EVERSOURCE ENERGY

56 Prospect Street
P.O. Box 270
Hartford, CT 06141-0270

John R. Morissette
Project Manager - Transmission Siting - CT

February 16, 2016

Robert Stein, Chairman
Connecticut Siting Council
Ten Franklin Square
New Britain, CT 06051

Dear Chairman Stein:

The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") submits the attached original and fifteen (15) copies of a Request for Tower Sharing seeking the Council approval of the tower sharing of an existing telecommunications tower in Bolton, Connecticut pursuant to the exemption provided under Sections 16-50j-88 to 16-50j-90 of the Regulations of Connecticut State Agencies.

Also, attached is a check for the filing fee in the amount of $625.

The First Selectman of the Town of Bolton and the property owner has been informed of the requested approval of sharing this tower in Bolton.

If you have any questions or comments, please call me at (860) 728-4532.

Sincerely,

John R. Morissette
Project Manager - Transmission Siting - CT

Attachment: Request for Tower Sharing

cc: Robert Morra, First Selectman, Town of Bolton
Milton Hathaway, Mountaintop Services, Inc.

THE CONNECTICUT LIGHT AND POWER COMPANY DOING BUSINESS AS EVERSOURCE ENERGY

REQUEST FOR TOWER SHARING ON AN EXISTING TELECOMMUNICATIONS FACILITY IN THE TOWN OF BOLTON, CONNECTICUT

A. Introduction:

Pursuant to Regulations of Connecticut State Agencies ("RCSA") §§16-50j-88 to 16-50j-90, and Connecticut General Statutes ("CGS") §16-50k, The Connecticut Light and Power Company doing business as Eversource Energy ("Eversource") hereby requests approval of the Connecticut Siting Council (the "Council") for a proposed tower sharing on an existing wireless telecommunications facility located at 130 Vernon Road, Bolton, Connecticut (the "Property"). The latitude and longitude of the location of this telecommunications facility are 41° 48' 10" and 72° 26' 30" respectively. Specifically, Eversource proposes to colocate telecommunications equipment on an existing guyed telecommunications lattice tower (the "Tower") that is owned and maintained by Mountaintop Enterprises, Inc. ("Mountaintop"). Eversource submits that no certificate of environmental compatibility and public need pursuant to CGS §16-50k ("Certificate") is required because the proposed tower sharing would satisfy the requirements set out in RCSA §§16-50j-88 to 16-50j-90 and therefore would qualify for exemption.

B. Background:

Eversource is in the process of expanding its 900 megahertz ("MHz") Distribution Supervisory Control and Data Acquisition ("DSCADA") system throughout Connecticut. This system enhances the reliability of the electrical distribution system and public safety by means of remotely operating line disconnect equipment where wireless operated power switching equipment has been installed. Furthermore, Eversource is currently adding base stations throughout its service territory to improve land mobile radio voice communications with electrical workers in the field when they are performing maintenance work on or repairs to the electric system infrastructure. Mountaintop currently owns and operates a telecommunications tower located on the Property. The total height of the existing guyed lattice tower is approximately 280 feet above ground level ("AGL").

C. Project Description :

Eversource proposes to make the following equipment modifications to the Tower (the "Project"):

- Attach one new 9-foot long omnidirectional antenna to a new 3-foot long standoff mount on the Tower, at a centerline height of 234.7 feet AGL;
- Attach one new 16-foot dipole antenna to a new 6-foot long side-arm mount on the Tower, at a centerline height of 218 feet AGL;
- Remove one 5.5-foot diameter microwave dish currently mounted on the Tower, at a centerline of 153 feet AGL.

Eversource also proposes to install associated radio equipment in the Tower's equipment shelter that currently houses Eversource's existing telecommunications equipment. Emergency back-up power will be supplied by the existing battery and generator located on site. For elevation and location drawings of the proposed installations, please see Attachment 1: Project Plans.

Mountaintop has agreed to Eversource's proposed modifications and has entered into a lease agreement with Eversource to allow for such modifications and to provide necessary associated rights to Eversource to access the Property. Please see Attachment 2: Letter of Authorization from Mountaintop Enterprises Incorporated, stating its agreement with Eversource's applying for and obtaining permits needed for the proposed shared use of the Tower.

A structural loading analysis has been performed to determine if the Tower and foundation are capable of supporting the additional loading from the proposed Eversource installations. This analysis determined that the Tower and foundation can support the loading from the proposed installations. A report summarizing the structural analysis is included as Attachment 3: Structural Analysis Report.

D. The proposed modifications would not have a substantial adverse environmental effect because:

1) Wetlands and Watercourses

There are no wetlands or watercourses located on or near the location of the proposed modifications; therefore, the Project would not have an adverse effect on wetlands or watercourses.

2) Wildlife and Vegetation

The Project would not have a significant adverse effect on wildlife or vegetation because its scope is limited to the area within the existing chain link fenced compound.

3) Forests, Park Lands and Open Space

The Property contains no areas of recreation or public interest administered by any federal, state, local, or private agencies.

4) Visual

The Project would have only minimal visual impact due to the dimensions and heights of the proposed antennas on the existing tower. For a visual comparison of the existing and planned compound configuration, including the Tower with the planned modifications, please refer to Attachment 1: Project Plans.

5) Noise

The main source of noise at the facility would be from the existing outdoor generator located adjacent to the existing shelter. Sound emitted by the facility after completion of the proposed modifications would continue to comply with State regulations.

6) Safety and Health

The proposed modifications would not create any safety or health hazards to persons or property.

Eversource does not anticipate the need for specific traffic control measures during construction on the Property or equipment and materials delivery. Subsequent to completion of construction, the proposed modifications would not generate any additional traffic to the area beyond the current periodic maintenance visits.

The Project would have minimal impact on the air quality of the telecommunications facility. Eversource plans to continue to use the existing outdoor emergency generator to supply backup power for its equipment on this facility; the additional incremental power needed as a result of the addition of the Eversource equipment to the facility would not have any impact on emissions beyond present day levels.

Radio-signal emissions from the proposed equipment, after installation on the Property, would not exceed the total radio-frequency ("RF") electromagnetic power density level permitted by the Federal Communications Commission ("FCC"). To ensure compliance with the applicable standard, Eversource commissioned C Squared Systems to perform a calculated power-density analysis for the proposed Eversource antenna installations using the methodology prescribed by the FCC's Office of Engineering and Technology ("OET") Bulletin No. 65, Edition 97-01 (August 1997). The analysis verifies that after completion of the proposed modifications, composite emissions from the facility would be below the maximum power density levels as outlined by the FCC in OET Bulletin 65 Ed. 97-01. The highest expected percent of Maximum Permissible Exposure, at ground level, is 77.60% of the FCC limit. For details of the analysis please refer to Attachment 4: Calculated Radio Frequency Emissions Report.

7) Soil Erosion and Sedimentation Control.

The Project would not require any site work other than the installation and removal of the equipment described above. Access to the tower will be from within the fenced in area at the base of the tower. Though not anticipated, to the extent that it may be needed during the Project, CL&P would apply soil

erosion and sediment control practices pursuant to the 2002 *Connecticut Guidelines for Soil Erosion and Sediment Control.*

E. Schedule:

The proposed modifications would begin as soon as practical after issuance of the requested approval by the Council and the work would be less than four months in duration. Eversource anticipates that construction would be completed by the end of the second quarter of 2016.

F. Conclusion:

RCSA §16-50j-88 provides that a Certificate is not required for a proposed sharing of a telecommunications facility that the Council determines satisfies the criteria set out in RCSA §§16-50j-88 to 16-50j-90. Based on the factors explained above, Eversource respectfully submits that the modifications of the antennas and other equipment at this existing telecommunications facility would be technically, legally, environmentally and economically feasible and would satisfy the criteria of RCSA §§16-50j-88 to 16-50j-90 for exemption from the requirement for a Certificate. Accordingly, Eversource requests that the Council issue an order approving this proposed tower sharing pursuant to RCSA §16-50j-88.

G. Communications regarding this Request for Tower Sharing should be directed to:

Mr. John R. Morissette
Project Manager - Transmission Siting - CT
Eversource Energy
P.O. Box 270
Hartford, CT 06141-0270
Telephone: (860) 728-4532

Eversource Energy

By: _____
John R. Morissette
Project Manager - Transmission Siting - CT

Attachments:

Attachment 1: Project Plans
Attachment 2: Letter of Authorization from Mountaintop Enterprises Inc.
Attachment 3: Structural Analysis Report
Attachment 4: Calculated Radio Frequency Emissions Report

Attachment 1: Project Plans

EVERSOURCE ENERGY

BOLTON
130 VERNON ROAD
BOLTON, CT 06043

SITE DIRECTIONS

FROM: 107 SELDEN STREET, BERLIN, CONNECTICUT **TO:** 130 VERNON ROAD, BOLTON, CONNECTICUT

1.	HEAD WEST TOWARD SELDEN ST	59 FT
2.	TURN RIGHT ONTO SELDEN ST	0.2 MI
3.	TURN RIGHT ONTO BERLIN TURNPIKE	4.5 MI
4.	USE THE RIGHT 2 LANES TO TAKE THE US-5/CT-15 RAMP TO I-91/HARTFORD	0.3 MI
5.	CONTINUE ONTO CT-15 N/US-5 N	3.8 MI
6.	CONTINUE ONTO CT-15 N	0.8 MI
7.	USE THE LEFT 2 LANES TO MERGE ONTO I-84 E TOWARD BOSTON	2.4 MI
8.	USE THE RIGHT 2 LANES TO TAKE EXIT 59 FOR I-384 E TOWARD PROVIDENCE	0.8 MI
9.	KEEP LEFT TO CONTINUE TOWARD I-384 E	0.6 MI
10.	CONTINUE ONTO I-384 E	7.2 MI
11.	CONTINUE ONTO US-44 E/US-6 E	0.2 MI
12.	CONTINUE STRAIGHT ONTO US-44 E (SIGNS FOR COVENTRY/MANSFIELD)	0.3 MI
13.	TURN LEFT ONTO QUARRY RD	0.7 MI
14.	CONTINUE ONTO BOLTON RD/VERNON RD DESTINATION WILL BE ON THE LEFT	194 FT

GENERAL NOTES

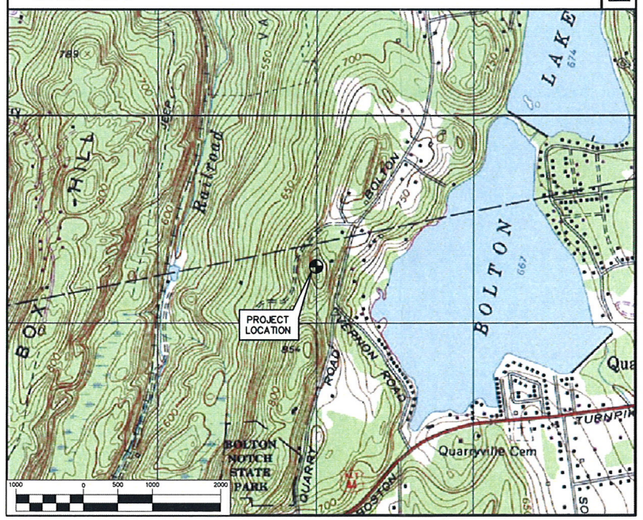
1. PROPOSED ANTENNA LOCATIONS AND HEIGHTS PROVIDED BY EVERSOURCE ENERGY.

PROJECT SCOPE

1. THE PROPOSED SCOPE OF WORK GENERALLY INCLUDES THE INSTALLATION OF ONE (1) DECIBEL DB 589-Y OMNI ANTENNA, ONE (1) COMPROD 531-70HD DIPOLE ANTENNA AND ASSOCIATED CABLING PROPOSED TO BE INSTALLED ON THE EXISTING TOWER.
2. ADDITIONALLY ONE (1) 5'-5"ø MICROWAVE DISH AND ONE (1) COAXIAL CABLE ARE TO BE REMOVED.
3. NO CHANGES ARE PROPOSED TO THE EXISTING UTILITIES SERVICING THE COMPOUND AT THIS TIME.

VICINITY MAP

SCALE: 1" = 1000'



PROJECT SUMMARY

SITE NAME:	BOLTON
SITE ADDRESS:	130 VERNON ROAD BOLTON, CT 06043
LESSEE/ TENANT:	EVERSOURCE ENERGY 107 SELDEN STREET BERLIN, CT 06037
CONTACT PERSON:	STEVE FLORIO EVERSOURCE ENERGY SERVICE COMPANY (860) 665-5611
TOWER COORDINATES:	LATITUDE: 41°-48'-10" N LONGITUDE: 72°-26'-30" W GROUND ELEVATION: 825'± A.M.S.L. TOWER COORDINATES AND GROUND ELEVATION REFERENCED FROM CONNECTICUT SITING COUNCIL DATABASE.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV. NO.
T-1	TITLE SHEET	1
C-1	PARTIAL SITE PLAN AND ELEVATION	1

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	11/18/15	CTP	DMD	CSC - ISSUED FOR SITING COUNCIL
1	09/24/15	CTP	DMD	CSC - REVISED PER CLIENT REVIEW
0	07/24/15	CTP	DMD	CSC - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

EVERSOURCE ENERGY

CENTEK engineering
Centered on Solutions
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405
www.CentekEng.com

EVERSOURCE ENERGY

WIRELESS COMMUNICATIONS FACILITY

BOLTON

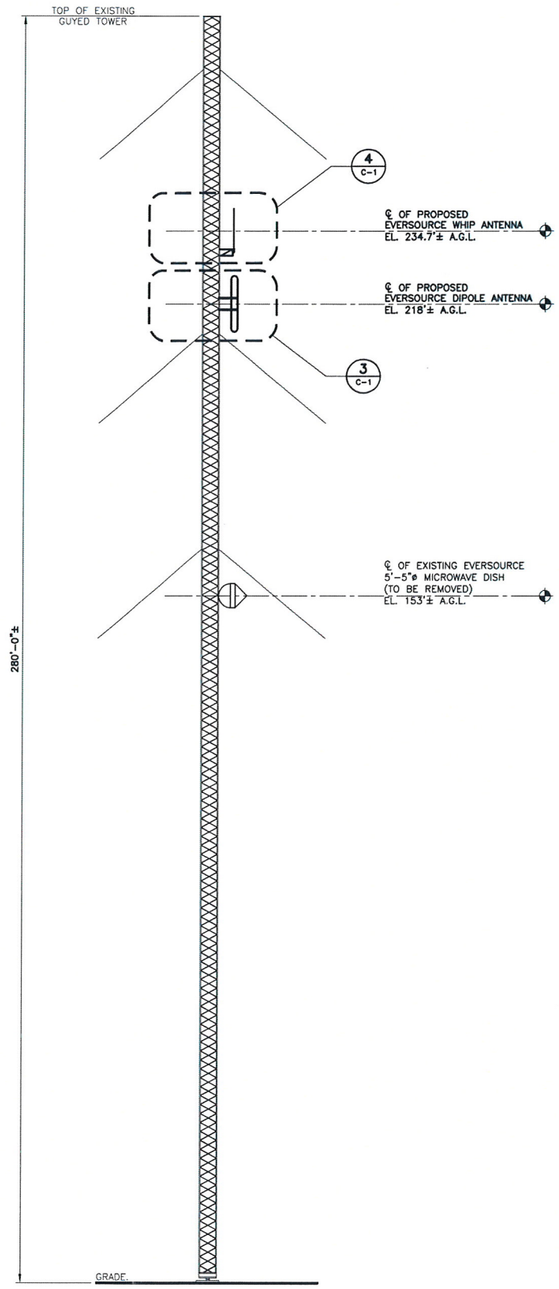
130 VERNON ROAD
BOLTON, CT 06043

DATE: 07/23/15
SCALE: AS NOTED
JOB NO. 15121.000

TITLE SHEET

T-1

Sheet No. 1 of 2



TOWER STRUCTURAL NOTE:

1. REFER TO STRUCTURAL ANALYSIS REPORT AS PREPARED BY AECOMM PROJECT NUMBER: MTS-013 DATED SEPTEMBER 24, 2015.

NOTE:
NOT ALL EXISTING ANTENNAS SHOWN FOR CLARITY

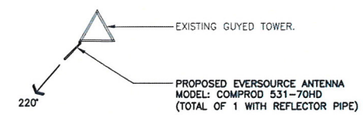
2 / C-1 TOWER ELEVATION

SCALE: 1" = 15'

GRAPHIC SCALE

15 0 7.5 15 30 60

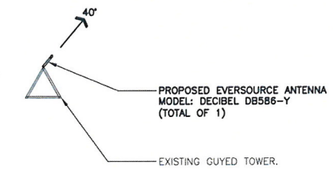
(IN FEET)
1 inch = 15 ft.



3 / C-1 PLAN VIEW AT EL. 218'± A.G.L.

NOT TO SCALE

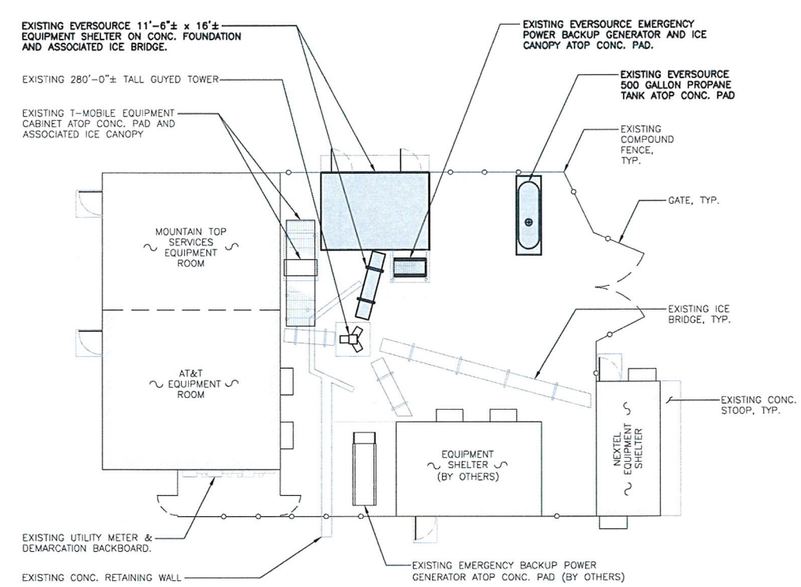
APPROX. NORTH



4 / C-1 PLAN VIEW AT EL. 234.7'± A.G.L.

NOT TO SCALE

APPROX. NORTH



1 / C-1 COMPOUND PLAN

SCALE: 1" = 10'

APPROXIMATE NORTH

GRAPHIC SCALE

10 0 5 10 30 40

(IN FEET)
1 inch = 10 ft.

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
2	11/18/15	CTP	DMD	CSC - ISSUED FOR SITING COUNCIL
1	08/24/15	CTP	DMD	CSC - REVISED PER CLIENT REVIEW
0	07/24/15	CTP	DMD	CSC - ISSUED FOR CLIENT REVIEW

PROFESSIONAL ENGINEER SEAL

EVERSOURCE ENERGY

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(203) 488-8587 Fax
63-2 North Branford Road, Branford, CT 06405

EVERSOURCE ENERGY
WIRELESS COMMUNICATIONS FACILITY
BOLTON
130 VERNON ROAD
BOLTON, CT 06043

DATE: 07/23/15
SCALE: AS NOTED
JOB NO. 15121.000

PARTIAL SITE PLAN AND ELEVATION

C-1

Sheet No. 2 of 2

Attachment 2: Letter of Authorization from Mountaintop Enterprises Inc.

MOUNTAINTOP SERVICES
Real Estate
Contractor Services Development & Sales

LETTER OF AUTHORIZATION for CT Siting Council Application

LEESOR: Mountaintop Enterprises, Inc
LEESEE: The Connecticut Light & Power Company, d/b/a Eversource Energy
SITE: 130 Vernon Road., Bolton CT 06043

I, Milton Hathaway, President of Mountaintop Services, Inc., who manages Mountaintop Enterprises, Inc. and its tower facility located at the address identified above (the "Lessor"), do hereby authorize Eversource, its successors and assigns, and/or its agent, (collectively, the "Leesee") to act as Mountaintop Enterprise's non-exclusive agent for the sole purpose of filing and consummating any permit application (s) as may be required by the CT Siting Council's applicable permitting authorities for Licensee's telecommunications' installation, strictly for their Second Amendment to their existing Lease currently in negotiation with the Lessor.

We understand that this application may be denied, modified, or approved with conditions which we require notice thereof. The above authorization is limited to the acceptance by Leesee only of conditions related to Leesee's installation and any such conditions of approval or modification will be Licensee's sole responsibility.

Signature:

Milton Hathaway

Print Name: Milton Hathaway
Mountaintop Services, Inc.

10 Quarry Road Suites C Bolton, CT 06043
Office: 860-647-7772 Fax: 860-647-8519
mts@mountaintopservices.com

Attachment 3: Structural Analysis Report

AECOM

Submitted to
Eversource Energy
107 Selden Street
Berlin, CT 06037

Submitted by
AECOM
500 Enterprise Drive,
Suite 3B
Rocky Hill, CT 06067
September 24, 2015

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 280' GUYED TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

EVERSOURCE ENERGY

Site ID : Bolton, CT
Site Address: 130 Vernon Road
Bolton, CT

36931459.00000
MTS-013

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- TNX TOWER FEEDLINE DISTRIBUTION
- TNX TOWER FEEDLINE PLAN
- GUY TENSIONS AND TOWER REACTIONS
- TNX TOWER DETAILED OUTPUT
- FOUNDATION ANALYSIS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 280' guyed lattice tower located at 130 Vernon Road in Bolton, Connecticut. The analysis was conducted in accordance with the 2005 Connecticut State Building Code which requires a three second gust wind speed of 100 mph which converts to a 80 mph fastest mile per 2003 IBC (Table 1609.3.1) and the TIA/EIA-222-F standard for a wind velocity of 85 mph (fastest mile). The wind speed from the TIA/EIA-222-F governs the design at 85 mph (fastest mile) and 74 mph (fastest mile) concurrent with ½" ice. The antenna loading considered in the analysis consists of all existing and proposed antennas, transmission lines, and ancillary items as outlined in the Introduction Section of this report.

The proposed Eversource Energy (formerly Northeast Utilities) modification is as follows:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
Remove: (1) 6' Microwave Dish – Gamma Sector (250° Azimuth) (1) EW63 Coaxial CAble	Eversource Energy (existing)	@ EL. 153'
Install: (1) Decibel DB 589-Y Omni Antenna (1) 1-1/4" Coaxial Cable	Eversource Energy (Proposed)	@ EL. 234.7'
(1) Comprod 531-70HD Dipole Antenna (1) 7/8" Coaxial Cable		@ EL. 218'

The results of the analysis indicate that the tower structure, guy cables and foundation are in compliance with the proposed loading conditions without modification. **The existing tower, guy cables and foundation are considered structurally adequate for the proposed antenna loading with the wind load classification specified above.**

1. EXECUTIVE SUMMARY (continued)

This analysis is based on:

1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Geotechnical information taken from report by Dr. Clarence Welti, P.E., P.C. Geotechnical Engineering dated February 13, 1991.
3) Tower geometry, structural member sizes and foundation information taken from structural analysis performed by L&R Communications, Limited, L&R File No. 92-43-023, signed and sealed October 16, 1992.
4) Structural analysis performed by URS Corp. for Eversource Energy (formerly Northeast Utilities), Job No. MTS-012 / 36931339, signed and sealed September 29, 2014.
5) Tower inventory mapping of existing tower antennas, mounts and cables performed by Northeast Towers, Inc. for Mountaintop Services, obtained via e-mail, dated November 10, 2014.
6) Previous Structural analysis performed by URS Corporation on behalf of T-Mobile, project no. 36931359 / NSS-014, signed and sealed November 18, 2014.
7) Antenna inventory update for Eversource Energy (formerly Northeast Utilities) obtained via e-mail dated March 24, 2015 (Updated inventory via e-mail dated May 1, 2015)
8) Antenna and mount configuration as specified on the inventory page following this Executive Summary.

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

If you should have any questions, please call.

Sincerely,

AECOM, legacy URS Corporation AES

STATE OF CONNECTICUT
RICHARD A. SAMBOR
No. 5057
LICENSED
PROFESSIONAL ENGINEER

Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/mcd

cc: CF/Book – AECOM

2. INTRODUCTION

The subject tower is located at 130 Vernon Road in Bolton, Connecticut. The structure is a 280' guyed lattice tower. The inventory is summarized in the table below:

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
10' Omnidirectional Antenna	Not in Operation	3' Standoff	284'	1-1/4"
(1) LED Medium Intensity Beacon Light (DLS L-864/L-865)	Tower (existing)	Top of Tower Plate	280'	(1) 18 AWG Dual Flashhead Cable (1) 1/2" Power Cable
FM Antenna	WMRQ (Existing)	5' Standoff	289'	1-1/4"
Kathrein MF-950B Grid Antenna	WBMW (Existing)	Leg Mounted	280'	1-1/4"
14' Whip antenna	Mountaintop Services (Existing)	3' Standoff	260'	1-1/4" (shared with dipole)
ASPA-711 Dipole Antenna	Mountaintop Services (Existing)	1' Standoff	260'	1-1/4" (shared with whip)
(1) Decibel DB-589-Y Omni Antenna	**Eversource Energy (Proposed)**	(1) 3' Side-Arm (mounted at 230')	**234.7'**	**(1) 1-1/4"**
(1) 531-70HD Dipole Antenna	**Eversource Energy (Proposed)**	(1) 6' Side-Arm	**218'**	**(1) 7/8"**
(3) AIR21 B4A/B2P (3) AIR21 B2A/B4P (3) TMA Units	T-Mobile (Existing)	(3) T-Arm Mounts	226'	(12) 1-5/8" (1) 1-5/8" Fiber Optic Cable
8' Dish with Radome	Eversource Energy (Existing)	Leg Mount	212'-6"	(1) EW63
8' Dish with Radome	Eversource Energy (Existing)	Leg Mount	204'-6"	(1) EW63
6' Dish with Radome	Eversource Energy (Existing)	Leg Mount	204'-6"	(1) EW63
None	Not in Use	6' Standoff	180'-6"	N/A
(6) Powerwave 7770 Panel Antennas (3) SBNH-1D6565C Panel Antennas (6) LGP21401 TMAs (12) LGP21901 Diplexers (6) Ericsson RRUs (1) Surge Suppressor	AT&T (Existing)	(3) Andrew 12' Sector Frames, (SF-U12-3-72)	164'	(12) 1-5/8" (1) Fiber Optic Cable (2) DC Cables
5.5' Dish with Radome	Eversource Energy (Existing)	Leg Mount	153'	(1) EW63

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(3) L-810 Obstruction Lights	Tower (existing)	Leg Mount	140'	(1) 1/2" DC Cable
22' Whip Antenna	Unknown (Existing)	6' Standoff	132'	(1) 1-1/4"
12' Dipole	Unknown (Existing)	6' Standoff	132'	(1) 1-1/4"
12.5' Omni	Not in Operation	1.5' Standoff	125'	Dead Line
1' Yagi	Not in Operation	Leg Mount	124'-6"	N/A
Alpha: (1) BXA-70063-6CF (2) LPA-80080-4CF (2) LPA-171080-8CF *Beta:* (1) BXA-70063-6CF (2) LPA-80063-4CF (2) LPA-171063-8CF	Verizon (existing)	(2) T-Arms	121'	(4) 1-5/8" (6) 1 1/4"
4' Dish with Radome	Eversource Energy (Existing)	Leg Mount	113'	(1) EW-90
9' Dish with Radome	Eversource Energy (Existing)	Leg Mount	104'-6"	(1) EW-63

This structural analysis of the communications tower was performed by AECOM for Eversource Energy (formerly Northeast Utilities). The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing and proposed antenna loads. This analysis was conducted to evaluate stress on the tower and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

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

The Connecticut State Building Code requires a three second gust wind speed of 100 mph which converts to a 80 mph fastest mile per 2003 IBC (Table 1609.3.1). The TIA/EIA-222-F requires a basic wind speed of 85 mph fastest mile. In this case the wind speed from the TIA/EIA-222-F governs the design.

The analysis was conducted using TNX Tower 6.1.3.1. Two load conditions were evaluated as shown below which were compared to allowable stresses according to AISC and TIA/EIA.

Load Condition 1 = 85 mph (fastest mile) Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 74 mph (fastest mile) Wind Load (with ice) + Ice Load + Tower Dead Load

Please note that wind pressure is a function of velocity squared. Under Load Condition 2, a 25 percent reduction in wind pressure is allowed by code to account for the unlikelihood of the full wind pressure and ice load occurring at the same time. The same results may be achieved by utilizing a lower wind pressure without taking the 25 percent reduction, as shown above.

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

4. FINDINGS AND EVALUATION

Stresses on the tower structure were evaluated to compare with allowable stresses in accordance with AISC. The calculated stresses under the proposed loading were within the allowable limits (see table below). Detailed analysis and calculations for the proposed load condition are provided in section 6 of this report.

COMPONENT (SECTION NO.)	CONTROLLING COMPONENT / ELEVATION	STRESS RATIO (% CAPACITY)	PASS/FAIL
Legs (T12)	40'-60'	90.8 %	Pass
Diagonal (T1)	260'-280'	77.3 %	Pass
Sec. Horizontal (T12)	40'-60'	11.5 %	Pass
Top Girt (T1)	260'-280'	7.8 %	Pass
Guy @ 270' (3/4" EHS)	270'	65.0 %	Pass
Guy @ 196' (5/8" EHS)	196'	84.3 %	Pass
Guy @ 128' (9/16" EHS)	128'	92.6 %	Pass
Guy @ 70' (1/2" EHS)	70'	93.4 %	Pass
Top Guy Pull-Off (T8)	120'-140'	27.1 %	Pass
Bottom Guy Pull-Off (T8)	120'-140'	12.8 %	Pass
Torque Arm Top (T5)	180'-200'	28.3 %	Pass
Torque Arm Bottom (T5)	180'-200'	53.1 %	Pass
Foundation	Guy Anchor Shear	97.9 %	Pass

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicate that the tower structure, guy cables and foundation are in compliance with the proposed loading conditions without modification. **The existing tower, guy cables and foundation are considered structurally adequate for the proposed antenna loading with the wind load classification specified above.**

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report.
2. Tower is properly installed and maintained.
3. All members are as specified in the original design documents and are in good condition.
4. All required members are in place.
5. All bolts are in place and are properly tightened.
6. Tower is in plumb condition.
7. All member protective coatings are in good condition.
8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
9. Foundations are in good condition without defect and were properly constructed to support original design loads as specified in the original design documents.
10. All coaxial cables are installed as specified in Section 6 of this report.

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

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

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

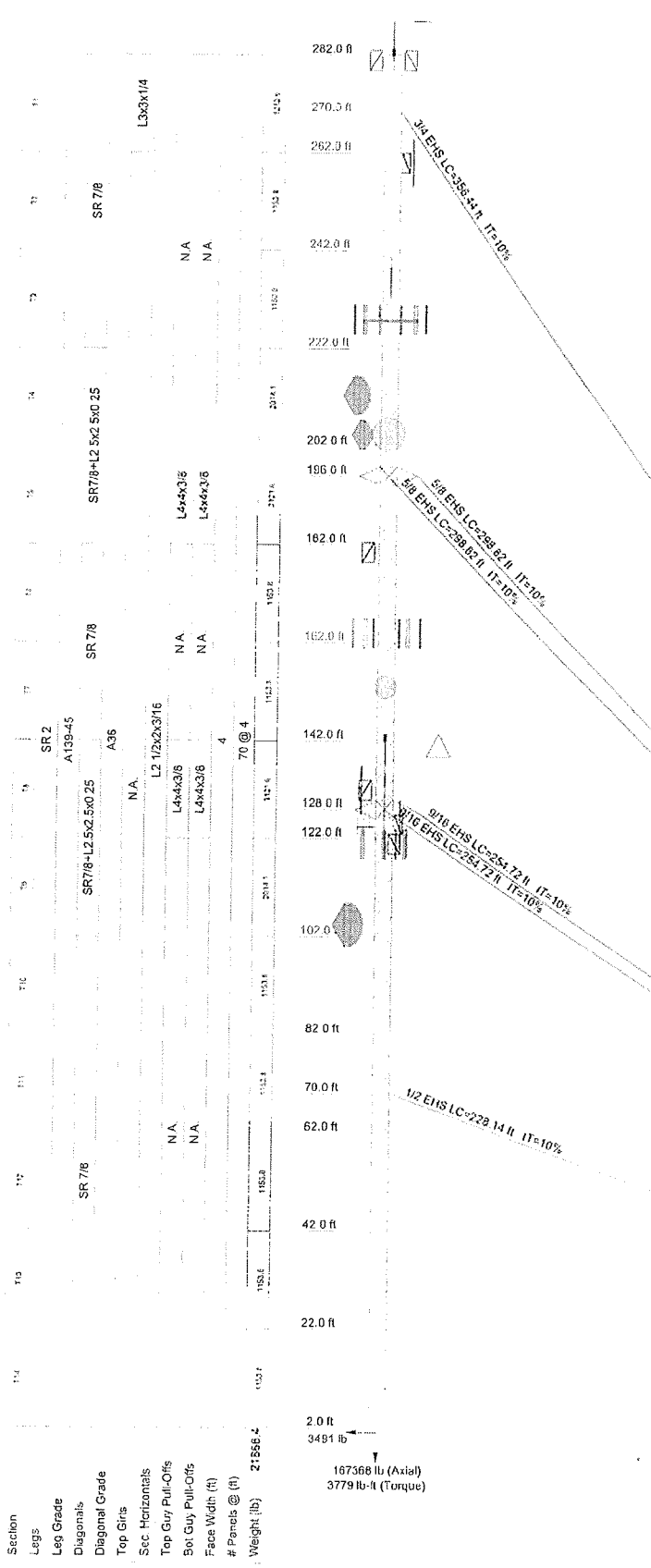
Ongoing and Periodic Inspection and Maintenance:

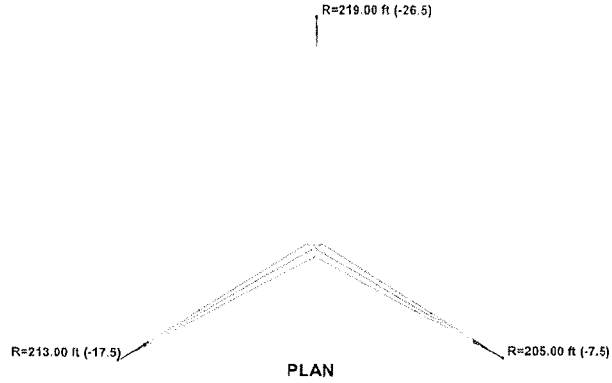
After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

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

6. DRAWINGS AND DATA

TNX TOWER INPUT/OUTPUT SUMMARY





PLAN

DESIGNED APPURTENANCE LOADING

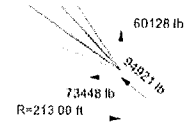
TYPE	ELEVATION	TYPE	ELEVATION
FM Antenna (WMRQ)	289	SBNH-1D6565C (ATT)	164
2.5" x 10' Omni (Not Used)	284	Surge Suppressor (ATT)	164
DLS L 864-L-865 Light Beacon Unit (Tower)	282	(2) RRU (ATT)	164
6' Stand-off (Unknown)	281	(2) RRU (ATT)	164
6' Stand-off (Unknown)	281	(2) RRU (ATT)	164
6' Stand-off (Unknown)	281	Andrew 12' Sector Frame (SF-U12-3-72) (ATT)	164
MF-950B (WBMW)	280	Andrew 12' Sector Frame (SF-U12-3-72) (ATT)	164
3' Stand-off (Unknown)	260	Andrew 12' Sector Frame (SF-U12-3-72) (ATT)	164
2.5" x 14' Omni (Unknown)	260	(2) LGP214nn TMA (ATT)	164
3' Stand-off (Unknown)	260	(4) LGP 219nn (ATT)	164
ASP-711 (Unknown)	260	SBNH-1D6565C (ATT)	164
DB589-Y (Eversource)	236.7	(2) 7770 Panel Antenna (ATT)	164
3' Stand-off (Eversource)	230	(2) 7770 Panel Antenna (ATT)	164
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	228	(2) 7770 Panel Antenna (ATT)	164
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	228	(2) LGP214nn TMA (ATT)	164
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	228	(4) LGP 219nn (ATT)	164
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	228	(4) LGP 219nn (ATT)	164
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	228	SBNH-1D6565C (ATT)	164
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	228	(2) LGP214nn TMA (ATT)	164
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	228	5.5' Dish w/ Radome (Eversource)	153
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	228	(3) L-810 Obstruction Lights w/ Mount Kit (Tower - OBS Light)	142
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	228	6' Stand-off (Unknown)	132
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	228	2.5" x 22' Whip (Unknown)	132
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	228	14' Dipole (Unknown)	132
TMA (T-Mobile)	228	6' Stand-off (Unknown)	132
TMA (T-Mobile)	228	3' Stand-off (Not Used)	125
TMA (T-Mobile)	228	3" x 12.5' Omni (Not Used)	125
531-70HD Exposed Dipole Antenna (Eversource)	218	1' Yagi antenna (Not Used)	124.5
6' Stand-off (Eversource)	218	(2) LPA-80063-4CF (Verizon)	121
8' Dish w/ Radome (Eversource)	212.5	BXA-70063-6CF-EDIN (Verizon)	121
8' Dish w/ Radome (Eversource)	204.5	(2) LPA-80080-4CF-EDIN (Verizon)	121
6' Dish w/ Radome (Eversource)	204.5	(2) LPA-171063-8CF-EDIN (Verizon)	121
6' Stand-off (Not Used)	180.5	BXA-70063 6CF-EDIN (Verizon)	121
		(2) LPA-171080-8CF-EDIN (Verizon)	121
		6'8"x4" Pipe Mount (Verizon)	121
		6'8"x4' Pipe Mount (Verizon)	121
		9' Dish w/ Radome (Eversource)	104.5

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A139-45	45 ksi	60 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower designed for a 85 mph basic wind in accordance with the TIA/EIA-222-F Standard.
2. Tower is also designed for a 74 mph basic wind with 0.50 in ice.
3. Deflections are based upon a 50 mph wind.
4. TOWER RATING: 93.4%

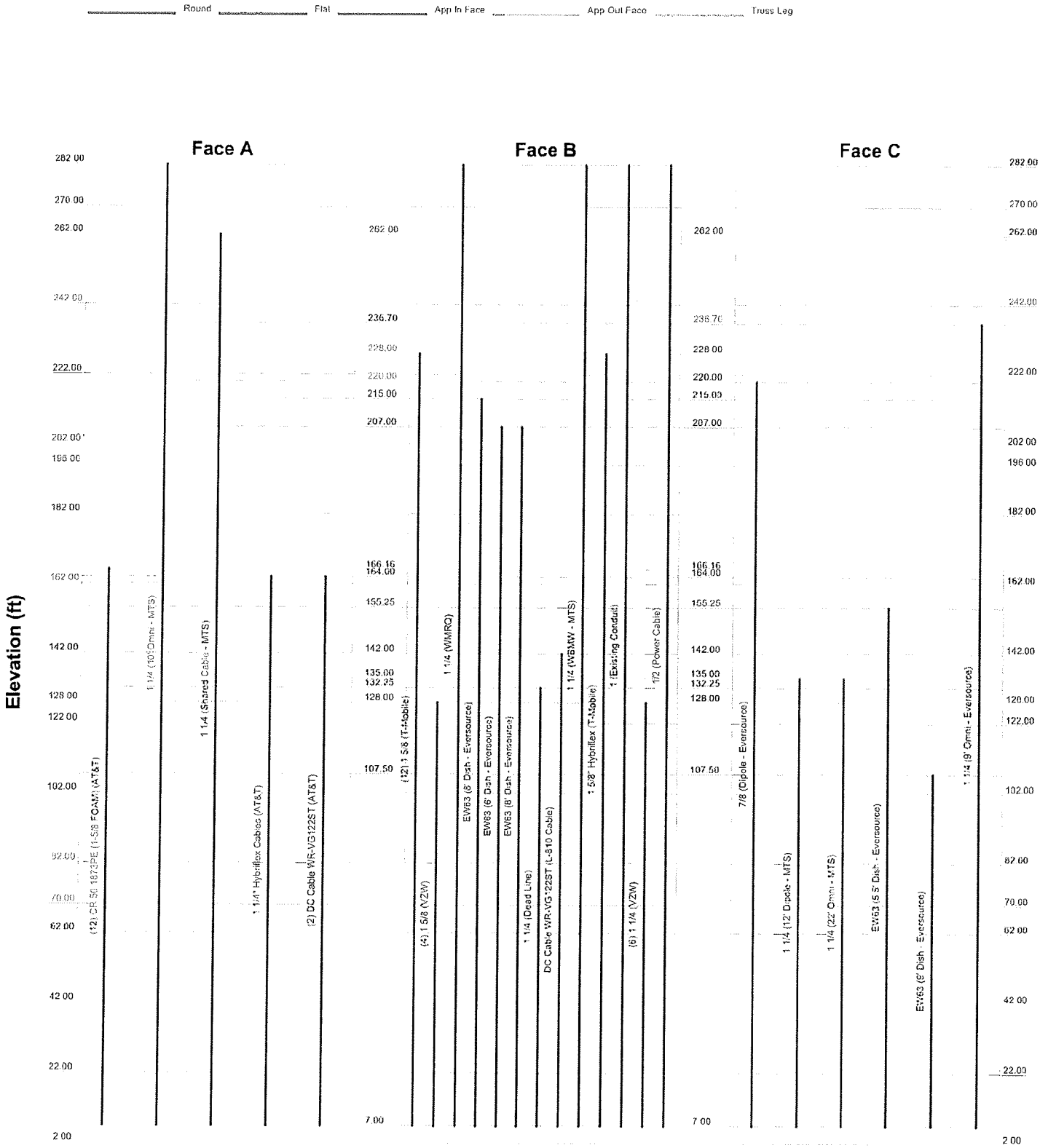


AECOM
500 Enterprise Drive, Suite 3B
Rocky Hill, CT
Phone: 860-529-8882
FAX: 860-529-3991

Job:	***280' Guyed Tower***		
Project:	***130 Vernon Rd Bolton, CT***		
Client:	Eversource / MTS-013	Drawn by: MCD	App'd:
Code:	TIA/EIA-222-F	Date: 09/26/15	Scale: NTS
Path:			Dwg No. E-1

TNX TOWER FEEDLINE DISTRIBUTION

Feed Line Distribution Chart
2' - 282'

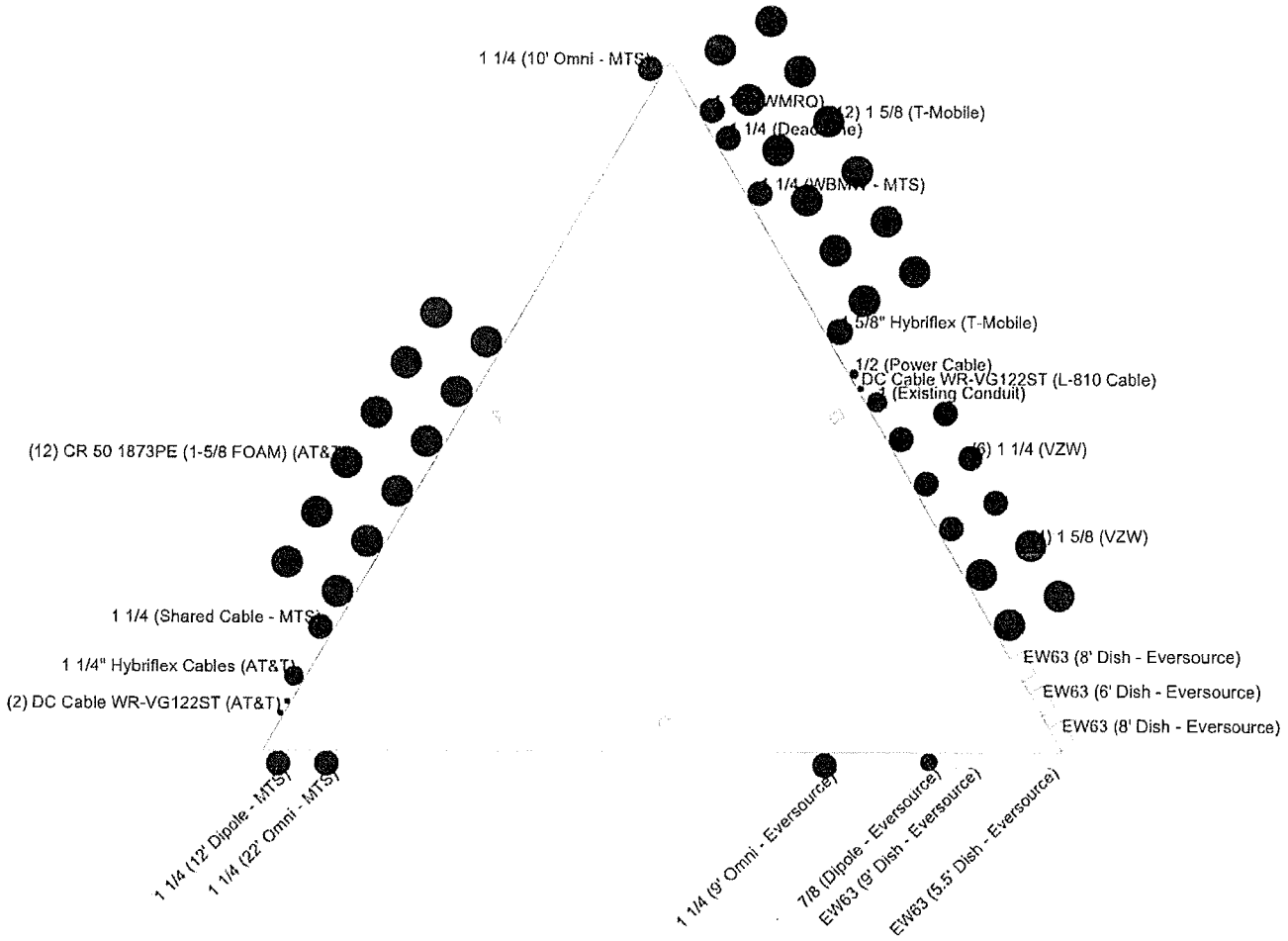


AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job: ***280' Guyed Tower*** Project: ***130 Vernon Rd Bolton, CT*** Client: Eversource / MTS-013 — Drawn by: MCD — App'd: Code: TIA/EIA-222-F — Date: 09/26/15 — Scale: NTS Path: — Dwg No: E-7

TNX TOWER FEEDLINE PLAN

Feed Line Plan

Round Flat App In Face App Out Face



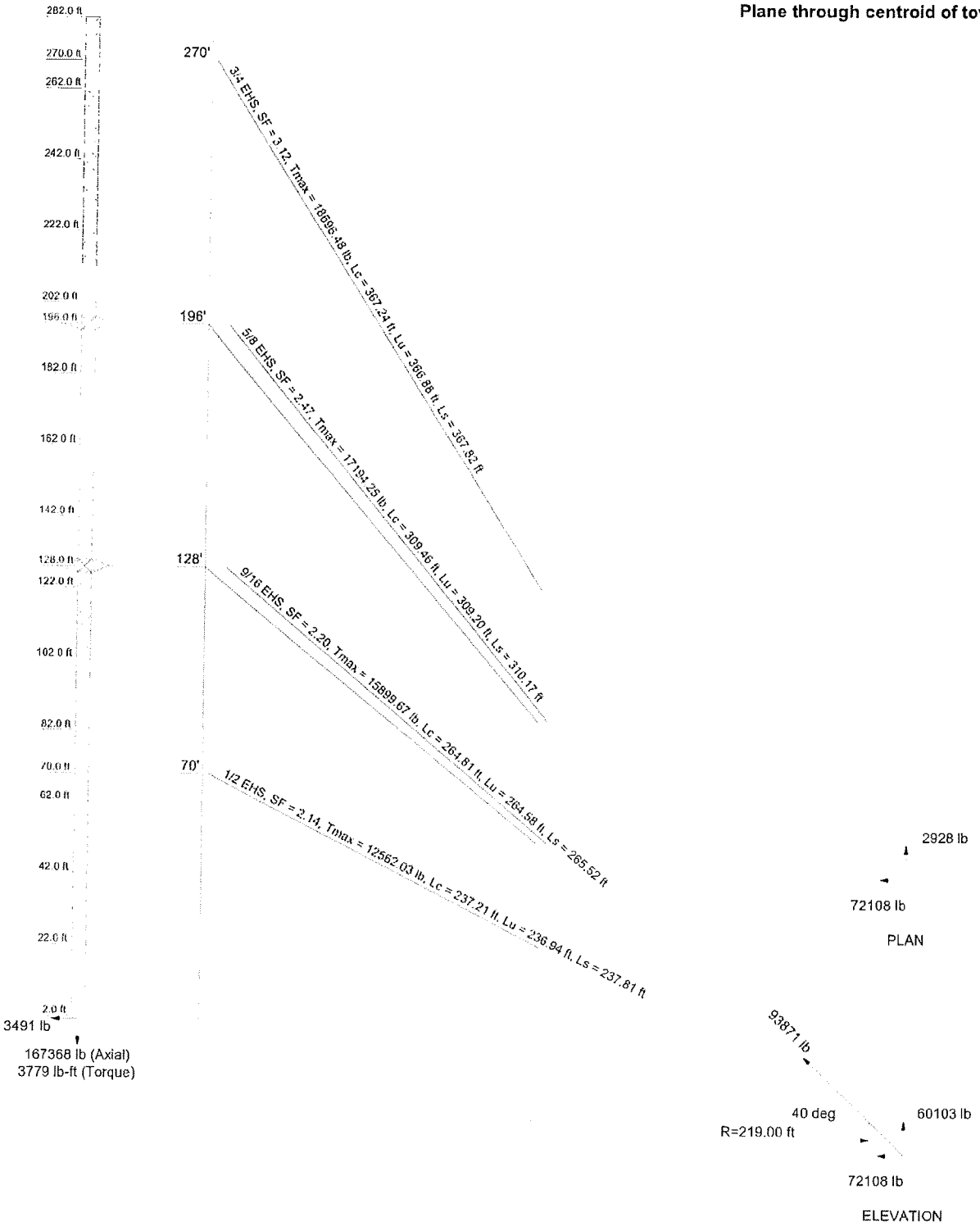
AECOM 500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Job: ***280' Guyed Tower*** Project: ***130 Vernon Rd Bolton, CT*** Client: Eversource / MTS-013 Drawn by: MCD App'd: Code: TIA/EIA-222-F Date: 09/26/15 Scale: NTS Path: Dwg No. E-7

GUY TENSIONS AND TOWER REACTIONS

Guy Tensions and Tower Reactions

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

Maximum Values
Anchor 'A'@219 ft Azimuth 0 deg Elev -26.5 ft
Plane through centroid of tower

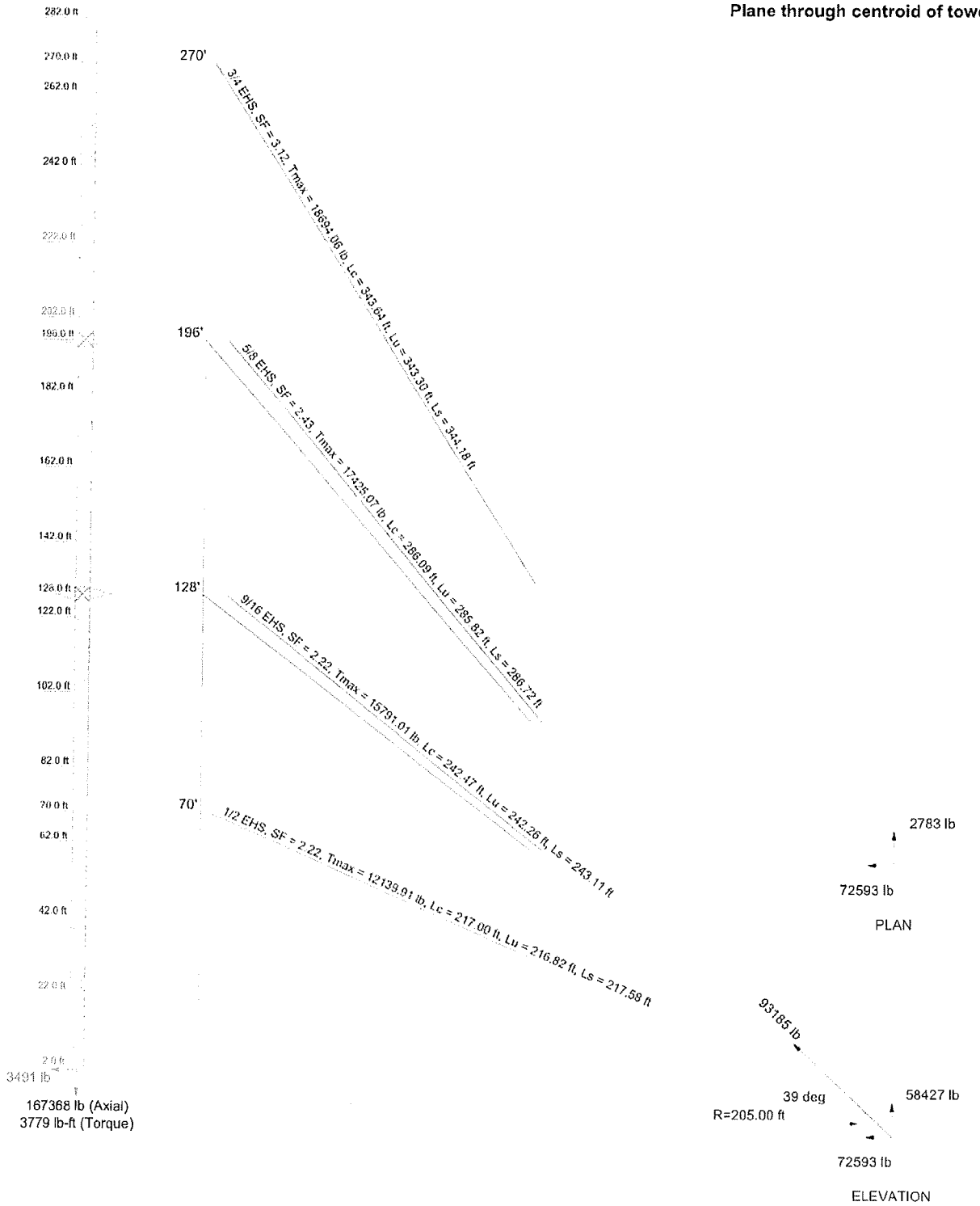


AECOM	Job: 280' Guyed Tower		
500 Enterprise Drive, Suite 3B	Project: 130 Vernon Rd Bolton, CT		
Rocky Hill, CT	Client: Eversource / MTS-013	Drawn by: MCD	App'd:
Phone: 860-529-8882	Code: TIA/EIA-222-F	Date: 09/26/15	Scale: NTS
FAX: 860-529-3991	Path:		Dwg No. E-6

Guy Tensions and Tower Reactions

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

Maximum Values
Anchor 'B'@205 ft Azimuth 120 deg Elev -7.5 ft
Plane through centroid of tower



AECOM	Job: 280' Guyed Tower		
500 Enterprise Drive, Suite 3B	Project: 130 Vernon Rd Bolton, CT		
Rocky Hill, CT	Client: Eversource / MTS-013	Drawn by: MCD	App'd:
Phone: 860-529-8882	Code: TIA/EIA-222-F	Date: 09/26/15	Scale: NTS
FAX: 860-529-3991	Path:		Dwg No E-6

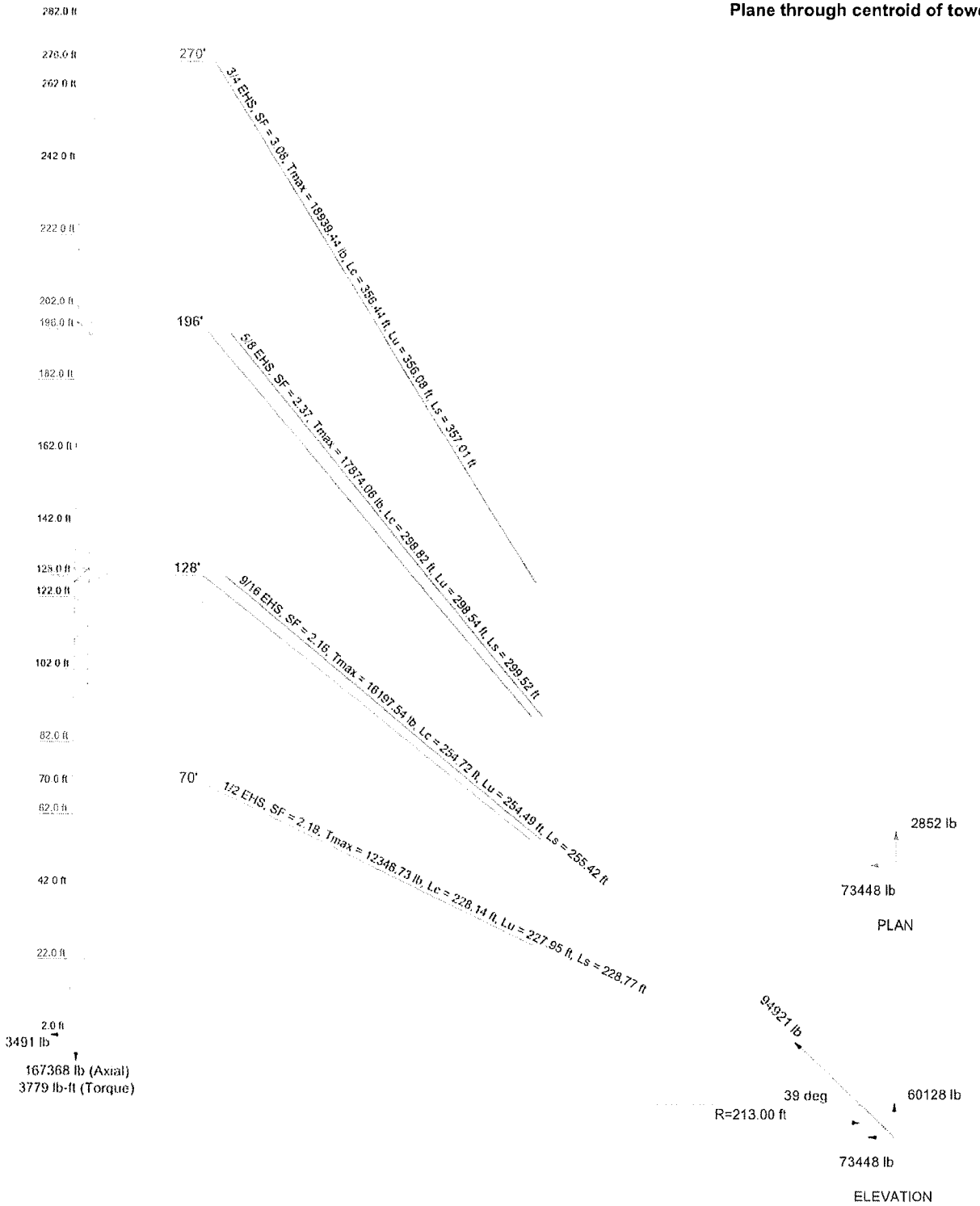
Guy Tensions and Tower Reactions

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

Maximum Values

Anchor 'C'@213 ft Azimuth 240 deg Elev -17.5 ft

Plane through centroid of tower



AECOM	Job: 280' Guyed Tower
500 Enterprise Drive, Suite 3B Rocky Hill, CT Phone: 860-529-8882 FAX: 860-529-3991	Project: 130 Vernon Rd Bolton, CT Client: Eversource / MTS-013 — Drawn by: MCD — App'd: Code: TIA/EIA-222-F — Date: 09/26/15 — Scale: NTS Path: — Dwg No: E-6

TNX TOWER DETAILED OUTPUT

Tower Input Data

The main tower is a 3x guyed tower with an overall height of 282.00 ft above the ground line.
The base of the tower is set at an elevation of 2.00 ft above the ground line.
The face width of the tower is 4.00 ft at the top and 4.00 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

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.
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, feed line supports, and appurtenance mounts are not considered.

Options

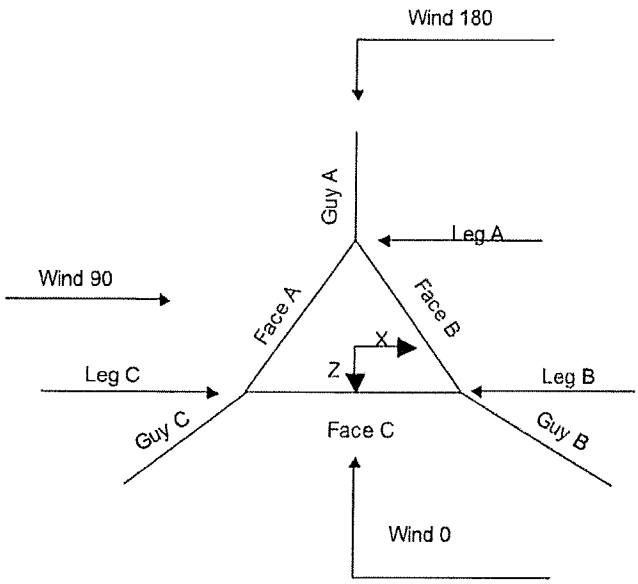
Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
√ Include Bolts In Member Capacity
√ Leg Bolts Are At Top Of Section
√ Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
Add IBC .6D+W Combination

Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
√ Retension Guys To Initial Tension
Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
√ Autocalc Torque Arm Areas
√ SR Members Have Cut Ends
√ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Use TIA-222-G Tension Splice Capacity Exemption

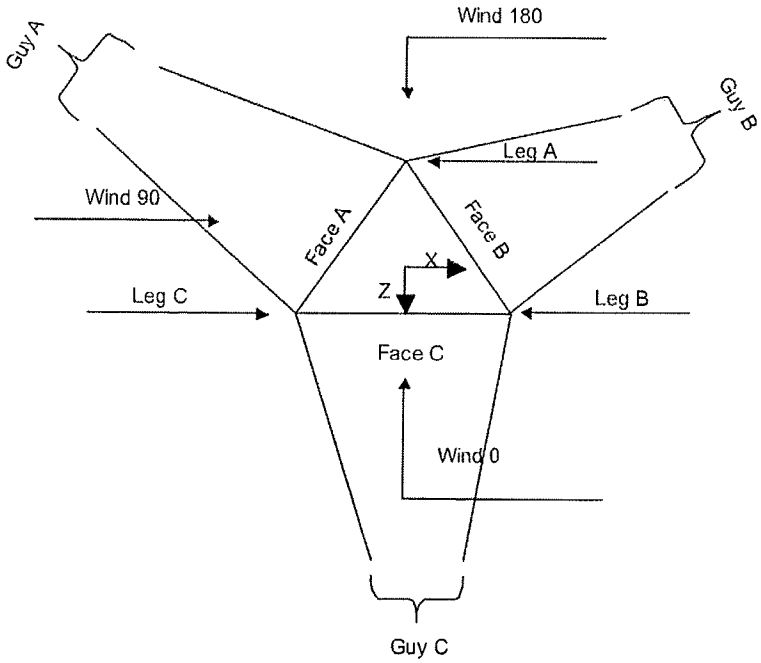
Treat Feedline Bundles As Cylinder
Use ASCE 10 X-Brace Ly Rules
√ Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
√ SR Leg Bolts Resist Compression
√ All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feedline Torque
Include Angle Block Shear Check

Poles

Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets



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	282.00-262.00			4.00	1	20.00
T2	262.00-242.00			4.00	1	20.00
T3	242.00-222.00			4.00	1	20.00
T4	222.00-202.00			4.00	1	20.00
T5	202.00-182.00			4.00	1	20.00
T6	182.00-162.00			4.00	1	20.00
T7	162.00-142.00			4.00	1	20.00
T8	142.00-122.00			4.00	1	20.00
T9	122.00-102.00			4.00	1	20.00
T10	102.00-82.00			4.00	1	20.00
T11	82.00-62.00			4.00	1	20.00
T12	62.00-42.00			4.00	1	20.00
T13	42.00-22.00			4.00	1	20.00
T14	22.00-2.00			4.00	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	282.00-262.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T2	262.00-242.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T3	242.00-222.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T4	222.00-202.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T5	202.00-182.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T6	182.00-162.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T7	162.00-142.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T8	142.00-122.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T9	122.00-102.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T10	102.00-82.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T11	82.00-62.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T12	62.00-42.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T13	42.00-22.00	4.00	CX Brace	No	Yes	0.0000	0.0000
T14	22.00-2.00	4.00	CX Brace	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 282.00-262.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	A36 (36 ksi)
T2 262.00-242.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	A36 (36 ksi)
T3 242.00-222.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	A36 (36 ksi)
T4 222.00-202.00	Solid Round	2	A139-45 (45 ksi)	Arbitrary Shape	SR7/8+L2.5x2.5x0.25	A36 (36 ksi)
T5 202.00-182.00	Solid Round	2	A139-45 (45 ksi)	Arbitrary Shape	SR7/8+L2.5x2.5x0.25	A36 (36 ksi)
T6 182.00-162.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	A36 (36 ksi)
T7 162.00-142.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	A36 (36 ksi)
T8 142.00-122.00	Solid Round	2	A139-45 (45 ksi)	Arbitrary Shape	SR7/8+L2.5x2.5x0.25	A36 (36 ksi)
T9 122.00-102.00	Solid Round	2	A139-45 (45 ksi)	Arbitrary Shape	SR7/8+L2.5x2.5x0.25	A36 (36 ksi)
T10 102.00-82.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	A36 (36 ksi)
T11 82.00-62.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	A36 (36 ksi)
T12 62.00-42.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	A36 (36 ksi)
T13 42.00-22.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	A36 (36 ksi)
T14 22.00-2.00	Solid Round	2	A139-45 (45 ksi)	Solid Round	7/8	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 282.00-262.00	Single Angle	L3x3x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T1 282.00-262.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T2 262.00-242.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T3 242.00-222.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T4 222.00-202.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T5 202.00-182.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T6 182.00-162.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T7 162.00-142.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T8 142.00-122.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T9 122.00-102.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T10 102.00-82.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T11 82.00-62.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T12 62.00-42.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T13 42.00-22.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T14 22.00-2.00	Single Angle	L2 1/2x2x3/16	A36 (36 ksi)	Solid Round		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 282.00-262.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_t	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
T2 262.00-242.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T3 242.00-222.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T4 222.00-202.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T5 202.00-182.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T6 182.00-162.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T7 162.00-142.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T8 142.00-122.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T9 122.00-102.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T10 102.00-82.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T11 82.00-62.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T12 62.00-42.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T13 42.00-22.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000
T14 22.00-2.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz X Y	Inner Brace X Y
T1	No	No	1	0.5	1	1	1	1	1	1
282.00-262.00				0.5	1	1	1	1	1	1
T2	No	No	1	0.5	1	1	1	1	1	1
262.00-242.00				0.5	1	1	1	1	1	1
T3	No	No	1	0.5	1	1	1	1	1	1
242.00-222.00				0.5	1	1	1	1	1	1
T4	No	No	1	0.5	1	1	1	1	1	1
222.00-202.00				0.5	1	1	1	1	1	1
T5	No	No	1	0.5	1	1	1	1	1	1
202.00-182.00				0.5	1	1	1	1	1	1
T6	No	No	1	0.5	1	1	1	1	1	1
182.00-162.00				0.5	1	1	1	1	1	1
T7	No	No	1	0.5	1	1	1	1	1	1
162.00-142.00				0.5	1	1	1	1	1	1
T8	No	No	1	0.5	1	1	1	1	1	1
142.00-122.00				0.5	1	1	1	1	1	1
T9	No	No	1	0.5	1	1	1	1	1	1
122.00-102.00				0.5	1	1	1	1	1	1
T10	No	No	1	0.5	1	1	1	1	1	1
102.00-82.00				0.5	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T11	No	No	1	0.5	1	1	1	1	1	1
82.00-62.00				0.5	1	1	1	1	1	1
T12	No	No	1	0.5	1	1	1	1	1	1
62.00-42.00				0.5	1	1	1	1	1	1
T13	No	No	1	0.5	1	1	1	1	1	1
42.00-22.00				0.5	1	1	1	1	1	1
T14	No	No	1	0.5	1	1	1	1	1	1
22.00-2.00				0.5	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
282.00-262.00														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
262.00-242.00														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
242.00-222.00														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
222.00-202.00														
T5	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
202.00-182.00														
T6	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
182.00-162.00														
T7	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
162.00-142.00														
T8	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
142.00-122.00														
T9	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
122.00-102.00														
T10	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
102.00-82.00														
T11	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
82.00-62.00														
T12	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
62.00-42.00														
T13	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
42.00-22.00														
T14 22.00-2.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

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 %
270	EHS	A	3/4	5830.00	10%	19000	1.155	366.92	219.00	0.0000	-26.50	100%
		B	3/4	5830.00	10%	19000	1.155	343.34	205.00	0.0000	-7.50	100%
		C	3/4	5830.00	10%	19000	1.155	356.13	213.00	0.0000	-17.50	100%
196	EHS	A	5/8	3799.04	8.96%	21000	0.813	309.24	219.00	0.0000	-26.50	100%
		B	5/8	4240.00	10%	21000	0.813	285.85	205.00	0.0000	-7.50	100%
		C	5/8	4240.00	10%	21000	0.813	298.58	213.00	0.0000	-17.50	100%
128	EHS	A	9/16	3500.00	10%	21000	0.671	264.60	219.00	0.0000	-26.50	100%
		B	9/16	3500.00	10%	21000	0.671	242.28	205.00	0.0000	-7.50	100%
		C	9/16	3500.00	10%	21000	0.671	254.52	213.00	0.0000	-17.50	100%
70	EHS	A	1/2	3497.00	13%	21000	0.517	236.95	219.00	0.0000	-26.50	100%
		B	1/2	2690.00	10%	21000	0.517	216.83	205.00	0.0000	-7.50	100%
		C	1/2	2690.00	10%	21000	0.517	227.96	213.00	0.0000	-17.50	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
270	Corner						
196	Torque Arm	14.00	15.0000	Wing	A36 (36 ksi)	Single Angle	L4x4x3/8
128	Torque Arm	14.00	15.0000	Wing	A36 (36 ksi)	Single Angle	L4x4x3/8
70	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
270.00	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Solid Round	
196.00	A572-50 (50 ksi)	Solid Round			Yes	A36 (36 ksi)	Single Angle	L4x4x3/8
128.00	A572-50 (50 ksi)	Solid Round			Yes	A36 (36 ksi)	Single Angle	L4x4x3/8
70.00	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Solid Round	

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
270	423.80	396.56	411.33		12.97 6.2 sec/pulse	11.38 5.8 sec/pulse	12.23 6.0 sec/pulse	
196	251.41	232.40	242.75		10.00 5.5 sec/pulse	7.69 4.8 sec/pulse	8.38 5.0 sec/pulse	
128	177.55	162.57	170.78		6.62 4.4 sec/pulse	5.56 4.1 sec/pulse	6.13 4.3 sec/pulse	
70	122.50	112.10	117.85		4.13 3.5 sec/pulse	4.49 3.7 sec/pulse	4.96 3.8 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
270	No	No			1	1	1	1
196	No	No	1	1	1	1	1	1
128	No	No	1	1	1	1	1	1
70	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
270	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
196	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
128	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
70	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75	0.6250 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
270	A	121.75	27	20	0.5000
	B	131.25	27	21	0.5000
	C	126.25	27	20	0.5000
196	A	84.75	24	18	0.5000
	B	94.25	25	19	0.5000
	C	89.25	25	18	0.5000
128	A	50.75	21	16	0.5000
	B	60.25	22	16	0.5000

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
	C	55.25	21	16	0.5000
70	A	21.75	18	14	0.5000
	B	31.25	18	14	0.5000
	C	26.25	18	14	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
270	A	53.8396	6172.14 5830.00	0.00	5056.62	-3539.19	-11677.76	0.00	0.00
	B	53.8550	6150.21 5830.00	3058.49	5035.14	1765.82	5814.08	0.00	-10070.28
	C	53.7647	6161.75 5830.00	-3067.94	5041.58	1771.28	5821.51	-0.00	10083.15
			Sum:	**-9.45**	15133.33	**-2.10**	**-42.17**	-0.00	**12.87**
196	A	45.9725	3979.87 3799.12	-87.94	2922.02	-2700.63	-11809.19	19259.85	-20454.12
	A	45.9725	3979.87 3799.12	87.94	2922.02	-2700.63	-11809.19	-19259.85	20454.12
	B	45.3427	4405.30 4240.00	2681.71	3190.78	1426.19	25790.79	21675.98	0.00
	B	45.3427	4405.30 4240.00	2575.97	3190.78	1609.33	-12895.39	-21675.98	-22335.48
	C	45.5998	4413.42 4240.00	-2568.71	3212.45	1600.04	-12982.98	21581.64	22487.18
	C	45.5998	4413.42 4240.00	-2670.04	3212.45	1424.55	25965.96	-21581.64	0.00
			Sum:	**18.93**	18650.51	**658.85**	**2259.99**	0.00	**151.71**
128	A	35.6920	3603.58 3500.00	-93.86	2160.85	-2882.31	-8732.96	20555.51	-15125.93
	A	35.6920	3603.58 3500.00	93.86	2160.85	-2882.31	-8732.96	-20555.51	15125.93
	B	33.9744	3590.84 3500.00	2595.29	2062.43	1380.23	16670.40	20977.44	0.00
	B	33.9744	3590.84 3500.00	2492.96	2062.43	1557.47	-8335.20	-20977.44	-14436.99
	C	34.8348	3597.55 3500.00	-2471.78	2112.36	1539.66	-8537.01	20767.23	14786.53
	C	34.8348	3597.55 3500.00	-2569.28	2112.36	1370.79	17074.02	-20767.23	0.00
			Sum:	**47.18**	12671.27	**83.53**	**-593.71**	0.00	**349.54**
70	A	24.0051	3546.83 3497.00	0.00	1493.97	-3216.84	-3450.18	0.00	0.00
	B	20.9247	2730.03 2690.00	2191.72	1023.84	1265.39	1182.23	0.00	-2047.69
	C	22.5532	2735.20 2690.00	-2169.04	1099.25	1252.29	1269.30	-0.00	2198.49
			Sum:	**22.68**	3617.06	**-699.16**	**-998.64**	0.00	**150.81**

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
270	A	53.8396	8569.71 8001.40	0.00	7040.78	-4885.42	-16259.98	0.00	0.00
	B	53.8550	8517.80 7985.91	4212.49	6992.34	2432.08	8074.06	0.00	-13984.68
	C	53.7647	8546.06 7995.00	-4230.94	7011.94	2442.74	8096.69	-0.00	14023.88
			Sum:	**-18.45**	21045.06	**-10.60**	**-89.23**	-0.00	**39.20**
196	A	45.9725	5905.34 5571.82	-129.72	4357.49	-3983.53	-17610.59	28408.99	-30502.43
	A	45.9725	5905.34 5571.82	129.72	4357.49	-3983.53	-17610.59	-28408.99	30502.43
	B	45.3427	6291.82 5986.80	3807.91	4581.01	2025.13	37027.84	30778.96	0.00
	B	45.3427	6291.82 5986.80	3657.77	4581.01	2285.18	-18513.92	-30778.96	-32067.05
	C	45.5998	6317.07 5997.06	-3654.53	4622.53	2276.39	-18681.74	30704.35	32357.72
	C	45.5998	6317.07 5997.06	-3798.68	4622.53	2026.72	37363.47	-30704.35	0.00
			Sum:	**12.47**	27122.06	**646.35**	**1974.48**	0.00	**290.66**
128	A	35.6920	5222.87 5019.11	-135.30	3161.98	-4154.75	-12778.98	29630.05	-22133.85
	A	35.6920	5222.87 5019.11	135.30	3161.98	-4154.75	-12778.98	-29630.05	22133.85
	B	33.9744	5177.55 4998.85	3723.86	3002.97	1980.43	24272.69	30099.57	0.00
	B	33.9744	5177.55 4998.85	3577.03	3002.97	2234.74	-12136.34	-30099.57	-21020.76
	C	34.8348	5202.53 5010.64	-3556.03	3084.56	2215.04	-12466.10	29876.84	21591.91
	C	34.8348	5202.53 5010.64	-3696.30	3084.56	1972.09	24932.19	-29876.84	0.00
			Sum:	**48.55**	18499.01	**92.80**	**-955.52**	0.00	**571.15**
70	A	24.0051	4811.01 4702.30	0.00	2068.48	-4343.64	-4776.95	0.00	0.00
	B	20.9247	4010.66 3923.33	3207.50	1538.83	1851.85	1776.89	0.00	-3077.66
	C	22.5532	4035.40 3936.80	-3186.50	1657.13	1839.72	1913.49	-0.00	3314.27
			Sum:	**21.00**	5264.44	**-652.07**	**-1086.57**	0.00	**236.61**

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
270	A	53.8396	6172.14 5830.00	0.00	5056.62	-3539.19	-11677.76	0.00	0.00
	B	53.8550	6150.21	3058.49	5035.14	1765.82	5814.08	0.00	-10070.28

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
			5830.00						
	C	53.7647	6161.75	-3067.94	5041.58	1771.28	5821.51	-0.00	10083.15
			5830.00						
			Sum:	**-9.45**	15133.33	**-2.10**	**-42.17**	-0.00	**12.87**
196	A	45.9725	3979.87	-87.94	2922.02	-2700.63	-11809.19	19259.85	-20454.12
			3799.12						
	A	45.9725	3979.87	87.94	2922.02	-2700.63	-11809.19	-19259.85	20454.12
			3799.12						
	B	45.3427	4405.30	2681.71	3190.78	1426.19	25790.79	21675.98	0.00
			4240.00						
	B	45.3427	4405.30	2575.97	3190.78	1609.33	-12895.39	-21675.98	-22335.48
			4240.00						
	C	45.5998	4413.42	-2568.71	3212.45	1600.04	-12982.98	21581.64	22487.18
			4240.00						
	C	45.5998	4413.42	-2670.04	3212.45	1424.55	25965.96	-21581.64	0.00
			4240.00						
			Sum:	**18.93**	18650.51	**658.85**	**2259.99**	0.00	**151.71**
128	A	35.6920	3603.58	-93.86	2160.85	-2882.31	-8732.96	20555.51	-15125.93
			3500.00						
	A	35.6920	3603.58	93.86	2160.85	-2882.31	-8732.96	-20555.51	15125.93
			3500.00						
	B	33.9744	3590.84	2595.29	2062.43	1380.23	16670.40	20977.44	0.00
			3500.00						
	B	33.9744	3590.84	2492.96	2062.43	1557.47	-8335.20	-20977.44	-14436.99
			3500.00						
	C	34.8348	3597.55	-2471.78	2112.36	1539.66	-8537.01	20767.23	14786.53
			3500.00						
	C	34.8348	3597.55	-2569.28	2112.36	1370.79	17074.02	-20767.23	0.00
			3500.00						
			Sum:	**47.18**	12671.27	**83.53**	**-593.71**	0.00	**349.54**
70	A	24.0051	3546.83	0.00	1493.97	-3216.84	-3450.18	0.00	0.00
			3497.00						
	B	20.9247	2730.03	2191.72	1023.84	1265.39	1182.23	0.00	-2047.69
			2690.00						
	C	22.5532	2735.20	-2169.04	1099.25	1252.29	1269.30	-0.00	2198.49
			2690.00						
			Sum:	**22.68**	3617.06	**-699.16**	**-998.64**	0.00	**150.81**

Guy-Tensioning Information

				Temperature At Time Of Tensioning													
				0 F		20 F		40 F		60 F		80 F		100 F		120 F	
Guy Elevation ft		H ft	V ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft	Initial Tension lb	Intercept ft
270	A	216.69	296.50	6599	11.49	6339	11.95	6083	12.44	5830	12.97	5582	13.53	5338	14.13	5100	14.77
	B	202.69	277.50	6609	10.06	6346	10.47	6086	10.91	5830	11.38	5578	11.88	5330	12.42	5087	12.99
	C	210.69	287.50	6606	10.82	6344	11.26	6085	11.73	5830	12.23	5579	12.76	5333	13.34	5092	13.95
196	A	215.07	222.50	4603	8.29	4328	8.80	4060	9.37	3799	10.00	3548	10.70	3306	11.46	3078	12.29
	B	201.08	203.50	5106	6.41	4813	6.79	4524	7.22	4240	7.69	3963	8.22	3694	8.81	3435	9.46
	C	209.08	213.50	5091	7.00	4803	7.42	4518	7.88	4240	8.38	3968	8.95	3705	9.57	3451	10.26
128	A	215.07	154.50	4445	5.23	4123	5.63	3807	6.09	3500	6.62	3203	7.22	2920	7.91	2653	8.70
	B	201.08	135.50	4499	4.34	4159	4.69	3825	5.09	3500	5.56	3185	6.10	2884	6.73	2601	7.45
	C	209.08	145.50	4472	4.81	4141	5.19	3816	5.63	3500	6.13	3195	6.71	2903	7.37	2629	8.13
70	A	216.69	96.50	4471	3.23	4142	3.49	3817	3.78	3497	4.13	3183	4.53	2877	5.01	2582	5.58
	B	202.69	77.50	3671	3.29	3336	3.62	3008	4.02	2690	4.49	2386	5.06	2100	5.74	1840	6.55
	C	210.69	87.50	3642	3.67	3316	4.03	2998	4.45	2690	4.96	2396	5.56	2120	6.28	1868	7.12

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
7/8 (Dipole - Eversource)	C	Yes	Ar (CfAe)	220.00 - 7.00	0.0000	-0.33	1	1	1.1100	1.1100		0.54
1 5/8 (T-Mobile)	B	Yes	Ar (CfAe)	228.00 - 7.00	2.0000	-0.3	12	6	1.5000	1.9800		1.04
CR 50 1873PE (1-5/8 FOAM) (AT&T)	A	Yes	Ar (CfAe)	166.16 - 7.00	0.0000	-0.1	12	6	1.5000	1.9800		0.83
1 5/8 (VZW)	B	Yes	Ar (CfAe)	128.00 - 7.00	0.0000	0.29	4	2	1.5000	1.9800		1.04
1 1/4 (10' Omni - MTS)	A	Yes	Ar (CfAe)	282.00 - 7.00	0.0000	0.48	1	1	1.5500	1.5500		0.66
1 1/4 (Shared Cable - MTS)	A	Yes	Ar (CfAe)	262.00 - 7.00	0.0000	-0.33	1	1	1.5500	1.5500		0.66
1 1/4 (12' Dipole - MTS)	C	Yes	Ar (CfAe)	135.00 - 7.00	0.0000	0.48	1	1	1.5500	1.5500		0.66
1 1/4 (22' Omni - MTS)	C	Yes	Ar (CfAe)	135.00 - 7.00	0.0000	0.42	1	1	1.5500	1.5500		0.66
1 1/4 (WMRQ)	B	Yes	Ar (CfAe)	282.00 - 7.00	0.0000	-0.42	1	1	1.5500	1.5500		0.66
EW63 (8' Dish - Eversource)	B	Yes	Af (CfAe)	215.00 - 7.00	0.0000	0.48	1	1	1.5742	1.5742	5.0668	0.51
EW63 (6' Dish - Eversource)	B	Yes	Af (CfAe)	207.00 - 7.00	0.0000	0.43	1	1	1.5742	1.5742	5.0668	0.51
EW63 (8' Dish - Eversource)	B	Yes	Af (CfAe)	207.00 - 7.00	0.0000	0.38	1	1	1.5742	1.5742	5.0668	0.51
EW63 (5.5' Dish - Eversource)	C	Yes	Af (CfAe)	155.25 - 7.00	0.0000	-0.48	1	1	1.5742	1.5742	5.0668	0.51
1 1/4 (Dead Line)	B	Yes	Ar (CfAe)	132.25 - 7.00	0.0000	-0.38	1	1	1.5500	1.5500		0.66
EW63 (9' Dish - Eversource)	C	Yes	Af (CfAe)	107.50 - 7.00	0.0000	-0.38	1	1	1.5742	1.5742	5.0668	0.51
DC Cable WR-VG122ST (L-810 Cable)	B	Yes	Ar (CfAe)	142.00 - 7.00	0.0000	-0.025	1	1	0.4000	0.4000		0.25
1 1/4 (WBMW - MTS)	B	Yes	Ar (CfAe)	282.00 - 7.00	0.0000	-0.3	1	1	1.5500	1.5500		0.66
1 1/4" Hybriflex Cables (AT&T)	A	Yes	Ar (CfAe)	164.00 - 7.00	0.0000	-0.4	1	1	1.2500	1.2500		0.99
DC Cable WR-VG122S	A	Yes	Ar (CfAe)	164.00 - 7.00	0.0000	-0.44	2	2	0.4000	0.4000		0.25

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
T (AT&T) 1 5/8" Hybriflex (T-Mobile)	B	Yes	Ar (CfAe)	228.00 - 7.00	0.0000	-0.1	1	1	1.6250	1.6250		0.21
1 (Existing Conduit)	B	Yes	Ar (CfAe)	282.00 - 7.00	0.0000	0	1	1	1.2500	1.2500		0.58
1 1/4 (VZW)	B	Yes	Ar (CfAe)	128.00 - 7.00	0.0000	0.12	6	3	1.5500	1.5500		0.66
1/2 (Power Cable)	B	Yes	Ar (CfAe)	282.00 - 7.00	0.0000	-0.045	1	1	0.5800	0.5800		0.25
1 1/4 (9' Omni - Eversource)	C	Yes	Ar (CfAe)	236.70 - 7.00	0.0000	-0.2	1	1	1.5500	1.5500		0.66

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	282.00-262.00	A	2.583	0.000	0.000	0.000	13.20
		B	8.217	0.000	0.000	0.000	43.00
		C	0.000	0.000	0.000	0.000	0.00
T2	262.00-242.00	A	5.167	0.000	0.000	0.000	26.40
		B	8.217	0.000	0.000	0.000	43.00
		C	0.000	0.000	0.000	0.000	0.00
T3	242.00-222.00	A	5.167	0.000	0.000	0.000	26.40
		B	14.969	0.000	0.000	0.000	119.15
		C	1.899	0.000	0.000	0.000	9.70
T4	222.00-202.00	A	5.167	0.000	0.000	0.000	26.40
		B	30.725	3.017	0.000	0.000	308.57
		C	4.248	0.000	0.000	0.000	22.92
T5	202.00-182.00	A	5.167	0.000	0.000	0.000	26.40
		B	30.725	7.871	0.000	0.000	327.44
		C	4.433	0.000	0.000	0.000	24.00
T6	182.00-162.00	A	9.627	0.000	0.000	0.000	70.82
		B	30.725	7.871	0.000	0.000	327.44
		C	4.433	0.000	0.000	0.000	24.00
T7	162.00-142.00	A	28.383	0.000	0.000	0.000	255.44
		B	30.725	7.871	0.000	0.000	327.44
		C	4.433	1.738	0.000	0.000	30.76
T8	142.00-122.00	A	28.383	0.000	0.000	0.000	255.44
		B	37.021	7.871	0.000	0.000	387.93
		C	7.792	2.624	0.000	0.000	51.36
T9	122.00-102.00	A	28.383	0.000	0.000	0.000	255.44
		B	48.325	7.871	0.000	0.000	508.04
		C	9.600	3.345	0.000	0.000	63.41
T10	102.00-82.00	A	28.383	0.000	0.000	0.000	255.44
		B	48.325	7.871	0.000	0.000	508.04
		C	9.600	5.247	0.000	0.000	70.80
T11	82.00-62.00	A	28.383	0.000	0.000	0.000	255.44
		B	48.325	7.871	0.000	0.000	508.04
		C	9.600	5.247	0.000	0.000	70.80
T12	62.00-42.00	A	28.383	0.000	0.000	0.000	255.44
		B	48.325	7.871	0.000	0.000	508.04
		C	9.600	5.247	0.000	0.000	70.80

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
T13	42.00-22.00	A	28.383	0.000	0.000	0.000	255.44
		B	48.325	7.871	0.000	0.000	508.04
		C	9.600	5.247	0.000	0.000	70.80
T14	22.00-2.00	A	21.288	0.000	0.000	0.000	191.58
		B	36.244	5.903	0.000	0.000	381.03
		C	7.200	3.936	0.000	0.000	53.10

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	282.00-262.00	A	0.500	4.250	0.000	0.000	0.000	38.25
		B		14.883	0.000	0.000	0.000	127.67
		C		0.000	0.000	0.000	0.000	0.00
T2	262.00-242.00	A	0.500	8.500	0.000	0.000	0.000	76.49
		B		14.883	0.000	0.000	0.000	127.67
		C		0.000	0.000	0.000	0.000	0.00
T3	242.00-222.00	A	0.500	8.500	0.000	0.000	0.000	76.49
		B		25.136	0.000	0.000	0.000	320.68
		C		3.124	0.000	0.000	0.000	28.11
T4	222.00-202.00	A	0.500	8.500	0.000	0.000	0.000	76.49
		B		49.058	4.295	0.000	0.000	813.91
		C		7.415	0.000	0.000	0.000	65.67
T5	202.00-182.00	A	0.500	8.500	0.000	0.000	0.000	76.49
		B		49.058	11.204	0.000	0.000	882.85
		C		7.767	0.000	0.000	0.000	68.72
T6	182.00-162.00	A	0.500	15.307	0.133	0.000	0.000	200.55
		B		49.058	11.204	0.000	0.000	882.85
		C		7.767	0.000	0.000	0.000	68.72
T7	162.00-142.00	A	0.500	44.383	1.333	0.000	0.000	709.23
		B		49.058	11.204	0.000	0.000	882.85
		C		7.767	2.474	0.000	0.000	93.40
T8	142.00-122.00	A	0.500	44.383	1.333	0.000	0.000	709.23
		B		60.375	11.204	0.000	0.000	1048.61
		C		13.292	3.735	0.000	0.000	155.70
T9	122.00-102.00	A	0.500	44.383	1.333	0.000	0.000	709.23
		B		78.325	11.204	0.000	0.000	1370.96
		C		16.267	4.762	0.000	0.000	192.72
T10	102.00-82.00	A	0.500	44.383	1.333	0.000	0.000	709.23
		B		78.325	11.204	0.000	0.000	1370.96
		C		16.267	7.470	0.000	0.000	219.74
T11	82.00-62.00	A	0.500	44.383	1.333	0.000	0.000	709.23
		B		78.325	11.204	0.000	0.000	1370.96
		C		16.267	7.470	0.000	0.000	219.74
T12	62.00-42.00	A	0.500	44.383	1.333	0.000	0.000	709.23
		B		78.325	11.204	0.000	0.000	1370.96
		C		16.267	7.470	0.000	0.000	219.74
T13	42.00-22.00	A	0.500	44.383	1.333	0.000	0.000	709.23
		B		78.325	11.204	0.000	0.000	1370.96
		C		16.267	7.470	0.000	0.000	219.74
T14	22.00-2.00	A	0.500	33.288	1.000	0.000	0.000	531.92
		B		58.744	8.403	0.000	0.000	1028.22
		C		12.200	5.602	0.000	0.000	164.80

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	282.00-262.00	A	0.133	0.576	0.167	0.274
		B	0.424	2.016	0.531	0.961
		C	0.000	0.000	0.000	0.000
T2	262.00-242.00	A	0.266	1.116	0.269	0.443
		B	0.424	1.954	0.428	0.775
		C	0.000	0.000	0.000	0.000
T3	242.00-222.00	A	0.266	1.116	0.269	0.443
		B	0.772	3.301	0.780	1.309
		C	0.098	0.410	0.099	0.163
T4	222.00-202.00	A	0.000	0.177	1.030	2.029
		B	0.000	1.125	6.728	12.887
		C	0.000	0.154	0.847	1.770
T5	202.00-182.00	A	0.000	0.248	1.202	2.312
		B	0.000	1.806	8.982	16.846
		C	0.000	0.227	1.032	2.113
T6	182.00-162.00	A	0.496	2.028	0.501	0.804
		B	1.990	8.132	2.010	3.225
		C	0.229	1.020	0.231	0.405
T7	162.00-142.00	A	1.463	6.003	1.478	2.381
		B	1.990	8.132	2.010	3.225
		C	0.318	1.393	0.321	0.553
T8	142.00-122.00	A	0.000	1.333	6.606	12.436
		B	0.000	2.136	10.448	19.924
		C	0.000	0.513	2.424	4.783
T9	122.00-102.00	A	0.000	0.952	5.660	10.912
		B	0.000	1.900	11.205	21.767
		C	0.000	0.453	2.581	5.188
T10	102.00-82.00	A	1.463	6.003	1.478	2.381
		B	2.897	11.976	2.927	4.750
		C	6.00	3.263	0.773	1.294
T11	82.00-62.00	A	1.463	6.003	1.478	2.381
		B	2.897	11.976	2.927	4.750
		C	0.766	3.263	0.773	1.294
T12	62.00-42.00	A	1.463	6.003	1.478	2.381
		B	2.897	11.976	2.927	4.750
		C	0.766	3.263	0.773	1.294
T13	42.00-22.00	A	1.463	6.003	1.478	2.381
		B	2.897	11.976	2.927	4.750
		C	0.766	3.263	0.773	1.294
T14	22.00-2.00	A	1.098	4.503	1.109	1.786
		B	2.173	8.982	2.195	3.562
		C	0.574	2.447	0.580	0.971

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	282.00-262.00	0.8606	-3.2881	0.9269	-3.1182
T2	262.00-242.00	0.0255	-3.0944	0.1638	-2.9413
T3	242.00-222.00	1.1422	-4.2794	1.1294	-3.9369
T4	222.00-202.00	2.6046	-4.4532	2.7013	-4.5923
T5	202.00-182.00	3.0459	-3.5137	3.0450	-3.6833
T6	182.00-162.00	3.5644	-5.1165	3.2490	-4.7817

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T7	162.00-142.00	0.5765	-4.3297	0.6139	-4.1314
T8	142.00-122.00	0.6247	-2.7985	0.7169	-2.9980
T9	122.00-102.00	1.5623	-2.7485	1.6530	-2.9413
T10	102.00-82.00	2.1275	-3.1475	2.0464	-3.1169
T11	82.00-62.00	2.1275	-3.1475	2.0464	-3.1169
T12	62.00-42.00	2.1275	-3.1475	2.0464	-3.1169
T13	42.00-22.00	2.1275	-3.1475	2.0464	-3.1169
T14	22.00-2.00	1.9169	-2.8358	1.8281	-2.7844

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
6'8"x4" Pipe Mount (Verizon)	A	From Leg	0.50 0.00 0.00	0.0000	121.00	No Ice 1/2" Ice	2.60 3.01	2.60 3.01	72.00 93.13
6'8"x4" Pipe Mount (Verizon)	B	From Leg	0.50 0.00 0.00	0.0000	121.00	No Ice 1/2" Ice	2.60 3.01	2.60 3.01	72.00 93.13
14' Dipole (Unknown)	C	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice	2.80 4.22	2.80 4.22	75.00 97.50
6' Stand-off (Unknown)	C	From Leg	3.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice	1.20 1.40	4.50 5.50	75.00 125.00
2.5" x 22' Whip (Unknown)	A	From Leg	4.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice	5.51 7.77	5.51 7.77	150.30 191.34
6' Stand-off (Unknown)	A	From Leg	3.00 0.00 0.00	0.0000	132.00	No Ice 1/2" Ice	1.20 1.40	4.50 5.50	75.00 125.00
ASP-711 (Unknown)	A	From Leg	1.50 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	1.30 3.63	1.30 3.63	13.00 31.56
3' Stand-off (Unknown)	A	From Leg	0.75 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	1.00 1.20	2.00 2.70	50.00 75.00
2.5" x 14' Omni (Unknown)	B	From Leg	3.50 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	3.50 4.93	3.50 4.93	30.00 55.97
3' Stand-off (Unknown)	B	From Leg	1.50 0.00 0.00	0.0000	260.00	No Ice 1/2" Ice	1.00 1.20	2.00 2.70	50.00 75.00
6' Stand-off (Unknown)	A	From Leg	2.50 0.00 0.00	0.0000	281.00	No Ice 1/2" Ice	1.20 1.40	4.50 5.50	75.00 125.00
6' Stand-off (Unknown)	B	From Leg	2.50 0.00 0.00	0.0000	281.00	No Ice 1/2" Ice	1.20 1.40	4.50 5.50	75.00 125.00
6' Stand-off (Unknown)	C	From Leg	2.50 0.00	0.0000	281.00	No Ice 1/2" Ice	1.20 1.40	4.50 5.50	75.00 125.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00						
DLS L 864-L-865 Light Beacon Unit (Tower)	C	None		0.0000	282.00	No Ice 1/2" Ice	2.50 2.72	1.14 1.29	52.00 69.23
1' Yagi antenna (Not Used)	C	From Leg	0.50 0.00 0.00	0.0000	124.50	No Ice 1/2" Ice	0.50 0.86	0.50 0.86	25.00 29.40
3" x 12.5' Omni (Not Used)	B	From Leg	2.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	3.75 5.03	3.75 5.03	30.00 57.13
3' Stand-off (Not Used)	B	From Leg	1.50 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice	1.00 1.20	2.00 2.70	50.00 75.00
6' Stand-off (Not Used)	C	From Leg	3.00 0.00 0.00	0.0000	180.50	No Ice 1/2" Ice	1.20 1.40	4.50 5.50	75.00 125.00
2.5" x 10' Omni (Not Used)	A	From Leg	1.00 0.00 0.00	0.0000	284.00	No Ice 1/2" Ice	2.50 3.53	2.50 3.53	30.00 48.64
FM Antenna (WMRQ)	B	From Face	4.50 0.00 0.00	0.0000	289.00	No Ice 1/2" Ice	8.30 13.00	8.30 13.00	102.00 132.60
(2) 7770 Panel Antenna (AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	35.00 67.63
(2) 7770 Panel Antenna (AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	35.00 67.63
(2) 7770 Panel Antenna (AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	5.88 6.31	2.93 3.27	35.00 67.63
(2) LGP214nn TMA (AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	1.90 9.06
(4) LGP 219nn (AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70
(2) LGP214nn TMA (AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	1.90 9.06
(4) LGP 219nn (AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70
(2) LGP214nn TMA (AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	1.29 1.45	0.23 0.31	1.90 9.06
(4) LGP 219nn (AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	0.23 0.30	0.12 0.17	5.50 7.70
SBNH-1D6565C (AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	11.41 12.02	7.70 8.29	61.00 126.70
SBNH-1D6565C (AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	164.00	No Ice 1/2" Ice	11.41 12.02	7.70 8.29	61.00 126.70
SBNH-1D6565C (AT&T)	C	From Leg	4.00 0.00	0.0000	164.00	No Ice 1/2" Ice	11.41 12.02	7.70 8.29	61.00 126.70

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00						
Surge Suppressor	C	None		0.0000	164.00	No Ice	0.80	0.80	30.00
(AT&T)						1/2" Ice	0.94	0.94	41.94
(2) RRU	A	From Leg	4.00	0.0000	164.00	No Ice	1.40	0.70	10.00
(AT&T)			0.00			1/2" Ice	1.56	0.82	20.34
			0.00						
(2) RRU	B	From Leg	4.00	0.0000	164.00	No Ice	1.40	0.70	10.00
(AT&T)			0.00			1/2" Ice	1.56	0.82	20.34
			0.00						
(2) RRU	C	From Leg	4.00	0.0000	164.00	No Ice	1.40	0.70	10.00
(AT&T)			0.00			1/2" Ice	1.56	0.82	20.34
			0.00						
Andrew 12' Sector Frame	A	From Leg	2.00	0.0000	164.00	No Ice	10.80	10.80	487.00
(SF-U12-3-72)			0.00			1/2" Ice	15.10	15.10	633.10
(AT&T)			0.00						
Andrew 12' Sector Frame	B	From Leg	2.00	0.0000	164.00	No Ice	10.80	10.80	487.00
(SF-U12-3-72)			0.00			1/2" Ice	15.10	15.10	633.10
(AT&T)			0.00						
Andrew 12' Sector Frame	C	From Leg	2.00	0.0000	164.00	No Ice	10.80	10.80	487.00
(SF-U12-3-72)			0.00			1/2" Ice	15.10	15.10	633.10
(AT&T)			0.00						
BXA-70063-6CF-EDIN	A	From Leg	1.00	0.0000	121.00	No Ice	7.73	4.16	20.00
(Verizon)			0.00			1/2" Ice	8.27	4.60	62.49
			0.00						
BXA-70063-6CF-EDIN	B	From Leg	1.00	0.0000	121.00	No Ice	7.73	4.16	20.00
(Verizon)			0.00			1/2" Ice	8.27	4.60	62.49
			0.00						
(2) LPA-80080-4CF-EDIN	A	From Leg	1.00	0.0000	121.00	No Ice	2.62	6.06	20.00
(Verizon)			0.00			1/2" Ice	2.92	6.45	53.12
			0.00						
(2) LPA-80063-4CF	B	From Leg	1.00	0.0000	121.00	No Ice	7.00	6.04	32.00
(Verizon)			0.00			1/2" Ice	7.41	6.43	84.41
			0.00						
(2) LPA-171080-8CF-EDIN	A	From Leg	1.00	0.0000	121.00	No Ice	2.10	3.19	13.50
(Verizon)			0.00			1/2" Ice	2.40	3.54	33.28
			0.00						
(2) LPA-171063-8CF-EDIN	B	From Leg	1.00	0.0000	121.00	No Ice	3.69	3.69	16.50
(Verizon)			0.00			1/2" Ice	4.06	4.06	45.29
			0.00						
3' Stand-off	A	From Leg	0.00	0.0000	230.00	No Ice	1.00	2.00	50.00
(Eversource)			0.00			1/2" Ice	1.20	2.70	75.00
			0.00						
531-70HD Exposed Dipole	A	From Leg	3.00	0.0000	218.00	No Ice	5.91	5.91	45.00
Antenna			0.00			1/2" Ice	7.68	7.68	79.03
(Eversource)			0.00						
6' Stand-off	A	From Leg	0.00	0.0000	218.00	No Ice	1.20	4.50	75.00
(Eversource)			0.00			1/2" Ice	1.40	5.50	125.00
			0.00						
(3) L-810 Obstruction Lights	C	None		0.0000	142.00	No Ice	0.85	0.43	45.00
w/ Mount Kit						1/2" Ice	0.97	0.53	51.66
(Tower - OBS Light)									
Pirod 12' T-Frame Sector	A	From Leg	1.50	0.0000	228.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(T-Mobile)			0.00						
Pirod 12' T-Frame Sector	B	From Leg	1.50	0.0000	228.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(T-Mobile)			0.00						

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Pirod 12' T-Frame Sector Mount (1) (T-Mobile)	C	From Leg	1.50 0.00 0.00	0.0000	228.00	No Ice 1/2" Ice	13.60 18.40	13.60 18.40	465.00 600.00
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	A	From Leg	4.00 6.00 0.00	0.0000	228.00	No Ice 1/2" Ice	6.75 7.31	5.65 6.56	104.90 161.79
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	A	From Leg	4.00 -6.00 0.00	0.0000	228.00	No Ice 1/2" Ice	6.75 7.31	5.65 6.56	104.90 161.79
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	B	From Leg	4.00 6.00 0.00	0.0000	228.00	No Ice 1/2" Ice	6.75 7.31	5.65 6.56	104.90 161.79
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	B	From Leg	4.00 -6.00 0.00	0.0000	228.00	No Ice 1/2" Ice	6.75 7.31	5.65 6.56	104.90 161.79
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	C	From Leg	4.00 6.00 0.00	0.0000	228.00	No Ice 1/2" Ice	6.75 7.31	5.65 6.56	104.90 161.79
AIR B2A/B4P w/ 6' Sch 40 Pipe Mount (T-Mobile)	C	From Leg	4.00 -6.00 0.00	0.0000	228.00	No Ice 1/2" Ice	6.75 7.31	5.65 6.56	104.90 161.79
TMA (T-Mobile)	A	From Leg	4.00 -6.00 0.00	0.0000	228.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	20.00 26.53
TMA (T-Mobile)	A	From Leg	4.00 -6.00 0.00	0.0000	228.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	20.00 26.53
TMA (T-Mobile)	A	From Leg	4.00 -6.00 0.00	0.0000	228.00	No Ice 1/2" Ice	1.06 1.21	0.45 0.57	20.00 26.53
DB589-Y (Eversource)	A	From Leg	3.00 0.00 0.00	0.0000	236.70	No Ice 1/2" Ice	2.13 3.00	2.13 3.00	11.50 27.39

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
9' Dish w/ Radome (Eversource)	C	Paraboloid w/Radome	From Leg	3.00 0.00 0.00	0.0000		104.50	9.00	No Ice 1/2" Ice	63.62 64.80	100.00 432.64
5.5' Dish w/ Radome (Eversource)	A	Paraboloid w/Radome	From Leg	2.50 0.00 0.00	0.0000		153.00	5.50	No Ice 1/2" Ice	23.76 24.48	75.00 200.66
8' Dish w/ Radome (Eversource)	A	Paraboloid w/Radome	From Leg	2.83 0.00 0.00	0.0000		204.50	8.00	No Ice 1/2" Ice	50.27 51.32	75.00 338.44
6' Dish w/ Radome	C	Paraboloid	From	2.25	0.0000		204.50	6.00	No Ice	28.27	75.00

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
(Eversource)		w/Radome	Leg	0.00 0.00					1/2" Ice	29.07	224.23
8' Dish w/ Radome (Eversource)	C	Paraboloid w/Radome	From Leg	2.83 0.00 0.00	0.0000		212.50	8.00	No Ice 1/2" Ice	50.27 51.32	75.00 338.44
MF-950B (WBMW)	C	Grid	From Leg	0.50 0.00 0.00	0.0000		280.00	1.33	No Ice 1/2" Ice	2.66 3.50	13.00 21.00

Tower Pressures - No Ice

$G_H = 1.092$

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	272.00	1.827	34	83.333	A	4.785	13.070	6.667	37.34	0.000	0.000
282.00-262.00					B	4.421	18.413		29.20	0.000	0.000
					C	4.951	10.620		42.81	0.000	0.000
T2	252.00	1.788	33	83.333	A	3.724	15.520	6.667	34.64	0.000	0.000
262.00-242.00					B	3.565	18.413		30.33	0.000	0.000
					C	3.993	10.620		45.62	0.000	0.000
T3	232.00	1.746	32	83.333	A	3.724	15.520	6.667	34.64	0.000	0.000
242.00-222.00					B	3.213	24.817		23.78	0.000	0.000
					C	3.894	12.420		40.86	0.000	0.000
T4	212.00	1.701	31	83.333	A	14.257	11.833	6.667	25.55	0.000	0.000
222.00-202.00					B	11.576	37.392		13.61	0.000	0.000
					C	14.440	10.915		26.29	0.000	0.000
T5	192.00	1.654	31	83.333	A	16.640	11.833	6.667	23.41	0.000	0.000
202.00-182.00					B	16.731	37.392		12.32	0.000	0.000
					C	16.811	11.100		23.89	0.000	0.000
T6	172.00	1.603	30	83.333	A	3.492	19.750	6.667	28.68	0.000	0.000
182.00-162.00					B	9.854	39.355		13.55	0.000	0.000
					C	3.762	14.824		35.87	0.000	0.000
T7	152.00	1.547	29	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
162.00-142.00					B	9.854	39.355		13.55	0.000	0.000
					C	5.410	14.735		33.09	0.000	0.000
T8	132.00	1.486	27	83.333	A	11.237	35.050	6.667	14.40	0.000	0.000
142.00-122.00					B	15.266	43.687		11.31	0.000	0.000
					C	18.042	14.458		20.51	0.000	0.000
T9	112.00	1.418	26	83.333	A	9.628	35.050	6.667	14.92	0.000	0.000
122.00-102.00					B	11.953	54.992		9.96	0.000	0.000
					C	16.051	16.267		20.63	0.000	0.000
T10	92.00	1.34	25	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
102.00-82.00					B	8.937	56.047		10.26	0.000	0.000
					C	8.467	19.454		23.88	0.000	0.000
T11	72.00	1.25	23	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
82.00-62.00					B	8.937	56.047		10.26	0.000	0.000
					C	8.467	19.454		23.88	0.000	0.000
T12	52.00	1.139	21	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
62.00-42.00					B	8.937	56.047		10.26	0.000	0.000
					C	8.467	19.454		23.88	0.000	0.000
T13	32.00	1	18	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
42.00-22.00					B	8.937	56.047		10.26	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
					C	8.467	19.454		23.88	0.000	0.000
T14 22.00-2.00	12.00	1	18	83.333	A	2.884	30.810	6.667	19.79	0.000	0.000
					B	7.701	44.690		12.72	0.000	0.000
					C	7.349	17.245		27.11	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.092$

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	272.00	1.827	25	0.5000	85.000	A	4.677	24.061	10.000	34.80	0.000	0.000
282.00-262.00						B	3.990	33.254		26.85	0.000	0.000
						C	4.951	20.387		39.47	0.000	0.000
T2	252.00	1.788	25	0.5000	85.000	A	3.550	27.452	10.000	32.26	0.000	0.000
262.00-242.00						B	3.218	32.997		27.61	0.000	0.000
						C	3.993	20.068		41.56	0.000	0.000
T3	232.00	1.746	24	0.5000	85.000	A	3.550	27.452	10.000	32.26	0.000	0.000
242.00-222.00						B	2.684	41.903		22.43	0.000	0.000
						C	3.830	22.781		37.58	0.000	0.000
T4	212.00	1.701	24	0.5000	85.000	A	16.270	19.920	10.000	27.63	0.000	0.000
222.00-202.00						B	9.707	59.531		14.44	0.000	0.000
						C	16.529	18.858		28.26	0.000	0.000
T5	192.00	1.654	23	0.5000	85.000	A	18.542	20.488	10.000	25.62	0.000	0.000
202.00-182.00						B	15.213	59.488		13.39	0.000	0.000
						C	18.742	19.776		25.96	0.000	0.000
T6	172.00	1.603	22	0.5000	85.000	A	3.322	33.347	10.000	27.27	0.000	0.000
182.00-162.00						B	11.972	60.994		13.71	0.000	0.000
						C	3.589	26.815		32.89	0.000	0.000
T7	152.00	1.547	21	0.5000	85.000	A	2.945	58.448	10.000	16.29	0.000	0.000
162.00-142.00						B	11.972	60.994		13.71	0.000	0.000
						C	5.915	26.441		30.91	0.000	0.000
T8	132.00	1.486	21	0.5000	85.000	A	9.752	55.286	10.000	15.38	0.000	0.000
142.00-122.00						B	12.135	70.475		12.11	0.000	0.000
						C	19.807	25.015		22.31	0.000	0.000
T9	112.00	1.418	20	0.5000	85.000	A	8.721	55.028	10.000	15.69	0.000	0.000
122.00-102.00						B	7.737	88.022		10.44	0.000	0.000
						C	17.873	27.411		22.08	0.000	0.000
T10	92.00	1.34	19	0.5000	85.000	A	2.945	58.448	10.000	16.29	0.000	0.000
102.00-82.00						B	10.448	86.417		10.32	0.000	0.000
						C	10.169	33.072		23.13	0.000	0.000
T11 82.00-62.00	72.00	1.25	17	0.5000	85.000	A	2.945	58.448	10.000	16.29	0.000	0.000
						B	10.448	86.417		10.32	0.000	0.000
						C	10.169	33.072		23.13	0.000	0.000
T12 62.00-42.00	52.00	1.139	16	0.5000	85.000	A	2.945	58.448	10.000	16.29	0.000	0.000
						B	10.448	86.417		10.32	0.000	0.000
						C	10.169	33.072		23.13	0.000	0.000
T13 42.00-22.00	32.00	1	14	0.5000	85.000	A	2.945	58.448	10.000	16.29	0.000	0.000
						B	10.448	86.417		10.32	0.000	0.000
						C	10.169	33.072		23.13	0.000	0.000
T14 22.00-2.00	12.00	1	14	0.5000	85.000	A	3.207	48.853	10.000	19.21	0.000	0.000
						B	8.834	69.830		12.71	0.000	0.000
						C	8.625	29.821		26.01	0.000	0.000

Tower Pressure - Service

$G_H = 1.092$

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 282.00-262.00	272.00	1.827	12	83.333	A	4.785	13.070	6.667	37.34	0.000	0.000
					B	4.421	18.413		29.20	0.000	0.000
					C	4.951	10.620		42.81	0.000	0.000
T2 262.00-242.00	252.00	1.788	11	83.333	A	3.724	15.520	6.667	34.64	0.000	0.000
					B	3.565	18.413		30.33	0.000	0.000
					C	3.993	10.620		45.62	0.000	0.000
T3 242.00-222.00	232.00	1.746	11	83.333	A	3.724	15.520	6.667	34.64	0.000	0.000
					B	3.213	24.817		23.78	0.000	0.000
					C	3.894	12.420		40.86	0.000	0.000
T4 222.00-202.00	212.00	1.701	11	83.333	A	14.257	11.833	6.667	25.55	0.000	0.000
					B	11.576	37.392		13.61	0.000	0.000
					C	14.440	10.915		26.29	0.000	0.000
T5 202.00-182.00	192.00	1.654	11	83.333	A	16.640	11.833	6.667	23.41	0.000	0.000
					B	16.731	37.392		12.32	0.000	0.000
					C	16.811	11.100		23.89	0.000	0.000
T6 182.00-162.00	172.00	1.603	10	83.333	A	3.492	19.750	6.667	28.68	0.000	0.000
					B	9.854	39.355		13.55	0.000	0.000
					C	3.762	14.824		35.87	0.000	0.000
T7 162.00-142.00	152.00	1.547	10	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
					B	9.854	39.355		13.55	0.000	0.000
					C	5.410	14.735		33.09	0.000	0.000
T8 142.00-122.00	132.00	1.486	10	83.333	A	11.237	35.050	6.667	14.40	0.000	0.000
					B	15.266	43.687		11.31	0.000	0.000
					C	18.042	14.458		20.51	0.000	0.000
T9 122.00-102.00	112.00	1.418	9	83.333	A	9.628	35.050	6.667	14.92	0.000	0.000
					B	11.953	54.992		9.96	0.000	0.000
					C	16.051	16.267		20.63	0.000	0.000
T10 102.00-82.00	92.00	1.34	9	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
					B	8.937	56.047		10.26	0.000	0.000
					C	8.467	19.454		23.88	0.000	0.000
T11 82.00-62.00	72.00	1.25	8	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
					B	8.937	56.047		10.26	0.000	0.000
					C	8.467	19.454		23.88	0.000	0.000
T12 62.00-42.00	52.00	1.139	7	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
					B	8.937	56.047		10.26	0.000	0.000
					C	8.467	19.454		23.88	0.000	0.000
T13 42.00-22.00	32.00	1	6	83.333	A	2.515	37.539	6.667	16.64	0.000	0.000
					B	8.937	56.047		10.26	0.000	0.000
					C	8.467	19.454		23.88	0.000	0.000
T14 22.00-2.00	12.00	1	6	83.333	A	2.884	30.810	6.667	19.79	0.000	0.000
					B	7.701	44.690		12.72	0.000	0.000
					C	7.349	17.245		27.11	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

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	56.20	1212.63	A	0.214	2.549	0.593	1	1	12.540	1364.73	68.24	B
282.00-262.00			B	0.274	2.367	0.608	1	1	15.621			
			C	0.187	2.641	0.588	1	1	11.194			
T2	69.40	1153.83	A	0.231	2.496	0.597	1	1	12.992	1273.36	63.67	B
262.00-242.00			B	0.264	2.397	0.605	1	1	14.713			
			C	0.175	2.68	0.586	1	1	10.213			
T3	155.25	1153.83	A	0.231	2.496	0.597	1	1	12.992	1460.28	73.01	B
242.00-222.00			B	0.336	2.204	0.628	1	1	18.791			
			C	0.196	2.61	0.59	1	1	11.217			
T4	357.89	2014.07	A	0.313	2.262	0.62	1	1	21.593	2458.40	122.92	B
222.00-202.00			B	0.588	1.812	0.746	1	1	39.474			
			C	0.304	2.285	0.617	1	1	21.177			
T5	377.84	2247.64	A	0.342	2.191	0.63	1	1	24.090	2743.16	137.16	B
202.00-182.00		TA 873.93	B	0.649	1.782	0.785	1	1	46.088			
			C	0.335	2.207	0.627	1	1	23.773			
T6	422.26	1153.83	A	0.279	2.354	0.61	1	1	15.533	2302.16	115.11	B
182.00-162.00			B	0.591	1.81	0.748	1	1	39.285			
			C	0.223	2.521	0.595	1	1	12.588			
T7	613.64	1153.83	A	0.481	1.926	0.688	1	1	28.335	2222.27	111.11	B
162.00-142.00			B	0.591	1.81	0.748	1	1	39.285			
			C	0.242	2.463	0.6	1	1	14.248			
T8	694.73	2247.64	A	0.555	1.838	0.727	1	1	36.730	2736.64	136.83	B
142.00-122.00		TA 873.93	B	0.707	1.777	0.825	1	1	51.319			
			C	0.39	2.084	0.648	1	1	27.405			
T9	826.88	2014.07	A	0.536	1.857	0.717	1	1	34.744	3197.57	159.88	B
122.00-102.00			B	0.803	1.819	0.899	1	1	61.397			
			C	0.388	2.089	0.647	1	1	26.571			
T10	834.28	1153.83	A	0.481	1.926	0.688	1	1	28.335	2843.33	142.17	B
102.00-82.00			B	0.78	1.802	0.88	1	1	58.266			
			C	0.335	2.207	0.627	1	1	20.670			
T11	834.28	1153.83	A	0.481	1.926	0.688	1	1	28.335	2651.01	132.55	B
82.00-62.00			B	0.78	1.802	0.88	1	1	58.266			
			C	0.335	2.207	0.627	1	1	20.670			
T12	834.28	1153.83	A	0.481	1.926	0.688	1	1	28.335	2415.64	120.78	B
62.00-42.00			B	0.78	1.802	0.88	1	1	58.266			
			C	0.335	2.207	0.627	1	1	20.670			
T13	834.28	1153.83	A	0.481	1.926	0.688	1	1	28.335	2121.32	106.07	B
42.00-22.00			B	0.78	1.802	0.88	1	1	58.266			
			C	0.335	2.207	0.627	1	1	20.670			
T14	625.71	1153.83	A	0.404	2.055	0.653	1	1	23.014	1524.34	76.22	B
22.00-2.00			B	0.629	1.789	0.772	1	1	42.183			
			C	0.295	2.309	0.614	1	1	17.945			
Sum Weight:	7536.92	21868.35								31314.22		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl Face
T1	56.20	1212.63	A	0.214	2.549	0.593	0.825	1	11.703	1297.14	64.86	B
282.00-262.00			B	0.274	2.367	0.608	0.825	1	14.847			
			C	0.187	2.641	0.588	0.825	1	10.327			
T2	69.40	1153.83	A	0.231	2.496	0.597	0.825	1	12.341	1219.37	60.97	B
262.00-242.00			B	0.264	2.397	0.605	0.825	1	14.090			
			C	0.175	2.68	0.586	0.825	1	9.514			

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
T3	155.25	1153.83	A	0.231	2.496	0.597	0.825	1	12.341	1416.58	70.83	B
242.00-222.00			B	0.336	2.204	0.628	0.825	1	18.229			
			C	0.196	2.61	0.59	0.825	1	10.535			
T4	357.89	2014.07	A	0.313	2.262	0.62	0.825	1	19.099	2332.23	116.61	B
222.00-202.00			B	0.588	1.812	0.746	0.825	1	37.448			
			C	0.304	2.285	0.617	0.825	1	18.650			
T5	377.84	2247.64	A	0.342	2.191	0.63	0.825	1	21.178	2568.89	128.44	B
202.00-182.00		TA 873.93	B	0.649	1.782	0.785	0.825	1	43.160			
			C	0.335	2.207	0.627	0.825	1	20.831			
T6	422.26	1153.83	A	0.279	2.354	0.61	0.825	1	14.922	2201.11	110.06	B
182.00-162.00			B	0.591	1.81	0.748	0.825	1	37.560			
			C	0.223	2.521	0.595	0.825	1	11.930			
T7	613.64	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	2124.72	106.24	B
162.00-142.00			B	0.591	1.81	0.748	0.825	1	37.560			
			C	0.242	2.463	0.6	0.825	1	13.301			
T8	694.73	2247.64	A	0.555	1.838	0.727	0.825	1	34.764	2594.17	129.71	B
142.00-122.00		TA 873.93	B	0.707	1.777	0.825	0.825	1	48.647			
			C	0.39	2.084	0.648	0.825	1	24.248			
T9	826.88	2014.07	A	0.536	1.857	0.717	0.825	1	33.059	3088.63	154.43	B
122.00-102.00			B	0.803	1.819	0.899	0.825	1	59.306			
			C	0.388	2.089	0.647	0.825	1	23.762			
T10	834.28	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	2767.01	138.35	B
102.00-82.00			B	0.78	1.802	0.88	0.825	1	56.702			
			C	0.335	2.207	0.627	0.825	1	19.188			
T11	834.28	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	2579.85	128.99	B
82.00-62.00			B	0.78	1.802	0.88	0.825	1	56.702			
			C	0.335	2.207	0.627	0.825	1	19.188			
T12	834.28	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	2350.80	117.54	B
62.00-42.00			B	0.78	1.802	0.88	0.825	1	56.702			
			C	0.335	2.207	0.627	0.825	1	19.188			
T13	834.28	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	2064.38	103.22	B
42.00-22.00			B	0.78	1.802	0.88	0.825	1	56.702			
			C	0.335	2.207	0.627	0.825	1	19.188			
T14	625.71	1153.83	A	0.404	2.055	0.653	0.825	1	22.510	1475.64	73.78	B
22.00-2.00			B	0.629	1.789	0.772	0.825	1	40.836			
			C	0.295	2.309	0.614	0.825	1	16.659			
Sum Weight:	7536.92	21868.35								30080.52		

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	56.20	1212.63	A	0.214	2.549	0.593	0.8	1	11.583	1287.48	64.37	B
282.00-262.00			B	0.274	2.367	0.608	0.8	1	14.737			
			C	0.187	2.641	0.588	0.8	1	10.203			
T2	69.40	1153.83	A	0.231	2.496	0.597	0.8	1	12.248	1211.66	60.58	B
262.00-242.00			B	0.264	2.397	0.605	0.8	1	14.000			
			C	0.175	2.68	0.586	0.8	1	9.414			
T3	155.25	1153.83	A	0.231	2.496	0.597	0.8	1	12.248	1410.34	70.52	B
242.00-222.00			B	0.336	2.204	0.628	0.8	1	18.148			
			C	0.196	2.61	0.59	0.8	1	10.438			
T4	357.89	2014.07	A	0.313	2.262	0.62	0.8	1	18.742	2314.21	115.71	B
222.00-202.00			B	0.588	1.812	0.746	0.8	1	37.159			
			C	0.304	2.285	0.617	0.8	1	18.289			

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
T5	377.84	2247.64	A	0.342	2.191	0.63	0.8	1	20.762	2544.00	127.20	B
202.00-182.00		TA 873.93	B	0.649	1.782	0.785	0.8	1	42.742			
			C	0.335	2.207	0.627	0.8	1	20.411			
T6	422.26	1153.83	A	0.279	2.354	0.61	0.8	1	14.834	2186.67	109.33	B
182.00-162.00			B	0.591	1.81	0.748	0.8	1	37.314			
			C	0.223	2.521	0.595	0.8	1	11.836			
T7	613.64	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	2110.79	105.54	B
162.00-142.00			B	0.591	1.81	0.748	0.8	1	37.314			
			C	0.242	2.463	0.6	0.8	1	13.166			
T8	694.73	2247.64	A	0.555	1.838	0.727	0.8	1	34.483	2573.82	128.69	B
142.00-122.00		TA 873.93	B	0.707	1.777	0.825	0.8	1	48.265			
			C	0.39	2.084	0.648	0.8	1	23.797			
T9	826.88	2014.07	A	0.536	1.857	0.717	0.8	1	32.819	3073.07	153.65	B
122.00-102.00			B	0.803	1.819	0.899	0.8	1	59.007			
			C	0.388	2.089	0.647	0.8	1	23.361			
T10	834.28	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	2756.11	137.81	B
102.00-82.00			B	0.78	1.802	0.88	0.8	1	56.479			
			C	0.335	2.207	0.627	0.8	1	18.976			
T11	834.28	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	2569.69	128.48	B
82.00-62.00			B	0.78	1.802	0.88	0.8	1	56.479			
			C	0.335	2.207	0.627	0.8	1	18.976			
T12	834.28	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	2341.53	117.08	B
62.00-42.00			B	0.78	1.802	0.88	0.8	1	56.479			
			C	0.335	2.207	0.627	0.8	1	18.976			
T13	834.28	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	2056.25	102.81	B
42.00-22.00			B	0.78	1.802	0.88	0.8	1	56.479			
			C	0.335	2.207	0.627	0.8	1	18.976			
T14	625.71	1153.83	A	0.404	2.055	0.653	0.8	1	22.438	1468.68	73.43	B
22.00-2.00			B	0.629	1.789	0.772	0.8	1	40.643			
			C	0.295	2.309	0.614	0.8	1	16.475			
Sum Weight:	7536.92	21868.35								29904.28		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	56.20	1212.63	A	0.214	2.549	0.593	0.85	1	11.823	1306.79	65.34	B
282.00-262.00			B	0.274	2.367	0.608	0.85	1	14.958			
			C	0.187	2.641	0.588	0.85	1	10.451			
T2	69.40	1153.83	A	0.231	2.496	0.597	0.85	1	12.434	1227.08	61.35	B
262.00-242.00			B	0.264	2.397	0.605	0.85	1	14.179			
			C	0.175	2.68	0.586	0.85	1	9.614			
T3	155.25	1153.83	A	0.231	2.496	0.597	0.85	1	12.434	1422.82	71.14	B
242.00-222.00			B	0.336	2.204	0.628	0.85	1	18.309			
			C	0.196	2.61	0.59	0.85	1	10.632			
T4	357.89	2014.07	A	0.313	2.262	0.62	0.85	1	19.455	2350.25	117.51	B
222.00-202.00			B	0.588	1.812	0.746	0.85	1	37.738			
			C	0.304	2.285	0.617	0.85	1	19.011			
T5	377.84	2247.64	A	0.342	2.191	0.63	0.85	1	21.594	2593.79	129.69	B
202.00-182.00		TA 873.93	B	0.649	1.782	0.785	0.85	1	43.579			
			C	0.335	2.207	0.627	0.85	1	21.251			
T6	422.26	1153.83	A	0.279	2.354	0.61	0.85	1	15.009	2215.54	110.78	B
182.00-162.00			B	0.591	1.81	0.748	0.85	1	37.806			
			C	0.223	2.521	0.595	0.85	1	12.024			

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	613.64	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	2138.66	106.93	B
162.00-142.00			B	0.591	1.81	0.748	0.85	1	37.806			
			C	0.242	2.463	0.6	0.85	1	13.436			
T8	694.73	2247.64	A	0.555	1.838	0.727	0.85	1	35.045	2614.52	130.73	B
142.00-122.00		TA 873.93	B	0.707	1.777	0.825	0.85	1	49.029			
			C	0.39	2.084	0.648	0.85	1	24.699			
T9	826.88	2014.07	A	0.536	1.857	0.717	0.85	1	33.300	3104.20	155.21	B
122.00-102.00			B	0.803	1.819	0.899	0.85	1	59.604			
			C	0.388	2.089	0.647	0.85	1	24.163			
T10	834.28	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	2777.91	138.90	B
102.00-82.00			B	0.78	1.802	0.88	0.85	1	56.926			
			C	0.335	2.207	0.627	0.85	1	19.400			
T11	834.28	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	2590.02	129.50	B
82.00-62.00			B	0.78	1.802	0.88	0.85	1	56.926			
			C	0.335	2.207	0.627	0.85	1	19.400			
T12	834.28	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	2360.06	118.00	B
62.00-42.00			B	0.78	1.802	0.88	0.85	1	56.926			
			C	0.335	2.207	0.627	0.85	1	19.400			
T13	834.28	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	2072.51	103.63	B
42.00-22.00			B	0.78	1.802	0.88	0.85	1	56.926			
			C	0.335	2.207	0.627	0.85	1	19.400			
T14	625.71	1153.83	A	0.404	2.055	0.653	0.85	1	22.582	1482.59	74.13	B
22.00-2.00			B	0.629	1.789	0.772	0.85	1	41.028			
			C	0.295	2.309	0.614	0.85	1	16.842			
Sum Weight:	7536.92	21868.35								30256.76		

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	165.91	1607.29	A	0.338	2.2	0.628	1	1	19.795	1445.53	72.28	B
282.00-262.00			B	0.438	1.993	0.668	1	1	26.201			
			C	0.298	2.301	0.615	1	1	17.496			
T2	204.16	1515.91	A	0.365	2.138	0.638	1	1	21.060	1368.35	68.42	B
262.00-242.00			B	0.426	2.015	0.663	1	1	25.081			
			C	0.283	2.342	0.611	1	1	16.252			
T3	425.28	1515.91	A	0.365	2.138	0.638	1	1	21.060	1604.91	80.25	B
242.00-222.00			B	0.525	1.87	0.71	1	1	32.449			
			C	0.313	2.262	0.62	1	1	17.955			
T4	956.07	2563.59	A	0.426	2.015	0.662	1	1	29.466	3004.44	150.22	B
222.00-202.00			B	0.815	1.827	0.908	1	1	63.784			
			C	0.416	2.033	0.658	1	1	28.945			
T5	1028.05	2880.99	A	0.459	1.959	0.678	1	1	32.424	3445.71	172.29	B
202.00-182.00		TA	B	0.879	1.895	0.964	1	1	72.554			
		1187.59	C	0.453	1.968	0.675	1	1	32.085			
T6	1152.11	1515.91	A	0.431	2.005	0.665	1	1	25.495	3164.25	158.21	B
182.00-162.00			B	0.858	1.871	0.946	1	1	69.660			
			C	0.358	2.154	0.635	1	1	20.622			
T7	1685.48	1515.91	A	0.722	1.779	0.836	1	1	51.811	3054.44	152.72	B
162.00-142.00			B	0.858	1.871	0.946	1	1	69.660			
			C	0.381	2.104	0.644	1	1	22.940			
T8	1913.53	2880.99	A	0.765	1.794	0.869	1	1	57.773	3800.47	190.02	B
142.00-122.00		TA	B	0.972	2.044	1	1	1	82.609			
		1187.59	C	0.527	1.867	0.712	1	1	37.613			

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
T9	2272.90	2563.59	A	0.75	1.787	0.857	1	1	55.872	3651.47*	182.57	B
122.00-102.00			B	1	2.1	1	1	1	95.759			
			C	0.533	1.861	0.715	1	1	37.465			
T10	2299.92	1515.91	A	0.722	1.779	0.836	1	1	51.811	3451.90*	172.60	B
102.00-82.00			B	1	2.1	1	1	1	96.865			
			C	0.509	1.889	0.702	1	1	33.384			
T11	2299.92	1515.91	A	0.722	1.779	0.836	1	1	51.811	3218.42*	160.92	B
82.00-62.00			B	1	2.1	1	1	1	96.865			
			C	0.509	1.889	0.702	1	1	33.384			
T12	2299.92	1515.91	A	0.722	1.779	0.836	1	1	51.811	2932.67*	146.63	B
62.00-42.00			B	1	2.1	1	1	1	96.865			
			C	0.509	1.889	0.702	1	1	33.384			
T13	2299.92	1515.91	A	0.722	1.779	0.836	1	1	51.811	2575.36*	128.77	B
42.00-22.00			B	1	2.1	1	1	1	96.865			
			C	0.509	1.889	0.702	1	1	33.384			
T14	1724.94	1515.91	A	0.612	1.797	0.761	1	1	40.399	2338.51	116.93	B
22.00-2.00			B	0.925	1.962	1	1	1	78.664			
			C	0.452	1.97	0.674	1	1	28.734			
Sum Weight:	20728.12	28514.80			*$2A_g$ limit					39056.43		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	165.91	1607.29	A	0.338	2.2	0.628	0.825	1	18.976	1407.01	70.35	B
282.00-262.00			B	0.438	1.993	0.668	0.825	1	25.503			
			C	0.298	2.301	0.615	0.825	1	16.630			
T2	204.16	1515.91	A	0.365	2.138	0.638	0.825	1	20.439	1337.62	66.88	B
262.00-242.00			B	0.426	2.015	0.663	0.825	1	24.518			
			C	0.283	2.342	0.611	0.825	1	15.553			
T3	425.28	1515.91	A	0.365	2.138	0.638	0.825	1	20.439	1581.68	79.08	B
242.00-222.00			B	0.525	1.87	0.71	0.825	1	31.979			
			C	0.313	2.262	0.62	0.825	1	17.284			
T4	956.07	2563.59	A	0.426	2.015	0.662	0.825	1	26.619	2924.43	146.22	B
222.00-202.00			B	0.815	1.827	0.908	0.825	1	62.085			
			C	0.416	2.033	0.658	0.825	1	26.052			
T5	1028.05	2880.99	A	0.459	1.959	0.678	0.825	1	29.179	3319.27	165.96	B
202.00-182.00		TA	B	0.879	1.895	0.964	0.825	1	69.892			
		1187.59	C	0.453	1.968	0.675	0.825	1	28.806			
T6	1152.11	1515.91	A	0.431	2.005	0.665	0.825	1	24.914	3069.08	153.45	B
182.00-162.00			B	0.858	1.871	0.946	0.825	1	67.565			
			C	0.358	2.154	0.635	0.825	1	19.994			
T7	1685.48	1515.91	A	0.722	1.779	0.836	0.825	1	51.295	2962.58	148.13	B
162.00-142.00			B	0.858	1.871	0.946	0.825	1	67.565			
			C	0.381	2.104	0.644	0.825	1	21.905			
T8	1913.53	2880.99	A	0.765	1.794	0.869	0.825	1	56.066	3702.78	185.14	B
142.00-122.00		TA	B	0.972	2.044	1	0.825	1	80.486			
		1187.59	C	0.527	1.867	0.712	0.825	1	34.146			
T9	2272.90	2563.59	A	0.75	1.787	0.857	0.825	1	54.346	3651.47*	182.57	B
122.00-102.00			B	1	2.1	1	0.825	1	94.405			
			C	0.533	1.861	0.715	0.825	1	34.337			
T10	2299.92	1515.91	A	0.722	1.779	0.836	0.825	1	51.295	3451.90*	172.60	B
102.00-82.00			B	1	2.1	1	0.825	1	95.036			

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
			C	0.509	1.889	0.702	0.825	1	31.605			
T11	2299.92	1515.91	A	0.722	1.779	0.836	0.825	1	51.295	3218.42*	160.92	B
82.00-62.00			B	1	2.1	1	0.825	1	95.036			
			C	0.509	1.889	0.702	0.825	1	31.605			
T12	2299.92	1515.91	A	0.722	1.779	0.836	0.825	1	51.295	2932.67*	146.63	B
62.00-42.00			B	1	2.1	1	0.825	1	95.036			
			C	0.509	1.889	0.702	0.825	1	31.605			
T13	2299.92	1515.91	A	0.722	1.779	0.836	0.825	1	51.295	2575.36*	128.77	B
42.00-22.00			B	1	2.1	1	0.825	1	95.036			
			C	0.509	1.889	0.702	0.825	1	31.605			
T14	1724.94	1515.91	A	0.612	1.797	0.761	0.825	1	39.838	2292.55	114.63	B
22.00-2.00			B	0.925	1.962	1	0.825	1	77.118			
			C	0.452	1.97	0.674	0.825	1	27.224			
Sum Weight:	20728.12	28514.80			*2A_g limit					38426.82		

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 ft^2	F lb	w plf	Ctrl. Face
T1	165.91	1607.29	A	0.338	2.2	0.628	0.8	1	18.859	1401.51	70.08	B
282.00-262.00			B	0.438	1.993	0.668	0.8	1	25.403			
			C	0.298	2.301	0.615	0.8	1	16.506			
T2	204.16	1515.91	A	0.365	2.138	0.638	0.8	1	20.350	1333.23	66.66	B
262.00-242.00			B	0.426	2.015	0.663	0.8	1	24.437			
			C	0.283	2.342	0.611	0.8	1	15.453			
T3	425.28	1515.91	A	0.365	2.138	0.638	0.8	1	20.350	1578.36	78.92	B
242.00-222.00			B	0.525	1.87	0.71	0.8	1	31.912			
			C	0.313	2.262	0.62	0.8	1	17.188			
T4	956.07	2563.59	A	0.426	2.015	0.662	0.8	1	26.212	2913.00	145.65	B
222.00-202.00			B	0.815	1.827	0.908	0.8	1	61.843			
			C	0.416	2.033	0.658	0.8	1	25.639			
T5	1028.05	2880.99	A	0.459	1.959	0.678	0.8	1	28.715	3301.21	165.06	B
202.00-182.00		TA	B	0.879	1.895	0.964	0.8	1	69.511			
		1187.59	C	0.453	1.968	0.675	0.8	1	28.337			
T6	1152.11	1515.91	A	0.431	2.005	0.665	0.8	1	24.831	3055.49	152.77	B
182.00-162.00			B	0.858	1.871	0.946	0.8	1	67.266			
			C	0.358	2.154	0.635	0.8	1	19.905			
T7	1685.48	1515.91	A	0.722	1.779	0.836	0.8	1	51.222	2949.45	147.47	B
162.00-142.00			B	0.858	1.871	0.946	0.8	1	67.266			
			C	0.381	2.104	0.644	0.8	1	21.757			
T8	1913.53	2880.99	A	0.765	1.794	0.869	0.8	1	55.822	3688.82	184.44	B
142.00-122.00		TA	B	0.972	2.044	1	0.8	1	80.182			
		1187.59	C	0.527	1.867	0.712	0.8	1	33.651			
T9	2272.90	2563.59	A	0.75	1.787	0.857	0.8	1	54.128	3651.47*	182.57	B
122.00-102.00			B	1	2.1	1	0.8	1	94.212			
			C	0.533	1.861	0.715	0.8	1	33.890			
T10	2299.92	1515.91	A	0.722	1.779	0.836	0.8	1	51.222	3451.90*	172.60	B
102.00-82.00			B	1	2.1	1	0.8	1	94.775			
			C	0.509	1.889	0.702	0.8	1	31.350			
T11	2299.92	1515.91	A	0.722	1.779	0.836	0.8	1	51.222	3218.42*	160.92	B
82.00-62.00			B	1	2.1	1	0.8	1	94.775			
			C	0.509	1.889	0.702	0.8	1	31.350			
T12	2299.92	1515.91	A	0.722	1.779	0.836	0.8	1	51.222	2932.67*	146.63	B

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
62.00-42.00			B	1	2.1	1	0.8	1	94.775			
			C	0.509	1.889	0.702	0.8	1	31.350			
T13	2299.92	1515.91	A	0.722	1.779	0.836	0.8	1	51.222	2575.36*	128.77	B
42.00-22.00			B	1	2.1	1	0.8	1	94.775			
			C	0.509	1.889	0.702	0.8	1	31.350			
T14	1724.94	1515.91	A	0.612	1.797	0.761	0.8	1	39.758	2285.99	114.30	B
22.00-2.00			B	0.925	1.962	1	0.8	1	76.897			
			C	0.452	1.97	0.674	0.8	1	27.009			
Sum Weight:	20728.12	28514.80			*$2A_g$ limit					38336.87		

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	165.91	1607.29	A	0.338	2.2	0.628	0.85	1	19.093	1412.51	70.63	B
282.00-262.00			B	0.438	1.993	0.668	0.85	1	25.603			
			C	0.298	2.301	0.615	0.85	1	16.753			
T2	204.16	1515.91	A	0.365	2.138	0.638	0.85	1	20.528	1342.01	67.10	B
262.00-242.00			B	0.426	2.015	0.663	0.85	1	24.598			
			C	0.283	2.342	0.611	0.85	1	15.653			
T3	425.28	1515.91	A	0.365	2.138	0.638	0.85	1	20.528	1585.00	79.25	B
242.00-222.00			B	0.525	1.87	0.71	0.85	1	32.046			
			C	0.313	2.262	0.62	0.85	1	17.380			
T4	956.07	2563.59	A	0.426	2.015	0.662	0.85	1	27.026	2935.86	146.79	B
222.00-202.00			B	0.815	1.827	0.908	0.85	1	62.328			
			C	0.416	2.033	0.658	0.85	1	26.465			
T5	1028.05	2880.99	A	0.459	1.959	0.678	0.85	1	29.642	3337.33	166.87	B
202.00-182.00		TA	B	0.879	1.895	0.964	0.85	1	70.272			
		1187.59	C	0.453	1.968	0.675	0.85	1	29.274			
T6	1152.11	1515.91	A	0.431	2.005	0.665	0.85	1	24.997	3082.68	154.13	B
182.00-162.00			B	0.858	1.871	0.946	0.85	1	67.865			
			C	0.358	2.154	0.635	0.85	1	20.084			
T7	1685.48	1515.91	A	0.722	1.779	0.836	0.85	1	51.369	2975.70	148.79	B
162.00-142.00			B	0.858	1.871	0.946	0.85	1	67.865			
			C	0.381	2.104	0.644	0.85	1	22.053			
T8	1913.53	2880.99	A	0.765	1.794	0.869	0.85	1	56.310	3716.73	185.84	B
142.00-122.00		TA	B	0.972	2.044	1	0.85	1	80.789			
		1187.59	C	0.527	1.867	0.712	0.85	1	34.642			
T9	2272.90	2563.59	A	0.75	1.787	0.857	0.85	1	54.564	3651.47*	182.57	B
122.00-102.00			B	1	2.1	1	0.85	1	94.598			
			C	0.533	1.861	0.715	0.85	1	34.784			
T10	2299.92	1515.91	A	0.722	1.779	0.836	0.85	1	51.369	3451.90*	172.60	B
102.00-82.00			B	1	2.1	1	0.85	1	95.298			
			C	0.509	1.889	0.702	0.85	1	31.859			
T11	2299.92	1515.91	A	0.722	1.779	0.836	0.85	1	51.369	3218.42*	160.92	B
82.00-62.00			B	1	2.1	1	0.85	1	95.298			
			C	0.509	1.889	0.702	0.85	1	31.859			
T12	2299.92	1515.91	A	0.722	1.779	0.836	0.85	1	51.369	2932.67*	146.63	B
62.00-42.00			B	1	2.1	1	0.85	1	95.298			
			C	0.509	1.889	0.702	0.85	1	31.859			
T13	2299.92	1515.91	A	0.722	1.779	0.836	0.85	1	51.369	2575.36*	128.77	B
42.00-22.00			B	1	2.1	1	0.85	1	95.298			
			C	0.509	1.889	0.702	0.85	1	31.859			

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
T14	1724.94	1515.91	A	0.612	1.797	0.761	0.85	1	39.918	2299.12	114.96	B
22.00-2.00			B	0.925	1.962	1	0.85	1	77.339			
			C	0.452	1.97	0.674	0.85	1	27.440			
Sum Weight:	20728.12	28514.80			*2A_g limit					38516.76		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	56.20	1212.63	A	0.214	2.549	0.593	1	1	12.540	472.22	23.61	B
282.00-262.00			B	0.274	2.367	0.608	1	1	15.621			
			C	0.187	2.641	0.588	1	1	11.194			
T2	69.40	1153.83	A	0.231	2.496	0.597	1	1	12.992	440.61	22.03	B
262.00-242.00			B	0.264	2.397	0.605	1	1	14.713			
			C	0.175	2.68	0.586	1	1	10.213			
T3	155.25	1153.83	A	0.231	2.496	0.597	1	1	12.992	505.29	25.26	B
242.00-222.00			B	0.336	2.204	0.628	1	1	18.791			
			C	0.196	2.61	0.59	1	1	11.217			
T4	357.89	2014.07	A	0.313	2.262	0.62	1	1	21.593	850.66	42.53	B
222.00-202.00			B	0.588	1.812	0.746	1	1	39.474			
			C	0.304	2.285	0.617	1	1	21.177			
T5	377.84	2247.64	A	0.342	2.191	0.63	1	1	24.090	949.19	47.46	B
202.00-182.00		TA 873.93	B	0.649	1.782	0.785	1	1	46.088			
			C	0.335	2.207	0.627	1	1	23.773			
T6	422.26	1153.83	A	0.279	2.354	0.61	1	1	15.533	796.60	39.83	B
182.00-162.00			B	0.591	1.81	0.748	1	1	39.285			
			C	0.223	2.521	0.595	1	1	12.588			
T7	613.64	1153.83	A	0.481	1.926	0.688	1	1	28.335	768.95	38.45	B
162.00-142.00			B	0.591	1.81	0.748	1	1	39.285			
			C	0.242	2.463	0.6	1	1	14.248			
T8	694.73	2247.64	A	0.555	1.838	0.727	1	1	36.730	946.93	47.35	B
142.00-122.00		TA 873.93	B	0.707	1.777	0.825	1	1	51.319			
			C	0.39	2.084	0.648	1	1	27.405			
T9	826.88	2014.07	A	0.536	1.857	0.717	1	1	34.744	1106.43	55.32	B
122.00-102.00			B	0.803	1.819	0.899	1	1	61.397			
			C	0.388	2.089	0.647	1	1	26.571			
T10	834.28	1153.83	A	0.481	1.926	0.688	1	1	28.335	983.85	49.19	B
102.00-82.00			B	0.78	1.802	0.88	1	1	58.266			
			C	0.335	2.207	0.627	1	1	20.670			
T11	834.28	1153.83	A	0.481	1.926	0.688	1	1	28.335	917.31	45.87	B
82.00-62.00			B	0.78	1.802	0.88	1	1	58.266			
			C	0.335	2.207	0.627	1	1	20.670			
T12	834.28	1153.83	A	0.481	1.926	0.688	1	1	28.335	835.86	41.79	B
62.00-42.00			B	0.78	1.802	0.88	1	1	58.266			
			C	0.335	2.207	0.627	1	1	20.670			
T13	834.28	1153.83	A	0.481	1.926	0.688	1	1	28.335	734.02	36.70	B
42.00-22.00			B	0.78	1.802	0.88	1	1	58.266			
			C	0.335	2.207	0.627	1	1	20.670			
T14	625.71	1153.83	A	0.404	2.055	0.653	1	1	23.014	527.45	26.37	B
22.00-2.00			B	0.629	1.789	0.772	1	1	42.183			
			C	0.295	2.309	0.614	1	1	17.945			
Sum Weight:	7536.92	21868.35								10835.37		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl Face
T1	56.20	1212.63	A	0.214	2.549	0.593	0.825	1	11.703	448.84	22.44	B
282.00-262.00			B	0.274	2.367	0.608	0.825	1	14.847			
			C	0.187	2.641	0.588	0.825	1	10.327			
T2	69.40	1153.83	A	0.231	2.496	0.597	0.825	1	12.341	421.93	21.10	B
262.00-242.00			B	0.264	2.397	0.605	0.825	1	14.090			
			C	0.175	2.68	0.586	0.825	1	9.514			
T3	155.25	1153.83	A	0.231	2.496	0.597	0.825	1	12.341	490.17	24.51	B
242.00-222.00			B	0.336	2.204	0.628	0.825	1	18.229			
			C	0.196	2.61	0.59	0.825	1	10.535			
T4	357.89	2014.07	A	0.313	2.262	0.62	0.825	1	19.099	807.00	40.35	B
222.00-202.00			B	0.588	1.812	0.746	0.825	1	37.448			
			C	0.304	2.285	0.617	0.825	1	18.650			
T5	377.84	2247.64	A	0.342	2.191	0.63	0.825	1	21.178	888.89	44.44	B
202.00-182.00		TA 873.93	B	0.649	1.782	0.785	0.825	1	43.160			
			C	0.335	2.207	0.627	0.825	1	20.831			
T6	422.26	1153.83	A	0.279	2.354	0.61	0.825	1	14.922	761.63	38.08	B
182.00-162.00			B	0.591	1.81	0.748	0.825	1	37.560			
			C	0.223	2.521	0.595	0.825	1	11.930			
T7	613.64	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	735.20	36.76	B
162.00-142.00			B	0.591	1.81	0.748	0.825	1	37.560			
			C	0.242	2.463	0.6	0.825	1	13.301			
T8	694.73	2247.64	A	0.555	1.838	0.727	0.825	1	34.764	897.64	44.88	B
142.00-122.00		TA 873.93	B	0.707	1.777	0.825	0.825	1	48.647			
			C	0.39	2.084	0.648	0.825	1	24.248			
T9	826.88	2014.07	A	0.536	1.857	0.717	0.825	1	33.059	1068.73	53.44	B
122.00-102.00			B	0.803	1.819	0.899	0.825	1	59.306			
			C	0.388	2.089	0.647	0.825	1	23.762			
T10	834.28	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	957.44	47.87	B
102.00-82.00			B	0.78	1.802	0.88	0.825	1	56.702			
			C	0.335	2.207	0.627	0.825	1	19.188			
T11	834.28	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	892.68	44.63	B
82.00-62.00			B	0.78	1.802	0.88	0.825	1	56.702			
			C	0.335	2.207	0.627	0.825	1	19.188			
T12	834.28	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	813.42	40.67	B
62.00-42.00			B	0.78	1.802	0.88	0.825	1	56.702			
			C	0.335	2.207	0.627	0.825	1	19.188			
T13	834.28	1153.83	A	0.481	1.926	0.688	0.825	1	27.895	714.32	35.72	B
42.00-22.00			B	0.78	1.802	0.88	0.825	1	56.702			
			C	0.335	2.207	0.627	0.825	1	19.188			
T14	625.71	1153.83	A	0.404	2.055	0.653	0.825	1	22.510	510.60	25.53	B
22.00-2.00			B	0.629	1.789	0.772	0.825	1	40.836			
			C	0.295	2.309	0.614	0.825	1	16.659			
Sum Weight:	7536.92	21868.35								10408.48		

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	56.20	1212.63	A	0.214	2.549	0.593	0.8	1	11.583	445.50	22.27	B
282.00-262.00			B	0.274	2.367	0.608	0.8	1	14.737			
			C	0.187	2.641	0.588	0.8	1	10.203			
T2	69.40	1153.83	A	0.231	2.496	0.597	0.8	1	12.248	419.26	20.96	B
262.00-242.00			B	0.264	2.397	0.605	0.8	1	14.000			
			C	0.175	2.68	0.586	0.8	1	9.414			
T3	155.25	1153.83	A	0.231	2.496	0.597	0.8	1	12.248	488.01	24.40	B
242.00-222.00			B	0.336	2.204	0.628	0.8	1	18.148			
			C	0.196	2.61	0.59	0.8	1	10.438			
T4	357.89	2014.07	A	0.313	2.262	0.62	0.8	1	18.742	800.76	40.04	B
222.00-202.00			B	0.588	1.812	0.746	0.8	1	37.159			
			C	0.304	2.285	0.617	0.8	1	18.289			
T5	377.84	2247.64	A	0.342	2.191	0.63	0.8	1	20.762	880.28	44.01	B
202.00-182.00		TA 873.93	B	0.649	1.782	0.785	0.8	1	42.742			
			C	0.335	2.207	0.627	0.8	1	20.411			
T6	422.26	1153.83	A	0.279	2.354	0.61	0.8	1	14.834	756.63	37.83	B
182.00-162.00			B	0.591	1.81	0.748	0.8	1	37.314			
			C	0.223	2.521	0.595	0.8	1	11.836			
T7	613.64	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	730.38	36.52	B
162.00-142.00			B	0.591	1.81	0.748	0.8	1	37.314			
			C	0.242	2.463	0.6	0.8	1	13.166			
T8	694.73	2247.64	A	0.555	1.838	0.727	0.8	1	34.483	890.59	44.53	B
142.00-122.00		TA 873.93	B	0.707	1.777	0.825	0.8	1	48.265			
			C	0.39	2.084	0.648	0.8	1	23.797			
T9	826.88	2014.07	A	0.536	1.857	0.717	0.8	1	32.819	1063.35	53.17	B
122.00-102.00			B	0.803	1.819	0.899	0.8	1	59.007			
			C	0.388	2.089	0.647	0.8	1	23.361			
T10	834.28	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	953.67	47.68	B
102.00-82.00			B	0.78	1.802	0.88	0.8	1	56.479			
			C	0.335	2.207	0.627	0.8	1	18.976			
T11	834.28	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	889.17	44.46	B
82.00-62.00			B	0.78	1.802	0.88	0.8	1	56.479			
			C	0.335	2.207	0.627	0.8	1	18.976			
T12	834.28	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	810.22	40.51	B
62.00-42.00			B	0.78	1.802	0.88	0.8	1	56.479			
			C	0.335	2.207	0.627	0.8	1	18.976			
T13	834.28	1153.83	A	0.481	1.926	0.688	0.8	1	27.832	711.50	35.58	B
42.00-22.00			B	0.78	1.802	0.88	0.8	1	56.479			
			C	0.335	2.207	0.627	0.8	1	18.976			
T14	625.71	1153.83	A	0.404	2.055	0.653	0.8	1	22.438	508.19	25.41	B
22.00-2.00			B	0.629	1.789	0.772	0.8	1	40.643			
			C	0.295	2.309	0.614	0.8	1	16.475			
Sum Weight:	7536.92	21868.35								10347.50		

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	56.20	1212.63	A	0.214	2.549	0.593	0.85	1	11.823	452.18	22.61	B
282.00-262.00			B	0.274	2.367	0.608	0.85	1	14.958			
			C	0.187	2.641	0.588	0.85	1	10.451			
T2	69.40	1153.83	A	0.231	2.496	0.597	0.85	1	12.434	424.60	21.23	B
262.00-242.00			B	0.264	2.397	0.605	0.85	1	14.179			
			C	0.175	2.68	0.586	0.85	1	9.614			

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
T3	155.25	1153.83	A	0.231	2.496	0.597	0.85	1	12.434	492.33	24.62	B
242.00-222.00			B	0.336	2.204	0.628	0.85	1	18.309			
			C	0.196	2.61	0.59	0.85	1	10.632			
T4	357.89	2014.07	A	0.313	2.262	0.62	0.85	1	19.455	813.24	40.66	B
222.00-202.00			B	0.588	1.812	0.746	0.85	1	37.738			
			C	0.304	2.285	0.617	0.85	1	19.011			
T5	377.84	2247.64	A	0.342	2.191	0.63	0.85	1	21.594	897.50	44.88	B
202.00-182.00		TA 873.93	B	0.649	1.782	0.785	0.85	1	43.579			
			C	0.335	2.207	0.627	0.85	1	21.251			
T6	422.26	1153.83	A	0.279	2.354	0.61	0.85	1	15.009	766.62	38.33	B
182.00-162.00			B	0.591	1.81	0.748	0.85	1	37.806			
			C	0.223	2.521	0.595	0.85	1	12.024			
T7	613.64	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	740.02	37.00	B
162.00-142.00			B	0.591	1.81	0.748	0.85	1	37.806			
			C	0.242	2.463	0.6	0.85	1	13.436			
T8	694.73	2247.64	A	0.555	1.838	0.727	0.85	1	35.045	904.68	45.23	B
142.00-122.00		TA 873.93	B	0.707	1.777	0.825	0.85	1	49.029			
			C	0.39	2.084	0.648	0.85	1	24.699			
T9	826.88	2014.07	A	0.536	1.857	0.717	0.85	1	33.300	1074.12	53.71	B
122.00-102.00			B	0.803	1.819	0.899	0.85	1	59.604			
			C	0.388	2.089	0.647	0.85	1	24.163			
T10	834.28	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	961.22	48.06	B
102.00-82.00			B	0.78	1.802	0.88	0.85	1	56.926			
			C	0.335	2.207	0.627	0.85	1	19.400			
T11	834.28	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	896.20	44.81	B
82.00-62.00			B	0.78	1.802	0.88	0.85	1	56.926			
			C	0.335	2.207	0.627	0.85	1	19.400			
T12	834.28	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	816.63	40.83	B
62.00-42.00			B	0.78	1.802	0.88	0.85	1	56.926			
			C	0.335	2.207	0.627	0.85	1	19.400			
T13	834.28	1153.83	A	0.481	1.926	0.688	0.85	1	27.958	717.13	35.86	B
42.00-22.00			B	0.78	1.802	0.88	0.85	1	56.926			
			C	0.335	2.207	0.627	0.85	1	19.400			
T14	625.71	1153.83	A	0.404	2.055	0.653	0.85	1	22.582	513.01	25.65	B
22.00-2.00			B	0.629	1.789	0.772	0.85	1	41.028			
			C	0.295	2.309	0.614	0.85	1	16.842			
Sum Weight:	7536.92	21868.35								10469.47		

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	8979.76			
Bracing Weight	12888.60			
Total Member Self-Weight	21868.35			
Guy Weight	4059.04			
Total Weight	39664.92			
Wind 0 deg - No Ice		376.37	-47802.19	-3874.06
Wind 30 deg - No Ice		23852.14	-41039.95	-10280.06
Wind 45 deg - No Ice		33370.28	-33222.39	-12044.05
Wind 60 deg - No Ice		40649.10	-23140.85	-15199.90
Wind 90 deg - No Ice		47382.00	339.05	-15880.31
Wind 120 deg - No Ice		41755.90	23752.48	-10642.03
Wind 135 deg - No Ice		33315.43	32406.70	-6975.70

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Torques lb-ft
Wind 150 deg - No Ice		23783.33	39728.60	-1646.83
Wind 180 deg - No Ice		264.13	45656.27	6284.55
Wind 210 deg - No Ice		-23557.40	40560.52	11712.81
Wind 225 deg - No Ice		-33120.57	33237.82	14525.88
Wind 240 deg - No Ice		-41582.65	24087.05	14516.10
Wind 270 deg - No Ice		-46137.04	303.80	13299.03
Wind 300 deg - No Ice		-38838.16	-22400.30	8915.34
Wind 315 deg - No Ice		-31708.31	-32080.72	6047.57
Wind 330 deg - No Ice		-22426.76	-39723.85	2795.36
Member Ice	6646.44			
Guy Ice	3447.39			
Total Weight Ice	66940.97			
Wind 0 deg - Ice		406.54	-53429.53	26.65
Wind 30 deg - Ice		26899.35	-46205.57	-8039.20
Wind 45 deg - Ice		37744.98	-37546.53	-11071.93
Wind 60 deg - Ice		46067.49	-26326.46	-15080.32
Wind 90 deg - Ice		53427.33	188.78	-17930.83
Wind 120 deg - Ice		46637.61	26498.84	-14531.33
Wind 135 deg - Ice		37701.04	36856.18	-11468.38
Wind 150 deg - Ice		26753.77	45177.70	-6677.89
Wind 180 deg - Ice		197.66	52105.84	1852.94
Wind 210 deg - Ice		-26585.33	45837.96	9275.94
Wind 225 deg - Ice		-37483.45	37550.27	13062.84
Wind 240 deg - Ice		-46425.18	26845.63	14504.69
Wind 270 deg - Ice		-52428.02	228.60	15813.53
Wind 300 deg - Ice		-44621.71	-25719.97	13227.38
Wind 315 deg - Ice		-36409.29	-36636.09	10755.47
Wind 330 deg - Ice		-25709.18	-45175.78	7558.45
Total Weight	39664.92			
Wind 0 deg - Service		130.23	-16540.55	-1340.51
Wind 30 deg - Service		8253.33	-14200.67	-3557.11
Wind 45 deg - Service		11546.81	-11495.64	-4167.49
Wind 60 deg - Service		14065.43	-8007.22	-5259.48
Wind 90 deg - Service		16395.16	117.32	-5494.92
Wind 120 deg - Service		14448.41	8218.85	-3682.36
Wind 135 deg - Service		11527.83	11213.39	-2413.74
Wind 150 deg - Service		8229.52	13746.92	-569.84
Wind 180 deg - Service		91.39	15798.02	2174.59
Wind 210 deg - Service		-8151.35	14034.78	4052.87
Wind 225 deg - Service		-11460.40	11500.98	5026.26
Wind 240 deg - Service		-14388.46	8334.62	5022.87
Wind 270 deg - Service		-15964.37	105.12	4601.74
Wind 300 deg - Service		-13438.81	-7750.97	3084.89
Wind 315 deg - Service		-10971.73	-11100.59	2092.58
Wind 330 deg - Service		-7760.12	-13745.28	967.25

Load Combinations

Comb No	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice+Guy
3	Dead+Wind 30 deg - No Ice+Guy
4	Dead+Wind 45 deg - No Ice+Guy

Comb. No.	Description
5	Dead+Wind 60 deg - No Ice+Guy
6	Dead+Wind 90 deg - No Ice+Guy
7	Dead+Wind 120 deg - No Ice+Guy
8	Dead+Wind 135 deg - No Ice+Guy
9	Dead+Wind 150 deg - No Ice+Guy
10	Dead+Wind 180 deg - No Ice+Guy
11	Dead+Wind 210 deg - No Ice+Guy
12	Dead+Wind 225 deg - No Ice+Guy
13	Dead+Wind 240 deg - No Ice+Guy
14	Dead+Wind 270 deg - No Ice+Guy
15	Dead+Wind 300 deg - No Ice+Guy
16	Dead+Wind 315 deg - No Ice+Guy
17	Dead+Wind 330 deg - No Ice+Guy
18	Dead+Ice+Temp+Guy
19	Dead+Wind 0 deg+Ice+Temp+Guy
20	Dead+Wind 30 deg+Ice+Temp+Guy
21	Dead+Wind 45 deg+Ice+Temp+Guy
22	Dead+Wind 60 deg+Ice+Temp+Guy
23	Dead+Wind 90 deg+Ice+Temp+Guy
24	Dead+Wind 120 deg+Ice+Temp+Guy
25	Dead+Wind 135 deg+Ice+Temp+Guy
26	Dead+Wind 150 deg+Ice+Temp+Guy
27	Dead+Wind 180 deg+Ice+Temp+Guy
28	Dead+Wind 210 deg+Ice+Temp+Guy
29	Dead+Wind 225 deg+Ice+Temp+Guy
30	Dead+Wind 240 deg+Ice+Temp+Guy
31	Dead+Wind 270 deg+Ice+Temp+Guy
32	Dead+Wind 300 deg+Ice+Temp+Guy
33	Dead+Wind 315 deg+Ice+Temp+Guy
34	Dead+Wind 330 deg+Ice+Temp+Guy
35	Dead+Wind 0 deg - Service+Guy
36	Dead+Wind 30 deg - Service+Guy
37	Dead+Wind 45 deg - Service+Guy
38	Dead+Wind 60 deg - Service+Guy
39	Dead+Wind 90 deg - Service+Guy
40	Dead+Wind 120 deg - Service+Guy
41	Dead+Wind 135 deg - Service+Guy
42	Dead+Wind 150 deg - Service+Guy
43	Dead+Wind 180 deg - Service+Guy
44	Dead+Wind 210 deg - Service+Guy
45	Dead+Wind 225 deg - Service+Guy
46	Dead+Wind 240 deg - Service+Guy
47	Dead+Wind 270 deg - Service+Guy
48	Dead+Wind 300 deg - Service+Guy
49	Dead+Wind 315 deg - Service+Guy
50	Dead+Wind 330 deg - Service+Guy

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	282 - 262	Leg	Max Tension	22	7072.03	-245.45	145.59
			Max. Compression	27	-15955.27	9.39	459.76
			Max. Mx	20	-14987.47	-804.19	314.66
			Max. My	27	-15870.18	-3.43	-867.89
			Max. Vy	24	-531.22	0.00	0.00
			Max. Vx	27	562.38	-3.43	-867.89
		Diagonal	Max Tension	23	4824.56	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	23	-4183.12	0.00	0.00
			Max. Mx	24	2343.42	8.21	0.00
			Max. My	23	2790.93	0.00	0.09
			Max. Vy	24	-5.81	0.00	0.00
			Max. Vx	23	-0.06	0.00	0.00
		Secondary Horizontal	Max Tension	30	315.47	0.00	0.00
			Max. Compression	27	-276.35	0.00	0.00
			Max. Mx	18	140.18	-9.77	0.00
			Max. My	24	248.07	0.00	0.00
			Max. Vy	18	9.77	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	19	-2328.76	0.00	0.00
			Max. Mx	18	-1164.82	-15.23	0.00
			Max. My	24	-1523.62	0.00	0.00
			Max. Vy	18	15.23	0.00	0.00
			Max. Vx	24	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	18131.97		
			Top Tension	27	18696.48		
			Top Cable Vert	27	15453.01		
			Top Cable Norm	27	10524.39		
			Top Cable Tan	27	1.78		
			Bot Cable Vert	27	-14205.91		
			Bot Cable Norm	27	11267.67		
			Bot Cable Tan	27	1.78		
		Guy B	Bottom Tension	32	18165.85		
			Top Tension	32	18694.06		
			Top Cable Vert	32	15434.10		
			Top Cable Norm	32	10547.81		
			Top Cable Tan	32	2.04		
			Bot Cable Vert	32	-14256.12		
			Bot Cable Norm	32	11258.83		
			Bot Cable Tan	32	2.04		
		Guy C	Bottom Tension	22	18392.20		
			Top Tension	22	18939.44		
			Top Cable Vert	22	15625.16		
			Top Cable Norm	22	10703.12		
			Top Cable Tan	22	3.91		
			Bot Cable Vert	22	-14409.33		
			Bot Cable Norm	22	11429.96		
			Bot Cable Tan	22	3.91		
T2	262 - 242	Leg	Max Tension	13	15669.85	-78.66	44.76
			Max. Compression	27	-31447.23	-2.81	22.48
			Max. Mx	20	-20767.47	-509.01	166.58
			Max. My	27	-22377.90	-42.77	-531.13
			Max. Vy	21	-383.04	-498.08	211.72
			Max. Vx	27	-405.54	-42.77	-531.13
		Diagonal	Max Tension	27	2830.55	0.00	0.00
			Max. Compression	27	-2493.22	0.00	0.00
			Max. Mx	24	1584.83	8.21	0.00
			Max. My	23	1676.63	0.00	0.09
			Max. Vy	24	-5.81	0.00	0.00
			Max. Vx	23	-0.06	0.00	0.00
		Secondary Horizontal	Max Tension	27	544.68	0.00	0.00
			Max. Compression	27	-544.68	0.00	0.00
			Max. Mx	18	137.19	-9.77	0.00
			Max. My	23	231.55	0.00	0.00
			Max. Vy	18	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T3	242 - 222	Leg	Max Tension	13	22102.80	246.39	-172.34
			Max. Compression	27	-36567.45	22.64	-391.68
			Max. Mx	6	-30979.01	776.96	-161.76
			Max. My	10	-33731.70	-77.20	872.67
			Max. Vy	6	-599.44	-390.91	161.56
			Max. Vx	10	-690.14	32.35	-473.29
		Diagonal	Max Tension	33	1934.06	0.00	0.00
			Max. Compression	33	-2480.47	0.00	0.00
			Max. Mx	24	-300.52	8.20	0.00
			Max. My	23	-664.32	0.00	0.07
			Max. Vy	24	-5.80	0.00	0.00
			Max. Vx	23	-0.05	0.00	0.00
		Secondary Horizontal	Max Tension	27	633.37	0.00	0.00
			Max. Compression	27	-633.37	0.00	0.00
			Max. Mx	28	609.06	-9.77	0.00
			Max. My	23	279.58	0.00	0.00
			Max. Vy	28	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T4	222 - 202	Leg	Max Tension	13	16043.60	-59.07	38.40
			Max. Compression	27	-30380.99	-65.22	-113.94
			Max. Mx	5	-13596.49	817.70	-50.54
			Max. My	3	-8186.55	68.61	-746.46
			Max. Vy	5	-822.90	-407.54	12.52
			Max. Vx	3	733.08	-61.15	348.01
		Diagonal	Max Tension	4	4844.43	0.00	0.00
			Max. Compression	12	-4731.39	0.00	0.00
			Max. Mx	22	3029.30	25.69	0.00
			Max. My	23	-597.27	0.00	0.18
			Max. Vy	22	-18.16	0.00	0.00
			Max. Vx	23	-0.13	0.00	0.00
		Secondary Horizontal	Max Tension	27	526.21	0.00	0.00
			Max. Compression	27	-526.21	0.00	0.00
			Max. Mx	18	224.59	-9.77	0.00
			Max. My	23	473.43	0.00	-0.00
			Max. Vy	18	9.77	0.00	0.00
			Max. Vx	23	0.00	0.00	0.00
T5	202 - 182	Leg	Max Tension	15	7348.37	40.68	138.41
			Max. Compression	28	-41242.58	-25.62	-294.84
			Max. Mx	6	-19405.10	363.60	41.40
			Max. My	2	-8677.72	-11.00	-338.40
			Max. Vy	6	281.25	-177.24	-42.38
			Max. Vx	2	270.98	-23.29	197.43
		Diagonal	Max Tension	12	5561.70	0.00	0.00
			Max. Compression	27	-9203.87	0.00	0.00
			Max. Mx	22	4966.26	25.68	0.00
			Max. My	23	-2592.95	0.00	0.16
			Max. Vy	22	-18.16	0.00	0.00
			Max. Vx	23	-0.11	0.00	0.00
		Secondary Horizontal	Max Tension	28	714.34	0.00	0.00
			Max. Compression	28	-714.34	0.00	0.00
			Max. Mx	18	383.67	-9.77	0.00
			Max. My	23	630.16	0.00	-0.00
			Max. Vy	18	9.77	0.00	0.00
			Max. Vx	23	0.00	0.00	0.00
		Guy A	Bottom Tension	27	16863.27		
			Top Tension	27	17194.25		
			Top Cable Vert	27	12616.54		
			Top Cable Norm	27	11681.83		

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	27	10.89		
			Bot Cable Vert	27	-11794.60		
			Bot Cable Norm	27	12052.26		
			Bot Cable Tan	27	12.45		
		Guy B	Bottom Tension	32	17122.38		
			Top Tension	32	17425.07		
			Top Cable Vert	32	12632.54		
			Top Cable Norm	32	12002.17		
			Top Cable Tan	32	11.03		
			Bot Cable Vert	32	-11866.03		
			Bot Cable Norm	32	12343.95		
			Bot Cable Tan	32	12.50		
		Guy C	Bottom Tension	21	17556.78		
			Top Tension	21	17874.06		
			Top Cable Vert	21	13015.09		
			Top Cable Norm	21	12250.99		
			Top Cable Tan	21	54.68		
			Bot Cable Vert	21	-12219.22		
			Bot Cable Norm	21	12606.34		
			Bot Cable Tan	21	107.08		
		Top Guy Pull-Off	Max Tension	22	20046.79	0.00	0.00
			Max. Compression	19	-5523.87	0.00	0.00
			Max. Mx	18	4612.58	-26.45	0.00
			Max. My	23	-3809.87	0.00	-0.00
			Max. Vy	18	26.45	0.00	0.00
			Max. Vx	23	0.00	0.00	0.00
		Bottom Guy Pull-Off	Max Tension	32	3113.81	0.00	0.00
			Max. Compression	19	-2647.21	0.00	0.00
			Max. Mx	18	540.49	-26.45	0.00
			Max. My	23	-1742.14	0.00	-0.00
			Max. Vy	18	26.45	0.00	0.00
			Max. Vx	23	0.00	0.00	0.00
		Torque Arm Top	Max Tension	23	23286.70	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	23	19711.82	-89.23	0.00
			Max. My	23	8701.55	0.00	0.18
			Max. Vy	23	47.70	0.00	0.00
			Max. Vx	23	-0.10	0.00	0.00
		Torque Arm Bottom	Max Tension	13	1018.53	0.00	0.00
			Max. Compression	21	-22893.54	0.00	0.00
			Max. Mx	24	-16384.36	-89.26	0.00
			Max. My	23	-367.91	0.00	-0.18
			Max. Vy	24	47.71	0.00	0.00
			Max. Vx	23	-0.10	0.00	0.00
T6	182 - 162	Leg	Max Tension	7	4222.81	-243.38	-146.01
			Max. Compression	26	-52632.00	-119.02	-505.70
			Max. Mx	6	-38211.31	1008.05	-162.54
			Max. My	27	-51407.82	4.36	1081.85
			Max. Vy	31	766.77	534.18	205.35
			Max. Vx	27	-858.96	-8.51	-622.10
		Diagonal	Max Tension	23	1718.87	0.00	0.00
			Max. Compression	23	-1712.04	0.00	0.00
			Max. Mx	27	834.51	8.19	0.00
			Max. My	23	-1286.31	0.00	0.05
			Max. Vy	27	-5.79	0.00	0.00
			Max. Vx	23	0.04	0.00	0.00
		Secondary Horizontal	Max Tension	26	911.61	0.00	0.00
			Max. Compression	26	-911.61	0.00	0.00
			Max. Mx	21	494.12	-9.77	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	23	824.93	0.00	0.00
			Max. Vy	21	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T7	162 - 142	Leg	Max Tension	7	573.81	-294.27	-181.51
			Max. Compression	26	-49983.36	99.70	-139.39
			Max. Mx	31	-44835.91	469.93	167.98
			Max. My	27	-49182.25	-3.45	-555.10
			Max. Vy	14	311.37	98.92	-123.06
			Max. Vx	27	-362.64	-1.57	-272.90
		Diagonal	Max Tension	29	3393.78	0.00	0.00
			Max. Compression	29	-3509.44	0.00	0.00
			Max. Mx	28	3334.20	8.20	0.00
			Max. My	23	1895.33	0.00	0.05
			Max. Vy	28	-5.80	0.00	0.00
			Max. Vx	23	-0.04	0.00	0.00
		Secondary Horizontal	Max Tension	26	865.74	0.00	0.00
			Max. Compression	26	-865.74	0.00	0.00
			Max. Mx	22	604.54	-9.77	0.00
			Max. My	23	782.92	0.00	0.00
			Max. Vy	22	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T8	142 - 122	Leg	Max Tension	5	5466.68	-138.30	174.25
			Max. Compression	19	-55933.27	-50.80	41.43
			Max. Mx	30	-38236.72	415.35	111.19
			Max. My	26	-34157.52	-162.96	-436.55
			Max. Vy	6	-338.81	-367.01	-76.32
			Max. Vx	23	300.38	-192.68	-362.86
		Diagonal	Max Tension	29	4313.20	0.00	0.00
			Max. Compression	29	-11980.34	0.00	0.00
			Max. Mx	28	3476.37	25.75	0.00
			Max. My	23	2253.19	0.00	0.14
			Max. Vy	28	-18.21	0.00	0.00
			Max. Vx	23	-0.10	0.00	0.00
		Secondary Horizontal	Max Tension	19	968.79	0.00	0.00
			Max. Compression	19	-968.79	0.00	0.00
			Max. Mx	22	831.64	-9.77	0.00
			Max. My	23	861.76	0.00	0.00
			Max. Vy	22	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
		Guy A	Bottom Tension	28	15697.86		
			Top Tension	28	15899.67		
			Top Cable Vert	28	9462.99		
			Top Cable Norm	28	12776.77		
			Top Cable Tan	28	73.65		
			Bot Cable Vert	28	-8907.20		
			Bot Cable Norm	28	12925.14		
			Bot Cable Tan	28	159.42		
		Guy B	Bottom Tension	32	15613.40		
			Top Tension	32	15791.01		
			Top Cable Vert	32	8992.75		
			Top Cable Norm	32	12980.24		
			Top Cable Tan	32	6.19		
			Bot Cable Vert	32	-8496.45		
			Bot Cable Norm	32	13099.18		
			Bot Cable Tan	32	7.08		
		Guy C	Bottom Tension	21	16007.03		
			Top Tension	21	16197.54		
			Top Cable Vert	21	9428.76		
			Top Cable Norm	21	13170.35		

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	21.73		
			Bot Cable Vert	21	-8901.35		
			Bot Cable Norm	21	13303.60		
			Bot Cable Tan	21	73.16		
		Top Guy Pull-Off	Max Tension	22	22311.48	0.00	0.00
			Max. Compression	19	-5493.06	0.00	0.00
			Max. Mx	22	22311.48	-26.45	0.00
			Max. My	23	7896.10	0.00	0.00
			Max. Vy	22	26.45	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
		Bottom Guy Pull-Off	Max Tension	32	10541.46	0.00	0.00
			Max. Compression	2	-2454.23	0.00	0.00
			Max. Mx	22	10453.19	-26.45	0.00
			Max. My	23	3032.95	0.00	0.00
			Max. Vy	22	26.45	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
		Torque Arm Top	Max Tension	23	20098.45	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	28	18664.21	-89.28	0.00
			Max. My	23	18222.92	0.00	0.13
			Max. Vy	28	47.72	0.00	0.00
			Max. Vx	23	0.07	0.00	0.00
		Torque Arm Bottom	Max Tension	30	4414.47	0.00	0.00
			Max. Compression	28	-19537.46	0.00	0.00
			Max. Mx	28	-10005.64	-89.29	0.00
			Max. My	23	1384.22	0.00	-0.11
			Max. Vy	28	47.73	0.00	0.00
			Max. Vx	23	0.06	0.00	0.00
T9	122 - 102	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-67271.23	649.03	-74.44
			Max. Mx	23	-67271.23	649.03	-74.44
			Max. My	17	-39395.72	-127.67	-796.57
			Max. Vy	7	-710.98	-428.51	-119.18
			Max. Vx	17	829.60	3.45	447.77
		Diagonal	Max Tension	20	4300.75	0.00	0.00
			Max. Compression	20	-4185.49	0.00	0.00
			Max. Mx	28	-361.63	25.74	0.00
			Max. My	23	575.06	0.00	0.14
			Max. Vy	28	-18.20	0.00	0.00
			Max. Vx	23	-0.10	0.00	0.00
		Secondary Horizontal	Max Tension	23	1165.17	0.00	0.00
			Max. Compression	23	-1165.17	0.00	0.00
			Max. Mx	22	809.10	-9.77	0.00
			Max. My	23	1165.17	0.00	0.00
			Max. Vy	22	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T10	102 - 82	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-72999.89	405.90	-267.50
			Max. Mx	19	-61637.29	-792.86	136.13
			Max. My	25	-67363.09	243.28	-768.62
			Max. Vy	19	597.24	-792.86	136.14
			Max. Vx	25	617.21	243.28	-768.62
		Diagonal	Max Tension	25	2051.57	0.00	0.00
			Max. Compression	25	-2780.19	0.00	0.00
			Max. Mx	25	-1029.10	8.22	0.00
			Max. My	23	1729.89	0.00	0.06
			Max. Vy	25	-5.81	0.00	0.00
			Max. Vx	23	-0.04	0.00	0.00
		Secondary	Max Tension	23	1264.40	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov Load Comb	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Horizontal					
			Max. Compression	23	-1264.40	0.00	0.00
			Max. Mx	22	612.49	-9.77	0.00
			Max. My	23	1264.40	0.00	0.00
			Max. Vy	22	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T11	82 - 62	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	23	-72959.07	450.52	-327.50
			Max. Mx	19	-68551.52	-1563.98	293.23
			Max. My	25	-62893.27	449.40	-1555.81
			Max. Vy	19	1028.36	-1563.98	293.25
			Max. Vx	25	-1044.05	449.42	-1555.81
		Diagonal	Max Tension	22	4306.04	0.00	0.00
			Max. Compression	22	-3889.80	0.00	0.00
			Max. Mx	25	-3272.54	8.24	0.00
			Max. My	24	-2735.03	0.00	0.08
			Max. Vy	25	-5.83	0.00	0.00
			Max. Vx	24	-0.05	0.00	0.00
		Secondary Horizontal	Max Tension	23	1263.69	0.00	0.00
			Max. Compression	23	-1263.69	0.00	0.00
			Max. Mx	18	691.51	-9.77	0.00
			Max. My	23	1263.69	0.00	0.00
			Max. Vy	18	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
		Guy A	Bottom Tension	27	12453.77		
			Top Tension	27	12562.03		
			Top Cable Vert	27	5247.15		
			Top Cable Norm	27	11413.68		
			Top Cable Tan	27	0.25		
			Bot Cable Vert	27	-4898.51		
			Bot Cable Norm	27	11449.93		
			Bot Cable Tan	27	0.25		
		Guy B	Bottom Tension	32	12052.95		
			Top Tension	32	12139.91		
			Top Cable Vert	32	4457.22		
			Top Cable Norm	32	11292.06		
			Top Cable Tan	32	1.52		
			Bot Cable Vert	32	-4153.98		
			Bot Cable Norm	32	11314.51		
			Bot Cable Tan	32	1.52		
		Guy C	Bottom Tension	21	12250.67		
			Top Tension	21	12348.73		
			Top Cable Vert	21	4870.15		
			Top Cable Norm	21	11347.81		
			Top Cable Tan	21	12.29		
			Bot Cable Vert	21	-4532.97		
			Bot Cable Norm	21	11381.07		
			Bot Cable Tan	21	48.30		
T12	62 - 42	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-85704.74	440.56	-232.55
			Max. Mx	19	-72016.04	-1153.97	180.99
			Max. My	25	-73361.74	359.90	-1113.01
			Max. Vy	19	-798.61	-1153.97	180.99
			Max. Vx	25	-810.65	359.90	-1113.01
		Diagonal	Max Tension	23	3035.25	0.00	0.00
			Max. Compression	22	-2765.85	0.00	0.00
			Max. Mx	25	555.44	8.27	0.00
			Max. My	24	1211.92	0.00	0.09
			Max. Vy	25	-5.85	0.00	0.00
			Max. Vx	24	-0.06	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
		Secondary Horizontal	Max Tension	21	1484.45	0.00	0.00
			Max. Compression	21	-1484.45	0.00	0.00
			Max. Mx	18	688.67	-9.77	0.00
			Max. My	23	1481.17	0.00	0.00
			Max. Vy	18	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T13	42 - 22	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-85025.12	419.69	-222.11
			Max. Mx	19	-73894.55	-660.41	129.10
			Max. My	25	-78162.59	183.10	-652.29
			Max. Vy	20	-530.33	-631.95	207.17
			Max. Vx	28	-557.09	-132.28	-644.65
		Diagonal	Max Tension	24	1571.77	0.00	0.00
			Max. Compression	24	-2243.44	0.00	0.00
			Max. Mx	25	1503.77	8.29	0.00
			Max. My	24	-77.41	0.00	0.11
			Max. Vy	25	-5.86	0.00	0.00
			Max. Vx	24	-0.08	0.00	0.00
		Secondary Horizontal	Max Tension	21	1472.68	0.00	0.00
			Max. Compression	21	-1472.68	0.00	0.00
			Max. Mx	18	696.82	-9.77	0.00
			Max. My	23	1464.69	0.00	0.00
			Max. Vy	18	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
T14	22 - 2	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-75545.11	-191.86	100.90
			Max. Mx	19	-67896.60	-508.71	155.30
			Max. My	25	-71296.15	94.14	-530.96
			Max. Vy	20	-434.53	-498.27	204.32
			Max. Vx	28	-472.00	-70.29	-529.77
		Diagonal	Max Tension	25	2832.12	0.00	0.00
			Max. Compression	25	-3599.38	0.00	0.00
			Max. Mx	25	2739.33	8.31	0.00
			Max. My	24	394.16	0.00	0.12
			Max. Vy	25	-5.87	0.00	0.00
			Max. Vx	24	-0.08	0.00	0.00
		Secondary Horizontal	Max Tension	21	1308.48	0.00	0.00
			Max. Compression	21	-1308.48	0.00	0.00
			Max. Mx	18	707.41	-9.77	0.00
			Max. My	23	1304.28	0.00	0.00
			Max. Vy	18	9.77	0.00	0.00
			Max. Vx	23	-0.00	0.00	0.00
		Base Beam	Max Tension	24	3331.52	-128379.41	1044.35
			Max. Compression	22	-2628.69	370.54	1.34
			Max. Mx	24	-55798.75	-128481.62	-821.81
			Max. My	23	-54644.61	-125847.41	3462.46
			Max. Vy	24	-55798.75	-128481.62	-821.81
			Max. Vx	23	1498.13	-125847.41	3462.46

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb

Location	Condition	Gov. Load Comb	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Guy C @ 213 ft Elev -17.5 ft Azimuth 240 deg	Max. Vert	13	-1738.04	-1215.64	700.91
	Max. H_x	13	-1738.04	-1215.64	700.91
	Max. H_z	21	-60127.94	-63279.31	37293.27
	Min. Vert	22	-60169.85	-63529.95	36739.13
	Min. H_x	22	-60169.85	-63529.95	36739.13
	Min. H_z	13	-1738.04	-1215.64	700.91
Guy B @ 205 ft Elev -7.5 ft Azimuth 120 deg	Max. Vert	7	-1667.70	1176.21	678.55
	Max. H_x	32	-58426.73	62847.82	36329.99
	Max. H_z	33	-58060.28	62264.57	36667.79
	Min. Vert	32	-58426.73	62847.82	36329.99
	Min. H_x	7	-1667.70	1176.21	678.55
	Min. H_z	7	-1667.70	1176.21	678.55
Guy A @ 219 ft Elev -26.5 ft Azimuth 0 deg	Max. Vert	2	-1859.94	-0.35	-1479.54
	Max. H_x	31	-32842.18	2908.73	-38578.58
	Max. H_z	2	-1859.94	-0.35	-1479.54
	Min. Vert	27	-60102.55	13.78	-72107.74
	Min. H_x	23	-32814.43	-2928.17	-38661.72
	Min. H_z	27	-60102.55	13.78	-72107.74
Mast	Max. Vert	24	167368.19	-2694.64	-1488.52
	Max. H_x	31	162888.02	3303.24	187.24
	Max. H_z	19	165977.36	27.43	3175.21
	Max. M_x	1	0.00	4.06	119.30
	Max. M_z	1	0.00	4.06	119.30
	Max. Torsion	23	3778.72	-3203.91	209.52
	Min. Vert	1	85515.69	4.06	119.30
	Min. H_x	23	164047.71	-3203.91	209.52
	Min. H_z	27	157596.67	33.32	-3341.49
	Min. M_x	1	0.00	4.06	119.30
	Min. M_z	1	0.00	4.06	119.30
	Min. Torsion	31	-3539.27	3303.24	187.24

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	85515.69	-4.06	-119.30	0.00	0.00	0.09
Dead+Wind 0 deg - No Ice+Guy	123945.89	-9.10	-2562.64	0.00	0.00	319.67
Dead+Wind 30 deg - No Ice+Guy	119186.75	1327.43	-2175.77	0.00	0.00	-702.22
Dead+Wind 45 deg - No Ice+Guy	113427.80	1895.67	-1841.57	0.00	0.00	-1280.89
Dead+Wind 60 deg - No Ice+Guy	109488.31	2310.70	-1404.47	0.00	0.00	-2253.19
Dead+Wind 90 deg - No Ice+Guy	119285.23	2539.41	-202.06	0.00	0.00	-2761.44
Dead+Wind 120 deg - No Ice+Guy	125340.06	2165.99	1135.79	0.00	0.00	-2352.36
Dead+Wind 135 deg - No Ice+Guy	122289.93	1697.07	1664.72	0.00	0.00	-1833.09

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+Wind 150 deg - No Ice+Guy	118603.66	1178.23	2123.91	0.00	0.00	-1177.57
Dead+Wind 180 deg - No Ice+Guy	108724.67	-24.34	2548.80	0.00	0.00	106.88
Dead+Wind 210 deg - No Ice+Guy	119011.33	-1191.94	2104.95	0.00	0.00	1014.84
Dead+Wind 225 deg - No Ice+Guy	122438.95	-1712.41	1651.11	0.00	0.00	1604.78
Dead+Wind 240 deg - No Ice+Guy	124855.07	-2192.04	1141.38	0.00	0.00	2019.06
Dead+Wind 270 deg - No Ice+Guy	117513.96	-2597.25	-177.74	0.00	0.00	2488.71
Dead+Wind 300 deg - No Ice+Guy	108812.51	-2352.25	-1405.18	0.00	0.00	2124.30
Dead+Wind 315 deg - No Ice+Guy	111954.08	-1930.82	-1879.42	0.00	0.00	1587.22
Dead+Wind 330 deg - No Ice+Guy	117071.24	-1360.67	-2234.70	0.00	0.00	1120.46
Dead+Ice+Temp+Guy	123160.08	-16.57	-63.60	0.00	0.00	1.37
Dead+Wind 0 deg+Ice+Temp+Guy	165977.36	-27.43	-3175.21	0.00	0.00	845.06
Dead+Wind 30 deg+Ice+Temp+Guy	164177.41	1706.77	-2690.65	0.00	0.00	-349.38
Dead+Wind 45 deg+Ice+Temp+Guy	160753.89	2427.74	-2259.07	0.00	0.00	-1234.13
Dead+Wind 60 deg+Ice+Temp+Guy	158444.88	2948.25	-1726.81	0.00	0.00	-2492.76
Dead+Wind 90 deg+Ice+Temp+Guy	164047.71	3203.91	-209.52	0.00	0.00	-3778.72
Dead+Wind 120 deg+Ice+Temp+Guy	167368.19	2694.64	1488.52	0.00	0.00	-3255.07
Dead+Wind 135 deg+Ice+Temp+Guy	165850.12	2143.51	2208.94	0.00	0.00	-2613.09
Dead+Wind 150 deg+Ice+Temp+Guy	163511.04	1451.57	2781.03	0.00	0.00	-1855.96
Dead+Wind 180 deg+Ice+Temp+Guy	157596.67	-33.32	3341.49	0.00	0.00	-661.79
Dead+Wind 210 deg+Ice+Temp+Guy	163912.10	-1489.74	2758.98	0.00	0.00	632.01
Dead+Wind 225 deg+Ice+Temp+Guy	165812.64	-2192.90	2196.31	0.00	0.00	1538.10
Dead+Wind 240 deg+Ice+Temp+Guy	166722.09	-2764.02	1497.76	0.00	0.00	2375.98
Dead+Wind 270 deg+Ice+Temp+Guy	162888.02	-3303.24	-187.24	0.00	0.00	3539.27
Dead+Wind 300 deg+Ice+Temp+Guy	158155.81	-3030.03	-1734.37	0.00	0.00	3109.02
Dead+Wind 315 deg+Ice+Temp+Guy	159819.93	-2498.15	-2316.06	0.00	0.00	2386.81
Dead+Wind 330 deg+Ice+Temp+Guy	162650.07	-1776.87	-2765.30	0.00	0.00	1747.98
Dead+Wind 0 deg - Service+Guy	87657.67	-2.32	-1150.47	0.00	0.00	142.03
Dead+Wind 30 deg - Service+Guy	87532.24	492.90	-982.55	0.00	0.00	-195.10
Dead+Wind 45 deg - Service+Guy	87543.22	698.23	-817.82	0.00	0.00	-363.33
Dead+Wind 60 deg - Service+Guy	87512.03	855.63	-609.13	0.00	0.00	-605.26
Dead+Wind 90 deg - Service+Guy	87251.01	1013.27	-108.77	0.00	0.00	-865.55

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+Wind 120 deg - Service+Guy	87185.57	917.89	411.78	0.00	0.00	-768.54
Dead+Wind 135 deg - Service+Guy	87022.34	725.18	597.88	0.00	0.00	-604.53
Dead+Wind 150 deg - Service+Guy	87012.91	508.75	752.34	0.00	0.00	-395.13
Dead+Wind 180 deg - Service+Guy	87155.36	-8.78	869.56	0.00	0.00	-52.78
Dead+Wind 210 deg - Service+Guy	87179.88	-521.86	750.49	0.00	0.00	274.11
Dead+Wind 225 deg - Service+Guy	87242.88	-735.95	597.06	0.00	0.00	481.41
Dead+Wind 240 deg - Service+Guy	87445.00	-925.83	414.12	0.00	0.00	622.19
Dead+Wind 270 deg - Service+Guy	87536.14	-1024.15	-103.16	0.00	0.00	765.79
Dead+Wind 300 deg - Service+Guy	87767.97	-868.53	-607.67	0.00	0.00	654.71
Dead+Wind 315 deg - Service+Guy	87735.83	-709.51	-819.71	0.00	0.00	538.43
Dead+Wind 330 deg - Service+Guy	87631.94	-502.07	-987.08	0.00	0.00	407.34

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	-39664.50	0.00	6.00	39664.53	15.08	0.041%
2	365.77	-39929.44	-53056.59	-364.13	39927.20	52973.47	0.125%
3	26476.94	-39639.03	-45574.31	-26484.13	39637.14	45494.38	0.122%
4	37100.91	-39432.52	-36919.61	-37117.47	39431.26	36847.29	0.113%
5	45219.50	-39354.86	-25762.48	-45200.82	39355.12	25822.70	0.097%
6	52661.01	-39695.97	350.02	-52598.55	39694.21	-301.30	0.120%
7	46345.59	-40028.93	26397.48	-46265.29	40026.43	-26348.85	0.141%
8	37069.35	-39941.07	36126.41	-36991.19	39938.80	-36084.06	0.136%
9	26431.49	-39721.44	44281.49	-26356.53	39719.56	-44247.37	0.127%
10	274.72	-39399.56	50910.67	-227.81	39399.67	-50919.85	0.074%
11	-26182.20	-39689.96	45094.88	26108.07	39688.02	-45058.86	0.126%
12	-36851.19	-39896.47	36935.04	36778.05	39894.28	-36893.34	0.128%
13	-46153.05	-39974.14	26708.68	46079.29	39971.79	-26662.01	0.131%
14	-51416.05	-39633.02	292.84	51359.10	39631.42	-246.53	0.113%
15	-43427.85	-39300.06	-25045.30	43449.36	39300.74	25075.70	0.058%
16	-35462.23	-39387.92	-35800.43	35479.75	39386.90	35736.04	0.104%
17	-25074.92	-39607.56	-44276.73	25084.47	39605.98	44206.58	0.110%
18	0.00	-66940.20	0.00	-0.78	66940.18	-4.21	0.006%
19	385.71	-67469.78	-63567.90	-383.92	67467.47	63474.98	0.100%
20	31963.33	-66889.29	-54952.78	-31977.37	66887.46	54864.52	0.097%
21	44944.65	-66476.62	-44678.16	-44971.08	66475.36	44592.12	0.098%
22	54887.07	-66321.20	-31384.95	-54825.62	66320.17	31383.73	0.067%
23	63612.82	-67002.88	210.56	-63543.83	67001.10	-148.33	0.101%
24	55495.54	-67668.38	31603.52	-55409.74	67665.88	-31550.94	0.108%
25	44946.95	-67492.62	44032.07	-44854.84	67490.15	-43985.96	0.112%
26	31863.92	-67053.79	53961.32	-31772.99	67051.82	-53927.21	0.106%
27	218.48	-66410.62	62244.22	-193.14	66409.26	-62174.56	0.081%
28	-31649.31	-66991.11	54585.18	31560.29	66989.12	-54549.13	0.104%
29	-44683.12	-67403.79	44681.91	44598.36	67401.49	-44637.17	0.104%
30	-55244.77	-67559.20	31904.13	55162.87	67556.79	-31851.76	0.105%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
31	-62613.51	-66877.52	206.81	62549.21	66875.89	-146.90	0.096%
32	-53479.63	-66212.02	-30824.65	53460.17	66211.60	30813.28	0.025%
33	-43655.20	-66387.78	-43811.98	43682.54	66386.73	43732.66	0.092%
34	-30819.33	-66826.61	-53959.41	30836.46	66824.95	53875.05	0.094%
35	126.57	-39756.17	-18358.68	-125.76	39755.96	18336.12	0.052%
36	9161.57	-39655.68	-15769.66	-9164.54	39655.53	15748.48	0.049%
37	12837.69	-39584.23	-12774.95	-12840.43	39584.11	12753.56	0.050%
38	15646.89	-39557.36	-8914.35	-15628.19	39557.22	8905.40	0.048%
39	18221.80	-39675.39	121.11	-18206.15	39675.30	-105.22	0.051%
40	16036.54	-39790.60	9134.08	-16018.48	39790.41	-9122.72	0.049%
41	12826.76	-39760.20	12500.49	-12806.52	39760.03	-12491.08	0.051%
42	9145.84	-39684.20	15322.31	-9123.99	39684.08	-15315.11	0.053%
43	95.06	-39572.82	17616.15	-94.58	39572.70	-17594.31	0.050%
44	-9059.59	-39673.31	15603.77	9037.42	39673.17	-15595.37	0.054%
45	-12751.28	-39744.77	12780.29	12731.72	39744.59	-12770.36	0.050%
46	-15969.91	-39771.64	9241.76	15951.69	39771.45	-9229.44	0.050%
47	-17791.02	-39653.61	101.33	17776.18	39653.52	-85.46	0.050%
48	-15026.94	-39538.39	-8666.19	15012.22	39538.28	8659.46	0.037%
49	-12270.67	-39568.80	-12387.69	12274.87	39568.69	12365.24	0.053%
50	-8676.44	-39644.79	-15320.67	8681.20	39644.66	15298.44	0.052%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	20	0.00000001	0.00004732
2	Yes	98	0.00019206	0.00009085
3	Yes	92	0.00019976	0.00008184
4	Yes	86	0.00019849	0.00005761
5	Yes	31	0.00019837	0.00014482
6	Yes	100	0.00019247	0.00007376
7	Yes	103	0.00019935	0.00009381
8	Yes	101	0.00019895	0.00008815
9	Yes	98	0.00019628	0.00007697
10	Yes	32	0.00018769	0.00016273
11	Yes	95	0.00019777	0.00008214
12	Yes	99	0.00019254	0.00008874
13	Yes	101	0.00019305	0.00009247
14	Yes	96	0.00019413	0.00007137
15	Yes	28	0.00019656	0.00012268
16	Yes	84	0.00019619	0.00005037
17	Yes	92	0.00019116	0.00007127
18	Yes	12	0.00020000	0.00018021
19	Yes	101	0.00019254	0.00007200
20	Yes	96	0.00019286	0.00006207
21	Yes	88	0.00019741	0.00004322
22	Yes	25	0.00019038	0.00017095
23	Yes	103	0.00019320	0.00005413
24	Yes	107	0.00019158	0.00006930
25	Yes	104	0.00019949	0.00006784
26	Yes	101	0.00019556	0.00005663
27	Yes	28	0.00019891	0.00016431
28	Yes	98	0.00019761	0.00006291
29	Yes	102	0.00019187	0.00006925
30	Yes	104	0.00019338	0.00007191
31	Yes	99	0.00019791	0.00005474

32	Yes	21	0.00010635	0.00019988
33	Yes	86	0.00019788	0.00003841
34	Yes	95	0.00019693	0.00005696
35	Yes	38	0.00000001	0.00003783
36	Yes	35	0.00000001	0.00003149
37	Yes	30	0.00000001	0.00003345
38	Yes	20	0.00000001	0.00005999
39	Yes	35	0.00000001	0.00003882
40	Yes	40	0.00000001	0.00004833
41	Yes	37	0.00000001	0.00004978
42	Yes	34	0.00000001	0.00004460
43	Yes	19	0.00000001	0.00006579
44	Yes	34	0.00019363	0.00004294
45	Yes	37	0.00000001	0.00004527
46	Yes	39	0.00000001	0.00004643
47	Yes	34	0.00000001	0.00003576
48	Yes	20	0.00000001	0.00005493
49	Yes	28	0.00000001	0.00003988
50	Yes	33	0.00000001	0.00003612

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	282 - 262	2.675	43	0.1064	0.1443
T2	262 - 242	3.025	43	0.1040	0.1339
T3	242 - 222	3.311	43	0.0717	0.1216
T4	222 - 202	3.414	43	0.0254	0.1025
T5	202 - 182	3.338	43	0.0269	0.0932
T6	182 - 162	3.243	43	0.0309	0.0882
T7	162 - 142	3.069	44	0.0689	0.0806
T8	142 - 122	2.782	46	0.0875	0.0570
T9	122 - 102	2.692	35	0.0576	0.0505
T10	102 - 82	2.701	35	0.0639	0.0481
T11	82 - 62	2.545	35	0.0806	0.0495
T12	62 - 42	2.212	35	0.1002	0.0446
T13	42 - 22	1.686	35	0.1538	0.0341
T14	22 - 2	0.925	35	0.2034	0.0189

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
289.00	FM Antenna	43	2.675	0.1064	0.1443	399399
284.00	2.5" x 10' Omni	43	2.675	0.1064	0.1443	399399
282.00	DLS L 864-L-865 Light Beacon Unit	43	2.675	0.1064	0.1443	399399
281.00	6' Stand-off	43	2.693	0.1066	0.1438	399399
280.00	MF-950B	43	2.711	0.1068	0.1433	399399
270.00	Guy	43	2.888	0.1075	0.1380	166416
260.00	ASP-711	43	3.059	0.1023	0.1329	73404
236.70	DB589-Y	43	3.359	0.0590	0.1166	21768
230.00	3' Stand-off	43	3.399	0.0428	0.1098	20841
228.00	Pirod 12' T-Frame Sector Mount (1)	43	3.406	0.0381	0.1078	20580

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
218.00	531-70HD Exposed Dipole Antenna	43	3.408	0.0241	0.0997	26268
212.50	8' Dish w/ Radome	43	3.389	0.0264	0.0969	47303
204.50	8' Dish w/ Radome	43	3.350	0.0270	0.0940	40051
196.00	Guy	43	3.311	0.0282	0.0914	44481
180.50	6' Stand-off	43	3.234	0.0324	0.0879	40880
164.00	(2) 7770 Panel Antenna	44	3.094	0.0646	0.0822	20397
153.00	5.5' Dish w/ Radome	44	2.932	0.0840	0.0700	54292
142.00	(3) L-810 Obstruction Lights w/ Mount Kit	46	2.782	0.0875	0.0570	33634
132.00	14' Dipole	35	2.693	0.0732	0.0518	35900
128.00	Guy	35	2.690	0.0660	0.0511	38892
125.00	3" x 12.5' Omni	35	2.690	0.0612	0.0508	41733
124.50	1' Yagi antenna	35	2.690	0.0605	0.0507	42372
121.00	6'8"x4" Pipe Mount	35	2.693	0.0567	0.0504	52570
104.50	9' Dish w/ Radome	35	2.706	0.0614	0.0482	25644
70.00	Guy	35	2.366	0.0867	0.0474	27348

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	282 - 262	14.117	30	0.3596	0.5875
T2	262 - 242	15.504	30	0.3545	0.5525
T3	242 - 222	16.681	30	0.2576	0.5093
T4	222 - 202	17.347	24	0.1328	0.4455
T5	202 - 182	17.582	24	0.1340	0.4147
T6	182 - 162	17.774	24	0.1105	0.3978
T7	162 - 142	17.566	24	0.2113	0.3566
T8	142 - 122	16.702	24	0.2767	0.2684
T9	122 - 102	15.867	24	0.2142	0.2462
T10	102 - 82	15.033	24	0.3003	0.2403
T11	82 - 62	13.528	24	0.4479	0.2325
T12	62 - 42	11.354	24	0.6016	0.2023
T13	42 - 22	8.406	24	0.8137	0.1513
T14	22 - 2	4.542	24	1.0128	0.0830

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
289.00	FM Antenna	30	14.117	0.3596	0.5875	123623
284.00	2.5" x 10' Omni	30	14.117	0.3596	0.5875	123623
282.00	DLS L 864-L-865 Light Beacon Unit	30	14.117	0.3596	0.5875	123623
281.00	6' Stand-off	30	14.188	0.3603	0.5858	123623
280.00	MF-950B	30	14.258	0.3610	0.5840	123623
270.00	Guy	30	14.959	0.3641	0.5666	51510
260.00	ASP-711	30	15.636	0.3495	0.5490	23246
236.70	DB589-Y	30	16.907	0.2179	0.4926	7005
230.00	3' Stand-off	30	17.126	0.1663	0.4698	6666

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
228.00	Pirod 12' T-Frame Sector Mount (1)	24	17.186	0.1517	0.4632	6571
218.00	531-70HD Exposed Dipole Antenna	24	17.420	0.1349	0.4362	8206
212.50	8' Dish w/ Radome	24	17.489	0.1441	0.4265	13850
204.50	8' Dish w/ Radome	24	17.560	0.1387	0.4170	13822
196.00	Guy	24	17.646	0.1208	0.4097	16990
180.50	6' Stand-off	24	17.780	0.1140	0.3962	10478
164.00	(2) 7770 Panel Antenna	24	17.620	0.1987	0.3638	5523
153.00	5.5' Dish w/ Radome	24	17.223	0.2581	0.3157	11750
142.00	(3) L-810 Obstruction Lights w/ Mount Kit	24	16.702	0.2767	0.2684	10592
132.00	14' Dipole	24	16.259	0.2448	0.2500	10639
128.00	Guy	24	16.097	0.2290	0.2477	11182
125.00	3" x 12.5' Omni	24	15.980	0.2196	0.2468	11608
124.50	1' Yagi antenna	24	15.961	0.2183	0.2467	11724
121.00	6'8"x4" Pipe Mount	24	15.830	0.2135	0.2460	14264
104.50	9' Dish w/ Radome	24	15.164	0.2827	0.2410	6313
70.00	Guy	24	12.306	0.5370	0.2172	6899

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	270.00 (A) (678)	3/4 EHS	5830.00	58299.91	18696.50	29150.00	2.000	3.118 ✔
	270.00 (B) (677)	3/4 EHS	5830.00	58299.91	18694.10	29150.00	2.000	3.119 ✔
	270.00 (C) (676)	3/4 EHS	5830.00	58299.91	18939.40	29150.00	2.000	3.078 ✔
T5	196.00 (A) (697)	5/8 EHS	3799.04	42399.99	17004.30	21200.00	2.000	2.493 ✔
	196.00 (A) (698)	5/8 EHS	3799.04	42399.99	17194.30	21200.00	2.000	2.466 ✔
	196.00 (B) (691)	5/8 EHS	4240.00	42399.99	16788.00	21200.00	2.000	2.526 ✔
	196.00 (B) (692)	5/8 EHS	4240.00	42399.99	17425.10	21200.00	2.000	2.433 ✔
	196.00 (C) (679)	5/8 EHS	4240.00	42399.99	17874.10	21200.00	2.000	2.372 ✔
	196.00 (C) (680)	5/8 EHS	4240.00	42399.99	17030.30	21200.00	2.000	2.490 ✔
T8	128.00 (A) (721)	9/16 EHS	3500.00	35000.04	15701.00	17500.00	2.000	2.229 ✔
	128.00 (A) (722)	9/16 EHS	3500.00	35000.04	15899.70	17500.00	2.000	2.201 ✔
	128.00 (B) (715)	9/16 EHS	3500.00	35000.04	15344.70	17500.00	2.000	2.281 ✔
	128.00 (B) (716)	9/16 EHS	3500.00	35000.04	15791.00	17500.00	2.000	2.216 ✔
	128.00 (C) (703)	9/16 EHS	3500.00	35000.04	16197.50	17500.00	2.000	2.161 ✔
	128.00 (C) (704)	9/16 EHS	3500.00	35000.04	15680.10	17500.00	2.000	2.232 ✔
T11	70.00 (A) (729)	1/2 EHS	3497.00	26900.04	12562.00	13450.00	2.000	2.141 ✔
	70.00 (B) (728)	1/2 EHS	2690.00	26900.04	12139.90	13450.00	2.000	2.216 ✔

Section No.	Elevation ft	Size	Initial Tension lb	Breaking Load lb	Actual T lb	Allowable T_a lb	Required S.F.	Actual S.F.
	70.00 (C) (727)	1/2 EHS	2690.00	26900.04	12348.70	13450.00	2.000	2.178 ✓

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	282 - 262	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-15955.30	70773.60	0.225 ✓
T2	262 - 242	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-31447.20	70773.60	0.444 ✓
T3	242 - 222	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-36567.50	70773.60	0.517 ✓
T4	222 - 202	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-30381.00	70773.60	0.429 ✓
T5	202 - 182	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-41242.60	70773.60	0.583 ✓
T6	182 - 162	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-52632.00	70773.60	0.744 ✓
T7	162 - 142	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-49983.40	70773.60	0.706 ✓
T8	142 - 122	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-55933.30	70773.60	0.790 ✓
T9	122 - 102	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-67271.20	70773.60	0.951 ✓
T10	102 - 82	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-72999.90	70773.60	1.031 ✓
T11	82 - 62	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-72959.10	70773.60	1.031 ✓
T12	62 - 42	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-85704.70	70773.60	1.211 ✓
T13	42 - 22	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-85025.10	70773.60	1.201 ✓
T14	22 - 2	2	20.00	2.00	48.0 K=1.00	1.00	22.528	3.1416	-75545.10	70773.60	1.067 ✓

Diagonal Design Data (Compression)

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

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	282 - 262	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-4183.12	4061.32	1.030 ✔
T2	262 - 242	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-2493.22	4061.32	0.614 ✔
T3	242 - 222	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-2480.47	4061.32	0.611 ✔
T4	222 - 202	SR7/8+L2.5x2.5x0.25	5.66	5.42	53.0 K=0.50	18.081	2.0910	-4731.39	37807.40	0.125 ✔
T5	202 - 182	SR7/8+L2.5x2.5x0.25	5.66	5.42	53.0 K=0.50	18.081	2.0910	-9203.87	37807.40	0.243 ✔
T6	182 - 162	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-1712.04	4061.32	0.422 ✔
T7	162 - 142	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-3509.44	4061.32	0.864 ✔
T8	142 - 122	SR7/8+L2.5x2.5x0.25	5.66	5.42	53.0 K=0.50	18.081	2.0910	-11980.30	37807.40	0.317 ✔
T9	122 - 102	SR7/8+L2.5x2.5x0.25	5.66	5.42	53.0 K=0.50	18.081	2.0910	-4185.49	37807.40	0.111 ✔
T10	102 - 82	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-2780.19	4061.32	0.685 ✔
T11	82 - 62	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-3889.80	4061.32	0.958 ✔
T12	62 - 42	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-2765.85	4061.32	0.681 ✔
T13	42 - 22	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-2243.44	4061.32	0.552 ✔
T14	22 - 2	7/8	5.66	5.42	148.7 K=0.50	6.754	0.6013	-3599.38	4061.32	0.886 ✔

Secondary Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	282 - 262	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-276.35	9688.31	0.029 ✔
T2	262 - 242	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-544.68	9688.31	0.056 ✔
T3	242 - 222	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-633.37	9688.31	0.065 ✔
T4	222 - 202	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-526.21	9688.31	0.054 ✔
T5	202 - 182	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-714.34	9688.31	0.074 ✔
T6	182 - 162	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-911.61	9688.31	0.094 ✔
T7	162 - 142	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-865.74	9688.31	0.089 ✔
T8	142 - 122	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-968.79	9688.31	0.100 ✔

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 $\frac{P}{P_a}$
T9	122 - 102	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-1165.17	9688.31	0.120 ✓
T10	102 - 82	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-1264.40	9688.31	0.131 ✓
T11	82 - 62	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-1263.69	9688.31	0.130 ✓
T12	62 - 42	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-1484.45	9688.31	0.153 ✓
T13	42 - 22	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-1472.68	9688.31	0.152 ✓
T14	22 - 2	L2 1/2x2x3/16	4.00	3.83	107.7 K=1.00	11.976	0.8090	-1308.48	9688.31	0.135 ✓

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	282 - 262	L3x3x1/4	4.00	3.83	77.7 K=1.00	15.609	1.4400	-2328.76	22476.90	0.104 ✓

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 $\frac{P}{P_a}$
T5	202 - 182	L4x4x3/8	4.00	3.83	58.4 K=1.00	17.585	2.8600	-5523.87	50292.20	0.110 ✓
T8	142 - 122	L4x4x3/8	4.00	3.83	58.4 K=1.00	17.585	2.8600	-5493.06	50292.20	0.109 ✓

Bottom 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 $\frac{P}{P_a}$
T5	202 - 182	L4x4x3/8	4.00	3.83	58.4 K=1.00	17.585	2.8600	-2647.21	50292.20	0.053 ✓
T8	142 - 122	L4x4x3/8	4.00	3.83	58.4 K=1.00	17.585	2.8600	-2454.23	50292.20	0.049 ✓

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 $\frac{P}{P_a}$
T5	202 - 182 (686)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-22893.50	32355.50	0.708 ✓
T5	202 - 182 (687)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-22006.90	32355.50	0.680 ✓
T5	202 - 182 (695)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-21719.20	32355.50	0.671 ✓
T5	202 - 182 (696)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-22185.20	32355.50	0.686 ✓
T5	202 - 182 (701)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-22344.10	32355.50	0.691 ✓
T5	202 - 182 (702)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-22016.60	32355.50	0.680 ✓
T8	142 - 122 (710)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-19495.20	32355.50	0.603 ✓
T8	142 - 122 (711)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-19537.50	32355.50	0.604 ✓
T8	142 - 122 (719)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-18658.60	32355.50	0.577 ✓
T8	142 - 122 (720)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-19166.90	32355.50	0.592 ✓
T8	142 - 122 (725)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-18897.30	32355.50	0.584 ✓
T8	142 - 122 (726)	L4x4x3/8	7.48	7.40	112.6 K=1.00	11.313	2.8600	-19390.40	32355.50	0.599 ✓

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	282 - 262	2	20.00	2.00	48.0	27.000	3.1416	7072.04	84823.00	0.083 ✓
T2	262 - 242	2	20.00	2.00	48.0	27.000	3.1416	15669.80	84823.00	0.185 ✓
T3	242 - 222	2	20.00	2.00	48.0	27.000	3.1416	22102.70	84823.00	0.261 ✓
T4	222 - 202	2	20.00	2.00	48.0	27.000	3.1416	16043.60	84823.00	0.189 ✓
T5	202 - 182	2	20.00	2.00	48.0	27.000	3.1416	7348.37	84823.00	0.087 ✓
T6	182 - 162	2	20.00	2.00	48.0	27.000	3.1416	4222.81	84823.00	0.050 ✓
T7	162 - 142	2	20.00	2.00	48.0	27.000	3.1416	573.82	84823.00	0.007

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T8	142 - 122	2	20.00	2.00	48.0	27.000	3.1416	5466.68	84823.00	0.064 ✓

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	282 - 262	7/8	5.66	5.42	297.4	21.600	0.6013	4824.56	12988.50	0.371 ✓
T2	262 - 242	7/8	5.66	5.42	297.4	21.600	0.6013	2830.55	12988.50	0.218 ✓
T3	242 - 222	7/8	5.66	5.42	297.4	21.600	0.6013	1934.06	12988.50	0.149 ✓
T4	222 - 202	SR7/8+L2.5x2.5x0.25	5.66	5.42	106.0	21.600	2.0910	4844.43	45165.60	0.107 ✓
T5	202 - 182	SR7/8+L2.5x2.5x0.25	5.66	5.42	106.0	21.600	2.0910	5561.70	45165.60	0.123 ✓
T6	182 - 162	7/8	5.66	5.42	297.4	21.600	0.6013	1718.87	12988.50	0.132 ✓
T7	162 - 142	7/8	5.66	5.42	297.4	21.600	0.6013	3393.78	12988.50	0.261 ✓
T8	142 - 122	SR7/8+L2.5x2.5x0.25	5.66	5.42	106.0	21.600	2.0910	4313.20	45165.60	0.095 ✓
T9	122 - 102	SR7/8+L2.5x2.5x0.25	5.66	5.42	106.0	21.600	2.0910	4300.75	45165.60	0.095 ✓
T10	102 - 82	7/8	5.66	5.42	297.4	21.600	0.6013	2051.57	12988.50	0.158 ✓
T11	82 - 62	7/8	5.66	5.42	297.4	21.600	0.6013	4306.04	12988.50	0.332 ✓
T12	62 - 42	7/8	5.66	5.42	297.4	21.600	0.6013	3035.25	12988.50	0.234 ✓
T13	42 - 22	7/8	5.66	5.42	297.4	21.600	0.6013	1571.77	12988.50	0.121 ✓
T14	22 - 2	7/8	5.66	5.42	297.4	21.600	0.6013	2832.12	12988.50	0.218 ✓

Secondary Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	282 - 262	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	315.48	17474.40	0.018 ✓
T2	262 - 242	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	544.68	17474.40	0.031 ✓

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	242 - 222	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	633.37	17474.40	0.036 ✓
T4	222 - 202	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	526.21	17474.40	0.030 ✓
T5	202 - 182	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	714.34	17474.40	0.041 ✓
T6	182 - 162	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	911.61	17474.40	0.052 ✓
T7	162 - 142	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	865.74	17474.40	0.050 ✓
T8	142 - 122	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	968.79	17474.40	0.055 ✓
T9	122 - 102	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	1165.17	17474.40	0.067 ✓
T10	102 - 82	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	1264.40	17474.40	0.072 ✓
T11	82 - 62	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	1263.69	17474.40	0.072 ✓
T12	62 - 42	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	1484.45	17474.40	0.085 ✓
T13	42 - 22	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	1472.68	17474.40	0.084 ✓
T14	22 - 2	L2 1/2x2x3/16	4.00	3.83	76.7	21.600	0.8090	1308.48	17474.40	0.075 ✓

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 $\frac{P}{P_a}$
T5	202 - 182	L4x4x3/8	4.00	3.83	37.4	21.600	2.8600	20046.80	61776.00	0.325 ✓
T8	142 - 122	L4x4x3/8	4.00	3.83	37.4	21.600	2.8600	22311.50	61776.00	0.361 ✓

Bottom 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 $\frac{P}{P_a}$
T5	202 - 182	L4x4x3/8	4.00	3.83	37.4	21.600	2.8600	3113.81	61776.00	0.050 ✓
T8	142 - 122	L4x4x3/8	4.00	3.83	37.4	21.600	2.8600	10541.50	61776.00	0.171 ✓

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 $\frac{P}{P_a}$
T5	202 - 182 (681)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	21835.50	61776.00	0.353 ✓
T5	202 - 182 (682)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	23286.70	61776.00	0.377 ✓
T5	202 - 182 (693)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	22138.70	61776.00	0.358 ✓
T5	202 - 182 (694)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	21950.70	61776.00	0.355 ✓
T5	202 - 182 (699)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	21677.70	61776.00	0.351 ✓
T5	202 - 182 (700)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	22946.90	61776.00	0.371 ✓
T8	142 - 122 (705)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	19254.70	61776.00	0.312 ✓
T8	142 - 122 (706)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	20098.50	61776.00	0.325 ✓
T8	142 - 122 (717)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	18803.30	61776.00	0.304 ✓
T8	142 - 122 (718)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	18652.10	61776.00	0.302 ✓
T8	142 - 122 (723)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	18902.10	61776.00	0.306 ✓
T8	142 - 122 (724)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	19684.80	61776.00	0.319 ✓

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 $\frac{P}{P_a}$
T5	202 - 182 (686)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	482.99	61776.00	0.008 ✓
T5	202 - 182 (687)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	625.16	61776.00	0.010 ✓
T5	202 - 182 (695)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	859.00	61776.00	0.014 ✓
T5	202 - 182 (696)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	1018.53	61776.00	0.016 ✓
T5	202 - 182 (701)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	640.39	61776.00	0.010 ✓
T5	202 - 182 (702)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	937.69	61776.00	0.015 ✓
T8	142 - 122 (710)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	4062.79	61776.00	0.066 ✓
T8	142 - 122 (711)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	4072.38	61776.00	0.066 ✓
T8	142 - 122 (719)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	4332.60	61776.00	0.070 ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T8	142 - 122 (720)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	4414.47	61776.00	0.071 ✓
T8	142 - 122 (725)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	4134.81	61776.00	0.067 ✓
T8	142 - 122 (726)	L4x4x3/8	7.48	7.40	72.2	21.600	2.8600	4353.67	61776.00	0.070 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	282 - 262	Leg	2	3	-15955.30	94341.21	16.9	Pass
T2	262 - 242	Leg	2	54	-31447.20	94341.21	33.3	Pass
T3	242 - 222	Leg	2	102	-36567.50	94341.21	38.8	Pass
T4	222 - 202	Leg	2	150	-30381.00	94341.21	32.2	Pass
T5	202 - 182	Leg	2	198	-41242.60	94341.21	43.7	Pass
T6	182 - 162	Leg	2	246	-52632.00	94341.21	55.8	Pass
T7	162 - 142	Leg	2	294	-49983.40	94341.21	53.0	Pass
T8	142 - 122	Leg	2	342	-55933.30	94341.21	59.3	Pass
T9	122 - 102	Leg	2	388	-67271.20	94341.21	71.3	Pass
T10	102 - 82	Leg	2	436	-72999.90	94341.21	77.4	Pass
T11	82 - 62	Leg	2	484	-72959.10	94341.21	77.3	Pass
T12	62 - 42	Leg	2	532	-85704.70	94341.21	90.8	Pass
T13	42 - 22	Leg	2	580	-85025.10	94341.21	90.1	Pass
T14	22 - 2	Leg	2	628	-75545.10	94341.21	80.1	Pass
T1	282 - 262	Diagonal	7/8	38	-4183.12	5413.74	77.3	Pass
T2	262 - 242	Diagonal	7/8	86	-2493.22	5413.74	46.1	Pass
T3	242 - 222	Diagonal	7/8	106	-2480.47	5413.74	45.8	Pass
T4	222 - 202	Diagonal	SR7/8+L2.5x2.5x0.25	156	-4731.39	50397.26	9.4	Pass
T5	202 - 182	Diagonal	SR7/8+L2.5x2.5x0.25	229	-9203.87	50397.26	18.3	Pass
T6	182 - 162	Diagonal	7/8	283	-1712.04	5413.74	31.6	Pass
T7	162 - 142	Diagonal	7/8	300	-3509.44	5413.74	64.8	Pass
T8	142 - 122	Diagonal	SR7/8+L2.5x2.5x0.25	356	-11980.30	50397.26	23.8	Pass
T9	122 - 102	Diagonal	SR7/8+L2.5x2.5x0.25	423	-4185.49	50397.26	8.3	Pass
T10	102 - 82	Diagonal	7/8	444	-2780.19	5413.74	51.4	Pass
T11	82 - 62	Diagonal	7/8	487	-3889.80	5413.74	71.9	Pass
T12	62 - 42	Diagonal	7/8	562	-2765.85	5413.74	51.1	Pass
T13	42 - 22	Diagonal	7/8	585	-2243.44	5413.74	41.4	Pass
T14	22 - 2	Diagonal	7/8	633	-3599.38	5413.74	66.5	Pass
T1	282 - 262	Secondary Horizontal	L2 1/2x2x3/16	15	-276.35	12914.52	2.1	Pass
T2	262 - 242	Secondary Horizontal	L2 1/2x2x3/16	63	-544.68	12914.52	4.2	Pass
T3	242 - 222	Secondary Horizontal	L2 1/2x2x3/16	119	-633.37	12914.52	4.9	Pass
T4	222 - 202	Secondary Horizontal	L2 1/2x2x3/16	167	-526.21	12914.52	4.1	Pass
T5	202 - 182	Secondary Horizontal	L2 1/2x2x3/16	206	-714.34	12914.52	5.5	Pass
T6	182 - 162	Secondary Horizontal	L2 1/2x2x3/16	254	-911.61	12914.52	7.1	Pass
T7	162 - 142	Secondary Horizontal	L2 1/2x2x3/16	303	-865.74	12914.52	6.7	Pass
T8	142 - 122	Secondary Horizontal	L2 1/2x2x3/16	351	-968.79	12914.52	7.5	Pass
T9	122 - 102	Secondary Horizontal	L2 1/2x2x3/16	397	-1165.17	12914.52	9.0	Pass
T10	102 - 82	Secondary Horizontal	L2 1/2x2x3/16	447	-1264.40	12914.52	9.8	Pass
T11	82 - 62	Secondary Horizontal	L2 1/2x2x3/16	502	-1263.69	12914.52	9.8	Pass
T12	62 - 42	Secondary Horizontal	L2 1/2x2x3/16	541	-1484.45	12914.52	11.5	Pass
T13	42 - 22	Secondary Horizontal	L2 1/2x2x3/16	589	-1472.68	12914.52	11.4	Pass
T14	22 - 2	Secondary Horizontal	L2 1/2x2x3/16	637	-1308.48	12914.52	10.1	Pass
T1	282 - 262	Top Girt	L3x3x1/4	4	-2328.76	29961.71	7.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	282 - 262	Guy A@270	3/4	678	18696.50	29150.00	64.1	Pass
T5	202 - 182	Guy A@196	5/8	698	17194.30	21200.00	81.1	Pass
T8	142 - 122	Guy A@128	9/16	722	15899.70	17500.00	90.9	Pass
T11	82 - 62	Guy A@70	1/2	729	12562.00	13450.00	93.4	Pass
T1	282 - 262	Guy B@270	3/4	677	18694.10	29150.00	64.1	Pass
T5	202 - 182	Guy B@196	5/8	692	17425.10	21200.00	82.2	Pass
T8	142 - 122	Guy B@128	9/16	716	15791.00	17500.00	90.2	Pass
T11	82 - 62	Guy B@70	1/2	728	12139.90	13450.00	90.3	Pass
T1	282 - 262	Guy C@270	3/4	676	18939.40	29150.00	65.0	Pass
T5	202 - 182	Guy C@196	5/8	679	17874.10	21200.00	84.3	Pass
T8	142 - 122	Guy C@128	9/16	703	16197.50	17500.00	92.6	Pass
T11	82 - 62	Guy C@70	1/2	727	12348.70	13450.00	91.8	Pass
T5	202 - 182	Top Guy Pull-Off@196	L4x4x3/8	684	20046.80	82347.40	24.3	Pass
T8	142 - 122	Top Guy Pull-Off@128	L4x4x3/8	708	22311.50	82347.40	27.1	Pass
T5	202 - 182	Bottom Guy Pull-Off@196	L4x4x3/8	688	-2647.21	67039.50	3.9	Pass
T8	142 - 122	Bottom Guy Pull-Off@128	L4x4x3/8	714	10541.50	82347.40	12.8	Pass
T5	202 - 182	Torque Arm Top@196	L4x4x3/8	682	23286.70	82347.40	28.3	Pass
T8	142 - 122	Torque Arm Top@128	L4x4x3/8	706	20098.50	82347.40	24.4	Pass
T5	202 - 182	Torque Arm Bottom@196	L4x4x3/8	686	-22893.50	43129.88	53.1	Pass
T8	142 - 122	Torque Arm Bottom@128	L4x4x3/8	711	-19537.50	43129.88	45.3	Pass

	Summary	
Leg (T12)	90.8	Pass
Diagonal (T1)	77.3	Pass
Secondary Horizontal (T12)	11.5	Pass
Top Girt (T1)	7.8	Pass
Guy A (T11)	93.4	Pass
Guy B (T11)	90.3	Pass
Guy C (T8)	92.6	Pass
Top Guy Pull-Off (T8)	27.1	Pass
Bottom Guy Pull-Off (T8)	12.8	Pass
Torque Arm Top (T5)	28.3	Pass
Torque Arm Bottom (T5)	53.1	Pass
RATING =	**93.4**	**Pass**

FOUNDATION ANALYSIS

AECOM

Job	280' Guyed Tower - Bolton, CT	Project No.	MTS-013	Page	of
Description	Foundation Analysis	Computed by	MCD	Sheet 1	of 1
		Checked by		Date	09/24/15
				Date	

Tower Base

Width of Base $w_{base} := 5ft$ Thickness of Base $t_{base} := 3.5ft$

Unit Weight of Concrete $\gamma_{conc} := 150pcf$

Weight of Base $Wt_{base} := w_{base}^2 \cdot t_{base} \cdot \gamma_{conc}$ $Wt_{base} = 13.13 \cdot kip$

Compressive force of Tower $P_{tower} := 167.378kip$

Total Downward Force $P_{foundation} := P_{tower} + Wt_{base}$ $P_{foundation} = 180.5 \cdot kip$

Bearing Pressure $P_{bearing} := \frac{P_{foundation}}{w_{base}^2}$ $P_{bearing} = 7.22 \cdot ksf$

Allowable Bearing Pressure $P_{bearing.allow} := 10tsf$

$Bearing_{check} := \begin{cases} \text{"OK"} & \text{if } P_{bearing} \le P_{bearing.allow} \\ \text{"NG"} & \text{otherwise} \end{cases}$ $Bearing_{check} = \text{"OK"}$

Guy Anchors

Six #8 bars in 2 1/4" dia. holes extending 8'6" below foundation

Bond between Rock & Grout = 50 psi

$Bond_{capacity} := 2.25in \cdot \pi \cdot 50psi$ $Bond_{capacity} = 4.24 \cdot \frac{kip}{ft}$

$Bond_{capacity} \cdot 8.5ft = 36.05 \cdot kip$ < Fy.rebar

$Uplift_{resistance} := Bond_{capacity} \cdot 8.5ft \cdot 6$ $Uplift_{resistance} = 216.3 \cdot kip$

$Uplift_{anchor} := 60.127kip$

$Uplift_{check} := \begin{cases} \text{"OK"} & \text{if } Uplift_{anchor} \le Uplift_{resistance} \\ \text{"NG"} & \text{otherwise} \end{cases}$ $Uplift_{check} = \text{"OK"}$

Each anchor is embeded into rock a minimum of 1'6"

$Shear_{resistance} := 5tsf \cdot 1.5ft \cdot 5ft$ $Shear_{resistance} = 75 \cdot kip$

$Shear_{anchor} := 73.448kip$

$Shear_{check} := \begin{cases} \text{"OK"} & \text{if } Shear_{anchor} \le Shear_{resistance} \\ \text{"NG"} & \text{otherwise} \end{cases}$ $Shear_{check} = \text{"OK"}$

2 C6x10.5 Anchor Shafts

$A_s := 2 \cdot 3.07in^2$ $F_y := 36ksi$

$Tension := 94.921kip$

$\sigma := \frac{Tension}{A_s}$ $\sigma = 15.46 \cdot ksi$

$\sigma_{check} := \begin{cases} \text{"OK"} & \text{if } \sigma \le F_y \\ \text{"NG"} & \text{otherwise} \end{cases}$ $\sigma_{check} = \text{"OK"}$

About AECOM

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Attachment 4: Calculated Radio Frequency Emissions Report

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Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

EVERSOURCE ENERGY

Bolton

130 Vernon Road, Bolton, CT 06043

September 5, 2014

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for Eversource Energy's (formerly Northeast Utilities) proposed modifications and additions to their existing antenna arrays mounted on the guyed tower located at 130 Vernon Road in Bolton, CT. The coordinates of the tower are 41° 48' 10" N, 72° 26' 30" W.

Eversource Energy is proposing the following:

1) Replace the radio equipment connected to one existing 6 GHz microwave dish;
2) Install one 900 MHz omnidirectional antenna;
3) Install one 47 MHz omnidirectional antenna.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment B of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment B contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{1.6^2 \times EIRP}{4\pi \times R^2}\right) \text{x Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

These calculations assume that the antennas are operating at 100 percent capacity and power, and that all channels are transmitting simultaneously. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final site configuration.

4. Calculation Results

Table 1 below outlines the power density information for the site. The radiation patterns of the proposed and existing Eversource Energy's antennas cause the majority of the RF power to be focused out towards the horizon, with respect to the vertical plane. As a result, there will be less RF power directed below the antenna relative to the horizon, and consequently lower power density levels around the base of the tower. Please refer to Attachment C for the vertical patterns of the proposed Eversource Energy antennas. The calculated results for Eversource Energy in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

The existing Northeast Utilities filing (shown in italic and grey in Table 1 below) should be removed and replaced with the Eversource Energy updated antenna configuration shown in bold at the bottom of Table 1.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
AT&T UMTS	164	880	2	565	0.0151	0.5867	2.58%
AT&T UMTS	164	1900	2	875	0.0234	1.0000	2.34%
AT&T GSM	164	880	1	283	0.0038	0.5867	0.64%
AT&T GSM	164	1900	4	525	0.0281	1.0000	2.81%
AT&T LTE	164	734	1	1375	0.0184	0.4893	3.76%
Voicestream	180	1930	4	226	0.0100	1.0000	1.00%
Verizon Cellular	121	869	9	230	0.0508	0.5793	8.78%
Verizon PCS	121	1970	11	255	0.0689	1.0000	6.89%
Verizon AWS	121	2145	1	1750	0.0430	1.0000	4.30%
Verizon LTE	121	698	1	851	0.0209	0.4653	4.49%
Sprint CDMA/LTE	148	1900	3	693	0.0341	1.0000	3.41%
Sprint CDMA/LTE	148	850	1	390	0.0064	0.5667	1.13%
Bolton Radio Station	280	97.5	1	10	0.0000	0.2000	0.02%
Commsite Internat'l	285	929.1875	2	300	0.0027	0.6195	0.43%
Metrocall	125	929.5125	1	300	0.0069	0.6197	1.11%
Pagemart	100	929.7125	1	3500	0.1258	0.6198	20.30%
AirTouch	120	158.1	1	452	0.0113	0.2000	5.64%
Conn. Radio	120	462.15	1	258	0.0064	0.3081	2.09%
Nextel	223	869	24	100	0.0174	0.5793	3.00%
Northeast Utilities	*100*	*6785*	*1*	*65.4*	*0.0024*	*1.0000*	*0.24%*
Northeast Utilities	*190*	*6685*	*1*	*63.9*	*0.0006*	*1.0000*	*0.06%*
Northeast Utilities	*200*	*6785*	*1*	*63.9*	*0.0006*	*1.0000*	*0.06%*
Northeast Utilities	*200*	*6705*	*1*	*52.4*	*0.0005*	*1.0000*	*0.05%*
Northeast Utilities	**100**	**6785**	**1**	**3467**	**0.0125**	**1.0000**	**1.25%**
Northeast Utilities	**190**	**6685**	**1**	**2455**	**0.0024**	**1.0000**	**0.24%**
Northeast Utilities	**200**	**6765**	**1**	**12589**	**0.0113**	**1.0000**	**1.13%**
Northeast Utilities	**200**	**6705**	**1**	**174**	**0.0002**	**1.0000**	**0.02%**
Northeast Utilities	**240**	**935**	**2**	**255**	**0.0003**	**0.6233**	**0.05%**
Northeast Utilities	**220**	**47.9**	**1**	**500**	**0.0004**	**0.2000**	**0.19%**
						Total	**77.60%**

Table 1: Carrier Information[1] [2]

[1] The power density information for carriers other than Northeast Utilities was taken directly from the CSC database dated 9/5/2014. Please note that %MPE values listed are rounded to two decimal points. The total %MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[2] The antenna height listed for the proposed microwave dish is in reference to documents provided by Northeast Utilities received on September 5, 2014.

5. Conclusion

The above analysis verifies that RF emissions from the site, after the proposed modifications have been completed, will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed and existing transmit antennas is below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at ground level is **77.60% of the FCC General Population/Uncontrolled limit**.

As noted previously, obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the final site configuration.

6. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Daniel L. Goulet
C Squared Systems, LLC

September 5, 2014
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

ANSI C95.1-1982, American National Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz. IEEE-SA Standards Board

IEEE Std C95.3-1991 (Reaff 1997), IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave. IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[3]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[4]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 2: FCC Limits for Maximum Permissible Exposure (MPE)

[3] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[4] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

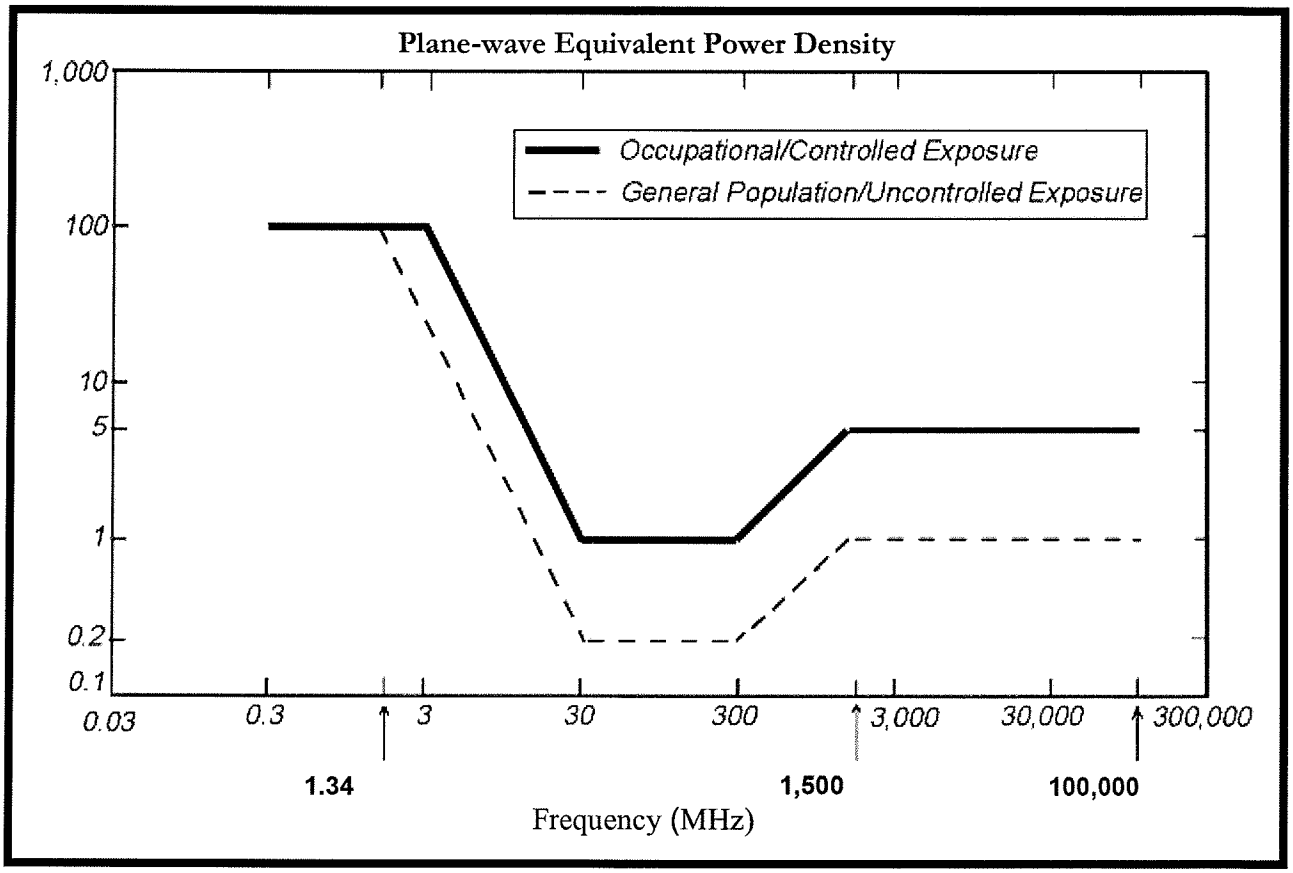
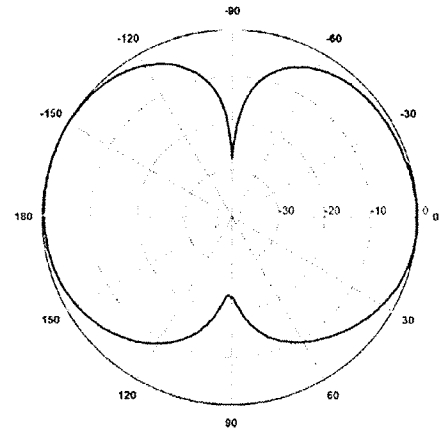


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Antenna Data Sheets and Electrical Patterns[5]

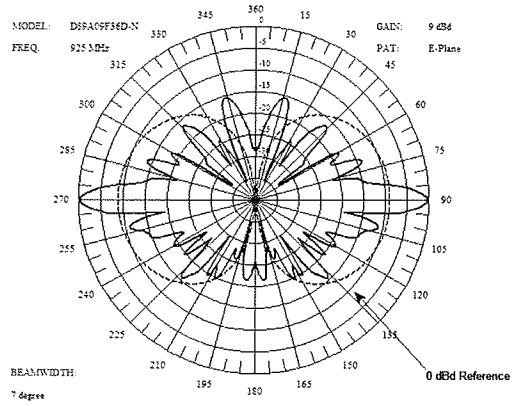
47 MHz

Manufacturer:	Comprod
Model #:	531-70HD
Frequency Band:	30-76 MHz
Gain:	2.5 dBd
Vertical Beamwidth:	N/A
Horizontal Beamwidth:	360°
Polarization:	Vertical
Length:	15.75'



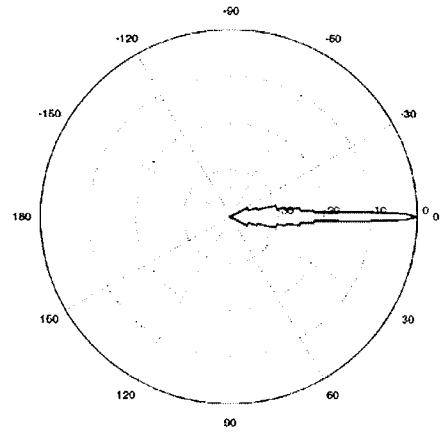
935 MHz

Manufacturer:	DBSpectra
Model #:	DS9A09F36D-N
Frequency Band:	896-960 MHz
Gain:	9.0 dBd
Vertical Beamwidth:	8°
Horizontal Beamwidth:	360°
Polarization:	Vertical
Length:	21'



6 GHz

Manufacturer:	RFS
Model #:	PAL8-65
Frequency Band:	6425-7125 MHz
Gain:	40.3 dBd
Vertical Beamwidth:	1.3°
Horizontal Beamwidth:	1.3°
Polarization:	Single
Diameter:	8'



[5] In the case where pattern data was unavailable from the manufacturer, vertical patterns shown are for antennas with similar specifications.