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

April 16, 2012

Douglas Talmadge, Real Estate Consultant
Transcend Wireless, LLC
c/o Clearwire, LLC
147 Austin Ryer Lane
Branford, CT 06405

RE: **EM-CLEARWIRE-044-120327** – Clearwire LLC notice of intent to modify an existing telecommunications facility located at 45 Saltonstall Road, East Haven, Connecticut.

Dear Mr. Talmadge:

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

- Any deviation from the proposed modification as specified in this notice and supporting materials with Council shall render this acknowledgement invalid;
- Any material changes to this modification as proposed shall require the filing of a new notice with the Council;
- Not less than 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration;

The proposed modifications including the placement of all necessary equipment and shelters within the tower compound are to be implemented as specified here and in your notice dated March 23, 2012. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

Very truly yours,

Linda Roberts

Linda Roberts
Executive Director

LR/CDM/laf

c: The Honorable Joseph Maturo, Jr., Mayor, Town of East Haven
George Mingione, Zoning Enforcement Officer, Town of East Haven
South Central CT Regional Water Authority

CSC
CONNECTICUT SITING COUNCIL

EM-CLEARWIRE-044-120327

clearwire
wireless broadband

Transcend Wireless, LLC
C/O Clearwire, LLC
147 Austing Ryer Ln
Branford, CT 06405
Phone: (203)-410-4531
Douglas Talmadge
Real Estate Consultant

March 23, 2012

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

RE: Clearwire LLC notice of intent to modify an existing telecommunications facility located at 45 Saltonstall Rd, East haven, CT 06512. Clearwire site CT-NHN0095.

Dear Ms. Roberts:

In order to accommodate technological changes, implement 4G Worldwide Interoperability for Microwave Access ("WIMAX") to wirelessly deliver high-speed internet service to a large geographical area and enhance system performance in the state of Connecticut, Clearwire, LLC plans to modify the equipment originally approved for a Tower Share on Dec. 2, 2010 Doc. TS-Clearwire-044-101109. The build was put on hold by Clearwire shortly after the approval. Clearwire is continuing with the original build and since it has been over a one (1) year time frame since the original approval and the equipment may very slightly Clearwire is requesting approval for an Exempt Modification. Please accept this letter and attachments as notification, pursuant to R.C.S.A. Section 16-50j-73, of construction which constitutes an exempt modification pursuant to R.C.S.A. Section 16-50j-72(b)(2). In compliance with R.C.S.A. Section 16-50j-73, a copy of this letter and its attachments is being sent to the chief elected official of the municipality in which affected cell site is located.

4G Worldwide Interoperability for Microwave Access ("WiMAX") is a communication technology for wirelessly delivering high-speed Internet service to large geographical areas. WiMAX can provide at-home or mobile internet access across whole cities or countries. In many cases this has resulted in competition in markets which typically only had access through an existing incumbent DSL (or similar) operator.

Attached is a summary of the planned modifications, including power density calculations reflecting the modifications of Clearwire's equipment at the site and a structural assessment of the tower to accommodate the revised antenna configuration.

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

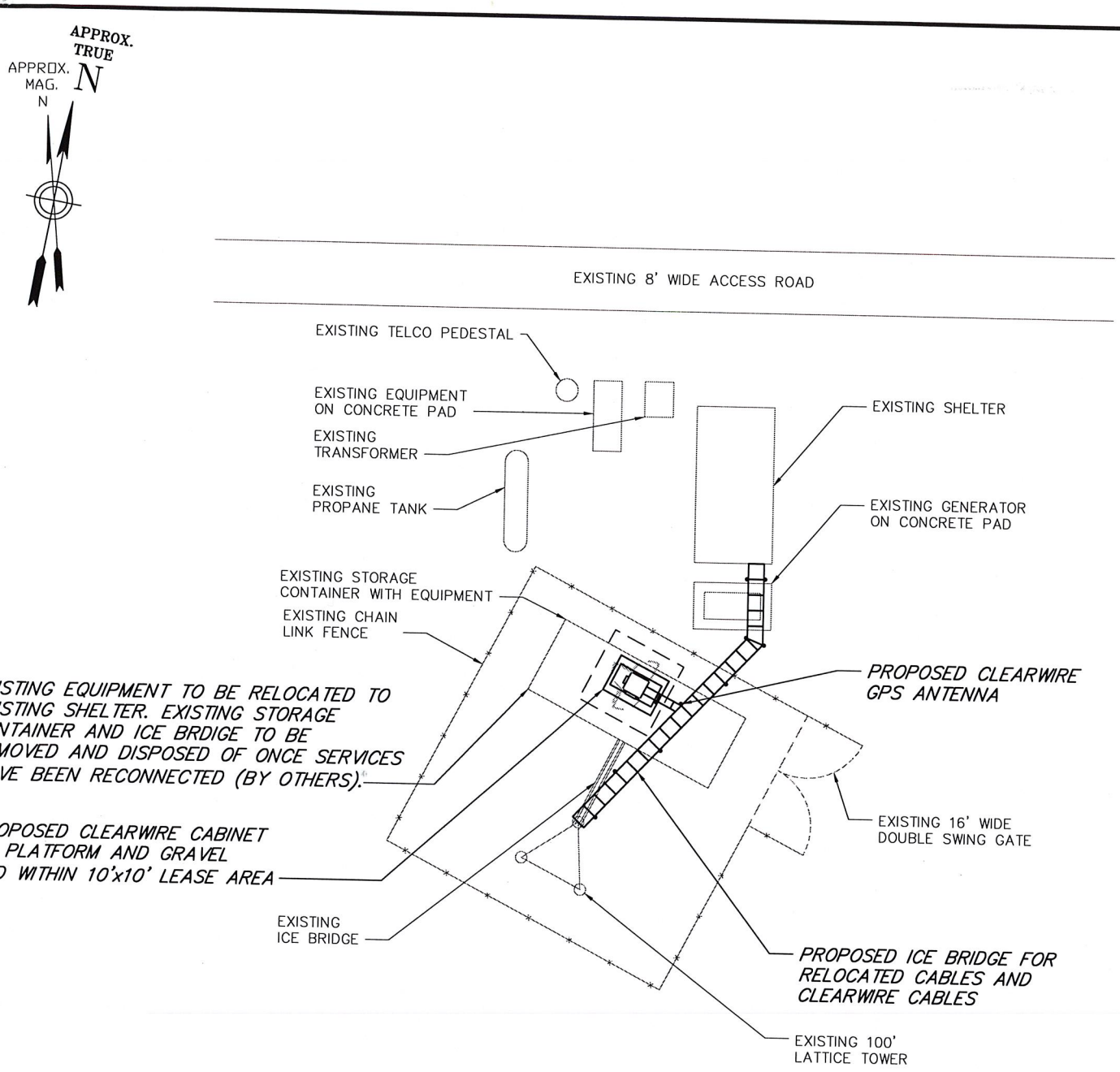
1. The height of the overall structure will not be affected.
2. The proposed changes will not extend the site boundaries. The equipment will be located within the existing fenced in compound.
3. The proposed changes will not increase the noise level at the existing facility by 6 decibels or more.
4. Radio Frequency power density may increase due to the use of WiMAX. . However, the changes will not increase the calculated "worst case" power density for the combined operations at the site to a level at or above the applicable standard for uncontrolled environments as calculated for a mixed frequency site.

For the foregoing reasons Clearwire, LLC respectfully submits that the proposed changes at the referenced site constitute exempt modifications under R.C.S.A. Section 16-50j-72(b)(2).

Please feel free to call me at (203)-410-4531 with questions concerning this matter. Thank you for your consideration.

Sincerely,

Douglas Talmadge
Real Estate Consultant



SITE PLAN

GRAPHIC SCALE

20 0 10 20

IN FEET

NOT FOR CONSTRUCTION

STATE OF CONNECTICUT
LICENSED PROFESSIONAL ENGINEER
No. 17027

LEASE EXHIBIT

SCALE: 1" = 20'
MARCH 20, 2012

1 OF 3

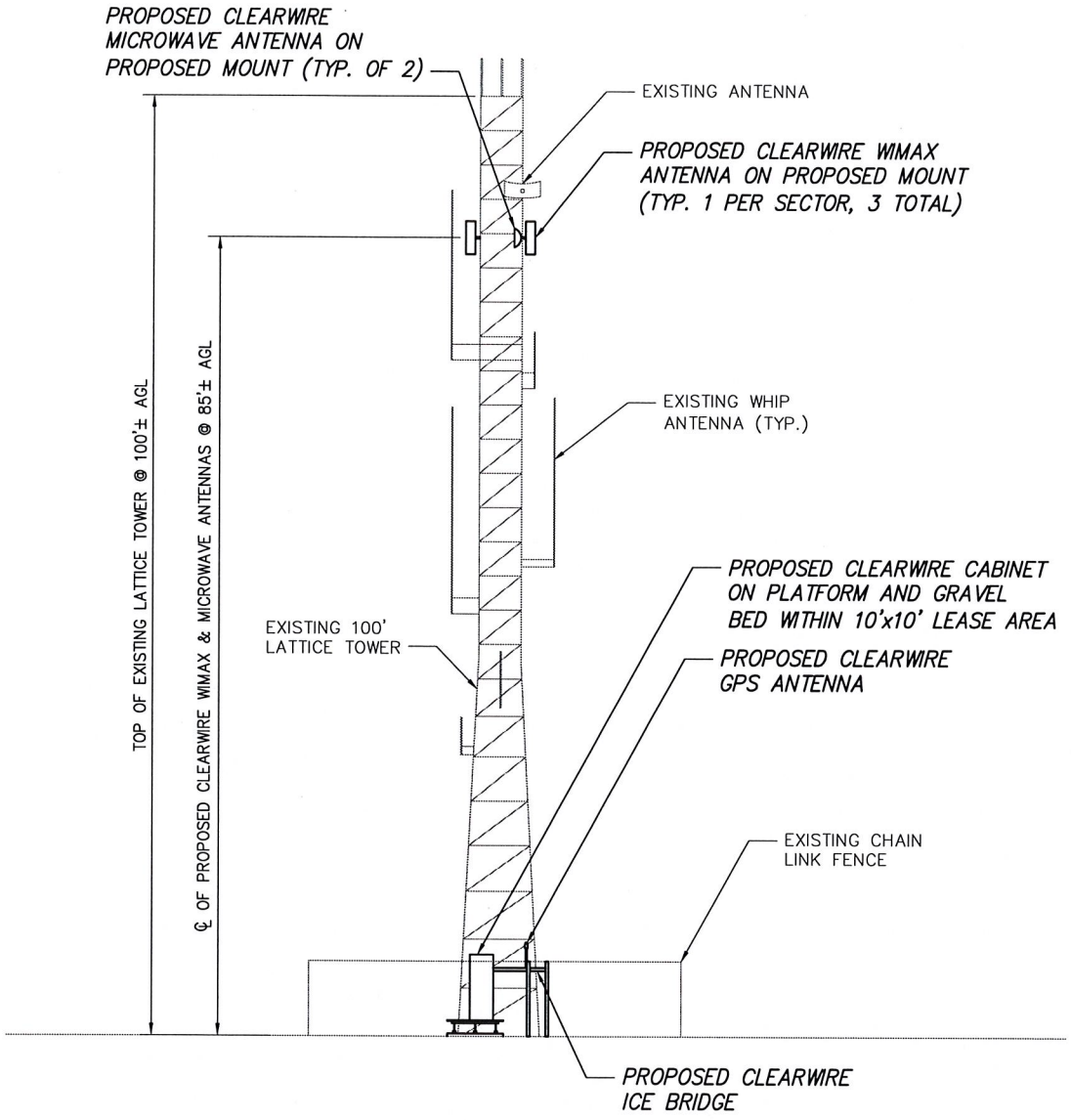
REVISION NUMBER 0

CHA
2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2336
Main: (860) 257-4557 · www.chacompanies.com

clearwire® TECHNOLOGIES, INC.
5808 LAKE WASHINGTON BLVD. NE STE. 300
KIRKLAND, WA 98033
OFFICE: (425) 216-7600
FAX: (425) 216-7900

CT-NHN0095E
12 SALTONSTALL PLACE
EAST HAVEN, CT 06512

CHA PROJ. NO. – 20621.1065.43000



NOT FOR CONSTRUCTION

NORTH TOWER ELEVATION

NO SCALE

STATE OF CONNECTICUT
JOHN P. GORMAN
No. 17607
LICENSED PROFESSIONAL ENGINEER

LEASE EXHIBIT	NO SCALE MARCH 20, 2012	2 OF 3	REVISION NUMBER 0

CHA
2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2336
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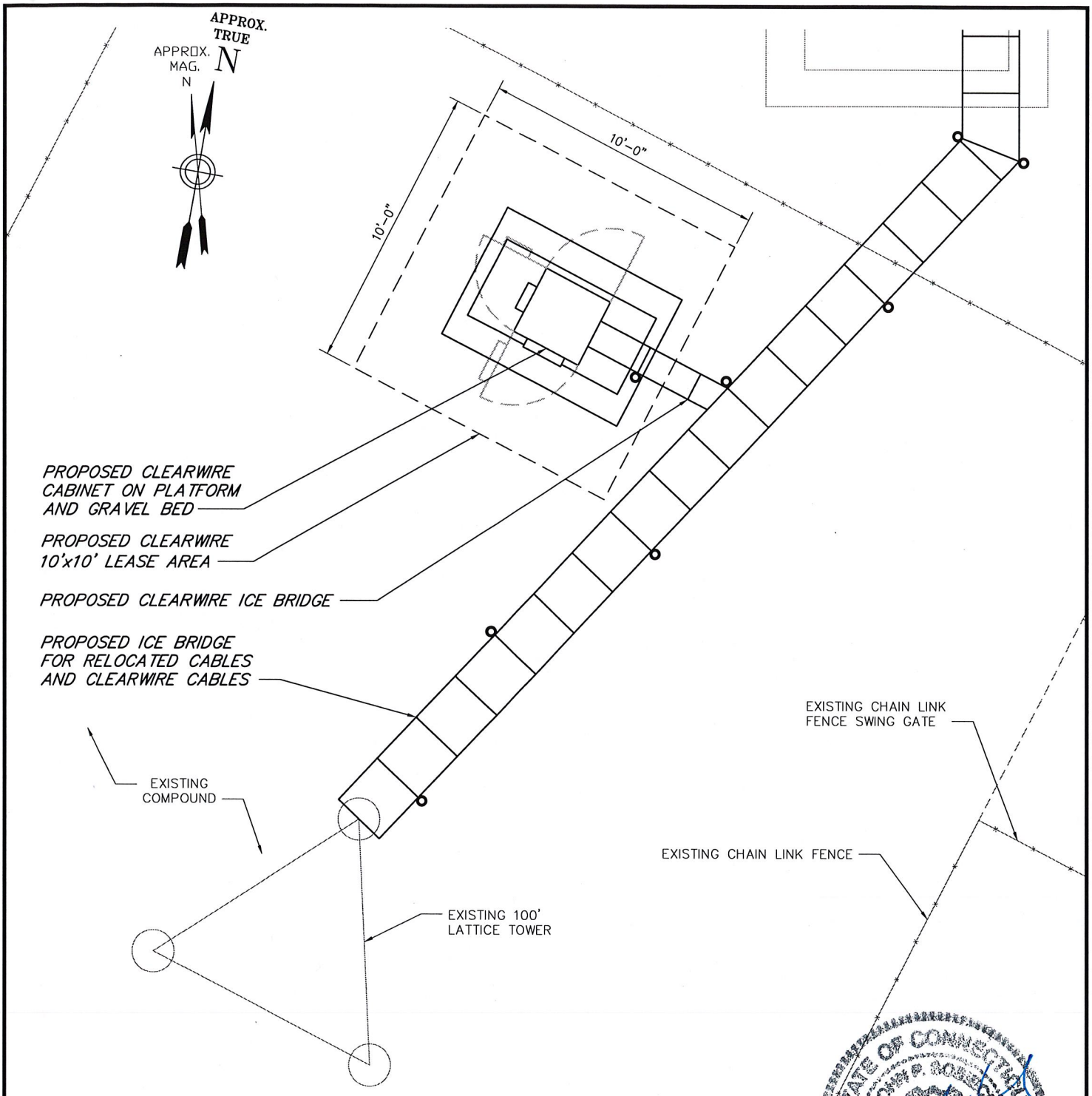

EQUIPMENT LAYOUT

GRAPHIC SCALE

5 0 2.5 5

IN FEET

NOT FOR CONSTRUCTION

STATE OF CONNECTICUT — JOHN P. ROSSI — No. 17827 — LICENSED PROFESSIONAL ENGINEER

LEASE EXHIBIT

SCALE: 1" = 5'
MARCH 20, 2012

3 OF 3

REVISION NUMBER 0

CHA
2139 Silas Deane Highway, Suite 212 · Rocky Hill, CT 06067-2336
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CT-NHN0095E
12 SALTONSTALL PLACE
EAST HAVEN, CT 06512

CHA PROJ. NO. – 20621.1065.43000

C Squared Systems, LLC
65 Dartmouth Fr.
Auburn, NH 03032
Phone: (603) 644 2800
support@csquaredsystems.com

Field Measured & Calculated Radio Frequency Emissions

clearwire®

CT-NHN0095

Saltonstall Place, East Haven, CT 06512

Table of Contents

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed collocation of Clearwire on the existing lattice tower located off Saltonstall Place in East Haven, CT. The coordinates of the tower are 41-17-37.28 N, 72-51-26.49 W.

Clearwire is proposing the following:

1) Install three 2.6GHz panel antennas (one per sector),
2) Install two 11GHz microwave dishes for network backhaul.

Since the actual ERP for each of the existing antennas is unknown, and no previous CSC filing exists for this tower, RF field measurements were taken around the perimeter of the facility compound.

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:

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

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

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. 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 finished installation.

4. Measured & Calculated Results

Table 1 below outlines the power density information for the site. Frequency and ERP information for carriers other than Clearwire is based on licenses obtained through the FCC database. Since the actual ERP for each antenna is unknown, and no previous CSC filing exists for this tower, measurements were taken at the base of the tower. Measurements were taken on November 1, 2010. The highest measured value is used in Table 1 below as the existing composite %MPE.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	%MPE
East Haven FD	102	453.5625	1	55	0.0019	0.3024	1.6% (Field Measured)
East Haven PD	102	453.2000	1	110	0.0038	0.3021	
East Haven PD	91	934.3750	1	1995	0.0866	0.6229	
East Haven DPW	89	156.2400	1	100	0.0045	0.2000	
HAM Radio	79	449.8250	1	100	0.0058	0.2999	
HAM Radio	70	147.2550	1	100	0.0073	0.2000	
Clearwire (WiMAX)	85	2650	2	155	0.0154	1.0000	1.54%
Clearwire (MWV)	85	10800	1	50	0.0025	1.0000	0.25%
						Total	**3.39%**

Table 1: Carrier Information[1]

[1] For carriers other than Clearwire, the ERP per transmitter value represents the maximum ERP allowed by the particular operator's FCC license.

5. Conclusion

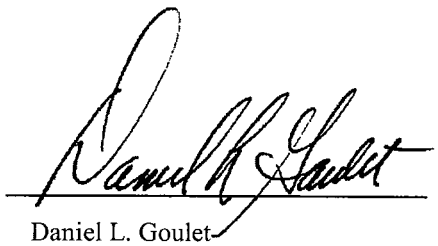
The above analysis verifies that emissions from the existing site will be well below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Even when using conservative methods, the cumulative power density from the proposed and existing transmit antennas at the existing facility is well below the limits for the general public. The highest expected percent of Maximum Permissible Exposure at the base of the tower is 3.4% of the FCC limit.[2]

As noted in the introduction, 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 finished installation.

[2] The above analysis and report was initially completed in November of 2010 in anticipation of Clearwire's pending installation. Clearwire elected to postpone that installation until this year and is now moving forward with their permitting process. Transcend Wireless has confirmed that the operations on the tower has remained unchanged since the time of the initial survey and further, that Clearwire's proposed installation is the same today as was planned in 2010. For these reasons we affirm that this report is still valid as presented. The report dates have been changed to reflect our second review and submission.

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/IEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.



Daniel L. Goulet
C Squared Systems, LLC

March 21, 2012
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

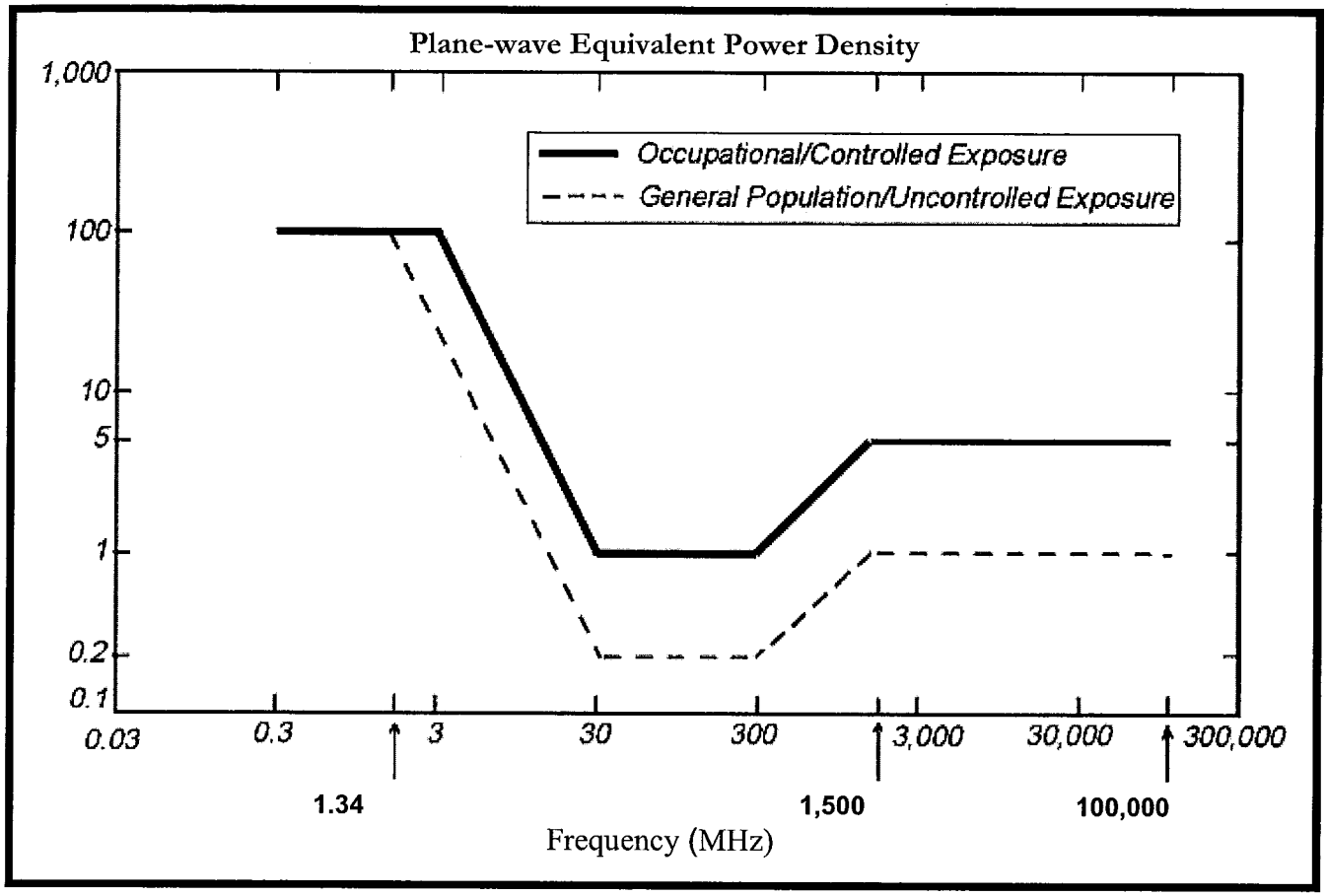
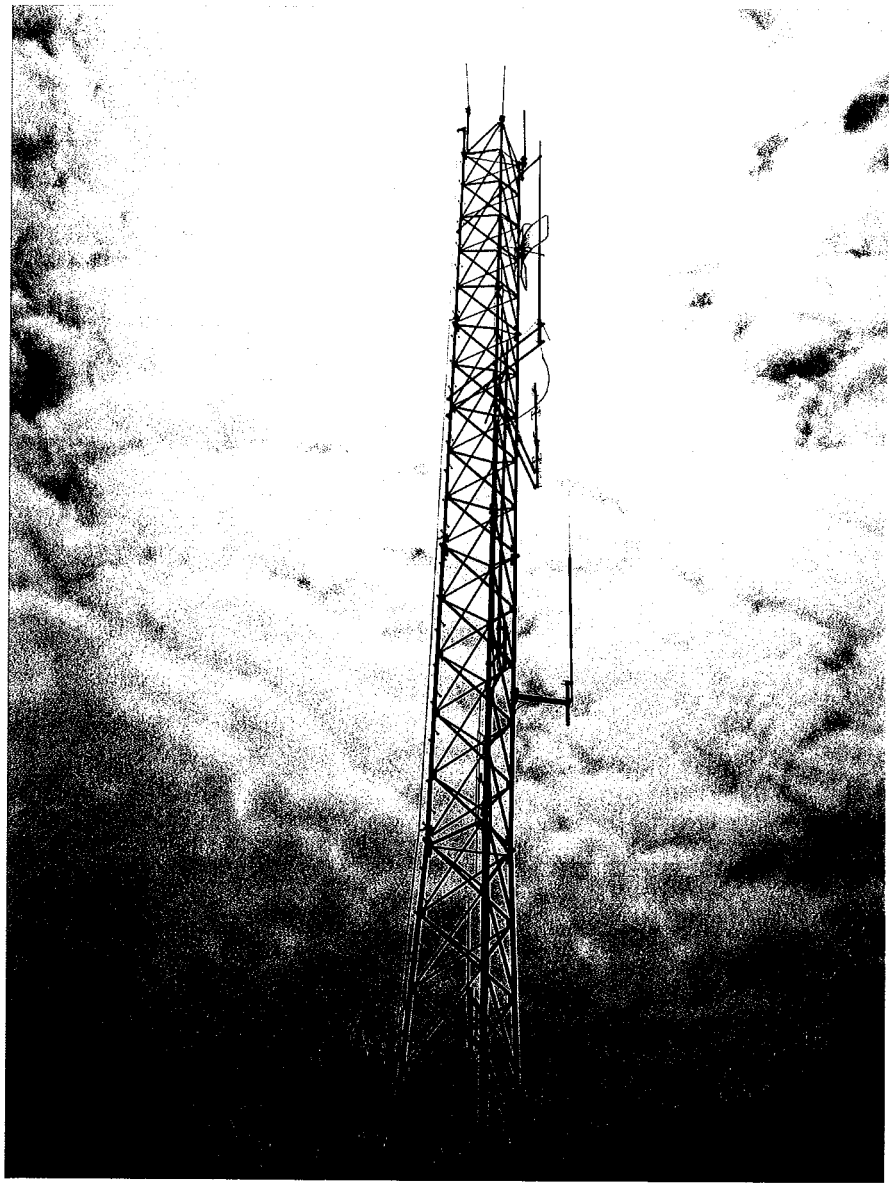


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Saltonstall Place Tower

New Haven County, Connecticut
CT-NHN0095E



Prepared for:
Transcend Wireless
18 Industrial Avenue
Mahwah, New Jersey 07430
March 16, 2012

CHA Consulting, Inc.
III Winners Circle
P.O. Box 5269
Albany, NY 12205
CHA Project No. 20621.1065.28000 R3

March 16, 2012

Mr. Mike Kithcart
Transcend Wireless
18 Industrial Avenue
Mahwah, New Jersey 07430

RE: Structural Analysis for Saltonstall Place Tower
Located in East Haven, CT
Site No. CT-NHN0095E
CHA Project No. 20621-1065-28000 Rev. 3

Dear Mr. Kithcart:

CHA has performed a structural analysis of the referenced site. This analysis is based on the following information:

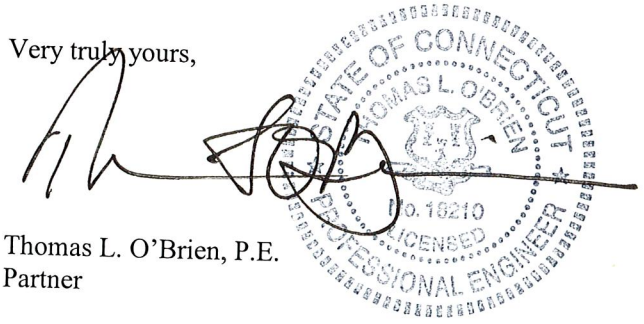
- A site visit performed by CHA on May 24, 2010.
- Existing tower design drawings by Rohn Manufacturing, dated November 22, 1991.
- Tower climb information provided by Bay State Design, Inc., dated September 8, 2010.
- A previous Structural Analysis performed by CHA, dated September 17, 2010.

Based upon our analysis the Lattice Tower **is** capable of supporting the proposed equipment under the existing conditions. The tower will support the following proposed antennas which includes (2) Andrew VHLP2-18 24" microwave antennas, (3) panel antennas and (3) remote radio units attached to the tower at a centerline elevation of 85' above grade level. The proposed Clearwire cabinet is proposed to be placed on a new concrete pad within the lease area.

This analysis is based on the current Connecticut State Building Code (2003 IBC), with the 2005 Connecticut Supplement and the 2009 Amendment to the 2005 Connecticut Supplement. The Connecticut State Building Code also references ASCE 7-02, "Minimum Design Loads for Buildings and Other Structures" and the TIA-EIA-222-F, "Structural Standards for Steel Antenna Towers and Antenna Supporting Structures", which were referenced in the analysis.

If you have any questions or if we can be of further assistance please call.

Very truly yours,



Thomas L. O'Brien, P.E.
Partner

TOB/am
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EXECUTIVE SUMMARY

Saltonstall Place Tower
Transcend Wireless
CT-NHN0095E

March 16, 2012

Tower Information:

Tower Owner:	East Haven Water Department
Tower Manufacturer:	ROHN
Tower Height:	100 feet
Tower Type:	Lattice Tower

Proposed Antenna and Appurtenance Data:

- Three (3) Argus LLPX310R panel antennas and three (3) remote radio units mounted on (3) 2' standoff frames and (3) double antenna mounts at an antenna centerline elevation of 85' above ground level with six (6) 5/16" coaxial cables within a 2" diameter innerduct.

- Two (2) Andrew VHLP2-18 2' diameter Microwave dishes mounted on the above mentioned mounts at an antenna centerline elevation of 85' above ground level with two (2) 1/2" diameter coaxial cables.

Existing Antenna and Appurtenance Data:

- Three (3) 10' whip antennas mounted to the top of the tower at a centerline elevation of 100'-0" above ground level with three (3) 1/2" coaxial cables.

- One (1) Police Department 960 MDS microwave grid antenna mounted to the tower leg at an antenna centerline elevation of 90'-0" above ground level with one (1) 1/2" coaxial cable.

- One (1) 18' whip antenna mounted to the tower leg at a centerline elevation of 72'-0" above ground level with one (1) 1/2" coaxial cable.

- One (1) 4 bay microwave antenna mounted to the tower leg at a centerline elevation of 69'-0" above ground level with one (1) 1/2" coaxial cable.

- One (1) 18' whip antenna mounted to the tower leg at a centerline elevation of 50'-0" above ground level with one (1) 1/2" coaxial cable.

- One (1) 22' whip antenna mounted to the tower leg at a centerline elevation of 45'-0" above ground level.

- One (1) 6' ham antenna mounted to the tower leg at a centerline elevation of 35'-0" above ground level with one (1) 1/2" coaxial cable.

- One (1) 4' whip antenna mounted to the tower leg at a centerline elevation of 30'-0" above ground level with one (1) 1/2" coaxial cable.

CHA

Code Data: Applicable Code: - ANSI/EIA/TIA-222-F, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures
- Connecticut State Building Code (2003 IBC)

Wind Velocity: 85 mph (fastest mile) for New Haven County, Connecticut

Load Cases: (1) Weight of Tower, Antennas, and Appurtenances plus Wind Load without radial ice.
(2) Weight of Tower, Antennas, and Appurtenances plus Wind Load on iced tower plus weight of 1/2" radial ice.

Tower Leg Members: *(50 ksi)*

0' – 40'-0":	ROHN 2-1/2" X-STR
40'-0" – 60'-0":	ROHN 2-1/2" STD
60'-0" – 80' – 0":	ROHN 2" STD
80' – 100':	ROHN 2" STD

Tower Diagonal Members: *(36 ksi)*

0'-0" – 40'-0", 60'-0" – 100'-0":	L1.5x1.5x1/8
40'- 0" – 60' -0":	L1.5x1.5x3/16

Tower Superstructure:

The governing tower section (Legs from 0' - 20' AGL) is stressed at approximately 97.8% of its allowable capacity.

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	100 - 80	Leg	ROHN 2 STD	3	-4479.190	32298.456	13.9	Pass
		Diagonal	L1 1/2x1 1/2x1/8	12	873.469	8154.214	10.7	Pass
							27.8 (b)	
		Top Girt	L1 1/2x1 1/2x1/8	6	-24.380	2332.097	1.0	Pass
T2	80 - 60	Leg	ROHN 2 STD	39	-19215.301	32298.456	59.5	Pass
		Diagonal	L1 1/2x1 1/2x1/8	42	1936.940	8154.214	23.8	Pass
							61.7 (b)	
T3	60 - 40	Leg	ROHN 2.5 STD	71	-42634.102	55076.626	77.4	Pass
		Diagonal	L1 1/2x1 1/2x3/16	75	-3159.320	12333.262	25.6	Pass
							63.8 (b)	
T4	40 - 20	Leg	ROHN 2.5 X-STR	104	-55084.500	65602.926	84.0	Pass
		Diagonal	L1 1/2x1 1/2x1/8	129	-1844.880	7827.962	23.6	Pass
							54.3 (b)	
		Top Girt	L1 1/2x1 1/2x1/8	108	-198.956	2332.097	8.5	Pass
T5	20 - 0	Leg	ROHN 2.5 X-STR	134	-64158.000	65600.525	97.8	Pass
		Diagonal	L1 1/2x1 1/2x1/8	144	-1745.750	6549.428	26.7	Pass
							55.2 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	SF*P_{allow} lb	% Capacity	Pass Fail
							Summary	
						Leg (T5)	97.8	Pass
						Diagonal (T3)	63.8	Pass
						Top Girt (T4)	8.5	Pass
						Bolt Checks	63.8	Pass
						RATING =	**97.8**	**Pass**

Foundation Analysis:

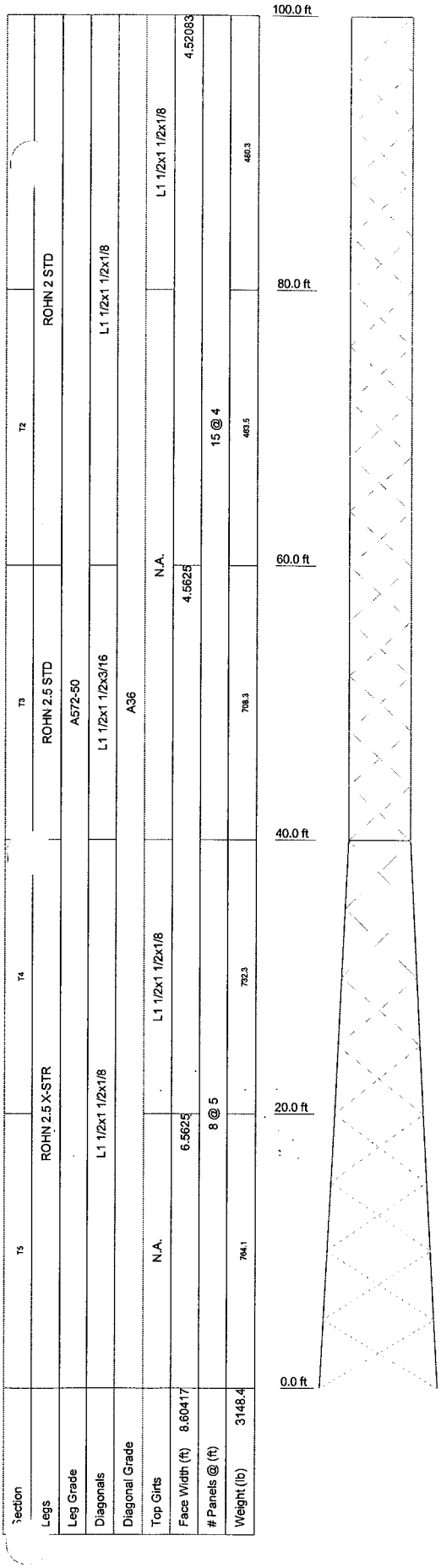
Force	Design Reactions*	Actual	Results
Tower Compression	65.0 kips	65.00 kips	Pass
Shear	8.2 kips	5.45 kips	Pass
Uplift	59.3 kips	57.90 kips	Pass
Moment	455.3 kip-ft	461.87 kip-ft	Pass*

***The design of the foundation uses a factor of safety of 2 against uplift/overturning. This complies to section 3108.4.2 of the International Building Code. The overturning moment is within the allowable 5% capacity limit.**

Conclusion:

The analysis indicates that the existing 100'-0" Lattice tower and foundation is structurally capable of supporting the existing and proposed equipment.

TOWER PROFILE



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
4' WHIP (E-TOP)	100	Remote RU (P)	80
4' WHIP (E-TOP)	100	Remote RU (P)	80
4' WHIP (E-TOP)	100	Remote RU (P)	80
PR950 (E-FOR GRID DISH)	90	Pirod 6' Side Mount Standoff (1) (E)	72
ADP-U frame for 2 ant w 2' standoff (P)	85	19.5' WHIP (E)	72
		DB264-JJ (E)	69
ADP-U frame for 2 ant w 2' standoff (P)	85	Pirod 6' Side Mount Standoff (1) (E)	69
		19.5' WHIP (E)	50
ADP-U frame for 2 ant w 2' standoff (P)	85	Pirod 4' Side Mount Standoff (1) (E)	50
		Pirod 4' Side Mount Standoff (1) (E)	45
LLPX310R (P)	85	20' WHIP (E)	45
LLPX310R (P)	85	7' WHIP (E)	35
LLPX310R (P)	85	Pirod 4' Side Mount Standoff (1) (E)	35
Andrew 2' w/Radome (P)	85	4' WHIP (E)	30
Andrew 2' w/Radome (P)	85		

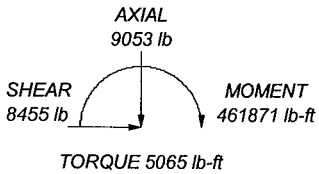
MATERIAL STRENGTH

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

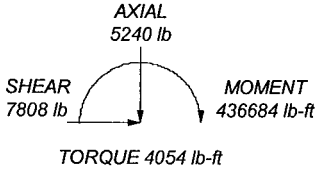
TOWER DESIGN NOTES

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

MAX. CORNER REACTIONS AT BASE:
DOWN: 65000 lb
UPLIFT: -57940 lb
SHEAR: 5454 lb



TORQUE 5065 lb-ft
74 mph WIND - 0.5000 in ICE

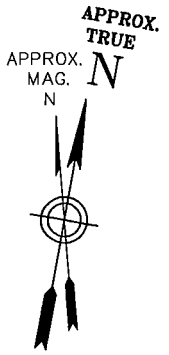


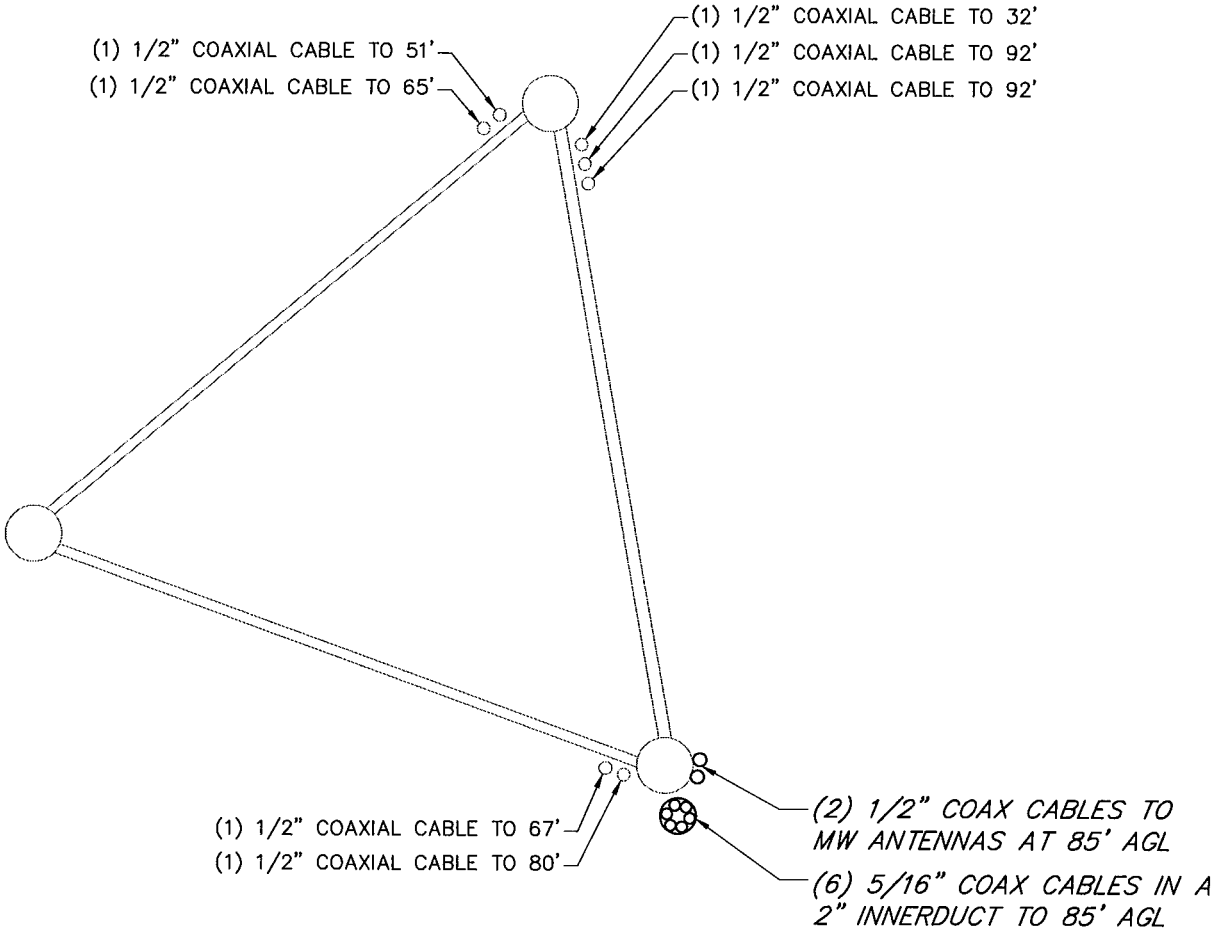
TORQUE 4054 lb-ft
REACTIONS - 85 mph WIND

CHA Consulting, Inc.
III Winners Circle
Albany, NY 12205
Phone: (518) 453-4500
FAX: (518) 453-4712

Job: *Saltonstall - CT_NHN0095E*		
Project: *20621.1065.28000 R3*		
Client: Transcend	Drawn by: 3159	App'd:
Code: TIA/EIA-222-F	Date: 03/16/12	Scale: NTS
Path: W:\Transcend\20621\Sites\1065 - CT-NHN0095\Struct\Rev 3\Tower Model-R3.eri		Dwg No. E-1

CABLE LAYOUT





CABLE LAYOUT DIAGRAM

NOTE:
CONTRACTOR TO VERIFY THAT THE EXISTING COAXIAL CABLE CONFIGURATION SHOWN IS ACCURATE AND NOTIFY ENGINEER IMMEDIATELY IF CABLES ARE INSTALLED DIFFERENTLY PRIOR TO THE START OF CONSTRUCTION.

CHA
III Winners Circle, PO Box 5269, Albany, NY 12205
www.chacompanies.com

TRANSCEND WIRELESS, LLC

18 INDUSTRIAL AVENUE
MAHWAH, NJ 07430

SALTONSTALL TOWER
EAST HAVEN, CT

CHA PROJ. NO. – 20621.1065

1 OF 1

REV 3

S–1

RISA TOWER ANALYSIS

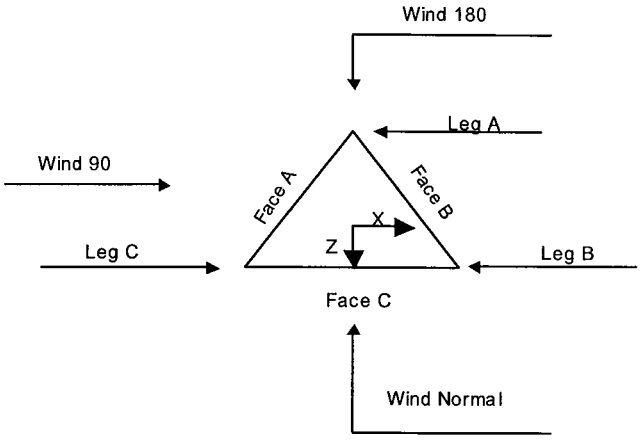
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 100.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 4.521 ft at the top and 8.604 ft at the base.
This tower is designed using the TIA/EIA-222-F standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 85 mph.
Nominal ice thickness of 0.5000 in.
Ice density of 56 pcf.
A wind speed of 74 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.333.
Local bending stresses due to climbing loads, feedline supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	100.000-80.000			4.521	1	20.000
T2	80.000-60.000			4.521	1	20.000
T3	60.000-40.000			4.563	1	20.000
T4	40.000-20.000			4.563	1	20.000
T5	20.000-0.000			6.563	1	20.000

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	100.000-80.000	4.000	X Brace	No	No	0.0000	0.0000
T2	80.000-60.000	4.000	X Brace	No	No	0.0000	0.0000
T3	60.000-40.000	4.000	X Brace	No	No	0.0000	0.0000
T4	40.000-20.000	5.000	X Brace	No	No	0.0000	0.0000
T5	20.000-0.000	5.000	X Brace	No	No	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 100.000-80.000	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)
T2 80.000-60.000	Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)
T3 60.000-40.000	Pipe	ROHN 2.5 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x3/16	A36 (36 ksi)
T4 40.000-20.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)
T5 20.000-0.000	Pipe	ROHN 2.5 X-STR	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	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 100.000-80.000	Equal Angle	Block Shear	80• L(36 (36 ksi)	Solid Round		A36 (36 ksi)
T4 40.000-20.000	Equal Angle	L1 1/2x1 1/2x1/8	A36 (36 ksi)	Equal Angle		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 100.000-80.000	0.000	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000
T2 80.000-60.000	0.000	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000
T3 60.000-40.000	0.000	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000
T4 40.000-20.000	0.000	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000
T5 20.000-0.000	0.000	0.0000	A36 (36 ksi)	1.05	1	1.05	36.0000	36.0000

Tower Section Geometry *(cont'd)*

K Factors[1]

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	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	0.5	0.5	1	1	1	1
100.000-80.000				0.5	0.5	0.5	1	1	1	1
T2	No	No	1	0.5	0.5	0.5	1	1	1	1
80.000-60.000				0.5	0.5	0.5	1	1	1	1
T3	No	No	1	0.5	0.5	0.5	1	1	1	1
60.000-40.000				0.5	0.5	0.5	1	1	1	1
T4	No	No	1	0.5	0.5	0.5	1	1	1	1
40.000-20.000				0.5	0.5	0.5	1	1	1	1
T5	No	No	1	0.5	0.5	0.5	1	1	1	1
20.000-0.000				0.5	0.5	0.5	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1	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
100.000-80.000														
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
80.000-60.000														
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
60.000-40.000														
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
40.000-20.000														
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
20.000-0.000														

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
100.000-80.000															
T2	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
80.000-60.000															
T3	Flange	0.6250 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
60.000-40.000															
T4	Flange	0.7500 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
40.000-20.000															

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T5 20.000-0.000	Flange	0.7500 A325N	4	0.5000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF4P-50A (1/2 FOAM) (E)	A	No	Ar (CfAe)	30.000 - 8.000	1	1	0.6300	0.6300		0.150
LDF4-50A (1/2 FOAM) (E)	A	No	Ar (Leg)	35.000 - 8.000	1	1	0.6300	0.6300		0.150
LDF4-50A (1/2 FOAM) (E)	A	No	Ar (Leg)	45.000 - 8.000	1	1	0.6300	0.6300		0.150
LDF4-50A (1/2 FOAM) (E)	A	No	Ar (Leg)	50.000 - 8.000	1	1	0.6300	0.6300		0.150
LDF4-50A (1/2 FOAM) (E)	A	No	Ar (Leg)	69.000 - 8.000	1	1	0.6300	0.6300		0.150
LDF4-50A (1/2 FOAM) (E)	A	No	Ar (Leg)	72.000 - 8.000	1	1	0.6300	0.6300		0.150
LDF4-50A (1/2 FOAM) (E)	A	No	Ar (Leg)	90.000 - 8.000	1	1	0.6300	0.6300		0.150
PROPOSED										
2" Rigid Conduit (P-(6) 5/16")	B	No	Ar (Leg)	85.000 - 8.000	1	1	2.0000	2.0000		2.800
LDF4-50A (1/2 FOAM) (P-MWA)	B	No	Ar (Leg)	85.000 - 8.000	1	1	0.6300	0.6300		0.150
LDF4P-50A (1/2 FOAM) (P-MWA)	B	No	Ar (Leg)	85.000 - 8.000	1	1	0.6300	0.6300		0.150
Exisitng										
LDF4-50A (1/2 FOAM) (E)	A	No	Ar (Leg)	100.000 - 8.000	1	1	0.6300	0.6300		0.150
LDF4-50A (1/2 FOAM) (E)	A	No	Ar (Leg)	100.000 - 8.000	1	1	0.6300	0.6300		0.150
LDF4-50A (1/2 FOAM) (E)	A	No	Ar (Leg)	100.000 - 8.000	1	1	0.6300	0.6300		0.150

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	100.000-80.000	A	3.675	0.000	0.000	0.000	10.500
		B	5.033	0.000	0.000	0.000	15.500
		C	1.358	0.000	0.000	0.000	0.000
T2	80.000-60.000	A	5.303	0.000	0.000	0.000	15.150
		B	10.736	0.000	0.000	0.000	62.000
		C	5.433	0.000	0.000	0.000	0.000
T3	60.000-40.000	A	7.088	0.000	0.000	0.000	20.250
		B	12.521	0.000	0.000	0.000	62.000
		C	5.433	0.000	0.000	0.000	0.000
T4	40.000-20.000	A	9.713	0.000	0.000	0.000	27.750

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
T5	20.000-0.000	B	14.621	0.000	0.000	0.000	62.000
		C	5.433	0.000	0.000	0.000	0.000
		A	6.300	0.000	0.000	0.000	18.000
		B	8.930	0.000	0.000	0.000	37.200
		C	3.260	0.000	0.000	0.000	0.000

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	100.000-80.000	A	0.500	9.508	0.000	0.000	0.000	58.819
		B		12.117	0.000	0.000	0.000	30.039
		C		2.608	0.000	0.000	0.000	0.000
T2	80.000-60.000	A	0.500	13.719	0.000	0.000	0.000	84.868
		B		24.153	0.000	0.000	0.000	120.154
		C		10.433	0.000	0.000	0.000	0.000
T3	60.000-40.000	A	0.500	18.337	0.000	0.000	0.000	113.437
		B		28.771	0.000	0.000	0.000	120.154
		C		10.433	0.000	0.000	0.000	0.000
T4	40.000-20.000	A	0.500	25.129	0.000	0.000	0.000	155.451
		B		34.204	0.000	0.000	0.000	120.154
		C		10.433	0.000	0.000	0.000	0.000
T5	20.000-0.000	A	0.500	16.300	0.000	0.000	0.000	100.833
		B		20.930	0.000	0.000	0.000	72.093
		C		6.260	0.000	0.000	0.000	0.000

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	100.000-80.000	0.6326	-1.6110	0.7225	-2.6241
T2	80.000-60.000	2.1769	-1.1974	2.3828	-2.2438
T3	60.000-40.000	1.9455	-1.8072	2.1420	-3.1105
T4	40.000-20.000	2.0720	-3.0943	2.1794	-4.9440
T5	20.000-0.000	1.6877	-2.7828	1.8330	-4.6550

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Pirod 4' Side Mount Standoff (1)	A	From Leg	0.000 0.000	0.0000	35.000	No Ice 1/2" Ice	2.720 4.910	2.720 4.910	50.000 89.000

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(E)			0.000						
7' WHIP	A	From Leg	2.000	0.0000	35.000	No Ice	1.400	1.400	15.000
(E)			0.000			1/2" Ice	2.125	2.125	25.919
			0.000						
Pirod 4' Side Mount Standoff	A	From Leg	0.000	0.0000	45.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000
(E)			0.000						
20' WHIP	A	From Leg	4.000	0.0000	45.000	No Ice	6.000	6.000	60.000
(E)			0.000			1/2" Ice	8.033	8.033	103.168
			0.000						
Pirod 4' Side Mount Standoff	B	From Leg	0.000	0.0000	50.000	No Ice	2.720	2.720	50.000
(1)			0.000			1/2" Ice	4.910	4.910	89.000
(E)			0.000						
19.5' WHIP	B	From Leg	4.000	0.0000	50.000	No Ice	5.850	5.850	32.000
(E)			0.000			1/2" Ice	7.833	7.833	74.099
			0.000						
Pirod 6' Side Mount Standoff	B	From Leg	0.000	0.0000	69.000	No Ice	4.970	4.970	70.000
(1)			0.000			1/2" Ice	6.120	6.120	130.000
(E)			0.000						
DB264-JJ	B	From Leg	6.000	0.0000	69.000	No Ice	3.160	3.160	36.000
(E)			0.000			1/2" Ice	5.688	5.688	46.800
			0.000						
Pirod 6' Side Mount Standoff	A	From Leg	0.000	0.0000	72.000	No Ice	4.970	4.970	70.000
(1)			0.000			1/2" Ice	6.120	6.120	130.000
(E)			0.000						
19.5' WHIP	A	From Leg	6.000	0.0000	72.000	No Ice	5.850	5.850	32.000
(E)			0.000			1/2" Ice	7.833	7.833	74.099
			0.000						
PR950	B	From Leg	0.000	0.0000	90.000	No Ice	5.950	2.975	38.000
(E-FOR GRID DISH)			0.000			1/2" Ice	6.291	3.258	75.009
			0.000						
4' WHIP	A	From Leg	0.000	0.0000	100.000	No Ice	0.600	0.600	8.250
(E-TOP)			0.000			1/2" Ice	0.919	0.919	13.296
			0.000						
4' WHIP	B	From Leg	0.000	0.0000	100.000	No Ice	0.600	0.600	8.250
(E-TOP)			0.000			1/2" Ice	0.919	0.919	13.296
			0.000						
4' WHIP	C	From Leg	0.000	0.0000	100.000	No Ice	0.600	0.600	8.250
(E-TOP)			0.000			1/2" Ice	0.919	0.919	13.296
			0.000						
PROPOSED									
ADP-U frame for 2 ant w 2'	A	From Leg	0.000	0.0000	85.000	No Ice	3.223	3.223	300.000
standoff			0.000			1/2" Ice	3.616	3.616	333.960
(P)			0.000						
ADP-U frame for 2 ant w 2'	B	From Leg	0.000	0.0000	85.000	No Ice	3.223	3.223	300.000
standoff			0.000			1/2" Ice	3.616	3.616	333.960
(P)			0.000						
ADP-U frame for 2 ant w 2'	C	From Leg	0.000	0.0000	85.000	No Ice	3.223	3.223	300.000
standoff			0.000			1/2" Ice	3.616	3.616	333.960
(P)			0.000						
LLPX310R	A	From Leg	4.000	0.0000	85.000	No Ice	4.837	1.957	28.700
(P)			0.000			1/2" Ice	5.191	2.226	54.670
			0.000						
LLPX310R	B	From Leg	4.000	0.0000	85.000	No Ice	4.837	1.957	28.700
(P)			0.000			1/2" Ice	5.191	2.226	54.670
			0.000						
LLPX310R	C	From Leg	4.000	0.0000	85.000	No Ice	4.837	1.957	28.700

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(P)			0.000 0.000			1/2" Ice	5.191	2.226	54.670
Remote RU	A	From Leg	4.000	0.0000	80.000	No Ice	0.000	0.856	33.000
(P)			0.000 0.000			1/2" Ice	0.000	0.999	44.966
Remote RU	B	From Leg	4.000	0.0000	80.000	No Ice	0.000	0.856	33.000
(P)			0.000 0.000			1/2" Ice	0.000	0.999	44.966
Remote RU	C	From Leg	4.000	0.0000	80.000	No Ice	0.000	0.856	33.000
(P)			0.000 0.000			1/2" Ice	0.000	0.999	44.966
Existing 4' WHIP	A	From Leg	0.000	0.0000	30.000	No Ice	0.600	0.600	8.250
(E)			0.000 0.000			1/2" Ice	0.919	0.919	13.296

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
Andrew 2' w/Radome	A	Paraboloid	From	2.000	Worst		85.000	2.000	No Ice	3.142	70.000
(P)		w/Radome	Leg	0.000 0.000					1/2" Ice	3.409	282.000
Andrew 2' w/Radome	C	Paraboloid	From	2.000	Worst		85.000	2.000	No Ice	3.142	70.000
(P)		w/Radome	Leg	0.000 0.000					1/2" Ice	3.409	282.000

Tower Pressures - No Ice

$G_H = 1.162$

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	90.000	1.332	25	94.375	A	8.143	11.592	7.917	40.11	0.000	0.000
100.000-80.00					B	8.143	12.950		37.53	0.000	0.000
0					C	8.143	9.275		45.45	0.000	0.000
T2	70.000	1.24	23	94.792	A	7.597	13.219	7.917	38.03	0.000	0.000
80.000-60.000					B	7.597	18.653		30.16	0.000	0.000
					C	7.597	13.350		37.79	0.000	0.000
T3	50.000	1.126	21	96.042	A	7.553	16.671	9.583	39.56	0.000	0.000
60.000-40.000					B	7.553	22.104		32.31	0.000	0.000
					C	7.553	15.017		42.46	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
T4	30.000	1	18	116.048	A	8.092	19.312	9.599	35.03	0.000	0.000
40.000-20.000					B	8.092	24.220		29.71	0.000	0.000
					C	8.092	15.033		41.51	0.000	0.000
T5	10.000	1	18	156.465	A	9.242	15.900	9.600	38.18	0.000	0.000
20.000-0.000					B	9.242	18.530		34.57	0.000	0.000
					C	9.242	12.860		43.43	0.000	0.000

Tower Pressure - With Ice

$G_H = 1.162$

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	90.000	1.332	18	0.5000	96.042	A	8.143	25.929	11.250	33.02	0.000	0.000
100.000-80.000						B	8.143	28.537		30.67	0.000	0.000
						C	8.143	19.029		41.40	0.000	0.000
T2	70.000	1.24	17	0.5000	96.458	A	7.597	29.793	11.250	30.09	0.000	0.000
80.000-60.000						B	7.597	40.226		23.52	0.000	0.000
						C	7.597	26.507		32.99	0.000	0.000
T3	50.000	1.126	16	0.5000	97.708	A	7.553	36.050	12.917	29.62	0.000	0.000
60.000-40.000						B	7.553	46.483		23.90	0.000	0.000
						C	7.553	28.145		36.18	0.000	0.000
T4	30.000	1	14	0.5000	117.716	A	8.092	43.205	12.938	25.22	0.000	0.000
40.000-20.000						B	8.092	52.280		21.43	0.000	0.000
						C	8.092	28.509		35.35	0.000	0.000
T5 20.000-0.000	10.000	1	14	0.5000	158.133	A	9.242	35.107	12.939	29.18	0.000	0.000
						B	9.242	39.737		26.42	0.000	0.000
						C	9.242	25.067		37.71	0.000	0.000

Tower Pressure - Service

$G_H = 1.162$

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	90.000	1.332	12	94.375	A	8.143	11.592	7.917	40.11	0.000	0.000
100.000-80.00					B	8.143	12.950		37.53	0.000	0.000
0					C	8.143	9.275		45.45	0.000	0.000
T2	70.000	1.24	11	94.792	A	7.597	13.219	7.917	38.03	0.000	0.000
80.000-60.000					B	7.597	18.653		30.16	0.000	0.000
					C	7.597	13.350		37.79	0.000	0.000
T3	50.000	1.126	10	96.042	A	7.553	16.671	9.583	39.56	0.000	0.000
60.000-40.000					B	7.553	22.104		32.31	0.000	0.000
					C	7.553	15.017		42.46	0.000	0.000
T4	30.000	1	9	116.048	A	8.092	19.312	9.599	35.03	0.000	0.000
40.000-20.000					B	8.092	24.220		29.71	0.000	0.000
					C	8.092	15.033		41.51	0.000	0.000
T5	10.000	1	9	156.465	A	9.242	15.900	9.600	38.18	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
20.000-0.000					B	9.242	18.530		34.57	0.000	0.000
					C	9.242	12.860		43.43	0.000	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.000	480.293	A	0.209	2.566	0.592	1	1	15.009	1143.592	57.180	B
100.000-80.00			B	0.224	2.519	0.595	1	1	15.855			
0			C	0.185	2.648	0.587	1	1	13.591			
T2	77.150	463.480	A	0.22	2.532	0.595	1	1	15.457	1191.810	59.590	B
80.000-60.000			B	0.277	2.359	0.609	1	1	18.959			
			C	0.221	2.527	0.595	1	1	15.539			
T3	82.250	708.279	A	0.252	2.431	0.602	1	1	17.596	1167.759	58.388	B
60.000-40.000			B	0.309	2.273	0.619	1	1	21.227			
			C	0.235	2.483	0.598	1	1	16.535			
T4	89.750	732.304	A	0.236	2.48	0.598	1	1	19.649	1156.877	57.844	B
40.000-20.000			B	0.278	2.355	0.61	1	1	22.855			
			C	0.199	2.598	0.59	1	1	16.965			
T5	55.200	764.064	A	0.161	2.733	0.583	1	1	18.515	1154.917	57.746	B
20.000-0.000			B	0.177	2.673	0.586	1	1	20.102			
			C	0.141	2.804	0.58	1	1	16.704			
Sum Weight:	330.350	3148.420						OTM	290993.43 lb-ft	5814.955		

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 ft²	F lb	w plf	Ctrl. Face
T1	26.000	480.293	A	0.209	2.566	0.592	0.8	1	13.380	1026.118	51.306	B
100.000-80.00			B	0.224	2.519	0.595	0.8	1	14.226			
0			C	0.185	2.648	0.587	0.8	1	11.963			
T2	77.150	463.480	A	0.22	2.532	0.595	0.8	1	13.938	1096.293	54.815	B
80.000-60.000			B	0.277	2.359	0.609	0.8	1	17.439			
			C	0.221	2.527	0.595	0.8	1	14.020			
T3	82.250	708.279	A	0.252	2.431	0.602	0.8	1	16.086	1084.658	54.233	B
60.000-40.000			B	0.309	2.273	0.619	0.8	1	19.717			
			C	0.235	2.483	0.598	0.8	1	15.025			
T4	89.750	732.304	A	0.236	2.48	0.598	0.8	1	18.030	1074.958	53.748	B
40.000-20.000			B	0.278	2.355	0.61	0.8	1	21.237			
			C	0.199	2.598	0.59	0.8	1	15.347			
T5	55.200	764.064	A	0.161	2.733	0.583	0.8	1	16.666	1048.717	52.436	B
20.000-0.000			B	0.177	2.673	0.586	0.8	1	18.254			
			C	0.141	2.804	0.58	0.8	1	14.855			
Sum Weight:	330.350	3148.420						OTM	266059.96 lb-ft	5330.745		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	26.000	480.293	A	0.209	2.566	0.592	0.85	1	13.788	1055.487	52.774	B
100.000-80.00			B	0.224	2.519	0.595	0.85	1	14.633			
0			C	0.185	2.648	0.587	0.85	1	12.370			
T2	77.150	463.480	A	0.22	2.532	0.595	0.85	1	14.318	1120.172	56.009	B
80.000-60.000			B	0.277	2.359	0.609	0.85	1	17.819			
			C	0.221	2.527	0.595	0.85	1	14.400			
T3	82.250	708.279	A	0.252	2.431	0.602	0.85	1	16.463	1105.434	55.272	B
60.000-40.000			B	0.309	2.273	0.619	0.85	1	20.094			
			C	0.235	2.483	0.598	0.85	1	15.402			
T4	89.750	732.304	A	0.236	2.48	0.598	0.85	1	18.435	1095.438	54.772	B
40.000-20.000			B	0.278	2.355	0.61	0.85	1	21.641			
			C	0.199	2.598	0.59	0.85	1	15.751			
T5	55.200	764.064	A	0.161	2.733	0.583	0.85	1	17.128	1075.267	53.763	B
20.000-0.000			B	0.177	2.673	0.586	0.85	1	18.716			
			C	0.141	2.804	0.58	0.85	1	15.317			
Sum Weight:	330.350	3148.420						OTM	272293.33 lb-ft	5451.797		

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	88.858	887.080	A	0.355	2.161	0.634	1	1	24.587	1196.916	59.846	B
100.000-80.00			B	0.382	2.101	0.644	1	1	26.532			
0			C	0.283	2.342	0.611	1	1	19.766			
T2	205.022	849.993	A	0.388	2.089	0.647	1	1	26.862	1354.515	67.726	B
80.000-60.000			B	0.496	1.906	0.695	1	1	35.569			
			C	0.354	2.163	0.634	1	1	24.396			
T3	233.592	1113.845	A	0.446	1.98	0.672	1	1	31.762	1379.899	68.995	B
60.000-40.000			B	0.553	1.841	0.726	1	1	41.299			
			C	0.365	2.137	0.638	1	1	25.512			
T4	275.606	1155.762	A	0.436	1.998	0.667	1	1	36.903	1363.715	68.186	B
40.000-20.000			B	0.513	1.884	0.704	1	1	44.904			
			C	0.311	2.267	0.619	1	1	25.748			
T5	172.926	1225.790	A	0.28	2.349	0.61	1	1	30.662	1238.475	61.924	B
20.000-0.000			B	0.31	2.27	0.619	1	1	33.837			
			C	0.217	2.54	0.594	1	1	24.133			
Sum Weight:	976.004	5232.469						OTM	324829.69 lb-ft	6533.520		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	R_R	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	88.858	887.080	A	0.355	2.161	0.634	0.8	1	22.958	1123.445	56.172	B
100.000-80.00			B	0.382	2.101	0.644	0.8	1	24.904			
0			C	0.283	2.342	0.611	0.8	1	18.138			
T2	205.022	849.993	A	0.388	2.089	0.647	0.8	1	25.343	1296.653	64.833	B
80.000-60.000			B	0.496	1.906	0.695	0.8	1	34.049			
			C	0.354	2.163	0.634	0.8	1	22.877			
T3	233.592	1113.845	A	0.446	1.98	0.672	0.8	1	30.252	1329.427	66.471	B
60.000-40.000			B	0.553	1.841	0.726	0.8	1	39.788			
			C	0.365	2.137	0.638	0.8	1	24.001			
T4	275.606	1155.762	A	0.436	1.998	0.667	0.8	1	35.285	1314.566	65.728	B
40.000-20.000			B	0.513	1.884	0.704	0.8	1	43.286			
			C	0.311	2.267	0.619	0.8	1	24.129			
T5	172.926	1225.790	A	0.28	2.349	0.61	0.8	1	28.813	1170.818	58.541	B
20.000-0.000			B	0.31	2.27	0.619	0.8	1	31.989			
			C	0.217	2.54	0.594	0.8	1	22.284			
Sum Weight:	976.004	5232.469						OTM	309492.26 lb-ft	6234.908		

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 ft²	F lb	w plf	Ctrl. Face
T1	88.858	887.080	A	0.355	2.161	0.634	0.85	1	23.365	1141.813	57.091	B
100.000-80.00			B	0.382	2.101	0.644	0.85	1	25.311			
0			C	0.283	2.342	0.611	0.85	1	18.545			
T2	205.022	849.993	A	0.388	2.089	0.647	0.85	1	25.722	1311.119	65.556	B
80.000-60.000			B	0.496	1.906	0.695	0.85	1	34.429			
			C	0.354	2.163	0.634	0.85	1	23.256			
T3	233.592	1113.845	A	0.446	1.98	0.672	0.85	1	30.630	1342.045	67.102	B
60.000-40.000			B	0.553	1.841	0.726	0.85	1	40.166			
			C	0.365	2.137	0.638	0.85	1	24.379			
T4	275.606	1155.762	A	0.436	1.998	0.667	0.85	1	35.689	1326.853	66.343	B
40.000-20.000			B	0.513	1.884	0.704	0.85	1	43.691			
			C	0.311	2.267	0.619	0.85	1	24.534			
T5	172.926	1225.790	A	0.28	2.349	0.61	0.85	1	29.276	1187.732	59.387	B
20.000-0.000			B	0.31	2.27	0.619	0.85	1	32.451			
			C	0.217	2.54	0.594	0.85	1	22.746			
Sum Weight:	976.004	5232.469						OTM	313326.61 lb-ft	6309.561		

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	26.000	480.293	A	0.209	2.566	0.592	1	1	15.009	569.818	28.491	B
100.000-80.00			B	0.224	2.519	0.595	1	1	15.855			
0			C	0.185	2.648	0.587	1	1	13.591			

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
T2	77.150	463.480	A	0.22	2.532	0.595	1	1	15.457	593.843	29.692	B
80.000-60.000			B	0.277	2.359	0.609	1	1	18.959			
			C	0.221	2.527	0.595	1	1	15.539			
T3	82.250	708.279	A	0.252	2.431	0.602	1	1	17.596	581.859	29.093	B
60.000-40.000			B	0.309	2.273	0.619	1	1	21.227			
			C	0.235	2.483	0.598	1	1	16.535			
T4	89.750	732.304	A	0.236	2.48	0.598	1	1	19.649	576.437	28.822	B
40.000-20.000			B	0.278	2.355	0.61	1	1	22.855			
			C	0.199	2.598	0.59	1	1	16.965			
T5	55.200	764.064	A	0.161	2.733	0.583	1	1	18.515	575.460	28.773	B
20.000-0.000			B	0.177	2.673	0.586	1	1	20.102			
			C	0.141	2.804	0.58	1	1	16.704			
Sum Weight:	330.350	3148.420						OTM	144993.27 lb-ft	2897.417		

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 ft^2	F lb	w plf	Ctrl. Face
T1	26.000	480.293	A	0.209	2.566	0.592	0.8	1	13.380	511.284	25.564	B
100.000-80.00			B	0.224	2.519	0.595	0.8	1	14.226			
0			C	0.185	2.648	0.587	0.8	1	11.963			
T2	77.150	463.480	A	0.22	2.532	0.595	0.8	1	13.938	546.250	27.312	B
80.000-60.000			B	0.277	2.359	0.609	0.8	1	17.439			
			C	0.221	2.527	0.595	0.8	1	14.020			
T3	82.250	708.279	A	0.252	2.431	0.602	0.8	1	16.086	540.453	27.023	B
60.000-40.000			B	0.309	2.273	0.619	0.8	1	19.717			
			C	0.235	2.483	0.598	0.8	1	15.025			
T4	89.750	732.304	A	0.236	2.48	0.598	0.8	1	18.030	535.619	26.781	B
40.000-20.000			B	0.278	2.355	0.61	0.8	1	21.237			
			C	0.199	2.598	0.59	0.8	1	15.347			
T5	55.200	764.064	A	0.161	2.733	0.583	0.8	1	16.666	522.544	26.127	B
20.000-0.000			B	0.177	2.673	0.586	0.8	1	18.254			
			C	0.141	2.804	0.58	0.8	1	14.855			
Sum Weight:	330.350	3148.420						OTM	132569.67 lb-ft	2656.150		

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 ft^2	F lb	w plf	Ctrl. Face
T1	26.000	480.293	A	0.209	2.566	0.592	0.85	1	13.788	525.917	26.296	B
100.000-80.00			B	0.224	2.519	0.595	0.85	1	14.633			
0			C	0.185	2.648	0.587	0.85	1	12.370			
T2	77.150	463.480	A	0.22	2.532	0.595	0.85	1	14.318	558.148	27.907	B
80.000-60.000			B	0.277	2.359	0.609	0.85	1	17.819			
			C	0.221	2.527	0.595	0.85	1	14.400			

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
T3	82.250	708.279	A	0.252	2.431	0.602	0.85	1	16.463	550.804	27.540	B
60.000-40.000			B	0.309	2.273	0.619	0.85	1	20.094			
			C	0.235	2.483	0.598	0.85	1	15.402			
T4	89.750	732.304	A	0.236	2.48	0.598	0.85	1	18.435	545.824	27.291	B
40.000-20.000			B	0.278	2.355	0.61	0.85	1	21.641			
			C	0.199	2.598	0.59	0.85	1	15.751			
T5	55.200	764.064	A	0.161	2.733	0.583	0.85	1	17.128	535.773	26.789	B
20.000-0.000			B	0.177	2.673	0.586	0.85	1	18.716			
			C	0.141	2.804	0.58	0.85	1	15.317			
Sum Weight:	330.350	3148.420						OTM	135675.57 lb-ft	2716.466		

Discrete Appurtenance Pressures - No Ice $G_H = 1.162$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft²	C_AA_C Side ft²
Pirod 4' Side Mount Standoff (1)	0.0000	50.000	0.000	-2.923	35.000	1.017	19	2.720	2.720
7' WHIP	0.0000	15.000	0.000	-4.923	35.000	1.017	19	1.400	1.400
Pirod 4' Side Mount Standoff (1)	0.0000	50.000	0.000	-2.634	45.000	1.093	20	2.720	2.720
20' WHIP	0.0000	60.000	0.000	-6.634	45.000	1.093	20	6.000	6.000
Pirod 4' Side Mount Standoff (1)	120.0000	50.000	2.281	1.317	50.000	1.126	21	2.720	2.720
19.5' WHIP	120.0000	32.000	5.745	3.317	50.000	1.126	21	5.850	5.850
Pirod 6' Side Mount Standoff (1)	120.0000	70.000	2.272	1.312	69.000	1.235	23	4.970	4.970
DB264-JJ	120.0000	36.000	7.468	4.312	69.000	1.235	23	3.160	3.160
Pirod 6' Side Mount Standoff (1)	0.0000	70.000	0.000	-2.620	72.000	1.250	23	4.970	4.970
19.5' WHIP	0.0000	32.000	0.000	-8.620	72.000	1.250	23	5.850	5.850
PR950	120.0000	38.000	2.260	1.305	90.000	1.332	25	5.950	2.975
4' WHIP	0.0000	8.250	0.000	-2.610	100.000	1.373	25	0.600	0.600
4' WHIP	120.0000	8.250	2.260	1.305	100.000	1.373	25	0.600	0.600
4' WHIP	240.0000	8.250	-2.260	1.305	100.000	1.373	25	0.600	0.600
ADP-U frame for 2 ant w 2' standoff	0.0000	300.000	0.000	-2.610	85.000	1.310	24	3.223	3.223
ADP-U frame for 2 ant w 2' standoff	120.0000	300.000	2.260	1.305	85.000	1.310	24	3.223	3.223
ADP-U frame for 2 ant w 2' standoff	240.0000	300.000	-2.260	1.305	85.000	1.310	24	3.223	3.223
LLPX310R	0.0000	28.700	0.000	-6.610	85.000	1.310	24	4.837	1.957
LLPX310R	120.0000	28.700	5.725	3.305	85.000	1.310	24	4.837	1.957
LLPX310R	240.0000	28.700	-5.725	3.305	85.000	1.310	24	4.837	1.957
Remote RU	0.0000	33.000	0.000	-6.610	80.000	1.288	24	0.000	0.856
Remote RU	120.0000	33.000	5.725	3.305	80.000	1.288	24	0.000	0.856
Remote RU	240.0000	33.000	-5.725	3.305	80.000	1.288	24	0.000	0.856
4' WHIP	0.0000	8.250	0.000	-3.212	30.000	1.000	18	0.600	0.600
	Sum Weight:	1621.100							

Discrete Appurtenance Pressures - With Ice $G_H = 1.162$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Pirod 4' Side Mount Standoff (1)	0.0000	89.000	0.000	-2.923	35.000	1.017	14	4.910	4.910	0.5000
7' WHIP	0.0000	25.919	0.000	-4.923	35.000	1.017	14	2.125	2.125	0.5000
Pirod 4' Side Mount Standoff (1)	0.0000	89.000	0.000	-2.634	45.000	1.093	15	4.910	4.910	0.5000
20' WHIP	0.0000	103.168	0.000	-6.634	45.000	1.093	15	8.033	8.033	0.5000
Pirod 4' Side Mount Standoff (1)	120.0000	89.000	2.281	1.317	50.000	1.126	16	4.910	4.910	0.5000
19.5' WHIP	120.0000	74.099	5.745	3.317	50.000	1.126	16	7.833	7.833	0.5000
Pirod 6' Side Mount Standoff (1)	120.0000	130.000	2.272	1.312	69.000	1.235	17	6.120	6.120	0.5000
DB264-JJ	120.0000	46.800	7.468	4.312	69.000	1.235	17	5.688	5.688	0.5000
Pirod 6' Side Mount Standoff (1)	0.0000	130.000	0.000	-2.620	72.000	1.250	17	6.120	6.120	0.5000
19.5' WHIP	0.0000	74.099	0.000	-8.620	72.000	1.250	17	7.833	7.833	0.5000
PR950	120.0000	75.009	2.260	1.305	90.000	1.332	18	6.291	3.258	0.5000
4' WHIP	0.0000	13.296	0.000	-2.610	100.000	1.373	19	0.919	0.919	0.5000
4' WHIP	120.0000	13.296	2.260	1.305	100.000	1.373	19	0.919	0.919	0.5000
4' WHIP	240.0000	13.296	-2.260	1.305	100.000	1.373	19	0.919	0.919	0.5000
ADP-U frame for 2 ant w 2' standoff	0.0000	333.960	0.000	-2.610	85.000	1.310	18	3.616	3.616	0.5000
ADP-U frame for 2 ant w 2' standoff	120.0000	333.960	2.260	1.305	85.000	1.310	18	3.616	3.616	0.5000
ADP-U frame for 2 ant w 2' standoff	240.0000	333.960	-2.260	1.305	85.000	1.310	18	3.616	3.616	0.5000
LLPX310R	0.0000	54.670	0.000	-6.610	85.000	1.310	18	5.191	2.226	0.5000
LLPX310R	120.0000	54.670	5.725	3.305	85.000	1.310	18	5.191	2.226	0.5000
LLPX310R	240.0000	54.670	-5.725	3.305	85.000	1.310	18	5.191	2.226	0.5000
Remote RU	0.0000	44.966	0.000	-6.610	80.000	1.288	18	0.000	0.999	0.5000
Remote RU	120.0000	44.966	5.725	3.305	80.000	1.288	18	0.000	0.999	0.5000
Remote RU	240.0000	44.966	-5.725	3.305	80.000	1.288	18	0.000	0.999	0.5000
4' WHIP	0.0000	13.296	0.000	-3.212	30.000	1.000	14	0.919	0.919	0.5000
	Sum Weight:	2280.069								

Discrete Appurtenance Pressures - Service $G_H = 1.162$

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Pirod 4' Side Mount Standoff (1)	0.0000	50.000	0.000	-2.923	35.000	1.017	9	2.720	2.720
7' WHIP	0.0000	15.000	0.000	-4.923	35.000	1.017	9	1.400	1.400
Pirod 4' Side Mount Standoff (1)	0.0000	50.000	0.000	-2.634	45.000	1.093	10	2.720	2.720
20' WHIP	0.0000	60.000	0.000	-6.634	45.000	1.093	10	6.000	6.000
Pirod 4' Side Mount Standoff (1)	120.0000	50.000	2.281	1.317	50.000	1.126	10	2.720	2.720
19.5' WHIP	120.0000	32.000	5.745	3.317	50.000	1.126	10	5.850	5.850
Pirod 6' Side Mount Standoff (1)	120.0000	70.000	2.272	1.312	69.000	1.235	11	4.970	4.970
DB264-JJ	120.0000	36.000	7.468	4.312	69.000	1.235	11	3.160	3.160
Pirod 6' Side Mount Standoff (1)	0.0000	70.000	0.000	-2.620	72.000	1.250	12	4.970	4.970
19.5' WHIP	0.0000	32.000	0.000	-8.620	72.000	1.250	12	5.850	5.850
PR950	120.0000	38.000	2.260	1.305	90.000	1.332	12	5.950	2.975
4' WHIP	0.0000	8.250	0.000	-2.610	100.000	1.373	13	0.600	0.600

Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
4' WHIP	120.0000	8.250	2.260	1.305	100.000	1.373	13	0.600	0.600
4' WHIP	240.0000	8.250	-2.260	1.305	100.000	1.373	13	0.600	0.600
ADP-U frame for 2 ant w 2' standoff	0.0000	300.000	0.000	-2.610	85.000	1.310	12	3.223	3.223
ADP-U frame for 2 ant w 2' standoff	120.0000	300.000	2.260	1.305	85.000	1.310	12	3.223	3.223
ADP-U frame for 2 ant w 2' standoff	240.0000	300.000	-2.260	1.305	85.000	1.310	12	3.223	3.223
LLPX310R	0.0000	28.700	0.000	-6.610	85.000	1.310	12	4.837	1.957
LLPX310R	120.0000	28.700	5.725	3.305	85.000	1.310	12	4.837	1.957
LLPX310R	240.0000	28.700	-5.725	3.305	85.000	1.310	12	4.837	1.957
Remote RU	0.0000	33.000	0.000	-6.610	80.000	1.288	12	0.000	0.856
Remote RU	120.0000	33.000	5.725	3.305	80.000	1.288	12	0.000	0.856
Remote RU	240.0000	33.000	-5.725	3.305	80.000	1.288	12	0.000	0.856
4' WHIP	0.0000	8.250	0.000	-3.212	30.000	1.000	9	0.600	0.600
	Sum Weight:	1621.100							

Dish Pressures - No Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
85.000	Andrew 2' w/Radome	0.0000	70.000	0.000	-4.610	1.310	3.142	24
85.000	Andrew 2' w/Radome	240.0000	70.000	-3.992	2.305	1.310	3.142	24
		Sum Weight:	140.000					

Dish Pressures - With Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf	t_z in
85.000	Andrew 2' w/Radome	0.0000	282.000	0.000	-4.610	1.310	3.409	18	0.5000
85.000	Andrew 2' w/Radome	240.0000	282.000	-3.992	2.305	1.310	3.409	18	0.5000
		Sum Weight:	564.000						

Dish Pressures - Service

Elevation ft	Dish Description	Aiming Azimuth °	Weight lb	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
85.000	Andrew 2' w/Radome	0.0000	70.000	0.000	-4.610	1.310	3.142	12
85.000	Andrew 2' w/Radome	240.0000	70.000	-3.992	2.305	1.310	3.142	12
		Sum Weight:	140.000					

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	1793.866					
Bracing Weight	1354.554					
Total Member Self-Weight	3148.420					
Total Weight	5239.870			-843.84	-1149.80	
Wind 0 deg - No Ice		-36.881	-7743.854	-843.84	-1149.80	
Wind 30 deg - No Ice		3679.701	-6373.429	-429050.49	2169.54	2605.08
Wind 60 deg - No Ice		6305.476	-3597.881	-353827.25	-204944.87	663.64
Wind 90 deg - No Ice		7423.283	36.881	-199605.81	-352054.29	-1396.23
Wind 120 deg - No Ice		6761.696	3903.867	2475.50	-414489.19	-3099.02
Wind 150 deg - No Ice		3743.582	6410.311	216134.12	-376966.64	-4040.64
Wind 180 deg - No Ice		36.881	7259.643	355458.91	-210694.12	-3762.66
Wind 210 deg - No Ice		-3679.701	6373.429	402429.35	-4469.13	-2539.01
Wind 240 deg - No Ice		-6724.815	3839.986	352139.57	202645.27	-663.64
Wind 270 deg - No Ice		-7423.283	-36.881	210384.86	371347.71	1435.56
Wind 300 deg - No Ice		-6342.357	-3661.762	-4163.17	412189.59	3099.02
Wind 330 deg - No Ice		-3743.582	-6410.311	-205355.06	353074.03	3935.24
Member Ice	2084.049			-357146.58	208394.52	3762.66
Total Weight Ice	9052.542					
Wind 0 deg - Ice		-28.204	-8405.977	-2991.16	-1493.70	
Wind 30 deg - Ice		4082.867	-7071.733	-456958.06	1044.62	3076.59
Wind 60 deg - Ice		7035.286	-4029.257	-384906.92	-221992.87	651.00
Wind 90 deg - Ice		8214.584	28.204	-220107.65	-382627.13	-1902.68
Wind 120 deg - Ice		7322.094	4227.413	-452.84	-446888.53	-3969.40
Wind 150 deg - Ice		4131.717	7099.937	226190.54	-398448.05	-5032.06
Wind 180 deg - Ice		28.204	8107.365	381462.92	-226389.36	-4620.41
Wind 210 deg - Ice		-4082.867	7071.733	435638.32	-4032.02	-3032.40
Wind 240 deg - Ice		-7293.891	4178.563	378924.60	219005.47	-651.00
Wind 270 deg - Ice		-8214.584	-28.204	221794.05	392922.33	1955.47
Wind 300 deg - Ice		-7063.489	-4078.107	-5529.47	443901.13	3969.40
Wind 330 deg - Ice		-4131.717	-7099.937	-224504.14	382178.04	4935.09
Total Weight	5239.870			-387445.23	223401.96	4620.41
Wind 0 deg - Service		-18.377	-3858.529	-843.84	-1149.80	
Wind 30 deg - Service		1833.484	-3175.688	-214290.66	1121.71	1298.03
Wind 60 deg - Service		3141.829	-1792.716	-176809.18	-102077.16	330.67
Wind 90 deg - Service		3698.798	18.377	-99965.28	-175377.36	-695.70
Wind 120 deg - Service		3369.150	1945.179	725.75	-206486.79	-1544.15
Wind 150 deg - Service		1865.314	3194.065	107185.41	-187790.44	-2013.33
Wind 180 deg - Service		18.377	3617.262	176606.76	-104941.85	-1874.82
Wind 210 deg - Service		-1833.484	3175.688	200010.72	-2186.14	-1265.11
Wind 240 deg - Service		-3350.773	1913.350	174952.83	101012.73	-330.67
Wind 270 deg - Service		-3698.798	-18.377	104320.73	185072.08	715.30
Wind 300 deg - Service		-3160.206	-1824.546	-2582.10	205422.36	1544.15
Wind 330 deg - Service		-1865.314	-3194.065	-102829.96	175966.85	1960.81
				-178463.11	103877.41	1874.82

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	IBC .6 Dead+Wind 0 deg - No Ice
4	Dead+Wind 30 deg - No Ice
5	IBC .6 Dead+Wind 30 deg - No Ice
6	Dead+Wind 60 deg - No Ice
7	IBC .6 Dead+Wind 60 deg - No Ice
8	Dead+Wind 90 deg - No Ice

Comb. No.	Description
9	IBC .6 Dead+Wind 90 deg - No Ice
10	Dead+Wind 120 deg - No Ice
11	IBC .6 Dead+Wind 120 deg - No Ice
12	Dead+Wind 150 deg - No Ice
13	IBC .6 Dead+Wind 150 deg - No Ice
14	Dead+Wind 180 deg - No Ice
15	IBC .6 Dead+Wind 180 deg - No Ice
16	Dead+Wind 210 deg - No Ice
17	IBC .6 Dead+Wind 210 deg - No Ice
18	Dead+Wind 240 deg - No Ice
19	IBC .6 Dead+Wind 240 deg - No Ice
20	Dead+Wind 270 deg - No Ice
21	IBC .6 Dead+Wind 270 deg - No Ice
22	Dead+Wind 300 deg - No Ice
23	IBC .6 Dead+Wind 300 deg - No Ice
24	Dead+Wind 330 deg - No Ice
25	IBC .6 Dead+Wind 330 deg - No Ice
26	Dead+Ice+Temp
27	Dead+Wind 0 deg+Ice+Temp
28	IBC .6 Dead+Wind 0 deg+.6 Ice+Temp
29	Dead+Wind 30 deg+Ice+Temp
30	IBC .6 Dead+Wind 30 deg+.6 Ice+Temp
31	Dead+Wind 60 deg+Ice+Temp
32	IBC .6 Dead+Wind 60 deg+.6 Ice+Temp
33	Dead+Wind 90 deg+Ice+Temp
34	IBC .6 Dead+Wind 90 deg+.6 Ice+Temp
35	Dead+Wind 120 deg+Ice+Temp
36	IBC .6 Dead+Wind 120 deg+.6 Ice+Temp
37	Dead+Wind 150 deg+Ice+Temp
38	IBC .6 Dead+Wind 150 deg+.6 Ice+Temp
39	Dead+Wind 180 deg+Ice+Temp
40	IBC .6 Dead+Wind 180 deg+.6 Ice+Temp
41	Dead+Wind 210 deg+Ice+Temp
42	IBC .6 Dead+Wind 210 deg+.6 Ice+Temp
43	Dead+Wind 240 deg+Ice+Temp
44	IBC .6 Dead+Wind 240 deg+.6 Ice+Temp
45	Dead+Wind 270 deg+Ice+Temp
46	IBC .6 Dead+Wind 270 deg+.6 Ice+Temp
47	Dead+Wind 300 deg+Ice+Temp
48	IBC .6 Dead+Wind 300 deg+.6 Ice+Temp
49	Dead+Wind 330 deg+Ice+Temp
50	IBC .6 Dead+Wind 330 deg+.6 Ice+Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 60 deg - Service
54	Dead+Wind 90 deg - Service
55	Dead+Wind 120 deg - Service
56	Dead+Wind 150 deg - Service
57	Dead+Wind 180 deg - Service
58	Dead+Wind 210 deg - Service
59	Dead+Wind 240 deg - Service
60	Dead+Wind 270 deg - Service
61	Dead+Wind 300 deg - Service
62	Dead+Wind 330 deg - Service

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	100 - 80	Leg	Max Tension	48	2963.653	58.19	35.54
			Max. Compression	27	-4479.189	6.72	-3.21
			Max. Mx	8	-514.419	136.33	1.13
			Max. My	2	296.859	-1.38	-139.87
			Max. Vy	20	-215.224	75.15	-0.91
			Max. Vx	2	-226.470	-1.38	83.16
		Diagonal	Max Tension	4	873.469	0.00	0.00
			Max. Compression	16	-877.159	0.00	0.00
			Max. Mx	49	468.450	4.64	-0.03
			Max. My	4	-873.927	-0.43	0.84
			Max. Vy	49	4.761	4.64	-0.03
			Max. Vx	31	0.285	0.00	0.00
		Top Girt	Max Tension	11	18.171	0.00	0.00
			Max. Compression	47	-24.380	0.00	0.00
			Max. Mx	31	-23.117	-7.24	0.00
			Max. My	49	-4.063	0.00	-0.00
			Max. Vy	26	6.403	0.00	0.00
			Max. Vx	49	-0.000	0.00	0.00
T2	80 - 60	Leg	Max Tension	48	16313.160	-19.86	-2.03
			Max. Compression	27	-19215.333	49.13	-9.84
			Max. Mx	27	-12105.431	54.26	-42.83
			Max. My	41	-1108.038	-0.56	-110.56
			Max. Vy	2	123.001	29.32	-21.92
			Max. Vx	20	-327.841	0.02	-18.83
		Diagonal	Max Tension	49	1936.943	0.00	0.00
			Max. Compression	37	-1963.097	0.00	0.00
			Max. Mx	27	1169.631	10.73	-0.58
			Max. My	37	-1841.290	-1.96	2.32
			Max. Vy	27	-6.803	10.73	-0.58
			Max. Vx	37	-0.770	-1.96	2.32
T3	60 - 40	Leg	Max Tension	48	38039.466	25.49	59.11
			Max. Compression	35	-42634.106	-172.18	-102.49
			Max. Mx	33	-2196.677	-311.29	-13.72
			Max. My	27	15951.881	88.14	224.73
			Max. Vy	33	259.908	-311.29	-13.72
			Max. Vx	29	148.609	-96.17	186.56
		Diagonal	Max Tension	49	3006.955	0.00	0.00
			Max. Compression	35	-3159.316	0.00	0.00
			Max. Mx	35	2456.225	22.54	-0.60
			Max. My	33	-2071.464	-9.28	6.63
			Max. Vy	35	-11.376	22.54	-0.60
			Max. Vx	33	-2.192	-9.28	6.63
T4	40 - 20	Leg	Max Tension	48	49057.136	-25.42	-7.44
			Max. Compression	35	-55084.532	42.57	4.84
			Max. Mx	10	-44893.984	200.40	-0.33
			Max. My	33	-2449.134	-0.79	243.54
			Max. Vy	10	46.093	200.40	-0.33
			Max. Vx	33	151.686	-0.79	243.54
		Diagonal	Max Tension	35	1704.052	0.00	0.00
			Max. Compression	35	-1844.883	0.00	0.00
			Max. Mx	27	630.192	13.53	-2.40
			Max. My	49	-1655.850	-5.17	-6.83
			Max. Vy	27	-7.499	13.53	-2.40
			Max. Vx	49	2.203	0.00	0.00
		Top Girt	Max Tension	48	161.624	0.00	0.00
			Max. Compression	10	-198.956	0.00	0.00
			Max. Mx	26	20.417	-7.37	0.00
			Max. My	35	92.975	0.00	0.21
			Max. Vy	26	6.459	0.00	0.00
			Max. Vx	35	-0.187	0.00	0.00
T5	20 - 0	Leg	Max Tension	48	56739.149	66.41	-5.01

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	35	-64158.023	0.00	0.01
			Max. Mx	48	55530.709	-242.21	-3.27
			Max. My	33	-2737.411	135.75	193.11
			Max. Vy	48	-75.452	-242.21	-3.27
			Max. Vx	33	55.992	135.75	193.11
		Diagonal	Max Tension	38	1732.280	0.00	0.00
			Max. Compression	37	-1745.753	0.00	0.00
			Max. Mx	47	203.418	16.13	-1.25
			Max. My	49	-1721.643	5.18	-3.66
			Max. Vy	47	9.090	16.13	-1.25
			Max. Vx	49	0.999	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	43	64052.574	4333.464	-2658.246
	Max. H_x	43	64052.574	4333.464	-2658.246
	Max. H_z	32	-57554.912	-4621.989	2818.800
	Min. Vert	32	-57554.912	-4621.989	2818.800
	Min. H_x	32	-57554.912	-4621.989	2818.800
	Min. H_z	43	64052.574	4333.464	-2658.246
Leg B	Max. Vert	35	64999.976	-4267.096	-2856.136
	Max. H_x	48	-57939.726	4546.987	3011.547
	Max. H_z	48	-57939.726	4546.987	3011.547
	Min. Vert	48	-57939.726	4546.987	3011.547
	Min. H_x	35	64999.976	-4267.096	-2856.136
	Min. H_z	35	64999.976	-4267.096	-2856.136
Leg A	Max. Vert	27	64837.421	204.616	5096.272
	Max. H_x	47	33395.094	592.927	2352.343
	Max. H_z	27	64837.421	204.616	5096.272
	Min. Vert	40	-57086.474	-204.340	-5403.961
	Min. H_x	36	-28844.166	-598.363	-2979.896
	Min. H_z	40	-57086.474	-204.340	-5403.961

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	5239.870	-0.000	0.000	-843.72	-1149.80	-0.00
Dead+Wind 0 deg - No Ice	5239.870	-36.881	-7743.854	-431168.37	2168.63	2616.76
IBC .6 Dead+Wind 0 deg - No Ice	3143.922	-36.881	-7743.854	-429972.02	2624.82	2611.61
Dead+Wind 30 deg - No Ice	5239.870	3679.702	-6373.430	-355571.41	-205961.65	670.79
IBC .6 Dead+Wind 30 deg - No Ice	3143.922	3679.702	-6373.430	-354526.08	-205089.96	668.80
Dead+Wind 60 deg - No Ice	5239.870	6305.477	-3597.882	-200594.95	-353795.47	-1398.19
IBC .6 Dead+Wind 60 deg - No Ice	3143.900	6305.465	-3597.809	-199858.27	-352628.23	-1397.04
Dead+Wind 90 deg - No Ice	5239.870	7423.284	36.881	2474.96	-416543.87	-3109.60
IBC .6 Dead+Wind 90 deg - No	3143.922	7423.284	36.881	2807.75	-415250.76	-3106.14

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Ice						
Dead+Wind 120 deg - No Ice	5239.870	6761.697	3903.867	217183.45	-378846.16	-4054.27
IBC .6 Dead+Wind 120 deg - No Ice	3143.922	6761.697	3903.867	217089.64	-377627.69	-4048.29
Dead+Wind 150 deg - No Ice	5239.870	3743.582	6410.312	357206.14	-211762.11	-3775.04
IBC .6 Dead+Wind 150 deg - No Ice	3143.922	3743.582	6410.312	356834.01	-210875.31	-3769.17
Dead+Wind 180 deg - No Ice	5239.870	36.882	7259.644	404417.60	-4513.95	-2549.91
IBC .6 Dead+Wind 180 deg - No Ice	3143.906	36.829	7259.604	403952.54	-4039.67	-2545.14
Dead+Wind 210 deg - No Ice	5239.870	-3679.701	6373.431	353877.14	203636.66	-670.78
IBC .6 Dead+Wind 210 deg - No Ice	3143.922	-3679.701	6373.431	353514.18	203696.07	-668.80
Dead+Wind 240 deg - No Ice	5239.870	-6724.816	3839.986	211408.27	373181.38	1437.53
IBC .6 Dead+Wind 240 deg - No Ice	3143.922	-6724.815	3839.987	211330.68	372902.62	1436.69
Dead+Wind 270 deg - No Ice	5239.870	-7423.284	-36.882	-4209.99	414228.08	3109.49
IBC .6 Dead+Wind 270 deg - No Ice	3143.922	-7423.284	-36.882	-3858.48	413865.07	3106.02
Dead+Wind 300 deg - No Ice	5239.870	-6342.359	-3661.763	-206396.69	354813.93	3948.09
IBC .6 Dead+Wind 300 deg - No Ice	3143.920	-6342.363	-3661.761	-205643.82	354567.70	3942.56
Dead+Wind 330 deg - No Ice	5239.870	-3743.583	-6410.311	-358926.33	209412.25	3775.17
IBC .6 Dead+Wind 330 deg - No Ice	3143.922	-3743.583	-6410.312	-357871.55	209455.05	3769.20
Dead+Ice+Temp	9052.542	-0.000	0.000	-3023.53	-1503.13	0.03
Dead+Wind 0 deg+Ice+Temp	9052.542	-28.203	-8405.977	-460646.69	1045.17	3087.68
IBC .6 Dead+Wind 0 deg+.6 Ice+Temp	5431.525	-28.203	-8405.978	-457887.62	1637.63	3082.76
Dead+Wind 30 deg+Ice+Temp	9052.542	4082.867	-7071.734	-388009.09	-223782.15	647.01
IBC .6 Dead+Wind 30 deg+.6 Ice+Temp	5431.525	4082.867	-7071.734	-385496.19	-222429.99	649.39
Dead+Wind 60 deg+Ice+Temp	9052.542	7035.285	-4029.257	-221892.53	-385708.42	-1924.01
IBC .6 Dead+Wind 60 deg+.6 Ice+Temp	5431.525	7035.285	-4029.257	-219938.55	-383808.58	-1915.09
Dead+Wind 90 deg+Ice+Temp	9052.542	8214.585	28.204	-483.10	-450496.42	-4002.71
IBC .6 Dead+Wind 90 deg+.6 Ice+Temp	5431.525	8214.586	28.205	726.50	-448376.27	-3989.49
Dead+Wind 120 deg+Ice+Temp	9052.542	7322.095	4227.414	227980.32	-401683.14	-5065.35
IBC .6 Dead+Wind 120 deg+.6 Ice+Temp	5431.525	7322.097	4227.414	228421.15	-399725.45	-5051.12
Dead+Wind 150 deg+Ice+Temp	9052.542	4131.717	7099.937	384512.33	-228249.10	-4643.19
IBC .6 Dead+Wind 150 deg+.6 Ice+Temp	5431.525	4131.718	7099.937	384427.22	-226874.98	-4632.41
Dead+Wind 180 deg+Ice+Temp	9052.542	28.203	8107.365	439134.01	-4096.00	-3043.12
IBC .6 Dead+Wind 180 deg+.6 Ice+Temp	5431.525	28.203	8107.364	438866.73	-3476.35	-3038.22
Dead+Wind 210 deg+Ice+Temp	9052.542	-4082.867	7071.733	381961.20	220755.05	-646.99
IBC .6 Dead+Wind 210 deg+.6 Ice+Temp	5431.525	-4082.868	7071.733	381888.33	220616.45	-649.38
Dead+Wind 240 deg+Ice+Temp	9052.542	-7293.891	4178.563	223549.65	396089.58	1977.60
IBC .6 Dead+Wind 240 deg+.6 Ice+Temp	5431.525	-7293.892	4178.564	224011.79	395357.36	1968.33
Dead+Wind 270 deg+Ice+Temp	9052.542	-8214.585	-28.203	-5619.12	447482.95	4002.64
IBC .6 Dead+Wind 270 deg+.6 Ice+Temp	5431.525	-8214.586	-28.202	-4384.80	446574.62	3989.41
Dead+Wind 300 deg+Ice+Temp	9052.542	-7063.490	-4078.107	-226356.40	385256.26	4967.03
IBC .6 Dead+Wind 300 deg+.6 Ice+Temp	5431.525	-7063.490	-4078.107	-224380.83	384554.84	4953.30
Dead+Wind 330 deg+Ice+Temp	9052.542	-4131.718	-7099.937	-390593.08	225193.76	4643.07
IBC .6 Dead+Wind 330 deg+.6	5431.525	-4131.717	-7099.938	-388067.73	225030.13	4632.37

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
Ice+Temp						
Dead+Wind 0 deg - Service	5239.870	-18.377	-3858.529	-215271.48	503.62	1303.92
Dead+Wind 30 deg - Service	5239.870	1833.484	-3175.688	-177602.24	-103207.00	333.34
Dead+Wind 60 deg - Service	5239.870	3141.829	-1792.716	-100377.76	-176871.57	-696.74
Dead+Wind 90 deg - Service	5239.870	3698.798	18.377	811.07	-208137.89	-1548.57
Dead+Wind 120 deg - Service	5239.870	3369.150	1945.179	107798.20	-189351.88	-2020.21
Dead+Wind 150 deg - Service	5239.870	1865.314	3194.065	177565.45	-106093.86	-1881.94
Dead+Wind 180 deg - Service	5239.857	18.418	3617.230	201087.41	-2826.57	-1270.56
Dead+Wind 210 deg - Service	5239.870	-1833.484	3175.688	175903.70	100888.75	-333.33
Dead+Wind 240 deg - Service	5239.870	-3350.773	1913.350	104916.79	185369.02	716.29
Dead+Wind 270 deg - Service	5239.870	-3698.798	-18.377	-2519.96	205822.05	1548.53
Dead+Wind 300 deg - Service	5239.870	-3160.206	-1824.546	-103265.54	176219.15	1967.02
Dead+Wind 330 deg - Service	5239.870	-1865.314	-3194.064	-179270.30	103769.55	1881.90

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	-0.000	-5239.870	0.000	0.000	5239.870	-0.000	0.000%
2	-36.881	-5239.870	-7743.853	36.881	5239.870	7743.854	0.000%
3	-36.881	-3143.922	-7743.853	36.881	3143.922	7743.854	0.000%
4	3679.701	-5239.870	-6373.429	-3679.702	5239.870	6373.430	0.000%
5	3679.701	-3143.922	-6373.429	-3679.702	3143.922	6373.430	0.000%
6	6305.476	-5239.870	-3597.881	-6305.477	5239.870	3597.882	0.000%
7	6305.476	-3143.922	-3597.881	-6305.465	3143.900	3597.809	0.001%
8	7423.283	-5239.870	36.881	-7423.284	5239.870	-36.881	0.000%
9	7423.283	-3143.922	36.881	-7423.284	3143.922	-36.881	0.000%
10	6761.696	-5239.870	3903.867	-6761.697	5239.870	-3903.867	0.000%
11	6761.696	-3143.922	3903.867	-6761.697	3143.922	-3903.867	0.000%
12	3743.582	-5239.870	6410.311	-3743.582	5239.870	-6410.312	0.000%
13	3743.582	-3143.922	6410.311	-3743.582	3143.922	-6410.312	0.000%
14	36.881	-5239.870	7259.643	-36.882	5239.870	-7259.644	0.000%
15	36.881	-3143.922	7259.643	-36.829	3143.906	-7259.604	0.001%
16	-3679.701	-5239.870	6373.429	3679.701	5239.870	-6373.431	0.000%
17	-3679.701	-3143.922	6373.429	3679.701	3143.922	-6373.431	0.000%
18	-6724.815	-5239.870	3839.986	6724.816	5239.870	-3839.986	0.000%
19	-6724.815	-3143.922	3839.986	6724.815	3143.922	-3839.987	0.000%
20	-7423.283	-5239.870	-36.881	7423.284	5239.870	36.882	0.000%
21	-7423.283	-3143.922	-36.881	7423.284	3143.922	36.882	0.000%
22	-6342.357	-5239.870	-3661.762	6342.359	5239.870	3661.763	0.000%
23	-6342.357	-3143.922	-3661.762	6342.363	3143.920	3661.761	0.000%
24	-3743.582	-5239.870	-6410.311	3743.583	5239.870	6410.311	0.000%
25	-3743.582	-3143.922	-6410.311	3743.583	3143.922	6410.312	0.000%
26	-0.000	-9052.542	0.000	0.000	9052.542	-0.000	0.000%
27	-28.204	-9052.542	-8405.976	28.203	9052.542	8405.977	0.000%
28	-28.204	-5431.525	-8405.976	28.203	5431.525	8405.978	0.000%
29	4082.867	-9052.542	-7071.733	-4082.867	9052.542	7071.734	0.000%
30	4082.867	-5431.525	-7071.733	-4082.867	5431.525	7071.734	0.000%
31	7035.285	-9052.542	-4029.257	-7035.285	9052.542	4029.257	0.000%
32	7035.285	-5431.525	-4029.257	-7035.285	5431.525	4029.257	0.000%
33	8214.584	-9052.542	28.204	-8214.585	9052.542	-28.204	0.000%
34	8214.584	-5431.525	28.204	-8214.586	5431.525	-28.205	0.000%
35	7322.094	-9052.542	4227.413	-7322.095	9052.542	-4227.414	0.000%
36	7322.094	-5431.525	4227.413	-7322.097	5431.525	-4227.414	0.000%
37	4131.717	-9052.542	7099.937	-4131.717	9052.542	-7099.937	0.000%
38	4131.717	-5431.525	7099.937	-4131.718	5431.525	-7099.937	0.000%
39	28.204	-9052.542	8107.365	-28.203	9052.542	-8107.365	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
40	28.204	-5431.525	8107.365	-28.203	5431.525	-8107.364	0.000%
41	-4082.867	-9052.542	7071.733	4082.867	9052.542	-7071.733	0.000%
42	-4082.867	-5431.525	7071.733	4082.868	5431.525	-7071.733	0.000%
43	-7293.891	-9052.542	4178.563	7293.891	9052.542	-4178.563	0.000%
44	-7293.891	-5431.525	4178.563	7293.892	5431.525	-4178.564	0.000%
45	-8214.584	-9052.542	-28.204	8214.585	9052.542	28.203	0.000%
46	-8214.584	-5431.525	-28.204	8214.586	5431.525	28.202	0.000%
47	-7063.489	-9052.542	-4078.107	7063.490	9052.542	4078.107	0.000%
48	-7063.489	-5431.525	-4078.107	7063.490	5431.525	4078.107	0.000%
49	-4131.717	-9052.542	-7099.937	4131.718	9052.542	7099.937	0.000%
50	-4131.717	-5431.525	-7099.937	4131.717	5431.525	7099.938	0.000%
51	-18.377	-5239.870	-3858.529	18.377	5239.870	3858.529	0.000%
52	1833.484	-5239.870	-3175.688	-1833.484	5239.870	3175.688	0.000%
53	3141.829	-5239.870	-1792.716	-3141.829	5239.870	1792.716	0.000%
54	3698.798	-5239.870	18.377	-3698.798	5239.870	-18.377	0.000%
55	3369.150	-5239.870	1945.179	-3369.150	5239.870	-1945.179	0.000%
56	1865.314	-5239.870	3194.065	-1865.314	5239.870	-3194.065	0.000%
57	18.377	-5239.870	3617.261	-18.418	5239.857	-3617.230	0.001%
58	-1833.484	-5239.870	3175.688	1833.484	5239.870	-3175.688	0.000%
59	-3350.773	-5239.870	1913.350	3350.773	5239.870	-1913.350	0.000%
60	-3698.798	-5239.870	-18.377	3698.798	5239.870	18.377	0.000%
61	-3160.206	-5239.870	-1824.546	3160.206	5239.870	1824.546	0.000%
62	-1865.314	-5239.870	-3194.065	1865.314	5239.870	3194.064	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000001
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000372
28	Yes	4	0.00000001	0.00000394

29	Yes	4	0.00000001	0.00000374
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000406
34	Yes	4	0.00000001	0.00000354
35	Yes	4	0.00000001	0.00000381
36	Yes	4	0.00000001	0.00000401
37	Yes	4	0.00000001	0.00000367
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000363
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000362
44	Yes	4	0.00000001	0.00000387
45	Yes	4	0.00000001	0.00000400
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000373
50	Yes	4	0.00000001	0.00000001
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation	Horz. Deflection	Gov. Load Comb.	Tilt	Twist
	ft	in		°	°
T1	100 - 80	6.044	55	0.4605	0.0930
T2	80 - 60	4.115	55	0.4514	0.0918
T3	60 - 40	2.322	55	0.3723	0.0754
T4	40 - 20	0.981	55	0.2374	0.0541
T5	20 - 0	0.244	55	0.1091	0.0197

Critical Deflections and Radius of Curvature - Service Wind

Elevation	Appurtenance	Gov. Load Comb.	Deflection	Tilt	Twist	Radius of Curvature
ft			in	°	°	ft
100.000	4' WHIP	55	6.044	0.4605	0.0930	236145
90.000	PR950	55	5.075	0.4615	0.0939	118072
85.000	Andrew 2' w/Radome	55	4.593	0.4585	0.0935	78715
80.000	Remote RU	55	4.115	0.4514	0.0918	50627
72.000	Pirod 6' Side Mount Standoff (1)	55	3.365	0.4291	0.0865	19386

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
69.000	Pirod 6' Side Mount Standoff (1)	55	3.092	0.4174	0.0839	15469
50.000	Pirod 4' Side Mount Standoff (1)	55	1.581	0.3077	0.0662	8473
45.000	Pirod 4' Side Mount Standoff (1)	55	1.262	0.2726	0.0607	7992
35.000	Pirod 4' Side Mount Standoff (1)	55	0.739	0.2033	0.0459	7722
30.000	4' WHIP	55	0.536	0.1705	0.0368	7886

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	100 - 80	12.456	27	0.9433	0.2218
T2	80 - 60	8.514	35	0.9240	0.2180
T3	60 - 40	4.845	35	0.7668	0.1803
T4	40 - 20	2.068	35	0.4948	0.1308
T5	20 - 0	0.518	35	0.2296	0.0488

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
100.000	4' WHIP	27	12.456	0.9433	0.2218	112128
90.000	PR950	35	10.471	0.9446	0.2233	56064
85.000	Andrew 2' w/Radome	35	9.489	0.9384	0.2219	37376
80.000	Remote RU	35	8.514	0.9240	0.2180	24350
72.000	Pirod 6' Side Mount Standoff (1)	35	6.982	0.8795	0.2057	9655
69.000	Pirod 6' Side Mount Standoff (1)	35	6.425	0.8561	0.1997	7716
50.000	Pirod 4' Side Mount Standoff (1)	35	3.315	0.6376	0.1590	4229
45.000	Pirod 4' Side Mount Standoff (1)	35	2.654	0.5665	0.1464	3962
35.000	Pirod 4' Side Mount Standoff (1)	35	1.563	0.4248	0.1114	3771
30.000	4' WHIP	35	1.136	0.3572	0.0899	3819

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	100	Leg	A325N	0.6250	4	740.913	13499.000	0.055 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	873.469	2356.250	0.371 ✔	1.333	Member Block Shear
T2	80	Leg	A325N	0.6250	4	4078.290	13499.000	0.302 ✔	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1936.940	2356.250	0.822 ✔	1.333	Member Block Shear
T3	60	Leg	A325N	0.6250	4	9509.870	13499.000	0.704 ✔	1.333	Bolt Tension

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load lb	Ratio Load / Allowable	Allowable Ratio	Criteria
		Diagonal	A325N	0.5000	1	3006.960	3534.380	0.851 ✓	1.333	Member Block Shear
T4	40	Leg	A325N	0.7500	4	12264.300	19438.600	0.631 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1704.050	2356.250	0.723 ✓	1.333	Member Block Shear
T5	20	Leg	A325N	0.7500	4	14184.800	19438.600	0.730 ✓	1.333	Bolt Tension
		Diagonal	A325N	0.5000	1	1732.280	2356.250	0.735 ✓	1.333	Member Block Shear

Compression Checks

Leg 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	100 - 80	ROHN 2 STD	20.000	4.000	61.0 K=1.00	22.549	1.0745	-4479.190	24229.900	0.185 ✓
T2	80 - 60	ROHN 2 STD	20.000	4.000	61.0 K=1.00	22.549	1.0745	-19215.301	24229.900	0.793 ✓
T3	60 - 40	ROHN 2.5 STD	20.000	4.000	50.7 K=1.00	24.247	1.7040	-42634.102	41317.801	1.032 ✓
T4	40 - 20	ROHN 2.5 X-STR	20.033	5.008	65.0 K=1.00	21.839	2.2535	-55084.500	49214.500	1.119 ✓
T5	20 - 0	ROHN 2.5 X-STR	20.035	5.009	65.0 K=1.00	21.838	2.2535	-64158.000	49212.699	1.304 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	100 - 80	L1 1/2x1 1/2x1/8	6.036	2.886	58.5 K=0.50	17.576	0.3594	-877.159	6316.480	0.139 ✓
T2	80 - 60	L1 1/2x1 1/2x1/8	6.065	2.903	58.8 K=0.50	17.543	0.3594	-1963.100	6304.510	0.311 ✓
T3	60 - 40	L1 1/2x1 1/2x3/16	6.068	2.875	58.8 K=0.50	17.545	0.5273	-3159.320	9252.260	0.341 ✓
T4	40 - 20	L1 1/2x1 1/2x1/8	6.941	3.498	70.9 K=0.50	16.341	0.3594	-1844.880	5872.440	0.314 ✓
T5	20 - 0	L1 1/2x1 1/2x1/8	9.299	4.661	94.4 K=0.50	13.672	0.3594	-1745.750	4913.300	0.355 ✓

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	100 - 80	L1 1/2x1 1/2x1/8	4.521	4.323	175.1 K=1.00	4.868	0.3594	-24.380	1749.510	0.014 ✔
T4	40 - 20	L1 1/2x1 1/2x1/8	4.563	4.323	175.1 K=1.00	4.868	0.3594	-198.956	1749.510	0.114 ✔

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	100 - 80	ROHN 2 STD	20.000	4.000	61.0	30.000	1.0745	2963.650	32235.900	0.092 ✔
T2	80 - 60	ROHN 2 STD	20.000	4.000	61.0	30.000	1.0745	16313.200	32235.900	0.506 ✔
T3	60 - 40	ROHN 2.5 STD	20.000	4.000	50.7	30.000	1.7040	38039.500	51121.500	0.744 ✔
T4	40 - 20	ROHN 2.5 X-STR	20.033	5.008	65.0	30.000	2.2535	49057.102	67606.203	0.726 ✔
T5	20 - 0	ROHN 2.5 X-STR	20.035	5.009	65.0	30.000	2.2535	56739.102	67606.203	0.839 ✔

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	100 - 80	L1 1/2x1 1/2x1/8	6.036	2.886	111.7	29.000	0.2109	873.469	6117.190	0.143 ✔
T2	80 - 60	L1 1/2x1 1/2x1/8	6.065	2.903	112.3	29.000	0.2109	1936.940	6117.190	0.317 ✔
T3	60 - 40	L1 1/2x1 1/2x3/16	6.068	2.875	113.3	29.000	0.3076	3006.960	8920.900	0.337 ✔
T4	40 - 20	L1 1/2x1 1/2x1/8	7.297	3.667	137.5	29.000	0.2109	1704.050	6117.190	0.279 ✔
T5	20 - 0	L1 1/2x1 1/2x1/8	9.733	4.876	184.8	29.000	0.2109	1732.280	6117.190	0.283 ✔

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	F_a ksi	A in^2	Actual P lb	Allow. P_a lb	Ratio $\frac{P}{P_a}$
T1	100 - 80	L1 1/2x1 1/2x1/8	4.521	4.323	111.5	21.600	0.3594	18.171	7762.500	0.002 ✓
T4	40 - 20	L1 1/2x1 1/2x1/8	4.563	4.323	111.5	21.600	0.3594	161.624	7762.500	0.021 ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$SF*P_{allow}$ lb	% Capacity	Pass Fail
T1	100 - 80	Leg	ROHN 2 STD	3	-4479.190	32298.456	13.9	Pass
		Diagonal	L1 1/2x1 1/2x1/8	12	873.469	8154.214	10.7	Pass
							27.8 (b)	
		Top Girt	L1 1/2x1 1/2x1/8	6	-24.380	2332.097	1.0	Pass
T2	80 - 60	Leg	ROHN 2 STD	39	-19215.301	32298.456	59.5	Pass
		Diagonal	L1 1/2x1 1/2x1/8	42	1936.940	8154.214	23.8	Pass
							61.7 (b)	
T3	60 - 40	Leg	ROHN 2.5 STD	71	-42634.102	55076.626	77.4	Pass
		Diagonal	L1 1/2x1 1/2x3/16	75	-3159.320	12333.262	25.6	Pass
							63.8 (b)	
T4	40 - 20	Leg	ROHN 2.5 X-STR	104	-55084.500	65602.926	84.0	Pass
		Diagonal	L1 1/2x1 1/2x1/8	129	-1844.880	7827.962	23.6	Pass
							54.3 (b)	
		Top Girt	L1 1/2x1 1/2x1/8	108	-198.956	2332.097	8.5	Pass
T5	20 - 0	Leg	ROHN 2.5 X-STR	134	-64158.000	65600.525	97.8	Pass
		Diagonal	L1 1/2x1 1/2x1/8	144	-1745.750	6549.428	26.7	Pass
							55.2 (b)	
							Summary	
							Leg (T5) 97.8	Pass
							Diagonal (T3) 63.8	Pass
							Top Girt (T4) 8.5	Pass
							Bolt Checks 63.8	Pass
							RATING = 97.8	**Pass**