.649 | 1 | 1 | 19.811 | | | |
| | | | C | 0.229 | 2.501 | 0.597 | 1 | 1 | 11.347 | | | |
| T3 | 482.00 | 680.49 | A | 0.56 | 1.834 | 0.73 | 1 | 1 | 31.012 | 626.92 | 31.35 | A |
| 160.00-140.00 | | TA 242.49 | B | 0.542 | 1.852 | 0.72 | 1 | 1 | 29.626 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 1 | 1 | 14.807 | | | |
| T4 | 590.40 | 680.49 | A | 0.56 | 1.834 | 0.73 | 1 | 1 | 31.012 | 790.36 | 39.52 | B |
| 140.00-120.00 | | TA 242.49 | B | 0.689 | 1.776 | 0.812 | 1 | 1 | 42.072 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 1 | 1 | 14.807 | | | |
| T5 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 752.13 | 37.61 | B |
| 120.00-100.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T6 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 710.22 | 35.51 | B |
| 100.00-80.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |
| T7 | 590.40 | 661.59 | A | 0.559 | 1.835 | 0.73 | 1 | 1 | 30.963 | 661.62 | 33.08 | B |
| 80.00-60.00 | | | B | 0.689 | 1.776 | 0.812 | 1 | 1 | 42.033 | | | |
| | | | C | 0.299 | 2.299 | 0.616 | 1 | 1 | 14.742 | | | |
| T8 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 600.42 | 30.02 | B |
| 60.00-40.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |
| T9 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 533.21 | 26.66 | B |
| 40.00-20.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |
| T10 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 1 | 1 | 30.914 | 533.21 | 26.66 | B |
| 20.00-0.00 | | | B | 0.688 | 1.776 | 0.812 | 1 | 1 | 41.994 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 1 | 1 | 14.677 | | | |
| Sum Weight: | 5067.29 | 6797.35 | | | | | | | | 6191.34 | | |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 107.60 | 340.32 | A | 0.563 | 1.832 | 0.731 | 0.8 | 1 | 15.452 | 331.22 | 33.12 | A |
| 190.00-180.00 | | | B | 0.21 | 2.563 | 0.592 | 0.8 | 1 | 5.002 | | | |
| | | | C | 0.21 | 2.563 | 0.592 | 0.8 | 1 | 5.002 | | | |
| T2 | 344.89 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 641.38 | 32.07 | A |
| 180.00-160.00 | | | B | 0.393 | 2.079 | 0.649 | 0.8 | 1 | 19.376 | | | |
| | | | C | 0.229 | 2.501 | 0.597 | 0.8 | 1 | 10.795 | | | |
| T3 | 482.00 | 680.49 | A | 0.56 | 1.834 | 0.73 | 0.8 | 1 | 30.681 | 620.23 | 31.01 | A |
| 160.00-140.00 | | TA 242.49 | B | 0.542 | 1.852 | 0.72 | 0.8 | 1 | 29.282 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 0.8 | 1 | 14.280 | | | |
| T4 | 590.40 | 680.49 | A | 0.56 | 1.834 | 0.73 | 0.8 | 1 | 30.681 | 785.97 | 39.30 | B |
| 140.00-120.00 | | TA 242.49 | B | 0.689 | 1.776 | 0.812 | 0.8 | 1 | 41.838 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 0.8 | 1 | 14.280 | | | |
| T5 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 748.13 | 37.41 | B |
| 120.00-100.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| T6 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 706.44 | 35.32 | B |
| 100.00-80.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| T7 | 590.40 | 661.59 | A | 0.559 | 1.835 | 0.73 | 0.8 | 1 | 30.639 | 658.02 | 32.90 | B |
| 80.00-60.00 | | | B | 0.689 | 1.776 | 0.812 | 0.8 | 1 | 41.804 | | | |
| | | | C | 0.299 | 2.299 | 0.616 | 0.8 | 1 | 14.227 | | | |
| T8 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 597.23 | 29.86 | B |
| 60.00-40.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| T9 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 530.37 | 26.52 | B |
| 40.00-20.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| T10 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.8 | 1 | 30.598 | 530.37 | 26.52 | B |
| 20.00-0.00 | | | B | 0.688 | 1.776 | 0.812 | 0.8 | 1 | 41.770 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.8 | 1 | 14.174 | | | |
| Sum Weight: | 5067.29 | 6797.35 | | | | | | | | 6149.38 | | |

## 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 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 107.60 | 340.32 | A | 0.563 | 1.832 | 0.731 | 0.85 | 1 | 15.499 | 332.23 | 33.22 | A |
| 190.00-180.00 | | | B | 0.21 | 2.563 | 0.592 | 0.85 | 1 | 5.087 | | | |
| | | | C | 0.21 | 2.563 | 0.592 | 0.85 | 1 | 5.087 | | | |
| T2 | 344.89 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 643.04 | 32.15 | A |
| 180.00-160.00 | | | B | 0.393 | 2.079 | 0.649 | 0.85 | 1 | 19.485 | | | |
| | | | C | 0.229 | 2.501 | 0.597 | 0.85 | 1 | 10.933 | | | |
| T3 | 482.00 | 680.49 | A | 0.56 | 1.834 | 0.73 | 0.85 | 1 | 30.764 | 621.90 | 31.10 | A |
| 160.00-140.00 | | TA 242.49 | B | 0.542 | 1.852 | 0.72 | 0.85 | 1 | 29.368 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 0.85 | 1 | 14.411 | | | |
| T4 | 590.40 | 680.49 | A | 0.56 | 1.834 | 0.73 | 0.85 | 1 | 30.764 | 787.07 | 39.35 | B |
| 140.00-120.00 | | TA 242.49 | B | 0.689 | 1.776 | 0.812 | 0.85 | 1 | 41.896 | | | |
| | | | C | 0.3 | 2.297 | 0.616 | 0.85 | 1 | 14.411 | | | |
| T5 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 749.13 | 37.46 | B |
| 120.00-100.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| T6 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 707.38 | 35.37 | B |
| 100.00-80.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| T7 | 590.40 | 661.59 | A | 0.559 | 1.835 | 0.73 | 0.85 | 1 | 30.720 | 658.92 | 32.95 | B |
| 80.00-60.00 | | | B | 0.689 | 1.776 | 0.812 | 0.85 | 1 | 41.861 | | | |
| | | | C | 0.299 | 2.299 | 0.616 | 0.85 | 1 | 14.356 | | | |
| T8 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 598.03 | 29.90 | B |
| 60.00-40.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| T9 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 531.08 | 26.55 | B |
| 40.00-20.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| T10 | 590.40 | 658.24 | A | 0.559 | 1.835 | 0.729 | 0.85 | 1 | 30.677 | 531.08 | 26.55 | B |
| 20.00-0.00 | | | B | 0.688 | 1.776 | 0.812 | 0.85 | 1 | 41.826 | | | |
| | | | C | 0.298 | 2.302 | 0.615 | 0.85 | 1 | 14.300 | | | |
| Sum Weight: | 5067.29 | 6797.35 | | | | | | | | 6159.87 | | |

## 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 | 3305.16 | | | |
| Bracing Weight | 3492.18 | | | |
| Total Member Self-Weight | 6797.35 | | | |
| Guy Weight | 2622.32 | | | |
| Total Weight | 22230.35 | | | |
| Wind 0 deg - No Ice | | 0.00 | -30317.30 | 266.61 |
| Wind 30 deg - No Ice | | 15113.17 | -26176.79 | -1173.12 |
| Wind 60 deg - No Ice | | 26150.53 | -15098.01 | -2297.55 |
| Wind 90 deg - No Ice | | 30226.35 | 0.00 | -2813.87 |
| Wind 120 deg - No Ice | | 26255.55 | 15158.65 | -2581.51 |
| Wind 150 deg - No Ice | | 15113.17 | 26176.79 | -1640.75 |
| Wind 180 deg - No Ice | | 0.00 | 30196.03 | -271.11 |

| Load Case | Vertical Forces lb | Sum of Forces X lb | Sum of Forces Z lb | Sum of Torques lb-ft |
|---|---|---|---|---|
| Wind 210 deg - No Ice | | -15113.17 | 26176.79 | 1173.12 |
| Wind 240 deg - No Ice | | -26255.55 | 15158.65 | 2314.90 |
| Wind 270 deg - No Ice | | -30226.35 | 0.00 | 2813.87 |
| Wind 300 deg - No Ice | | -26150.53 | -15098.01 | 2568.67 |
| Wind 330 deg - No Ice | | -15113.17 | -26176.79 | 1640.75 |
| Member Ice | 3660.36 | | | |
| Guy Ice | 2408.48 | | | |
| Total Weight Ice | 43512.78 | | | |
| Wind 0 deg - Ice | | 0.00 | -38406.82 | 6.27 |
| Wind 30 deg - Ice | | 18536.31 | -32105.83 | -1787.57 |
| Wind 60 deg - Ice | | 31339.09 | -18093.63 | -3066.92 |
| Wind 90 deg - Ice | | 37072.62 | 0.00 | -3693.34 |
| Wind 120 deg - Ice | | 33261.28 | 19203.41 | -3363.55 |
| Wind 150 deg - Ice | | 18536.31 | 32105.83 | -1905.77 |
| Wind 180 deg - Ice | | 0.00 | 36187.27 | -63.48 |
| Wind 210 deg - Ice | | -18536.31 | 32105.83 | 1787.57 |
| Wind 240 deg - Ice | | -33261.28 | 19203.41 | 3357.28 |
| Wind 270 deg - Ice | | -37072.62 | 0.00 | 3693.34 |
| Wind 300 deg - Ice | | -31339.09 | -18093.63 | 3130.40 |
| Wind 330 deg - Ice | | -18536.31 | -32105.83 | 1905.77 |
| Total Weight | 22230.35 | | | |
| Wind 0 deg - Service | | 0.00 | -10490.42 | 92.25 |
| Wind 30 deg - Service | | 5229.47 | -9057.71 | -405.92 |
| Wind 60 deg - Service | | 9048.63 | -5224.23 | -795.00 |
| Wind 90 deg - Service | | 10458.94 | 0.00 | -973.66 |
| Wind 120 deg - Service | | 9084.97 | 5245.21 | -893.26 |
| Wind 150 deg - Service | | 5229.47 | 9057.71 | -567.73 |
| Wind 180 deg - Service | | 0.00 | 10448.45 | -93.81 |
| Wind 210 deg - Service | | -5229.47 | 9057.71 | 405.92 |
| Wind 240 deg - Service | | -9084.97 | 5245.21 | 801.00 |
| Wind 270 deg - Service | | -10458.94 | 0.00 | 973.66 |
| Wind 300 deg - Service | | -9048.63 | -5224.23 | 888.81 |
| Wind 330 deg - Service | | -5229.47 | -9057.71 | 567.73 |

## Load Combinations

| Comb. No. | Description |
|---|---|
| 1 | Dead Only |
| 2 | Dead+Wind 0 deg - No Ice+Guy |
| 3 | Dead+Wind 30 deg - No Ice+Guy |
| 4 | Dead+Wind 60 deg - No Ice+Guy |
| 5 | Dead+Wind 90 deg - No Ice+Guy |
| 6 | Dead+Wind 120 deg - No Ice+Guy |
| 7 | Dead+Wind 150 deg - No Ice+Guy |
| 8 | Dead+Wind 180 deg - No Ice+Guy |
| 9 | Dead+Wind 210 deg - No Ice+Guy |
| 10 | Dead+Wind 240 deg - No Ice+Guy |
| 11 | Dead+Wind 270 deg - No Ice+Guy |
| 12 | Dead+Wind 300 deg - No Ice+Guy |
| 13 | Dead+Wind 330 deg - No Ice+Guy |
| 14 | Dead+Ice+Temp+Guy |
| 15 | Dead+Wind 0 deg+Ice+Temp+Guy |
| 16 | Dead+Wind 30 deg+Ice+Temp+Guy |

| Comb. No. | Description |
|---|---|
| 17 | Dead+Wind 60 deg+Ice+Temp+Guy |
| 18 | Dead+Wind 90 deg+Ice+Temp+Guy |
| 19 | Dead+Wind 120 deg+Ice+Temp+Guy |
| 20 | Dead+Wind 150 deg+Ice+Temp+Guy |
| 21 | Dead+Wind 180 deg+Ice+Temp+Guy |
| 22 | Dead+Wind 210 deg+Ice+Temp+Guy |
| 23 | Dead+Wind 240 deg+Ice+Temp+Guy |
| 24 | Dead+Wind 270 deg+Ice+Temp+Guy |
| 25 | Dead+Wind 300 deg+Ice+Temp+Guy |
| 26 | Dead+Wind 330 deg+Ice+Temp+Guy |
| 27 | Dead+Wind 0 deg - Service+Guy |
| 28 | Dead+Wind 30 deg - Service+Guy |
| 29 | Dead+Wind 60 deg - Service+Guy |
| 30 | Dead+Wind 90 deg - Service+Guy |
| 31 | Dead+Wind 120 deg - Service+Guy |
| 32 | Dead+Wind 150 deg - Service+Guy |
| 33 | Dead+Wind 180 deg - Service+Guy |
| 34 | Dead+Wind 210 deg - Service+Guy |
| 35 | Dead+Wind 240 deg - Service+Guy |
| 36 | Dead+Wind 270 deg - Service+Guy |
| 37 | Dead+Wind 300 deg - Service+Guy |
| 38 | Dead+Wind 330 deg - Service+Guy |

## Maximum Member Forces

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| T1 | 190 - 180 | Leg | Max Tension | 12 | 2915.35 | 369.30 | 216.60 |
| | | | Max. Compression | 17 | -14373.79 | 107.91 | -76.72 |
| | | | Max. Mx | 11 | -3544.72 | 455.95 | -0.36 |
| | | | Max. My | 2 | -4004.79 | -2.33 | 461.78 |
| | | | Max. Vy | 11 | -1217.18 | 455.95 | -0.36 |
| | | | Max. Vx | 2 | -1232.84 | -2.33 | 461.78 |
| | | Diagonal | Max Tension | 12 | 3759.65 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 17 | 248.96 | 0.00 | 0.00 |
| | | | Max. Compression | 10 | -4747.63 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 151.27 | -5.12 | 0.00 |
| | | | Max. My | 24 | 238.76 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 4 | -2541.22 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -2372.27 | -5.12 | 0.00 |
| | | | Max. My | 24 | -2241.29 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| | | Guy A | Bottom Tension | 21 | 12719.60 | | |
| | | | Top Tension | 21 | 12967.45 | | |
| | | | Top Cable Vert | 21 | 10406.34 | | |
| | | | Top Cable Norm | 21 | 7737.11 | | |
| | | | Top Cable Tan | 21 | 0.31 | | |
| | | | Bot Cable Vert | 21 | -9788.39 | | |
| | | | Bot Cable Norm | 21 | 8122.54 | | |
| | | | Bot Cable Tan | 21 | 0.31 | | |
| | | Guy B | Bottom Tension | 25 | 12768.46 | | |
| | | | Top Tension | 25 | 13016.31 | | |
| | | | Top Cable Vert | 25 | 10444.65 | | |
| | | | Top Cable Norm | 25 | 7767.46 | | |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | | Top Cable Tan | 25 | 0.41 | | |
| | | | Bot Cable Vert | 25 | -9826.70 | | |
| | | | Bot Cable Norm | 25 | 8152.89 | | |
| | | | Bot Cable Tan | 25 | 0.41 | | |
| | | Guy C | Bottom Tension | 17 | 12736.60 | | |
| | | | Top Tension | 17 | 12984.44 | | |
| | | | Top Cable Vert | 17 | 10419.66 | | |
| | | | Top Cable Norm | 17 | 7747.68 | | |
| | | | Top Cable Tan | 17 | 0.72 | | |
| | | | Bot Cable Vert | 17 | -9801.71 | | |
| | | | Bot Cable Norm | 17 | 8133.10 | | |
| | | | Bot Cable Tan | 17 | 0.72 | | |
| | | Top Guy Pull-Off | Max Tension | 15 | 1980.99 | 0.00 | 0.00 |
| | | | Max. Compression | 12 | -2521.33 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1088.49 | -5.91 | 0.00 |
| | | | Max. My | 23 | -945.67 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 6.75 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | 0.00 | 0.00 | 0.00 |
| T2 | 180 - 160 | Leg | Max Tension | 12 | 11750.87 | -581.30 | -341.92 |
| | | | Max. Compression | 23 | -34091.02 | 110.78 | -102.67 |
| | | | Max. Mx | 18 | 9179.87 | 726.05 | -74.08 |
| | | | Max. My | 15 | 2734.69 | 47.25 | -764.97 |
| | | | Max. Vy | 18 | 2402.07 | -174.28 | 8.07 |
| | | | Max. Vx | 15 | -2603.78 | -18.07 | 210.51 |
| | | Diagonal | Max Tension | 22 | 7194.65 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 23 | 590.47 | 0.00 | 0.00 |
| | | | Max. Compression | 22 | -4506.07 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 190.11 | -5.12 | 0.00 |
| | | | Max. My | 24 | 516.95 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 8 | -2640.53 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -2280.26 | -5.12 | 0.00 |
| | | | Max. My | 24 | -2187.20 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 23 | -3767.37 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -2099.46 | -5.12 | 0.00 |
| | | | Max. My | 24 | -2170.04 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| T3 | 160 - 140 | Leg | Max Tension | 12 | 11749.89 | 129.26 | 74.53 |
| | | | Max. Compression | 23 | -46341.90 | -37.00 | 45.30 |
| | | | Max. Mx | 18 | 9173.57 | -1076.13 | 90.65 |
| | | | Max. My | 15 | 2728.31 | -83.21 | 1187.82 |
| | | | Max. Vy | 18 | 2406.41 | -1076.13 | 90.65 |
| | | | Max. Vx | 15 | -2608.04 | -83.21 | 1187.82 |
| | | Diagonal | Max Tension | 12 | 4123.03 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 23 | 802.67 | 0.00 | 0.00 |
| | | | Max. Compression | 10 | -5909.26 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 344.78 | -5.12 | 0.00 |
| | | | Max. My | 24 | 726.66 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 10 | -2337.86 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1800.88 | -5.12 | 0.00 |
| | | | Max. My | 24 | -1478.95 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| | | Guy A | Bottom Tension | 21 | 13306.70 | | |
| | | | Top Tension | 21 | 13539.74 | | |
| | | | Top Cable Vert | 21 | 10013.80 | | |
| | | | Top Cable Norm | 21 | 9113.09 | | |
| | | | Top Cable Tan | 21 | 5.08 | | |
| | | | Bot Cable Vert | 21 | -9439.69 | | |
| | | | Bot Cable Norm | 21 | 9378.72 | | |
| | | | Bot Cable Tan | 21 | 6.83 | | |
| | | Guy B | Bottom Tension | 25 | 13392.77 | | |
| | | | Top Tension | 25 | 13625.80 | | |
| | | | Top Cable Vert | 25 | 10076.01 | | |
| | | | Top Cable Norm | 25 | 9172.58 | | |
| | | | Top Cable Tan | 25 | 5.43 | | |
| | | | Bot Cable Vert | 25 | -9501.91 | | |
| | | | Bot Cable Norm | 25 | 9438.22 | | |
| | | | Bot Cable Tan | 25 | 6.48 | | |
| | | Guy C | Bottom Tension | 17 | 13436.57 | | |
| | | | Top Tension | 17 | 13669.59 | | |
| | | | Top Cable Vert | 17 | 10107.64 | | |
| | | | Top Cable Norm | 17 | 9202.89 | | |
| | | | Top Cable Tan | 17 | 5.44 | | |
| | | | Bot Cable Vert | 17 | -9533.53 | | |
| | | | Bot Cable Norm | 17 | 9468.53 | | |
| | | | Bot Cable Tan | 17 | 6.47 | | |
| | | Top Guy Pull-Off | Max Tension | 17 | 1281.64 | 0.00 | 0.00 |
| | | | Max. Compression | 15 | -5134.06 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -2075.14 | -8.96 | 0.00 |
| | | | Max. My | 24 | -1830.72 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 10.24 | 0.00 | 0.00 |
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| | | Torque Arm Top | Max Tension | 23 | 12229.75 | 0.00 | 0.00 |
| | | | Max. Compression | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Mx | 15 | 12158.49 | -15.95 | 0.00 |
| | | | Max. My | 23 | 6439.79 | 0.00 | -0.14 |
| | | | Max. Vy | 15 | 13.43 | 0.00 | 0.00 |
| | | | Max. Vx | 23 | 0.12 | 0.00 | 0.00 |
| | | Torque Arm Bottom | Max Tension | 15 | 2771.94 | 0.00 | 0.00 |
| | | | Max. Compression | 25 | -8945.14 | 0.00 | 0.00 |
| | | | Max. Mx | 17 | -8786.15 | -11.66 | 0.00 |
| | | | Max. My | 24 | -4550.64 | 0.00 | -0.00 |
| | | | Max. Vy | 17 | 13.33 | 0.00 | 0.00 |
| | | | Max. Vx | 24 | 0.00 | 0.00 | 0.00 |
| T4 | 140 - 120 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 15 | -63031.44 | 71.33 | 957.61 |
| | | | Max. Mx | 19 | -15690.15 | -1185.42 | -504.39 |
| | | | Max. My | 15 | -15381.51 | -106.48 | 1191.82 |
| | | | Max. Vy | 18 | -2399.42 | -1139.83 | -32.50 |
| | | | Max. Vx | 15 | 2394.44 | -106.48 | 1191.82 |
| | | Diagonal | Max Tension | 8 | 3873.47 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 15 | 1091.74 | 0.00 | 0.00 |
| | | | Max. Compression | 2 | -4359.64 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 456.41 | -5.12 | 0.00 |
| | | | Max. My | 24 | 964.21 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 28 | -1956.00 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1789.95 | -5.12 | 0.00 |
| | | | Max. My | 24 | -1544.97 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | | Max. Vx | 24 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 17 | 1010.28 | 0.00 | 0.00 |
| | | | Max. Compression | 15 | -4199.49 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1597.41 | -5.12 | 0.00 |
| | | | Max. My | 18 | -1222.51 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| | | Guy A | Bottom Tension | 21 | 10111.66 | | |
| | | | Top Tension | 21 | 10269.67 | | |
| | | | Top Cable Vert | 21 | 6625.42 | | |
| | | | Top Cable Norm | 21 | 7846.65 | | |
| | | | Top Cable Tan | 21 | 3.69 | | |
| | | | Bot Cable Vert | 21 | -6204.56 | | |
| | | | Bot Cable Norm | 21 | 7984.31 | | |
| | | | Bot Cable Tan | 21 | 4.49 | | |
| | | Guy B | Bottom Tension | 25 | 10225.10 | | |
| | | | Top Tension | 25 | 10383.10 | | |
| | | | Top Cable Vert | 25 | 6696.64 | | |
| | | | Top Cable Norm | 25 | 7934.96 | | |
| | | | Top Cable Tan | 25 | 3.83 | | |
| | | | Bot Cable Vert | 25 | -6275.78 | | |
| | | | Bot Cable Norm | 25 | 8072.62 | | |
| | | | Bot Cable Tan | 25 | 4.35 | | |
| | | Guy C | Bottom Tension | 17 | 10224.05 | | |
| | | | Top Tension | 17 | 10382.05 | | |
| | | | Top Cable Vert | 17 | 6695.99 | | |
| | | | Top Cable Norm | 17 | 7934.15 | | |
| | | | Top Cable Tan | 17 | 3.68 | | |
| | | | Bot Cable Vert | 17 | -6275.13 | | |
| | | | Bot Cable Norm | 17 | 8071.80 | | |
| | | | Bot Cable Tan | 17 | 4.50 | | |
| | | Top Guy Pull-Off | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 19 | -6177.39 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -3422.93 | -8.96 | 0.00 |
| | | | Max. My | 18 | -2674.86 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 10.24 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| | | Torque Arm Top | Max Tension | 23 | 7854.73 | 0.00 | 0.00 |
| | | | Max. Compression | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Mx | 16 | 7246.59 | -15.85 | 0.00 |
| | | | Max. My | 18 | 4616.26 | 0.00 | 0.07 |
| | | | Max. Vy | 16 | 13.36 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | 0.06 | 0.00 | 0.00 |
| | | Torque Arm Bottom | Max Tension | 19 | 4755.08 | 0.00 | 0.00 |
| | | | Max. Compression | 26 | -7648.80 | 0.00 | 0.00 |
| | | | Max. Mx | 18 | 4179.33 | -11.66 | 0.00 |
| | | | Max. My | 18 | -4242.23 | 0.00 | 0.00 |
| | | | Max. Vy | 18 | 13.33 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| T5 | 120 - 100 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 15 | -61083.67 | 5.87 | 225.11 |
| | | | Max. Mx | 18 | -27802.09 | 659.30 | -23.16 |
| | | | Max. My | 15 | -15390.94 | 65.87 | -603.05 |
| | | | Max. Vy | 18 | -2402.94 | -240.95 | -28.05 |
| | | | Max. Vx | 15 | 2395.99 | -20.32 | 294.69 |
| | | Diagonal | Max Tension | 19 | 6191.30 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 15 | 1058.00 | 0.00 | 0.00 |
| | | | Max. Compression | 19 | -4261.03 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 468.90 | -5.12 | 0.00 |
| | | | Max. My | 18 | 925.48 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 17 | 289.44 | 0.00 | 0.00 |
| | | | Max. Compression | 15 | -3177.91 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1524.07 | -5.12 | 0.00 |
| | | | Max. My | 18 | -1611.54 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 29 | -1797.59 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1472.91 | -5.12 | 0.00 |
| | | | Max. My | 19 | -1392.24 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | 0.00 | 0.00 | 0.00 |
| T6 | 100 - 80 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 21 | -42510.01 | 6.76 | -1.86 |
| | | | Max. Mx | 19 | -31908.22 | 405.59 | 204.08 |
| | | | Max. My | 15 | -31223.72 | -45.85 | -476.24 |
| | | | Max. Vy | 19 | -1063.06 | 7.72 | -7.17 |
| | | | Max. Vx | 15 | 1225.74 | -4.89 | -17.20 |
| | | Diagonal | Max Tension | 19 | 3288.05 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 21 | 736.29 | 0.00 | 0.00 |
| | | | Max. Compression | 33 | -3305.74 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 484.88 | -5.12 | 0.00 |
| | | | Max. My | 18 | 728.41 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 2 | -1950.10 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1456.32 | -5.12 | 0.00 |
| | | | Max. My | 19 | -985.00 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | 0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 28 | -1712.64 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1431.50 | -5.12 | 0.00 |
| | | | Max. My | 18 | -1157.82 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| T7 | 80 - 60 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 21 | -41474.66 | -8.16 | 62.85 |
| | | | Max. Mx | 18 | -32453.98 | -862.66 | 263.11 |
| | | | Max. My | 21 | -30945.81 | -48.15 | -958.20 |
| | | | Max. Vy | 18 | -1919.08 | -862.64 | 263.09 |
| | | | Max. Vx | 21 | -2138.56 | -48.15 | -958.20 |
| | | Diagonal | Max Tension | 25 | 3272.69 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 21 | 718.36 | 0.00 | 0.00 |
| | | | Max. Compression | 31 | -3375.67 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 506.86 | -5.12 | 0.00 |
| | | | Max. My | 18 | 716.73 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 33 | -1752.23 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1414.56 | -5.12 | 0.00 |
| | | | Max. My | 18 | -1085.78 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| | | Guy A | Bottom Tension | 21 | 11542.94 | | |
| | | | Top Tension | 21 | 11622.29 | | |
| | | | Top Cable Vert | 21 | 4494.72 | | |
| | | | Top Cable Norm | 21 | 10717.98 | | |

| Section No. | Elevation ft | Component Type | Condition | Gov. Load Comb. | Force lb | Major Axis Moment lb-ft | Minor Axis Moment lb-ft |
|---|---|---|---|---|---|---|---|
| | | | Top Cable Tan | 21 | 0.43 | | |
| | | | Bot Cable Vert | 21 | -4232.84 | | |
| | | | Bot Cable Norm | 21 | 10738.83 | | |
| | | | Bot Cable Tan | 21 | 0.43 | | |
| | | Guy B | Bottom Tension | 25 | 11536.85 | | |
| | | | Top Tension | 25 | 11616.21 | | |
| | | | Top Cable Vert | 25 | 4492.43 | | |
| | | | Top Cable Norm | 25 | 10712.35 | | |
| | | | Top Cable Tan | 25 | 1.10 | | |
| | | | Bot Cable Vert | 25 | -4230.55 | | |
| | | | Bot Cable Norm | 25 | 10733.19 | | |
| | | | Bot Cable Tan | 25 | 1.10 | | |
| | | Guy C | Bottom Tension | 17 | 11541.09 | | |
| | | | Top Tension | 17 | 11620.44 | | |
| | | | Top Cable Vert | 17 | 4494.02 | | |
| | | | Top Cable Norm | 17 | 10716.27 | | |
| | | | Top Cable Tan | 17 | 0.66 | | |
| | | | Bot Cable Vert | 17 | -4232.15 | | |
| | | | Bot Cable Norm | 17 | 10737.12 | | |
| | | | Bot Cable Tan | 17 | 0.66 | | |
| | | Top Guy Pull-Off | Max Tension | 19 | 3883.67 | 0.00 | 0.00 |
| | | | Max. Compression | 4 | -950.81 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 751.91 | -5.91 | 0.00 |
| | | | Max. My | 18 | 1626.65 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 6.75 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| T8 | 60 - 40 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 25 | -51487.71 | 136.92 | 131.55 |
| | | | Max. Mx | 18 | -37344.62 | 577.17 | -212.26 |
| | | | Max. My | 21 | -36139.31 | 24.89 | 646.01 |
| | | | Max. Vy | 18 | -1922.56 | -143.40 | 25.40 |
| | | | Max. Vx | 21 | -2142.04 | -11.63 | -156.77 |
| | | Diagonal | Max Tension | 26 | 4513.90 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 25 | 891.79 | 0.00 | 0.00 |
| | | | Max. Compression | 37 | -3160.09 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 546.67 | -5.12 | 0.00 |
| | | | Max. My | 19 | 828.32 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | 0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 27 | -1583.71 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1125.53 | -5.12 | 0.00 |
| | | | Max. My | 18 | -1124.22 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 18 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 4 | -1806.24 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1268.66 | -5.12 | 0.00 |
| | | | Max. My | 19 | -1277.67 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | 0.00 | 0.00 | 0.00 |
| T9 | 40 - 20 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 25 | -55752.39 | -53.30 | -28.94 |
| | | | Max. Mx | 23 | -18837.25 | -272.25 | 139.77 |
| | | | Max. My | 15 | -18877.62 | 7.57 | -296.92 |
| | | | Max. Vy | 23 | -559.81 | -62.67 | 34.53 |
| | | | Max. Vx | 15 | -602.40 | 0.88 | -71.49 |
| | | Diagonal | Max Tension | 6 | 2527.88 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 25 | 965.66 | 0.00 | 0.00 |
| | | | Max. Compression | 4 | -3229.46 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 562.65 | -5.12 | 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 | 19 | 861.55 | 0.00 | -0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | 0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 33 | -1629.40 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1251.93 | -5.12 | 0.00 |
| | | | Max. My | 19 | -1085.18 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 29 | -1634.14 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1226.72 | -5.12 | 0.00 |
| | | | Max. My | 19 | -1024.55 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | -0.00 | 0.00 | 0.00 |
| T10 | 20 - 0 | Leg | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 25 | -53995.42 | -81.98 | -40.35 |
| | | | Max. Mx | 24 | -39428.38 | 1250.80 | 493.78 |
| | | | Max. My | 22 | -39410.02 | 222.26 | -1312.12 |
| | | | Max. Vy | 24 | -3221.90 | 1250.80 | 493.78 |
| | | | Max. Vx | 21 | 3456.44 | -2.56 | -1308.67 |
| | | Diagonal | Max Tension | 24 | 3291.74 | 0.00 | 0.00 |
| | | Horizontal | Max Tension | 25 | 935.23 | 0.00 | 0.00 |
| | | | Max. Compression | 37 | -3136.77 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | 581.95 | -5.12 | 0.00 |
| | | | Max. My | 19 | 847.21 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | -0.00 | 0.00 | 0.00 |
| | | Top Girt | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 8 | -1767.45 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -1210.08 | -5.12 | 0.00 |
| | | | Max. My | 19 | -1218.77 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | -0.00 | 0.00 | 0.00 |
| | | Bottom Girt | Max Tension | 25 | 365.71 | 0.00 | 0.00 |
| | | | Max. Compression | 35 | -422.82 | 0.00 | 0.00 |
| | | | Max. Mx | 14 | -98.83 | -5.12 | 0.00 |
| | | | Max. My | 19 | 90.81 | 0.00 | 0.00 |
| | | | Max. Vy | 14 | 5.85 | 0.00 | 0.00 |
| | | | Max. Vx | 19 | -0.00 | 0.00 | 0.00 |
| | | Base Beam | Max Tension | 1 | 0.00 | 0.00 | 0.00 |
| | | | Max. Compression | 24 | -3450.96 | 1329.82 | 2.19 |
| | | | Max. Mx | 15 | -39402.61 | -78485.67 | 1498.24 |
| | | | Max. My | 24 | -38973.26 | -78003.91 | -1710.83 |
| | | | Max. Vy | 18 | -39435.42 | -78373.29 | -853.28 |
| | | | Max. Vx | 24 | -844.80 | -78003.91 | -1710.83 |

## Maximum Reactions

| Location | Condition | Gov. Load Comb. | Vertical lb | Horizontal, X lb | Horizontal, Z lb |
|---|---|---|---|---|---|
| Guy C @ 150 ft Elev 0 ft Azimuth 240 deg | Max. Vert | 10 | -1345.92 | -1285.16 | 741.56 |
| | Max. $H_x$ | 10 | -1345.92 | -1285.16 | 741.56 |
| | Max. $H_z$ | 17 | -45285.09 | -46364.39 | 26782.14 |

| Location | Condition | Gov. Load Comb. | Vertical lb | Horizontal, X lb | Horizontal, Z lb |
|---|---|---|---|---|---|
| | Min. Vert | 17 | -45285.09 | -46364.39 | 26782.14 |
| | Min. $H_x$ | 17 | -45285.09 | -46364.39 | 26782.14 |
| | Min. $H_z$ | 10 | -1345.92 | -1285.16 | 741.56 |
| Guy B @ 150 ft Elev 0 ft Azimuth 120 deg | Max. Vert | 6 | -1345.05 | 1283.58 | 740.57 |
| | Max. $H_x$ | 25 | -45252.88 | 46323.40 | 26759.02 |
| | Max. $H_z$ | 25 | -45252.88 | 46323.40 | 26759.02 |
| | Min. Vert | 25 | -45252.88 | 46323.40 | 26759.02 |
| | Min. $H_x$ | 6 | -1345.05 | 1283.58 | 740.57 |
| | Min. $H_z$ | 6 | -1345.05 | 1283.58 | 740.57 |
| Guy A @ 150 ft Elev 0 ft Azimuth 0 deg | Max. Vert | 2 | -1344.01 | 0.07 | -1482.06 |
| | Max. $H_x$ | 24 | -24459.56 | 1928.14 | -28429.82 |
| | Max. $H_z$ | 2 | -1344.01 | 0.07 | -1482.06 |
| | Min. Vert | 21 | -45231.96 | -0.49 | -53493.62 |
| | Min. $H_x$ | 18 | -24474.22 | -1928.59 | -28453.77 |
| | Min. $H_z$ | 21 | -45231.96 | -0.49 | -53493.62 |
| Mast | Max. Vert | 15 | 117382.60 | 29.89 | 2893.10 |
| | Max. $H_x$ | 24 | 116971.35 | 2734.60 | -51.67 |
| | Max. $H_z$ | 15 | 117382.60 | 29.89 | 2893.10 |
| | Max. $M_x$ | 1 | 0.00 | 7.82 | -6.67 |
| | Max. $M_z$ | 1 | 0.00 | 7.82 | -6.67 |
| | Max. Torsion | 1 | 0.00 | 7.82 | -6.67 |
| | Min. Vert | 1 | 65413.84 | 7.82 | -6.67 |
| | Min. $H_x$ | 18 | 117014.85 | -2665.19 | -49.33 |
| | Min. $H_z$ | 21 | 115930.62 | 34.39 | -2589.56 |
| | Min. $M_x$ | 1 | 0.00 | 7.82 | -6.67 |
| | Min. $M_z$ | 1 | 0.00 | 7.82 | -6.67 |
| | Min. Torsion | 1 | 0.00 | 7.82 | -6.67 |

## 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 | 65413.84 | -7.82 | 6.67 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 0 deg - No Ice+Guy | 80714.33 | -7.38 | -2022.91 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 30 deg - No Ice+Guy | 80234.04 | 952.42 | -1683.96 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 60 deg - No Ice+Guy | 77617.70 | 1667.07 | -963.25 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 90 deg - No Ice+Guy | 80213.37 | 1935.82 | 16.64 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 120 deg - No Ice+Guy | 80697.23 | 1749.86 | 1018.15 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 150 deg - No Ice+Guy | 80213.00 | 975.30 | 1682.52 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 180 deg - No Ice+Guy | 77603.92 | -8.34 | 1942.21 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 210 deg - No Ice+Guy | 80207.40 | -992.11 | 1683.75 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 240 deg - No Ice+Guy | 80682.21 | -1767.26 | 1019.80 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 270 deg - No | 80207.62 | -1953.04 | 17.06 | 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 300 deg - No Ice+Guy | 77617.18 | -1683.80 | -963.23 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 330 deg - No Ice+Guy | 80233.87 | -968.06 | -1683.88 | 0.00 | 0.00 | 0.00 |
| Dead+Ice+Temp+Guy | 93972.23 | -31.44 | 19.63 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 0 deg+Ice+Temp+Guy | 117382.60 | -29.89 | -2893.10 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 30 deg+Ice+Temp+Guy | 117041.47 | 1279.84 | -2338.84 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 60 deg+Ice+Temp+Guy | 115968.00 | 2189.44 | -1271.82 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 90 deg+Ice+Temp+Guy | 117014.85 | 2665.19 | 49.33 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 120 deg+Ice+Temp+Guy | 117354.31 | 2491.63 | 1464.12 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 150 deg+Ice+Temp+Guy | 117003.02 | 1351.43 | 2330.85 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 180 deg+Ice+Temp+Guy | 115930.62 | -34.39 | 2589.56 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 210 deg+Ice+Temp+Guy | 116966.15 | -1419.64 | 2335.90 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 240 deg+Ice+Temp+Guy | 117282.57 | -2560.82 | 1469.96 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 270 deg+Ice+Temp+Guy | 116971.35 | -2734.60 | 51.67 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 300 deg+Ice+Temp+Guy | 115949.74 | -2256.59 | -1270.26 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 330 deg+Ice+Temp+Guy | 117035.19 | -1342.97 | -2338.16 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 0 deg - Service+Guy | 66006.24 | -8.32 | -688.24 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 30 deg - Service+Guy | 66133.17 | 333.64 | -591.81 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 60 deg - Service+Guy | 66267.64 | 585.09 | -336.40 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 90 deg - Service+Guy | 66133.59 | 680.61 | 9.10 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 120 deg - Service+Guy | 66007.38 | 593.22 | 353.58 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 150 deg - Service+Guy | 66132.32 | 338.65 | 601.61 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 180 deg - Service+Guy | 66266.20 | -8.36 | 691.69 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 210 deg - Service+Guy | 66132.52 | -355.40 | 601.63 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 240 deg - Service+Guy | 66006.83 | -609.94 | 353.65 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 270 deg - Service+Guy | 66133.72 | -697.35 | 9.15 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 300 deg - Service+Guy | 66267.75 | -601.81 | -336.38 | 0.00 | 0.00 | 0.00 |
| Dead+Wind 330 deg - Service+Guy | 66133.10 | -350.34 | -591.80 | 0.00 | 0.00 | 0.00 |

## Solution Summary

| Load Comb. | Sum of Applied Forces PX lb | PY lb | PZ lb | Sum of Reactions PX lb | PY lb | PZ lb | % Error |
|---|---|---|---|---|---|---|---|
| 1 | 0.00 | -22229.82 | 0.00 | 3.35 | 22150.48 | -4.73 | 0.358% |
| 2 | 0.00 | -22442.74 | -33827.51 | -0.02 | 22441.31 | 33798.57 | 0.071% |
| 3 | 16864.39 | -22229.82 | -29209.98 | -16866.73 | 22228.63 | 29185.45 | 0.061% |
| 4 | 29190.46 | -22016.91 | -16853.12 | -29143.75 | 22015.51 | 16826.92 | 0.133% |
| 5 | 33728.78 | -22229.82 | -0.00 | -33708.75 | 22228.64 | 14.31 | 0.061% |
| 6 | 29295.48 | -22442.74 | 16913.75 | -29270.47 | 22441.31 | -16899.27 | 0.071% |
| 7 | 16864.39 | -22229.82 | 29209.98 | -16841.90 | 22228.63 | -29199.68 | 0.061% |
| 8 | -0.00 | -22016.91 | 33706.24 | 0.11 | 22015.51 | -33652.73 | 0.133% |
| 9 | -16864.39 | -22229.82 | 29209.98 | 16842.06 | 22228.63 | -29199.79 | 0.061% |
| 10 | -29295.48 | -22442.74 | 16913.75 | 29270.64 | 22441.32 | -16899.39 | 0.071% |
| 11 | -33728.78 | -22229.82 | 0.00 | 33708.85 | 22228.64 | 14.24 | 0.061% |
| 12 | -29190.46 | -22016.91 | -16853.12 | 29143.84 | 22015.51 | 16826.85 | 0.133% |
| 13 | -16864.39 | -22229.82 | -29209.98 | 16866.70 | 22228.62 | 29185.38 | 0.061% |
| 14 | 0.00 | -43511.77 | 0.00 | 16.12 | 43437.29 | -13.47 | 0.178% |
| 15 | 0.00 | -43945.30 | -45526.40 | -0.08 | 43943.46 | 45475.26 | 0.081% |
| 16 | 22088.09 | -43511.77 | -38257.70 | -22096.71 | 43510.40 | 38210.22 | 0.078% |
| 17 | 37504.83 | -43078.23 | -21653.43 | -37456.01 | 43076.70 | 21627.06 | 0.091% |
| 18 | 44176.18 | -43511.77 | -0.00 | -44139.07 | 43510.39 | 31.66 | 0.079% |
| 19 | 39427.02 | -43945.30 | 22763.20 | -39382.57 | 43943.46 | -22737.35 | 0.081% |
| 20 | 22088.09 | -43511.77 | 38257.70 | -22042.38 | 43510.39 | -38241.17 | 0.078% |
| 21 | -0.00 | -43078.23 | 43306.85 | 2.48 | 43076.72 | -43251.58 | 0.091% |
| 22 | -22088.09 | -43511.77 | 38257.70 | 22042.97 | 43510.41 | -38241.54 | 0.077% |
| 23 | -39427.02 | -43945.30 | 22763.20 | 39383.07 | 43943.48 | -22737.71 | 0.080% |
| 24 | -44176.18 | -43511.77 | 0.00 | 44139.70 | 43510.41 | 31.16 | 0.077% |
| 25 | -37504.83 | -43078.23 | -21653.43 | 37457.20 | 43076.69 | 21624.97 | 0.091% |
| 26 | -22088.09 | -43511.77 | -38257.70 | 22096.56 | 43510.40 | 38210.29 | 0.078% |
| 27 | 0.00 | -22303.50 | -11705.02 | 0.06 | 22303.39 | 11635.43 | 0.276% |
| 28 | 5835.43 | -22229.82 | -10107.26 | -5801.18 | 22229.61 | 10043.78 | 0.287% |
| 29 | 10100.50 | -22156.15 | -5831.53 | -10039.04 | 22155.84 | 5796.18 | 0.283% |
| 30 | 11670.86 | -22229.82 | -0.00 | -11598.63 | 22229.61 | 2.27 | 0.288% |
| 31 | 10136.84 | -22303.50 | 5852.51 | -10076.43 | 22303.39 | -5817.61 | 0.277% |
| 32 | 5835.43 | -22229.82 | 10107.26 | -5797.40 | 22229.61 | -10045.87 | 0.288% |
| 33 | -0.00 | -22156.15 | 11663.06 | 0.11 | 22155.84 | -11592.20 | 0.283% |
| 34 | -5835.43 | -22229.82 | 10107.26 | 5797.61 | 22229.61 | -10045.90 | 0.287% |
| 35 | -10136.84 | -22303.50 | 5852.51 | 10076.65 | 22303.39 | -5817.66 | 0.276% |
| 36 | -11670.86 | -22229.82 | 0.00 | 11598.83 | 22229.61 | 2.24 | 0.287% |
| 37 | -10100.50 | -22156.15 | -5831.53 | 10039.22 | 22155.84 | 5796.16 | 0.283% |
| 38 | -5835.43 | -22229.82 | -10107.26 | 5801.34 | 22229.61 | 10043.76 | 0.287% |

## Non-Linear Convergence Results

| Load Combination | Converged? | Number of Cycles | Displacement Tolerance | Force Tolerance |
|---|---|---|---|---|
| 1 | Yes | 121 | 0.00000001 | 0.00000000 |
| 2 | Yes | 295 | 0.00014456 | 0.00015000 |
| 3 | Yes | 287 | 0.00014747 | 0.00015000 |
| 4 | Yes | 242 | 0.00000001 | 0.00005967 |
| 5 | Yes | 287 | 0.00014678 | 0.00015000 |
| 6 | Yes | 295 | 0.00014429 | 0.00015000 |
| 7 | Yes | 287 | 0.00014720 | 0.00015000 |
| 8 | Yes | 242 | 0.00000001 | 0.00005955 |
| 9 | Yes | 287 | 0.00014700 | 0.00015000 |
| 10 | Yes | 295 | 0.00014384 | 0.00015000 |
| 11 | Yes | 287 | 0.00014667 | 0.00015000 |
| 12 | Yes | 242 | 0.00000001 | 0.00005957 |
| 13 | Yes | 287 | 0.00014756 | 0.00015000 |

| | | | | |
|---|---|---|---|---|
| 14 | Yes | 121 | 0.00000001 | 0.00000000 |
| 15 | Yes | 304 | 0.00014754 | 0.00015000 |
| 16 | Yes | 293 | 0.00014851 | 0.00015000 |
| 17 | Yes | 249 | 0.00014723 | 0.00006221 |
| 18 | Yes | 293 | 0.00014919 | 0.00015000 |
| 19 | Yes | 304 | 0.00014818 | 0.00015000 |
| 20 | Yes | 293 | 0.00014885 | 0.00015000 |
| 21 | Yes | 249 | 0.00014597 | 0.00006172 |
| 22 | Yes | 293 | 0.00014762 | 0.00015000 |
| 23 | Yes | 304 | 0.00014701 | 0.00015000 |
| 24 | Yes | 293 | 0.00014756 | 0.00015000 |
| 25 | Yes | 249 | 0.00014728 | 0.00006221 |
| 26 | Yes | 293 | 0.00014822 | 0.00015000 |
| 27 | Yes | 221 | 0.00000001 | 0.00008020 |
| 28 | Yes | 220 | 0.00000001 | 0.00007713 |
| 29 | Yes | 220 | 0.00000001 | 0.00007382 |
| 30 | Yes | 220 | 0.00000001 | 0.00007734 |
| 31 | Yes | 221 | 0.00000001 | 0.00008067 |
| 32 | Yes | 220 | 0.00000001 | 0.00007743 |
| 33 | Yes | 220 | 0.00000001 | 0.00007387 |
| 34 | Yes | 220 | 0.00000001 | 0.00007723 |
| 35 | Yes | 221 | 0.00000001 | 0.00008028 |
| 36 | Yes | 220 | 0.00000001 | 0.00007710 |
| 37 | Yes | 220 | 0.00000001 | 0.00007359 |
| 38 | Yes | 220 | 0.00000001 | 0.00007701 |

## Maximum Tower Deflections - Service Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|---|---|---|---|---|---|
| T1 | 190 - 180 | 2.457 | 37 | 0.1375 | 0.0478 |
| T2 | 180 - 160 | 2.166 | 37 | 0.1426 | 0.0461 |
| T3 | 160 - 140 | 1.544 | 29 | 0.1271 | 0.0359 |
| T4 | 140 - 120 | 1.118 | 29 | 0.0860 | 0.0390 |
| T5 | 120 - 100 | 0.846 | 29 | 0.0322 | 0.0378 |
| T6 | 100 - 80 | 0.822 | 33 | 0.0037 | 0.0666 |
| T7 | 80 - 60 | 0.791 | 33 | 0.0167 | 0.0907 |
| T8 | 60 - 40 | 0.699 | 31 | 0.0191 | 0.1081 |
| T9 | 40 - 20 | 0.626 | 31 | 0.0346 | 0.1217 |
| T10 | 20 - 0 | 0.396 | 35 | 0.0764 | 0.1296 |

## Critical Deflections and Radius of Curvature - Service Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|---|---|---|---|---|---|---|
| 193.00 | Antel BXA-70063-6CF | 37 | 2.457 | 0.1375 | 0.0478 | 48824 |
| 190.00 | Lightning Rod 5/8x4' | 37 | 2.457 | 0.1375 | 0.0478 | 48824 |
| 189.63 | Guy | 37 | 2.446 | 0.1378 | 0.0477 | 48824 |
| 180.00 | Sector Frame | 37 | 2.166 | 0.1426 | 0.0461 | 30066 |
| 165.50 | Sector Frame | 29 | 1.703 | 0.1345 | 0.0375 | 26529 |
| 156.42 | Guy | 29 | 1.452 | 0.1214 | 0.0359 | 17521 |
| 150.00 | Sector Frame | 29 | 1.308 | 0.1093 | 0.0373 | 24981 |
| 120.38 | Guy | 29 | 0.848 | 0.0331 | 0.0376 | 13901 |

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|---|---|---|---|---|---|---|
| 60.38 | Guy | 31 | 0.701 | 0.0190 | 0.1079 | 56924 |

## Maximum Tower Deflections - Design Wind

| Section No. | Elevation ft | Horz. Deflection in | Gov. Load Comb. | Tilt ° | Twist ° |
|---|---|---|---|---|---|
| T1 | 190 - 180 | 12.860 | 15 | 0.7830 | 0.2380 |
| T2 | 180 - 160 | 11.364 | 15 | 0.7915 | 0.2354 |
| T3 | 160 - 140 | 8.304 | 15 | 0.7045 | 0.2160 |
| T4 | 140 - 120 | 6.148 | 19 | 0.5107 | 0.2356 |
| T5 | 120 - 100 | 4.920 | 19 | 0.2396 | 0.2415 |
| T6 | 100 - 80 | 5.031 | 19 | 0.0646 | 0.3831 |
| T7 | 80 - 60 | 5.054 | 19 | 0.1007 | 0.4677 |
| T8 | 60 - 40 | 4.626 | 19 | 0.1245 | 0.5267 |
| T9 | 40 - 20 | 4.023 | 19 | 0.2517 | 0.5980 |
| T10 | 20 - 0 | 2.467 | 19 | 0.4898 | 0.6301 |

## Critical Deflections and Radius of Curvature - Design Wind

| Elevation ft | Appurtenance | Gov. Load Comb. | Deflection in | Tilt ° | Twist ° | Radius of Curvature ft |
|---|---|---|---|---|---|---|
| 193.00 | Antel BXA-70063-6CF | 15 | 12.860 | 0.7830 | 0.2380 | 16296 |
| 190.00 | Lightning Rod 5/8x4' | 15 | 12.860 | 0.7830 | 0.2380 | 16296 |
| 189.63 | Guy | 15 | 12.805 | 0.7836 | 0.2380 | 16296 |
| 180.00 | Sector Frame | 15 | 11.364 | 0.7915 | 0.2354 | 10293 |
| 165.50 | Sector Frame | 15 | 9.093 | 0.7410 | 0.2183 | 5868 |
| 156.42 | Guy | 15 | 7.839 | 0.6771 | 0.2179 | 3991 |
| 150.00 | Sector Frame | 15 | 7.101 | 0.6204 | 0.2256 | 5051 |
| 120.38 | Guy | 19 | 4.929 | 0.2445 | 0.2405 | 2598 |
| 60.38 | Guy | 19 | 4.635 | 0.1238 | 0.5254 | 12755 |

## 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 | 190 | Leg | A325N | 0.7500 | 4 | 728.84 | 19429.40 | 0.038 ✔ | 1.333 | Bolt Tension |
| T2 | 180 | Leg | A325N | 0.7500 | 4 | 0.00 | 19434.00 | 0.000 ✔ | 1.333 | Bolt Tension |
| T3 | 160 | Leg | A325N | 0.7500 | 4 | 2936.57 | 19397.40 | 0.151 ✔ | 1.333 | Bolt Tension |
| | | Top Guy Pull-Off@156.417 | A325N | 0.7500 | 2 | 2567.03 | 9277.52 | 0.277 ✔ | 1.333 | Bolt Shear |
| | | Torque Arm Top@156.417 | A325N | 0.7500 | 2 | 6114.88 | 9277.52 | 0.659 ✔ | 1.333 | Bolt Shear |

| 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Torque Arm Bottom@156.417 | A325N | 0.7500 | 2 | 4472.57 | 9277.52 | 0.482 ✔ | 1.333 | Bolt Shear |
| T4 | 140 | Leg | A325N | 0.7500 | 4 | 0.00 | 19436.20 | 0.000 ✔ | 1.333 | Bolt Tension |
| | | Top Guy Pull-Off@120.375 | A325N | 0.7500 | 2 | 3088.70 | 9277.52 | 0.333 ✔ | 1.333 | Bolt Shear |
| | | Torque Arm Top@120.375 | A325N | 0.7500 | 2 | 3927.36 | 9277.52 | 0.423 ✔ | 1.333 | Bolt Shear |
| | | Torque Arm Bottom@120.375 | A325N | 0.7500 | 2 | 3824.40 | 9277.52 | 0.412 ✔ | 1.333 | Bolt Shear |
| T5 | 120 | Leg | A325N | 0.7500 | 4 | 0.00 | 19391.30 | 0.000 ✔ | 1.333 | Bolt Tension |
| T6 | 100 | Leg | A325N | 0.7500 | 4 | 0.00 | 19427.50 | 0.000 ✔ | 1.333 | Bolt Tension |
| T7 | 80 | Leg | A325N | 0.7500 | 4 | 0.00 | 19437.10 | 0.000 ✔ | 1.333 | Bolt Tension |
| T8 | 60 | Leg | A325N | 0.7500 | 4 | 0.00 | 19405.30 | 0.000 ✔ | 1.333 | Bolt Tension |
| T9 | 40 | Leg | A325N | 0.7500 | 4 | 0.00 | 19436.00 | 0.000 ✔ | 1.333 | Bolt Tension |
| T10 | 20 | Leg | A325N | 0.7500 | 4 | 0.00 | 19435.80 | 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 | 189.63 (A) (615) | 9/16 EHS | 3500.00 | 35000.04 | 12967.50 | 17500.00 | 2.000 | 2.699 ✔ |
| | 189.63 (B) (614) | 9/16 EHS | 3500.00 | 35000.04 | 13016.30 | 17500.00 | 2.000 | 2.689 ✔ |
| | 189.63 (C) (613) | 9/16 EHS | 3500.00 | 35000.04 | 12984.40 | 17500.00 | 2.000 | 2.696 ✔ |
| T3 | 156.42 (A) (586) | 5/8 EHS | 4240.00 | 42399.99 | 13481.90 | 21200.00 | 2.000 | 3.145 ✔ |
| | 156.42 (A) (587) | 5/8 EHS | 4240.00 | 42399.99 | 13539.70 | 21200.00 | 2.000 | 3.132 ✔ |
| | 156.42 (B) (580) | 5/8 EHS | 4240.00 | 42399.99 | 13409.80 | 21200.00 | 2.000 | 3.162 ✔ |
| | 156.42 (B) (581) | 5/8 EHS | 4240.00 | 42399.99 | 13625.80 | 21200.00 | 2.000 | 3.112 ✔ |
| | 156.42 (C) (574) | 5/8 EHS | 4240.00 | 42399.99 | 13669.60 | 21200.00 | 2.000 | 3.102 ✔ |
| | 156.42 (C) (575) | 5/8 EHS | 4240.00 | 42399.99 | 13395.40 | 21200.00 | 2.000 | 3.165 ✔ |
| T4 | 120.38 (A) (604) | 9/16 EHS | 3500.00 | 35000.04 | 10269.70 | 17500.00 | 2.000 | 3.408 ✔ |
| | 120.38 (A) (605) | 9/16 EHS | 3500.00 | 35000.04 | 10212.40 | 17500.00 | 2.000 | 3.427 ✔ |
| | 120.38 (B) (598) | 9/16 EHS | 3500.00 | 35000.04 | 10058.80 | 17500.00 | 2.000 | 3.480 ✔ |
| | 120.38 (B) (599) | 9/16 EHS | 3500.00 | 35000.04 | 10383.10 | 17500.00 | 2.000 | 3.371 ✔ |

| Section No. | Elevation ft | Size | Initial Tension lb | Breaking Load lb | Actual T lb | Allowable $T_a$ lb | Required S.F. | Actual S.F. |
|---|---|---|---|---|---|---|---|---|
| T7 | 120.38 (C) (592) | 9/16 EHS | 3500.00 | 35000.04 | 10382.10 | 17500.00 | 2.000 | 3.371 ✔ |
| | 120.38 (C) (593) | 9/16 EHS | 3500.00 | 35000.04 | 10114.60 | 17500.00 | 2.000 | 3.460 ✔ |
| | 60.38 (A) (612) | 9/16 EHS | 3500.00 | 35000.04 | 11622.30 | 17500.00 | 2.000 | 3.011 ✔ |
| | 60.38 (B) (611) | 9/16 EHS | 3500.00 | 35000.04 | 11616.20 | 17500.00 | 2.000 | 3.013 ✔ |
| | 60.38 (C) (610) | 9/16 EHS | 3500.00 | 35000.04 | 11620.40 | 17500.00 | 2.000 | 3.012 ✔ |

# Compression Checks

## 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 | 190 - 180 | P2.5x.203 | 10.00 | 3.08 | 39.1 K=1.00 | 1.00 | 28.266 | 1.7040 | -14373.80 | 48167.40 | 0.298 ✔ |
| T2 | 180 - 160 | P2.5x.203 | 20.00 | 3.21 | 40.6 K=1.00 | 1.00 | 28.005 | 1.7040 | -34091.00 | 47721.80 | 0.714 ✔ |
| T3 | 160 - 140 | P2.5x.203 | 20.00 | 3.21 | 40.6 K=1.00 | 1.00 | 28.005 | 1.7040 | -46341.90 | 47721.80 | 0.971 ✔ |
| T4 | 140 - 120 | P2.5x.203 | 20.00 | 3.21 | 40.6 K=1.00 | 1.00 | 28.005 | 1.7040 | -63031.40 | 47721.80 | 1.321 ✔ |
| T5 | 120 - 100 | P2.5x.203 | 20.00 | 3.21 | 40.6 K=1.00 | 0.99 | 27.830 | 1.7040 | -61083.70 | 47424.40 | 1.288 ✔ |
| T6 | 100 - 80 | P2.5x.203 | 20.00 | 3.21 | 40.6 K=1.00 | 0.99 | 27.743 | 1.7040 | -42510.00 | 47275.10 | 0.899 ✔ |
| T7 | 80 - 60 | P2.5x.203 | 20.00 | 3.21 | 40.6 K=1.00 | 0.99 | 27.731 | 1.7040 | -41474.70 | 47255.00 | 0.878 ✔ |
| T8 | 60 - 40 | P2.5x.203 | 20.00 | 3.21 | 40.6 K=1.00 | 0.99 | 27.729 | 1.7040 | -51487.70 | 47250.80 | 1.090 ✔ |
| T9 | 40 - 20 | P2.5x.203 | 20.00 | 3.21 | 40.6 K=1.00 | 0.99 | 27.746 | 1.7040 | -55752.40 | 47280.50 | 1.179 ✔ |
| T10 | 20 - 0 | P2.5x.203 | 20.00 | 3.21 | 40.6 K=1.00 | 0.99 | 27.732 | 1.7040 | -53995.40 | 47257.10 | 1.143 ✔ |

## 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 | 190 - 180 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -4698.71 | 7695.87 | 0.611* |

| 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 | 180 - 160 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -4398.94 | 7695.87 | 0.572* |
| T3 | 160 - 140 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -5909.26 | 7695.87 | 0.768 |
| T4 | 140 - 120 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -3702.65 | 7695.87 | 0.481* |
| T5 | 120 - 100 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -3291.33 | 7695.87 | 0.428* |
| T6 | 100 - 80 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -3262.84 | 7695.87 | 0.424* |
| T7 | 80 - 60 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -3320.45 | 7695.87 | 0.431* |
| T8 | 60 - 40 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -3115.73 | 7695.87 | 0.405* |
| T9 | 40 - 20 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -3053.71 | 7695.87 | 0.397* |
| T10 | 20 - 0 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -3111.46 | 7695.87 | 0.404* |

* DL controls

## 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T2 | 180 - 160 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -2325.72 | 7695.87 | 0.302* |
| T4 | 140 - 120 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1951.98 | 7695.87 | 0.254* |
| T5 | 120 - 100 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -3177.91 | 7695.87 | 0.413 |
| T6 | 100 - 80 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1720.25 | 7695.87 | 0.224* |
| T7 | 80 - 60 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1702.88 | 7695.87 | 0.221* |
| T8 | 60 - 40 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1494.36 | 7695.87 | 0.194* |
| T9 | 40 - 20 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1610.05 | 7695.87 | 0.209* |
| T10 | 20 - 0 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1592.66 | 7695.87 | 0.207* |

* DL controls

## Bottom 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 | 190 - 180 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -2408.82 | 7695.87 | 0.313* ✔ |
| T2 | 180 - 160 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -3767.37 | 7695.87 | 0.490 ✔ |
| T3 | 160 - 140 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1953.79 | 7695.87 | 0.254* ✔ |
| T4 | 140 - 120 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -4199.49 | 7695.87 | 0.546 ✔ |
| T5 | 120 - 100 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1723.03 | 7695.87 | 0.224* ✔ |
| T6 | 100 - 80 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1705.78 | 7695.87 | 0.222* ✔ |
| T8 | 60 - 40 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1613.09 | 7695.87 | 0.210* ✔ |
| T9 | 40 - 20 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -1595.71 | 7695.87 | 0.207* ✔ |
| T10 | 20 - 0 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 86.7 K=0.65 | 14.594 | 0.5273 | -404.64 | 7695.87 | 0.053* ✔ |

* DL controls

## Top Guy Pull-Off 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 | 190 - 180 | L1 3/4x1 3/4x3/16 | 3.50 | 3.26 | 113.9 K=1.00 | 11.138 | 0.6211 | -2521.33 | 6917.59 | 0.364 ✔ |
| T3 | 160 - 140 | L2x2x5/16 | 3.50 | 3.26 | 100.3 K=1.00 | 12.937 | 1.1500 | -5134.06 | 14877.70 | 0.345 ✔ |
| T4 | 140 - 120 | L2x2x5/16 | 3.50 | 3.26 | 100.3 K=1.00 | 12.937 | 1.1500 | -6177.39 | 14877.70 | 0.415 ✔ |
| T7 | 80 - 60 | L1 3/4x1 3/4x3/16 | 3.50 | 3.26 | 113.9 K=1.00 | 11.138 | 0.6211 | -950.81 | 6917.59 | 0.137 ✔ |

## Torque-Arm Bottom 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T3 | 160 - 140 (578) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -8892.15 | 23880.20 | 0.372 ✔ |
| T3 | 160 - 140 (579) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -8768.51 | 23880.20 | 0.367 ✔ |

| 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T3 | 160 - 140 (584) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -8740.21 | 23880.20 | 0.366 ✔ |
| T3 | 160 - 140 (585) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -8786.15 | 23880.20 | 0.368 ✔ |
| T3 | 160 - 140 (590) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -8945.14 | 23880.20 | 0.375 ✔ |
| T3 | 160 - 140 (591) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -8867.61 | 23880.20 | 0.371 ✔ |
| T4 | 140 - 120 (596) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -7520.14 | 23880.20 | 0.315 ✔ |
| T4 | 140 - 120 (597) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -7491.40 | 23880.20 | 0.314 ✔ |
| T4 | 140 - 120 (602) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -7299.36 | 23880.20 | 0.306 ✔ |
| T4 | 140 - 120 (603) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -7270.79 | 23880.20 | 0.304 ✔ |
| T4 | 140 - 120 (608) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -7648.80 | 23880.20 | 0.320 ✔ |
| T4 | 140 - 120 (609) | L3x3x1/4 | 3.50 | 3.38 | 68.5 K=1.00 | 16.584 | 1.4400 | -7648.76 | 23880.20 | 0.320 ✔ |

## *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 | 190 - 180 | P2.5x.203 | 10.00 | 3.08 | 39.1 | 33.000 | 1.7040 | 2915.35 | 56233.70 | 0.052 ✔ |
| T2 | 180 - 160 | P2.5x.203 | 20.00 | 3.21 | 40.6 | 33.000 | 1.7040 | 11750.90 | 56233.70 | 0.209 ✔ |
| T3 | 160 - 140 | P2.5x.203 | 20.00 | 3.21 | 40.6 | 33.000 | 1.7040 | 11749.90 | 56233.70 | 0.209 ✔ |

## 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T1 | 190 - 180 | 5/8 | 4.66 | 4.35 | 333.7 | 21.600 | 0.3068 | 3397.02 | 6626.80 | 0.513* ✔ |
| T2 | 180 - 160 | 5/8 | 4.75 | 4.42 | 339.7 | 21.600 | 0.3068 | 7194.65 | 6626.80 | 1.086 ✔ |
| T3 | 160 - 140 | 5/8 | 4.75 | 4.42 | 339.7 | 21.600 | 0.3068 | 4123.03 | 6626.80 | 0.622 |

| 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T4 | 140 - 120 | 5/8 | 4.75 | 4.42 | 339.7 | 21.600 | 0.3068 | 3873.47 | 6626.80 | 0.585 |
| T5 | 120 - 100 | 5/8 | 4.75 | 4.42 | 339.7 | 21.600 | 0.3068 | 6191.30 | 6626.80 | 0.934 |
| T6 | 100 - 80 | 5/8 | 4.75 | 4.42 | 339.7 | 21.600 | 0.3068 | 3288.05 | 6626.80 | 0.496 |
| T7 | 80 - 60 | 5/8 | 4.75 | 4.42 | 339.7 | 21.600 | 0.3068 | 2497.52 | 6626.80 | 0.377* |
| T8 | 60 - 40 | 5/8 | 4.75 | 4.42 | 339.7 | 21.600 | 0.3068 | 4513.90 | 6626.80 | 0.681 |
| T9 | 40 - 20 | 5/8 | 4.75 | 4.42 | 339.7 | 21.600 | 0.3068 | 2180.76 | 6626.80 | 0.329* |
| T10 | 20 - 0 | 5/8 | 4.75 | 4.42 | 339.7 | 21.600 | 0.3068 | 3291.74 | 6626.80 | 0.497 |

* DL controls

## 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 | 190 - 180 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 248.96 | 11390.60 | 0.022 |
| T2 | 180 - 160 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 590.47 | 11390.60 | 0.052 |
| T3 | 160 - 140 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 802.66 | 11390.60 | 0.070 |
| T4 | 140 - 120 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 1091.74 | 11390.60 | 0.096 |
| T5 | 120 - 100 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 1058.00 | 11390.60 | 0.093 |
| T6 | 100 - 80 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 736.29 | 11390.60 | 0.065 |
| T7 | 80 - 60 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 718.36 | 11390.60 | 0.063 |
| T8 | 60 - 40 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 891.79 | 11390.60 | 0.078 |
| T9 | 40 - 20 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 965.66 | 11390.60 | 0.085 |
| T10 | 20 - 0 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 935.23 | 11390.60 | 0.082 |

## 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T5 | 120 - 100 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 289.44 | 11390.60 | 0.025 ✔ |

## Bottom 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T4 | 140 - 120 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 1010.28 | 11390.60 | 0.089 ✔ |
| T10 | 20 - 0 | L1 1/2x1 1/2x3/16 | 3.50 | 3.26 | 85.7 | 21.600 | 0.5273 | 365.71 | 11390.60 | 0.032 ✔ |

## Top Guy Pull-Off 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 | 190 - 180 | L1 3/4x1 3/4x3/16 | 3.50 | 3.26 | 72.9 | 21.600 | 0.6211 | 1980.99 | 13415.60 | 0.148 ✔ |
| T3 | 160 - 140 | L2x2x5/16 | 3.50 | 3.26 | 65.1 | 29.000 | 0.6574 | 1281.64 | 19065.20 | 0.067 ✔ |
| T7 | 80 - 60 | L1 3/4x1 3/4x3/16 | 3.50 | 3.26 | 72.9 | 21.600 | 0.6211 | 3883.67 | 13415.60 | 0.289 ✔ |

## 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T3 | 160 - 140 (576) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 11957.50 | 26562.20 | 0.450 ✔ |
| T3 | 160 - 140 (577) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 12099.10 | 26562.20 | 0.455 ✔ |
| T3 | 160 - 140 (582) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 12182.70 | 26562.20 | 0.459 ✔ |
| T3 | 160 - 140 (583) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 11911.90 | 26562.20 | 0.448 ✔ |
| T3 | 160 - 140 (588) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 11817.50 | 26562.20 | 0.445 ✔ |
| T3 | 160 - 140 (589) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 12229.80 | 26562.20 | 0.460 ✔ |
| T4 | 140 - 120 (594) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 7787.95 | 26562.20 | 0.293 ✔ |

| 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T4 | 140 - 120 (595) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 7808.80 | 26562.20 | 0.294 ✔ |
| T4 | 140 - 120 (600) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 7716.49 | 26562.20 | 0.291 ✔ |
| T4 | 140 - 120 (601) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 7853.79 | 26562.20 | 0.296 ✔ |
| T4 | 140 - 120 (606) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 7696.91 | 26562.20 | 0.290 ✔ |
| T4 | 140 - 120 (607) | L3x3x1/4 | 4.75 | 4.59 | 59.2 | 29.000 | 0.9159 | 7854.73 | 26562.20 | 0.296 ✔ |

## Torque-Arm Bottom 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 $\frac{P}{P_a}$ |
|---|---|---|---|---|---|---|---|---|---|---|
| T3 | 160 - 140 (578) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 2667.73 | 26562.20 | 0.100 ✔ |
| T3 | 160 - 140 (579) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 2623.20 | 26562.20 | 0.099 ✔ |
| T3 | 160 - 140 (584) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 2615.65 | 26562.20 | 0.098 ✔ |
| T3 | 160 - 140 (585) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 2702.33 | 26562.20 | 0.102 ✔ |
| T3 | 160 - 140 (590) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 2729.75 | 26562.20 | 0.103 ✔ |
| T3 | 160 - 140 (591) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 2771.94 | 26562.20 | 0.104 ✔ |
| T4 | 140 - 120 (596) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 4671.01 | 26562.20 | 0.176 ✔ |
| T4 | 140 - 120 (597) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 4540.53 | 26562.20 | 0.171 ✔ |
| T4 | 140 - 120 (602) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 4514.02 | 26562.20 | 0.170 ✔ |
| T4 | 140 - 120 (603) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 4453.04 | 26562.20 | 0.168 ✔ |
| T4 | 140 - 120 (608) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 4755.08 | 26562.20 | 0.179 ✔ |
| T4 | 140 - 120 (609) | L3x3x1/4 | 3.50 | 3.38 | 43.6 | 29.000 | 0.9159 | 4685.58 | 26562.20 | 0.176 ✔ |

## Section Capacity Table

| Section No. | Elevation ft | Component Type | Size | Critical Element | P lb | $SF*P_{allow}$ lb | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| T1 | 190 - 180 | Leg | P2.5x.203 | 1 | -14373.80 | 64207.14 | 22.4 | Pass |
| | | Diagonal | 5/8 | 31 | 3397.02 | 6626.80 | 51.3 | Pass |

| Section No. | Elevation ft | Component Type | Size | Critical Element | P lb | $SF*P_{allow}$ lb | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| | | Horizontal | L1 1/2x1 1/2x3/16 | 26 | -4698.71 | 7695.87 | 61.1 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 9 | -2408.82 | 7695.87 | 31.3 | Pass |
| | | Guy A@189.625 | 9/16 | 615 | 12967.50 | 17500.00 | 74.1 | Pass |
| | | Guy B@189.625 | 9/16 | 614 | 13016.30 | 17500.00 | 74.4 | Pass |
| | | Guy C@189.625 | 9/16 | 613 | 12984.40 | 17500.00 | 74.2 | Pass |
| | | Top Guy Pull-Off@189.625 | L1 3/4x1 3/4x3/16 | 6 | -2521.33 | 9221.15 | 27.3 | Pass |
| T2 | 180 - 160 | Leg | P2.5x.203 | 34 | -34091.00 | 63613.16 | 53.6 | Pass |
| | | Diagonal | 5/8 | 47 | 7194.65 | 8833.52 | 81.4 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 86 | -4398.94 | 7695.87 | 57.2 | Pass |
| | | Top Girt | L1 1/2x1 1/2x3/16 | 37 | -2325.72 | 7695.87 | 30.2 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 41 | -3767.37 | 10258.59 | 36.7 | Pass |
| T3 | 160 - 140 | Leg | P2.5x.203 | 94 | -46341.90 | 63613.16 | 72.8 | Pass |
| | | Diagonal | 5/8 | 142 | 4123.03 | 8833.52 | 46.7 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 146 | -5909.26 | 10258.59 | 57.6 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 101 | -1953.79 | 7695.87 | 25.4 | Pass |
| | | Guy A@156.417 | 5/8 | 587 | 13539.70 | 21200.00 | 63.9 | Pass |
| | | Guy B@156.417 | 5/8 | 581 | 13625.80 | 21200.00 | 64.3 | Pass |
| | | Guy C@156.417 | 5/8 | 574 | 13669.60 | 21200.00 | 64.5 | Pass |
| | | Top Guy Pull-Off@156.417 | L2x2x5/16 | 97 | -5134.06 | 19831.97 | 25.9 | Pass |
| | | Torque Arm Top@156.417 | L3x3x1/4 | 589 | 12229.80 | 35407.41 | 34.5<br>49.4 (b) | Pass |
| | | Torque Arm Bottom@156.417 | L3x3x1/4 | 590 | -8945.14 | 31832.30 | 28.1<br>36.2 (b) | Pass |
| T4 | 140 - 120 | Leg | P2.5x.203 | 156 | -63031.40 | 63613.16 | 99.1 | Pass |
| | | Diagonal | 5/8 | 176 | 3873.47 | 8833.52 | 43.8 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 205 | -3702.65 | 7695.87 | 48.1 | Pass |
| | | Top Girt | L1 1/2x1 1/2x3/16 | 157 | -1951.98 | 7695.87 | 25.4 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 160 | -4199.49 | 10258.59 | 40.9 | Pass |
| | | Guy A@120.375 | 9/16 | 604 | 10269.70 | 17500.00 | 58.7 | Pass |
| | | Guy B@120.375 | 9/16 | 599 | 10383.10 | 17500.00 | 59.3 | Pass |
| | | Guy C@120.375 | 9/16 | 592 | 10382.10 | 17500.00 | 59.3 | Pass |
| | | Top Guy Pull-Off@120.375 | L2x2x5/16 | 171 | -6177.39 | 19831.97 | 31.1 | Pass |
| | | Torque Arm Top@120.375 | L3x3x1/4 | 607 | 7854.73 | 35407.41 | 22.2<br>31.8 (b) | Pass |
| | | Torque Arm Bottom@120.375 | L3x3x1/4 | 608 | -7648.80 | 31832.30 | 24.0<br>30.9 (b) | Pass |
| T5 | 120 - 100 | Leg | P2.5x.203 | 216 | -61083.70 | 63216.72 | 96.6 | Pass |
| | | Diagonal | 5/8 | 270 | 6191.30 | 8833.52 | 70.1 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 266 | -3291.33 | 7695.87 | 42.8 | Pass |
| | | Top Girt | L1 1/2x1 1/2x3/16 | 217 | -3177.91 | 10258.59 | 31.0 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 221 | -1723.03 | 7695.87 | 22.4 | Pass |
| T6 | 100 - 80 | Leg | P2.5x.203 | 276 | -42510.00 | 63017.71 | 67.5 | Pass |
| | | Diagonal | 5/8 | 330 | 3288.05 | 8833.52 | 37.2 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 327 | -3262.84 | 7695.87 | 42.4 | Pass |
| | | Top Girt | L1 1/2x1 1/2x3/16 | 277 | -1720.25 | 7695.87 | 22.4 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 281 | -1705.78 | 7695.87 | 22.2 | Pass |
| T7 | 80 - 60 | Leg | P2.5x.203 | 336 | -41474.70 | 62990.91 | 65.8 | Pass |
| | | Diagonal | 5/8 | 347 | 2497.52 | 6626.80 | 37.7 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 351 | -3320.45 | 7695.87 | 43.1 | Pass |
| | | Top Girt | L1 1/2x1 1/2x3/16 | 337 | -1702.88 | 7695.87 | 22.1 | Pass |
| | | Guy A@60.375 | 9/16 | 612 | 11622.30 | 17500.00 | 66.4 | Pass |
| | | Guy B@60.375 | 9/16 | 611 | 11616.20 | 17500.00 | 66.4 | Pass |
| | | Guy C@60.375 | 9/16 | 610 | 11620.40 | 17500.00 | 66.4 | Pass |
| | | Top Guy Pull-Off@60.375 | L1 3/4x1 3/4x3/16 | 342 | 3883.67 | 17882.99 | 21.7 | Pass |
| T8 | 60 - 40 | Leg | P2.5x.203 | 395 | -51487.70 | 62985.31 | 81.7 | Pass |
| | | Diagonal | 5/8 | 451 | 4513.90 | 8833.52 | 51.1 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 446 | -3115.73 | 7695.87 | 40.5 | Pass |

| Section No. | Elevation ft | Component Type | Size | Critical Element | P lb | SF*$P_{allow}$ lb | % Capacity | Pass Fail |
|---|---|---|---|---|---|---|---|---|
| | | Top Girt | L1 1/2x1 1/2x3/16 | 397 | -1494.36 | 7695.87 | 19.4 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 401 | -1613.09 | 7695.87 | 21.0 | Pass |
| T9 | 40 - 20 | Leg | P2.5x.203 | 455 | -55752.40 | 63024.90 | 88.5 | Pass |
| | | Diagonal | 5/8 | 512 | 2180.76 | 6626.80 | 32.9 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 506 | -3053.71 | 7695.87 | 39.7 | Pass |
| | | Top Girt | L1 1/2x1 1/2x3/16 | 457 | -1610.05 | 7695.87 | 20.9 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 461 | -1595.71 | 7695.87 | 20.7 | Pass |
| T10 | 20 - 0 | Leg | P2.5x.203 | 515 | -53995.40 | 62993.71 | 85.7 | Pass |
| | | Diagonal | 5/8 | 524 | 3291.74 | 8833.52 | 37.3 | Pass |
| | | Horizontal | L1 1/2x1 1/2x3/16 | 530 | -3111.46 | 7695.87 | 40.4 | Pass |
| | | Top Girt | L1 1/2x1 1/2x3/16 | 517 | -1592.66 | 7695.87 | 20.7 | Pass |
| | | Bottom Girt | L1 1/2x1 1/2x3/16 | 521 | -404.64 | 7695.87 | 5.3 | Pass |
| | | | | | | | Summary | |
| | | | | | | | Leg (T4) 99.1 | Pass |
| | | | | | | | Diagonal (T2) 81.4 | Pass |
| | | | | | | | Horizontal (T1) 61.1 | Pass |
| | | | | | | | Top Girt (T5) 31.0 | Pass |
| | | | | | | | Bottom Girt (T4) 40.9 | Pass |
| | | | | | | | Guy A (T1) 74.1 | Pass |
| | | | | | | | Guy B (T1) 74.4 | Pass |
| | | | | | | | Guy C (T1) 74.2 | Pass |
| | | | | | | | Top Guy Pull-Off (T4) 31.1 | Pass |
| | | | | | | | Torque Arm Top (T3) 49.4 | Pass |
| | | | | | | | Torque Arm Bottom (T3) 36.2 | Pass |
| | | | | | | | Bolt Checks 49.4 | Pass |
| | | | | | | | **RATING = 99.1** | **Pass** |

| | |
|---|---|
| Site Name: | **Eastford, CT** |
| Job Number: | **114-13067** |
| Date: | **03/29/14** |

**Design Base Loads (Unfactored) per TIA-222-F**

| | | | | | |
|---|---|---|---|---|---|
| Foundation Mapped: | N | | | | |
| Moment (M): | 0.0 | k-ft | Concrete Compressive Strength ($f'_c$): | 3000 | psi |
| Shear/Leg (V): | 3.0 | k | Vertical Steel Rebar Size #: | 5 | |
| Compression/Leg (P): | 117.4 | k | Vertical Steel Rebar Area: | 0.31 | $in^2$ |
| Uplift/Leg (U): | 0.0 | k | # of Vertical Steel Rebars: | 8 | |
| Tower Type (GT / SST): | GT | | Vertical Steel Rebar Yield Strength ($F_y$): | 60 | ksi |
| Diameter of Prismatic Portion of Pier (d): | 2.0 | ft | Tie / Stirrup Size #: | 4 | |
| Depth to Base of Foundation: | 4.5 | ft | Tie / Stirrup Area: | 0.20 | $in^2$ |
| Pier Height Above Ground (h): | 1.00 | ft | Tie / Stirrup Spacing: | 10.0 | in |
| Length / Width of Pad (w): | 5.5 | ft | Tie / Stirrup Steel Yield Strength ($F_y$): | 40 | ksi |
| Thickness of Pad (t): | 1.5 | ft | Rebar Cage Diameter: | 16.0 | in |
| Depth Below Ground Surface to Water Table (w): | 20.0 | ft | Bending/Tension Reduction Factor ($\phi_B$): | 0.90 | |
| Unit Weight of Concrete: | 150.0 | pcf | Shear Reduction Factor ($\phi_V$): | 0.75 | |
| Unit Weight of Water: | 62.4 | pcf | Compression Reduction Factor ($\phi_V$): | 0.65 | |
| Unit Weight of Soil Above Water Table: | 120.0 | pcf | Wind Design Factor: | 1.30 | |
| Unit Weight of Soil Below Water Table: | 65.0 | pcf | Steel Elastic Modulus: | 29000 | ksi |
| Friction Angle of Uplift from Top of Pad: | 33 | Degrees | Pad Steel Rebar Size #: | 5 | |
| Friction Angle of Uplift from Base of Pad: | 33 | Degrees | Pad Steel Rebar Area: | 0.31 | $in^2$ |
| Uplift Angle Started at Top or Base of Pad (T/B): | B | | Pad Steel Rebar Yield Strength ($F_y$): | 60 | ksi |
| Allowable Skin Friction: | 0 | psf | # of Rebar in Top of Pad: | 0 | |
| Allowable Compressive Bearing Pressure: | 4000 | psf | # of Rebar in Base of Pad: | 10 | |
| Capacity Increase (Due to Transient Loads): | 1.00 | | Pad Clear Cover: | 3 | in |

**Axial Capacities and Design Moment**

| | | |
|---|---|---|
| Weight of Concrete (Bouyancy Considered): | 8.7 | k |
| Weight of Soil (Bouyancy Considered): | 33.3 | k |
| Allowable Skin Friction Resistance: | 0.0 | k |
| Controlling Failure Mode (Top / Base): | Base | |
| Allowable Uplift Capacity per Leg: | 23.6 | k |
| Compressive Design Load: | 119.5 | k |
| Allowable Compression Capacity per Leg: | 121.0 | k |
| Uplift Design Load/Uplift Capacity: | 0.00 | Result: OK |
| Compression Design Load/Compression Capacity: | 0.99 | Result: OK |

| Depth (ft) Top | Depth (ft) Bottom | Ultimate Lateral Bearing Pressure (psf) | Increment (psf/ft) | $\gamma_{Soil}$ (pcf) | Cohesion (psf) | $\phi$ (degree) |
|---|---|---|---|---|---|---|
| 0.0 | 0.5 | 0.0 | 115.0 | 115 | 0 | 0 |
| 0.5 | 3.0 | 179.6 | 359.3 | 115 | 0 | 31 |

| | | |
|---|---|---|
| Inflection Point (Below Ground Surface): | 2.9 | ft |
| Unfactored Design Moment At Inflection Point: | 6.9 | k-ft |

**Pad Strength Capacity**

| | | |
|---|---|---|
| $\beta$: | 0.85 | ACI318-05 - 10.2.7.3 |
| Lower Pad Flexural Reinforcement Ratio: | 0.0033 | OK - Minimum Reinforcement Ratio Met - ACI10.5.1 |
| Upper Pad Flexural Reinforcement Ratio: | 0.0000 | OK - Minimum Reinforcement Ratio Met - ACI10.5.1 |
| Lower Pad Flexural Reinforcement Spacing: | 7 | in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4 |
| Upper Pad Flexural Reinforcement Spacing: | 0 | in - Pad Reinforcing Spacing OK - ACI7.12.2.2 & 10.5.4 |
| One Way Design Shear ($V_u$): | 14.9 | k |
| One Way Shear Capacity ($\phi V_c$): | 81.2 | k - ACI318-05 - 11.3.1.1 |
| $V_u$ / $\phi V_c$: | 0.18 | Result: OK |
| Punching Design Shear ($V_u$): | 110.7 | k |
| Nominal Punching Shear Capacity ($\phi_c V_n$): | 293.3 | k - ACI318-05 - 11.12.2.1 |
| $V_u$ / $\phi V_c$: | 0.38 | Result: OK |
| Flexural Loading Due to Soil Pressure ($M_u$): | 43.3 | k-ft |
| Lower Steel Pad Moment Capacity ($\phi M_n$): | 197.2 | k-ft - ACI318-05 - 10.3 |
| $M_u$ / $\phi M_n$: | 0.22 | Result: OK |
| Flexural Loading Due to Uplift ($M_u$): | 0.0 | k-ft |
| Upper Steel Pad Moment Capacity ($\phi M_n$): | 0.0 | k-ft - ACI318-05 - 10.3 |
| $M_u$ / $\phi M_n$: | 0.00 | Result: OK |

**Pier Strength Capacity**

| | | |
|---|---|---|
| Design Moment ($M_u$): | 9.0 | k-ft |
| Nominal Moment Capacity ($\phi_B M_n$): | 88.9 | k-ft - ACI318-005 - 10.2 |
| $M_u/\phi_B M_n$: | 0.10 | Result: OK |
| Design Shear ($V_u$): | 3.8 | k |
| Nominal Shear Capacity ($\phi_V V_n$): | 67.9 | k - ACI318-05 - 11.3.1.1 or 11.5.7.2 |
| $V_u/\phi_V V_n$: | 0.06 | Result: OK |
| Design Tension ($T_u$): | 0.0 | k |
| Nominal Tension Capacity ($\phi_T T_n$): | 133.9 | k - ACI318-05 - 10.2 |
| $T_u/\phi_T T_n$: | 0.00 | Result: OK |
| Design Compression ($P_u$): | 152.6 | k |
| Nominal Compression Capacity ($\phi_P P_n$): | 596.6 | k - ACI318-05 - 10.3.6.2 |
| $P_u/\phi_P P_n$: | 0.26 | Result: OK |
| Pier Reinforcement Ratio: | 0.005 | Reinforcement Ratio is Satisfactory - ACI318-05 - 10.9.1 & 10.8.4 |
| $M_u/\phi_B M_n + T_u/\phi_T T_n$: | 0.10 | Result: OK |

| | |
|---|---|
| Site Name: | **Eastford, CT** |
| Engineering Number: | **114-13067** |
| Date: | **03/29/14** |

**Design Standard per TIA-222-F**

| | | |
|---|---|---|
| Anchor Radius: | 150.0 | ft |
| Uplift (Unfactored): | 45.3 | k |
| Shear (Unfactored): | 53.5 | k |
| Berm Present: | N | |
| Design Anchor Rod: | Y | |
| Mapped Foundation: | N | |
| Anchor Base Depth (d): | 8.0 | ft |
| Width of Anchor (W): | 5.5 | ft |
| Length of Anchor (L): | 11.5 | ft |
| Thickness of Anchor (t): | 2.0 | ft |
| Depth Below Ground Surface to Water Table (w): | 20.0 | ft |
| Soil Uplift at Base / Top of Anchor (B/T): | T | |
| Unit Weight of Concrete: | 150.0 | pcf |
| Unit Weight of Soil Above Water Table: | 120.0 | pcf |
| Unit Weight of Water: | 62.4 | pcf |
| Submerged Soil Unit Weight: | 65.0 | pcf |
| Internal Angle of Friction: | 36 | Degrees |
| Cohesion: | 0 | psf |
| Allowable Skin Friction of Pad Sides to Soil: | 0 | psf |
| Ultimate Coefficient of Shear Friction: | 0.45 | |
| Maximum Top Conical Failure Angle: | 31 | Degrees |
| Maximum Base Conical Failure Angle: | 31 | Degrees |
| Allowable Capacity Increase: | 1.33 | (Due to Transient Loads) |

**Uplift**

| | | |
|---|---|---|
| Weight of Concrete (Buoyancy Effect Considered): | 19.0 | k |
| Weight of Soil (Buoyancy Effect Considered): | 99.5 | k |
| Uplift Resistance from Skin Friction: | 0.0 | k |
| Allowable Uplift Resistance (FS = 1.5 to 2): | 64.9 | k |
| Uplift Design Load/Allowable Uplift Resistance: | 0.70 | Result: OK |

**Shear**

| | | |
|---|---|---|
| Ultimate Shear Friction Resistance Due to Normal Force - Uplift: | 8.7 | k |
| Passive Pressure: | 3236 | psf |
| Ultimate Passure Pressure Resistance: | 99.2 | k |
| Allowable Shear Resistance (FS = 1.5 to 2): | 53.9 | k |
| Shear Design Load/Allowable Shear Resistance: | 0.99 | Result: OK |

**Anchor Rod Capacity**

| | | |
|---|---|---|
| # of Anchor Rods: | 1 | |
| Anchor Rod Gross Area: | 2.41 | $in^2$ |
| Anchor Rod Net Area: | 2.41 | $in^2$ |
| Anchor Rod Yield Strength: | 48 | ksi |
| Anchor Rod Ultimate Strength: | 62 | ksi |
| Allowable Stress Increase: | 1.33 | |
| Resultant Tensile Load: | 70.1 | k |
| Anchor Rod Tensile Resistance: | 92.4 | k |
| Resultant Tensile Load / Anchor Rod Tensile Resistance: | 0.76 | Result: OK |

**Strength Analysis of Reinforced Concrete**

| | | |
|---|---|---|
| Concrete Compressive Srength ($f'_c$): | 3000 | psi |
| Longitudinal Rebar Yield Strength: | 60000 | psi |
| # Longitudinal Rebar (Top): | 6 | |
| # Longitudinal Rebar (1 Side): | 5 | |
| Rebar Size: | 4 | |
| Wind Load Factor: | 1.3 | |
| Strength Reduction Factor for Shear ($\phi_v$): | 0.75 | |
| Strength Reduction Factor for Flexure ($\phi_b$): | 0.9 | |
| Compression Zone Factor ($\beta_1$): | 0.85 | |
| Area of Single Rebar: | 0.20 | $in^2$ |
| | | |
| One Way Shear due to Shear Load ($V_u$): | 19.2 | k |
| Nominal One Way Shear Capacity for Shear Load ($\phi_c V_n$): | 122.3 | k |
| $V_u/\phi_v V_n$: | 0.16 | Result: OK |
| One Way Shear due to Uplift ($V_u$): | 25.2 | k |
| Nominal One Way Shear Capacity for Uplift ($\phi_c V_n$): | 108.4 | k |
| $V_u/\phi_v V_n$: | 0.23 | Result: OK |
| | | |
| Pad Flexure due to Shear Load ($M_u$): | 100.1 | k-ft |
| Nominal Flexural Capacity for Shear Load ($\phi_b M_n$): | 279.0 | k-ft |
| Pad Flexure due to Uplift ($M_u$): | 84.6 | k-ft |
| Nominal Flexural Capacity for Uplift ($\phi_b M_n$): | 107.9 | k-ft |
| $M_u/\phi_b M_n$ (Max.): | 0.78 | Result: OK |

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

Sprint Existing Facility

Site ID: CT33XC016

Eastford
34 Old Toute 44
Eastford, CT 06242

**October 25, 2012**

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

EBI Consulting
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October 25, 2012

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

Re: Emissions Values for Site: **CT33XC016 – Eastford**

EBI Consulting was directed to analyze the proposed upgrades to the existing Sprint facility located at 34 Old Toute 44, Eastford, CT, for the purpose of determining whether the emissions from the proposed Sprint equipment upgrades on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of μW/cm2 calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limit for the cellular band is approximately 567 $\mu W/cm^2$, and the general population exposure limit for the PCS band is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

## CALCULATIONS

Calculations were done for the proposed upgrades to the existing Sprint Wireless antenna facility located at 34 Old Toute 44, Eastford, CT, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario. Actual values seen from this site will be dramatically less than those shown in this report. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all emissions were calculated using the following assumptions:

1) 2 CDMA Carriers (1900 MHz) were considered for each sector of the proposed installation.
2) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.
3) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The actual gain in this direction was used per the manufactures supplied specifications.
4) The antenna used in this modeling is the DB980H90E-M. This is based on feedback from the carrier with regards to anticipated antenna selection. This antenna has a 14.95 dBd gain value at its main lobe at 1900 MHz. All calculations were performed assuming the main lobe of the antenna was focused at the base of the tower to present a worst case scenario.

5) The antenna mounting height centerline of the proposed antennas is **165.5 feet** above ground level (AGL)
6) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

| Site ID | CT33XC016 - Eastford |
|---|---|
| Site Addresss | 34 Old Toute 44, Eastford, CT, 06242 |
| Site Type | Guyed Tower |

**Sector 1**

| Antenna Number | Antenna Make | Antenna Model | Radio Type | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBd) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP | Power Density Value | Power Density Percentage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1a | Decibel | DB980H90E-M | RRH | 1900 MHz | CDMA / LTE | 20 | 2 | 40 | 14.95 | 165.5 | 159.5 | 1/2 " | 0.5 | 0 | 1114.4485 | 15.7487 | 1.57487% |
| | | | | | | | | | | | | | | Sector total Power Density Value: | | 1.575% | |

**Sector 2**

| Antenna Number | Antenna Make | Antenna Model | Radio Type | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBd) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP | Power Density Value | Power Density Percentage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2a | Decibel | DB980H90E-M | RRH | 1900 MHz | CDMA / LTE | 20 | 2 | 40 | 14.95 | 165.5 | 159.5 | 1/2 " | 0.5 | 0 | 1114.4485 | 15.7487 | 1.57487% |
| | | | | | | | | | | | | | | Sector total Power Density Value: | | 1.575% | |

**Sector 3**

| Antenna Number | Antenna Make | Antenna Model | Radio Type | Frequency Band | Technology | Power Out Per Channel (Watts) | Number of Channels | Composite Power | Antenna Gain in direction of sample point (dBd) | Antenna Height (ft) | analysis height | Cable Size | Cable Loss (dB) | Additional Loss | ERP | Power Density Value | Power Density Percentage |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3a | Decibel | DB980H90E-M | RRH | 1900 MHz | CDMA / LTE | 20 | 2 | 40 | 14.95 | 165.5 | 159.5 | 1/2 " | 0.5 | 0 | 1114.4485 | 15.7487 | 1.57487% |
| | | | | | | | | | | | | | | Sector total Power Density Value: | | 1.575% | |

**Site Composite MPE %**

| Carrier | MPE % |
|---|---|
| Sprint | 4.725% |
| Verizon Wireless | 8.180% |
| Nextel | 2.070% |
| AT&T | 5.950% |
| **Total Site MPE %** | **20.925%** |

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## Summary

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

The anticipated Maximum Composite contributions from the Sprint facility are **4.725% (1.575% from each sector)** of the allowable FCC established general public limit considering all three sectors simultaneously sampled at the ground level.

The anticipated composite MPE value for this site assuming all carriers present is **20.925%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government

Scott Heffernan
RF Engineering Director

**EBI Consulting**
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